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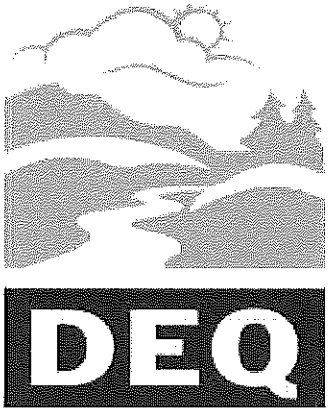
OREGON
ENVIRONMENTAL QUALITY
COMMISSION MEETING
MATERIALS 08/18/1995



State of Oregon
Department of Environmental Quality

A G E N D A

ENVIRONMENTAL QUALITY COMMISSION MEETING

August 18, 1995
High Desert Museum, south of Bend

<u>Friday, August 18, 1995</u>: Regular Meeting beginning at 9:00 a.m.

Notes:

Because of the uncertain length of time needed for each agenda item, the Commission may deal with any item at any time in the meeting. If a specific time is indicated for an agenda item, an effort will be made to consider that item as close to that time as possible. However, scheduled times may be modified if agreeable with participants. Anyone wishing to be heard or listen to the discussion on any item should arrive at the beginning of the meeting to avoid missing the item of interest.

Public Forum: *The Commission will break the meeting at approximately* ***12:00 p.m.*** *for the Public Forum if there are people signed up to speak. The Public Forum is an opportunity for citizens to speak to the Commission on environmental issues and concerns not a part of the agenda for this meeting. Individual presentations will be limited to 5 minutes. The Commission may discontinue this forum after a reasonable time if an exceptionally large number of speakers wish to appear.*

A. Approval of Minutes

B. Approval of Tax Credits

C. **Action Item:** Revisions to the Klamath Falls PM_{10} Control Plan as Amendment to the Oregon Clean Air Act State Implementation and Rule Clarifications and Housekeeping Amendments to Divisions 25, 28, and 32

~~D. †**Rule Adoption:** Rule Clarifications and Housekeeping Amendments to Divisions 25, 28, and 32~~

E. **Information Item:** Willamette River Basin Water Quality Study Phase II

F. DEQ v. Bolch, et al. HW-SWR-92-241

G. Commissioners' Report (Oral)

H. Director's Report (Oral)

10:00 a.m. - FORUM ON GROWTH IN CENTRAL OREGON: *A panel discussion between the EQC and an invited panel from Crook, Deschutes and Jefferson Counties*

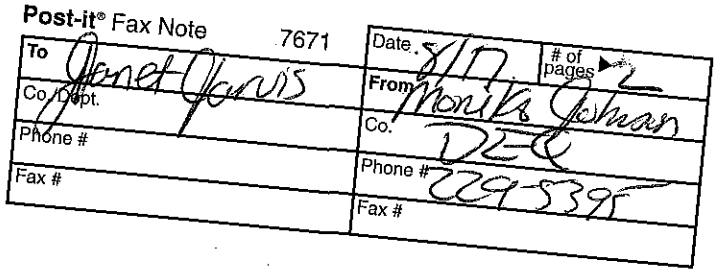
†*Hearings have already been held on the Rule Adoption items; therefore, any testimony received will be limited to comments on changes proposed by the Department in response to hearing testimony. The Commission also may choose to question interested parties present at the meeting.*

The Commission has set aside September 28-29, 1995, for their next meeting. The location has not been established.

Copies of staff reports for individual agenda items are available by contacting the Director's Office of the Department of Environmental Quality, 811 S. W. Sixth Avenue, Portland, Oregon 97204, telephone 229-5395, or toll-free 1-800-452-4011. Please specify the agenda item letter when requesting.

If special physical, language or other accommodations are needed for this meeting, please advise the Director's Office, (503)229-5395 (voice)/(503)229-6993 (TTY) as soon as possible but at least 48 hours in advance of the meeting.

August 16, 1995



Approved ✓
Approved with Corrections _____

Minutes are not final until approved by the EQC

ENVIRONMENTAL QUALITY COMMISSION
Minutes of the Two Hundred and Forty Third Meeting

April 14, 1995
REGULAR MEETING

The Environmental Quality Commission regular meeting was convened at 9 a.m. on Friday, April 14, 1995, in Conference Room 3A, Oregon Department of Environmental Quality (DEQ), 811 S. W. Sixth Avenue, Portland, Oregon. The following Commission members were present:

William Wessinger, Chair
Henry Lorenzen, Member
Linda McMahan, Member
Carol Whipple, Member

(Vice Chair Castle was unable to attend this meeting.)

Also present were Lydia Taylor, Interim Director, DEQ, Michael Huston, Assistant Attorney General, Oregon Department of Justice, and other DEQ staff.

Note: Staff reports represented at this meeting, which contain the Department's recommendations, are on file in the Office of the Director, DEQ, 811 S. W. Sixth Avenue, Portland, Oregon 97204. Written material submitted at this meeting is made a part of this record and is on file at the above address. These written materials are incorporated into the minutes of the meeting by reference.

A. Approval of minutes.

Commissioner Whipple moved approval of the February 16, 1995, special meeting minutes; Commissioner McMahan seconded the motion. The motion was unanimously approved.

B. Approval of tax credits.

The Department recommended issuance of the following tax credit applications.

Application Number	Applicant	Description
TC 4220	Source Recycling, Inc. ($65,390)	A reclaimed plastic facility consisting of a conveyor sorting system, roll-up door, forklift and baler conveyor belt for reclaiming and recycling plastic material.
TC 4299	Carmichael Columbia Oil, Inc. ($188,988/79%)	A UST water pollution control facility consisting of four doublewall fiberglass tanks, piping, spill containment basins, a tank gauge system, float vent valves, automatic shutoff valves, line leak detectors, sumps, an oil/water separator, Stage I vapor recovery equipment and Stage II vapor recovery piping.
TC 4337	Carlton Truck Stop ($22,110)	A water pollution control facility consisting of a Kracher wastewater treatment facility comprised of settlement, mixing and filter components.
TC 4342	Ron Larvik, aka City Garbage Service ($6,488)	A reclaimed plastic facility consisting of two 40 yd. drop boxes, four stellar hooks and ten instruction signs.
TC 4345	Portland Willamette, Buyers Industries ($101,328/95%)	A water pollution control wastewater treatment facility consisting of electroplating, mesh painting and powder coating components.
TC 4346	Consolidated Metco, Inc. ($19,500)	A water pollution control wastewater treatment facility consisting of a natural gas fired Asendor Wastewater Evaporator.
TC 4351	Kelly Farms, Inc. ($78,865)	An air quality field burning facility consisting of a 162' x 74' x 27' steel structure straw storage building.

Tax credit application review reports with facility costs over $250,000.

Application Number	Applicant	Description
TC 4308	Ore-Ida Foods, Inc. ($10,716,986)	A water pollution control facility consisting of the redesign and replacement of a wastewater treatment system for a vegetable processing plant.

The Department recommended the Commission approve certification for the tax credit applications listed above. The Department also recommended approval of Weyerhaeuser Company's request for an extension to file a pollution control facilities tax credit application and revocation of tax credit certificate 2295, Carmichael Columbia Oil, Inc.

Commissioner Lorenzen moved approval of the Department's recommendations; Commissioner Whipple seconded the motion. The motion was unanimously approved.

H. Action item: National Marine Fisheries Service (NMFS) request for variance from Total Dissolved Gas (TDG).

On March 27, 1995, the Commission received a petition from the NMFS seeking a variation to the state's water quality standard for TDG on the mainstem Columbia River to enable spill over hydroelectric dams for outmigrating threatened and endangered salmon smolts. The service sought the variation to allow for a TDG standard of 115 percent as a daily (12 highest hours) average as monitored at forebays and a daily (12 highest hours) average of 120 percent as measured in tailrace monitors below the dams. The variation was requested to begin on April 29 through August 31, 1995.

The Department recommended the Commission grant the petition, subject to implementation of the physical and biological monitoring regime as detailed in the monitoring plan submitted by the NMFS dated April 7, 1995, and to:

1) Approve a revised TDG standard for the Columbia River from midnight on April 19, 1995, to midnight on August 31, 1995;

2) Approve a TDG standard for the Columbia River of a daily average of 115 percent as measured at established monitors at the forebay of the next dam downstream for the spilling dam during this time. In the case of Bonneville Dam, the measurement shall be taken at Camas/Washougal;

3) Approve a further modification of the TDG standard for the Columbia River to allow for a daily average of 120 percent as measured at established tailrace monitors below the spilling dams during this time. In the case of Bonneville Dam, the measurement shall be taken at Warrendale/Skamania.

4) Approve a cap on TDG for the Columbia River during the spill program of 125 percent based on the highest two hours during the 12 highest hourly measurements per calendar day during the time; and

5) Require the Director to halt the spill program if either 15 percent of the fish examined show signs of gas bubble trauma in their non-paired fins or 5 percent of the fish examined show signs of gas bubble trauma in their non-paired fins where more than 25 percent of the surface area of the fin is occluded by gas bubbles; whichever is the less.

Chair Wessinger said that the petitioner, the NMFS would present their position, then two panels, one supporting the petition made up of Oregon Fish and Wildlife (ODFW) and Columbia River Inter-Tribal Fish Commission (CRITF) and the other opposing the petition made up of Chris Anderson, Associate Professor of Fisheries of the University of Washington and Larry Fidler, Aspen Applied Sciences, would speak to the Commission. At the conclusion of the panels, staff would make a presentation and recommendation. Chair Wessinger said the purpose of the panel was to have opposing viewpoints and experts available to assist the Commission in reaching a decision.

Dr. William Stelle, Director of the NMFS for the Northwest Region, told the Commission that the overall goal of the recovery effort is to improve salmon survivals in the system, short and long term. Dr. Stelle said that in making a judgment about appropriate exposure levels to gas supersaturation, he advised the NMFS professional staff that they should analyze the risk from gas exposures. He said a gas level and this waiver should not be treated as a surrogate for the spill program being implemented by the U. S. Corps of Engineers and Bureau of Reclamation and that the request should not be used as a surrogate in regard to transportation of fish.

Dr. Stelle concluded by saying the spill program can be improved. He said that by improving the spillways, more fish can be moved with less water more safely with less gas bubbles. Dr. Stelle also urged Washington, Oregon and Idaho to agree on the decision about this waiver request.

Dr. Douglas DeHart, Assistant Director for Fisheries, Oregon Department of Fish and Wildlife (ODFW), and Ron Boyce, Fish Passage Program Manager, ODFW, spoke to the Commission about ODFW's review and recommendations for the rule modification request. Dr. DeHart said that the ODFW supports the rule modification request by the NMFS. He highlighted points of his testimony that he gave at the public hearing held on April 7, 1995.

Dr. DeHart said the ODFW has looked at the CRiSP model analysis work that was presented at the April 7 public hearing. He said this particular model approach was extremely sensitive to assumptions. Dr. DeHart said that the ODFW believes this level of uncertainty and sensitivity has not been clearly explained to the Department and Commission.

Concluding, Dr. DeHart said that the NMFS has worked hard to develop a comprehensive monitoring and evaluation program and have consulted ODFW and others in the developing the program.

Ted Strong, Executive Director of the Columbia River Inter-Tribal Fish Commission (CRITFC), told the Commission that the beneficial uses of the Columbia River have been to the detriment of the Native peoples along the river even though treaties are not to be subordinated by any state. He talked about the historical flows when salmon returns were substantial. Mr. Strong said that water pollution in the forebays has affected the fish. He said that for Native peoples salmon is their economy, culture, religion and way of life. He concluded by saying that the need for the salmon to survive is a need for sovereign governments to represent the well being of their peoples and thoughts.

Dr. Larry Fidler, Aspen Applied Sciences, and Chris Anderson, University of Washington, spoke to the Commission. Dr. Fidler suggested an alternative to the NMFS spill program which consisted of incremental spills. Jim Anderson spoke to the Commission about the CRiSP model. He also indicated that the incremental approach was a good alternative.

Commissioner Whipple moved approval of the Department's recommendations and findings, incorporating a revision made by Commissioner Lorenzen to recommendation (v), page 6, of the staff report :

Old Wording

(v) Require that the Director halt the spill program if:

either 15 percent of the fish examined show signs of gas bubble trauma in their non-paired fins;

or five percent of the fish examined show signs of gas bubble trauma in their non-paired fins where more than 25 percent of the surface area of the fin is occluded by gas bubbles.

Which ever is the less.

New Wording

...that the Director halt the spill program if any outmigrating smolts, returning adults, or resident fish populations show signs of gas bubble trauma indicating significant risk of harm.

Commissioner McMahan seconded the motion. The motion was unanimously approved.

Note: Agenda Item E and G were considered next.

E. Action item: City of Portland's combined sewer overflow final plan.

Under terms of the August 1994 Amended Stipulation and Final Order (ASFO) signed by the City of Portland and the Commission, the City submitted a Final Facilities Plan pertaining to control of the Combined Sewer Overflows (CSOs). The ASFO specifies that final approval of the control strategies and schedules to eliminate untreated CSO discharges will be made by the Commission.

The Department recommended the Commission approve the Control Strategies and Schedule set forth in the CSO Final Facilities Plan and that the Commission emphasize that the objective of the CSO Control Program is the attainment of water quality standards and protection of beneficial uses.

Neil Mullane, Water Quality Manager in the Department's Northwest Region Office, introduced this item to the Commission. Richard Santner of the Northwest Region water quality staff presented an overview of the staff report. Mr. Santner noted that the ASFO between the City and Commission required Commission approval of the Final CSO Facilities Plan.

Mr. Santner described the facilities the City proposed to build to meet CSO control requirements set forth in the Order. In conclusion, staff characterized the Final CSO Facilities Plan and the proposed CSO control program as appropriate and responsive to the requirements of the Order.

Dean Marriott, Director of the City's Bureau of Environmental Services, briefly addressed the Commission. He expressed appreciation to the Department for its cooperation during development of the Final Plan. Mr. Marriott explained the progress the City was making on the roof disconnection program and public education concerning CSOs and clean rivers.

Commissioner Lorenzen moved adoption of the Department's staff report recommendation; Commissioner Whipple seconded the motion. The motion was unanimously approved (three yes votes.)

PUBLIC FORUM

Larry Tuttle indicated he would suspend promotion of his proposed *bad actor* chemical mining rule until the end of the legislative session due to his opinion that Department staff supported Senate Bill 829 (which requires that a mine be issued a permit based on the rules in place at the time of application). Interim Director Taylor said the bill was not created by the Department but that the Department was asked to provide factual comments.

G. Action item: request for Commission action on Memorandum of Agreement (MOA) between the EQC and Oregon Department of Agriculture (ODA), regarding Combined Animal Feeding Operations (CAFO).

Recently enacted state law (Chapter 567 Oregon Laws 1993, Senate Bill 1008) requires the Commission and Oregon Department of Agriculture to enter into a MOA providing for the ODA to operate a CAFO waste management program, allowing the ODA to perform any function of the DEQ (including final enforcement actions) relating to CAFOs and allowing the ODA to impose civil penalties on owners or operators of CAFO facilities for failure to comply with water quality requirements. The current MOA does not fully satisfy the legislative intent of the 1993 law.

The Department presented a staff report and proposed MOA between the EQC and the ODA for administration of the statewide CAFO wastewater control program. The Department recommended the EQC enter into the MOA and authorize the Director to sign the agreement on behalf of the Commission.

Stephanie Hallock , Administrator of the Department's Eastern Regional Office, gave a brief overview of the background of the CAFO program and provided highlights of the proposed MOA. Chuck Craig, Assistant Administrator, Natural Resources Division, ODA, presented some information to the Commission about how the ODA would administer the program. He also spoke about the two full-time and two half-time positions available in the ODA for this program.

Commissioner Whipple asked about enforcing the rules in regard to hobby farms. Mr. Craig indicated that the ODA did not have enforcement capabilities for those facilities and said that ODA would refer those facilities to the DEQ for enforcement.

Commissioner Lorenzen moved approval of the request for Commission action on MOA between the EQC and ODA in regard to the CAFO; Commissioner McMahan seconded the motion. The motion as unanimously approved (three yes votes). Additionally, the Commission authorized the Interim Director to sign the MOA.

Note: Chair Wessinger was unable to attend the remainder of the meeting. Commissioner Lorenzen presided as acting chair.

C. Rule adoption: Temporary rule, revision of Divisions 94 and 95, solid waste rules for municipal and non-municipal solid waste.

On March 31, 1995, the U. S. Environmental Protection Agency (EPA) amended the financial assurance rules for municipal solid waste landfills to grant a two-year delay in the financial assurance requirements for closure and post-closure care of solid waste landfills. Because the federal Subtitle D landfill requirements were adopted by reference in Oregon, the Department believes that the state should adopt the new federal date for consistency with federal requirements and to provide landfill permittees greater time to develop or acquire sufficient financial assurance. The Department's proposal will impact both municipal and non-municipal landfills equally.

Mary Wahl, Administrator of the Department's Waste Management and Cleanup Division, introduced this item to the Commission. She said the rule amendments would delay the effective date of financial assurance requirements to April 9, 1995.

Commissioner Whipple moved approval of the temporary rules, along with supporting findings on the need for temporary rules; Commissioner McMahan seconded the motion. The motion was unanimously approved (three yes votes).

D. Rule adoption: Lakeview PM_{10} control plan, revision to the Oregon Clean Air Act State Implementation Plan (SIP).

The Lakeview PM_{10} Control Plan includes emission control strategies for the town of Lakeview, whose ambient air quality violates the federal air quality health standard for respirable particulate (PM_{10}). The plan is designed to bring Lakeview into compliance with standards by the Clean Air Act attainment deadline of December 31, 1999. The plan also includes the following:

- the Oregon Department of Forestry (ODF) Smoke Management Plan to add a revisions to Lakeview Voluntary Special Protection Zone (SPZ) for prescribed burning;

- housekeeping and conform rule amendments.

Amendments to the Smoke Management Plan also eliminate SPZs for the Grants Pass and Eugene-Springfield PM_{10} nonattainment areas which have achieved attainment with the PM_{10} standard.

The Department recommended the Commission adopt the Lakeview PM_{10} Control Plan and associated rule amendments as presented in Attachment A of the staff report.

Greg Green, Administrator of the Department's Air Quality Division, and David Collier of the Air Quality Division, presented this item to the Commission.

Commissioner McMahan moved approval of the Department's recommendation; Commissioner Whipple seconded the motion. The motion was unanimously approved (three yes votes).

I. Commissioner reports.

There were no Commission reports.

J. Director's report.

Proposal to Form a Willamette Valley Livability Council. Under a recommendation from an advisory committee to the Oregon Transportation Commission's Willamette Valley Transportation Strategy (WVTS) project, the Commission would be represented on a Willamette Valley Livability Council. This council is envisioned as primarily educational—addressing on a valley-wide basis growth issues related to transportation, land-use and the environment. Council members would primarily be local and regional elected officials, plus members from key state commissions—the EQC, Oregon Transportation Commission, Land Conservation and Development Commission and Oregon Economic Development Commission.

The recommendation to form the Council came from the Willamette Valley Policy Advisory Committee on Transportation (VPACT). The 24-member committee has been meeting monthly since September 1993 to:

- Explore the need for greater transportation coordination in the valley.
- Prepare a recommendation for the Oregon Transportation Commission on how valley-wide coordination might be instituted.
- Develop a strategy for implementing priority transportation improvements in the valley, as outlined in the Oregon Transportation Plan.

Dave Bishop of Oregon Department of Transportation, project manager for the WVTS project, briefly spoke to the Commission about this proposal.

Clackamas County Case Marks First for Environmental Crimes Act. The first felony conviction and sentencing under Oregon's 1993 Environmental Crimes Act took place recently in Clackamas County Circuit Court. The company president and corporate entity of Surgichrome Inc., a Clackamas chrome-plating firm, pleaded guilty to two felony counts of first-degree unlawful disposal of hazardous waste in connection with several years of chromium contamination of soil and groundwater. Under plea agreements that included provisions negotiated with the DEQ, the defendants were ordered to pay a $30,000 fine to a neighbor whose well water was contaminated and $3,000 a month to the DEQ until the contamination is cleaned up. They also were placed on five years' probation and ordered to perform 100 hours of community service. The agreement was designed to allow Surgichrome to stay in business so it can repay DEQ for the cleanup costs, estimated at $1.25 million. The defendants accepted responsibility for the contamination and have cooperated in the cleanup.

1994 DEQ Enforcement Accomplishments Report Issued. The DEQ has issued the 1994 Enforcement Accomplishments Report—the fifth annual report on the agency's enforcement activities. In 1994, the number of civil penalties issued for violations, as well as the amount of penalties assessed, exceeded any previous year: the DEQ issued 160 civil penalties for a total of $1,265,251 in penalties assessed. In 1993--the next highest year—DEQ issued 146 actions for a total of $1,228,536 in penalties.

The report also describes how enforcement activities are being complemented with technical assistance and pollution prevention programs that help businesses achieve compliance without the threat of a civil penalty. For example, a 1994 DEQ Northwest Region Technical Assistance Outreach Program visited 470 businesses to help them obtain compliance with hazardous waste regulations. A similar program is under way in the Western Region.

Western Region Hazardous Waste Technical Assistance "Blitz." As mentioned above, DEQ Western Region is in the middle of a hazardous waste technical assistance outreach program. When completed, this "blitz" will have offered technical assistance to every small quantity generator of hazardous waste in the region. The Department believes this is really the most effective way to achieve

a high degree of hazardous waste regulatory compliance. Results so far include one company that saved $35,000 a year in disposal costs.

Lower Columbia River Nominated for National Estuary Program. The governors of Oregon and Washington have completed nominating the lower Columbia River to the National Estuary Program. This EPA program focuses on protecting and restoring the health of estuaries while supporting economical and recreational activities. If the lower Columbia is included, it will mean federal funding for continued research and planning for specific activities designed to protect the river. EPA will decide the nominations this summer. Oregon already has one national estuary, Tillamook Bay, designated in 1992.

Water Conference on Bear Creek Issues. On Thursday, April 20, the DEQ will participate in a Conference on Water sponsored by the Rogue Valley Council of Governments. The conference will deal with Bear Creek water quality issues and the possibility of re-using effluent from sewage treatment plants for irrigation purposes.

Legislature Gets Feedback on Portland Air Quality Maintenance Plan. A legislative task force chaired by Representative Tom Brian of Washington County was convened to examine air quality strategies contained in the Portland Metropolitan Area Ten-Year Maintenance Plan. (The EQC has been briefed by Air Quality Planning Manager John Kowalczyk on elements of this plan.) Public testimony was heavily in favor of strategies included in the plan. While many expressed reservations about certain aspects of the plan, nearly all agreed that the plan was well-balanced—that it targeted all sources of pollution and probably was the best overall approach. Expanded I/M boundaries and parking ratios are the most controversial aspects of the plan. Representative Leslie Lewis of Newberg has introduced a bill that would roll back the vehicle inspection boundaries to its previous borders.

Oxy-Fuel Program Ends for Season. The third year of DEQ's oxygenated fuel program ended as of March 1 in areas where the gas blend is sold every winter from November 1 to the end of February to help reduce local carbon monoxide pollution problems (Portland area, Yamhill County, Jackson County, Grants Pass, Klamath Falls). Last year, we saw reductions of up to 20 percent in carbon monoxide emissions because of oxy-fuels. This past season, the DEQ received only four complaints about oxy-fuels.

Title V Update—Oregon Still Out in Front. Thanks to cooperation from Oregon businesses and hard work by Oregon permit writers, Oregon is on its way to being the first state to issue a Title V Operating Permit under the federal Clean Air Act Amendments of 1990. Five draft permits have advanced through the public comment period. The proposed permits have been forwarded to the EPA for review—the first to be submitted from any state. The five proposed permits are for Ash Grove Cement Company, Crown Beverage Packaging, Northwest Aluminum, Pacific Gas Transmission Company and Portland General Electric.

DEQ Project Picked for EPA Environmental Leadership Program. A joint proposal from DEQ and WMX Technologies Inc., operator of Arlington's Columbia Ridge landfill and hazardous waste disposal facility, has been selected as a demonstration project for EPA's new Environmental Leadership Program. The White House has designated this program as one of its top priorities for "Reinventing Environmental Regulations." The DEQ-WMX project is designed to show how a facility can work in cooperation with regulatory agencies to achieve a high standard of compliance and environmental performance. The project will also seek to transfer information about innovative and successful environmental management approaches to other industries and regulatory agencies.

Household Hazardous Waste and CEG Collection Events Under Way. The DEQ has launched another season of household hazardous waste collection events, in cooperation with local Oregon communities. Seventeen events are scheduled around the state; the first was held April 1 in Florence. The collection events give local residents a chance to dispose of hazardous materials properly—from auto batteries and antifreeze to paints and pesticides. When this year's events are completed in June, there will be only five of Oregon's 36 counties where a collection event has not been held.

In connection with the household hazardous waste events, collections are also scheduled this spring at eight locations around the state for "conditionally exempt generators" of hazardous waste. These are businesses that generate less than 220 pounds of hazardous waste per month. DEQ held seven CEG collection events last year. Over 100 small business took part, safely disposing of more than 55,000 pounds of hazardous waste. DEQ is also coordinating special collection events this spring in Pendleton and in McMinnville where agricultural producers can safely dispose of pesticides.

Hearing Authorizations:

- Adoption by Reference of Federal Hazardous Waste Regulations. The proposed rules adopt by reference federal hazardous waste regulations enacted between July 1, 1993, and April 1, 1995. This would include permanent adoption of the land disposal restriction universal treatment standards for toxicity characteristic waste. The proposed rules also would adopt housekeeping changes to state regulations, including clarification of the legal status of the federal mixture and derived-from rules in Oregon.

F. Action item: Petition for reconsideration of limited party status/appeal of hearings officer decision in the matter of Ross Bros. Construction, SWP-WR-94-274.

Petitioners are nearby land owners with interest in the outcome of a DEQ solid waste contested case. The Petitioners were granted limited party status by the hearings officer in this contested case. This is an appeal from the December 28, 1994, EQC Hearings Officer Order granting limited party status, without the right of cross-examination to the 12 intervenors. The intervenors are seeking party status with the ability to cross-examine witnesses to the contested case proceeding.

On December 29, 1994 the Commission's hearings officer, Lawrence Smith, issued an Order granting limited party status to 12 individuals seeking party status (intervenors) in the Contested Case SW-WR-94-274. The Order allowed limited party status to the intervenors with one restriction being that the intervenors would not have the right of cross examination. The intervenors appealed to the EQC, requesting that the EQC allow them the right of cross examination.

The hearings officer presented the rationale for limiting the party status to not include the right of cross examination to the EQC. The hearings officers' experience was that limiting the intervenors to direct testimony only and limiting the right of cross examination would lead to a more efficient hearings process. The hearings officer believed that the Department's Enforcement Section representative could be effective in presenting the intervenors' questions and concerns.

The attorney for Ross Bros. & Company, Inc. presented testimony in support of the Hearings Officer's decision.

Commissioner Whipple moved that the parties be granted party status; the motion died for lack of a second. Commissioner McMahan moved approval to uphold the hearing's officer's opinion; the motion was approved with Commissioners Lorenzen and McMahan voting yes and Commissioner Whipple voting no.

Acting Chair Lorenzen suggested a compromise that would allow the intervenors the right of cross examination with the limit placed upon the intervenors that one intervenor be appointed by the intervenors to asked all of the questions. Commissioner Whipple moved approval of the compromise; Commissioner McMahan seconded the motion. The motion was unanimously approved.

There was no further business, and the meeting adjourned at 2 p.m.

Approved ✓
Approved with Corrections_____

Minutes are not final until approved by the EQC

ENVIRONMENTAL QUALITY COMMISSION

Minutes of the Two Hundred and Forty-Fourth Meeting
May 18, 1995

Regular Meeting

The Environmental Quality Commission regular meeting was convened at 9 a.m. on Thursday, May 18, 1995, in Conference room 3A, Oregon Department of Environmental Quality (DEQ), 811 S. W. Sixth Avenue, Portland, Oregon. The following commission members were present:

William Wessinger, Chair
Emery Castle, Vice Chair
Linda McMahan, Member
Carol Whipple, Member
Henry Lorenzen, Member

Also present were Michael Huston, Assistant Attorney General, Oregon Department of Justice, Lydia Taylor, Interim Director, DEQ, Langdon Marsh, Director, DEQ, and other DEQ staff.

Note: Staff reports presented at this meeting, which contain the Department's recommendations, are on file in the Office of the Director, 811 S. W. Sixth Avenue, Portland, Oregon 97204. Written material submitted at this meeting is made a part of this record and is on file at the above address. These written materials are incorporated in the minutes of the meeting by reference.

Chair Wessinger called the meeting to order. He welcomed new Director, Langdon Marsh, and thanked Lydia Taylor for her tenure as Interim Director. Carolyn Young, acting legislative liaison, gave a brief legislative status report and talked about bills affecting the Department.

A. Approval of minutes.

Commissioner Castle moved approval of the March 3, 1995, regular meeting minutes and March 11, 1995, special conference call meeting minutes; Commissioner Whipple seconded the motion. The motion was unanimously approved.

B. Approval of tax credits.

The Department recommended the Commission approve issuance of the tax credit certificates listed below.

Application Number	Applicant	Description
TC 4106	**Dinihanian Manufacturing, Inc. ($13,322)**	**A plastic product reclamation facility consisting of a CD-100 Con Air plastic resin dryer for drying granulated polycarbonate bottles for the manufacture of plastic wreath frames.**
TC 4320	**Willamette Beverage Co. ($89,313)**	**A water pollution control wastewater pretreatment pH neutralization facility.**
TC 4340	**Weyerhaeuser Company ($117,257)**	**An industrial solid waste landfill facility consisting of a french drain system including pumps and control equipment to direct leachate from the landfill to holding ponds, thereby avoiding groundwater contamination.**
TC 4352	**Templeton Enterprises, Inc. ($1,895)**	**A waste pollution control facility consisting of an automobile coolant recycling machine.**

Application Number	Applicant	Description
TC 4369	**Roger Neuschwander ($7,515)**	**An air quality field burning facility consisting of an Artsway 2400 land leveler.**
TC 4374	**William J. Stellmacher ($56,348/86 percent)**	**An air quality field burning facility consisting of a John Deere 4960 225 hp tractor.**
TC 4378	**Roy Dean Bowers ($90,000)**	**An air quality field burning facility consisting of a John Deere 4960 225 hp tractor.**

The Department also requested the Commission grant a request by the Weyerhaeuser Company for an extension (to September 1, 1995) to file an application for pollution control tax credit relief and that the Commission revoke certificate 2295, which provided tax credit relief for a facility that is replaced by equipment claimed in TC 4299, a tax credit request recommended for approval in this report.

Commissioner McMahan moved approval of the Department's recommendations; Commissioner McMahan seconded the motion. The motion was unanimously approved.

C. Adopting federal hazardous waste regulations by reference, including permanent adoption of the federal land disposal restriction universal treatment standards and treatment standards for toxicity characteristic waste; and adoption of housekeeping changes that correct and clarify state regulations.

On September 19, 1994, the U. S. Environmental Protection Agency (EPA) promulgated a final rule amending the hazardous waste land disposal restrictions (LDR). To reduce confusion about whether federal or state standards were in effect in Oregon, the Commission temporarily adopted the federal LDR rule changes on December 2, 1994. The federal rule and temporary state rule both became effective on December 19, 1994; since, however, the state rule is temporary, it will expire on June 16, 1995, unless adopted permanently.

The Department continues to align its program with the federal program by adopting all federal regulations promulgated between July 1, 1993, and April 1, 1995, and to correct and clarify its state-only regulations.

The Department recommended the Commission adopt the amendments and deletions as presented in Attachment A of the staff report. Mary Wahl, Administrator of the Department's Waste Management and Cleanup Division (WMCD), and Roy Brower of the WMCD presented this item to the Commission.

Commissioner Castle moved approval of the Department's recommendation; Commissioner Lorenzen seconded the motion. The motion was unanimously approved.

D. Volatile Organic Compound (VOC) area source rules for the Portland ozone maintenance plan and housekeeping amendments.

These regulations will establish limits for the amount of VOCs that can be used in a variety of paint and consumer products available in the Portland air quality maintenance area. The rules also require use of high-efficiency spray guns and spray gun cleaning equipment at Portland area automotive refinishing activities.

The proposed rule package affects motor vehicle refinishing, consumer products, spray paint and architectural coatings and will provide the first VOC reductions needed to support the ozone maintenance plan. Housekeeping amendments update the definition of VOC and remove an unintended requirement for categorical Reasonable Available Control Technology (RACT) regulations.

The Department recommended the Commission adopt the proposed regulations to ensure that the early VOC reductions produced by these rules are available for the full maintenance plan period. Greg Green, Air Quality Administrator, provided a brief summary about this issue. Dave Nordberg and Andy Ginsburg, Air Quality Division (AQD), presented the item.

John Powell, representing the Cosmetic, Toiletry and Fragrance Association, told the Commission that the association supports the proposed rule. He indicated the VOC reductions could be accomplished without consumer bans. Mr. Powell added, however, that the association did disagree with one item which would allow the Department to inspect manufacturing plants.

Commissioner Lorenzen moved approval of the Department's recommendation; Commissioner McMahan seconded the motion. The motion was unanimously approved.

E. Oregon Title V operating permit fee increase.

Costs of implementing and administering the federal operating permit program in Oregon have increased due to inflation. The permitting program must remain 100 percent self-supporting through fees assessed on the regulated facilities so that Oregon can retain federal approval status; a fee increase is necessary to maintain this self-sufficiency.

The rule amendments will raise the annual base fee from $2,500 a year to $2,569 a year, and the emissions fee from $29.26 a ton based on an increase of 2.7 percent in the U. S. Consumer Price Index since the last rule adoption. These fees are charged to regulated major industrial sources.

The Department recommended the Commission adopt the rule amendments regarding increases in the annual fees for major industrial air emissions sources as presented in Attachment A of the staff report. Greg Green and Gregg Lande, AQD, presented this item.

Commissioner Whipple moved approval of the Department's recommendation; Commissioner Castle seconded the motion. The motion was unanimously approved.

F. Boundary descriptions: air quality control regions and nonattainment and maintenance areas of Oregon.

This rulemaking will give the Department and public greater certainty when dealing with air quality control areas. The proposed rules provide legal definitions for boundaries that already exist but often only in the form of maps.

The Department recommended the Commission adopt the rules as presented in Attachment A of the staff report.

Commissioner McMahan moved approval of the proposed rules; Commissioner Whipple seconded the motion. The motion was unanimously approved.

G. Adoption by reference of federal Hazardous Air Pollutant (HAP) program rules and HAP emission standards.

The Department is proposing to adopt by reference specific federal National Emission Standards for Hazardous Air Pollutants (NESHAPs). In addition to the general provisions common to all NESHAP standards, the proposed rule will set Maximum Available Control Technology (MACT) for seven industrial source categories.

The Department recommended the Commission adopt the federal NESHAP presented in Attachment A of the staff report. Greg Green and John Kinney, AQD, presented this item to the Commission.

Commissioner Lorenzen moved approval of the Department's recommendations; Commissioner Whipple seconded the motion. The motion was unanimously approved.

H. Amendments to Division 32 Hazardous Air Pollutants and Division 33 licensing and certification asbestos requirements.

Amendments proposed in Division 32 and 33 are required to maintain EPA approval of the Department's asbestos certification program under the revised Model Accreditation Program (MAP) specified by the Asbestos School Hazard Abatement Reauthorization Act (ASHARA).

Amendments proposed in Division 32 would create an annual notification fee option for nonfriable asbestos abatement projects. Schools, colleges and other regulated facilities would benefit by paying annually and reducing administrative costs.

The Department recommended the Commission adopt the amendments to Division 32 Hazardous Air Pollutants and Division 33 Licensing and Certification Asbestos Requirements as presented in Attachment A of the staff report. Messrs. Green and Lande, AQD, presented this item to the Commission.

Commissioner Whipple moved approval of the Department's recommendation; Commissioner McMahan seconded the motion. The motion was unanimously approved.

I. Commissioner reports.

Commissioner McMahan talked about a report from a national database started by The Nature Conservancy. She said the chart had been developed on endangered and threatened species. She said what was salient to her was the high percentage of endangerment among water dwelling creatures such as crayfish, mussels, freshwater fish and amphibians and how this related to the spill program considered by the Commission.

Note: At this time of the meeting, Mike Downs, Water Quality Administrator, indicated that the Direct Services Industries (DSI) had wanted to speak to the Commission during the Public Forum section of the meeting about this issue. Chair Wessinger asked Mr. Downs to contact all the parties involved and ask if they could attend the meeting at 10:30 instead of 11:30 so that the issue could be taken up during the Director's Report.

In the meantime, Chair Wessinger asked Mr. Marsh to talk about States/EPA meeting. Mr. Marsh said that state programs have matured to more of a co-equal partnership with the EPA. He said state directors have been calling for more equality in partnering for many years. Mr. Marsh said that emphasis would be on continuous environmental improvement while incorporating pollution prevention, multi-media and ecosystem concerns in the agreements negotiated between the states and EPA.

Mr. Marsh said he will participate with EPA assistant administrators to develop national performance indicators that would be used as benchmarks in all state programs. Each state would negotiate additional performance indicators relevant to that state. Also, this program would allow states and the federal government to explain to the public what work is being done and progress being made.

Mr. Marsh talked about the proposed changes to the Clean Water Act (CWA). He said the greatest rollback is in wetlands protection but that the water quality standards section gives the states more flexibility in establishing standards relevant to a particular water body or shed. However, he said, the standards provide no federal benchmark for assurance that minimal water quality levels be achieved. He added that the standards also introduce a net benefits test into technology standards.

J. Director's report.

Lydia Taylor reported to the Commission on the following items.

DEQ and OPEU Strike

The DEQ was not directly affected by the Oregon Public Employees Union strike since the Department is represented by AFSCME instead of OPEU. However, ten DEQ managers volunteered and were deployed to the Department of Human Resources to help provide critical services otherwise performed by striking employees. The DEQ managers were assigned to the State Hospital and Children's Services Division. They returned to the DEQ when the strike was called. Negotiations with both

OPEU and AFSCME are continuing. The state's contracts with both unions expire June 30.

DEQ Budget and Legislative News

The DEQ budget for the 1995-97 biennium was passed out of the Natural Resources Ways and Means subcommittee; no cuts were made to the Department's base budget. The subcommittee approved the addition of 50 positions to the base budget and required the Department to seek Emergency Board approval of 12 more positions. The DEQ had requested 84 new positions. The Willamette River Study in Water Quality was the only program effort lost which was cut to backfill behind a roll-back of the industrial waste permit fee. The Department's budget will go to the full committee and then to the full House and Senate.

Other Legislative news: A new bill on the air quality plan for the Portland area was introduced. The bill would limit the Vehicle Inspection Program boundary to the tri-county area and make parking ratios voluntary only. Other important bills pending as the Legislature moves toward closure include changes to the rigid plastic container law and changes to the Environmental Cleanup Program. Senate Joint Resolution 12 would refer to Oregon voters a requirement that the Legislature approve administrative rules for all state agencies. The bill would affect rules passed by the Commission. Because SJR 12 is a referral to the voters, the bill cannot be vetoed by the Governor.

Columbia River Voluntary Spill Program

At this time in the Director's Report, the Commission considered the Columbia River Voluntary Spill Program. Chair Wessinger indicated for the record that the Commission asked for discussion of this issue as an informational item since they granted the Director authority to make changes in the spill program. Because this item was found to be of public interest, the Commission indicated they wanted to hear what people had to say.

As an introduction, Department staff said the Columbia River spill program continues to be contentious. While the Commission granted a waiver to the state's water quality standard for total dissolved gas, levels exceeding the waiver limits were detected in the forebays and tailraces of spilling dams. The Department contacted the U. S. Corps of Engineers (Corps) and received assurances the spill program would be managed so that dissolved gas remains within the allowed levels. The Department

contacted the Assistant Attorney General's (AAG's) Office to develop an appropriate compliance response should violations continue.

Additionally, the Department continues oversight of the biological monitoring program. Although the primary means of detecting gas bubble symptoms is still the lateral line and on-paired fins, the Department noted that internal examinations of gill lamellae of outmigrating smolts are being conducted. The fisheries agencies believe the lateral line and non-paired fins provide a more reliable correlation to gas bubble trauma than internal signs. While satisfied with the biological monitoring at this stage, the Department continues active participation in the program. No significant fish mortalities are evident in Oregon at this time but the Department is concerned with the incident at Ice Harbor Dam in Idaho that involved extremely high dissolved gas levels and substantial fish deaths.

James Buchal, Ball, Janik and Novack, representing the Direct Services Industries (DSI), said even though the Corps maintains an extensive system of monitoring stations, measurements do not correctly reflect what is happening on the river. Mr. Buchal said this is known due to the recent fish kill at the Ice Harbor Dam. He said the Corps monitors (located three to four miles upriver from the net pens) could not possibly show compliance with the Commission's waiver since fish were dying in the pen below the monitoring station.

Mr. Buchal said the TDG level is too high and should be cut back. He said the Commission order authorized the Director to reduce spill if significant evidence of damage is shown; however, significant evidence of damage has not been defined. He said the best result would be to cut back TDG levels either to 110 or 115 percent or provide the Director with guidance to significant evidence of harm.

Mr. Buchal concluded by saying the Corps is spilling at all eight projects but the spills cost money and do not help the fish.

Mike Downs, Administrator of the Department's Water Quality Division (WQD), said two problems exist: first, the Commission waiver is being exceeded in terms of TDG levels in the forebays and tailraces and, second, a definition of significant evidence of damage is not clear. He said the Department told the Corps that exceeding the waiver was not acceptable and approved levels are expected to be achieved. He said the Department has contacted the AAG's Office about formal action to ensure that approved levels are maintained.

Mr. Downs said that the NMFS, under the Endangered Species Act, makes recommendations to the Corps about flow and spill levels and about when spilling should occur; nonetheless, he said, the Corps operates the dams and is also responsible for spill levels.

Russell Harding, WQD, said the Corps contacted the Department when the dissolved gas levels in the forebays at McNary Dam exceeded the 115 percent level. He said the Corps tried to manage the spill further upstream in Idaho to help reduce gas levels. He said a communications structure has been established as a result of last year's spill and is working very well; all agencies have been responsive when difficulties have occurred.

Gene Foster, WQD, described the fish kill at the Ice Harbor Dam and talked about the studies made at the net pens below the Bonneville Dam. He said that physical monitoring problems occurring at Ice Harbor by the Corps became apparent when net pen studies indicated the stationary dissolved gas monitor at the tailrace at Ice Harbor was reading low. He said the monitor was replaced but the monitor continues to read low. He also discussed internal and external fish examination techniques.

Russell Harding concluded by saying the Department is concerned about any fish mortalities but that the Ice Harbor fish kill had appeared to be an isolated case. He said the concern at this point is violation of the waiver. He said the Department would recommend halting the spill if those conditions cited in April 17 staff report recommendations are met; that is, either 15 percent of the fish examined show signs of gas bubble trauma or that 5 percent of the fish examined show signs of gas bubble trauma in the non-paired fins where more that 25 percent of the surface area of the fin shows signs of gas bubble trauma.

Commissioner Lorenzen asked why the Department was changing the methodology of determining action when an expert panel could not agree on appropriate levels. Gene Foster said that data recently collected indicates a low correlation between internal gas bubble disease signs with mortality but that external signs correlate better with mortality in regard to fall Chinook. He said this data has not been released or published and species differences could occur, thus creating the shift from internal signs.

Mr. Downs said that due to the spring season, more water than can be held in the basin will have to be released through the turbines. This release may create a greater spill than the NMFS would request. He said the Department will be working with the Corps and others on developing recommendations since the NMFS may need to mitigate the resulting high TDG levels.

Concluding, Mr. Buchal said that as the data show fish continue to die, benefits of spill need to be reconsidered.

DEQ Testifies at Congressional Hearing

John Rusciqno, manager of the Air Quality Program Operations Section, is scheduled to testify this morning before a Congressional subcommittee in Washington, D.C. The Committee on Commerce Subcommittee on Oversight and Investigation is looking closely at the Clean Air Amendments of 1990. John was invited to testify by Oregon Representative Ron Wyden's office in response to Congressional attempts to re-open the Clean Air Act and, in this particular case, to alter the Title V federal operating permit program. Our position, endorsed by Representative Wyden, is that problems with the Act can be resolved through greater flexibility and administrative changes at EPA.

John's testimony will show how we have successfully implemented the Title V program in Oregon. We have worked closely with industry and EPA Region 10 to develop a program that industry regards as workable. We will be issuing the first Title V permits in the nation in about 45 days. John will also discuss the Intel pollution prevention permit. This is an innovative approach that allows certain permit conditions to be pre-approved if significant pollution prevention measures are implemented.

Other Congressional news: Oregon Representative Wes Cooley and others have introduced legislation in Congress that would reinstate an exemption from groundwater monitoring requirements for landfills that are small, dry and remote. Those landfills face a deadline of this October to decide whether to close or stay open. This legislation could have an impact on that decision, so it may also include an extension of the October deadline. (The exemption was in the original Subtitle D of RCRA, but the Sierra Club sued and won, so there are no exemptions unless Congress acts.) DEQ supports the exemption for small landfills in Eastern Oregon.

DEQ participated in drafting a letter from Governor John Kitzhaber to Representative Ron Wyden and other members of the Oregon Congressional Delegation regarding House Resolution 961--The Clean Water Act Amendments of 1995. The letter expresses the state of Oregon's opposition to HR 961 because of several provisions that "would undermine the careful balance of the Clean Water Act." The state's concerns include the bill's failure to add clear deadlines, goals and consequences for the nonpoint source program; phasing out stormwater permitting requirements; weakening effective pretreatment requirements; and classifying wetlands according to a scheme that has no scientific basis.

Triennial Water Quality Standards Review

The Clean Water Act requires states to review their water quality standards once every three years. Oregon's 1992-1994 review is currently being concluded with a series of public workshops being held around the state (La Grande, Bend, Portland, Medford, Eugene and Newport). The workshops are designed to inform the public of proposals to amend the reviewed standards. This will give the public the chance to become familiar with the issues involved before formal public hearings are held in August. The six standards being reviewed are temperature, dissolved oxygen, nitrates, pH, outstanding national resource waters, and bacteria. Formal Commission rulemaking is scheduled for this November.

Hearing Authorizations

Revisions to the Klamath Falls PM_{10} Control Plan as an amendment to the Oregon Clean Air Act State Implementation Plan (SIP), including rule clarifications and housekeeping amendments to Divisions 25, 28 and 32 of Oregon Administrative Rules.

The Klamath Falls PM_{10} Control Plan must be amended to revise the existing motor vehicle emission budget for purposes of transportation conformity. Amendments to Divisions 25, 28 and 32 are needed to bring rules into conformance with federal requirements, and to clarify and correct rule language.

The Commission indicated that their July meeting would be held in southern Oregon. There was no further business, and the meeting adjourned at 11:55 a.m.

Environmental Quality Commission

☐ Rule Adoption Item
X Action Item
☐ Information Item

Agenda Item B
August 18, 1995 Meeting

Title:
Approval of Tax Credit Applications

Summary:
New Applications - Eighteen (18) tax credit applications with a total facility cost of $7,537,035 are recommended for approval as follows:

- 4 Air Quality facilities with a total facility cost of:	$ 881,965
- 9 Field Burning related facilities recommended by the Department of Agriculture with a total facility cost of:	$ 617,463
- 1 Noise pollution facility costing:	$ 164,384
- 2 Reclaimed plastic product facilities with a total facility cost of:	$ 56,759
- 2 Water Quality facilities costing:	$5,816,464

Three applications with claimed facility cost exceeding $250,000 were reviewed by independent accounting firm contractors. The review statements are attached to the application reports.

Department Recommendation:
Approve issuance of tax credit certificates for 18 applications as presented in Attachment A of the staff report.

Willamette Industries, Inc. has requested a second extension to file a tax credit for a facility located in Dallas, Oregon. Because of the specific language of the Oregon Administrative Rules, the Department cannot recommend a second extension to file on behalf of the applicant. A discussion of the issues that pertain to this request is presented in the Background section of this report.

The Department also requests that the Commission approve the transfer of tax credit certificate 2495 from Ronald and Diane Gustafson to James and Harold Pliska, the current owners and operators of the pollution control facility.

Report Author | Division Administrator | Director

July 31, 1995

†Accommodations for disabilities are available upon request by contacting the Public Affairs Office at (503)229-5317(voice)/(503)229-6993(TDD).

State of Oregon
Department of Environmental Quality Memorandum[†]

Date: August 18, 1995

To: Environmental Quality Commission

From: Langdon Marsh, Director

Subject: Agenda Item B, August 18, 1995 EQC Meeting

Approval of Tax Credit Applications

Statement of the Need for Action

This staff report presents the staff analysis of pollution control facilities tax credit applications and the Department's recommendation for Commission action on these applications. The following is a summary of the applications presented in this report:

Tax Credit Application Review Reports:

Application No.	Applicant	Description
TC 4268	Johnson Controls Battery Group, Inc. $164,384	A noise and air pollution control facility consisting of conical flow silencers, noise reduction enclosures for motors, a model 7CDL11 Cycloblower Power Unit and a natural gas burner to minimize the oxidation of lead in the lead-acid battery manufacturing process.
TC 4307	Northwest Foam Products, Inc. $16,000	A plastic product reclamation facility consisting of a Freffner Varag 6 EF regranulator for the manufacture of expanded polystyrene (EPS) pellets.
TC 4354	Columbia Forest Products $138,452	An air pollution control facility consisting of a Wellons W120 boiler multicyclone system including fans and support equipment for a plywood manufacturing plant.

[†]A large print copy of this report is available upon request.

TC 4405	Mullen Farms $120,541	An air pollution control "field burning" facility consisting of a 180hp John Deere 8200 tractor, a Kello-bilt 18' disc, and a Rear's 15' Pak-Flail chopper.
TC 4407	Berger Bros. $54,800	An air pollution control "field burning" facility consisting of a 1992 John Deere 4960 200 hp tractor and a 1992 Case IH 720 6 bottom plow.
TC 4413	Solidur Pacific Co. $40,759	A plastic product reclamation facility consisting of a model 402 Air Sentry Dust Recovery unit.
TC 4416	TRICO Farms $23,325	An air pollution control "field burning" facility consisting of a Case IH 20'5" 770 disc.
TC 4421	Truax Harris Energy Company $24,033	An air pollution control facility consisting of OPW nozzles, adapters and safety valves, Dayco hoses, piping and miscellaneous equipment to prevent the escape of gasoline vapors into the atmosphere.
TC 4430	Willamette Seed Company $23,445	An air pollution control facility consisting of a baghouse, a blower and supporting equipment for a grass seed, grain and wildflower cleaning and storage plant.
TC 4433	Richard D. Baker $6,177	An air pollution control "field burning" facility consisting of a 16'8" roller-leveler.
TC 4449	Gerald E. Phelan $158,195/12%	An air pollution control "field burning" facility consisting of a 1993 RPL roadrunner hay squeeze and a 1993 Freeman 1592 big baler.
TC 4451	Galen & Vernon Kropf $51,675	An air pollution control "field burning" facility consisting of a John Deere 2810 8 bottom plow and a Kello-built 24'heavy duty disc.

TC 4453	Vernon Kropf $86,599	An air pollution control "field burning" facility consisting of a 1995 Manteca roadrunner hay squeeze.
TC 4483	Leroy & Lowell Kropf $103,401	An air pollution control "field burning" facility consisting of a John Deere 145 hp 7800 tractor and a Kello-bilt 21' disc.
TC 4484	Allen D. Chapman $12,750	An air pollution control "field burning" facility consisting of a 15' Rear's flail chopper.

Tax Credit Application Review Reports With Facility Costs Over $250,000 (Accountant Review Reports Attached).

Application No.	Applicant	Description
TC 4266	Johnson Controls Battery Group, Inc. $2,356,563	A water pollution control facility consisting of a 54,600 square foot building that provides covered storage for battery components and lead ingots to prevent storm water contamination.
TC 4348	Jeld-Wen, Inc. $696,035	An air pollution control facility consisting of a Geoenergy E-Tube System, model 1013-189 wet electrostatic precipitator, for the control of wood particulate emissions from a wood pellet manufacturing concern.
TC 4370	Tillamook County Creamery Association $3,459,901/95%	A water pollution control facility consisting of an expanded and upgraded activated sludge wastewater treatment plant.

Background

At the March 3, 1995 meeting of the Environmental Quality Commission, Willamette Industries, Inc. requested and was granted an extension of 180 days (until June 29, 1995) to file for tax credit relief for their Dalles Plywood Project Dry Waste System facility. The facility was completed and placed in service on December 31, 1992. Under the Oregon Administrative Rules that govern the program an applicant must file for a

pollution control facility tax credit within two years of substantial completion of a pollution control facility or be denied a tax credit relief. However, an extension to file of up to one year can be granted by the Commission for circumstances beyond the control of the applicant that would make a timely filing unreasonable (OAR 340-16-020 (1) (c)). The applicant is requesting an additional extension of 90 days because of difficulties they have experienced in segregating and documenting the costs of the project that pertain to pollution control. The Department has no objection to recommend granting the extension except that the rules also specify that only one extension to file may be granted (OAR 340-16-020 (1) (d)). For this reason, the Department cannot recommend granting the extension. The applicant's letters requesting the extensions of time to file are included in this report.

On a matter not covered in the body of this report, the Eichler Hay Company, owner and operator of a custom grass seed straw baling firm, applied for a pollution control tax credit for a straw storage building that was constructed in 1994. The facility was determined to be integral to the operation of the business of custom baling and is treated under the alternative cost allocation methodology that applies to pollution control businesses. In applying the cost allocation methodology that is required for such facilities, the Department determined that the average return on assets before taxes for the five years prior to facility construction for the standard industrial code that has been determined to reflect most accurately the custom baling business (SIC 5261) is greater than the reference rate of return presented in Table 2 of the rules governing the Program for 1994 (ROI:4.8/RROI:4.5). This results in a percentage of the facility cost that is allocable to pollution control of zero percent, which will be the case for all grass seed straw commercial businesses for facilities constructed in 1994. Given that the facility is ineligible for tax credit relief under the Rules, the applicant was advised by the Department of Agriculture to withdraw their application and to seek a refund of the application processing fee. The Department requests that withdrawals in such cases be treated as a rejection of the applications by the Commission to allow for the refund of the application fees under the rules governing the Program.

In addition, the Department received a request to transfer pollution control tax credit certificate 2495 from Ronald and Diane Gustafson to James and Harold Pliska, the current owners of the facility. A copy of the sales agreement was provided as documentation of ownership of the facility.

Authority to Address the Issue

ORS 468.150 through 468.190 and OAR 340-16-005 through 340-16-050 (Pollution Control Facilities Tax Credit).

ORS 468.925 through 468.965 and OAR 340-17-010 through 340-17-055 (Reclaimed Plastic Product Tax Credit).

Alternatives and Evaluation

None.

Summary of Any Prior Public Input Opportunity

The Department does not solicit public comment on individual tax credit applications during the staff application review process. Opportunity for public comment exists during the Commission meeting when the applications are considered for action.

Conclusions

- The recommendations for action on the attached applications are consistent with statutory provisions and administrative rules related to the pollution control facilities and reclaimed plastic product tax credit programs.

o Proposed August 18, 1995 Pollution Control Tax Credit Totals:

Certificates	Certified Costs*	Certified Allocable Costs**	No.
Air Quality	881,965	881,965	4
CFC	0	0	0
Field Burning	617,463	478,251	9
Hazardous Waste	0	0	0
Noise	164,384	164,384	1
Plastics	56,759	56,759	2
SW - Recycling	0	0	0
SW - Landfill	0	0	0
Water Quality	5,816,464	5,643,469	2
UST	0	0	0
	$7,537,035	$7,224,828	18

o Calendar Year Totals Through July 7, 1995:

Certificates	Certified Costs*	Certified Allocable Costs**	No.
Air Quality	$ 94,402	$ 94,402	1
CFC	0	0	0
Field Burning	1,020,386	906,773	15
Hazardous Waste	0	0	0
Noise	0	0	0
Plastic	95,525	95,525	4
SW - Recycling	0	0	0
SW - Landfill	290,496	290,496	2
Water Quality	45,433,507	45,428,441	23
UST	188,988	149,301	1
	$47,123,304	$46,964,938	46

*These amounts represent the total facility costs. The actual dollars that can be applied as credit is calculated by multiplying the total facility cost by the determined percent allocable and dividing by 2.

**These amounts represent the total eligible facility costs that are allocable to pollution control. To calculate the actual dollars that can be applied as credit, the certifiable allocable cost is multiplied by 50 percent.

Recommendation for Commission Action

A) The Department recommends that the Commission approve certification for the tax credit applications as presented in Attachment A of the Department Staff Report.

B) Because of the specificity of the rules governing the extension of time to file an application, the Department cannot recommend approval of the Willamette Industries, Inc. request for a further 90 day extension to file for their Dalles facility.

C) The Department recommends the transfer of the remaining value of tax credit certificate 2495 to James and Harold Pliska from Ronald and Diane Gustafson. As in all transfers, this entails the revocation of the extant certificate and its replacement with a new certificate bearing the names of the new owners and current operators of the pollution control facility.

Intended Followup Actions

Notify applicants of Environmental Quality Commission actions.

Attachments

A. Pollution Control Tax Credit Application Review Reports.

Reference Documents (available upon request)

1. ORS 468.150 through 468.190.
2. OAR 340-16-005 through 340-16-050.
3. ORS 468.925 through 468.965.
4. OAR 340-17-010 through 340-17-055.

Approved:

Section:

Division:

Report Prepared By: Charles Bianchi

Phone: 229-6149

Date Prepared: July 31, 1995

Charles Bianchi
AUGEQC

CB

Willamette Industries, Inc.
Executive Offices

3800 First Interstate Tower
Portland, OR 97201
(503) 227-5581

December 27, 1994

State of Oregon
Department of Environmental Quality
Management Services Department
811 SW Sixth Avenue
Portland, OR 97204

Re: Willamette Industries, Inc.
Extension Request for Filing Application for Final Certification
NC.2822 - Dallas Plywood Dry Waste System

Gentlemen:

Willamette Industries, Inc. hereby requests an extension of 180 days until June 29, 1995, pursuant to OAR 340-16-020(1)(e), to complete and receive approval for the above-referenced Application for Final Certification of Pollution Control Facility for Tax Relief Purposes.

Per our books and records, Willamette's Dallas Plywood Project #237 - Dry Waste System (NC 2822) was totally completed and placed in service on December 31, 1992. Since the completion of this project, Willamette as been trying to gather and document data which breaks down the project between components eligible for the pollution control credit and those not eligible. Of the approximately $500 thousand project, only a portion appears eligible for the credit. We have experienced difficulty in documenting the eligible portion of this project in a manner which will satisfy the Certified Public Accountants who certify to the eligible costs of the project. Our environmental engineering staff, who complete these applications, have also had tremendous time pressures placed upon them recently with work involving Title V Federal Air Permits, the EPA Section 114 Questionnaires, and measuring and maintaining compliance with the various DEQ requirements. Because of this difficulty and time constraints, we are unable to meet the two year deadline for filing the DEQ's Application for Final Certification pursuant to OAR 340-16-020(1)(d) of December 31, 1994.

We therefore request an extension of 180 days until June 29, 1995, pursuant to OAR 340-16-020(1)(e), to complete and receive approval for the above-reference Application for Final Certification of Pollution Control Facility for Tax Relief Purposes. Please note that we intend to file the application within 90 days of today's date, but we are requesting a 180 day extension in case the DEQ requests additional information.

Cordially,

WILLAMETTE INDUSTRIES, INC.

Jim Aden
Assistant Tax Manager

Willamette Industries, Inc.
Executive Offices

3800 First Interstate Tower
Portland, OR 97201
(503) 227-5581

June 28, 1995

State of Oregon
Department of Environmental Quality
Management Services Department
811 SW Sixth Avenue
Portland, OR 97204

Re: Willamette Industries, Inc.
Extension Request for Filing Application for Final Certification
NC 2822 - Dallas Plywood Dry Waste System

Gentlemen:

Willamette Industries, Inc. hereby requests an additional extension of 90 days until September 25, 1995, pursuant to OAR 340-16-020(1)(e), to complete the above-referenced Application for Final Certification of Pollution Control Facility for Tax Relief Purposes.

Per our books and records, Willamette's Dallas Plywood Project #237 - Dry Waste System (NC 2822) was totally completed and placed in service on December 31, 1992. We then asked for and received an extension of time until June 28, 1995 to complete the application process. Since the completion of this project, Willamette has been trying to gather and document data which breaks down the project between components eligible for the pollution control credit and those not eligible. Of the approximately $500 thousand project, only a portion appears eligible for the credit. We have experienced difficulty in documenting the eligible portion of this project in a manner which will satisfy the Certified Public Accountants who certify to the eligible costs of the project. Our environmental engineering staff, who complete these applications, have also had tremendous time pressures placed upon them recently with work involving Title V Federal Air Permits, the EPA Section 114 Questionnaires, and measuring and maintaining compliance with the various DEQ requirements. Because of this difficulty and time constraints, we are unable to meet the extended deadline for filing the DEQ's Application for Final Certification of June 28, 1995.

We therefore request an additional extension of 90 days until September 25, 1995, pursuant to OAR 340-16-020(1)(e), to complete and receive approval for the above-reference Application for Final Certification of Pollution Control Facility for Tax Relief Purposes. Please note that we intend to file the application within the next couple of weeks, but we are requesting an additional 90 day extension in case the DEQ requests additional information.

Cordially,

WILLAMETTE INDUSTRIES, INC.

Jim Aden
Assistant Tax Manager

Charles Branchi, WQ

July 17, 1995

Mr. Mike Downs, Administrator
DEQ - Water Quality
Tax Credit Program
811 S.W. Sixth Avenue
Portland, OR 97204

Dear Mr. Downs:

I'm writing in regard to a pollution tax credit that Ron Gustafson was receiving for a tank upgrade at 12990 S.E. Stark, Portland, Oregon 97233.

Jim Pliska and Harold Pliska purchased the property from Ronald H. Gustafson and Diana J. Gustafson on 5/1/95; consequently, the tax credit needs to be transferred into our names.

Enclosed is a copy of the relevant Sales Agreement. If additional, information, is needed, please give me a call at 665-5693. Our mailing address is: P.O. Box 607, Gresham, OR 97030.

Sincerely,

Jim Pliska

Enclosure

STATE OF OREGON
DEPARTMENT OF ENVIRONMENTAL QUALITY

Certificate No. 2495
Date of Issue 4/26/91
Application No. T-3382

POLLUTION CONTROL FACILITY CERTIFICATE

Issued To:	Location of Pollution Control Facility:
Ronald H. Gustafson 1565 N. E. 148th Portland, OR 97230	12990 S. E. Stark Portland, Oregon

As: ( )Lessee (x)Owner

Description of Pollution Control Facility: Installation of three STI-P3 tanks and fiberglass piping, cathodic protection, spill containment basins, tank monitor, turbine leak detectors, float vent valves, monitoring wells and Stage I vapor recovery equipment.

Type of Pollution Control Facility:
( )Air ( )Noise (x)Water ( )Solid Waste ( )Hazardous Waste ( )Used Oil

Date Facility was Completed: 6/30/89 Placed into Operation: 6/30/89

Actual Cost of Pollution Control Facility: $ 49,652.00

Percent of Actual Cost Properly Allocable to Pollution Control: 75%

Based upon the information contained in the application referenced above, the Environmental Quality Commission certifies that the facility described herein was erected, constructed or installed in accordance with the requirements of subsection (1) of ORS 468.165, and is designed for, and is being operated or will operate to a substantial extent for the purpose of preventing, controlling or reducing air, water or noise pollution or solid waste, hazardous wastes or used oil, and that it is necessary to satisfy the intents and purposes of ORS Chapters 454, 459, 467 and 468 and rules adopted thereunder.

Therefore, this Pollution Control Facility Certificate is issued this date subject to compliance with the statutes of the State of Oregon, the regulations of the Department of Environmental Quality and the following special conditions:

1. The facility shall be continuously operated at maximum efficiency for the designed purpose of preventing, controlling, and reducing the type of pollution as indicated above.
2. The Department of Environmental Quality shall be immediately notified of any proposed change in use or method of operation of the facility and if, for any reason, the facility ceases to operate for its intended pollution control purpose.
3. Any reports or monitoring data requested by the Department of Environmental Quality shall be promptly provided.

NOTE: The facility described herein is not eligible to receive tax credit certification as an Energy Conservation Facility under the provisions of Chapter 512, Oregon Law 1979, if the person issued the Certificate elects to take the tax credit relief under ORS 316.097 or 317.072.

Signed: _____

Title: William P. Hutchison, Jr., Chairman

Approved by the Environmental Quality Commission on the 26th day of April, 1991.

IGC\MY101417.C(1) PCFCERT.MSD (3/91)

Application No. TC-4268

State of Oregon
Department of Environmental Quality

TAX RELIEF APPLICATION REVIEW REPORT

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1. Applicant

Johnson Controls Battery Group, Inc.
Battery Division
5757 N. Green Bay Ave.
Milwaukee, WI 53209

The applicant owns and operates a lead-acid battery manufacturing facility in Canby, Oregon.

Application was made for tax credit for a noise pollution control facility.

2. Description of Facility

The claimed facility consists of several modifications to reduce noise levels to the surrounding neighborhood. This was accomplished by the addition of silencers to the exhaust side of process blowers, enclosing outside fans and motors and the relocation of noisy exterior equipment away from adjacent neighbors. Also included in the claimed facility cost is purchase of natural gas burners for the lead grid casting process. The burners are designed to reduce lead fume and dust emissions.

Claimed Facility Cost: $196,467

A distinct portion of the claimed facility makes an insignificant contribution to the principal of noise reduction. The applicant claimed $13,258 for routine maintenance repairs and $18,825 for the demolition and removal of obsolete equipment.

Ineligible Costs: $32,083

Adjusted Facility Cost: $164,384

Accountant's Certification was provided.

The applicant indicated the useful life of the facility is 20 years.

3. Procedural Requirements

The facility is governed by ORS 468.150 through 468.190, and by OAR Chapter 340, Division 16.

The facility met all statutory deadlines in that:

Installation of the facility was substantially completed on May 1, 1994 and placed into operation on June 1, 1994. The application for final certification was received by the Department on August 18, 1994. The application was found to be complete on May 10, 1995, within two years of substantial completion of the facility.

4. Evaluation of Application

a. Rationale For Eligibility

The facilities are eligible because their principal purpose is to reduce noise levels at the plant site property line as required by the noise standards set forth in Table 7 of OAR 340-35-035 (1)(a). A Notice of Violation and Intent to Assess Civil Penalty required Johnson Controls to establish a compliance plan.

A Notice of Noncompliance (NWR-NF-89-299) was issued on December 6, 1989. The Notice stated that results from a DEQ noise survey found Johnson Controls had exceeded the daytime L10 and L50 standards by eight and thirteen decibels at noise sensitive properties. This is a Class I violation. A Notice of Violation and Intent to Assess Civil Penalty (NP-NWR-89-244) was issued on December 21, 1989, by the Department. Johnson Controls was given 45 days to provide the Department with a plan that identified specific controls that would be installed, a schedule for the installation of the controls, expected noise reductions and a projected date when compliance would be attained.

The noise abatement equipment includes Conical Flow Silencers for the Pasting baghouse fan, the Pasting Radco fan, the COS baghouse fan, Line 3 and 4 Radco fans, and the new casting fan. The motors that drive these fans also received custom made noise reduction enclosures manufactured by The Lynch Company. All of these fans and motors are located outside of the building. A model 7CDL11 Cycloblower Power Unit with a 75 HP motor drive was installed to

unload lead oxide from trucks. This system eliminated the need for the trucks to use their blowers which generated excess noise when unloading the lead oxide.

During the grid casting process lead ingots are melted using natural gas burners. The molten lead is poured into molds that produce battery grids. "Reducing" flames, produced through combustion of natural gas using insufficient oxygen, are used to minimize the oxidation of lead which reduces airborne lead oxide emissions. Johnson Controls replaced their old style burners with the reducing flame design. A study performed at Johnson Controls' Tampa Plant found the new burner design reduced lead emissions by 63%.

b. Eligible Cost Findings

In determining the percent of the pollution control facility cost allocable to pollution control, the following factors from ORS 468.190 have been considered and analyzed as indicated:

1) The extent to which the facility is used to recover and convert waste products into a salable or usable commodity.

The facility does not recover waste products into a salable or usable commodity.

2) The estimated annual percent return on the investment in the facility.

There is no income or savings from the facility, so there is no return on the investment.

3) The alternative methods, equipment and costs for achieving the same pollution control objective.

The applicant considered the construction of a perimeter noise barrier. The wall would need to be 30 feet high by 400 feet long. Johnson Controls estimated the cost to engineer and construct a wall this size would exceed $200,000.

4) Any related savings or increase in costs which occur or may occur as a result of the installation of the facility.

There is no savings from the facility. The cost of maintaining and operating the facility is $4,660 annually.

5) Any other factors which are relevant in establishing the portion of the actual cost of the facility properly allocable to the prevention, control or reduction of air pollution.

Other than the adjustments to the claimed facility cost referenced in Section 2, the cost allocation review of this application has identified no issues to be resolved and confirms the cost allocation as submitted in the application. The principal purpose of the facility is to reduce a substantial quantity of noise pollution.

The actual cost of the facility properly allocable to pollution control as determined by using this factor or these factors is 100% of the adjusted facility cost.

5. Summation

a. The facility was constructed in accordance with all regulatory deadlines.

b. The facility is eligible for final tax credit certification in that the principal purpose of the facility is to comply with a requirement imposed by the Department to reduce noise pollution.

c. The facility complies with DEQ statutes and rules, Commission orders, permit conditions.

d. The portion of the facility cost that is properly allocated to pollution control is 100% of the adjusted facility cost.

6. Director's Recommendation

Based upon these findings, it is recommended that a Pollution Control Facility Certificate bearing the adjusted facility cost of $164,384 with 100% allocated to pollution control, be issued for the facility claimed in Tax Credit Application No. TC-4268.

Dennis Cartier
SJO Consulting Engineers, Inc.

July 5, 1995

Application No. TC-4307

State of Oregon
Department of Environmental Quality

RECLAIMED PLASTIC TAX CREDIT
TAX RELIEF APPLICATION REVIEW REPORT

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1. Applicant

Northwest Foam Products, Inc
9565 SW Ridder Road, Suite 290
Wilsonville, Oregon 97070

The applicant is a corporation which fabricates items from expanded polystyrene.

Application was made for Reclaimed Plastic Tax Credit.

2. Description of Equipment, Machinery or Personal Property

The claimed equipment and installation cost: $16,000.00

The claimed equipment consists of: One Freffner Varag 6 E-F Regranulator for Expanded Polystyrene (EPS) for manufacturing plastic pellets.

Invoices, purchase orders, and copies of cancelled checks for all products and services were provided.

3. Procedural Requirements

The investment is governed by ORS 468.925 through 468.965, and by OAR Chapter 340, Division 17.

The investment met all statutory deadlines in that:

a. The request for preliminary certification was received on September 15, 1994. The preliminary application was filed complete and a waiver of the 30 day waiting period was issued.

b. The request for preliminary certification was approved on October 13, 1994.

c. The investment was made on September 21, 1994. The request for final certification was submitted on June 26, 1995 and was filed complete on June 28, 1995.

4. Evaluation of Application

a. The investment is eligible because the equipment is necessary to process reclaimed plastic.

b. Allocable Cost Findings

In determining the portion of the investment costs properly allocable to reclaiming and recycling plastic material, the following factors from ORS 468.960 have been considered and analyzed as indicated:

1) The extent to which the claimed collection, transportation, processing or manufacturing process is used to convert reclaimed plastic into a salable or usable commodity.

This factor is applicable because the sole purpose of the machine is to regrind scrap EPS for shipment to a manfuacturing plant in Twin Falls, Idaho for reprocessing into EPS blocks.

2) The alternative methods, equipment and costs for achieving the same objective.

The applicant investigated other alternatives and determined that this equipment is the most efficient and productive from an economic standpoint.

3) Any other factors which are relevant in establishing the portion of the actual cost of the investment properly allocable to the collection, transportation or processing of reclaimed plastic or to the manufacture of a reclaimed plastic product.

No other factors were considered relevant.

The actual cost of the investment properly allocable to processing reclaimed plastic as determined by using these factors is 100%.

5. Summation

a. The investment was made in accordance with all regulatory deadlines.

b. The investment is eligible for final tax credit

certification in that the equipment is necessary to manufacture a reclaimed plastic product.

c. The qualifying business complies with DEQ statutes and rules.

d. The portion of the investment cost that is properly allocable to reclaiming and recycling plastic is 100%.

6. Director's Recommendation

Based upon these findings, it is recommended that a Reclaimed Plastic Tax Credit Certificate bearing the cost of $16,000.00, 100% allocated to reclaiming plastic material, be issued for the investment claimed in Tax Credit Application No. TC-4307.

Rick Paul:rap
wp51\tax\tc4307rr.sta
(503) 229-5934
July 13, 1995

Application No. TC-4354

State of Oregon
Department of Environmental Quality

TAX RELIEF APPLICATION REVIEW REPORT

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1. Applicant

Columbia Forest Products
Klamath Falls Division
Highway 97 South
Klamath Falls, Oregon 97601

The applicant manufactures hardwood veneer overlayed plywood.

Application was made for tax credit for an air pollution control facility installed at the applicant's Columbia Plywood Corporation, Klamath Falls manufacturing facility.

2. Description of Facility

The claimed facility controls particle emissions from the fuel burning equipment. The facility consists of a Wellons W120 boiler multicyclone, fan system, and support equipment.

Claimed Facility Cost: $138,452.00

Accountant's certification was provided.

The applicant indicated the useful life of the facility is 15 years.

3. Procedural Requirements

The facility is governed by ORS 468.150 through 468.190, and by OAR Chapter 340, Division 16.

The facility met all statutory deadlines in that:

Erection of the facility was substantially completed on July 10, 1994, and it was placed into operation on July 11, 1994. The application for final certification was received by the Department on February 22, 1995. The application was considered complete on April 18, 1995, within 2 years of substantial completion of the facility.

4. Evaluation of Application

a. Rationale For Eligibility

The facility is eligible because the principal purpose of the facility is to comply with a requirement imposed by the Department to control air pollution. This is in accordance with OAR Chapter 340, Division 21, Rule 020. The Air Contaminant Discharge Permit for this source, 18-0014, requires the permittee to limit the emission of particulate matter from any fuel burning equipment in excess of 0.2 grains per standard cubic foot for existing sources or 0.1 grains per standard cubic foot for new sources.

The claimed facility controls the particulate emissions from the boiler stack. The boiler uses waste wood bark to produce steam for the manufacturing operation. Before the multicyclone system was installed, the boiler exhaust emissions to the atmosphere were uncontrolled. Results from the source testing performed on September 15, 1993, measured the particulate emissions to be 0.533 grains per dry standard cubic foot. The permit limit is 0.20. On April 5, 1994, a Stipulation and Final Order was issued by the Department that required the company to retrofit the boiler with a multiple clone collector and induced and forced draft fan systems.

The multicyclone system is a modification of the cyclone system. The multicyclone is a nest of individual cyclones in parallel, with a single header and a single dust hopper. The system depends upon the tendency of suspended particles to move in a straight line when the direction of the gas stream is altered. Suspended particles are thrown toward the wall on which they collect, and slide down into the conical collector. Near the bottom of the cone, the gas turns abruptly upward and forms an inner spiral, which leaves through the pipe or duct extending into the center of the cyclone body. The fan system is powered by electricity.

A source test conducted on August 4, 1994, following the installation of the air pollution control system, measured the particulate emissions to be 0.13 per dry standard cubic foot.

b. Eligible Cost Findings

In determining the percent of the pollution control facility cost allocable to pollution control, the following factors from ORS 468.190 have been considered and analyzed as indicated:

1. The extent to which the facility is used to recover and convert waste products into a salable or usable commodity.

The facility does not recover or convert waste products into a salable or usable commodity.

2. The estimated annual percent return on the investment in the facility.

   The annual operating expenses exceed income from the facility, so there is no return on investment.

3. The alternative methods, equipment, and costs for achieving the same pollution control objective.

   Multicyclones are technically recognized as an acceptable method for controlling the emissions of particulate from wood-fired boilers. Two other methods were considered. These methods include the conversion of the boiler to natural gas and replacement of the current boiler with a newer technology hog fuel boiler. However, both these methods had prohibitive costs.

4. Any related savings or increase in costs that occur or may occur as a result of the installation of the facility.

   The annual operating cost of the facility is approximately $16,000 per year from the increased use of electricity, materials, and labor. There are no related cost savings.

5. Any other factors which are relevant in establishing the portion of the actual cost of the facility properly allocable to the prevention, control, or reduction of air pollution.

   No other factors are relevant in establishing the portion of the actual cost of the facility properly allocable to the prevention, control, or reduction of air pollution.

The actual cost of the facility properly allocable to pollution control as determined by using these factors is 100 percent.

5. Summary

a. The facility was constructed in accordance with all regulatory deadlines.

b. The facility is eligible for final tax credit certification in that the principal purpose of the facility is to comply with a requirement imposed by the Department to control air pollution.

c. The portion of the facility cost that is allocable to pollution control is 100 percent.

6. Director's Recommendation

Based upon these findings, it is recommended that a Pollution Control Facility Certificate bearing the cost of $138,452 with 100 percent allocated to pollution control, be issued for the facility claimed in Tax Credit Application No. TC-4354.

Tonia C. Garbowsky : PRC Environmental Management, Inc.
June 23, 1995

State of Oregon
Department of Agriculture

TAX RELIEF APPLICATION REVIEW REPORT

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1. Applicant

Mullen Farms
17792 River Road NE
St. Paul, Oregon 97137

The applicant owns and operates a grass seed farm operation in Marion County, Oregon.

Application was made for tax credit for air pollution control equipment.

2. Description of Claimed Facility

The equipment described in this application is located at 17792 River Road NE, St. Paul, Oregon. The equipment is owned by the applicant.

180 hp John Deere 8200 tractor	$86,130
Kello-bilt 18' disk	$23,300
Rear's 15' Pak-Flail chopper	$11,111

Claimed equipment cost: $120,541
(Accountant's Certification was provided.)

3. Description of Farm Operation Plan to Reduce Open Field Burning.

The applicant and relative have 1600 acres of perennial grass seed under cultivation. Prior to incorporating alternatives, the applicant and relative open field burned as many acres as the weather and smoke management program permitted.

The applicant's and relative's alternatives include baling, stacking and giving the straw away; flail chopping and vacuuming the remaining stubble; and mulching the vacuum loaves. Some of the alternatives were accomplished by using equipment borrowed from a neighboring operation. As both the applicant's and relative's alternative practices expand, the applicant states that for "the continued, timely removal of straw, it is now necessary to provide this equipment to be used in combination with the above mentioned practices, thus maintaining our ability to avoid burning as a method of straw removal."

4. Procedural Requirements

The equipment is governed by ORS 468.150 through 468.190, and by OAR Chapter 340, Division 16. The equipment has met all statutory deadlines in that:

Purchase of the equipment was substantially completed on May 1, 1995. The application was submitted on May 15, 1995; and the application for final certification was found to be complete on June 26, 1995. The application was filed within two years of substantial completion of the equipment.

5. Evaluation of Application

a. The equipment is eligible under ORS 468.150 because the equipment is an approved alternative method for field sanitation and straw utilization and disposal that reduces a substantial quantity of air pollution. This reduction is accomplished by reduction of air contaminants, defined in ORS 468A.005; by reducing the maximum acreage to be open burned in the Willamette Valley as required in OAR 340-26-013; and, the facility's qualification as a "pollution control facility", defined in OAR 340-16-025(2)(f) A): "Equipment, facilities, and land for gathering, densifying, processing, handling, storing, transporting and incorporating grass straw or straw based products which will result in reduction of open field burning."

b. Eligible Cost Findings

In determining the percent of the pollution control equipment cost allocable to pollution control, the following factors from ORS 468.190 have been considered and analyzed as indicated:

1. The extent to which the equipment is used to recover and convert waste products into a salable or usable commodity.

   The equipment does not recover or convert waste products into a salable or usable commodity.

2. The estimated annual percent return on the investment in the equipment.

   There is no annual percent return on the investment as applicant claims no gross annual income.

3. The alternative methods, equipment and costs for achieving the same pollution control objective.

   The method chosen is an accepted method for reduction of air pollution. The method is one of the least costly, most effective methods of reducing air pollution.

4. Any related savings or increase in costs which occur or may occur as a result of the purchase of the equipment.

   There is an increase in operating costs of $7,550 to annually maintain and operate the equipment. These costs were considered in the return on investment calculation.

5. Any other factors which are relevant in establishing the portion of the actual cost of the equipment properly allocable to the prevention, control or reduction of air pollution.

The established average annual operating hours for tractors is set at 450 hours. To obtain a total percent allocable, the annual operating hours per implement used in reducing acreage open field burned is as follows:

Implement	Acres	Acres/Hour	Annual Operating Hours
Disk	1,320	6	220
Flail Chopper	1,320 (440x3)	6	220
Plow	360	6	60
Baler	240	6	40
Total Annual Operating Hours			540

The total annual operating hours of 540 exceeds the established average annual operating hours of 450 producing an allocation of 100 percent.

The actual cost of the equipment properly allocable to pollution control as determined by using these factors is 100%.

6. Summation

a. The equipment was constructed in accordance with all regulatory deadlines.

b. The equipment is eligible under ORS 468.150 as an approved alternative method for field sanitation and straw utilization and disposal that reduces a substantial quantity of air pollution as defined in ORS 468A.005

c. The equipment complies with DEQ statutes and rules.

d. The portion of the equipment that is properly allocable to pollution control is 100%.

7. The Department of Agriculture's Recommendation

Based upon these findings, it is recommended that a Pollution Control Facility Certificate bearing the cost of $120,541, with 100% allocated to pollution control, be issued for the equipment claimed in Tax Credit Application Number TC-4405.

Jim Britton, Manager
Smoke Management Program
Natural Resources Division
Oregon Department of Agriculture
(503) 986-4701
FAX: (503) 986-4730

JB:bk4405
July 6, 1995

State of Oregon
Department of Agriculture

TAX RELIEF APPLICATION REVIEW REPORT

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1. Applicant

Berger Bros.
34125 Riverside Drive
Albany, Oregon 97321

The applicant owns and operates a grass seed farm operation in Linn County, Oregon.

Application was made for tax credit for air pollution control equipment.

2. Description of Claimed Facility

The equipment described in this application is located at 29722 Highway 34, Albany, Oregon. The equipment is owned by the applicant.

1992 John Deere 4960 200 hp tractor
1992 Case IH 720 6 bottom plow

Claimed equipment cost: $54,800
(Accountant's Certification was provided.)

3. Description of Farm Operation Plan to Reduce Open Field Burning.

The applicant has 600 acres of perennial grass seed and 600 acres of annual grass seed under cultivation. Until 1989, the applicant open field burned as much acreage annually as the weather and smoke management program permitted. Records indicate that acreage open field burned has progressively declined since 1989 to a level indicating that open field burning is used only to sanitize problem fields.

The applicant has removed approximately 1,200 acres from open field burning and needs the Case IH 720 to complete the increased plowing in a timely manner. The John Deere tractor is required to complete the flail chopping, plowing, harrowing, rolling and vibra-shanking in a timely manner.

4. Procedural Requirements

The equipment is governed by ORS 468.150 through 468.190, and by OAR Chapter 340, Division 16. The equipment has met all statutory deadlines in that:

Purchase of the equipment was substantially completed on March 15, 1995. The application was submitted on May 18, 1995; and the application for final certification was found to be complete on June 30, 1995. The application was filed within two years of substantial completion of the equipment.

5. Evaluation of Application

a. The equipment is eligible under ORS 468.150 because the equipment is an approved alternative method for field sanitation and straw utilization and disposal that reduces a substantial quantity of air pollution. This reduction is accomplished by reduction of air contaminants, defined in ORS 468A.005; by reducing the maximum acreage to be open burned in the Willamette Valley as required in OAR 340-26-013; and, the facility's qualification as a "pollution control facility", defined in OAR 340-16-025(2)(f) A): "Equipment, facilities, and land for gathering, densifying, processing, handling, storing, transporting and incorporating grass straw or straw based products which will result in reduction of open field burning."

b. Eligible Cost Findings

In determining the percent of the pollution control equipment cost allocable to pollution control, the following factors from ORS 468.190 have been considered and analyzed as indicated:

1. The extent to which the equipment is used to recover and convert waste products into a salable or usable commodity.

   The equipment does not recover or convert waste products into a salable or usable commodity.

2. The estimated annual percent return on the investment in the equipment.

   There is no annual percent return on the investment as applicant claims no gross annual income.

3. The alternative methods, equipment and costs for achieving the same pollution control objective.

   The method chosen is an accepted method for reduction of air pollution. The method is one of the least costly, most effective methods of reducing air pollution.

4. Any related savings or increase in costs which occur or may occur as a result of the purchase of the equipment.

   There is an increase in operating costs of $4,725 to annually maintain and operate the equipment. These costs were considered in the return on investment calculation.

5. Any other factors which are relevant in establishing the portion of the actual cost of the equipment properly allocable to the prevention, control or reduction of air pollution.

The established average annual operating hours for tractors is set at 450 hours. To obtain a total percent allocable, the annual operating hours per implement used in reducing acreage open field burned is as follows:

Implement	Acres Worked	Acres/Hour	Annual Operating Hours
Flail Chopper	600 acres	7	86
Plow	600 acres	8	75
Harrow & Roller	1,800 acres	7	257
Vibra-Shank	200 acres	6	33
Total annual operating hours			451

The total annual operating hours (451) exceeds the average annual operating hours producing a 100% allocation.

6. Summation

a. The equipment was constructed in accordance with all regulatory deadlines.

b. The equipment is eligible under ORS 468.150 as an approved alternative method for field sanitation and straw utilization and disposal that reduces a substantial quantity of air pollution as defined in ORS 468A.005

c. The equipment complies with DEQ statutes and rules.

d. The portion of the equipment that is properly allocable to pollution control is 100%.

7. The Department of Agriculture's Recommendation

Based upon these findings, it is recommended that a Pollution Control Facility Certificate bearing the cost of $54,800, with 100% allocated to pollution control, be issued for the equipment claimed in Tax Credit Application Number TC-4407.

Jim Britton, Manager
Smoke Management Program
Natural Resources Division
Oregon Department of Agriculture
(503) 986-4701
FAX: (503) 986-4730

JB:bk4407
June 30, 1995

Application No. T-4413

STATE OF OREGON
Department of Environmental Quality

TAX RELIEF APPLICATION REVIEW REPORT

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1. **Applicant**

Solidur Pacific Co.
181 SW Boones Ferry Road
Portland, Or 97224

The applicant is a fabricator/manufacturer of Ultra High Molecular Weight - Polyethylene (UHMW-PE) and other plastic material products.

2. **Description of Facility**

The facility is a plastic scrap recovery system consisting of a model 402 Air Sentry Dust Recovery unit, with 500 feet of applicable ducting network.

An independent accountant's certification of costs was provided.

Total cost claimed is $40,759.00.

3. **Procedural Requirements**

The facility is governed by ORS 468.150 through 468.190 and by OAR Chapter 340, Division 16.

The facility met all statutory deadlines in that:

a. Installation of the facility was started on July 1, 1994.

b. The facility was placed into operation on October 10, 1994.

c. The application for tax credit was filed with the Department on June 05, 1995, within two years of substantial completion of the facility.

4. **Evaluation of Application**

a. The principal purpose of the facility is to recover from the solid waste stream scrap plastic chips and shavings previously disposed as waste.

b. Eligible Cost Findings

In determining the percent of the pollution control facility cost allocable to pollution control, the following factors from ORS 468.190 have been considered and analyzed as indicated:

1) The extent to which the facility is used to recover and convert waste products into a salable or usable commodity.

The facility Is used to recover and convert waste into a salable commodity. The facility recovers 75 per cent of the scrap plastic.

2) The estimated annual percent return on the investment in the facility.

A) The Applicant has claimed a facility cost of $40,759.00. The Department has identified no ineligible costs relating to construction of the plastic scrap recovery system.

B) Annual Percentage Return on Investment

The annual percentage return on investment was calculated and determined does not apply. There was no salvage value of any facility removed from service. There is no income from this activity, no annual operating expenses and no annual cash flow.

The applicant has claimed a fifteen year useful life. As a result of using Table 1, OAR 340-16-030, for a fifteen year useful life, the return on investment for the claimed facility is 0% and the percent allocable is 100%.

3) The alternative methods, equipment, and costs for achieving the same pollution control objective.

The applicant did use the method of manual collection of the materials and found the contamination rate was very high rendering the material collected unusable.

4) Any related savings or decrease in costs which occur or may occur as a result of the installation of the facility.

There are no savings, other than those considered in (2) above, associated with the use of this reclamation system.

5) Any other factors which are relevant in establishing the portion of the actual cost of the facility properly allocable to the prevention, control or reduction of air, water, or noise pollution or solid or hazardous waste, or to recycle or properly dispose of used oil.

There are no other factors to consider in establishing the actual cost of the installation of the reclamation system.

The actual cost of the facility properly allocable to pollution control as determined by using these factors is 100%.

5. **Summation**

a. The facility was constructed in accordance with all regulatory deadlines.

b. The facility is eligible for tax credit certification in that the sole purpose of the plastic scrap recovery system is to control and reduce the waste of recyclable plastic scrap material.

c. The facility complies with DEQ statutes and permit conditions.

d. The portion of the facility cost that is properly allocable to pollution control is 100%.

6. **Director's Recommendation**

Based upon the findings, it is recommended that a Pollution Control Facility certificate bearing the cost of $40,759.00 with 100% allocable to pollution control be issued for the facility claimed in Tax Credit Application No. T-4413

Rick Paul:rap
wp51\tax\tc4413RR.STA
(503)229-5934
June 21, 1995

State of Oregon
Department of Agriculture

TAX RELIEF APPLICATION REVIEW REPORT

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1. Applicant

TRICO FARMS
66911 Hunter Road
Summerville, Oregon 97876

The applicant owns and operates a grass seed farm operation in Union County, Oregon.

Application was made for tax credit for air pollution control equipment.

2. Description of Claimed Facility

The equipment described in this application is a case IH 20'5", 770 disc located at 63446 Highway 237, LaGrande, Oregon. The equipment is owned by the applicant.

Claimed equipment cost: $23,325
(Accountant's Certification was provided.)

3. Description of Farm Operation Plan to Reduce Open Field Burning.

The applicant has 296 acres of perennial grass seed under cultivation. Prior to investigating alternatives to thermal sanitization, the applicant open field burned as much acreage as the Union County Smoke Management program and weather permitted.

After experimenting with various practices, the applicant's chosen alternatives consist of trading the straw for removal from the fields, flail chopping the remaining stubble, plowing and discing to incorporate the residue into the soil.

4. Procedural Requirements

The equipment is governed by ORS 468.150 through 468.190, and by OAR Chapter 340, Division 16. The equipment has met all statutory deadlines in that:

Purchase of the equipment was substantially completed on September 19, 1994. The application was submitted on May 31, 1995; and the application for final certification was found to be complete on June 30, 1995. The application was filed within two years of substantial completion of the equipment.

5. Evaluation of Application

a. The equipment is eligible under ORS 468.150 because the equipment is an approved alternative method for field sanitation and straw utilization and disposal that reduces a substantial quantity of air pollution. This reduction is accomplished by reduction of air

contaminants, defined in ORS 468A.005; by reducing the maximum acreage to be open burned in the Willamette Valley as required in OAR 340-26-013; and, the facility's qualification as a "pollution control facility", defined in OAR 340-16-025(2)(f) A): "Equipment, facilities, and land for gathering, densifying, processing, handling, storing, transporting and incorporating grass straw or straw based products which will result in reduction of open field burning."

b. Eligible Cost Findings

In determining the percent of the pollution control equipment cost allocable to pollution control, the following factors from ORS 468.190 have been considered and analyzed as indicated:

1. The extent to which the equipment is used to recover and convert waste products into a salable or usable commodity.

   The equipment does not recover or convert waste products into a salable or usable commodity.

2. The estimated annual percent return on the investment in the equipment.

   There is no annual percent return on the investment as applicant claims no gross annual income.

3. The alternative methods, equipment and costs for achieving the same pollution control objective.

   The method chosen is an accepted method for reduction of air pollution. The method is one of the least costly, most effective methods of reducing air pollution.

4. Any related savings or increase in costs which occur or may occur as a result of the purchase of the equipment.

   There is no savings or increase in costs as a result of the equipment.

5. Any other factors which are relevant in establishing the portion of the actual cost of the equipment properly allocable to the prevention, control or reduction of air pollution.

   There are no other factors to consider in establishing the actual cost of the equipment properly allocable to prevention, control or reduction of air pollution.

The actual cost of the equipment properly allocable to pollution control as determined by using these factors is 100%.

6. Summation

a. The equipment was constructed in accordance with all regulatory deadlines.

b. The equipment is eligible under ORS 468.150 as an approved alternative method for field sanitation and straw utilization and disposal that reduces a substantial quantity of air pollution as defined in ORS 468A.005

c. The equipment complies with DEQ statutes and rules.

d. The portion of the equipment that is properly allocable to pollution control is 100%.

7. The Department of Agriculture's Recommendation

Based upon these findings, it is recommended that a Pollution Control Facility Certificate bearing the cost of $23,325, with 100% allocated to pollution control, be issued for the equipment claimed in Tax Credit Application Number TC-4416.

Jim Britton, Manager
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JB:bk4416
June 30, 1995

Application No. 4421

State of Oregon
Department of Environmental Quality

TAX RELIEF APPLICATION REVIEW REPORT

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1. Applicant

Truax Harris Energy Company
P.O. Box 607
Wilsonville, OR 97070

The applicant owns and operates a gasoline sales and service station at 5000 N. Basin, in Portland, Oregon.

Application was made for tax credit for an air pollution control facility.

2. Description of Facility

The claimed facility is an above ground vacuum assist type system. The system is composed of OPW nozzles, Dayco hoses, OPW adapters, OPW breakaway safety valves, piping and additional miscellaneous equipment. Installation of the facility prevents the escape of gasoline vapors into the atmosphere.

Claimed Facility Cost: $24,032.60

The applicant documented the facility costs.

3. Procedural Requirements

The facility is governed by ORS 468.150 through 468.190, and by OAR Chapter 340, Division 16.

The facility met all statutory deadlines in that:

Construction and installation of the facility was substantially completed on April 28, 1995. The facility was placed into operation on April 28, 1995. The application for final certification was submitted to the Department on May 26, 1995, within two years of substantial completion of the facility. The application was found to be complete on July 10, 1995.

4. Evaluation of Application

a. Rationale For Eligibility

The facility is eligible because the principal purpose of the facility is to comply with a requirement imposed by the Department to prevent the escape of gasoline vapors into the atmosphere. This is in accordance with OAR Chapter 340-22-400

to 403. The emission reduction is accomplished by the elimination of air contaminants as defined in ORS 468A.005.

The facility prevents gasoline vapors from escaping into the atmosphere. The face plate on the nozzle delivering the gasoline forms a tight seal on the fill pipe of the automobile gas tank. As the spout dispenses gasoline there is a small pressure increase created in the automobile gasoline tank due to the additional volume of the added fuel. This pressure increase drives the gasoline vapor from the automobile fuel tank through a secondary line in the nozzle back into the underground storage tank. The gasoline vapor travels through a secondary containment pipe surrounding the pipe the gasoline is dispensed through. The underground tank receives the additional volume in the form of gasoline vapors. There is no net pressure increase in the underground tank because the tank has already dispensed an equivalent volume of liquid gasoline. The vapor recovered is vapor that would otherwise escape from the automobile tank and the gasoline dispensing nozzle into the atmosphere.

b. Eligible Cost Findings

In determining the percent of the pollution control facility cost allocable to pollution control, the following factors from ORS 468.190 have been considered and analyzed as indicated:

1) The extent to which the facility is used to recover and convert waste products into a salable or usable commodity.

A portion of the waste product is converted into a salable or usable commodity consisting of recovered gasoline. It is the position of the Department that the volume of gasoline recovered is of an insignificant economic benefit.

2) The estimated annual percent return on the investment in the facility.

The applicant indicates in the application there is no income or savings from the facility, so there is no return on the investment.

3) The alternative methods, equipment and costs for achieving the same pollution control objective.

Stage II vapor recovery balance type systems are technically recognized as an acceptable method for controlling the emissions of vapors from gasoline service stations.

4) Any related savings or increase in costs which occur or may occur as a result of the installation of the facility.

The applicant indicated there were no savings or increase in costs as a result of the facility modification.

5) Any other factors which are relevant in establishing the portion of the actual cost of the facility properly allocable to the prevention, control or reduction of air pollution.

There are no other factors to consider in establishing the actual cost of the facility properly allocable to reduction of pollution. The principal purpose of the facility is to prevent a substantial quantity of air pollution.

The actual cost of the facility properly allocable to pollution control as determined by using these factors is 100%.

5. Summation

a. The facility was constructed in accordance with all regulatory deadlines.

b. The facility is eligible for final tax credit certification in that the principal purpose of the facility is to comply with a requirement imposed by the Department to reduce air pollution.

c. The facility complies with Department rules.

d. The portion of the facility cost that is properly allocable to pollution control is 100%.

6. Director's Recommendation

Based upon these findings, it is recommended that a Pollution Control Facility Certificate bearing the cost of $24,033 with 100% allocated to pollution control, be issued for the facility claimed in Tax Credit Application No. TC-4421.

Tonia C. Garbowsky: PRC Environmental Management, July 10, 1995

Application No. TC-4430

State of Oregon
Department of Environmental Quality

TAX RELIEF APPLICATION REVIEW REPORT

1. Applicant

Willamette Seed Company
220 Jefferson St.
P.O Box 791
Albany, OR 97321

The applicant owns and operates a grass seed, grain, and wildflower cleaning and storing operation in Rickreall, Oregon.

Application was made for tax credit for an air pollution control facility.

2. Description of Facility

The claimed facility controls the emission of particulate generated from the processing and shipping of seed. The facility consists of a baghouse, a blower, and supporting equipment.

Claimed Facility Cost: $23,445.00

Accountant's Certification was provided.

The applicant indicated the useful life of the facility is seven years.

3. Procedural Requirements

The facility is governed by ORS 468.150 through 468.190, and by OAR Chapter 340, Division 16.

The facility met all statutory deadlines in that:

Installation of the facility was substantially completed on June 28, 1994 and placed into operation the same day. The application for final certification was received by the Department on June 6, 1995. The application was found to be complete on July 10, 1995, within two years of substantial completion of the facility.

4. Evaluation of Application

a. Rationale For Eligibility

The facility is eligible because the principal purpose of the facility is to comply with a requirement imposed by the Department to control air pollution. This is in accordance with OAR Chapter 340, Division 21, rules 015 and 050 through 060. The Air Contaminant Discharge Permit for this source, 27-6019, requires the permittee to limit the emissions of particulate to the atmosphere. The emission reduction is accomplished by the elimination of air contaminants as defined in ORS 468A.005.

Prior to installation of the new facilities, dust from all production systems was collected in a cyclone system. Grain was brought in to the plant by truck and dumped into a storage pit. It was then raised by elevator to a crib bin over a cleaning machine which used air and screens to separate out the seed from the waste. The blowers then entered the cyclone system where centrifugal force was used to force the waste dust through the cyclone filters before being emitted to the atmosphere.

The claimed facility consists of a baghouse, a blower, and associated equipment. The claimed facility was installed in place of the cyclone system in the seed cleaning process. The baghouse uses a blower to force dust through the baghouse filters. The fine dust particles are collected on the bag surface. The dust collected by the bag is then removed and disposed of.

Prior to the installation of the baghouse, in June of 1993, the Department estimated particulate emissions from the plant to be 4.63 tons per year. After installaton of the baghouse, in June of 1994, the Department estimated the particulate emissions to be 1.98 tons per year.

b. Eligible Cost Findings

In determining the percent of the pollution control facility cost allocable to pollution control, the following factors from ORS 468.190 have been considered and analyzed as indicated:

1) The extent to which the facility is used to recover and convert waste products into a salable or usable commodity.

The facility does not recover or convert waste products into a salable or usable commodity. A local animal feed producer removes the waste at no charge.

2) The estimated annual percent return on the investment in the facility.

The annual operating expenses exceed income from the facility, so there is no return on investment.

3) The alternative methods, equipment and costs for achieving the same pollution control objective.

Baghouse control systems are technically recognized as an acceptable method for controlling the emissions of particulate from seed plants.

4) Any related savings or increase in costs which occur or may occur as a result of the installation of the facility.

The annual operating cost of the facility is $1,000 for maintenance of the baghouse.

5) Any other factors which are relevant in establishing the portion of the actual cost of the facility properly allocable to the prevention, control or reduction of air pollution.

There are no other factors to consider in establishing the actual cost of the facility properly allocable to reduction of pollution. The principal purpose of the facility is to prevent a substantial quantity of air pollution.

The actual cost of the facility properly allocable to pollution control as determined by using this factor or these factors is 100%.

5. Summation

a. The facility was constructed in accordance with all regulatory deadlines.

b. The facility is eligible for final tax credit certification in that the principal purpose of the facility is to comply with a requirement imposed by Department to control air pollution.

c. The facility complies with DEQ statutes and rules, and permit conditions.

d. The portion of the facility cost that is properly allocable to pollution control is 100%.

6. Director's Recommendation

Based upon these findings, it is recommended that a Pollution Control Facility Certificate bearing the cost of $23,445 with 100% allocated to pollution control, be issued for the facility claimed in Tax Credit Application No. TC-4430.

Tonia C. Garbowsky : PRC Environmental Management, Inc.
July 10, 1995.

State of Oregon
Department of Agriculture

TAX RELIEF APPLICATION REVIEW REPORT

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1. Applicant

Richard D. Baker
32283 Diamond Hill Drive
Harrisburg, Oregon 97446

The applicant owns and operates a grass seed farm operation in Linn County, Oregon.

Application was made for tax credit for air pollution control equipment.

2. Description of Claimed Facility

The equipment described in this application is a 16'8" roller-leveler, located at 32283 Diamond Hill Drive, Harrisburg, Oregon. The equipment is owned by the applicant.

Claimed equipment cost: $6,177.
(The applicant provided copies of cost of construction.)

3. Description of Farm Operation Plan to Reduce Open Field Burning.

The applicant has 117 perennial grass seed acres and 488 annual grass seed acres under cultivation. The alternatives to open field burning the applicant has investigated include baling the bulk straw off the perennial fields and flail chopping the remaining residue and stubble and flail chopping the full straw load on the annual fields followed by plowing, harrowing, and rolling.

The applicant is now ready to replace open field burning on all his acreage with the alternatives. However, the majority of his grass seed acreage is blue dobby soil which is very low, flat and difficult to drain. Plowing the straw under makes the land very uneven with humps and holes throughout. To provide adequate drainage and avoid heavy corp loss due to drown out, the applicant must level these low lying fields to achieve drainage and produce a reasonable crop.

4. Procedural Requirements

The equipment is governed by ORS 468.150 through 468.190, and by OAR Chapter 340, Division 16. The equipment has met all statutory deadlines in that:

Construction of the equipment was substantially completed on May 1, 1995. The application was submitted on June 9, 1995; and the application for final certification was found to be complete on June 22, 1995. The application was filed within two years of substantial completion of the equipment.

5. Evaluation of Application

a. The equipment is eligible under ORS 468.150 because the equipment is an approved alternative method for field sanitation and straw utilization and disposal that reduces a substantial quantity of air pollution. This reduction is accomplished by reduction of air contaminants, defined in ORS 468A.005; by reducing the maximum acreage to be open burned in the Willamette Valley as required in OAR 340-26-013; and, the facility's qualification as a "pollution control facility", defined in OAR 340-16-025(2)(f) A): "Equipment, facilities, and land for gathering, densifying, processing, handling, storing, transporting and incorporating grass straw or straw based products which will result in reduction of open field burning."

b. Eligible Cost Findings

In determining the percent of the pollution control equipment cost allocable to pollution control, the following factors from ORS 468.190 have been considered and analyzed as indicated:

1. The extent to which the equipment is used to recover and convert waste products into a salable or usable commodity.

   The equipment does not recover or convert waste products into a salable or usable commodity.

2. The estimated annual percent return on the investment in the equipment.

   There is no annual percent return on the investment as applicant claims no gross annual income.

3. The alternative methods, equipment and costs for achieving the same pollution control objective.

   The method chosen is an accepted method for reduction of air pollution. The method is one of the least costly, most effective methods of reducing air pollution.

4. Any related savings or increase in costs which occur or may occur as a result of the purchase of the equipment.

   There is an increase in operating costs of $1,050 to annually maintain and operate the equipment. These costs were considered in the return on investment calculation.

5. Any other factors which are relevant in establishing the portion of the actual cost of the equipment properly allocable to the prevention, control or reduction of air pollution.

   There are no other factors to consider in establishing the actual cost of the equipment properly allocable to prevention, control or reduction of air pollution.

The actual cost of the equipment properly allocable to pollution control as determined by using these factors is 100%.

6. Summation

a. The equipment was constructed in accordance with all regulatory deadlines.

b. The equipment is eligible under ORS 468.150 as an approved alternative method for field sanitation and straw utilization and disposal that reduces a substantial quantity of air pollution as defined in ORS 468A.005

c. The equipment complies with DEQ statutes and rules.

d. The portion of the equipment that is properly allocable to pollution control is 100%.

7. The Department of Agriculture's Recommendation

Based upon these findings, it is recommended that a Pollution Control Facility Certificate bearing the cost of $6,177, with 100% allocated to pollution control, be issued for the equipment claimed in Tax Credit Application Number TC-4433.

Jim Britton, Manager
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JB:bk4433
June 22, 1995

State of Oregon
Department of Agriculture

TAX RELIEF APPLICATION REVIEW REPORT

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1. Applicant

Gerald E. Phelan
33973 Looney Lane
Tangent, Oregon 97389

The applicant owns and operates a custom baling operation in Linn County, Oregon.

Application was made for tax credit for air pollution control equipment.

2. Description of Claimed Facility

The equipment described in this application is located at 33973 Looney Lane, Tangent, Oregon. The equipment is owned by the applicant.

1993 RPL roadrunner hay squeeze	$88,195
1993 Freeman 1592 big baler	$70,000

Claimed equipment cost: $158,195
(Accountant's Certification was provided.)

3. Description of Farm Operation Plan to Reduce Open Field Burning

The applicant's operation consists of baling the straw in the field, transporting it to storage facilities, unloading and loading and transporting to compressing facilities as needed.

The applicant states that his business is integral in removing 40,000 acres from open field burning consideration by removing the bulk straw.

4. Procedural Requirements

The equipment is governed by ORS 468.150 through 468.190, and by OAR Chapter 340, Division 16. The equipment has met all statutory deadlines in that:

Purchase of the equipment was substantially completed on July 15, 1993. The application was submitted on June 23, 1995; and the application for final certification was found to be complete on July 6, 1995. The application was filed within two years of substantial completion of the equipment.

5. Evaluation of Application

a. The equipment is eligible under ORS 468.150 because the equipment is an approved alternative method for field sanitation and straw utilization and disposal that reduces a

substantial quantity of air pollution. This reduction is accomplished by reduction of air contaminants, defined in ORS 468A.005; by reducing the maximum acreage to be open burned in the Willamette Valley as required in OAR 340-26-013; and, the facility's qualification as a "pollution control facility", defined in OAR 340-16-025(2)(f) A): "Equipment, facilities, and land for gathering, densifying, processing, handling, storing, transporting and incorporating grass straw or straw based products which will result in reduction of open field burning."

b. Eligible Cost Findings

In determining the percent of the pollution control equipment cost allocable to pollution control, the following factors from ORS 468.190 have been considered and analyzed as indicated:

1. The extent to which the equipment is used to recover and convert waste products into a salable or usable commodity.

   The equipment promotes the conversion of a waste product (straw) into a salable commodity by providing the method of removing the straw from the fields in a packaged form.

2. The estimated annual percent return on the investment in the equipment.

   The pollution control facility is integral to the operation of the applicant's business such that the business would operate at reduced income levels without the claimed pollution control facility. Following steps outlined in OAR 340-16-030 (5) and referencing Robert Morris Associates' (RMA) Annual statement Studies the applicants primary four digit Standard Industrial Classification is 5621. The industry median profit before taxes as a percent of total assets (ROA) for the five years prior to the year of completion of the claimed facility from RMA, Annual Statement Studies are 5.4, 5.4, 5.1, and 5.0, and 3.3. Therefore, the industry average profit before taxes as a percent of total assets (IROI) is 4.84 (IMP/5). Selecting the reference annual percent return (RROI) of 5.5 from Table 2 that corresponds with the year construction or purchase was completed the percentage of actual costs allocable to pollution control (RROI-IROI/RROI X 100) is 12%.

3. The alternative methods, equipment and costs for achieving the same pollution control objective.

   The method chosen is an accepted method for reduction of air pollution. The method is one of the least costly, most effective methods of reducing air pollution.

4. Any related savings or increase in costs which occur or may occur as a result of the purchase of the equipment.

   There is no savings or increase in costs as a result of the equipment.

5. Any other factors which are relevant in establishing the portion of the actual cost of the equipment properly allocable to the prevention, control or reduction of air pollution.

   There are no other factors to consider in establishing the actual cost of the equipment properly allocable to prevention, control or reduction of air pollution.

   The actual cost of the equipment properly allocable to pollution control as determined by using these factors is 12%.

6. Summation

   a. The equipment was constructed in accordance with all regulatory deadlines.

   b. The equipment is eligible under ORS 468.150 as an approved alternative method for field sanitation and straw utilization and disposal that reduces a substantial quantity of air pollution as defined in ORS 468A.005

   c. The equipment complies with DEQ statutes and rules.

   d. The portion of the equipment that is properly allocable to pollution control is 12%.

7. The Department of Agriculture's Recommendation

   Based upon these findings, it is recommended that a Pollution Control Facility Certificate bearing the cost of $158,195 with 12% allocated to pollution control, be issued for the equipment claimed in Tax Credit Application Number TC-4449.

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JB:bk4449
June 6, 1995

State of Oregon
Department of Agriculture

TAX RELIEF APPLICATION REVIEW REPORT

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1. Applicant

Galen Kropf, Vernon Kropf
24980 Peoria Road
Harrisburg, Oregon 97446

The applicant owns and operates a grass seed farm operation in Linn County, Oregon.

Application was made for tax credit for air pollution control equipment.

2. Description of Claimed Facility

The equipment described in this application is located at 32191 Cartney Drive, Harrisburg, Oregon. The equipment is owned by the applicant.

John Deere 2810 8 bottom plow	$15,675
Kello built 24' Heavy Duty Disc	$36,000

Claimed equipment cost: $51,675
(Accountant's Certification was provided.)

3. Description of Farm Operation Plan to Reduce Open Field Burning.

The applicant has 1,161 acres of perennial grass seed and 884 acres of annual grass seed under cultivation. Prior to investigating alternatives to thermal sanitization, the applicant open field burned as many acres as the smoke management program and weather permitted.

The applicant's prior practice was to open field burn and no till drill the annual acreage. The alternative selected includes flail chopping the entire straw load, plowing the straw under, discing the field, harrowing and rolling, and conventional planting.

4. Procedural Requirements

The equipment is governed by ORS 468.150 through 468.190, and by OAR Chapter 340, Division 16. The equipment has met all statutory deadlines in that:

Purchase of the equipment was substantially completed on October 19, 1994. The application was submitted on June 26, 1995; and the application for final certification was found to be complete on July 7, 1995. The application was filed within two years of substantial completion of the equipment.

5. Evaluation of Application

a. The equipment is eligible under ORS 468.150 because the equipment is an approved alternative method for field sanitation and straw utilization and disposal that reduces a substantial quantity of air pollution. This reduction is accomplished by reduction of air contaminants, defined in ORS 468A.005; by reducing the maximum acreage to be open burned in the Willamette Valley as required in OAR 340-26-013; and, the facility's qualification as a "pollution control facility", defined in OAR 340-16-025(2)(f) A): "Equipment, facilities, and land for gathering, densifying, processing, handling, storing, transporting and incorporating grass straw or straw based products which will result in reduction of open field burning."

b. Eligible Cost Findings

In determining the percent of the pollution control equipment cost allocable to pollution control, the following factors from ORS 468.190 have been considered and analyzed as indicated:

1. The extent to which the equipment is used to recover and convert waste products into a salable or usable commodity.

   The equipment does not recover or convert waste products into a salable or usable commodity.

2. The estimated annual percent return on the investment in the equipment.

   There is no annual percent return on the investment as applicant claims no gross annual income.

3. The alternative methods, equipment and costs for achieving the same pollution control objective.

   The method chosen is an accepted method for reduction of air pollution. The method is one of the least costly, most effective methods of reducing air pollution.

4. Any related savings or increase in costs which occur or may occur as a result of the purchase of the equipment.

   There is an increase in operating costs of $8,618 to annually maintain and operate the equipment. These costs were considered in the return on investment calculation.

5. Any other factors which are relevant in establishing the portion of the actual cost of the equipment properly allocable to the prevention, control or reduction of air pollution.

There are no other factors to consider in establishing the actual cost of the equipment properly allocable to prevention, control or reduction of air pollution.

The actual cost of the equipment properly allocable to pollution control as determined by using these factors is 100%.

6. Summation

a. The equipment was constructed in accordance with all regulatory deadlines.

b. The equipment is eligible under ORS 468.150 as an approved alternative method for field sanitation and straw utilization and disposal that reduces a substantial quantity of air pollution as defined in ORS 468A.005

c. The equipment complies with DEQ statutes and rules.

d. The portion of the equipment that is properly allocable to pollution control is 100%.

7. The Department of Agriculture's Recommendation

Based upon these findings, it is recommended that a Pollution Control Facility Certificate bearing the cost of $51,675, with 100% allocated to pollution control, be issued for the equipment claimed in Tax Credit Application Number TC-4451.

Jim Britton, Manager
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Natural Resources Division
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JB:bk4451
July 7, 1995

State of Oregon
Department of Agriculture

TAX RELIEF APPLICATION REVIEW REPORT

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1. Applicant

Vernon Kropf
32191 Cartney Drive
Harrisburg, Oregon 97446

The applicant owns and operates a grass seed farm operation in Linn County, Oregon.

Application was made for tax credit for air pollution control equipment.

2. Description of Claimed Facility

The equipment described in this application is a 1995 Manteca roadrunner hay squeeze, located at 32191 Cartney Drive, Harrisburg, Oregon. The equipment is owned by the applicant.

Claimed equipment cost: $86,599
(Accountant's Certification was provided.

3. Description of Farm Operation Plan to Reduce Open Field Burning.

The applicant has 1,161 acres of perennial grass seed and 884 acres of annual grass seed under cultivation. Prior to investigating alternatives to thermal sanitization, the applicant open field burned as many acres as the Smoke Management Program and weather permitted.

The applicant states that alternatives to open field burning on perennial acreage begins with straw removal by baling, and the hay squeeze is required to stack straw blocks three high in the storage building to efficiently utilize the space. The hay squeeze allows the applicant to continue the methodical reduction in acreage open field burned.

4. Procedural Requirements

The equipment is governed by ORS 468.150 through 468.190, and by OAR Chapter 340, Division 16. The equipment has met all statutory deadlines in that:

Purchase of the equipment was substantially completed on June 1, 1995. The application was submitted on June 28, 1995; and the application for final certification was found to be complete on July 7, 1995. The application was filed within two years of substantial completion of the equipment.

5. Evaluation of Application

a. The equipment is eligible under ORS 468.150 because the equipment is an approved alternative method for field sanitation and straw utilization and disposal that reduces a

substantial quantity of air pollution. This reduction is accomplished by reduction of air contaminants, defined in ORS 468A.005; by reducing the maximum acreage to be open burned in the Willamette Valley as required in OAR 340-26-013; and, the facility's qualification as a "pollution control facility", defined in OAR 340-16-025(2)(f) A): "Equipment, facilities, and land for gathering, densifying, processing, handling, storing, transporting and incorporating grass straw or straw based products which will result in reduction of open field burning."

b. Eligible Cost Findings

In determining the percent of the pollution control equipment cost allocable to pollution control, the following factors from ORS 468.190 have been considered and analyzed as indicated:

1. The extent to which the equipment is used to recover and convert waste products into a salable or usable commodity.

   The equipment does not recover or convert waste products into a salable or usable commodity.

2. The estimated annual percent return on the investment in the equipment.

   There is no annual percent return on the investment as applicant claims no gross annual income. The applicant trades the straw for the custom baling services.

3. The alternative methods, equipment and costs for achieving the same pollution control objective.

   The method chosen is an accepted method for reduction of air pollution. The method is one of the least costly, most effective methods of reducing air pollution.

4. Any related savings or increase in costs which occur or may occur as a result of the purchase of the equipment.

   There is an increase in operating costs of $1,300 to annually maintain and operate the equipment. These costs were considered in the return on investment calculation.

5. Any other factors which are relevant in establishing the portion of the actual cost of the equipment properly allocable to the prevention, control or reduction of air pollution.

   There are no other factors to consider in establishing the actual cost of the equipment properly allocable to prevention, control or reduction of air pollution.

The actual cost of the equipment properly allocable to pollution control as determined by using these factors is 100%.

6. Summation

a. The equipment was constructed in accordance with all regulatory deadlines.

b. The equipment is eligible under ORS 468.150 as an approved alternative method for field sanitation and straw utilization and disposal that reduces a substantial quantity of air pollution as defined in ORS 468A.005

c. The equipment complies with DEQ statutes and rules.

d. The portion of the equipment that is properly allocable to pollution control is 100%.

7. The Department of Agriculture's Recommendation

Based upon these findings, it is recommended that a Pollution Control Facility Certificate bearing the cost of $86,599, with 100% allocated to pollution control, be issued for the equipment claimed in Tax Credit Application Number TC-4453.

Jim Britton, Manager
Smoke Management Program
Natural Resources Division
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JB:bk4453
July 7, 1995

State of Oregon
Department of Agriculture

TAX RELIEF APPLICATION REVIEW REPORT

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1. Applicant

Leroy and Lowell Kropf
24305 Powerline Road
Harrisburg, Oregon 97446

The applicant owns and operates a grass seed farm operation in Linn County, Oregon.

Application was made for tax credit for air pollution control equipment.

2. Description of Claimed Facility

The equipment described in this application is located at 24305 Powerline Road, Harrisburg, Oregon. The equipment is owned by the applicant.

John Deere 145 hp 7800 tractor	$78,026
Kellobilt 21' disc	$25,375

Claimed equipment cost: $103,401
(Accountant's Certification was provided.)

3. Description of Farm Operation Plan to Reduce Open Field Burning.

The applicant has 720 acres of perennial grass seed and 280 acres of annual grass seed under cultivation. Prior to investigating alternatives to thermal sanitization, the applicant open field burned as many acres as the Smoke Management Program and weather permitted.

On some perennial fields, the straw is removed by baling. The remaining stubble is flail chopped and sanitization is accomplished by propane flaming or chemicals. On other perennial fields, the bulk straw is flail chopped two to three times and left on the surface to decompose. On annual fields, the bulk straw is flail chopped then the field is plowed, disced, harrowed, and leveled in preparation for the new seedbed.

With an approximate 75% reduction in open field burning, the tractor is required to complete the alternatives in a timely manner. The disc is required to incorporate the straw into the soil on unburned fields.

4. Procedural Requirements

The equipment is governed by ORS 468.150 through 468.190, and by OAR Chapter 340, Division 16. The equipment has met all statutory deadlines in that:

Purchase of the equipment was substantially completed on April 1, 1995. The application was submitted on June 29, 1995; and the application for final certification was found to be complete on July 11, 1995. The application was filed within two years of substantial completion of the equipment.

5. Evaluation of Application

a. The equipment is eligible under ORS 468.150 because the equipment is an approved alternative method for field sanitation and straw utilization and disposal that reduces a substantial quantity of air pollution. This reduction is accomplished by reduction of air contaminants, defined in ORS 468A.005; by reducing the maximum acreage to be open burned in the Willamette Valley as required in OAR 340-26-013; and, the facility's qualification as a "pollution control facility", defined in OAR 340-16-025(2)(f) A): "Equipment, facilities, and land for gathering, densifying, processing, handling, storing, transporting and incorporating grass straw or straw based products which will result in reduction of open field burning."

b. Eligible Cost Findings

In determining the percent of the pollution control equipment cost allocable to pollution control, the following factors from ORS 468.190 have been considered and analyzed as indicated:

1. The extent to which the equipment is used to recover and convert waste products into a salable or usable commodity.

   The equipment does not recover or convert waste products into a salable or usable commodity.

2. The estimated annual percent return on the investment in the equipment.

   There is no annual percent return on the investment as applicant claims no gross annual income.

3. The alternative methods, equipment and costs for achieving the same pollution control objective.

   The method chosen is an accepted method for reduction of air pollution. The method is one of the least costly, most effective methods of reducing air pollution.

4. Any related savings or increase in costs which occur or may occur as a result of the purchase of the equipment.

   There is an increase in operating costs of $13,080 to annually maintain and operate the equipment. These costs were considered in the return on investment calculation.

5. Any other factors which are relevant in establishing the portion of the actual cost of the equipment properly allocable to the prevention, control or reduction of air pollution.

The established average annual operating hours for tractors is set at 450 hours. To obtain a total percent allocable, the annual operating hours per implement used in reducing acreage open field burned is as follows:

Implement	Acres	Acres/hour	Annual Operating Hours
Flail Chopper	850	6.5	130
Disc	800 (400x2)	6.5	123
Harrow	1,200 (400x3)	7	171
Leveler	800 (400x2)	10	80
Total Annual Operating Hours			504

The annual operating hours (504) exceeds the average annual operating hours (450) producing a 100 percent allocation.

The actual cost of the equipment properly allocable to pollution control as determined by using these factors is 100%.

6. Summation

a. The equipment was constructed in accordance with all regulatory deadlines.

b. The equipment is eligible under ORS 468.150 as an approved alternative method for field sanitation and straw utilization and disposal that reduces a substantial quantity of air pollution as defined in ORS 468A.005

c. The equipment complies with DEQ statutes and rules.

d. The portion of the equipment that is properly allocable to pollution control is 100%.

7. The Department of Agriculture's Recommendation

Based upon these findings, it is recommended that a Pollution Control Facility Certificate bearing the cost of $103,401, with 100% allocated to pollution control, be issued for the equipment claimed in Tax Credit Application Number TC-4483.

Jim Britton, Manager
Smoke Management Program
Natural Resources Division
Oregon Department of Agriculture
(503) 986-4701
FAX: (503) 986-4730

JB:bk4483
July 11, 1995

State of Oregon
Department of Agriculture

TAX RELIEF APPLICATION REVIEW REPORT

---

1. Applicant

Allen D. Chapman
4476 South Timber Trail Drive
Woodburn, Oregon 97071

The applicant owns and operates a grass seed farm operation in Marion County, Oregon.

Application was made for tax credit for air pollution control equipment.

2. Description of Claimed Facility

The equipment described in this application is a 15' Rear's Flail Chopper, located at 4476 South Timber Drive, Woodburn, Oregon. The equipment is owned by the applicant.

Claimed equipment cost: $12,750
(The applicant provided copies of the purchase agreement.)

3. Description of Farm Operation Plan to Reduce Open Field Burning.

The applicant has 240 acres of perennial grass seed under cultivation. Prior to purchasing the flail chopper, the applicant either open field burned or baled and propaned his acreage.

The open field burning will be replaced with full straw load flail chopping.

4. Procedural Requirements

The equipment is governed by ORS 468.150 through 468.190, and by OAR Chapter 340, Division 16. The equipment has met all statutory deadlines in that:

Purchase of the equipment was substantially completed on October 25, 1994. The application was submitted on June 29, 1995; and the application for final certification was found to be complete on July 11, 1995. The application was filed within two years of substantial completion of the equipment.

5. Evaluation of Application

a. The equipment is eligible under ORS 468.150 because the equipment is an approved alternative method for field sanitation and straw utilization and disposal that reduces a substantial quantity of air pollution. This reduction is accomplished by reduction of air contaminants, defined in ORS 468A.005; by reducing the maximum acreage to be open burned in the Willamette Valley as required in OAR 340-26-013; and, the facility's qualification as a "pollution control facility", defined in OAR 340-16-025(2)(f)

A): "Equipment, facilities, and land for gathering, densifying, processing, handling, storing, transporting and incorporating grass straw or straw based products which will result in reduction of open field burning."

b. Eligible Cost Findings

In determining the percent of the pollution control equipment cost allocable to pollution control, the following factors from ORS 468.190 have been considered and analyzed as indicated:

1. The extent to which the equipment is used to recover and convert waste products into a salable or usable commodity.

   The equipment does not recover or convert waste products into a salable or usable commodity.

2. The estimated annual percent return on the investment in the equipment.

   There is no annual percent return on the investment as applicant claims no gross annual income.

3. The alternative methods, equipment and costs for achieving the same pollution control objective.

   The method chosen is an accepted method for reduction of air pollution. The method is one of the least costly, most effective methods of reducing air pollution.

4. Any related savings or increase in costs which occur or may occur as a result of the purchase of the equipment.

   There is an increase in operating costs of $4,503 to annually maintain and operate the equipment. These costs were considered in the return on investment calculation.

5. Any other factors which are relevant in establishing the portion of the actual cost of the equipment properly allocable to the prevention, control or reduction of air pollution.

   There are no other factors to consider in establishing the actual cost of the equipment properly allocable to prevention, control or reduction of air pollution.

The actual cost of the equipment properly allocable to pollution control as determined by using these factors is 100%.

6. Summation

a. The equipment was constructed in accordance with all regulatory deadlines.

b. The equipment is eligible under ORS 468.150 as an approved alternative method for field sanitation and straw utilization and disposal that reduces a substantial quantity of air pollution as defined in ORS 468A.005

c. The equipment complies with DEQ statutes and rules.

d. The portion of the equipment that is properly allocable to pollution control is 100%.

7. The Department of Agriculture's Recommendation

Based upon these findings, it is recommended that a Pollution Control Facility Certificate bearing the cost of $12,750, with 100% allocated to pollution control, be issued for the equipment claimed in Tax Credit Application Number TC-4484.

Jim Britton, Manager
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Oregon Department of Agriculture
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JB:bk4484
July 11, 1995

Application No.T-4266

State of Oregon
Department of Environmental Quality

TAX RELIEF APPLICATION REVIEW REPORT

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1. Applicant

Johnson Controls Battery Group, Inc.
SLI Battery Division
5757 N. Green Bay Avenue
Milwaukee, WI 53209

The applicant owns and operates a lead-acid battery manufacturing plant in Canby, Oregon.

Application was made for tax credit for a water pollution control facility.

2. Description of Facility

The facility is a 54,600 square foot warehouse added to the existing manufacturing plant. It covers all lead storage areas which were formerly out in the open around the plant building and uncovered.

Claimed Facility Cost: $2,461,970

Johnson Controls Battery Group, Inc. (JCBGI) submitted a claimed facility cost of $2,595,000 in its original tax credit certification application. In a letter to the Department dated March 15, 1995, JCBGI revised the claimed facility cost down to $2,461,970 which was based on a more accurate group costs statements from Johnson Controls' accounting department office in Milwaukee, Wisconsin.

The accountant's certification was provided by Price Waterhouse LLP on August 4, 1994.

Eligible Cost.

The Department determined that the costs submitted by the applicant were eligible except for the fire protection system, landscaping, landscaping irrigation system, painting expenses for lead oxide storage tank and power supply relocation expenses charged by the local utility board. The Department considered these items to be ineligible because they do not contribute significantly to controlling pollution at the site.

Claimed Facility Cost:		$2,461,970
Ineligible Costs		
Sprinkler system as part of the seismic upgrade	$5,100	
Landscaping	2,500	
Fire protection	69,998	
#12 sprinkler upgrade	17,773	
2" irrigation line	1,459	
#28 oxide tank paint	2,211	
Water tanks chiller	4,044	
Canby Utility Board	2,322	
Total		$105,407
Eligible Facility Cost:		$2,356,563

3. Procedural Requirements

The facility is governed by ORS 468.150 through 468.190 and by OAR Chapter 340, Division 16.

The facility met the statutory deadline in that construction of the facility was substantially completed in March 8, 1994 and the application for certification was found to be complete on April 24, 1995, within 2 years of substantial completion of the facility.

4. Evaluation of Application

a. The facility is eligible because the sole purpose of the facility is to prevent pollution of storm water. This prevention is accomplished by preventing storm water from contacting stored lead materials and products.

JCBGI was issued a National Pollutant Discharge Elimination System (NPDES) General Permit 1200L which specifies the development and implementation of a Storm Water Management Control Plan (SWMCP). One of the best management practices (BMP) specified in the SWMCP is the provision of covered storage for manufacturing areas where materials could come in contact with storm water. JCBGI identified in its SWMCP storage areas for battery components and lead ingots where they are out in the open and could be potential sources of storm water lead contamination.

JCBGI added a 54,600 square feet of covered storage to the existing manufacturing plant building. The implementation of this BMP eliminated the potential for storm water contamination.

b. Eligible Cost Findings

In determining the percent of the pollution control facility cost allocable to pollution control, the following factors from ORS 468.190 have been considered and analyzed as indicated:

1) The extent to which the facility is used to recover and convert waste products into a saleable or usable commodity.

   The facility does not recover or convert waste products into a salable or usable commodity.

2) The estimated annual percent return on the investment in the facility.

   There is no return on investment for this facility.

3) The alternative methods, equipment and costs for achieving the same pollution control objective.

   Alternative storage outside of the manufacturing plant property could have been obtained. However, the cost would have been greater. The cost to purchase storage space at another location would have exceeded $3,600,000. This option would have also resulted in additional transportation and utility costs of $100,000 annually.

4) Any related savings or increase in costs which occur or may occur as a result of the installation of the facility.

   There are no savings from the facility. The cost of maintaining and operating the facility is $12,581 annually.

5) Any other factors which are relevant in establishing the portion of the actual cost of the facility properly allocable to the prevention, control or reduction of air, water or noise pollution or solid or hazardous waste or to recycling or properly disposing of used oil.

The Department determined that some components of the claimed facility are ineligible because they do not contribute significantly to pollution control at the plant site. These are the sprinkler system for fire protection, landscaping, irrigation system, production related equipment and power supply relocation charges from the local utility board. The ineligible costs are as follows:

Non JCBGI costs

1.	Fire sprinklers (Seabold Construction Co.)	-	$5,100
2.	Power supply relocation (Canby Utility Board)	-	2,322
	Subtotal		$7,422

JCBGI costs

1.	Landscaping	-	$2,500
2.	Fire protection	-	69,998
3.	#12 Sprinkler upgrade	-	17,773
4.	2" Irrigation line	-	1,459
5.	#28 Oxide tank paint	-	2,211
6.	Water tanks chiller	-	4,044
	Subtotal		$97,985
	Ineligible cost		$105,407

The actual cost of the facility properly allocable to pollution control is:

Claimed facility cost	-	$2,461,970
Ineligible cost	-	(105,407)
Eligible cost	-	$2,356,563

The Environmental Quality Commission has directed that tax credit applications having claimed facility costs at or above $250,000 undergo an additional accounting review to ensure that eligible costs are properly allocated to pollution control. This review was performed by the accounting firm of Boldt, Carlisle & Smith, CPAs. The review did not identify any additional ineligible or unallocable costs.

5. Summation

a. The facility was constructed in accordance with all regulatory deadlines.

b. The facility is eligible for tax credit certification in that the sole purpose of the facility is to prevent pollution of storm water and accomplishes this purpose by preventing storm water from contacting stored lead products.

c. The facility complies with DEQ permit conditions.

d. The portion of the facility cost that is properly allocable to pollution control is $2,356,563.

6. Director's Recommendation

Based upon these findings, it is recommended that a Pollution Control Facility Certificate bearing the cost of $2,356,563 with 100% allocated to pollution control, be issued for the facility claimed in Tax Credit Application No. T-4266.

Elliot J. Zais
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BOLDT, CARLISLE & SMITH
CERTIFIED PUBLIC ACCOUNTANTS

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OREGON DEPARTMENT OF ENVIRONMENTAL
QUALITY
811 S. W. 6th Ave.
Portland, OR 97204

At your request, we have performed agreed-upon procedures with respect to Johnson Controls Battery Group, Inc. Pollution Tax Control Credit Application No. 4266 regarding warehouse space added to house materials that were stored outside, which would have violated stormwater permits. The aggregate claimed costs on the original application were $2,595,000. This was later revised by the applicant to $2,461,970 based on more accurate group costs statements from Johnson Controls' accounting department office in Milwaukee, Wisconsin. This cost was reduced by $105,407 to $2,356,563 by the DEQ to eliminate components of the claimed facility that did not significantly contribute to pollution control at the plant site. The agreed-upon procedures and our related findings are as follows:

1. We read the application, the Oregon Revised Statutes on Pollution Control Facilities tax credits—Section 468.150-468.190 (the Statutes) and the Oregon Administrative Rules on Pollution Control Tax Credits—Sections 340-16-005 through 340-16-050 (OAR's).

2. We discussed the Application and Statutes with Elliot Zais of the Oregon Department of Environmental Quality and with Charles Bianchi, the Pollution Control Facilities tax credit program consultant.

3. We discussed the Application with Jana Bader Jarvis, customer service manager, and Brian Krytenberg, environmental engineer of Johnson Controls Battery Group, Inc. and reviewed the accountant's certification issued by Price Waterhouse LLP in connection with the Application for final certification.

4. We inquired as to whether there were any direct or indirect company costs charged to the facility costs claimed in the Application. We were informed no direct or indirect costs were included in the Application. Based on our review of supporting documentation discussed in item 5, we noted no direct or indirect costs were included in the Application.

5. We reviewed supporting documentation for 96 percent of the amount claimed on the Application through review of vendor invoices and the certificate for payment received from the prime contractor. All costs, which we reviewed, supporting the Application appeared to be from third party vendors.

6. We discussed with Jana Bader Jarvis and Brian Krytenberg the extent to which non-allowable costs were excluded from the Application. This was accomplished by reviewing specific invoices and the certificate for payment (see item 5). We determined that the company had properly excluded all non-allowable costs from the Application.

Conclusions

Because the above procedures do not constitute an audit conducted in accordance with generally accepted auditing standards, we do not express an opinion on any of the items referred to above. In connection with the procedures referred to above, no matters came to our attention that caused us to believe that the claimed facilities cost of $2,356,563 on the Application, as revised by the DEQ review report, should be adjusted. Had we performed additional procedures, or had we conducted an audit of the financial statements of the company in accordance with generally accepted auditing standards, other matters might have come to our attention that would have been reported to you. This report relates only to the items specified above and does not extend to any financial statements of the company taken as a whole.

This report is solely for the State of Oregon Department of Environmental Quality in the evaluating of the company's Pollution Control Tax Credit Application and should not be used for any other purpose.

Boldt, Carlisle & Smith, LLC
Certified Public Accountants
Salem, Oregon
July 14, 1995

Application No. TC-4348

State of Oregon
Department of Environmental Quality

TAX RELIEF APPLICATION REVIEW REPORT

1. Applicant

Jeld-Wen, Inc.
P.O. Box 1329
Klamath Falls, OR 97601

The applicant manufactures wood pellets.

Application was made for tax credit for an air pollution control facility installed at the applicant's Brownsville, Oregon plant.

2. Description of Facility

The claimed facility controls the emission of particulate generated from a wood particle dryer. The facility consists of a Geoenergy E-Tube System, Model 1013-189, Wet Electrostatic Precipitator.

Claimed Facility Cost: $696,034.87

Accountant's certification was provided.

The applicant indicated that the useful life of the facility is 20 years.

3. Procedural Requirements

The facility is governed by ORS 468.150 through 468.190, and by OAR Chapter 340, Division 16.

The facility met all statutory deadlines in that:

Erection of the facility was substantially completed on January 15, 1994 and the facility was placed into operation on January 21, 1994. The application for final certification was received by the Department on January 17, 1995. The application was considered to be complete on March 1, 1995, within 2 years of substantial completion of the facility.

4. Evaluation of Application

a. Rationale For Eligibility

The facility is eligible because the principal purpose of the facility is to comply with a requirement imposed by the Department to control air pollution. This is in accordance with OAR Chapter 340, Division 21, Rule 015. The Air

Contaminant Discharge Permit for this source, 22-1034, Condition 2, requires the permittee to limit the emission of air contaminants into the atmosphere from the wood particle dryer. This is accomplished by the elimination of air contaminants as defined in ORS 468A.005.

The claimed facility reduces particulate emissions from the wood dryer of the applicant's wood pellet manufacturing operation. Prior to installation of the new electrostatic precipitator, dust from the dryer vented to a series of multiclones. On August 25, 1992, a DEQ inspection noted that the particle dryer was in non-compliance because the emissions had an opacity of 40 percent. The permit specifies that emission opacity must be under 20 percent.

The claimed facility that was installed as a result of the compliance schedule is more effective at controlling emissions and consists of a Geoenergy E-tube 1013-189 system and a centrifuge to dispose of water. Dust generated by the dryer is passed between the 182 ten foot long, stainless steel tubes with surfaces carrying a high electric potential. Under the force of the electric field, particles are driven to the collecting electrode and precipitated. The dust collected by the plate is removed and disposed of.

Source testing performed on February 8, 1994, after the installation of the air pollution control facility, demonstrated that emission opacity was less than 5 percent.

b. Eligible Cost Findings

In determining the percent of the pollution control facility cost allocable to pollution control, the following factors from ORS 468.190 have been considered and analyzed as indicated:

1) The extent to which the facility is used to recover and convert waste products into a salable or usable commodity.

The facility does not recover or convert waste products into a salable or usable commodity.

2) The estimated annual percent return on the investment in the facility.

The annual operating expenses exceed income from the facility, so there is no return on investment.

3) The alternative methods, equipment, and costs for achieving the same pollution control objective.

Electrostatic precipitator systems are technically recognized as an acceptable method for controlling the emissions of particulate from wood dryers. Besides the GeoEnergy system, prices were acquired for a United-McGill electrostatic precipitator. GeoEnergy's price was thirty

percent lower and was therefore chosen for installation.

4) Any related savings or increase in costs which occur or may occur as a result of the installation of the facility.

The annual operating cost of the facility is approximately $60,000 from the increased use of electricity use and the additional time spent on equipment maintenance.

5) Any other factors which are relevant in establishing the portion of the actual cost of the facility properly allocable to the prevention, control, or reduction of air pollution.

There are no other factors to consider in establishing the actual cost of the facility properly allocable to reduction of pollution. The principal purpose of the facility is to prevent a substantial quantity of air pollution.

The actual cost of the facility properly allocable to pollution control as determined by using these factors is 100%.

5. Summation

a. The facility was constructed in accordance with all regulatory deadlines.

b. The facility is eligible for final tax credit certification in that the principal purpose of the facility is to comply with a requirement imposed by the Department to control air pollution.

c. The facility complies with DEQ statutes, rules, and permit conditions.

d. The portion of the facility cost that is allocable to pollution control is 100%.

6. Director's Recommendation

Based upon these findings, it is recommended that a Pollution Control Facility Certificate bearing the cost of $696,035 with 100% allocated to pollution control, be issued for the facility claimed in Tax Credit Application No. TC-4348.

Tonia C. Garbowsky : PRC Environmental Management, Inc. / June 23, 1995

Coopers & Lybrand

Coopers & Lybrand L.L.P.

a professional services firm

2700 First Interstate Bank Tower
1300 Southwest Fifth Avenue
Portland, Oregon 97201-5687

telephone (503) 227-8600

Oregon Department of Environmental Quality
811 S.W. Sixth Avenue
Portland, Oregon 97204

At your request, we have performed certain agreed upon procedures with respect to Jeld-Wen, Inc.'s (the Company) Pollution Control Facility Tax Credit Application No. 4348 (the Application) regarding the Geoenergy E-Tube System, Model 1013-189, Wet Electrostatic Precipitator in Linn County, Oregon (the Facility). The aggregate Facility costs claimed on the Application were $696,035. The following are our agreed upon procedures and related findings:

1. We read the Application, the Oregon Revised Statutes regarding Pollution Control Facilities Tax Credits - Sections 468.150 - 468.190 (the Statutes) and the Oregon Administrative Rules regarding Pollution Control Tax Credits - Sections 340-16-005 through 340-16-050 (OAR's).

2. We discussed the Application and Statutes with Charles Bianchi and Brian Fields of the Oregon Department of Environmental Quality (DEQ).

3. We discussed the Application and Statutes with Gary Koepke, Project Engineer of the Company.

4. We inquired as to whether there were any direct or indirect Company costs included in the Facility costs claimed on the Application. We were informed that $144,438 of direct and indirect Company costs were included in the Application.

   Based on our procedures discussed in item no. 5 below, we noted the direct and indirect Company costs included in the Application appeared to be allowable.

5. We compared supporting vendor invoices, canceled checks and Company job cost records for 78% of the amount claimed on the Application to (1) Exhibit C of the Application and (2) the Statutes and OAR's in item no.1 above. All items which we tested appeared to be from third party vendors and Company employees who worked on the construction of the Facility.

6. We discussed with Gary Koepke, Project Engineer for the Company, the extent to which non-allowable costs were excluded from the Application. This was accomplished by reviewing specific contractor invoices and the Company's job cost records (see item no. 5) with Mr. Koepke. We determined the Company had properly excluded from the Application all costs which were not allowed by the Statues or OAR's.

Because the above procedures do not constitute an audit conducted in accordance with generally accepted auditing standards, we do not express an opinion on any of the items referred to above. Had we performed additional procedures, or had we conducted an audit of the financial statements of the Company in accordance with generally accepted auditing standards, other matters might have come to our attention that would have been reported to you. This report relates only to the items specified above and does not extend to any financial statements of the Company as a whole.

This report is solely for the State of Oregon Department of Environmental Quality in evaluating the Company's Pollution Control Facility Tax Credit Application and should not be used for any other purpose.

Coopers & Lybrand L.L.P.

Portland, Oregon
July 20, 1995

Application No.T-4370

State of Oregon
Department of Environmental Quality

TAX RELIEF APPLICATION REVIEW REPORT

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1. Applicant

Tillamook County Creamery Association
Wastewater Treatment Plant
4174 Hwy 101 N, PO Box 313
Tillamook OR 97141

The applicant owns and operates a wastewater treatment plant in Tillamook, Oregon.

Application was made for tax credit for a water pollution control facility.

2. Description of Facility

The facility is an expanded and upgraded activated sludge wastewater treatment plant which treats water from the cheesemaking operation of the creamery. A visitors' center is also operated at the creamery. Wastewater from the dairy products plant and sanitrary wastes from the plant and visitors' center are treated in the wastewater treatment plant. The applicant holds an NPDES permit which allows them to discharge treated effluent from the wastewater treatment plant to the Wilson River at River Mile 1.7. The facility being claimed for a tax credit includes the following components:

Raw influent lift station
Raw influent line
Primary effluent pump station
Chlorine contact chamber
Aerobic digester
Emergency generator
Selector cells
Three cell aeration basin
New intermediate clarifier
Modification of Smith & Loveless package plant
Modification of surge tank

Claimed Facility Cost: $3,714,486.21
Accountant's Certification was provided for costs totaling $3,685,976.91, which is the adjusted claimed facility cost.

The summary of project costs follows:

Phase I	
Aerobic Digester	$176,818.36
Contact Chamber	13,979.00
Emergency Generator	67,420.00
Engineering	336,858.62
Ferric Tank	12,031.00
General	30.903.60
General Site	1,439,549.00
Primary Wet Well	50,879.63
Raw Influent	57,454.00
Subtotal	2,185,893.21
Phase II	
Aeration Basins	133,005.00
Clarifier	77,589.00
General	30,515.00
General Contractor	1,157,370.00
General Engineering	119,174.00
General Inspection	7,129.00
Surge Tank	3,811.00
Subtotal	1,528,593.00
Total	$3,714,486.21

Accountant's Certified Costs: $3,685,976.91

3. Procedural Requirements

The facility is governed by ORS 468.150 through 468.190 and by OAR Chapter 340, Division 16.

The facility met the statutory deadline in that construction, erection, and installation of the facility was substantially completed in October 1993 and the application for certification was found to be complete on in March 1995, within 2 years of substantial completion of the facility.

4. Evaluation of Application

a. The facility is eligible because the principal purpose of the facility is to comply with a requirement imposed by the federal Environmental Protection Agency to control water pollution. The requirement is to comply with a Consent Decree issued in June 1992.

b. Eligible Cost Findings

In determining the percent of the pollution control facility cost allocable to pollution control, the

following factors from ORS 468.190 have been considered and analyzed as indicated:

1) The extent to which the facility is used to recover and convert waste products into a salable or usable commodity.

   The facility does convert waste products into a usable commodity, namely sludge. The sludge is used as an agricultural soil supplement/fertilizer, and is disposed of in this manner. No income is derived from this source, since users of the sludge do not pay for the material and the applicant pays all expenses associated with the application of the sludge to agricultural lands.

   The percent allocable determined by using this factor is 100%.

2) The estimated annual percent return on the investment in the facility.

   As noted above, the facility does not recover or convert waste products into a salable commodity, and no income is derived from the operation of the activated sludge wastewater facility.

3) The alternative methods, equipment and costs for achieving the same pollution control objective.

   A consulting firm hired by the applicant prepared a report, *Conceptual Design Report for the Wastewater Treatment System Evaluation*, dated July 1991 which evaluated the following five treatment systems:

   Two-stage activated sludge
   Anaerobic treatment followed by activated sludge
   Single-stage activated sludge followed by aerated stabilization basin (ASB)
   Sequencing batch reactors (SRB)
   Aerated stabilization basin (ASB)

   The ASB was eliminated based on:

   No use of any existing equipment
   Extensive land area required
   Less likely to meet strict effluent criteria
   Tertiary filtration needed to achieve low TSS

Necessity of dredging of accumulated sludge after several years of operation
Lower aeration equipment efficiency compared to activated sludge process, requiring more connected horsepower
Lack of process control

The SBR was eliminated based on:
Limited use of existing equipment
Operator would be unfamiliar with the system
The approach is less proven in this application
Preliminary cost estimates showed higher costs than the two-stage activated sludge alternative.
Successful SBR operation promotes nitrification, which increases oxygen demand, sludge production, and pH adjustment; however, this waste is nitrogen deficient, and these considerations would be minimal.

The two-stage activated sludge alternative was developed in the greatest detail since it has been a proven process in the past and involved the lowest initial capital cost compared to other viable alternatives.

4) Any related savings or increase in costs which occur or may occur as a result of the installation of the facility.

The annual operating costs are reduced by $100,000 because the new aerobic digester reduces the volume of solids which need to be land applied. This causes a savings in time for hauling, use of chemicals, and amount to be hauled.

However, the savings are not sufficient to produce an impact on the return on investment calculation for the purpose of cost allocation to pollution control under the Rules. Therefore, the percent allocable determined by using this factor is 100%.

5) Any other factors which are relevant in establishing the portion of the actual cost of the facility properly allocable to the prevention, control or reduction of air, water or noise pollution or solid or hazardous waste or to recycling or properly disposing of used oil.

a) The Environmental Quality Commission has directed that tax credit applications having claimed facility costs at or above $250,000 undergo an additional departmental accounting review to ensure that all eligible costs are properly allocated to pollution control. This review was performed by the accounting firm of Merina, McCoy, Gerritz, P.C. which found that, of the amount claimed, $226,076.26 in costs were not actual costs of the project are therefore ineligible.

Moreover, the claimed facility treats wastewater that originates from three sources: production of dairy products; the retail deli on site; and human wastes from employees. ORS 468.155(2)(b) states that a "Pollution control facility" does not include septic tanks or other facilities for human waste. The Department believes that the portion of the claimed facility that is used for the treatment of human waste is ineligible, and that the tax credit should be reduced by an appropriate amount. Human wastes are contributed by employees and the retail deli; the contribution is estimated below. The estimate is based on the portion of the total flow to the wastewater treatment system coming from human sources.

OAR 340-71-Table 2, from the Department's On-Site Sewage Disposal Rules, gives quantities of sewage flow for various types of operations, including:

Factories (exclusive of industrial wastes, without shower facilities: 15 gallons/day/person.

The applicant provided the following average water usage information for the period June thru August, 1994:

Water usage by the retail facility: 5,400 gal/day
Total flow to the treatment plant: 183,000 gal/day

The applicant employs approximately 390 staff, approximately 90 of whom are seasonal employees who work in the deli. The flow contribution from the extra seasonal employees would reasonably be accounted for in the retail usage figure of 5,400 gal/day.

After subtracting the seasonal employees, the flow contribution from approximately 300 employees

remains to be accounted for. The applicant stated that showers are available in some areas of the production facility, but are not regularly used. Therefore, the Department used the figure of 15 gal/day/person from OAR 340-71-Table 2 to estimate the human waste contribution by employees:

300 people x 15 gal/day/person = 4,500 gal/day.

The percentage of the facility used to treat human waste is then estimated to be:

(5,400 + 4,500)/183,000 x 100 = 5.4%; This rounds off to 5%.

Thus, the Department estimates that 5% of the adjusted claimed cost is not allocable to pollution control.

In consequence, the actual cost of the facility properly allocable to pollution control as determined by using this factor is 95%.

5. Summation

a. The facility was constructed in accordance with all regulatory deadlines.

b. The facility is eligible for tax credit certification in that the principal purpose of the facility is to comply with a requirement imposed by the federal Environmental Protection Agency to control water pollution.

c. The facility complies with DEQ statutes and rules and permit conditions.

d. The portion of the facility cost that is properly allocable to pollution control is 95%.

6. Director's Recommendation

Based upon these findings, it is recommended that a Pollution Control Facility Certificate bearing the cost of $3,459,901.00 with 95% allocable to pollution control, be issued for the facility claimed in Tax Credit Application No. T-4370.

Elliot J. Zais:ejz
TC-4370
(503) 229-5292

MERINA McCOY GERRITZ, P.C.
CERTIFIED PUBLIC ACCOUNTANTS

PARTNERS
John W. Merina, CPA
Michael E. McCoy, CPA
Gerald V. Gerritz, Jr., CPA

CERTIFIED IN
Oregon
Washington

INDEPENDENT ACCOUNTANTS' REPORT ON APPLYING AGREED-UPON PROCEDURES

Oregon Department of
Environmental Quality
811 S.W. Sixth Avenue
Portland, OR 97204

At your request, we have performed the procedures enumerated below, which were agreed to by the Oregon Department of Environmental Quality (DEQ), solely to assist the DEQ in evaluating Tillamook County Creamery Association's (the Association) Pollution Control Tax Credit Application No. 4370 regarding the Water Pollution Control Facility (the Facility) in Tillamook, Oregon. The claimed facility costs on the Application are $3,714,486.21. The following agreed-upon procedures and related findings are:

1. We read the Application, the Oregon Revised Statutes on Pollution Control Facilities Tax Credits - Sections 469.150 - 468.190 (the Statutes) and the Oregon Administrative Rules on Pollution Control Tax Credits - Sections 340-16-050 (OARs).

2. We reviewed and discussed the Application, supporting documents, and Statutes with Charles Bianchi and Dr. Elliot Zias of the Oregon Department of Environmental Quality (DEQ).

3. We reviewed and discussed the Application, supporting documents, Statutes, and OARs with Shawn Reiersgaard, Environmental Supervisor, and Debra E. Werner, Controller.

4. We inquired as to whether there were any direct or indirect Company costs charged or allocated to the facility costs claimed in the Application. We were informed that no direct or indirect Company costs were included in the Application.

   Based on our review of supporting documentation discussed in item number 5, below, we noted no direct or indirect Company costs were included in the Application.

5. We reviewed the documents and workpapers of applicant's certified public accountants that relate to the facility claim.

   The claimed facility cost in the Application was $3,714,486.21. The Accountant's Certificate was for costs totaling $3,685,976.91.

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6. We visited the site and visually inspected the Facility. During the tour, we noted the Facility didn't have any of the items disallowed under OAR 340-16-025(3).

7. We reviewed all costs contained in the Application and found that certain costs claimed in Phase I were duplicated in the list of costs claimed in Phase II. We also noted that Dr. Zias determined that 5% of the claimed costs are not eligible and that the portion of the facility cost that is properly allocable to pollution control is 95%.

   Accordingly, the following adjustments should be made to the claimed facility costs:

Adjusted claimed facility costs	$ 3,685,976.91
Reduction for credits to costs incurred in phase I	(226,076.26)
Eligible facility cost	$ 3,459,900.65

   We determined that the adjusted claimed facility cost is eligible for pollution control tax credit certification under the rules and statutes that govern the program. The Association personnel identified in procedure three have confirmed to us their agreement with the adjustments.

8. We reviewed Section V of the Application to determine the portion of actual costs properly allocable to the Pollution Control Facility. We determined that there is no income generated by the claimed facility, however, there is a reduction in operating costs primarily as a result of a reduction in the amount of sludge to be disposed of. The operating cost savings are estimated to be as follows:

Year	Annual Cash Flow
1	$ 58,135
2	62,902
3	68,001
4	73,453
5	79,711
Average	68,440

   The Association personnel identified in procedure three have confirmed to us their agreement with these estimates.

The average annual cash flow of $68,440 is so small in relation to the eligible facility cost of $3,459,900.65, that the portion of actual costs properly allocable to the Facility is not affected by the return on investment of the Facility. However, as indicated in paragraph 7, the percentage of actual costs properly allocable to pollution control is 95% due to the fact that the Facility serves purposes in addition to pollution control.

9. The Association's personnel identified in procedure three have confirmed to us that no billings from related parties or affiliates of the Association have been included in the claimed costs.

Because the above procedures do not constitute an audit conducted in accordance with generally accepted auditing standards, we do not express an opinion on any of the items referred to above. In connection with the procedures referred to above, no matters came to our attention that caused us to believe that the Application should be adjusted, except as detailed in procedure seven. Had we performed additional procedures or had we conducted an audit of the financial statements of the Company in accordance with generally accepted auditing standards, other matters might have come to our attention that would have been reported to you. This report relates only to the items specified above and does not extend to any financial statements of the Company taken as a whole.

This report is solely for the State of Oregon Department of Environmental Quality in evaluating the Association's Pollution Control Tax Credit Application and should not be used for any other purpose.

Merina McCoy Gerritz, CPA's, P.C.
West Linn, Oregon 97068
June 27, 1995

Environmental Quality Commission

☒ Rule Adoption Item
☐ Action Item
☐ Information Item

Agenda Item C
August 18, 1995 Meeting

Title:

1. Revisions to the Klamath Falls PM_{10} Control Plan as an amendment to the Oregon Clean Air Act State Implementation Plan (SIP).
2. Unrelated housekeeping and clarifying amendments to Divisions 25, 28, and 32, clarifying rule language and adding a definition.

Summary:

This proposal would amend the Klamath Falls PM_{10} Control Plan to incorporate new and more accurate transportation emission estimates from the Oregon Department of Transportation, and a revised motor vehicle emissions budget. This will facilitate meeting federal transportation funding and approval requirements under Clean Air Act conformity provisions. The revised control plan also incorporates new emission reduction information from the Klamath Falls low income woodstove replacement program, and addresses modeling requirements for the Klamath Falls Weyerhaeuser facility. Housekeeping amendments to OAR Division 25 (Specific Industrial Standards), Division 28 (Stationary Source Air Pollution Control and Permitting Procedures), and Division 32 (Hazardous Air Pollutants, General Provisions for Stationary Sources) would bring existing rules into conformance with federal requirements, and clarify and correct rule language.

Department Recommendation:

Adopt the revised Klamath Falls PM_{10} Control Plan as an amendment to the Oregon Clean Air Act State Implementation Plan (SIP). Adopt amendments to OAR Divisions 25, 28, and 32.

Report Author	Division Administrator	Director

June 23, 1995

†Accommodations for disabilities are available upon request by contacting the Public Affairs Office at (503)229-5317(voice)/(503)229-6993(TDD).

State of Oregon
Department of Environmental Quality Memorandum†

Date: June 23, 1995

To: Environmental Quality Commission

From: Langdon Marsh, Director

Subject: Agenda Item C, August 18, 1995 EQC Meeting

1. Revisions to the Klamath Falls PM_{10} Control Plan as an amendment to the Oregon Clean Air Act State Implementation Plan (SIP).
2. Unrelated housekeeping and clarifying amendments to Divisions 25, 28, and 32, clarifying rule language and adding a definition.

Background

On May 12, 1995 the Director authorized the Air Quality Division to proceed to a rulemaking hearing on the following rule amendments.

(1) Revisions to the Klamath Falls PM_{10} Control Plan as an amendment to the Oregon Clean Air Act State Implementation Plan (SIP)

(2) Housekeeping amendments to OAR Division 25 (Specific Industrial Standards), Division 28 (Stationary Source Air Pollution Control and Permitting Procedures), and Division 32 (Hazardous Air Pollutants).

Pursuant to the authorization, hearing notice was published in the Secretary of State's Bulletin on June 1, 1995. The Hearing Notice and informational materials were mailed to the mailing list of those persons who have asked to be notified of rulemaking actions, and to a mailing list of persons known by the Department to be potentially affected by or interested in the proposed rulemaking action on May 12, 1995.

Public Hearings were held June 16, 1995 in Klamath Falls (for the Klamath Falls PM_{10} Control Plan revision), and June 20, 1995 in Portland (for amendments to OAR Divisions 25, 28, and 32), with David Collier (Klamath Falls) and Patti Seastrom (Portland) serving as Presiding Officers. The Presiding Officer's Report (Attachment C) summarizes the oral testimony presented at the hearings.

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†Accommodations for disabilities are available upon request by contacting the Public Affairs Office at (503)229-5317(voice)/(503)229-6993(TDD).

Written comment was received through June 22, 1995 at 5:00 pm. A list of written comments received is included as Attachment D. (A copy of the comments is available upon request.)

Department staff have evaluated the comments received (Attachment E). Based upon that evaluation, the following modification to the initial rulemaking proposal is being recommended by the Department. Weyerhaeuser commented that the Department had not fully taken into account recent significant reductions in permitted emissions which are being incorporated into Weyerhaeuser's new Air Contaminant Discharge Permit (ACDP). Because permitted emissions have been significantly reduced since the Department's initial modeling analysis, the Department has provided Weyerhaeuser the opportunity to model emission impacts at Peterson School using their new permitted emissions. Preliminary results of this modeling indicate that Weyerhaeuser's maximum exceedence day impact at the Peterson School monitoring site is insignificant (below the Department's 5 ug/m^3 significance criteria). The Department will continue to review the new modeling results and will, by October 1, 1995, make a final determination regarding the significance of Weyerhaeuser's emission impact at the Peterson School monitoring site in Klamath Falls.

Relevant language in the revised PM_{10} Control Plan has been modified to reflect these new developments. The revised text can be found on page A-26 and A-82 of the current proposed PM_{10} Control Plan revision (Attachment A).

A comparison of relevant language both as originally presented for public comment in June, 1995, and as currently revised, is presented on pages 13 through 17 of this memorandum. Tables 2 and 3 (pages 13 and 14) summarize where significant changes or additions have been made. Pages 15 and 16 provide the original text as presented for public comment.

- **No other modifications to the proposal are recommended by the Department.**

Proposal Summary

The following sections summarize the issue that this proposed rulemaking action is intended to address, the authority to address the issue, the process for development of the rulemaking proposal including alternatives considered, a summary of the rulemaking proposal presented for public hearing, a summary of the significant public comments and the changes proposed in response to those comments, a summary of how the rule will work and how it is proposed to be implemented, and a recommendation for Commission action.

Issue this Proposed Rulemaking Action is Intended to Address

1. The Department of Transportation is proposing to construct a motor vehicle interchange project (Washburn Way) in the City of Klamath Falls. State and federal transportation conformity rules require that an air quality impact analysis be conducted in nonattainment areas for any regionally significant transportation project. This analysis must demonstrate that projected emissions from the proposed project are consistent with emissions allocated to motor vehicle use in the PM_{10} Control Plan, and that no degradation of air quality will occur as a result of the project. Impact analysis shows that construction of the Washburn Way project will slightly increase PM_{10} emissions from motor vehicles above levels initially accounted for in the Klamath Falls PM_{10} Control Plan. The Washburn Way project is therefore unable to demonstrate conformity, and construction can not go forward. The City of Klamath Falls has stated the urgent need for the Washburn Way project, citing fatalities at the existing intersection, and the significant public safety benefit to be derived from the new interchange. The City has requested that the control plan be revised to accommodate this transportation project.

The Department has reviewed the Washburn Way project and has determined that the Klamath Falls PM_{10} Control Plan can be safely revised to accommodate the slight increase in motor vehicle emissions without jeopardizing attainment or maintenance of air quality standards. The emission reduction strategies and attainment demonstration in the PM_{10} Control Plan provide an adequate margin of safety to address small unanticipated emission increases in the airshed. Additional emission reductions achieved since 1991 have also been added to the PM_{10} control strategy, which more than offset the minor motor vehicle emission increase, and further increase the attainment margin of safety. The Department is confident in the ability of the control plan to protect air quality standards in Klamath Falls, and therefore proposes to amend the Klamath Falls PM_{10} Control Plan to revise the motor vehicle emission budget so that a successful conformity determination can be made.

The City of Klamath Falls has stated the urgent need for the Washburn Way project, and has reiterated their concerns regarding the adverse impact to public safety should the project be significantly delayed. The City has requested that the Klamath Falls PM_{10} Control Plan be revised as soon as possible to accommodate this project. The Department has committed to complete this SIP revision as quickly as possible, and has committed to work with EPA on the expeditious approval of the SIP revision, with a target completion date of no later than December 31, 1995.

2. Housekeeping amendments to OAR Division 25 (Specific Industrial Standards), Division 28 (Stationary Source Air Pollution Control and Permitting Procedures), and Division 32 (Hazardous Air Pollutants, General Provisions for Stationary Sources) would bring existing rules into conformance with federal requirements, and clarify and correct rule language. For purposes of program delegation approval, EPA has requested an amendment to Division 25 modifying the New Source Performance Standard (NSPS) definition of "reference method" to delete references to Department manuals which are not approved by EPA for NSPS purposes. Amendments to Division 28 will bring public notification procedures for proposed federal operating permits in line with federal requirements. Amendments to Division 32 adds a definition for "Open Accumulation of Asbestos Containing Material." This definition will aid enforceability of the existing open accumulation rules.

Relationship to Federal and Adjacent State Rules

The Klamath Falls SIP amendments are consistent with federal guidance for PM_{10} nonattainment areas, and equivalent to adjacent state rules.

Amendments to Division 28 will make public notice requirements consistent with federal rules. Regarding Division 32, federal regulations do not use the term "Open Accumulation of Asbestos", therefore no equivalent federal definition exists.

Authority to Address the Issue

OAR 468A.035	Comprehensive Air Pollution Control Plan
OAR 340-20-047	State of Oregon Clean Air Act Implementation Plan
OAR 340-20-700	Criteria and Procedures for Determining Conformity to State or Federal Implementation Plans of Transportation Plans, Programs, and Projects.

Process for Development of the Rulemaking Proposal (including Advisory Committee and alternatives considered)

The Department has worked closely with the Klamath Falls City Council, the Klamath County Board of Commissioners, and the Oregon Department of Transportation regarding transportation conformity issues in Klamath Falls, and the proposed revision to the PM_{10} Control Plan. Amendments to Divisions 25, 28, and 32 do not add any additional regulatory requirements, therefore an advisory committee was not utilized.

Summary of Rulemaking Proposal Presented for Public Hearing and Discussion of Significant Issues Involved.

1. The Oregon Department of Transportation (ODOT) has recently provided more accurate information on regional transportation emissions in the Klamath Falls PM_{10} Nonattainment Area, which has allowed the Department to more accurately characterize regional motor vehicle emissions in the airshed for both the 1986 base year and projected future years. Incorporating these new estimates into the Klamath Falls PM_{10} Control Plan would improve the accuracy of the plan, and would allow the Department to more accurately assess (under the state and federal transportation conformity[††] rule) the air quality impact of any regionally significant transportation project proposed in the nonattainment area.

One regionally significant project has recently been proposed for Klamath Falls. ODOT is planning to construct a motor vehicle interchange project at the intersection of the Southside Expressway and Washburn Way. Since the Wasburn Way project is regionally significant, state and federal transportation conformity rules apply, and an air quality impact analysis is required.

[††] Transportation Conformity provides a safeguard against increased emissions from transportation projects jeopardizing air quality standards in nonattainment areas. The Transportation Conformity Rule requires all proposed regionally significant transportation projects to undergo an emissions analysis, which must demonstrate that the project is consistent with a state's strategy to attain and maintain air quality standards.

Under the Department's conformity rules for "transitional areas"[†††] such as Klamath Falls, proposed regionally significant transportation projects must meet two separate conformity tests before funding can be approved. Under the first conformity test, emission levels resulting from construction of the project must not exceed either; a) 1990 baseline transportation emission levels; or b) the **no-build** emission level. The second conformity test requires future emissions to be consistent with the motor vehicle emissions budget submitted to EPA in the PM_{10} Control Plan. Klamath Falls is currently considered to be a "transitional area" for conformity because the Environmental Protection Agency (EPA) has yet to fully approve the PM_{10} Control Plan. Once approval is granted, the transitional area conformity tests (1990 baseline and build/no-build) will no longer be required. Only an emission budget requirement will apply.

Regional emissions analysis indicates that the Washburn Way project will slightly increase PM_{10} emissions from motor vehicles above 1990 baseline levels. In addition, projected future emissions (*including the project*) exceed future emission levels under the *"no-build"* scenario. The regional analysis demonstrates a failure of the Washburn Way project to meet the 1990 baseline and "build/no-build" tests. Therefore, conformity can not be demonstrated under the first set of transitional area tests. In addition, the original motor vehicle emissions budget established in the 1991 Klamath Falls PM_{10} Control Plan is unable to accommodate the proposed Washburn Way project. Therefore, given the current regulatory structure and EPA status of the Klamath Falls PM_{10} Control Plan, conformity can not be demonstrated, and construction of the Washburn Way project can not go forward.

The emission reduction strategies and attainment demonstration in the Klamath Falls PM_{10} Control Plan provide an adequate margin of safety to address small emission increases in the airshed. Revising the attainment demonstration to reflect the new, more accurate transportation estimates, including the Washburn Way project, does not compromise this safety margin. The minor emissions increase caused by motor vehicles has been more than offset by additional unanticipated emission reductions from the Klamath Falls low income woodstove replacement program. The additional emission

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[†††] Several descriptive designations can apply to nonattainemnt areas under the conformity rule. These are designed to describe the three distinct stages of control strategy development/implementation, and the associated conformity requirements. Under the conformity rule, the "Phase II Interim Period" describes the time prior to the initial EPA submittal of the attainment or maintenance plan; the "Transitional Period" describes the interval between plan submittal and final EPA action on the plan; the "Control Strategy Period" describes the period after EPA approval of a states attainment or maintenance plan, where only the emissions budget applies.

reduction achieved by this program since 1991 will increase the effectiveness of the PM_{10} control strategy, and further increase the attainment safety margin.

The Department has reviewed the Washburn Way project and has determined that the attainment demonstration and emissions budget can be safely revised to accommodate the slight increase in motor vehicle emissions without jeopardizing attainment or maintenance of PM_{10} air quality standards. In light of the more accurate ODOT information, additional emission reductions achieved since 1991, the satisfactory safety margin in the attainment demonstration, and the public safety and funding concerns relating to the Washburn Way project, the Department proposes to amend the Klamath Falls PM_{10} Control Plan to improve the accuracy of the attainment demonstration, and to revise the motor vehicle emissions budget so that a successful conformity determination can be made. The revised budget will allow for the slight increase in motor vehicle emissions while still demonstrating compliance with national ambient air quality standards for PM_{10}.

In addition to the conformity revision, a previous SIP commitment has provided the opportunity to re-evaluate the air quality impact of the Klamath Falls Weyerhaeuser facility on the critical air monitoring site in the nonattainment area (Peterson School). In January, 1995, the Department evaluated dispersion modeling of Weyerhaeuser emissions using estimates of permitted emission levels, which resulted in an estimated maximum exceedence day impact at Peterson School slightly above the Department's significance criteria of 5 ug/m^3. The Department determined that these emission impacts would not jeopardize attainment or continued maintenance of PM_{10} air quality standards. During the public comment period Weyerhaeuser testified that the Department had not fully taken into account all recent and significant reductions in permitted emissions which are currently being incorporated into Weyerhaeuser's new Air Contaminant Discharge Permit. The Department recognizes that Weyerhaeuser's final permitted emission level is below the initial modeled emission estimates. Therefore, the Department has provided Weyerhaeuser the opportunity to model emission impacts at Peterson School using their new permitted emission level. The wording in the proposed PM_{10} Control Plan amendment has been revised to reflect this new development. Preliminary results of this modeling indicate that Weyerhaeuser's maximum exceedence day impact at the Peterson School monitoring site is insignificant (below the Department's 5 ug/m^3 significance criteria). The Department will continue to review the new modeling results and will, by October 1, 1995, make a final determination regarding the significance of Weyerhaeuser's emission impact at the Peterson School monitoring site. If exceedence day PM_{10} impacts at Peterson School are determined to be significant, and if attainment is not maintained in Klamath Falls, then the Department will require Weyerhaeuser to comply with the same RACT contingency requirements as other stationary sources within

the nonattainment area boundary. If exceedence day impacts at Peterson School are determined to be insignificant, Weyerhaeuser will not be subject to the PM_{10} Control Plan Industrial Contingency Requirements.

2. Divisions 25, 28, and 32 contain minor inconsistencies and outdated references. Of specific concern is OAR 340-28-2290, publication requirement for federal operating permits. Also the asbestos rules in Division 32 refer to the term "Open Accumulation of Asbestos", but do not define it. OAR 340-28-2290 is being amended to conform to federal requirements. A definition for "Open Accumulation of Asbestos" is proposed to be added to Division 32.

Summary of Significant Public Comment and Changes Proposed in Response

Comment

1. Dr. Robert Palzer, acting for the Oregon Chapter of the Sierra Club, commented in support of the conformity revisions, but believes that the proposed amendments are inadequate and deceptive because of a failure to adequately address the impact from the Klamath Falls Weyerhaeuser facility.

Response

The Department has addressed the impact from the Klamath Falls Weyerhaeuser facility using both receptor and dispersion modeling as committed to in the adopted 1991 PM_{10} Control Plan. A dispersion modeling analysis of Weyerhaeuser's estimated permitted emissions was evaluated by the Department in January, 1995, which identified the emission impact on the critical PM_{10} monitoring site of Peterson School. Weyerhaeuser's average exceedence day impacts at Peterson School were determined to be minimal, and are consistent with the original receptor modeling analysis conducted in 1991 which indicated that industrial emissions were not a major contributor to violations of the 24-hour ambient air quality standard for PM_{10}. The maximum exceedence day impact was estimated to be slightly above the Department's 5 ug/m^3 significance criteria, but would not jeopardize attainment or continued maintenance of the PM_{10} standard. Current modifications to Weyerhaeuser's Air Contaminant Discharge Permit incorporate significant reductions in permitted emissions achieved since the Department's initial modeling analysis. Since Weyerhaeuser's permitted emissions are now lower than initially estimated, the Department has provided Weyerhaeuser the opportunity to model emission impacts at Peterson School using their new permitted emissions. Preliminary results of this modeling indicate that

Weyerhaeuser's maximum exceedence day impact at the Peterson School monitoring site is insignificant (below the Department's 5 ug/m^3 significance criteria). The Department will continue to review the new modeling results and will, by October 1, 1995, make a final determination regarding the significance of Weyerhaeuser's emission impact at the Peterson School monitoring site.

2. **Comments**

The Weyerhaeuser Company commented in support of the conformity revisions. However, Weyerhaeuser objected to the Departments conclusion that their Klamath Falls operation has a significant impact on the nonattainment area, and to the Department's position that Weyerhaeuser be subjected to the Industrial Contingency Requirements for PM_{10} Nonattainment Areas, should the area slip back into nonattainment. Weyerhaeuser's objections covered three main areas. Weyerhaeuser believed that:

a. The Department had failed to demonstrate that the industrial contingency requirements are relevant and applicable since the area has not been designated by EPA as failing to attain PM_{10} air quality standards by the attainment date cited in the rule. DEQ had also failed to demonstrate that Weyerhaeuser has the potential to have a significant impact on the nonattainment area.

b. The Department had failed to recognize that a significant reduction in emissions has occurred at the Klamath Falls Weyerhaeuser facility since the control plan was adopted, further minimizing the possibility that Weyerhaeuser could have a significant impact on the Klamath Falls PM_{10} nonattainment area.

c. The Department had failed to use the results from both receptor and dispersion modeling, and had made a determination of significance based only on DEQ dispersion modeling results.

Response

Meetings with Weyerhaeuser subsequent to the close of the public comment period have resolved the comments listed above to Weyerhaeuser's satisfaction. The summary below addresses the three main points raised by Weyerhaeuser:

Based on the Department's original modeling, the Weyerhaeuser facility has the potential to significantly impact the Klamath Falls nonattainment area, therefore the contingency measures are relevant. The facility is located in close proximity to the nonattainment area boundary, and until recently possessed total permitted emissions which exceeded the entire 1994 Klamath Falls nonattainment area emission inventory. Weyerhaeuser has recently relinquished approximately 870 tons/yr of PM_{10} emission credits, significantly reducing permitted emissions. Additional modeling should be done at the new permitted emission level to determine if this conclusion is still accurate.

Contingency measures remain applicable to Weyerhaeuser. The Klamath Falls area has successfully achieved compliance with the PM_{10} standard by the Clean Air Act deadline of December 31, 1994; and therefore has not been designated by EPA as failing to attain by the date cited in the contingency rule. Should future PM_{10} levels exceed standards, Klamath Falls will have failed to meet the Clean Air Act attainment date. Contingency measures must continue after the Clean Air Act attainment deadline is reached, to ensure timely corrective action should violations of air quality standards reoccur. Under the Clean Air Act, contingency measures required in the PM_{10} control plan remain in effect until they are replaced by contingency measures in the maintenance plan.

The Department fully recognizes the significant voluntary effort made by Weyerhaeuser to reduce emissions from the Klamath Falls facility. While the original modeled average exceedence day impacts were well below the Department's 24-hour significance criteria of 5.0 ug/m^3, the Department's initial analysis did indicate that Weyerhaeuser's maximum exceedence day impact was slightly above the significance level. The Department concluded that this impact would not threaten attainment or continued maintenance of the PM_{10} standard. The Department also recognizes that Weyerhaeuser's final permitted emission level as reflected in their new Air Contaminant Discharge Permit (ACDP) is below the initial emission estimates modeled by the Department. Therefore, the Department has provided Weyerhaeuser the opportunity to model emission impacts at Peterson School using these new permitted emissions. Preliminary results of this modeling indicate that Weyerhaeuser's maximum exceedence day impact at the Peterson School monitoring site is insignificant (below the Department's 5 ug/m^3 significance criteria). The Department will continue to review the new modeling results and will, by October 1, 1995, make a final determination regarding the significance of Weyerhaeuser's emission impact at the Peterson School monitoring site. If exceedence day PM_{10} impacts at the Peterson School monitoring site are determined to be significant, and if attainment is not maintained in Klamath Falls,

then the Department will require Weyerhaeuser to comply with the same RACT contingency requirements as other stationary sources within the nonattainment area boundary. If exceedence day impacts at Peterson School are determined to be insignificant, Weyerhaeuser will not be subject to the PM_{10} Control Plan Industrial Contingency Requirements.

Table 1 below summarizes the reduction in Weyerhaeuser's permitted emissions and the corresponding maximum exceedence day impacts at the Peterson School monitor site.

TABLE 1: PRELIMINARY MODELING RESULTS

Weyerhaeuser Permitted Emissions And Modeled Maximum Exceedence Day Impact		
Modeling Period	**Permitted Emissions (PSEL)**	**Maximum Modeled Exceedence Day Impact At Peterson School**
1986 Baseline	483 lbs/hr PM_{10}	Not Modeled
DEQ Evaluation Dec/Jan. 1994/95	152 lbs/hr PM_{10}	7.2 ug/m^3
New Modeling 1995	106 lbs/hr PM_{10}	3.8 ug/m^3 *

* The Department's significance criteria is 5.0 ug/m^3. Modeling results using Weyerhaeuser's new permitted emission level is being currently reviewed by the Department.

Summary of How the Proposed Rule Will Work and How it Will be Implemented

1. The Klamath Falls PM_{10} attainment demonstration can be successfully revised to accommodate the slight increase in motor vehicle emissions without jeopardizing attainment or the 10 year maintenance period in Klamath Falls. If adopted, the Control Plan revision will be submitted to the Environmental Protection Agency (EPA) for approval. EPA approval is anticipated in the winter of 1995. Once approval is granted, the Washburn Way project will be able to meet the emissions budget as amended in this proposal, thereby allowing construction to proceed as scheduled.

2. Amendments to Divisions 25, 28, and 32 will be incorporated into the Secretary of State and Department's printed rules and distributed in the usual manner.

Recommendation for Commission Action

It is recommended that the Commission adopt the rules/rule amendments regarding the Klamath Falls PM_{10} Control Plan, and amendments to OAR Divisions 25, 28 and 32, as presented in Attachment A of the Department Staff Report.

Attachments

A. Rule (Amendments) Proposed for Adoption
B. Supporting Procedural Documentation:
   1. Legal Notice of Hearing
   2. Public Notice of Hearing (Chance to Comment)
   3. Rulemaking Statements (Statement of Need)
   4. Fiscal and Economic Impact Statement
   5. Land Use Evaluation Statement
   6. Questions to be Answered to Reveal Potential Justification for Differing from Federal Requirements
C. Presiding Officer's Report on Public Hearing
D. List of Written Comments Received
E. Department's Evaluation of Public Comment
F. Appendix 5: Demonstration of Attainment

Reference Documents (available upon request)

Written Comments Received (listed in Attachments D and E)

Approved:

Section:

Division:

Report Prepared By: David L. Collier
Phone: (503) 229-5177
Date Prepared: July 11, 1995

DLC:DLC
July 11, 1995

Table 2: Page A-25 Of Currently Proposed Plan Revision

First Through Third Paragraphs: No substantive changes from initial proposal.

Fourth Paragraph: The fourth paragraph has been modified as follows. For comparison, regular-type below represents language as presented for public comment. **Bold-Underline** represents changes made in response to public comment.

Initial ~~[*Dispersion*]~~ modeling analysis of Weyerhaeuser emissions indicate estimated typical exceedence day impacts of less than 4 ug/m^3, and a maximum exceedence day impact of approximately 7 ug/m^3. ~~[*These impacts are based on anticipated new permit limits.*]~~ The attainment demonstration, with RACM strategies applied, provides an estimated 1994 design day of 137 ug/m^3. With this 13 ug/m^3 (9%) safety margin (150-137), the attainment demonstration shows that the attainment needs of the community can be adequately met through the implementation of RACM control strategies on dust and residential woodburning. Therefore, relatively minor impacts from the Weyerhaeuser facility would not jeopardize attainment or maintenance of the PM_{10} NAAQS. Weyerhaeuser's permitted emissions have recently been significantly reduced to levels below Department estimates, and their Air Contaminant Discharge Permit (ACDP) is being modified to reflect this lower emission level. The Department has therefore provided Weyerhaeuser the opportunity to model emission impacts at Peterson School using these new permitted emissions. Preliminary results of this modeling indicate that Weyerhaeuser's maximum exceedence day impact at Peterson School is below the Department's 5 ug/m^3 significance criteria. The Department will continue to review the new modeling results and will, by October 1, 1995, make a final determination regarding the significance of Weyerhaeuser's impact at the Peterson School monitoring site. If exceedence day PM_{10} impacts at the Peterson School monitoring site are determined to be significant, and if attainment is not maintained in Klamath Falls, then the Department will require Weyerhaeuser to comply with the same RACT contingency requirements as other stationary sources within the nonattainment area boundary. If exceedence day impacts at Peterson School are determined to be insignificant, Weyerhaeuser will not be subject to the PM_{10} Control Plan Industrial Contingency Requirements.

Table 3: Page A-82 Of Currently Proposed Plan Revision

First Paragraph: The following paragraph, originally included in the draft plan revision, has been removed.

~~[*The Department has completed has completed a dispersion modeling analysis of Weyerhaeuser emissions and the impact on the nonattainment area, and has determined that emission impacts from Weyerhaeuser will not jeopardize attainment or maintenance of the PM_{10} NAAQS. Since dispersion modeling indicates that Weyerhaeuser's maximum exceedence day impact (approximately 7 ug/m^3) is above the Department's 24-hour significance criteria of 5.0 ug/m^3, the Department will require Weyerhaeuser to comply with the same RACT contingency requirements as other stationary sources within the nonattainment area boundary.*]~~

Second Paragraph: The following paragraph, originally deleted from the draft plan revision, has been restored and modified as follows.

Under OAR 340-21-210(2), the Department ~~[*is*]~~ requested~~[*ing*]~~ Weyerhaeuser to conduct a receptor/dispersion modeling study by December 31, 1994, to determine whether emissions from the Weyerhaeuser facility have a significant impact (annual average impact of 1.0 ug/m^3, or 24-hour impact of 5.0 ug/m^3) at the maximum concentration point within the nonattainment area (Peterson School monitoring site). ~~[*If the PM_{10} impacts are determined to be significant, and if attainment is not reached by the December 31, 1994, deadline of the Clean Air Act, then the Weyerhaeuser facility will become subject to the RACT contingency requirements.*]~~ Weyerhaeuser's permitted emissions have recently been significantly reduced to levels below Department estimates, and their Air Contaminant Discharge Permit (ACDP) is being modified to reflect this lower emission level. The Department has therefore provided Weyerhaeuser the opportunity to model emission impacts at Peterson School using these new permitted emissions. Preliminary results of this modeling indicate that Weyerhaeuser's maximum exceedence day impact at Peterson School is below the Department's 5 ug/m^3 significance criteria. The Department will continue to review the new modeling results and will, by October 1, 1995, make a final determination regarding the significance of Weyerhaeuser's impact at the Peterson School monitoring site. If the PM_{10} impacts are determined to be significant, and if attainment is not maintained in Klamath Falls, then the Department will require Weyerhaeuser to comply with the same RACT contingency requirements as other stationary sources within the nonattainment area boundary. If exceedence day impacts at Peterson School are determined to be insignificant, Weyerhaeuser will not be subject to the PM_{10} Control Plan Industrial Contingency Requirements.

Impacts from Sources External to the Urban Growth Boundary

The largest industrial source within Klamath County located outside of the UGB is the Weyerhaeuser Company plant which emits a total of approximately 631 tons of PM_{10} per year, largely from hog fuel boilers used to generate steam for the plant. In spite of the magnitude of these emissions and the proximity of the plant to the Urban Growth Boundary, ~~[the Department does not believe that emissions from the plant have a significant impact on the nonattainment area.]~~ the Department believes that Weyerhauser does not significantly affect the ability of the area to attain and maintain attainment of the PM_{10} standard. This is based on findings from two field studies, ~~[and]~~ as well as receptor and dispersion modeling analysis.

The spatial distribution of PM_{10} levels measured during the mobil nephelometer surveys of January, 1989 indicated that concentration fell as the distance from the plant increased. These findings were confirmed by the saturation survey conducted in the Fall of 1985. If the plant had a major impact on the nonattainment area, concentrations should have increased as the distance from the plant decreased.

Receptor modeling analysis of source impacts on exceedence day filter samples at the Peterson School site confirm that hog fuel boiler impacts are small. This is based on studies indicating that the Chemical Mass Balance receptor model is able to quantify hog fuel boiler impacts at levels of 2 $\mu g/m^3$ or greater impact with relative uncertainties of ± 20%.[8] Results of the CMB analysis estimate hog fuel boiler impacts on typical exceedence days in the range of 0 $\mu g/m^3$ to 3 $\mu g/m^3$.

Dispersion modeling analysis of Weyerhauser emissions indicate typical exceedence day impacts of less than 4 $\mu g/m^3$, and a maximum exceedence day impact of approximately 7 $\mu g/m^3$. These impacts are based on anticipated new permit limits. The attainment demonstration, with RACM strategies applied, provides an estimated 1994 design day of 137 $\mu g/m^3$. With this 13 $\mu g/m^3$ (9%) safety margin (150-137), the attainment demonstration shows that the attainment needs of the community can be adequitly met through the implementation of RACM control strategies for fugitive dust and residential woodburning. Therefore, relatively small impacts from the Weyerhauser facility would not jeopardize attainment or maintenance of the PM_{10} NAAQS.

Division. Report 89-1. February, 1989.

[8]Pacific Northwest Source Profile Library: Volume 2 Final Project Report. J. Core, Editor. Department of Environmental Quality. September, 1989.

triggered by failure to meet the Clean Air Act deadline for attainment, affected sources will be required to submit detailed plans to the Department within three months and demonstrate compliance within 30 months. This schedule is consistent with Clean Air Act requirements to implement contingency measures as expeditiously as practicable to continue progress toward attainment while a revised control strategy is under development.

The Department has completed a dispersion modeling analysis of Weyerhauser emissions and the impact on the nonattainment area, and has determined that emission impacts from Weyerhauser will not jeopardize attainment or maintenance of the PM_{10} NAAQS. Since dispersion modeling indicates that Weyerhauser's maximum exceedence day impact (approximately 7 ug/m^3) is above the Department's 24-hour significance criteria of 5.0 ug/m^3, the Department will require Weyerhauser to comply with the same RACT contingency requirements as other stationary sources within the nonattainment area boundary.

~~[Under OAR 340-21-210(2), the Department is requesting Weyerhauser to conduct a receptor/dispersion modeling study by December 31, 1994, to determine whether emissions from the Weyerhauser facility have a significant impact (annual average impact of 1.0 ug/m^3, or 24 hour impact of 5.0 ug/m^3) at the maximum concentration point within the nonattainment area (Peterson School monitoring site). If the PM_{10} impacts are determined to be significant, and if attainment is not reached by the December 31, 1994, deadline of the Clean Air Act, then the Weyerhauser facility will become subject to the RACT contingency requirements.]~~

Emission Reductions From Contingency Measures

Woodstove emissions would be reduced an additional 108 tons per year by the year 2000 through the contingency plan. Industrial emissions would be reduced an additional 132 tons per year (844 tons per year including industries outside of the Urban Growth Boundary but inside the Klamath County Control Area with significant impacts) through installation of RACT\BACT contingency emission controls. Additional reductions which cannot be quantified by the emission inventory would be achieved through fugitive dust control contingency measures. Total reductions are estimated at a minimum of 240 tons per year (nonattainment area industries, only) which is 11% of the estimated 1994 emission levels prior to application of control strategy credits and 25% of the expected 1994 emission level following strategy reductions. Because of the dominance of woodburning emission within the airshed and the very large woodstove emission reductions included in the attainment strategy, it is not possible to achieve a full 25% reduction from the 1994 uncontrolled emission level through contingency measures.

ATTACHMENT A

State of Oregon
Department of Environmental Quality
Air Quality Division

State Implementation Plan For PM_{10} in Klamath Falls

A Plan for Attaining and Maintaining
Compliance with National
Ambient Air Quality Standards
For PM_{10}

October, 1991

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Executive Summary

The US Environmental Protection Agency (EPA) adopted a new particulate National Ambient Air Quality Standard (NAAQS) for PM_{10} on July 1, 1987. PM_{10} particulate is less than 10 micrometers in aerodynamic diameter or about one-tenth of the diameter of a human hair. The NAAQS adopted by the US Environmental Protection Agency were established to protect public health and welfare. The Environmental Quality Commission adopted a Klamath Falls PM_{10} control strategy in January of 1991. The Clean Air Act as amended in November, 1990 contains further requirements for PM_{10} control strategies that include the necessity to demonstrate attainment by December 31, 1994 and include a contingency plan to be implemented if attainment is not reached by the deadline. This document describes the State of Oregon's revised plan to attain the PM_{10} standard in Klamath Falls.

High exposure to particulate matter is of concern because of human health effects such as changes in lung functions and increased respiratory symptoms, aggravation of existing respiratory and cardiovascular disease, alteration in the body's defense system against foreign materials, damage to lung tissue, increased risk of cancer and, in extreme cases, premature death. Most sensitive to the effects of particulate matter are people with chronic obstructive pulmonary cardiovascular disease and those with influenza, asthmatics, the elderly, children and mouth-breathers.

Air quality measurements taken in Klamath Falls have indicated that the 24-hour PM_{10} health NAAQS was exceeded on average 47 days per year during the winter months during the period of mid-1986 to mid-1989. The annual average concentration of PM_{10} during the years 1986-1989 of 75 $\mu g/m^3$ also exceeds the annual average PM_{10} NAAQS of 50 $\mu g/m^3$.

The 24-hour PM_{10} NAAQS is 150 micrograms per cubic meter of air ($\mu g/m^3$), not to be exceeded more than three times averaged over three calendar years. Winter 24-hour concentrations of PM_{10} in Klamath Falls are among the highest recorded anywhere in the nation with maximum concentrations reaching as high as 792 $\mu g/m^3$ on January 25, 1988.

An inventory of PM_{10} emissions developed for the Klamath Falls Urban Growth Boundary indicates that the major sources of particulate emissions during 1986 winter periods of worst-case 24-hour PM_{10} concentrations are residential wood combustion (80%), industrial emissions (7%) and soil dust (9%). On an annual basis, these sources contribute 61%, 11% and 10%, respectively. Emission inventory information representative of worst-case 24-hour conditions has been verified through receptor modeling techniques which actually measure source contributions to ambient air quality on the basis of their chemical "fingerprints."

Extensive air monitoring surveys have been completed which clearly demonstrate that the south suburban area of Klamath Falls, which comprises about 54% of the population within the UGB, has the highest winter PM_{10} concentrations within the airshed. Based on these surveys, ambient air monitoring conducted at Peterson School have been shown to generally represent the highest PM_{10} levels within the Urban Growth Boundary. Development of a SIP which assures attainment and maintenance of the NAAQS at the Peterson School site should therefore be adequate to demonstrate attainment of the NAAQS anywhere within the airshed.

PM_{10} design values are those representative 24-hour worst case and annual average concentrations from which reductions must be made to achieve the NAAQS. Analysis of all of the available PM_{10} air quality data over the period of mid-1986 to mid-1989 (the largest available database) indicates 1986 24-hour and annual design values of 550 $\mu g/m^3$ and 75 $\mu g/m^3$, respectively. The design values adjusted for expected or potential emission changes (assuming no emission strategy elements are applied) during the 1986-1994 period are 600 $\mu g/m^3$ and ~~{81}~~ 82 $\mu g/m^3$, respectively. Control strategies included in this plan have been designed to reduce projected 24-hour concentrations of PM_{10} by 450 $\mu g/m^3$ (600 - 150 $\mu g/m^3$) and the annual average by ~~{31}~~ 32 $\mu g/m^3$ (~~{81}~~82 - 50 $\mu g/m^3$). To achieve these 24 hour and annual average air quality improvements will require a 76% reduction in 24-hour worst case day emissions and a 47% reduction in annual emissions within the Urban Growth Boundary.

CONTROL STRATEGY OVERVIEW

The control strategies needed to assure attainment of the PM_{10} National Ambient Air Quality Standards focus on control of residential wood combustion, fugitive dust and open burning emissions. Other strategies include stringent management of future growth in industrial emissions. The strategies are implemented through a comprehensive and stringent program and ordinance adopted by the Klamath County Board of Commissioners on July 31, 1991 and through the Department's rules. The City of Klamath Falls, in a resolution adopted in August, 1991, authorized Klamath County to implement and enforce all of the provisions of the Klamath County ordinance within the city limits of Klamath Falls.

The Clean Air Act requires that PM_{10} control strategies include Reasonably Available Control Measures (RACM). EPA guidance indicates listed RACM measures must be included in the attainment plan if needed to demonstrate attainment. Otherwise, RACM is to be included in the contingency plan for all significant source categories contributing to PM_{10} violations. RACM for industrial point sources is referred to as Reasonably Available Control Technology (RACT).

For an area that fails to meet PM_{10} standards by December 31, 1994, the Clean Air Act requires that the area be redesignated as a "serious" nonattainment area and that a revised PM_{10} control strategy include additional control measures. EPA guidance indicates Best Available Control Measures (BACM) must be included for all significant source categories contributing to PM_{10} violations. BACM for industrial point sources is referred to as Best Available Control Technology (BACT).

The Klamath Falls PM_{10} control strategy (the combination of the attainment strategy and contingency plan) satisfies the RACM requirements for area sources, and should satisfy the RACT and BACT requirements for industrial point sources. In Klamath Falls, attainment can be successfully demonstrated by controlling sources other than industry (RACM measures for area sources). Therefore, RACT requirements for industrial point sources have been included in the contingency measures, and not in the primary attainment strategy. EPA is scheduled to provide BACM guidance on residential woodburning, fugitive dust and prescribed burning by May 15, 1992. It is anticipated that the Klamath Falls PM_{10} control strategy should satisfy BACM requirements for area sources.

Residential Wood Combustion Strategies

The principal means of achieving the needed reductions is through a stringent woodburning curtailment and emission reduction program. At least a 86% reduction in wood smoke emissions is needed on poor ventilation days to attain the 24-hour NAAQS. This reduction will have to come from most of Klamath Falls' estimated 10,000 woodburning households which will have to forego use of their woodstoves during air stagnation episodes. Additional reductions throughout the heating season from the phase in of certified woodstoves will help achieve attainment of the annual standard. A strong public education program is an essential element of the strategy.

The Klamath County program also includes a year around, 20% woodstove plume opacity regulation (stove startup and shutdown periods exempted) and phase-out of woodheating curtailment exemptions: sole source nonowner occupied dwellings by 1993 and owner occupied, low income sole source by 1998. All households that are solely heated with wood (except tenant occupied and low income) must have secondary heat sources by 1996. Also adopted was a ban on the sale of used, uncertified woodstoves within the county.

A home weatherization and woodstove replacement program for low income homeowners funded at approximately $1.44 million has further reduced woodstove emissions by removing uncertified stoves from about ~~{325}~~ 743 homes resulting in a ~~{507}~~ 973 pound per day woodstove emission reduction. In addition, results from the Klamath Falls 1991 Woodheating Survey indicate that 30% of the households

that burned wood as their main source of heat in 1987 have voluntarily switched to other fuels (principally natural gas). Voluntary fuel switching by the public and reductions in the amount of wood each household burns has resulted in a reduction of worst case day emission by 36% relative to 1986 levels, exclusive of all other control strategies. The strategy is implemented through the Klamath County Air Quality Air Quality Program and the Department's rules regulating woodstoves.

Fugitive Dust Control Strategies

A 60% reduction in winter road sanding emissions through the use of liquid road deicing techniques in lieu of rock aggregate, application of less road sanding material and rapid cleanup of used road sanding aggregate will achieve fugitive dust emissions reductions needed to assure attainment of the annual standard. The road sanding strategy is implemented through a Memorandum of Understanding with the Oregon Department of Transportation Highway Division. Other dust control measures include mandatory cleanup of trackout from unpaved areas onto State highway right-of-ways enforced through Oregon Department of Transportation Administrative Rules.

Open Burning Control Strategies

The Klamath County program includes a year around prohibition on agricultural open burning within the nonattainment area and within one-quarter mile of the nonattainment area boundary; a prohibition on highway right-of-way burning within the county, a prohibition on residential open burning on woodburning curtailment days, a voluntary agricultural smoke management program on farm lands within Klamath County and a voluntary forestry smoke management program on forest lands within approximately 20 miles of the nonattainment area. Additional restrictions under discussion with the Oregon Department of Forestry on slash burning may be included.

Industrial Control Strategies

Additional enforceable strategies include new rules designed to tightly manage industrial emission growth through reduction in the significant emission rate increase that triggers emission offset requirements for new or modified sources. The significant emission rate was reduced from 15 to 5 tons per year. The rule was adopted to assure that industrial emission growth beyond the current permit limits (Plant Site Emission Limit) does not jeopardize emission reductions gained through other strategy elements.

Contingency Measures

Measures to be implemented upon failure to attain the air quality standards by the December 31, 1994 Clean Air Act deadline include:

A. Woodburning Controls: State backup authority from the 1991 Legislature to require removal of uncertified woodstoves upon sale of a home; measures in the Klamath County ordinance including mandatory fuelwood seasoning requirements on all firewood sold within the county; expansion of the Klamath County Air Quality Control Area to include the Keno - Midland area south to the California border; a prohibition on the installation of more than one woodstove in a new dwelling and removal of uncertified woodstoves upon sale of property.

Open Burning Measures: As a contingency, the County ordinance requires establishment of a mandatory agricultural open burning smoke management program. In addition, a mandatory forestry smoke management program implemented within Klamath County and surrounding forest lands is under discussion with the Oregon Department of Forestry. The mandatory forestry program would be implemented if slash burning smoke is found to be a significant contributor to PM_{10} nonattainment.

Industrial Emission Control Measures: Industrial contingency measures proposed for adoption by the Department include requirements for the installation of new control systems which will meet the Clean Air Act RACT/BACT requirements. These will include bag filters on significant wood dust handling systems. Industrial sources located outside of the nonattainment area but within Klamath County's Air Quality Control Area will also be required to install RACT/BACT controls if their emissions have a significant impact on the nonattainment area.

Strategy Emission Reduction - 24-Hour Worst Case Day

Attainment of the 24-hour NAAQS in 1994 will require a 76% reduction in worst case day emissions equalling a reduction of ~~[18,484]~~ 18,877 pounds per day. The needed reduction is achieved through the strategy elements listed below.

~~[Summary of 24-Hour Emission Reductions To Be Achieved by 1994~~

~~Strategy Element~~	~~Credit~~	~~Emission Reduction~~
~~New Road Deicing Practices~~	~~60%~~	~~1,344 Pounds/Day~~
~~Woodburning Strategies:~~		
~~- Woodburning Curtailment~~	~~86%~~	~~16,624 Pounds/Day~~
~~- Certification of Woodstoves~~	~~24%~~	~~582 Pounds/Day~~
~~- Woodstove Removal Program~~		~~507 Pounds/Day~~
~~Woodstove Strategies, Total~~		~~17,713 Pounds/Day~~
~~Total reduction from all strategies....19,057 Pounds/Day~~		
~~Required emission reduction .....18,922 Pounds/Day]~~		

Summary of 24-Hour Emission Reductions
To Be Achieved by 1994

Strategy Element	Credit	Emission Reduction
New Road Deicing Practices	60%	1,265 Pounds/Day
Woodburning Strategies:		
- Woodburning Curtailment	86%	16,625 Pounds/Day
- Certification of Woodstoves	24%	582 Pounds/Day
- Woodstove Removal Program		973 Pounds/Day
Woodstove Strategies, Total		18,180 Pounds/Day
Total reduction from all strategies....19,444 Pounds/Day		
Required emission reduction .....18,877 Pounds/Day		

(Note: Because emission reductions are calculated on a declining balance basis, the product of percentage credits and total reduction (~~[19,057]~~ 19,444 pounds/day) will not yield the individual element emission reductions shown. See Appendix 5)

EPA guidance specifies that no credits can be taken for the Klamath County public education programs nor have credits been taken for residential open burning restrictions since there are no accurate worst case day emission inventory estimates for these sources. The 36% reduction (from 1987 levels) in winter worst case day PM_{10} emissions has resulted from major reductions in both the amount of woodburned within the airshed and the number of households that rely on wood as their main source of heat but these credits have not been included since they are not enforceable. The

above emission reduction credits are therefore very conservative.

Strategy Emission Reduction - Annual Average Case

Attainment of the annual average NAAQS in 1994 will require a 47% reduction in annual emissions or a reduction of ~~[1008]~~1035 tons per year. ~~[Although]~~ ~~[t]~~The ~~[entire]~~ **majority of the** needed emission reduction is achieved through the woodburning curtailment program.~~[,]~~ ~~E[e]~~mission reductions obtained from the road deicing **strategy** and other elements of the woodburning emission reduction programs **provide the balance of the required emission reductions.** ~~[are also included since they will occur as a result of implementing the 24-hour strategy and elements of the Klamath County Ordinance.]~~ The needed reductions are achieved through the strategy elements listed below.

~~[Summary of Annual Average Emission Reductions To be Achieved by 1994~~

~~Strategy Element Credit Emission Reduction~~

~~Highway Road Sanding Program 60% 18 Tons/Year~~
~~Eliminate Agricultural Burning 100% 156 Tons/Year~~

~~Woodburning Strategies:~~

~~- Woodburning Curtailment 74% 841 Tons/Year~~
~~- Woodstove Certification 24% 78 Tons/Year~~
~~- Woodstove 20% Opacity 5% 12 Tons/Year~~

~~Woodstove Strategies, Total 931 Tons/Year~~

~~Total reduction from all strategies.....1203 Tons/Year *~~
~~Total required emission reduction.....1020 Tons/Year]~~

Summary of Annual Average Emission Reductions
To be Achieved by 1994

Strategy Element	Credit	Emission Reduction
Highway Road Sanding Program	60%	17 Tons/Year
Eliminate Agricultural Burning	100%	156 Tons/Year
Woodburning Strategies:		
- Woodburning Curtailment	74%	938 Tons/Year
- Woodstove Certification	24%	78 Tons/Year
- Woodstove 20% Opacity	5%	12 Tons/Year
Woodstove Strategies, Total		1028 Tons/Year

Total reduction from all strategies.....1201 Tons/Year *
Total required emission reduction.....1035 Tons/Year

* Note: On an annual basis, the woodburning curtailment program will result in a 18% reduction in annual wood smoke emissions. This, however, is not reflective of annual air quality benefits of the program since the restricted ventilation during the curtailment periods compounds the benefits of the emission reductions. The effective or equivalent reduction is calculated based on a 86% curtailment program operating on 47 days per year indicating a reduction of the annual average PM_{10} concentration from 75 to 50.2 $\mu g/m^3$. As a result, the woodburning curtailment program alone,

implemented on 47 days per year, will provide sufficient benefits to assure that the annual NAAQS is achieved. Additional strategy elements are claimed as a result of reductions achieved through the 24-hour strategy. See Section 4.12.3.3.

Air Quality Standard Maintenance

During the six year period following attainment of the NAAQS, a net decrease in emissions is projected to occur as a result of attainment strategies and the replacement of older conventional stoves with certified cordwood and pelletstoves, offsetting increases in fugitive dust and transportation emissions. Both the 24-hour and annual NAAQS are projected to be maintained ~~[to]~~ **beyond** the year 2000 at which time worst case day and the annual average PM_{10} air quality is projected to be ~~[145]~~ **138** $\mu g/m^3$ and ~~[44]~~ **45** $\mu g/m^3$, respectively.

Enforceability

The Clean Air Act requires SIP control strategies to be enforceable. Based on EPA guidance, a woodstove curtailment program requiring more than a 30% credit must be based on enforceable measures in order for the SIP to be approved by EPA. Klamath County has adopted a mandatory curtailment program with an objective of achieving an 86% compliance rate in the 1991-92 heating season. The program and penalty provisions of the ordinance is enforced by the Klamath County Department of Health Service. Violations of the provisions of the Ordinance are cumulative over multiple years. In the event that local governments fail to implement a mandatory curtailment program, the Department has statutory backup authority to implement the program.

The highway road sanding program is implemented through commitments provided by the Oregon Department of Transportation; residential, highway right-of-way and agricultural open burning restrictions are implemented through the Klamath County ordinance. The voluntary forestry smoke management program is coordinated by the Oregon Department of Forestry.

4.12.0 State Implementation Plan for Klamath Falls PM_{10} Nonattainment Area

4.12.0.1 Introduction

On July 1, 1987, the Environmental Protection Agency promulgated new federal ambient air quality standards for particles less than or equal to 10 micrometers in aerodynamic diameter (PM_{10}) to replace the Total Suspended Particulate (TSP) standard[1]. The standard became effective 30 days later on July 31, 1987. On August 7, 1987, EPA classified Klamath Falls as a Group I PM_{10} nonattainment area (52 FR 29383). The Clean Air Act Amendments of 1990 initially classified all PM_{10} nonattainment areas (including Klamath Falls) as Moderate Nonattainment Areas. Air monitoring has shown that air quality within the Klamath Falls Urban Growth Boundary far exceeds the PM_{10} National Ambient Air Quality Standards (NAAQS).

Section 110 of the Clean Air Act Amendments of 1990 requires states to adopt and submit plans (State Implementation Plans or SIPs) to EPA by not later than November 15, 1991. The Act allows EPA twelve months to approve or disapprove the plan. The plan must provide for attainment of the standard as expeditiously as practicable but no later than December 31, 1994.

The plan has been developed in consultation with officials of the City and County of Klamath Falls, the Oregon Department of Transportation, the Oregon Department of Forestry and the US EPA. The plan was prepared in accordance with the regulations and requirements of the Clean Air Act of 1990 and the US EPA. The Department believes that the PM_{10} plan can achieve attainment of the NAAQS within the time frame required by the Act.

4.12.0.2 SIP Overview

This revision to the State Implementation Plan (SIP) has six sections. The first (4.12.1) provides a description of PM_{10} ambient air quality in Klamath Falls; Section 4.12.2 describes the PM_{10} air quality problem within the Klamath Falls Nonattainment Area; Section 4.12.3 describes emission reductions needed to attain NAAQS; Section 4.12.4 describes implementation of the control strategies, Section 5 described resource commitments and Section 6 discusses public involvement.

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[1]A micrometer (μm) is a unit of length equal to about 1/25,000 of an inch. For comparison, the thickness of a human hair is about 100 to 200 micrometers.

4.12.0.3 Area Description

Klamath Falls is located in south central Oregon at an elevation of 4,105 feet. The area is typified by its semi-arid, high desert climate where annual rainfall is only 14.3 inches. The population of south suburban Klamath Falls within which the highest PM_{10} concentrations are found is about 19,300 (1980 census) while the population within the Klamath Falls urban area is 36,500. About 13,600 households are located within the Urban Growth Boundary.

The Klamath basin is a relatively flat area of some several thousand square miles of old lake bed which is drained by the Klamath River. Upper Klamath Lake covers 132 square miles and has a surface elevation of 4140 ft above sea level. The Lower Klamath Lake area is a very large, flat, somewhat marshy region with an elevation of about 4100 ft above sea level. The region is punctuated by occasional hills and a system of elongated ridges aligned with a northwest-southeast orientation. These ridges may rise up to 2,000 ft above the basin floor. Two such ridges form a narrow opening at the outfall of Upper Klamath Lake.

The central business district of Klamath Falls is situated in this narrow opening at the southern end of Upper Klamath Lake where the elevation changes between the Upper and Lower Klamath Lake areas. Most of the Klamath Falls residential area, especially the south suburban area, is located on the lower elevation area. Thus it may be seen that the Klamath Falls area is confined by high terrain to the east and west. To the north is large expanse of Upper Klamath Lake and the flat terrain stretches for a number of miles to the south.

Figure 4.12.0-1 shows the boundaries of the Klamath Falls Urban Growth Boundary which was adopted as the nonattainment area boundary by the Environmental Quality Commission on June 2, 1989 (OAR 340-20-225 (22)). The criteria for selection of the UGB as the nonattainment area are as follows:

1. The nonattainment boundary must include the geographical area within which national ambient air quality standards are currently being exceeded. Air sampling studies completed in November, 1985, March, 1988 and January, 1989 have consistently show that minor day-to-day variations in the pattern of PM_{10} levels exist depending on wind direction and the time of day of the survey. All surveys indicate a consistent pattern of maximum concentrations near Peterson School extending outward toward the downtown district, south toward Kingsley Field and westerly toward Green Springs Junction. The PM_{10} levels appear to follow local topography with concentrations decreasing with increases in elevation. They also appear to follow the emission density of homes (woodstoves) in the area.

2. The nonattainment boundary must include the area within which air standards may be exceeded in the future. EPA requires that SIP control strategies consider future population, transportation, housing and industrial growth to assure that air standards will be attained and maintained. Development of a strategy to assure maintenance of air standards therefore requires that the nonattainment area boundary be consistent with the regional planning boundary for which community growth projections are available.

3. The nonattainment area must be a legally defined boundary recognized by local governments. A legal definition is required for rulemaking purposes. Additionally, some component of the control strategy may need to be implemented through county land use planning ordinances tied to the Urban Growth Boundary.

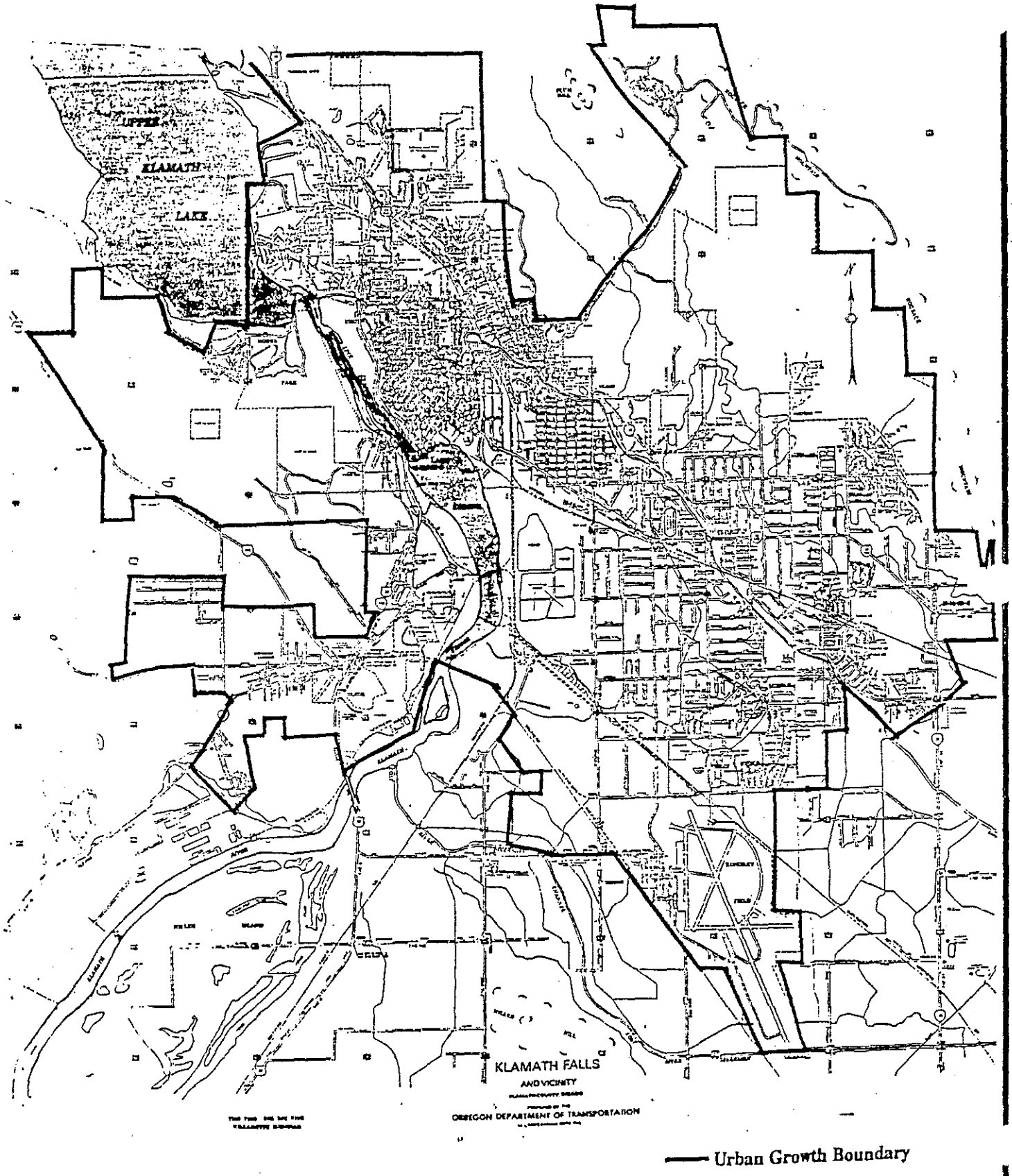
Designation of the Urban Growth Boundary as the nonattainment area is the only legally defined boundary that meets all of the above criteria. For purposes of wider control of woodburning emission within Klamath County, the Klamath County Clean Air Ordinance regulates woodheating emissions and open burning within and beyond the Growth Boundary.

4.12.0.4 Klamath Falls Meteorology

Because of its elevation, dry climate and low frequency of cloud cover, Klamath Falls experiences very strong and shallow night time winter radiation inversions which break up with day time solar heating. In winter time, frigid arctic air masses frequently invade the Klamath Basin. Temperatures can remain well below freezing for several weeks at a time. Upper Klamath Lake often freezes over and 6 to 10 inches or more of snow may cover the ground.

Winter nights are commonly clear and cool in the Klamath Basin. Under these conditions, strong nocturnal radiation inversions occur as a result of the snow covered surface and frozen lake, creating extreme inversions over the south suburban area of Klamath Falls. These inversions are confined and maintained by the surrounding terrain. Inversions of as much as 10 °F have been observed within 60 feet of the surface, creating an impenetrable barrier to smoke from woodstoves and fireplaces. The highest smoke concentrations of any place in the State have been recorded in the Klamath Falls residential areas under these intense, shallow inversions.

Figure 4.12.0-1: Nonattainment Area Map



4.12.0.5 Health Effects of PM_{10} and Wood Smoke

Particulate matter measuring less than or equal to 10 micrometers is considered a risk to human health due to the body's inability to effectively filter out particles of this size. These particles deeply penetrate and become lodged in the alveolar regions of the respiratory system for days, weeks or even years where they trigger biochemical and morphological changes in the lungs[2].

For example, constriction of air passages (i.e., reduced air flow) occurs rapidly upon exposure to PM_{10}. Episodic and continuous exposure aggravates chronic respiratory diseases such as asthma, bronchitis, and emphysema which in turn restrict the lung's ability to transfer oxygen into the bloodstream. Traditionally, children, the elderly, and cigarette smokers are the most susceptible to lung dysfunctions and are therefore at greatest risk from PM_{10} exposure.[3] Episodic exposure can also cause changes in the activity of the lung's mucous secretions and accelerates the mucociliary action to sweep the particles out of the lungs. This results in increased symptoms of cough, phlegm, and dyspnea (difficulty in breathing). Continuous exposure can inhibit this defense mechanism by introducing new particles into the lungs and redistributing those being swept out. This slows the clearance of the bronchial system thus increasing susceptibility to acute bacterial and viral infections.

The increased stress on the pulmonary system caused by PM_{10} exposure is usually tolerable for those with healthy respiratory systems, however, it can lead to irreversible or fatal damage in people already suffering from cardiopulmonary disease, typically children, the elderly, the ill, and cigarette smokers.[4] Another group that falls into the high risk category are people who breathe through their mouths.[4] This group includes a wide range of people from chronic mouth-breathers to anyone involved in outdoor exercise and heavy labor. During mouth-breathing, particulate matter is breathed more directly into the lungs since it bypasses the filtering systems of the nasal passages.

Among the sources of PM_{10} emissions, wood smoke is of particular concern in Klamath County because it accounts for a

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[2]J. Koenig, T.V. Larson, P. Jenkins, D. Calvert, N. Maykut and W. Pierson, "Wood Smoke: Health Effects and Legislation," Health Effects of Woodsmoke, Northwest Center for Occupational Health and Safety, January 20, 1988.

[3]U.S. Environmental Protection Agency, Second Addendum to Air Quality Criteria for Particulate Matter and Sulfur Oxides (1982: Assessment of Newly Available Health Effects. EPA 600/8-86-020.

majority of the small particulate matter measured in the nonattainment area. A description of emission sources is found in Section 4.12.2.2. These particles are less than 1 μm in diameter and remain suspended in the air for long periods of time. Because of their small size and their ability to remain airborne, they are easily inhaled and lodged in the alveolar region of the lungs. These particles can also act as carriers for toxic chemicals which are transported deep into the respiratory system. Some of these toxics are then absorbed into the bloodstream.

Wood smoke contains at least fourteen carcinogenic compounds including benzo(a)pyrene, benzo(a)anthracene, and other polycyclic organic materials.[4] Additionally, wood smoke contains several other hazardous compounds such as aldehydes, phenols, carbon monoxide and volatile organic vapors. These compounds can cause or contribute to illness ranging from neurological dysfunctions and headaches to lung cancer.3 Many of the components of wood smoke are also found in cigarette smoke and coke oven emissions and can affect the cilia in a similar manner making it difficult for the body to expel the particulate matter. Because wood smoke concentrations are highest in residential areas, a large segment of the population is routinely exposed to wood smoke pollution in the winter months. Additionally, it is those people who are most sensitive, children, the elderly, and the ill, who spend the most time in their homes, thereby increasing their risk.[5]

A study of lung function in 600 grade school children in Klamath Falls was conducted by the Oregon Department of Health and the Klamath County Department of Health Services just before, during and immediately following the 1990-91 woodheating season.[5] Results from the study demonstrated that impaired lung function was associated with elevated levels of PM_10 that occurred during the woodheating emissions. Studies conducted by the Department demonstrate that these high particulate levels are caused by wood smoke emissions.

4.12.1 Ambient Air Quality

Particulate ambient air quality monitoring for Total Suspended Particulate (TSP) began in Klamath Falls in November of 1969 at the Broad and Wall Street Fire Station. During the period of 1970 to 1986, annual average TSP concentrations averaged 66 $\mu g/m^3$ with maximum 24-hour TSP concentrations (which have occurred exclusively

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[4]P.G. Jenkins, Washington Wood Smoke: Emissions, Impacts and Reduction Strategies, Washington Department of Ecology, Olympia, Washington. December, 1986.

[5]Klamath Falls Lung Function Health Study. State of Oregon Department of Health. June, 1991.

within the winter months) reaching 295 $\mu g/m^3$ in 1973. While these levels were over the TSP NAAQS, it was thought that rural fugitive dust (considered uncontrollable and not a health hazard by EPA) was the principal contributing source. To determine those areas that had a high probability of exceeding the PM_{10} NAAQS, the US Environmental Protection Agency completed an analysis of historical Klamath Falls TSP data. The results of the analysis indicated a better than 95% probability that Klamath Falls PM_{10} levels would exceed the NAAQS. Based on these findings, EPA has classified Klamath Falls as a Moderate Nonattainment Area. EPA regulations requires that daily PM_{10} air quality monitoring must be conducted in such areas.

PM_{10} air quality monitoring began in November, 1985 following completion of an area-wide survey designed to characterize the spacial distribution of PM_{10} concentrations.[6] Results from the study demonstrated that the Broad and Wall Street monitoring site was not representative of the highest levels of PM_{10} in the airshed and that levels recorded at the Peterson School site in south suburban Klamath Falls better represented worst case levels within the area. The PM_{10} concentration contours shown in Figure 4.12.1-1 were developed from the survey. The Figure also shows the location of the Peterson School site. A review of the area encompassed by the 150 $\mu g/m^3$ (the 24-hour NAAQS) contour shows that it best approximates the Urban Growth Boundary.

In February of 1987, monitoring at the Broad and Wall Street site was discontinued. PM_{10} monitoring at the Peterson School site began in February, 1986. Additional PM_{10} data was gathered during the November 1988 to April, 1989 period at Sixth and Hope Streets as additional verification of the extent of the high levels measured in the south suburban area.

In March of 1988 and February, 1989, the Department conducted evening mobile nephelometer surveys to further verify the spacial distribution of PM_{10} concentrations. Figure 4.12.1-1 shows a typical distribution of concentrations measured during these surveys. Although the distributions of particulate mass vary slightly from day to day depending on wind directions and mixing height, the surveys are basically consistent with the findings of the February, 1985 particulate survey that identified the Peterson School area as the location of the highest concentrations. The surveys also provide evidence that the major sources of PM_{10} are found within the residential area of south suburban Klamath Falls where the woodstove emission density is greatest.

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[6] Special Study Report: Klamath Falls Particulate Survey. Report 87-7. Program Planning & Development Section, Air Quality Division, State of Oregon Department of Environmental Quality. June, 1987.

4.12.1.1 Air Monitoring Methods

Several sampling methods have been used to measure PM_{10} concentrations in Klamath Falls:

Integrating Nephelometer measurements of light scattering (a surrogate for PM_{10}) have been conducted during the winter months of highest PM_{10} concentrations at the Peterson School site. This method provides hourly light scattering averages which are highly correlated to PM_{10} concentrations measured using the high volume samplers equipped with size selective inlets (HV-SSI).

The PM_{10} Medium-Vol. sampler collects PM_{10} aerosol using a 12 port, 47 mm filter sequencing system that is programmed to collect 24-hour samples. The sampler pulls ambient air at a 4 CFM flow rate through a 10 μm Sierra-Anderson 254 inlet providing a PM_{10} cut point. A dual-port system capable simultaneously collecting aerosol on both Teflon and quartz filter substrate is used to allow complete chemical analysis for Chemical Mass Balance receptor modeling purposes. Because of the excellent agreement between PM_{10} concentrations measured by the Medium-Vol and the HV-SSI reference method, EPA has designated the Medium-Vol sampler as an acceptable equivalent method.

The PM_{10} High Volume Size Selective Inlet (HV-SSI) is a High Volume air sampler equipped with a Sierra-Anderson SA321A, SA321B or SA1200 PM_{10} cut-point inlet. This method has been designated by EPA as a reference method to be used to judge attainment with the NAAQS. Sampling occurs every 6th day.

The High Volume air sampler collects samples of Total Suspended Particulate (TSP). The method uses pre-weighted 8" X 10" filters through which air is drawn at 50 CFM over a 24-hour period. Because these samplers are not equipped with a size selective inlet, the upper limit of particle size captured on the filter may reach 100 μm. Prior to EPA's adoption of the PM_{10} NAAQS, this method was the standard reference method for measurement of airborne particulate matter at the Broad & Wall Street site but has now been discontinued.

All of the data discussed herein was collected at the Peterson School site in south suburban Klamath Falls. Table 4.12.1-1 lists monitoring data collection periods by measurement method.

Table 4.12.1-1: Data Collection Periods by Method
Peterson School

Measurement Method	Began	Terminated
Integrating Nephelometer (Light Scattering or Bscat)	Jan. 30, 1985	Apr. 24, 1986
	Jan. 23, 1986	Apr. 15, 1986
	Oct. 23, 1986	Apr. 7, 1987
	Nov. 3, 1987	Apr. 20, 1988
	Nov. 1, 1988	Current
PM_{10} Medium-Vol.(MV) * (Daily Sampling)	Jan. 2, 1987	Apr. 3, 1987
	Nov. 30, 1987	Current
PM_{10} HV-SSI (SSI) (Every 6th Day)	Jan. 3, 1987	Current
High-Volume TSP (TSP)	Jan. 24, 1986	Oct. 6, 1987

* Both Teflon and quartz filter substrate are used.

4.12.1.2 PM_{10} Air Quality in Klamath Falls

Figure 4.12.1-2 illustrates the hourly and seasonal variations in PM_{10} concentrations in Klamath Falls. As seen in the Figure, the highest 24-hour concentrations occur during the winter space heating season when PM_{10} concentrations have reached levels as high as 792 $\mu g/m^3$. This exceeds the EPA Significant Harm level (the level at which an imminent and substantial risk to public health exists) of 600 $\mu g/m^3$. Peak 24-hour concentrations decrease dramatically during the spring months and reach a low of about 50 $\mu g/m^3$ during the summer months. Concentrations then raise again in the fall months as woodstove use increases and atmospheric dispersion decreases.

Review of PM_{10} Concentrations

The four highest concentrations of PM_{10} mass measured in Klamath Falls during the past 3 years are listed in Table 4.12.1-2, below.

Table 4.12.1-2: PM_{10} Maximum Concentrations, 24-hour Averages

	$\mu g/m^3$	Date	Method
Highest Value	792	880125	Medium-Vol.
Second High	723	880203	SA321B HV-SSI
Third High	507	880122	SA321B HV-SSI
Fourth High	502	890120	Nephelometer Est.

Table 4.12.1-3 summarizes PM_{10} monitoring data for the mid-1986 to mid-1989 period over which the design values were calculated. Appendix 1 contains a tabulation of daily PM_{10} concentrations over the period of July 1, 1986 to June 30, 1989.

Table 4.12.1-3: Summary PM_{10} Data ($\mu g/m^3$)

	All Data		1986*	1987	1988	1989	1990
No. Days Sampled	1414		343	365	303	195	208
Arithmetic Mean **	--		77	73	71	68	46
Maximum Value	792	(880125)	--	330	792	417	258
Second High	723	(880203)	--	298	723	400	236
No.Days > 150	155		40	38	29	27	21

* For period January 23 to December 31, 1986.
** Annual average values computed as prescribed in 40CFR52 Appendix K.

Hourly Variability

Hourly variations in PM_{10} levels on worst-case winter days can be seen in the diurnal variations of light scattering measurements from the Peterson School site (Figure 4.12.1-2). Particulate concentrations begin increasing from a mid-day low, peak during the 11 PM to 1 AM period and then steadily decrease until 8-9 AM at which time the levels again reach mid-day concentrations. The early morning peak at 6 AM is believed to be associated with early morning woodstove start up by Klamath Falls residents.

Worst Case Day Characteristics

During the mid-1986 to mid-1989 period, the 24-hour NAAQS was exceeded an average of 47 days per year, exclusively during the months of late October to April. During these periods, residential woodheating reaches its peak and atmospheric dispersion is at its poorest. Worst case winter days typically have daily average temperatures of 10 °F (55 degree heating days), snow cover, intense, extremely shallow temperature inversions as low as 50 feet and extended periods of calm winds. These conditions occur during periods when snow producing storm systems are followed by stable high pressure systems. The spatial distribution of PM_{10} concentrations during worst case day conditions is shown in Figure 4.12.1-1.[7]

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[7]J.E. Core, "Distribution of PM_{10} Within the Klamath Falls Nonattainment Area: Mobil Nephelometer Surveys of January, 1989," State of Oregon Department of Environmental Quality, Air Quality

Impacts from Sources External to the Urban Growth Boundary

The largest industrial source within Klamath County located outside of the UGB is the Weyerhaeuser Company plant which has historically emitted ~~[is a total of]~~ approximately 631 tons of PM_{10} per year, largely from hog fuel boilers used to generate steam for the plant. In spite of the magnitude of these emissions and the proximity of the plant to the Urban Growth Boundary, ~~[the Department does not believe that emissions from the plant have a significant impact on the nonattainment area.]~~ the Department believes that Weyerhaeuser does not significantly affect the ability of the area to attain and maintain attainment of the PM_{10} standard. This is based on findings from two field studies, ~~[and]~~ as well as receptor and dispersion modeling analysis. The spatial distribution of PM_{10} levels measured during the mobil nephelometer surveys of January, 1989 indicated that concentration fell as the distance from the plant increased. These findings were confirmed by the saturation survey conducted in the Fall of 1985. If the plant had a major impact on the nonattainment area, concentrations should have increased as the distance from the plant decreased.

Receptor modeling analysis of source impacts on exceedence day filter samples at the Peterson School site confirm that hog fuel boiler impacts are small. This is based on studies indicating that the Chemical Mass Balance receptor model is able to quantify hog fuel boiler impacts at levels of 2 $\mu g/m^3$ or greater impact with relative uncertainties of $\pm$ 20%.[8] Results of the CMB analysis estimate hog fuel boiler impacts on typical exceedence days in the range of 0 $\mu g/m^3$ to 3 $\mu g/m^3$.

Initial modeling analysis of Weyerhaeuser emissions indicate estimated typical exceedence day impacts of less than 4 $\mu g/m^3$, and a maximum exceedence day impact of approximately 7 $\mu g/m^3$. The attainment demonstration, with RACM strategies applied, provides an estimated 1994 design day of 137 ug/m^3. With this 13 ug/m^3 (9%) safety margin (150-137 $\mu g/m^3$), the attainment demonstration shows that the attainment needs of the community can be adequitly met through the implementation of RACM control strategies for fugitive dust and residential woodburning. Therefore, relatively small impacts from the Weyerhaeuser facility would not jeopardize attainment or maintenance of the PM_{10} NAAQS. Weyerhaeuser's permitted emissions have recently been significantly reduced to levels below Department estimates, and their Air Contaminant Discharge Permit (ACDP) is being modified to reflect this lower

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Division. Report 89-1. February, 1989.

[8]Pacific Northwest Source Profile Library: Volume 2 Final Project Report. J. Core, Editor. Department of Environmental Quality. September, 1989.

emission level. The Department has therefore provided Weyerhaeuser the opportunity to model emission impacts at Peterson School using these new permitted emissions. Preliminary results of this modeling indicate that Weyerhaeuser's maximum exceedence day impact at Peterson School is below the Department's 5 ug/m^3 significance criteria. The Department will continue to review the new modeling results and will, by October 1, 1995, make a final determination regarding the significance of Weyerhaeuser's impact at the Peterson School monitoring site. If exceedence day PM_{10} impacts at the Peterson School monitoring site are determined to be significant, and if attainment is not maintained in Klamath Falls, then the Department will require Weyerhaeuser to comply with the same RACT contingency requirements as other stationary sources within the nonattainment area boundary. If exceedence day impacts at Peterson School are determined to be insignificant, Weyerhaeuser will not be subject to the PM_{10} Control Plan Industrial Contingency Requirements.

These findings are consistent with the hypothesis that emissions from Weyerhaeuser's boiler are emitted, on typical NAAQS exceedence days, above the very shallow inversions that form within the Klamath Basin. As a result, their ground level impacts would be expected to be small.

Background Air Quality

PM_{10} aerosols from sources external to the UGB collectively contribute to background air quality or the concentration of PM_{10} in the air mass as it is transported into the Klamath Falls Basin. The closest background monitoring site is located in the Quartz Creek Valley (elevation 5,390 ft) at the Quartz Mountain Gold Project 50 miles east of Klamath Falls.[9]

The Quartz Mountain data was collected by a Air Sciences, Inc. of Lakewood, Colorado under contract to the Quartz Mountain mining project. The data was collected pursuant to Federal EIS requirements imposed by the US Forest Service, Bly District. The data was collected pursuant to standard EPA quality assurance requirements. The Quartz Mountain background data during worst case winter days is representative of the Klamath Falls UGB for the following reasons:

1. The site is located in a remote area not influenced by sources within the Klamath Falls UGB yet not located at such distance that it would clearly not be representative of the regional air mass. Even if the site were located at the edge of the Growth Boundary, little change in the data would be expected because of the fact that lands immediately beyond the UGB are sparsely inhabited and largely of a wilderness nature.

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[9]Quartz Mountain Gold Project Environmental Impact Statement. Prepared for the Fremont National Forest by Air Sciences, Inc. Lakewood, Colorado. February, 1989.

2. A worst case winter day background of 7 $\mu g/m^3$ is reasonable considering that the Quartz Mountain site is above the very shallow mixing height found in the nonattainment area, that snow cover eliminates windblown fugitive dust emissions and that there are no wildfires or slash burning emissions during the winter months. It is common to encounter long range visibility conditions at elevations of only a few hundred feet above the basin floor where the highest PM_{10} concentrations are found.

On an annual basis, there is little differences between the background levels at Medford's Dodge Road site (12 $\mu g/m^3$) and Quartz Mountain (13 $\mu g/m^3$), supporting the Department's belief that neither site is being unduly impacted by nearby sources; that the annual distribution of the data is not being unduly bias by high winter worst case concentrations and that both sites are representative of regional background.

PM_{10} monitoring at the Quartz Mountain site was based on GMW 2310 samplers with GMW 321-B inlets was conducted during the November, 1987 to November, 1988 period (108 observations) on a 6th day schedule. The annual arithmetic average was 12 $\mu g/m^3$ while the worst case winter (November-March) observation was 7 $\mu g/m^3$. The maximum observed value (86 $\mu g/m^3$) occurred on September 4th, 1988 when several forest fires were active in the area. The sources contributing to background PM_{10} concentrations are regional and global in nature.

The Quartz Mountain background air quality values used in the annual and 24-hour winter worst case control strategy calculations are 15 $\mu g/^3$ annual arithmetic average and 7 $\mu g/m^3$ 24-hour average, respectively.

Aerosol Chemistry

Chemically, Klamath Falls winter-season PM_{10} aerosol is composed of organic carbon (37%), elemental carbon or soot (6%), crustal elements (5%), other trace elements (2%) and secondary sulfate and nitrates (3%). The balance is associated oxygen, hydrogen, water and ammonium. While the winter season aerosol is chemically very similar to the composition of woodsmoke with small amounts of soil elements, the composition of the aerosol during the summer months is quite different and is largely composed of crustal elements (Al, Si, Ca and Fe). Lead concentrations are very low, averaging 0.1 $\mu g/m^3$, 24-hour average. The aerosol composition cannot be used to directly infer source contributions.

4.12.2 Nonattainment Area Analysis

This section describes the Department's analysis of PM_{10} air quality in Klamath Falls as it related to the National Ambient Air Quality Standards. Source contributions to the airshed's PM_{10} air quality are discussed both in terms of emission strengths and source contributions to air quality as measured at the Peterson School site.

4.12.2.1 Design Values Determination

Attainment of the annual NAAQS requires that a control strategy be adopted which will reduce ambient concentrations from the 1994 design value to below the NAAQS; specifically that the expected number of exceedances of the 24-hour NAAQS not exceed 150 $\mu g/m^3$ more than once per year averaged over three years.

The EPA PM_{10} Development Guidelines specify that the preferred approach for estimating a design value is through the use of an applicable dispersion model corroborated by receptor models.[10] If there is no applicable dispersion model and at least one complete year of PM_{10} data is available, then the PM_{10} data should be used to estimate the design value. This is the case for Klamath Falls.

Dispersion modeling was not used to estimate the design values or in the attainment/maintenance demonstration for the following reasons:

- The only historical meteorological data available for the air basin is that collected by the Department. Surface wind speed and direction data collection began in the fall of 1988. Although upper air data is available from Medford, temperature lapse rates near the surface (a very important factor that determines atmospheric dispersion in Klamath Falls) is much different than Medford. No other upper air data is available. Delays caused by the necessity to collect the several years of met data needed to support a dispersion modeling effort (and the factor listed below) have forced the Department to rely on receptor modeling/proportional rollback modeling.

- The spatially resolved emission inventory data needed for modeling has only recently become available;

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[10] PM_{10} SIP Development Guidelines. US Environmental Protection Agency, Office of Air Quality Planning and Standards, Research Triangle Park, N.C. June, 1987. EPA-450/2-86-001.

- The intense and extremely shallow inversions with their associated calm winds that typify Klamath Falls winter worst case day conditions are not conducive to dispersion modeling;

- On winter days when worst case air quality conditions occur the airshed is heavily dominated by emissions from woodstove, fireplace and road sanding. The relatively simple nature of the airshed, the dominance of area source emissions that are easily resolved by receptor models and the difficulty of applying dispersion modeling methods under stagnate air mass conditions have led the Department to apply receptor modeling and proportional rollback models.

EPA specifies that the annual design value should be calculated as arithmetic average of 3 years of PM_{10} monitoring data and that the 24-hour design concentration should be estimated using the empirical frequency distribution for the largest available data base. Both the annual and 24-hour design concentrations must then be adjusted to compensate for emission changes that will occur as a result of emission growth and control strategy affects likely to occur by 1994, the year in which attainment must be demonstrated.

The current design values are based on PM_{10} data collected between mid-1986 and mid-1989. The information used to calculate design values is a composite of data collected over the year using a number of different PM_{10} measurement methods in accordance with agreements reached with EPA Region X staff in December, 1989. As a result, a hierarchy of daily measurements has been used to build a composite data set. Reference method Medium-Vol. samples were selected first. Where these measurements were not available, reference method SSI data was used. If neither were available, non-reference method Medium Vol. data was used and if none of the above data was available, non-reference SSI data adjusted to a Medium-Vol. sampler equivalent value was used. If only integrating nephelometer scattering coefficient measurements were available, they were adjusted to medium-vol. equivalent values. This approach (1) greatly expands the database available for analysis; (2) provides a design value that is consistent with the measurement method that the Department will be using to determine NAAQS attainment and (3) assures that future receptor modeling analysis of PM_{10} source contributions are consistent with control strategy design considerations. This approach is described further in Appendix 2.

Table 4.12.2-1: Design Values Summary

24-Hour Design Value, Graphical Procedure	550 $\mu g/m^3$
Annual Design Value	75 $\mu g/m^3$

Figure 4.12.1-1: Klamath Falls PM_{10} Distribution

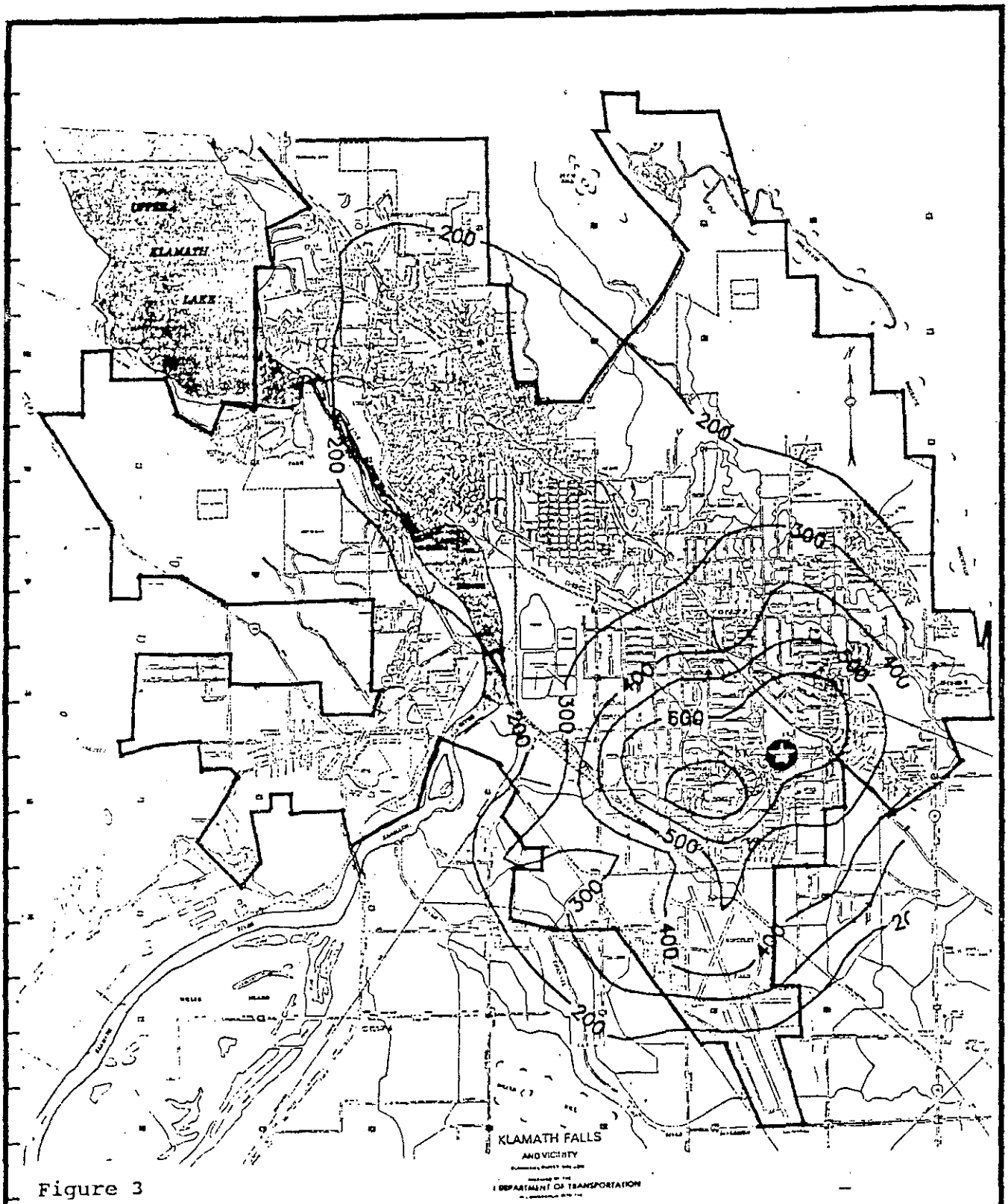
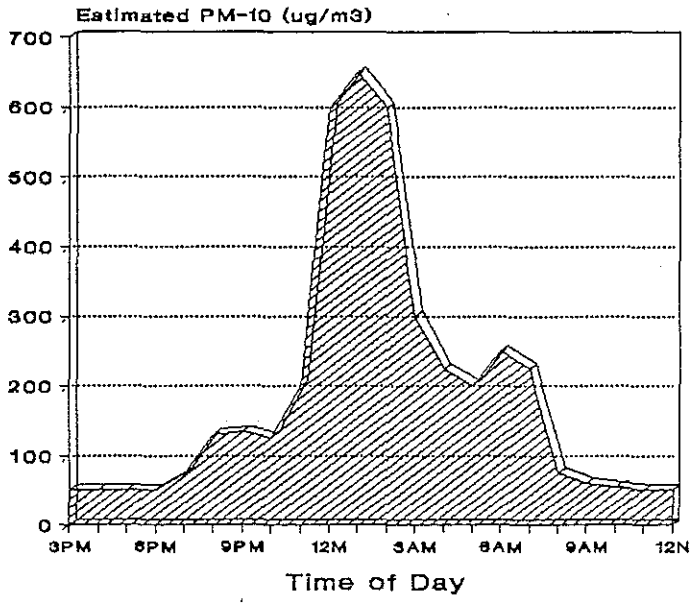
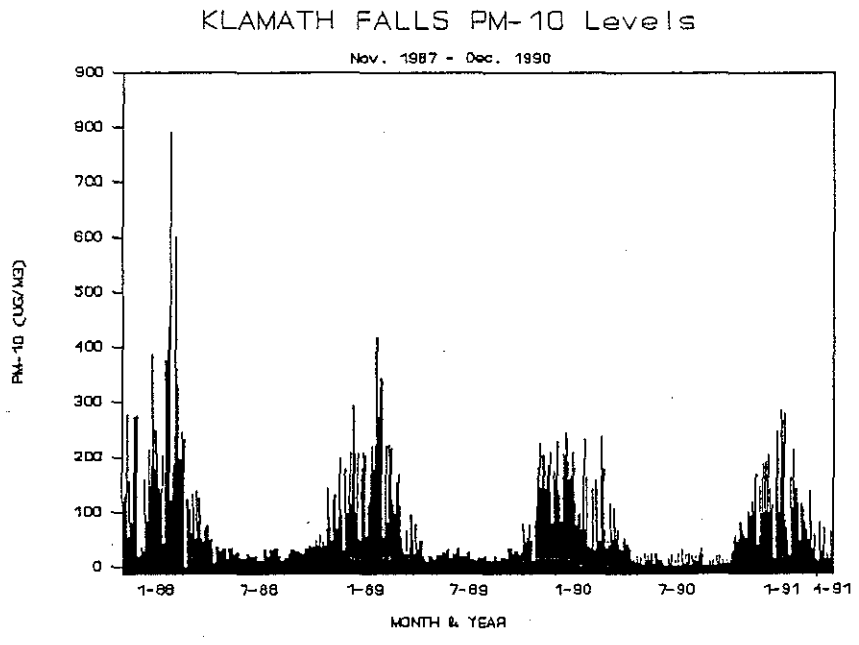


Figure 3

Klamath Falls Nephelometer Survey
January 25, 1989 at 7 AM
($\mu g/m^3$ PM_{10}, 5 Minute Averages)

Figure 4.12.1-2
Diurnal & Seasonal PM-10 Variations





4.12.2.2 Emission Inventory

Introduction

Emission inventories provide information on the relative strength of sources within an airshed and provide a basis for control strategy evaluation. In addition, emission inventories provide a basis for tracking emission reductions and growth. PM_{10} emissions (usually expressed in tons of particulate per year or TPY) are calculated from emission factors and source activity records. Emission factors are the weight of pollutant emitted per unit weight of material processed such as grams of PM_{10} emitted per pound of cordwood burned; pounds of road dust emitted per vehicle mile driven or pounds of particulate emitted per unit area of plywood veneer processed. Emission factors used in this analysis are principally from the Environmental Protection Agency's compilation of emission factors AP-42.[11]

Source activity information on the amount of cordwood burned by residents, vehicle miles driven or veneer production volumes are obtained from a variety of sources including industrial air contaminant discharge permits, public mail surveys and data gathered from other government agencies.

Estimation of seasonal or worst-case day PM_{10} emissions requires the development of a source operating schedule which describes the percent of annual emission that occur during specific seasons, months or 24-hour periods.

Base Year Emission Inventory

PM_{10} emissions for the 1986 base year within the Urban Growth Boundary (UGB) were estimated for industrial sources, residential heating (gas, oil and wood), commercial space heating, residential open burning, agricultural field burning, paved and unpaved roads, construction and agricultural dust as well as transportation sources (cars, trucks railroads and aircraft). The basis of the emission estimates for the most significant sources are described below:

Industrial Sources: ~~[209]~~ 203 TPY PM_{10}. These emissions are principally from the wood products industry wood-fired boilers and material handling. Twelve point sources, principally wood products, are included in the inventory. The largest source emits 100 tons per year of

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[11] Compilation of Emission Factors, U.S. Environmental Protection Agency AP-42 Fourth Edition and subsequent supplements. US EPA Office of Air Quality Planning and Standards. Research Triangle Park, N.C. 27711.

PM_{10}. The 1986 annual emissions are those that actually occurred during the year. **The industrial source category includes press vent emissions from the production of hardboard.**

Residential Woodheating: 1,202 TPY PM_{10}. Information obtained from the Department's 1987 woodheating survey[12] and the County of Klamath Falls indicates that 13,600[13] single family housing units are located within the UGB and that 73% of the housing units use woodburning devices. Approximately 75% of the devices are woodstoves while the remainder are fireplaces.

The survey indicates that, on average, residents burn 4.1 cords/year of firewood in their woodstoves and 2.7 cords/year in fireplaces. At 39.9 pounds of PM_{10} emitted per ton of wood burned in a woodstove, 1,076 tons of PM_{10} are emitted per year. An emission factor of 39.9 pounds of PM_{10} per ton of wood burned is more appropriate for use in Oregon (rather than the AP-42 factor of 30 pounds/ton national value) because of the higher stove burn rates typical of Oregon stove use. In-home studies of stove operation in Oregon communities has confirmed the higher emission factor. Fireplace emissions at 26.6 pounds per ton of wood burned total 126 TPY for a total 1202 tons per year. Based on the survey, about 12% of the woodstoves are DEQ-certified models. Forty six percent of those surveyed indicated that wood was the main source of heat in their home. Wood is the only source of heat in 4-5% of Klamath Falls homes.

The Department's 1991 woodheating survey (Appendix 6) indicates that worst-case day emissions have decreased by 36% because 23% fewer Klamath Falls residents are using wood as their main source of heat. The total number of cords burned has decreased by 53% since the 1987 survey[14]. As a result, annual and worst - case day PM_{10} emissions have been reduced by 36% to 771 tons per year and 11,800 pounds per day, respectively. Since the emission reduction reflected in the

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[12]Oregon Wood Heating Survey for 1987: Klamath Falls Area. State of Oregon Department of Environmental Quality, Air Quality Division. February, 1987.

[13]Klamath County Planning Department Correspondence of May 4, 1990.

[14]Klamath Falls Wood Heating Survey, 1991. Klamath County Department of Health Services and the Oregon Department of Environmental Quality, Air Quality Division. July, 1991.

1991 survey are not based on legally enforceable measures, these emission reduction credits have not been included in the demonstration of attainment.

Backyard and Agricultural Burning: 173 TPY PM_{10}. Approximately 3,380 tons of backyard debris is burned each year generating 26 TPY of PM_{10}. This estimate assumes that 183 pounds of combustible material (principally yard debris) is burned per person each year during the months of March through November. Each ton of debris burned is assumed to emit 15.3 pounds of PM_{10} particulate. Although (for purposes of the emission inventory) no backyard burning is assumed to occur during the months of December through February, local observations have confirmed that some burning is occurring on woodstove curtailment days. Agricultural burning also occurs within the UGB and, in early November, 1989 was occurring during woodheating curtailment periods. Agricultural Extension Service estimates that about 30% of the 8,000 acres of cereal grain fields within the UGB are burned annually. Assuming 3.8 tons of straw per acre, approximately 146 TPY of PM_{10} would be generated by this source during the late summer and early fall. Other agricultural burning is know to occur outside of the UGB, but no reliable information is available to estimate emissions.

Fugitive Dust Emissions: ~~[192]~~ **188** TPY PM_{10}. The principal sources of dust within the UGB on an annual basis are paved and unpaved road dust (~~[112]~~ **110** and 53 TPY, respectively) and emissions from winter road sanding (~~[27]~~ **25** TPY). Paved and unpaved road dust estimates are based on ~~[a 1985 estimate of 414,800 vehicle miles per day]~~ **Oregon Department of Transportation (Systems Studies Unit) estimates of 1986 VMT (495,455 vehicles miles per day)** and an assumed PM_{10}/TSP ratio of 24%. There are **approximately** ~~[127]~~ **14** miles of dirt road and ~~[69]~~ **14** miles of gravel road within the UGB.

Transportation Sources: ~~[131]~~ **149** TPY PM_{10}. Highway vehicles (autos and trucks) emit ~~[97]~~ **115** TPY PM_{10} in tailpipe and tire wear particulate; off highway vehicles 12 TPY and railroad diesel engines, 19 TPY. Aircraft emissions are 3 TPY.

Table 4.12.2-2 and Figure 4.12.2-1 summarize annual PM_{10} emissions within the UGB.

~~[Table 4.12.2-2: 1986 UGB Annual Emission Inventory~~

~~Source~~	~~Tons/Year PM_{10}~~	~~Percent~~
~~Industry~~	~~209~~	~~11 %~~
~~Residential Woodburning~~	~~1202~~	~~55 %~~
~~Solid Waste Disposal~~	~~173~~	~~9 %~~
~~Fugitive Dust~~	~~192~~	~~10 %~~
~~Transportation~~	~~131~~	~~7 %~~
~~Other Sources~~	~~54~~	~~3 %~~
~~Totals~~	~~1961~~	~~100 %]~~

Table 4.12.2-2: 1986 UGB Annual Emission Inventory

Source	Tons/Year PM_{10}	Percent
Industry	203	10 %
Residential Woodburning	1202	61 %
Solid Waste Disposal	173	9 %
Fugitive Dust	188	10 %
Transportation	149	8 %
Other Sources	54	2 %
Totals	1969	100 %

24-Hour Worst Case Day Inventory

Development of an inventory representative of emissions during 24-hour periods when PM_{10} ambient air concentrations reach their highest levels is important to understanding the sources that cause winter season episodes. The relative proportion of emissions during these periods is expected to be quite different than those reflected in the annual emission inventory because some sources (such as agricultural burning) are not active while others (such as residential woodheating) are much stronger.

The 24-hour worst case inventory for the UGB is based on the following information and assumptions:

Industrial and Transportation Source. The 1986 worst case day industrial emissions are based on 1986 annual emissions increased by the ratio of the 1994 daily Plant Site Emission Limit (PSEL) (pounds/hour PSEL over 24-hours) to the 1994 annual PSEL emissions. The 1994 PSELs are applied to 1994. The annual transportation emissions are assumed to be evenly distributed throughout the year.

Residential Woodburning emissions are assumed to be proportional to the coolness of the weather as reflected in the degree heating days statistic tabulated by the National Weather Service. During the period of October, 1986 to October, 1987, the coldest day (January 9, 1986) had 47 degree heating days. Since the total degree heating days for this period was 6,109, this represents 0.76% of the annual total or 9.2 tons of PM_{10} emission.

Winter Road Sanding emissions peak during periods when several inches of snow covers the area. During these periods, as much as 70 cubic yards per day of aggregate are spread on roads within the UGB. Because snow covers the roadways and landscape, essentially all of the fugitive dust emissions are assumed to originate from road sanding. Chemical analysis of PM_{10} samples collected on days exceeding the 24-hour NAAQS indicated that 9% of the PM_{10} mass was soil dust. Road sanding emission were therefore estimated to be of similar magnitude in the inventory or about ~~[2,000]~~ **1,900** lbs/day during the 27 days per year when road sanding occurs. The worst case day emission estimates provide the basis for the annual emission estimate for road sanding.

As noted, road sanding emissions were based on chemical mass balance analysis of PM_{10} samples, not on the basis of emission factors. This was done for several reasons:

(1) the CMB model can very accurately apportion soil dust impacts on actual worst case days. Even with the best possible emission factors, estimates of fugitive emissions are highly uncertain;

(2) Paved road dust emission factors are not appropriate since road surfaces are covered with packed snow;

(3) Initial calculations of emissions assuming unpaved road dust emission factors and the silt content of the aggregate used in road sanding resulted in unrealistic emission estimates far greater that the sum of all other air shed sources.

A draft report prepared by an EPA contractor (MRI, Inc.) describing fugitive dust emissions in Klamath Falls failed to quantify winter road sanding emissions under the winter worst-case day conditions described herein for two reasons; (a) in-field samples were not collected during the winter so no data could be developed to describe road surface silt loadings and (b) emission factors appropriate to conditions of roadways covered with packed snow are not available. ~~[*Final dust emission estimates are not available from MRI as of this writing*]~~.

~~[Table 4.12.2-3: 24-Hour Worst Case Emission Inventory 1986 Base Year Period.~~

~~Source~~	~~Pounds PM_{10}~~	~~Percent~~
~~Industry~~	~~1630~~	~~7 %~~
~~Residential Woodburning~~	~~18326~~	~~80 %~~
~~Fugitive Dust~~	~~2000~~	~~9 %~~
~~Transportation~~	~~768~~	~~3 %~~
~~Other Sources~~	~~123~~	~~1 %~~
~~Totals~~	~~22847~~	~~100 %]~~

Table 4.12.2-3: 24-Hour Worst Case Emission Inventory 1986 Base Year Period.

Source	Pounds PM_{10}	Percent
Industry	1580	7%
Residential Woodburning	18326	80%
Fugitive Dust	1882	8%
Transportation	879	4%
Other Sources	123	1%
Totals	22790	100%

Appendix 3 provides a detailed annual and worst case 24-hour emission inventory listing.

Growth Factors

PM_{10} emission growth factors are used to estimate future year emission inventories and source category impacts. Key indicators used to estimate future emissions include population growth, increases in transportation (vehicle miles traveled) and Plant Site Emission Limits (PSELs) for industrial sources.

Transportation Growth, estimated at 1.5% per year is used to estimate increases in vehicular and road dust emissions.[15] **Future emissions were estimated by compounding the annual growth rate of 1.5%/yr.**

[15]State of Oregon Department of Transportation Highway Division Planning Section estimate. February 22, 1989.

Population Growth data indicates that the number of people living within the Klamath Falls Urban Growth Boundary will increase by 1% per year from 37,000 to 39,500 by the year 1994.[16] Population growth is used to proportionally increase residential open burning emission and woodstove use. The population growth rate used herein is consistent with those used by the Klamath County Planning Department.

Woodburning Emission Growth from woodstoves is expected to increase by 1% per year (8% total) by the year 1994 as a result of an increased amount of firewood burned and fireplace emissions are expected to decrease by 2% per year. The one percent growth rate is based on energy projections and fuel cost modeling performed to estimate future woodburning emission growth in the Pacific Northwest.[17] These projections do not account for emission reductions that will occur as a result of woodstove certification programs as these reductions are explicitly accounted for in the Section 4.12.3.2, Evaluation of Potential Control Measures.

Industrial Emission Growth has been projected to increase to the maximum permitted within their current Plant Site Emission Limits (PSELs). The 24-hour worst case growth factor is calculated as the increase from the 1986 actual hourly emissions to their hourly maximum PSEL emission rate over a 24-hour period.

Projected Emissions, 1986 to 1994

The 1986 annual and 24-hour emission and design value estimates must be adjusted to account for emission growth or decreases that may occur within the airshed during the eight year period of 1986-1994. Estimates are based on the emission growth factors described above. The information presented in Table 4.12.2-4 provides a basis for the future year source impact estimates (Section 4.12.3.1) which, in turn, provide the basis for the control strategy analysis.

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[16]Klamath Basin Wastewater Facilities Plan Update for the North Suburban Area of the City of Klamath Falls, Klamath County, Oregon. June, 1987.

[17]U.S. Environmental Protection Agency, Region X "Residential Wood Combustion Study, Task 3, Fuel Wood Use Projections", EPA 910/9-82-089 (1984).

~~[Table 4.12.2-4: 1994 Estimated Emissions~~

Source Category	Annual 1994 Tons	%	24-Hr Worst Case 1994 Pounds	%
~~Industry~~	~~289~~	~~13 %~~	~~2375~~	~~10%~~
~~Residential Woodburning~~	~~1268~~	~~59 %~~	~~19330~~	~~77 %~~
~~Fugitive Dust~~	~~214~~	~~10 %~~	~~2240~~	~~9 %~~
~~Solid Waste Disposal~~	~~187~~	~~9 %~~	~~0~~	~~0 %~~
~~Transportation~~	~~147~~	~~7 %~~	~~860~~	~~3 %~~
~~Other~~	~~58~~	~~3 %~~	~~132~~	~~1 %~~
~~Totals~~	~~2164~~	~~100 %~~	~~24939~~	~~100 %~~ ~~]~~

Table 4.12.2-4: 1994 Estimated Emissions
(With Out Strategies)

Source Category	-Annual- 1994 Tons	%	-24-Hr Worst Case- 1994 Pounds	%
Industry	291	13%	2323	9%
Residential Woodburning	1268	58%	19330	78%
Fugitive Dust	212	10%	2108	8%
Solid Waste Disposal	187	9%	1	0%
Transportation	167	8%	986	4%
Other	59	2%	130	1%
Totals	2184	100 %	24878	100 %

Projected Emissions Beyond 1994

Analysis of the ability of the attainment strategies to maintain the NAAQS during the period 1994 to the year 2000 requires development of a third set of emission estimates. The growth rates assumed for the maintenance analysis are based on the 1994 inventory adjusted to reflect the attainment strategy emission reductions:

- Population growth rate of 1% per year to residential oil, gas and wood combustion emissions; solid waste incineration emissions and structural fires;

- Transportation growth rate of 1.5% per year (compounded) to transportation sources and paved, unpaved and construction dust as well as street sanding emissions;

- Industrial emissions are held constant at the annual and 24-hour PSEL emission rates shown in the 1994 emission inventory;

The projected residential wood combustion emissions, following application of a 1% per year growth rate, were adjusted to reflect emission reduction credits associated with the woodstove certification program. Information from the Klamath County Building Department indicates that approximately 100% of the new woodstoves being installed in new construction homes are certified and 20% of these are pelletstoves.[18] Additional information from manufacturers suggests that certified pelletstoves sales should expand to a larger share of the market in future years. This may be, in part, supported by the fact that pellet stove owners have not been asked to curtail burning during cordwood stove curtailment periods.[19] Therefore, during the period 1994 to 1996, it is assumed that 80% of newly installed stoves are cordwood and 20% are pelletstoves. During the period 1996 to 2000, it is assumed that 50% are cordwood and 50% are pelletstoves.

Actual and projected annual emissions during 1994 to the year 2000 **(assuming that <u>all</u> control strategy elements are implemented)** are listed in Table 4.12.2-5. Similar projected 24-hour worst case emissions are summarized in Table 4.12.2-6. Figure 4.12.2-2 shows changes in emission inventories during the period 1986 to the year 2000. If all of the strategy elements are applied, the year 2000 annual and 24-hour projected emissions were reduced from 1986 levels by ~~{1,379}~~ <u>970</u> tons per year and ~~{17,252}~~ <u>17,283</u> pounds per day, respectively, through the implementation of mandatory curtailment; the woodstove certification and woodstove replacement programs, opacity regulations, open burning controls and fugitive dust control programs.

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[18]Correspondence from Klamath County Building Department of February 14, 1990.

[19]Personal communications with the Chairman, Association of Pellet Fuel Industries, Sparks, Nevada. February 22, 1990.

~~[Table 4.12.2-5: 1994 to Year 2000 Annual Emissions With All Strategies Implemented (Tons Per Year)~~

~~Source Category~~	~~1994~~	~~1996~~	~~1998~~	~~2000~~
~~Industry~~	~~289~~	~~289~~	~~289~~	~~289~~
~~Residential Woodburning~~	~~239~~	~~230~~	~~225~~	~~219~~
~~Fugitive Dust~~	~~197~~	~~203~~	~~209~~	~~215~~
~~Solid Waste Disposal~~	~~31~~	~~31~~	~~32~~	~~33~~
~~Transportation~~	~~147~~	~~151~~	~~156~~	~~160~~
~~Other~~	~~58~~	~~59~~	~~61~~	~~62~~
~~Totals~~	~~961~~	~~964~~	~~971~~	~~979~~

~~Table 4.12.2-6: 1994 to Year 2000 24-Hour Worst Case Emissions With All Strategies Implemented (Pounds Per Day)~~

~~Source Category~~	~~1994~~	~~1996~~	~~1998~~	~~2000~~
~~Industry~~	~~2375~~	~~2375~~	~~2375~~	~~2375~~
~~Residential Woodburning~~	~~1731~~	~~1596~~	~~1526~~	~~1459~~
~~Fugitive Dust~~	~~896~~	~~923~~	~~951~~	~~979~~
~~Solid Waste Disposal~~	~~0~~	~~0~~	~~0~~	~~0~~
~~Transportation~~	~~860~~	~~886~~	~~913~~	~~940~~
~~Other~~	~~132~~	~~133~~	~~134~~	~~136~~
~~Totals~~	~~5995~~	~~5914~~	~~5899~~	~~5889~~]

Table 4.12.2-5: 1994 to Year 2000 Annual Emissions With All Strategies Implemented (Tons Per Year)

Source Category	1994	1996	1998	2000
Industry	291	291	291	291
Residential Woodburning	239	230	223	217
Fugitive Dust	195	201	206	212
Solid Waste Disposal	31	31	32	33
Transportation	166	172	178	183
Other	59	61	62	63
Totals	982	986	992	999

Table 4.12.2-6: 1994 to Year 2000 24-Hour Worst Case Emissions With All Strategies Implemented (Pounds Per Day)

Source Category	1994	1996	1998	2000
Industry	2323	2323	2323	2323
Residential Woodburning	1151	1110	1077	1044
Fugitive Dust	843	869	895	922
Solid Waste Disposal	1	1	1	1
Transportation	986	1014	1046	1077
Other	130	134	135	139
Totals	5434	5452	5478	5507

Transportation Conformity (Emission Budget)

Transportation air quality conformity is a quantitative analysis intended to ensure that transportation systems and projects are consistent with a state's strategy to attain and maintain air quality standards. This section establishes specific motor vehicle emissions budgets for the Klamath Falls PM_{10} Nonattainment Area to be used for conformity purposes. The Fugitive Dust and Transportation source categories contain motor vehicle related emissions for the Klamath Falls PM_{10} Nonattainment Area. These emissions have been estimated for the 1994 attainment year, and projected forward for the 10 year maintenance milestone year of 2004, as well as the transportation analysis years 2000 and 2005. These emission estimates are established as the transportation emissions budget for each respective year. The transportation emissions budget exists as a cap on expected future transportation emissions. Emissions associated with regionally significant transportation projects subject to Oregon's Transportation Conformity Rule must be equal to or less than the established budgets.

Annual and Daily transportation emissions budgets have been established for key analysis dates. The annual budget includes paved and unpaved road dust, winter road sanding, and mobile tailpipe emissions (highway). The daily budget includes winter road sanding and highway emissions. The daily budget reflects a worse-case winter day scenario, which assumes heavy snow cover, and eliminates daily emissions from paved and unpaved roadways.

ANNUAL MOTOR VEHICLE EMISSIONS BUDGET (Tons/Yr)				
Source Category	1994 Attainment Date	2000	2004 Ten Year Maintenance Milestone	2005
Dust-Unpaved	60	65	69	70
Dust-Paved	124	135	144	146
Dust-Sanding	11	12	13	13
Highway	129	141	150	152
TOTAL BUDGET	324	354	376	382

DAILY MOTOR VEHICLE EMISSIONS BUDGET (Lbs/Day)				
Source Category	1994 Attainment Date	2000	2004 Ten Year Maintenance Milestone	2005
Dust-Sanding	843	922	978	993
Highway	780	853	905	918
TOTAL BUDGET	1623	1774	1883	1911

Transportation emissions have been estimated using VMT and growth projections provided by the Oregon Department Of Transportation Systems Studies Unit. Estimated growth factors are included in Section 4.12.2.2. Emission factors were estimated by the DEQ Technical Services Section for paved and unpaved road dust, as well as tail pipe emissions. Winter road sanding emissions were calculated using chemical mass balance (CMB) receptor modeling. All estimates reflect emissions within the Klamath Falls Nonattainment Area boundary. Below is a summary of transportation emission assumptions for major dust source categories:

SOURCE CATEGORY	ESTIMATED ANNUAL VEHICLE MILES TRAVELED	PM_{10} EMISSION FACTOR
PAVED ROADS	169,990,610	0.0013 lbs/mile
UNPAVED ROADS (GRAVEL)	95,119	0.5 lbs/mile
UNPAVED ROADS (DIRT)	25,696	2.8 lbs/mile
WINTER ROAD SANDING	Calculated using CMB receptor model. Estimated as 9% of total WCD source contribution.	

For conformity purposes, additional emission estimate information may be obtained from the Department's Technical Services Section.

Methodologies and emission factors for mobile sources and road sanding emissions should be verified with the Department of Environmental Quality during the interagency conformity consultation process.

4.12.2.3 Source Contributions to PM_{10}

Development of strategies designed to attain and maintain the PM_{10} NAAQS requires an accurate knowledge of contributions that sources make to the measured PM_{10} aerosol mass. Two approaches are commonly used to estimate source contributions (1) atmospheric dispersion modeling and (2) receptor model analysis based on the properties of the aerosol measured at the receptor.

The Environmental Protection Agency PM_{10} SIP Development Guidelines Section 4.4 describes procedures to be used by the states for using receptor models to estimate source contributions to PM_{10} concentrations. These guidelines support the use of receptor models as an important element of the SIP strategy development process. Receptor modeling (specifically Chemical Mass Balance or CMB) is especially appropriate in Klamath Falls where severe air stagnation and complex terrain conditions likely make dispersion modeling inappropriate. The specific application of the CMB Receptor Model to PM_{10} source apportionment in Oregon's Group 1 areas is described elsewhere.[20]

Chemical Mass Balance (CMB) is a form of receptor modeling based upon regression analysis of aerosol features such as trace element concentrations. The model attempts to find the most likely combination of source contribution estimates (SCE's) by minimizing the difference between the measured and model-predicted concentration of aerosol features. Values for the ambient aerosol matrix are obtained through chemical analysis of PM_{10} filters taken at the Peterson School sites while the source "fingerprint" values are obtained through analysis of stack emissions. The CMB modeling protocol applied follows EPA guidance.[21] All of the CMB modelling has been conducted using EPA's Version 7.0 CMB program.[22]

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[20] PM_{10} Receptor Modeling for Oregon's Group I Areas: Medford, Grants Pass and Klamath Falls. State of Oregon Department of Environmental Quality, Air Quality Division. February, 1990.

[21] Protocol for Reconciling Differences Among Receptor and Dispersion Models. US EPA 450/4-87-008. March, 1987.

[22] Receptor Model Technical Series, Volume III (Revised): CMB User's Manual (Version 6.0) US EPA 450/4-83-014R. May, 1987.

Ambient Aerosol & Source Emission Analysis

Thirty eight PM_{10} samples from the Peterson School site have been chemically analyzed for CMB analysis. Fourteen of the samples exceeded 150 $\mu g/m^3$, all of which were collected during the winter months. The highest sample analyzed was 417 $\mu g/m^3$ on January 19, 1989. Chemical characterization of the samples includes 19 trace elements analyzed by x-ray fluorescence, 3 anions and elemental/organic carbon, providing a data set that is compatible with the source emission profiles. Analytical uncertainties for each values are routinely reported and included in the CMB calculations. PM_{10} source profiles representing all major emission groups within the airshed were used in the modeling. All of the profiles were obtained from the Pacific Northwest Source Profile Project.[23] A list of the sources included in the analysis is presented below:

Table 4.12.2-7: Source Profiles

No.	Acronym	Description
1	KFSOIL	Resuspended soil dust from Klamath Falls
2	SLASH	Forestry slash broadcast burning (Also may be vegetative burning such as yard debris)
3	RWC MED	Residential wood combustion profile for Medford
4	LD AUTO	Light duty autos (leaded gasoline)
5	HOGFUEL	Hogfuel boiler burning plywood trim in the fuel
6	WOOD	Wood fiber including sander dust
7	HDDIESEL	Diesel exhaust (Federal Test Cycle)
8	SECSO4	Secondary sulfate estimated as ammonium sulfate
9	SECNO3	Secondary nitrate estimated as ammonium nitrate
10	SECNH4	Secondary Ammonium ion
11	SALT	Road salt applied during the winter months
12	CONST	Construction dust - Medford Aerosol Study
13	VENEER	Steam heated veneer drier emissions

Receptor Model Source Contribution Estimates 24-Hour Exceedance Days

Table 4.12.2-8 is a summary of the source contribution obtained for the 14 samples that exceeded the 24-hour NAAQS. All samples were collected during the winter months. Figure 4.12.2-3 illustrates the results in graphical form.

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[23] Pacific Northwest Source Profile Library Project, Final Report Prepared by the State of Oregon Department of Environmental Quality, Air Quality Division. J. Core, Ed. September, 1989.

Table 4.12.2-8: Average Winter Exceedance Day PM_{10} Source Contribution Estimates

Source	PM_{10} ($\mu g/m^3$)	% PM_{10}
Soil Dust	27.4	10.9 %
Wood Smoke	219.0	82.0 %
Transportation	0.2	0.1 %
Sec. Aerosol	10.7	3.2 %
Others	11.7	4.3 %
	269 $\mu g/m^3$	100 %

Other sources noted in Table 4.12.2-8 include water associated with the aerosol; minor contributions and uncertainties in the apportionment. Studies recently conducted in Los Angeles suggest that as much as 7% of the PM_{10} mass is water.[24]

No contribution from hogged fuel boilers was detected on these exceedance days. US EPA Chemical Mass Balance guidance specifies that the apportionment should account for at least 80% of the measured aerosol mass. Ninety-six percent of the mass has been apportioned in the above table. Average source contribution uncertainties (relative percent of mass) are 18% for wood smoke, 11% for hog fuel boilers and 8% for soil dust.

Annual Average Contributions

The annual average source contribution estimates noted in Table 4.12.2-9 were estimated from CMB analysis of PM_{10} samples with mass loadings that approximate monthly average mass loadings. No data was available for September or November. The average mass loading of the analyzed filters is 77 $\mu g/m^3$ as compared to an actual annual arithmetic mean of 75 $\mu g/m^3$. Since the source contributions shown are based on a limited number of samples, the annual averages shown are only approximations of the true annual source contributions.

[24]S. Witz, R. Eden, C. Liu and M. Wadley,"Water Content of Collected Aerosols in the Los Angeles Basin," Presented at the Pacific Conference on Chemistry and Spectroscopy, Irvine, CA. October, 1987.

Table 4.12.2-9: Annual Average PM_{10} SCE's

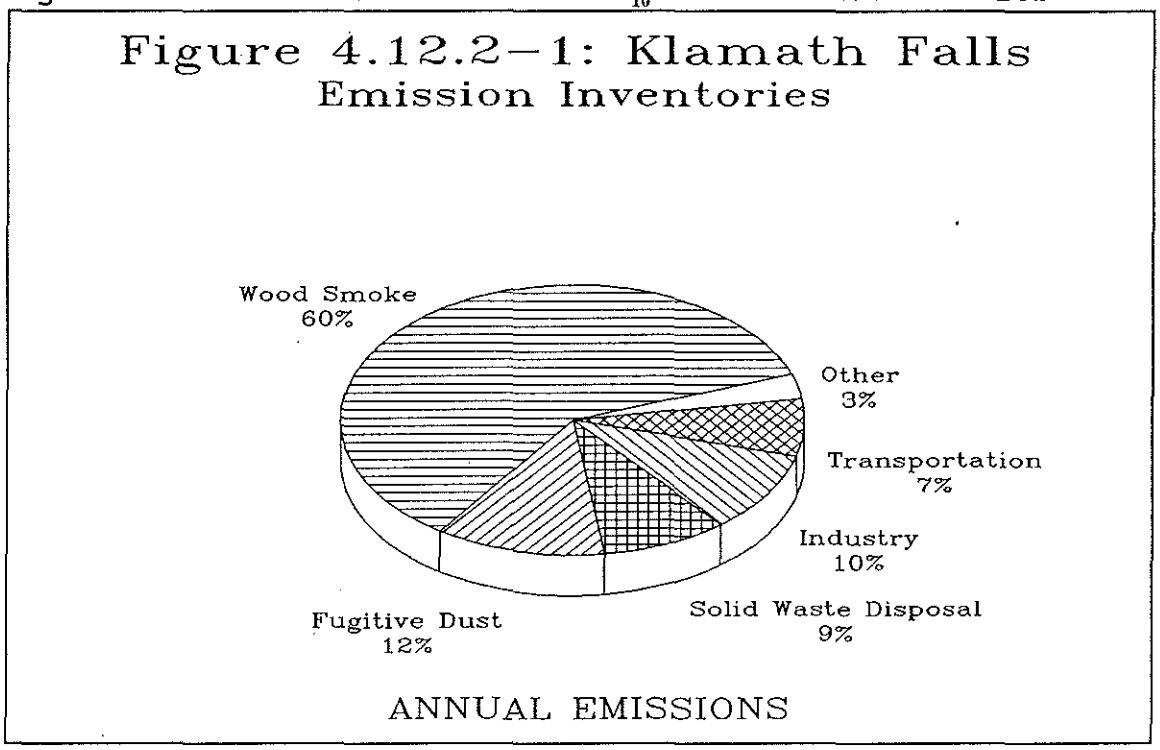
Source	PM_{10} ($\mu g/m^3$)	% PM_{10}
Soil Dust	12.9	17.0 %
Wood Smoke	55.4	72.9 %
Industry	0.9	1.1 %
Burning *	1.4	1.8 %
Transportation	0.1	0.1 %
Sec. Aerosol	1.5	1.9 %
Others	3.8	5.0 %
	76 $\mu g/m^3$	100 %

* Burning includes slash and field burning, land clearing and residential open burning.

Multiple Linear Regression Analysis

A second receptor modeling method of apportioning source contributions is multiple linear regression wherein the source contributions are estimated from variability in the aerosol chemistry. The MLR analysis was completed to determine the degree to which PM_{10} mass concentrations could be predicted from the aerosol chemistry and as a second independent check on the CMB source apportionment. Based on 49 observations, 90% (R-Sq = 0.95) of the PM_{10} mass variability can be accounted for on the basis of the aluminum (a tracer for soil dust), sulfate (a secondary aerosol) and organic and elemental carbon (from woodburning). The relative standard errors for the coefficients are 53%, 45%, 5% and 40%, respectively.

Figure 4.12.2-1: Klamath Falls PM_{10} Emission Inventories



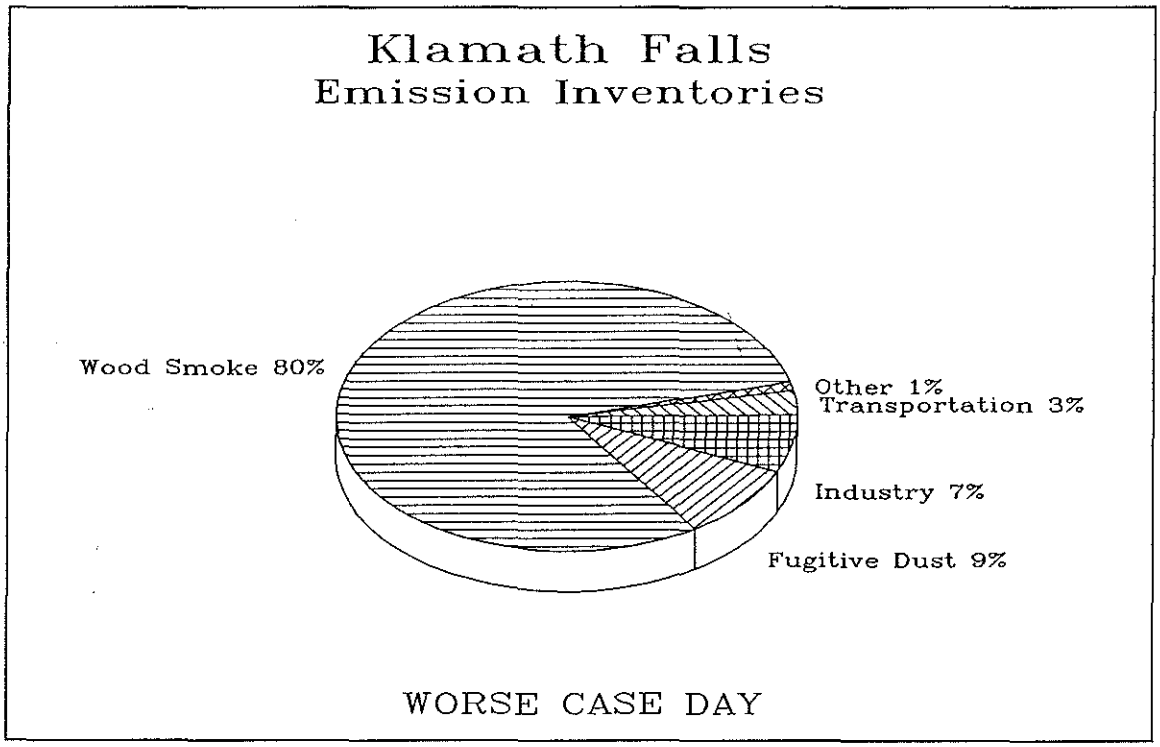
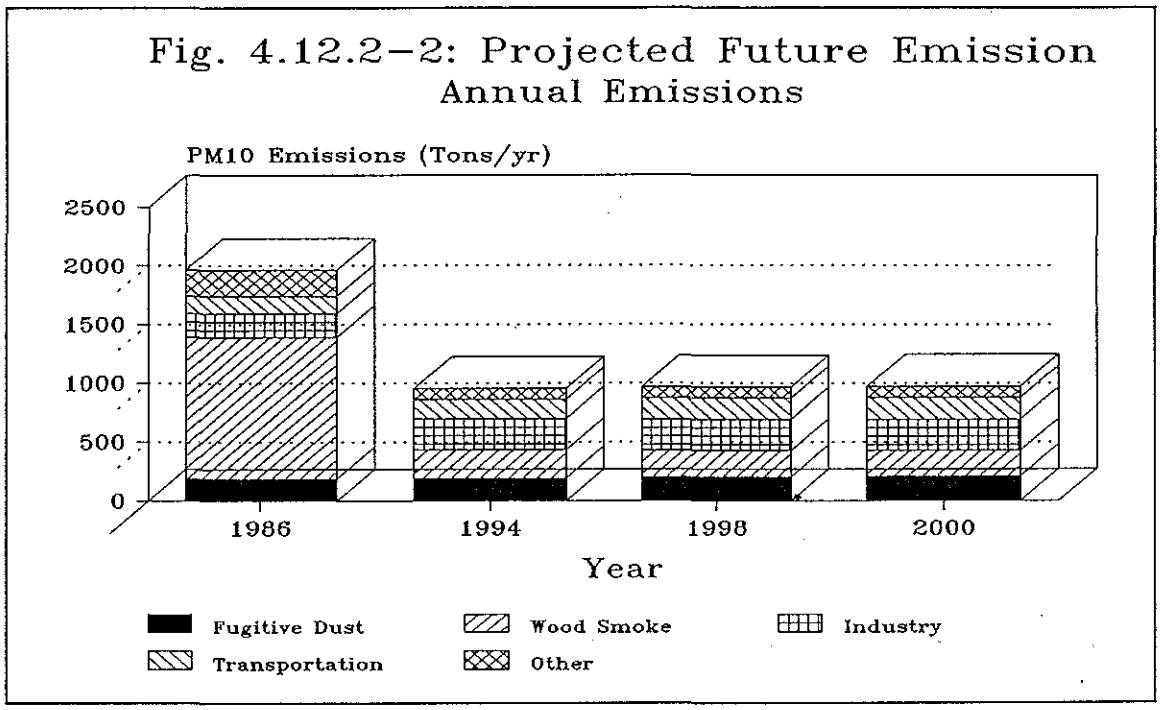
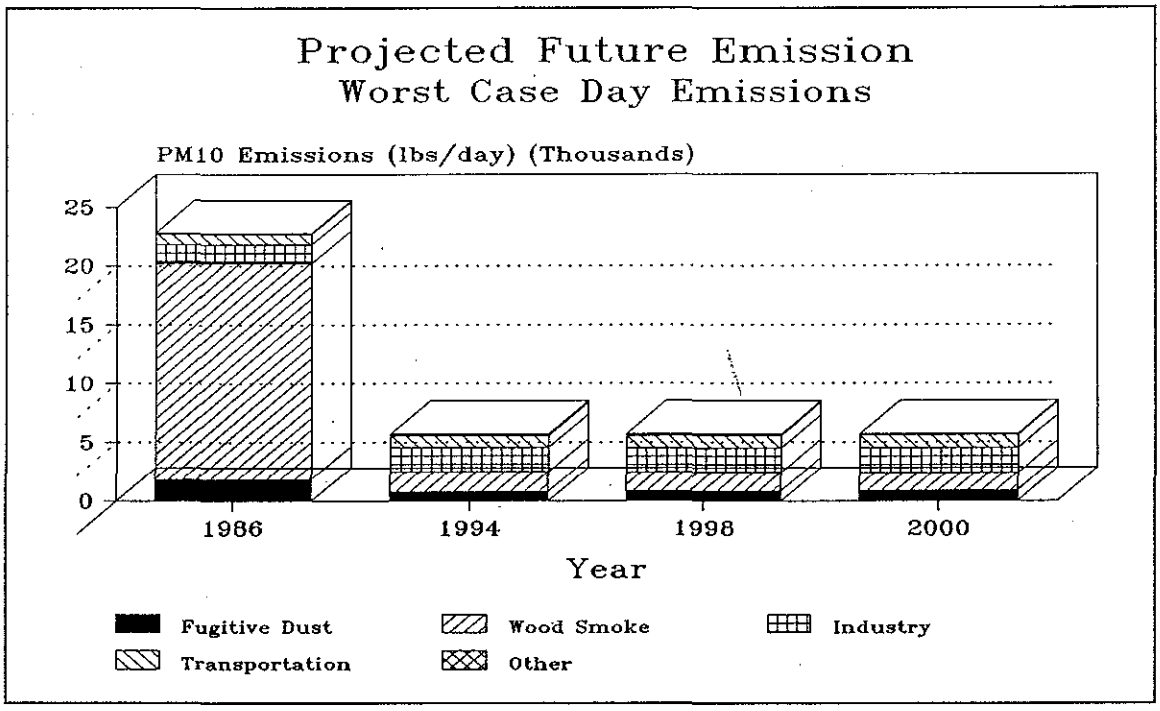


Figure 4.12.2-2: 1986 to 2000 Emission Projections





The results indicating that the PM_{10} mass can reasonably be estimated from organic carbon, aluminum, sulfate and elemental carbon measurements. The regression equation is:

$$PM_{10}\ (\mu g/m^3) = 7.3(Al) + 6.4(SO_4) + 1.9(OC) + 1.0(EC) + 26$$

Source apportionment based on MLR analysis indicate that on typical winter days exceeding the 24-hour NAAQS 5.3% of the mass is soil dust, 7.7% is sulfate and 67% is wood smoke. These findings support the emission inventory and receptor modeling conclusions that soil dust and woodburning are significant contributors to Klamath Falls PM_{10} levels during winter 24-hour worst case episodes. Since industrial emissions cannot be identified by any single aerosol component, industry contributions cannot be reliably estimated using this approach.

Analysis of Impacts by Source Categories

Receptor modeling of samples collected on days exceeding the NAAQS clearly show that residential wood smoke is the predominant source; that wood smoke varies from 69% to nearly all of the PM_{10} mass and that these impacts are consistent with the aerosol chemistry observed within the airshed. These finding are also generally consistent with diurnal and seasonal variations in Klamath Falls PM_{10} concentrations (Figure 4.12.1-2).

Comparisons between emission inventory and receptor modeling results has been used to provide a qualitative assessment of the relative significance of source categories. The source contribution estimates by these two methods for the winter 24-hour worst case and annual average periods are shown in Tables 4.12.2-11 and -12. They illustrate the generally close agreement between the source categories. The wood products industry contributions as estimated by emission inventory are higher than that estimated by receptor modeling because dispersion of the emissions is not considered. Transportation emissions are also somewhat higher than indicated by receptor modeling.

Background PM_{10} Air Quality

Annual average background PM_{10} air quality being transported into the Klamath Basin is estimated to be similar to background levels at the Medford Dodge Road monitoring site, about 15 $\mu g/m^3$ (see Section 4.12.1.2). This is similar to annual average background of 12 $\mu g/m^3$ measured at the Quartz Mountain PM_{10} site southeast of Klamath Falls. The 24-hour average exceedance day background of 7 $\mu g/m^3$ apportionment is based on the percentage contributions found at the Peterson School site with very low PM_{10} concentrations (11 $\mu g/m^3$) likely to reflect background sources.

Table 4.12.2-10: Background PM_{10} Source Contributions

Source	Annual Ave. PM_{10} ($\mu g/m^3$)		24-Hr Ave. Exceedance Day	
Soil Dust	4.6	30.6 %	4.3	62 %
Industry	0.7	4.5 %	0.0	0 %
Wood Smoke	7.2	48.0 %	1.9	27 %
Sec. Aerosol	1.4	9.3 %	0.6	8 %
Others	1.0	6.6 %	0.2	3 %
	15 $\mu g/m^3$		7 $\mu g/m^3$	

Estimation of "Local" Air Quality Impacts

Estimation of the impact of emission sources within the UGB requires that background components listed in Table 4.12.2-10 be subtracted from the source contributions listed in Table 4.12.2-8 and 9. The difference between these two sets of estimates is the contribution of "local" sources identified in the emission inventories. Table 4.12.2-11 and 12 lists the "local" source contribution estimates (SCEs) to PM_{10} mass average winter days which exceed the NAAQS and annual PM_{10} mass loading, respectively.

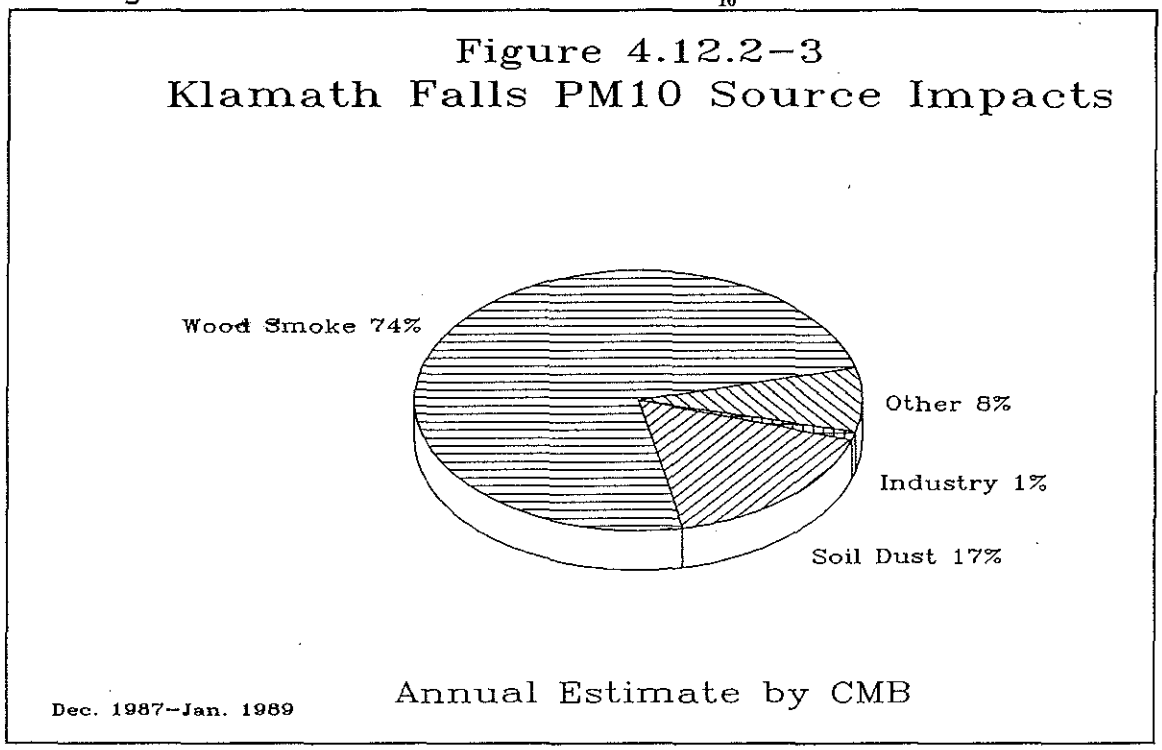
Table 4.12.2-11: Average Exceedance Day "Local" PM_{10} SCE's

Source	PM_{10} ($\mu g/m^3$)	% PM_{10}	Emission Inventory
Soil Dust	23.1	8.8 %	9 %
Industry	0.0	0.0 %	7 %
Wood Smoke	217.1	82.8 %	81 %
Sec. Aerosol	10.1	3.8 %	----
Others	11.5	4.3 %	3 %
	262 $\mu g/m^3$	100 %	100 %

Table 4.12.2-12: Annual Average "Local" PM_{10} SCE's

Source	PM_{10} ($\mu g/m^3$)	% PM_{10}	Emission Inventory
Soil Dust	8.3	13.6 %	10 %
Industry	0.9	1.4 %	11 %
Wood Smoke	48.2	79.0 %	70 % **
Burning *	1.4	2.2 %	----
Sec. Aerosol	0.1	0.1 %	----
Transportation	0.1	0.1 %	7 %
Others	2.0	3.2 %	2 %
	61 $\mu g/m^3$	100 %	100 %

Figure 4.12.2-3: Klamath Falls PM_{10} Source Contributions



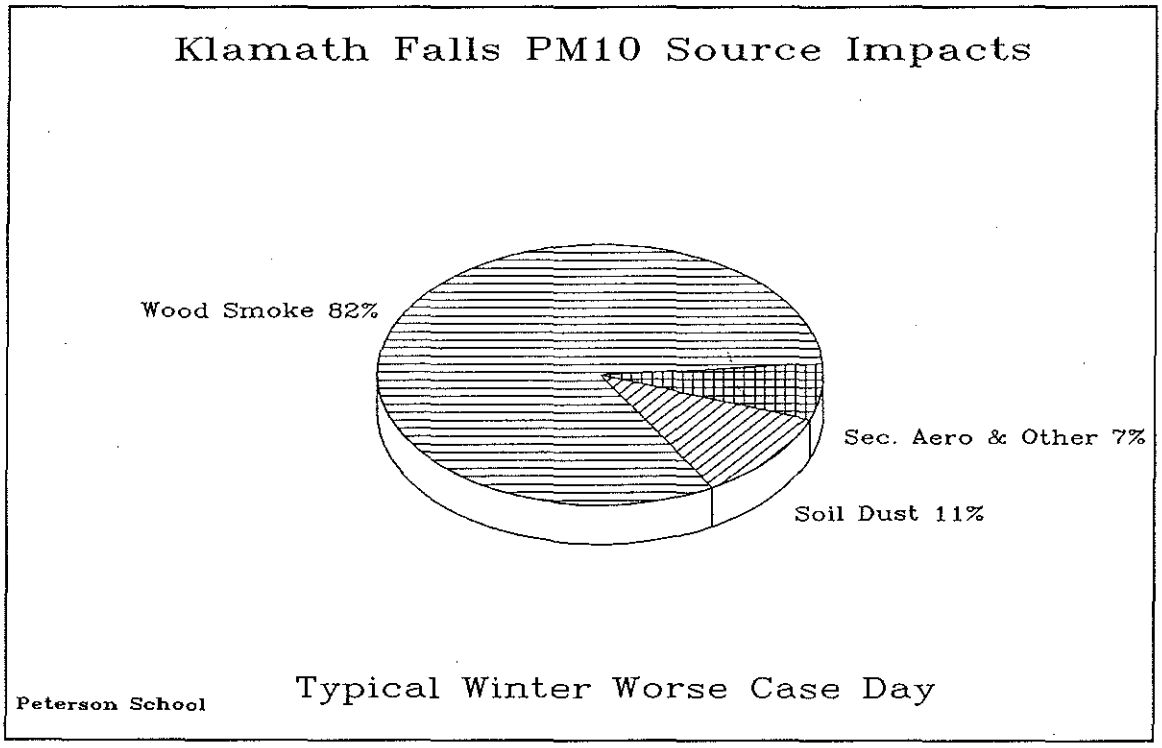


Table 4.12.2-12 Notes:

* Includes smoke from open burning occurring outside of the winter space heating season.

** Includes residential woodburning and solid waste disposal open burning.

The above analysis demonstrates that the 1986 emission inventory and receptor modeling analysis results are reasonably comparable. The validated emission inventories support the use of the 1994 emission inventory projection as the basis for the emission rollback calculations used in the attainment demonstration.

4.12.3 Emission Reduction Analysis

This section describes the emission reductions necessary to attain the NAAQS (4.12.3.1), a review of potential control measures that may be applied in Klamath Falls (4.12.3.2) and an assessment of the adequacy of the control measures to attain the NAAQS within the time limits specified by Section 110 (a) of the Clean Air Act (4.12.3.3).

4.12.3.1 Emission Reduction Necessary for Attainment

The EPA PM_{10} SIP Development Guidelines specify that a proportional modeling method can be used to estimate the control strategy requirements of the SIP. In the analysis below, the contribution of emission sources to the 1994 design values have been apportioned based on the 1994 annual and 24-hour worst case emission inventory estimates. Emission growth rates between 1986 and 1994 were first applied to each emission inventory source category. The sum of the 1994 source impacts plus background provide the 1994 24-hour worst case design value. A similar approach is taken to estimate 1994 annual emission reduction requirements. Appendix 5 contains the Demonstration of Attainment rollback calculations.

Projected 24-Hour Source Impacts in Future Years

Table 4.12.3-1 lists 1994 source contribution estimates for the 24-hour worst case scenario. Source contributions at the 1994 design level were apportioned using the 1986 24-hour worst case day emission inventory percentages applied to the "local" PM_{10} air quality level of 543 $\mu g/m^3$ (550 $\mu g/m^3$ design value less the 7 $\mu g/m^3$ background).

~~[Table 4.12.3-1: Projected Future Source Category Impacts (24-Hr Worst Case)~~

~~Source~~	~~1986 Worst Day EI~~	~~"Local" Design ($\mu g/m^3$)~~	~~1986-94 Growth (%)~~	~~1994 $\mu g/m^3$~~	~~1994 % "Local" PM_{10}~~
~~Woodstoves~~	~~72 %~~	~~389~~	~~8.0 %~~	~~421~~	~~70.2 %~~
~~Fireplaces~~	~~8 %~~	~~46~~	~~16.0 %~~	~~38~~	~~6.4 %~~
~~Industry~~	~~7 %~~	~~36~~	~~45.7 %~~	~~56~~	~~9.4 %~~
~~Fugitive Dust~~	~~9 %~~	~~48~~	~~12.0 %~~	~~53~~	~~8.9 %~~
~~Transportation~~	~~3 %~~	~~18~~	~~12.0 %~~	~~20~~	~~3.4 %~~
~~Other Sources~~	~~1 %~~	~~3~~	~~8.0 %~~	~~3~~	~~0.5 %~~
~~Subtotals~~		~~543~~		~~593 $\mu g/m^3$~~	
~~Background~~				~~7 $\mu g/m^3$~~	
~~Total~~				~~600 $\mu g/m^3$~~	

Table 4.12.3-1: Projected Future Source Category Impacts (24-Hr Worst Case)

Source	1986 Worst Day EI	"Local" Design ($\mu g/m^3$)	1986-94 Growth (%)	1994 $\mu g/m^3$	1994 % "Local" PM_{10}
Woodstoves	72%	391	8.0%	422	71.2%
Fireplaces	8%	46	-16.0%	39	6.5%
Industry	7%	38	47.0%	55	9.3%
Fugitive Dust	8%	45	12.0%	50	8.5%
Transportation	4%	21	12.0%	24	4.0%
Other Sources	1%	2	8.0%	3	0.6%
Subtotals		543		593 $\mu g/m^3$	
Background				7 $\mu g/m^3$	
Total				600 $\mu g/m^3$	

Air quality improvement needed = 450 $\mu g/m^3$ (600-150 $\mu g/m^3$) or a 75.9% [450/(600-7 bkgnd)] in worst case day emissions equivalent to ~~[18,922]~~ 18,877 pounds per day.

The control strategy must be comprised of a mix of individual source reduction measures such that the sum of the reductions equal or exceed the total reduction requirement. Adopted control strategies must be shown through a demonstration of attainment (Section 4.12.3.3) to attain and maintain the NAAQS by reducing emissions such that an overall reduction in PM_{10} 24-hour worst case concentrations is at least 450 $\mu g/m^3$.

Projected Annual Source Impacts in 1994

Table 4.12.3-2 lists 1994 source contribution estimates for the annual scenario. Source contributions at the 1994 annual design level were apportioned using the 1994 annual emission inventory percentages applied to the "local" PM_{10} air quality level of 60 $\mu g/m^3$ (75 $\mu g/m^3$ design value less the 15 $\mu g/m^3$ background).

~~[Table 4.12.3-2: Projected Annual Source Category Impacts~~

~~Source~~	~~1986 Annual EI~~	~~"Local" Design ($\mu g/m^3$)~~	~~1986-94 Annual Growth~~	~~1994 Annual $\mu g/m^3$~~	~~1994 %"Local" PM_{10}~~
~~Woodstoves~~	~~55 %~~	~~33~~	~~8 %~~	~~36~~	~~48 %~~
~~Fireplaces~~	~~6 %~~	~~4~~	~~16 %~~	~~3~~	~~7 %~~
~~Industry~~	~~11 %~~	~~6~~	~~38 %~~	~~9~~	~~14 %~~
~~Fugitive Dust~~	~~10 %~~	~~6~~	~~12 %~~	~~2~~	~~10 %~~
~~Transportation~~	~~7 %~~	~~4~~	~~12 %~~	~~4~~	~~7 %~~
~~Open Burning~~	~~9 %~~	~~5~~	~~8 %~~	~~6~~	~~10 %~~
~~Other Sources~~	~~3 %~~	~~2~~	~~8 %~~	~~2~~	~~3 %~~
~~Sub Totals~~		~~60~~		~~66 $\mu g/m^3$~~	
~~Background~~				~~15 $\mu g/m^3$~~	
~~Total .....~~				~~81 $\mu g/m^3$]~~	

Table 4.12.3-2: Projected Annual Source Category Impacts

Source	1986 Annual EI	"Local" Design ($\mu g/m^3$)	1986-94 Annual Growth	1994 Annual $\mu g/m^3$	1994 %"Local" PM_{10}
Woodstoves	55%	33	8%	35	54 %
Fireplaces	6%	4	-16%	3	5 %
Industry	10%	6	44%	9	12 %
Fugitive Dust	10%	5	12%	7	10 %
Transportation	8%	5	12%	5	8 %
Open Burning	9%	5	8%	6	9 %
Other Sources	3%	2	8%	2	2 %
Sub Totals		60		67 $\mu g/m^3$	
Background				15 $\mu g/m^3$	
Total				82 $\mu g/m^3$	

Air quality improvement needed = ~~[31]~~32 $\mu g/m^3$ (~~[81]~~82-50 $\mu g/m^3$) or a 47% [~~[31]~~32/(~~[81]~~82-15 bkgnd)] reduction in 1994 emissions. This is equivalent to a reduction of ~~[1020]~~ 1035 tons per year.

4.12.3.2 Evaluation of Potential Control Measures

The PM_{10} control strategy for the Klamath Falls UGB focuses on residential woodburning and winter road sanding fugitive emission dust control measures as well as public education programs, on-going restrictions on open burning, forest slash burning emissions reductions and management of industrial point source emission growth.

PM_{10} Control Strategy Elements

The following control strategy elements have been adopted to assure attainment of the annual and 24-hour PM_{10} NAAQS. Emission reduction credits associated with each element are listed and discussed. A PM_{10} emission reduction credit is a measure of the reduction in PM_{10} emissions that would be accomplished through adoption and implementation of the program element. The strategy elements and credits are further described in Section 4.12.3.3.

The emission projections listed in the following tables reflect estimated 1994 emissions.

~~Table 4.12.3-3 PM_{10} Control Strategies Elements~~

~~Element~~	~~Strategy~~	~~Emission Reduction Credits by 1994 24-Hr. Annual~~	
~~Attainment Strategies~~			
~~1~~	~~Woodstove Certification Program~~	~~24 %~~	~~24 %~~
~~2~~	~~Woodstove Curtailment Programs~~	~~86 %~~	~~74 % *~~
~~3~~	~~Winter Road Sanding Controls~~	~~60 %~~	~~60 %~~
~~4~~	~~Woodstove 20% Opacity Program~~		~~5 %~~
~~5~~	~~Woodstove Removal Program~~	~~27 %~~	
~~6~~	~~Public Education Programs~~	~~No Credit Taken~~	
~~7~~	~~Industrial Significant Emission Rate Offset Restrictions~~	~~No Credit Taken~~	
~~8~~	~~Forestry Slash Burning Emission Reductions & Restrictions~~	~~No Credit Taken~~	

~~* Equivalent Emission Reduction Credit - See Text~~

Table 4.12.3-3 PM_{10} Control Strategies Elements

Element	Strategy	Emission Reduction Credits by 1994 24-Hr. Annual	
Attainment Strategies			
1	Woodstove Certification Program	24 %	24 %
2	Woodstove Curtailment Programs	86 %	74 % *
3	Winter Road Sanding Controls	60 %	60 %
4	Woodstove 20% Opacity Program	--	5 %
5	Woodstove Removal Program	53 %	--
6	Public Education Programs	No Credit Taken	
7	Industrial Significant Emission Rate Offset Restrictions	No Credit Taken	
8	Forestry Slash Burning Emission Reductions & Restrictions	No Credit Taken	

* Equivalent Emission Reduction Credit - See Text

Residential Wood Smoke Control Elements

There are two basic approaches to reducing woodsmoke from stoves and fireplaces: (1) improving the performance of the woodheating systems such as through a certified woodstove program; and (2) burning less wood through woodstove curtailment programs.

Some strategies have multiple advantages. Certified woodstoves, for example, improve emission performance by reducing the amount of woodsmoke per cord of wood burned while improving energy efficiency, thus reducing the amount of wood burned. Other examples are well designed public information, energy conservation, or firewood seasoning programs that result in better combustion (lower emissions) and better energy efficiency (less fuel burned). The key elements of the residential wood smoke control program are described below.

The Woodstove Certification Program

In 1983, the Oregon Legislature directed the Department to require that all new woodstoves sold in the State be laboratory tested for emissions and efficiency prior to sale to assure compliance with established emission standards. As a result, stoves sold after July, 1986 were required to emit 50% less smoke than conventional woodstoves. After July, 1988 new woodstoves were required to emit 70% less smoke.

Subsequent to the adoption of Oregon's emission standards, the Environmental Protection Agency (EPA) adopted a slightly more restrictive national certification program which became effective July, 1990. In March, 1990 the Department completed rulemaking to modify the Oregon woodstove certification rules (OAR 340 Division 21) to assure consistency with EPA's national program.

In-home studies of first generation certified woodstoves have indicated that they actually reduce emissions by about 30%. Second generation certified stoves have been shown to reduce emission by about 50%. The majority of stoves certified by the Department and sold in Oregon have been second generation stoves.

Second generation catalytic stove designs have incorporated new advancements in combustor technology which in part accounts for the stoves increased effectiveness. First generation catalytic stoves incorporated less effective catalytic elements which are currently reaching the end of their useful life. When replaced with new generation catalysts, the first generation catalytic stoves will provide effective emission reductions approaching that of second generation stoves. These improved first generation stove will make up part of the stove population in 1994.

RESIDENTIAL WOODBURNING

WOODSTOVES:

Residential woodstove emissions constitute 89.5% (1076 tons) of the total 1986 woodburning baseline emission inventory. Growth of residential woodstove use was estimated by comparing a study of projected firewood use, conducted by Del Green Associates, and actual woodheating surveys conducted by the department from 1981

through 1987. The Del Green projections can be used to estimate wood use growth from 1986 to 1994 at a 1% per year increase. This projection is conservative compared to the actual firewood use trends projected from the 1981 and 1987 woodheating surveys and represent a worst-case assumption considering the substantial (53%) reduction from 1987 levels in wood use reported in the Klamath Falls 1991 woodheating survey.

FIREPLACES:

Fireplace emissions in Klamath Falls represent 10.5% (126 tons) of the total 1986 baseline woodburning emission inventory. The emission impact from fireplaces has been separated from woodstove use in calculating the emission reduction benefit derived from the woodstove certification program. The Del Green projections for wood use trends in fireplaces estimates a 2% per year decrease in fireplace use from 1986 through 1994. This estimate is also conservative when compared to the actual firewood use trends for fireplaces from the 1981 and 1987 woodheating surveys.

Pelletstoves:

Residential pelletstoves are included as part of the 1986 baseline woodstove EI, and are expected to grow at a significantly accelerated rate in the near future. A conservative estimate of pelletstove growth is to assume a growth rate equivalent to cordwood stoves.

The following calculations are included in Appendix 5. Note that since the following calculation do not include emission reductions associated with woodburning curtailment program, the following tables cannot be directly compared to those found in Appendix 5, Tables 6 and 7 which report emission inventory changes associated with <u>all</u> strategies.

<u>RESIDENTIAL WOODSTOVES</u>

Basis for a 24% Woodstove Certification Program Credit

As noted above, firewood use in residential woodstoves is projected to increase by 1% per year over the 8 year period from 1986 to 1994. This is the basis of the growth factor used in calculating projected 1994 wood smoke emissions. Therefore, in the absence of any certification program, emission would increase by:

1% per year x 8 years = + 8%

Building permit authorities in Klamath County indicate that essentially all permitted installations are certified stoves and that about 20% of these are pelletstoves. The 5% per year replacement rate for removal of conventional stoves and installation

of certified stoves was confirmed in the 1991 Klamath Falls Woodheating Survey which found a replacement rate of 7%.

(1) For new certified cordwood stoves emitting 50% of conventional stoves, emissions would be expected to decrease over the period 1986-1994 by :

(a) Assuming 80% are new or replacement cordwood stoves:

80% x {[8% x (100%-50%)] x BL86 + [5%/Yr. x 8 Yrs x (100-50%)] x BL86} = 18.4%(BL86)[tons]; Where BL86 = Baseline emissions in 1986

(2) For new certified pelletstoves emitting 10% of conventional stove, emissions would be expected to decrease over the period 1986-1994 by :

(a) Assuming 20% are new or replacement pelletstoves:

20% x {[8% x (100%-10%)] x BL86 + [5%/Yr. x 8 Yrs x (100-10%)] x BL86} = 7.88%(BL86)[tons]

(3) The total emission reduction as a function of the 1994 uncontrolled woodstove emissions is:

$$\{18.4(BL86) + 7.88(BL86)\}/BL94 = \frac{26.28(BL86)}{1.08(BL86)} = 24.3\%$$

Where: BL94 = 1.08 x BL86

Therefore, the woodstove certification program alone provides a 24.3% credit by 1994.

RESIDENTIAL FIREPLACE EMISSION PROJECTION

Emissions from residential fireplaces are expected to decrease 2% per year from 1986 to 1994.

NET BENEFIT OF CERTIFICATION PROGRAM AND FIREPLACE TRENDS

Woodstove and Pelletstove Replacement:

Assuming 80% of replacement stoves to be certified cordwood stoves, and 20% pelletstoves; the net emission reduction from the 1986 base line will be 31.2 tons per year. This yearly reduction is applied consistently (not compounded) each year from 1986 to 1994.

[80% x(5%/yr x .5)] + [20% x (5%/yr x .9)] = 2.9%/yr reduction.

1986 woodstove baseline [1076] x .029 = 31.2 tons/yr.

New Woodstoves and New Pelletstoves:

Assuming 80% of new certified stoves to be cordwood stoves, and 20% to be pelletstoves; the net emission increase due to growth will be 4.5 tons/yr. This yearly increase is applied consistently (not compounded) from 1986 to 1994.

[80% x (1%/yr x .5)] + [20% x (1%/yr x .1)] = 0.42%/yr increase.
1986 woodstove baseline [1076] x .0042 = 4.5 tons/yr.

Residential Fireplace Trend:
Residential fireplace use is projected to decrease by 2% each year. This means a constant reduction of 2.5 tons per year, (not compounded) from the 1986 fireplace emission baseline.
[126 t/yr x .02] = 2.5 tons/yr.

Source Category	ANNUAL EMISSIONS BY YEAR (Tons) 1986	1987	1988	1989	1990	1992	1994
Existing Stoves	1076	1044	1012	982	953	896	843
New Stoves	0	5	9	14	18	27	36
Old & New Fireplaces	126	124	121	119	116	112	107
TOTAL	1202	1174	1142	1115	1087	1035	987

The net reduction due to the woodstove certification program, and fireplace usage trends (from the projected 1994 uncontrolled RWC emissions of 1268 tons) becomes 22% :

$$1 - \frac{\text{[1994 controlled] 987 tons}}{\text{[1994 uncontrolled] 1268 tons}} = 22\ \%\ \text{reduction}$$

Maintenance Credits Beyond 1994

The credits claimed for the certification program beyond 1994 follow the same approach but are based on the fact that pelletstoves are likely to be an increasing proportion of the new stoves being installed. During the period 1994-1996, an 80%/20% cordwood/pellet stove mix is assumed increasing to a 50%/50% mix during the period 1996 to year 2000. Growth in new stoves is expected to increase to 1.1% per year, reflecting the projected population growth rate.

The stove replacement is expected to remain 5% per year, and fireplace use trends will continue at a 2.0% per year reduction. The calculated net benefits adjusted for emission growth provide a 98 ton reduction during the 1994-96 period, and an additional 113 ton reduction during the period of 1996 to 2000.

Maintenance Period 1994 through 1996

Replacement: Woodstoves and Pelletstoves
[80% x (5%/yr x .5)] + [20% x (5%/yr x .9)] = 2.9%/yr
BL1994 [850 tons] x .029/yr = 24.6 ton/yr reduction.

New: Woodstoves and Pelletstoves:

[80% x (1.1%/yr x .5)] + [20% x (1.1% x .1)] = 0.46%/yr
BL1994 [850 tons] x .0046/yr = 3.9 tons/yr increase.

Fireplace: continue at -2%/yr. from the 1994BL.[109] x .02/yr] = 2.18 tons/yr decrease.

	1994	1995	1996
Existing Stoves	843	823	803
New Stoves	36	41	45
Fireplaces	107	105	103
TOTAL	987	969	951

Net Emission Benefit for 1994- 1996:
[987 - 951] = 36.0 ton reduction

Maintenance Period 1996 through 2000

Replacement: Woodstoves and Pelletstoves

[50% x (5%/yr x .5)] + [50% x (5%/yr x .9)] = 3.5%/yr
BL1996 [811 tons] x .035/yr = 28.4 ton/yr reduction.

New: Woodstoves and Pelletstoves:

[50% x (1.1%/yr x .5)] + [50% x (1.1% x .1)] = 0.33%/yr
BL1996 [811 tons] x .0033/yr = 2.7 ton/yr increase.

Fireplace: continues at -2%/yr. from the 1996BL.{[109] x .02/yr} = 2.18 tons/yr decrease.

	1996	1997	1998	1999	2000
Existing Stoves	803	786	768	751	735
New Stoves	45	50	54	59	63
Fireplaces	103	101	99	97	95
TOTAL	951	936	921	907	893

Net Emission Benefit for 1996 - 2000:

[951 - 893] = 58 ton reduction.

The Klamath County Air Quality Program

Resolution 89-116, adopted August 31, 1988 by the Klamath County Board of Commissions established Klamath County's Air Quality Program under the direction of the County Health Department. The program was established to implement the Klamath County Air Quality Compliance Development Plan for the Klamath Falls City and Urban Growth Boundary which was adopted as Resolution 89-148 on April 19, 1989. On July 31, 1991, the Commission adopted a new ordinance establishing a mandatory woodburning curtailment program as well as enforced restrictions on open burning and other restrictions on airshed emissions. The City of Klamath Falls adopted Ordinance No. 6630 on September 16, 1991 implementing the County air quality program within the city boundaries.

The program is funded by Klamath County at a level of $112,600 per year (FY 91) and employs one full time Air Quality Coordinator and two administrative assistants. Effective in the Fall of 1991, two full time field inspectors will be added to implement and enforce the mandatory provisions of the Klamath County ordinance. Additional special project funds are provided by the Department to support major capital outlay and other one-time program needs. The Klamath County Program is found in Appendix 4. Key elements of the County program are described below.

1. Public Information Programs.

A comprehensive, professional, and well-financed public information program is essential for public cooperation and support in reducing woodsmoke emissions. The program clearly describes the need for the public's cooperation, the health-safety-energy-economic benefits to individuals and the community, and precisely what individuals can do to help. Key elements include: home

weatherization, firewood seasoning, cleaner burning practices, proper stove installation and sizing, maintenance of woodburning systems and most importantly curtailment of woodburning during poor ventilation episodes. Although no emission reduction credits are taken for the public information program, it is critical to the success of all of the other woodsmoke reduction elements.

The Klamath Falls Air Quality education program fulfills all of these criteria. Key element of this aggressive program include:

- Television and radio public service announcements;
- Billboards, posters, brochures and road side signs;
- Neighborhood and house-to-house meetings promoting clean air and proper woodheating practices;
- Newspaper articles on clean air issues, Air Pollution Index (API) trends and woodburning curtailment calls;
- Advertising in newspapers and on radio;
- Wood smoke health effects studies and symposiums;
- Public classes and forums on proper burning methods;
- A voluntary firewood moisture certification program for fuel wood dealers;
- Coordination with advisory committees, woodstove dealers environmental and governmental groups;
- Operation of the Klamath County Burning Advisory telephone system which, during the 1990-91 heating season, answered 122,000 public calls. An additional 5,000 calls were handled by the Klamath County Air Quality staff.

EPA's Guidance Document for Residential Wood Combustion Emission Control Measures recognizes public education programs as an essential element of any residential woodburning control strategy. The highest level education program described by EPA is based on a comprehensive, aggressive program that includes all of the elements found in the Klamath County program described above. Although EPA recognizes public education programs as an essential element of woodburning control programs, no emission reduction credits can be assigned to the program without further technical justification.[25]

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[25]US EPA, "Guidance Document for Residential Wood Combustion Emission Control Measures," EPA-450/2-89-015 (1989).

2. Home Weatherization and Stove Replacement Program

In May, 1990 and in June of 1991, the City and County of Klamath Falls received awards totalling $1.44 million from the State of Oregon Community Block Grant funds for a home weatherization and woodstove replacement program similar to the Medford CLEAR Project. Woodstoves in ~~[325]~~ 743 low income, sole source homes have been replaced by natural gas, electrical furnaces, certified woodstoves and pelletstoves with grant funds administered under Klamath County's PURE project. The program has reduced woodheating emission by ~~[32.9]~~ 67 tons per year and ~~[506.9]~~ 973 pounds/day. These reductions are based on Klamath County information indicating that approximately 90% of the conversions are natural gas. The average cost of converting and weatherizing each home is $2,200.

3. Curtailment During Poor Ventilation Episodes.

A mandatory woodburning curtailment program was adopted by the Klamath County Board of Commissioners on July 31, 1991 following three years of a voluntary program. The program has been operated by Klamath County since 1988. The program has been designed to limit the use of woodstoves and fireplaces during periods likely to exceed the 24-hour NAAQS.

Woodburning curtailment forecasts are made twice daily at 7 AM and 4 PM during the woodheating season by the County Health Department. The forecasts are made daily between November 1st and April 1st. A "Yellow" forecast is issued if the 6 AM to 6 PM levels are forecast to be greater than 4.0 but less than 7.0 Bscat (equivalent to 81-150 $\mu g/m^3$ PM_{10}).[26] A "Red" forecast is issued if the 6AM-6PM forecast is for Bscat levels greater than 7.0 or 150 $\mu g/m^3$. The curtailment calls are based on criteria provided by the Department and are based on a forecast algorithm using National Weather Service upper air and barometric pressure data, forecasts of synoptic meteorology; surface temperatures and wind speed/direction. Nephelometer measurements of hourly light scattering and local observations of air quality conditions are also used. A detailed discussion of the curtailment methodology is found in Appendix 7.

Woodburning curtailment advisories are issued at three levels:

> "Green" advisories are issued for periods during which NAAQS violations are unlikely. Woodburning is unrestricted during these periods but the public is asked to follow good woodburning practices. "Green" advisories are issued when PM_{10} levels are expected to be less than 80 $\mu g/m^3$, 12-hour average from 6 AM to 6 PM.

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[26]Bscat measured by integrating nephelometer in units of 10^{-4} M^{-1}.

"Yellow" advisories are issued for periods approaching exceedance of the NAAQS. Under a "Yellow" curtailment, the public is asked to curtail all unnecessary woodburning, excepting only pelletstoves, certified woodstoves and those that use wood as their sole source of heat

"Red" advisories are issued for periods of severely restricted ventilation during which PM_{10} levels are expected to exceed the NAAQS. Only households in which woodburning is the sole source of heat are permitted to burn during these periods.

Based on the past three years of air monitoring data, about 47 curtailment days are expected to occur during the space heating season. Compliance with the advisories is determined through evening surveys of woodburning activity during "Green", "Yellow" and "Red" curtailment periods.

The goal of the Klamath Falls Woodburning Advisory Program is to achieve an 86% compliance rate on the 40 to 50 days per year on which violations of the PM_{10} health standards would be expected. The Klamath Falls compliance rate during the first year of the mandatory program is expected to be similar to that reported for other mandatory curtailment programs such as the Medford, Oregon program which achieved an 85% compliance rate during the first months of the program.

4. Opacity, Phase Out of Exemptions & Enforcement

The Klamath County ordinance provides for a year around, 20% woodstove plume opacity (stove startup and shutdown periods exempted). The 5% emission reduction credit claimed for this program is based on EPA guidance.[27] Other elements include a phase-out of curtailment exemptions: sole source nonowner occupied dwellings by 1993 and owner occupied, low income sole source by 1998. All sole source households (except tenant occupied and low income) must have secondary heat sources by 1996. A ban on the sale of used, uncertified woodstove is also included in the ordinance.

The County Ordinance, Section 170.500, provides for penalties for violation of the conditions of the ordinance. First offenses are subject to a $25 fine; second offenses by a fine of $100 and subsequent violations of $250 per occurrence. The County's enforcement policy is that violations of the Ordinance are cumulative over time and not limited to the heating season or

[27]US EPA, OAQPS, Guidance Document for Residential Wood Combustion Emission Control Measures. Appendix F. EPA 450/2-89-015. September, 1989.

calendar year. This policy significantly strengthens the stringency of the Ordinance.

Long Term Woodheating Control Strategy

Woodheating curtailment is viewed as a short-range control strategy to allow rapid attainment of the short term (24 hour) PM10 air quality standard. The department of Environmental Quality is committed to pursue permanent reductions in woodheating emissions as a long-range strategy to reduce and eliminate the reliance on curtailment and to provide significant improvement in annual PM10 air quality.

At a minimum, the following measures will be pursued to permanently reduce woodheating emissions:

- Public education activities will include more specific information on the true cost of woodheating in relation to other alternative cleaner heat sources. The major goal of this effort is to persuade those households that are spending more money to heat with wood in uncertified stoves than with conventional fuels, such as natural gas, or certified stoves.

- Further information and studies on the toxicity, health effects and other detrimental effects of woodstoves will be pursued and heavily publicized in a continuing effort to convince more people that they should reduce their woodheating smoke.

- Funding sources will be perused to implement the programs authorized by the 1991 Oregon legislature for loans and grants to accelerate the replacement of uncertified woodstoves.

Basis for Woodburning Curtailment Credits (Worst Case Day)

The highest reported compliance rates have been for mandatory curtailment programs in Washoe County, Nevada (90%), Juneau, Alaska (80-90%), Yakima, Washington (80%), and Missoula, Montana (70%). In the Medford area a 80% to 85% compliance rate was achieved in the first year of mandatory curtailment. The 90% emission reduction credit for Klamath Falls attainment is based on the above compliance rates.

Basis for Woodburning Curtailment Credits (Annual Emissions)

Annual emission credits taken for reductions made on the 47 curtailment days that occur, on average, each year have been estimated by two methods:

Reductions Based on Degree Heating Days were calculated by summing the product of the number of degree heating days that occurred on the 47 coldest days (most of which

exceeded the 24-hour NAAQS) during the winter months, generally curtailment days (December, 1987 to March, 1989) and the total number of degree heating days per year to obtain the fraction of annual degree days that occurred on the 47 coldest days of the winter. This fraction (0.31) was then applied to the 1994 annual woodburning emission estimate of 1268 tons per year to obtain the total tons of emissions on curtailment days (393 tons). If emissions are reduced by 86% on curtailment days, than emissions should be reduced by 338 tons (86% of 393 tons) which represents 27% of the 1994 annual emissions. The curtailment program will therefore provide, at minimum, a 27% credit on an annual basis. However if the fact that reductions occur during poor ventilation conditions is considered, much greater benefits are apparent.

Annual Air Quality Improvements of Curtailment are believed to be much greater than the above emission reduction credit would estimate because the emission reductions are occurring during the worst atmospheric ventilation periods of the year. To estimate the true annual air quality benefits of curtailment, actual PM_{10} concentrations on winter days with PM_{10} levels greater than 150 $\mu g/m^3$ (mid-1986 to mid-1989) were used to estimate daily PM_{10} concentrations that would occur on curtailment days given the following: (1) a background PM_{10} level of 7 $\mu g/m^3$; (2) 83% of non-background PM_{10} is wood smoke and (3) the curtailment program will reduce woodsmoke concentrations by 86%. These PM_{10} estimates were then used to recalculate the three year, annual average. Given these assumptions, the design value annual average of 75 $\mu g/m^3$ was reduced to 50.2 $\mu g/m^3$. Since the proportional rollback model estimates that a 938 ton per year emission reduction in woodsmoke is needed to attain the annual NAAQS ~~[and given that the woodheating strategies alone will attain the annual NAAQS]~~, the curtailment program will provide a minimum equivalent emission reduction credit of 74% (938 TPY/1268 TPY of total woodsmoke). This is the basis for the 74% "comparable" emission reduction credit noted in Table 4.12.3-3. ~~[If it is assumed that the woodheating strategy will provide all of the 1008 ton/year reduction needed for attainment, a credit of 79.5% (1008/1268) could be justified.]~~

State of Oregon Statute

The 1991 Oregon Legislature passed several measures in HB2175 which will be available as either as control strategies or contingency measures for the control of PM_{10} emission from residential woodheating. These measures are outlined below:

Residential Woodheating Controls

I. WOODSTOVE CHANGEOUT PROGRAM (OAR 340 Division 34)

A. The Residential Woodheating Air Quality Improvement Fund created under Section 10 of HB2175 provides for a two faceted program that offers both low, or no interest loans, as well as total subsidies for the replacement of uncertified woodstoves with alternate heat sources. The low/no interest loan program, available to woodheating households within the western interior valleys or any PM_{10} nonattainment area, provides criteria under which a uncertified stove may be removed and destroyed, and a high efficiency, low polluting heating system installed to building code and manufacturers specifications.

B. The subsidy program would fund local governments or regional authorities in PM_{10} nonattainment areas to provide subsidies for the replacement of uncertified stoves. In order to receive funding a local government or control authority must meet eligibility criteria, among which is the adoption of an ordinance that limits visible emissions from woodstoves and fireplaces during periods of air stagnation. This provision does not restrict the establishment of a woodstove curtailment program if deemed necessary.

Both programs include eligibility requirements for individual applicant households.

Funding and Resources:

Although the Residential Woodheating Air Quality Improvement Fund was established to provide resources for the Low/No Interest Loan, and Stove Subsidy programs the legislature did not authorize an emission fee on the sale of cordwood which would have provided funding.

The Department intends to fully pursue the funding of these programs through federal assistance grants and other grant sources. The Department also intends to return to the 1993 legislative session and try to establish a permanent source of funding for these programs.

At such time as funding is provided the Department will provide staff resources to administer both program, and to fully analyze the most efficient and effective means of concentrating efforts on emission reduction in the most critical areas.

Emission Reduction:

Emission reduction benefits vary considerably depending upon the number of participants, and the type of replacement heating system selected. Stove replacement subsidy programs with a high degree of participation that are focused within a limited geographical area will see the most immediate benefit in improved air quality.

If a community were to participate in a local stove replacement subsidy program it would be possible for each household to achieve a reduction in PM_{10} emissions of approximately 50% if uncertified stoves were replaced with EPA phase II certified stoves. If each household were to replace their uncertified stove with a gas furnace the emission reduction would be approximately 99%.

II. REMOVAL OF UNCERTIFIED STOVE UPON SALE OF HOME IN PM_{10} NONATTAINMENT AREA EFFECTIVE DECEMBER 31, 1994 (OAR 340 Division 34)

The 1990 Clean Air Act requires states to revise PM_{10} control strategies for problem areas to include contingency plans and other provisions to insure that PM_{10} health standards will be achieved by specified dates. HB2175 requires that after December 31, 1994 all uncertified woodstoves, except antique and cookstoves, be removed and destroyed upon sale of a home. The Department views this program as a primary contingency measure for the overall PM_{10} control strategies required by EPA.

The requirements of the statute are immediately enforceable through civil penalties by amending OAR Chapter 340, Division 12. By December 1994, the Department will also develop an advisory committee comprised of representatives from Oregon Title Companies, the Oregon Association of Realtors, and the State Real Estate Agency in Salem. The goal of the advisory group will be to outline the most efficient means to disseminate information about the sale requirements to all home sellers in the nonattainment areas, and to ensure that the stove removal and destruction requirement is carried out.

FUNDING AND RESOURCES:

The Department will commit staff resources to the enforcement of the statute where necessary. The Department will also coordinate the advisory group efforts to enhance the development and implementation of a comprehensive education and enforcement effort in each PM_{10} nonattainment area.

EMISSION REDUCTION:

The long term emission reduction potential of the stove removal contingency strategy will vary depending upon the turn over rate of homes with uncertified stoves, and the choice of replacement heat. An evaluation of census information and surveys of real estate transactions estimates an average annual home turn over rate of approximately 3% per year, with the average home being owned for 20 years.

A random home replacement distribution over 20 years, at 3% per year would increase the replacement rate of uncertified stoves from 5% to 8%. The expected emission reduction from both stove replacement strategies may range from 50% cleaner in the case of a certified woodstove being chosen as the replacement heating device, to 99% cleaner if a gas heater is chosen.

III. STATEWIDE WOODSTOVE CURTAILMENT (OAR 340 Division 34)

The 1991 Oregon legislature authorized the following program to be put in place in any area of the State where such a program is required under the Clean Air Act: If a local government or regional authority has not adopted or is not adequately implementing the Clean Air Act required woodstove curtailment program, the Environmental Quality Commission may adopt by rule and the Department of Environmental Quality may operate and enforce a program to curtail residential woodburning during periods of air stagnation. The curtailment program would apply to woodstoves, fireplaces, and other woodheating devices. The State curtailment program must include at a minimum:

- A provision for a two stage curtailment program based on the severity of the projected air quality conditions.
- A provision to exempt all Oregon certified woodstoves from the first stage of curtailment.
- A provision for low income exemptions.
- A provisional exemption for sole source woodburning households.
- An exemption for pelletstoves.
- A provision for the Department to defer the operation and enforcement of the curtailment program at such time as the local government or regional authority has adopted and is

adequately implementing the required curtailment program.

FUNDING AND RESOURCES:

Should it become necessary for the Department to implement a State residential wood smoke curtailment program within a community the Department would seek assistance from the EPA to fund the necessary public education, daily advisory, monitoring, surveyance, and enforcement efforts.

The Department staff could provide support for a public education campaign, and distribute the daily burn advisory. The Department would explore the possibilities of contracting with local agencies to provide services in the areas of monitoring, compliance surveys, and enforcement.

EMISSION REDUCTION:

EPA guidance regarding woodheating curtailment programs suggests that a minimum 10% credit for emission reduction can be taken for a voluntary curtailment program, and that a minimum 50% emission reduction credit may be taken for a mandatory program. The Department has had several years of experience establishing and monitoring curtailment programs in the Medford, Klamath Falls, Jackson County, and Grants Pass PM_{10} nonattainment areas.

The Department's experience with curtailment programs supports that a 30% emission reduction credit is a reasonable estimate for a voluntary woodburning curtailment program. A mandatory curtailment program, given the proper effort in the area of community education and information is capable of attaining emission reductions in the range of 70% to 90%.

IV. USED STOVE BAN (OAR 340 Division 34)

The 1991 legislature enacted a ban on the sale of uncertified used woodstoves. As of the effective date of House Bill 2175 August 5, 1991 no person shall advertise for sale, offer to sell or sell, a used woodstove that was not certified for sale as new to the 1986 Oregon woodstove emission standard. Additionally, HB2175 has charged the State Building Code Agency to amend their administrative rules, prohibiting the installation of uncertified used woodstoves.

FUNDING AND RESOURCES:

The Department's Woodheating Program staff will investigate potential violations of the uncertified used stove sales ban, and with assistance from the Department's enforcement section will take the appropriate enforcement action when necessary. The Department's Public Relations section in conjunction with the Woodheating Program staff will mount a public education and information campaign to make the public aware of the new ban on used stove sales. The State Building Code Agency will enforce these regulations prohibiting the installation of uncertified used stoves.

EMISSION REDUCTION:

Our best information indicates that 1 out of every 4 stoves purchased is a uncertified used stove. Prohibiting their purchase and installation will ensure that the full emission credit potential offered by the normal change over to certified stoves will be realized. With the prohibition on uncertified used stoves each new stove purchase will provide at a minimum a 50% decrease in emissions or better depending upon the type of replacement heating device chosen. The 1991 Oregon Legislature adopted a new statute (HB2175) prohibiting the commercial sale of uncertified woodstoves and requiring the removal of conventional woodstoves upon sale of a home. Stove removal upon sale has been reserved as a contingency measure (see below) to be implemented in the event that the attainment strategy fails to achieve the NAAQS. Both measures greatly accelerate the woodstove changeover rate.

RACM Elements

Reasonably Available Control Measures (RACM) for Urban Fugitive Dust, Residential Wood Combustion and Prescribed Burning are defined by the EPA's April 2, 1991, Memorandum on PM_{10} Moderate Area SIP Guidance. Further guidance is contained in EPA-450/3-88-008 (September, 1988), Control of Open Fugitive Dust Sources and EPA-450/2-89-015 (September, 1989), Guidance Document for Residential Wood Combustion Control Measures.

URBAN FUGITIVE DUST RACM MEASURES

EPA guidance requires that the following fugitive dust RACM elements be included in the PM_{10} SIPs if the source is a significant contributor to PM_{10} nonattainment and it is economically and technologically feasible to control:

(1) Pave, vegetate or chemically stabilize access points where unpaved traffic surfaces adjoin paved roads; (2) Require dust control plans for construction or land clearing projects; (3) Require haul trucks to be covered; (4) Provide for traffic rerouting or rapid clean up of temporary (and not readily preventable) sources of dust on paved roads (water erosion runoff, mud/dirt carryout areas, material spills, skid control sand). Delineate who is responsible for clean up;

(5) Prohibit permanent unpaved haul roads, and parking or staging areas at commercial, municipal, or industrial facilities; (6) Develop traffic reduction plans for unpaved roads using speed bumps, low speed limits, etc. to encourage use of other (paved) roads; (7) Limit use of recreational vehicles on open land (e.g., confine operations to specific areas, require use permits, outright ban); (8) Require improved material specification for and reduction of usage of skid control sand and salt (e.g., require use of coarse, nonfriable material during snow and ice season); (9) Require curbing and pave or stabilize (chemically or with vegetation) shoulders of paved roads; (10) Pave or chemically stabilize unpaved roads;

(11) Pave, vegetate, or chemically stabilize unpaved parking areas; (12) Require dust control measures for material storage piles; (13) Provide for storm water drainage to prevent water erosion onto paved roads; (14) Require revegetation, chemical stabilization, or other abatement of wind erodible soil, including lands subjected to water mining, abandoned farms, and abandoned construction sites and (15) Rely upon the soil conservation requirements (e.g., conservation plans, conservation reserve) of the Food Security Act to reduce emissions from agricultural operations.

Fugitive dust control measures that have already been adopted by rule are found in Chapter 340, Division 21, Department of Environmental Quality. These rules apply within incorporated cities of 4,000 or more population and are enforce under OAR 340-21-060. These rules implement the following fugitive dust RACM measures:

RACM Element	OAR 340 Division 21 Section:
1	(2)(a)
2,10,11	(2)(b)
3	(2)(f)
4	(2)(g)
12	(2)(c)

In addition, the Klamath County Clean Air Ordinance requires implementation of RACM elements 4 (trackout) and 8 (winter road sanding). The contingency plan implements elements 3 (covering haul trucks), 7 (recreational vehicle use on open lands) and 14 (abatement of wind erodible soil).

REASONABLY AVAILABLE RESIDENTIAL WOOD COMBUSTION CONTROL MEASURES

EPA guidance requires that the State PM_{10} SIPs include strategies from each of the following four RACM measures:

1. Establish an episode curtailment program, including: a curtailment plan; a communication strategy to implement the plan; a surveillance plan (e.g., "windshield" survey, opacity trigger); and enforcement provisions including procedures, penalties, and exemptions). A voluntary program will be deemed reasonable if the area demonstrates attainment.

The Klamath Falls mandatory curtailment program fulfills this requirement. Enforcement procedures, penalties and exemptions are found in the Klamath County Clean Air Ordinance.

2. Establish a public information program to inform and educate citizens about stove sizing, installation, proper operation and maintenance, general health risks of wood smoke, new technology stoves, and alternatives to woodheating.

The Klamath County public education program, as administered by Klamath County Department of Health Services, provides a comprehensive information on each of the elements of this RACM measure. This program is supplemented by the Department's public information program.

3. Encourage improved performance of woodburning devices by:

- **Establishing a program to identify, through opacity observation, deficiencies in stove operation and maintenance. (Under such a program, advice and assistance should be provided to the identified households to help reduce visible emissions from their devices);**

  Klamath County's curtailment surveillance program is used both to assess compliance rates and to identify homeowners that are operating woodstoves with excessive emissions. The mandatory 20%, year around opacity program will identify those that need to improve stove operation.

- **Providing voluntary dryness certification programs for dealers and/or making free or inexpensive wood moisture checks available to burners;**

  The Klamath County program includes a voluntary cordwood certification program implemented

through local fire districts. A similar mandatory program is included as a contingency.

- Evaluating and encouraging, as appropriate, the accelerated changeover of existing devices to new source performance standards or other new technology stoves (e.g., hybrid designs, pelletstoves) by such approaches as subsidized stove purchases tax credits or other incentives.

  Accelerated changeover is encouraged through the woodstove changeout program established under OAR 340 Division 34; through the phaseout of curtailment exemptions in the Klamath County ordinance and through the low income home weatherization program operated by Klamath County (PURE).

4. Provide inducements that would lead to reductions in the stove and fireplace population (or use) by:

- Encourage a reduction in the number of woodburning devices (i.e., removing or disabling the devices) through tax credits or other incentives;

  OAR 340 Division 34 includes, as a contingency measure, removal of uncertified stoves upon home sale.

- Discouraging the resale of used stoves through taxes, fees or other incentives;

  OAR 340 Division 34 and the Klamath County Clean Air Ordinance includes a ban on the sale of used woodstoves.

RACM Measures not included in the Klamath Falls SIP include:

- Discouraging the availability of free (or very inexpensive) firewood by increasing cutting fees or limiting the cutting season.

- Slowing the growth of woodburning devices in new housing units by taxes, installation permit fees, or other disincentives;

REASONABLY AVAILABLE CONTROL MEASURES FOR PRESCRIBED BURNING

EPA guidance requires that RACM measures from prescribed (slash burning) be included where it is shown that prescribed burning is or does contribute significantly to PM_{10} exceedances within the

nonattainment area. The guidance specifies that such a program must include (1) smoke dispersion forecasts based (at minimum) on National Weather Service data; (2) a process for preparation and approval of burn plans; (3) availability of training programs for burners; (4) a public information program; (5) provisions for surveillance and enforcement of any mandatory requirements; (6) development of emission inventories; and (7) State oversight of the smoke management programs.

Oregon's forestry smoke management program administered by the Oregon Department of Forestry (ODOF) is administered through a voluntary program on forest lands surrounding Klamath Falls. The voluntary program meets all of the above RACM requirements. Smoke dispersion forecasts issued daily by ODOF's smoke management center for the Klamath Falls area are based on NWS and local weather data. The program requires the preparation and approval of burn plans prior to ignition. Training is provided each year by ODOF staff to all burners. For Federal employees, this training is supplemented by training programs offered by the US Forest Service, the Bureau of Land Management and the National Park Service. ODOF and the Federal agencies all offer information on their programs to the public. Air monitoring surveillance is provided through the Department's programs and through aircraft plume tracking conducted by those conducting the burning. Emission inventories are developed in cooperation with ODOF using state of the art fuel consumption models. The Department oversees ODOF's program through periodic reviews and through ORS 477.515 which requires that the Director of the Department approve the program.

Fugitive Dust Control Element

A 60% reduction in emissions from winter road sanding is required to attain the 24-hour NAAQS on worst-case winter days. Sanding materials used in the Klamath Falls area are obtained from a gravel pit located near Merrill, Oregon where volcanic cinders, pea gavels, silts and clays have been deposited. Nearly all of the aggregate used within the UGB is applied by the Oregon Department of Transportation Highway Division, mostly on US 97, South Sixth Street, Alameda Bypass and the South Side Bypass. The City, County and State all maintain sections of Washburn Way and other streets in South suburban Klamath Falls. The City maintains streets within the Central Business District. Approximately 2,000 cubic yards of aggregate are applied each year by the Highway Division. The County and City use very little sanding material.

Three control options were evaluated: (1) processing of aggregate from the Merrill pit to remove silts and clays thereby reducing the amount of material to be entrained by traffic; (2) substitution of the Merrill aggregate with crushed gravel from hard rock sources located in the area or (3) use of a deicing slurry in lieu of road sanding and improved road sanding practices to minimize

use of the aggregate consistent with public safety standards.

Basis for 60% Credit for the Winter Road Sanding Control Program

The specifics of the winter road sanding control strategy are contained in correspondence from the Oregon State Highway Division (Appendix 4). The 60% credit is based on the Highway Division's commitment to reduce winter road sanding by 60% through (a) replacement of aggregate with a deicing slurry; (b) reduction in the amount of aggregate used by maintenance crews and (c) rapid cleanup using street washing or sweeping of road sanding materials used on major thoroughfares. Streets included in the program are south Sixth Street, Alameda Bypass, Washburn Way, South Side Bypass and portions of US 97. During worst case winter days, a ~~[1,300]~~ **1,265** pound per day emission reduction will occur. On an annual basis, road sanding emissions will be reduced by ~~[18]~~ **17** tons per year.

These reductions will be documented on the basis of Highway Division records of the number of cubic yards of sanding material applied each winter to roadways. Since road sanding emissions are linearly related to road surface silt loading, emission reduction credits can be documented on the basis of Oregon State Highway Division records of the number of cubic yards of sanding material used each year within the nonattainment area. Because of significant yearly variations in snowfall, the use of road sanding aggregate should also be expected to vary accordingly.

Since all of the heavily traveled roads in the Klamath Falls UGB are paved, reductions in resuspended road dust from paved streets may also be considered should additional emission reductions be required. Other methods of control include the addition of asphalt shoulders and curbs to major paved streets thereby eliminating trackout from the edge of the pavement into the traffic lanes. The paving of unpaved roads and control of mud trackout from construction sites are additional strategies that may be useful.

In addition, the Klamath County ordinance provides for mandatory cleanup of trackout from unpaved areas onto State highway right-of-ways enforced through Oregon Department of Transportation administrative rules by the Highway Division.

Restrictions on Open Burning

The Klamath County ordinance contains the following open burning restrictions:

1. A year around prohibition on agricultural open burning within the nonattainment area and within one-quarter mile of the nonattainment area boundary. Elimination of these emissions results in a reduction of ~~[146]~~ **156** tons per

year of PM_{10} and is the basis of the emission reduction credit noted in the annual NAAQS demonstration of attainment;

2. Prohibition of highway right-of-way burning within the county and residential open burning on woodburning curtailment days;

3. A voluntary agricultural smoke management program on farm lands within Klamath County coordinated by the Klamath County Farm Bureau was adopted in June, 1991 (Appendix 4). Burn\no-burn advisories are provided by Klamath County Air Quality during October 15 through March 15 of each year; cooperating operators monitor and report smoke transport conditions and record date, acreage and location of each field fire which is reported to Klamath County yearly.

In correspondence dated November 27, 1989 (Appendix 4) the Department requested that the State Fire Marshal direct the local fire districts not to issue open burning permits during periods when "Yellow" or "Red" woodburning curtailment advisories are issues by the Klamath County Department of Health Services. A cooperative agreement between the Klamath County Board of Fire Chiefs and Klamath County restricting open burning has also been adopted. The Department has further requested that land clearing and agricultural burning permits not be issued within approximately 30 miles of the Urban Growth Boundary during poor air quality days.

Forestry Slash Burning

PM_{10} emissions from forestry slash burning, both because of the magnitude of the emissions and the proximity of the burning to the nonattainment area, can potentially have a significant impact on Klamath Falls air quality. Forestry burning is regulated under Oregon law (ORS 477.515) which requires that the State Forester and the Department of Environmental Quality jointly approve a plan to manage smoke from slash burning in areas they designate.

By statute, the Oregon Department of Forestry (ODOF) is responsible for the administration of rules (OAR 629-43-043) and written procedures to assure the protection of air quality. At present, the mandatory, daily burning instructions issues by ODOF apply only within the smoke management plan's Restricted Area which covers western Oregon (crest of the Cascades west) and the Deschutes National Forest.

Recognizing the need to protect the Klamath Falls nonattainment area from slash smoke intrusions, forest land owners surrounding Klamath basin have entered into a voluntary smoke management program

(See Appendix 4). The voluntary program was adopted in April, 1990 and signed by all of the major forest land owners near Klamath Falls. The provisions of this program are coordinated by the Oregon Department of Forestry which provides daily smoke management forecasts and advisories for Klamath County, thereby meeting EPA's requirements for Reasonably Available Control Measures (RACM) for forestry smoke management programs.

In addition, the Visibility Protection Program incorporated as Section 5.2 of the Oregon State Implementation Plan includes as a goal a 50% reduction in western Oregon PM_{10} prescribed burning emissions relative to the 1978-79 baseline emissions. These emission reductions are to be achieved in a reasonably linear manner over by the year 2000. Reductions are to be achieved through increases in wood waste utilization, rescheduling burning to spring-like fuel moisture conditions, application of mass ignition burning techniques, reductions in acres burned and accelerated mop-up of smoldering units. Although the emission reductions will occur west of the Cascades, the strategy will reduce impacts from forestry burning that may be transported into the Urban Growth Boundary from units burned on the Rogue River and Umpqua National Forests and BLM's Medford District.

Industrial Emission Growth Management

In June, 1989, the Department amended OAR 340-20-225 Significant Emission Rate provisions for industrial sources. The significant emission rate for new or expanding industrial emission was revised from 15 to 5 tons per year to assure that even relatively small increases in industrial emissions would be offset by compensating emission reductions of an equal or greater amount. The tightened offset requirement assures that future industrial emission growth will not offset emission reductions achieved through elements of the attainment strategy.

Contingency Measures & Emission Reductions

Section 172(C)(9) of the Clean Air Act Amendments of 1990 Clean Air Act requires that the State Implementation Plan include contingency measures for significant sources of PM_{10}. These measures are to take effect without any further action by the State if the area fails to attain the PM_{10} standard by the attainment date required by the Act. Contingency measures are triggered upon publication by EPA of notice in the Federal Register that the area has failed to attain the National Ambient Air Quality Standard for PM_{10} by the attainment date required in the Clean Air Act. Depending upon the effectiveness of the control strategies, EPA could make this determination in 1994 or subsequent years.

The following elements have been included to fulfill this requirement of the Act:

Residential Woodburning Measures

1. State backup authority from the 1991 Legislature to require removal of uncertified woodstoves upon sale of a home. Rules to implement the statute are being proposed as a revision to OAR 340 Division 34. A similar provision is found in Klamath County ordinance Section 170.650(5);

2. Fuelwood seasoning requirement on all firewood sold with Klamath County implemented through the Klamath County ordinance Section 170.650(6);

3. Expansion of the Klamath County air quality control area to include the Keno - Midland area south to the California border implemented through the Klamath County ordinance Section 170.650(7);

4. Prohibition on installation of more than one woodstove in a new dwelling implemented through the Klamath County ordinance Section 170.650(9);

Fugitive Dust Control Measures

1. Prohibition on off road vehicle use on open fields and hillsides within the nonattainment area implemented through the Klamath County ordinance Section 170.650(4);

2. Dust control on public and private landfill sites, abandoned construction sites and quarries as well as lots without ground cover implemented through the Klamath County ordinance Section 170.650(3);

3. Requirements to cover haul trucks implemented through the Klamath County ordinance Section 170.650(2);

4. Construction sites within the nonattainment area required to have asphalt trackout strips to reduce trackout implemented through the Klamath County ordinance Section 170.650(3);

5. Requires establishment of a mandatory agricultural open burning smoke management program within Klamath County implemented through the Klamath County ordinance Section 170.650(8);

Industrial RACT Requirements

The industrial contingency plan is adopted as OAR 340-21-200 through 340-21-240. The 1990 Clean Air Act requires RACT in the control strategy if it is needed to demonstrate attainment, and otherwise requires RACT in the contingency plan. **In Klamath Falls, attainment can be successfully demonstrated by controlling sources other than industry (RACM measures for area sources). Therefore, RACT requirements for industrial point sources have been included in the contingency measures, and not in the primary attainment strategy.** The industrial contingency elements in Division 21 satisfy Reasonably Available Control Technology (RACT) requirements for industrial sources of PM_{10} emissions which are not otherwise subject

to RACT under state-wide standards. If the contingency plan is triggered by failure to meet the Clean Air Act deadline for attainment, affected sources will be required to submit detailed plans to the Department within three months and demonstrate compliance within 30 months. This schedule is consistent with Clean Air Act requirements to implement contingency measures as expeditiously as practicable to continue progress toward attainment while a revised control strategy is under development.

Under OAR 340-21-210(2), the Department ~~[is]~~ request<u>ed</u>~~[ing]~~ Weyerhaeuser to conduct a receptor/dispersion modeling study by December 31, 1994, to determine whether emissions from the Weyerhaeuser facility have a significant impact (annual average impact of 1.0 ug/m^3, or 24-hour impact of 5.0 ug/m^3) at the maximum concentration point within the nonattainment area (Peterson School monitoring site). ~~[*If the PM_{10} impacts are determined to be significant, and if attainment is not reached by the December 31, 1994, deadline of the Clean Air Act, then the Weyerhaeuser facility will become subject to the RACT contingency requirements.*]~~ <u>Weyerhaeuser's permitted emissions have recently been significantly reduced to levels below Department estimates, and their Air Contaminant Discharge Permit (ACDP) is being modified to reflect this lower emission level. The Department has therefore provided Weyerhaeuser the opportunity to model emission impacts at Peterson School using these new permitted emissions. Preliminary results of this modeling indicate that Weyerhaeuser's maximum exceedence day impact at Peterson School is below the Department's 5 ug/m^3 significance criteria. The Department will continue to review the new modeling results and will, by October 1, 1995, make a final determination regarding the significance of Weyerhaeuser's impact at the Peterson School monitoring site.</u> If the PM_{10} impacts are determined to be significant, and <u>if attainment is not maintained in Klamath Falls,</u> ~~[*if attainment is not reached by the December 31, 1994, deadline of the Clean Air Act,*]~~ then <u>the Department will require Weyerhaeuser to comply with the same RACT contingency requirements as other stationary sources within the nonattainment area boundary.</u> ~~[*the Weyerhaeuser facility will become subject to the RACT contingency requirements.*]~~ <u>If exceedence day impacts at Peterson School are determined to be insignificant, Weyerhaeuser will not be subject to the PM_{10} Control Plan Industrial Contingency Requirements.</u>

<u>Emission Reductions From Contingency Measures</u>

Woodstove emissions would be reduced an additional 108 tons per year by the year 2000 through the contingency plan. Industrial emissions would be reduced an additional 132 tons per year (844 tons per year including industries outside of the Urban Growth Boundary but inside the Klamath County Control Area with significant impacts) through installation of RACT\BACT contingency emission controls. Additional reductions which cannot be quantified by the emission

inventory would be achieved through fugitive dust control contingency measures. Total reductions are estimated at a minimum of 240 tons per year (nonattainment area industries, only) which is 11% of the estimated 1994 emission levels prior to application of control strategy credits and 25% of the expected 1994 emission level following strategy reductions. Because of the dominance of woodburning emission within the airshed and the very large woodstove emission reductions included in the attainment strategy, it is not possible to achieve a full 25% reduction from the 1994 uncontrolled emission level through contingency measures.

4.12.3.3 Demonstration of Attainment

This section describes the application of emission reduction credits described in Section 4.12.3.2. in demonstrating attainment of the NAAQS. The calculations are based on proportional rollback of 1994 emission estimates. Appendix 5 contains the detailed calculations that support the following text.

~~[Table 4.12.3-4: Summary of 24-Hour Emission Reductions To Be Achieved by 1994~~

~~Strategy Element~~	~~Credit~~	~~Emission Reduction~~
~~Highway Road Sanding Program~~	~~60%~~	~~1,344 Pounds/Day~~
~~Woodburning Strategies:~~		
~~- Woodburning Curtailment~~	~~86%~~	~~16,624 Pounds/Day~~
~~- Certification of Woodstoves~~	~~24%~~	~~582 Pounds/Day~~
~~- Woodstove Removal Program~~		~~507 Pounds/Day~~
~~Woodstove Strategies, Total~~		~~17,713 Pounds/Day~~
~~Total reduction from all strategies....19,057 Pounds/Day~~		
~~Required emission reduction .....18,922 Pounds/Day]~~		

Table 4.12.3-4: Summary of 24-Hour Emission Reductions To Be Achieved by 1994

Strategy Element	Credit	Emission Reduction
Highway Road Sanding Program	60%	1,265 Pounds/Day
Woodburning Strategies:		
- Woodburning Curtailment	86%	16,625 Pounds/Day
- Certification of Woodstoves	24%	582 Pounds/Day
- Woodstove Removal Program	--	973 Pounds/Day
Woodstove Strategies, Total		18,180 Pounds/Day

Total reduction from all strategies....19,444 Pounds/Day
Required emission reduction .....18,877 Pounds/Day

No credits have been taken for the Klamath County public education programs, the 36% reduction in woodburning emissions that have occurred since 1987 because of voluntary fuel switching, the voluntary forestry and agricultural smoke management programs or the other fugitive dust control elements included in the Klamath County ordnance.

Strategy Emission Reduction - Annual Average Case

Attainment of the annual average NAAQS in 1994 will require a 47% reduction in annual emissions or a reduction of 1008 tons per year. Although the entire needed emission reduction is achieved through the woodburning curtailment program, emission reductions obtained from the road deicing, elimination of agricultural burning within the nonattainment area and other elements of the woodburning emission reduction programs are also included since they will occur as a result of implementing the 24-hour strategy. The needed reductions are achieved through the strategy elements listed below.

~~[Table 4.12.3-5: Summary of Annual Average Emission Reductions To be Achieved by 1994~~

~~Strategy Element~~	~~Credit~~	~~Emission Reduction~~
~~Highway Road Sanding Program~~	~~60%~~	~~18 Tons/Year~~
~~Eliminate Agricultural Burning~~	~~100%~~	~~156 Tons/Year~~
~~Woodburning Strategies:~~		
~~- Woodburning Curtailment~~	~~74%~~	~~941 Tons/Year~~
~~- Woodstove Certification~~	~~24%~~	~~78 Tons/Year~~
~~- Woodstove 20% Opacity~~	~~5%~~	~~12 Tons/Year~~
~~Woodstove Strategies, Total~~		~~931 Tons/Year~~

~~Total reduction from all strategies.....1203 Tons/Year *~~
~~Total required emission reduction.....1020 Tons/Year]~~

Table 4.12.3-5: Summary of Annual Average Emission Reductions To be Achieved by 1994

Strategy Element	Credit	Emission Reduction
Highway Road Sanding Program	60%	17 Tons/Year
Eliminate Agricultural Burning	100%	156 Tons/Year
Woodburning Strategies:		
- Woodburning Curtailment	74%	938 Tons/Year
- Woodstove Certification	24%	78 Tons/Year
- Woodstove 20% Opacity	5%	12 Tons/Year
Woodstove Strategies, Total		1028 Tons/Year

Total reduction from all strategies.....1201 Tons/Year *
Total required emission reduction.....1035 Tons/Year

* Note: On an annual basis, the woodburning curtailment program will result in a 28% reduction in annual wood smoke emissions. This, however, is not reflective of annual air quality benefits of the program since the restricted ventilation during the curtailment periods compounds the benefits of the emission reductions. The effective or equivalent reduction is calculated based on a 86% curtailment program operating on 47 days per year indicating a reduction of the annual average PM_{10} concentration from 75 to 50.2 $\mu g/m^3$. As a result, the woodburning strategies alone, implemented on 47 days per year, will provide sufficient benefits to assure that the annual NAAQS is achieved. Additional strategy elements are claimed as a result of reductions achieved through the 24-hour strategy. See Section 4.12.3.3.

4.12.3.4 Emission Offsets and Banking

Although the control strategy does not formally incorporate provisions for growth in industrial emissions through an emission offset and banking provisions, there is considerable growth margin for increases in industrial emissions within the current plant permits. The difference between the 1986 actual and the 1994 projected industrial emission projections is ~~[77]~~ 88 tons per year (annual) and ~~[745]~~ 743 pounds per day in PM_{10} emissions.

OAR 340-20-225 (22) requires that new or modified industrial sources that emit more than 5 tons per year of PM_{10} emissions must obtain emission reductions from other sources to offset their emissions. The emission offsets may be obtained by reducing emissions within the facility to be modified, from other industrial sources or from external sources, including woodstove emissions from sole source, low income households. The Department estimates that an additional 100 tons per year could be obtained by reducing existing

wood-fired boiler emissions by 70-85% to 0.03 grains per standard cubic foot and veneer driers by 42-70% to 0.3-0.45 pounds per thousand square feet of veneer (3/8" basis). In addition, at least 175 tons per year of PM_{10} emission offset is available by replacing conventional woodstoves in sole source, low income households with natural gas or electrical heating systems.[28]

The emissions margins and sources of offsets will help assure continued maintenance of the NAAQS beyond 1994.

4.12.3.5 Demonstration of Maintenance

Emission reductions achieved through the adoption of a county ordinance banning the installation of uncertified woodstoves will assure that emission growth associated with fugitive dust and transportation sources will not cause the NAAQS to be exceeded by the year 2000. Appendix 5 lists emission projections for the ten year period following attainment in 1994.

4.12.3.6 Emergency Action Plan Provisions

OAR 340 Division 27 describes Oregon's Emergency Action Plan. The rule is intended to prevent the excessive accumulation of air contaminants during periods of air stagnation which, if unchecked, could result in concentrations of pollutants which could cause significant harm to the public health. The rules establish criteria for identifying and declaring air pollution episodes below the significant harm level and were adopted pursuant to requirements of the Clean Air Act. The action levels found in the Plan were established by the Environmental Protection Agency and subsequently adopted by the Department.

The significant harm level for PM_{10} particulate matter of 600 $\mu g/m^3$, 24-hour average (adopted by the Environmental Quality Commission April, 1988) was exceeded twice in Klamath Falls; on January 25, 1988 (792 $\mu g/m^3$) and on February 3, 1988 (723 $\mu g/m^3$). At the time of these events, the significant harm level was 1,000 $\mu g/m^3$ of Total Suspended Particulate, a level which was not exceeded.

The PM_{10} "Alert" level is 350 $\mu g/m^3$; the "Warning" level is 420 $\mu g/m^3$ and the "Emergency" level is 500 $\mu g/m^3$, 24-hour average. These levels must be coupled with meteorological forecasts for continuing air stagnation to trigger the Action Plan.

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[28]Response to testimony received at the Klamath Falls public hearing on proposed changes to industrial rules. Attachment E to staff report prepared for the June 2, 1989 Environmental Quality Commission, Agenda Item H.

Authority for the Department to regulate air pollution sources during emergency episodes is provided under ORS 468, including emissions from woodstoves. The provisions of HB2175 which authorizes the Department to regulate woodstoves are implemented under OAR 340-34-150 through - 175. These rules and statute give the Department authority to regulate woodstoves under emergency episode conditions. When there is an imminent and substantial endangerment to public health (the significant harm level), ORS 468.115 authorizes the Department, at the direction of the Governor, to enforce orders requiring any person to cease and desist actions causing the pollution. State and local police are directed to cooperate in the enforcement of such orders.

4.12.4 Implementation of the Control Strategy

Specific elements of the strategy were implemented as noted below.

4.12.4.1 Schedule for Implementation

The Oregon Woodstove Certification Program became effective June 30, 1986; the Klamath County Air Quality and voluntary woodburning curtailment programs were implemented on August 31, 1988 and the road sanding control strategy commitments were received from the Oregon Department of Transportation on December 11, 1989 and will be implemented during the winter of 1989-1990. Open burning restrictions implemented through the Oregon State Fire Marshal's office and local Board of Fire Chiefs began in November, 1989. The Department's Significant Emission Rate rules became effective on the date of adoption, June 2, 1989. Klamath County adopted their Clean Air Ordinance on July 31, 1991 and the City of Klamath Falls adopted a resolution assigning air quality program enforcement within the city limits to Klamath County on September 16, 1991. Implementation of all of the provisions of the Klamath County program will begin in September, 1991. All of the program elements will be implemented prior to November 1, 1991, the beginning of the 1991-92 heating season.

4.12.4.2 Rules, Regulations and Commitments

The following rules and commitments have been adopted to assure the enforceability of the control strategies. The ordinance adopted by the City of Klamath Falls authorizes Klamath County to implement their ordinance within the city limits. Item marked with an asterisk (*) are contingency elements.

State of Oregon Rules

Woodstove Changeout Program	OAR Division 34
Ban on Used Woodstove Sales	OAR Division 34
Industrial RACT\BACT Controls *	OAR Division 21
Woodstove Removal on Home Sale *	OAR 340 Division 34
Mandatory Curtailment Authority *	OAR 340 Division 34
Woodstove Certification Program	OAR 340 Division 21
Klamath Falls Significant Emission Rate Rule	OAR 340-20-225

Klamath County & City Ordinances

Klamath County Clean Air Ordinance	Ordinance 36
City of Klamath Falls Ordinance	Ordinance 6630
Klamath County Air Quality Program Development Plan for the Klamath Falls UGB	Resolution 89-116

Interagency Commitments

Winter Road Sanding Program, Oregon Department of Transportation Highway Division Memorandum of Understanding.

Oregon Dept. of Forestry Smoke Management Plan OAR 629-43-043
State Fire Marshall's Office Open Burning Statute ORS 478.960

4.12.4.3 Reasonable Further Progress

Part D of Title I of the Clean Air Act Amendments of 1990 (Section 171) requires that State Implementation Plans for PM_10 make Reasonable Further Progress (RFP) toward attainment of the National Ambient Air Quality Standards (NAAQS). The Act further specifies that RFP means those annual incremental reductions of PM_{10} emissions necessary to attain the NAAQS by the attainment date. The Department believes that the scheduled implementation of the provisions of the Klamath Falls PM_10 SIP and attainment of the NAAQS within the Klamath Falls nonattainment area fulfills the FRP requirement of the Act.

4.12.4.4 Revisions to the Plan

In the event that the Klamath Falls area fails to meet Reasonable Further Progress milestones, or the applicable PM_{10} attainment deadline, then the Department, as the designated lead agency, will first notify in writing the affected local governments and industrial organizations. Within 30 days of notification, the Department will complete a written analysis of control strategy commitments, evaluating the adequacy of implementation. Any deficiencies in implementation will be corrected through rulemaking, if necessary, within six months of the original deficiency notification. The six month time frame will accommodate the State's

normal rulemaking process. Additionally, affected parties will be notified of the requirement to implement expeditiously the contingency measures, if necessary. As the lead agency, the Department will submit a plan revision that meets all relevant Clean Air Act and EPA requirements within 18 months of a notification from EPA that the area has failed to meet the attainment deadline and has been reclassified to "Serious." The revision will include provisions to ensure that the Best Available Control Measures (BACM/BACT) for the control of PM_{10} shall be implemented no later that 4 years after the date the area is reclassified as a "serious" area.'

4.12.4.5 New Source Review Permitting Authority

The New Source Review rules (OAR 340-20-220 to -276) and Air Contaminant Discharge Permit rules (OAR 340-20-140 to -185) identify the procedures for reviewing and permitting new sources. The significant emission rate for PM_{10} emissions in the Klamath Falls Nonattainment Area is twenty five tons per year (OAR 340-20-225). The New Source Review rule (OAR 340-20-240) identifies requirements for sources in nonattainment areas, including applying the lowest achievable emission rate (LAER) and a 1:1 offset ratio, both required in the Klamath Falls Nonattainment Area.

4.12.4.6 Delegation of Lead Agency Authority

Barbara Roberts, Governor of the State of Oregon, has delegated the Department of Environmental Quality as the lead agency to implement, maintain and enforce the requirements of the Clean Air Act for PM_10 air quality in Klamath Falls.

4.12.5 Resource Commitments

Residential woodburning programs are being implemented by Klamath County with a FY 91 budget of $112,600 to operate public information programs, the daily woodburning advisory, mandatory curtailment program including field surveillance and enforcement, and progress reporting. The Department operates the air monitoring network used by Klamath County for the daily woodburning advisory, provides public information assistance, and administers the woodstove certification program; these services are part of the statewide Department's base program identified in the State/EPA Agreement (SEA).

Financial assistance programs are available through Klamath County's Project PURE to assist low-income households in weatherization and replacement of conventional woodstoves with cleaner burning units; about $1.44 million has been raised to date.

Industrial compliance assurance programs are implemented by DEQ as part of the statewide base program; resources are identified in the SEA. Open burning control programs are implemented by local fire departments, Klamath County and the Department as part of base programs.

Forestry slash burning programs are administered by the Oregon Department of Forestry, the US Forest Service, the Bureau of Land Management and other private forest land owners as part of their base programs.

4.12.6 Public Involvement

Development of the Klamath Falls PM_{10} control strategy included several areas of public involvement including a continuing Citizen Advisory Committees, public participation at hearing on proposed industrial source rules and attendance at hearings conducted by the Klamath County Board of Commissioners.

Proposed industrial rules to reduce the significant emission rate for new or modified industrial sources within the Klamath Falls Urban Growth Boundary were approved by the Environmental Quality Commission on November 4, 1988. A public hearing on the proposal to reduce the significant emission offset from 15 to 5 tons per year PM_{10} was held in Klamath Falls on February 15, 1988. The rule was adopted at the Environmental Quality Commission's April, 1989 meeting. Public hearings on the Klamath County ordinance occurred on July 10 and 31, 1991.

4.12.6.1 Citizen Advisory Committee

The Klamath County Board of Commissions appointed members to the Klamath County Air Quality Task Force in November of 1987 to assist the County and the Department in the development of control programs for the Klamath Falls Nonattainment Area. The 14 member committee was advised of the requirements of the Clean Air Act and State Implementation Plan. The Task Force considered alternative control strategies and provided recommendation to the Board in November, 1988. On January 26th and February 3rd, 1988, the Board of Commissioners held public hearings on a proposed county mandatory curtailment ordinance designed to achieve the degree of woodsmoke emission reduction required. Following the hearings, the ordinance was dropped from further consideration and a second 15 member Task Force (New Citizens Air Quality Committee) was appointed to consider other options, including development of a voluntary curtailment program. In May of 1988, the Committee submitted an outline for a voluntary curtailment program to the Department and the Klamath County Board of Commissioners and, in April, 1989, the Board adopted the Klamath County Voluntary Woodburning Compliance Program. In May of 1991, the Klamath County Board of Commissioners asked the County Department of Health Services to begin preparation of a

comprehensive ordinance to include a mandatory curtailment program. The draft ordinance was reviewed by the County's Advisory Committee, the Department and the County Board of Health prior to the first public hearing on July 10, 1991.

4.12.6.2 Public Notice

Public notice of proposed rule revisions is done through mail lists maintained by the Department, through notifications published in local newspapers and through Department press releases.

4.12.6.3 Public Hearings

As noted above, public hearings on the Klamath County Plan were held on January 26 and February 3, 1988. A hearing on revisions to the industrial rules on significant offset emission rates was held February 15, 1988 and public hearings on proposed woodstove legislation were held before the Senate Agriculture and Natural Resources Committee on several occasions in February and March, 1989. Hearings on the Klamath County ordinance including the mandatory curtailment program occurred on July 10 and 31, 1991. ~~[A] [p]~~Public hearings on the Klamath Falls PM_{10} ~~[SIP]~~ Control Plan were held in Klamath Falls on September 26, 1991, and June 16, 1995.

4.12.6.4 Intergovernmental Review

Public hearing notices regarding adoption of this revision to the State Implementation Plan will be distributed for local and State agency review through the A-95 State Clearinghouse process forty-five days prior to adoption by the Environmental Quality Commission.

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JEC:a
RPT\AH15036
(10/25/91)
Revised
DLC
(8/09/95)

ATTACHMENT A-1

Division 25

DIVISION 25

SPECIFIC INDUSTRIAL STANDARDS

Construction and Operation of Wigwam Waste Burners

Existing Administrative Agency Orders

340-25-027

(1) The provisions of OAR 340-25-005 through 340-25-020 and ~~[OAR]~~340-25-025(1) are in addition thereto and do not modify, amend, repeal, alter, postpone, or in any other manner affect any specific existing agency orders directed against specific parties or persons to abate air pollution.

(2) The provisions of OAR 340-25-025(2) shall not be made applicable nor extend in any manner to any specific existing agency orders directed against specific parties or persons to abate air pollution.

[**NOTE:** This rule is included in the State of Oregon Clean Air Act Implementation Plan as adopted by the Environmental Quality Commission under OAR 340-20-047.]

Stat. Auth.: ORS Ch. 468 & 468A

Hist.: SA 30 f. 6-7-68, ef. 8-1-68; DEQ 4-1993, f. & cert. ef. 3-10-93, **Renumberedfrom 340-25-080**

Reduction of Animal Matter

Effective Date

340-25-075

[SA 30, f. 6-7-68, ef. 8-1-68; Repealed ~~[1-29-93]~~**by DEQ 4-1993, f. & cert. 3-10-93**]

Kraft Pulp Mills

Definitions

340-25-150 As used in **OAR** 340-25-150 through 340-25-205:

(1) "BLS" means Black Liquor Solids, dry weight.

(2) "Continual Monitoring" means sampling and analysis, in a timed sequence, using techniques which will adequately reflect actual emission levels or concentrations on an ongoing basis.

(3) "Continuous monitoring" means instrumental sampling of a gas stream on a continuous basis, excluding periods of calibration.

(4) "Daily Arithmetic Average" means the average concentration over the twenty-four hour period in a calendar day, or Department approved equivalent period, as determined by continuous monitoring equipment or reference method testing. Determinations based on EPA reference methods or equivalent methods in accordance with the Department **Source Sampling Manual** consist of three ~~[(3)]~~ separate consecutive runs having a minimum sampling time of sixty ~~[(60)]~~ minutes each and a maximum sampling time of eight ~~[(8)]~~ hours each. The three values for concentration (ppm or grains/dscf) are averaged and expressed as the daily arithmetic average which is used to determine compliance with process weight limitations, grain loading or volumetric concentration limitations and to determine daily emission rate.

(5) "Department" means the Department of Environmental Quality.

(6) "Emission" means a release into the atmosphere of air contaminants.

(7) "Kraft Mill" or "Mill" means any industrial operation which uses for a cooking liquor an alkaline sulfide solution containing sodium hydroxide and sodium sulfide in its pulping process.

(8) "Lime Kiln" means any production device in which calcium carbonate is thermally converted to calcium oxide.

(9) "Non-Condensibles" mean gases and vapors, contaminated with TRS compounds, from the digestion and multiple-effect evaporation processes of a mill.

(10) "Other Sources" mean sources of TRS emissions in a kraft mill other than recovery furnaces and lime kilns, including but not limited to:

(a) Vents from knotters, brown stock washing systems, evaporators, blow tanks, blow heat accumulators, black liquor storage tanks, black liquor oxidation system, pre-steaming vessels, tall oil recovery operations; and

(b) Any vent which is shown to contribute to an identified nuisance condition.

(11) "Particulate Matter" means all solid or liquid material, other than uncombined water, emitted to the ambient air as measured by EPA Method 5 or an equivalent test method in accordance with the Department **Source Sampling Manual**. Particulate matter emission determinations by EPA Method 5 shall use water as the cleanup solvent instead of acetone, and consist of the average of three

~~[(3)~~]separate consecutive runs having a minimum sampling time of 60 minutes each, a maximum sampling time of eight ~~[(8)~~]hours each, and a minimum sampling volume of 31.8 dscf each.

(12) "Parts Per Million (ppm)" means parts of a contaminant per million parts of gas by volume on a dry-gas basis (1 ppm equals 0.0001% by volume).

(13) "Production" means the daily amount of air-dried unbleached pulp, or equivalent, produced during the 24-hour period each calendar day, or Department approved equivalent period, and expressed in air-dried metric tons (admt) per day. The corresponding English unit is air-dried tons (adt) per day.

(14) "Recovery Furnace" means the combustion device in which dissolved wood solids are incinerated and pulping chemicals recovered from the molten smelt. For OAR 340-25-150 through 340-25-205, and where present, this term shall include the direct contact evaporator.

(15) "Significant Upgrading of Pollution Control Equipment" means a modification or a rebuild of an existing pollution control device for which a capital expenditure of 50 percent or more of the replacement cost of the existing device is required, other than ongoing routine maintenance.

(16) "Smelt dissolving tank vent" means the vent serving the vessel used to dissolve the molten smelt produced by the recovery furnace.

(17) "Standard Dry Cubic Meter" means the amount of gas that would occupy a volume of one cubic meter, if the gas were free of uncombined water, at a temperature of 20° C. (68° F.) and a pressure of 760 mm of mercury (29.92 inches of mercury). The corresponding English unit is standard dry cubic foot. When applied to recovery furnace gases "standard dry cubic meter" requires adjustment of the gas volume to that which would result in a concentration of 8% oxygen if the oxygen concentration exceeds 8%. When applied to lime kiln gases "standard dry cubic meter" requires adjustment of the gas volume to that which would result in a concentration of 10% oxygen if the oxygen concentration exceeds 10%. The mill shall demonstrate that oxygen concentrations are below noted values or furnish oxygen levels and corrected pollutant data.

(18) "Total Reduced Sulfur (TRS)" means the sum of the sulfur compounds hydrogen sulfide, methyl mercaptan, dimethyl sulfide, and dimethyl disulfide, and any other organic sulfides present expressed as hydrogen sulfide (H_2S).

[**NOTE:** This rule is included in the State of Oregon Clean Air Act Implementation Plan as adopted by the Environmental Quality Commission under OAR 340-20-047.]

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 50, f. 2-9-73, ef. 3-1-73; DEQ 137, f. & ef. 6-10-77; DEQ 2-1990, f. & cert. ef. 1-24-90; DEQ 4-1993, f. & cert. ef. 3-10-93

Neutral Sulfite Semi-Chemical (NSSC) Pulp Mills

Definitions

340-25-220 As used in OAR 340-25-220 through 340-25-234:

(1) "Acid Absorption Tower" means the device where the sodium carbonate and sulfur dioxide react to form a sodium sulfite solution prior to use as the cooking liquor.

(2) "BLS" means black liquor solids, dry weight.

(3) "Continual Monitoring" means sampling and analysis, in a timed sequence, using techniques which will adequately reflect actual emission levels or concentrations on an ongoing basis.

(4) "Continuous Monitoring" means instrumental sampling of a gas stream on a continuous basis, excluding periods of calibration.

(5) "Daily Arithmetic Average" means the average concentration over the ~~[twenty four]~~24-hour period in a calendar day or, Department approved equivalent period, as determined by continuous monitoring equipment or reference method testing. Determinations based on EPA reference methods or equivalent methods in accordance with the Department **Source Sampling Manual** consist of three (3) separate consecutive runs having a minimum sampling time of sixty (60) minutes each and a maximum sampling time of eight (8) hours each. The three values for concentration (ppm or grains/dscf) are averaged and expressed as the daily arithmetic average which is used to determine compliance with process weight limitations, grain loading or volumetric concentration limitations and to determine daily emission rate.

(6) "Department" means the Department of Environmental Quality.

(7) "Emission" means a release into the atmosphere of air contaminants.

(8) "Neutral Sulfite Semi-Chemical (NSSC) Pulp Mill" means any industrial operation which uses for cooking, a liquor prepared from a sodium carbonate solution and sulfur dioxide at a neutral pH, range 6-8.

(9) "Particulate Matter" means all solid or liquid material, other than uncombined water, emitted to the ambient air as measured by EPA Method 5 or an equivalent test method in accordance with the Department **Source Sampling Manual**. Particulate matter emission determinations by EPA Method 5 shall use water as the cleanup solvent instead of acetone, and consist of the average of three (3) separate consecutive runs having a minimum sampling time of 60 minutes each, a maximum sampling time of eight (8) hours each, and a minimum sampling volume of 31.8 dscf each.

(10) "Parts Per Million (ppm)" means parts of a contaminant per million parts of gas by volume on a dry-gas basis (one ppm equals 0.0001~~[%]~~**percent** by volume).

(11) "Production" means the daily amount of virgin air-dried unbleached NSSC pulp, or equivalent, produced during the 24-hour period each calendar day, or Department approved equivalent period, expressed in air-dried metric tons (ADMT) per day. The corresponding English unit is air-dried tons (ADT) per day.

(12) "Spent Liquor Incinerator" means the combustion device in which pulping chemicals are subjected to high temperature to evaporate the water, incinerate organics and reclaim the sodium sulfate (saltcake) and sodium carbonate.

(13) "Standard Dry Cubic Meter" means the amount of gas that would occupy a volume of one cubic meter, if the gas were free of uncombined water, at a temperature of 20 °C. (68 °F.) and a pressure of 760 mm of mercury.

(14) "Total Reduced Sulfur (TRS)" means the sum of the sulfur compounds hydrogen sulfide, methyl mercaptan, dimethyl sulfide, and dimethyl disulfide, and any other organic sulfides present expressed as hydrogen sulfide (H_2S).

[**NOTE:** This rule is included in the State of Oregon Clean Air Act Implementation Plan as adopted by the Environmental Quality Commission under OAR 340-20-047.]

[**Publications:** The publication(s) referred to or incorporated by reference in this rule are available from the Department of Environmental Quality.]

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 2-1990, f. & cert. ef. 1-24-90; DEQ 4-1993, f. & cert. ef. 3-10-93

Emission Limitations

340-25-224

(1) Emission of Total Reduced Sulfur (TRS): Spent Liquor Incinerator. The emissions of TRS from any spent liquor incinerator stack shall not exceed 10 ppm and 0.07 gram/kg BLS (0.14 lb/ton BLS) as a daily arithmetic average.

(2) Particulate Matter: Spent Liquor Incinerator. The emissions of particulate matter from any spent liquor incinerator stack shall not exceed:
  (a) 3.6 grams/kg BLS (7.2 lbs/ton BLS) as a daily arithmetic average in accordance with the Department **Source Sampling Manual**; and
  (b) An opacity equal to or greater than 35 percent for a period exceeding 3 minutes in any one hour, excluding periods when the facility is not operating.

(3) Sulfur Dioxide (SO_2):
  (a) Spent Liquor Incinerator. The emissions of sulfur dioxide from each spent liquor incinerator stack shall not exceed a 3-hr arithmetic average of 10 ppm on a dry gas basis;
  (b) Acid Absorption Tower. The emissions of sulfur dioxide from the acid absorption tower stack shall not exceed 20 ppm as a 3-hr arithmetic average on a dry gas basis.

(4) All NSSC sources, with the exception of spent liquor incinerators, shall not exhibit an opacity equal to or greater than 20 percent for a period exceeding three (3) minutes in any one hour.

[**NOTE:** This rule is included in the State of Oregon Clean Air Act Implementation Plan as adopted by the Environmental Quality Commission under OAR 340-20-047.]

[**Publications:** The publication(s) referred to or incorporated by reference in this rule are available from the Department of Environmental Quality.]

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 2-1990, f. & cert. ef. 1-24-90; DEQ 4-1993, f. & cert. ef. 3-10-93

Monitoring

340-25-230

(1) General:
  (a) The details of the monitoring program for each mill shall be submitted to and approved by the Department. This submittal shall include diagrams and descriptions of all monitoring systems, monitoring frequencies, calibration schedules, descriptions of all sampling sites, data reporting formats and duration of maintenance of all data and reports. Any changes that are subsequently made in the approved monitoring program shall be submitted in writing to the Department for review and approved in writing

prior to change;

(b) All records associated with the approved monitoring program including, but not limited to, original data sheets, charts, calculations, calibration data, production records and final reports shall be maintained for a period of at least two calendar years and shall be furnished to the Department upon request.

(2) (a) Total Reduced Sulfur (TRS). Each mill shall continuously monitor the spent liquor incinerator for TRS emissions using: continuous monitoring equipment, except where a vibration problem, which was in existence on March 26, 1989, exists and continuous monitoring equipment is not practical or economically feasible; in which case, upon documentation of the above condition, the spent liquor incinerator shall be sampled for TRS emissions using the reference method and the analytical method (EPA Method 16, 16A, or 16B) as outlined in the Department **Source Sampling Manual**;

(b) Spent liquor incinerator TRS source tests shall be performed quarterly except that testing may be semi-annual when the preceding six (6) source tests were less than 7.5 ppm;

(c) Flow rate measurements used to determine TRS mass emission rates shall be corrected for cyclonic flow, where applicable.

(3) (a) Particulate Matter. Each mill shall sample the spent liquor incinerator for particulate emissions with:

(A) The sampling method; and

(B) The analytical method specified in the Department **Source Sampling Manual**.

(b) Spent liquor incinerator particulate source tests shall be performed quarterly except that testing may be semi-annual when the preceding six (6) source tests were less than 2.7 ~~[G]~~grams/~~[K]~~kg BLS (5.4 lbs./ton BLS). All sampling data shall be corrected for cyclonic flow, where applicable;

(c) Each mill shall provide continuous monitoring of opacity of emissions discharged to the atmosphere from the spent liquor incinerator, and the acid plant in accordance with the **Department Continuous Monitoring Manual**; except that when continuous monitoring of opacity is not feasible due to excessive moisture then EPA Method 9 shall be used for the determination of opacity.

(4) Sulfur Dioxide (SO_2). Representative sulfur dioxide emissions from spent liquor incinerators and from the acid absorption tower shall be determined at least once every six (6) months with:

(a) The sampling method; and

(b) The analytical method specified in the **Department Source Sampling Manual**.

[**NOTE:** This rule is included in the State of Oregon Clean Air Act Implementation Plan as adopted by the Environmental Quality Commission under OAR 340-20-047.]

[**Publications:** The publication(s) referred to or incorporated by reference in this rule are available from the Department of Environmental Quality.]

Stat. Auth.: ORS Ch. 468 & 468A

Hist.: DEQ 2-1990, f. & cert. ef. 1-24-90; DEQ 4-1993, f. & cert. ef. 3-10-93

Primary Aluminum Plants

Statement of Purpose

340-25-255 In furtherance of the public policy of the ~~[s]~~State as set forth in ORS 468A.010, it is hereby declared to be the purpose of the Commission in adopting the following regulations to:

(1) Require, in accordance with a specific program and time table for each operating primary aluminum plant, the highest and best practicable collection, treatment, and control of atmospheric pollutants emitted from primary aluminum plants through the utilization of technically feasible equipment, devices, and procedures necessary to attain and maintain desired air quality.

(2) Require effective monitoring and reporting of emissions, ambient air levels of fluorides, fluoride content of forage, and other pertinent data, The Department will use these data, in conjunction with observation of conditions in the surrounding areas, to develop emission and ambient air standards and to determine compliance therewith.

(3) Encourage and assist the aluminum industry to conduct a research and technological development program designed to reduce emissions, in accordance with a definite program, including specified objectives and time schedules.

(4) Establish standards which, based upon presently available technology, are reasonably attainable with the intent of revising the standards as needed when new information and better technology are developed.

[**NOTE:** This rule is included in the State of Oregon Clean Air Act Implementation Plan as adopted by the Environmental Quality Commission under OAR 340-20-047.]

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 60, f. 12-5-73, ef. 12-25-73; DEQ 10-1982, f. & ef. 6-18-82; DEQ 4-1993, f. & cert. ef. 3-10-93

Definitions

340-25-260 As used in OAR 340-25-255 through 340-25-285:

(1) "All Sources" means sources including, but not limited to, the reduction process, alumina plant, anode plant, anode baking plant, cast house, and collection, treatment, and recovery systems.

(2) "Ambient Air" means the air that surrounds the earth, excluding the general volume of gases contained within any building or structure.

(3) "Annual Average" means the arithmetic average of the monthly averages reported to the Department during the twelve most recent consecutive months.

(4) "Anode Baking Plant" means the heating and sintering of pressed anode blocks in oven-like devices, including the loading and unloading of the oven-like devices.

(5) "Anode Plant" means all operations directly associated with the preparation of anode carbon except the anode baking operation.

(6) "Commission" means Environmental Quality Commission.

(7) "Cured Forage" means hay, straw, ensilage that is consumed or is intended to be consumed by livestock.
(8) "Department" means Department of Environmental Quality.
(9) "Emission" means a release into the outdoor atmosphere of air contaminants.
(10) "Emission Standards" means the limitation on the release of contaminant or multiple contaminants to the ambient air.
(11) "Fluorides" means matter containing fluoride ion.
(12) "Forage" means grasses, pasture, and other vegetation that is consumed or is intended to be consumed by livestock.
(13) "Monthly Average" means the summation of the arithmetic average of all representative test results obtained during any calendar month and the emission rates established for sources not subject to routine testing.
(14) "Opacity" means the degree to which an emission reduces transmission of light or obscures the view of an object in the background.
(15) "Particulate Matter" means a small discrete mass of solid or liquid matter, but not including uncombined water.
(16) "Primary Aluminum Plant" means those plants which will or do operate for the purpose of, or related to, producing aluminum metal from aluminum oxide (alumina).
(17) "Pot Line Primary Emission Control Systems" means the system which collects and removes contaminants prior to the emission point. If there is more than one such system, the primary system is that system which is most directly related to the aluminum reduction cell.
(18) "Regularly Scheduled Monitoring" means sampling and analyses in compliance with a program and schedule approved pursuant to OAR 340-25-280.
~~(19) "Ringlemann Smoke Chart" means the Ringlemann Smoke Chart with instructions for use as published in May, 1967, by the U.S. Department of Interior, Bureau of Mines.~~
([~~20~~]**19**) "Standard Dry Cubic Foot of Gas" means that amount of the gas which would occupy a cube having dimensions of one foot on each side, if the gas were free of water vapor at a pressure of 14.7 P.S.I.A. and a temperature of 68 °F.

[**NOTE:** This rule is included in the State of Oregon Clean Air Act Implementation Plan as adopted by the Environmental Quality Commission under OAR 340-20-047.]

[**Publications:** The Publication(s) referred to or incorporated by reference in this rule are available from the Department of Environmental Quality.]

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 60, f. 12-5-73, ef. 12-25-73; DEQ 10-1982, f. & ef. 6-18-82; DEQ 4-1993, f. & cert. ef. 3-10-93

Emission Standards

340-25-265

(1) The exhaust gases from each primary aluminum plant constructed after January 1, 1973, shall be collected and treated as necessary so as not to exceed the following minimum requirements:
(a) Total fluoride emissions from all sources shall not exceed:
(A) A monthly average of 1.3 pounds of fluoride ion per ton of aluminum

produced; and

(B) An annual average of 1.0 pound of fluoride ion per ton of aluminum produced; and

(C) 12.5 tons of fluoride ion per month from any single aluminum plant without prior written approval by the Department.

(b) The total of organic and inorganic particulate matter emissions from all sources shall not exceed:

(A) A monthly average of 7.0 pounds of particulate per ton of aluminum produced; and

(B) An annual average of 5.0 pounds of particulate per ton of aluminum produced.

(c) Visible emissions from any source shall not exceed ten (10) percent opacity[~~ or 0.5 on the Ringlemann Smoke Chart~~] at anytime.

(2) Each primary aluminum plant constructed and operated after January 1, 1973, shall be in full compliance with OAR 340-25-255 through 340-25-285 no later than 180 days after completing potroom start-up and shall maintain full compliance thereafter.

(3) The exhaust gases from each primary aluminum plant constructed on or before January 1, 1973, shall be collected and treated as necessary so as not to exceed the following minimum requirements:

(a) Total fluoride emissions from all sources shall not exceed:

(A) A monthly average of 3.5 pounds of fluoride ion per ton of aluminum produced; and

(B) An annual average of 2.5 pounds of fluoride ion per ton of aluminum produced; and

(C) 22.0 tons of fluoride ion per month from any single aluminum plant without prior written approval by the Department.

(b) The total of organic and inorganic particulate matter emissions from all sources at plants using vertical stud Soderberg cells shall not exceed:

(A) A monthly average of 13.0 pounds of particulate per ton of aluminum produced; and

(B) An annual average of 10.0 pounds of particulate per ton of aluminum produced.

(c) The total of organic and inorganic particulate matter emissions from all sources at plants using prebake cells shall not exceed:

(A) A monthly average of 15.6 pounds of particulate per ton of aluminum produced; and

(B) An annual average of 13.5 pounds of particulate per ton of aluminum produced.

(d) Visible emissions from any source shall not exceed 20 percent opacity[~~ or 1.0 on the Ringlemann Smoke Chart~~] at any time.

(4) Each existing primary aluminum plant shall comply with OAR 340-25-255 through 340-25-285 upon adoption.

[**NOTE:** This rule is included in the State of Oregon Clean Air Act Implementation Plan as adopted by the Environmental Quality Commission under OAR 340-20-047.]

[**Publications:** The Publication(s) referred to or incorporated by reference in this rule are available from the Department of Environmental Quality.]

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 60, f. 12-5-73, ef. 12-25-73; DEQ 4-1980, f. & ef. 1-28-80; DEQ 10-1982, f. & ef. 6-18-82; DEQ 4-1993, f. & cert. ef. 3-10-93

Laterite Ore Production of Ferronickel

Statement of Purpose

340-25-405 In furtherance of the public policy of the ~~[s]~~State as set forth in ORS 468A.010, it is hereby declared to be the purpose of the Commission in adopting OAR 340-25-405 through 340-25-430 to:

(1) Require, in accordance with a specific program and timetable, the highest and best practicable collection, treatment, and control of atmospheric pollutants through the utilization of technically feasible equipment, devices, and procedures necessary to attain and maintain desired air quality.

(2) Establish standards which based upon presently available technology, are reasonably attainable with the intent of revising the standards as needed when new information and/or better technology are developed.

[**NOTE:** This rule is included in the State of Oregon Clean Air Act Implementation Plan as adopted by the Environmental Quality Commission under OAR 340-20-047.]

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 37, f. 2-15-72, ef. 3-1-72; DEQ 4-1993, f. & cert. ef. 3-10-93

Standards of Performance for New Stationary Sources

Definitions

340-25-510 As used in OAR 340-25-505 through 340-25-805:

(1) "Administrator" means the Administrator of the EPA or authorized representative.

(2) "CFR" means Code of Federal Regulations.

(3) "Alternative method" means any method of sampling and analyzing for an air pollutant which is not a reference or equivalent method but which has been demonstrated to the Department's satisfaction to, in specific cases, produce results adequate for determination of compliance.

(4) "Capital expenditures" means an expenditure for a physical or operational change to an existing facility which exceeds the product of the applicable "annual asset guideline repair allowance percentage" specified in the latest edition of **Internal Revenue Service (IRS) Publication 534** and the existing facility's basis, as defined by **Section 1012** of the **Internal Revenue Code**.

However, the total expenditure for a physical or operational change to an existing facility must not be reduced by any "excluded additions" as defined in **IRS Publication 534**, as would be done for tax purposes.

(5) "Commenced" means, with respect to the definition of "new source" in section 111(a)(2) of the federal Clean Air Act, that an owner or operator has undertaken a continuous program of construction or modification or that an owner or operator has entered into a contractual obligation to undertake and complete, within a reasonable time, a continuous program of construction or modification.

(6) "Construction" means fabrication, erection, or installation of a facility.

(7) "Department" means the Department of Environmental Quality or, in the case of Lane County, the Lane Regional Air Pollution Authority.

(8) "Environmental Protection Agency" or "EPA" means the United States Environmental Protection Agency.

(9) "Equivalent method" means any method of sampling and analyzing for an air pollutant which has been demonstrated to the Department's satisfaction to have a consistent and quantitatively known relationship to the reference method, under specified conditions.

(10) "Existing facility" means, with reference to a stationary source, any apparatus of the type for which a standard is promulgated in **40 CFR Part 60**, and the construction or modification of which commenced before the date of proposal by EPA of that standard; or any apparatus which could be altered in such a way as to be of that type.

(11) "Facility" means all or part of any public or private building, structure, installation, equipment, vehicle or vessel, including, but not limited to, ships.

(12) "Fixed capital cost" means the capital needed to provide all the depreciable components.

(13) "Modification" means any physical change in, or change in the method of operation of, an existing facility which increases the amount of any air pollutant (to which a standard applies) emitted into the atmosphere by that facility or which results in the emission of any air pollutant (to which a standard applies) into the atmosphere not previously emitted.

(14) "Particulate matter" means any finely divided solid or liquid material, other than uncombined water, as measured by an applicable reference method, or an equivalent or alternative method.

(15) "Reconstruction" means the replacement of components of an existing facility to such an extent that:

(a) The fixed capital cost of the new components exceeds 50 percent of the fixed capital cost that would be required to construct a comparable entirely new facility, and

(b) It is technologically and economically feasible to meet the applicable standards set forth in **40 CFR Part 60**.

(16) "Reference method" means any method of sampling and analyzing for an air pollutant as specified in~~[*the Department's Source Sampling Manual, January 1992,*] the Department's Continuous Monitoring Manual, January 1992, or an applicable subpart of~~ **40 CFR Part 60** (July 1, 1993).

(17) "Standard" means a standard of performance proposed or promulgated under **40 CFR Part 60**.

(18) "Stationary source" means any building, structure, facility, or installation that emits or may emit any air pollutant subject to regulation under the federal Clean Air Act.

(19) "Volatile organic compounds" or "VOC" means any organic compounds that participate in atmospheric photochemical reactions; or that are measured by a reference method, an equivalent

method, an alternative method, or that are determined by procedures specified under any applicable rule.

[**Publications**: The Publication(s) referred to or incorporated by reference in this rule are available from the Department of Environmental Quality.]

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 97, f. 9-2-75, ef. 9-25-75; DEQ 22-1982, f. & ef. 10-21-82; DEQ 17-1983, f. & ef. 10-19-83; DEQ 16-1984, f. & ef. 8-21-84; DEQ 15-1985, f. & ef. 10-21-85; DEQ 19-1986, f. & ef. 11-7-86; DEQ 17-1987, f. & ef. 8-24-87; DEQ 24-1989, f. & cert. ef. 10-26-89; DEQ 4-1993, f. & cert. ef. 3-10-93; DEQ 17-1993, f. & ef. 11-4-93

Federal Regulations Adopted by Reference

340-25-535

(1) Except as provided in section (2) of this rule, **40 CFR Part 60 Subparts D through XX and BBB through NNN and PPP through VVV (July 1, 1993)** are by this reference adopted and incorporated herein, and **40 CFR Part 60 Subpart OOO (July 1, 1993)** is by this reference adopted and incorporated herein for major sources only.

(2) Where "Administrator" or "EPA" appears in **40 CFR Part 60**, "Department" shall be substituted, except in any section of **40 CFR Part 60** for which a federal rule or delegation specifically indicates that authority will not be delegated to the state.

(3) Where a discrepancy is determined to exist between OAR 340-25-505 through 340-25-80~~[5]~~**0** and **40 CFR Part 60, 40 CFR Part 60** shall apply.

[**Publications**: The Publication(s) referred to or incorporated by reference in this rule are available from the Department of Environmental Quality.]

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 97, f. 9-2-75, ef. 9-25-75; DEQ 16-1981, f. & ef. 5-6-81; sections (1) thru (12) of this rule renumbered to 340-25-550 thru 340-25-605; DEQ 22-1982, f. & ef. 10-21-82; DEQ 17-1983, f. & ef. 10-19-83; DEQ 16-1984, f. & ef. 8-21-84; DEQ 15-1985, f. & ef. 10-21-85; DEQ 19-1986, f. & ef. 11-7-86; DEQ 17-1987, f. & ef. 8-24-87; DEQ 24-1989, f. & cert. ef. 10-26-89; DEQ 17-1993, f. & ef. 11-4-93

Standards of Performance for Municipal Waste Combustors

340-25-556

(1) Applicability.

(a) Except as provided in subsections (b) through (d) of this section and section (3) of this rule, this rule applies to each Municipal Waste Combustor with an MWC unit capacity greater than 250 tons per day of MSW or RDF for which construction, modification, or reconstruction is commenced after December 20, 1989.

(b) Cofired combustors that are subject to a federally-enforceable permit limiting the operation of the combustor to no more than 250 tons per day of MSW or RDF are not subject to this rule.

(c) MWC units combusting solely medical waste are not subject to this rule.

(d) Cofired combustors which fire less than 30 percent segregated medical waste and no

other municipal solid waste are not subject to this rule.

(2) Requirements.

(a) Except as provided in subsections (b) and (c) of this section, MWC units subject to this rule shall comply with **40 CFR Part 60, Subpart Ea**, as adopted under OAR 340-25-535.

(b) An MWC unit combusting tires or fuel derived solely from tires and that combust no other MSW or refuse-derived fuel (RDF) is only subject to the initial reporting in **40 CFR 60.59a(a)**.

(c) Cofired combustors are only subject to the initial reporting in **40 CFR 60.59a(a)**, and records and reports of the daily weight of MSW or RDF and other fuels fired as required under **40 CFR 60.59a(b)(14)** and **40 CFR 60.59a(m)**.

(3) Special provisions. Physical or operational changes made to an existing MWC unit solely to comply with emission guidelines under **40 CFR Part 60, Subpart Ca**, are not considered a modification or reconstruction and do not subject an existing MWC unit to this rule.

(4) Definitions. As used in this rule:

(a) "Cofired combustor" means a unit combusting municipal-type solid waste or refuse-derived fuel with a non-MSW fuel and subject to a federally enforceable permit limiting the unit to combusting a fuel feed stream, 30 percent or less of the weight of which is comprised, in aggregate, of MSW or RDF as measured on a 24-hour daily basis. A unit combusting a fuel feed stream, more than 30 percent of the weight of which is comprised, in aggregate, of MSW or RDF shall be considered an municipal waste combustor unit and not a cofired combustor;

(b) "Medical waste" means any solid waste which is generated in the diagnosis, treatment, or immunization of human beings or animals, in research pertaining thereto, or in production or testing of biologicals. Medical waste does not include any hazardous waste identified under Subtitle C of the Resource Conservation and Recovery Act or any household waste as defined in regulations under subtitle C of the Resource Conservation and Recovery Act;

(c) "Municipal-type solid waste" or "MSW" means household, commercial/retail, and/or institutional waste. Household waste includes material discarded by single and multiple residential dwellings, hotels, motels, and other similar permanent or temporary housing establishments or facilities. Commercial/retail waste includes material discarded by stores, offices, restaurants, warehouses, nonmanufacturing activities at industrial facilities and other similar establishments or facilities. Institutional waste includes material discarded by schools and hospitals, and nonmanufacturing activities at prisons and government facilities and other similar establishments or facilities. Household, commercial/retail, and institutional waste do not include sewage, wood pallets, construction and demolition wastes, industrial process or manufacturing wastes, or motor vehicles (including motor vehicle parts or vehicle fluff). Municipal-type solid waste does include motor vehicle maintenance materials, limited to vehicle batteries, used motor oil, and tires. Municipal type solid waste does not include wastes that are solely segregated medical wastes. However, any mixture of segregated medical wastes and other wastes which contains more than 30 percent medical waste discards, is considered to be

municipal-type solid waste;

(d) "Municipal waste combustor" or "MWC" or "MWC unit" means any device that combusts, solid, liquid, or gasified MSW including, but not limited to, field-erected incinerators (with or without heat recovery), modular incinerators (starved air or excess air), boilers (i.e., steam generating units), furnaces (whether suspension-fired, grate-fired, mass-fired, or fluidized bed-fired) and gasification/combustion units. This does not include combustion units, engines, or other devices that combust landfill gases collected by landfill gas collection systems;

(e) "MWC unit capacity" means the maximum design charging rate of an MWC unit expressed in megagrams per day (tons per day) of MSW combusted, calculated according to the procedures under **40 CFR 60.58a(j)**. Municipal waste combustor unit capacity is calculated using a design heating value of 4,500 British thermal units per pound for MSW and 8,500 British thermal units per pound for medical waste. The calculation procedures under **40 CFR 60.58a(j)** include procedures for determining MWC unit capacity for batch MWC's and cofired combustors and combustors firing mixtures of medical waste and other MSW;

(f) "Refuse-derived fuel" or "RDF" means a type of MSW produced by processing MSW through shredding and size classification. This includes all classes of RDF including low density fluff RDF through densified RDF and RDF fuel pellets.

[**Publications**: The Publication(s) referred to or incorporated by reference in this rule are available from the Department of Environmental Quality.]

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 17-1993, f. & ef. 11-4-93

Standards of Performance for Volatile Organic Liquid Storage Vessels (Including Petroleum Liquid Storage Vessels) for which Construction, Reconstruction, or Modification Commenced after July 23, 1984

340-25-587

(1) Applicability:

(a) Except as provided in subsections (b) through (d) of this section, this rule applies to each storage vessel with a capacity greater than or equal to 40 cubic meters (m^3) used to store volatile organic liquids (VOL's), for which construction, reconstruction, or modification is commenced after July 23, 1984;

(b) Except for record-keeping requirements specified in **40 CFR 60.116b(a) and (b)**, storage vessels with design capacity less than 75 m^3 are not subject to OAR 340-25-530 or this rule;

(c) Except for record-keeping requirements specified in **40 CFR 60.116b(a) and (b)**, vessels either with a capacity greater than or equal to 151 m^3 storing a liquid with a maximum true vapor pressure less than 3.5 kPa or with a capacity greater than or equal to 75 m^3 but less than 151 m^3 storing a liquid with a maximum true vapor pressure less than 15.0 kPa are not subject to OAR 340-25-530 or this rule;

(d) The following storage vessels are not subject to this rule:
  (A) Vessels at coke oven by-product plants;
  (B) Pressure vessels designed to operate in excess of 204.9 kPa and without emissions to the atmosphere;
  (C) Vessels permanently attached to mobile vehicles such as trucks, rail cars, barges, or ships;
  (D) Vessels with a design capacity less than or equal to 1,589.874 m^3 used for petroleum or condensate stored, processed, or treated prior to custody transfer;
  (E) Vessels located at bulk gasoline plants;
  (F) Storage vessels located at gasoline service stations;
  (G) Vessels used to store beverage alcohol.

(2) Requirements. Storage vessels subject to this rule shall comply with **40 CFR Part 60, Subpart Kb**, as adopted under OAR 340-25-535.

(3) Definitions. As used in this rule:

(a) "Bulk gasoline plant" means any gasoline distribution facility that has a gasoline throughput less than or equal to 75,700 liters per day. Gasoline throughput shall be the maximum calculated design throughput as may be limited by compliance with an enforceable condition under Federal requirement or Federal, State or local law, and discoverable by the Department and any other person.

(b) "Condensate" means hydrocarbon liquid separated from natural gas that condenses due to changes in the temperature or pressure, or both, and remains liquid at standard conditions.

(c) "Custody transfer" means the transfer of produced petroleum and/or condensate, after processing and/or treatment in the producing operations, from storage vessels or automatic transfer facilities to pipelines or any other forms of transportation.

(d) "Maximum true vapor pressure" means the equilibrium partial pressure exerted by the stored VOL at the temperature equal to the highest calendar-month average of the VOL storage temperature for VOL's stored above or below the ambient temperature or at the local maximum monthly average temperature as reported by the National Weather Service for VOL's stored at the ambient temperature:
  (A) As determined in accordance with methods described in **American Petroleum Institute Bulletin 2517**, Evaporation Loss From External Floating Roof Tanks;
  (B) As obtained from standard reference texts; or
  (C) As determined by **ASTM**[~~*Method*~~] **D2879-83**;
  (D) As determined by any other method approved by the Department.

(e) "Petroleum" means the crude oil removed from the earth and the oils derived from tar sands, shale, and coal.

(f) "Petroleum liquids" means petroleum, condensate, and any finished or intermediate products manufactured in a petroleum refinery.

(g) "Storage vessel" means each tank, reservoir, or container used for the storage of volatile organic liquids, but does not include:
  (A) frames, housing, auxiliary supports, or other components that are not directly involved in the containment of liquids or vapors; or

(B) subsurface caverns or porous rock reservoirs.

(h) "Volatile organic liquid" or "VOL" means any organic liquid which can emit volatile organic compounds into the atmosphere except those VOL's that emit only those compounds which the Department has determined do not contribute appreciably to the formation of ozone. These compounds are identified in **42 FR 35314, 44 FR 32042, 45 FR 32424, and 45 FR 48941**.

[**Publications**: The Publication(s) referred to or incorporated by reference in this rule are available from the Department of Environmental Quality.]

Stat. Auth.: 468 & 468A
Hist.:DEQ 24-1989, f. & cert. ef. 10-26-89; DEQ 17-1993, f. & ef. 11-4-93

Standards of Performance for Coal Preparation Plants

340-25-615

(1) Applicability. This rule applies to the following facilities in coal preparation plants which process more than 200 tons per day, and for which construction or modification commenced after October 24, 1974:
- (a) thermal dryers;
- (b) pneumatic coal-cleaning equipment (air tables);
- (c) coal processing and conveying equipment (including breakers and crushers);
- (d) coal storage systems; and
- (e) coal transfer and loading systems.

(2) Requirements. Facilities subject to this rule shall comply with **40 CFR Part 60, Subpart Y**, as adopted under OAR 340-25-535.

(3) Definitions. As used in this rule:
- (a) "Coal" means all solid fossil fuels classified as anthracite, bituminous, subbituminous, or lignite by **ASTM[~~ Designation~~] D388-77**.
- (b) "Coal preparation plant" means any facility (excluding underground mining operations) which prepares coal by one or more of the following processes: breaking, crushing, screening, wet or dry cleaning, and thermal drying.
- (c) "Coal processing and conveying equipment" means any machinery used to reduce the size of coal or to separate coal from refuse, and the equipment used to convey coal to or remove coal and refuse from the machinery. This includes, but is not limited to, breakers, crushers, screens, and conveyor belts.
- (d) "Coal storage system" means any facility used to store coal except for open storage piles.
- (e) "Pneumatic coal-cleaning equipment" means any facility which classifies bituminous coal by size or separates bituminous coal from refuse by application of air stream(s).
- (f) "Thermal dryer" means any facility in which the moisture content of bituminous coal is reduced by contact with a heated gas stream which is exhausted to the atmosphere.
- (g) "Transfer and loading systems" means any facility used to transfer and load coal for shipment.

[**Publications**: The Publication(s) referred to or incorporated by reference in this rule are available from the Department of Environmental Quality.]

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 16-1981, f. & ef. 5-6-81; DEQ 4-1993, f. & cert. ef. 3-10-93; DEQ 17-1993, f. & ef. 11-4-93

Standards of Performance for Ferroalloy Production Facilities
340-25-620

(1) Applicability. This rule applies to the following facilities for which construction or modification commenced after October 21, 1974:
  (a) electric submerged arc furnaces which produce silicon metal, ferrosilicon, calcium silicon, silicomanganese zirconium, ferrochrome silicon, silvery iron, high-carbon ferrochrome, charge chrome, standard ferromanganese, silicomanganese, ferromanganese silicon, or calcium carbide; and
  (b) dust-handling equipment.

(2) Requirements. Ferroalloy production facilities subject to this rule shall comply with **40 CFR Part 60, Subpart Z**, as adopted under OAR 340-25-535.

(3) Definitions. As used in this rule:
  (a) "Calcium carbide" means material containing 70 to 85 percent calcium carbide by weight.
  (b) "Calcium silicon" means that alloy as defined by **ASTM**[~~*Designation*~~] **A495-76**.
  (c) "Charge chrome" means that alloy containing 52 to 70 percent by weight chromium, 5 to 8 percent by weight carbon, and 3 to 6 percent by weight silicon.
  (d) "Dust-handling equipment" means any equipment used to handle particulate matter collected by the air pollution control device (and located at or near such device) serving an electric submerged arc furnace subject to this rule.
  (e) "Electric submerged arc furnace" means any furnace in which electrical energy is converted to heat energy by transmission of current between electrodes partially submerged in the furnace charge.
  (f) "Ferrochrome silicon" means that alloy as defined by [~~*American Society of Testing & Materials* (~~]**ASTM**[~~) *Designation*~~] ~~A482-76~~.
  (g) "Ferromanganese silicon" means that alloy containing 63 to 66 percent by weight manganese, 28 to 32 percent by weight silicon, and a maximum of 0.08 percent by weight carbon.
  (h) "Ferrosilicon" means that alloy as defined by **ASTM**[~~*Designation*~~] **A100-69** grades A, B, C, D, and E, which contains 50 or more percent by weight silicon.
  (i) "High-carbon ferrochrome" means that alloy as defined by **ASTM**[~~*Designation*~~] **A101-73**.
  (j) "Silicomanganese" means that alloy as defined by **ASTM**[~~*Designation*~~] **A483-64**.
  (k) "Silicomanganese zirconium" means that alloy containing 60 to 65 percent by weight silicon, 1.5 to 2.5 percent by weight calcium, 5 to 7 percent by weight zirconium, 0.75 to 1.25 percent by weight aluminum, 5 to 7 percent by weight manganese, and 2 to 3 percent by weight barium.
  (l) "Silvery iron" means that alloy as defined by **ASTM**[~~*Designation*~~] **A100-69**, which

contains less than 30 percent silicon.

(m) "Silicon metal" means any silicon alloy containing more than 96 percent silicon by weight.

(n) "Standard ferromanganese" means that alloy as defined by **ASTM**~~[*Designation*]~~ **A99-76**.

[**Publications**: The Publication(s) referred to or incorporated by reference in this rule are available from the Department of Environmental Quality.]

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 16-1981, f. & ef. 5-6-81; DEQ 17-1993, f. & ef. 11-4-93

More Restrictive Regulations

340-25-805 If at any time there is a conflict between **OAR 340-25-005 through805**~~[*Department*]~~ or regional authority rules and the Federal Regulation **(40 CFR, Part 60)**, both shall apply.

[**Publications**: The Publication(s) referred to or incorporated by reference in this rule are available from the Department of Environmental Quality.]

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 97, f. 9-2-75, ef. 9-25-75; Renumbered from 340-25-545; DEQ 15-1985, f. & ef. 10-21-85; Renumbered from 340-25-705; DEQ 17-1993, f. & ef. 11-4-93

ATTACHMENT A-2

Division 28

DIVISION 28

Stationary Source Air Pollution Control and Permitting Procedures

General

Purpose, Application and Organization
340-28-100

(1) The purpose of this Division is to prescribe air pollution control and permitting procedures which apply to all stationary sources regulated by the Department.

(2) This Division applies in addition to all other rules of the Environmental Quality Commission. In cases of apparent conflict, the most stringent rule shall apply. The requirements in this Division shall be administered by the Department, except in Lane County, where they shall be administered by the Lane Regional Air Pollution Authority.

(3) This Division is organized as follows:
   (a) General Rules, including purpose, application, organization and definitions;
   (b) Rules applicable to all stationary sources, including information submittal and disclosure, compliance schedules, general control requirements, registration, and Notice of Construction;
   (c) Rules applicable to sources required to have Air Contaminant Discharge Permits or ~~[federal operating permits]~~ Oregon Title V Operating Permits, including plant site emission limits, sampling, testing, monitoring, excess emissions, and emission statements;
   (d) Rules applicable to sources required to have Air Contaminant Discharge Permits, including permitting procedures, New Source Review, and fees; and
   (e) Rules applicable to sources required to have ~~[federal operating permits]~~ Oregon Title V Operating Permits, including permitting procedures and fees.

(4) Subject to the provision of the rules in this Division, the Regional Authority is designated by the Commission as the permitting agency to implement the ~~[federal permit program]~~ Oregon Title V Operating Permit program within its area of jurisdiction. The Regional Authority's program is subject to Department oversight. The requirements and procedures contained in this Division pertaining to the ~~[federal operating permit]~~ Oregon Title V Operating Permit program shall be

used by the Regional Authority to implement its permitting program until the Regional Authority adopts superseding rules which are at least as restrictive as state rules.

[NOTE: This rule is included in the State of Oregon Clean Air Act Implementation Plan as adopted by the EQC under OAR 340-20-047.]

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 13-1993, f. & ef. 9-24-93; DEQ 19-1993, f. & ef. 11-4-93

Definitions

340-28-110 As used in this Division:

(1) "Act" or "FCAA" means the Federal Clean Air Act, Public Law 88-206 as last amended by Public Law 101-549.

(2) "Actual emissions" means the mass emissions of a pollutant from an emissions source during a specified time period. Actual emissions shall be directly measured with a continuous monitoring system or calculated using a material balance or verified emission factor in combination with the source's actual operating hours, production rates, or types of materials processed, stored, or combusted during the specified time period.

(a) For purposes of determining actual emissions as of the baseline period:

(A) Except as provided in paragraph (B) of this subsection, actual emissions shall equal the average rate at which the source actually emitted the pollutant during a baseline period and which is representative of normal source operation;

(B) The Department may presume the source-specific mass emissions limit included in the permit for a source that was effective on September 8, 1981 is equivalent to the actual emissions of the source during the baseline period if it is within 10% of the actual emissions calculated under paragraph (A) of this subsection.

(b) For any source which had not yet begun normal operation in the specified time period, actual emissions shall equal the potential to emit of the source.

(c) For purposes of determining actual emissions for Emission Statements under OAR 340-28-1500 through 340-28-1520, Major Source Interim Emission Fees under OAR 340-28-2400 through 340-28-2550, and ~~[federal operating permit]~~**Oregon Title V Operating Permit** Fees under OAR 340-28-2560 through 340-28-2740, actual emissions include, but are not limited to, routine process emissions, fugitive emissions, excess emissions from maintenance, startups and shutdowns, equipment malfunction, and

other activities.

(3) "Affected source" means a source that includes one or more affected units that are subject to emission reduction requirements or limitations under Title IV of the FCAA.

(4) "Affected States" mean all States:
  (a) Whose air quality may be affected by a proposed permit, permit modification or permit renewal and that are contiguous to Oregon; or
  (b) That are within 50 miles of the permitted source.

(5) "Aggregate insignificant emissions" means the annual actual emissions of any regulated air pollutant from one or more designated activities at a source that are less than or equal to the lowest applicable level specified in this section. The total emissions from each designated activity and the aggregate emissions from all designated activities shall be less than or equal to the lowest applicable level specified in this section. The aggregate insignificant emissions levels are:
  (a) One ton for total reduced sulfur, hydrogen sulfide, sulfuric acid mist, any Class I or II substance subject to a standard promulgated under or established by Title VI of the Act, and each criteria pollutant, except lead;
  (b) 120 pounds for lead;
  (c) 600 pounds for fluoride;
  (d) 500 pounds for PM_{10} in a PM_{10} nonattainment area;
  (e) The lesser of the amount established in OAR 340-32-130, Table 1 or OAR 340-32-5400, Table 3, or 1,000 pounds;
  (e) An aggregate of 5,000 pounds for all Hazardous Air Pollutants.

(6) "Air Contaminant" means a dust, fume, gas, mist, odor, smoke, vapor, pollen, soot, carbon, acid or particulate matter, or any combination thereof.

(7) "Air Contaminant Discharge Permit" or "ACDP" means a written permit issued, renewed, amended, or revised by the Department, pursuant to OAR 340-28-1700 through 340-28-1790 and includes the application review report.

(8) "Alternative method" means any method of sampling and analyzing for an air pollutant which is not a reference or equivalent method but which has been demonstrated to the Department's satisfaction to, in specific cases, produce results adequate for determination of compliance. An alternative method used to meet an applicable federal requirement for which a reference method is specified shall be approved by EPA unless EPA has delegated authority for the approval to the Department.

(9) "Applicable requirement" means all of the following as they apply to emissions units in a~~[federal operating~~

~~permit~~]n Oregon Title V Operating Permit program source, including requirements that have been promulgated or approved by the EPA through rule making at the time of issuance but have future-effective compliance dates:

(a) Any standard or other requirement provided for in the applicable implementation plan approved or promulgated by the EPA through rulemaking under Title I of the Act that implements the relevant requirements of the Act, including any revisions to that plan promulgated in 40 CFR Part 52 (July 1, 1993);

(b) Any standard or other requirement adopted under OAR 340-20-047 of the State of Oregon Clean Air Act Implementation Plan, that is more stringent than the federal standard or requirement which has not yet been approved by the EPA, and other state-only enforceable air pollution control requirements;

(c) Any term or condition in an ACDP, OAR 340-28-1700 through 340-28-1790, including any term or condition of any preconstruction permits issued pursuant to OAR 340-28-1900 through 340-28-2000, New Source Review), until or unless the Department revokes or modifies the term or condition by a permit modification;

(d) Any term or condition in a Notice of Construction and Approval of Plans, OAR 340-28-800 through 340-28-820, until or unless the Department revokes or modifies the term or condition by a Notice of Construction and Approval of Plans or a permit modification;

(e) Any term or condition in a Notice of Approval, OAR 340-28-2270, until or unless the Department revokes or modifies the term or condition by a Notice of Approval or a permit modification;

(f) Any standard or other requirement under section 111 of the Act, including section 111(d);

(g) Any standard or other requirement under section 112 of the Act, including any requirement concerning accident prevention under section 112(r)(7) of the Act;

(h) Any standard or other requirement of the acid rain program under Title IV of the Act or the regulations promulgated thereunder;

(i) Any requirements established pursuant to section 504(b) or section 114(a)(3) of the Act;

(j) Any standard or other requirement governing solid waste incineration, under section 129 of the Act;

(k) Any standard or other requirement for consumer and commercial products, under section 183(e) of the Act;

(l) Any standard or other requirement for tank vessels, under section 183(f) of the Act;

(m) Any standard or other requirement of the program to control air pollution from outer continental shelf sources, under section 328 of the Act;

(n) Any standard or other requirement of the regulations promulgated to protect stratospheric ozone under Title VI of the Act, unless the Administrator has determined that such requirements need not be contained in a ~~[federal operating permit]~~n Oregon Title V Operating Permit; and

(o) Any national ambient air quality standard or increment or visibility requirement under part C of Title I of the Act, but only as it would apply to temporary sources permitted pursuant to section 504(e) of the Act.

(10) "Assessable Emission" means a unit of emissions for which the major source owner or operator will be assessed a fee. It includes an emission of a pollutant as specified in OAR 340-28-2420 or OAR 340-28-2610 from an emission unit and from an area within a major source. For routine process emissions, emissions of each pollutant in OAR 340-28-2420 or OAR 340-28-2610 from each emission unit included in an ACDP or ~~[federal]~~Oregon Title V ~~[o]~~Operating ~~[p]~~Permit shall be an assessable emission.

(11) "Baseline Emission Rate" means the average actual emission rate during the baseline period. Baseline emission rate shall not include increases due to voluntary fuel switches or increased hours of operation that have occurred after the baseline period.

(12) "Baseline Period" means either calendar years 1977 or 1978. The Department shall allow the use of a prior time period upon a determination that it is more representative of normal source operation.

(13) "Best Available Control Technology" or "BACT" means an emission limitation, including, but not limited to, a visible emission standard, based on the maximum degree of reduction of each air contaminant subject to regulation under the Act which would be emitted from any proposed major source or major modification which, on a case-by-case basis, taking into account energy, environmental, and economic impacts and other costs, is achievable for such source or modification through application of production processes or available methods, systems, and techniques, including fuel cleaning or treatment or innovative fuel combustion techniques for control of such air contaminant. In no event~~[,]~~ shall the application of BACT result in emissions of any air contaminant which would exceed the emissions allowed by any applicable new source performance standard or any standard for hazardous air pollutant. If an emission limitation is not feasible, a design, equipment, work practice, or operational standard, or combination thereof, may be required. Such

standard shall, to the degree possible, set forth the emission reduction achievable and shall provide for compliance by prescribing appropriate permit conditions.

(14) "Calculated Emissions" as used in OAR 340-28-2400 through 340-28-2550 means procedures used to estimate emissions for the 1991 calendar year.

(15) "Categorically insignificant activity" means any of the following listed pollutant emitting activities principally supporting the source or the major industrial group. Categorically insignificant activities must comply with all applicable requirements.

(a) constituents of a chemical mixture present at less than 1% by weight of any chemical or compound regulated under Divisions 20 through 32 of this chapter, or less than 0.1% by weight of any carcinogen listed in the U.S. Department of Health and Human Service's Annual Report on Carcinogens when usage of the chemical mixture is less than 100,000 pounds/year;

(b) evaporative and tail pipe emissions from on-site motor vehicle operation;

(c) distillate oil, kerosene, and gasoline fuel burning equipment rated at less than or equal to 0.4 million Btu/hr;

(d) natural gas and propane burning equipment rated at less than or equal to 2.0 million Btu/hr;

(e) office activities;

(f) food service activities;

(g) janitorial activities;

(h) personal care activities;

(i) groundskeeping activities including, but not limited to building painting and road and parking lot maintenance;

(j) on-site laundry activities;

(k) on-site recreation facilities

(l) instrument calibration;

(m) maintenance and repair shop;

(n) automotive repair shops or storage garages;

(o) air cooling or ventilating equipment not designed to remove air contaminants generated by or released from associated equipment;

(p) refrigeration systems with less than 50 pounds of charge of ozone depleting substances regulated under Title VI, including pressure tanks used in refrigeration systems but excluding any combustion equipment associated with such systems;

(q) bench scale laboratory equipment and laboratory equipment used exclusively for chemical and physical analysis, including associated vacuum producing devices but excluding research and development facilities;

(r) temporary construction activities;

(s) warehouse activities;
(t) accidental fires;
(u) air vents from air compressors;
(v) air purification systems;
(w) continuous emissions monitoring vent lines;
(x) demineralized water tanks;
(y) pre-treatment of municipal water, including use of deionized water purification systems;
(z) electrical charging stations;
(aa) fire brigade training;
(bb) instrument air dryers and distribution;
(cc) process raw water filtration systems;
(dd) pharmaceutical packaging;
(ee) fire suppression;
(ff) blueprint making;
(gg) routine maintenance, repair, and replacement such as anticipated activities most often associated with and performed during regularly scheduled equipment outages to maintain a plant and its equipment in good operating condition, including but not limited to steam cleaning, abrasive use, and woodworking;
(hh) electric motors;
(ii) storage tanks, reservoirs, transfer and lubricating equipment used for ASTM grade distillate or residual fuels, lubricants, and hydraulic fluids;
(jj) on-site storage tanks not subject to any New Source Performance Standards (NSPS), including underground storage tanks (UST), storing gasoline or diesel used exclusively for fueling of the facility's fleet of vehicles;
(kk) natural gas, propane, and liquefied petroleum gas (LPG) storage tanks and transfer equipment;
(ll) pressurized tanks containing gaseous compounds;
(mm) vacuum sheet stacker vents;
(nn) emissions from wastewater discharges to publicly owned treatment works (POTW) provided the source is authorized to discharge to the POTW, not including on-site wastewater treatment and/or holding facilities;
(oo) log ponds;
(pp) storm water settling basins;
(qq) fire suppression and training;
(rr) paved roads and paved parking lots within an urban growth boundary;
(ss) hazardous air pollutant emissions of fugitive dust from paved and unpaved roads except for those sources that have processes or activities that contribute to the deposition and entrainment of hazardous air pollutants from surface soils;
(tt) health, safety, and emergency response activities;

(uu) emergency generators and pumps used only during

loss of primary equipment or utility service;
(vv) non-contact steam vents and leaks and safety and relief valves for boiler steam distribution systems;
(ww) non-contact steam condensate flash tanks;
(xx) non-contact steam vents on condensate receivers, deaerators and similar equipment;
(yy) boiler blowdown tanks;
(zz) industrial cooling towers that do not use chromium-based water treatment chemicals;
(aaa) ash piles maintained in a wetted condition and associated handling systems and activities;
(bbb) oil/water separators in effluent treatment systems;
(ccc) combustion source flame safety purging on startup;
(ddd) broke beaters, pulp and repulping tanks, stock chests and pulp handling equipment, excluding thickening equipment and repulpers;
(eee) stock cleaning and pressurized pulp washing, excluding open stock washing systems; and
(fff) white water storage tanks.

(16) "Certifying individual" means the responsible person or official authorized by the owner or operator of a source who certifies the accuracy of the emission statement.

(17) "CFR" means Code of Federal Regulations.

(18) "Class I area" means any Federal, State or Indian reservation land which is classified or reclassified as Class I area. Class I areas are identified in OAR 340-31-120.

(19) "Commence" or "commencement" means that the owner or operator has obtained all necessary preconstruction approvals required by the Act and either has:
(a) Begun, or caused to begin, a continuous program of actual on-site construction of the source to be completed in a reasonable time; or
(b) Entered into binding agreements or contractual obligations, which cannot be canceled or modified without substantial loss to the owner or operator, to undertake a program of construction of the source to be completed in a reasonable time.

(20) "Commission" or "EQC" means Environmental Quality Commission.

(21) "Constant Process Rate" means the average variation in process rate for the calendar year is not greater than plus or minus ten percent of the average process rate.

(22) "Construction":
(a) except as provided in subsection (b) of this section means any physical change including, but not limited to, fabrication, erection, installation, demolition, or modification of a source or part of a source;

(b) as used in OAR 340-28-1900 through 340-28-2000 means any physical change including, but not limited to, fabrication, erection, installation, demolition, or modification of an emissions unit, or change in the method of operation of a source which would result in a change in actual emissions.

(23) "Continuous Monitoring Systems" means sampling and analysis, in a timed sequence, using techniques which will adequately reflect actual emissions or concentrations on a continuing basis in accordance with the Department's Continuous Monitoring Manual, and includes continuous emission monitoring systems and continuous parameter monitoring systems.

(24) "Criteria Pollutant" means nitrogen oxides, volatile organic compounds, particulate matter, PM_{10}, sulfur dioxide, carbon monoxide, or lead.

(25) "Department"

(a) as used in OAR 340-28-100 through 340-28-2000 and OAR 340-28-2400 through 340-28-2550 means Department of Environmental Quality;

(b) as used in OAR 340-28-2100 through 340-28-2320 and OAR 340-28-2560 throughout 340-28-2740 means Department of Environmental Quality or in the case of Lane County, Lane Regional Air Pollution Authority.

(26) "Director" means the Director of the Department or the Director's designee.

(27) "Draft permit" means the version of a~~[federal operating permit]~~n Oregon Title V Operating Permit for which the Department or Lane Regional Air Pollution Authority offers public participation under OAR 340-28-2290 or the EPA and affected State review under OAR 340-28-2310.

(28) "Effective date of the program" means the date that the EPA approves the ~~[federal operating permit]~~Oregon Title V Operating Permit program submitted by the Department on a full or interim basis. In case of a partial approval, the "effective date of the program" for each portion of the program is the date of the EPA approval of that portion.

(29) "Emergency" means any situation arising from sudden and reasonably unforeseeable events beyond the control of the owner or operator, including acts of God, which situation requires immediate corrective action to restore normal operation, and that causes the source to exceed a technology-based emission limitation under the permit, due to unavoidable increases in emissions attributable to the emergency. An emergency shall not include noncompliance to the extent caused by improperly designed equipment, lack of preventative maintenance, careless or improper operation, or operator error.

(30) "Emission" means a release into the atmosphere of any regulated pollutant or air contaminant.
(31) "Emission Estimate Adjustment Factor" or "EEAF" means an adjustment applied to an emission factor to account for the relative inaccuracy of the emission factor.
(32) "Emission Factor" means an estimate of the rate at which a pollutant is released into the atmosphere, as the result of some activity, divided by the rate of that activity (e.g., production or process rate). Sources shall use an emission factor approved by EPA or the Department.
(33) "Emission Limitation" and "Emission Standard" mean a requirement established by a State, local government, or the EPA which limits the quantity, rate, or concentration of emissions of air pollutants on a continuous basis, including any requirements which limit the level of opacity, prescribe equipment, set fuel specifications, or prescribe operation or maintenance procedures for a source to assure continuous emission reduction.
(34) "Emission Reduction Credit Banking" means to presently reserve, subject to requirements of OAR 340-28-1900 through 340-28-2000, New Source Review, emission reductions for use by the reserver or assignee for future compliance with air pollution reduction requirements.
(35) "Emission Reporting Form" means a paper or electronic form developed by the Department that shall be completed by the permittee to report calculated emissions, actual emissions or permitted emissions for interim emission fee assessment purposes.
(36) "Emissions unit" means any part or activity of a source that emits or has the potential to emit any regulated air pollutant.
    (a) A part of a source is any machine, equipment, raw material, product, or byproduct which produces or emits air pollutants. An activity is any process, operation, action, or reaction (e.g., chemical) at a stationary source that emits air pollutants. Except as described in subsection (d) of this section, parts and activities may be grouped for purposes of defining an emissions unit provided the following conditions are met:
        (A) the group used to define the emissions unit may not include discrete parts or activities to which a distinct emissions standard applies or for which different compliance demonstration requirements apply, and
        (B) the emissions from the emissions unit are quantifiable.
    (b) Emissions units may be defined on a pollutant by pollutant basis where applicable.
    (c) The term emissions unit is not meant to alter or affect the definition of the term "unit" for

purposes of Title IV of the FCAA.

(d) Parts and activities shall not be grouped for purposes of determining emissions increases from an emissions unit under OAR 340-28-1930, OAR 340-28-1940, or OAR 340-28-2270, or for purposes of determining the applicability of any New Source Performance Standard (NSPS).

(37) "EPA" or "Administrator" means the Administrator of the United States Environmental Protection Agency or the Administrator's designee.

(38) "Equivalent method" means any method of sampling and analyzing for an air pollutant which has been demonstrated to the Department's satisfaction to have a consistent and quantitatively known relationship to the reference method, under specified conditions. An equivalent method used to meet an applicable federal requirement for which a reference method is specified shall be approved by EPA unless EPA has delegated authority for the approval to the Department.

(39) "Event" means excess emissions which arise from the same condition and which occur during a single calendar day or continue into subsequent calendar days.

(40) "Excess emissions" means emissions which are in excess of a permit limit or any applicable air quality rule.

(41) "Federal Land Manager" means with respect to any lands in the United States, the Secretary of the federal department with authority over such lands.

(4~~[5]~~2) "Final permit" means the version of a~~[federal operating permit]~~n Oregon Title V Operating Permit issued by the Department or Lane Regional Air Pollution Authority that has completed all review procedures required by OAR 340-28-2200 through 340-28-2320.

(4~~[6]~~3) "Fugitive Emissions":

(a) except as used in subsection (b) of this section, means emissions of any air contaminant which escape to the atmosphere from any point or area that is not identifiable as a stack, vent, duct, or equivalent opening.

(b) as used to define a major ~~[federal operating permit]~~Oregon Title V Operating Permit program source, means those emissions which could not reasonably pass through a stack, chimney, vent, or other functionally equivalent opening.

(4~~[7]~~4) "General permit" means a~~[federal operating permit]~~n Oregon Title V Operating Permit that meets the requirements of OAR 340-28-2170.

(4~~[8]~~5) "Growth Increment" means an allocation of some part of an airshed's capacity to accommodate future new major sources and major modifications of sources.

(4~~[9]~~6) "Immediately" means as soon as possible but in no case more than one hour after the beginning of the excess emission period.

(~~[50]~~47) "Insignificant Activity" means an activity or emission that the Department has designated as categorically insignificant, or that meets the criteria of aggregate insignificant emissions.

(~~[51]~~48) "Insignificant Change" means an off-permit change defined under OAR 340-28-2220(2)(a) to either a significant or an insignificant activity which:

(a) does not result in a redesignation from an insignificant to a significant activity;

(b) does not invoke an applicable requirement not included in the permit; and

(c) does not result in emission of regulated air pollutants not regulated by the source's permit.

(~~[52]~~49) "Interim Emission Fee" means $13 per ton for each assessable emission subject to emission fees under OAR 340-28-2420 for calculated, actual or permitted emissions released during calendar years 1991 and 1992.

(5~~[3]~~0) "Large Source" as used in OAR 340-28-1400 through 340-28-1450 means any stationary source whose actual emissions or potential controlled emissions while operating full-time at the design capacity are equal to or exceed 100 tons per year of any regulated air pollutant, or which is subject to a National Emissions Standard for Hazardous Air Pollutants (NESHAP). Where PSELs have been incorporated into the ACDP, the PSEL shall be used to determine actual emissions.

(5~~[4]~~1) "Late Payment" means a fee payment which is postmarked after the due date.

(5~~[5]~~2) "Lowest Achievable Emission Rate" or LAER" means that rate of emissions which reflects: the most stringent emission limitation which is contained in the implementation plan of any state for such class or category of source, unless the owner or operator of the proposed source demonstrates that such limitations are not achievable; or the most stringent emission limitation which is achieved in practice by such class or category of source, whichever is more stringent. In no event, shall the application of this term permit a proposed new or modified source to emit any air contaminant in excess of the amount allowable under applicable New Source Performance Standards (NSPS) or standards for hazardous air pollutants.

(5~~[6]~~3) "Major Modification" means any physical change or change of operation of a source that would result in a net significant emission rate increase for any regulated air pollutant. This criteria also applies to any pollutants not previously emitted by the source. Calculations of net emission increases shall take into account all accumulated increases and decreases in actual emissions occurring at the source since the baseline period,

or since the time of the last construction approval issued for the source pursuant to the New Source Review Regulations in OAR 340-28-1900 through 340-28-2000 for that pollutant, whichever time is more recent. Emissions from insignificant activities shall be included in the calculation of net emission increases. Emission decreases required by rule shall not be included in the calculation of net emission increases. If accumulation of emission increases results in a net significant emission rate increase, the modifications causing such increases become subject to the New Source Review requirements, including the retrofit of required controls.

(5~~[7]~~4) "Major Source":

(a) except as provided in subsections (b) and (c) of this section, means a source which emits, or has the potential to emit, any regulated air pollutant at a Significant Emission Rate, as defined in this rule. Emissions from insignificant activities shall be included in determining if a source is a major source.

(b) as used in OAR 340-28-2100 through 340-28-2320, Rules Applicable to Sources Required to Have ~~[*Federal Operating*]~~**Oregon Title V Operating** Permits, 340-28-2560 through 340-28-2740, ~~[*Federal*]~~**Oregon Title V** Operating Permit Fees, and OAR 340-28-1740, Synthetic Minor Sources, means any stationary source, (or any group of stationary sources that are located on one or more contiguous or adjacent properties and are under common control of the same person (or persons under common control)), belonging to a single major industrial grouping or~~[are]~~ **is** supporting the major industrial group and that are described in paragraphs (A), (B), or (C) of this subsection. For the purposes of this subsection, a stationary source or group of stationary sources shall be considered part of a single industrial grouping if all of the pollutant emitting activities at such source or group of sources on contiguous or adjacent properties belong to the same Major Group (i.e., all have the same two-digit code) as described in the Standard Industrial Classification Manual (U.S. Office of Management and Budget, 1987) or support the major industrial group.

(A) A major source of hazardous air pollutants, which is defined as:

(i) For pollutants other than radionuclides, any stationary source or group of stationary sources located within a contiguous area and under

common control that emits or has the potential to emit, in the aggregate, 10 tons per year (tpy) or more of any hazardous air pollutants which has been listed pursuant to OAR 340-32-130, 25 tpy or more of any combination of such hazardous air pollutants, or such lesser quantity as the Administrator may establish by rule. Notwithstanding the preceding sentence, emissions from any oil or gas exploration or production well, with its associated equipment, and emissions from any pipeline compressor or pump station shall not be aggregated with emissions from other similar units, whether or not such units are in a contiguous area or under common control, to determine whether such units or stations are major sources; or

(ii) For radionuclides, "major source" shall have the meaning specified by the Administrator by rule.

(B) A major stationary source of air pollutants, as defined in section 302 of the Act, that directly emits or has the potential to emit, 100 tpy or more of any regulated air pollutant, including any major source of fugitive emissions of any such pollutant. The fugitive emissions of a stationary source shall not be considered in determining whether it is a major stationary source for the purposes of section 302(j) of the Act, unless the source belongs to one of the following categories of stationary source:

(i) Coal cleaning plants (with thermal dryers);

(ii) Kraft pulp mills;

(iii) Portland cement plants;

(iv) Primary zinc smelters;

(v) Iron and steel mills;

(vi) Primary aluminum ore reduction plants;

(vii) Primary copper smelters;

(viii) Municipal incinerators capable of charging more than 250 tons of refuse per day;

(ix) Hydrofluoric, sulfuric, or nitric acid plants;

(x) Petroleum refineries;

(xi) Lime plants;

(xii) Phosphate rock processing plants;

(xiii) Coke oven batteries;

(xiv) Sulfur recovery plants;

(xv) Carbon black plants (furnace process);

(xvi) Primary lead smelters;

(xvii) Fuel conversion plants;

(xviii) Sintering plants;

(xix) Secondary metal production plants;

(xx) Chemical process plants;

(xxi) Fossil-fuel boilers, or combination thereof, totaling more than 250 million British thermal units per hour heat input;

(xxii) Petroleum storage and transfer units with a total storage capacity exceeding 300,000 barrels;

(xxiii) Taconite ore processing plants;

(xxiv) Glass fiber processing plants;

(xxv) Charcoal production plants;

(xxvi) Fossil-fuel-fired steam electric plants of more than 250 million British thermal units per hour heat input; or

(xxvii) All other stationary source categories regulated by a standard promulgated under section 111 or 112 of the Act, but only with respect to those air pollutants that have been regulated for that category;

(C) A major stationary source as defined in part D of Title I of the Act, including:

(i) For ozone nonattainment areas, sources with the potential to emit 100 tpy or more of VOCs or oxides of nitrogen in areas classified as "marginal" or "moderate," 50 tpy or more in areas classified as "serious," 25 tpy or more in areas classified as "severe," and 10 tpy or more in areas classified as "extreme";

except that the references in this paragraph to 100, 50, 25, and 10 tpy of nitrogen oxides shall not apply with respect to any source for which the Administrator has made a finding, under section 182(f)(1) or (2) of the Act, that requirements under section 182(f) of the Act do not apply;

(ii) For ozone transport regions established pursuant to section 184 of the Act, sources with the potential to emit 50 tpy or more of VOCs;

(iii) For carbon monoxide nonattainment areas
(I) that are classified as "serious," and
(II) in which stationary sources contribute significantly to carbon monoxide levels as determined under rules issued by the Administrator, sources with the potential to emit 50 tpy or more of carbon monoxide;

(iv) For particulate matter (PM_{10}) nonattainment areas classified as "serious," sources with the potential to emit 70 tpy or more of PM_{10}.

(c) as used in OAR 340-28-2400 through 340-28-2550, Major Source Interim Emission Fees, means a permitted stationary source or group of stationary sources located within a contiguous area and under common control or any stationary facility or source of air pollutants which directly emits, or is permitted to emit:
(A) One hundred tons per year or more of any regulated pollutant, or
(B) Fifty tons per year or more of a VOC and is located in a serious ozone nonattainment area.

(5~~[8]~~5) "Material Balance" means a procedure for determining emissions based on the difference in the amount of material added to a process and the amount consumed and/or recovered from a process.

(5~~[9]~~6) "Nitrogen Oxides"or "NO_x" means all oxides of nitrogen except nitrous oxide.

(~~[60]~~57) "Nonattainment Area" means a geographical area of the State which exceeds any state or federal primary or secondary ambient air quality standard as designated by the Environmental Quality Commission or the EPA.

(~~[61]~~58) "Normal Source Operation" means operations which do not include such conditions as forced fuel substitution, equipment malfunction, or highly abnormal market conditions.

(~~[62]~~59) "Offset" means an equivalent or greater emission reduction which is required prior to allowing an emission increase from a new major source or major modification of a source.

(~~[42]~~60) "~~[Federal]~~**Oregon Title V** Operating Permit" means any permit covering a~~[federal operating permit]~~n **Oregon Title V Operating Permit** program source that is issued, renewed, amended, or revised pursuant to OAR 340-28-2100 through 340-28-2320.

(~~[43]~~61) "~~[Federal Operating Permit]~~**Oregon Title V Operating Permit** program" means a program approved by the Administrator under **40 CFR Part 70 July 1, 1993.**

(~~[44]~~62) "~~[Federal]~~**Oregon Title V** Operating Permit program source" means any source subject to the permitting requirements, OAR 340-28-2100 through 340-28-2320, as provided in OAR 340-28-2110.

(63) "Ozone Season" means the contiguous 3 month period of the year during which ozone exceedances typically occur (i.e., June, July, and August).

(64) "Particulate Matter" means all finely divided solid or liquid material, other than uncombined water, emitted to the ambient air as measured by an applicable reference method in accordance with the Department's Source Sampling Manual, (January, 1992).

(65) "Permit" means an Air Contaminant Discharge Permit or a~~[Federal]~~n **Oregon Title V** Operating Permit issued pursuant to this Division.

(66) "Permit modification" means a revision to a permit that meets the applicable requirements of OAR 340-28-1700 through 340-28-1790, OAR 340-28-1900 through 340-28-2000, or OAR 340-28-2240 through 340-28-2260.

(67) "Permit revision" means any permit modification or administrative permit amendment.

(68) "Permitted Emissions" as used in OAR 340-28-2400 through 340-28-2550, and OAR 340-28-2560 through 340-28-2740 means each assessable portion of the annual PSEL.

(69) "Permittee" means the owner or operator of the facility, in whose name the operation of the source is authorized by the ACDP or the ~~[federal]~~**Oregon Title V** Operating Permit.

(70) "Person" means ~~[the United States Government and agencies thereof, any state,]~~individual**s**, ~~[public or private]~~corporation**s**, ~~[political subdivision,~~

~~*governmental agency, municipality, industry, co-partnership,* ~~associations, firms, partnerships, joint stock companies, public and municipal corporations, political subdivisions, the state and any agencies thereof, and the Federal government and any agencies thereof~~[*trust, estate, or any other legal entity whatsoever*]~~.

(71) "Plant Site Emission Limit" or "PSEL" means the total mass emissions per unit time of an individual air pollutant specified in a permit for a source. The PSEL for a major source may consist of more than one assessable emission.

(72) "PM_{10}":

(a) when used in the context of emissions, means finely divided solid or liquid material, including condensible particulate, other than uncombined water, with an aerodynamic diameter less than or equal to a nominal 10 micrometers, emitted to the ambient air as measured by an applicable reference method in accordance with the Department's Source Sampling Manual (January, 1992);

(b) when used in the context of ambient concentration, means airborne finely divided solid or liquid material with an aerodynamic diameter less than or equal to a nominal 10 micrometers as measured in accordance with 40 CFR Part 50, Appendix J (July, 1993).

(73) "Potential to emit" means the maximum capacity of a stationary source to emit any air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of a source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored, or processed, shall be treated as part of its design if the limitation is enforceable by the Administrator. This definition does not alter or affect the use of this term for any other purposes under the Act, or the term "capacity factor" as used in Title IV of the Act or the regulations promulgated thereunder. Secondary emissions shall not be considered in determining the potential to emit of a source.

(74) "Process Upset" means a failure or malfunction of a production process or system to operate in a normal and usual manner.

(75) "Proposed permit" means the version of a~~[*federal*]~~n Oregon Title V Operating Permit that the Department or Lane Regional Air Pollution Authority proposes to issue and forwards to the Administrator for review in compliance with OAR 340-28-2310.

(76) "Reference method" means any method of sampling and analyzing for an air pollutant as specified in **40 CFR Part 60, 61 or 63** (July 1, 1993).

(77) "Regional Authority" means Lane Regional Air Pollution Authority.

(78) "Regulated air pollutant" or "Regulated Pollutant":

(a) as used in OAR 340-28-100 through 340-28-2320 means:

(A) Nitrogen oxides or any VOCs;

(B) Any pollutant for which a national ambient air quality standard has been promulgated;

(C) Any pollutant that is subject to any standard promulgated under section 111 of the Act;

(D) Any Class I or II substance subject to a standard promulgated under or established by Title VI of the Act; or

(E) Any pollutant listed under OAR 340-32-130 or OAR 340-32-5400.

(b) as used in OAR 340-28-2400 through 340-28-2550 means PM_{10}, Sulfur Dioxide (SO_2), Oxides of Nitrogen (NO_X), Lead (Pb), VOC, and Carbon Monoxide (CO); and any other pollutant subject to a New Source Performance Standard (NSPS) such as Total Reduced Sulfur (TRS) from kraft pulp mills and Fluoride (F) from aluminum mills.

(c) as used in OAR 340-28-2560 through 340-28-2740 means any regulated air pollutant as defined in 340-28-110(78) except the following:

(A) Carbon monoxide;

(B) Any pollutant that is a regulated pollutant solely because it is a Class I or Class II substance subject to a standard promulgated under or established by Title VI of the Federal Clean Air Act; or

(C) Any pollutant that is a regulated air pollutant solely because it is subject to a standard or regulation under section 112(r) of the Federal Clean Air Act.

(79) "Renewal" means the process by which a permit is reissued at the end of its term.

(80) "Responsible official" means one of the following:

(a) For a corporation: a president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision-making functions for the corporation, or a duly authorized representative of such person if the representative is responsible for the overall operation of one or more manufacturing, production, or operating facilities applying for or subject to a permit and either:

(A) the facilities employ more than 250 persons or have gross annual sales or expenditures exceeding $25 million (in second quarter 1980 dollars); or

(B) the delegation of authority to such

representative is approved in advance by the Department or Lane Regional Air Pollution Authority;

(b) For a partnership or sole proprietorship: a general partner or the proprietor, respectively;

(c) For a municipality, State, Federal, or other public agency: either a principal executive officer or ranking elected official. For the purposes of this Division, a principal executive officer of a Federal agency includes the chief executive officer having responsibility for the overall operations of a principal geographic unit of the agency (e.g., a Regional Administrator of the EPA); or

(d) For affected sources:

(A) The designated representative in so far as actions, standards, requirements, or prohibitions under Title IV of the Act or the regulations promulgated thereunder are concerned; and

(B) The designated representative for any other purposes under the ~~[federal]~~Oregon Title V Operating Permit program.

(81) "Secondary Emissions" means emissions from new or existing sources which occur as a result of the construction and/or operation of a source or modification, but do not come from the source itself. Secondary emissions shall be specific, well defined, quantifiable, and impact the same general area as the source associated with the secondary emissions. Secondary emissions may include, but are not limited to:

(a) Emissions from ships and trains coming to or from a facility;

(b) Emissions from off-site support facilities which would be constructed or would otherwise increase emissions as a result of the construction of a source or modification.

(82) "Section 111" means that section of the FCAA that includes Standards of Performance for New Stationary Sources (NSPS).

(83) "Section 111(d)" means that subsection of the FCAA that requires states to submit plans to the EPA which establish standards of performance for existing sources and provides for the implementation and enforcement of such standards.

(84) "Section 112" means that section of the FCAA that contains regulations for Hazardous Air Pollutants (HAP).

(85) "Section 112(b)" means that subsection of the FCAA that includes the list of hazardous air pollutants to be regulated.

(86) "Section 112(d)" means that subsection of the FCAA that directs the EPA to establish emission standards for

sources of hazardous air pollutants. This section also defines the criteria to be used by the EPA when establishing the emission standards.

(87) "Section 112(e)" means that subsection of the FCAA that directs the EPA to establish and promulgate emissions standards for categories and subcategories of sources that emit hazardous air pollutants.

(88) "Section 112(r)(7)" means that subsection of the FCAA that requires the EPA to promulgate regulations for the prevention of accidental releases and requires owners or operators to prepare risk management plans.

(89) "Section 114(a)(3)" means that subsection of the FCAA that requires enhanced monitoring and submission of compliance certifications for major sources.

(90) "Section 129" means that section of the FCAA that requires the EPA to establish emission standards and other requirements for solid waste incineration units.

(91) "Section 129(e)" means that subsection of the FCAA that requires solid waste incineration units to obtain ~~[federal]~~ **Oregon Title V** ~~[o]~~Operating ~~[p]~~Permits.

(92) "Section 182(f)" means that subsection of the FCAA that requires states to include plan provisions in the State Implementation Plan for NO_x in ozone nonattainment areas.

(93) "Section 182(f)(1)" means that subsection of the FCAA that requires states to apply those plan provisions developed for major VOC sources and major NO_x sources in ozone nonattainment areas.

(94) "Section 183(e)" means that subsection of the FCAA that requires the EPA to study and develop regulations for the control of certain VOC sources under federal ozone measures.

(95) "Section 183(f)" means that subsection of the FCAA that requires the EPA to develop regulations pertaining to tank vessels under federal ozone measures.

(96) "Section 184" means that section of the FCAA that contains regulations for the control of interstate ozone air pollution.

(97) "Section 302" means that section of the FCAA that contains definitions for general and administrative purposes in the Act.

(98) "Section 302(j)" means that subsection of the FCAA that contains definitions of "major stationary source" and "major emitting facility."

(99) "Section 328" means that section of the FCAA that contains regulations for air pollution from outer continental shelf activities.

(100) "Section 408(a)" means that subsection of the FCAA that contains regulations for the Title IV permit program.

(101) "Section 502(b)(10) change" means a change that contravenes an express permit term but is not a change that:

(a) would violate applicable requirements;
(b) would contravene federally enforceable permit terms and conditions that are monitoring, recordkeeping, reporting, or compliance certification requirements; or
(c) is a Title I modification.

(102) "Section 504(b)" means that subsection of the FCAA that states that the EPA can prescribe by rule procedures and methods for determining compliance and for monitoring.

(103) "Section 504(e)" means that subsection of the FCAA that contains regulations for permit requirements for temporary sources.

(104) "Significant Air Quality Impact" means an ambient air quality impact which is equal to or greater than those set out in **Table 1**. For sources of VOC or NO_x, a major source or major modification will be deemed to have a significant impact if it is located within 30 kilometers of an ozone nonattainment area and is capable of impacting the nonattainment area.

Table 1
OAR 340-28-110

Significant Ambient Air Quality Impact Which is Equal to or Greater Than:

Pollutant Averaging Time

Pollutant	Annual	24-Hour	8-Hour	3-Hour	1-Hour
SO_2	1.0 ug/m³	5 ug/m³		25 ug/m³	
TSP or PM_{10}	.2 ug/m3	1.0 ug/m³			
NO_2	1.0 ug/m³				
CO				0.5 mg/m_3	2 mg/m_3

(105) "Significant emission rate" , except as provided in subsections (a) through (c) of this section, means emission rates equal to or greater than the rates specified in **Table 2**.

Table 2
OAR 340-28-110

Significant Emission Rates for Pollutants Regulated Under the Clean Air Act

	Significant Pollutant	Emission Rate
(A)	Carbon Monoxide	100 tons/year
(B)	Nitrogen Oxides (NO_x)	40 tons/year
(C)	Particulate Matter	25 tons/year
(D)	PM_{10}	15 tons/year
(E)	Sulfur Dioxide	40 tons/year
(F)	VOC	40 tons/year
(G)	Lead	0.6 ton/year
(H)	Mercury	0.1 ton/year
(I)	Beryllium	0.0004 ton/year
(J)	Asbestos	0.007 ton/year
(K)	Vinyl Chloride	1 ton/year
(L)	Fluorides	3 tons/year
(M)	Sulfuric Acid Mist	7 tons/year
(N)	Hydrogen Sulfide	10 tons/year
(O)	Total reduced sulfur (including hydrogen sulfide)	10 tons/year
(P)	Reduced sulfur compounds (including hydrogen sulfide)	10 tons/year
(Q)	Municipal waste combustor organics (measured as total tetra- through octa- chlorinated dibenzo-p-dioxins and dibenzofurans)	0.0000035 ton/year
(R)	Municipal waste combustor metals (measured as particulate matter)	15 tons/year
(S)	Municipal waste combustor acid gases (measured as sulfur dioxide and hydrogen chloride)	40 tons/year

(a) For the Medford-Ashland Air Quality Maintenance Area, and the Klamath Falls Urban Growth Area, the Significant Emission Rate for particulate matter is defined in **Table 3**. For the Klamath Falls Urban Growth Area, the Significant Emission Rates in Table 3 for particulate matter apply to all new or modified sources for which permit applications have not been submitted prior to June 2, 1989.

Table 3
OAR 340-28-110

Significant Emission Rates for the Nonattainment Portions of the Medford-Ashland Air Quality Maintenance Area and the Klamath Falls Urban Growth Area

Emission Rate

	Annual		Day		Hour
Air Contaminant	Kilograms	(tons)	Kilogram	(lbs)	kilogram (lbs)
Particulate Matter (10.0) or PM_{10}	4,500	(5.0)	23	(50.0)	4.6

(b) For regulated air pollutants not listed in Table 2 or 3, the Department shall determine the rate that constitutes a significant emission rate.

(c) Any new source or modification with an emissions increase less than the rates specified in Table 2 or 3 associated with a new source or modification which would construct within 10 kilometers of a Class I area, and would have an impact on such area equal to or greater than 1 ug/m^3 (24 hour average) shall be deemed to be emitting at a significant emission rate.

(106) "Significant Impairment" occurs when visibility impairment in the judgment of the Department interferes with the management, protection, preservation, or enjoyment of the visual experience of visitors within a Class I area. The determination shall be made on a case-by-case basis considering the recommendations of the Federal Land Manager; the geographic extent, intensity, duration, frequency, and time of visibility impairment. These factors will be considered with respect to visitor use of the Class I areas, and the frequency and occurrence of natural conditions that reduce visibility.

(107) "Small Source" means any stationary source with a regular ACDP (not a letter permit or a minimal source permit) or a[~~*federal*~~]**n Oregon Title V** Operating Permit which is not classified as a large source.

(108) "Source":

(a) except as provided in subsection (b) of this section, means any building, structure, facility, installation or combination thereof which emits or is capable of emitting air contaminants to the atmosphere and is located on one or more contiguous or adjacent properties and is owned or operated by the same person or by persons under common control.

(b) as used in OAR 340-28-1900 through 340-28-2000, New Source Review, and the definitions of "BACT", "Commenced", "Construction", "Emission Limitation", Emission Standard", "LAER", "Major Modification", "Major Source", "Potential to Emit", and "Secondary Emissions" as these terms are used for purposes of OAR 340-28-1900 through 340-28-2000, includes all pollutant emitting activities which belong to a single major industrial group (i.e., which have the same two-

digit code) as described in the **Standard Industrial Classification Manual**, (U.S. Office of Management and Budget, 1987) or are supporting the major industrial group.

(109) "Source category":

(a) except as provided in subsection (b) of this section, means all the pollutant emitting activities which belong to the same industrial grouping (i.e., which have the same two-digit code) as described in the **Standard Industrial Classification Manual**, (U.S. Office of Management and Budget, 1987).

(b) as used in OAR 340-28-2400 through 340-28-2550, Major Source Interim Emission Fees, and OAR 340-28-2560 through 340-28-2740, ~~[*Federal*]~~**Oregon Title V** Operating Permit Fees, means a group of major sources determined by the Department to be using similar raw materials and having equivalent process controls and pollution control equipment.

(110) "Source Test" means the average of at least three test runs during operating conditions representative of the period for which emissions are to be determined, conducted in accordance with the Department's Source Sampling Manual or other Department approved methods.

(111) "Startup" and "shutdown" means that time during which an air contaminant source or emission-control equipment is brought into normal operation or normal operation is terminated, respectively.

(112) "Stationary source" means any building, structure, facility, or installation that emits or may emit any regulated air pollutant.

(113) "Substantial Underpayment" means the lesser of ten percent (10%) of the total interim emission fee for the major source or five hundred dollars.

(114) "Synthetic minor source" means a source which would be classified as a major source under OAR 340-28-110, but for physical or operational limits on its potential to emit air pollutants contained in an ACDP issued by the Department under OAR 340-28-1700 through 340-28-1790.

(115) "Title I modification" means one of the following modifications pursuant to Title I of the FCAA:

(a) a major modification subject to OAR 340-28-1930, Requirements for Sources in Nonattainment Areas;

(b) a major modification subject to OAR 340-28-1940, Prevention of Significant Deterioration Requirements for Sources in Attainment or Unclassified Areas ;

(c) a change which is subject to a New Source Performance Standard under Section 111 of the FCAA; or

(d) a modification under Section 112 of the FCAA.

(116) "Total Suspended Particulate" or "TSP" means particulate matter as measured by the reference method described in 40 CFR Part 50, Appendix B (July 1, 1993).

(117) "Total Reduced Sulfur" or "TRS" means the sum of the sulfur compounds hydrogen sulfide, methyl mercaptan, dimethyl sulfide, and dimethyl disulfide, and any other organic sulfides present expressed as hydrogen sulfide (H_2S).

(118) "Typically Achievable Control Technology" or "TACT" means the emission limit established on a case-by-case basis for a criteria pollutant from a particular emissions unit in accordance with OAR 340-28-630. For existing sources, the emission limit established shall be typical of the emission level achieved by emissions units similar in type and size. For new and modified sources, the emission limit established shall be typical of the emission level achieved by well controlled new or modified emissions units similar in type and size that were recently installed. TACT determinations shall

be based on information known to the Department considering pollution prevention, impacts on other environmental media, energy impacts, capital and operating costs, cost effectiveness, and the age and remaining economic life of existing emission control equipment. The Department may consider emission control technologies typically applied to other types of emissions units where such technologies could be readily applied to the emissions unit. If an emission limitation is not feasible, a design, equipment, work practice, or operational standard, or combination thereof, may be required.

(119) "Unavoidable" or "could not be avoided" means events which are not caused entirely or in part by poor or inadequate design, operation, maintenance, or any other preventable condition in either process or control equipment.

(120) "Upset" or "Breakdown" means any failure or malfunction of any pollution control equipment or operating equipment which may cause an excess emission.

(121) "Verified Emission Factor" means an emission factor approved by the Department and developed for a specific major source or source category and approved for application to that major source by the Department.

(122) "Visibility Impairment" means any humanly perceptible change in visual range, contrast or coloration from that which would have existed under natural conditions. Natural conditions include fog, clouds, windblown dust, rain, sand, naturally ignited wildfires, and natural aerosols.

(123) "Volatile Organic Compounds" or "VOC" means any compound of carbon, excluding carbon monoxide, carbon dioxide, carbonic acid, metallic carbides, or carbonates, and ammonium carbonate, which participates in atmospheric photochemical reactions.

(a) This includes any such organic compound other than the following, which have been determined to have negligible photochemical reactivity: ~~[M]~~methane; ethane; methylene chloride (dichloromethane); 1,1,1-trichloroethane (methyl chloroform); 1,1,1-trichloro-2,2,2-trifluoroethane (CFC-113); Trichlorofluoromethane (CFC-11); dichlorodifluoromethane (CFC-12); chlorodifluoromethane (CFC-22); trifluoromethane (FC-23); 1,2-dichloro-1,1,2,2-tetrafluoroethane (CFC-114); chloropentafluoroethane (CFC-115); 1,1,1-trifluoro 2,2-dichloroethane (HCFC-123); 1,1,1,2-tetrafluoroethane (HFC-134a); 1,1-dichloro 1-fluoroethane (HCFC-141b); 1-chloro 1,1-difluoroethane (HCFC-142b); 2-chloro-1,1,1,2-tetrafluoroethane (HCFC-124); pentafluoroethane (HFC-125); 1,1,2,2-tetrafluoroethane(HFC-134); 1,1,1-trifluoroethane(HFC-143a); 1,1-difluoroethane (HFC-152a); and perfluorocarbon compounds which fall into these classes:

(A) Cyclic, branched, or linear, completely fluorinated alkanes;

(B) Cyclic, branched, or linear, completely fluorinated ethers with no unsaturations;

(C) Cyclic, branched, or linear, completely fluorinated tertiary amines with no unsaturations; and

(D) Sulfur containing perfluorocarbons with no unsaturations and with sulfur bonds only to carbon and fluorine.

(b) For purposes of determining compliance with emissions limits, VOC will be measured by an applicable reference method in accordance with the Department's **Source Sampling Manual, January, 1992**. Where such a method also measures compounds with negligible photochemical reactivity, these negligibly-reactive compounds, as listed in subsection (a), may be excluded as VOC if the amount of such compounds is accurately quantified, and such exclusion is approved by the Department.

(c) As a precondition to excluding these compounds, as listed in subsection (a), as VOC or at any time thereafter, the Department may require an owner or operator to provide monitoring or testing methods and results demonstrating, to the satisfaction of the Department, the amount of negligibly-reactive compounds in the source's emissions.

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 47, f. 8-31-72, ef. 9-15-72; DEQ 63, f. 12-20-73, ef. 1-11-74; DEQ 107, f. & ef. 1-6-76; Renumbered from OAR 340-20-033.04; DEQ 25-1981, f. & ef. 9-8-81; DEQ 5-1983, f. & ef. 4-18-83; DEQ 18-1984, f. & ef. 10-16-84; DEQ 8-1988, f. & cert. ef. 5-19-88 (and corrected 5-31-88); DEQ 14-1989, f. & cert. ef. 6-26-89; DEQ 42-1990, f. 12-13-90, cert. ef. 1-2-91; DEQ 2-1992, f. & ef. 1-30-92; DEQ 27-1992, f. & ef. 11-12-92; Renumbered from OAR 340-20-145; Renumbered from OAR 340-20-225; Renumbered from OAR 340-20-305; Renumbered from OAR 340-20-355; Renumbered from OAR 340-20-460; Renumbered from OAR 340-20-520, DEQ 13-1993, f. & ef. 9-24-93; DEQ 19-1993, f. & ef. 11-4-93; DEQ 20-1993(T), f. & ef. 11-4-93; DEQ 13-1994, f. & ef. 5-19-94; DEQ 24-1994, f. & ef. 10-28-94

[**NOTE:** This rule is included in the State of Oregon Clean Air Act Implementation Plan as adopted by the EQC under OAR 340-20-047.]

Rules Applicable to All Stationary Sources

Scope

340-28-810

(1) Except as provided in section (2) of this rule, OAR 340-28-800 through 340-28-820 shall apply to the following classes of sources of air contaminant emission:
   (a) Air pollution control equipment;
   (b) Fuel burning equipment rated at 400,000 BTU per hour or greater;
   (c) Refuse burning equipment rated at 50 pounds per hour or greater;
   (d) Open burning operations;
   (e) Process equipment having emission to the atmosphere;
   (f) Such other sources as the Department may determine to be potentially significant sources of air contamination.

(2) OAR 340-28-800 through 340-28-820 shall not apply to ~~[federal]~~**Oregon Title V** ~~[o]~~Operating ~~[p]~~Permit program sources.

[**NOTE:** This rule is included in the State of Oregon Clean Air Act Implementation Plan as adopted by the EQC under OAR 340-20-047.]

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 15, f. 6-12-70, ef. 9-1-70; DEQ 37, f. 2-15-72, ef. 3-1-72; DEQ 4-1993, f. & cert. ef. 3-10-93; Renumbered from 340-20-025, DEQ 13-1993, f. & ef. 9-24-93

Rules Applicable to Sources Required to Have Air Contaminant Discharge Permits or ~~[Federal]~~Oregon Title V Operating Permits

Applicability

340-28-900 OAR 340-28-900 through 340-28-1520 apply to stationary sources that are required to obtain ACDPs under OAR 340-28-1720 or ~~[federal]~~Oregon Title V ~~[o]~~Operating ~~[p]~~Permits under OAR 340-28-2110.

[NOTE: This rule is included in the State of Oregon Clean Air Act Implementation Plan as adopted by the EQC under OAR 340-20-047.]

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 13-1993, f. & ef. 9-24-93; DEQ 19-1993, f. & ef. 11-4-93

Plant Site Emission Limits

Requirement for Plant Site Emission Limits

340-28-1010

(1) PSELs shall be incorporated in all ACDPs and ~~[federal]~~Oregon Title V ~~[o]~~Operating ~~[p]~~Permits except minimal source permits and special letter permits as a means of managing airshed capacity. Except as provided in OAR 340-28-1050 or 340-28-1060, all sources subject to regular permit requirements shall be subject to PSELs for all regulated pollutants. PSELs will be incorporated in permits when permits are renewed, modified, or newly issued.

(2) The emissions limits established by PSELs shall provide the basis for:
   (a) Assuring reasonable further progress toward attaining compliance with ambient air standards;
   (b) Assuring that compliance with ambient air standards and Prevention of Significant Deterioration increments are being maintained;
   (c) Administering offset, banking and bubble programs;
   (d) Establishing the baseline for tracking consumption of Prevention of Significant Deterioration Increments.

[NOTE: This rule is included in the State of Oregon Clean Air Act Implementation Plan as adopted by the EQC under OAR 340-20-047.]

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 25-1981, f. & ef. 9-8-81; DEQ 4-1993, f. & cert. ef. 3-10-93; Renumbered from OAR 340-20-301, DEQ 13-1993, f. & ef. 9-24-93; DEQ 19-1993, f. & ef. 11-4-93

Criteria for Establishing Plant Site Emission Limits

340-28-1020

(1) For existing sources, PSELs shall be based on the baseline emission rate for a particular pollutant at a source and shall be adjusted upward or downward pursuant to Department Rules:
   (a) If an applicant requests that the PSEL be established at a rate higher than the baseline

emission rate, the applicant shall:

(A) Demonstrate that the requested increase is less than the significant emission rate increase[~~*defined in OAR 340-28-110*~~]; or

(B) Provide an assessment of the air quality impact pursuant to procedures specified in OAR 340-28-1930 to 340-28-1940. A demonstration that no air quality standard or PSD increment will be violated in an attainment area or that a growth increment or offset is available in a nonattainment area shall be sufficient to allow an increase in the PSEL to an amount not greater than the plant's demonstrated need to emit as long as no physical modification of an emissions unit is involved.

(b) Increases above baseline emission rates shall be subject to public notice and opportunity for public hearing pursuant to applicable permit requirements.

(2) PSELs shall be established on at least an annual emission basis and a short term period emission basis that is compatible with source operation and air quality standards.

(3) Mass emission limits may be established separately within a particular source for process emissions, combustion emissions, and fugitive emissions.

(4) Documentation of PSEL calculations shall be available to the permittee.

(5) For new sources, PSELs shall be based on application of applicable control equipment requirements and projected operating conditions.

(6) PSELs shall not be established which allow emissions in excess of those allowed by any applicable federal or state regulation or by any specific permit condition unless specific provisions of OAR 340-28-1030 are met.

(7) PSELs may be changed pursuant to Department rules when:

(a) Errors are found or better data is available for calculating PSELs;

(b) More stringent control is required by a rule adopted by the Commission;

(c) An application is made for a permit modification pursuant to OAR 340-28-1700 through 340-28-1790, ACDPs, OAR 340-28-1900 through 340-28-2000, New Source Review, and approval can be granted based on growth increments, offsets, or available Prevention of Significant Deterioration increments, or OAR 340-28-2100 through 340-28-2320, Rules Applicable to Sources Required to Have [~~*Federal*~~]**Oregon Title V** Operating Permits; or

(d) The Department finds it necessary to initiate modifications of a permit pursuant to OAR 340-14-040, Modification of a Permit or OAR 340-28-2280, Reopenings.

[NOTE: This rule is included in the State of Oregon Clean Air Act Implementation Plan as adopted by the EQC under OAR 340-20-047.]

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 25-1981, f. & ef. 9-8-81; DEQ 4-1993, f. & cert. ef. 3-10-93; Renumbered from 340-20-310, DEQ 13-1993, f. & ef. 9-24-93; DEQ 19-1993, f. & ef. 11-4-93

Alternative Emission Controls (Bubble)

340-28-1030 Alternative emission controls may be approved for use within a plant site such that specific mass emission limit rules are exceeded provided that:

(1) Such alternatives are not specifically prohibited by a permit condition.

(2) Net emissions for each pollutant are not increased above the PSEL.

(3) The net air quality impact is not increased as demonstrated by procedures required by OAR 340-28-1970, Requirements for Net Air Quality Benefit.

(4) No other pollutants including malodorous, toxic or hazardous pollutants are substituted.

(5) BACT and LAER where required by a previously issued permit and NSPS, OAR 340-25-

505 through [~~530~~]**805**, and NESHAP, OAR 340-[~~25-450~~]**32-5500** through [~~340-25-485~~]**5650**, where required, are not relaxed.

(6) Specific mass emission limits are established for each emission unit involved such that compliance with the PSEL can be readily determined.

(7) Application is made for a permit modification and such modification is approved by the Department.

[NOTE: This rule is included in the State of Oregon Clean Air Act Implementation Plan as adopted by the EQC under OAR 340-20-047.]

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 25-1981, f. & ef. 9-8-81; DEQ 4-1993, f. & cert. ef. 3-10-93; Renumbered from 340-20-315, DEQ 13-1993, f. & ef. 9-24-93

Plant Site Emission Limits for Sources of Hazardous Air Pollutants
340-28-1050

(1) For purposes of establishing PSELs, hazardous air pollutants listed under OAR 340-32-130 or OAR 340-32-5400 shall not be considered regulated pollutants under OAR 340-28-1010 until such time as the Commission determines otherwise.

(2) The Department may establish PSELs for hazardous air pollutants for the following causes:
  (a) an owner or operator elects to establish a PSEL for any hazardous air pollutant emitted for purposes of determining emission fees as prescribed in OAR 340-28-2400 through 340-28-2550 or,
  (b) the source is subject to a hazardous air pollutant emission standard, limitation, or control requirement other than Plant Site Emission Limits.

(3) Procedures for establishing and modifying PSELs for hazardous air pollutant emissions shall be consistent with OAR 340-28-1020 except for the following:
  (a) a baseline emission rate shall not apply, and
  (b) the provisions of OAR 340-28-1030 shall not apply.

(4) PSELs established for hazardous air pollutants shall not be used for any provisions other than those prescribed in section (2) of this rule.

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 13-1993, f. & ef. 9-24-93; DEQ 19-1993, f. & ef. 11-4-93

Sampling, Testing and Measurement of Air Contaminant Emissions

Stack Heights and Dispersion Techniques
340-28-1110

(1) 40 CFR Parts 51.100(ff) through 51.100(kk), 51.118, 51.160 through 51.166 (July 1, 1993) are by this reference adopted and incorporated herein, concerning stack heights and dispersion techniques.

(2) In general, the rule prohibits the use of excessive stack height and certain dispersion techniques when calculating compliance with ambient air quality standards. The rule does not forbid the construction and actual use of excessively tall stacks, nor use of dispersion

techniques; it only forbids their use in calculations as noted above.

(3) The rule has the following general applicability. With respect to the use of excessive stack height, stacks 65 meters high or greater, constructed after December 31, 1970, and major modifications to existing plants after December 31, 1970 with stacks 65 meters high or greater which were constructed before that date, are subject to this rule, with the exception that certain stacks at federally-owned, coal-fired steam electric generating units constructed under a contract awarded before February 8, 1974, are exempt. With respect to the use of dispersion techniques, any technique implemented after December 31, 1970, at any plant is subject to this rule. However, if the plant's total allowable emissions of sulfur dioxide are less than 5,000 tons per year, then certain dispersion techniques to increase final exhaust gas plume rise are permitted to be used when calculating compliance with ambient air quality standards for sulfur dioxide:

(a) Where found in the federal rule, the term "reviewing agency" means the Department, LRAPA, or the EPA, as applicable;

(b) Where found in the federal rule, the term "authority administering the State Implementation Plan" means Department, LRAPA, or EPA;

(c) The "procedures" referred to in **40 CFR 51.164** are the New Source Review procedures at the Department (OAR 340-28-1900 to 340-28-2000) or at LRAPA (Title 38), and the review procedures for new, or modifications to, minor sources, at the Department (OAR 340-28-800 to 340-28-820, 340-28-1700 to 340-28-1790) or at LRAPA (Title 34[~~*and OAR 38-045*~~]);

(d) Where "the state" or "state, or local control agency" is referred to in **40 CFR 51.118**, it means the Department or LRAPA;

(e) Where found in the federal rule, the terms "applicable state implementation plan" and "plan" refer to the programs and rules of the Department or LRAPA, as approved by the EPA, or any EPA-promulgated regulations (see **40 CFR Part 52, Subpart MM**).

[**Publications:** The publication(s) referred to or incorporated by reference in this rule are available from the office of the Department.]

[**NOTE:** This rule is included in the State of Oregon Clean Air Act Implementation Plan as adopted by the EQC under OAR 340-20-047.]

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 11-1986, f. & ef. 5-12-86; DEQ 4-1993, f. & cert. ef. 3-10-93; Renumbered from OAR 340-20-037, DEQ 13-1993, f. & ef. 9-24-93; DEQ 19-1993, f. & ef. 11-4-93

Emission Statements for VOC and No_x Sources in Ozone Nonattainment Areas

Purpose and Applicability

340-28-1500

(1) The purpose of these rules is to obtain data on actual emissions of VOCs and NO_x from sources in ozone nonattainment areas, in accordance with FCAA requirements, for the purpose of monitoring progress toward attainment of the ozone national ambient air quality standard.

(2) This rule shall apply to sources of VOC and NO_x in ozone nonattainment areas, with a

PSEL equal to or greater than 25 tons per year for either pollutant, and to any source whose actual emissions are equal to or greater than 25 tons per year.

(3) For purposes of establishing consistent emission reporting requirements, owners or operators of VOC and NO_x sources already subject to the Department's Interim Emission Fee Rules, OAR 340-28-2400 through 340-28-2550 **and the Oregon Title V Operating Permit Rules, OAR 340-28-2560 through 2740**, and electing to pay fees based on actual emissions shall report emission data to the Department, utilizing procedures identified in those rules to calculate actual VOC and NO_x emissions, to the extent applicable. Owners or operators of other sources shall use current and applicable emission factors and actual production data to estimate and report actual emissions.

Stat. Auth.: ORS Ch. 468A
Hist: DEQ 27-1992, f. & ef. 11-12-92; Renumbered from OAR 340-20-450, DEQ 13-1993, f. & ef. 9-24-93; DEQ 19-1993, f. & ef. 11-4-93

[NOTE: This rule is included in the State of Oregon Clean Air Act Implementation Plan as adopted by the EQC under OAR 340-20-047.]

Submission of Emission Statement

340-28-1520 The owner or operator of any facility meeting the applicability requirements stated in OAR 340-28-1500 shall submit annual Emission Statements to the Department beginning in 1993. The Emission Statement for the preceding calendar year is due to the Department no later than~~[either February 28 or]~~ the due date for the annual permit report specified in the source's ACDP or ~~[federal]~~**Oregon Title V** ~~[o]~~Operating ~~[p]~~Permit.

Stat. Auth.: ORS 468A
Hist.: DEQ 27-1992, f. & ef. 11-12-92; DEQ 4-1993, f. & cert. ef. 3-10-93; Renumbered from 340-20-480, DEQ 13-1993, f. & ef. 9-24-93

[NOTE: This rule is included in the State of Oregon Clean Air Act Implementation Plan adopted by the EQC under OAR 340-20-047.]

Rules Applicable to Sources Required to Have Air Contaminant Discharge Permits

Air Contaminant Discharge Permits

Purpose

340-28-1700 The purpose of OAR 340-28-1700 through 340-28-1790 is to prescribe the requirements and procedures for obtaining ACDPs pursuant to ORS 468A.040 through 468A.060 and related statutes for stationary sources. OAR 340-28-1700 through 340-28-1790 shall not apply to ~~[federal]~~**Oregon Title V** ~~[o]~~Operating ~~[p]~~Permit program sources unless an ACDP is required by OAR 340-28-1720(2), OAR 340-28-1720(4), OAR 340-28-1740, or OAR 340-28-1900(1).

[NOTE: This rule is included in the State of Oregon Clean Air Act Implementation Plan as adopted by the EQC under OAR 340-20-047.]

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 47, f. 8-31-72, ef. 9-15-72; DEQ 63, f. 12-20-73, ef. 1-11-74; DEQ 107, f. & ef. 1-6-86; Renumbered from 340-20-033.02; DEQ 4-1993, f. & cert. ef. 3-10-93; Renumbered from OAR 340-20-140, DEQ 13-1993, f. & ef. 9-24-93

Permit Required

340-28-1720

(1) No person shall construct, install, establish, develop or operate any air contaminant source which is referred to in **Table 4**, appended hereto and incorporated herein by reference, without first obtaining an Air Contaminant Discharge Permit (ACDP) from the Department or Regional Authority.

(2) No person shall construct, install, establish, or develop any major source, as defined by OAR 340-28-2110 that will be subject to the ~~[federal]~~**Oregon Title V** ~~[o]~~Operating ~~[p]~~Permit program without first obtaining an ACDP from the Department or Regional Authority. Any ~~[federal]~~**Oregon Title V** ~~[o]~~Operating ~~[p]~~Permit program source required to have obtained an ACDP prior to construction shall:

(a) choose to become a synthetic minor source, OAR 340-28-1740, and remain in the ACDP program; or

(b) file a complete application to obtain the ~~[federal]~~**Oregon Title V** ~~[o]~~Operating ~~[p]~~Permit within 12 months after initial startup.

(3) No person shall modify any source covered by an ACDP under OAR 340-28-1700 through 340-28-1790 such that the emissions are significantly increased without first applying for and obtaining a permit modification.

(4) No person shall modify any source required to be covered by an ACDP under OAR 340-28-1700 through 340-28-1790 such that the source becomes subject to the ~~[federal]~~**Oregon Title V** ~~[o]~~Operating ~~[p]~~Permit program, OAR 340-28-2100 through 340-28-2320 without first applying for and obtaining a modified ACDP. Any ~~[federal]~~**Oregon Title V** ~~[o]~~Operating ~~[p]~~Permit program source required to have obtained an ACDP prior to modification shall:

(a) choose to become a synthetic minor source, OAR 340-28-1740, and remain in the ACDP program;

(b) choose to remain a synthetic minor source, OAR 340-28-1740, and remain in the ACDP program; or

(c) file a complete application to obtain the ~~[federal]~~**Oregon Title V** ~~[o]~~Operating ~~[p]~~Permit within 12 months after initial startup of the modification.

(5) No person shall increase emissions above the PSEL or operate in excess of the enforceable condition to limit potential to emit and remain a synthetic minor source without first applying for and obtaining a modified ACDP.

(6) No person shall modify any source covered by an ACDP under OAR 340-28-1700 through 340-28-1790 and not required to obtain a~~[federal]~~**n Oregon Title V** ~~[o]~~Operating ~~[p]~~Permit such that:

(a) The process equipment is substantially changed or added to; or

(b) The emissions are significantly changed without first notifying the Department.

(7) Any owner or operator may apply to the Department or Regional Authority for a special letter permit if operating a facility with no, or insignificant, air contaminant discharges. The determination of applicability of this special permit shall be made solely by the Department or Regional Authority having jurisdiction. If issued a special permit, the application processing fee and/or annual compliance determination fee, provided by OAR 340-28-1750, may be waived by the Department or Regional Authority.

(8) The Department may designate any source as a "Minimal Source" based upon the following

criteria:

(a) Quantity and quality of emissions;
(b) Type of operation;
(c) Compliance with Department regulations; and
(d) Minimal impact on the air quality of the surrounding region. If a source is designated as a minimal source, the annual compliance determination fee, provided by OAR 340-28-1750, will be collected no less frequently than every five (5) years.

[**NOTE:** This rule is included in the State of Oregon Clean Air Act Implementation Plan as adopted by the EQC under OAR 340-20-047.]

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 47, f. 8-31-72, ef. 9-15-72; DEQ 63, f. 12-20-73, ef. 1-11-74; DEQ 107, f. & ef. 1-6-76; Renumbered from 340-20-033.08; DEQ 125, f. & ef. 12-16-76; DEQ 20-1979, f. & ef. 6-29-79; DEQ 23-1980, f. & ef. 9-26-80; DEQ 13-1981, f. 5-6-81, ef. 7-1-81; DEQ 11-1983, f. & ef. 5-31-83; DEQ 3-1986, f. & ef. 2-12-86; DEQ 12-1987, f. & ef. 6-15-87; DEQ 4-1993, f. & cert. ef. 3-10-93; Renumbered from OAR 340-20-155, DEQ 13-1993, f. & ef. 9-24-93; DEQ 19-1993, f. & ef. 11-4-93

Synthetic Minor Sources

340-28-1740

(1) Enforceable conditions to limit a source's potential to emit shall be included in the ACDP for a synthetic minor source. Enforceable conditions, in addition to the PSEL established under OAR 340-28-1000 through 340-28-1060, shall include one or more of the following physical or operational limitations but in no case shall exceed the conditions used to establish the PSEL:
   (a) restrictions on hours of operation;
   (b) restrictions on levels of production;
   (c) restrictions on the type or amount of material combusted, stored, or processed;
   (d) additional air pollution control equipment; or
   (e) other limitations on the capacity of a source to emit air pollutants.

(2) The reporting and monitoring requirements of the conditions which limit the potential to emit contained in the ACDP of synthetic minor sources shall meet the requirements of OAR 340-28-1100 through 340-28-1140.

(3) To avoid being required to submit an application for a[~~*federal*~~]**n Oregon Title V** [~~*o*~~]Operating [~~*p*~~]Permit, the owner or operator of a major source shall obtain an ACDP or a modification to an ACDP containing conditions that would qualify the source as a synthetic minor source before the owner or operator would be required to submit a[~~*federal*~~]**n Oregon Title V** [~~*o*~~]Operating [~~*p*~~]Permit application.

(4) Applications for synthetic minor source status shall be subject to notice procedures of OAR 340-28-1710.

(5) Synthetic minor source owners or operators who cause their source to be subject to the [~~*federal*~~]**Oregon Title V** [~~*o*~~]Operating [~~*p*~~]Permit program by requesting an increase in the source's potential to emit, when that increase uses the source's existing capacity and does not result from construction or modification, shall:
   (a) become subject to OAR 340-28-2100 through 340-28-2320;
   (b) submit a[~~*federal*~~]**n Oregon Title V** [~~*o*~~]Operating [~~*p*~~]Permit application pursuant to OAR 340-28-2120; and
   (c) receive a[~~*federal*~~]**n Oregon Title V** [~~*o*~~]Operating [~~*p*~~]Permit before commencing operation in excess of the enforceable condition to limit potential to emit.

(6) Synthetic minor source owners or operators who cause their source to be subject to the

~~[federal]~~**Oregon Title V** ~~[o]~~Operating ~~[p]~~Permit program by requesting an increase in the source's potential to emit, when that increase is the result of construction or modification, shall:

(a) submit an application for the modification of the existing ACDP;
(b) receive the modified ACDP before beginning construction or modification;
(c) become subject to OAR 340-28-2100 through 340-28-2320; and
(d) submit a~~[federal]~~n **Oregon Title V** ~~[o]~~Operating ~~[p]~~Permit application under OAR 340-28-2120 to obtain a~~[federal]~~n **Oregon Title V** ~~[o]~~Operating ~~[p]~~Permit within 12 months after initial startup of the construction or modification.

(7) Synthetic minor sources that exceed the limitations on potential to emit are in violation of OAR 340-28-2110(1)(a).

[**NOTE:** This rule is included in the State of Oregon Clean Air Act Implementation Plan as adopted by the EQC under OAR 340-20-047.]

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 13-1993, f. & ef. 9-24-93; DEQ 19-1993, f. & ef. 11-4-93

Fees and Permit Duration

340-28-1750

(1) All persons required to obtain a permit shall be subject to a three part fee consisting of a uniform non-refundable filing fee of $75, an application processing fee, and an annual compliance determination fee which are determined by applying Table 4, Part II. The amount equal to the filing fee, application processing fee, and the annual compliance determination fee shall be submitted as a required part of any application for a new permit. The amount equal to the filing fee and the application processing fee shall be submitted with any application for modification of a permit. ~~[*The amount equal to the filing fee, application processing fee, and the annual compliance determination fee shall be submitted with any application for a renewed permit.*]~~

(2) The fee schedule contained in the listing of air contaminant sources in Table 4 shall be applied to determine the fees for ACDP user fees (Table 4, Part I.) and ACDP fees (Table 4, Part II.) on a Standard Industrial Classification (SIC) plant site basis.

(3) Modifications of existing, unexpired permits which are instituted by the Department or Regional Authority due to changing conditions or standards, receipts or additional information, or any other reason pursuant to applicable statutes and do not require refiling or review of an application or plans and specifications shall not require submission of the filing fee or the application processing fee.

(4) Applications for multiple-source permits received pursuant to OAR 340-28-1730 shall be subject to a single $75 filing fee. The application processing fee and annual compliance determination fee for multiple-source permits shall be equal to the total amounts required by the individual sources involved, as listed in Table 4.

(5) The annual compliance determination fee shall be paid at least 30 days prior to the start of each subsequent permit year. Failure to timely remit the annual compliance determination fee in accordance with the above shall be considered grounds for not issuing a permit or revoking an existing permit.

(6) If a permit is issued for a period less than one (1) year, the applicable annual compliance determination fee shall be equal to the full annual fee. If a permit is issued for a period greater than 12 months, the applicable annual compliance determination fee shall be prorated by multiplying the annual compliance determination fee by the number of months covered

by the permit and dividing by twelve (12).

(7) In no case shall a permit be issued for more than ten (10) years, except for synthetic minor source permits which shall not be issued for more than five (5) years.

(8) Upon accepting an application for filing, the filing fee shall be non-refundable.

(9) When an air contaminant source which is in compliance with the rules of a permit issuing agency relocates or proposes to relocate its operation to a site in the jurisdiction of another permit issuing agency having comparable control requirements, application may be made and approval may be given for an exemption of the application processing fee. The permit application and the request for such fee reduction shall be accompanied by:
   (a) A copy of the permit issued for the previous location; and
   (b) Certification that the permittee proposes to operate with the same equipment, at the same production rate, and under similar conditions at the new or proposed location. Certification by the agency previously having jurisdiction that the source was operated in compliance with all rules and regulations will be acceptable should the previous permit not indicate such compliance.

(10) If a temporary or conditional permit is issued in accordance with adopted procedures, fees submitted with the application for an ACDP shall be retained and be applicable to the regular permit when it is granted or denied.

(11) All fees shall be made payable to the permit issuing agency.

(12) Pursuant to ORS 468A.135, a regional authority may adopt fees in different amounts than set forth in Table 4 provided such fees are adopted by rule and after hearing and in accordance with ORS 468.065(2).

(13) Sources which are temporarily not conducting permitted activities, for reasons other than regular maintenance or seasonal limitations, may apply for use of a modified annual compliance determination fee in lieu of an annual compliance determination fee determined by applying Table 4. A request for use of the modified annual compliance determination fee shall be submitted to the Department in writing along with the modified annual compliance determination fees on or before the due date of the annual compliance determination fee. The modified annual compliance determination fee shall be $385.

(14) Owners or operators who have received Department approval for payment of a modified annual compliance determination fee shall obtain authorization from the Department prior to resuming permitted activities. Owners or operators shall submit written notification to the Department at least thirty (30) days before startup specifying the earliest anticipated startup date, and accompanied by:
   (a) Payment of the full annual compliance determination fee determined from Table 4 if greater than six (6) months would remain in the billing cycle for the source, or
   (b) Payment of 50% of the annual compliance determination fee determined from Table 4 if six (6) months or less would remain in the billing cycle.

[**NOTE:** This rule is included in the State of Oregon Clean Air Act Implementation Plan as adopted by the EQC under OAR 340-20-047.]

Stat. Auth.: ORS Ch. 468 & 468A

Hist.: DEQ 47, f. 8-31-72, ef. 9-15-72; DEQ 63, f. 12-20-73, ef. 1-11-74; DEQ 107, f. & ef. 1-6-76; Renumbered from 340-20-033.12; DEQ 125, f. & ef. 12-16-76; DEQ 20-1979, f. & ef. 6-29-79; DEQ 11-1983, f. & ef. 5-31-83; DEQ 6-1986, f. & ef. 3-26-86; DEQ 12-1987, f. & ef. 6-15-87; DEQ 17-1990, f. & cert. ef. 5-25-90; AQ 4-1992, f. & ef. 12-2-91; AQ 1-1993, f. & ef. 3-9-93; Renumbered from OAR 340-20-165; AQ 9-1993, f & ef. 9-24-93; AQ 11-1993 Temp., f. & ef. 11-2-93; DEQ 13-1994, f. & ef. 5-19-94; DEQ 21-1994, f. & ef. 10-14-94; DEQ 22-1994, f. & ef. 10-14-94

Permit Program For Regional Air Pollution Authority

340-28-1790 Subject to the provisions of this rule, the Commission authorizes the Regional Authority to issue, modify, renew, suspend, and revoke ACDPs or ~~[federal]~~**Oregon Title V** ~~[o]~~Operating ~~[p]~~Permits for air contamination sources within its jurisdiction.

(1) Each permit proposed to be issued or modified by the Regional authority shall be submitted to the Department at least thirty (30) days prior to the proposed issuance date.

(2) A copy of each permit issued, modified, or revoked by the Regional authority shall be promptly submitted to the Department.

[**NOTE:** This rule is included in the State of Oregon Clean Air Act Implementation Plan as adopted by the EQC under OAR 340-20-047.]

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 47, f. 8-31-72, ef. 9-15-72; DEQ 63, f. 12-20-73, ef. 1-11-74; DEQ 107, f. & ef. 1-6-76; Renumbered from 340-20-033.20; AQ 1-1993, f. & ef. 3-9-93; Renumbered from OAR 340-20-185, DEQ 13-1993, f. & ef. 9-24-93

New Source Review

Procedural Requirements

340-28-1910

(1) Information Required. The owner or operator of a proposed major source or major modification shall submit all information necessary to perform any analysis or make any determination required under these rules. Such information shall include, but not be limited to:

(a) A description of the nature, location, design capacity, and typical operating schedule of the source or modification, including specifications and drawings showing its design and plant layout;

(b) An estimate of the amount and type of each air contaminant emitted by the source in terms of hourly, daily, and yearly rates, showing the calculation procedure;

(c) A detailed schedule for construction of the source or modification;

(d) A detailed description of the air pollution control equipment and emission reduction processes which are planned for the source or modification, and any other information necessary to determine that BACT or LAER technology, whichever is applicable, would be applied;

(e) To the extent required by these rules, an analysis of the air quality and/or visibility impact of the source or modification, including meteorological and topographical data, specific details of models used, and other information necessary to estimate air quality impacts; and

(f) To the extent required by these rules, an analysis of the air quality and/or visibility impacts, and the nature and extent of all commercial, residential, industrial, and other source emission growth which has occurred since January 1, 1978, in the area the source or modification would affect.

(g) The owner or operator of a source for which a~~[federal]~~**n Oregon Title V** ~~[o]~~Operating ~~[p]~~**P**ermit has been issued who applies for a permit to construct or modify under OAR 340-28-1900 through 340-28-2000 may request that an enhanced New Source Review process be used, including the external review procedures required under OAR 340-28-2290 and OAR 340-28-2310 instead of the notice procedures under this rule to allow for subsequent incorporation of the construction permit as an administrative

amendment. All information required under OAR 340-28-2120 shall be submitted as part of any such request.

(2) Other Obligations:

(a) Any owner or operator who constructs or operates a source or modification not in accordance with the application submitted pursuant to OAR 340-28-1900 through 340-28-2000 or with the terms of any approval to construct, or any owner or operator of a source or modification subject to OAR 340-28-1900 who commences construction without applying for and receiving an ACDP, shall be subject to appropriate enforcement action;

(b) Approval to construct shall become invalid if construction is not commenced within 18 months after receipt of such approval, if construction is discontinued for a period of 18 months or more, or if construction is not completed within 18 months of the scheduled time. The Department may extend the 18-month period upon satisfactory showing that an extension is justified. This provision does not apply to the time period between construction of the approved phases of a phased construction project; each phase shall commence construction within 18 months of the projected and approved commencement date;

(c) Approval to construct shall not relieve any owner or operator of the responsibility to comply fully with applicable provisions of the State Implementation Plan and any other requirements under local, state or federal law.

(d) Approval to construct a source under an ACDP issued under paragraph (3)(b)(I) of this rule shall authorize construction and operation of the source,except as prohibited in subsection (e) of this rule, until the later of:

(A) One year from the date of initial startup of operation of the major source or major modification, or

(B) If a timely and complete application for a~~[*federal*]~~**n Oregon Title V** ~~[*o*]~~**O**perating ~~[*p*]~~**P**ermit is submitted, the date of final action by the Department on the ~~[*federal*]~~**Oregon Title V** ~~[*o*]~~**O**perating ~~[*p*]~~**P**ermit application.

(e) Where an existing ~~[*federal*]~~**Oregon Title V** ~~[*o*]~~**O**perating ~~[*p*]~~**P**ermit would prohibit such construction or change in operation, the owner or operator must obtain a permit revision before commencing operation.

(3) Public Participation:

(a) Within 30 days after receipt of an application to construct, or any addition to such application, the Department shall advise the applicant of any deficiency in the application or in the information submitted. The date of the receipt of a complete application shall be, for the purpose of this section, the date on which the Department received all required information;

(b) Notwithstanding the requirements of OAR 340-14-020 or OAR 340-28-2120, but as expeditiously as possible and at least within six months after receipt of a complete application, the Department shall make a final determination on the application. This involves performing the following actions in a timely manner:

(A) Make a preliminary determination whether construction should be approved, approved with conditions, or disapproved;

(B) Make available for a 30-day period in at least one location a copy of the permit application, a copy of the preliminary determination, and a copy or summary of other materials, if any, considered in making the preliminary determination;

(C) Notify the public, by advertisement in a newspaper of general circulation in the area in which the proposed source or modification would be constructed, of the application, the preliminary determination, the extent of increment consumption

that is expected from the source or modification, the opportunity for a public hearing and for written public comment and, if applicable, that an enhanced New Source Review process, including the external review procedures required under OAR 340-28-2290 and OAR 340-28-2310, is being used to allow for subsequent incorporation of the operating approval into a[~~federal~~]n Oregon Title V [~~o~~]Operating [~~p~~]Permit as an administrative amendment;

(D) Send a copy of the notice of opportunity for public comment to the applicant and to officials and agencies having cognizance over the location where the proposed construction would occur as follows: The chief executives of the city and county where the source or modification would be located, any comprehensive regional land use planning agency, any State, Federal Land Manager, or Indian Governing Body whose lands may be affected by emissions from the source or modification, and the EPA;

(E) Upon determination that significant interest exists, or upon written requests for a hearing from ten (10) persons or from an organization or organizations representing at least ten persons, provide opportunity for a public hearing for interested persons to appear and submit written or oral comments on the air quality impact of the source or modification, alternatives to the source or modification, the control technology required, and other appropriate considerations. For energy facilities, the hearing may be consolidated with the hearing requirements for site certification contained in OAR Chapter 345, Division 15;

(F) Consider all written comments submitted within a time specified in the notice of public comment and all comments received at any public hearing(s) in making a final decision on the approvability of the application. No later than 10 working days after the close of the public comment period, the applicant may submit a written response to any comments submitted by the public. The Department shall consider the applicant's response in making a final decision. The Department shall make all comments available for public inspection in the same locations where the Department made available preconstruction information relating to the proposed source or modification;

(G) Make a final determination whether construction should be approved, approved with conditions, or disapproved pursuant to this section;

(H) Notify the applicant in writing of the final determination and make such notification available for public inspection at the same location where the Department made available preconstruction information and public comments relating to the source or modification.

(I) After the effective date of Oregon's program to implement the [~~federal~~]Oregon Title V [~~o~~]Operating [~~p~~]Permit program, the owner or operator of a source subject to OAR 340-28-2110 who has received a permit to construct or modify under OAR 340-28-1900 through 340-28-2000, shall submit an application for an [~~federal~~]Oregon Title V [~~o~~]Operating [~~p~~]Permit within one year of initial startup of the construction or modification, unless the [~~federal~~]Oregon Title V [~~o~~]Operating [~~p~~]Permit prohibits such construction or change in operation. The [~~federal~~]Oregon Title V [~~o~~]Operating [~~p~~]Permit application shall include the following information:

(i) information required by OAR 340-28-2120, if not previously included in the ACDP application;

(ii) a copy of the existing ACDP;

(iii) information on any changes in the construction or operation from the existing ACDP, if applicable; and

(iv) any monitoring or source test data obtained during the first year of operation.

[NOTE: This rule is included in the State of Oregon Clean Air Act Implementation Plan as adopted by the EQC under OAR 340-20-047.]

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 25-1981, f. & ef. 9-8-81; DEQ 18-1984, f. & ef. 10-16-84; DEQ 13-1988, f. & cert. ef. 6-17-88; DEQ 4-1993, f. & cert. ef. 3-10-93; Renumbered from 340-20-230, DEQ 13-1993, f. & ef. 9-24-93; DEQ 19-1993, f. & ef. 11-4-93; DEQ 24-1994, f. & ef. 10-28-94

Requirements for Sources in Nonattainment Areas
340-28-1930

Proposed new major sources and major modifications which would emit a nonattainment pollutant within a designated nonattainment area[s], including VOC or NO_x in a designated Ozone Nonattainment Area, shall meet the requirements listed below:

(1) LAER. The owner or operator of the proposed major source or major modification shall demonstrate that the source or modification will comply with the LAER for each nonattainment pollutant which is emitted at or above the significant emission rate . In the case of a major modification, the requirement for LAER shall apply only to each new or modified emission unit which increases emissions. For phased construction projects, the determination of LAER shall be reviewed at the latest reasonable time prior to commencement of construction of each independent phase.

(2) Source Compliance. The owner or operator of the proposed major source or major modification shall demonstrate that all major sources owned or operated by such person (or by an entity controlling, controlled by, or under common control with such person) in the state are in compliance or on a schedule for compliance, with all applicable emission limitations and standards under the Act.

(3) Offsets. The owner or operator of the proposed major source or major modification shall provide offsets as specified in OAR 340-28-1960 and 340-28-1970.

(4) Net Air Quality Benefit. For cases in which emission reductions or offsets are required, the applicant shall demonstrate that a net air quality benefit will be achieved in the affected area as described in OAR 340-28-1970 and that the reductions are consistent with reasonable further progress toward attainment of the air quality standards. Applicants in an ozone nonattainment area shall demonstrate that the proposed VOC or NO_x offsets will result in a 10% net reduction in emissions, as required by OAR 340-28-1970(3)(c).

(5) Alternative Analysis:

(a) The owner or operator of a proposed new major source or major modification shall conduct an alternative analysis for each nonattainment pollutant emitted at or above the significant emission rate , except that no analysis shall be required for TSP;

(b) This analysis shall include an evaluation of alternative sites, sizes, production processes, and environmental control techniques for such proposed source or modification which demonstrates that benefits of the proposed source or modification significantly outweigh the environmental and social costs imposed as a result of its location, construction or modification.

(6) Special Exemption for the Salem Ozone Nonattainment Area. Proposed new major sources and major modifications which are located in or impact the Salem Ozone Nonattainment Area are exempt from OAR 340-28-1970 and sections (3) through (5) of this rule for VOC

and NO_x emissions with respect to ozone formation in the Salem Ozone Nonattainment area.

(7) Special requirements for the Klamath Falls Urban Growth Area. For the Klamath Falls Urban Growth Area, particulate matter or PM_{10} emission increases of 5.0 or more tons per year shall be fully offset, but the application of LAER is not required unless the emission increase is 15 or more tons per year. At the option of the owner or operator of a source with particulate matter or PM_{10} emissions of 5.0 or more tons per year but less than 15 tons per year, LAER control technology may be applied in lieu of offsets.

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 25-1981, f. & ef. 9-8-81; DEQ 5-1983, f. & ef. 4-18-83; DEQ 27-1992, f. & ef. 11-12-92; DEQ 4-1993, f. & cert. ef. 3-10-93, Renumbered from 340-20-240, DEQ 13-1993, f. & ef. 9-24-93; DEQ 19-1993, f. & ef. 11-4-93

[NOTE: This rule is included in the State of Oregon Clean Air Act Implementation Plan as adopted by the EQC under OAR 340-20-047.]

Exemptions

340-28-1950

(1) Temporary emission sources[~~,~~] which would be in operation at a site for less than two years, such as pilot plants and portable facilities, and emissions resulting from the construction phase of a new source or modification shall comply with OAR 340-28-1930(1) and (2) or OAR 340-28-1940(1), whichever is applicable, but are exempt from the remaining requirements of OAR 340-28-1930 and OAR 340-28-1940 provided that the source or modification would **not** impact [~~*no*~~]**a** Class I area or [~~*no*~~]**an** area where an applicable [~~*increment in*~~]**requirementis** known to be violated.

(2) Proposed increases in hours of operation or production rates which would cause emission increases above the levels allowed in a permit and would not involve a physical change in the source may be exempted from the requirement of OAR 340-28-1940(1) provided that the increases cause no exceedances of an increment or standard and that the net impact on a nonattainment area is less than the significant air quality impact levels. This exemption shall not be allowed for new sources or modifications that received permits to construct after January 1, 1978.

(3) Also refer to OAR 340-28-1940(3) for exemptions pertaining to sources smaller than the Federal Size-Cutoff Criteria.

(4) Emissions of hazardous air pollutants that are subject to a MACT standard under OAR 340-32-500 or OAR 340-32-4500 shall not be subject to OAR 340-28-1940.

[NOTE: This rule is included in the State of Oregon Clean Air Act Implementation Plan as adopted by the EQC under OAR 340-20-047.]

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 25-1981, f. & ef. 9-8-81; DEQ 4-1993, f. & cert. ef. 3-10-93; Renumbered from 340-20-250, DEQ 13-1993, f. & ef, 9-24-93; DEQ 19-1993, f. & ef. 11-4-93

Rules Applicable to Sources Required to Have [*Federal*]Oregon Title V Operating Permits

Policy and Purpose

340-28-2100 These rules establish a program to implement Title V of the FCAA for the State of Oregon as part of the overall industrial source control program.

(1) All sources subject to OAR 340-28-2100 through 340-28-2320 shall have an [*federal*]**Oregon Title V** [*o*]Operating [*p*]Permit that assures compliance by the source with all applicable requirements in effect as of the date of permit issuance.

(2) The requirements of the [*federal*]**Oregon Title V** [*o*]Operating [*p*]Permit program, including provisions regarding schedules for submission and approval or disapproval of permit applications, shall apply to the permitting of affected sources under the national acid rain program, except as provided herein.

(3) All sources subject to OAR 340-28-2100 through 340-28-2320 are exempt from the following:
   (a) registration as required by ORS 468A.050 and OAR 340-28-500 through 340-28-520,
   (b) Notice of Construction and Approval of Plans, OAR 340-28-800 through 340-28-820;
   (c) Air Contaminant Discharge Permits, OAR 340-28-1700 through 340-28-1790, unless required by OAR 340-28-1720(2), OAR 340-28-1720(4), or OAR 340-28-1900(1); and
   (d) OAR 340, Division 14.

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 13-1993, f. & ef. 9-24-93

Applicability

340-28-2110

(1) OAR 340-28-2100 through 340-28-2320 apply to the following sources:
   (a) Any major source;
   (b) Any source, including an area source, subject to a standard, limitation, or other requirement under section 111 of the FCAA;
   (c) Any source, including an area source, subject to a standard or other requirement under section 112 of the FCAA, except that a source is not required to obtain a permit solely because it is subject to regulations or requirements under section 112(r) of the FCAA;
   (d) Any affected source under Title IV; and
   (e) Any source in a source category designated by the Commission pursuant to OAR 340-28-2110.

(2) The owner or operator of a source with a[*federal*]**n Oregon Title V** [*o*]Operating [*p*]Permit whose potential to emit later falls below the emission level that causes it to be a major source, and which is not otherwise required to have a[*federal*]**n Oregon Title V** [*o*]Operating [*p*]Permit, may submit a request for revocation of the [*federal*]**Oregon Title V** [*o*]Operating [*p*]Permit. Granting of the request for revocation does not relieve the source from compliance with all applicable requirements or ACDP requirements.

(3) Synthetic minor sources.
   (a) A source which would otherwise be a major source subject to OAR 340-28-2100 through 340-28-2320 may choose to become a synthetic minor source by limiting its emissions below the emission level that causes it to be a major source through

production or operational limits contained in an ACDP issued by the Department under 340-28-1700 through 340-28-1790.

(b) The reporting and monitoring requirements of the emission limiting conditions contained in the ACDPs of synthetic minor sources issued by the Department under 340-28-1700 through 340-28-1790 shall meet the requirements of OAR 340-28-0 through 340-28-1140.

(c) Synthetic minor sources who request to increase their potential to emit above the major source emission rate thresholds shall become subject to OAR 340-28-2100 through 340-28-2320 and shall submit a permit application under OAR 340-28-2120 in accordance with OAR 340-28-1740.

(d) Synthetic minor sources that exceed the limitations on potential to emit are in violation of OAR 340-28-2(1)(a).

(4) Source category exemptions.

(a) The following source categories are exempted from the obligation to obtain a ~~[federal]~~**n Oregon Title V** ~~[o]~~**O**perating ~~[p]~~**P**ermit:

(A) All sources and source categories that would be required to obtain a permit solely because they are subject to 40 CFR part 60, Subpart AAA - Standards of Performance for New Residential Wood Heaters; and

(B) All sources and source categories that would be required to obtain a permit solely because they are subject to 40 CFR part 61, Subpart M - National Emission Standard for Hazardous Air Pollutants for Asbestos, section 61.145, Standard for Demolition and Renovation

(b) All sources listed in OAR 340-28-2110(1) that are not major sources, affected sources, or solid waste incineration units required to obtain a permit pursuant to section 129(c) of the FCAA, are exempted by the Department from the obligation to obtain a ~~[federal]~~**n Oregon Title V** ~~[o]~~**O**perating ~~[p]~~**P**ermit.

(c) Any source listed in OAR 340-28-2110(1) exempt from the requirement to obtain a permit under this rule may opt to apply for a ~~[federal]~~**n Oregon Title V** ~~[o]~~**O**perating ~~[p]~~**P**ermit.

(5) Emissions units and ~~[federal]~~**Oregon Title V** ~~[o]~~**O**perating ~~[p]~~**P**ermit program sources.

(a) For major sources, the Department shall include in the permit all applicable requirements for all relevant emissions units in the major source, including any equipment used to support the major industrial group at the site.

(b) For any nonmajor source subject to the ~~[federal]~~**Oregon Title V** ~~[o]~~**O**perating ~~[p]~~**P**ermit program under OAR 340-28-2110(1) and not exempted under OAR 340-28-2110(4), the Department shall include in the permit all applicable requirements applicable to emissions units that cause the source to be subject to the ~~[federal]~~**Oregon Title V** ~~[o]~~**O**perating ~~[p]~~**P**ermit program.

(6) Fugitive emissions. Fugitive emissions from a ~~[federal]~~**n Oregon Title V** ~~[o]~~**O**perating ~~[p]~~**P**ermit program source shall be included in the permit application and the permit in the same manner as stack emissions, regardless of whether the source category in question is included in the list of sources contained in the definition of major source.

(7) Insignificant activity emissions. All emissions from insignificant activities, including categorically insignificant activities and aggregate insignificant emissions, shall be included in the determination of the applicability of any requirement.

(8) ~~[Federal]~~**Oregon Title V** ~~[o]~~**O**perating ~~[p]~~**P**ermit program sources that are required to obtain an ACDP, OAR 340-28-1700 through 340-28-1790, or a Notice of Approval, OAR 340-28-2270, because of a Title I modification, shall operate in compliance with the ~~[federal]~~**Oregon Title V** ~~[o]~~**O**perating ~~[p]~~**P**ermit until the ~~[federal]~~**Oregon Title V**

[o]Operating [p]Permit is revised to incorporate the ACDP or the Notice of Approval for the Title I modification.

Stat. Auth.: ORS Ch. 468 & 468A

Hist.: DEQ 13-1993, f. & ef. 9-24-93; DEQ 24-1994, f. & ef. 10-28-94

Permit Applications

340-28-2120

(1) Duty to apply. For each [federal]**Oregon Title V** [o]Operating [p]Permit program source, the owner or operator shall submit a timely and complete permit application in accordance with this rule.

(a) Timely application.

(A) A timely application for a source that is in operation as of the effective date of the [federal]**Oregon Title V** [o]Operating [p]Permit program is one that is submitted 12 months after the effective date of the [federal]**Oregon Title V** [o]Operating [p]Permit program in Oregon or on or before such earlier date as the Department may establish. If an earlier date is established, the Department will provide at least six (6) months for the owner or operator to prepare an application. A timely application for a source that is not in operation or that is not subject to the [federal]**Oregon Title V** [o]Operating [p]Permit program as of the effective date of the [federal]**Oregon Title V** [o]Operating [p]Permit program is one that is submitted within 12 months after the source becomes subject to the [federal]**Oregon Title V** [o]Operating [p]Permit program.

(B) Any [federal]**Oregon Title V** [o]Operating [p]Permit program source required to have obtained a permit prior to construction under the ACDP program, OAR 340-28-1700 through 340-28-1790; New Source Review program, OAR 340-28-1900 through 340-28-2000; or the construction/operation modification rule, OAR 340-28-2270; shall file a complete application to obtain the [federal]**Oregon Title V** [o]Operating [p]Permit or permit revision within 12 months after commencing operation. Commencing operation shall be considered initial startup. Where an existing [federal]**Oregon Title V** [o]Operating [p]Permit would prohibit such construction or change in operation, the owner or operator shall obtain a permit revision before commencing operation.

(C) Any [federal]**Oregon Title V** [o]Operating [p]Permit program source owner or operator shall follow the appropriate procedures under OAR 340-28-2100 through 340-28-2320 prior to commencement of operation of a source permitted under the construction/operation modification rule, OAR 340-28-2270.

(D) For purposes of permit renewal, a timely application is one that is submitted at least 12 months prior to the date of permit expiration, or such other longer time as may be approved by the Department that ensures that the term of the permit will not expire before the permit is renewed. If more than 12 months is required to process a permit renewal application, the Department shall provide no less than six (6) months for the owner or operator to prepare an application. In no event shall this time be greater than 18 months.

(E) Applications for initial phase II acid rain permits shall be submitted to the Department by January 1, 1996 for sulfur dioxide, and by January 1, 1998 for nitrogen oxides.

(F) Applications for Compliance Extensions for Early Reductions of HAP shall be submitted before proposal of an applicable emissions standard issued under section 112(d) of the FCAA and shall be in accordance with provisions

prescribed in OAR 340-32-300 through 340-32-380.

(b) Complete application.

(A) To be deemed complete, an application shall provide all information required pursuant to section (3) of this rule. The application shall include six (6) copies of all required forms and exhibits in hard copy and one (1) copy in electronic format as specified by the Department. Applications for permit revision need to supply information required under OAR 340-28-2120(3) only if it is related to the proposed change. Information required under section (3) of this rule shall be sufficient to evaluate the subject source and its application and to determine all applicable requirements. A responsible official shall certify the submitted information is in accordance with section (5) of this rule.

(B) Applications which are obviously incomplete, unsigned, or which do not contain the required exhibits, clearly identified, will not be accepted by the Department for filing and shall be returned to the applicant for completion.

(C) If the Department determines that additional information is necessary before making a completeness determination, it may request such information in writing and set a reasonable deadline for a response. The application will not be considered complete for processing until the adequate information has been received. When the information in the application is deemed adequate, the applicant will be notified that the application is complete for processing.

(D) Unless the Department determines that an application is not complete within 60 days of receipt of the application, such application shall be deemed to be complete, except as otherwise provided in OAR 340-28-2200(1)(e). If, while processing an application that has been determined or deemed to be complete, the Department determines that additional information is necessary to evaluate or take final action on that application, it may request such information in writing and set a reasonable deadline for a response. If the additional information is not provided by the deadline specified, the application shall be determined to be incomplete, and the application shield shall cease to apply.

(E) Applications determined or deemed to be complete shall be submitted by the Department to the EPA as required by OAR 340-28-2310(1)(a).

(F) The source's ability to operate without a permit, as set forth in 340-28-2200(2), shall be in effect from the date the application is determined or deemed to be complete until the final permit is issued, provided that the applicant submits any requested additional information by the deadline specified by the Department.

(2) Duty to supplement or correct application. Any applicant who fails to submit any relevant facts or who has submitted incorrect information in a permit application shall, upon becoming aware of such failure or incorrect submittal, promptly submit such supplementary facts or corrected information. In addition, an applicant shall provide additional information as necessary to address any requirements that become applicable to the source after the date it filed a complete application but prior to release of a draft permit.

(3) Standard application form and required information. Applications shall be submitted on forms and in electronic formats specified by the Department. Information as described below for each emissions unit at a ~~[federal]~~**n Oregon Title V** ~~[o]~~Operating ~~[p]~~Permit program source shall be included in the application. An application may not omit information needed to determine the applicability of, or to impose, any applicable requirement, including those requirements that apply to categorically insignificant activities, or to evaluate the fee amount required. The application shall include the elements specified below:

(a) Identifying information, including company name and address, plant name and address if different from the company's name, owner's name and agent, and telephone number and names of plant site manager/contact.

(b) A description of the source's processes and products by Standard Industrial Classification Code including any associated with each alternative operating scenario identified by the owner or operator and related flow chart(s).

(c) The following emissions-related information for all requested alternative operating scenarios identified by the owner or operator:

(A) All emissions of pollutants for which the source is major, all emissions of regulated air pollutants and all emissions of pollutants listed in OAR 340-32-130. A permit application shall describe all emissions of regulated air pollutants emitted from any emissions unit, except where such units are exempted under section (3) of this rule. The Department shall require additional information related to the emissions of air pollutants sufficient to verify which requirements are applicable to the source, and other information necessary to collect any permit fees owed.

(B) Identification and description of all points of emissions described in paragraph (3)(c)(A) of this rule in sufficient detail to establish the basis for fees and applicability of requirements of the FCAA and state rules.

(C) Emissions rates in tons per year and in such terms as are necessary to establish compliance consistent with the applicable standard reference test method and to establish PSELs for all regulated air pollutants except as restricted by OAR 340-28-1050 and OAR 340-28-1060.

(i) An applicant may request that a period longer than hourly be used for the short term PSEL provided that the requested period is consistent with the means for demonstrating compliance with any other applicable requirement and the PSEL requirement, and:

(I) The requested period is no longer than the shortest period of the Ambient Air Quality Standards for the pollutant, which shall be no longer than daily for VOC and NO_x, or

(II) The applicant demonstrates that the requested period, if longer than the shortest period of the Ambient Air Quality Standards for the pollutant, is the shortest period compatible with source operations.

(ii) The requirements of the applicable rules shall be satisfied for any requested increase in PSELs, establishment of baseline emissions rates, requested emission reduction credit banking, or other PSEL changes.

(D) Additional information as determined to be necessary to establish any alternative emission limit in accordance with OAR 340-28-1030, if the permit applicant requests one.

(E) The application shall include a list of all categorically insignificant activities and an estimate of all emissions of regulated air pollutants from those activities which are designated insignificant because of aggregate insignificant emissions. Owners or operators that use more than 100,000 pounds per year of a mixture that contains not greater than 1% by weight of any chemical or compound regulated under Divisions 20 through 32 of this chapter, and not greater than 0.1% by weight of any carcinogen listed in the U.S. Department of Health and Human Service's Annual Report on Carcinogens shall contact the supplier and manufacturer of the mixture to try and obtain information other than Material Safety Data Sheets in order to quantify emissions.

(F) The following information to the extent it is needed to determine or regulate emissions: fuels, fuel sulfur content, fuel use, raw materials, production rates, and operating schedules.

(G) Any information on pollution prevention measures and cross-media impacts the owner or operator wants the Department to consider in determining applicable control requirements and evaluating compliance methods; and

(H) Where the operation or maintenance of air pollution control equipment and emission reduction processes can be adjusted or varied from the highest reasonable efficiency and effectiveness, information necessary for the Department to establish operational and maintenance requirements under OAR 340-28-620 (1) and (2).

(I) Identification and description of air pollution control equipment, including estimated efficiency of the control equipment, and compliance monitoring devices or activities.

(J) Limitations on source operation affecting emissions or any work practice standards, where applicable, for all regulated air pollutants at the ~~[federal]~~**Oregon Title V** ~~[o]~~Operating ~~[p]~~Permit program source.

(K) Other information required by any applicable requirement, including information related to stack height limitations developed pursuant to OAR 340-28-1110.

(L) Calculations on which the information in items (A) through (K) above is based.

(d) A plot plan showing the location of all emissions units identified by Universal Transverse Mercator or "UTM" as provided on United States Geological Survey maps and the nearest residential or commercial property.

(e) The following air pollution control requirements:

(A) Citation and description of all applicable requirements, and

(B) Description of or reference to any applicable test method for determining compliance with each applicable requirement.

(f) The following monitoring, recordkeeping, and reporting requirements:

(A) A proposed Enhanced Monitoring Protocol as required by the FCAA;

(B) All emissions monitoring and analysis procedures or test methods required under the applicable requirements;

(C) Proposed periodic monitoring to determine compliance where an applicable requirement does not require periodic testing or monitoring;

(D) The proposed use, maintenance, and installation of monitoring equipment or methods, as necessary;

(E) Documentation of the applicability of the proposed Enhanced Monitoring Protocol, such as test data and engineering calculations;

(F) Proposed consolidation of reporting requirements, where possible;

(G) A proposed schedule of submittal of all reports; and

(H) Other similar information as determined by the Department to be necessary to protect human health or the environment or to determine compliance with applicable requirements.

(g) Other specific information that may be necessary to implement and enforce other applicable requirements of the FCAA or state rules or of OAR 340-28-2100 through 340-28-2320 or to determine the applicability of such requirements.

(h) An explanation of any proposed exemptions from otherwise applicable requirements.

(i) A copy of any existing permit attached as part of the permit application. Owners or operators may request that the Department make a determination that an existing permit term or condition is no longer applicable by supplying adequate information to

support such a request. The existing permit term or condition shall remain in effect unless or until the Department determines that the term or condition is no longer applicable by permit modification.

(j) Additional information as determined to be necessary by the Department to define permit terms and conditions implementing off-permit changes for permit renewals.

(k) Additional information as determined to be necessary by the Department to define permit terms and conditions implementing section 502(b)(10) changes for permit renewals.

(l) Additional information as determined to be necessary by the Department to define permit terms and conditions implementing emissions trading under the PSEL including but not limited to proposed replicable procedures and permit terms that ensure the emissions trades are quantifiable and enforceable if the applicant requests such trading.

(m) Additional information as determined to be necessary by the Department to define permit terms and conditions implementing emissions trading, to the extent that the applicable requirements provide for trading without a case-by-case approval of each emissions trade if the applicant requests such trading.

(n) A compliance plan that contains all the following:

  (A) A description of the compliance status of the source with respect to all applicable requirements.

  (B) A description as follows:

    (i) For applicable requirements with which the source is in compliance, a statement that the source will continue to comply with such requirements.

    (ii) For applicable requirements that will become effective during the permit term, a statement that the source will meet such requirements on a timely basis.

    (iii) For requirements for which the source is not in compliance at the time of permit issuance, a narrative description of how the source will achieve compliance with such requirements.

  (C) A compliance schedule as follows:

    (i) For applicable requirements with which the source is in compliance, a statement that the source will continue to comply with such requirements.

    (ii) For applicable requirements that will become effective during the permit term, a statement that the source will meet such requirements on a timely basis. A statement that the source will meet in a timely manner applicable requirements that become effective during the permit term shall satisfy this provision, unless a more detailed schedule is expressly required by the applicable requirement.

    (iii) A schedule of compliance for sources that are not in compliance with all applicable requirements at the time of permit issuance. Such a schedule shall include a schedule of remedial measures, including an enforceable sequence of actions with milestones, leading to compliance with any applicable requirements for which the source will be in noncompliance at the time of permit issuance and interim measures to be taken by the source to minimize the amount of excess emissions during the scheduled period. This compliance schedule shall resemble and be at least as stringent as that contained in any judicial consent decree or administrative order to which the source is subject. Any such schedule of compliance shall be supplemental to, and shall not sanction noncompliance with, the applicable requirements on which it is based.

  (D) A schedule for submission of certified progress reports no less frequently than

every 6 months for sources required to have a schedule of compliance to remedy a violation.

(E) The compliance plan content requirements specified in this section shall apply and be included in the acid rain portion of a compliance plan for an affected source, except as specifically superseded by regulations promulgated under Title IV of the FCAA with regard to the schedule and method(s) the source will use to achieve compliance with the acid rain emissions limitations.

(o) Requirements for compliance certification, including the following:

(A) A certification of compliance with all applicable requirements by a responsible official consistent with section (5) of this rule and section 114(a)(3) of the FCAA;

(B) A statement of methods used for determining compliance, including a description of monitoring, recordkeeping, and reporting requirements and test methods;

(C) A schedule for submission of compliance certifications during the permit term, to be submitted no less frequently than annually, or more frequently if specified by the underlying applicable requirement or by the Department; and

(D) A statement indicating the source's compliance status with any applicable enhanced monitoring and compliance certification requirements of the FCAA or state rules.

(p) A Land Use Compatibility Statement (LUCS), if applicable, to assure that the type of land use and activities in conjunction with that use have been reviewed and approved by local government before a permit is processed and issued.

(q) The use of nationally-standardized forms for acid rain portions of permit applications and compliance plans, as required by regulations promulgated under Title IV of the FCAA.

(r) For purposes of permit renewal, the owner or operator shall submit all information as required in section (3) of this rule. The owner or operator may identify information in its previous permit application for emissions units that should remain unchanged and for which no changes in applicable requirements have occurred and provide copies of the previous permit application for only those emissions units.

(4) Quantifying Emissions

(a) When quantifying emissions for purposes of a permit application, modification, or renewal an owner or operator shall use the most representative data available or required in a permit condition. The Department shall consider the following data collection methods as acceptable for determining air emissions:

(A) Continuous emissions monitoring system data obtained in accordance with the Department's Continuous Monitoring Manual (January, 1992);

(B) Source testing data obtained in accordance with the Department's Source Sampling Manual (January, 1992) except where material balance calculations are more accurate and more indicative of an emission unit's continuous operation than limited source test results (e.g. a volatile organic compound coating operation);

(C) Material balance calculations;

(D) Emission factors subject to Department review and approval; and

(E) Other methods and calculations subject to Department review and approval.

(b) When continuous monitoring or source test data has previously been submitted to and approved by the Department for a particular emissions unit, that information shall be used for quantifying emissions. Material balance calculations may be used as the basis for quantifying emissions when continuous monitoring or source test data exists if it can be demonstrated that the results of material balance calculations are more

indicative of actual emissions under normal continuous operating conditions. Emission factors or other methods may be used for calculating emissions when continuous monitoring data, source test data, or material balance data exists if the owner or operator can demonstrate that the existing data is not representative of actual operating conditions. When an owner or operator uses emission factors or other methods as the basis of calculating emissions, a brief justification for the validity of the emission factor or method shall be submitted with the calculations. The Department shall review the validity of the emission factor or method during the permit application review period. When an owner or operator collects emissions data that is more representative of actual operating conditions, either as required under a specific permit condition or for any other requirement imposed by the Department, the owner or operator shall use that data for calculating emissions when applying for a permit modification or renewal. Nothing in this provision shall require owners or operators to conduct monitoring or testing solely for the purpose of quantifying emissions for permit applications, modifications, or renewals.

(5) Any application form, report, or compliance certification submitted pursuant to OAR 340-28-2100 through 340-28-2320 shall contain certification by a responsible official of truth, accuracy, and completeness. This certification and any other certification required under OAR 340-28-2100 through 340-28-2320 shall state that, based on information and belief formed after reasonable inquiry, the statements and information in the document are true, accurate, and complete.

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 13-1993, f. & ef. 9-24-93; DEQ 19-1993, f. & ef. 11-4-93; DEQ 24-1994, f. & ef. 10-28-94

Standard Permit Requirements

340-28-2130 Each permit issued under OAR 340-28-2100 through 340-28-2320 shall include the following elements:

(1) Emission limitations and standards, including those operational requirements and limitations that assure compliance with all applicable requirements at the time of permit issuance.
   (a) The permit shall specify and reference the origin of and authority for each term or condition, and identify any difference in form as compared to the applicable requirement upon which the term or condition is based.
   (b) For sources regulated under the national acid rain program, the permit shall state that, where an applicable requirement of the FCAA or state rules is more stringent than an applicable requirement of regulations promulgated under Title IV of the FCAA, both provisions shall be incorporated into the permit and shall be enforceable by the EPA.
   (c) For any alternative emission limit established in accordance with OAR 340-28-1030, the permit shall contain an equivalency determination and provisions to ensure that any resulting emissions limit has been demonstrated to be quantifiable, accountable, enforceable, and based on replicable procedures.

(2) Permit duration. The Department shall issue permits for a fixed term of 5 years in the case of affected sources, and for a term not to exceed 5 years in the case of all other sources.

(3) Monitoring and related recordkeeping and reporting requirements.
   (a) Each permit shall contain the following requirements with respect to monitoring:
      (A) A monitoring protocol to provide accurate and reliable data that:
         (i) is representative of actual source operation;
         (ii) is consistent with the averaging time in the permit emission limits;
         (iii) is consistent with monitoring requirements of other applicable

requirements; and

(iv) can be used for compliance certification and enforcement.

(B) All emissions monitoring and analysis procedures or test methods required under the applicable requirements, including any procedures and methods promulgated pursuant to sections 504(b) or 114(a)(3) of the FCAA;

(C) Where the applicable requirement does not require periodic testing or instrumental or noninstrumental monitoring (which may consist of recordkeeping designed to serve as monitoring), periodic monitoring sufficient to yield reliable data from the relevant time period that are representative of the source's compliance with the permit, as reported pursuant to OAR 340-28-2130(3)(c). Such monitoring requirements shall assure use of terms, test methods, units, averaging periods, and other statistical conventions consistent with the applicable requirement. Continuous monitoring and source testing shall be conducted in accordance with the Department's Continuous Monitoring Manual (January, 1992) and the Source Sampling Manual (January, 1992), respectively. Other monitoring shall be conducted in accordance with Department approved procedures. The monitoring requirements may include but shall not be limited to any combination of the following:

(i) continuous emissions monitoring systems (CEMS);
(ii) continuous opacity monitoring systems (COMS);
(iii) continuous parameter monitoring systems (CPMS);
(iv) continuous flow rate monitoring systems (CFRMS);
(v) source testing;
(vi) material balance;
(vii) engineering calculations;
(viii) recordkeeping; or
(ix) fuel analysis; and

(D) As necessary, requirements concerning the use, maintenance, and, where appropriate, installation of monitoring equipment or methods.

(E) A condition that prohibits any person from knowingly rendering inaccurate any required monitoring device or method.

(F) Methods used to determine actual emissions for fee purposes shall also be used for compliance determination and can be no less rigorous than the requirements of OAR 340-28-2160. For any assessable emission for which fees are paid on actual emissions, the compliance monitoring protocol shall include the method used to determine the amount of actual emissions.

(G) Monitoring requirements shall commence on the date of permit issuance unless otherwise specified in the permit.

(b) With respect to recordkeeping, the permit shall incorporate all applicable recordkeeping requirements and require, where applicable, the following:

(A) Records of required monitoring information that include the following:

(i) The date, place as defined in the permit, and time of sampling or measurements;
(ii) The date(s) analyses were performed;
(iii) The company or entity that performed the analyses;
(iv) The analytical techniques or methods used;
(v) The results of such analyses;
(vi) The operating conditions as existing at the time of sampling or measurement; and
(vii) The records of quality assurance for continuous monitoring systems

(including but not limited to quality control activities, audits, calibrations drifts);

(B) Retention of records of all required monitoring data and support information for a period of at least 5 years from the date of the monitoring sample, measurement, report, or application. Support information includes all calibration and maintenance records and all original strip-chart recordings for continuous monitoring instrumentation, and copies of all reports required by the permit.

(C) Recordkeeping requirements shall commence on the date of permit issuance unless otherwise specified in the permit.

(c) With respect to reporting, the permit shall incorporate all applicable reporting requirements and require the following:

(A) Submittal of four (4) copies of reports of any required monitoring at least every 6 months, completed on forms approved by the Department. Unless otherwise approved in writing by the Department, six month periods are January 1 to June 30, and July 1 to December 31. The reports required by this rule shall be submitted within 30 days after the end of each reporting period, unless otherwise approved in writing by the Department. ~~[*Two*]~~**One** cop~~[*ies*]~~**y** of the report shall be submitted to the Air Quality Division, ~~[*one*]~~**two** cop~~[*y*]~~**ies** to the regional office, and one copy to the EPA. All instances of deviations from permit requirements shall be clearly identified in such reports.

(i) The semi-annual report shall be due on July 30, unless otherwise approved in writing by the Department, and shall include the semi-annual compliance certification, OAR 340-28-2160.

(ii) The annual report shall be due on February 15, unless otherwise approved in writing by the Department, but shall be due no later than March 15, and shall consist of the annual reporting requirements as specified in the permit; the emission fee report; the emission statement, if applicable, OAR 340-28-1520; the excess emissions upset log, OAR 340-28-1440; the annual certification that the risk management plan is being properly implemented, OAR 340-32-5400; and the semi-annual compliance certification, OAR 340-28-2160.

(B) Prompt reporting of deviations from permit requirements that do not cause excess emissions, including those attributable to upset conditions, as defined in the permit, the probable cause of such deviations, and any corrective actions or preventive measures taken. "Prompt" means within seven (7) days of the deviation. Deviations that cause excess emissions, as specified in OAR 340-28-1400 through 340-28-1460 shall be reported in accordance with OAR 340-28-1440.

(C) Submittal of any required source test report within 30 days after the source test.

(D) All required reports shall be certified by a responsible official consistent with OAR 340-28-2120(5).

(E) Reporting requirements shall commence on the date of permit issuance unless otherwise specified in the permit.

(d) The Department may incorporate more rigorous monitoring, recordkeeping, or reporting methods than required by applicable requirements in a~~[*federal*]~~**n Oregon Title V** ~~[*o*]~~**O**perating ~~[*p*]~~**P**ermit if they are contained in the permit application, are determined by the Department to be necessary to determine compliance with applicable requirements, or are needed to protect human health or the environment.

(4) A permit condition prohibiting emissions exceeding any allowances that the source lawfully holds under Title IV of the FCAA or the regulations promulgated thereunder.
   (a) No permit revision shall be required for increases in emissions that are authorized by allowances acquired pursuant to the acid rain program, provided that such increases do not require a permit revision under any other applicable requirement.
   (b) No limit shall be placed on the number of allowances held by the source. The source may not, however, use allowances as a defense to noncompliance with any other applicable requirement.
   (c) Any such allowance shall be accounted for according to the procedures established in regulations promulgated under Title IV of the FCAA.

(5) A severability clause to ensure the continued validity of the various permit requirements in the event of a challenge to any portions of the permit.

(6) Provisions stating the following:
   (a) The permittee shall comply with all conditions of the ~~[*federal*]~~**Oregon Title V** ~~[o]~~Operating ~~[p]~~Permit. Any permit condition noncompliance constitutes a violation of the FCAA and state rules and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application.
   (b) The need to halt or reduce activity shall not be a defense. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.
   (c) The permit may be modified, revoked, reopened and reissued, or terminated for cause as determined by the Department. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or of a notification of planned changes or anticipated noncompliance does not stay any permit condition.
   (d) The permit does not convey any property rights of any sort, or any exclusive privilege.
   (e) The permittee shall furnish to the Department, within a reasonable time, any information that the Department may request in writing to determine whether cause exists for modifying, revoking and reissuing, or terminating the permit or to determine compliance with the permit. Upon request, the permittee shall also furnish to the Department copies of records required to be kept by the permit or, for information claimed to be confidential, the permittee may furnish such records directly to the EPA along with a claim of confidentiality.

(7) A provision to ensure that a~~[*federal*]~~**n Oregon Title V** ~~[o]~~Operating ~~[p]~~Permit program source pays fees to the Department consistent with the fee schedule.

(8) Terms and conditions for reasonably anticipated alternative operating scenarios identified by the owner or operator in its application as approved by the Department. Such terms and conditions:
   (a) Shall require the owner or operator, contemporaneously with making a change from one operating scenario to another, to record in a log at the permitted facility a record of the scenario under which it is operating;
   (b) Shall extend the permit shield described in OAR 340-28-2190 to all terms and conditions under each such alternative operating scenario; and
   (c) Shall ensure that the terms and conditions of each such alternative operating scenario meet all applicable requirements and the requirements of OAR 340-28-2100 through 340-28-2320.

(9) Terms and conditions, if the permit applicant requests them, for the trading of emissions

increases and decreases in the permitted facility solely for the purpose of complying with the PSELs. Such terms and conditions:

(a) Shall include all terms required under OAR 340-28-2130 and OAR 340-28-2160 to determine compliance;

(b) Shall extend the permit shield described in OAR 340-28-2190 to all terms and conditions that allow such increases and decreases in emissions;

(c) Shall ensure that the trades are quantifiable and enforceable;

(d) Shall ensure that the trades are not Title I modifications;

(e) Shall require a minimum 7-day advance, written notification to the Department and the EPA of the trade that shall be attached to the Department's and the source's copy of the permit. The written notification shall state when the change will occur and shall describe the changes in emissions that will result and how these increases and decreases in emissions will comply with the terms and conditions of the permit; and

(f) Shall meet all applicable requirements and requirements of OAR 340-28-2100 through 340-28-2320.

(10) Terms and conditions, if the permit applicant requests them, for the trading of emissions increases and decreases in the permitted facility, to the extent that the applicable requirements provide for trading such increases and decreases without a case-by-case approval of each emission trade. Such terms and conditions:

(a) Shall include all terms required under OAR 340-28-2130 and OAR 340-28-2160 to determine compliance;

(b) Shall extend the permit shield described in OAR 340-28-2190 to all terms and conditions that allow such increases and decreases in emissions; and

(c) Shall meet all applicable requirements and requirements of OAR 340-28-2100 through 340-28-2320.

(11) Terms and conditions allowing for off-permit changes, OAR 340-28-2220(2).

(12) Terms and conditions allowing for section 502(b)(10) changes, OAR 340-28-2220(3).

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 13-1993, f. & ef. 9-24-93; DEQ 24-1994, f. & ef. 10-28-94

State-enforceable Requirements

340-28-2140 The Department shall specifically designate as not being federally enforceable any terms and conditions included in the permit that are not required under the FCAA or under any of its applicable requirements. Terms and conditions so designated are subject to the requirements of OAR 340-28-2120 through 340-28-2300, other than those contained in OAR 340-28-2150. All terms and conditions in a~~[*federal*]~~**n Oregon Title V** ~~[o]~~Operating ~~[p]~~Permit are enforceable by the Department.

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 13-1993, f. & ef. 9-24-93

Compliance Requirements

340-28-2160 All ~~[federal]~~**Oregon Title V** ~~[o]~~Operating ~~[p]~~Permits shall contain the following elements with respect to compliance:

(1) Consistent with OAR 340-28-2130(3), compliance certification, testing, monitoring, reporting, and recordkeeping requirements sufficient to assure compliance with the terms and conditions of the permit.

(2) A requirement that any document (including but not limited to reports) required by a[*federal*]**n Oregon Title V** [*o*]Operating [*p*]Permit shall contain a certification by a responsible official or the designated representation for the acid rain portion of the permit that meets the requirements of OAR 340-28-2120(5).

(3) Inspection and entry requirements that require that, upon presentation of credentials and other documents as may be required by law, the permittee shall allow the Department or an authorized representative to perform the following:

(a) Enter upon the permittee's premises where a[*federal*]**n Oregon Title V** [*o*]Operating [*p*]Permit program source is located or emissions-related activity is conducted, or where records shall be kept under the conditions of the permit;

(b) Have access to and copy, at reasonable times, any records that shall be kept under the conditions of the permit;

(c) Inspect at reasonable times any facilities, equipment (including monitoring and air pollution control equipment), practices, or operations regulated or required under the permit; and

(d) As authorized by the FCAA or state rules, sample or monitor at reasonable times substances or parameters for the purpose of assuring compliance with the permit or applicable requirements.

(4) A schedule of compliance consistent with OAR 340-28-2120(3)(n)(C).

(5) Progress reports consistent with an applicable schedule of compliance and OAR 340-28-2120(3)(n)(C) to be submitted at least semi-annually, or at a more frequent period if specified in the applicable requirement or by the Department. Such progress reports shall contain the following:

(a) Dates for achieving the activities, milestones, or compliance required in the schedule of compliance, and dates when such activities, milestones or compliance were achieved; and

(b) An explanation of why any dates in the schedule of compliance were not or will not be met, and any preventive or corrective measures adopted.

(6) Requirements for compliance certification with terms and conditions contained in the permit, including emission limitations, standards, or work practices. Permits shall include each of the following:

(a) The frequency (not less than annually or such more frequent periods as specified in the applicable requirement or by the Department) of submissions of compliance certifications;

(b) In accordance with OAR 340-28-2130(3), a means for monitoring the compliance of the source with its emissions limitations, standards, and work practices;

(c) A requirement that the compliance certification include the following:

(A) The identification of each term or condition of the permit that is the basis of the certification;

(B) The compliance status;

(C) Whether compliance was continuous or intermittent;

(D) The method(s) used for determining the compliance status of the source, currently and over the reporting period consistent with OAR 340-28-2130(3);

(E) Any deviations from permit requirements, the probable cause of such deviations, and any corrective actions or preventive measures taken; and

(F) Such other facts as the Department may require to determine the compliance status of the source;

(d) A requirement that all compliance certifications be submitted to the EPA as well as to the Department; and

(e) Such additional requirements as may be specified pursuant to sections 114(a)(3) and 504(b) of the FCAA.

(7) Annual certification that the risk management plan is being properly implemented, OAR 340-32-5400.

(8) Such other provisions as the Department may require in order to protect human health or the environment.

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 13-1993, f. & ef. 9-24-93

General Permits

340-28-2170

(1) The Department may, after notice and opportunity for public participation provided under OAR 340-28-2290, issue general permits covering numerous similar sources in specific source categories as defined in section (2) of this rule. General permits shall comply with all requirements applicable to other ~~[federal]~~**Oregon Title V** ~~[o]~~Operating ~~[p]~~Permits.

(2) The owner or operator of an existing major HAP source which meets all of the following criteria may apply to be covered under the terms and conditions of a general permit:
   (a) the source is a major source under section 112 of the Act only;
   (b) no emissions standard for existing sources, promulgated pursuant to section 112(d) of the FCAA or OAR 340-32-2500 through OAR 340-32-5000, applies to the source; and
   (c) the Department does not consider the source to be a problem source based on its complaint record and compliance history.

(3) Notwithstanding the shield provisions of OAR 340-28-2190, the source shall be subject to enforcement action for operation without a~~[federal]~~**n Oregon Title V** ~~[o]~~Operating ~~[p]~~Permit if the source is later determined not to qualify for the conditions and terms of the general permit. General permits shall not be authorized for affected sources under the national acid rain program unless provided in regulations promulgated under Title IV of the FCAA.

(4) (a) ~~[Federal]~~**Oregon Title V** ~~[o]~~Operating ~~[p]~~Permit program sources that would qualify for a general permit shall apply to the Department for coverage under the terms of the general permit or shall apply for a~~[federal]~~**n Oregon Title V** ~~[o]~~Operating ~~[p]~~Permit consistent with OAR 340-28-2120.
   (b) The Department may, in the general permit, provide for applications which deviate from the requirements of OAR 340-28-2120, provided that such applications meet the requirements of Title V of the FCAA and include all information necessary to determine qualification for, and compliance with, the general permit.
   (c) Without repeating the public participation procedures required under OAR 340-28-2290, the Department shall grant an owner's or operator's request for authorization to operate under a general permit if the source meets the applicability criteria for the general permit, but such a grant shall not be a final permit action for purposes of judicial review.

(5) When an emissions limitation applicable to a general permit source is promulgated by the EPA pursuant to 112(d), or adopted by the state pursuant to OAR 340-32-500 through OAR 340-32-5000, the source shall:
   (a) immediately comply with the provisions of the applicable emissions standard; and
   (b) (A) within 12 months of standard promulgation, apply for an operating permit, pursuant to OAR 340-28-2120, if three (3) or more years are remaining on the general permit term; or
   (B) apply for an operating permit at least 12 months prior to permit expiration,

pursuant to OAR 340-28-2120, if less than three (3) years remain on the general permit term.

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 13-1993, f. & ef. 9-24-93; DEQ 24-1994, f. & ef. 10-28-94

Permit Shield

340-28-2190

(1) Except as provided in OAR 340-28-2100 through 340-28-2320, the Department shall expressly include in a[~~*federal*~~]**n Oregon Title V** [~~*o*~~]Operating [~~*p*~~]Permit a provision stating that compliance with the conditions of the permit shall be deemed compliance with any applicable requirements as of the date of permit issuance, provided that:
   (a) Such applicable requirements are included and are specifically identified in the permit; or
   (b) The Department, in acting on the permit application or revision, determines in writing that other requirements specifically identified are not applicable to the source, and the permit includes the determination or a concise summary thereof.

(2) A[~~*federal*~~]**n Oregon Title V** [~~*o*~~]Operating [~~*p*~~]Permit that does not expressly state that a permit shield exists shall be presumed not to provide such a shield.

(3) Changes made to a permit in accordance with OAR 340-28-2230(1)(h) and OAR 340-28-2260 shall be shielded.

(4) Nothing in this rule or in any [~~*federal*~~]**Oregon Title V** [~~*o*~~]Operating [~~*p*~~]Permit shall alter or affect the following:
   (a) The provisions of ORS 468.115 (enforcement in cases of emergency) and ORS 468.035;
   (b) The liability of an owner or operator of a source for any violation of applicable requirements prior to or at the time of permit issuance;
   (c) The applicable requirements of the national acid rain program, consistent with section 408(a) of the FCAA; or
   (d) The ability of the Department to obtain information from a source pursuant to ORS 468.095 (investigatory authority, access to records).

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 13-1993, f. & ef. 9-24-93

Permit Issuance

340-28-2200

(1) Action on application.
   (a) A permit, permit modification, or permit renewal may be issued only if all of the following conditions have been met:
      (A) The Department has received a complete application for a permit, permit modification, or permit renewal, except that a complete application need not be received before issuance of a general permit under OAR 340-28-2170;
      (B) Except for modifications qualifying for minor permit modification procedures under OAR 340-28-2250, the Department has complied with the requirements for public participation under OAR 340-28-2290;
      (C) The Department has complied with the requirements for notifying and responding

to affected States under OAR 340-28-2310(2);

(D) The conditions of the permit provide for compliance with all applicable requirements and the requirements of OAR 340-28-2100 through 340-28-2320; and

(E) The EPA has received a copy of the proposed permit and any notices required under OAR 340-28-2310(1) and (2), and has not objected to issuance of the permit under OAR 340-28-2310(3) within the time period specified therein or such earlier time as agreed to with the Department if no changes were made to the draft permit.

(b) When a multiple-source permit includes air contaminant sources subject to the jurisdiction of the Department and the Regional Authority, the Department may require that it shall be the permit issuing agency. In such cases, the Department and the Regional Authority shall otherwise maintain and exercise all other aspects of their respective jurisdictions over the permittee.

(c) Denial of a Permit. If the Department proposes to deny issuance of a permit, permit renewal, permit modification, or permit amendment, it shall notify the applicant by registered or certified mail of the intent to deny and the reasons for denial. The denial shall become effective 60 days from the date of mailing of such notice unless within that time the applicant requests a hearing. Such a request for hearing shall be made in writing to the Director and shall state the grounds for the request. Any hearing held shall be conducted pursuant to the applicable provisions of ORS Chapter 183.

(d) The Department or Lane Regional Air Pollution Authority is the permitting authority for purposes of the 18 month requirement contained in 42 USC § 7661b(c) and this subsection. Except as provided under the initial transition plan or under regulations promulgated under Title IV of the FCAA or under OAR 340-28-2100 through 340-28-2320 for the permitting of affected sources under the national acid rain program, the Department shall take final action on each permit application (including a request for permit modification or renewal) within 18 months after receiving a complete application. In the case of any complete permit application containing an early reductions demonstration pursuant to OAR 340-32-300, the Department shall take final action within 9 months of receipt.

(e) The Department shall promptly provide notice to the applicant of whether the application is complete. Unless the Department requests additional information or otherwise notifies the applicant of incompleteness within 60 days of receipt of an application, the application shall be deemed complete. For modifications processed through minor permit modification procedures, OAR 340-28-2250(2), the Department shall not require a completeness determination.

(f) The Department shall provide a review report that sets forth the legal and factual basis for the draft permit conditions (including references to the applicable statutory or regulatory provisions). The Department shall send this report to the EPA and to any other person who requests it.

(g) The submittal of a complete application shall not affect the requirement that any source have a Notice of Approval in accordance with OAR 340-28-2270 or a preconstruction permit in accordance with OAR 340-28-1700 through 340-28-1790 or OAR 340-28-1900 through 340-28-2000.

(h) Failure of the Department to take final action on a complete application or failure of the Department to take final action on an EPA objection to a proposed permit within the appropriate time shall be considered to be a final order for purposes of ORS Chapter 183.

(i) If the final permit action being challenged is the Department's failure to take final

action, a petition for judicial review may be filed any time before the Department denies the permit or issues the final permit.

(2) Requirement for a permit.

(a) Except as provided in OAR 340-28-2200(2)(b), OAR 340-28-2220(3), and OAR 340-28-2250(2)(d), no ~~[federal]~~**Oregon Title V** ~~[o]~~**O**perating ~~[p]~~**P**ermit program source may operate after the time that it is required to submit a timely and complete application after the effective date of the program, except in compliance with a permit issued under a~~[federal]~~**n Oregon Title V** ~~[o]~~**O**perating ~~[p]~~**P**ermit program.

(b) If a~~[federal]~~**n Oregon Title V** ~~[o]~~**O**perating ~~[p]~~**P**ermit program source submits a timely and complete application for permit issuance (including for renewal), the source's failure to have a~~[federal]~~**n Oregon Title V** ~~[o]~~**O**perating ~~[p]~~**P**ermit is not a violation of OAR 340-28-2100 through 340-28-2320 until the Department takes final action on the permit application, except as noted in this section. This protection shall cease to apply if, subsequent to the completeness determination made pursuant to OAR 340-28-2200(1)(e), and as required by OAR 340-28-2120(1)(b), the applicant fails to submit by the deadline specified in writing by the Department any additional information identified as being needed to process the application. If the final permit action being challenged is the Department's failure to take final action, a petition for judicial review may be filed any time before the Department denies the permit or issues the final permit.

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 13-1993, f. & ef. 9-24-93; DEQ 20-1993(T), f. & ef. 11-4-93; DEQ 13-1994, f. & ef. 5-19-94; DEQ 24-1994, f. & ef. 10-28-94

Administrative Permit Amendments

340-28-2230

(1) An "administrative permit amendment" is a permit revision that:

(a) Corrects typographical errors;

(b) Identifies a change in the name, address, or phone number of the responsible official(s) identified in the permit, or provides a similar minor administrative change at the source;

(c) Allows for a change in the name of the permittee;

(d) Allows for a change in ownership or operational control of a source where the Department determines that no other change in the permit is necessary, provided that a written agreement containing a specific date for transfer of permit responsibility, coverage, and liability between the current and new permittee has been submitted to the Department;

(e) Requires more frequent monitoring or reporting by the permittee;

(f) Allows for a change in the date for reporting or source testing requirements for extenuating circumstances, except when required by a compliance schedule;

(g) Relaxes monitoring, reporting or recordkeeping due to a permanent source shutdown for only the emissions unit(s) being shutdown;

(h) Incorporates into the ~~[federal]~~**Oregon Title V** ~~[o]~~**O**perating ~~[p]~~**P**ermit the requirements from preconstruction review permits authorized under OAR 340-28-1900 through 340-28-2000 or OAR 340-28-2270, provided that the procedural requirements followed in the preconstruction review are substantially equivalent to the requirements of OAR 340-28-2200 through 340-28-2290 and OAR 340-28-2310 that would be applicable to the change if it were subject to review as a permit modification, compliance

requirements are substantially equivalent to those contained in OAR 340-28-2130 through 340-28-2190, and no changes in the construction or operation of the facility that would require a permit modification under OAR 340-28-2240 through 340-28-2260 have taken place; or

(i) Corrects baseline or PSELs when more accurate emissions data is obtained but does not increase actual emissions.

(2) Administrative permit amendments for purposes of the national acid rain portion of the permit shall be governed by regulations promulgated under Title IV of the FCAA.

(3) Administrative permit amendment procedures. An administrative permit amendment shall be made by the Department consistent with the following:

(a) The owner or operator shall promptly submit an application for an administrative permit amendment upon becoming aware of the need for one on forms provided by the Department along with a copy of the draft amendment.

(b) The Department shall take no more than 60 days from receipt of a request for an administrative permit amendment to take final action on such request, and may incorporate such changes without providing notice to the public or affected States provided that it designates any such permit revisions as having been made pursuant to this rule.

(c) The Department shall issue the administrative permit amendment in the form of a permit addendum for only those conditions that will change.

(d) The Department shall submit a copy of the permit addendum to the EPA.

(e) The source may implement the changes addressed in the request for an administrative amendment immediately upon submittal of the request.

(f) If the source fails to comply with its draft permit terms and conditions upon submittal of the application and until the Department takes final action, the existing permit terms and conditions it seeks to modify may be enforced against it.

(4) The Department shall, upon taking final action granting a request for an administrative permit amendment, allow coverage by the permit shield in OAR 340-28-2190 only for administrative permit amendments made pursuant to OAR 340-28-2230(1)(h) which meet the relevant requirements of OAR 340-28-2130 through 340-28-2320 for significant permit modifications.

(5) If it becomes necessary for the Department to initiate an administrative amendment to the permit, the Department shall notify the permittee of the intended action by certified or registered mail. The action shall become effective 20 days after the date of mailing unless within that time the permittee makes a written request for a hearing. The request shall state the grounds for the hearing. Any hearing held shall be conducted pursuant to the applicable provisions of ORS Chapter 183.

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 13-1993, f. & ef. 9-24-93; DEQ 24-1994, f. & ef. 10-28-94

Permit Modification

340-28-2240 A permit modification is any revision to a~~[*federal*]~~**n Oregon Title V** ~~[o]~~**O**perating ~~[p]~~**P**ermit that cannot be accomplished under the Department's provisions for administrative permit amendments under OAR 340-28-2230. A permit modification for purposes of the acid rain portion of the permit shall be governed by regulations promulgated under Title IV of the FCAA.

Stat. Auth.: ORS Ch. 468 & 468A

Hist.: DEQ 13-1993, f. & ef. 9-24-93

Significant Permit Modifications

340-28-2260

(1) Criteria. Significant modification procedures shall be used for applications requesting permit modifications that do not qualify as minor permit modifications or as administrative amendments. Significant modifications shall include:
   (a) increases in PSELs except those increases subject to OAR 340-28-1900 through 340-28-2000; OAR 340-28-2230(1)(i); or OAR 340-28-2270;
   (b) every significant change in existing monitoring permit terms or conditions;
   (c) every relaxation of reporting or recordkeeping permit terms or conditions;
   (d) incorporation into the ~~[federal]~~**OregonTitle V** ~~[o]~~**O**perating ~~[p]~~**P**ermit the requirements from preconstruction review permits authorized under OAR 340-28-1900 through 340-28-2000 unless the incorporation qualifies as an administrative amendment;
   (e) incorporation into the ~~[federal]~~**OregonTitle V** ~~[o]~~**O**perating ~~[p]~~**P**ermit the requirements from preconstruction review permits authorized under OAR 340-28-2270 unless otherwise specified in OAR 340-28-2270(3)(g); and
   (f) Nothing herein shall be construed to preclude the permittee from making changes consistent with OAR 340-28-2100 through 340-28-2320 that would render existing permit compliance terms and conditions irrelevant.
(2) Significant permit modifications shall be subject to all requirements of OAR 340-28-2100 through 340-28-2320, including those for applications, public participation, review by affected States, and review by the EPA, as they apply to permit issuance and permit renewal.
(3) Major modifications, as defined in OAR 340-28-110, shall require an ACDP under OAR 340-28-1900 through 340-28-2000.
(4) Modifications at sources which are major hazardous air pollutant sources that cause increases of emissions of HAP greater than de minimis are subject to OAR 340-28-2270 and OAR 340-32-4500.

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 13-1993, f. & ef. 9-24-93

Construction/Operation Modifications

340-28-2270

(1) Scope. This regulation shall apply to:
   (a) Any stationary source; and
   (b) Any air pollution control equipment used to comply with a Department requirement.
(2) Requirement.
   (a) No owner or operator shall construct, fabricate, erect, install, establish, develop or operate a new stationary source or air pollution control equipment listed in OAR 340-28-2270(1) without first notifying the Department in writing and obtaining approval.
   (b) No owner or operator shall make any physical change or change in the method of operation that the source is physically unable to accommodate or replace any stationary source or air pollution control equipment listed in OAR 340-28-2270(1), covered by a permit under OAR 340-28-2100 through 340-28-2320, without first notifying the Department in writing and obtaining approval if:
      (A) Any stationary source's maximum capacity to emit any regulated air pollutant,

excluding those pollutants listed in OAR 340-32-130 or 340-32-5400, is increased on an hourly basis at full production, including air pollution control equipment; or

(B) The performance of any pollution control equipment used to comply with a Department requirement is degraded causing an increase of the amount of any air pollutant emitted or which results in the emission of any air pollutant not previously emitted (excluding routine maintenance).

(c) No owner or operator shall make any physical change in, or change in the method of operation of, a major source that increases the actual emissions of any hazardous air pollutant (HAP) emitted by such source by more than a de minimis amount or which results in the emission of any HAP not previously emitted by more than a de minimis amount, without first notifying the Department in writing and obtaining approval if the source becomes subject to OAR 340-32-4500.

(3) Procedure.

(a) Notice. Any owner or operator required to obtain approval for a new, modified, or replaced stationary source or air pollution control equipment listed in OAR 340-28-2270(1) shall notify the Department in writing on a form supplied by the Department.

(b) Submission of Plans and Specifications. The Department shall require the submission of plans and specifications for any stationary source or air pollution control equipment listed in OAR 340-28-2270(1) being constructed or modified and its relationship to the production process. The following information shall be required for a complete application for a Notice of Approval:

(A) Name, address, and nature of business;

(B) Name of local person responsible for compliance with these rules;

(C) Name of person authorized to receive requests for data and information;

(D) A description of the constructed or modified source;

(E) A description of the production processes and a related flow chart for the constructed or modified source;

(F) A plot plan showing the location and height of the constructed or modified stationary source. The plot plan shall also indicate the nearest residential or commercial property;

(G) Type and quantity of fuels used;

(H) The change in the amount, quantities emitted, nature and duration of regulated air pollutant emissions;

(I) Any information on pollution prevention measures and cross-media impacts the owner or operator wants the Department to consider in determining applicable control requirements and evaluating compliance methods;

(J) Where the operation or maintenance of air pollution control equipment and emission reduction processes can be adjusted or varied from the highest reasonable efficiency and effectiveness, information necessary for the Department to establish operational and maintenance requirements under OAR 340-28-620 (1) and (2);

(K) Estimated efficiency of air pollution control equipment under present or anticipated operating conditions;

(L) Land Use Compatibility Statement signed by a local (city or county) planner either approving or disapproving construction or modification to the source if required by the local planning agency;

(M) Corrections and revisions to the plans and specifications to insure compliance with applicable rules, orders and statutes; and

(N) Sufficient information for the Department to determine applicable emission

limitations and requirements for hazardous air pollutant sources.

(c) Notice of Approval:

(A) For construction or modification of any stationary source or air pollution control equipment listed in OAR 340-28-2270(1) that does not increase emissions above the facility-wide PSEL; or does not increase the amount of any air pollutant emitted by any individual stationary source above the significant emission rate, excluding any emissions decreases; or does not establish a federally enforceable limit on potential to emit; or does not establish a new applicable requirement as a result of a TACT determination under OAR 340-28-630 or a MACT determination under OAR 340-32-4500:

(i) The Department shall, upon determining that the proposed construction or modification is, in the opinion of the Department, in accordance with the provisions of applicable rules, order, and statutes, notify the owner or operator that construction may proceed within 60 days of receipt of the required information;

(ii) A Notice of Approval to proceed with construction or modification shall allow the owner or operator to construct or modify the stationary source or air pollution control equipment listed in OAR 340-28-2270(1) and operate it in accordance with provisions under OAR 340-28-2220, 340-28-2230 or 340-28-2240, whichever is applicable.

(iii) A Notice of Approval to proceed with construction or modification shall not relieve the owner or operator of the obligation of complying with applicable emission standards and orders.

(B) For construction or modification of any stationary source or air pollution control equipment listed in OAR 340-28-2270(1) that increases emissions above the facility-wide PSEL; or increases the amount of any air pollutant emitted by any individual stationary source above the significant emission rate, excluding any emissions decreases; or establishes a federally enforceable limit on potential to emit; or establishes a new applicable requirement as a result of a TACT determination under OAR 340-28-630 or a MACT determination under OAR 340-32-4500:

(i) The Department shall upon determining that the proposed construction or modification is in the opinion of the Department in accordance with the provisions of applicable rules, order, and statutes, issue public notice as to the intent to issue an approval for construction or modification within 180 days of receipt of the required information;

(ii) The public notice shall allow at least thirty (30) days for written comment from the public, and from interested State and Federal agencies, prior to issuance of the approval. Public notice shall include the name and quantities of new or increased emissions for which permit limits are proposed, or new or increased emissions which exceed significant emission rates established by the Department.

(iii) In addition to the information required under OAR 340-11-007, public notices for approval of construction or modification shall contain a determination of:

(I) Whether the proposed permitted emission would have a significant impact on a Class I airshed;

(II) Whether each proposed permitted emission is a criteria pollutant and whether the area in which the source is located is designated as attainment or nonattainment for that pollutant; and

(III) For each major source within an attainment area for which dispersion modeling has been performed as a requirement of the Notice of Approval, an indication of what impact each proposed permitted emission would have on the Prevention of Significant Deterioration Program within that attainment area.

(iv) The owner or operator may request that the external review procedures required under OAR 340-28-2290 and OAR 340-28-2310 be used instead of the notice procedures under paragraph (ii) and (iii) of this rule to allow for subsequent incorporation of the Notice of Approval as an administrative amendment. The public notice shall state that the external review procedures are being used, if the applicant requests them.

(v) If, within 30 days after commencement of the public notice period, the Department receives written requests from ten (10) persons, or from an organization or organizations representing at least ten persons, for a public hearing to allow interested persons to appear and submit oral or written comments on the proposed provisions, the Department shall provide such a hearing before taking final action on the application, at a reasonable place and time and on reasonable notice. Requests for public hearing shall clearly identify the air quality concerns in the draft permit.

(vi) The Department shall give notice of any public hearing at least 30 days in advance of the hearing. Notice of such a hearing may be given, in the Department's discretion, either in the public notice under 340-28-2290(1) or in such other manner as is reasonably calculated to inform interested persons.

(vii) After the public notice period and the public hearing, if requested, the Department shall, upon determining that the proposed construction or modification is, in the opinion of the Department, in accordance with the provisions of applicable rules, order, and statutes, notify the owner or operator that construction may proceed.

(viii) A Notice of Approval to proceed with construction or modification shall allow the owner or operator to construct or modify the stationary source or air pollution control equipment listed in OAR 340-28-2270(1) and operate it in accordance with provisions under OAR 340-28-2220, 340-28-2230, or 340-28-2240, whichever is applicable.

(ix) A Notice of Approval to proceed with construction or modification shall not relieve the owner or operator of the obligation of complying with applicable emission standards and orders.

(d) Order Prohibiting Construction.

(i) If within the 60 day or 180 day review period, whichever is applicable, the Director determines that the proposed construction or modification is not in accordance with applicable statutes, rules, regulations and orders, the Director shall issue an order prohibiting the construction or modification of the stationary source or air pollution control equipment listed in OAR 340-28-2270(1). Said order is to be forwarded to the owner by certified mail. The Department shall issue public notice as to the intent to prohibit construction in accordance with OAR 340-28-2270(3)(c)(B)(ii) and (iii).

(ii) Failure to issue such order within the 60 day **or 180 day** review period shall be considered a determination that the proposed construction, installation, or establishment may proceed, provided that it is in accordance with plans,

specifications, and any corrections or revisions thereto, or other information, if any, previously submitted, and provided further that it shall not relieve the owner of the obligation of complying with applicable emission standards and orders.

(e) Hearing. Pursuant to law, an owner or operator against whom an order prohibiting construction is directed may within 20 days from the date of mailing of the order, demand a hearing. The demand shall be in writing, state the grounds for hearing, and be mailed to the Director of the Department. The hearing shall be conducted pursuant to the applicable provisions of ORS Chapter 183.

(f) Notice of Completion. Within thirty (30) days, or other period specified in the ~~[federal]~~**Oregon Title V** ~~[o]~~Operating ~~[p]~~Permit, after any owner or operator has constructed or modified a stationary source or air pollution control equipment listed in OAR 340-28-2270(1), that owner or operator shall so report in writing on a form furnished by the Department, stating the date of completion of construction or modification and the date the stationary source or air pollution control equipment was or will be put in operation.

(g) Incorporation into a~~[Federal]~~**n Oregon Title V** Operating Permit.

(A) Where ~~[federal]~~**an Oregon Title V** ~~[o]~~Operating ~~[p]~~Permit would allow incorporation of such construction or modification as an off-permit change [OAR 340-28-2220(2)] or a section 502(b)(10) change [OAR 340-28-2220(3)]:

(i) The owner or operator of the stationary source or air pollution control equipment listed in OAR 340-28-2270(1) shall submit to the Department the applicable notice, and

(ii) The Department shall incorporate the construction or modification at permit renewal, if applicable.

(B) Where a~~[federal]~~**n Oregon Title V** ~~[o]~~Operating ~~[p]~~Permit would allow incorporation of such construction or modification as an administrative amendment [OAR 340-28-2230], the owner or operator of the stationary source or air pollution control equipment listed in OAR 340-28-2270(1) may:

(i) submit the permit application information required under OAR 340-28-2230(3) with the information required under OAR 340-28-2270(3)(b) upon becoming aware of the need for an administrative amendment; and

(ii) request that the external review procedures required under OAR 340-28-2290 and OAR 340-28-2310 be used instead of the notice procedures under OAR 340-28-2270(3)(c)(B)(ii) and (iii) to allow for subsequent incorporation of the construction permit as an administrative amendment.

(C) Where a~~[federal]~~**n Oregon Title V** ~~[o]~~Operating ~~[p]~~Permit would require incorporation of such construction or modification as a minor permit modification [OAR 340-28-2250] or a significant permit modification [OAR 340-28-2260], the owner or operator of the stationary source or air pollution control equipment listed in OAR 340-28-2270(1) shall submit the permit application information required under OAR 340-28-2120(3) within one year of initial startup of the construction or modification, except as prohibited in paragraph (D) of this rule.

(D) Where an existing ~~[federal]~~**Oregon Title V** ~~[o]~~Operating ~~[p]~~Permit would prohibit such construction or change in operation, the owner or operator must obtain a permit revision before commencing operation.

[**NOTE:** This rule is included in the State of Oregon Clean Air Act Implementation Plan as adopted by the EQC under OAR 340-20-047.]

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 13-1993, f. & ef. 9-24-93; DEQ 19-1993, f. & ef. 11-4-93; DEQ 24-1994, f. & ef. 10-28-94

Reopenings

340-28-2280

(1) Reopening for cause.

(a) Each issued permit shall include provisions specifying the conditions under which the permit will be reopened prior to the expiration of the permit. A permit shall be reopened and revised under any of the following circumstances:

(A) Additional applicable requirements under the FCAA or state rules become applicable to a major~~[*federal*]~~ **Oregon Title V** ~~[o]~~Operating ~~[p]~~Permit program source with a remaining permit term of 3 or more years. Such a reopening shall be completed not later than 18 months after promulgation of the applicable requirement. No such reopening is required if the effective date of the requirement is later than the date on which the permit is due to expire, unless the original permit or any of its terms and conditions has been extended pursuant to OAR 340-28-2210.

(B) Additional requirements (including excess emissions requirements) become applicable to an affected source under the national acid rain program. Upon approval by the EPA, excess emissions offset plans shall be deemed to be incorporated into the permit.

(C) The Department or the EPA determines that the permit contains a material mistake or that inaccurate statements were made in establishing the emissions standards or other terms or conditions of the permit.

(D) The Department or the EPA determines that the permit shall be revised or revoked to assure compliance with the applicable requirements.

(E) The Department determines that the permit shall be revised or revoked to assure compliance with the National Ambient Air Quality Standards (NAAQS).

(b) Proceedings to reopen and issue a permit shall follow the same procedures as apply to initial permit issuance and shall affect only those parts of the permit for which cause to reopen exists. Such reopening shall be made as expeditiously as practicable.

(c) Reopenings under OAR 340-28-2280(1)(a) shall not be initiated before a notice of such intent is provided to the source by the Department at least 30 days in advance of the date that the permit is to be reopened, except that the Department may provide a shorter time period in the case of an emergency.

(2) Reopening for cause by the EPA.

(a) The Department shall, within 90 days after receipt of a notification from the EPA of reopening for cause, forward to the EPA a proposed determination of termination, modification, or revocation and reissuance, as appropriate. The EPA may extend this 90-day period for an additional 90 days if the EPA finds that a new or revised permit application is necessary or that the permittee shall submit additional information.

(b) The Department shall have 90 days from receipt of an EPA objection to resolve any objection that the EPA makes and to terminate, modify, or revoke and reissue the permit in accordance with the EPA's objection or determine not to reissue the permit in accordance with the EPA's objection.

(c) The Department shall provide at least 30 days' notice to the permittee in writing of the reasons for any such action and provide an opportunity for a hearing.

(d) Proceedings to terminate, revoke, or modify and reissue a permit initiated by the EPA shall follow the same procedures as apply to initial permit issuance and shall affect

only those parts of the permit for which cause to reopen exists. Such reopening shall be made as expeditiously as practicable by the Department.

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 13-1993, f. & ef. 9-24-93

Public Participation

340-28-2290 Except for modifications qualifying for minor permit modification procedures and administrative amendments, all permit proceedings, including initial permit issuance, significant modifications, construction/operation modifications when there is an increase of emissions above the PSEL, and renewals, shall provide adequate procedures for public notice including offering an opportunity for public comment and a hearing on the draft permit. These procedures shall include the following:

(1) Notice shall be given: by publication in a newspaper of general circulation in the area where the source is located or in a Department publication designed to give general public notice; to persons on a mailing list developed by the Department, including those who request in writing to be on the list; and by other means if necessary to assure adequate notice to the affected public;

(2) The notice shall identify:
   (a) the affected facility;
   (b) the name and address of the permittee;
   (c) the name and address of the Department processing the permit;
   (d) the activity or activities involved in the permit action;
   (e) the emissions change involved in any permit modification;
   ~~[*(f) whether any increase in proposed permitted emissions would have a significant impact on a Class I airshed;*~~
   ~~*(g) Whether each proposed permitted emission is a criteria pollutant and whether the area in which the source is located is designated as attainment or nonattainment for that pollutant;*~~
   ~~*(h) For each increase in allowable emissions of a criteria pollutant within an attainment area for which dispersion modeling has been performed an indication of what impact each proposed permitted emission would have on the PSD Program within that attainment area;*~~]
   (~~[*i*]~~**f**) the name, address, and telephone number of a person from whom interested persons may obtain additional information, including copies of the permit draft,~~[~~
   ~~*(j) the address and location of at least one place where a copy of*~~] the application, all relevant supporting materials, including any compliance plan, permit, and monitoring and compliance certification report, except for information entitled to confidential treatment, and all other materials available to the Department that are relevant to the permit decision are available for review;
   (~~[*k*]~~**g**) a brief description of the comment procedures required by OAR 340-28-2100 through 340-28-2320; and
   (~~[*l*]~~**h**) a brief description of the procedures to request a hearing or the time and place of any hearing that may be held;

(3) The Department shall provide such notice and opportunity for participation by affected States as is provided for by OAR 340-28-2310;

(4) Timing.
   (a) The Department shall provide at least 30 days for public comment.
   (b) If, within 30 days after commencement of the public notice period, the Department

receives written requests from ten (10) persons, or from an organization or organizations representing at least ten persons, for a public hearing to allow interested persons to appear and submit oral or written comments on the proposed provisions, the Department shall provide such a hearing before taking final action on the application, at a reasonable place and time and on reasonable notice. Requests for public hearing shall clearly identify the air quality concerns in the draft permit.

(c) The Department shall give notice of any public hearing at least 30 days in advance of the hearing. Notice of such a hearing may be given, in the Department's discretion, either in the public notice under 340-28-2290(1) or in such other manner as is reasonably calculated to inform interested persons.

(5) The Department shall consider all relevant written comments submitted within a time specified in the notice of public comment and all relevant comments received at any public hearing(s) in making a final decision on the approvability of the application. No later than 10 working days after the close of the public comment period, the applicant may submit a written response to any comments submitted by the public. The Department shall consider the applicant's response in making a final decision.

(6) The Department shall keep a record of the commenters and also of the issues raised during the public participation process and such records shall be available to the public in the same location(s) as listed in OAR 340-28-2290(2)(j). Such record may be in summary form rather than a verbatim transcript.

(7) Any person who submitted written or oral comments during the public participation process described in this rule shall be an adversely affected or aggrieved person for purposes of ORS 183.484.

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 13-1993, f. & ef. 9-24-93

Permit Review by the EPA and Affected States
340-28-2310

(1) Transmission of information to the EPA.

(a) The Department shall provide to the EPA a copy of each permit application (including any application for permit modification), each proposed permit except when a draft permit has been submitted and the EPA determines that the submittal of the draft permit is adequate, and each final~~[*federal*]~~ **Oregon Title V** ~~[o]~~**O**perating ~~[p]~~**P**ermit.

(b) The requirements of OAR 340-28-2310 (1)(a) and (2)(a) may be waived for any category of sources (including any class, type, or size within such category) other than major sources if allowed by the EPA.

(c) The Department shall keep for 5 years such records and submit to the EPA such information as the EPA may reasonably require to ascertain whether the Department program complies with the requirements of the FCAA or state rules or of OAR 340-28-2100 through 340-28-2320.

(2) Review by affected States.

(a) The Department shall give notice of each draft permit to any affected State on or before the time that the Department provides this notice to the public under OAR 340-28-2290, except to the extent that OAR 340-28-2250 requires the timing of the notice to be different.

(b) The Department, as part of the submittal of the proposed permit to the EPA (or as soon as possible after the submittal for minor permit modification procedures allowed under OAR 340-28-2250), shall notify the EPA and any affected State in writing of

any omission by the Department of any recommendations for the proposed permit that the affected State submitted during the public or affected State review period. The notice shall include the Department's reasons for not accepting any such recommendation. The Department is not required to accept recommendations that are not based on applicable requirements or the requirements of OAR 340-28-2100 through 340-28-2320.

(3) EPA objection.

(a) No permit for which an application shall be transmitted to the EPA under OAR 340-28-2310(1) shall be issued as drafted if the EPA objects to its issuance in writing within 45 days of receipt of the proposed permit and all necessary supporting information or such earlier time as agreed to by the EPA.

(b) The Department shall, within 90 days after the date of an objection under OAR 340-28-2310(3)(a), revise and submit a proposed permit in response to the objection, or determine not to issue the permit.

(c) If the Department determines not to issue the permit, notice of the determination shall be provided to the source by certified or registered mail.

(4) Public petitions to the EPA.

(a) If the EPA does not object in writing under OAR 340-28-2310(3), any person may petition the EPA within 60 days after the expiration of the EPA's 45-day review period to make such objection. Any such petition shall be based only on objections to the permit that were raised with reasonable specificity during the public comment period provided for in OAR 340-28-2290, unless the petitioner demonstrates that it was impracticable to raise such objections within such period, or unless the grounds for such objection arose after such period.

(b) If the EPA objects to the permit as a result of a petition filed under this section, the Department shall not issue the permit until the EPA's objection has been resolved, except that a petition for review does not stay the effectiveness of a permit or its requirements if the permit was issued after the end of the 45-day review period and prior to an EPA objection.

(c) If the Department has issued a permit prior to receipt of an EPA objection under OAR 340-28-2310, the EPA will modify, terminate, or revoke such permit, and shall do so consistent with the procedures in OAR 340-28-2280(2)(b) except in unusual circumstances, and the Department may thereafter issue only a revised permit that satisfies the EPA's objection. In any case, the source will not be in violation of the requirement to have submitted a timely and complete application.

(5) Prohibition on default issuance. The Department shall not issue a[~~*federal*~~]**n Oregon Title V** [~~*o*~~]Operating [~~*p*~~]Permit (including a permit renewal or modification) until affected States and the EPA have had an opportunity to review the proposed permit as required under this rule.

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 13-1993, f. & ef. 9-24-93

Major Source Interim Emission Fees

Purpose, Scope And Applicability

340-28-2400

(1) The purpose of OAR 340-28-2400 through 340-28-2550 is to provide permittees, major

sources, and the Department with the criteria and procedures to determine interim emissions and fees based on calculated (1991 only), actual and permitted air emissions only for calendar years 1991 and 1992.

Note: These interim fees will be used to provide resources to cover the costs of the Department to develop an approvable[~~*federal*~~] **Oregon Title V** [~~*o*~~]**O**perating [~~*p*~~]**P**ermit program in accordance with the Federal Clean Air Act and ORS 468A.

(2) OAR 340-28-2400 through 340-28-2550 apply to major sources as defined in OAR 340-28-110. The permittee may elect to pay interim emission fees on either calculated emissions (1991 only), actual emissions or permitted emissions for each assessable emission.

(3) The interim emission fees are in addition to fees required by OAR 340-28-1720 and 340-28-1750.

Note: Assessment of fees for calendar years 1993 and beyond is subject to the EPA approval of the[~~*federal*~~] **Oregon Title V** [~~*o*~~]**O**perating [~~*p*~~]**P**rogram developed by the Department pursuant to Oregon Laws 1991 Chapter 752, ORS 468A, enacted by the 1991 Oregon Legislature in response to the federal Clean Air Act Amendments of 1990.

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 2-1992, f. & ef. 1-30-92; DEQ 4-1993, f. & cert. ef. 3-10-93; Renumbered from OAR 340-20-500, DEQ 13-1993, f. & ef. 9-24-93

Determining VOC Emissions Using Material Balance For 1992

340-28-2520 The permittee may determine the amount of VOC emissions for an assessable emission by using material balance.

(1) The permittee using material balance to calculate VOC emissions shall determine the amount of VOC added to the process, the amount of VOC consumed in the process and/or the amount of VOC recovered in the process by testing in accordance with **40 [*~~Code of Federal Regulations~~* (]CFR[)] Part 60,** EPA Method 18, 24, 25, a material balance method, or an equivalent plant specific method specified in the ACDP using the following equation:

$$VOC_{tot} = VOC_{add} - VOC_{cons}$$

Where:

VOC_{tot} = Total VOC emissions, tons

VOC_{add} = VOC added to the process, tons

VOC_{cons} = VOC consumed and/or recovered from the process, tons

[**Publications:** The publication(s) referred to or incorporated by reference in this rule are available from the office of the Department.]

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 2-1992, f. & ef. 1-30-92; DEQ 4-1993, f. & cert. ef. 3-10-93; Renumbered from OAR 340-28-630, DEQ 13-1993 f. & ef. 9-24-93

Verified Emission Factors Using Source Testing

340-28-2540

(1) To verify emission factors used to determine assessable emissions the permittee shall:
   (a) Utilize source testing data collected in accordance with appropriate procedures or Department guidance in effect at the time the data was collected, for source test data collected from 1985 through 1991, or
   (b) Perform source testing in accordance with the Department's Source Sampling Manual or other methods approved by the Department for source tests conducted in 1992. Source tests shall be conducted in accordance with testing procedures on file at the Department and the pretest plan submitted at least fifteen (15) days in advance and approved by the Department. All test data and results shall be submitted for review to the Department within thirty (30) days after testing.

      NOTE: It is recommended that the permittee notify the Department and obtain pre-approval of the Emission Factor source testing program prior to or as part of the submittal of the first source test notification.

(2) The permittee shall conduct or have conducted at least three compliance source tests each consisting of at least three individual test runs for a total of at least nine test runs.

(3) The permittee shall monitor and record or have monitored and recorded applicable process and control device operating data.

(4) The permittee shall perform or have performed a source test either:
   (a) In each of three quarters of the year with no two successive source tests performed any closer than thirty (30) days apart, or
   (b) At equal intervals over the operating period if the permittee demonstrates and the Department approves that:
      (A) The process operates or has operated for part of the year, or
      (B) The process is or was not subject to seasonal variations.

(5) The permittee shall conduct or have conducted the source tests to test the entire range of operating levels. At least one test shall be conducted at minimum operating conditions, one test at normal or average operating levels, and one test at anticipated maximum operating levels. If the process rate is constant, all tests shall be conducted at that rate. The permittee shall submit documentation to the Department demonstrating a constant process rate.

(6) The permittee shall determine or have determined an emission factor for each source test by dividing each test run emissions, in pounds per hour, by the applicable process rate during the source test run. At least nine emission factors shall be plotted against the respective process rates and a regression analysis performed to determine the best fit equation and the correlation coefficient (R^2). If the correlation coefficient is less than 0.50, which would indicate that there is a relatively weak relationship between emissions and process rates, the arithmetic average and standard deviation of at least nine emission factors shall be determined.

(7) The permittee shall determine the Emissions Estimate Adjustment Factor (EEAF) as follows:
   (a) If the correlation coefficient (R^2) of the regression analysis is greater than 0.50, the EEAF shall be $1+(1-R^2)$.
   (b) If the correlation coefficient (R^2) is less than 0.50, the EEAF shall be:

$EEAF = 1 + SD/EF_{avg}$

Where:

SD = Standard Deviation

EF_{avg} = Average of the Emission Factors

(8) The permittee shall determine actual emissions for interim emission fee purposes using one of the following methods:

(a) If the regression analysis correlation coefficient is less than 0.50, the actual emissions shall be the average emission factor determined from at least nine test runs multiplied by the EEAF multiplied by the total production for the entire year, or

$AE = EF_{avg} \times EEAF \times P$

Where:

AE = Actual Emissions

EF_{avg} = Average of the Emission Factors

EEAF = Estimated Emissions Adjustment Factor

P = Total production for the year

(b) If the regression analysis correlation coefficient is greater than 0.50 the following calculations shall be performed:

(A) Determine the average emission factor (EF) for each production rate category (maximum = EF_{max}, normal = EF_{norm}, and minimum = EF_{min}).

(B) Determine the total annual production ~~[and operating hours, production time]~~ ($P[T]_{tot}$), for the calendar year.

(C) Determine the ~~[total hours]~~**production while** operating within the maximum production rate category ($P[T]_{max}$). The maximum production rate category is any operation rate greater than the average of at least three maximum operating rates during the source testing plus the average of at least three normal operating rates during the source testing divided by two (2).

(D) Determine the ~~[total hours]~~**production** while operating within the normal production rate category ($P[T]_{norm}$). The normal production rate category is defined as any operating rate less than the average of at least three maximum operating rates during the source testing plus the average of at least three normal operating rates during the source testing divided by two (2) and any operating rate greater than the average of at least three minimum operating rates during the source testing plus the average of at least three normal operating rates during the source testing divided by two (2).

(E) Determine the ~~[total hours]~~**production** while operating within the minimum production rate category ($P[T]_{min}$). The minimum production rate category is defined as any operating rate less than the average of at least three minimum

operating rates during the source testing plus the average of at least three normal operating rates during the source testing divided by two (2).

(F) Actual emissions equals EEAF x [P[~~T~~]$_{max}$[~~/PT$_{test}$~~)]xEF$_{max}$ + [~~(~~]P[~~T~~]$_{norm}$[~~/PT$_{test}$~~)X]~~x~~EF$_{norm}$ + [~~(~~]P[~~T~~]$_{min}$[~~/PT$_{test}$~~)X]~~x~~EF$_{min}$].

(9) The permittee shall determine emissions during startup and shutdown, and for emissions greater than normal, during conditions that are not accounted for in the procedure(s) otherwise used to document actual emissions.

(a) All emissions during startup and shutdown, and emissions greater than normal shall be assumed equivalent to operation without an air pollution control device, unless accurately demonstrated by the permittee and approved by the Department in accordance with [~~*OAR 340-28-2540(9)(b), (9)(c), (9)(d), and (9)(e)*~~]**subsections (b) through (e) of this section**. The emission factor plus the EEAF shall be adjusted by the air pollution control device collection efficiency as follows:

Actual emission factor =
(EF x EEAF)/(1 - PCDE)

Where:

EF = Emission Factor

EEAF = Emission Estimate Adjustment Factor

PCDE = Pollution Control Device Collection Efficiency Unless otherwise approved by the Department, the pollution control device collection efficiencies used in this calculation shall be:

Particulate Matter:

ESP or baghouse	0.90
High energy wet scrubber	0.80
Low energy wet scrubber	0.70
Cyclonic separator	0.50

Acid gases:

Wet or dry scrubber	0.90

VOCs:

Incinerator:	0.98
Carbon absorber	0.95

(b) During process startups a Department approved source test shall be performed to determine an average startup factor. The average of at least three tests runs plus the standard deviation shall be used to determine actual emissions during startups.

(c) During process shutdowns a Department approved source test shall be performed to determine an emission factor for shutdowns. The average of at least three test runs plus the standard deviation shall be used to determine actual emissions during shutdowns.

(d) During routine maintenance activity the permittee shall:

(A) Perform routine maintenance activity during source testing for verified emission factors, or

(B) Determine emissions in accordance with Section (10) of this rule.

(e) The emission factor need not be adjusted if the permittee demonstrates to the Department that the pollutant emissions do not increase during startup and shutdown, and for conditions that are not accounted for the in procedure(s) otherwise used to document actual emissions (eg. NO_x emissions during an ESP failure).

(10) A verified emission factor developed pursuant to OAR 340-28-2400 through 340-28-2550 and approved by the Department can not be used if a process change occurs that would affect the accuracy of the verified emission factor.

(11) The permittee may elect to use verified emission factors for source categories if the Department determines the following criteria are met:

(a) The verified emission factor for a source category shall be based on verified emission factors from at least three individual sources within the source category,

(b) Verified emission factors from sources within a source category shall be developed in accordance with OAR 340-28-2540,

(c) The verified emission factors from the sources shall not differ from the mean by more than twenty percent, and

(d) The source category verified emission factor shall be the mean of the source verified emission factors plus the average of the source emission estimate adjustment factors.

[**Publications:** The publication(s) referred to or incorporated by reference in this rule are available from the office of the Department.]

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 2-1992, f. & ef. 1-30-92; DEQ 4-1993, f. & cert. ef. 3-10-93; Renumbered from OAR 340-20-650, DEQ 13-1993, f. & ef. 9-24-93

[~~*Federal*~~]Oregon Title V Operating Permit Fees

Purpose, Scope And Applicability
340-28-2560

(1) The purpose of OAR 340-28-2560 through 340-28-2740 is to provide owners and operators of major sources and the Department with the criteria and procedures to determine emissions and fees based on air emissions and specific activities.

(2) OAR 340-28-2560 through 340-28-2740 apply to major sources as defined in OAR 340-28-110.

(3) The owner or operator may elect to pay emission fees for each assessable emission on:

(a) actual emissions, or

(b) permitted emissions.

(4) If the assessable emission is of a regulated air pollutant listed in OAR 340-32-130 and there are no applicable methods to demonstrate actual emissions, the owner or operator may propose that the Department approve an emission factor based on the best representative data to demonstrate actual emissions for fee purposes.

(5) Major sources subject to the~~[*federal*]~~ **Oregon Title V** ~~[o]~~Operating ~~[p]~~Permit program defined in 340-28-, are subject to the following fees:

(a) Emission fees, (OAR 340-28-2610), and

(b) Annual base fee of $2,500 per source (OAR 340-28-2580).

(6) Major sources subject to the ~~[federal]~~**Oregon Title V** ~~[o]~~Operating ~~[p]~~Permit program may also be subject to user fees (OAR 340-28-2600 and 340-28-1750).

(7) The Department shall credit owners and operators of major sources subject to the first year of the~~[*Federal*]~~ **Oregon Title V** Operating Permit Fees for Annual Compliance Determination Fees paid for any period after October 1, 1994.

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 13-1993, f. & ef. 9-24-93; DEQ 20-1993(T), f. & ef. 11-4-93; DEQ 13-1992, f. & ef. 5-19-94

Annual Base Fee

340-28-2580

(1) The Department shall assess an annual base fee of $2,569 for each major source subject to the~~[*federal*]~~ **Oregon Title V** ~~[o]~~Operating ~~[p]~~Permit program.

(2) The annual base fee shall be apid to cover the period from November 1st of the current calendar year to November 14 of the following year.

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 13-1993, f. & ef. 9-24-93; DEQ 20-1993(T), f. & ef. 11-4-93; DEQ 13-1992, f. & ef. 5-19-94

Emission Fee

340-28-2590

(1) Based on the~~[*Federal*]~~ **Oregon Title V** Operating Permit Program Budget, prepared by the Department and approved by the 1993 Oregon Legislature, the Commission determines that an emission fee of $30.07 per ton is necessary to cover all reasonable direct and indirect costs of implementing the~~[*federal*]~~ **Oregon Title V** operating permit program.

(2) The emission fee shall be applied to emissions from the previous calendar year based on the elections made according to OAR 340-28-2640.

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 13-1993, f. & ef. 9-24-93; DEQ 20-1993(T), f. & ef. 11-4-93; DEQ 13-1994, f. & ef. 5-19-94

Exclusions

340-28-2620

(1) The Department shall not assess emission fees on newly permitted major sources that have not begun initial operation.

(2) The Department shall not assess emission fees on carbon monoxide. However, sources that emit or are permitted to emit 100 tons or more per year of carbon monoxide are subject to the emission fees on all other regulated air pollutants pursuant to OAR 340-28-2560.

(3) The Department shall not assess emission fees, OAR 340-28-2610, if there are no emissions of a regulated pollutant from an emission unit for the entire calendar year.

(4) If an owner or operator of a major source operates an assessable emission unit for less than

5% of the permitted operating schedule, the owner or operator may elect to report emissions based on a proration of the PSEL for the actual operating time.

(5) The Department shall not assess emission fees on emissions categorized as credits or unassigned PSELs within a[~~f federal~~]n Oregon Title V operating permit. However, credits and unassigned PSELs shall be included in determining whether a source is a[~~f federal~~]n Oregon Title V [~~o~~]Operating [~~p~~]Permit program source, as defined in OAR 340-28-110(41).

(6) The Department shall not assess emission fees on categorically insignificant emissions as defined in OAR 340-28-110(15).

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 13-1993, f. & ef. 9-24-93; DEQ 20-1993(T), f. & ef. 11-4-93; DEQ 13-1994, f. & ef. 5-19-94; DEQ 24-1994, f. & ef. 10-28-94

Determining Emissions From Continuous Monitoring Systems

340-28-2680

(1) The owner or operator shall use data collected in accordance with [~~federal~~]Oregon Title V [~~o~~]Operating [~~p~~]Permit conditions, applicable rules in OAR Chapter 340, or the Department's Continuous Monitoring Manual.

(2) If the owner or operator has continuous monitoring data that comprises less than ninety percent (90%) of the plant operating time, the actual emissions during the period when the continuous monitoring system was not operating shall be determined from 90 percentile continuous monitoring data.

[**Publications**: The publication(s) referred to or incorporated by reference in this rule are available from the office of the Department.]

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 13-1993, f. & ef. 9-24-93; DEQ 20-1993(T), f. & ef. 11-4-93; DEQ 13-1994, f. & ef. 5-19-94

Determining VOC Emissions Using Material Balance

340-28-2700 The owner or operator may determine the amount of VOC emissions for an assessable emission by using material balance. The owner or operator using material balance to calculate VOC emissions shall determine the amount of VOC added to the process, the amount of VOC consumed in the process and/or the amount of VOC recovered in the process by testing in accordance with **40 Code of Federal Regulations (CFR) Part 60 EPA Method 18, 24, 25**, a material balance method, or an equivalent plant specific method specified in the [~~federal~~] Oregon Title V [~~o~~]Operating [~~p~~]Permit using the following equation:

$$VOC_{tot} = VOC_{add} - VOC_{cons}$$

Where:

VOC_{tot} = Total VOC emissions, tons

VOC_{add} = VOC added to the process, tons

VOC_{cons} = VOC consumed and/or recovered from the process, tons

[**Publications**: The publication(s) referred to or incorporated by reference in this rule are available from the office of the Department.]

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 13-1993, f. & ef. 9-24-93; DEQ 20-1993(T), f. & ef. 11-4-93; DEQ 13-1994, f. & ef. 5-19-94

Verified Emission Factors Using Source Testing
340-28-2720

(1) To verify emission factors used to determine assessable emissions the owner or operator shall either perform source testing in accordance with the Department's Source Sampling Manual or other methods approved by the Department for source tests. Source tests shall be conducted in accordance with testing procedures on file at the Department and the pretest plan submitted at least fifteen (15) days in advance and approved by the Department. All test data and results shall be submitted for review to the Department within thirty (30) days after testing.

NOTE: It is recommended that the owner or operator notify the Department and obtain pre-approval of the Emission Factor source testing program prior to or as part of the submittal of the first source test notification.

(2) The owner or operator shall conduct or have conducted at least three compliance source tests, each consisting of at least three individual test runs for a total of at least nine test runs.

(3) The owner or operator shall monitor and record or have monitored and recorded applicable process and control device operating data.

(4) The owner or operator shall perform or have performed a source test either:
   (a) In each of three quarters of the year with no two successive source tests performed any closer than thirty (30) days apart, or
   (b) At equal intervals over the operating period if the owner or operator demonstrates and the Department approves that:
      (A) The process operates or has operated for part of the year, or
      (B) The process is or was not subject to seasonal variations.

(5) The owner or operator shall conduct or have conducted the source tests to test the entire range of operating levels. At least one test shall be conducted at minimum operating conditions, one test at normal or average operating levels, and one test at anticipated maximum operating levels. If the process rate is constant, all tests shall be conducted at that rate. The owner or operator shall submit documentation to the Department demonstrating a constant process rate.

(6) The owner or operator shall determine or have determined an emission factor for each source test by dividing each test run emissions, in pounds per hour, by the applicable process rate during the source test run. At least nine emission factors shall be plotted against the respective process rates and a regression analysis performed to determine the best fit equation and the correlation coefficient (R^2). If the correlation coefficient is less than 0.50, which would indicate that there is a relatively weak relationship between emissions and process rates, the arithmetic average and standard deviation of at least nine emission factors shall be determined.

(7) The owner or operator shall determine the Emissions Estimate Adjustment Factor (EEAF) as follows:
   (a) If the correlation coefficient (R^2) of the regression analysis is greater than 0.50, the EEAF shall be $1+(1-R^2)$.
   (b) If the correlation coefficient (R^2) is less than 0.50, the EEAF shall be:

$EEAF = 1 + SD/EF_{avg}$

Where:

SD = Standard Deviation

EF_{avg} = Average of the Emission Factors

(8) The owner or operator shall determine actual emissions for emission fee purposes using one of the following methods:

(a) If the regression analysis correlation coefficient is less than 0.50, the actual emissions shall be the average emission factor determined from at least nine test runs multiplied by the EEAF multiplied by the total production for the entire year, or

$AE = EF_{avg} \times EEAF \times P$

Where:

AE = Actual Emissions

EF_{avg} = Average of the Emission Factors

EEAF = Estimated Emissions Adjustment Factor

P = Total production for the year

(b) If the regression analysis correlation coefficient is greater than 0.50 the following calculations shall be performed:

(A) Determine the average emission factor (EF) for each production rate category (maximum = EF_{max}, normal = EF_{norm}, and minimum = EF_{min}).

(B) Determine the total annual production ~~[*and operating hours, production time*]~~(P~~[*T*]~~$_{tot}$), for the calendar year.

(C) Determine the ~~[*total hours*]~~**production while** operating within the maximum production rate category (P~~[*T*]~~$_{max}$). The maximum production rate category is any operation rate greater than the average of at least three maximum operating rates during the source testing plus the average of at least three normal operating rates during the source testing divided by two (2).

(D) Determine the ~~[*total hours*]~~**production** while operating within the normal production rate category (P~~[*T*]~~$_{norm}$). The normal production rate category is defined as any operating rate less than the average of at least three maximum operating rates during the source testing plus the average of at least three normal operating rates during the source testing divided by two (2) and any operating rate greater than the average of at least three minimum operating rates during the source testing plus the average of at least three normal operating rates during the source testing divided by two (2).

(E) Determine the ~~[*total hours*]~~**production** while operating within the

minimum production rate category $(P[T]_{min})$. The minimum production rate category is defined as any operating rate less than the average of at least three minimum operating rates during the source testing plus the average of at least three normal operating rates during the source testing divided by two (2).

(F) Actual emissions equals EEAF x $(P[T]_{max}[/PT_{tot})X]xEF_{max} + [(]P[T]_{norm}[/PT_{tot})X]xEF_{norm} + [(]PT_{min}[/PT_{tot})X]xEF_{min})$.

(9) The owner or operator shall determine emissions during startup and shutdown, and for emissions greater than normal, during conditions that are not accounted for in the procedure(s) otherwise used to document actual emissions. The owner or operator shall apply 340-28-2720(9)(a) or 340-28-2720(9)(b)(c) and (d) in developing emission factors. The owner or operator shall apply the emission factor obtained to the total time the assessable emission unit operated in these conditions.

(a) All emissions during startup and shutdown, and emissions greater than normal shall be assumed equivalent to operation without an air pollution control device, unless accurately demonstrated by the owner or operator and approved by the Department in accordance with OAR 340-28-2720(9)(b), (9)(c), (9)(d), and (9)(e). The emission factor plus the EEAF shall be adjusted by the air pollution control device collection efficiency as follows:

Actual emission factor =
(EF x EEAF)/(1 - PCDE)

Where:

EF	=	Emission Factor
EEAF	=	Emission Estimate Adjustment Factor
PCDE	=	Pollution Control Device Collection Efficiency Unless otherwise approved by the Department, the pollution control device collection efficiencies used in this calculation shall be:

Particulate Matter:

ESP or baghouse	0.90
High energy wet scrubber	0.80
Low energy wet scrubber	0.70
Cyclonic separator	0.50

Acid gases:

Wet or dry scrubber	0.90

VOCs:

Incinerator	0.98
Carbon absorber	0.95

(b) During process startups a Department approved source test shall be performed to determine an average startup factor. The average of at least three tests runs plus the standard deviation shall be used to determine actual emissions during startups.

(c) During process shutdowns a Department approved source test shall be performed to determine an emission factor for shutdowns. The average of at least three test runs plus the standard deviation shall be used to determine actual emissions during shutdowns.

(d) During routine maintenance activity the owner or operator shall:

(A) Perform routine maintenance activity during source testing for verified emission factors, or

(B) Determine emissions in accordance with Section (a) of this rule.

(e) The emission factor need not be adjusted if the owner or operator demonstrates to the Department that the pollutant emissions do not increase during startup and shutdown, and for conditions that are not accounted for the in procedure(s) otherwise used to document actual emissions (eg. NO_x emissions during an ESP failure).

(10) A verified emission factor developed pursuant to OAR 340-28-2560 through 340-28-2740 and approved by the Department can not be used if a process change occurs that would affect the accuracy of the verified emission factor.

(11) The owner or operator may elect to use verified emission factors for source categories if the Department determines the following criteria are met:

(a) The verified emission factor for a source category shall be based on verified emission factors from at least three individual sources within the source category,

(b) Verified emission factors from sources within a source category shall be developed in accordance with OAR 340-28-2720,

(c) The verified emission factors from the sources shall not differ from the mean by more than twenty percent, and

(d) The source category verified emission factor shall be the mean of the source verified emission factors plus the average of the source emission estimate adjustment factors.

[**Publications**: The publication(s) referred to or incorporated by reference in this rule are available from the office of the Department.]

Stat. Auth.: ORS Ch. 468 & 468A

Hist.: DEQ 13-1993, f. & ef. 9-24-93; DEQ 20-1993(T), f. & ef. 11-4-93; DEQ 13-1994, f. & ef. 5-19-94; DEQ 24-1994, f. & ef. 10-28-94

ATTACHMENT A-3

Division 32

DIVISION 32
HAZARDOUS AIR POLLUTANTS

General Provisions for Stationary Sources

Definitions

340-32-120 As used in this Division:

(1) "Accidental Release" means an unanticipated emission of a regulated substance or other extremely hazardous substance into the ambient air from a stationary source.

(2) "Act" and "FCAA" mean the Federal Clean Air Act, Public Law 88-206 as last amended by Public Law 101-549.

(3) "Actual Emissions" means the mass emissions of a pollutant from an emissions source during a specified time period.

(a) Actual emissions shall equal the average rate at which the source actually emitted the pollutant and which is representative of normal source operation. Actual emissions shall be directly measured with a continuous monitoring system or calculated using a material balance or verified emission factor in combination with the source's actual operating hours, production rates and types of materials processed, stored, or combusted during the specified time period.

(b) For any source which had not yet begun normal operation in the specified time period, actual emissions shall equal the potential to emit of the source.

(c) For purposes of OAR 340-32-300 through OAR 340-32-380 actual emissions shall equal the actual rate of emissions of a pollutant, but does not include excess emissions from a malfunction, or startups and shutdowns associated with a malfunction.

(4) "Area Source" means any stationary source which has the potential to emit hazardous air pollutants but is not a major source of hazardous air pollutants.

(5) "Artificially or Substantially Greater Emissions" means abnormally high emissions such as could be caused by equipment malfunctions, accidents, unusually high production or operating rates compared to historical rates, or other unusual circumstances.

(6) "Base Year Emissions" for purposes of Early Reductions only (OAR 340-32-300), means actual emissions in the calendar year 1987 or later.

(7) "Commission" means the Oregon Environmental Quality Commission.

(8) "Department" means the Department of Environmental Quality.

(9) "Director" means the Director of the Department or Regional authority, and authorized deputies or officers.

(10) "Early Reductions Unit" means a single emission point or group of emissions points defined as a unit for purposes of an alternative emissions limit issued under OAR 340-32-300 through 340-32-380.

(11) "Effective Date of the Program" means the date that the EPA approves the ~~[federal o]~~**Oregon Title V O**perating ~~[p]~~**P**ermit program submitted by the Department on a full or interim basis. In case of a partial approval, the "effective date of the program" for each portion of the program is the date of EPA approval of that portion.

(12) "Emission" means a release into the atmosphere of any regulated pollutant or air contaminant.

(13) "Emissions Limitation" and "Emissions Standard" mean a requirement adopted by the Department or regional authority, or proposed or promulgated by the Administrator of the EPA, which limits the quantity, rate, or concentration of emissions of air pollutants on a continuous basis, including any requirements which limit the level of opacity, prescribe equipment, set fuel specifications, or prescribe operation or maintenance procedures for a source to assure continuous emission reduction.

(14) "Emissions Unit" means any part or activity of a stationary source that emits or has the potential to emit any regulated air pollutant.

(a) A part of a stationary source is any machine, equipment, raw material, product, or by-product that produces or emits air pollutants. An activity is any process, operation, action, or reaction (e.g., chemical) at a stationary source that emits air pollutants. Except as described in subsection (d) of this section, parts and activities may be grouped for purposes of defining an emissions unit provided the following conditions are met:

(A) The group used to define the emissions unit may not include discrete parts or activities to which a distinct emissions standard applies or for which different compliance demonstration requirements apply; and

(B) The emissions from the emissions unit are quantifiable.

(b) Emissions units may be defined on a pollutant by pollutant basis where applicable.

(c) The term "emissions unit" is not meant to alter or affect the definition of the term "unit" for purposes of Title IV of the FCAA.

(d) Parts and activities shall not be grouped for purposes of determining emissions increases from an emissions unit under OAR 340-28-1930 , 340-28-1940, or 340-28-2270, or for purposes of determining the applicability of a New Source Performance Standard (NSPS).

(15) "EPA" means the Administrator of the United States Environmental Protection Agency or the Administrator's designee.

(16) "EPA Conditional Method" means any method of sampling and analyzing for air pollutants which has been validated by the EPA but which has not been published as an EPA reference method.

(17) "EPA Reference Method" means any method of sampling and

analyzing for an air pollutant as described in **40 CFR Part 60, 61, or 63** (July 1, 1993).

(18) "Equipment leaks" means leaks from pumps, compressors, pressure relief devices, sampling connection systems, open ended valves or lines, valves, connectors, agitators, accumulator vessels, and instrumentation systems in hazardous air pollutant service.

(19) "Existing Source" means any source, the construction of which commenced prior to proposal of an applicable standard under sections 112 or 129 of the FCAA.

(20) "Facility" means all or part of any public or private building, structure, installation, equipment, or vehicle or vessel, including but not limited to ships.

(21) "Fugitive Emissions" means emissions of any air contaminant that escape to the atmosphere from any point or area that is not identifiable as a stack, vent, duct or equivalent opening.

(22) "Generally Available Control Technology (GACT)" means an alternative emission standard promulgated by EPA for non-major sources of hazardous air pollutants which provides for the use of control technology or management practices which are generally available.

(23) "Hazardous Air Pollutant" (HAP) means an air pollutant listed by the EPA pursuant to section 112(b) of the FCAA or determined by the Commission to cause, or reasonably be anticipated to cause, adverse effects to human health or the environment.

(24) "High-Risk Pollutant" means any air pollutant listed in Table 2 of OAR 340-32-340 for which exposure to small quantities may cause a high risk of adverse public health effects.

(25) "Major Source" means any stationary source or group of stationary sources located within a contiguous area and under common control that emits or has the potential to emit considering controls, in the aggregate, 10 tons per year or more of any hazardous air pollutant or 25 tons per year or more of any combination of hazardous air pollutants. The EPA may establish a lesser quantity, or in the case of radionuclides different criteria, for a major source on the basis of the potency of the air pollutant, persistence, potential for bioaccumulation, other characteristics of the air pollutant, or other relevant factors.

(26) "Manufacture" as used in OAR 340-32-240 means to produce, prepare, compound, or import a substance. This includes the coincidental production of a substance as a byproduct or impurity.

(27) "Maximum Achievable Control Technology (MACT)" means an emission standard applicable to major sources of hazardous air pollutants that requires the maximum degree of reduction in emissions deemed achievable for either new or existing sources.

(28) "Modification" means any physical change in, or change in the method of operation of, a major source that increases the actual emissions of any HAP emitted by such source by

more than a de minimis amount or which results in the emission of any hazardous air pollutant not previously emitted by more than a de minimis amount.

(29) "New Source" means a stationary source, the construction of which is commenced after proposal of a federal MACT or the effective date of this Division, whichever is earlier.

(30) "Not Feasible to Prescribe or Enforce a Numerical Emission Limit" means a situation in which the Department determines that a pollutant or stream of pollutants listed in OAR 340-32-130 cannot be emitted through a conveyance designed and constructed to emit or capture such pollutant, or that any requirement for, or use of, such a conveyance would be inconsistent with any state or federal law or regulation; or the application of measurement technology to a particular source is not practicable due to technological or economic limitations.

(31) "Person" means the United States Government and agencies thereof, any state, individual, public or private corporation, political subdivision, governmental agency, municipality, industry, co-partnership, association, firm, trust, estate, or any other legal entity whatsoever.

(32) "Potential to Emit" means the maximum capacity of a stationary source to emit any air pollutant under its physical and operational design. Any physical or operational limitation on the capacity of a source to emit an air pollutant, including air pollution control equipment and restrictions on hours of operation or on the type or amount of material combusted, stored, or processed, shall be treated as part of its design if the limitation is enforceable by the EPA. This section does not alter or affect the use of this section for any other purposes under the Act, or the term "capacity factor" as used in Title IV of the Act or the regulations promulgated thereunder. Secondary emissions shall not be considered in determining the potential to emit of a source.

(33) "Process" as used in OAR 340-32-240 means the preparation of a substance, including the intentional incorporation of a substance into a product after its manufacture, for distribution in commerce.

(34) "Regional Authority" means Lane Regional Air Pollution Authority.

(35) "Regulated Air Pollutant" as used in this Division means:
  (a) Any pollutant listed under OAR 340-32-130 or OAR 340-32-5400; or
  (b) Any pollutant that is subject to a standard promulgated pursuant to Section 129 of the Act.

(36) "Secondary Emissions" means emissions from new or existing sources which occur as a result of the construction and/or operation of a source or modification, but do not come from the source itself. Secondary emissions shall be specific, well defined, and quantifiable, and impact the same general area as the source associated with the secondary emissions. Secondary emissions may include but are not limited to:
  (a) Emissions from ships and trains coming to or from a

facility;

(b) Emissions from offsite support facilities which would be constructed or would otherwise increase emissions as a result of the construction of a source or modification.

(37) "Section 111" means that section of the FCAA that includes standards of performance for new stationary sources.

(38) "Section 112(b)" means that subsection of the FCAA that includes the list of hazardous air pollutants to be regulated.

(39) "Section 112(d)" means that subsection of the FCAA that directs the EPA to establish emission standards for sources of hazardous air pollutants. This section also defines the criteria to be used by EPA when establishing the emission standards.

(40) "Section 112(e)" means that subsection of the FCAA that directs the EPA to establish and promulgate emissions standards for categories and subcategories of sources that emit hazardous air pollutants.

(41) "Section 112(n)" means that subsection of the FCAA that includes requirements for the EPA to conduct studies on the hazards to public health prior to developing emissions standards for specified categories of hazardous air pollutant emission sources.

(42) "Section 112(r)" means that subsection of the FCAA that includes requirements for the EPA promulgate regulations for the prevention, detection and correction of accidental releases.

(43) "Section 129" means that section of the FCAA that requires EPA to promulgate regulations for solid waste combustion.

(44) "Solid Waste Incineration Unit" as used in this Division shall have the same meaning as given in Section 129(g) of the FCAA.

(45) "Stationary Source":

(a) As used in OAR 340-32-100 through 340-32-5000 and 340-32-5500 through 340-32-5650 means any building, structure, facility, or installation which emits or may emit any regulated air pollutant.

(b) As used in OAR 340-32-5400 means any buildings, structures, equipment, installations, or substance emitting stationary activities:

(A) That belong to the same industrial group;

(B) That are located on one or more 2contiguous properties;

(C) That are under the control of the same person (or persons under common control); and

(D) From which an accidental release may occur.

(46) "Use" as used in OAR 340-32-240 means the consumption of a chemical that does not fall under the definitions of "manufacture" or "process". This may include the use of a chemical as a manufacturing aid, cleaning or degreasing aid, or waste treatment aid.

Stat. Auth.: ORS Ch. 468 & 468A

Hist.: DEQ 13-1993, f. & ef. 9-24-93; DEQ 18-1993, f. & ef. 11-4-93; DEQ 24-1994, f. & ef. 10-28-94

Permit Application Requirements

340-32-150 through 340-32-200 [Reserved]

Applicability

340-32-210 [Renumbered to 340-32-105]

Permit Application

340-32-220

(1) The owner or operator of a HAP source subject to OAR 340-32-400 through 340-32-4500 or 340-32-5500 through 340-32-5650 shall comply with the appropriate application requirements for construction permits, OAR 340-32-230 and operating permits, OAR 340-32-240.

(2) Notwithstanding the provisions of OAR Chapter 340, Divisions 28 and 32, no stationary source shall be required to apply for, or operate pursuant to, a ~~[federal o]~~**n Oregon Title V O**perating ~~[p]~~**P**ermit issued under OAR 340-28-2100 through 340-28-2320 solely because such source is subject to the provisions of OAR 340-32-5400, Accidental Release Prevention.

[**Note:** Rules specifying the full procedures and specific requirements for permitting can be found in OAR Chapter 340, Division 28.]

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 13-1993, f. & ef, 9-24-93; DEQ 18-1993, f. & ef. 11-4-93

Permit to Construct or Modify

340-32-230

(1) On or after the effective date of the program no owner or operator shall:

(a) Construct a new major source that will be subject to the ~~[federal o]~~**Oregon Title V O**perating ~~[p]~~**P**ermit program without obtaining an Air Contaminant Discharge Permit (ACDP) pursuant to OAR 340-28-1700 through 340-28-1770 prior to construction;

(b) Modify any existing major source operating under a ~~[federal o]~~**n Oregon Title V O**perating ~~[p]~~**P**ermit without obtaining a preconstruction notice of approval as described in OAR 340-28-2270 prior to modifying;

(c) Modify any existing source operating under an ACDP which will become a major source after modifying, without obtaining a permit modification pursuant to OAR 340-28-1700 through 340-28-1770 prior to modifying;

(d) Modify any existing source not currently operating under any permit which will become a major source after

modifying, without obtaining an ACDP pursuant to OAR 340-28-1700 through 340-28-1770 prior to modifying;

(e) Modify any existing source operating under an ACDP as a synthetic minor pursuant to OAR 340-28-1740 which will become a major source after modifying, without:

(A) Obtaining a~~[federal o]~~n Oregon Title V Operating ~~[p]~~Permit pursuant to OAR 340-28-2100 through 340-28-2320 for those sources proposing to change an enforceable condition in the permit prior to operating as a major source; or

(B) Obtaining a modified ACDP pursuant to OAR 340-28-1700 through 340-28-1770 for those sources proposing to construct or modify any emissions unit prior to construction or modification.

(2) Prior to the effective date of the program for a major source and at any time for an area source subject to OAR 340-32-5500 through 340-32-5600 or 340-32-5650, no owner or operator shall:

(a) Construct a new source subject to OAR 340-32-5500 through 340-32-5600 or 340-32-5650 without obtaining an ACDP pursuant to OAR 340-28-1700 through 340-28-1770;

(b) Modify any existing source subject to OAR 340-32-5500 through 340-32-5600 or 340-32-5650 such that HAP emissions are increased without obtaining a modified ACDP pursuant to OAR 340-28-1700 through 340-28-1770;

(c) Modify any existing source subject to OAR 340-32-5500 through 340-32-5600 or 340-32-5650 such that HAP emissions are not increased without obtaining a notice of construction approval pursuant to OAR 340-28-800 through 340-28-820.

(3) All applicants for construction or modification of a major source of HAP shall determine and report to the Department potential emissions of HAP listed in **Table 1** of OAR 340-32-130.

(4) Where an existing ~~[federal o]~~**Oregon Title V** Operating ~~[p]~~Permit would prohibit such construction or change in operation, the owner or operator must obtain a permit revision before commencing operation.

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 13-1993, f. & ef, 9-24-93; DEQ 18-1993, f. & ef. 11-4-93; DEQ 24-1994, f. & ef. 10-28-94

Permit to Operate
340-32-240

(1) On and after the effective date of the program or at such earlier date as the Department may establish pursuant to OAR 340-28-2120, no owner or operator shall operate a new, existing, or modified major source of HAP emissions without applying for an operating permit as described below:

(a) The following types of HAP sources shall, within 12 months after initial startup of the construction or modification, comply with the ~~[federal o]~~**Oregon Title V**

Operating ~~[p]~~Permit application procedures of OAR 340-28-2100 through 340-28-2320:

(A) New major sources as described in OAR 340-32-230(1)(a);

(B) Existing sources operating under an ACDP as described in OAR 340-32-230(1)(c);

(C) Existing sources previously unpermitted as described in OAR 340-32-230(d);

(D) Existing synthetic minor sources operating under an ACDP as described in OAR 340-32-230(1)(e)(B).

(b) Any existing major sources as described under OAR 340-32-230(1)(b) shall:

(A) Immediately upon receiving its preconstruction notice of approval, comply with the operating permit procedures described under OAR 340-28-2230 Administrative Amendments, if the source has complied with the enhanced provisions of OAR 340-28-2290 and OAR 340-28-2310;

(B) Within 12 months of commencing operation comply with the permit application procedures under OAR 340-28-2250 when the modification qualifies as a minor modification or OAR 340-28-2260 when the modification qualifies as a significant modification; or

(C) At the time of permit renewal comply with the permit application procedures under OAR 340-28-2220(2) when the modification qualifies as an off permit change or OAR 340-28-2220(3) when the modification qualifies as a "Section 502(b)(10)" change.

(c) Any synthetic minor source as described in OAR 340-32-230(1)(e)(A) shall, prior to commencing operation, apply for and obtain the required ~~[federal o]~~**Oregon Title V** Operating ~~[p]~~Permit according to the procedures of OAR 340-28-2100 through 340-28-2320.

(d) Any existing major source shall comply with the ~~[federal o]~~**Oregon Title V** Operating ~~[p]~~Permit application procedures of OAR 340-28-2100 through 340-28-2320 upon becoming subject to the ~~[federal o]~~**Oregon Title V** Operating ~~[p]~~Permit program.

(2) All ~~[federal o]~~**Oregon Title V** Operating ~~[p]~~Permit applicants shall include in the application:

(a) All emissions of HAP listed in **Table 1** of OAR 340-32-130 in accordance with OAR 340-28-2120(3) Standard Application Form and Required Information, and OAR 340-28-2120(4) Quantifying Emissions;

(b) An estimate of the use of additional substances, listed in OAR 340, Chapter 135, Appendix 1 and in OAR 340-32-5400 **Table 3**, that are manufactured, processed, or used at the facility and that could reasonably be expected to be emitted from the source;

(A) The estimated annual manufacture, processing, or use of each chemical shall be reported within the following ranges: "Not Present"; "Insignificant

Use" (less than 1,000 pounds); "1,001 - 10,000 pounds"; "10,00~~[0]~~1 - 20,000 pounds"; 20,001 - 50,000 pounds"; and "Over 50,000 pounds".

(B) The owner or operator shall provide estimates of the usage of these additional chemicals based on readily available information. The owner or operator is not required to estimate the "manufacture" of any chemical from combustion or manufacturing processes for which there are no verifiable emission factors, mass balance calculation methods, or for which no EPA approved testing, sampling, or monitoring method exists. The use of chemicals in the following categories are exempt from quantification:

(i) Aggregate insignificant emissions as defined under OAR 340-28-110(5) and categorically insignificant activities as defined under OAR 340-28-110(15);

(ii) Products and fuels for maintaining motor vehicles used onsite; or

(iii) Chemicals used in a manufactured item that are not released under normal circumstances of processing at the facility;

(C) Nothing in paragraphs (A) or (B) of this subsection shall require a source to conduct monitoring or testing solely for the purpose of estimating annual usage of the additional substances.

(3) Prior to the effective date of the program for a major source and at any time for an area source, no owner or operator shall operate a new, existing, or modified stationary source subject to OAR 340-32-5500 through 340-32-5600 or 340-32-5650 without first obtaining a permit pursuant to OAR 340-28-1700 through 340-28-1770.

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 13-1993, f. & ef, 9-24-93; DEQ 18-1993, f. & ef. 11-4-93; DEQ 24-1994, f. & ef. 10-28-94

Emission Standards

340-32-400 through 340-32-490 [Reserved]

Emissions Limitation for New Major Sources
340-32-500

(1) Federal MACT. Any person who proposes to construct a major source of HAP after an applicable emissions standard has been proposed by the EPA pursuant to Section 112(d), Section 112(n), or Section 129 of the FCAA shall comply with the requirements and emission standard for new sources when promulgated by EPA.

(2) State MACT. Any person who proposes to construct a major source of hazardous air pollutants before MACT requirements applicable to that source have been proposed by the EPA and after the effective date of the program shall comply with new source MACT requirements determined by the Department on a case-by-case basis.

(a) In establishing a state MACT the Department shall require the maximum degree of reduction in emissions of hazardous air pollutants (including a prohibition on such emissions, where achievable) that the Department, taking into consideration the cost of achieving such emission reductions, and any non-air quality health and environmental impacts and energy requirements, determines is achievable through application of processes, methods, systems, or techniques including, but not limited to, emissions reduction measures that:

(A) Reduce the volume of, or eliminate emissions of, HAP through process changes, substitution of materials or other modifications;

(B) Enclose systems or processes to eliminate emissions;

(C) Collect, capture or treat HAP emissions when released from the process, stack, storage or fugitive emissions point;

(D) Are design, equipment, work practice, or operational standards, including requirements for operator training or certification; or

(E) Are a combination of the above.

(b) The owner or operator of the proposed major source must demonstrate to the Department that the source shall achieve at least the maximum degree of emissions reduction that is achieved in practice by the best controlled similar source.

(c) If, after a permit has been issued, the EPA promulgates a MACT standard applicable to a source which is more stringent than the one established pursuant to this section, the Department shall revise the permit upon the next renewal to reflect the standard promulgated by the EPA. The source shall be given a reasonable time to comply, but no longer than 8 years after the standard is

promulgated.

(d) The Department shall not establish a case-by-case state MACT:

(A) For new solid waste incineration units where an emissions standard will be established for these units by the EPA pursuant to Section 111 of the FCAA. These sources are subject to applicable emissions standards under OAR Chapter 340, Division 25.

(B) For new major HAP sources where an emissions standard or alternative control strategy will be established by the EPA pursuant to Section 112(n) of the FCAA.

(3) Compliance schedule. The owner or operator of the proposed major source must demonstrate to the Department that the source will achieve the required emissions limitation prior to commencing operation.

(4) Residual emissions.

(a) The owner or operator of the proposed major source shall assess whether its residual emissions of each listed HAP, after complying with any emissions limitation in section (1) or (2) of this rule, would be less than the de minimis quantity listed in Table 1 of OAR 340-32-130. This requirement shall apply only to increases in emissions from the new emissions units.

(b) If the residual emissions of any listed HAP exceeds the de minimis quantity for that HAP then the owner or operator of the source shall notify the Department when applying for a construction permit which of the following options the owner or operator chooses for addressing residual emissions:

(A) Propose additional emissions reduction measures to reduce residual HAP emissions that, if approved by the Department, shall be included as permit terms or conditions;

(B) Provide an air quality analysis to the Department showing impacts from residual emissions; or

(C) Propose no additional emissions reduction measures and will provide additional information when requested, for the Department to evaluate the source's residual emissions.

(c) The Department may request additional information from the owner or operator. The information requested shall be necessary for determining additional control measures or for conducting an air quality analysis. The Department shall determine, prior to issuance of an construction permit, if residual emissions have been adequately addressed to protect public health and the environment and may propose rule making to require additional emission reduction measures on a case-by-case basis.

(d) Additional emissions reduction measures may include:

(A) Those listed in subsection 2(a) of this rule regardless of cost;

(B) Equipment shutdown or additional controls on other emissions units within the facility; or
(C) Reductions in releases to other environmental media.

(e) When applying for a ~~[*Federal]*~~**n Oregon Title V** Operating Permit the source shall notify the Department if its actual emissions exceed the estimate of residual emissions and the de minimis quantities. The Department shall then determine if residual emissions have been adequately addressed or whether additional emissions reductions measures are needed for the operating permit according to subsections 4(b), (c), and (d) **of this rule**.

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 13-1993, f. & cert. ef. 9-24-93

Requirements for Modifications of Existing Major Sources
340-32-4500

(1) After the effective date of the program, no person may modify a major source of HAP in such a way as to start emitting or increase potential emissions of any HAP by more than its de minimis quantity listed in Table 1 (OAR 340-32-130) without applying the MACT emissions limitation for that source category.

(2) Where no applicable emissions limitation has been promulgated by the EPA and adopted as a rule within this Division, the Department shall determine on a case-by-case basis whether the Emissions Limitation for New Major Sources (OAR 340-32-500(2)) or the Emissions Limitation for Existing Major Sources (OAR 340-32-2500(2)) applies to the modified emissions unit.

(3) Residual emissions.
(a) The owner or operator of the proposed major source shall assess whether its residual emissions of each listed HAP, after complying with any emissions limitation in section (1) or (2) of this rule, would be less than the de minimis quantity listed in Table 1 of OAR 340-32-130. This requirement shall apply only to increases in emissions from the modified emissions units.
(b) If the residual emissions of any listed HAP exceeds the de minimis quantity for that HAP then the owner or operator of the source shall notify the Department when applying for a construction permit which of the following options the owner or operator chooses for addressing residual emissions:
(A) Propose additional emissions reduction measures to reduce residual HAP emissions that, if approved by the Department, shall be included as permit terms or conditions;
(B) Provide an air quality analysis to the Department showing impacts from residual emissions; or
(C) Propose no additional emissions reduction measures and will provide additional information when

requested, for the Department to evaluate the source's residual emissions.

(c) The Department may request additional information from the owner or operator. The information requested shall be necessary for determining additional control measures or for conducting an air quality analysis. The Department shall determine, prior to issuance of a construction permit, if residual emissions have been adequately addressed to protect public health and the environment and may propose rule making to require additional emission reduction measures on a case-by-case basis.

(d) Additional emissions reduction measures may include:
  (A) Those listed in OAR 340-32-500(2)(a) regardless of cost;
  (B) Equipment shutdown or additional controls on other emissions units within the facility; or
  (C) Reductions in releases to other environmental media.

(e) When applying for a ~~[*Federal*]~~**n Oregon Title V** Operating Permit the source shall notify the Department if its actual emissions exceed the estimate of residual emissions and the de minimis quantities. The Department shall then determine if residual emissions have been adequately addressed or whether additional emissions reductions measures are needed for the operating permit according to subsections 4(b), (c), and (d) of this rule.

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 13-1993, f. & cert. ef. 9-24-93

340-32-4510 through 340-32-4990 [Reserved]

Requirements for Area Sources

340-32-5000

(1) Applicability. After the effective date of the program the requirements of sections (2) and (3) of this rule shall apply to:
  (a) Area sources for which EPA has promulgated, and the Department has adopted, a GACT standard; or
  (b) Area sources for which an emissions limitation has been developed and adopted by the Department.

(2) Permit Requirements. All area sources subject to GACT standards promulgated by EPA, or emission limitations developed by the Department and adopted as rule by the Commission, are temporarily deferred from the requirement to obtain a ~~[*federal o*]~~**n Oregon Title V O**perating ~~[*p*]~~**P**ermit until such time as the Department determines how the program should be structured and completes rule making.

(3) Emissions Limitation for Area Sources
  (a) Generally Available Control Technology (GACT) may take the form of control technology requirements or

performance standards. GACT may include, but is not limited to, work practice modifications, material substitutions, pollution prevention techniques, alternative technology, process changes, or other options, as well as emissions control technologies. In some cases GACT may be identical to MACT for major HAP sources in the same source category.

(b) Any person who proposes to operate an area source after a GACT standard has been promulgated by EPA shall comply with the applicable GACT requirements.

(c) Any person who proposes to operate an area source after the Commission has adopted an emissions limitation, shall comply with the applicable requirements.

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 13-1993, f. & cert. ef. 9-24-93

Emission Standards for Airborne Radionuclide Emissions From Facilities Licensed by the Nuclear Regulatory Commission

340-32-5585

(1) Applicability:

(a) This rule applies to any ~~[federal o]~~Oregon Title V Operating ~~[p]~~Permit source which is a major source under OAR 340-28-110(45) that is also subject to **40 CFR 61.100**.

(2) Requirements. Sources subject to this rule shall comply with **40 CFR Part 61, Subpart I, as adopted under OAR 340-32-5520.**

[Note: Other sources which are not major sources may be subject to **40 CFR Part 61, Subpart I** under authority retained by EPA.]

[**Publications:** The Publication(s) referred to or incorporated by reference in this rule are available from the office of the Department of Environmental Quality.]

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 32-1994, f. & ef. 12-22-94

Definitions for Asbestos Emission Standards and Procedural Requirements

340-32-5590 As used in OAR 340-32-5600 through 340-32-5650:

(1) "Adequately Wet" means to sufficiently mix or penetrate asbestos-containing material with liquid to prevent the release of particulate asbestos materials. The absence of visible emissions is not sufficient evidence of being adequately wet.

(2) "Asbestos" means the asbestiform varieties of serpentine (chrysotile), riebeckite (crocidolite), cummingtonite-grunerite (amosite), anthophyllite, actinolite and tremolite.

(3) "Asbestos Abatement Project" means any demolition, renovation, repair, construction or maintenance activity of any public or private facility that involves the repair, enclosure, encapsulation, removal, salvage, handling or disposal of any material with the potential of releasing asbestos fibers from

asbestos-containing material into the air. Emergency fire fighting is not an asbestos abatement project.

(4) "Asbestos Manufacturing Operation" means the combining of commercial asbestos, or in the case of woven friction products, the combining of textiles containing commercial asbestos with any other material(s) including commercial asbestos, and the processing of this combination into a product as specified in OAR 340-32-5590(3).

(5) "Asbestos-Containing Material" means asbestos or any material containing more than one percent (1%) asbestos by weight, including particulate asbestos material.

(6) "Asbestos Mill" means any facility engaged in the conversion or any intermediate step in the conversion of asbestos ore into commercial asbestos.

(7) "Asbestos Survey" means an inspection using the procedures contained in **40 CFR 763.86, Subpart E** (July 1, 1993) to determine whether materials or structures to be worked on, removed, or demolished, contain asbestos.

(8) "Asbestos Tailings" mean any solid waste product of asbestos mining or milling operations which contains asbestos.

(9) "Asbestos Waste Generator" means any person performing an asbestos abatement project or any owner or operator of a source subject to OAR 340-32-5590 through 340-32-5650 whose act or process generates asbestos-containing waste material.

(10) "Asbestos-Containing Waste Material" means any waste which contains asbestos tailings or any commercial asbestos, and is generated by a source subject to OAR 340-32-5500 through 340-32-5520 and OAR 340-32-5590 through 340-32-5650. This term includes, but not limited to, filters from control devices, asbestos abatement project waste, and bags or containers that previously contained commercial asbestos.

(11) "Asbestos Waste Shipment Record" means the shipment document, required to be originated and signed by the asbestos waste generator; used to track and substantiate the disposition of asbestos-containing waste material.

(12) "Commercial Asbestos" means asbestos which is produced by extracting asbestos from asbestos ore.

(13) "Demolition" means the wrecking or removal of any load-supporting structural member of a facility together with any related handling operations or the intentional burning of any facility.

(14) "Fabricating" means any processing (e.g., cutting, sawing, drilling) of a manufactured product that contains commercial asbestos, with the exception of processing at temporary sites (field fabricating) for the construction or restoration of facilities. In the case of friction products, fabricating includes bonding, debonding, grinding, sawing, drilling, or other similar operations performed as part of fabricating.

(15) "Friable Asbestos Material" means any asbestos-containing material that hand pressure can crumble, pulverize or reduce to powder when dry.

(16) "Full-Scale Asbestos Abatement Project" means any removal, renovation, encapsulation, repair or maintenance of any asbestos-containing material which could potentially release

asbestos fibers into the air, and which is not classified as a small-scale asbestos abatement project.

(17) "HEPA Filter" means a high efficiency particulate air filter capable of filtering 0.3 micron particles with 99.97 percent efficiency.

(18) "Inactive Asbestos-Containing Waste Disposal Site" means any disposal site for asbestos-containing waste where the operator has allowed the Department's solid waste permit to lapse, has gone out of business, or no longer receives asbestos-containing waste.

(19) "Interim Storage of Asbestos-Containing Material" means the storage of asbestos-containing waste material which has been placed in a container outside a regulated area until transported to an authorized landfill.

(20) "Nonfriable Asbestos-Containing Material" means any material containing more than one percent (1%) asbestos as determined by weight that when dry, cannot be crumbled, pulverized, or reduced to powder by hand pressure.

(21) **"Open accumulation" means any accumulation, including storage of friable asbestos-containing material or asbestos-containing waste material other than material securely enclosed and stored as required by OAR 340-32-5650.**

(22) "Particulate Asbestos Material" means any finely divided particles of asbestos material.

(2~~[2]~~3) "Renovation" means altering in any way one or more facility components. Operations in which load-supporting structural members are wrecked or removed are excluded.

(2~~[3]~~4) "Small-Scale Asbestos Abatement Project" means any small-scale, short-duration renovating and maintenance activity or removal, renovation, encapsulation, repair, or maintenance procedures intended to prevent asbestos-containing material from releasing fibers into the air and which:

(a) Removes, encapsulates, repairs or maintains less than 40 linear feet or 80 square feet of asbestos-containing material;

(b) Does not subdivide an otherwise full-scale asbestos abatement project into smaller sized units in order to avoid the requirements of this Division;

(c) Utilizes all practical worker isolation techniques and other control measures; and

(d) Does not result in worker exposure to an airborne concentration of asbestos in excess of 0.1 fibers per cubic centimeter of air, calculated as an eight (8) hour time weighted average.

(2~~[4]~~5) "Small-Scale, Short-Duration Renovating and Maintenance Activity" means a task for which the removal of asbestos is not the primary objective of the job, including, but not limited to:

(a) Removal of quantities of asbestos-containing insulation on pipes;

(b) Removal of small quantities of asbestos-containing insulation on beams or above ceilings;

(c) Replacement of an asbestos-containing gasket on a valve;

(d) Installation or removal of a small section of drywall;
(e) Installation of electrical conduits through or proximate to asbestos-containing materials. Small-scale, activities shall be limited to no more than 40 linear feet or 80 square feet of asbestos-containing material. An asbestos abatement activity that would otherwise qualify as a full-scale abatement project shall not be subdivided into smaller units in order to avoid the requirements of this Division; or
(f) No such activity described above shall result in airborne asbestos concentrations above 0.1 fibers per cubic centimeter of air (calculated as an eight (8) hour time weighted average).

(2~~[5]~~6) "Structural Member" means any load-supporting member of a facility, such as beams and load-supporting walls; or any non-supporting member, such as ceilings and non-load-supporting walls.

Stat. Auth. ORS Ch. 468 & 468A
Hist.: Renumbered from OAR 340-25-455, DEQ 18-1993, f. & ef. 11-4-93; DEQ 20-1993(T), f. & ef. 11-4-93

Emission Standards and Procedural Requirements for Asbestos
340-32-5600

(1) Emission standard for asbestos mills. No person shall cause to be discharged into the atmosphere any visible emissions from any asbestos milling operation, including fugitive emissions, except as provided under OAR 340-32-5640(14) Air Cleaning. For purposes of this rule, the presence of uncombined water in the emission plume shall not be cause for failure to meet the visible emission requirement. Outside storage of asbestos materials is not considered a part of an asbestos mill. Each owner or operator of an asbestos mill shall meet the following requirements:
(a) Monitor each potential source of asbestos emissions from any part of the mill facility, including air cleaning devices, process equipment, and buildings that house equipment for material processing and handling, at least once each day, during daylight hours, for visible emissions to the outside air during periods of operations. The monitoring shall be by visual observation of at least 15 seconds duration per source of emissions;
(b) Inspect each air cleaning device at least once each week for proper operation and for changes that signal the potential for malfunction including, to the maximum extent possible without dismantling other than opening the device, the presence of tears, holes, and abrasions in filter bags and for dust deposits on the clean side of bags. For air cleaning devices that cannot be inspected

on a weekly basis according to this subsection, submit to the Department, revise as necessary, and implement a written maintenance plan to include, at a minimum, the following:
(A) Maintenance schedule;
(B) Recordkeeping plan.

(c) Maintain records of the results of visible emissions monitoring and air cleaning device inspections using a format approved by the Department which includes the following:
(A) Date and time of each inspection;
(B) Presence or absence of visible emissions;
(C) Condition of fabric filters, including presence of any tears, holes, and abrasions;
(D) Presence of dust deposits on clean side of fabric filters;
(E) Brief description of corrective actions taken, including date and time;
(F) Daily hours of operation for each air cleaning device.

(d) Furnish upon request, and make available at the affected facility during normal business hours for inspection by the Department, all records required under this section;

(e) Retain a copy of all monitoring and inspection records for at least two years;

(f) Submit a copy of visible emission monitoring records to the Department quarterly. The quarterly reports shall be postmarked by the 30th day following the end of the calendar quarter;

(g) Asbestos-containing waste material produced by any asbestos milling operation will be disposed of according to OAR 340-32-5650.

(2) Roadways and Parking Lots. No person may construct or maintain a roadway with asbestos tailings or asbestos-containing waste material on that roadway, unless (for asbestos tailings):
(a) It is a temporary roadway on an area of asbestos ore deposits (asbestos mine); or
(b) It is a temporary roadway at an active asbestos mill site and is encapsulated with a resinous or bituminous binder. The encapsulated road surface must be maintained at a minimum frequency of once per year to prevent dust emissions; or
(c) It is encapsulated in asphalt concrete meeting the specifications contained in **Section 401 of Standard Specifications for Construction of Roads and Bridges on Federal Highway Projects, FP-85, 1985**, or their equivalent.

(3) Manufacturing. No person shall cause to be discharged into the atmosphere any visible emissions, except as provided in OAR 340-32-5640(14), from any building or structure in which manufacturing operations utilizing commercial asbestos are conducted, or directly from any such manufacturing operations if they are conducted outside buildings or structures, or from

any other fugitive emissions. All asbestos-containing waste material produced by any manufacturing operation shall be disposed of according to OAR 340-32-5650. Visible emissions from boilers or other points not producing emissions directly from the manufacturing operation; and having no possible asbestos material in the exhaust gases, shall not be considered for purposes of this rule. The presence of uncombined water in the exhaust plume shall not be cause for failure to meet the visible emission requirements:

(a) Applicability. Manufacturing operations considered for purposes of this rule are as follows:
  (A) The manufacture of cloth, cord, wicks, tubing, tape, twine, rope, thread, yarn, roving, lap, or other textile materials;
  (B) The manufacture of cement products;
  (C) The manufacture of fire proofing and insulating materials;
  (D) The manufacture of friction products;
  (E) The manufacture of paper, millboard, and felt;
  (F) The manufacture of floor tile;
  (G) The manufacture of paints, coatings, caulks, adhesives, or sealants;
  (H) The manufacture of plastics and rubber materials;
  (I) The manufacture of chlorine, using asbestos diaphragm technology;
  (J) The manufacture of shotgun shell wads;
  (K) The manufacture of asphalt concrete;
  (L) Any other manufacturing operation which results or may result in the release of asbestos material to the ambient air.

(b) Monitor each potential source of asbestos emissions from any part of the manufacturing facility, including air cleaning devices, process equipment, and buildings housing material processing and handling equipment, at least once each day during daylight hours for visible emissions to the outside air during periods of operation. The monitoring shall be visual observation of at least 15 seconds;

(c) Inspect each air cleaning device at least once each week for proper operation and for changes that signal the potential for malfunctions, including, to the maximum extent possible without dismantling other than opening the device, the presence of tears, holes, and abrasions in filter bags and for dust deposits on the clean side of bags. For air cleaning devices that cannot be inspected on a weekly basis according to this subsection, submit to the Department, revise as necessary, and implement a written maintenance plan to include, at a minimum, the following:
  (A) Maintenance schedule;
  (B) Recordkeeping plan.

(d) Maintain records of the results of visible emission monitoring and air cleaning device inspections using a format approved by the Department which includes the

following:
(A) Date and time of each inspection;
(B) Presence or absence of visible emissions;
(C) Condition of fabric filters, including presence of any tears, holes and abrasions;
(D) Presence of dust deposits on clean side of fabric filters;
(E) Brief description of corrective actions taken, including date and time;
(F) Daily hours of operation for each air cleaning device.

(e) Furnish upon request, and make available at the affected facility during normal business hours for inspection by the Department, all records required under this section;
(f) Retain a copy of all monitoring and inspection records for at least two years;
(g) Submit quarterly a copy of the visible emission monitoring records to the Department if visible emissions occurred during the report period. Quarterly reports shall be postmarked by the 30th day following the end of the calendar quarter;
(h) Asbestos-containing waste material produced by any asbestos milling operation shall be disposed of according to OAR 340-32-5650.

(4) Open accumulation of friable asbestos-containing material or asbestos-containing waste material is prohibited.

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 96, f. 9-2-75, ef. 9-25-75; DEQ 22-1982, f. & ef. 10-21-82; DEQ 18-1992, f. & cert. ef. 10-7-91; DEQ 4-1993, f. & cert. ef. 3-10-93; Renumbered from OAR 340-25-465, DEQ 18-1993, f. & ef. 11-4-93

Asbestos Inspection Requirements for ~~[Federal]~~Oregon Title V Operating Permit Program Sources.

340-32-5610 This rule applies to renovation and demolition activities at major sources subject to the ~~[federal o]~~**Oregon Title V O**perating ~~[p]~~**P**ermit program as defined in OAR 340-28-110.

(1) To determine applicability of the Department's asbestos regulations, the owner or operator of a renovation or demolition project shall thoroughly inspect the affected area for the presence of asbestos.
(2) For demolition projects where no asbestos-containing material is present, written notification shall be submitted to the Department on an approved form. The notification shall be submitted by the owner or operator or by the demolition contractor as follows:
(a) Submit the notification, as specified in section (3) of this rule, to the Department at least ten days before beginning any demolition project.
(b) The Department shall be notified prior to any changes in the scheduled starting or completion dates or other substantial changes or the notification of demolition will be void.
(3) The following information shall be provided for each

notification of demolition:

(a) Name, address, and telephone number of the person conducting the demolition.

(b) Contractor's Oregon demolition license number, if applicable.

(c) Certification that no asbestos was found during the predemolition asbestos inspection and that if asbestos-containing material is uncovered during demolition the procedures found in OAR 340-32-5620 through OAR 340-32-5650 will be followed.

(d) Description of building, structure, facility, installation, vehicle, or vessel to be demolished, including:

(A) The age, present and prior use of the facility;

(B) Address or location where the demolition project is to be accomplished.

(e) Major source owner's or operator's name, address and phone number.

(f) Scheduled starting and completion dates of demolition work.

(g) Any other information requested on the Department form.

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 20-1993(T), f. & ef. 11-4-93; DEQ 13-1994, f. & ef. 5-19-94; DEQ 24-1994, f. & ef. 10-28-94

Asbestos Abatement Projects

340-32-5620

(1) Any person who conducts an asbestos abatement project shall comply with OAR 340-32-5630 and 340-32-5640(1) through (11). The following asbestos abatement projects are exempt from OAR 340-32-5630 and 340-32-5640(1) through (11):

(a) Asbestos abatement conducted in a private residence which is occupied by the owner and the owner-occupant performs the asbestos abatement.

(b) Mastics and roofing products that are fully encapsulated with a petroleum-based binder that are not hard, dry, and brittle. This exemption shall end whenever these materials are burned, shattered, crumbled, pulverized, or reduced to dust.

(c) Removal of less than three square feet or three linear feet of asbestos-containing material provided that the removal of asbestos is not the primary objective and methods of removal are in compliance with OAR 437 Division 3 "Construction" **(29 CFR 1926.58 Appendix G)**. An asbestos abatement project shall not be subdivided into smaller sized units in order to qualify for this exemption.

(d) Removal of asbestos-containing materials which are sealed from the atmosphere by a rigid casing, provided that the casing is not broken or otherwise altered such that asbestos fibers could be released during removal, handling, and transport to an authorized disposal site.

~~[(2) Open storage of friable asbestos containing material or asbestos containing waste material is prohibited.~~

~~(3) Open accumulation of friable asbestos containing material or asbestos containing waste material is prohibited.]~~

(~~[4]~~2) Any person who removes non-friable asbestos-containing material not exempted under OAR 340-32-5620(1) shall comply with the following:

(a) Submit notification and fee to the Department Business Office on a Department form in accordance with OAR 340-32-5630.

(b) Removal of nonfriable asbestos-containing materials that are not shattered, crumbled, pulverized or reduced to dust until delivered to an authorized disposal site is exempt from OAR 340-32-5640(10) and OAR 340-33-030. This exemption shall end whenever the asbestos-containing material becomes friable and releases asbestos fibers into the environment.

NOTE: The requirements and jurisdiction of the Department of Insurance and Finance, Oregon Occupational Safety and Health Division and any other state agency are not affected by OAR 340-32-5500 through 340-32-5650.

[**Publications**: The publication(s) referred to or incorporated by reference in this rule are available from the office of the Department of Environmental Quality.]

Stat. Auth.: ORS Ch. 468 & 468A
Hist.: DEQ 18-1992, f. & cert. ef. 10-7-91; DEQ 4-1993, f. & cert. ef. 3-10-93; Renumbered from OAR 340-25-466, DEQ 18-1993, f. & ef. 11-4-93; DEQ 19-1994, f. 9-6-94 & ef. 10-1-94

NOTICE OF PROPOSED RULEMAKING HEARING

(Rulemaking Statements and Statement of Fiscal Impact **must** accompany this form.)

Department of Environmental Quality — Air Quality Division

OAR Chapter 340

The public hearing regarding revisions to the Klamath Falls PM_{10} Control Plan will be held at the following location:

DATE:	TIME:	LOCATION:
June 16, 1995	7:00 pm	Klamath County Museum (**Spring Street Entrance**) 1451 Main Street Klamath Falls, OR 97601

The public hearing regarding revisions to Divisions 25, 28, and 32 will be held at the following location:

DATE:	TIME:	LOCATION:
June 20, 1995	11:00 am	Department of Environmental Quality 811 SW Sixth Ave., Tenth Floor (Room 10A) Portland, OR 97204

HEARINGS OFFICER(s): David L. Collier (Klamath Falls)
Patti Seastrom (Portland)

STATUTORY AUTHORITY: ORS 468A.035 General Comprehensive Plan

ADOPT:

1. Revisions to the Klamath Falls PM_{10} Control Plan as an amendment to the Oregon Clean Air Act State Implementation Plan (SIP).

2. Unrelated housekeeping and clarifying amendments to Divisions 25, 28, and 32, clarifying rule language and adding a definition.

Amendments or additions to other sections of the Klamath Falls PM_{10} Control Plan, Divisions 25, 28, and 32 listed above (or related administrative rules) may be made in response to information or public comment received by the Department.

☒ This hearing notice is the initial notice given for this rulemaking action.
☐ This hearing was requested by interested persons after a previous rulemaking notice.
☒ Auxiliary aids for persons with disabilities are available upon advance request.

SUMMARY:

Proposed revisions to the Klamath Falls PM_{10} Control Plan incorporate new and more accurate information on regional transportation emissions in the Klamath Falls PM_{10} Nonattainment Area which has recently been provided by the Oregon Department of Transportation (ODOT). Incorporating the new transportation estimates into the PM_{10} Control Plan would improve the accuracy of the plan, and would allow the Department to more accurately assess (under the transportation conformity rule) the air quality impact of any regionally significant transportation project proposed in the Klamath Falls nonattainment area. In addition to the revised ODOT estimates, new information from the Klamath Falls low income woodstove replacement program will be included in the plan revision. The additional emission reduction achieved by this program since 1991 will increase the effectiveness of the PM_{10} control strategy, and further increase the attainment safety margin. The plan revision also incorporates emission reductions achieved through recent Departmental rules affecting the production of hardboard. The revised PM_{10} Control Plan also reevaluates the air quality impact of the Klamath Falls Weyerhauser facility on the nonattainment area.

Based on a dispersion modeling analysis of Weyerhauser emissions, the Department has determined that while significant, emission impacts from Weyerhauser will not jeopardize attainment or maintenance of the PM_{10} NAAQS.

Housekeeping amendments to OAR Division 25 (Specific Industrial Standards), Division 28 (Stationary Source Air Pollution Control and Permitting Procedures), and Division 32 (Hazardous Air Pollutants, General Provisions for Stationary Sources) would bring existing rules into conformance with federal requirements, and clarify and correct rule language. For purposes of program delegation approval, EPA has requested an amendment to Division 25 modifying the New Source Performance Standard (NSPS) definition of "reference method". Amendments to Division 28 will bring public notification procedures for proposed federal operating permits in line with federal requirements. Amendments to Division 32 adds a definition for "Open Accumulation." This definition will aid enforceability of the open storage rules.

LAST DATE FOR COMMENT: June 22, 1995 at 5:00 pm

DATE PROPOSED TO BE EFFECTIVE: Upon adoption by the Environmental Quality Commission and subsequent filing with the Secretary of State.

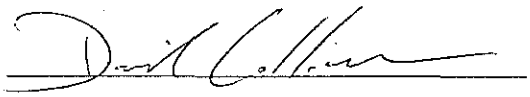
AGENCY RULES COORDINATOR: Chris Rich, (503) 229-6775

AGENCY CONTACT FOR THIS PROPOSAL: David L. Collier
ADDRESS: Air Quality Division
811 S. W. 6th Avenue
Portland, Oregon 97204

TELEPHONE: (503) 229-5177

or Toll Free 1-800-452-4011

Interested persons may comment on the proposed rules orally or in writing at the hearing. Written comments will also be considered if received by the date indicated above.

Signature  Date 5/12/95

Oregon Department of Environmental Quality

A CHANCE TO COMMENT ON...

1. **Revisions to the Klamath Falls PM_{10} Control Plan as an amendment to the Oregon Clean Air Act State Implementation Plan (SIP).**

2. **Unrelated housekeeping and clarifying amendments to Divisions 25, 28, and 32, clarifying rule language and adding a definition.**

Date Issued:	May 12, 1995
Public Hearings:	June 16, 1995, and June 20, 1995
Comments Due:	June 22, 1995

WHO IS AFFECTED: The Department of Environmental Quality, Oregon Department of Transportation, City of Klamath Falls, Klamath County, regulated industry, general public.

WHAT IS PROPOSED: This proposal would adopt new rules/rule amendments regarding the Klamath Falls PM_{10} Control Plan, transportation conformity in the Klamath Falls PM_{10} Nonattainment Area, and unrelated housekeeping amendments to OAR Divisions 25, 28, and 32. The proposal would amend the Klamath Falls PM_{10} Control Plan to incorporate new and more accurate transportation estimates from the Oregon Department of Transportation, and revise the existing motor vehicle emission budget for conformity purposes. Revising the emission budget will require a minor revision to the PM_{10} emission inventory and attainment demonstration. This amendment would improve the accuracy of the PM_{10} Control Plan, and allow the successful conformity determination of a proposed motor vehicle interchange project in Klamath Falls that will enhance public safety. No previously adopted emission PM_{10} control strategies are affected by this proposal.

Housekeeping amendments to OAR Division 25 (Specific Industrial Standards), Division 28 (Stationary Source Air Pollution Control and Permitting Procedures), and Division 32 (Hazardous Air Pollutants, General Provisions for Stationary Sources) would bring existing rules into conformance with federal requirements, and clarify and correct rule language. Amendments to Division 32 adds a definition for "Open Accumulation of Asbestos." This definition will aid enforceability of the asbestos rules.

811 S.W. 6th Avenue
Portland, OR 97204

FOR FURTHER INFORMATION:
Contact the person or division identified in the public notice by calling 229-5696 in the Portland area. To avoid long distance charges from other parts of the state, call 1-800-452-4011.

11/1/86

WHAT ARE THE HIGHLIGHTS:

The Oregon Department of Transportation (ODOT) has recently provided more accurate information on regional transportation emissions in the Klamath Falls PM_{10} Nonattainment Area. Incorporating the new estimates into the Klamath Falls PM_{10} Control Plan would improve the accuracy of the plan, and would allow the Department to more accurately assess (under the transportation conformity rule) the air quality impact of any regionally significant transportation project proposed in the nonattainment area. ODOT is planning to construct a motor vehicle interchange project (Washburn Way) in the City of Klamath Falls. Regional emission analysis indicates that the Washburn Way project will slightly increase PM_{10} emissions from motor vehicles; therefore, transportation conformity can not be demonstrated and the project can not be built. The emission reduction strategies and attainment demonstration in the Klamath Falls PM_{10} Control Plan provide an adequate margin of safety to address small unanticipated emission increases in the airshed. In addition to the revised ODOT estimates, new information from the Klamath Falls low income woodstove replacement program will be considered in the attainment demonstration revision. The additional emission reduction achieved by this program since 1991 will increase the effectiveness of the PM_{10} control strategy, and further increase the attainment safety margin. The plan revision also incorporates emission reductions achieved through recent rules affecting the production of hardboard. The revised PM_{10} Control Plan also reevaluates the air quality impact of the Klamath Falls Weyerhauser facility on the nonattainment area. Based on a dispersion modeling analysis of Weyerhauser emissions, the Department has determined that while significant, emission impacts from Weyerhauser will not jeopardize attainment or maintenance of the PM_{10} NAAQS.

The Department has reviewed the Washburn Way project, using the more accurate transportation estimates provided by ODOT, and has determined that the attainment demonstration and emission budget can be safely revised to accommodate the slight increase in motor vehicle emissions without jeopardizing attainment or maintenance of PM_{10} air quality standards. In light of the more accurate ODOT information, the satisfactory safety margin in the attainment demonstration, and the public safety concerns relating to the Washburn Way project, the Department proposes to amend the Klamath Falls PM_{10} Control Plan to improve the accuracy of the attainment demonstration, and to revise the motor vehicle emission budget so that a successful conformity determination can be made, and the project can proceed as scheduled.

HOW TO COMMENT: The public hearing regarding revisions to the Klamath Falls PM_{10} Control Plan will be held at the following location:

DATE:	TIME:	LOCATION:
June 16, 1995	7:00 pm	Klamath County Museum (Spring Street Entrance) 1451 Main Street Klamath Falls, OR 97601

The public hearing regarding revisions to Divisions 25, 28, and 32 will be held at the following location:

DATE:	TIME:	LOCATION:
June 20, 1995	11:00 am	Department of Environmental Quality 811 SW Sixth Ave., Tenth Floor (Room 10A) Portland, OR 97204

HEARINGS OFFICER(s): David L. Collier (Klamath Falls); Patti Seastrom (Portland)

Written comments must be ***received*** by 5:00 p.m. on June 22, 1995 at the following address:

Department of Environmental Quality
Air Quality Division
811 S. W. 6th Avenue
Portland, Oregon, 97204

A copy of the Proposed Rule may be reviewed at the above address. A copy may be obtained from the Department by calling the Air Quality Division at 229-5177 or calling Oregon toll free 1-800-452-4011.

WHAT IS THE NEXT STEP: The Department will evaluate comments received and will make a recommendation to the Environmental Quality Commission. Interested parties can request to be notified of the date the Commission will consider the matter by writing to the Department at the above address.

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State of Oregon
DEPARTMENT OF ENVIRONMENTAL QUALITY

Rulemaking Proposal
for

1. Revisions to the Klamath Falls PM_{10} Control Plan as an amendment to the Oregon Clean Air Act State Implementation Plan (SIP).

2. Unrelated housekeeping and clarifying amendments to Divisions 25, 28, and 32, clarifying rule language and adding a definition.

Rulemaking Statements

Pursuant to ORS 183.335(7), this statement provides information about the Environmental Quality Commission's intended action to adopt a rule.

1. Legal Authority

ORS 468A.035, General Comprehensive Plan.

2. Need for the Rule

The Oregon Department of Transportation (ODOT) has recently provided more accurate information on regional transportation emissions in the Klamath Falls PM_{10} Nonattainment Area. The ODOT Systems Studies Unit has provided new vehicle miles travelled (VMT) estimates which more accurately characterize regional motor vehicle emissions in the Klamath Falls airshed for both the 1986 base year and projected future years. Incorporating the new estimates into the Klamath Falls PM_{10} Control Plan would improve the accuracy of the plan, and would allow the Department to more accurately assess (under the transportation conformity rule) the air quality impact of any regionally significant transportation project proposed in the nonattainment area.

In addition, the Department of Transportation is proposing to construct a motor vehicle interchange project (Washburn Way) in the City of Klamath Falls. Transportation conformity analysis shows that construction of the Washburn Way project will slightly increase PM_{10} emissions from motor vehicles above levels initially accounted for in the attainment demonstration; therefore, the project is unable to demonstrate conformity with the existing motor vehicle emission budget. Funding for this project can not be approved until a successful conformity determination is made.

The Klamath Falls PM_{10} Control Plan provides an adequate margin of safety to address small unanticipated emission increases in the airshed. The attainment demonstration has the flexibility to accommodate small emission changes without jeopardizing PM_{10} attainment or the continued maintenance of attainment. Revising the attainment demonstration to reflect the new, more accurate ODOT estimates does not compromise this safety margin. In addition to the revised ODOT estimates, new information from the Klamath Falls low income woodstove replacement program will be considered in the attainment demonstration revision. The additional emission reduction achieved

by this program since 1991 will increase the effectiveness of the PM_{10} control strategy, and further increase the attainment safety margin. The plan revision also incorporates emission reductions achieved through recent Departmental rules affecting the production of hardboard. The revised PM_{10} Control Plan also reevaluates the air quality impact of the Klamath Falls Weyerhauser facility on the nonattainment area. Based on a dispersion modeling analysis of Weyerhauser emissions, the Department has determined that while significant, emission impacts from Weyerhauser will not jeopardize attainment or maintenance of the PM_{10} NAAQS.

The Department has reviewed the Washburn Way project, using the more accurate transportation estimates provided by ODOT, and has determined that the attainment demonstration and emission budget can be safely revised to accommodate the slight increase in motor vehicle emissions without jeopardizing attainment or maintenance of air quality standards. In light of the more accurate ODOT information, the satisfactory safety margin in the attainment demonstration, and the public safety concerns relating to the Washburn Way project, the Department proposes to amend the Klamath Falls PM_{10} Control Plan to improve the accuracy of the attainment demonstration, and to revise the motor vehicle emission budget so that a successful conformity determination can be made. In light of the public safety concerns regarding the Washbburn Way project, the Department has committed to complete this SIP revision as quickly as possible, and to work with EPA on the expeditious approval of the SIP revision, with a target completion date of no later than December 31, 1995.

Housekeeping amendments to OAR Division 25 (Specific Industrial Standards), Division 28 (Stationary Source Air Pollution Control and Permitting Procedures), and Division 32 (Hazardous Air Pollutants, General Provisions for Stationary Sources) are needed to bring existing rules into conformance with federal requirements, and clarify and correct rule language. For purposes of program delegation approval, EPA has requested an amendment to Division 25 modifying the New Source Performance Standard (NSPS) definition of "reference method". Amendments to Division 28 will bring public notification procedures for proposed federal operating permits in line with federal requirements. Amendments to Division 32 adds a definition for "Open Accumulation." This definition will aid enforceability of the open storage rules.

3. Principal Documents Relied Upon in this Rulemaking

OAR 340-20-047	State of Oregon Clean Air Act Implementation Plan
OAR 340-20-700	Criteria and Procedures for Determining Conformity to State or Federal Implementation Plans of Transportation Plans, Programs, and Projects
OAR 340,	Divisions 25, 28, and 32

These documents are available for review at DEQ Headquarters, Air Quality Division, 811 S.W. Sixth Avenue, Portland, Oregon, 97204.

4. Advisory Committee Involvement

The Department has worked closely with the Klamath Falls City Council, the Klamath County Board of Commissioners, and the Oregon Department of Transportation regarding transportation conformity issues in Klamath Falls, and the proposed revision to the PM_{10} Control Plan. Amendments to Divisions 25, 28, and 32 do not add any additional regulatory requirements, therefore an advisory committee was not utilized.

State of Oregon
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2. Unrelated housekeeping and clarifying amendments to Divisions 25, 28, and 32, clarifying rule language and adding a definition.

Fiscal and Economic Impact Statement

Introduction

- The Oregon Department of Transportation (ODOT) has recently provided more accurate information on regional transportation emissions in the Klamath Falls PM_{10} Nonattainment Area. Incorporating the new transportation estimates into the Klamath Falls PM_{10} Control Plan would improve the accuracy of the plan, and would allow the Department to more accurately assess (under the transportation conformity rule) the air quality impact of any regionally significant transportation project proposed in the nonattainment area.

In addition, The Department of Transportation is proposing to construct a motor vehicle interchange project (Washburn Way) in the City of Klamath Falls. The project can not currently demonstrate conformity with the transportation emission budget in the Klamath Falls PM_{10} Control Plan. Funding for this project can not be approved until such time as a successful conformity determination is made. The emission reduction strategies and attainment demonstration in the Klamath Falls PM_{10} Control Plan provide an adequate margin of safety to address small unanticipated emission increases in the airshed. In addition to the revised ODOT estimates, additional emission reductions achieved from the Klamath Falls low income woodstove replacement program will be considered in the attainment demonstration revision. The plan revision also incorporates emission reductions achieved through recent Departmental rules affecting the production of hardboard. The revised PM_{10} Control Plan also reevaluates the air quality impact of the Klamath Falls Weyerhauser facility on the nonattainment area. Based on a dispersion modeling analysis of Weyerhauser emissions, the Department has determined that while significant, emission impacts from Weyerhauser will not jeopardize attainment or maintenance of the PM_{10} NAAQS.

The PM_{10} Control Plan can be safely revised to accommodate the slight increase in motor vehicle emissions without jeopardizing attainment or maintenance of air quality standards. In light of the more accurate ODOT information, the satisfactory safety margin in the attainment demonstration, and the public safety concerns relating to the Washburn Way project, the Department proposes to amend the Klamath Falls PM_{10} Control Plan to improve the accuracy of the attainment demonstration, and to revise the motor vehicle emission budget so that a successful conformity determination can be made.

Housekeeping amendments to OAR Division 25 (Specific Industrial Standards), Division 28 (Stationary Source Air Pollution Control and Permitting Procedures), and Division 32 (Hazardous Air Pollutants, General Provisions for Stationary Sources) would bring existing rules into conformance with federal requirements, and clarify and correct rule language. For purposes of program delegation approval, EPA has requested an amendment to Division 25 modifying the New Source Performance Standard (NSPS) definition of "reference method". Amendments to Division 28 will bring public notification procedures for proposed federal operating permits in line with federal requirements. Amendments to Division 32 adds a definition for "Open Accumulation." This definition will aid enforceability of the open storage rules.

Proposed amendments to Division 25, 28, and 32 do not add any additional regulatory requirements and therefore would have no fiscal or economic impact.

General Public

The proposed revision to the Klamath Falls PM_{10} Control Plan will have no direct fiscal or economic impact on the general public; however, the public will benefit from increased public safety as a results of the Washburn Way interchange project.

Small Business

The proposed revision will allow planning and construction of the Washburn Way project to proceed as scheduled. Some small construction contractors and suppliers may benefit.

Large Business

The proposed revision will allow planning and construction of the Washburn Way project to proceed as scheduled. Some larger construction contractors and suppliers may benefit.

Local Governments

The City of Klamath Falls has stated the urgent need for the Washburn Way project, citing its significant benefit to public safety. While seen as positive, the direct fiscal and economic impact of this project can not be determined. The City has requested that a revision to the PM_{10} Control Plan be accomplished as quickly as possible so that construction of the project can begin as scheduled.

State Agencies

- DEQ

The proposed revisions will have no fiscal or economic impact on the Department.

- Other Agencies

The proposed revision will allow planning and construction of the Washburn Way project to proceed as scheduled. The Oregon Department of Transportation will incur some fiscal and economic benefit by being able to compete their construction design and operations for this project in a timely manner.

State of Oregon
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Land Use Evaluation Statement

1. Explain the purpose of the proposed rules.

The Oregon Department of Transportation (ODOT) has recently provided more accurate information on regional transportation emissions in the Klamath Falls PM_{10} Nonattainment Area. The ODOT Systems Studies Unit has provided new vehicle miles travelled (VMT) estimates which more accurately characterize regional motor vehicle emissions in the Klamath Falls airshed for both the 1986 base year and projected future years. Incorporating the new estimates into the Klamath Falls PM_{10} Control Plan would improve the accuracy of the plan, and would allow the Department to more accurately assess (under the transportation conformity rule) the air quality impact of any regionally significant transportation project proposed in the nonattainment area.

In addition, The Department of Transportation is proposing to construct a motor vehicle interchange project (Washburn Way) in the City of Klamath Falls. The project can not currently demonstrate conformity with the transportation emission budget in the Klamath Falls PM_{10} Control Plan. Funding for this project can not be approved until such time as a successful conformity determination is made. The emission reduction strategies and attainment demonstration in the Klamath Falls PM_{10} Control Plan provide an adequate margin of safety to address small unanticipated emission increases in the airshed. In addition to the revised ODOT estimates, new information from the Klamath Falls low income woodstove replacement program will be considered in the attainment demonstration revision. The additional emission reduction achieved by this program since 1991 will increase the effectiveness of the PM_{10} control strategy, and further increase the attainment safety margin. The attainment demonstration and emission budget can be safely revised to accommodate the slight increase in motor vehicle emissions without jeopardizing attainment or maintenance of air quality standards. In light of the more accurate ODOT information, the satisfactory safety margin in the attainment demonstration, and the public safety concerns relating to the Washburn Way project, the Department proposes to amend the Klamath Falls PM_{10} Control Plan to improve the accuracy of the attainment demonstration, and to revise the motor vehicle emission budget so that a successful conformity determination can be made.

Amendments to Divisions 25, 28, and 32 are needed to bring rules into conformance with federal requirements, and clarify and correct rule language.

2. **Do the proposed rules affect existing rules, programs or activities that are considered land use programs in the DEQ State Agency Coordination (SAC) Program?**

   Yes_ X__ No____

   a. **If yes, identify existing program/rule/activity:**

   Divisions 25, 28, and 32: Approval of Notice of Construction for Air Pollution Sources; Issuance of Air Contaminant Discharge Permits; Issuance of Indirect Source Construction Permits.

   b. **If yes, do the existing statewide goal compliance and local plan compatibility procedures adequately cover the proposed rules?**

   Yes_ X__ No_____ **(if no, explain):**

   c. **If no, apply the following criteria to the proposed rules.**

No new provisions of the control strategy are:

1) Specifically referenced in the statewide planning goals; or
2) Reasonably expected to have significant effects on:
   (a) resources, objectives or areas identified in the statewide planning goals, or
   (b) present or future land uses identified in acknowledged comprehensive plans.

ODOT contact with the City of Klamath Falls and Klamath County indicate that although the proposed transportation project is not specifically identified in their comprehensive plans, the need to improve traffic flows in this area are mentioned in both plans. Both jurisdictions state that zone changes, exceptions or transportation plan amendments would not be required for this project. ODOT states that this project is consistent with the Oregon Transportation Planning Rule.

In the space below, state if the proposed rules are considered programs affecting land use. State the criteria and reasons for the determination.

The proposed rules are not considered programs affecting land use.

3. **If the proposed rules have been determined a land use program under 2. above, but are not subject to existing land use compliance and compatibility procedures, explain the new procedures the Department will use to ensure compliance and compatibility.**

Not Applicable

Air Quality
Division

Intergovernmental Coord.

5/9/95
Date

Questions to be Answered to Reveal Potential Justification for Differing from Federal Requirements.

(a) Revisions to the Klamath Falls PM_{10} Control Plan as an amendment to the Oregon Clean Air Act State Implementation Plan (SIP).

(b) Unrelated housekeeping and clarifying amendments to Divisions 25, 28, and 32, clarifying rule language and adding a definition.

Note: If a federal rule is relaxed, the same questions should be asked in arriving at a determination of whether to continue the existing more stringent state rule.

1. *Are there federal requirements that are applicable to this situation? If so, exactly what are they?*

   (a) Amendments to the Klamath Falls PM_{10} Control Plan: Section 176 of the Clean Air Act as amended in 1990. Limitations On Certain Federal Assistance (Transportation Conformity).

   (b) Amendments to Divisions 25, 28, and 32: Proposed amendments to OAR 340-28-2290 are equivalent to the requirements of 40 CFR Part 70, requirements for public notification of Federal Operating Permits. The addition in Division 32 of the definition for "Open Accumulation of Asbestos" has no equivalent federal regulation. The prohibition of accumulation and storage of asbestos is provided for in existing state rules. This rulemaking is simply defining the term "open accumulation" for clarity in enforcing the existing rules.

2. *Are the applicable federal requirements performance based, technology based, or both with the most stringent controlling?*

   (a) Performance Based: State and federal transportation conformity rules require that an air quality impact analysis be conducted in nonattainment areas for any regionally significant transportation project. This analysis must demonstrate that projected emissions from the proposed transportation system are consistent with emissions allocated to motor vehicle use in the PM_{10} Control Plan, and that no degradation of air quality will occur as a result of the project.

   (b) Not Applicable.

3. *Do the applicable federal requirements specifically address the issues that are of concern in Oregon? Was data or information that would reasonably reflect Oregon's concern and situation considered in the federal process that established the federal requirements?*

   (a) Yes.

   (b) Not Applicable

4. *Will the proposed requirement improve the ability of the regulated community to comply in a more cost effective way by clarifying confusing or potentially conflicting requirements (within or cross-media), increasing certainty, or preventing or reducing the need for costly retrofit to meet more stringent requirements later?*

   (a) Yes. This amendment will improve the ability of the regulated community in Klamath Falls to comply with state and federal conformity requirements by revising the existing transportation emission budget in the Klamath Falls PM_{10} Control Plan so that a successful conformity determination can be made.

(b) Yes. The housekeeping amendments to OAR Division 25 (Specific Industrial Standards), Division 28 (Stationary Source Air Pollution Control and Permitting Procedures), and Division 32 (Hazardous Air Pollutants, General Provisions for Stationary Sources) are needed to bring existing rules into conformance with federal requirements, and clarify and correct rule language.

5. *Is there a timing issue which might justify changing the time frame for implementation of federal requirements?*

(a) No

(b) No

6. *Will the proposed requirement assist in establishing and maintaining a reasonable margin for accommodation of uncertainty and future growth?*

(a) Yes. Projected future emissions used to establish the proposed transportation emission budget takes into account the anticipated growth in motor vehicle use.
(b) Not Applicable

7. *Does the proposed requirement establish or maintain reasonable equity in the requirements for various sources? (level the playing field)*

(a) Establishing a motor vehicle emission budget affects regionally significant transportation projects, and does not affect any requirements for other sources.

(b) Not Applicable

8. *Would others face increased costs if a more stringent rule is not enacted?*

(a) No. The proposed revisions are not more stringent than federal requirements.

(b) Not Applicable

9. *Does the proposed requirement include procedural requirements, reporting or monitoring requirements that are different from applicable federal requirements? If so, Why? What is the "compelling reason" for different procedural, reporting or monitoring requirements?*

(a) No.

(b) Not Applicable

10. *Is demonstrated technology available to comply with the proposed requirement?*

(a) Not Applicable

(b) Not Applicable

11. *Will the proposed requirement contribute to the prevention of pollution or address a potential problem and represent a more cost effective environmental gain?*
(a) Yes
(b) Yes

State of Oregon
Department of Environmental Quality Memorandum

Date: June 25, 1995

To: Environmental Quality Commission

From: David L. Collier and Patti Seastrom

Subject: Presiding Officer's Report for Rulemaking Hearing

Hearing Date and Time: June 16, 1995, beginning at 7:00 pm
Hearing Location: Klamath Falls, OR

Hearing Date and Time: June 20, 1995, beginning at 11:00 am
Hearing Location: Portland, OR

Title of Proposal:

1. Revisions to the Klamath Falls PM_{10} Control Plan as an amendment to the Oregon Clean Air Act State Implementation Plan (SIP).
2. Unrelated housekeeping and clarifying amendments to Divisions 25, 28, and 32, clarifying rule language and adding a definition.

The rulemaking hearing on the above titled proposal was convened at 7:30pm and 11:00am respectively. People were asked to sign witness registration forms if they wished to present testimony. People were also advised that the hearing was being recorded and of the procedures to be followed.

Klamath Falls: Three people were in attendance, one person provided testimony.
Portland: Six people were in attendance, no one testified.

At the opening of the respective hearings, David Collier and Patti Seastrom briefly explained the specific rulemaking proposal, the reason for the proposal, and responded to questions from the audience. People were then called to testify in the order of receipt of witness registration forms. Testimony was presented as noted below.

Memo To: Environmental Quality Commission
June 25, 1995 Presiding Officer's Report on
June 16, & June 20, 1995 Rulemaking Hearing

SUMMARY OF ORAL TESTIMONY

KLAMATH FALLS

Ms. Mavis McCormic

Ms. McCormic is concerned about emissions from industries which already exist in the vicinity of the Washburn Way project. Specifically industries which may be in violation of permit conditions, and newly permitted or proposed facilities. Ms. McCormic supports the interchange project, but is concerned about increased air emissions. Ms. McCormic in concerned about the emission inventory in the PM_{10} Control Plan, specifically that the numbers have been intentionally adjusted to accommodate the small increase in motor vehicle emissions caused by the Washburn Way project. Ms. McCormic also finds that the addition of issues dealing with the Klamath Falls Weyerhaeuser facility, and the low income stove replacement program, distracts from the main issue of the Washburn Way project. Written testimony was not provided by the close of comment date.

There was no further testimony and the hearing was closed at 8:00pm.

SUMMARY OF WRITTEN COMMENTS

KLAMATH FALLS

The following people handed in written comments but did not present oral testimony:

Dr. Robert Palzer, Air Quality Coordinator, Oregon Chapter of the Sierra Club

Dr. Palzer supports the emission budget revision for purposes of transportation conformity. However, he believes that the proposed amendments are inadequate and deceptive because of the failure to adequately address the impact from the Weyerhaeuser facility. In objecting, Dr. Palzer cites prior modeling analysis which estimate significant impacts from the Weyerhaeuser facility, limitations of the original 1990 receptor modeling analysis which estimated the relative contribution of industry, dust, and residential woodburning emissions to the airshed, and his calculations suggesting correlations between reduced wood products industry production and decreasing ambient PM_{10} levels. Dr. Palzer objects to the exclusion of the Weyerhaeuser facility from the primary emission control strategy, and believes that disproportionate emphasis has been

placed on residential woodstove control. He believes that Weyerhaeuser emissions should be included in the PM_{10} Control Plan, and that recent showdown credits be listed as contributing to the reduction of ambient PM_{10} levels in Klamath Falls. Dr. Palzer stated that a permit modification reflecting the reduction in Weyerhaeuser's banked emissions should be made part of the SIP.

Dr. Palzer believes that the hardboard rule was relaxed without a corresponding offset included in the control strategy. Dr. Palzer has concerns that the annual PM_{10} levels projected for the attainment year are within 10% of the annual PM_{10} standard. He cites the existence of evidence which suggests there is a significant increase in mortality at PM_{10} levels below the current standard, and believes that including Weyerhaeuser in the control primary strategy could provide a lower and healthier air quality target. Dr. Palzer takes strong objection of the statement in the control plan that attainment can be successfully demonstrated in Klamath Falls by controlling sources other than industry. He views recent industrial shutdowns as de facto control on industrial sources, and partially attributes current lower PM_{10} levels to these shutdowns.

Weyerhaeuser Company

Weyerhaeuser supports efforts by the Department to amend the Klamath Falls PM_{10} Control Plan to incorporate new transportation conformity information, and consider new information from the Klamath Falls low income stove replacement project. Weyerhaeuser objects to the Departments conclusions that Weyerhaeuser's Klamath Falls operation has a significant impact on the nonattainment area, and the proposal to potentially subject Weyerhaeuser to the Industrial Contingency Requirements for PM_{10} Nonattainment Areas, should the area slip back into nonattainment.

Weyerhaeuser's objections cover three main areas. Weyerhaeuser believes that:

1. The Department has failed to demonstrate that the industrial contingency requirements in OAR 340-21-200 through 240 and the industrial contingency requirements for the Klamath Falls PM_{10} nonattainment area are relevant and applicable since the area has not been designated by EPA as failing to attainment the PM_{10} air quality standards by the attainment date cited in the rule. DEQ has also failed to demonstrate that Weyerhaeuser has the potential to have a significant impact on the nonattainment area. Previous analysis by DEQ indicated that the Weyerhaeuser facility did not have a significant impact on the nonattainment area.

2. The Department has failed to recognize that a significant reduction in Weyerhaeuser emissions has occurred since the control plan was adopted, further minimizing the possibility that Weyerhaeuser could have a significant impacts on the Klamath Falls nonattainment area.

3. The Department has failed to use the results from both receptor and dispersion modeling, and has made a determination of significance based only on DEQ dispersion modeling results.

Attachments:

Written Testimony Submitted for the Record.

Dr. Robert Palzer
Weyerhaeuser Company

ATTACHMENT D

INDEX OF COMMENTS RECEIVED

1.	Mavis McCormic	(Oral Testimony)
2.	Dr. Robert Palzer Oregon Chapter, Sierra Club	(Written Testimony)
3.	Kevin Godbout Oregon Environmental Affairs Weyerhaeuser Company	(Written Testimony)

ATTACHMENT E

DEPARTMENT'S EVALUATION OF PUBLIC COMMENT

1. **Comments**

Ms. McCormic is concerned about emissions from industries which already exist in the vicinity of the Washburn Way project. Specifically industries which may be in violation of permit conditions, and newly permitted or proposed facilities. Ms. McCormic supports the interchange project, but is concerned about increased air emissions. Ms. McCormic in concerned about the emission inventory in the PM_{10} Control Plan, specifically that the numbers have been intentionally adjusted to accommodate the small increase in motor vehicle emissions caused by the Washburn Way project. Ms. McCormic also finds that the addition of issues dealing with the Klamath Falls Weyerhaeuser facility, and the low income stove replacement program, distracts from the main issue of the Washburn Way project. Written testimony was not provided by the close of comment date.

Response

The Department's eastern regional office coordinates compliance issues for existing industry in Klamath Falls. Any violation of permit conditions are addressed through technical assistance, and enforcement actions if necessary. All permitted industrial emissions are accounted for in the PM_{10} control strategy. Revising the transportation emission budget in the PM_{10} control plan will require a minor revision to the emission inventory and attainment demonstration, and the relevant sections of the control plan have been adjusted accordingly. The demonstration of attainment can be successfully revised to accommodate the slight increase in motor vehicle emissions without jeopardizing PM_{10} attainment or the 10 year maintenance period in Klamath Falls. A previous SIP commitment required the re-evaluation of emission impacts from the Klamath Falls Weyerhaeuser facility. Amending the control plan for conformity purposes has also provided the opportunity to incorporate the results of the Weyerhaeuser evaluation, as well as the additional emission reductions achieved since 1991 by the Klamath Falls low income woodstove replacement program.

2. **Comments**

Dr. Palzer supports the emission budget revision for purposes of transportation conformity. However, he believes that the proposed amendments are inadequate and deceptive because of the failure to adequately address the impact from the Weyerhaeuser facility. In objecting, Dr. Palzer cites prior modeling analysis which estimate significant impacts from the Weyerhaeuser facility, limitations of the original 1990 receptor modeling analysis which estimated the relative contribution of industry, dust, and

residential woodburning emissions to the airshed, and his calculations suggesting correlations between reduced wood products industry production and decreasing ambient PM_{10} levels. Dr. Palzer objects to the exclusion of the Weyerhaeuser facility from the primary emission control strategy, and believes that disproportionate emphasis has been placed on residential woodstove control. He believes that Weyerhaeuser emissions should be included in the PM_{10} Control Plan, and that recent industrial shutdown credits should be listed as contributing to the reduction of ambient PM_{10} levels in Klamath Falls. Dr. Palzer stated that a permit modification reflecting the reduction in Weyerhaeuser's banked emissions should be made part of the SIP.

Dr. Palzer believes that the hardboard rule was relaxed without a corresponding offset included in the control strategy. Dr. Palzer has concerns that the annual PM_{10} levels projected for the attainment year are within 10% of the annual PM_{10} standard. He cites the existence of evidence which suggests there is a significant increase in mortality at PM_{10} levels below the current standard, and believes that including Weyerhaeuser in the control primary strategy could provide a lower and healthier air quality target. Dr. Palzer takes strong objection of the statement in the control plan that attainment can be successfully demonstrated in Klamath Falls by controlling sources other than industry. He views recent industrial shutdowns as de facto control on industrial sources, and partially attributes current lower PM_{10} levels to these shutdowns.

Response

The Department has addressed the impact from the Klamath Falls Weyerhaeuser facility using both receptor and dispersion modeling. A dispersion modeling analysis using estimates of Weyerhaeuser's permitted emissions was evaluated by the Department which identified the emissions impact on the critical PM_{10} monitoring site of Peterson School. Seventy two exceedence days (days on which ambient PM_{10} standards were violated) between 1987 and 1991 were modeled using worse-case day meteorology. Weyerhaeuser's average exceedence day impact at Peterson School was determined to be minimal (less than the Department's significant impact criteria of 5 ug/m^3), and is consistent with the original receptor modeling analysis conducted in 1991 which indicated that industrial emissions were not a major contributor to violations of the 24-hour ambient air quality standard for PM_{10}. While the Department's analysis indicated typical exceedence day impacts of less than 4 $\mu g/m^3$, the maximum exceedence day impact was estimated at approximately 7 $\mu g/m^3$.

During the public comment period Weyerhaeuser testified that the Department had not fully taken into account recent and significant reductions in permitted emissions which are being incorporated into Weyerhaeuser's new Air Contaminant Discharge Permit (ACDP). The Department recognizes that Weyerhaeuser's final permitted emission level is below the initial emission estimates modeled by the Department. Therefore, the Department is providing Weyerhaeuser the opportunity to model emission impacts at Peterson School using their new permitted emission level. The Department will review

any new modeling results and will, by October 1, 1995, make a determination regarding the significance of Weyerhaeuser's emission impact at the Peterson School monitoring site.

The initial dispersion modeling analysis conducted by the Department confirms the Department's original 1991 receptor modeling analysis which identified residential woodheating as the major contributor to PM_{10} exceedences. While an apparent correlation can be shown between decreasing wood products industry production and decreasing ambient PM_{10} levels, the Department believes that a similar correlation could be shown linking improvements in ambient air quality with decreasing woodstove use. Mandatory curtailment of residential woodheating on potential exceedence days has shown a compliance rate (reduction in smoke) of approximately 86%. In addition, survey trend data since 1987 shows a significant decrease in overall woodstove and wood-fuel use. The Department believes that an appropriate amount of emphasis has been placed on residential woodstove control, and that reductions in stove use together with corresponding emission reductions is the primary reason for improving air quality in Klamath Falls.

Recent amendments to the statewide board products rule increase the allowable limit for hardboard production. These increases were estimated and accounted for in the original 1991 PM_{10} Control Plan. Refinements to these estimates based on the recent board products rule revision result in minor changes to the industrial emission inventory. This small increase has been more than offset by the additional unanticipated emission reduction achieved since 1991 by the Klamath Falls low income woodstove replacement project.

While emission reductions have undoubtedly occurred due to the shut down of some industrial processes, the revised attainment demonstration has not accounted for these decreases. The demonstration uses industrial emissions at their maximum permitted levels (excluding shutdowns), thereby providing the most conservative (most stringent) test for the emission control strategies. Even with industrial emissions at maximum allowable levels the attainment demonstration provides an acceptable safety margin in the attainment year (1994), with estimated PM_{10} levels approximately 10% below the national ambient air quality health standards.

3. **Comments**

Weyerhaeuser supports efforts by the Department to amend the Klamath Falls PM_{10} Control Plan to incorporate new transportation conformity information, and consider new information from the Klamath Falls low income stove replacement project. Weyerhaeuser objects to the Departments conclusion that Weyerhaeuser's Klamath Falls operation has a significant impact on the nonattainment area, and to the Department's position that Weyerhaeuser be subject to the Industrial Contingency Requirements for PM_{10} Nonattainment Areas, should the area slip back into nonattainment.

Weyerhaeuser's objections cover three main areas. Weyerhaeuser believes that:

a. The Department has failed to demonstrate that the industrial contingency requirements in OAR 340-21-200 through 240 and the industrial contingency requirements for the Klamath Falls PM_{10} nonattainment area are relevant and applicable since the area has not been designated by EPA as failing to attain PM_{10} air quality standards by the attainment date cited in the rule. DEQ has also failed to demonstrate that Weyerhaeuser has the potential to have a significant impact on the nonattainment area. Previous analysis by DEQ indicated that the Weyerhaeuser facility did not have a significant impact on the nonattainment area.

b. The Department has failed to recognize that a significant reduction in emissions has occurred at the Klamath Falls Weyerhaeuser facility since the control plan was adopted, further minimizing the possibility that Weyerhaeuser could have a significant impact on the Klamath Falls PM_{10} nonattainment area.

c. The Department has failed to use the results from both receptor and dispersion modeling, and has made a determination of significance based only on DEQ dispersion modeling results.

Response

Meetings with Weyerhaeuser subsequent to the close of the public comment period have resolved the comments listed above to Weyerhaeuser's satisfaction. The summary below addresses the three main points raised by Weyerhaeuser:

a) The industrial contingency measures are relevant and applicable to Weyerhaeuser.

The Weyerhaeuser facility has the potential to significantly impact the Klamath Falls nonattainment area, therefore the contingency measures are relevant to Weyerhaeuser. The facility is located in close proximity to the nonattainment area boundary, and until recently possessed total permitted emissions which exceeded the entire 1994 Klamath Falls nonattainment area emission inventory. Weyerhaeuser has recently relinquished approximately 870 tons/yr of PM_{10} emission credits, significantly reducing permitted emissions. While the Department's 1991 receptor modeling analysis indicated that Weyerhaeuser did not have a significant impact, the 1991 control plan also required that additional dispersion modeling be done to verify the emission impact at the critical monitor site of Peterson School. The initial modeling evaluated by Department in January, 1995, indicated that the maximum exceedence day impact was slightly above the significance level. As a precaution, the Weyerhaeuser facility has been included in the industrial contingency plan pending final analysis of their air quality impact.

Contingency measures remain applicable to Weyerhaeuser. The Klamath Falls area has successfully achieved compliance with the PM_{10} standard by the Clean Air Act deadline of December 31, 1994; and therefore has not been designated by EPA as failing to attain by the date cited in the contingency rule. Should future PM_{10} levels exceed standards, Klamath Falls will have failed to meet the Clean Air Act attainment date. Contingency measures must continue after the Clean Air Act attainment deadline is reached, to ensure timely corrective action should violations of air quality standards reoccur. Under the Clean Air Act, contingency measures required in the PM_{10} control plan remain in effect until they are replaced by contingency measures in the maintenance plan.

b/c) The Department fully recognizes the significant voluntary effort made by Weyerhaeuser to reduce emissions from the Klamath Falls facility, and the Department has used both receptor and dispersion modeling to evaluate the impact of the Weyerhaeuser facility. In January 1995, the Department evaluated dispersion modeling of Weyerhaeuser emissions using the best available estimates of permitted emissions. While modeled average exceedence day impacts were well below the Department's 24-hour significance criteria of 5.0 ug/m^3, the Department's analysis did indicate that Weyerhaeuser's maximum exceedence day impact was slightly above the significance level. Results of the dispersion modeling analysis are consistent with the Department's 1991 receptor modeling, which indicated that Weyerhaeuser's average exceedence day impact at the critical monitor site of Peterson School is minimal and will not jeopardize attainment or maintenance of the PM_{10} standard within the Klamath Falls PM_{10} nonattainment area.

During the public comment period Weyerhaeuser testified that the Department had not fully taken into account recent and significant reductions in permitted emissions which are being incorporated into Weyerhaeuser's new Air Contaminant Discharge Permit (ACDP). The Department recognizes that Weyerhaeuser's final permitted emission level is below the initial emission estimates modeled by the Department. Therefore, the Department is providing Weyerhaeuser the opportunity to model emission impacts at Peterson School using their new permitted emissions. The Department will review any new modeling results and will, by October 1, 1995, make a determination regarding the significance of Weyerhaeuser's emission impact at the Peterson School monitoring site. If exceedence day PM_{10} impacts at Peterson School are determined to be significant, and if attainment is not maintained in Klamath Falls, then the Department will require Weyerhaeuser to comply with the same RACT contingency requirements as other stationary sources within the nonattainment area boundary. If exceedence day impacts at Peterson School are determined to be insignificant, Weyerhaeuser will not be subject to the PM_{10} Control Plan Industrial Contingency Requirements.

ATTACHMENT F

APPENDIX 5

Demonstration of Attainment

KLAMATH FALLS PM10 NONATTAINMENT AREA File: Attain94.wq1
PM10 STRATEGY ANALYSIS (CONFORMITY EMISSION BUDGET)

APRIL 25, 1995

TABEL 1: EMISSION INVENTORIES FOR BASE YEAR AND 1994 (WITHOUT STRATEGIES)

Source	ANNUAL 1986 TONS	1986 PCT	ANNUAL 1994 TONS	1994 PCT	WCDAY 1986 LBS	WCDA 1986 PCT	WCDAY 1994 LBS	WCDAY 1994 PCT	86-94 ANNUAL GROWT %/YR	86-94 ANNUAL GROWT TOTAL	86-94 WCD GROWTH %/YR	86-94 WCD GROWT TOTAL
DUST-UNPAVED	53	2.7%	60	2.7%	0	0.0%	0	0.0%	1.5%	12.0%	0.0%	0.0%
DUST-PAVED	110	5.6%	124	5.7%	0	0.0%	0	0.0%	1.5%	12.0%	0.0%	0.0%
DUST-SANDING	25	1.3%	28	1.3%	1882	8.3%	2108	8.5%	1.5%	12.0%	1.5%	12.0%
FIREPLACES	126	6.4%	106	4.8%	1923	8.4%	1615	6.5%	-2.0%	-16.0%	-2.0%	-16.0%
WOODSTOVES	1076	54.6%	1162	53.2%	16403	72.0%	17715	71.2%	1.0%	8.0%	1.0%	8.0%
INDUSTRY*	203	10.3%	291	13.3%	1580	6.9%	2323	9.3%	NA	43.9%	NA	47.0%
HIGHWAY	115	5.9%	129	5.9%	696	3.1%	780	3.1%	1.5%	12.0%	1.5%	12.0%
OFF ROAD	12	0.6%	13	0.6%	63	0.3%	71	0.3%	1.5%	12.0%	1.5%	12.0%
RAILROADS	19	1.0%	21	1.0%	105	0.5%	118	0.5%	1.5%	12.0%	1.5%	12.0%
AIRCRAFT	3	0.2%	3	0.2%	15	0.1%	17	0.1%	1.5%	12.0%	1.5%	12.0%
TOTAL TRANSPORT	149	--	167	--	879	--	985	--	1.5%	12.0%	1.5%	12.0%
INCINERATION	173	8.8%	187	8.6%	1	0.0%	1	0.0%	1.0%	8.0%	1.0%	8.0%
OTHERS	54	2.7%	58	2.7%	122	0.5%	132	0.5%	1.0%	8.0%	1.0%	8.0%
TOTAL	1969	100%	2184	100%	22790	100%	24878	100%				

* INDUSTRY UPDATED 4/95 FOR PRESS VENT EMISSIONS
1994 INDUSTRIAL EMISSIONS AT MAX PSEL

1986 WCD Design Value	550	ug/m3

TABEL 2:1999 WORST-CASE DAY APPORTIONMENT 550 ug/m3 Design Value
INVENTORY DRIVEN - ROLLBACK

SOURCE	1986 WCD EI	1986 UG/M3	86-94 GROW	1994 UG/M3	1994 PCT
DUST SANDIN	8.3%	44.8	12.0%	50.2	8.5%
FIREPLACES	8.4%	45.8	-16.0%	38.5	6.5%
WOODSTOVE	72.0%	390.8	8.0%	422.1	71.2%
INDUSTRY	6.9%	37.7	47.0%	55.3	9.3%
TRANSPORTA	3.9%	20.9	12.0%	23.5	4.0%
INCINERATIO	0.0%	0.0	8.0%	0.0	0.0%
OTHER	0.5%	2.9	8.0%	3.1	0.5%
SUBTOTAL	100%	543.0		592.7	100%
BKGRND		7.0		7.0	
TOTAL	------	550.0		599.7	

IMPROVEMENT NEEDED 599.7 - 150 = 450 UG/M3

PCT REDUCTION NEEDED I 450 / 593 = 75.9%

WORSE-CASE DAY REDUC 75.9% OF 24878 OR 18877 LBS NEEDED

TABEL 3: 24-HR WORST CASE DAY STRATEGY ELEMENTS

	CREDIT	LBS EMISSIONS IN 1994		LBS REMAINING	LBS REDUCTI
ROAD SANDING PROGRAM CREDIT	60.0%	2108		843	1265
WOOD BURNING CURTAILMENT	86.0%	19331		2706	16625
WOODSTOVE CERTIFICATION PROGRAM	24.0%	2425	(2706*89	1843	582
WOODSTOVE REMOVAL PROGRAM	52.8%	1843		870	973
TOTAL FROM WOODSMOKE STRATEGIES					18180
TOTAL FROM ALL STRATEGIES					19444
TOTAL REDUCTION NEEDED					18877
REDUCTION NEEDED - REDUCTION ACHIVED					-568

1994 IMPACTS WITH ALL STRATEGIES APPLIED

1994 WCD EI W/OUT STRATEGIES LBS/DAY	REDUCTIONS ACHIVED FROM STRATEGIES	PCT REDUCTION	1994 IMPACT EI DRIVEN (UNCONTROLLED)	1994 IMPACT EI DRIVEN (CONTROLLED)
24,878	19,444	78.2%	592.7	129.5
			7.0	7.0
			599.7	136.5 UG/M3

TABEL 4: 1994 ANNUAL APPORTIONMENT AT 75 ug/m3 Design Value
INVENTORY DRIVEN - ROLLBACK

SOURCE	1986 ANNUAL PCT	1986 ANNUA UG/M3	86-94 ANNUA GROWT	1994 ANNUAL UG/M3	1994 ANNUAL PCT
UNPAVED DUS	2.7%	1.6	12.0%	1.8	2.7%
PAVED DUST	5.6%	3.4	12.0%	3.8	5.7%
SANDING DUS	1.3%	0.8	12.0%	0.9	1.3%
FIREPLACES	6.4%	3.8	-16.0%	3.2	4.8%
WOODSTOVES	54.6%	32.8	8.0%	35.4	53.2%
INDUSTRY	10.3%	6.2	43.9%	8.9	13.4%
TRANSPORTAT	7.6%	4.6	12.0%	5.1	7.7%
INCINERATION	8.8%	5.3	8.0%	5.7	8.6%
OTHER	2.7%	1.6	8.0%	1.8	2.7%
SUBTOTAL	100%	60		67	100%
BKGRND		15		15	
TOTAL		75		82	

IMPROVEMENT NEEDED 82 - 50 32 UG/M3

PCT REDUCTION NEEDED IN 32 / 67 = 47.4%

WORSE-CASE DAY REDUCTI 47.4% OF 2184 OR 1035 TONS NEEDED

TABEL 5: ANNUAL AVERAGE STRATEGY ELEMENTS

	CREDIT	TONS EMISSIONS IN 1994	TONS REMAINING	TONS REDUCTI
1. WOOD BURNING CURTAILMENT CREDIT OF	74.0%	1268	330	938
NOTE: BECAUSE REDUCTION OCCUR ON WORST-CASE DAYS HIGHLY RESATRICTED METOROLOGY, ACTUAL AIR QUALITY IMPACT REDUCTIONS ARE ACUTUALLY 2.3 TIMES GREATER THAN THE EMISSION REDUCTION WOULD REFLECT. CALCULATIONS INDICATE THAT A 90% CURTAILMENT PROGRAM WILL REDUCE ANNUAL AVERAGE PM10 LEVELS FROM 77 UG/M3 TO 50 UG/M3 BASED ON 47 CURTAILMENT DAYS/YR. SEE SIP SECTION 4.12.3.3				
2. WOODSTOVE CERTIFICATION PROGRAM	24.3%	321	243	78
3. 20% OPACITY PROGRAM @ 5% CREDIT	5.0%	243	231	12
TOTAL WOODBURNING				1028
4. ROAD SANDING EMISSION REDUCTIONS	60%	28	11	17
5. ELIMINATE AGRICULTURAL BURNING IN UGB	100%	156	0	156
TOTAL FROM ALL STRATEGIES				1201
TOTAL REDUCTION NEEDED				1035
REDUCTION NEEDED - REDUCTION ACHIVED				-167

1994 IMPACTS WITH ALL STRATEGIES APPLIED

1994 ANNUAL EI W/OUT STRATEGIES TON/YR	REDUCTIONS ACHIVED FROM STRATEGIES	PCT REDUCTION	1994 ANNUAL IMPACT EI DRIVEN (UNCONTROLLED)	1994 ANNUAL IMPACT EI DRIVEN (CONTROLLED)
2184	1201	55.0%	66.5	29.9
			15.0	15.0
			81.5	44.9 UG/M3

TABEL 6: 1994 EMISSION INVENTORY WITH STRATEGIES
WORST-CASE DAY EMISSION INVENTORY

Source	Uncontrolled New ODOT WCDAY 1986 LBS	WCDAY 1986 PCT	86-94 WCDAY GROWTH	WCDA 1994 LBS	CONTROL STRATEGY REDUCTION %	1994 WCD EI W/STRATEGIES LBS	PCT
DUST-UNPAVE	0	0.0%	0.0%	0	0.0%	0	0.0%
DUST-PAVED	0	0.0%	0.0%	0	0.0%	0	0.0%
DUST-SANDING	1882	8.3%	12.0%	2108	60.0%	843	15.5%
FIREPLACES	1923	8.4%	-16.0%	1615	94.0%	96	1.8%
WOODSTOVES	16403	72.0%	8.0%	17715	94.0%	1055	19.4%
INDUSTRY	1580	6.9%	47.0%	2323	0.0%	2323	42.7%
HIGHWAY	696	3.1%	12.0%	780	0.0%	780	14.3%
OFF ROAD	63	0.3%	12.0%	71	0.0%	71	1.3%
RAILROADS	105	0.5%	12.0%	118	0.0%	118	2.2%
AIRCRAFT	15	0.1%	12.0%	17	0.0%	17	0.3%
TOTAL TRANSP	879	---	12.0%	985		985	18.1%
INCINERATION	1	0.0%	8.0%	1	0.0%	1	0.0%
OTHERS	122	0.5%	8.0%	132	0.0%	132	2.4%
TOTAL	22790	100%		24878	NA	5434	100%

1994 INDUSTRIAL EMISSIONS AT MAX PSEL

OVERALL REDUCTION 78.2%

TABEL 6A: PCT EMISSION REDUCTION

TOTAL EMISSIONS REMAINING AFTER STOVE REPLACEMENT AND USED STOVE BAN CREDITS TAKEN (LBS/DAY)

1994 ** UNCONTROLLED STOVE EMISSIONS (LBS/DAY)	TOTAL REDUCTION FROM WOODHEATING STRATEGIES (LBS/DAY)	1994 WOODHEATING EI REMAINING (LBS/DAY)
19331	18180	1151

1994 WOODHEATING W/OUT STRATEGIES	LBS/DAY	PCT	1999 EI W/STRATEGIES	PCT Reduction
WOODSTOVE EMISSIONS	17715	91.6%	1055	94.0%
FIREPLACE EMISSIONS	1615	8.4%	96	
TOTAL **	19331		1151	

TABEL 7: 2004 WCD WINTER DAY APPORTIONMENT 136.5 ug/m3 1994 DESIGN VALUE
EMISSION INVENTORY DRIVEN ROLLBACK. ---------- COMPOUNDED GROWTH ----------

SOURCE	1994 WCD E "LOCAL" IMPACTS	1994 "Local" WCD (UG/M3)	1995 GROWT %/YR	1995 LOCAL UG/M3	1996 GROW %/YR	1996 LOCAL UG/M3	1997 GROW %/YR	1997 LOCAL UG/M3	1998 GROWT %/YR	1998 LOCAL UG/M3	1999 GROWT %/YR	1999 LOCAL UG/M3	2000 GROWT %/YR	2000 LOCAL UG/M3	2001 GROW %/YR	2001 LOCAL UG/M3	2002 GROWTH %/YR	2002 LOCAL UG/M3	2003 GROWTH %/YR	2003 LOCAL UG/M3	2004 GROWTH %/YR	2004 LOCAL UG/M3
DUST-UNPAV	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0
DUST-PAVED	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0	0.0%	0.0
DUST-SANDIN	15.5%	20.1	1.5%	20.4	1.5%	20.7	1.5%	21.0	1.5%	21.3	1.5%	21.6	1.5%	22.0	1.5%	22.3	1.5%	22.6	1.5%	23.0	1.5%	23.3
FIREPLACES	1.8%	2.3	-2.0%	2.2	-2.0%	2.2	-2.0%	2.2	-2.0%	2.1	-2.0%	2.1	-2.0%	2.0	-2.0%	2.0	-2.0%	1.9	-2.0%	1.9	-2.0%	1.9
WOODSTOVE	19.4%	25.1	-1.8%	24.7	-1.8%	24.3	-1.5%	23.9	-1.5%	23.5	-1.5%	23.2	-1.5%	22.9	-1.5%	22.5	-1.5%	22.2	-1.5%	21.9	-1.5%	21.5
INCINERATIO	0.0%	0.0	1.0%	0.0	1.0%	0.0	1.0%	0.0	1.0%	0.0	1.0%	0.0	1.0%	0.0	1.0%	0.0	1.0%	0.0	1.0%	0.0	1.0%	0.0
INDUSTRY*	42.7%	55.3	0.0%	55.3	0.0%	55.3	0.0%	55.3	0.0%	55.3	0.0%	55.3	0.0%	55.3	0.0%	55.3	0.0%	55.3	0.0%	55.3	0.0%	55.3
TRANSPORT	18.1%	23.5	1.5%	23.8	1.5%	24.2	1.5%	24.5	1.5%	24.9	1.5%	25.3	1.5%	25.7	1.5%	26.0	1.5%	26.4	1.5%	26.8	1.5%	27.2
OTHER	2.4%	3.1	1.0%	3.2	1.0%	3.2	1.0%	3.2	1.0%	3.3	1.0%	3.3	1.0%	3.3	1.0%	3.4	1.0%	3.4	1.0%	3.4	1.0%	3.5
SUBTOTAL	100%	129.5		129.7		129.9		130.2		130.5		130.9		131.2		131.6		132.0		132.4		132.8
BKGRND		7.0		7.0		7.0		7.0		7.0		7.0		7.0		7.0		7.0		7.0		7.0
TOTAL	------	136.5		136.7		136.9		137.2		137.5		137.9		138.2		138.6		139.0		139.4		139.8

YEAR 2004
Ug Safety Margin 139.8 - 150 = 10.21 UG/M3

PCT SAFTEY MARGIN 10.21 / 150 6.8% SAFETY MARGIN
IN 2004

TABEL 7A: 1994 - 2004 WCD EMISSION INVENTORIES ---------- COMPOUNDED GROWTH ----------

SOURCE	1994 PCT EI: W/ STRATEGIE	1994 WCD EI EI: WITH/ STRATEGIES	1995 GROWT %/YR	1995 WCD EI EI: WITH STRAT.	1996 GROW %/YR	1996 WCD EI EI: WITH STRAT.	1997 GROW %/YR	1997 WCD EI EI: WITH STRAT.	1998 GROWT %/YR	1998 WCD EI EI: WITH STRAT.	1999 GROWT %/YR	1999 WCD EI EI: WITH/ STRAT.	2000 GROWT %/YR	2000 WCD EI EI: WITH STRAT.	2001 GROW %/YR	2001 WCD EI EI: WITH STRAT.	2002 GROWTH %/YR	2002 WCD EI EI: WITH/ STRAT.	2003 GROWTH %/YR	2003 WCD EI EI: WITH STRAT.	2004 GROWTH %/YR	2004 WCD EI EI: WITH/ STRAT.
DUST-UNPAV	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0
DUST-PAVED	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0	0.0%	0
DUST-SANDIN	15.5%	843	1.5%	856	1.5%	869	1.5%	882	1.5%	895	1.5%	908	1.5%	922	1.5%	936	1.5%	950	1.5%	964	1.5%	978
FIREPLACES	1.8%	96	-2.0%	94	-2.0%	92	-2.0%	91	-2.0%	89	-2.0%	87	-2.0%	85	-2.0%	83	-2.0%	82	-2.0%	80	-2.0%	79
WOODSTOVE	19.4%	1055	-1.8%	1036	-1.8%	1018	-1.5%	1003	-1.5%	988	-1.5%	974	-1.5%	959	-1.5%	945	-1.5%	931	-1.5%	918	-1.5%	904
INCINERATIO	0.0%	1	1.0%	1	1.0%	1	1.0%	1	1.0%	1	1.0%	1	1.0%	1	1.0%	1	1.0%	1	1.0%	1	1.0%	1
INDUSTRY*	42.7%	2323	0.0%	2323	0.0%	2323	0.0%	2323	0.0%	2323	0.0%	2323	0.0%	2323	0.0%	2323	0.0%	2323	0.0%	2323	0.0%	2323
HIGHWAY	14.3%	780	1.5%	791	1.5%	803	1.5%	815	1.5%	828	1.5%	840	1.5%	853	1.5%	865	1.5%	878	1.5%	891	1.5%	905
OFF ROAD	1.3%	71	1.5%	72	1.5%	73	1.5%	74	1.5%	75	1.5%	76	1.5%	77	1.5%	78	1.5%	79	1.5%	81	1.5%	82
RAILROADS	2.2%	118	1.5%	119	1.5%	121	1.5%	123	1.5%	125	1.5%	127	1.5%	129	1.5%	131	1.5%	132	1.5%	134	1.5%	136
AIRCRAFT	0.3%	17	1.5%	17	1.5%	17	1.5%	18	1.5%	18	1.5%	18	1.5%	18	1.5%	19	1.5%	19	1.5%	19	1.5%	19
TOTAL TRANS	18.1%	---	1.5%	---	1.5%	---	1.5%	---	1.5%	---	1.5%	---	1.5%	---	1.5%	---	1.5%	---	1.5%	---	1.5%	---
OTHER	2.4%	132	1.0%	133	1.0%	134	1.0%	136	1.0%	137	1.0%	138	1.0%	140	1.0%	141	1.0%	143	1.0%	144	1.0%	146
	100%	5434		5442	1.5%	5452	1.5%	5464	1.5%	5478	1.5%	5492	1.5%	5507	1.5%	5522	1.5%	5539	1.5%	5556	1.5%	5573

TABEL 8: 1994 EMISSION INVENTORY WITH STRATEGIES
ANNUAL AVERAGE EMISSION INVENTORY

Source	Uncontrolled New ODOT ANNUAL 1986 TONS	ANNUAL 1986 PCT	86-94 ANNUAL GROWTH	ANNU 1994 TONS	CONTROL STRATEGY REDUCTION %	1994 ANNUAL EI W/STRATEGIES TONS	PCT
DUST-UNPAVE	53	2.7%	12.0%	60	0.0%	60	6.1%
DUST-PAVED	110	5.6%	12.0%	124	0.0%	124	12.6%
DUST-SANDING	25	1.3%	12.0%	28	60.0%	11	1.2%
FIREPLACES	126	6.4%	-16.0%	106	81.2%	20	2.0%
WOODSTOVES	1076	54.6%	8.0%	1162	81.2%	219	22.3%
INDUSTRY	203	10.3%	43.9%	291	0.0%	291	29.7%
HIGHWAY	115	5.9%	12.0%	129	0.0%	129	13.2%
OFF ROAD	12	0.6%	12.0%	13	0.0%	13	1.4%
RAILROADS	19	1.0%	12.0%	21	0.0%	21	2.2%
AIRCRAFT	3	0.2%	12.0%	3	0.0%	3	0.3%
TOTAL TRANSP	149	--	12.0%	167	0.0%	167	17.0%
INCINERATION	29	1.5%	8.0%	31	0.0%	31	3.1%
AGRICULTURA	144	7.3%	8.0%	156	100.0%	0	0.0%
TOTAL INCINER	173	8.8%	8.0%	187	0.0%	31	3.1%
OTHERS	54	2.7%	8.0%	58	0.0%	58	5.9%
TOTAL	1969	100%		2184		982	100%

1999 INDUSTRIAL EMISSIONS AT MAX PSEL

OVERALL REDUCTION 55.0%

TABEL 8A:

TOTAL EMISSIONS REMAINING AFTER
STOVE REPLACEMENT AND USED STOVE BAN CREDITS TAKEN
(TONS/YR)

1994 UNCONTROLLED STOVE EMISSIONS (TONS/YR)	TOTAL REDUCTION FROM WOODHEATING STRATEGIES (TONS/YR)	1994 WOODHEATING EI REMAINING (TONS/YR)
1268	1029	239

1994 WOODHEATING W/OUT STRATEGIES	(TONS/YR)	PCT	1999 EI W/STRATEGIES	Pct Reduciton
WOODSTOVE EMISSIONS	1162	91.7%	219	81.2%
FIREPLACE EMISSIONS	106	8.3%	20	81.2%
TOTAL	1268	100%	239	

OVERALL P REDUCTION 81.2%

TABEL 9: 2004 WCD WINTER DAY APPORTIONMENT 44.9 ug/m3 1994 DESIGN VALUE
EMISSION INVENTORY DRIVEN ROLLBACK. ---------- COMPOUNDED GROWTH ----------

SOURCE	1994 ANNU "LOCAL" IMPACTS	1994 "Local" ANNUAL (UG/M3)	1995 GROWT %/YR	1995 LOCAL UG/M3	1996 GROW %/YR	1996 LOCAL UG/M3	1997 GROW %/YR	1997 LOCAL UG/M3	1998 GROWT %/YR	1998 LOCAL UG/M3	1999 GROWT %/YR	1999 LOCAL UG/M3	2000 GROWT %/YR	2000 LOCAL UG/M3	2001 GROW %/YR	2001 LOCAL UG/M3	2002 GROWTH %/YR	2002 LOCAL UG/M3	2003 GROWTH %/YR	2003 LOCAL UG/M3	2004 GROWTH %/YR	2004 LOCAL UG/M3
DUST SOURC	19.9%	5.9	1.5%	6.0	1.5%	6.1	1.5%	6.2	1.5%	6.3	1.5%	6.4	1.5%	6.5	1.5%	6.6	1.5%	6.7	1.5%	6.8	1.5%	6.9
FIREPLACES	2.0%	0.6	-2.0%	0.6	-2.0%	0.6	-2.0%	0.6	-2.0%	0.6	-2.0%	0.5	-2.0%	0.5	-2.0%	0.5	-2.0%	0.5	-2.0%	0.5	-2.0%	0.5
WOODSTOVE	22.3%	6.7	-1.8%	6.6	-1.8%	6.4	-1.5%	6.3	-1.5%	6.3	-1.5%	6.2	-1.5%	6.1	-1.5%	6.0	-1.5%	5.9	-1.5%	5.8	-1.5%	5.7
INCINERATIO	3.1%	0.9	1.0%	0.9	1.0%	1.0	1.0%	1.0	1.0%	1.0	1.0%	1.0	1.0%	1.0	1.0%	1.0	1.0%	1.0	1.0%	1.0	1.0%	1.0
INDUSTRY*	29.7%	8.9	0.0%	8.9	0.0%	8.9	0.0%	8.9	0.0%	8.9	0.0%	8.9	0.0%	8.9	0.0%	8.9	0.0%	8.9	0.0%	8.9	0.0%	8.9
TRANSPORT	17.0%	5.1	1.5%	5.2	1.5%	5.3	1.5%	5.3	1.5%	5.4	1.5%	5.5	1.5%	5.6	1.5%	5.7	1.5%	5.7	1.5%	5.8	1.5%	5.9
OTHER	5.9%	1.8	1.0%	1.8	1.0%	1.8	1.0%	1.8	1.0%	1.8	1.0%	1.9	1.0%	1.9	1.0%	1.9	1.0%	1.9	1.0%	1.9	1.0%	2.0
SUBTOTAL	100%	29.9		30.0		30.0		30.1		30.2		30.3		30.4		30.6		30.7		30.8		30.9
BKGRND		15.0		15.0		15.0		15.0		15.0		15.0		15.0		15.0		15.0		15.0		15.0
TOTAL	-----	44.9		45.0		45.0		45.1		45.2		45.3		45.4		45.6		45.7		45.8		45.9

YEAR 2004
UG SAFETY MARGI 45.9 - 50 = -4.2 UG/M3

PCT saftey margin IN 2004 4.2 / 50 8.5%

TABEL 9A: 1994 - 2004 ANNUAL EMISSION INVENTORIES ---------- COMPOUNDED GROWTH ----------

SOURCE	1994 PCT EI: W/ STRATEGIE	1994 ANNUAL EI: WITH/ STRATEGIES	1995 GROWT %/YR	1995 ANNUAL EI: WITH STRAT.	1996 GROW %/YR	1996 ANNUAL EI: WITH STRAT.	1997 GROW %/YR	1997 ANNUAL EI: WITH STRAT.	1998 GROWT %/YR	1998 ANNUAL EI: WITH STRAT.	1999 GROWT %/YR	1999 ANNUAL EI: WITH/ STRAT.	2000 GROWT %/YR	2000 ANNUAL EI: WITH STRAT.	2001 GROW %/YR	2001 ANNUAL EI: WITH STRAT.	2002 GROWTH %/YR	2002 ANNUAL EI: WITH/ STRAT.	2003 GROWTH %/YR	2003 ANNUAL EI: WITH STRAT.	2004 GROWTH %/YR	2004 ANNUAL EI: WITH/ STRAT.
DUST-UNPAV	6.1%	60	1.5%	61	1.5%	62	1.5%	62	1.5%	63	1.5%	64	1.5%	65	1.5%	66	1.5%	67	1.5%	68	1.5%	69
DUST-PAVED	12.6%	124	1.5%	126	1.5%	127	1.5%	129	1.5%	131	1.5%	133	1.5%	135	1.5%	137	1.5%	139	1.5%	141	1.5%	144
DUST-SANDIN	1.2%	11	1.5%	12	1.5%	12	1.5%	12	1.5%	12	1.5%	12	1.5%	12	1.5%	13	1.5%	13	1.5%	13	1.5%	13
FIREPLACES	2.0%	20	-2.0%	20	-2.0%	19	-2.0%	19	-2.0%	18	-2.0%	18	-2.0%	18	-2.0%	17	-2.0%	17	-2.0%	17	-2.0%	16
WOODSTOVE	22.3%	219	-1.8%	215	-1.8%	211	-1.5%	208	-1.5%	205	-1.5%	202	-1.5%	199	-1.5%	196	-1.5%	193	-1.5%	191	-1.5%	188
INCINERATIO	3.1%	31	1.0%	31	1.0%	31	1.0%	32	1.0%	32	1.0%	32	1.0%	33	1.0%	33	1.0%	33	1.0%	34	1.0%	34
INDUSTRY*	29.7%	291	0.0%	291	0.0%	291	0.0%	291	0.0%	291	0.0%	291	0.0%	291	0.0%	291	0.0%	291	0.0%	291	0.0%	291
HIGHWAY	13.2%	129	1.5%	131	1.5%	133	1.5%	135	1.5%	137	1.5%	139	1.5%	141	1.5%	143	1.5%	146	1.5%	148	1.5%	150
OFF ROAD	1.4%	13	1.5%	14	1.5%	14	1.5%	14	1.5%	14	1.5%	14	1.5%	15	1.5%	15	1.5%	15	1.5%	15	1.5%	16
RAILROADS	2.2%	21	1.5%	22	1.5%	22	1.5%	22	1.5%	23	1.5%	23	1.5%	23	1.5%	24	1.5%	24	1.5%	24	1.5%	25
AIRCRAFT	0.3%	3	1.5%	3	1.5%	3	1.5%	4	1.5%	4	1.5%	4	1.5%	4	1.5%	4	1.5%	4	1.5%	4	1.5%	4
TOTAL TRANS	0.0%	—	1.5%	—	1.5%	—	1.5%	—	1.5%	—	1.5%	—	1.5%	—	1.5%	—	1.5%	—	1.5%	—	1.5%	—
OTHER	5.9%	58	1.0%	59	1.0%	59	1.0%	60	1.0%	61	1.0%	61	1.0%	62	1.0%	63	1.0%	63	1.0%	64	1.0%	64
	100%	982		984	1.5%	986	1.5%	989	1.5%	992	1.5%	996	1.5%	999	1.5%	1003	1.5%	1006	1.5%	1010	1.5%	1014

TABEL 10: WOODSTOVE NET EMISSION DECLINE

WOODSTOVE EMISSIONS (TONS/YR) FROM 1994 - 2000

Different growth periods assume different stove replacement mixes for each period

									Theoretical Emissions			
	1994	1995	1996	1997	1998	1999	2000	Net Growth %/yr	2001	2002	2003	2004
EXISTING STOVES	843	823	803	786	768	751	735					
NEW STOVES	36	41	45	50	54	59	63					
TOTAL STOVES	879	864	848	836	822	810	798	-1.47%	786	775	763	752
FIREPLACES	107	105	103	101	99	97	95					
TOTAL RWC	986	969	951	937	921	907	893					

EMISSION CHANGE FROM 1994-96	(1-848/879)/ 2 years =	1.76% /yr decline
EMISSION CHANGE FROM 1996-2000	(1-798/848)/ 4 years =	1.47% /yr decline
PROJECTED TOTAL EMISSION CHANGE 1994 TO 2004	1-(752/879) =	14.5% TOTAL DECLINE

TOTAL EMISSION INVENTORY

	WCD (LBS/DAY)						ANNUAL (TONS/YR)					
	1994	1995	2000	2004	GROWTH %/Yr	2005	1994	1995	2000	2004	GROWTH %/Yr	2005
DUST-UNPAVED	0	0	0	0	0.0%	0	60	61	65	69	1.5%	70
DUST-PAVED	0	0	0	0	0.0%	0	124	126	135	144	1.5%	146
DUST-SANDING	843	856	922	978	1.5%	993	11	12	12	13	1.5%	13
FIREPLACES	96	94	85	79	-2.0%	77	20	20	18	16	-2.0%	16
WOODSTOVES	1055	1036	959	904	-1.5%	891	219	215	199	188	-1.5%	185
INCINERATION	1	1	1	1	1.0%	1	31	31	33	34	1.0%	34
INDUSTRY*	2323	2323	2323	2323	0.0%	2323	291	291	291	291	0.0%	291
HIGHWAY	780	791	853	905	1.5%	918	129	131	141	150	1.5%	152
OFF ROAD	71	72	77	82	1.5%	83	13	14	15	16	1.5%	16
RAILROADS	118	119	129	136	1.5%	139	21	22	23	25	1.5%	25
AIRCRAFT	17	17	18	19	1.5%	20	3	3	4	4	1.5%	4
TOTAL TRANSPORT	---	---	---	---	---	---	---	---	---	---	---	---
OTHER	132	133	140	146	1.0%	147	58	59	62	64	1.0%	65
TOTAL	5434	5442	5507	5573		5592	982	984	999	1014		1019
STRATEGY SAFETY MARGIN AVAILABLE	568	559	495	428		410	167	165	150	134		130

AVAILABLE SAFETY MARGIN = SAFETY MARGIN 94 - [FUTURE YEAR EI - 1994 EI]

TABEL 11: ESTIMATED EMISSION BUDGET FOR TRANSPORTATION EMISSIONS

	WCD (LBS/DAY)						ANNUAL (TONS/YR)					
					GROWTH						GROWTH	
	1994	1995	2000	2004	%/Yr	2005	1994	1995	2000	2004	%/Yr	2005
DUST-UNPAVED	0	0	0	0	0.0%	0	60	61	65	69	1.5%	70
DUST-PAVED	0	0	0	0	0.0%	0	124	126	135	144	1.5%	146
DUST-SANDING	843	856	922	978	1.5%	993	11	12	12	13	1.5%	13
HIGHWAY	780	791	853	905	1.5%	918	129	131	141	150	1.5%	152
TOTAL EMISSION BUDGET	1623	1647	1774	1883		1911	324	329	354	376		382
POTENTIAL BUDGET AVAILABLE BY ADDING SAFTERY MARGIN	2190	2206	2269	2312		2322	491	494	504	511		512

Environmental Quality Commission

☐ Rule Adoption Item
☐ Action Item
☑ Information Item

Agenda Item E

Title:

Willamette River Basin Water Quality Study

Summary:

The second two year study phase of the Willamette River Basin has been completed, and the Study's Technical Advisory Steering Committee is presenting it's finding.

The study is cooperatively funded by the State, municipalities and industry

Department Recommendation:

Department recommends that the Commission approve the report for public dissemination.

Barbara Priest
Report Author

Michael Downs
Division Administrator

Director

†Accommodations for disabilities are available upon request by contacting the Public Affairs Office at (503)229-5317(voice)/(503)229-6993(TDD).

SA\WC13\WC13618.doc

State of Oregon
Department of Environmental Quality Memorandum†

Date: August 1, 1995

To: Environmental Quality Commission

From: Langdon Marsh, Director

Subject: Agenda Item E, August 18, 1995, EQC Meeting

Willamette River Basin Water Quality Study

Statement of Purpose

Phase II of the Willamette River Basin Water Quality Study has been completed. Findings of the Phase II Study, recommendations for Phase III and a summary report from the Willamette Technical Advisory Steering Committee are presented as an informational item.

Background

The 1972 Clean Water Act mandated the development of programs that would evaluate, restore and maintain the chemical, physical and biological integrity of the nation's water. Amendments to the Clean Water Act in 1987 required the Department to list state water bodies that do not meet standards, to establish maximum daily loads for these waters, and to design and implement management plans to allocate waste loads to dischargers. In 1990 the Department listed the Willamette River as being water quality limited for arsenic, chromium, copper, lead, zinc, dioxin and DDT.

Over the next decade municipalities and industry are expected to spend several billion dollars to develop and maintain wastewater treatment facilities to protect water quality for beneficial uses. The Department is in the process of examining the Willamette River basin to identify existing water quality conditions and develop quality models to evaluate dissolved oxygen levels, toxics, sediment, nonpoint sources, bacteria and the impacts of nutrients. Waste load allocations for specific industries and municipalities can then be determined for these parameters.

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†Accommodations for disabilities are available upon request by contacting the Public Affairs Office at (503)229-5317(voice)/(503)229-6993(TDD).

The objective of the study is to construct a complete data base with operative computer models of the basin to enable state, local and federal agencies, working cooperatively, to ensure the preservation of beneficial uses of the river. The short-term goal is to provide the Department with knowledge and the technical means to carry out its responsibilities under state and federal law which apply to maintaining water quality in the basin. The study has been cooperatively funded by the State, U.S. Geological Survey - Water Resources Division (USGS), municipalities and industry. Phase I began in 1991 with the establishment of a Technical Advisory Steering Committee (TASC)(see Attachment 1).

Phase I Findings

During Phase I the Willamette River Basin (see map Attachment 2) was broken down into four regions: 1) from the confluence of the Willamette with the Columbia to river mile 27 (Willamette Falls); 2) from the Willamette Falls to Newberg; 3) Newberg to Corvallis; and 4) Corvallis to Eugene.

Phase I focused on evaluating water quality computer models and field data collection for use in the predictive models. Model development focused on several water quality parameters (dissolved oxygen, nutrients, chlorophyll, bacteria, toxic chemicals, and suspended sediments) and addressed point and nonpoint sources. The models are discussed below:

- The model (QUAL2EU) for dissolved oxygen, nutrients and chlorophyll was developed and can be used for regulatory purposes, although further calibration and refinement was recommended. This model did not calibrate well in the lower river.

- A bacteria model was developed for fecal bacteria, but could not be calibrated due to interference from bacterial discharges of pulp and paper mills or other sources. Further work was delayed since this standard was under triennial review.

- A toxics and sediment model (SMPTOX3) was developed, but, the existing data was limited and there was a lack of uniform monitoring data from sources. Phase I funds were not sufficient to gather new field data for calibration.

- Nonpoint source pollution was identified as a concern in the Willamette Basin because the majority of suspended solids and nutrient loads were from this category. A predictive nonpoint source model was developed but does not allow for ranking of land uses and river subbasins in terms of their contribution to the overall loading. The model is not fully calibrated due to the limited number of storm samples available. Initial use shows that at least 90 percent of the source load enters the river during the wet months and that agriculture is the main contributor.

- o USGS developed a river model to be used to predict sediment and toxic transportation. The USGS model has been calibrated and verified for the basin. This work was integrated into the USGS National Water Quality Assessment Program survey for the Willamette Valley.

Information was also collected on the mainstem aquatic invertebrate community, fish communities, skeletal abnormalities in fish, algal abundance, and major point sources.

Phase II Findings

Phase II focused on additional measurement of toxic compounds, sediment oxygen demand and benthic production, a survey of minor permittees, continued ecological monitoring, and further study of nonpoint source pollution.

Toxics

Sampling sites contained a variety of land uses, such as urban, agricultural and forested, in an attempt to identify contaminant source areas with associated land and water uses. The criteria for trace elements in water were exceeded more frequently at urban sites than at agricultural sites. Urban sites of concern were A-3 at Wallis and Fifth street in Eugene, and Fanno Creek at Durham road in Washington County. Agricultural sites of concern included the Pudding River at Aurora, Zollner Creek near Mt. Angel, Muddy Creek near Peoria, Mill Creek near Turner, and Champoeg Creek near Butteville.

EPA and Department criteria for organic constituents in water were exceeded in the basin most frequently for pesticides (i.e., dieldrin and DDT plus metabolites) and metals. These compounds were detected at urban, industrial and agricultural sites.

Ecological

Benthic macroinvertebrates and fish were selected for additional development of biocriteria because methodologies exist for developing biocriteria for these groups and DEQ has on-going monitoring programs for fish and benthic macroinvertebrates. At this time more data are needed because there is uncertainty in the classification systems devised for the river. Long-term monitoring stations need to be established.

Many potential causes have been suggested for fish skeletal deformities in the Willamette, including genetic factors, hybridization, nutritional deficiencies, parasites, elevated water temperatures, low oxygen concentrations, heavy metals, herbicides, pesticides, and effluents. Exact causes are difficult to pinpoint, but the high frequency of defects found in the Newberg pool suggest a local source as the

cause of the defects. Currently insufficient data exists to determine whether toxics correlate with the increase of deformities in the pool. In general skeletal deformities have been proven to be a useful biological indicator to screen fish populations.

Habitat assessment showed that the complexity of the river channel increases from the mouth to the headwaters. Low complexity in the lower river may be due to natural widening and deepening of the channel along with maintenance dredging.

Nonpoint Sources

Nonpoint source sampling was conducted in the Pudding River during baseflow and storm conditions. Detailed GIS data on land use, soils, and slopes were obtained. Phase I estimates show this basin as the sub-basin with the highest pollution loadings from agriculture, reflected in high total nitrogen and total suspended solids loads. Nonpoint loads are erratic and strongly related to stream discharge. Nonpoint source loads increase during the winter when flows are high and dissolved oxygen concentrations approach saturation. In summer the effects of organic wastes, nutrients and low dissolved oxygen are critical. Future modeling efforts need to focus on water quality during low flow periods.

There is a strong relationship between water quality and land use activities in the watersheds. Sediment and nutrient loadings were found to be highest in the middle and lower valley which is consistent with agricultural use and water quality monitoring data. Contributions from major urban areas are being examined as part of the NPDES permitting programs. These studies will provide data about nonpoint source runoff from urban areas. The nonpoint source studies found toxic chemical levels in the water, sediments and fish tissue in certain basin locations. High levels of suspended particles and agricultural nutrients were also found in some river sections. Nonpoint source loading in the tributaries contributes the majority of the pollutants to the mainstem. Point source loading of total suspended sediments from major dischargers contributes less than 1 percent of the annual total suspended sediment load. The greatest concentrations and loads of nonpoint source pollutants were generated by high intensity agricultural watersheds. Monitoring and modeling activities demonstrate that nonpoint source pollution seriously impairs water quality in portions of the Willamette. Additionally, high concentrations of nitrate measured in storm flow downstream from intensive agriculture strongly suggest that aquifers in some areas are receiving excessive loads of nitrate which could lead to groundwater pollution problems.

Pollutant loading levels estimates for the sub-basins in the Willamette have been summarized in two matrices (Attachment 3 and 4). The nonpoint source data shows the Pudding River contributes substantial nonpoint source loads to the Willamette and during storms water quality standards are commonly exceeded. High nitrogen loads in the Pudding most likely reflect contributions from high rates of fertilizer application associated with irrigated agriculture and livestock wastes.

Most sub-basins on the west side of the Valley experience water quality problems associated with nonpoint sources. Water quality problems on the east side are less severe with the exception of the Pudding, where they are the most severe in the basin.

Overall Assessment

Tetra Tech (consultant) evaluated the impairment for each data type by river region using a matrix. A score of O to 9 is possible, with 9 representing an unimpaired situation and O representing a situation that would support little life. Scoring was done for the four regions and the basin as a whole.

- Region 4 (Springfield to Corvallis) had the highest health score of 6.5 in the basin on a scale of 9 to 0. Impairment or exceedances to water quality are seldom observed, except in specific locations. These locations had the best water quality conditions in the basin.

- Region 3 (Corvallis to Newberg) had a health status score of 5.3. Exceedances occurred in DO, toxics (water and sediment), and skeletal abnormalities, and were mainly found in the vicinity of Albany and Salem.

- Region 2 (Newberg to Oregon City) had a score of 4.7, indicating that impairments and exceedance of standards are commonly observed. Low scores were driven by toxics (water and sediment), metals, organics and incidence of skeletal abnormalities. Most toxic exceedances occurred in the Pudding and Tualatin.

- Region 1 (Oregon City to the Columbia River) had a score of 4.8. The score was low due to exceedances of water standards for toxics, sediments, poor physical habitat, and poor condition of fish assemblages (low IBI scores). Toxic exceedances were most common in Portland.

- The overall score for the basin was 5.4, indicating a fairly impacted condition due to physical river alteration and pollution loading. Biological integrity has been impaired due to toxic loads and habitat alterations.

Technical Advisory Steering Committee Recommendations

Committee recommendations are attached (Appendix 4), Committee members will be available to present these recommendations and supporting data.

Summary of Public Input Opportunity

The Technical Advisory Steering Committee has met monthly since its inception in 1991. All meetings have been open to the public. At the conclusion of Phase I, three public informational meetings were held in Eugene, Albany and Portland to present the Phase I findings and recommendations for Phase II. Input from the public was solicited. The committee plans to have public informational meetings later in 1995 as soon as findings and recommendations are finalized. The report will be sent to the legislature. At the completion of Phase I a brochure was developed and sent to various state and federal agencies as well as local interest groups. The Department will be putting out a press release in August, when the final integrated report by Tetra Tech is available.

The Department has distributed copies of the Phase I Summary and Phase II Summary reports to county, city and university libraries throughout the basin. Full sets of the reports are available to the public at Oregon State University, Portland State University and the University of Oregon, and at all Departmental offices in the basin. Minutes from the committee meetings are made available at all Departmental offices in the basin. DEQ maintains several mailing lists with over 800 interested groups, associations and individuals, who are notified of meetings and talks related to the Willamette Basin. Speakers have been made available to groups requesting further information.

Conclusions

The Committee and Department believe the continuation of the study is important. During Phase II much new data was gathered on chemistry, hydrology and biological communities. The acquired data will be used to better protect beneficial uses and water quality as population expands and industry grows in the basin. Study results will be used to support future rule making, TMDL modeling and changes in the Department's water quality policies.

Intended Future Actions

Phase III

The 1995 legislature has funded a continuated study to complete work begun in Phase I and II on toxics and nonpoint sources. State funding of $83,333 has been approved with matching funds provided by the Northwest Pulp and Paper Association and Association of Clean Water Agencies.

Total project funding for Phase III is $250,000. The Department is working with the Committee and the other two funding partners to develop a detailed study proposal for Phase III. The Department wishes to see the models fully calibrated and available for use at the end of Phase III.

The committee and Department hope to contract part of the work in fall 1995 as well as using matching funds from USGS. Additional funding opportunities are being sought to supplement the study.

Department of Environmental Quality

The predictive water quality models developed in this study will be used by the Department to achieve three broad objectives: 1) to review existing river basin management policies; 2) to develop a water quality based river management approach and 3) to revise existing and future permit and monitoring requirements. The models will be used to predict the effect of possible changes in river conditions, and to set minimum flow levels or waste loads for water quality.

In addition, the models and data will be used by the Department to refine the statewide biological criteria for assessing water quality, and will assist with future triennial standards reviews and TMDLs/WLA/LA designations in the basin. An evaluation and refinement of biological indices have been done to assist the agency in developing biological criteria to assess water quality.

Department Recommendation

The Department recommends the Commission approve the report for public dissemination.

Attachments

1) list of Committee (TASC) members
2) map of basin
3) Impairment matrix
4) Nonpoint source matrix
5) Committee report

Reference Documents (available upon request)

1. Minutes of the TASC meetings
2. Summary Reports from Phase I and II
3. Quarterly budget reports
4. FACT sheets

Approved:

Section: _____

Division: _____

Report Prepared By: Barbara Priest

Phone: 229-5945

Date Prepared: July 14, 1995

BP:BP
SA\WC13\WC13615
8/1/95

WILLAMETTE RIVER BASIN WATER QUALITY STUDY
TECHNICAL ADVISORY STEERING COMMITTEE
-- Current Membership List, August 1, 1995 --

Don Sterling, Chairman 1718 S.W. Myrtle Portland, OR 97201	223-4707 (home)
Colleen Bennett, Vice Chair 2251 Prestwick Road Lake Oswego, OR 97034	635-6950 (home) 369-1161 (Work)
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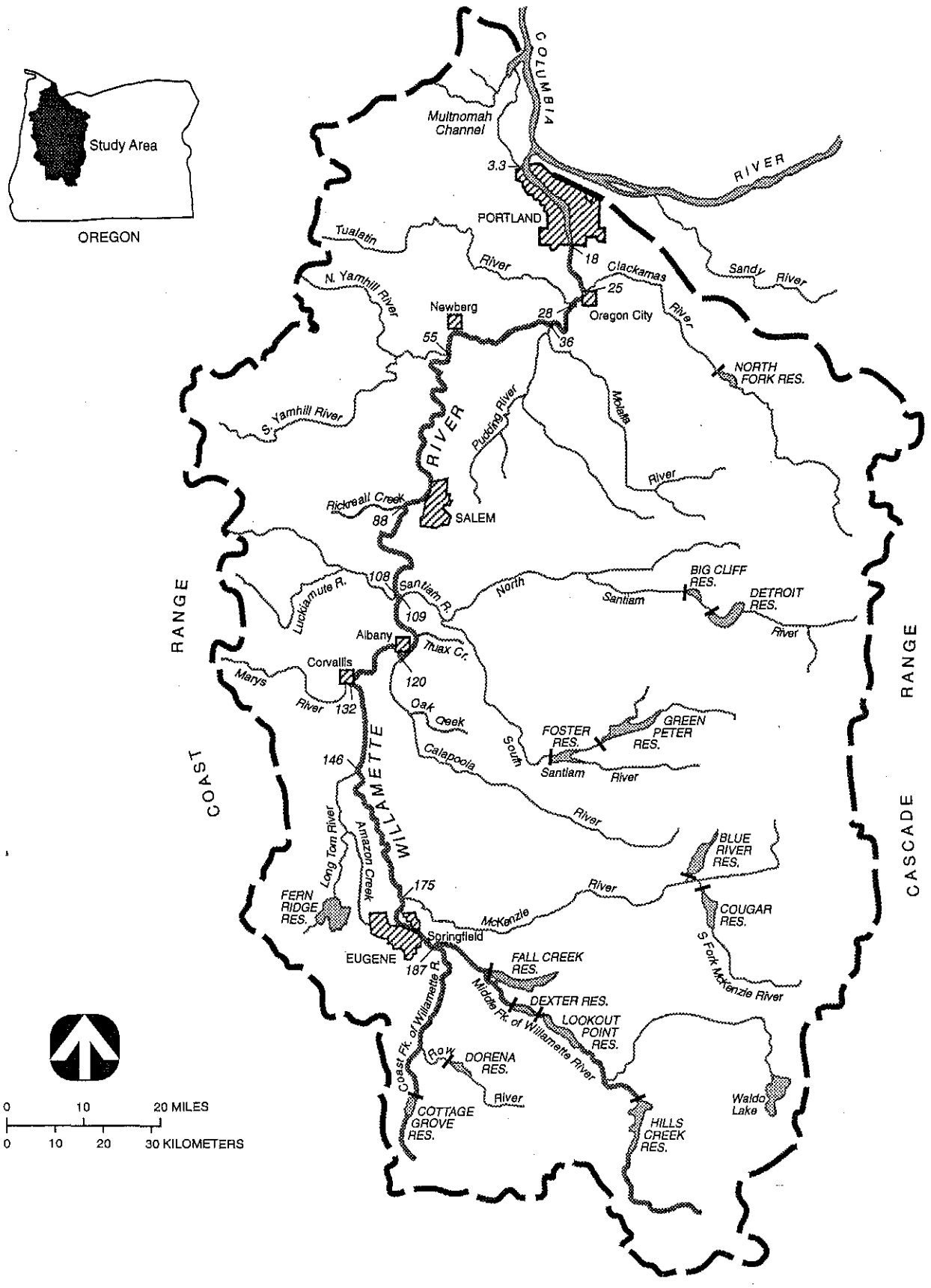
Carol Whitaker, Prof. Environ. Engin. James River Corporate Environ. Services 904 N.W. Drake Street Camas, WA 98607	(206) 834-8390(Work) (206) 834-8327 (FAX)
James Ollerenshaw City of Eugene - Wastewater Division 410 River Avenue Eugene, OR 97401	984-8604 (Work) 984-8601 (FAX)



Willamette River Basin Water Quality Study Area

TABLE 3-2 . EVALUATION OF WILLAMETTE RIVER IMPAIRMENT

	Water Quality Standards and Guidelines				Benthic Communities		Fish			Habitat	TOTAL	
RIVER REGION	Dissolved Oxygen	Chlorophyll a	Toxics-Water	Toxics-Sediment	Soft-bottom	Riffle	IBI	Skeletal Deformity	Fish Health		SUM	AVERAGE
4	9	9	4.9	4.5	6.5	5.8	5.6	9	5	5.5	64.8	6.5
3	7	9	5.5	3.8	4.9	5	5.2	2.5	5	5	52.9	5.3
2	9	9	3	2.3	5		4.3	0	5	4.7	42.3	4.7
1	9	9	3.3	1.2	4.6		3.8	4.5	5	2.8	43.2	4.8
TOTAL	34	36	16.7	11.8	21	10.8	18.9	16	20	18	203.2	5.3
	8.5	9	4.175	2.95	5.25	5.4	4.725	4	5	4.5	53.5	5.35

RIVER HEALTH INDEX	
Criteria:	Score
No Evidence of Impairment or Exceedance of Standards	9
Impairment or Exceedances of Standards Rarely Observed	7
Impairment or Exceedances of Standards Commonly Observed	4.5
Impairment or Exceedances of Standards Frequently Observed	2.5
Impairment or Exceedances of Standards Almost Always Observed	0

TABLE 3-4. RANKING OF THE NONPOINT SOURCE POLLUTANT LOADS AND ASSOCIATED WATER QUALITY PROBLEMS IN THE WILLAMETTE RIVER BASIN

Sub-basin (Rivers)	W.Q. Rank	TSS	TP	NO_3	Major NPS Issues
Severe Water Quality Problems					
Pudding	0	1	1	1	Several tributaries with extremely severe degradation all associated with irrigated agriculture and livestock operations.
Columbia	1	2	2	5	Major urban and urbanizing area, some agriculture.
Tualatin livestock	2	3	3	4	Major urban and urbanizing areas, intensive agriculture operations.
Long Tom	3	4	4	2	Intensive and light agriculture, some livestock.
Coast Range (Yamhill, Luckiamute, Marys)	4	5	5	3	Mixed agriculture, livestock some urbanizaiton.
Moderate Water Quality Problems					
Santiam	5	6	6	6	Mixed agriculture, livestock some urbanization.
Clackamas	6	7	7	7	Logging, urbanization in lower portions.
Mild Water Quality Problems					
Coast Fork (Willamette)	7	8	8	8	Logging, dryland agriculture.
Middle Fork (Willamette)	8	9	9	9	Logging, light agriculture in lowlands.
McKenzie, lower	9	10	10	10	Logging, urbanizing corridor along river, light agriculture in sections.

The Willamette River Basin Water Quality Study

Committee Report - Draft 3 (8/2/95)

Willamette River Technical Advisory Steering Committee

Abstract/Summary

(Do this section last)

The Willamette River Basin - Yesterday and Today

Basin Description/History

The Willamette River Basin is located in northwestern Oregon between the Coast Range and the Cascade mountains (Figure 1). The river system within the basin includes the Willamette River and 13 major tributaries. It is the largest river basin in the state, encompassing about 11,500 square miles, or about 12% of the land area of the state. From the joining of its headwater streams in the southern part of the basin near Eugene, the Willamette River flows 187 miles north, where it empties into the Columbia River. In terms of total annual flow, the Willamette River is the tenth largest river in the U.S. On average, the basin produces over 24 million acre-ft (M ac-ft) of water each year. The average annual flow (for 1972-93) of the Willamette River at Portland is 31,900 cubic feet per second (cfs). This results from an average annual precipitation in the basin that ranges from 40-50 inches per year in the valley to over about 175 inches in the mountains. Precipitation in the basin consists mostly of heavy

intermittent rainfall, primarily in the fall, winter, and spring. Very little rainfall occurs in the summer months. River flow follows this precipitation pattern, with natural flows ranging from a summer low of 4,200 cfs up to 283,000 cfs (1972-92). The pattern of precipitation and flows directly influence water quality in the river. Summer periods are critical times for dissolved oxygen levels because of low flows and higher water temperature. High intensity rainfall and runoff events tend to transport sediments and toxics from the land and tributary streams to the Willamette River and downstream locations.

The first European-American settlers began arriving in the basin during the 1830s. At that time, the river flowed freely from the mountain headwaters through the valley floor. The lower reaches of the river wandered through a wide area of floodplain and multiple channels; flow volume varied over the year substantially, with very low flows during summer dry periods and very high flows and frequent flooding during periods of high rainfall and mountain snowmelt. The local Indian population of the mid-1800s is estimated at ___ ( ); they subsisted on local plant foods, fish, and animal populations. The upland and mountain regions of the basin were covered with mature evergreen forest; the valley floor consisted of valley prairie and oak groves, with mixed evergreen and deciduous forest primarily along the river and tributaries.

The population of the basin increased dramatically during the "Great Migration" of European-American settlers. There were three farms in 1831, 6,000 people in 1845, 90,000 in 1880, and 234,000 in 1900. In 1990, the population of the basin was 1.67 million ( ). During this time period, many physical changes were made to the river system by the expanding human population. Land was

cleared and bottomland was drained for small farms. Later, the upland forests were cut, and the river was used for floating logs downstream. Some river tributaries were routinely dammed using logs and debris so that when these dams were broken by winter flows, the resultant flood was magnified enough to transport large numbers of logs down the river channel, causing extreme scouring of the river channel and disruption of wildlife habitat. As development increased, the river became important for commercial transportation, and channel changes were made, such as clearing snags and woody debris, removing streamside trees, channel dredging and deepening, and construction of revetments to constrain the river to a single flow channel.

In addition to physical changes in the basin and its river system, the activities of people have had major impacts on the water quality. Towns and cities early on established water supply intakes on the Willamette tributaries in upland areas above human habitation, and used the mainstem river for disposal of raw sewage. Industrial activities related to processing of wood and agricultural products, including pulp and paper mills, sugar beet processors, and meat packers, discharged additional wastes to the river. By the 1920s and 1930s, it became clear that the river was unable to assimilate this amount of raw waste; the river became increasingly acidic, and readings on the pH scale commonly fell as low as 3.5 to 4. Levels of dissolved oxygen routinely fell to zero near waste discharge points, making stretches of the river nearly lifeless. In response to public concern, cleanup efforts were begun in earnest in the late 1940s with public health as the main focus. These efforts included requirements for cities to provide primary sewage treatment year-round with disinfection in the summer, and for pulp mills to reduce summertime waste discharges. A

dissolved oxygen standard was established of 5 milligrams per liter (mg/L) minimum. Water quality improvements made through this effort were short-lived because urban and industrial growth resulted in increased waste discharge volume to the point where the waste-handling capability of the river was overwhelmed.

As the scale of agriculture, urban development, and transportation increased, attention turned to controlling the annual flooding of the river. Between 1940 and 1969, 13 flood-control dams were constructed by the US Army Corps of Engineers (COE) on major tributaries of the Willamette River upstream of Salem. These dams eliminated downstream floodplain habitat and natural disturbance processes. Today, nearly one-quarter of the length of the mainstem river channel from Eugene to Albany and 18% of the channel from Eugene to Newberg has fixed rip-rap embankments or retaining walls (revetments) on one or both banks of the river. About 70% of the mainstem river channel length between Eugene and Harrisburg has been eliminated by river straightening and restriction of the channel width. Fifty percent of the channel has been lost Between Eugene and Albany. The channel network in some places has been reduced in width from miles to hundreds of feet.

Even though waste discharges had some minimal treatment, the established standards were never fully met and the river's ability to assimilate the wastes had been exhausted by the mid-1960s. The Willamette was once again plagued by low dissolved oxygen levels and fish kills. These conditions that again raised public concern and alarm, and mobilized the state to action. A new strategy to "install the highest and best practicable treatment and control of wastes" was

begun. Cities were required to install secondary wastewater treatment facilities. Food processing wastes were treated and used as crop irrigation. Industrial discharges were cleaned up through installation of treatment and waste streams were reduced through recycling and use of alternative chemical processes. At the same time, water released from the flood control dams increased flows in the river for dilution of wastes. This effort was highly successful from a water quality standpoint; by the 1970s the "Willamette River Cleanup" was a dramatic highlight of national environmental protection efforts.

Today, much of the valley floor has been cleared and converted to urban and agricultural use. Land use in the basin is about 70% forest, 22% in farmland, and 8% urban and residential. Forty-one percent of the basin is publicly-owned, primarily by the federal government, with federal holdings managed by the U.S. Forest Service and Bureau of Land Management.

Importance of the Resource Today - Beneficial Uses

Human uses of the river have changed over time as the basin's population grew and the needs and values of society changed. Originally, the river was important for transportation and commerce. After railroads were built, attention turned to irrigation and flood control. Today, the Willamette River and its tributaries serve a variety of often competing uses. These include municipal and industrial water supply, irrigation and livestock watering, hunting and fishing, boating, swimming and other water contact recreation, esthetics and scenic purposes, hydroelectric power generation, commercial navigation and transportation, pollution abatement, fish migration and spawning, and support

of fish, aquatic life and wildlife.

Under the code of water law which evolved with the settlement of the American West, called the prior appropriation doctrine, water was required to be diverted from a stream and applied to a beneficial use in order for the user to receive a legal right to use of the water. Water law in Oregon has continued to evolve to recognize the importance and benefits of maintaining water instream for fish and for waste discharge dilution. Now, water rights for instream purposes have the same legal status as rights that withdraw water out of the stream. Water rights, whether for instream or out of stream uses, are assigned a priority date in the order of the date that the water right was initiated. When streamflows are low, the most recent or junior water rights may be restricted or stopped from using water so that the rights of the prior or more senior water users may be satisfied. As overall demand for water reaches the volume of water available, particularly in the summer, competition for water intensifies. In recent times, the need for maintaining streamflows adequate to support water quality and the beneficial uses dependent on clean water has been recognized as a critical issue. However, most instream water rights in Oregon are junior in priority to many older established water rights. This limits the effectiveness of instream water rights to maintain flow levels sufficient for water quality purposes in some streams, especially during low flow periods.

In much of the Willamette Basin, the natural flow of rivers and streams are fully or nearly fully allocated to a variety of existing instream and out of stream uses during the summer months when flows are lowest and demand greatest. The Willamette system of reservoirs operated by the U.S. Army Corps of

Engineers store about 2.3 million acre-feet (M ac-ft) of water. About 1.6 M ac-ft are currently allocated to irrigation purposes, but less than ten percent of this stored water has been purchased and used by irrigators. The Corps of Engineers has discretion to manage the unpurchased stored water; COE has used this water to increase flows in the river for water quality, fishery, and recreation purposes. Of the 1.2 million acres of cropland in the basin, 541,000 acres are currently irrigated (Dept of Ag 1994). These lands produce a wide variety of crops and other products, and possess considerable potential for increased production of high-value crops such as vegetables, fruits and berries, and nursery stock. The agricultural sector projects that by 2020, 850,000 acres could be irrigated, requiring 0.775 million additional acre-feet of water ( ). Oregon municipal water suppliers also project the need for additional water. Rapid population growth, mainly from in-migration to Oregon from other states, is occurring and an additional 500,000 residents are expected to reside in the basin by 2015. Urban water suppliers in the basin expect to serve 3.03 million people by 2050, and project a need for an additional 0.3 M ac-ft of water ( ). Water stored in the COE reservoirs could supply a significant amount of this need. However, use of the stored water for municipal and industrial needs may require congressional action authorizing this use. While out of stream uses are projected to increase, additional instream flows may be necessary to maintain productive fish and wildlife populations, to maintain and improve water quality through dilution of waste flows, and to meet recreation needs. For example, the river still supports significant steelhead and chinook salmon runs. As growth continues and fish and wildlife needs are more fully understood, the available water supply is likely to be exhausted.

Water Management in the Basin

Over the years, a system of water management has evolved in Oregon that spreads the various aspects of water management among 21 state agencies, 6 regional organizations, and 18 federal agencies (Figure 2). Different agencies have lead or coordinating roles in specific water management activities, and frequently the legislative authorities for these agencies create overlapping authorities, as well as gaps in authorities.

In recent years, it has become clear that water management must be done on a more coordinated, whole-basin approach. In an effort to coordinate the activities of these agencies into more of a whole, the Strategic Water Management Group was established in 1985, consisting of the directors of the 12 major state water management agencies and headed by the governor's policy advisor for natural resources. Willamette River basin issues considered by the group in the past years include review of management activities and the operation of the Corps of Engineers reservoirs and impacts of these operations on water temperature and fish. Most water management functions of the SWMG were transferred to designated state agencies by the legislature in 1995.

Relationship to Total Water Management - How to Manage a Large River System?

The time is right to make needed changes in policies for managing water in the Willamette River basin. The physical environment has been substantially altered by human activities, with both known and unknown impacts on water quality,

fish and wildlife populations, and habitat. Water quantity and water quality can no longer be considered as separate issues. Management decisions about the overall basin and each subbasin must be integrated since decisions about subbasins affect the whole basin. Water management and land-use planning decisions must be integrated. The public must be involved in water management decisions because water management success is increasingly dependent on the behaviors of individuals and local groups. Potential for increased impacts on the river system will increase as population grows.

The Willamette River Basin Water Quality Study

Background of Study and Technical Advisory Committee

In the mid-1980s, the Oregon Department of Environmental Quality (DEQ) concluded that a comprehensive study of water quality in the Willamette River basin was necessary. The agency identified this need in its proposed 1985-87 budget, but the Legislature did not appropriate the necessary funds. In 1987, amendments to the federal Clean Water Act required DEQ to list state water bodies that exceeded DEQ standards for toxics, to update this report every two years, to establish total maximum daily loads (TMDLs) for these contaminants, and to design and implement associated management plans to achieve the TMDLs and allocate waste loads to dischargers. The 1988 listing prepared by DEQ, and based on data collected by federal and state agencies, identified dioxin discharge in the Willamette basin as a contaminant in excess of DEQ standards. Pulp and paper mill discharges were identified as the major sources of dioxin in this preliminary listing.

Environmental groups, industry, and cities were understandably concerned about these preliminary findings and expressed strong interest in participating in the process of setting maximum daily loads for contaminants discharged to the river, and in the allocation of these loads among dischargers. There was a recognition that available information was not sufficient to support setting these complex new standards. In response to these concerns, the Legislative Emergency Board in the spring of 1990 authorized funds to Oregon State University (OSU) to prepare a plan to identify toxics in the river and to DEQ to form a technical advisory committee to plan a comprehensive study of water quality in the basin. The Legislative Emergency Board set aside $100,000 for OSU to fund a toxics identification study, pending approval of the advisory committee. A major pulp and paper manufacturer located in the basin agreed to match the legislative appropriation to support a larger and more comprehensive basin study ( ).

The Willamette River Technical Advisory Steering Committee (WRTASC) was established in April 1990. Its past and present members (Table 1) represent the public, industry, sewage agencies, environmental organizations, public health, and natural resource agencies. Representatives of many other groups and interests attended and participated in the committee's meetings, including federal agencies, public water suppliers, farmers, water recreation enthusiasts, and members of the general public. In May 1990, WRTASC reported its recommendation to the Legislative Emergency Board that funds be allocated to a specific, though limited, study by OSU of river toxics that was compatible with the preliminary plan prepared by DEQ for a comprehensive water quality study of the river basin. While the OSU toxics study progressed, WRTASC

provided consultation and oversight, and continued to work closely with DEQ to refine and complete the comprehensive basin study plan for presentation to the 1991 Legislative Assembly. This proved to be a formidable task; WRTASC meetings included presentations by national, regional, state, and local water experts suggesting that existing available study methods, models, and tools were developed primarily for small watersheds. Adaptation of these to a large river system like the Willamette would be far from easy. Another difficulty was that no unimpacted stretch of the river system remained to use as a reference for comparison with current conditions.

Study Scope and Focus ("Questions")

The committee presented its comprehensive basin study plan to the Legislature in April, 1991. This plan recognized that a large river system is more than a channel of water flowing to the sea. It is a medium in which a chain of many organisms live and feed, including bacteria, algae, crustaceans, insects, fish, and birds. Everything that goes into the river can affect that complex web of life. Humans have the ability to alter the physical environment to affect habitat, or to introduce chemical contaminants into the environment that can persist in bottom sediments and accumulate in certain forms of life. A river system is very complex, and many aspects of how the system works are not fully understood.

The long-range goal of the study was to assess and understand the health of the Willamette River and its basin sufficiently to 1) construct a complete database of water quality and other information, and 2) to use this data to develop

predictive models which can be used by federal, state, and local agencies and the public to ensure cooperatively the preservation and best use of this critical resource in the years that lie ahead. There were a variety of specific short-term goals of the study, including:

1) Develop the capability, using computer based mathematical models, to predict how the river will respond to varying pollutant loads and to other changes in the system which could result from a broad range of policy decisions.

2) Gather information that will allow the State to most fully integrate its efforts with ongoing federal basin studies and any other cooperative efforts that arise in the near future.

3) Encourage interagency coordination and cooperation among federal, State, and local agencies.

4) Respond to pressing policy issues in the Willamette River Basin that can not be delayed, including:

-Establish wasteload allocations for pollutants

-Establish biological standards for water quality

-Establish minimum streamflows needed to support fish, wildlife, and other uses

-Develop plans to minimize impacts of combined sewer overflows

-Develop the capability to answer questions about wasteload allocation increases and water quality management policies

Interagency/Interorganizational Approach to Study and Funding

A unique feature of the Willamette River Basin Water Quality Study is its reliance on partnerships for both project funding and study work. Project funding for Phases I and II of the study, carried out over the four-year period of 1991-1995, consisted of a mix of State and federal funds as well as funds contributed by private industry and municipal sewage agencies (Figure 3).

Study work was also carried out by a partnership. Early on, the basin study plan was integrated with a larger national effort by the U.S. Geological Survey (USGS) to assess the quantity and quality of waters in 60 areas around the country, called the National Water-Quality Assessment Program (NAWQA). The NAWQA study of the Willamette Basin was started in 1991, with a planned 10-year study period. Integration with the NAWQA program allowed efficient use of overall available funds for basin study. The USGS also participated in the study as a direct funding partner through a state-federal cooperative program. The remaining portion of the work was largely carried out by a major study consultant (Tetra Tech, Inc., Redmond, WA), with participation by subcontractor consultants, Oregon State University, and DEQ.

Related Studies by Others

The technical advisory steering committee (WRTASC) soon found that a variety of other smaller and more specific research projects were underway in the basin, and additional studies were actually initiated during the basin study period. The committee kept informed on this work throughout the project by inviting researchers to present status reports at regular committee meetings. There were a host of ecological investigations of various species of wildlife in the basin, as well as studies of impacts of specific land uses and management practices. Several other concurrent studies of interest included one commissioned by public drinking water suppliers in the basin to develop a water supply needs forecast to support reserving or allocating water now to meet future needs. Another was a treatability study of Willamette River water for a large Portland area public drinking water supplier ( ).

Related Issues Not Included in Study Scope

The Willamette River Basin Water Quality Study is comprehensive in scope but not unlimited. A number of issues were not included; they raise important questions that study results should be helpful in answering separately or later on. First and foremost was the assessment of risks and potential impacts on the health of humans and wildlife of contaminants in river water, sediments, aquatic organisms, and fish. Second, the tributaries were considered for their impact on the main river, but the condition of the tributary rivers themselves were not evaluated except in the Pudding River subbasin. Another issue not addressed is the impact of river flow characteristics on water quality and habitat. The study did not address the quality of groundwater and the interchange of groundwater and surface water in the basin, an important consideration since about one-third

of the river flow is from groundwater. There was not a detailed comprehensive inventory of habitat and biological populations. There also was no attempt to characterize the pristine historical condition of the river of the river prior to it's modification by people. The study did not attempt to determine the effects of water quality on the various beneficial uses of the river; existing standards were considered to be protective of these uses.

Other issues not addressed included impacts of introduced species on native species, effects on the river of instream activities (gravel mining, dredging), life cycles of fish and other aquatic species, solutions to specific identified water quality problems, assessment of specific land use management practices, trash dumping, and impacts of specific hazardous waste cleanup sites. The study did not attempt to construct a comprehensive Geographic Information System database for the basin and did not attempt to evaluate the river channel structure in detail.

Study Methods

Study Phases - Objectives

The Willamette River Basin Water Quality Study has been carried out in two-year phases to accommodate the State biennial budget process, Phase I from July 1991 to June 1993 and Phase II from July 1993 to June 1995. Phase III began in July 1995 and will extend to June 1997.

The study was designed, within a limited available budget, to begin creation of

a database by collecting samples of water, sediment, and aquatic organisms from the main stem of the river from which the health of the river and the life dependent on it could be assessed. This information was also used to select and begin to calibrate or test computer-based mathematical models that could predict existing and future conditions of the river under different conditions. Models were adapted and calibrated for dissolved oxygen, nutrients, chlorophyll, bacteria, toxics, and suspended sediments. The database and the models are intended to be made available to regulatory agencies, local agencies, interest groups, industry, and the public to assist in making decisions in the context of the health of the river. In addition, work was done to evaluate biological communities in the river, determine the numbers and types of organisms and the condition of their health, and to combine this information into a numerical "biologic index" so that indices from different sites or from the same site over time can be compared and used as a indicators of overall water quality status and changes.

Project management and oversight has primarily been carried out by DEQ staff with the assistance of the committee. The committee and DEQ have made use of an extensive peer review panel of local, regional, and national experts to review the study plan and draft reports on study results. In addition, the committee reached out to the public though a series of public meetings in the basin to present study results. Two public meeting series have been held, one series in 1993 to present Phase I results and another series in 1995 to present Phase II results. The committee also has sent information regularly to an extensive list of interested parties.

The Phase I basin study work was divided into ten components:

Toxics Modeling

Dissolved Oxygen Modeling

Nutrient and Periphyton Growth Modeling

Nutrient and Phytoplankton Growth Modeling

Bacterial Modeling

Biologic Responses

Point Source Loading

Nonpoint Source Loading

Ecological Systems Investigations

USGS Study of Hydrologic Modeling, Sediment Transport, and Toxics

Phase II work was designed to build on and complete work begun in Phase I, including:

Calibration of models for dissolved oxygen, nutrients, and chlorophyll,

Nonpoint source modeling and calibration in a specific subbasin,

Additional field sampling of aquatic organisms and fish populations,

Assessment of biologic stressors in specific areas of the basin, and

USGS study of pesticides, trace elements, sediment oxygen demand, and diel dissolved oxygen.

Proposed subjects for Phase III include nonpoint source modeling and model calibration for an additional subbasin, and monitoring of sediments and toxics to calibrate the toxics model.

Focus on Mainstem, River Study Reaches and Descriptions

As discussed above, a major river system is a very complex subject for study. There are many interrelationships between the mainstem river, its floodplain corridor, its tributaries, and the lands of the basin. The Willamette River Basin Water Quality Study is the beginning of an attempt to understand these interrelationships. The study has focused most of its initial effort on the 187-mile mainstem of the river, from Portland to Eugene.

In a large river like the Willamette, substantial differences in physical, chemical, and biological characteristics are evident from the headwaters to the mouth. An initial effort of the basin study was to divide the river mainstem into logical study segments that considered these differences. These segments were then used in selecting sampling sites and for comparing results of sampling. The river segments are described generally below and are shown in Figure 4.

River Segment I extends 27 miles from the Willamette Falls (RM 26.5) to the confluence of the Willamette with the Columbia River at Portland. This section of the river is influenced by ocean tides, and flow reversals can occur along the channel bottom from the Columbia into the Willamette. The river is about 40 feet deep and very slow moving , 0.1 miles per hour (mi/hr) at low flow, and the riverbed is mixed clay, sand, and gravel. Dissolved oxygen increases below the Willamette Falls due to turbulence and aeration by the Falls, but decreases to about 63% saturation (5.4 milligrams per liter or mg/L) near the river mouth. At the river mouth, Willamette and Columbia River waters mix, and dissolved oxygen increases again to near saturation. Pollution tolerant fish (bass, carp, perch) are present, with few pollution intolerant species.

River Segment II extends 35 miles from above Newberg (RM 60) to the Willamette Falls (RM 26.5). This section of the river, known as the Newberg Pool, is deep and slow moving, and flows over a riverbed of mixed clay, sand, and gravel, with some stone cobbles. The river is about 25 feet deep and flows at about 0.3 mi/hr under low flow conditions. Dissolved oxygen levels are relatively constant and are about 75-80% of saturation (7.0-7.5 mg/L).

River Segment III extends 71 miles from the city of Corvallis (RM 131) to the Newberg Pool (RM 60). This section of the river transitions from deep and slow moving at the lower section to shallow and swift in the upper section. For most of this distance, the river flows over a shallow bed of gravel and stone cobbles. The river is about 8 feet deep, on average, and flows at about 1.9 mi/hr in summer. Dissolved oxygen levels are about 30% lower than in River Segment IV, described next. Fish populations include a mix of pollution tolerant and intolerant species.

River Segment IV extends 56 miles from the upstream beginning of the main-stem channel near Eugene (River Mile 187) to Corvallis (River Mile 131). In this segment, the river flows quickly over a shallow riverbed made up of stone cobbles and gravel. The average river depth is 6 feet, and the current runs at about 2 mi/hr at low flow. Dissolved oxygen levels are at or near saturation (9.4 mg/L), because waste loadings of all kinds are low, and because the river is turbulent and rapidly reaerates along its length. Fish found in this section include some species that are intolerant of pollution, such as cutthroat trout and Chinook salmon.

Study Accomplishments and Needs for Further Work

As discussed above, the study work was organized into two major areas, collection and analysis of field data, and development of predictive models. Study accomplishments to date and needs for further work are summarized below.

A substantial amount of new data were gathered on chemistry, hydrology, and biological communities. Water quality models were developed for dissolved oxygen, nutrients, chlorophyll, bacteria, toxics, and suspended solids. Point and nonpoint sources of pollution were investigated. The models for dissolved oxygen, nutrients, and chlorophyll (QUAL2EU) are sufficiently developed as tools for regulatory purposes, although further calibration and refinement is recommended in the future. The model for chlorophyll did not calibrate in the lower river. A model was also attempted for fecal coliform bacteria, but could not be calibrated due to the discharges of pulp and paper mills that contain a particular species of coliform bacteria (*Klebsiella*) that is detected as a fecal coliform without indicating fecal contamination. The model for toxics (SYMPTOX) was developed for water and sediments, but study funding was insufficient to gather new field data to calibrate it, and this work is to occur in Phase III. The USGS developed, calibrated, and verified a steady-state streamflow model for the entire river basin, collected suspended sediment samples below the dams to compare to pre-reservoir conditions, and collected substantial data on toxics in bed sediment, suspended sediment, and water during low flows and high flows. Finally, development of an electronic database for storage and easy access and retrieval of basin study data and

information is needed.

A nonpoint source pollution predictive model was completed for the entire basin to generate rough estimates of basin-wide pollution loading rates, but did not allow for ranking of land uses and river subbasins in terms of their contribution to the overall pollutant loading. The Pudding River subbasin and two of its tributaries (Zollner Creek and Beaver Creek), were modeled on a more detailed scale and were calibrated using collected field data. Continued application of the model to other subbasins will result in a very useful regulatory tool.

Considerable work was done using various indexes to evaluate water quality by looking at numbers and condition of living organisms at specific locations in the river. Populations of bottom dwelling organisms in the two upper segments of the river were evaluated successfully. The need remains to find reference locations with which to compare these findings, to determine seasonal and annual variability of populations, and determine the relationship between the derived indexes and habitat condition. Populations of bottom dwellers in the lower segments of the river where the water is deep and the riverbed consists of soft materials need more sampling to better identify existing conditions. Fish population evaluation concentrated on squawfish and largescale sucker, species found throughout the river. More needs to be known about migration patterns, impacts of pollutant stressors on these fish, and impacts of habitat on population numbers.

Key Findings

Over the past several years of study participation, WRTASC has struggled with the major question of the comprehensive study - "Is the Willamette River healthy?", and has evolved a consensus on what the term "healthy river" means. A "healthy river system" is one with the following characteristics:

1) It meets established water quality standards for microorganisms (especially disease-causing ones), chemical contaminants, physical properties (such as temperature), and aesthetics (such as taste, odor, and appearance).

2) It supports fishing and swimming.

3) Its current condition compares closely to its original condition.

4) Its biological community is natural and diverse, and the populations are productive.

5) There is an adequate quantity and quality of riparian and other habitat available to support the biologic community. The habitat is complex and experiences natural disturbances such as flooding.

6) The relationship and linkage of the land to the water is maintained, preserved, and functional. Additional relationships and linkages of surface water to groundwater, upriver to downriver, mainstem to tributaries, and watershed to mainstem are also maintained, preserved, and functional.

7) The river's scenic qualities are maintained - in other words, the river "looks

good".

8) The water supports human needs and uses, including drinking water (without extensive or elaborate treatment), swimming and contact recreation, industrial water use, and irrigation. It has capacity to assimilate pollution with an adequate margin of safety and reserve capacity.

9) It has adequate capacity in water quality and quantity to meet current and future needs, even under seasonal low streamflow conditions or drought.

General Findings

Biologic Communities and Habitat. In general, the sampling of fish and bottom-dwelling organisms in the mainstem of the river shows that their condition ranges from good in the upper river segment, to fair in Segment III, and to poor in the lower two segments. Although some fish abnormalities were noted at all locations, significantly more skeletal deformities were noted in from the Newberg Pool (in river segment 2). Additional studies at the end of the report period to evaluate the toxicity of discharges from point sources in the Newberg Pool area were not definitive ( ). Observations of fish numbers and species types showed that the overall fish population is somewhat impaired throughout the river length, with more impairment in downstream river segments. No changes were noted in the variety of species and numbers of fish from a similar study in 1983.

Studies of bottom-dwelling (benthic) organisms showed impairment throughout

the river with increasing impairment at downstream locations. Assessments of habitat showed some impairment at all locations with increasing impairment downstream. It is not surprising that biological communities would degrade as the river flows through a populated valley, but whether this degradation is due to chemical inputs, alteration of habitat, physical water changes such as temperature, or interbreeding of fish populations is not known.

Physical habitat was assessed throughout the length of the mainstem river. This assessment showed that habitat was impaired throughout the river length, and the degree of impairment increased steadily from the headwaters to the river mouth. In terms of historical conditions, habitat losses between Eugene and Corvallis have probably been greater than from Salem to Portland.

Water and Sediment Data and Contaminants. Trace organic and inorganic contaminants were detected at a variety of sites within the basin in both water and sediment. In general, EPA or state water quality criteria (footnote) for surface waters were exceeded more often at urban sampling sites than at agricultural sites or mixed land use sites. Some individual sites located on tributary streams and in close proximity to point source and nonpoint pollution sources showed significant detections of organics such as organochlorines and pesticides, especially after storm runoff events. Samples of water from the mainstem river had the lowest frequency of detections of these contaminants, although the lower two river segments had more detections than the upper two river segments. No established drinking water standards were exceeded in the mainstem river, although criteria for toxicity to aquatic life were exceeded in a few samples.

Dioxin was an original concern that led to the basin study. The 1991 Oregon State study of fish tissue showed detectable, but generally low, concentrations of dioxin in fish at six sites on the river from the mouth to the headwaters, with higher levels in fish from the lower river segment. In the basin study, dioxins and furans were analyzed in bed sediment samples at eight sites, and levels from 9.3 to 32,000 parts per trillion (ppt) were found at three industrial sites located not on the mainstem river but in small tributary streams.. These were 2 to 87 times higher than levels at the other sites. Dioxin (TCDD) was found in water at one of the sites with high sediment dioxin levels. No criteria or standards for dioxin or furans in river sediments have been established.

More detections of trace contaminants were noted in bed sediments than in water, again primarily at tributary sites near sources of contamination, but also from sediments in the lower segment of the mainstem river. Some detections exceeded sediment quality guidelines (footnote), and the frequency of exceeding guideline levels in the mainstem river increased from upstream to downstream. Contaminants detected in sediments at various locations include triazine herbicides, carbamate pesticides, organophosphate insecticides, and urea herbicides. Aquatic life toxicity criteria for water and sediments have not been established for these compounds.

Dissolved oxygen, chlorophyll, and fecal coliform bacteria are conventional measures of water quality. The basin study showed few apparent problems; dissolved oxygen was nearly always greater than 90% of saturation and chlorophyll never exceeded the sate action level of 15 mg/L. This means that dissolve

oxygen levels are sufficient to meet needs of aquatic life, and that nutrient inputs to the river are not causing excessive or problematic algae growth. Fecal coliform bacteria have been historically used as indicators of fecal pollution presence in rivers. Using a standard of ____coliforms per 100 mL, the river and some tributaries are listed as not supporting water contact recreation at times; these episode occur when sewage treatment facilities break down or excessive storm water runoff enters combined storm and sanitary sewers causing direct discharge to the river. A difficulty with use of fecal coliform was highlighted by the study; pulp mill discharge contains large numbers of coliforms that are detected as fecal coliforms but do not arise from fecal material. The committee recommended that future work with bacteria monitoring and modeling use E. coli, a more specific indicator of fecal pollution.

Nonpoint Source Pollution. The study method gave pollutant loadings for the basin as a whole, but could not identify water quality impairments associated with these loadings basin-wide. Loading from the tributaries was found to contribute the majority of the pollutants in the mainstem river; the majority of this load is contributed during a few major storms each year. Ranking of the tributary subbasins in terms of pollutant loadings showed five basins with high loadings from intensive agriculture and urbanized areas where serious water quality problems are expected, two subbasins with less intensive agriculture and urban areas with moderate expected water quality problems, and three subbasins with mainly forest lands with mild water quality problems expected. The intensive modeling of the Pudding River basin did indicate the water quality associated with general types of land uses; water quality in forested areas was

excellent, was lower in areas of moderately intensive agriculture, and was very poor in areas of high intensity agriculture. Water quality samples collected during storm runoff from intensively farmed areas in the Pudding River sub-basin showed levels of nitrogen from fertilizer application which exceeded drinking water standards. In addition, detections of trace metals and organic chemicals including pesticides were found in this area.

Is the River "Healthy"?

Findings by River Segment (How healthy is each segment?)

The study consultant constructed a "River Health Index" for the Willamette river by evaluating the ten data types collected in the study and considering water quality standards and guidelines, benthic community assessment results, fish community assessment results, and habitat assessment results. Because nonpoint source loadings could not be tied to water quality impacts in this study, NPS results were not included in the river health index. All ten data types were ranked on a 0-9 scale for each river segment, weighted equally, and combined to an average score as shown in Figure __. A gradual decline in the river health index is evident from the upper river segments to the lower segments. Overall, based on the information collected, analyzed, and assessed in this study, the river as a whole appears to be fairly impaired, especially in lower, more industrialized, and more populated river segments.

So, how "Healthy" is the Willamette? (According to WRTASC)

An overall objective assessment of a river's health is difficult to make. Many rivers, including the Willamette, have been substantially altered. These alterations may have occurred so far in the past that there is very little in the way of written descriptions or data available to form a picture of original river conditions. Many river systems, including the Willamette, are so altered today that reference sites to use for comparison with conditions elsewhere in the river basin do not exist. Finally, river basins have sufficient natural differences that use of reference sites located in other less disturbed basins may cause misleading analyses. Finally, the available indicators of river health are themselves composed of many subjective elements and criteria, even though they are based on best available science and information.

The WRTASC debated these difficulties at length during the study, particularly the question "what reference or original conditions of the Willamette should the current conditions be compared to". One option was to make an attempt to use the original pre-settlement conditions. Another was to use the river conditions after physical changes had been made in the river system (construction of dams, channel deepening and straightening), but before current pollution loadings, accepting that these physical changes, on a practical level, probably can not be undone. The committee decided on a combination approach, illustrated in Figure __. In this approach, the presettlement Willamette basin is used as the measure of ideal and fully unimpaired health of the river. The approach then recognizes a conceptual level of attainable river health less than the ideal level. This approach recognizes that improvements in river health are possible, reminds the public that fragments of original river conditions that exist rarely today were commonplace before the river was altered, and recognizes that the

river may never be returned to its original state.

WRTASC then debated the current health of the river overall with respect to the level of attainable health, using the committee's nine characteristics of a healthy river discussed above. The characteristics were weighted and scored as shown in Figure__. The WRTASC assessment is that the current health of the Willamette River is.....! River health can be improved in the future, as described in the policy recommendations given below.

Policy Recommendations

Based on the findings to date of the Willamette River Basin Water Quality study, the Technical Advisory Steering Committee developed the following recommendations for consideration by state and local decision-makers. In general, a new framework for basin management is proposed, consisting of two parts. First is the establishment of standards related to river health, and the ongoing monitoring and analysis to track progress and status of river health. Second is the implementation of a more market-based incentive approach where costs of development are assigned according to impact on the river, allowing more locally and individually based decision making and accountability about resource use. Specific recommendations are listed below:

Monitoring and Standards

1) Implement an ongoing monitoring and evaluation strategy for key water quality parameters and indicators to track future trends in the health of the

river. Assure availability of staff and laboratory resources.

Key Water Quality Parameter	Frequency
Fish health and Assemblage	5 years
E. coli	2 years
Trace inorganics/organics - water	5 years
Trace inorganics/organics - sediment	5 years
Fish Tissue	5 years
OTHERS?	?

2) Develop staffing and begin using the predictive water quality standards. Move proactively to establish Total Maximum Daily Loads (TMDLs) for major pollutants in the basin and allocate them to dischargers:

Dissolved Oxygen

Nutrients (N,P)

Bacteria (E. coli)

Temperature

Trace Inorganics/Organics (USGS) exceeding human health guidance - Lead, Zinc, Benzene, 1,1-DCE, TCE, Lindane, Dieldrin, DDT, PCBs

3) Complete the establishment of minimum streamflows in the basin.

4) Complete a health risk assessment analysis of drinking water and fish consumption for the basin.

Basin Planning and Management

1) Establish the ultimate carrying capacity of the river, recognizing that the river as a resource is finite.

2) Strengthen the linkage of land use and economic development decisions to the impacts on river health.

3) Develop a comprehensive project review process that integrates and coordinates agency project reviews, considers quality and quantity issues together, considers impacts on groundwater and surface water in the basin, and takes into account cumulative impacts on river health.

4) Change to a market-based incentive approach to water rights and discharge permitting to make individuals accountable and responsible for costs associated with use of basin resources and specific impacts on the river basin health.

5) Complete the reauthorization of COE reservoir water to open up its use as needed in the future.

Outlook for the Future

Acknowledgements

Listing of Willamette Basin Water Quality Study Reports

Glossary of Terms

References

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List of Photos

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DEPARTMENT OF JUSTICE
PORTLAND OFFICE

May 11, 1995

Environmental Quality Commission
c/o Director's Office
Oregon Department of Environmental Quality
811 SW Sixth Avenue
Portland, Oregon 97204

Re: DEQ v. Bolch
DOJ File No.: HW-SWR-92-24/ORD98719121

To the Environmental Quality Commission:

Enclosed for filing please find the Department's answering brief and attachments in this appeal of the above referenced matter.

By agreement of the parties, no oral argument is requested and the matter is submitted on the basis of the briefs and attachments of the parties.

Sincerely,

Larry Edelman
Assistant Attorney General

LHE:ley/LHE0301.let
Enclosures
c: Glenn Klein

BEFORE THE ENVIRONMENTAL QUALITY COMMISSION

OF THE STATE OF OREGON

DEPARTMENT OF ENVIRONMENTAL QUALITY OF THE STATE OF OREGON. Department,	)	No. HW-SWR-92-241 ORD 987191921
v.	)	ANSWERING BRIEF OF THE DEPARTMENT IN RESPONSE TO APPEAL BY RESPONDENTS
KENNETH BOLCH; BETTY BOLCH; and STAR CONCRETE, INC., an Oregon Corporation Respondent.	)	

By Stipulation of the Department and Respondents (Attachment 3), two "interim orders" issued by the hearings officer in this matter (Attachments 4 and 5), became the hearings officer's Final Order for purposes of OAR 340- 11-132.

Rspondents have now appealed alleging error by the hearings officer in: 1) concluding that the doctrine of issue preclusion bars Respondents from re-litigating the issue of whether the materials in question were hazardous waste, 2) concluding that the materials in question were hazardous wastes in any event, and 3) concluding that Respondents were negligent.

The Department and Respondents have agreed that this appeal and response be submitted to the Commission without oral argument on the basis of the hearings officer's orders, briefs of the parties and attachments (the Department's briefs to the hearings officer are Attachments 6-9).

The Department maintains that the hearings officer ruled correctly in the Department's favor on each of the matters now raised by the Respondents on appeal.

I. The hearings officer correctly found that issue preclusion bars Respondent from re-litigating in this proceeding whether the materials were hazardous wastes because that very issue was previously determined as a matter of law in an earlier enforcement proceeding (Attachment 2). Interim Order April 1, 1994, p. 3;

II. The hearings officer also correctly found that even if issue preclusion were not applicable, the materials in question included hazardous wastes because they included "spent" materials which brought them first within the regulatory definition of solid wastes and also within the definition of listed hazardous wastes. Interim Order April 1, 1994 pp. 3-5;

III. Finally, the hearings officer properly decided that Respondents were negligent for purposes of penalty assessment under OAR 340-12-045(1)(c)(D) based in part on the Commission's holding in DEQ v. Fuel Processors, No. AQAB-NWR-90-81. Fuel Processors established that the Commission may infer negligence in such regulatory matters from the nature and circumstances of the violation without detailed findings of fact applicable in a tort proceeding. Second Interim Order November 8, 1994.

Even if more detailed factual findings on negligence were required, however, the Department's brief and attached Affidavit of Jonathan Gasik provided the hearings officer and the Commission a more than sufficient factual basis for determining negligence.

CONCLUSION

For the reasons stated above the Commission should issue a Final Order adopting the order of the hearings officer and affirming the

penalty imposed by the September 19, 1992 Notice of Assessment of Civil Penalty (Attachment 1).

Dated this 12 day of May, 1995

By: _____
Larry Edelman
Assistant Attorney General
for the Department of Environmental Quality

CERTIFICATE OF FILING

I certify that on May 12, 1995 I caused to be filed with the Environmental Quality Commission the original Answering Brief and Attachments.

CERTIFICATE OF SERVICE

I certify that on May 12, 1995 I caused to be served a true and complete copy of the foregoing Answering Brief and Attachments of the Department by regular mail on Glenn Klein, Harrang, Long, Gary, Rudnick, P.C., P.O. Box 11620, Eugene, Oregon 97440-3820.

L. Edelman

Larry Edelman
Assistant Attorney General

9/29/92

BEFORE THE ENVIRONMENTAL QUALITY COMMISSION

OF THE STATE OF OREGON

DEPARTMENT OF ENVIRONMENTAL QUALITY OF THE STATE OF OREGON, Department, v. KENNETH BOLCH; BETTY BOLCH; and STAR CONCRETE, INC., an Oregon corporation, Respondents.	)	NOTICE OF ASSESSMENT OF CIVIL PENALTY NO. HW-SWR-92-241 JOSEPHINE COUNTY ORD 987191921

This Notice of Assessment of Civil Penalty is issued by the Department of Environmental Quality (Department) pursuant to Oregon Revised Statutes (ORS) 468.130 through 468.140, 466.190, 466.880; ORS Chapter 183; and Oregon Administrative Rules (OAR) Chapter 340, Divisions 11 and 12.

I. FINDINGS

1. Respondents KENNETH BOLCH; BETTY BOLCH; and STAR CONCRETE, INC., an Oregon corporation, own or control real property located at 1550 Nebraska Avenue, in Grants Pass, Oregon, (Respondents' Site). Respondents' Site has been assigned EPA Identification Number ORD 987191921.

2. A representative of the Department conducted an inspection at Respondents' Site on June 18, 1992, and observed hazardous waste stored on-site at Respondents' Site.

3. At the time of the June 18, 1992, inspection, Respondents' Site was not a permitted hazardous waste treatment, storage or disposal site, nor was the hazardous waste being stored pursuant to ORS 466.075(2).

Attachment 1

4. On June 30, 1992, the Department issued a Notice of Violation and Compliance Order (HW-SWR-92-13) ("Order") to Respondents. The Order, incorporated herein by this reference, cited Respondents for illegally storing hazardous waste at Respondents' Site, and ordered Respondents to take certain investigative and corrective actions within the time periods specified in the Order. Respondents received the Order on July 2, 1992, and the Order became final on July 23, 1992.

II. VIOLATIONS

CLASS I VIOLATIONS:

1. From June 19, 1992 through August 2, 1992, Respondents violated ORS 466.095(1)(a) and/or (b) in that without obtaining a hazardous waste storage site permit, Respondents operated a hazardous waste storage site and/or stored hazardous waste at Respondents' Site which is not a permitted hazardous waste treatment, storage, or disposal site.

2. On August 2, 1992, Respondents violated the Order in that Respondents failed to submit an inventory of solid waste residues as required by Paragraph III. 3. of the Order, and Respondents failed to make a hazardous waste determination for each solid waste residue as required by Paragraph III. 4. of the Order.

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III. ASSESSMENT OF CIVIL PENALTIES

The Director imposes civil penalties against Respondents, jointly and severally, for the violations cited in Section II:

Violation	Penalty Amount
1	$9,600
2	$8,400

Respondents' total civil penalty is $18,000. Exhibits 1 and 2 are attached to and incorporated into this Notice and include the Department's findings and determination of the amount of each civil penalty calculated pursuant to OAR 340-12-045.

IV. OPPORTUNITY FOR CONTESTED CASE HEARING

This Notice of Assessment of Civil Penalty shall become final with respect to a Respondent unless, within 20 days of issuance, that Respondent requests a hearing before the Environmental Quality Commission pursuant to ORS 466.190, ORS Chapter 468, ORS Chapter 183, and OAR Chapter 340, Division 11. The request must be made in writing and must be received by the Commission's hearings officer within twenty (20) days from the date of service of this Notice, and must be accompanied by a written "Answer" to the allegations contained in this Notice. In the written "Answer", the Respondent shall admit or deny each allegation of fact contained in this Notice and the Respondent shall affirmatively allege any and all affirmative claims or defenses to violations and assessment of any

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civil penalty that the Respondent may have and the reasoning in support thereof. Except for good cause shown:

1. Factual matters not controverted shall be presumed admitted;

2. Failure to raise a claim or defense shall be presumed to be a waiver of such claim or defense;

3. New matters alleged in the "Answer" shall be presumed to be denied unless admitted in subsequent pleading or stipulation by the Department or Commission.

Send the request for hearing and "Answer" to: **Linda K. Zucker, Hearings Officer, Environmental Quality Commission, 811 S.W. Sixth Avenue, Portland, Oregon 97204.** Following receipt of a request for hearing and an "Answer", any Respondent who requests a hearing will be notified of the date, time and place of the hearing. If a Respondent fails to file a timely request for hearing and "Answer" a Default Order for the relief sought in this Notice may be issued with respect to that Respondent. Failure by a Respondent to appear at a scheduled hearing or meet a required deadline may result in a dismissal of the request for hearing and also an entry of a Default Order. The Department's case file at the time the Notice was issued may serve as the record for purposes of entering a Default Order.

V. OPPORTUNITY FOR INFORMAL DISCUSSION

In addition to filing a request for a contested case hearing, a Respondent may also request an informal discussion with the Department by attaching a written request to the hearing request and "Answer".

VI. PAYMENT OF CIVIL PENALTY

The civil penalty is due and payable ten (10) days after the Order imposing the civil penalty becomes final by operation of law or on appeal. A check or money order in the amount of $18,000 should be made payable to "Department of Environmental Quality" and sent to the **Business Office, Department of Environmental Quality, 811 S.W. Sixth Avenue, Portland, Oregon 97204.**

SEP 29 1992

Date

Fred Hansen, Director

C+K
6/30/92

BEFORE THE ENVIRONMENTAL QUALITY COMMISSION

OF THE STATE OF OREGON

DEPARTMENT OF ENVIRONMENTAL QUALITY OF THE STATE OF OREGON, Department, v. KENNETH BOLCH; BETTY BOLCH; and STAR CONCRETE, INC., an Oregon corporation, Respondents.	)	NOTICE OF VIOLATION AND COMPLIANCE ORDER NO. HW-SWR-92-13 JOSEPHINE COUNTY ORD 987191921

This Notice of Violation and Compliance Order is issued by the Department of Environmental Quality (Department or DEQ) pursuant to Oregon Revised Statutes (ORS) 466.190.

I. FINDINGS

1. Respondents KENNETH BOLCH, BETTY BOLCH; and STAR CONCRETE, INC., an Oregon corporation, own or control real property located at 1550 Nebraska Avenue, in Grants Pass, Oregon, (Respondents' Site).

2. A representative of DEQ conducted an inspection at Respondents' Site on June 18, 1992, and observed hazardous waste stored on-site at Respondents' Site.

3. Respondents' Site is not a permitted hazardous waste treatment, storage or disposal site, nor is the waste being stored pursuant to ORS 466.075(2).

II. VIOLATION

Based on the observations and findings from the above noted inspection, Respondents have violated ORS 466.095(1)(a).

Attachment 2

III. COMPLIANCE ORDER

Pursuant to ORS 466.190, and 466.225, Respondents are hereby ORDERED to take the following actions:

1. Immediately initiate action necessary to correct any continuing violation and come into full compliance with Oregon's hazardous waste management regulations.

2. Respondents shall obtain written ~~permission from DEQ~~ prior to removing any solid waste residue [as described and defined in Oregon Administrative Rule (OAR) 340-100-010(2)(z) and 40 CFR 261.2] from Respondents' Site.

3. **Within 30 days** of receipt of this Order, Respondents shall submit an inventory to the DEQ which lists each solid waste residue that is stored on-site. The inventory shall include the name or description of each solid waste residue, the quantity that is stored on-site, the type and condition of each container/tank in which the residue is stored, and each location where each residue is stored at Respondents' Site.

4. **Within 30 days** of receipt of this Order, Respondents shall make a hazardous waste determination for each solid waste residue at Respondents' Site pursuant to OAR 340-102-011, and **within 45 days** of receipt of this Order, Respondents shall submit to DEQ, the analytical results and/or other information relied on in making each hazardous waste determination.

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5. **Within 45 days** of receipt of this Order, Respondents shall submit to DEQ a detailed description of how Respondents plan to manage each solid waste residue in full compliance with Oregon law, and DEQ environmental regulations.

6. **Within 30 days** after receiving DEQ approval of the waste management plan referenced in Paragraph 5, Respondents shall remove all hazardous waste stored at Respondents' Site, and Respondents shall transport all such hazardous waste to a licensed hazardous waste treatment, storage, or disposal site in full compliance with Oregon law and DEQ environmental regulations.

7. **Within 45 days** after receiving DEQ approval of the waste management plan referenced in Paragraph 5, Respondents shall submit written documentation to DEQ which demonstrates full compliance with the terms of this Order.

IV. OPPORTUNITY FOR CONTESTED CASE HEARING

This Notice of Violation and Compliance Order shall become final with respect to a Respondent unless, within 20 days of issuance of this Notice and Order, that Respondent requests a hearing before the Environmental Quality Commission pursuant to ORS 466.190. The request must be made in writing and must be received by the Commission's hearing officer within twenty (20) days from the date of service of this Notice, and must be accompanied by a written "Answer" to the allegations contained in this Notice. In the written "Answer", the Respondent shall admit or deny each allegation of fact contained in this Notice and the

Respondent shall affirmatively allege any and all affirmative claims or defenses that the Respondent may have and the reasoning in support thereof. Except for good cause shown:

1. Factual matters not controverted shall be presumed admitted;
2. Failure to raise a claim or defense shall be presumed to be a waiver of such claim or defense;
3. New matters alleged in the answer shall be presumed to be denied unless admitted in subsequent pleading or stipulation by the Department or Commission.

Send the request for hearing and "Answer" to: **Linda K. Zucker, Hearings Officer, Environmental Quality Commission, 811 S.W. Sixth Avenue, Portland, Oregon 97204.** Following receipt of a request for hearing and an "Answer", any Respondent who requests a hearing will be notified of the date, time and place of the hearing. If a Respondent fails to file a timely "Answer" or request for hearing, the Order shall become a final and enforceable order of the Environmental Quality Commission by operation of law with respect to that Respondent, without any further action or proceeding. If the Order becomes final by operation of law, any right to judicial review is outlined within ORS 466.190(5).

JUN 30 1992
Date

Fred Hansen, Director

BEFORE THE ENVIRONMENTAL QUALITY COMMISSION

OF THE STATE OF OREGON

Department of Environmental Quality of the State of Oregon, Department, v. Kenneth Bolch; Betty Bolch; and Star Concrete, Inc., an Oregon corporation, Respondents.	)	No. HW-SWR-92-241 STIPULATION

The former Hearing Officer in this contested case proceeding has issued two "Interim Orders" dated April 1, 1994 and November 8, 1994, respectively. The Department and Respondents agree that the interim orders taken together address all matters at issue in the case. Therefore, the Department and Respondents stipulate to treat the two interim orders as the Hearing Officer's Final Order for purposes of OAR 340-11-132.

It is further stipulated that Respondent shall have thirty (30) days from the date of receipt of service of an executed copy of this stipulation to file a Notice of Appeal to the Environmental Quality Commission in accordance with OAR 340-11-132(2). Should Respondent not file a Notice of Appeal within the

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Attachment 3

thirty day period it is agreed that the interim orders shall be entered as the Commission's Final Order in this matter.

Date: JAN 30, 1995 By: Glenn Klein

GLENN KLEIN
Name
ATTORNEY OF RECORD FOR RESPONDENTS
Title

For Respondents

Date: Feb 2, 1995 By: L. Edelman

Larry Edelman
Assistant Attorney General
For the Department of
Environmental Quality

LHE0202.plc

CERTIFICATE OF SERVICE BY MAIL

I certify that on February 2, 1995, I served the foregoing STIPULATION upon the parties below by mailing, certified mail, postage prepaid, true copy to:

Glenn Klein (CERTIFIED)
Harrang Long Gary & Rudnick
P.O. Box 11620
Eugene, OR 97440

Environmental Quality Commission (REGULAR MAIL)
811 SW Sixth Avenue
Portland, OR 97204

Larry Edelman

dld0046.plc

BEFORE THE ENVIRONMENTAL QUALITY COMMISSION

OF THE STATE OF OREGON

DEPARTMENT OF ENVIRONMENTAL QUALITY OF THE STATE OF OREGON, Department, v. KENNETH BOLCH; BETTY BOLCH; and STAR CONCRETE, INC., an Oregon Corporation Respondent.	)	SECOND INTERIM ORDER NO. HW-SWR-02-241 ORD 98719121

On September 29, 1992, DEQ notified Kenneth Bolch, Betty Bolch and Star Concrete, Inc. (together "Bolch") that they were liable for civil penalties for illegally storing hazardous waste and for violating the terms of a June 30, 1992 compliance order. Bolch contested the assessment, arguing that its waste was not legally hazardous. Bolch and DEQ asked the hearings officer to rule on liability.

On April 1, 1994, the hearings officer issued an interim order finding that 1) Bolch was barred from litigating the waste status of the stored hazardous material, and 2) that the stored material was subject to hazardous waste regulation. Thereafter, the parties asked the hearings officer to determine whether Bolch was legally negligent.

In determining the amount of the penalty assessments, DEQ found that Bolch was negligent. Specifically, DEQ alleged that "in [o]perating an unpermitted hazardous waste site and/or storing hazardous waste at an unpermitted storage site" Bolch was "negligent in failing to take reasonable care to avoid the foreseeable risk of committing a violation by failing to properly remove the hazardous waste from the site or by applying for and obtaining a storage site permit." Notice of Assessment, Ex. 1. DEQ also alleged that in "[v]iolation of a Final Order of the Environmental Quality Commission" Bolch was "negligent in failing to take reasonable care to avoid a foreseeable risk of committing a violation by failing to take action as Ordered (sic)." Notice of Assessment, Ex. 2

To challenge the allegations of negligence, Bolch submitted a twelve-page affidavit and pporting exhibits (attached and incorporated as "Second Interim Order Attachment A") reciting the

Attachment 4

circumstances and events surrounding its responsibility for the hazardous materials involved in this proceeding. Bolch argued that it had made every effort to comply with DEQ's requirements by hiring a consultant recommended by DEQ to perform the actions required by DEQ, placing no constraints on the consultant who, nevertheless, was unable to meet DEQ's deadline. Bolch also argued that its ability to take action was also hindered by its lessees' numerous court filings as well as by the assertions of the United States Small Business Administration and the Coos/Curry/Douglas County Development Corporation that the materials and equipment belonged to them. Bolch argued that the information it submitted demonstrated that it had moved with all deliberate speed. Respondent's Hearing Brief.

In response, DEQ submitted a brief and a four-page affidavit with supporting exhibits (attached and incorporated as "Second Interim Order Attachment B"). In it, DEQ cited the Environmental Quality Commission's decision in DEQ v Fuel Processors, No. AQAB-NWR-90-81, as support for its determination that Bolch was negligent. In its brief, DEQ argued that in Fuel Processors, the EQC established that the "common meaning" of the term negligence, i.e., foreseeability of a "generalized risk of harm" from the conduct engaged in, is to be applied. The Commission concluded that the question of negligence in regulatory matters was more "one of law rather than fact." Id.

DEQ stated:

> Respondents were issued a Notice of Noncompliance (NON) by DEQ on December 13, 1991. Thereafter, DEQ repeatedly requested Respondents to arrange for proper handling of the wastes. Respondents ignored the NON. Subsequently, DEQ issued the Notice of Violation and Compliance Order. Respondents also failed to comply with the Order. Respondents did not actually comply until 18 months after the Compliance Order was issued. In the interim, a large volume of liquid wastes disappeared--apparently the result of purposeful evaporation by Respondents, and the premises remained unsecured, causing the county sheriff, among others, to demand resolution due to alarm at "the endless possibilities for disaster which this large quantity of toxic and hazardous materials present.
>
> At no time did either the Small Business Administration (SBA) or the Coos/Curry/Douglas County Development Corporation (CCD), both of which had security interests in the plating chemicals and equipment at the site, indicate an intent to prevent Respondents from complying with DEQ's directives to Respondents to properly store or manage the hazardous chemicals.

> Rather, they were aware of DEQ's actions and directed that Respondents comply with DEQ requirements. Contrary to Respondents' arguments, neither the interests of the secured parties nor the bankruptcy proceeding were factors in Respondents' negligent failure to comply with the law. (internal citations omitted). Attachment B.

In a reply to DEQ's brief, Bolch argued that contrary to the view expressed in Fuel Processors and asserted by DEQ, negligence cannot be found as a matter of law. To do so would be inconsistent with OAR 340-12-045(1)(c)(D) which expressly contemplates that one may not simply assume as a matter of law the existence of negligence, but instead, must support its existence with evidence.

In Fuel Processors the Commission stated that "findings of fact are unnecessary regarding the issue of negligence because the question is more in the nature of one of law (sic) rather than fact." Directed by the Commission's decision, I conclude that findings of fact are unnecessary regarding the issue of negligence in this case and I conclude that Bolch was negligent.

Dated this 8th day of November, 1994.

ENVIRONMENTAL QUALITY COMMISSION

for: Linda K. Zucker, Hearings Officer

BEFORE THE ENVIRONMENTAL QUALITY COMMISSION

OF THE STATE OF OREGON

DEPARTMENT OF ENVIRONMENTAL QUALITY OF THE STATE OF OREGON, Department, v. KENNETH BOLCH; BETTY BOLCH; and STAR CONCRETE, INC., an Oregon Corporation Respondent.	NO. HW-SWR-92-241 INTERIM ORDER JOSEPHINE COUNTY

BACKGROUND

On September 29, 1992, DEQ notified Kenneth Bolch, Betty Bolch and Star Concrete, Inc. (hereafter Bolch) that they were liable for a total of $18,000 in civil penalties for operating an unpermitted hazardous waste storage site and storing hazardous waste at that site ($9,600), and for violating the terms of a Compliance Order (Case #HW-SWR-92-13), (ORD 987191921), ($8,400).[1]

Bolch appealed, admitting specific allegations and denying the remainder and raising affirmative defenses and claims.

After extended efforts to resolve the matter informally, Bolch and DEQ together requested that the hearings officer address two issues in an interim order. They are:

1. Whether the doctrine of issue preclusion bars Bolch from litigating whether the hazardous materials contained in its tanks are hazardous wastes regulated by RCRA, and,

2. Whether Bolch's storage of hazardous materials in tanks for over 90 days without use constituted storage in lieu of disposal subjecting the materials to hazardous waste regulation.

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[1] The order was not specific in identifying the materials which DEQ believed were hazardous wastes. However, this omission was not made an issue in the present case.

Attachment 5

FACTS

On June 30, 1992, DEQ issued a Notice of Violation and Compliance Order in Case No. HW-SWR-92-13, Order 987191921. The order found that Bolch owned or controlled certain real property and that hazardous waste was stored on the site without a permit and contrary to statute.

The order required Bolch to come into full compliance with state hazardous waste management regulations, to obtain DEQ permission before removing any solid waste residue from the site, and to submit an inventory and conduct hazardous waste determinations for each solid waste residue, submitting analytical results, and other determination information to DEQ within 45 days. The order recited that it would become final unless appealed within 20 days. The order was accompanied by a letter which stated, among other things, that DEQ might assess a civil penalty of up to $10,000 per day per violation if Bolch violated any term of the compliance order or had a new or continuing violation.

Bolch did not appeal the order. The order became final by operation of law on July 23, 1992. An order resulting from default establishes all material facts alleged in the notice. Rajneesh Foundation v McGreer, 303 Or 139 (1987). In this case the material facts established by the order were that Bolch owns and controls the site, that hazardous waste was stored onsite, and that the site was not permitted.

In an effort to comply with a term of the order, Bolch submitted an inventory of materials onsite. The materials included various spent materials.

Subsequently, DEQ notified Bolch it was liable for operating an unpermitted hazardous waste storage site or for storing hazardous waste at an unpermitted site, and for violating the June 30, 1992 order.

Bolch challenged the assessments on the grounds, among others, that the materials of concern to DEQ were not hazardous wastes.

I. ISSUE PRECLUSION

DEQ asserts that Bolch may not challenge DEQ's characterization of the materials as hazardous waste because Bolch is precluded by former adjudication from disputing the

characterization under the doctrine of claim or issue preclusion.

The doctrine of issue preclusion bars a party who has had a full and fair opportunity to litigate an issue of fact or law from re-litigating the same issue in another proceeding. Hickey v Settlemier, 116 Or App 436, 439 (1992). The doctrine applies to administrative proceedings if the party against whom it is asserted has had a full opportunity to litigate the issues, there was a substantial incentive to litigate the issues, and the issues were subject to judicial review. Id.

In this case, the June 30, 1992 compliance order provided an opportunity to appeal and fully litigate the issues presented in a contested case hearing on the record before a neutral fact finder. ORS 183.413 et seq.; 466.190. Any resulting final order was subject to judicial review. ORS 183.310 et seq.; ORS 466.190. Bolch had a substantial incentive to contest the order because if permitted to take effect, violation of any of its terms exposed to Bolch to a civil penalty of $10,000 per day for each violation. OAR 340-12-042(1)(a); 340-12-068(1)(a). Accordingly, Bolch had a full and fair opportunity to litigate whether the stored materials were hazardous waste and is now precluded from re-litigating the issues in the present proceeding.

II. REGULATED WASTES OR HAZARDOUS MATERIALS

DEQ asserts that Bolch is liable for penalties for violation of the June, 1992 compliance order because hazardous plating materials in process dip tanks, preparation/cleaner tanks, and chemical holding tanks onsite and included in its inventory of materials were hazardous wastes, and that Bolch, as the facility operator, was liable for proper management.

Bolch disputes DEQ's assertion that the materials constitute hazardous wastes. There is no dispute as to the content of those materials; the dispute centers around whether the materials meet the definition of a waste.

DEQ has provided a correct analysis in reaching its conclusion that the inventory Bolch submitted included hazardous wastes. The inventory included spent materials. A "spent material" is any material that has been used and as a result of contamination can no

longer serve the purpose for which it was produced without processing. 40 CFR 261.1(c)(1). Spent materials are solid wastes if they meet any of the definitional criteria for solid waste in 40 CFR 261.2 and are not otherwise excluded. That is, if the materials are discarded by being abandoned, recycled or inherently wastelike as those terms are defined in 40 CFR 261.2(b), (c) or (d), they are solid wastes.

In this case, the spent materials had been stored onsite for nearly a year without use, re-use or turnover. Spent materials by definition require processing. If Bolch was storing the spent materials before recycling or reclaiming it, the materials were accumulated speculatively. See 261.1(c)(8). Speculative accumulation brings the materials into the definition of solid waste in 40 CFR 261.2.

40 CFR 261.2(e) provides that materials, including spent materials, are not solid wastes when they can be shown to be recycled (used, reused, or reclaimed. 40 CFR 261.1(c)(7)):

> (e) Materials that are not solid waste when recycled.
> (1) Materials are not solid wastes when they can be shown to be recycled by being:
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> "(i) Used or reused as ingredients in an industrial process to make a product, provided the materials are not being reclaimed; or
>
> "(ii) Used or reused as effective substitutes for commercial products; or
>
> "(iii) Returned to the original process from which they are generated, without first being reclaimed. The materials must be returned as a substitute for raw material feedstock, and the process must use raw materials as principal feedstocks."

However, in an enforcement action, 40 CFR 261.2(f) shifts the burden to the regulated party who seeks to raise a claim that certain materials are not a solid waste under 40 CFR 261.2(e):

> (f) Documentation of claims that materials are not solid wastes or are conditionally exempt from regulation. Respondents in actions to enforce regulations implementing Subtitle C of RCRA who raise a claim that a certain material is not a solid waste, or is conditionally exempt from regulation, must demonstrate that there is a known market or disposition for the material, and that they meet the terms of the exclusion or exemption. In doing so, they must provide appropriate documentation (such as contracts showing

that a second person uses the material as an ingredient in a production process) to demonstrate that the material is not a waste, or is exempt from regulation. In addition, owners or operators of facilities claiming that they actually are recycling materials must show that they have the necessary equipment to do so.

While Bolch has shown some intent and effort to arrange to or restart the business, sell it or move it to a new location, Bolch has not met the terms of the exclusion or exemption because Bolch has not shown that the spent materials were being used or reused or returned to the original process as provided in 40 CFR 261.2(e), and has not demonstrated a known market or disposition for the materials, and has not provided appropriate documentation as required by 40 CFR 261.2(f).

The spent materials included materials listed in 40 CFR 261.31 as hazardous wastes. Under RCRA they are hazardous wastes. According to 40 CFR 261.4(c), they were not subject to RCRA regulations applicable to generators, transporters, owners and operators of hazardous waste treatment storage and disposal facilities while they remained in the unit or tank and until 90 days after the unit ceased to be operated. Thereafter, the materials were to be managed as hazardous wastes.

Dated this 1st day of April, 1994.

ENVIRONMENTAL QUALITY COMMISSION

Linda K. Zucker

Linda K. Zucker, Hearings Officer

BEFORE THE ENVIRONMENTAL QUALITY COMMISSION

OF THE STATE OF OREGON

DEPARTMENT OF ENVIRONMENTAL QUALITY OF THE STATE OF OREGON, Department, v. KENNETH BOLCH; BETTY BOLCH; and STAR CONCRETE, INC., an Oregon corporation, Respondents.	No. HW-SWR-02-241 DEPARTMENT OF ENVIRONMENTAL QUALITY HEARING BRIEF ON THE ISSUE OF NEGLIGENCE

This matter involves a civil penalty assessment issued by the Department of Environmental Quality (DEQ) to Respondents for illegally storing hazardous waste and violating the terms of a final Compliance Order issued June 30, 1992. Respondents contested the civil penalty assessment by asserting errors in the jurisdictional allegations of the underlying Notice of Violation and Compliance Order. Specifically, Respondents argued that the waste in question was not legally hazardous. This matter was submitted on briefs to the hearings officer.

By an Interim Order dated April 1, 1994, the hearings officer found that (1) Respondents were barred by the doctrine of Issue Preclusion from challenging the Final Order, and (2) that Respondents storage of hazardous materials in tanks for over 90 days without use constituted storage in lieu of disposal subjecting the materials to hazardous waste regulation.

After discussion among counsel for Respondents, counsel for DEQ, and the hearings officer, it was agreed that the Interim

Attachment 6

Order resolved all contested issues except the correctness of DEQ's penalty calculation using +2 for the "R" factors based on a finding of Respondents' negligence. The parties agreed to submit the question of negligence to the hearings officer on briefs and affidavit(s).

ARGUMENT

With respect to the first violation, the Department found that a +2 value was appropriate because "Respondents were negligent in failing to take reasonable care to avoid a foreseeable risk of committing a violation by failing to properly remove the hazardous waste from the site or by applying for and obtaining a storage site permit." The Department found a +2 value appropriate on the second violation because "Respondents were negligent in failing to take reasonable care to avoid a foreseeable risk of committing a violation by failing to take action as ordered."

As explained in the attached affidavit of DEQ employee Jonathan Gasik, and the accompanying exhibits, there is ample evidence to support DEQ's finding of negligence as to both violations.

The Environmental Quality Commission (EQC) has opined that the question of negligence in regulatory matters such as the present case is more "one of law rather than fact." DEQ v. Fuel Processors, No. AQAB-NWR-90-81. In Fuel Processors, the EQC established that the "common meaning" of the term negligence,

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i.e., foreseeability of a "generalized risk of harm" from the conduct engaged in, is to be applied. Id. at 10.

Respondents were issued a Notice of Noncompliance (NON) by DEQ on December 13, 1991. Thereafter, DEQ repeatedly requested Respondents to arrange for proper handling of the wastes. Respondents ignored the NON. Subsequently, DEQ issued the Notice of Violation and Compliance Order. Respondents also failed to comply with the Order. Respondents did not actually comply until 18 months after the Compliance Order was issued. In the interim, a large volume of liquid wastes disappeared--apparently the result of purposeful evaporation by Respondents, and the premises remained unsecured, causing the county sheriff, among others, to demand resolution due to alarm at "the endless possibilities for disaster which this large quantity of toxic and hazardous materials present." See Affidavit of Jonathan Gasik, attached.

At no time did either the Small Business Administration (SBA) or the Coos/Curry/Douglas County Development Corporation (CCD), both of which had security interests in the plating chemicals and equipment at the site, indicate an intent to prevent Respondents from complying with DEQ's directives to Respondents to properly store or manage the hazardous chemicals.

Rather, they were aware of DEQ's actions and directed that Respondents comply with DEQ requirements. See Affidavit of Jonathan Gasik. Exhibit 13. Contrary to Respondents' arguments,

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neither the interests of the secured parties nor the bankruptcy proceeding were factors in Respondents' negligent failure to comply with the law.

DATED this 7 of July, 1994.

LARRY EDELMAN
Assistant Attorney General

LHE:dld LHE0160.plc

CERTIFICATE OF SERVICE BY MAIL

I certify that on July 7, 1994, I served the foregoing DEQ HEARING BRIEF ON THE ISSUE OF NEGLIGENCE and AFFIDAVIT OF JONATHAN GASIK upon the party below by mailing, regular mail, postage prepaid, true copy to:

Glenn Klein
Harrang Long Gary & Rudnick, PC
101 East Broadway, Suite 400
P.O. Box 11620
Eugene, OR 97440

Larry Edelman

dld0046.plc

BEFORE THE ENVIRONMENTAL QUALITY COMMISSION

OF THE STATE OF OREGON

DEPARTMENT OF ENVIRONMENTAL QUALITY OF THE STATE OF OREGON, Department, v. KENNETH BOLCH, BETTY BOLCH, and STAR CONCRETE, INC., an Oregon corporation, Respondents.	No. HW-SWR-02-241 AFFIDAVIT OF JONATHAN GASIK

STATE OF OREGON)
) ss.
County of Jackson)

I, Jonathan Gasik, being first duly sworn, depose and say:

1. I am employed by the Oregon Department of Environmental Quality (DEQ) in the Western Region, Medford office.

2. At all times relevant to the matters at issue in this proceeding I was employed by DEQ as a hazardous waste specialist in the Medford office.

3. I conducted hazardous waste inspections during 1991, 1992, and 1993 at Respondents' Nebraska Avenue facility which had been under lease as a chrome plating business. My inspections led to the enforcement actions which are the subject of these proceedings. The inspection reports are contained in DEQ's agency file which constitutes the record of this matter.

4. I prepared and issued a Notice of Noncompliance (Exhibit 1) to Respondents on December 13, 1991, after finding that Respondents had evicted the facility tenant on July 19,

10. DEQ agreed in a letter dated August 5, 1992, to refrain conditionally from assessing penalties against Respondents for violation of the Order (Exhibit 14).

11. Respondents failed to timely comply with the terms of DEQ's August 5, 1992 conditional agreement.

12. On September 29, 1992, DEQ assessed civil penalties against Respondents for illegal storage of hazardous waste and violation of the June 30, 1992 Order.

13. On November 20, 1992, I reinspected Respondents' facility to confirm cleanup operations which had finally been undertaken by Respondents' contractor. I noted that approximately 4,028 gallons of hazardous waste was missing from the facility (Exhibit 15).

14. DEQ subsequently requested and Respondents' counsel provided electric bills for the facility for the comparable periods during 1992 and 1991. These bills reflected a large differential in power usage apparently attributable to Respondents' illegal evaporation of waste by heating during 1992 (Exhibit 16, 17).

15. In my opinion, Respondents were negligent in that it was foreseeable that their failure to properly manage hazardous waste when requested by DEQ to do so would likely lead to

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violations of law and a generalized potential for harm to public health the environment by release or mishandling of the materials.

_____
Jonathan Gasik

SUBSCRIBED AND SWORN to before me this ____ day of June, 1994.

_____
NOTARY PUBLIC OF OREGON
My Commission Expires: _____

LHE:did LHE0161.ple

Exhibit 1

NEIL GOLDSCHMIDT
GOVERNOR

Department of Environmental Quality
SOUTHWEST REGION

201 W MAIN, SUITE 2-D, MEDFORD, OREGON 97501 PHONE (503) 776-6010

December 13, 1991

Mr. Kenneth Bolch
689 Union Ave.
Grants Pass, OR 97527

RE: HW - Josephine County
Chrome City
1550 Nebraska Ave.
Grants Pass, OR 97527
NOTICE OF NONCOMPLIANCE
NON 91-180

Dear Mr. Bolch:

On December 4, 1991, the Oregon Department of Environmental Quality ("ODEQ") conducted an inspection of Chrome City located at 1550 Nebraska Ave. in Grants Pass. The inspection was conducted under the authority of Oregon Revised Statutes (O.R.S.) 466.195 and 459.385. The purpose of the inspection was to determine compliance with Oregon Administrative Rules (O.A.R.) Chapter 340, for Hazardous Waste Management.

In our discussions prior to this inspection, you stated that you were not responsible for the chemicals on your property. However, a "Generator" of hazardous waste is defined as a "person who by virtue of ownership, management, or control, is responsible for causing or allowing to be caused the creation of a hazardous waste" (ORS 466.005). On July 19, 1991, you had the tenant forcibly removed from your property. This act transferred control of the facility to you. Therefore, you are a "generator" of hazardous wastes at the Chrome City facility.

The following violations of O.A.R., Chapter 340, were observed during the inspection. A copy of the inspection report is enclosed. This inspection report contains explanations and comments which should be reviewed in conjunction with this notice.

This Notice of Noncompliance is issued to the captioned facility for violation of the following Department rules:

Violation 1. 40 CFR 262.11 (adopted by reference in OAR 340-100-002) - The facility failed to carry out a hazardous

EXHIBIT

[redacted]ermination all solid wastes generated at the [redacted] - Class I.

[redacted]35 - Operation of a treatment, storage, or [redacted] TSD) facility without a permit. - The [redacted]ccumulated hazardous waste for more than 90 [redacted]s therefore subject to hazardous waste [redacted] requirements - Class I.

[redacted]35 - Operation of a treatment, storage, or [redacted] TSD) facility without a permit. - The [redacted] failed to comply with the hazardous waste [redacted] management standards of 40 CFR 262.34 [redacted] reference in OAR 340-100-002. Failure to [redacted]h these standards subjects facility to [redacted] waste permitting requirements. - Class I

[redacted]acility's container management activity does [redacted] following standards:

[redacted] a)(1) requires compliance with 40 CFR [redacted] The facility stored two drums of hazardous [redacted] not have covers.

[redacted]a)(4) requires compliance with 40 CFR [redacted] facility did not have an internal alarm or [redacted]nication device.

[redacted]a)(4) requires compliance with 40 CFR [redacted] facility did not have a device capable of [redacted]ency assistance.

[redacted]a)(4) requires compliance with 40 CFR [redacted] facility has not made arrangements with [redacted] response organizations as required by this [redacted]

[redacted]a)(4) requires compliance with 40 CFR 265.51 [redacted] does not have a contingency plan which meets [redacted]s of this subpart (D).

[redacted]a)(4) requires compliance with 40 CFR 265.16 [redacted] does not have a personnel training plan [redacted] requirements of this section.

[redacted]35 - Operation of a treatment, storage, or [redacted] TSD) facility without a permit. - The [redacted] failed to comply with the hazardous waste [redacted]gement standards of 40 CFR 262.34 adopted by [redacted] in OAR 340-100-002. Failure to comply with [redacted]dards subjects facility to hazardous waste [redacted] requirements. - Class I

Specifically, the facility's tank management activity does not comply with the following standards:

A) 40 CFR 262.34(a)(1) requires compliance with 40 CFR 265.192 - The facility did not comply with the requirements for the design and installation of a new tank system.

B) 40 CFR 262.34(a)(1) requires compliance with 40 CFR 265.193 - The facility did not comply with the secondary containment requirements of this section.

C) 40 CFR 262.34(a)(1) requires compliance with 40 CFR 265.195 - The facility did not perform daily inspection as required by this section.

Since cyanides were used in the process, some of the wastes will be listed hazardous wastes (F007, F008, and/or F009). Furthermore, since the facility has been out of operation since July 19, 1991 any waste in the process tanks at the facility came under regulation on October 19, 1991 (40 CFR 261.4 (10)(c)).

Civil penalties may be assessed for these violations. Each Class I violation is subject to a civil penalty assessment of up to $10,000 per day. The Departments Enforcement Division will review the violations and initiate further enforcement action as appropriate.

The above cited violations must be corrected. Actions including, but not necessarily limited to, the following will be required to achieve compliance:

1. Perform a hazardous waste determination on all solid wastes at the facility.

2. Remove all hazardous wastes within 90 days of the accumulation date.

3. Comply with the hazardous waste container management standards of 40 CFR 262.34, as appropriate.

4. Comply with the hazardous waste tank management standards of 40 CFR 262.34, as appropriate.

You are requested to submit a written status report defining the measures taken to correct the stated violations. This report is due within 30 days of the date of this letter. Evidence of compliance and supporting documentation may include the following, as appropriate:

1. Invoices
2. Photographs
3. Logs
4. Laboratory analysis
5. Manifests

6. Copies of any other applicable materials, documents and procedures.

In addition, it was noted in the inspection report that a sump pump was installed that connects the spill catchment basins to the sanitary sewer. To prevent the accidental discharge of hazardous wastes into the sewer, you are requested to disconnect this sump pump.

Please be advised that this Notice of Noncompliance is intended to notify you of the violations observed and the appropriate corrective action necessary to achieve compliance. As additional information is received and reviewed more violations may be confirmed. In that event, you would be cited for those violations in subsequent Notices of Noncompliance.

To avoid potential misunderstandings and to facilitate compliance efforts, it may be beneficial to contact this Department to schedule a technical assistance meeting. Should you need assistance, please contact the undersigned at (503) 776-6010.

Sincerely,

Jonathan D. Gasik
Senior Hazardous Waste Specialist

cc: Hazardous & Solid Waste Division, Tom Cusack.
Enforcement Section
Small Business Administration, Mr. Brian Otten
Mr. Dan Clark, representing CCD Business Development Corp.

Exhibit 2

M E M O R A N D U M

To: Bill Peterson, City Manager

From: Eric S. Mellgren, Public Safety Director ESM

SUBJECT: POTENTIAL HAZARDOUS MATERIALS PROBLEM - URGENT

Date: January 27, 1992

I was contacted by Josephine County Emergency Services Coordinator Jack Innes at appx. 2:30 p.m. today regarding a potentially disastrous hazardous materials problem. The situation is occurring at Chrome City, 1550 Nebraska Avenue, Grants Pass.

Apparently this firm is presently closed and its owners are involved in a civil conflict with the building's owners. In the interim, the Oregon D.E.Q. inspected the site on December 4, 1991 and found multiple major hazardous waste violations. A "Notice of Noncompliance" was issued to building owner Kenneth Bolch on December 13, 1991 (see attachments).

In a nutshell, D.E.Q. found 2400 gallons (18,000 pounds) of hazardous waste chemicals in the buildings. D.E.Q. has served notice that a cleanup must occur.

Our concerns are:

- The building is vacant and unheated. Freezing can occur and vats, pipes or drains can break and leak.

- According to Jack Innes there are various quantities of exceedingly dangerous materials including cyanide, strong acids and bases and various heavy metals in the building. A fire would be extremely dangerous to firefighters, area residents and our sewer system.

- Trespassers would be at great risk if entry were gained into the facility.

We need to address these issues jointly with D.E.Q. Possibly the Building Official can act to mitigate some of these situations. Public Safety can supply a temporary radio alarm to secure the site from burglary. A fire alarm is also needed (owner installed).

Let me know if I can provide further input.

cc: City Department Heads (4)
DPS (3)
Valley Fire
Jack Innes

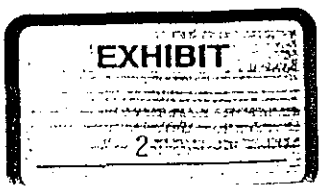


Exhibit 3

JOSEPHINE COUNTY SHERIFF'S OFFICE

W. E. "Bill" Arnado - Sheriff

State of Oregon
DEPARTMENT OF ENVIRONMENTAL QUALITY
RECEIVED
JAN 30 1992
SOUTHWEST REGION OFFICE

January 28, 1992

Department of Environmental Quality
201 W. Main Street, Suite 2D
Medford, Oregon 97501

Attention: Jon Gasik

Dear Mr. Gasik,

We have received a copy of your document relating to the hazardous materials situation at Chrome City, 1550 Nebraska Avenue, Grants Pass, Oregon.

We, frankly, are alarmed at the endless possibilities for disaster which this large quantity of toxic and hazardous materials present. We demand the chemical problem be resolved as soon as possible, thus cutting the time which our citizens are imperiled by this menace.

If there is any way we may assist in the resolution of this problem, please call upon us.

Sincerely,

W. E. "Bill" Arnado,
Emergency Services Director

By: Jack Innes
Emergency Services Coordinator

cc: Charles S. Crookham, Attorney General
Eric Mellgren, Director, Grants Pass Dept. of Public Safety
Josephine County Board of County Commissioners
Jim Boldt, Josephine County Legal Counsel

EXHIBIT
3

500 N.W. 6th/Courthouse Grants Pass, Oregon 97526 Phone (503) 474-5123

Exhibit 4

State of Oregon
DEPARTMENT OF ENVIRONMENTAL QUALITY
RECEIVED
JUN - 4 1992
SOUTHWEST REGION OFFICE

City of Grants Pass
101 Northwest A Street
Grants Pass, Oregon 97526
503-474-6360

June 2, 1992

Jonathan D. Gasik
Senior Hazardous Waste Specialist
Department of Environmental Quality
201 West Main, Suite 2-D
Medford, Oregon 97501

Dear Mr. Gasik:

We are in receipt of your letter dated December 13, 1991, regarding the Notice of Noncompliance for Chrome City. Your letter states they had 90 days to remove all hazardous wastes and a report was due within 30 days. We have never received a report and the materials are still there.

Please advise us of the status of this problem.

Sincerely,

Ulys Stapleton

Ulys Stapleton
City Attorney

US/bc

REGIONAL OPERATIONS DIVISION
DEPARTMENT OF ENVIRONMENTAL QUALITY
RECEIVED
JUN 0 8 1992

EXHIBIT
4

Exhibit 5

JOSEPHINE COUNTY SHERIFF'S OFFICE

W. E. "Bill" Arnado - Sheriff

June 11, 1992

Department of Environmental Quality
201 W. Main Street, Suite 2D
Medford, Oregon 97501

Attention: Jon Gasik

Dear Mr. Gasik,

This letter is in reference to Chrome City (a defunct plating business), 1550 Nebraska Avenue, Grants Pass, Oregon.

We last communicated on January 28, 1992 in a letter which expressed our alarm over the large amount of unsecured toxic chemicals in our community.

After six months, we have not received a reply to our letter, nor have we received any other form of communication.

What we are sure of is that the presence of a large quantity of toxic chemicals continues to exist which not only endangers our county's population but our very environment.

Is something happening at the Environmental Protection Agency? Can mitigation of the problem be accelerated? Is there some action we (Josephine County) can take to reduce or do away with this perilous situation? We look forward to hearing from you.

Sincerely,

W. E. "Bill" Arnado, Sheriff

cc: Charles C. Crookham, Attorney General
Eric Mellgren, Director, Grants Pass Dept. of Public Safety
Josephine County Board of County Commissioners
Jim Boldt, Josephine County Legal Counsel

June 11, 1992

Van Kollias
Larry Schurr
Department of Environmental Quality
811 S.W. 6th
Portland, Ore. 97204

City of Grants Pass
101 Northwest A Street
Grants Pass, Oregon 97526
503-474-6360

Re: Chrome City Cleanup

Dear Messrs. Kollias and Schurr,

The City of Grants Pass is extremely concerned about the noncompliance of Chrome City (NON 91-180). Because of the potential dangers, the City has capped off one on-site line which accessed our sanitary sewer system. A second line for restroom facilities is still connected.

Based upon Mr. Gasik's letter of December 13, 1991, it was our understanding that a status report was due January 13th and cleanup of the site was to be completed by March 13, 1992. Public Safety and our Utility have been continually monitoring the area on an informal basis and it appears that the cleanup has not even begun.

If these materials escape from the site, the consequences could be catastrophic. In addition to the obvious devastation if some of the materials obtain a gaseous state, the cyanide, acids, and heavy metals would cripple our sanitary sewer system, resulting in a massive raw sewage dump into the Rogue River. An escape into the Allen Creek watershed, which is only a few hundred yards away and flows directly into the Rogue River, could destroy wildlife and vegetation for years to come.

In either case, the environmental destruction would undoubtedly result in significant financial damages to the City, citizens and businesses in Josephine County, and could even impact Curry County. It seems imperative that the cleanup be undertaken immediately to alleviate this situation.

Please send me any information which you have regarding the latest plans of the Department of Environmental Quality for cleanup.

Sincerely,

Ulys Stapleton
City Attorney

cc. Dave Wheaton, Utilities Manager
Cheryl Kincaid, Public Works Director
Eric Melgren, Public Safety Director
Bill Peterson, City Manager
John Gasik, Senior Hazardous Waste Specialist

EXHIBIT
6

Exhibit 7

August 17, 1992

Larry M. Schurr
Enforcement Section
Department of Environmental Quality
811 SW Sixth Ave.
Portland, Ore. 97204

Re: DEQ v. Bolch, et al.
Case No. HW-SWR-92-13

City of Grants Pass
101 Northwest A Street
Grants Pass, Oregon 97526
503-474-6360

Dear Larry,

After reading the courtesy copies of letters from Glenn Klein directed to you, Dave Wheaton, and Jack Innes, I feel compelled to clarify the City's position regarding a cleanup of the site.

I realize that Mr. Bolch has hired Mr. Klein at the twelfth hour and that Mr. Klein is somewhat hamstrung in his ability to comply with the immediate nature of the existing order. I also understand that you may be inclined to grant an extension based on the good faith efforts of Mr. Klein through BWR to accomplish the stated tasks.

Please do not misconstrue the City's cooperation as agreement and acceptance. The City strongly opposes an open ended extension of the time limits specified in the Department's order. A two to three week extension of each date would be acceptable, but presently, I fail to see any justification for a lengthier delay.

Our previous correspondence and calls to the Department indicating the urgency of disposing of these extremely dangerous materials in a safe manner has not changed.

If you have any questions or concerns. Please feel free to contact me.

Yours Truly,

Ulys Stapleton
City Attorney

Exhibit 8

DAILY COURIER Grants Pass, Oregon MONDAY, SEPTEMBER 28, 1992

Toxic site's owner does little to comply with DEQ mandate

City seething, demands state action

By Gordon Gregory
of the Daily Courier

Nine months ago state environmental health officials notified Kenneth Bolch, owner of Star Concrete Inc., that he was illegally storing hazardous waste in a building off Redwood Highway.

The Department of Environmental Quality gave him until March 13 to remove the thousands of pounds of cyanides, acids and other toxic chemicals stored at the closed Chrome City plating business, located at 1550 Nebraska Ave.

But to date Bolch has done little besides hire an attorney and a consulting firm, according to state and local officials, who privately say Bolch is taking a cavalier attitude to the situation.

Frustrated both by Bolch's apparent delaying tactics and by the DEQ's tepid enforcement response, Grants Pass City Attorney Ulys Stapleton recently demanded that the state get tough.

In a Sept. 17 letter sent to the DEQ, Stapleton wrote:

"The city's concerns which I previously expressed have not evaporated with the passage of time.

"If these materials escape from the site, the consequences could be catastrophic. In addition to the obvious devastation if some of the materials obtain a gaseous state, the cyanide, acids, and heavy metals would cripple our sanitary sewer system, resulting in a massive raw sewage dump into the Rogue River.

"An escape into the Allen Creek watershed, which is only a few hundred yards away and flows directly into the Rogue River, could destroy wildlife and vegetation for years to come."

Stapleton asked that the DEQ set firm deadlines for Bolch and that it impose heavy daily fines for missing those deadlines.

"The safety of the citizens of Grants Pass should not be sacrificed to the department's orders," Stapleton wrote.

The Courier was unable to contact Bolch, who reportedly is on vacation.

DEQ officials say Bolch could be fined up to $10,000 a day for violating the cleanup order. However, Larry Schurr of the DEQ's enforcement division in Portland, said the agency hasn't decided whether to assess any penalties.

A month ago, Schurr was saying Bolch "can't afford to ignore the situation anymore."

Last week he said, "It's still under review."

Jon Gasik, hazardous waste specialists with the DEQ's Medford office, said he is frustrated.

"Typically, you don't see people violating agency orders, and when they do, typically the fines are pretty stiff," he said.

He said Bolch really has only two options: He can spend perhaps $100,000-plus cleaning up the site, or he can reopen the business.

The electroplating business was set up by Danny Martin in 1989 under a lease from Bolch for the building space. Martin claims Bolch never completed the building and tried to bill him for improvements that had never been discussed or agreed to.

He said Bolch told him the building would never be finished if Martin didn't pay the unexpected bill. Martin also said Bolch refused to accept any rent.

Martin, who still owns the equipment and chemicals, said all his efforts to resolve the dispute failed and Bolch evicted him from the site in November 1990. That eviction made Bolch responsible for the site.

"I tried to warn him. I tried to tell him these things were going to happen," Martin said.

Martin believes the best solution is for Bolch to either sell him the building or allow him to restart the business.

"There are things that can be done. It's just a matter of whether

EXHIBIT

8

Exhibit 4

Oregon

DEPARTMENT OF
ENVIRONMENTAL
QUALITY

CERTIFIED LETTER NO. P 541 007 230
RETURN RECEIPT REQUESTED

Kenneth Bolch and
Betty Bolch
689 Union Avenue
Grants Pass, Oregon 97527

Star Concrete, Inc.
c/o Kenneth Bolch
President
689 Union Avenue
Grants Pass, Oregon 97527

JUN 30 1992

RE: Notice of Violation and
Compliance Order
No. HW-SWR-92-13
Josephine County

ORD 987191921

On June 18, 1992, investigators from the Department of Environmental Quality (DEQ) inspected your commercial business property located at 1550 Nebraska Avenue, in Grants Pass.

DEQ investigators observed that many chemicals were being stored at the site. At least some of those chemicals were determined to be hazardous waste. Apparently, some or all of the chemicals were left on the property after you evicted a former tenant.

On December 13, 1991, DEQ sent Mr. Bolch a Notice of Noncompliance (NON) in which several violations of Oregon law and DEQ's hazardous waste regulations were cited. The NON warned that the violations would be referred for formal enforcement. Mr. Bolch was requested to file a status report within 30 days, and to properly remove all hazardous waste from the property within 90 days. A hazardous waste determination was to be made for each solid waste residue on the property and all wastes were to be managed in full compliance with DEQ's environmental regulations.

EXHIBIT 9

811 SW Sixth Avenue
Portland, OR 97204-1390
(503) 229-5696
TDD (503) 229-6993

DEQ-1

The June 18, 1992, inspection of your site confirmed that hazardous waste continues to be stored on-site in violation of Oregon Revised Statute (ORS) 466.095(1)(a).

Therefore, I am sending you the enclosed Notice of Violation and Compliance Order (HW-SWR-92-13) in which I have Ordered you to take action to determine the hazard that the stored waste presents and to properly remove all hazardous waste from the property in accordance with the schedule in the enclosed Compliance Order. Appeal procedures are outlined in Paragraph IV of the Notice and Order.

DEQ looks forward to your cooperation and actions to correct the violations cited in the NON and the Order. We expect your site to be in full compliance with Oregon's environmental regulations. We are willing to assist you with questions regarding rule interpretations or the applicability of specific regulations to your facility.

If you wish to discuss the Compliance Order or believe there are factors which DEQ might not have considered, you may request an informal discussion by attaching a request to your appeal. A request to discuss the matter with DEQ will not waive your right to a contested case hearing if a timely appeal is filed.

A civil penalty of up to $10,000 per day may be assessed against you for each violation if you violate any term of the Compliance Order or have a new or continuing violation.

If you have any questions about the enclosed enforcement action, please telephone Mr. Larry M. Schurr at 229-6932, or toll-free at 1-800-452-4011

Sincerely,

Fred Hansen
Director

FH:lms
Enclosure
cc: Southwest Regional Office, DEQ
Hazardous Waste Pilot Project, CR, DEQ
Hazardous and Solid Waste Division, DEQ
Oregon Department of Justice
Environmental Quality Commission
U.S. Environmental Protection Agency
Josephine County Sheriff's Office
City of Grants Pass

BEFORE THE ENVIRONMENTAL QUALITY COMMISSION

OF THE STATE OF OREGON

DEPARTMENT OF ENVIRONMENTAL QUALITY OF THE STATE OF OREGON, Department, v. KENNETH BOLCH; BETTY BOLCH; and STAR CONCRETE, INC., an Oregon corporation, Respondents.	)	NOTICE OF VIOLATION AND COMPLIANCE ORDER NO. HW-SWR-92-13 JOSEPHINE COUNTY ORD 987191921

This Notice of Violation and Compliance Order is issued by the Department of Environmental Quality (Department or DEQ) pursuant to Oregon Revised Statutes (ORS) 466.190.

I. FINDINGS

1. Respondents KENNETH BOLCH, BETTY BOLCH; and STAR CONCRETE, INC., an Oregon corporation, own or control real property located at 1550 Nebraska Avenue, in Grants Pass, Oregon, (Respondents' Site).

2. A representative of DEQ conducted an inspection at Respondents' Site on June 18, 1992, and observed hazardous waste stored on-site at Respondents' Site.

3. Respondents' Site is not a permitted hazardous waste treatment, storage or disposal site, nor is the waste being stored pursuant to ORS 466.075(2).

II. VIOLATION

Based on the observations and findings from the above noted inspection, Respondents have violated ORS 466.095(1)(a).

5. **Within 45 days** of receipt of this Order, Respondents shall submit to DEQ a detailed description of how Respondents plan to manage each solid waste residue in full compliance with Oregon law, and DEQ environmental regulations.

6. **Within 30 days** after receiving DEQ approval of the waste management plan referenced in Paragraph 5, Respondents shall remove all hazardous waste stored at Respondents' Site, and Respondents shall transport all such hazardous waste to a licensed hazardous waste treatment, storage, or disposal site in full compliance with Oregon law and DEQ environmental regulations.

7. **Within 45 days** after receiving DEQ approval of the waste management plan referenced in Paragraph 5, Respondents shall submit written documentation to DEQ which demonstrates full compliance with the terms of this Order.

IV. OPPORTUNITY FOR CONTESTED CASE HEARING

This Notice of Violation and Compliance Order shall become final with respect to a Respondent unless, within 20 days of issuance of this Notice and Order, that Respondent requests a hearing before the Environmental Quality Commission pursuant to ORS 466.190. The request must be made in writing and must be received by the Commission's hearing officer within twenty (20) days from the date of service of this Notice, and must be accompanied by a written "Answer" to the allegations contained in this Notice. In the written "Answer", the Respondent shall admit or deny each allegation of fact contained in this Notice and the

Exhibit 10

State of Oregon
DEPARTMENT OF ENVIRONMENTAL QUALITY
RECEIVED
JAN 17 1992
SOUTHWEST REGION OFFICE

MYRICK, SEAGRAVES, ADAMS & DAVIS

Attorneys at Law
600 Northwest Fifth Street
Grants Pass, Oregon 97526-2024
Office (503) 476-6627
FAX (503) 476-7048

Donald F. Myrick
Charles H. Seagraves, Jr.
Lynn M. Myrick
Richard D. Adams
John E. Davis

Donald H. Coulter
Retired

Nancy E. Metcalfe
Probate Assistant

Sherry Watson
Office Manager

January 14, 1992

REGIONAL ... OFFICE
DEPARTMENT OF ENVIRONMENTAL ...
RECEIVED
JAN 27 1992

Jonathan Gassek
Senior Hazardous Waste Specialist
Department of Environmental Quality
Suite 2-D
201 West Main
Medford OR 97501

Re: Chrome City at 1550 Nebraska Avenue, Grants Pass, Oregon
My client: Kenneth Bolch - Star Concrete

Dear Mr. Gassek:

Enclosed is a copy of a letter I recently sent to SBA, CCD and the Martins with regard to personal property located at 1550 Nebraska Avenue.

As you can see by this letter, we have given these individuals until February 1, 1992 to remove their personal property. If it is not removed, my client will consider this property abandoned and take action to remove the same.

Please understand that this property is owned by the Martins and is subject to the jurisdiction of the U. S. Bankruptcy Court. Any removal on our part will have to be preceded by an order from the Bankruptcy Court allowing us to dispose of the property.

If you have any questions, please feel free to contact me.

Very truly yours,

Jack Davis

JOHN E. [JACK] DAVIS

JED/sjs
Enc.
cc: Kenneth Bolch
Scott Palmer

EXHIBIT
10

Exhibit 11

MYRICK, SEAGRAVES, ADAMS & DAVIS

Attorneys at Law
600 Northwest Fifth Street
Grants Pass, Oregon 97526-2024
Office (503) 476-6627
FAX (503) 476-7048

Donald F. Myrick
Charles H. Seagraves, Jr.
Lynn M. Myrick
Richard D. Adams
John E. Davis

Donald H. Coulter
Retired

Nancy E. Metcalfe
Probate Assistant

Sherry Watson
Office Manager

January 15, 1992

Donald A. Dole
Attorney at Law
810 S E Douglas Avenue
P O Box 1205
Roseburg OR 97470-0303

Brian B. Otten
U. S. Small Business Administration
Portland District Office
Suite 500
222 S W Columbia Street
Portland OR 97201-6605

Danny and Glenda Martin
4670 Rogue River Highway
Grants Pass OR 97527

Re: Glenmar, Inc./Martin/Bolch

Please be advised that I represent Mr. and Mrs. Bolch and Star Concrete, Inc. Mr. and Mrs. Bolch are the owners of real property located at 1550 Nebraska Avenue, Grants Pass, Oregon, 97527. A portion of this property was at one time leased by Danny and Glenda Martin, and Glenmar, Inc. [Chrome City].

Certain equipment, chemicals, and tanks still remain on the leased premises. The Martins were allowed 30 days to remove these items of personal property prior to eviction. They did not do so.

It is my understanding that SBA and CCD have liens on this equipment and personal property.

The purpose of this letter is to advise both of you, together with Martin, that this property must be removed from the leased premises by February 1, 1992.

EXHIBIT 11

15, 1992

roperty is not removed by that time, my client will consider the
y to be abandoned and take steps to remove it.

nents should be made through my office to have the property

rtins are the owners of this personal property and since Martins
Chapter 13 Bankruptcy proceeding, before any action is taken by
nts to dispose of the property, they will obtain whatever
on is necessary from the Bankruptcy Court to do this. Do to the
c Stay which applies in Bankruptcy, it is my understanding we
ake action against the property until we obtain permission from
ruptcy Court.

advise you that my client would be willing to enter into
ions with the new tenant to allow them to operate a Chrome
business in this leased premises. My client, however, would
illing to enter into such negotiations with Mr. Martin.

ou have any questions, please feel free to call me.

ly yours,

JACK] DAVIS

Bolch

Exhibit 12

(4)

ill
Union Ave.
Pass, OR 97527

State of Oregon
DEPARTMENT OF ENVIRONMENTAL QUALITY
RECEIVED
SEP 26 1991
SOUTHWEST REGION OFFICE

er 24, 1991

ent of Environmental Quality
athan Gasik
ain, Suite 2-D
, OR 97501

. Gasik:

our conversation September 24, 1991, this letter is in se to your correspondence dated September 17, 1991. Mr. does not own manage or control the equipment and chemicals d 1515 Nebraska Ave. Grants Pass, Oregon.

y 19, 1991 Danny Martin, DBA Chrome City, was evicted from operty. At that date I notified Brian Otten, Commercial Loan list, from the SBA, of Mr Martin's eviction. Mr Otten g me that the equipment and chemicals in the building were ment property. These facts were again reiterated by Mr. at a meeting held the week of July 22, 1991.

tacted Mr. Otten today September 24, 1991 advising him of letter. He indicated that the SBA has not completed their tion pertaining to the disposal of the equipment and ials located on the premise.

e been designated to handle matters pertaining to Chrome City Mr. Bolch's absence. Please feel free to contact me if I e of further assistance.

Truly,

amrill

EXHIBIT
12

Exhibit 13

C.C.D. BUSINESS
DEVELOPMENT CORPORATION
744 Southeast Rose Street • Roseburg, OR 97470
Telephone 503 / 672-6728 • FAX 503 / 672-7011
Toll Free in Oregon 1-800-452-6010

August 19, 1991

Jack Davis
600 NW Fifth St
Grants Pass OR 97526

Re: Chrome City Custom Chrome Plating

Dear Mr. Davis:

The intent of this letter is to advise you that CCD Business Development Corporation has a perfected UCC-1 filing on all of the equipment located at 1550 Nebraska Ave., Grants Pass, Oregon. CCD's UCC-1 filing is subordinate to the Small Business Administration.

Your client Star Concrete, Ken and Betty Bolch, concluded legal action that forced Danny Martin, the owner of Chrome City, into the position of having to dispose of his company. On August 2, 1989, your client signed an assignment of lease to CCD (copy attached) which states that prior to Mr. Bolch taking any action against Danny Martin of Chrome City, CCD is to be in receipt of a written notification. As of this date the only notice that CCD has received was a copy of the bankruptcy notice filed by Mr. Martin.

Therefore, CCD is giving notice that as of this date your client assumes all responsibility to maintain the equipment, chemicals and supplies that Mr. Martin was forced to leave at 1550 Nebraska Avenue, Grants Pass, Oregon. It would appear that all costs incurred in fulfilling this responsibility rests entirely on your client. We are requesting written evidence that the maintenance is being performed in accordance with DEQ requirements.

If you have any questions please feel free to call me.

Sincerely,

Wayne Luzier
Loan Fund Manager

WL/dt

cc: Brian Otten, SBA
Danny Martin

EXHIBIT
13

Branch Offi
Municipal Airport Building, North Bend, Oregon 974
Telephone: (503) 756-4101 • FAX: (503) 756-11

Exhibit 14

Oregon

DEPARTMENT OF
ENVIRONMENTAL
QUALITY

Mr. Glenn Klein
Attorney at Law
Harrang Long Watkinson Arnold & Laird
101 E. Broadway, Suite 400
Eugene, OR 97401

August 5, 1992

Re: DEQ v. Bolch et. al.
Case No. HW-SWR-92-13
Josephine County

Dear Mr. Klein:

From our telephone conversations of August 3 and 4, 1992, I understand that you were very recently asked to represent the Respondents in the above referenced case.

The Compliance Order in the Notice (HW-SWR-92-13) became final on July 23, 1992. By August 2, 1992, the Respondents were to have completed an inventory and made hazardous waste determinations. Under the terms of the Compliance Order, analytical results and a management plan are due to be submitted to the Department by August 17, 1992.

On August 3, 1992, you requested that the Department refrain from assessing civil penalties against the Respondents for a period of 14 days in order to allow you the opportunity to become familiar with the case, have the inventory and hazardous waste determinations completed, and submit a management plan and proposal for satisfactory resolution of the matter.

DEQ agrees not to impose civil penalties against the Respondents for violating paragraph 3 or 4 of the Compliance Order through August 17, 1992, provided that you submit the items discussed above by August 17, 1992, and provided that:

* Respondents keep all chemical substances stored on-site in closed containers or tanks that are in good condition.

* Respondents inspect the facility daily for any hazardous conditions or potential releases of chemical substances.

EXHIBIT 14

811 SW Sixth Avenue
Portland, OR 97204-1390
(503) 229-5696

I understand that you will be working with Jon Gasik of DEQ's Southwest Regional Office in Medford (776-6010) as well as representatives from local jurisdictions in developing your proposal. We agreed that you would submit copies of all documents to both Jon Gasik and me.

Jon Gasik may know of some contractors or consultants who might be able to do the inventory/sampling/waste determination work on an accelerated basis as is needed in this case.

I look forward to you effort to reach a satisfactory resolution to this matter. If you have any questions, please call me at 229-6932 or toll-free at 1-800-452-4011.

Sincerely,

Larry M. Schurr
Environmental Law Specialist
Special Investigator
Enforcement Section, DEQ

cc: Southwest Regional Office, DEQ
Hazardous Waste Pilot Project, CR, DEQ
Josephine County Sheriff's Office
City of Grants Pass

Exhibit 15

Oregon

DEPARTMENT OF
ENVIRONMENTAL
QUALITY

SOUTHWEST REGION

December 4, 1992

Mr. Glenn Klein
Attorney at Law
Harrang Long Watkinson Arnold & Laird
101 E. Broadway, Suite 400
Eugene, OR 97401

RE: DEQ v. Bolch et. al.
Case No. HW-SWR-92-13
Josephine County

Dear Mr. Klein:

On November 20, 1992, I inspected the facility located at 1550 Nebraska Ave., Grants Pass, OR. formerly known as Chrome City. This facility is currently owned and operated by your client, Mr. Ken Bolch. This inspection was performed to confirm cleanup operations of the contractor hired by Mr. Bolch. The contractor, Mr. Russel Strader, Cascade Earth Science, was actively removing wastes from the tanks at the time of the inspection. They had labeled the drums with the number system that I had used during my initial inspection. The solutions within each plating line were combined in the drums (i.e. the A-line was combined, the B-line was combined, etc.). Separate plating lines were not combined. The following is a synopsis of the transfer of waste into the drums:

Tank #s	Number of Drums
A1,A2, A5, &E1	10 (550 gal)
A4	2 5-gal buckets
B1	5 drums (225 gal)
D4	5 drums (225 gal)
E4	7 drums (385 gal)

I noticed that the solutions from several of the tanks (A3, B2, B3, B4, C6, C7, D1, D2, D3, E2, and E3) were missing. When I questioned Mr. Strader about the tanks he informed me that those tanks (mentioned above) were empty upon his initial visit to the facility. I further questioned him about the two 55 gallon barrels that were on the inventory. Mr. Stader informed me that they were also not present when he arrived. Upon review of the facility we found two empty 55 gallon drums which may have been the ones which had contained the hazardous waste.

Mr. Strader further informed me that he had prepared an inventory upon his initial visit on 11/12/92. I requested a copy of this inventory. A comparison of

201 W Main, Suite 2-D
Medford, OR 97501
(503) 776-6010
FAX (503) 776-6262
DEQ/SWR 103

Exhibit 16

HARRANG LONG WATKINSON
LAIRD & RUBENSTEIN, P.C.
ATTORNEYS AND COUNSELORS AT LAW

400 SOUTH PARK BUILDING
101 EAST BROADWAY
EUGENE, OR 97401-3114
CORRESPONDENCE:
P.O. BOX 11620
EUGENE, OR 97440-3820
TELEPHONE: (503) 485-0220
FACSIMILE: (503) 686-6564

GLENN KLEIN

March 9, 1993

LARRY M. SCHURR
DEPARTMENT OF ENVIRONMENTAL QUALITY
811 S.W. SIXTH AVENUE
PORTLAND OR 97204-1390

Re: DEQ v. Bolch

Dear Larry:

Per your request, enclosed are copies of the electric utility bills for September - December 1992. Also, I understand that Cascade Earth Sciences has contacted Jon Gasik regarding the closure inspection. Once that inspection is complete, I look forward to resolving finally DEQ's enforcement action.

Sincerely,

Glenn Klein

GK/lj
cc: client

EXHIBIT 16

SALEM OFFICE
750 FRONT ST., N.E., SUITE 100
SALEM, OR 97301
(503) 362-8726

ROSEBURG OFFICE
2750 W. HARVARD BLVD.
ROSEBURG, OR 97470
(503) 672-2755

13 0325998-2 2 12

STAR CONCRETE
689 UNION AVE
GRANTS PASS OR 97527

SERVICE ADDRESS IF OTHER THAN MAILING
1550 NEBRASKA AVE 1 & 2
GRANTS PASS OR 97527

WHEN MAKING INQUIRIES PLEASE CONTACT:
301 N E SIXTH ST
GRANTS PASS OR
PHONE 479-3381

1992

METER NUMBER	RATE/ TYPE	SERVICE PERIOD FROM	SERVICE PERIOD TO	NO OF DAYS	DEMAND	METER READINGS PREVIOUS	METER READINGS PRESENT	METER MULT.	KILOWATT HOURS USED (KWH)	BILL CODE	AMOUNT
83003858	25B	NOV10	DEC11	31	43	4347	4376	80	2320		244.91

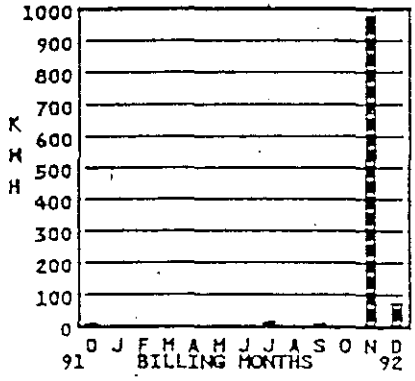
KW LOAD SIZE 62

1.5% CITY TAX 3.67

pd 12-92

TOTAL AMOUNT DUE JAN 4, 1993

CURRENT AMOUNT		248.58
LAST MONTH BILLING	1,378.49	
PAYMENTS - THANK YOU	-1,378.49	
THROUGH	12/15/92	
OTHER CHARGES (+) (-)	0.00	
BALANCE FORWARD	0.00 ▶	0.00
TOTAL AMOUNT DUE		$248.58



YOUR AVERAGE DAILY KWH USAGE BY MONTHS

PERIOD ENDING	AVG. DAILY TEMPERATURE	TOTAL KWH	KWH/DAY
DEC 92	41	2320	75
DEC 91	42	160	5

this inventory with the one submitted by BWR and Associates on 9/22/92 follows:

Tank #	9/22/92 Amount	11/10/92 Amount	Amount Missing
A1	240 gallon	424 gallon	+184 gallon
A2	215	50	165
A3	250	0	250
A4	240	13	219
A5	240	125	115
B1	240	135	105
B2	240	0	240
B3	240	0	240
B4	240	0	240
C6	135	0	135
C7	170	0	170
D1	350	0	350
D2	350	0	350
D3	350	0	350
D4	350	150	200
E1	335	38	297
E2	335	0	335
E3	350	0	350
E4	350	359	+9

Total missing from tanks = 3918 gallons
+ Two drums = +110 gallons

Total hazardous waste missing = 4028 gallons.

Item 2. of the Compliance Order (HW-SWR-92-13) states "Respondents shall obtain written permission from DEQ prior to removing any solid waste residue [...] from Respondent's Site".

We are currently considering assessing civil penalties for non-compliance of the Order.

You client is hearby requested to respond in writing as to the whereabouts of the approximately 4000 gallons of waste which is missing.

Should you have any questions, please feel free to call me at 776-6010.

Sincerely,

Jonathan Gasik
Senior Hazardous Waste Specialist

cc: Brett McKnight, Hazardous Waste Pilot Program Manager
Enforcement Section

-0325998-2.2.12

STAR CONCRETE
689 UNION AVE
GRANTS PASS OR 97527

SERVICE ADDRESS IF OTHER THAN MAILING
1550 NEBRASKA AVE 1 & 2
GRANTS PASS OR 97527

WHEN MAKING INQUIRIES PLEASE CONTACT:
301 N E SIXTH ST
GRANTS PASS OR
PHONE 479-3381

1993

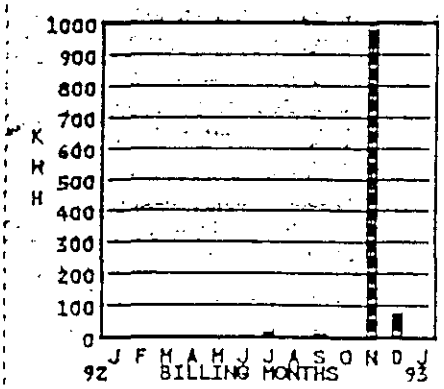
METER NUMBER	RATE TYPE	SERVICE PERIOD FROM	SERVICE PERIOD TO	NO. OF DAYS	DEMAND	METER READINGS PREVIOUS	METER READINGS PRESENT	METER MULT.	KILOWATT HOURS USED (KWH)	BILL CODE	AMOUNT
83003856	25E	DEC11	JAN13	33	1	4376	4376	80	0	M	44.90
KW LOAD SIZE					62						
1.5% CITY TAX											0.67

pd 2-93

TOTAL AMOUNT DUE FEB 2, 1993

CURRENT AMOUNT		45.57
LAST MONTH BILLING	248.58	
PAYMENTS - THANK YOU	-248.58	
THROUGH	1/15/93	
OTHER CHARGES (+) (-)	0.00	
BALANCE FORWARD	0.00	0.00
TOTAL AMOUNT DUE:		$45.57

19



STAR CONCRETE
689 UNION AVE
GRANTS PASS OR 97527

SERVICE ADDRESS IF OTHER THAN MAILING
1550 NEBRASKA AVE 1 & 2
GRANTS PASS OR 97527

WHEN MAKING INQUIRIES PLEASE CONTACT:
301 N E SIXTH ST
GRANTS PASS OR
PHONE 479-3381

1992

METER NUMBER	CYCLE/ ROUTE	SERVICE PERIOD FROM	SERVICE PERIOD TO	NO. OF DAYS	DEMAND	METER READINGS PREVIOUS	METER READINGS PRESENT	METER CONSTANT	KILOWATT HOURS USED	DAILY COST	AMOUNT
83003856	25B	SEP11	OCT13	32	1	4001	4001	80	0	M	16.90
KW LOAD SIZE					22						
1.5% CITY TAX											0.25

RR 10-92

TOTAL AMOUNT DUE NOV 2, 1992

CURRENT AMOUNT		17.15
LAST MONTH BILLING	21.65	
PAYMENTS - THANK YOU	-21.65	
THROUGH	10/15/92	
OTHER CHARGES (+) (-)	0.00	
BALANCE FORWARD	0.00	0.00
TOTAL AMOUNT DUE		$17.15

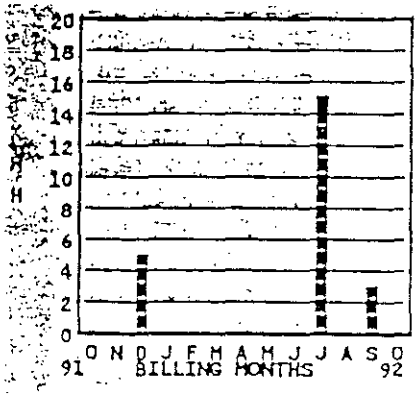


Exhibit 17

HARRANG LONG WATKINSON
ARNOLD & LAIRD, P.C.
ATTORNEYS AND COUNSELORS AT LAW

400 SOUTH PARK BUILDING
101 EAST BROADWAY
EUGENE, OR 97401-3196
CORRESPONDENCE:
P.O. BOX 11620
EUGENE, OR 97440-3820
TELEPHONE: (503) 485-0220
FACSIMILE: (503) 686-6564

GLENN KLEIN

December 18, 1992

VIA TELEFAX
AND FIRST CLASS MAIL

Jonathan Gasik
Senior Hazardous Waste Specialist
Oregon Department of Environmental Quality
201 W. Main, Suite 2-D
Medford, OR 97501

Re: DEQ v. Bolch

Dear Mr. Gasik:

This letter follows up our conversation on December 15 and my letter to you dated December 10. In your letter of December 4, 1992, you requested an explanation as to a difference of approximately 4,000 gallons in the estimated inventories produced by BWR Associates and Cascade Earth Sciences. As explained in greater detail below, the difference was due to evaporation; no material has been transported off the site.

As you may be aware, some tanks at the site were equipped with heaters. The heaters were used in the chrome plating operation. In order to prevent the chemicals from being rendered useless after Mr. Martin was evicted, the heaters occasionally had been turned on. As a result, some evaporation would occur. Again, to prevent the chemicals from being rendered useless, water occasionally was added.

More recently, and after BWR had completed its inventory estimates, the heaters again were turned on. This time, no water was added. When Larry Schurr spoke with me on November 10, 1992, he indicated that he had received a report that steam was being vented from the building and that plastic was on the windows. He further stated that evaporation of the liquids was considered a form of treatment of hazardous wastes which could not be done without a permit. Although Mr. Schurr was not aware for certain if the liquids were being evaporated, he stated that if they were, it must stop. When I spoke with my client later that day, the heaters already had been turned off. With one exception, the heaters were not turned on again. The only exception was at the time that Cascade Earth

Sciences was packaging the materials in drums; some material was heated for a very short period of time in order to make the material more viscous and able to be moved from the containment to the drums.

You also asked about the liquid that had been in the two empty drums. That liquid had been transferred to two of the baths between the time BWR completed its inventory and Cascade Earth Sciences began its work. The material in those baths was evaporated when the heaters were left on.

I also want to take this opportunity to reiterate my response to your comment during our conversation on December 15, that the missing inventory is the second "blatant" violation of DEQ's order. The first "blatant" violation, you explained, was the failure to meet the timelines contained in the order. My client retained BWR Associates -- a professional consultant recommended by DEQ -- to complete the work required by that order. My client did not place any constraints on BWR with respect to completing the work, and made BWR aware of DEQ's timelines. For reasons DEQ is aware of, the work took far longer than anyone liked. That additional delay, however, was not the result of action taken by my client, who hired a professional consultant to perform the task.

The second possible "blatant" violation of the order would be the discrepancy in inventory. That discrepancy was caused by evaporation, admittedly in large part as a result of leaving the heaters on. That process, as Mr. Schurr explained to me on November 10, constitutes treatment of a hazardous waste -- an activity requiring a permit, and DEQ's permission under the order. I would submit, however, that this violation also is not "blatant." Although it may be obvious to you that using the equipments' heaters constitutes "treatment" of hazardous waste, that conclusion is not obvious to everyone: the equipment was designed to have heaters, use of the heaters was part of the plating operation, and the materials heated were the same materials used (and heated) when Mr. Martin operated the chrome plating business. I hope that DEQ will take into account these factors when determining whether to take additional enforcement action.

If you require additional information, please contact me. As I mentioned in my previous letter to you, I will be out of the office next week and part of the week of December 27. I would appreciate it if you would take my absence into account if you take any action or request information prior to my return.

Sincerely,

Glenn Klein

GK:cmc
cc: Client
Larry Schurr

STAR CONCRETE
689 UNION AVE
GRANTS PASS OR 97527

SERVICE ADDRESS IF OTHER THAN MAILING
1550 NEBRASKA AVE 1 & 2
GRANTS PASS OR 97527

WHEN MAKING INQUIRIES PLEASE CONTACT:
301 NE 6TH STREET
GRANTS PASS OR 97526
PHONE (503) 479-3381

										AMOUNT
83003856	25	OCT13	NOV10	28	80	4001	4347	80	27680	1,358.12
83003856	ON -PEAK DEMAND				80					
	KW LOAD SIZE				46					
							1.50% CITY TAX			20.37

pd 11-92

CURRENT AMOUNT		1,378.49
LAST MONTH BILLING	17.15	
PAYMENTS - THANK YOU	-17.15	
THROUGH		
OTHER CHARGES (+) (-)		
BALANCE FORWARD	0.00	0.00
TOTAL AMOUNT DUE		

BEFORE THE ENVIRONMENTAL QUALITY COMMISSION

STATE OF OREGON

DEPARTMENT OF ENVIRONMENTAL QUALITY, Department, v. KENNETH BOLCH, BETTY BOLCH, and STAR CONCRETE, INC., an Oregon corporation, Respondents.	No. HW-SWR-92-241 Ord. 987119121 SUPPLEMENTAL MEMORANDUM OF THE DEPARTMENT OF ENVIRONMENTAL QUALITY

This memorandum is submitted pursuant to request of the hearings officer by conference call with the parties on February 17, 1994.

The hearings officer has requested clarification of the Department's position that certain materials at Respondents' facility at the time of the alleged violations were by definition solid and hazardous wastes. Department's Pre-Hearing Response Brief at 4.

The parties are in agreement that for a waste to be a hazardous waste it must first meet the definition of solid waste contained in 40 CFR 261.2.

The attached Exhibit 1 is an inventory of the materials identified by Respondent at Respondents' facility in September 1992 subsequent to the Department's June 1992 order. These materials are identified by the waste codes which were used for characterization and ultimate disposal of the materials.

///

Attachment 7

The inventory included *inter alia* materials listed in 40 CFR Part 261.31: (1) spent cyanide plating bath solutions from electroplating operations (F007), plating bath residues from the bottom of plating baths from electroplating operations where cyanides are used in the process (F008), and spent stripping and cleaning bath solutions from electroplating operations where cyanides are used in the process (F009). As the inventory indicates, these spent solutions and residues constituted the bulk of the materials in question.

Spent materials[1] and residues are solid wastes if they meet any of the criteria for solid waste in 40 CFR 261.2 and are not otherwise excluded. That is, if the materials are discarded by virtue of being abandoned, recycled, or inherently wastelike as those terms are defined in 40 CFR 261.2(a), (b), (c), or (d) they are solid waste.

In the present case, at the time of the Department's June 1992 order, Respondents were storing the specified spent materials and residues prior to or in lieu of disposal, or prior to recycling or reclamation. The materials had been stored onsite since Mr. Martin, the lessee, was evicted on July 19, 1991 (nearly one year), without any use, reuse, or turnover. If Respondents were storing the materials with the intent or hope of recycling or reclaiming them, they were accumulating them

---

[1] A spent material is by definition any material that has been used and as a result of contamination can no longer serve the purpose for which it was produced without processing. 40 CFR 261.1(c)(1).

speculatively as defined in 40 CFR 261.1(c)(8). In either case, the materials, therefore, met the definition of solid waste in 40 CFR 261.2.

40 CFR 261.2(e) provides that certain materials, including spent materials and residues, are not solid wastes when they can be shown to be recycled (used, reused, or reclaimed. 40 CFR 261.1(c)(7)):

> "(e)(1) Materials are not solid wastes when they can be shown to be recycled by being:
>
> "(i) Used or reused as ingredients in an industrial process to make a product, provided the materials are not being reclaimed; or
>
> "(ii) Used or reused as effective substitutes for commercial products; or
>
> "(iii) Returned to the original process from which they are generated, without first being reclaimed. The material must be returned as a substitute for raw material feedstock, and the process must use raw materials as principal feedstocks."

However, in an enforcement action, 40 CFR 261.2(f) shifts the burden to Respondents who seek to raise a claim that certain materials are not a solid waste under 40 CFR 261.2(e):

> "(f) *Documentation of claims that materials are not solid wastes or are conditionally exempt from regulation.* Respondents in actions to enforce regulations implementing Subtitle C of RCRA who raise a claim that a certain material is not a solid waste, or is conditionally exempt from regulation, must demonstrate that there is a known market or disposition for the material, and that they meet the terms of the exclusion or exemption. In doing so, they must provide appropriate documentation (such as contracts showing that a second person uses the material as an ingredient in a production process) to demonstrate that the material is not a waste, or is exempt from regulation.

///

> In addition, owners or operators of facilities claiming that they actually are recycling materials must show that they have the necessary equipment to do so."

Respondents here never attempted, nor could they have met this exclusion/exemption test because they were not using the materials as product, and they had no documentation of a known market or disposition for the material.

In the February 17, 1994, conference call, there appeared to be confusion about which particular criteria in 40 CFR 261.2 the Department is alleging as the basis for its position that the materials in question were solid wastes. Because 40 CFR 261.2(f) shifts the burden to Respondents to demonstrate that materials such as spent solutions and process residues being stored are actually excluded or exempt from regulation as solid wastes, the regulatory agency need not attempt to prove with particularity whether a material is discarded by being abandoned or by being accumulated speculatively. Indeed, the agency often may have no means of distinguishing between the two. The agency need only establish that the material meets any of the criteria for a discarded material under 40 CFR 261.2(a)(1) and (a)(2). At that point the burden of proof shifts to Respondents.

As noted in the Department's Brief, spent materials, residues, and sludges which are solid and hazardous wastes are exempt from regulation while in process units or tanks under 40 CFR 261.4(1) until 90 days after the process units or storage tanks cease to be operated. Thereafter, they lose the exemption and become fully regulated wastes. This subjects the units to

full regulation as hazardous waste treatment, storage, or disposal units.

DATED this 23 day of February, 1994.

Respectfully submitted,

Larry Edelman
Assistant Attorney General

dld LHE0117.plc

Exhibit 1

BWR ASSOCIATES, INC.

September 24, 1992

Mr. Glenn Klein, Attorney
Harrang, Long, Watkinson, Arnold & Laird, P.C.
101 East Broadway, Suite 400
Eugene, Oregon 97401

REGARDING: INVENTORY OF MATERIALS, 1550 NEBRASKA, GRANTS PASS, OREGON

Dear Mr. Klein:

This letter is to submit the results of our inventory of the subject materials. We electronically transmitted pages 1-3 to you on Tuesday. Also enclosed with this submission is a plan sketch of the containers inside the building.

Note that the BWR team assumed to start that all the included materials were solid wastes. Out objective was to classify those materials which were identified as hazardous wastes under RCRA.

As of this date, we are still receiving laboratory results. When all of the test result hard copies have been received, we will forward copies to you with MSDS copies which were obtained during the investigation.

On the Inventory, we used the same identification numbers that ODEQ reported in December of 1991. We added Cont. (Containment) I - VI, which have been identified as sections for spill containment below the fiberglass floor grates.

BWR staff accomplished two additional physical actions during our investigation which we previously reported to you.

1) Moved a bag of potassium hydroxide from C4 to C5 in order to isolate it from the nickel chloride in C4. Date was September 3, 1992.

2) Taped plastic sheeting over the open tops of two plastic drums (No.'s 10 & 11). Date was September 11, 1992.

The last day that BWR's staff was inside the subject building was September 11th; containers and containments were in good shape at that time.

Please call me with questions concerning the inventory. We will be pleased to follow up with required environmental services.

REGISTERED PROFESSIONAL ENGINEER
8707
R. L. Gantenbein
OREGON

Sincerely,

R. L. Gantenbein

R. L. Gantenbein, Jr., P.E.
General Manager

RLG/dmr

Enclosure
92-667L

STARTED: 9/1/92
FINISHED: 9/22/92
PROJECT: 92-667L

INVENTORY OF MATERIALS
1550 NEBRASKA
GRANTS PASS, OREGON 97527

TANK OR DRUM NUMBER	DESCRIPTION	ESTIMATED QUANTITY	RCRA* CLASSIFICATION	COMMENT	CONTAINER	CONDITION
A1	SOAP CLEANER SOLUTION	240 GAL	D007, F009		OPEN PLASTIC DIP TANKS	OK
A2	ALKALINE CLEANER	215 GAL	F009		"	OK
A3	WATER RINSE	250 GAL	F009		"	OK
A4	ACID CLEANER	240 GAL	D002, D007, F009		"	OK
A5	WATER RINSE	240 GAL	F009		"	OK
B1	COPPER PLATING SOLUTION	240 GAL	F007, F008		"	OK
B2	WATER RINSE	240 GAL	F007, F008		"	OK
B3	WATER RINSE,	240 GAL	F007, F008		"	OK
B4	WATER RINSE	300 GAL	F007, F008		"	OK
D1	WATER RINSE	350 GAL	F007, F008		"	OK
D2	WATER RINSE	350 GAL	F007, F008		"	OK
D3	WATER RINSE	350 GAL	F007, F008		"	OK
D4	NICKEL PLATING SOLUTION	250 GAL	F007, F008		"	OK
E1	WATER RINSE	335 GAL	D007, F007, F008		"	OK
E2	WATER RINSE	335 GAL	D007, F007, F008		"	OK
E3	WATER RINSE	350 GAL	D007, F007, F008		"	OK
E4	CHROME PLATING SOLUTION	350 GAL	D007, F009		"	OK
C6	WATER RINSE	135 GAL	D002, F007		"	OK
C7	ACID STRIP CLEANER	170 GAL	D002, D007, F009		"	

* ASSUMES ALL MATERIALS ARE SOLID WASTE.

INVENTORY OF MATERIALS
1550 NEBRASKA
GRANTS PASS, OREGON 97527

TANK OR DRUM NUMBER	DESCRIPTION	ESTIMATED QUANTITY	RCRA* CLASSIFICATION	COMMENT	CONTAINER	CONDITION
C3	I. POTASSIUM CYANIDE II. COPPER PLATING AGENT III. COPPER PLATING AGENT ADDITION	4 LB 2 LB(1QT) ½ GAL	P030, P098 F007 D002, F007	SOLID, IN DRY PLASTIC DIP TANK LIQUID, IN DRY PLASTIC DIP TANK LIQUID, IN DRY PLASTIC DIP TANK	BAG CAN CAN	OK OK OK
C4	I. BORIC ACID II. NICKEL CHLORIDE	50 LB 50 LB		SOLID SOLID	BAG BAG	OK OK
C5	POTASSIUM HYDROXIDE	50 LB	D002	SOLID (MOVED FROM C4)	BAG	OK
CONT. I	BELOW FLOOR GRATING	100 GAL	D007, F007	LIQUID	MINOR CONTAIN-MENT	OK
CONT. II	BELOW FLOOR GRATING	25 GAL	D002, D007, F002	LIQUID	MINOR CONTAIN-MENT	OK
CONT. III	BELOW FLOOR GRATING	25 GAL	D007, F007	SOLID	MINOR CONTAIN-MENT	OK
CONT. IV	BELOW FLOOR GRATING	0.05 LB	D007, F007	SOLID RESIDUE	MAJOR CONTAIN-MENT	OK
CONT. V	BELOW FLOOR GRATING	27 LB	D007, F007	SOLID RESIDUE	MAJOR CONTAIN-MENT	OK
CONT. VI	BELOW FLOOR GRATING	110 LB	D007, F007	SOLID	MAJOR CONTAIN-MENT	OK

* ASSUMES ALL MATERIALS ARE SOLID WASTE.

CERTIFICATE OF SERVICE BY MAIL

I certify that on February 23, 1994, I served the foregoing SUPPLEMENTAL MEMORANDUM OF THE DEPARTMENT OF ENVIRONMENTAL QUALITY upon the party below by mailing, regular mail, postage prepaid, a true copy to:

Glenn Klein
Harrang, Long, Gary & Rudnick, P.C.
101 East Broadway, Suite 400
P.O. Box 11620
Eugene, OR 97440

L. Edelman

Larry Edelman
Assistant Attorney General

dk40046.plc

BEFORE THE ENVIRONMENTAL QUALITY COMMISSION

STATE OF OREGON

DEPARTMENT OF ENVIRONMENTAL QUALITY, Department, v. KENNETH BOLCH, BETTY BOLCH, and STAR CONCRETE, INC., an Oregon corporation, Respondents.	No. HW-SWR-92-241 Ord. 987119121 DEPARTMENT RESPONSE TO RESPONDENTS' REPLY BRIEF

The Department submits this response for the purpose of clarifying two issues confused by Respondents' Reply Brief.

I. Respondents assert that preclusion does not apply to bar their asserted defense that the materials in question were not "hazardous wastes." Respondents, however, confuse the application of the preclusion doctrine in Oregon.

Respondents argue that claim preclusion bars only a "claim for relief," whereas issue preclusion bars relitigating only issues "actually litigated." Therefore, they argue neither doctrine applies in this case. This, however, is a gross oversimplification of the doctrines.

As noted in the Department's Response Brief, claim preclusion (*res judicata*) as applied in Oregon, also bars an asserted defense to an action on a judgment where the defense relates to an essential matter which was the subject of the action resulting in the judgment. See Drews v. EBI Companies, 310 Or 134, 795 P2d 531 (1990). Moreover, in Oregon, the

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doctrine expressly makes a default judgment conclusive as to all matters which a defendant (Respondent) interposed or could have interposed as a defense and all matters otherwise essential to that judgment. Buck v. Mueller, 221 Or 271, 351 P2d 51 (1960); Gwynn v. Wilhelm, 226 Or 606, 609, 360 P2d 312 (1961).[1]

The Restatement (Second) of the Law of Judgments illustrates:

> "(2) In an action upon [a] judgment, the defendant cannot avail himself of defenses he might have interposed, or did interpose, in the first action. Ch. 3, sec. 18, p. 154.
>
> "* * * when the Plaintiff brings an action upon [a] judgment, the defendant cannot avail himself of defenses which he might have interposed in the original action * * *. It is immaterial whether he interposed the defense or failed to do so or even defaulted in the original action * * *. Id.
>
> "Illustrations:
>
> "4. A brings an action against B on a promissory note. B defaults. Judgment is given for A. A brings an action against B on the judgment. In this action B is precluded from denying that he executed the note and from setting up an affirmative defense such as fraud or illegality."

The Restatement illustrations are precisely on point here. The Department alleged violations of hazardous waste regulations and issued a compliance order to Respondents. Respondents defaulted, allowing the Department's order to become final by operation of law. The default order established all matters essential to judgment. Gwynn v. Wilhelm, supra. Respondents

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[1] The court in Buck v. Mueller refers to this application of claim preclusion/*res judicata* as "estoppel by judgment," a seemingly more accurately descriptive term.

failed to comply with the Order, and the Department assessed civil penalties as a sanction. Respondents are precluded from raising defenses which could have been raised in the original action.[2]

II. Respondents miss the point of 40 CFR Part 261.4. That regulation (as adopted by reference in Oregon) allows operation of process units or storage tanks which generate hazardous waste sludges and residues without subjecting them to hazardous waste regulation as long as they are in operation. However, 90 days after the units cease to be operated they become regulated, and all hazardous sludges, spent materials, and residues must be managed as hazardous wastes. The salient point here is that Respondents' tanks and containers undisputably contained some hazardous waste residues and sludges by virtue of the nature of the process, even at the time of operation by the lessee.

When operations ceased, the 90 days began to run under 40 CFR Part 261.4, and, thereafter, all containers holding any hazardous waste residues or sludges became subject to hazardous

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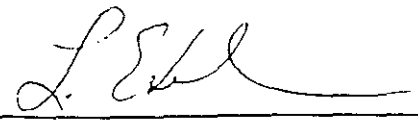
[2] Respondents also mischaracterize the law of issue preclusion as applied in Oregon. In Oregon a party may not litigate an issue of fact or law where the determination of that issue was essential to a prior judgment, and the party had an opportunity to litigate the issue, whether or not it was "actually" litigated. Hickey v. Settlemier, 116 Or App 436, 841 P2d 675 (1992).

waste regulation.[3] This obligated Respondents to empty the tanks, characterize the wastes and manage them appropriately.

Respectfully submitted,



Larry Edelman
Assistant Attorney General

dld LHE0103.plc

[3] At some indeterminate point after shutdown virtually all process chemicals in tanks and baths at the facility became spent wastes because they solidified or deteriorated so as to be unusable. However, this finding was not necessary for the Department's enforcement action. The presence of any hazardous waste, sludges or residues in the tanks triggered the violations once the 90-day period had run. The Department e-mails referenced by Respondents on page 5 of their Reply Brief merely reflect internal staff confusion on this distinction prior to review by enforcement and legal counsel.

CERTIFICATE OF SERVICE BY MAIL

I certify that on January 10, 1994, I served the foregoing DEPARTMENT OF ENVIRONMENTAL QUALITY RESPONSE TO RESPONDENTS' REPLY BRIEF upon the parties by mailing, regular mail, postage prepaid, a true copy to:

Glenn Klein
Harrang, Long, Watkinson, Arnold & Laird, P.C.
101 E. Broadway, Suite 400
Eugene, OR 97440

Larry Edelman
Assistant Attorney General

dld00104.plc

BEFORE THE ENVIRONMENTAL QUALITY COMMISSION

OF THE STATE OF OREGON

DEPARTMENT OF ENVIRONMENTAL QUALITY, Department, v. KENNETH BOLCH, BETTY BOLCH, and STAR CONCRETE, INC., an Oregon corporation, Respondents.	No. HW-SWR-92-241 Ord 987119121 DEPARTMENT OF ENVIRONMENTAL QUALITY PRE-HEARING RESPONSE BRIEF

Respondents, Kenneth Bolch, Betty Bolch, and Star Concrete, Inc. (Respondents) seek to challenge through this contested case a civil penalty imposed by the Department of Environmental Quality (DEQ) for their failure to comply with a June 30, 1992 final order.

The challenge is based on an assertion by Respondents that the violations alleged in DEQ's 1992 Order were improperly grounded, because the materials in question were not hazardous wastes. Respondents' Pre-Hearing Brief, p. 1. In essence, Respondents are moving to dismiss DEQ's penalty assessment.

Respondents challenge fails in two respects:

1. It is precluded by former adjudication under the doctrine of claim or issue preclusion (sometimes referred to as *res judicata* and collateral estoppel);

2. Even if it were not so precluded, the wastes in question were hazardous wastes by definition, a status not

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Attachment 9

affected by Respondents' alleged efforts to arrange for the sale, reuse, or reclamation of them.

PRECLUSION

Preclusion by former adjudication is a doctrine of rules and principles governing the binding effect on a subsequent proceeding of a final judgment previously entered in a claim. The term comprises two doctrines: claim preclusion, also know as *res judicata*, and issue preclusion, also known as collateral estoppel. See Drews v. EBI Companies, 310 Or 134, 139, 795 P2d 531 (1990).

Claim preclusion bars a party from relitigating a subject or question in a subsequent proceeding based on the same factual transaction. Drews v. EBI Companies, supra at 140. The doctrine applies to defenses which were or could have been raised. Id. at 140. The doctrine also applies to administrative proceedings. Id. at 439, citing Chavez v. Boise Cascade Corp. 307 Or 632, 772 P2d 409 (1989). Further, it applies to judgments by default as to matters essential to the judgment. Gwynn v. Wilhelm, 226 Or 606, 609, 360 P2d 312 (1961).

In the present case, the Notice of Violation and Compliance Order issued to Respondents on June 30, 1992, alleged that on June 18, 1992, a DEQ inspector observed hazardous waste stored onsite at Respondents' property, and that the site was not a permitted hazardous waste treatment, storage, or disposal site. Respondents did not contest these findings within the time

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allowed for appeal, and the Order became final by operation of law on July 23, 1992.

On September 29, 1992, after a lengthy period during which Respondents continuously disregarded DEQ's Order, Respondents were assessed a civil penalty for storing the same hazardous waste noted at the time of the inspection and violating the Order.

Respondents may not now assert that the subject wastes were not legally hazardous wastes on the theory that they were not "abandoned" or "discarded." Respondents could have raised such a claim in the prior action, but did not. The claim is therefore precluded in this action.[1]

THE PLATING WASTES AT RESPONDENTS' FACILITY WERE HAZARDOUS WASTES BY REGULATORY DEFINITION AND RESPONDENTS, AS FACILITY OWNERS, BECAME LIABLE FOR PROPER MANAGEMENT

Respondents' argument that plating wastes for which they became responsible upon eviction of their lessee were not solid wastes, and therefore not hazardous wastes is in error. See Respondents' Brief, pp. 4-7.

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[1] Even if the present case were not based upon the same facts as those in the June Notice of Violation, the doctrine of issue preclusion would nevertheless bar Respondents' collateral attack. Issue preclusion bars a party who has had an opportunity to litigate an issue of fact or law from relitigating the same issue where its determination was essential to the judgment. Hickey v. Settlemier, 116 Or App 436, 841 P2d 675 (1992). Here, a determination that the wastes were hazardous was essential to the judgment in the prior case. Under Oregon law, a default judgment establishes all material facts alleged in the complaint as long as the complaint states a valid claim. Rajneesh Foundation v. McGreer, 303 Or 139, 734 P2d 871 (1987).

Federal regulations at 40 CFR 261.2, incorporated by reference in OAR 340-100-002(1) provide that a solid waste is any garbage, refuse or sludge; or any other waste material which is (1) discarded or is being accumulated, stored or physically, chemically or biologically treated prior to being discarded; or (2) has served its original intended use and sometimes is discarded. Section 261.3 provides that a solid waste becomes a hazardous waste when (1) it first meets any of the listing descriptions set forth in Part 261, Subpart D; or (2) it first becomes a mixture containing a hazardous waste listed in Part 261, Subpart D; or (3) it first exhibits one or more of the characteristics of hazardous waste identified in Part 261, Subpart C. Section 261.1 provides that hazardous wastes identified in Part 261 are subject to regulation under Parts 262 through 265 and Parts 122 through 124.

Thus, plating bath residues, spent plating solutions, and bottom sludges in tanks and containers at Respondents' facility were hazardous wastes by definition even at the time the facility was being operated by Respondents' lessee.[2] They were exempted from regulation, however, while the business was operating by 40 CFR 261.4(1) which provides:

> "(c) Hazardous wastes which are exempted from certain regulations. A hazardous waste which is generated in a product or raw material storage tank, a product or raw

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[2] There is no factual dispute that the process dip tanks, prep/cleaner tanks and chemical holding tanks contained waste sludges and spent plating solutions. These were, in fact, ultimately characterized and managed as hazardous wastes by Respondent. See Uniform Hazardous Waste Manifests. Ex. 1.

material transport vehicle or vessel, a product or raw material pipeline, or in a manufacturing process unit or an associated non-waste-treatment-manufacturing unit, is not subject to regulation under parts 262 through 265, 268, 270, 271 and 124 of this chapter or to the notification requirements of section 3010 of RCRA until it exits the unit in which it was generated, unless the unit is a surface impoundment, or unless the hazardous waste remains in the unit more than 90 days after the unit ceases to be operated for manufacturing, or for storage or transportation of product or raw materials."[3] (Emphasis added).

After Respondents' lessee was evicted, the facility ceased operation. Waste remained in the tanks and containers for ninety days. Respondents, as the facility owners, had ninety additional days thereafter to empty the tanks and containers, segregate any useable product, and properly manage all hazardous waste.[4] When Respondents' failed to do so, the facility became an illegal hazardous waste storage facility, subjecting Respondents to the ensuing enforcement actions by the Department. Respondents' purported desire to sell or restart the business, or to have

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[3] The EPA preamble discussion of this section is attached as Exhibit 2.

[4] Respondents' lessee was evicted on July 19, 1991. DEQ reinspected Respondents' facility on June 18, 1992 and issued its Notice of Violation on June 30, 1992, nearly one year after the business ceased operating.

other persons assume responsibility for managing the wastes was entirely irrelevant to the regulatory characterization of the materials left onsite.[5]

DATED this 16 day of December, 1993 .

Respectfully submitted,

THEODORE R. KULONGOSKI
Attorney General

Larry Edelman #89158
Assistant Attorney General
Of Attorneys for State of Oregon
Department of Justice
1515 SW 5th Avenue, Suite 410
Portland, OR 97201
Telephone: (503) 229-5725

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[5] An allegation that some used or spent materials might have been reusable or reclaimable does not vitiate a regulatory characterization of such materials as discarded or abandoned under 40 CFR 261. See e.g., American Mining Congress v. EPA, 907 F2d 1179, 31 ERC 1935, 1940 (D.C. Cir. 1990).

Ex 1

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No. ORD987191921 | Manifest Document No. 01797 | 2. Page 1 of 1 | Information in the shaded areas is not required by Federal law.

3. Generator's Name and Mailing Address
CHROME CITY (KEN GOLCH)
39 UNION AVENUE, GRANTS PASS, OR 97527
4. Generator's Phone (503) 476-1471

A. State Manifest Document Number
B. State Generator's ID

5. Transporter 1 Company Name: SPENCER INC. | 6. US EPA ID Number: ORD088590575
C. State Transporter's ID
D. Transporter's Phone 503-655-0896

7. Transporter 2 Company Name | 8. US EPA ID Number
E. State Transporter's ID
F. Transporter's Phone

9. Designated Facility Name and Site Address
Tektronix
14150 SW Karl Braun Drive Building 40
Beaverton OR 97077
10. US EPA ID Number: ORD009020231
G. State Facility's ID
H. Facility's Phone 503-627-4648

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	HM	12. Containers No.	12. Containers Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. RQ, POISIONOUS LIQUIDS, N.O.S. (COPPER CYANIDE) (F007, F008, D010) 6.1, 11 UN 2810	X	005	DF	00275	G	F007, F008, D003, D010
b.						
c.						
d.						

J. Additional Descriptions for Materials Listed Above
PROFILE WT 368 COPPER PLATING SOLUTION

K. Handling Codes for Wastes Listed Above
BILL TO GENERATOR

15. Special Handling Instructions and Additional Information
WEARING PROTECTIVE CLOTHING, CONTAIN SPILL AND TAKE UP USING A VACUUM TRUCK OR ABSORBENT MATERIAL. IN CASE OF EMERGENCY, CONTACT MIKE GIBSON (503) 655-08967 ERG# 60-25, HAZ REG# 102092 85 0004

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national governmental regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name	Signature	Month	Day	Year
Ken Golch	Ken Golch	6	26	87

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
Bill Gibson	[illegible]	12	16	87

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year

GENERATOR'S COPY

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.	Manifest Document No.	2. Page 1 of 1	Information in the shaded areas is not required by Federal law.
ORD987191921	01746		

3. Generator's Name and Mailing Address
ROME CITY (KEN BOLCH)
689 UNION AVENUE, GRANTS PASS, OR 97527
4. Generator's Phone (503) 476-1471

A. State Manifest Document Number

B. State Generator's ID

5. Transporter 1 Company Name: SPENCER INC.
6. US EPA ID Number: ORD088590575
C. State Transporter's ID
D. Transporter's Phone: 503-655-0896

7. Transporter 2 Company Name
8. US EPA ID Number
E. State Transporter's ID
F. Transporter's Phone

9. Designated Facility Name and Site Address
TEKTRONIX
14150 SW KARL BRAUN DRIVE BUILDING 40
BEAVERTON OR 97077
10. US EPA ID Number: ORD009020231
G. State Facility's ID
H. Facility's Phone: 503-627-4648

11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	HM	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. RQ, WASTE CORROSIVE LIQUID, N.O.S. (SULFURIC ACID, CHROMIC ACID) (D004, D007) CORROSIVE MATERIAL UN 1760	X	07	DF		G	D002, D004, D005, D006, D007, D008
b.						D010
c.						
d.						

J. Additional Descriptions for Materials Listed Above
A) PROFILE WT 369 CHROME PLATING SOLUTION

K. Handling Codes for Wastes Listed Above
BILL DISPOSAL TO GENERATOR

15. Special Handling Instructions and Additional Information
WEARING PROTECTIVE CLOTHING, CONTAIN SPILL AND TAKE UP USING A VACUUM TRUCK OR ABSORBENT MATERIAL. IN CASE OF EMERGENCY, CONTACT MIKE GIBSON (503) 655-0896. ERG# 60 HAZ REG# 102092 85 0004

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national governmental regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name	Signature	Month	Day	Year
Ken Bolch	Ken Bolch	01	26	93

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year
John Hall		01	26	93

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month	Day	Year

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month	Day	Year

GENERATOR'S COPY

UNIFORM HAZARDOUS WASTE MANIFEST

1. Generator's US EPA ID No.	Manifest Document No.	2. Page 1 of	Information in the shaded areas is not required by Federal law.
ORD987191921	01798	4	

3. Generator's Name and Mailing Address
[illegible] City (Ken Bolch
89 Union Avenue, Grants Pass, OR 97527

4. Generator's Phone (503) [illegible]-1471

5. Transporter 1 Company Name	6. US EPA ID Number	C. State Transporter's ID
Spencer, Inc.	ORD088590575	D. Transporter's Phone 503-[illegible]

7. Transporter 2 Company Name	8. US EPA ID Number	E. State Transporter's ID
		F. Transporter's Phone

9. Designated Facility Name and Site Address	10. US EPA ID Number	G. State Facility's ID
Tektronix 14150 SW Karl Braun Drive Building 40 Beaverton OR 97077	ORD009020231	H. Facility's Phone [illegible]

HM	11. US DOT Description (Including Proper Shipping Name, Hazard Class, and ID Number)	12. Containers No.	Type	13. Total Quantity	14. Unit Wt/Vol	I. Waste No.
a. X	RQ, Hazardous Waste Liquid, N.O.S. (D008) (Chrome, Lead, Nickel) (F005, F008) ORM-E NA9189	13	DM	0715	[illegible]	F006/F00[illegible] D008/D00[illegible] D005,D0[illegible]
b. X	RQ, Hazardous Waste Liquid, N.O.S. (D008) (Chrome, Lead, Nickel) (F005, F008) ORM-E NA 9189	04	DM	0220	[illegible]	F006,F00[illegible] D005,D00[illegible]
c. X	RQ, Hazardous Waste, Solid, N.O.S. (D002) (Acid, Salts, H2O) ORM-E NA9189	01	DF	0225 / 0055	P	[illegible]
d. X	RQ, Waste Waste Corrosive, Liquid, N.O.S. (Sulphuric Acid, Nickel Sulphite) (D010) Corrosive Material NA1760	05	DF	0270	G	[illegible]

J. Additional Descriptions for Materials Listed Above
[illegible] Rinse Water [illegible] Land Ban certification attached
[illegible] Plating Solution [illegible]
[illegible] Acid Salts [illegible]
[illegible] Plating Solids

K. Handling Codes for Wastes Listed Above
[illegible] Generator

15. Special Handling Instructions and Additional Information
WEARING PROTECTIVE CLOTHING, CONTAIN SPILL AND TAKE UP USING A VACUUM TRUCK OR ABSORBENT MATERIAL. IN CASE OF EMERGENCY, CONTACT MIKE GIBSON (503)635-0[illegible]
ERG#160 HAZ REG# 102092 8500004

16. GENERATOR'S CERTIFICATION: I hereby declare that the contents of this consignment are fully and accurately described above by proper shipping name and are classified, packed, marked, and labeled, and are in all respects in proper condition for transport by highway according to applicable international and national governmental regulations.

If I am a large quantity generator, I certify that I have a program in place to reduce the volume and toxicity of waste generated to the degree I have determined to be economically practicable and that I have selected the practicable method of treatment, storage, or disposal currently available to me which minimizes the present and future threat to human health and the environment; OR, if I am a small quantity generator, I have made a good faith effort to minimize my waste generation and select the best waste management method that is available to me and that I can afford.

Printed/Typed Name	Signature	Month Day Year
Ken Bolch	Ken Bolch	06 16 93

17. Transporter 1 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month Day Year

18. Transporter 2 Acknowledgement of Receipt of Materials

Printed/Typed Name	Signature	Month Day Year
John Age	John Age	6 16 93

19. Discrepancy Indication Space

20. Facility Owner or Operator: Certification of receipt of hazardous materials covered by this manifest except as noted in Item 19.

Printed/Typed Name	Signature	Month Day Year

GENERATOR'S COPY

THIS SHIPPING ORDER must be legibly filled in, in Ink, in indelible pencil, or in carbon and retained by the Agent. —ORIGINAL—NON NEGOTIABLE

Shipper's No. ______

Carrier's No. ______

NAME OF CARRIER Spencer Jn

RECEIVED, subject to the classifications and tariffs in effect on the date of issue of this Original Bill of Lading.

AT ______ FROM ______ Date 1-26 1993

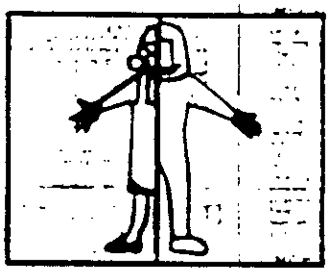
The property described below, in apparent good order, except as noted (contents and condition of contents of packages unknown) marked, consigned, and destined as shown below, which said company (the word company being understood through this contract as meaning any person or corporation in possession of the property under the contract) agrees to carry to its usual place of delivery at said destination, if on its own railroad, water line, highway route or routes, or within the territory of its highway operations, otherwise to deliver to another carrier on the route to said destination. It is mutually agreed, as to each carrier of all or any of said property over all or any portion of said route to destination, and as to each party at any time interested in all or any of said property, that every service to be performed hereunder shall be subject to all conditions not prohibited by law, whether printed or written, herein contained, including the conditions on the back hereof, which are hereby agreed to by the shippers and accepted for himself and his assigns.

CONSIGNED TO Tektronix Inc.	EXEMPTION # SEAL #
ADDRESS 14150 SW Karl Braun Dr, Bldg 40	ROUTE I-5 north FINAL DESTINATION Portland, OR
CITY Beaverton STATE OR ZIP 97077	INTERLINE CARRIER
EMERGENCY CONTACT: (503)-655-0896	CAR OR VEHICLE LICENSE # Y074036 NO. # 14

NO. & TYPES OF PKGS.	HAZ. MAT.	PROPER DOT SHIPPING NAME AS SHOWN IN 172.101 49CFR (See back for emergency response info)	CONSTITUENTS WHEN N.O.S SHIPPING NAME USED IN PARENTHESES	HAZARD CLASS UN/NA NUMBER(S)	* "POISON" & "INH. HAZARD" IF LC50. NAMES OF HAZARDOUS SUBSTANCE(S) IF "RQ"	WEIGHT SUBJECT TO CORRECTION	"RQ" VALUE & EMERGENCY RESP. GUIDE #
1 30lb		Potassium Hydroxide dry, solid A	( )	UN 1813	Non.	30lbs	☐ 1 ☐ 1000 ☐ 10 ☐ 5000 ☐ 100 ☐ ERG #
		B	( )				☐ 1 ☐ 1000 ☐ 10 ☐ 5000 ☐ 100 ☐ ERG #
		C	( )				☐ 1 ☐ 1000 ☐ 10 ☐ 5000 ☐ 100 ☐ ERG #
		D	( )				☐ 1 ☐ 1000 ☐ 10 ☐ 5000 ☐ 100 ☐ ERG #

WHERE CHECKED USE THE PROTECTIVE EQUIPMENT AND CLOTHING IF EXPOSED TO THIS MATERIAL IN USE OR IN AN EMERGENCY

- ☐ Hard Hat
- ☐ Safety Glasses
- ☒ Safety Goggles
- ☐ Full Face Shield
- ☒ Protective Gloves
- ☐ Splash Apron
- ☐ Protective Boots



- ☐ Respiratory Protection
- ☐ Air-purifying Respirator Type ______
- ☐ Fully Encapsulated Suit
- ☐ Atmosphere-Supplying Respirator Type ______

WHEN "RQ" QUANTITY RELEASED INTO ENVIRONMENT, IMMEDIATELY NOTIFY NAT. RESPONSE CENTER - 800-424-8802 AND 911 EMERGENCY SYSTEM OR LOCAL OPERATOR.

SPECIAL MARKINGS OR INSTRUCTIONS

SHIPPERS CERTIFICATION: This is to certify that the above named materials are properly classified, described, packaged, marked and labeled and are in proper condition for transportation according to the applicable regulations of the Department of Transportation.

Signature ______ Title ______

PLACARDS PROVIDED OR AFFIXED

*If the shipment moves between two ports by a carrier by water, the law requires that the bill of lading shall state whether it is "Carrier's or shipper's weight."

NOTE—Where the rate is dependent on value, shippers are required to state specifically in writing the agreed or declared value of the property. The agreed or declared value of the property is hereby specifically stated by the shipper to be not exceeding ______ per ______

SHIPPER'S CHECK LIST

DOT LABELS APPLIED AND SECURE.	DOT AUTHORIZED CONTAINERS
PROPER DOT NAME ON ALL PACKAGES	CHECKED FOR PROPER SEALING

Subject to Section 7 of conditions, if this shipment is to be delivered to the consignee without recourse on the consignor, the consignor shall sign the following statement: The carrier shall not make delivery of this shipment without payment of freight and all other lawful charges.

(Signature of consignor)

If charges are to be prepaid, write or stamp here "To be Prepaid."

Received $ ______ to apply in prepayment of the charges on the property described hereon.

Agent or Cashier

Per

(The signature here acknowledges only the amount prepaid)

Charges Advanced: $ ______

C.O.D. charge to be paid by Shipper ☐ Consignee ☐

* IF LC50 - ENTER "POISON- INHALATION HAZARD"

IF "RQ" IN ONE CONTAINER - ENTER NAMES OF HAZARDOUS SUBSTANCE(S) IN PARENTHESES

SHIPPER Chrome City

ADDRESS 1330 Nebraska

CITY Grants Pass STATE OR

TELEPHONE (503) 479-3483

PER Ken Balch SIGNATURE

AGENT

PER

NUMBER

PERMANENT POST OFFICE ADDRESS OF SHIPPER

2

Transportation Skills Program, 243 West Main Street, Kutztown, Pennsylvania 19530

PRINTED IN U.S.A.

Thursday
October 30, 1980

FEDERAL REGISTER

Part XI

Environmental Protection Agency

Hazardous Waste Management System: Identification and Listing of Hazardous Waste, and Interim Status Standards for Owners and Operators of Treatment, Storage, and Disposal Facilities; Final, Interim, and Proposed Regulations

ENVIRONMENTAL PROTECTION AGENCY

40 CFR Parts 260 and 261

[SW FRL 1642-4]

Hazardous Waste Management System; General and Identification and Listing of Hazardous Waste

AGENCY: Environmental Protection Agency.

ACTION: Interim final amendment to rule and request for comments.

SUMMARY: This regulation amends 40 CFR 261.4 to provide that a hazardous waste that is generated in a product or raw material storage tank, transport vehicle or vessel or in a manufacturing process unit is not subject to regulation under 40 CFR Parts 262 through 265 or Parts 122 through 124 or the requirements of Section 3010 of the Resource Conservation and Recovery Act (RCRA) until it is removed from the unit in which it was generated, unless the unit in which it is generated is a surface impoundment or unless the hazardous waste remains in the unit for more than 90 days after the unit ceases to be operated for the purpose of storing transporting product or raw materials manufacturing. This regulation also amends 40 CFR 260.10 to modify the definition of "generator" so that it clearly covers persons who remove hazardous wastes from product or raw material storage tanks, transport vehicles or vessels, or manufacturing process units in which the hazardous waste is generated. Finally, this regulation amends 40 CFR 260.10 to add definitions for "transport vehicle" and "vessel." The purpose of this requirement is to allow persons handling hazardous wastes sufficient lead time to prepare to comply with major new regulatory requirements. The effect of these amendments is to reduce the overall costs, economic impact and reporting and recordkeeping impacts of EPA's hazardous waste management regulations.

DATES: Effective Date: For the amendment to 40 CFR 261.4 and the definitions of "transport vehicle" and "vessel," in 40 CFR 260.10, November 19, 1980.

For the amendment to the definition of "generator," in 40 CFR 260.10, April 30, 1981.

Comment Date: This amendment is promulgated as an interim final rule. The Agency will accept comments on it until December 29, 1980.

ADDRESSES: Comments on the amendment should be sent to Docket Clerk [Docket No. 3001], Office of Solid Waste (WH-565), U.S. Environmental Protection Agency, 401 M Street, SW., Washington, D.C. 20460.

FOR FURTHER INFORMATION CONTACT: For general information, contact Alfred W. Lindsey, Office of Solid Waste, U.S. Environmental Protection Agency, 401 M Street, SW., Washington, D.C. 20460, (202) 755-9185. For information on implementation, contact:

Region I, Dennis Huebner, Chief, Radiation, Waste Management Branch, John F. Kennedy Building, Boston, Massachusetts 02203, (617) 223-5777

Region II, Dr. Ernest Regna, Chief, Solid Waste Branch, 28 Federal Plaza, New York, New York 10007, (212) 284-0504/5

Region III, Robert L. Allen, Chief, Hazardous Materials Branch, 6th and Walnut Streets, Philadelphia, Pennsylvania 19106, (215) 597-0980

Region IV, James Scarbrough, Chief, Residuals Management Branch, 345 Courtland Street, N.E., Atlanta, Georgia 30365, (404) 881-3018

Region V, Karl J. Klepitsch, Jr., Chief, Waste Management Branch, 230 South Dearborn Street, Chicago, Illinois 60604, (312) 886-6148

Region VI, R. Stan Jorgensen, Acting Chief, Solid Waste Branch, 1201 Elm Street, First International Building, Dallas, Texas 75270, (214) 787-2645

Region VII, Robert L. Morby, Chief, Hazardous Materials Branch, 324 E. 11th Street, Kansas City, Missouri 64106, (816) 374-3307

Region VIII, Lawrence P. Gazda, Chief, Waste Management Branch, 1860 Lincoln Street, Denver, Colorado 80203, (303) 837-2221

Region IX, Arnold R. Den, Chief, Hazardous Materials Branch, 215 Fremont Street, San Francisco, California 94105, (415) 556-4606

Region X, Kenneth D. Feigner, Chief, Waste Management Branch, 1200 Sixth Avenue, Seattle, Washington 98101, (206) 442-1260.

SUPPLEMENTARY INFORMATION:

I. Amendment to 40 CFR 261.4

On February 26 and May 19, 1980, EPA promulgated hazardous waste regulations in 40 CFR Parts 260 through 265 (45 FR 12721 et seq. and 45 FR 33066 et seq.) and on May 19, 1980, promulgated consolidated permit regulations in 40 CFR Parts 122 through 124 (45 FR 33289 et seq.). Section 261.2 of these regulations provides that a solid waste is any garbage, refuse or sludge or any other waste material which is (1) discarded or is being accumulated, stored or physically, chemically or biologically treated prior to being discarded; or (2) has served its original intended use and sometimes is discarded; or (3) is a manufacturing or mining by-product and sometimes is discarded. Section 261.3 provides that a solid waste becomes a hazardous waste when (1) it first meets any of the listing descriptions set forth in Part 261 Subpart D; or (2) it first becomes a mixture containing a hazardous waste listed in Part 261, Subpart D; or (3) it first exhibits one or more of the characteristics of hazardous waste identified in Part 261, Subpart C. Section 261.1 provides that hazardous wastes identified in Part 261 are subject to regulation under Parts 262 through 265 and Parts 122 through 124. The effect of these provisions, particularly § 261.3(b), is to make hazardous wastes subject to regulation at the point where they are generated. The point of generation, however, may be a product or raw material storage tank, transport vehicle or vessel, or a manufacturing process unit. A literal application of the Part 261 regulations would mean that such units are hazardous waste storage facilities, and that their owners and operators must comply with the notification requirements of Section 3010 of RCRA, submit applications for and obtain permits under Part 122 and comply with the Interim Status Standards of Part 265 until a permit is issued or denied. An exception to these requirements is provided in § 262.34 which states that hazardous waste may be accumulated on the site of its generation without a permit for 90 days or less before it is removed and transported off-site for treatment, storage or disposal. For such accumulation, the owner and operator of the unit must notify under Section 3010 and comply with § 262.34, including requirements for containerization, labelling, marking, inspection and personnel training.

Many members of the regulated community have questioned the Agency's intent and wisdom in regulating those units in which hazardous wastes are first generated. These people claim that such units only incidentally hold or treat hazardous wastes and thus should not be subject to the regulations. They contend that such hazardous wastes do not pose a hazard to human health or the environment while they remain in these units.

Commenters on this issue provided several examples of units in which hazardous wastes are generated which currently appear to be perhaps unnecessarily subject to these regulations.

responsibilities and to whom it will initially look to perform the generator duties where more than one party is involved and where EPA does not know which party, by mutual agreement, is appointed to carry out the generator duties, or where no party has been so designated. In the case of hazardous wastes generated in a stationary product or raw material storage tank, EPA will initially look to the operator of the tank to perform the generator responsibilities. EPA believes that this party is in the best position to perform the generator responsibilities. The operator typically is on-site and can determine when a tank contains sludges or residues that may be hazardous wastes. He certainly knows or ought to know when these sludges and residues are being removed and, therefore, when they become subject to regulation, if they are a hazardous waste. Because he is typically on-site, he is in a good position to carry out those duties of a generator which practically must be performed on-site. These include determining whether a hazardous waste exists (§ 262.11), initiating a manifest for off-site shipment (Part 262, Subpart B) and performing the pre-transportation requirements of packaging, labeling and marking (Part 262, Subpart C).

For hazardous wastes generated in a manufacturing process unit, EPA will initially look to the operator of the unit to fulfill the generator duties for the same reasons described above.

For hazardous wastes generated in a product or raw material transport vehicle or vessel which are removed at a central facility which is operated to remove sediments and residues from such vehicles or vessels, the Agency will initially look to the operator of the central facility to perform the generator duties. Following the reasoning outlined above, the Agency believes that the operator of a central facility is the party best able to perform the generator duties. Where hazardous wastes generated in product or raw material transport vehicles or vessels are not removed at a central facility, the Agency will look to the operator of the vehicle or vessel to perform the generator duties.

As discussed above, the person who removes hazardous waste from a manufacturing process unit or a product or raw materials storage tank, transport vehicle or vessel will be jointly and severally liable, along with the owner and operator of the tank, vehicle, vessel or unit and the owner of the product or raw material, as a generator. To clarify that such persons are included in the definition of generator, the Agency, in this rulemaking action, is amending the definition of "generator" in § 260.10 by adding a final clause so that the definition reads "* * * any person, by site, whose act or process produces a hazardous waste identified or listed in Part 261 of this Chapter or whose act first causes a hazardous waste to become subject to regulation."

IV. Accumulation of Hazardous Wastes

A number of questions have been asked about whether the hazardous wastes removed from product or raw material storage tanks, transport vehicles or vessels or manufacturing process units can be accumulated on-site without a permit for up to 90 days after removal and prior to off-site transport in accordance with § 262.34. Because today's amendment to § 261.4 subjects such hazardous wastes to regulation only after they are removed from such tanks, vehicles, vessels or units and because there often will be a need to accumulate the removed wastes until a sufficient quantity can be obtained for off-site transport, the Agency believes that the 90-day accumulation provisions of § 262.34 should be available to the generators of these hazardous wastes, except where these wastes are generated in a surface impoundment or the wastes remain in the unit more than 90 days following cessation of operation of the unit.

This allowance of 90-day accumulation without a permit is available to any of the persons who are generators, even though the party accumulating the waste on-site may not own or operate the site. This allowance only applies where the accumulation occurs on the site where the removal of hazardous waste from the tank, vehicle, vessel or unit takes place; all of the other conditions and requirements of § 262.34 must, of course, be met. The 90-day accumulation period starts when the hazardous waste is removed from the tank, vehicle, vessel or unit, except in the case where a tank, vehicle, vessel or unit ceases to be operated for its primary purpose, in which case the period starts when operation ceases.

V. Notification and EPA Identification Number Requirements

A number of questions have been asked about how the notification requirements of Section 3010 of RCRA and the EPA Identification Number requirements of § 262.12 apply to generators of hazardous wastes generated in manufacturing process units or product or raw material storage tanks, transport vehicles or vessels. Today's amendment to § 261.4 provides that such wastes (not including those generated in surface impoundments or retained for more than 90 days in non-operating units) are not subject to regulation, including section 3010 notification, until they exit the units in which they are generated. Thus, only those wastes that are removed during a future notification period are subject to notification.

Section 262.12, though, requires that a generator must not treat, store, dispose of, transport or offer for transportation a hazardous waste without having an EPA Identification Number. Section 260.10 defines a "generator" to be a person "by site" who generates wastes. Therefore a generator must have a separate EPA Identification Number for each site at which he generates hazardous wastes. Where two or more persons are generators, as discussed above, the person who performs the duties of a generator must have and use an EPA Identification Number for the site at which hazardous wastes are removed from a tank, vehicle, vessel or unit. Thus, if the operator of the tank, vehicle, vessel or unit performs the generator duties, he must have an EPA Identification Number for the facility and can use that number with respect to the management of all of his hazardous waste generated at that facility. If the owner of the product or raw material performs the duties of the generator, he must have and use an EPA Identification Number for the site at which the hazardous waste is generated: if he owns products being stored or processed at several sites, he must have and use a separate EPA Identification Number for each site. If the person who removes hazardous wastes from tanks or units performs the generator duties, he must have a separate EPA Identification Number for each site at which he performs these duties.

VI. Effective Date

Section 3010(b) of RCRA provides that EPA's hazardous waste regulations and revisions thereto take effect six months after their promulgation. The purpose of this requirement is to allow persons handling hazardous wastes sufficient lead time to prepare to comply with major new regulatory requirements. For the amendment to § 261.4 promulgated today, however, the Agency believes, that an effective date six months after promulgation would cause substantial and unnecessary disruption in the implementation of the regulations and would be counterproductive for the regulated community and the public. The regulatory provisions that these amendments modify take effect on November 19, 1980. In the absence of the effectuation of these amendments,

responsibilities and to whom it will initially look to perform the generator duties where more than one party is involved and where EPA does not know which party, by mutual agreement, is appointed to carry out the generator duties, or where no party has been so designated. In the case of hazardous wastes generated in a stationary product or raw material storage tank, EPA will initially look to the operator of the tank to perform the generator responsibilities. EPA believes that this party is in the best position to perform the generator responsibilities. The operator typically is on-site and can determine when a tank contains sludges or residues that may be hazardous wastes. He certainly knows or ought to know when these sludges and residues are being removed and, therefore, when they become subject to regulation, if they are a hazardous waste. Because he is typically on-site, he is in a good position to carry out those duties of a generator which practically must be performed on-site. These include determining whether a hazardous waste exists (§ 262.11), initiating a manifest for off-site shipment (Part 262, Subpart B) and performing the pre-transportation requirements of packaging, labeling and marking (Part 262, Subpart C).

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As discussed above, the person who removes hazardous waste from a manufacturing process unit or a product or raw materials storage tank, transport vehicle or vessel will be jointly and severally liable, along with the owner and operator of the tank, vehicle, vessel or unit and the owner of the product or raw material, as a generator. To clarify that such persons are included in the definition of generator, the Agency, in this rulemaking action, is amending the definition of "generator" in § 260.10 by adding a final clause so that the definition reads "* * * any person, by site, whose act or process produces a hazardous waste identified or listed in Part 261 of this Chapter or whose act first causes a hazardous waste to become subject to regulation."

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Section 262.12, though, requires that a generator must not treat, store, dispose of, transport or offer for transportation a hazardous waste without having an EPA Identification Number. Section 260.10 defines a "generator" to be a person "by site" who generates wastes. Therefore a generator must have a separate EPA Identification Number for each site at which he generates hazardous wastes. Where two or more persons are generators, as discussed above, the person who performs the duties of a generator must have and use an EPA Identification Number for the site at which hazardous wastes are removed from a tank, vehicle, vessel or unit. Thus, if the operator of the tank, vehicle, vessel or unit performs the generator duties, he must have an EPA Identification Number for the facility and can use that number with respect to the management of all of his hazardous waste generated at that facility. If the owner of the product or raw material performs the duties of the generator, he must have and use an EPA Identification Number for the site at which the hazardous waste is generated; if he owns products being stored or processed at several sites, he must have and use a separate EPA Identification Number for each site. If the person who removes hazardous wastes from tanks or units performs the generator duties, he must have a separate EPA Identification Number for each site at which he performs these duties.

VI. Effective Date

Section 3010(b) of RCRA provides that EPA's hazardous waste regulations and revisions thereto take effect six months after their promulgation. The purpose of this requirement is to allow persons handling hazardous wastes sufficient lead time to prepare to comply with major new regulatory requirements. For the amendment to § 261.4 promulgated today, however, the Agency believes that an effective date six months after promulgation would cause substantial and unnecessary disruption in the implementation of the regulations and would be counterproductive for the regulated community and the public. The regulatory provisions that these amendments modify take effect on November 19, 1980. In the absence of the effectuation of these amendments,

operators of a large number of product and raw material storage tanks, transport vehicles and vessels, and manufacturing process units in which hazardous wastes are generated would have to prepare to operate these facilities as hazardous waste storage facilities on and after November 19, 1980. This would involve preparation and submission of a Part A permit application, preparation of a contingency plan and implementation of a number of administrative and operational practices required by Part 265 for hazardous waste storage facilities. The Agency believes it makes little sense to allow these requirements promulgated on May 19 to become effective on November 19, 1980, and then have them substantially modified on a subsequent date, i.e., the six-month effective date for these amendments.

The amendment to § 261.4 in effect spends regulation of certain facilities by clarifying when certain hazardous wastes are first subject to the hazardous waste regulations. This lessening of regulatory requirements surely is not the type of revision to regulations that Congress had in mind when it provided a six-month delay between the promulgation and the effective date of revisions to regulations. Consequently, the Agency is setting an effective date of November 19, 1980, for the amendment to § 261.4 promulgated in this rulemaking action.

The definitions of "transport vehicle" and "vessel" are necessary for an understanding of the amendment to § 261.4 and consequently they too have an effective date of November 19, 1980.

EPA is making the amendment to the definition of "generator" effective six months after promulgation, as provided in Section 3010(b) of RCRA. Although many persons who remove hazardous wastes from manufacturing units or from product or raw material storage tanks, vehicles or vessels, recognized that in certain situations they fell within the May 19, 1980, definition of generators, the amendment to the definition will probably make some additional persons generators. These people undoubtedly deserve the six month lead time that Congress provided in Section 3010(b). All persons who fit the May 19 definition of "generator" must comply with all applicable generator requirements on November 19, 1980. Only those persons who are made generators by today's amendment to the definition have an additional six months before they must comply with Part 262 requirements.

VII. Regulatory Impacts

The effect of these amendments is to reduce the overall costs, economic impact and reporting and recordkeeping impacts of EPA's hazardous waste management regulations. This is achieved by removing from regulation as storage facilities product and raw materials storage tanks, transport vehicles and vessels, and manufacturing process units that generate hazardous waste. The Agency is unable to estimate these cost and impact reductions because it does not have an estimate of the number of such tanks and units that otherwise would be regulated. For the reasons already discussed, notwithstanding these cost and impact reductions, the Agency believes that human health and environmental protection will not be reduced by this action.

VIII. Request for Comments

The Agency invites comments on all aspects of these amendments and on all of the issues discussed in this preamble, including the interpretation of "generator," the allowance of 90-day accumulation to all generators, and the notification and EPA Identification Number requirements. EPA is providing a 60-day comment period.

The Agency also invites comments on whether the amendment should also apply to hazardous wastes generated in product or raw material containers other than transportation vehicles and vessels (see § 260.10 for definition of the term "containers"). The Agency has not applied this amendment to such hazardous wastes because it is not aware that significant amounts of hazardous wastes are generated in product or raw material containers (exclusive of transportation vehicles or vessels).

The Agency recognizes that a wide variety of situations exist in the real world, and it is anxious to make its regulations and regulatory interpretations reasonable, understandable, and capable of implementation. The Agency can only do this by learning of situations where the regulations do not work well.

Dated: October 24, 1980.

Douglas M. Costle,

Administrator.

Title 40 of the Code of Federal Regulations is amended as follows:

1. Add the following paragraph (c) to § 261.4:

§ 261.4 Exclusions.

* * * * *

(c) Hazardous wastes which are exempted from certain regulations. A hazardous waste which is generated in a product or raw material storage tank, a product or raw material transport vehicle or vessel, or in a manufacturing process unit or an associated non-waste-treatment manufacturing unit, is not subject to regulation under Parts 262 through 265 and Parts 122 through 124 of this chapter or to the notification requirements of Section 3010 of RCRA until it exits the unit in which it was generated, unless the unit is a surface impoundment, or unless the hazardous waste remains in the unit more than 90 days after the unit ceases to be operated for manufacturing, or for storage or transportation or product or raw materials.

§ 260.10 [Amended]

2. Amend the definition of "Generator" in § 260.10 to read as follows:

* * * * *

Generator means any person, by site, whose act or process produces hazardous waste identified or listed in Part 261 of this chapter or whose act first causes a hazardous waste to become subject to regulation.

* * * * *

3. Add the following definitions to § 260.10:

* * * * *

"Transport vehicle" means a motor vehicle or rail car used for the transportation of cargo by any mode. Each cargo-carrying body (trailer, railroad freight car, etc.) is a separate transport vehicle. "Vessel" includes every description of watercraft, used or capable of being used as a means of transportation on the water.

[FR Doc. 80-33856 Filed 10-29-80; 8:45 am]

BILLING CODE 6560-30-M

CERTIFICATE OF SERVICE BY MAIL

I certify that on December 16, 1993, I served the foregoing DEPARTMENT OF ENVIRONMENTAL QUALITY PRE-HEARING RESPONSE BRIEF upon the parties by mailing, regular mail, postage prepaid, a true copy to:

Glenn Klein
Harrang Long Watkinson
Arnold & Laird, P.C.
101 E. Broadway, Suite 400
P.O. Box 11620
Eugene, OR 97440

Larry Edelman
Assistant Attorney General

BEFORE THE ENVIRONMENTAL QUALITY COMMISSION

OF THE STATE OF OREGON

DEPARTMENT OF ENVIRONMENTAL QUALITY OF THE STATE OF OREGON, Department, v. KENNETH BOLCH; BETTY BOLCH; and STAR CONCRETE, INC., an Oregon corporation, Respondents.	No. HW-SWR-92-241 NOTICE OF APPEAL

Respondents hereby give notice of appeal from the "final decision" entered in this matter pursuant to the attached stipulation of the parties. The final decision consists of two interim orders issued by the hearings officer on April 1, 1994 and November 8, 1994.

I certify that I served a true copy of this Notice of Appeal on March 1, 1995, by mailing the Notice of Appeal in an envelope addressed to:

Lawrence Edelman
Assistant Attorney General
Department of Justice
1515 S.W. 5th Ave., Ste. 410
Portland, OR 97201

Representing Department

DATED this 1st day of March, 1995.

HARRANG LONG GARY RUDNICK P.C.

By: _____
Glenn Klein, OSB #83110
Of Attorneys for Respondents

HARRANG LONG
GARY RUDNICK
101 E. Broadway
Eugene, OR 97401
(503) 485-0220

CERTIFICATE OF FILING

I certify that on March 1, 1995, I filed the original of this **Notice of Appeal** with the Environmental Quality Commission, 811 S.W. 6th Ave., Portland, OR 97204, by causing the same to be deposited in the United States Mail at Eugene, Oregon, enclosed in a sealed envelope with postage prepaid.

Glenn Klein, OSB #83110
Of Attorneys for Respondents

CERTIFICATE OF SERVICE

I certify that on March 1, 1995, I served a full and complete copy of the foregoing **Notice of Appeal** on the party or parties listed below, by causing the same to be deposited in the United States Mail at Eugene, Oregon, enclosed in a sealed envelope with postage prepaid, and addressed as follows:

Lawrence Edelman
Assistant Attorney General
Department of Justice
1515 S.W. 5th Ave., Ste. 410
Portland, OR 97201

Glenn Klein, OSB #83110
Of Attorneys for Respondents

HARRANG LONG
GARY RUDNICK
101 E. Broadway
Eugene, OR 97401
(503) 485-0220

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DEPARTMENT OF ENVIRONMENTAL QUALITY OF THE STATE OF OREGON, Department, v. KENNETH BOLCH; BETTY BOLCH; and STAR CONCRETE, INC., an Oregon corporation, Respondents.	No. HW-SWR-92-241 NOTICE OF APPEAL

Respondents hereby give notice of appeal from the "final decision" entered in this matter pursuant to the attached stipulation of the parties. The final decision consists of two interim orders issued by the hearings officer on April 1, 1994 and November 8, 1994.

I certify that I served a true copy of this Notice of Appeal on March 1, 1995, by mailing the Notice of Appeal in an envelope addressed to:

Lawrence Edelman
Assistant Attorney General
Department of Justice
1515 S.W. 5th Ave., Ste. 410
Portland, OR 97201

Representing Department

DATED this 1st day of March, 1995.

HARRANG LONG GARY RUDNICK P.C.

By: _____
Glenn Klein, OSB #83110
Of Attorneys for Respondents

HARRANG LONG
GARY RUDNICK
101 E. Broadway
Eugene, OR 97401
(503) 485-0220

CERTIFICATE OF FILING

I certify that on March 1, 1995, I filed the original of this **Notice of Appeal** with the Environmental Quality Commission, 811 S.W. 6th Ave., Portland, OR 97204, by causing the same to be deposited in the United States Mail at Eugene, Oregon, enclosed in a sealed envelope with postage prepaid.

Glenn Klein, OSB #83110
Of Attorneys for Respondents

CERTIFICATE OF SERVICE

I certify that on March 1, 1995, I served a full and complete copy of the foregoing **Notice of Appeal** on the party or parties listed below, by causing the same to be deposited in the United States Mail at Eugene, Oregon, enclosed in a sealed envelope with postage prepaid, and addressed as follows:

Lawrence Edelman
Assistant Attorney General
Department of Justice
1515 S.W. 5th Ave., Ste. 410
Portland, OR 97201

Glenn Klein, OSB #83110
Of Attorneys for Respondents

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BEFORE THE ENVIRONMENTAL QUALITY COMMISSION

OF THE STATE OF OREGON

DEPARTMENT OF ENVIRONMENTAL QUALITY OF THE STATE OF OREGON, Department, vs. KENNETH BOLCH; BETTY BOLCH; and STAR CONCRETE, INC., an Oregon corporation, Respondents.	No. HW-SWR-92-241 ORD 987191921 RESPONDENTS' PRE-HEARING BRIEF RE: "HAZARDOUS WASTE" DEFINITIONAL ISSUE

OVERVIEW

Respondents have appealed civil penalties imposed by the Department due to the presence of materials in a building owned by respondents which the Department has concluded are "hazardous wastes." Respondents dispute the Department's assertion that the materials constitute "hazardous wastes." There is no dispute as to the content of those materials; instead, the dispute centers around whether the materials meet the definition of a "hazardous waste" simply because the business owned by Danny Martin had not operated for more than 90 days.

The parties believe that this issue goes to the heart of the Department's civil penalty assessment. Therefore, the parties are filing briefs on the question of whether the materials become "hazardous wastes" because of their "storage" at respondents' building.[1]

As will be discussed below, "hazardous wastes" are defined as "solid wastes" which meet certain criteria. Unless a material is a "solid waste," then the material cannot be a "hazardous waste." "Solid wastes" are defined to include material which is disposed of,

[1] The Department also may raise a question as to whether respondents' failure to challenge the Department's compliance order collaterally estops, or otherwise precludes respondents from raising this issue in this proceeding. If raised by the Department, respondents will address that issue in respondents' reply brief.

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burned, incinerated, or accumulated or stored in lieu of being disposed of. The materials from the chrome plating business were not being stored in lieu of disposal, but instead, were being stored until the legal issues could be resolved and the facility reopened or the materials sold to another business.

FACTUAL BACKGROUND

Respondents own the building located at 1515 Nebraska Avenue in Grants Pass. Respondents leased the building to Danny and Glenda Martin and Glenmar, Inc. ("Lessees") to operated a chrome plating business called Chrome City. In July 1991, the lessees were evicted, but they left behind most assets of the business, including the chemicals and equipment from the chrome plating business.

The Department inspected the facility on August 29, 1991. At that time, the Department's inspector, Jonathan Gasik, noticed three 5 gallon cans of brown sludge. The Department notified Mr. Martin that he must perform a hazardous waste determination on that waste (i.e., the three 5 gallon cans) and then properly handle and dispose of it.[2] [Ex. 16] With respect to the other materials located at the site, Mr. Gasik notified both Mr. Martin and respondents that the materials would become hazardous wastes. According to the Department, respondents' act of having lessees evicted "caused the material in the tanks to be abandoned by the Tenant.[3] As of October 28, 1991, the material in the tanks will become hazardous waste and you [respondents] will be a generator of hazardous waste as defined in ORS 466.005." [Exhibit ("Ex.") 1, attached hereto.]

As the language quoted above demonstrates, the Department assumed that the

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[2] The three 5 gallon cans subsequently were removed and are not at issue in this proceeding.

[3] Although not determinative on the issue presented in this brief, respondents note that Mr. Martin was given at least seven days to remove all of his equipment, chemicals and other possessions from the building at the time of the eviction, as well as additional time during the subsequent year.

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material was a "solid waste," and therefore, automatically would become a hazardous waste, after 90 days of non-use. The Department failed, however, to analyze whether the material, in fact, met the definition of "solid waste." For the reasons that follow, the material was not a "solid waste," and consequently, could not be a "hazardous waste."

REGULATORY FRAMEWORK AND DEFINITION OF "HAZARDOUS WASTE"

The Department's regulations for the hazardous waste program adopt the rules and regulations of the U.S. Environmental Protection Agency ("EPA"). See OAR 340-100-002(1). More specifically, the Environmental Quality Commission adopted by reference, inter alia, EPA's regulations at 40 CFR Parts 260-266. Id. Part 261 governs the definition and identification of hazardous wastes.

EPA's rules define a "hazardous waste" as a solid waste, as defined in § 261.2, if the solid waste meets certain criteria. 40 CFR § 261.3. In other words, hazardous wastes are a subset of solid wastes; for a material to be classified as a hazardous waste, it must meet EPA's definition of solid waste. See U.S. v. Self, 2 F.3d 1071, 1076 (10th Cir. 1993); Connecticut Coastal Fishermen v. Remington Arms, 989 F.2d 1305, 1313 (2nd Cir. 1993).

A solid waste is any "discarded material" which is not excluded under another regulation. 40 CFR § 261.2(a)(1). A "discarded material," in turn, is defined as any material which is "abandoned," "recycled," or "inherently wastelike" as those terms are defined by EPA rule. 40 CFR § 251.2(a)(2).

The Department concluded that the materials left by Mr. Martin were "solid wastes" because they were "abandoned" within the meaning of EPA's rules. An examination of that definition, however, demonstrates that the materials were not "abandoned." According to EPA's rules:

"(b) Materials are solid waste if they are abandoned by being:

"(1) Disposed of; or

"(2) Burned or incinerated; or

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> "(3) Accumulated, stored or treated (but not recycled) before or in lieu of being abandoned by being disposed of, burned, or incinerated." 40 CFR § 261.2(b).

The Department concluded that the materials were solid wastes (and therefore hazardous wastes) because the materials were being stored in lieu of disposal. The Department is wrong, as the discussion below demonstrates.

RESPONDENTS NEVER STORED THE MATERIALS IN LIEU OF DISPOSAL

The materials which Danny Martin left in respondents' building following Mr. Martin's eviction in July 1991 were used in Mr. Martin's chrome plating business.[4] Following the eviction, the materials remained on site while the U.S. Small Business Administration, Coos/Curry/Douglas County Development Corporation (CCD), and Mr. Martin all asserted a continuing interest in the materials and equipment. The materials were stored -- not in lieu of disposal -- but instead, with the expectation that the chrome plating business could be recommenced or sold and moved to another location. The following history makes that fact abundantly clear.

Following Mr. Martin's eviction, respondents informed the SBA on July 19, 1991, of that fact. [Ex. 5] On that same date, SBA notified respondents:

> "It is SBA's intention to have the premises and assets inspected and inventoried in order to determine the course of action to be taken by SBA for the removal or sale of the business assets of Chrome City." [Ex. 2]

The Department was aware that respondents did not claim ownership of the chemicals or equipment, and that the SBA had indicated its intention to deal with those business assets. [Ex. 3 and 4] On September 24, 1991, after respondents had received no additional communication from SBA since SBA's July 19 letter, respondents wrote SBA requesting

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[4] The exception was the three 5 gallon cans of sludge which the Department, in September 1991, asked Mr. Martin to properly handle and dispose of. [Ex. 1]

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SBA to follow-up with its inspection.[5] Respondents also notified SBA of respondents' action in referring to SBA "parties interested in purchasing the equipment and or business." [Ex. 5]

In a November 1991 letter from respondents' attorney (Jack Davis) to the attorney for CCD, respondents again demonstrated that materials were being stored not in lieu of disposal, but so that the business assets could be preserved and the business recommenced. In that letter, respondents wrote:

> "My client would consider entering into negotiations with your client to allow a qualified purchaser of debtor's business to enter into a lease with Bolch. . .
>
> "As an additional consideration, my client would be willing to sell the entire property to an interested purchase[r] of debtor's business." [Ex. 6]

In January 1992, respondents again indicated a willingness to enter into a lease with a purchaser of the business assets so that the business could be recommenced. In a letter to SBA, CCD and Mr. Martin, respondents' attorney wrote: "I would advise you that my client would be willing to enter into negotiations with the new tenant to allow them to operate a Chrome Platting business in this leased premises." [Ex. 7]

That willingness to re-lease or sell the premises, and recommence the operation continued until the end of October 1992, when the Department indicated it would not permit the business to recommence with those existing materials. This continuing interest in recommencing the operation -- rather than storing the materials in lieu of disposal -- also

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[5] It was not until February 1992 that SBA finally stated it was ready to proceed with its inspection. In a letter dated February 19, 1992, SBA wrote:

> "The SMALL BUSINESS ADMINISTRATION (SBA) is now, since the dismissal of the bankruptcy of the subject, prepared to have the property inspected in order to determine the course of action to be taken." [Ex. 5]

On March 17, 1992, SBA wrote that it had not yet been able to arrange that inspection, but it hoped to do so in the near future. [Ex. 9] In fact, SBA did not contact respondents again until after the Department issued its compliance order.

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is clear. In August 1992, respondents contacted the City of Grants Pass to ascertain the conditions under which the City would be agreeable to recommencement of the operation. [Ex. 10] In October of 1992 (after the Department imposed the penalties at issue here), respondents again advised SBA, CCD and Mr. Martin that they should remove the chemicals and equipment. [Ex. 11] Respondents also advised Mr. Martin that he could purchase the building, which would allow him to recommence the chrome plating business. [Ex. 12] On October 16, 1992, respondents informed the Department of respondents' desire to recommence the business themselves in the event that Mr. Martin, CCD and SBA did not remove the chemicals and equipment from the premises. [Ex. 13]

As the above chronology demonstrates, the materials never were stored in lieu of disposal. The SBA, CCD and the Martins all insisted that respondents could not dispose of the materials. Respondents, like those parties, contemplated that the business would be recommenced, or the materials and equipment sold to and used by another chrome plating business. In short, there is no basis for the Department's conclusion that the materials were "abandoned" by being stored in lieu of disposal. Consequently, there is no basis for concluding that the materials are "solid wastes," and therefore, "hazardous waste." Indeed, Paul Christiansen (HSW:DEQ), in a November 1991 inter-office message to Jon Gasik (SWR:DEQ) agreed that the materials were not hazardous wastes:

> "OR, if this plater reopens, he can go ahead and use the solutions, so they are a commercial chemical product, and were never a HW [hazardous waste].
>
> * * *
>
> "Confusing? To summarize, <u>if they reopen and leave everything in the tanks, no harm no foul</u>." [Ex. 14; emphasis supplied]

CONCLUSION

For the reasons discussed above, respondents request that the hearings officer rule that the materials were not stored in lieu of disposal. As a consequence, the materials were not "abandoned" within the meaning of 40 CFR § 261.2(b); were not "discarded" within the

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meaning of § 261.2(a)(2); were not "solid wastes" within the meaning of § 261.2; and consequently, were not "hazardous wastes" as defined by 40 CFR § 261.3.

Respectfully submitted this 3rd day of December, 1993.

HARRANG LONG WATKINSON
LAIRD & RUBENSTEIN, P.C.

By: _____
Glenn Klein, OSB #83110
Of Attorneys for Respondents

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Department of Environmental Quality
SOUTHWEST REGION
201 W MAIN, SUITE 2-D, MEDFORD, OREGON 97501 PHONE (503) 776-6010

September 17, 1991

Mr. Kenneth Bolch
C/O 689 Union Ave.
Grants Pass, OR 97527

Re: SW - Josephine County
Chrome City Facility
1515 Nebraska Ave.
Grants Pass, OR

Dear Mr. Bolch:

Thank you for meeting with me at the captioned facility on August 29, 1991. As you know, the purpose of this meeting was to inspect the facility for the potential for a release of hazardous materials into the sewer and/or the environment.

During the inspection, I noticed three 5 gallon open top cans of brown sludge in a wooden crate in the southeast portion of the facility. These cans had no labels. We have requested that Mr. Danny Martin perform a hazardous waste determination on this waste and properly handle and dispose of it.

Also, please be advised that the chemicals in the process tanks will become subject to regulation once the tanks have been out of operation for 90 days (40 CFR 261.4 (10c)).

A "Generator" of hazardous waste is defined as a "person who by virtue of ownership, management or control, is responsible for causing or allowing to be caused the creation of a hazardous waste" (ORS 466.005). It is our understanding that on July 30 1991, you had the tenant forcibly removed from your property. This act caused the material in the tanks to be abandoned by the tenant. As of October 23, 1991, the material in the tanks will be become hazardous waste and you will be a generator of hazardous waste as defined in ORS 466.005.

As a generator of hazardous waste, you would be required to meet the requirements set forth in Oregon Administrative Rules Chapter 340, Division 102. Some of the requirements are to make a hazardous waste determination on all solid wastes, properly label all hazardous wastes, and properly store all hazardous wastes.

Enclosed please find a copy of DEQ pamphlets to aid you in complying with the regulations. Please feel free to call our office if we can be of assistance.

DEQ/SWR 102

EXHIBIT 1

Regards,

Jonathan Gasik
Hazardous Waste Specialist

SMALL BUSINESS ADMINISTRATION
PORTLAND DISTRICT OFFICE
222 S.W. COLUMBIA ST., SUITE 500
PORTLAND, OREGON 97201-6605

July 19, 1991

CERTIFIED & REGULAR MAIL
RETURN RECEIPT REQUESTED

Mr. Ken Bolch
President
STAR CONCRETE, INC.
689 Union Ave.
Grants Pass, OR 97527

Subject: Glenmar Inc. dba
Chrome City
Danny L. & Glenda J. Martin
SBA Ref.: KGP 325809 3010 PTO

Dear Mr. Bolch:

This letter is to confirm our telephone conversations of July 12 and 18, 1991.

The SMALL BUSINESS ADMINISTRATION (SBA) understands that Star Concrete, Inc. has taken legal action to evict Glenmar, Inc. dba Chrome City, for default of their lease, from the premises known as 1550 Nebraska, Grants Pass, Oregon. Such eviction we have learned, took place on July 19, 1991 at 10:00 AM.

Mr. & Mrs. Martin indicate that all business assets remain on the premises and are now in your possession and control. The SBA has a first lien position on all machinery, equipment, furniture, fixtures, inventory, etc. of the subject located at 1550 Nebraska, Grants Pass, Oregon. I enclose a copy of our UCC fillngs and your acknowledgment of the SBA's priority lien and lease assignment.

Due to the technical nature of the business and the materials required in the maintenance and use of the equipment, Star Concrete, Inc. should take the necessary steps to secure the premises and preserve the materials and assets, including maintenance utilities, etc.

It is SBA's intention to have the premises and assets inspected and inventoried in order to determine the course of action to be taken by SBA for the removal or sale of the business assets of Chrome City. Per our telephone conversation, we understand you will

EXHIBIT 2

cooperate fully. We will contact your office by telephone on July 23, 1991, for introduction of our agents by name and to arrange access.

Should you have questions on this matter, please do not hesitate to contact me at the above address or at (503) 326-5224.

Sincerely,

Brian B. Otten
Loan Officer

Enclosures

---------- Forwarded Message Body ----------
Date: 9-6-91 1:04pm
From: Jon Gasik:SWR:DEQ
To: Tom Cusack:HSW:DEQ
cc: Jon Gasik:SWR:DEQ
Subj: Landlord reposession of Generator Facility

Got another on for you.

The operator of a chrome plating shop got into a dispute with the landlord. The landland had the operator forcibly removed from the premises by the county sheriff. The operator removed all that he could in the short time allowed, but guess what he left behind?? All the dip tanks are full. They have nickel chloride, chromium chloride, and copper cyanide tanks. I also found 1 open top 5 gallon cans of sludge which was unlabeled and improperly stored. However, there does not appear to be any immediate threat to the environment.

The landlord claims that the chemicals and equipment are not his. The Small Business Assoc. has forclosed on the equipment. However, it may not be cost effective to remove the equipment, so they may defaault to the owner (landlord).

I was considering trying to define the owner as "generator" and get him to take care of it. However, Van informs us that he just lost a case trying to do this.

You thoughts on this would be helpful. I have a call into Brett. Maybe you could forward this.

Thanks,

EXHIBIT 3

Ann Damrill
C/O 689 Union Ave.
Grants Pass, OR 97527

September 24, 1991

Department of Environmental Quality
Mr. Jonathan Gasik
201 W Main, Suite 2-D
Medford, OR 97501

Dear Mr. Gasik:

As per our conversation September 24, 1991, this letter is in resoonse to your correspondence dated September 17, 1991. Mr. Bolch does not own manage or control the equipment and chemicals located at 1515 Nebraska Ave, Grants Pass, Oregon.

On July 19, 1991 Danny Martin, DBA Chrome City, was evicted from the property. At that data I notified Brian Otten, Commercial Loan Specialist, from the SBA, of Mr Martin's eviction. Mr Otten advised me that the equipment and chemicals in the building were government property. These facts were again reiterated by Mr. Otten at a meeting held the week of July 22, 1991.

I contacted Mr. Otten today September 24, 1991 advising him of your letter. He indicated that the SBA had not comoleted their evaluation pertaining to the disposal of the equipment and chemicals located on the premise.

I have been designated to handle matters pertaining to Chrome City during Mr. Bolch's absence. Please feel free to contact me if I can be of further assistance.

Yours Truly,

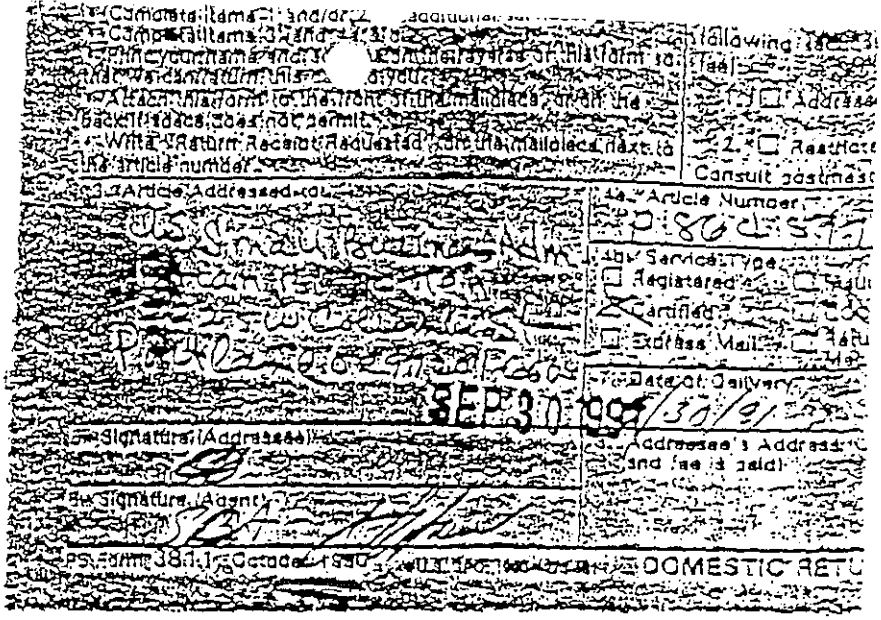
Ann Damrill

EXHIBIT 4

Ann Damrill
C/O 689 Union Ave.
Grants Pass, OR 97527

September 24, 1991

U.S. Small Business Administrat
Brian B. Otten
222 SW Columbia Street
Portland, OR 97201-6605



Dear Mr. Otten:

On July 19, 1991, I notified you that Danny Martin DBA Chrome City had been evicted. At that date you indicated that we had a responsibility to assure the safe keeping of the personal property belonging to the SBA and Mr. Martin. You also indicated that the SBA had sixty days from the date of notification to determine how they wished to dispose of the property. During your inspection of the equipment, chemicals and other personal property, the following week, we discussed a letter of authorization from the SBA. We also discussed what postion if any we would assume in resolving the matter.

I find it necessary at this time to clarify our position in the matter. There has been no contact or correspondence from you since we first met and discussed the issue the week of July 22, 1991. I have refered parties interested in purchasing the equipment and or business to your office. I now find that the Department of Environmental Quality will consider the chemicals a hazardous waste when abandoned.

The sixty day period expired September 17, 1991. Upon the advise of our attorney we will expect a decision as to the disposition of personal property owned by Danny Martin and the Small Business Administration by September 30, 1991.

Yours Truly
Ann Damrill
Ann Damrill

EXHIBIT 5

MYRICK, SEAGRAVES, ADAMS & DAVIS

Attorneys at Law
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Office (503) 476-6627
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Donald F. Myrick
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John E. Davis

Donald H. Coulter
Retired

Nancy E. Metcalfe
Probate Assistant

Sherry Watson
Office Manager

November 26, 1991

Donald A. Dole
Attorney at Law
810 S E Douglas Avenue
P O Box 1205
Roseburg OR 97470-0303

FAXED AND MAILED

Re: Star Concrete vs. Chrome City

Dear Mr. Dole:

I am in receipt of your letter dated November 14, 1991.

Your demand is rejected.

There was no consideration given for the consent to assignment document, therefore it is unenforceable against the Lessors by CCD. The Lease in question has been terminated because Lessee did not move to assume the Lease within 60 days of filing of its bankruptcy petition. CCD had notice of the bankruptcy proceeding and was in the position to protect its security interest in the Lease by seeking relief from the stay to take possession of the leased property and asking for adequate protection (i.e. making the Lessee file a motion to assume the Lease). When the Lease was deemed rejected and terminated under bankruptcy law CCD's and SBA's security interest in the Lease terminated.

I would cite you to the case of In re Chris-Kay Foods East, Inc., Debtor, 113 B.R. 70, 72 U.S. Bankruptcy Addition Michigan S.D. (1990) which indicates that when a lease is rejected pursuant to 11 USC 365 (d)(4), the effect of the rejection is to terminate the lease by operation of law. When the lease is terminated, any security interest in that lease is also terminated. See In re Gillis 92 B.R. 461, 465 (Bankruptcy D. Hawaii (1988), and In re Bernard 69 B.R. 13 (Bankruptcy, D. Hawaii (1986).

I would like to point our the case of In re Bernard at 13 stands for the proposition that the secured party has 60 days after the bankruptcy filing to compel the debtor in possession to assume the Lease. In this way the secured party's interest in the Lease is protected.

EXHIBIT 6

My client would consider entering into negotiations with your client to allow a qualified purchaser of debtor's business to enter into a lease with Bolch. The rent under such lease would be $1,250.00 per month and would include the payment by the landlord for water and landscaping.

As an additional consideration, my client would be willing to sell the entire property to an interested purchase of debtor's business.

If you wish to discuss this matter further, please feel free to give me a call.

Very truly yours,

JOHN E. [JACK] DAVIS

JED/sjs

:: Ken Bolch

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January 15, 1992

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810 S E Douglas Avenue
P O Box 1205
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Brian B. Otten
U. S. Small Business Administration
Portland District Office
Suite 500
222 S W Columbia Street
Portland OR 97201-6605

Danny and Glenda Martin
4670 Rogue River Highway
Grants Pass OR 97527

Re: Glenmar, Inc./Martin/Bolch

Please be advised that I represent Mr. and Mrs. Bolch and Star Concrete, Inc. Mr. and Mrs. Bolch are the owners of real property located at 1550 Nebraska Avenue, Grants Pass, Oregon, 97527. A portion of this property was at one time leased by Danny and Glenda Martin, and Glenmar, Inc. [Chrome City].

Certain equipment, chemicals, and tanks still remain on the leased premises. The Martins were allowed 30 days to remove these items of personal property prior to eviction. They did not do so.

It is my understanding that SBA and CCO have liens on this equipment and personal property.

The purpose of this letter is to advise both of you, together with Martin, that this property must be removed from the leased premises by February 1, 1992.

EXHIBIT 7

If the property is not removed by that time, my client will consider the property to be abandoned and take steps to remove it.

Arrangements should be made through my office to have the property removed.

Since Martins are the owners of this personal property and since Martins are in a Chapter 11 Bankruptcy proceeding, before any action is taken by my clients to dispose of the property, they will obtain whatever permission is necessary from the Bankruptcy Court to do this. Do to the Automatic Stay which applies in Bankruptcy, it is my understanding we cannot take action against the property until we obtain permission from the Bankruptcy Court.

I would advise you that my client would be willing to enter into negotiations with the new tenant to allow them to operate a Chrome Platting business in this leased premises. My client, however, would not be willing to enter into such negotiations with Mr. Martin.

Should you have any questions, please feel free to call me.

Very truly yours,

JOHN E. [JACK] DAVIS

JED/sjs

cc: Ken Bolch

U.S. SMALL BUSINESS ADMINISTRATION
PORTLAND DISTRICT OFFICE
222 S.W. COLUMBIA ST., SUITE 500
PORTLAND, OREGON 97201-6605

February 19, 1992

John E. (Jack) Davis
MYRICK, SEAGRAVES, ADAMS & DAVIS
Attorneys at Law
600 Northwest Fifth Street
Grants Pass, OR 97526-2024

Subject: Site Inspection, CSC Environmental
Glenmar, Inc. dba Chrome City
Danny L. and Glenda J. Martin
SBA Ref. XGP 325809 3010 PTD

Dear Mr. Davis.

We thank you for your letter dated January 7, 1992.

The SMALL BUSINESS ADMINISTRATION (SBA) is now, since the dismissal of the bankruptcy of the subject, prepared to have the property inspected in order to determine the course of action to be taken. CSC Environmental, Inc., Julie Berndt of Cottage Grove has been contracted to perform the site inspection of the premises and business assets of Chrome City. We provided Ms. Berndt with the contact name of Ms. Ann Damrill of Star Concrete in order to arrange for entry and inspection.

We are hopeful that the inspection will be complete by March 5 and a report to SBA on or about March 15, 1992. Upon receipt we will advise you of SBA's findings and SBA's intended course of action, if any. We appreciate your cooperation by coordination and permitting Ms. Berndt's access to the premises.

Should you have questions on this matter, please do not hesitate to contact me at the address above or at 326-5224.

Sincerely,

Brian B. Otten
Loan Officer

cc: R. Scott Palmer
Attorney at Law

Ann Damrill
Star Concrete, Inc.

EXHIBIT 8

US SMALL BUSINESS ADMINISTRATION
Portland District Office
222 SW Columbia Street Suite 500
Portland OR 97201-6605
(503) 326-5224, FAX (503) 326-2808

March 17, 1992

James E. (Jack) Davis
MYRICK, SEAGRAVES, ADAMS & DAVIS
Attorneys at Law
600 Northwest Fifth Street
Grants Pass, OR 97526-2024

Subject: Site Inspection, CSC Environmental
Glenmar, Inc. dba Chrome City
Danny L. and Glenda J. Martin
SBA Ref. XGP 345809 3010 PTD

Dear Mr. Davis:

CSC Environmental Services has advised this office March 16, 1992, that Julie Berndt, the contracting officer for the inspection of the Chrome City assets, is no longer with their company. They also indicate that orders for service are now being referred to Pat Troxell of their office and that he will be contacting your client by March 24, 1992 for inspection.

We apologize for the delays. Again, this office will give prompt attention to the matter upon receipt of CSC's inspection report.

Should you have questions on this matter, please do not hesitate to contact me at the address above or at 326-5224.

Sincerely,

Brian B. Otten
Loan Officer

Enclosures

cc: Danny & Glenda Martin
Ann Damrill, Star Concrete, Inc.

RECEIVED
MAR 19 1992
M S M A D

EXHIBIT 9

HARRANG LONG WATKINSON
ARNOLD & LAIRD, P.C.
ATTORNEYS AND COUNSELORS AT LAW

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101 EAST BROADWAY
EUGENE, OR 97401-3196
CORRESPONDENCE:
P.O. BOX 11620
EUGENE, OR 97440-3620
TELEPHONE (503) 485-0220
FACSIMILE (503) 686-6564

GLENN KLEIN

August 14, 1992

DAVE WHEATON
CITY OF GRANTS PASS
101 NORTHWEST A
GRANTS PASS OR 97526

Re: Kenneth & Betty Bolch, Star Concrete

Dear Dave:

This is to confirm our conversation on August 12, and to provide you the enclosed letter updating DEQ on the status of my client's efforts to resolve this matter.

When we spoke, you informed me of the City's immediate concerns related to the site, as well as the City's more long term concerns. It is my understanding that the City has primarily two immediate concerns: security and access. My clients have retained BWR Associates to assist them in responding to DEQ. As part of that effort, BWR Associates has inspected the site and concluded that the site has remained secure. In addition, BWR Associates concluded that there are no immediate threats to either the public health or the environment. My clients will continue to inspect the site to insure that security has not been breached, and will allow no one access to the site other than governmental authorities and consultants. In terms of access for the City, we have agreed that the City may have access at any time upon reasonable notice. If you will give me a call when you desire access, I will arrange for it.

With respect to the City's long term concerns, you indicated that the discharge permit obtained by Mr. Martin has expired and that a new one would be required prior to recommencement of the operation. You also indicated that in order to obtain that permit, it will be necessary to: (1) permanently plug the existing drain to the sanitary sewer system; (2) install a new connection to the sanitary sewer system, not in the floor and separate from the rest of the building; (3) install outside the building manhole access to the sewer connection to enable the city to monitor what gets put into the sanitary sewer; and (4) install a connection to the City's water supply separate from the rest of the building. Finally, it is

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1750 W. HARVARD BLVD.
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(503) 672-2715

EXHIBIT 10

my understanding that the City would not object to recommencement of the operation, rather than disposal of the chemicals, so long as the above conditions are met.

If I misunderstood any of the City's concerns, please give me call so that we can discuss them further. In addition, please do not hesitate to contact me in the event that other issues or concerns arise related to the presence of the chemicals at the site. I appreciate your assistance and cooperation in resolving this matter.

Very truly yours,

Glenn Klein

GKlj
cc: Kenneth and Betty Bolch
Clys Stapleton, City Attorney
Captain Innes, County Sheriff's Office

Myrick, Seagraves, Adams & Davis

Attorneys at Law
Six Hundred Northwest Fifth Street
Grants Pass, Oregon 97526-2024
Telephone (503) 476-6627 Fax (503) 476-7048

Charles H. Seagraves
Lynn M. Myrick
Richard D. Adams
John E. Davis
Holly A. Preslar

Donald H. Coulter
Retired
Nancy E. Metcalf
Probate Assistant
Sherry Watson
Office Manager

October 12, 1992

CERTIFIED MAIL/RETURN RECEIPT REQUESTED

Mr. and Mrs. Danny Martin
4670 Rogue River Highway
Grants Pass OR 97527

Glenmar, Inc.
4670 Rogue River Highway
Grants Pass OR 97527

C C D
c/o Donald A. Dole
Attorney At Law
810 S E Douglas Avenue
P O Box 1205
Roseburg OR 97470-0303

U. S. Small Business Administration
c/o Brian Otten, Loan Officer
Portland District Office
Suite 500
222 S W Columbia Street
Portland OR 97201

Re: [Glenmar, Inc. (Danny Martin, dba Chrome City) SBA Ref. XGP 325809 3010 PTD
Our Client: Kenneth Bolch/Star Concrete, Inc.

Dear Folks:

I am writing you this letter as a representative of Kenneth and Betty Bolch.

On January 15, 1992, I wrote all of you a letter advising you that the equipment, chemicals and tanks located on property once leased by Danny and Glenda Martin, dba Glenmar, Inc. from the Bolches at 1550 Nebraska Avenue, Grants Pass, Oregon be removed.

To this date these items have not been removed.

The purpose of this letter is to again advise each of you that you have until October 26, 1992 to remove the chemicals and equipment from my client's property.

EXHIBIT 11

Removal of these items from this property must be in compliance with Federal and State laws. Contact should be made with the Department of Environmental Quality to insure compliance with those laws.

If the chemicals and equipment are not removed by that time, my clients will take action regarding these materials to satisfy the demands of the Department of Environmental Quality.

Pursuant to Paragraph 12 of the Lease, the Martins and Glenmar, Inc. are to indemnify and save the Bolches harmless from any liabilities and expenses in connection with the Martins' use of the property.

I would like to point out to the Martins and Glenmar, Inc. that my clients will be looking to them to repay any expenses and costs associated with dealing with the chemicals and equipment left on the leased premises by the Martins and Glenmar, Inc.

If you have any questions, please feel free to contact me.

Very truly yours,

JOHN E. [JACK] DAVIS

JED/sjs

Myrick, Seagraves, Adams & Davis

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Donald H. Coulter
Retired
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Probate Assistant
Sherry Watson
Office Manager

October 22, 1992

Mr. Danny Martin
4670 Rogue River Highway
Grants Pass OR 97527

Re: Star Concrete, Inc. - Glenmar, Inc. Matter

Dear Mr. Martin:

I have conferred with Mr. Bolch regarding your offer.

First, I would like to say we are not convinced you have the funds to even make an offer of $150,000.00.

Secondly, the price is unfair.

My client originally valued the building and land at $320,000.00.

For purposes of compromise and settlement, my client would be willing to sell this land and building to you for the sum of $250,000.00.

However, you must understand that my client is making certain improvements to the property and if those improvements are made before you accept this offer, that the price will go up.

Very truly yours,

JOHN E. [JACK] DAVIS

JED/sjs

cc: Kenneth Bolch
Glenn Klein

EXHIBIT 12

HARRANG LONG WATKINSON
ARNOLD & LAIRD, P.C.
ATTORNEYS AND COUNSELORS AT LAW

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CORRESPONDENCE:
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EUGENE, OR 97440-3820
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GLENN KLEIN

October 16, 1992

LARRY M. SCHURR
DEPARTMENT OF ENVIRONMENTAL QUALITY
811 S.W. SIXTH AVENUE
PORTLAND OR 97204-1390

Re: DEQ v. Bolch, et al,
No. HW-SWR-92-13

Dear Mr. Schurr:

Thank you for your letter faxed yesterday.

Chemical Waste Management was one of the companies initially contacted by BWR Associates. BWR was informed at that time that Chemical Waste could not store the materials at its site. Following the receipt of your letter, I asked BWR to again contact Chemical Waste Management. BWR spoke with Joyce Johnson, chief sales person for Chemical Waste Management. She indicated that Chemical Waste could not store the materials under its permit. For the reasons discussed below, the issue probably is now moot. If it is not, and DEQ is aware of other permitted storage facilities which are authorized to accept the materials stored at my clients' site, we would appreciate receiving that information.

For your information, we have filed today a request for a hearing on the Notice of Assessment of Civil Penalty, and a request for an informal conference. As discussed below, I hope that at the informal conference, we will be able to agree on my clients' proposal for completely resolving all of DEQ's issues related to the site.

My clients have developed a plan for resolving the underlying issue of storage of hazardous wastes. My clients have again informed the Martins, SBA, and CCD Business Corporation that they must remove the materials (with DEQ's involvement and oversight). If they do not remove them, then my clients intend to recommence the chrome plating operation. As you will recall, DEQ indicated, both to my clients prior to my involvement and to me on August 5, that if the chrome plating business started up again, that the

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EXHIBIT 13

hazardous waste issue would be resolved. My clients are in the process of contacting the local authorities to ensure that my clients comply with the local requirements. Dave Wheaton (City of Grants Pass) had informed me on August 12 of four conditions the City would impose before recommencement, and my clients will work with the City to ensure compliance with those requirements.

I would appreciate an opportunity to confer with you and other appropriate personnel as soon as possible, about my client's proposal to recommence operations. Assuming that the Martins, SBA and CCD Business Corporation do not agree to remove immediately the materials, my clients are prepared to recommence operations within the next couple weeks, assuming that necessary approvals can be obtained and the City's conditions can be met. I can come to Portland to meet with you and others, or we can attempt to confer by conference call. If possible, we should discuss this issue, as well as an informal resolution of the notice of assessment, at the same time.

If you require additional information before a meeting, please let me know. I look forward to hearing from you.

Very truly yours,

Glenn Klein

GK/lj
Enclosure
cc: Kenneth Bolch

Date: 11-20-91 3:40pm
From: Paul Christiansen:HSW:DEQ
To: Jon Gasik:SWR:DEQ
cc: HWINSPECT
Subj: Generation of Waste in process tanks.
In-Reply-To: Message from Jon Gasik:SWR:DEQ of 11-20-91

Heres my $0.02 worth (I suspect KM might really be CC in GP):

I agree with your 40 CFR 261.4(c) call - you hit it on the head. The regulation is pretty clear that if a process halts for 90 days, then the waste is HW. Accumulation dates started on the day the process shut down (this is like sampling - accumulation dates start on the date the waste was generated rather than the date that sample results are received). This is the way we've traditionally interpreted this regulation...BUT...here is how the facility can weasel out:

> "We say that the unit is operated for the storage of raw materials for our process, and our process is temporarily down"

If you read the regulation carefully, this is an argument, whether or not it holds water depends upon the circumstances and how you can convince a hearings officer.

Another way out is that the commercial chemical product exemption of 40 CFR 261.2(e)(ii). In other words, if the plating solutions can be bought and used as a substitute for virgin solutions by another plater, then the solutions are not hazardous waste. OR, if this plater reopens, he can go ahead and use the solutions, so they are a commercial chemical product, and were never a HW.

Note that the above discussion relates to sludge only, sludge and liquid, or liquid only. If the operator tells you today that the sludge is unusable and will need to be disposed regardless of whether or not the business reopens, have him sign a written statement to that effect and consider the tanks HW storage tanks.

Confusing? To summarize, if they reopen and leave everything in the tanks, no harm no foul. If they go bankrupt, they can sell used solutions under the commercial chemical product exemption. If they dispose of any hazardous waste, the accumulation start dates actually started the day the process started down, and I doubt if they are currently abiding with all tank requirements.

Moral of the story...when a process or business is shutting down, they need to be aware of the regulatory status of all chemicals on site. Depending upon the ultimate use of the chemicals, they may subject themselves to HW liability by stalling, not doing anything, and ultimately disposing of a waste that they'd previously claimed was a product. i.e., manage the stuff.

Just to cover bases, I'd document the following because it may be

EXHIBIT 14

CERTIFICATE OF SERVICE

I certify that on December 3, 1993, I caused to be served a full and complete copy of the foregoing **RESPONDENTS' PRE-HEARING BRIEF RE: "HAZARDOUS WASTE" DEFINITIONAL ISSUE** on the party(ies) listed below, by causing the same to be deposited in the United States Mail at Eugene, Oregon, enclosed in a sealed envelope with postage prepaid, and addressed as follows:

Lawrence Edelman
Department of Justice
1515 S.W. 5th St.
Portland, OR 97201

Glenn Klein, OSB #83110
Of Attorneys for Respondents

HAR J LONG
WATKINSON LAIRD
& RUBENSTEIN, P.C.
101 E. Broadway
Eugene, Oregon 97401
(503) 485-0220

needed in the illegal storage scenario (you've probably done most of this):

A. Waste volumes and types (for later if you think that the waste may be mismanaged or sham recycled)

B. Date the process stopped (establish ASD). July 19, 1991.

C. Operating records from the process showing throughput, wastes generated, etc. (if possible). This will help show that the "temporarily down" claim is a sham.

D. Physical data on the tank system, secondary containment, etc.

E. Operation of the tank system, labelling, inspections, etc. (compliance w/ 40 CFR 265 Subpart J).

I hope this gives you some things to think about. Give me a call sometime if you'd like to discuss this.

BEFORE THE ENVIRONMENTAL QUALITY COMMISSION

OF THE STATE OF OREGON

DEPARTMENT OF ENVIRONMENTAL QUALITY OF THE STATE OF OREGON, Department, v. KENNETH BOLCH; BETTY BOLCH; and STAR CONCRETE, INC., an Oregon corporation, Respondents.	No. HW-SWR-02-241 ORD 98719121 RESPONDENTS' REPLY BRIEF RE: "HAZARDOUS WASTE" ISSUE

I. PRECLUSION DOES NOT APPLY

The Department argues that the doctrine of preclusion bars respondents from questioning the Department's assumption that the materials left by Danny Martin were "hazardous wastes" within the meaning of the Department's rules. Although respondents agree that, in appropriate cases, preclusion can apply to administrative proceedings, the law is clear that this is not an appropriate case.

Claim preclusion, or res judicata, bars litigation of a claim -- as opposed to relitigation of an issue -- which was or could have been raised in a prior proceeding:

> "'[A] plaintiff who has prosecuted one action against a defendant through to a final judgment * * * is barred from prosecuting another action against the same defendant where the claim in the second action is one which is based on the same factual transaction that was at issue in the first, seeks a remedy additional or alternative to the one sought earlier, and is of such a nature as could have been joined in the first action.'" Drews v. EBI Companies, 310 Or 134, 140 (1990), quoting Rennie v. Freeway Transport, 294 Or 319, 323 (1982).

Issue preclusion, or collateral estoppel, bars relitigation of an issue "actually litigated and determined" in a previous proceeding. Thus, claim preclusion bars a claim for relief, whereas issue preclusion bars relitigating an issue actually litigated.

/////

HARRANG LONG WATKINSON LAIRD & RUBENSTEIN, P.C.
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Eugene, Oregon 97401
(503) 485-0220

This contested case proceeding is brought by the Department, not by the respondents. The respondents did not raise any claim in the prior proceeding, and have not asserted any claims here. Respondents could have raised in response to the Department's compliance order, as an issue, whether hazardous wastes were present, but respondents chose to cooperate, rather than litigate, and therefore, did not raise that issue. For the reasons that follow, preclusion does not bar respondents from raising the issue now.

First, claim and issue preclusion do not apply, as the Oregon Supreme Court recently noted:

> "when, by provision of a statute or valid rule of the body making the final determination, that determination does not bar another action or proceeding on the same transactional claim." Drew v. EBI Companies, supra, 310 Or at 141.

The Department, of course, has authority under statutes and rules to bring additional actions based on the same "transactional claim." This very proceeding is one of them. If claim preclusion applied at all, then it would bar the Department, not the respondents, from proceeding. But of course, no one would assert that the Department's previous action (the compliance order) bars this action: the exception noted above covers just this situation.

Second, the law is clear that issue preclusion does not apply to bar litigation of an issue -- for example, whether the materials meet the definition of "hazardous waste" -- unless that issue actually was litigated.

> "A judgment is not conclusive in a subsequent action as to issues which might have been but were not litigated and determined in the prior action. There are many reasons why a party may choose not to raise an issue or to contest an assertion, in a particular action. The action may involve so small an amount that litigation of the issue may cost more than the value of the lawsuit. Or the forum may be an inconvenient one in which to produce the necessary evidence or in which to litigate at all. The interests of conserving judicial resources, of maintaining consistency, and of avoiding oppression or harassment of the adverse party are less compelling when the issue on which preclusion is sought has not actually been litigated before. And if

> preclusive effect were given to issues not litigated, the result might serve to discourage compromise, to decrease the likelihood that the issues in an action would be narrowed by stipulation, and thus to intensify litigation.
>
> * * *
>
> "An issue in not actually litigated if the defendant might have interposed it as an affirmative defense but failed to do so; nor is it actually litigated if it is raised by a material allegation of a party's pleading but is admitted (explicitly or by virtue of a failure to deny) in a responsive pleading; nor is it actually litigated if it is raised in an allegation by one party and is admitted by the other before evidence on the issue is adduced at trial; nor is it actually litigated if it is the subject of a stipulation between the parties. . .
>
> "In the case of judgment entered by confession, consent or default, none of the issues is actually litigated. Therefore, the rule . . . does not apply with respect to any issue in a subsequent action." Restatement (Second) of Judgments § 27 (cited in Drews v. EBI Companies, supra, 310 Or at 140).

See also, Nelson v. Emerald People's Utility District, __ Or __, Slip Op. at 6 (December 9, 1993) (issue preclusion applies if "[t]he issue was actually litigated . . ."); Hickey v. Settlemier, 116 Or App 436, 439 (1992) (issue preclusion applies if "there was a substantial incentive to litigate the issues"); Chavez v. Boise Cascade Corporation, 307 Or 632, 635 (1989) (issue preclusion does not apply unless the party had an "incentive to contest the point at issue" because otherwise, the doctrine would increase litigation by requiring parties to litigate issues -- to avoid future issue preclusion -- they otherwise might be willing not to contest).

The Department takes the position here that if a party chooses to comply with, rather than challenge, the Department's compliance order, the party will be penalized if future disputes arise. Such a position does little to encourage people to cooperate with the Department. Fortunately, the Department's position is flatly inconsistent with the preclusion doctrine as explained above. Respondents did not previously litigate the issue of whether the materials were "hazardous wastes." Instead, the respondents chose to comply with the order. Because respondents did not previously litigate the issue, respondents retain their right to question the Department's assumption that the materials

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ination, and no such admission, was ever made by

rtment's involvement with Mr. Martin's chrome plating
is acted based on an assumption that the materials were
"hazardous wastes," without ever analyzing whether the
efinition of "solid waste" contained in 40 C.F.R. § 261.2.
scussed in some detail why the materials did not constitute

e Department acted on the assumption, while other members
On June 4, 1992, Tom Bispham replied to an e-mail

ited knowledge of this situation, it sounds like we are
aterials that we don't have jurisdiction over. Perhaps
d by local public safety agencies like police, fire or
orks through a court order or injunction. I would
ry if ... te a meeting through his vast and mystic
to see if we can get this matter in the right hands. Of
taining that high profile of cooperation, conciliation and
" (Exhibit 2, at p. 2).

n again questioned the Department's jurisdiction:

ou to know that I am very disturbed that our shop up
this issue to me back in January. Procrasting (sic) on
hazardous material] or hw [hazardous waste] is
as I believe a short discussion 6 months ago could have
of action. Now we have another municipality mad at
decision and prolonging a potential threat to public
ssed this with Van and we are going to do a better job
lite decisions, but I want you and your staff to also feel
ative to ring our bell for a decision. On the immediate
onvince (sic) that time makes a decision on the
terial. If it isn't spent, which it doesn't sound like it is, I
her we have jurisdiction. My interest in your
try a (sic) soothe the local impressions and see if we
s to some type of creative solution that the locals or we
ibit 2, at p. 1).

NOT "SOLID WASTES," N § 261.4 IS MISPLACED

it acknowledges that a material must first
261.2, before that material can be classified
). Unless materials are solid wastes, then it
us: it is not hazardous materials which are
ort of its position here, the Department
ardous wastes.[1] That exemption, however,
defined by § 261.2. The question raised
e here, in fact, meet the definition of "solid

hat there is no dispute that the materials
pondents "ultimately characterized and
ment Br. at 4, fn 2). In fact, the
whether the materials were wastes at all.
the Department was threatening
ny discussion with the Department about
tes." Instead, respondents submitted the
ss caveat that the characterization
ASTE." (See Exhibit 1). Attached as
." At the bottom of each page of the
zation assumes that the materials are

e of hazardous wastes within a
tinues, and for an additional 90 days
mption says nothing, however, about
re "hazardous wastes," and what

solid waste. No such determination, and no such admission, was ever made by respondents.

Throughout the Department's involvement with Mr. Martin's chrome plating business, the Department[2] has acted based on an assumption that the materials were "solid wastes" and therefore "hazardous wastes," without ever analyzing whether the materials, in fact, met the definition of "solid waste" contained in 40 C.F.R. § 261.2. Respondents' initial brief discussed in some detail why the materials did not constitute

---

[2] In fact, only part of the Department acted on the assumption, while other members questioned the assumption. On June 4, 1992, Tom Bispham replied to an e-mail message, stating:

> "Based upon my limited knowledge of this situation, it sounds like we are dealing with haz. materials that we don't have jurisdiction over. Perhaps this is better handled by local public safety agencies like police, fire or city/county public works through a court order or injunction. I would suggest we have Gary initiate a meeting through his vast and mystic network of contacts to see if we can get this matter in the right hands. Of course, always maintaining that high profile of cooperation, conciliation and technical assistance." (Exhibit 2, at p. 2).

The next day, Mr. Bispham again questioned the Department's jurisdiction:

> "Gary, I just want you to know that I am very disturbed that our shop up here did not elevate this issue to me back in January. Procrasting (sic) on whether this is hm [hazardous material] or hw [hazardous waste] is unacceptable to me as I believe a short discussion 6 months ago could have established a course of action. Now we have another municipality mad at us for not making a decision and prolonging a potential threat to public safety. I have discussed this with Van and we are going to do a better job on our end to expedite decisions, but I want you and your staff to also feel free to take the initiative to ring our bell for a decision. On the immediate problem, I am not convince (sic) that time makes a decision on the definition of the material. If it isn't spent, which it doesn't sound like it is, I really question whether we have jurisdiction. My interest in your involvement was to try a (sic) soothe the local impressions and see if we could be the stimulus to some type of creative solution that the locals or we could pursue." (Exhibit 2, at p. 1).

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"solid wastes" within the meaning of those rules.

III. CONCLUSION

For the reasons discussed there, respondents request that the Hearings Officer find that the materials do not constitute "hazardous wastes."

Dated this 23rd day of December, 1993.

HARRANG LONG WATKINSON
LAIRD & RUBENSTEIN, P.C.

By: _____
Glenn Klein, OSB #83110
Of Attorneys for Respondents

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GLENN KLEIN

September 25, 1992

LARRY M. SCHURR
DEPARTMENT OF ENVIRONMENTAL QUALITY
811 S.W. SIXTH AVENUE
PORTLAND OR 97204-1390

Re: DEQ v. Bolch, et al,
No. HW-SWR-92-13

Dear Larry:

Enclosed is a copy of the hazardous waste inventory and report from BWR Associates. In an effort to complete the report as quickly as possible, BWR obtained some of the results from Nielsen Lab by Fax and phone. As soon as BWR receives the completed paperwork from the lab, BWR will forward copies of all of the lab analyses that support the determinations in the enclosed report.

My clients have begun contacting permitted transporters and TSD facilities for management of the materials. I will contact you next week to discuss.

Very truly yours,

Glenn Klein

GK/lj
Enclosure
cc: Jonathan Gasik
Kenneth Bolch

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EXHIBIT 1
PAGE 1 OF 5

BWR ASSOCIATES INC.
ENVIRONMENTAL CONSULTANTS

September 24, 1992

Mr. Glenn Klein, Attorney
Harrang, Long, Watkinson, Arnold & Laird, P.C.
101 East Broadway, Suite 400
Eugene, Oregon 97401

REGARDING: INVENTORY OF MATERIALS, 1550 NEBRASKA, GRANTS PASS, OREGON

Dear Mr. Klein:

This letter is to submit the results of our inventory of the subject materials. We electronically transmitted pages 1-3 to you on Tuesday. Also enclosed with this submission is a plan sketch of the containers inside the building.

Note that the BWR team assumed to start that all the included materials were solid wastes. Out objective was to classify those materials which were identified as hazardous wastes under RCRA.

As of this date, we are still receiving laboratory results. When all of the test result hard copies have been received, we will forward copies to you with MSDS copies which were obtained during the investigation.

On the Inventory, we used the same identification numbers that ODEQ reported in December of 1991. We added Cont. (Containment) I - VI, which have been identified as sections for spill containment below the fiberglass floor grates.

BWR staff accomplished two additional physical actions during our investigation which we previously reported to you.

1) Moved a bag of potassium hydroxide from C4 to C5 in order to isolate it from the nickel chloride in C4. Date was September 3, 1992.

2) Taped plastic sheeting over the open tops of two plastic drums (No.'s 10 & 11). Date was September 11, 1992.

The last day that BWR's staff was inside the subject building was September 11th; containers and containments were in good shape at that time.

Please call me with questions concerning the inventory. We will be pleased to follow up with required environmental services.

REGISTERED PROFESSIONAL ENGINEER 8407 R. L. Gantenbein, Jr. OREGON AUGUST 22, 1975 R. L. GANTENBEIN, JR.

Sincerely,

R. L. Gantenbein, Jr., P.E.
General Manager

RLG/dmr

Enclosure
92-667I

INVENTORY OF MATERIALS
1550 NEBRASKA
GRANTS PASS, OREGON 97527

TANK OR DRUM NUMBER	DESCRIPTION	ESTIMATED QUANTITY	RCRA* CLASSIFICATION	COMMENT	CONTAINER	CONDITION
C3	I. POTASSIUM CYANIDE II. COPPER PLATING AGENT III. COPPER PLATING AGENT ADDITION	4 LB 2 LB(1QT) ½ GAL	P030, P098 F007 D002, F007	SOLID, IN DRY PLASTIC DIP TANK LIQUID, IN DRY PLASTIC DIP TANK LIQUID, IN DRY PLASTIC DIP TANK	BAG CAN CAN	OK OK OK
C4	I. BORIC ACID II. NICKEL CHLORIDE	50 LB 50 LB		SOLID SOLID	BAG BAG	OK OK
C5	POTASSIUM HYDROXIDE	50 LB	D002	SOLID (MOVED FROM C4)	BAG	OK
CONT. I	BELOW FLOOR GRATING	100 GAL	D007, F007	LIQUID	MINOR CONTAIN-MENT	OK
CONT. II	BELOW FLOOR GRATING	25 GAL	D002, D007, F002	LIQUID	MINOR CONTAIN-MENT	OK
CONT. III	BELOW FLOOR GRATING	25 GAL	D007, F007	SOLID	MINOR CONTAIN-MENT	OK
CONT. IV	BELOW FLOOR GRATING	0.05 LB	D007, F007	SOLID RESIDUE	MAJOR CONTAIN-MENT	OK
CONT. V	BELOW FLOOR GRATING	27 LB	D007, F007	SOLID RESIDUE	MAJOR CONTAIN-MENT	OK
CONT. VI	BELOW FLOOR GRATING	110 LB	D007, F007	SOLID	MAJOR CONTAIN-MENT	OK

* ASSUMES ALL MATERIALS ARE SOLID WASTE.

EXHIBIT 5
PAGE 1 OF 5

STARTED: 9/1/92
FINISHED: 9/22/92
PROJECT: 92-667L

INVENTORY OF MATERIALS
1550 NEBRASKA
GRANTS PASS, OREGON 97527

TANK OR DRUM NUMBER	DESCRIPTION	ESTIMATED QUANTITY	RCRA* CLASSIFICATION	COMMENT	CONTAINER	CONDITION
A1	SOAP CLEANER SOLUTION	240 GAL	D007, F009		OPEN PLASTIC DIP TANKS	OK
A2	ALKALINE CLEANER	215 GAL	F009		"	OK
A3	WATER RINSE	250 GAL	F009		"	OK
A4	ACID CLEANER	240 GAL	D002, D007, F009		"	OK
A5	WATER RINSE	240 GAL	F009		"	OK
B1	COPPER PLATING SOLUTION	240 GAL	F007, F008		"	OK
B2	WATER RINSE	240 GAL	F007, F008		"	OK
B3	WATER RINSE	240 GAL	F007, F008		"	OK
B4	WATER RINSE	300 GAL	F007, F008		"	OK
D1	WATER RINSE	350 GAL	F007, F008		"	OK
D2	WATER RINSE	350 GAL	F007, F008		"	OK
D3	WATER RINSE	350 GAL	F007, F008		"	OK
D4	NICKEL PLATING SOLUTION	250 GAL	F007, F008		"	OK
E1	WATER RINSE	335 GAL	D007, F007, F008		"	OK
E2	WATER RINSE	335 GAL	D007, F007, F008		"	OK
E3	WATER RINSE	350 GAL	D007, F007, F008		"	OK
E4	CHROME PLATING SOLUTION	350 GAL	D007, F009		"	OK
C6	WATER RINSE	135 GAL	D002, F007		"	OK
C7	ACID STRIP CLEANER	170 GAL	D002, D007, F009		"	

* ASSUMES ALL MATERIALS ARE SOLID WASTE.

EXHIBIT 1
PAGE 3 OF 5

BEFORE THE ENVIRONMENTAL QUALITY COMMISSION

OF THE STATE OF OREGON

DEPARTMENT OF ENVIRONMENTAL QUALITY OF THE STATE OF OREGON, Department, vs. KENNETH BOLCH; BETTY BOLCH; and STAR CONCRETE, INC., an Oregon corporation, Respondents.	No. HW-SWR-02-241 ORD 98719121 **RESPONDENTS' WRITTEN EXCEPTIONS TO HEARING OFFICER'S DECISION AND BRIEF**

Respondents owned a building located at 1515 Nebraska Avenue in Grants Pass, which they leased to several individuals operating a chrome plating business. The lessees left behind most of the assets of the business, including the chemicals and equipment from the chrome plating business. The Department assumed that those usable chemicals from the business were "solid wastes" and consequently, "hazardous wastes" for purposes of RCRA. When the materials were not removed as ordered by DEQ, two civil penalties, totaling $18,000, were imposed.

Respondents' timely appealed the civil penalties. On February 2, 1995, a Final Order was entered which provided that the two interim orders issued by the hearings officer in this matter would be considered the final order. The two inerim orders had the effect of affirming the $18,000 penalty imposed by the Department. The first interim order was issued by the hearings officer on April 1, 1994. In that order, the hearings officer concluded that the doctrine of issue preclusion bars respondents from litigating whether the hazardous materials present at respondents' site constituted "hazardous wastes" for purposes of RCRA. The hearings officer also concluded that respondents' storage of the hazardous materials at the site constituted storage

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/////

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of "hazardous wastes" in violation of the Department's regulations. On November 8, 1994, the hearings officer issued the second interim order, in which she concluded:

> "In Fuel Processors the [Environmental Quality] Commission stated that 'findings of fact are unnecessary regarding the issue of negligence because the question is more in the nature of one of law (sic) rather than fact.' Directed by the Commission's decision, I conclude that findings of fact are unnecessary regarding the issue of negligence in this case and I conclude that Bolch was negligent."

The hearings officer erred in each of these three conclusions. The Environmental Quality Commission should reverse the hearings officer's decision upholding the penalty because each of those conclusions is incorrect. More specifically, respondents assert that the hearings officer erred:

(1) in concluding that issue preclusion applies;

(2) in concluding that the hazardous materials stored at the site were "hazardous wastes"; and

(3) in concluding that respondents were negligent as a matter of law.

Each of these issues was addressed in respondents' briefs before the hearings officer. Attachment 1 is respondents' brief regarding the "hazardous waste" definitional issue. Attachment 2 explains why issue preclusion does not apply to this case. Attachments 3 and 4 explain why respondents' actions were "unavoidable" and not "negligent."

In the event that the Commission agrees with respondents that the hazardous materials stored at the site were not "hazardous wastes," then the Commission must reverse the hearings officer and find that no penalty is owing. In the event that the Commission disagrees with respondents on the question of whether "hazardous wastes" were stored at the site, then the Commission needs to reach the "negligence" issue. For the reasons described in Attachments 3 and 4, the Commission should reduce the penalty by changing the "R" factor from a value of "+ 2" to a value of "0" and reduce the penalty accordingly.

/////

/////

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Dated this 14th day of April, 1995.

HARRANG LONG GARY RUDNICK P.C.

By: _____
Glenn Klein, OSB #83110
Of Attorneys for Respondents

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INVENTORY OF MATERIALS
1550 NEBRASKA
GRANTS PASS, OREGON 97527

TANK OR DRUM NUMBER	DESCRIPTION	ESTIMATED QUANTITY	RCRA* CLASSIFICATION	COMMENT	CONTAINER	CONDITION
1	ELECTRO-CLEANER	100 LB	D002	SOLID INCLUDES: SILICATES, TETRASODIUM PHOSPHATE, NaOH	DRUM	OK
2	BROWN SLUDGE	100 LB	D007, F008	SOLID WASTE	DRUM	OK
3	BROWN SLUDGE	100 LB	D007, F008	SOLID WASTE	DRUM	OK
4	FIBROUS WASTE	50 LB	D007, F008	SOLID WASTE	CAN	OK
5	SOLID WASTE	20 LB	D007, F008	SOLID WASTE	CAN	OK
6	BOX CLOTH MATERIAL	5 lb		MATERIAL	BOX	OK
7	MIST/FUME SUPPRESSANT	5 GAL		LIQUID	CAN	OK
8	CHROMIUM PLATING AGENT	5 GAL	D007	LIQUID	CAN	OK
9	CHROMIUM PLATING SOLUTION, SPILL RECEIVER	1 LB	D007, F008	SOLID WASTE	CAN	OK
10	NICKEL PLATING SOLUTION	50 GAL	D002, F007, F008	USED LIQUID (PLASTIC SHEETING WAS TAPED OVER TOP OF THE DRUM)	DRUM	OK
11	NICKEL PLATING SOLUTION	50 GAL	D002, F007, F008	USED LIQUID (PLASTIC SHEETING WAS TAPED OVER TOP OF THE DRUM)	DRUM	OK
12	MIST/FUME SUPPRESSANT	5 GAL		LIQUID	CAN	OK
13	MAKEUP NICKEL PLATING AGENT	50 LB		MATERIAL	CAN	OK
C1	I. NICKEL PLATING AGENT	5 GAL	F007	LIQUID, IN DRY PLASTIC DIP TANK	CAN	OK
	II. NICKEL PLATING AGENT	5 GAL	F007	LIQUID, IN DRY PLASTIC DIP TANK	CAN	OK
	III. NICKEL PLATING AGENT	5 GAL	F007	LIQUID, IN DRY PLASTIC DIP TANK	CAN	OK
	IV. NICKEL PLATING AGENT	5 GAL	F007	LIQUID, IN DRY PLASTIC DIP TANK	CAN	OK
	V. NICKEL PLATING AGENT	1 QT	F007	LIQUID, IN DRY PLASTIC DIP TANK	CAN	OK
C2	I. SULFURIC ACID	½ GAL	D002	LIQUID, IN DRY PLASTIC DIP TANK	BOTTLE	OK
	II. ACTIVATED CARBON	20 LB		SOLID, IN DRY PLASTIC DIP TANK	BAG	OK

* ASSUMES ALL MATERIALS ARE SOLID WASTE.

EXHIBIT
PAGE 1 OF 5

10

Date: 6-5-92 1:57pm
From: Van Kollias:RO:DEQ
To: staff:ro
Subj: Chrome City
Forwarded: Message from Tom Bispham:RO:DEQ of 6-5-92

Please read this e-mail carefully and put into your policy notebook for future reference. We need to address and deal with enforcement actions and issues as we receive them, and not put them off. If we don't have the solutions, we need to elevate the issues early on.

Thanks.

---------- Forwarded Message Body ----------
Date: 6-5-92 10:33am
From: Tom Bispham:RO:DEQ
To: Gary Grimes:SWR:DEQ,VK
Subj: Chrome City
In-Reply-To: Message from Gary Grimes:SWR:DEQ of 6-5-92

Gary, I just want you to know that I am very disturbed that our shop up here did not elevate this issue to me back in January. Procrasting on whether this is hm or hw is unacceptable to me as I believe a short discussion 6 months ago could have established a course of action. Now we have another municipality mad at us for not making a decision and prolonging a potential threat to public safety. I have discussed this with Van and we are going to do a better job on our end to expedite decisions, but I want you and your staff to also feel free to take the initiative to ring our bell for a decision.
On the immediate problem, I am not convince that time makes a decision on the definition of the material. If it isn't spent, which it doesn't sound like it is, I really question whether we have jurisdiction. My interest in your involvement was to try a soothe the local impressions and see if we could be the stimulus to some type of creative solution that the locals or we could pursue.

---------- Replied Message Body ----------
Date: 6-5-92 9:17am
From: Gary Grimes:SWR:DEQ
To: Tom Bispham:RO:DEQ
cc: Gary Grimes:SWR:DEQ,Jon gasik:SWR,Van kollias:RO
Subj: Chrome City

In-Reply-To: Message from Tom Bispham:RO:DEQ of 6-4-92

Not to pass the buck, But, we've gone about as far as we can on this
one. One basic change is that time gone by has an effect upon the definition and we may be able to more clearly define this as a waste.
One benefit of procrastination, so to speak. We don't feel that there
are any appropriate avenues for local government to pursue. I've asked
Jon to pursue with McKnight. If there's a way I can help, will do.

---------- Replied Message Body ----------

9 Date: 6-4-92 4:36pm
From: Tom Bispham:RO:DEQ
To: Gary Grimes:SWR,John Gasik:SWR
cc: vk,ls
Subj: Chrome City
Forwarded: Message from Van Kollias:RO:DEQ of 6-4-92

Based upon my limited knowledge of this situation, it sounds like we are
dealing with haz. materials that we don't have jurisdiction over.

Perhaps this is better handled by local public safety agencies like

police, fire or city/county public works through a court order or injunction. I would suggest we have Gary initiate a meeting through his
vast and mystic network of contacts to see if we can get this matter in
the right hands. Of course, always maintaining that high profile of
cooperation, conciliation and technical assistance.

---Date: 6-4-92 3:35pm
From: Van Kollias:RO:DEQ
To: Tom Bispham:RO:DEQ
cc: Tom Bispham:RO:DEQ, ls, tb, vk
Subj: Chrome City
In-Reply-To: Message from Tom Bispham:RO:DEQ of 6-4-92
---

8 It was an action submitted by Gasik and assigned to LMS on 1/15/92. It
involves a civil dispute between the landlord and company. LMS is most
familiar with this case, has been called several times by the Chrome
City owner, and should be able to give us a status update on whats been
going on and why the case is still in limbo.

Larry - please brief us. Thanks.

---------- Replied Message Body ----------

7

Date: 6-4-92 3:25pm
From: Tom Bispham:RO:DEQ
To: Van Kollias:RO:DEQ
cc: Tom Bispham:RO:DEQ, ls, tb, vk
Subj: Chrome City
In-Reply-To: Message from Van Kollias:RO:DEQ of 6-4-92

What is this?

---------- Replied Message Body ----------

6

Date: 6-4-92 3:10pm
From: Van Kollias:RO:DEQ
To: ls
cc: tb,vk
Subj: Chrome City
Forwarded: Message from Jon Gasik:SWR:DEQ of 6-4-92

Did you review this with the AG as I suggested you do so on 5/16?

---------- Forwarded Message Body ----------

Date: 6-4-92 2:57pm
From: Jon Gasik:SWR:DEQ
To: Larry Schurr:RO:DEQ
cc: Brett McKnight:CR:DEQ, Van Kollias:RO:DEQ, Gary Grimes
Subj: Chrome City

5

I have received a letter from the Grants Pass City Attorney (Ulys Stapleton) RE: the captioned. The City wants to know why we have allowed the violations to go uncorrected for so long.

What is being done about this?

I have advised Mr. Stapleton to contact you.

I am forwarding the City's letter. Would you please draft a response?

EXHIBIT 2
PAGE 3 OF 3

CERTIFICATE OF SERVICE

I certify that on December 23, 1993, I caused to be served a full and complete copy of the foregoing **RESPONDENTS' REPLY BRIEF RE: "HAZARDOUS WASTE" ISSUE** on the party(ies) listed below, by causing the same to be deposited in the United States Mail at Eugene, Oregon, enclosed in a sealed envelope with postage prepaid, and addressed as follows:

Lawrence Edelman
Department of Justice
1515 S.W. 5th St.
Portland, OR 97201

Glenn Klein, OSB #83110
Of Attorneys for Respondents

HARRANG LONG
WATKINSON LAIRD
& RUBENSTEIN, P.C.
101 E. Broadway
Eugene, Oregon 97401
(503) 485-0220

BEFORE THE ENVIRONMENTAL QUALITY COMMISSION

OF THE STATE OF OREGON

DEPARTMENT OF ENVIRONMENTAL QUALITY OF THE STATE OF OREGON, Department, v. KENNETH BOLCH; BETTY BOLCH; and STAR CONCRETE, INC., an Oregon corporation, Respondents.	No. HW-SWR-02-241 ORD 98719121 RESPONDENTS' HEARING BRIEF

This matter involves Respondents' appeal of the notice of assessment of civil penalty issued by the Department of Environmental Quality ("Department"), alleging two violations. First, the Department alleged that Respondents violated ORS 466.095 by operating a hazardous waste storage site without a permit between June 19, 1992 and August 2, 1992. Second, the Department alleged that Respondents violated a June 30, 1992 compliance order by failing to submit an inventory of solid waste residues and failing to make a hazardous waste determination, by August 2, 1992, as required by the order. The Department imposed a penalty in the amount of $9,600 for the first violation, and $8,400 for the second violation.

Respondents' answer and request for hearing admitted that chemicals and other liquids used in a chrome plating operation had been present at the site. Respondents do not dispute that they did not provide an inventory or hazardous waste determination by August 2, 1992. Respondents' answer, instead, raised several issues. First, were any of the materials present at the site "hazardous wastes?" Second, if so, what volume of materials constituted "hazardous wastes?" (The Department's penalty is premised on the assumption that more than 5,000 gallons of hazardous wastes were present.) Third, did the Department in determining the penalty err in using a value of +2 for the "R" factor, based on a finding that the respondents were negligent?

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The hearings officer's decision dated April 1, 1994, answers the first two issues in favor of the Department. For the reasons discussed in, and based on the information in the exhibits included with, the Respondents' Prehearing Brief and Respondents' Reply Brief on those prehearing issues, Respondents submit that the hearings officer erred in ruling in the Department's favor on those issues.

Not raised in nor addressed by the prehearing briefs and decision is the question of whether Respondents were "negligent," thereby enabling the Department to use a value of "+2" for the "R" factor on each of the violations. With respect to the first violation, the Department justified the use of the +2 value by stating: "Respondents were negligent in failing to take reasonable care to avoid a foreseeable risk of committing a violation by failing to properly remove the hazardous wastes from the site or by applying for and obtaining a storage site permit." The Department justified its use of the +2 on the second violation by stating: "Respondents were negligent in failing to take reasonable care to avoid a foreseeable risk of committing a violation by failing to take action as ordered [by the complaince order]." Respondents submit that Respondents were not negligent.

As explained in the accompanying Affidavit of Kenneth Bolch, and as supported by the exhibits attached to Mr. Bolch's affidavit, Respondents made every effort to comply with the Department's actions. As the exhibits demonstrate, Respondents hired a consultant—recommended by the Department—to perform the actions required by DEQ. Respondents placed no constraints on the consultant, but the consultant nevertheless was unable to meet the Department's deadline. Respondents' ability to take action also was hindered by Danny Martin's numerous filings in the bankruptcy court and state court, as well as by the assertions by the United States Small Business Administration and the Coos/Curry/Douglas County Development Corporation ("CCD") that the materials and equipment belonged to them. Respondents' submit that the accompanying information demonstrates that Respondents moved with all deliberate speed, that the "R" factor must be

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reduced to zero, and the penalties reduced accordingly.

Dated this 13th day of June, 1994.

HARRANG LONG GARY RUDNICK P.C.

By: _____
Glenn Klein, OSB #83110
Of Attorneys for Respondents

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CERTIFICATE OF SERVICE

I certify that on June 14th, 1994, I caused to be served a full and complete copy of the foregoing **RESPONDENTS' HEARING BRIEF** on the party or parties listed below, by causing the same to be deposited in the United States Mail at Eugene, Oregon, enclosed in a sealed envelope with postage prepaid, and addressed as follows:

Lawrence Edelman
Department of Justice
1515 S.W. 5th St.
Portland, OR 97201

Glenn Klein, OSB #83110
Of Attorneys for Respondents

HARRANG LONG
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BEFORE THE ENVIRONMENTAL QUALITY COMMISSION

OF THE STATE OF OREGON

DEPARTMENT OF ENVIRONMENTAL QUALITY OF THE STATE OF OREGON, Department, v. KENNETH BOLCH; BETTY BOLCH; and STAR CONCRETE, INC., an Oregon corporation, Respondents.	No. HW-SWR-02-241 ORD 98719121 RESPONDENTS' REPLY TO DEPARTMENT'S HEARING BRIEF

Respondents file this Reply to briefly address two points raised by the Department.

First, the Department raises the Environmental Quality Commission's opinion in DEQ v. Fuel Processors, suggesting that negligence can be found as a matter of law. Such a conclusion, however, is inconsistent with the Department's rules. OAR 340-12-045(1)(c)(D) governs application of the "R" factor. The rule expressly contemplates that the value for the "R" factor can be set at zero. Consequently, one may not simply assume as a matter of law the existence of "negligence", but instead, must support it with evidence of such.

Second, the Department includes with its hearing brief, evidence of events which occurred after the Department issued the Notice of Civil Penalty. Such evidence is irrelevant to this proceeding, and Respondents object to that evidence. Additionally, the Affidavit of Jonathan Gasik, at page 1, lines 22 and 23, appears to attempt to incorporate by reference as evidence in this hearing "DEQ's agency file." Respondents object to any evidence contained in DEQ's agency file which has not been specifically introduced as part of this hearing. Respondents are unaware of precisely what information or documents constitute the "agency file." The hearings officer should not consider any documents not attached to the parties' hearing briefs or prehearing briefs.

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ene, OR 97401
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For the reasons discussed in Respondents' hearing brief, Respondents submit that the hearings officer should conclude that the value of the "R" factor should be set at zero.

Dated this 20th day of July, 1994.

HARRANG LONG GARY RUDNICK P.C.

By: _____
Glenn Klein, OSB #83110
Of Attorneys for Respondents

HARRANG LONG
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101 E. Broadway
Eugene, OR 97401
(503) 485-0220

CERTIFICATE OF SERVICE

I certify that on July 20, 1994, I caused to be served a full and complete copy of the foregoing **RESPONDENTS' REPLY TO DEPARTMENT'S HEARING BRIEF** on the party or parties listed below, by causing the same to be deposited in the United States Mail at Eugene, Oregon, enclosed in a sealed envelope with postage prepaid, and addressed as follows:

Lawrence Edelman
Department of Justice
1515 S.W. 5th St.
Portland, OR 97201

Glenn Klein, OSB #83110
Of Attorneys for Respondents

HARRANG LONG
GARY RUDNICK
101 E. Broadway
Eugene, OR 97401
(503) 485-0220

CERTIFICATE OF SERVICE

I certify that on April 14, 1995, I caused to be served a true and complete copy of the foregoing **Respondents' Written Exceptions to Hearing Officer's Decision and Brief** on the party listed below, by causing the same to be deposited in the United States Mail at Eugene, Oregon, enclosed in a sealed envelope with postage prepaid, and addressed as follows:

Lawrence Edelman
Department of Justice
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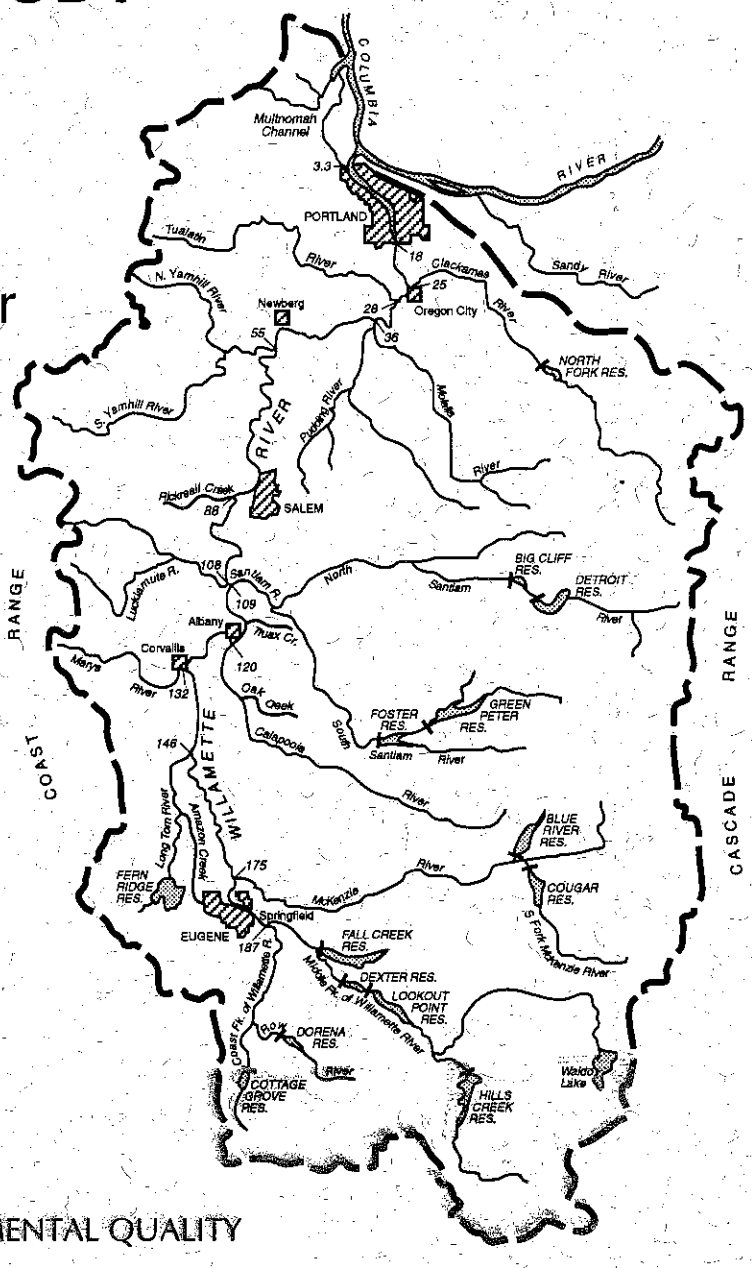
DEQ Contract No. 97-094
Tetra Tech Contract No. 9925-04

WILLAMETTE RIVER BASIN WATER QUALITY STUDY

A Summary of Recent Scientific Reports on the Willamette River



AUGUST 11, 1995

Prepared For:

OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY
WATER QUALITY DIVISION
PORTLAND, OREGON 97204

TETRA TECH

DEQ Contract No. 97-094
Tetra Tech Contract No. 9925-04

WILLAMETTE RIVER BASIN WATER QUALITY STUDY

A Summary of Recent Scientific Reports on the Willamette River

AUGUST 11, 1995

Submitted To:

OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY
811 S.W. SIXTH AVENUE
PORTLAND, OREGON 97204

Prepared By:

TETRA TECH, INC.
15400 NE 90TH, SUITE 100
REDMOND, WASHINGTON 98052-3521

A SUMMARY OF RECENT SCIENTIFIC REPORTS ON THE WILLAMETTE RIVER

OVERVIEW

In 1990, the Oregon Department of Environmental Quality and other agencies began an extensive study of the Willamette River Basin. The purpose of this study, called the Willamette River Basin Water Quality Study (WRBWQS) was to give decisionmakers who deal with the river scientific tools to help them predict what effects their decisions will have. Over 40 reports have been published in the course of this study to date. This report is a brief summary and synthesis of the findings of this study. It is organized into three sections:

- **Chapter 1** introduces the river and the study.
- **Chapter 2** summarizes the findings of the study.
- **Chapter 3** draws the findings together to state what we know about the basic health of the river.

If you're interested in a particular aspect of the river, we strongly encourage you to read the reports on that topic; you'll find final reports for each topic listed in the Appendix. This is a brief, condensed summary of a large set of published findings. For a more extensive technical summary of the WRBWQS, read *Willamette River Basin Water Quality Study: Summary and Synthesis of Findings* (Tetra Tech 1995), from which this summary is drawn.

CHAPTER 1: INTRODUCTION

A BRIEF HISTORY

When the first European American settlers arrived in the 1830s, the Willamette looked very different than it does today. Flow varied dramatically, with frequent floods during rain and snowmelt. In the valley, the channel was braided and shallow, spreading out into marshes miles wide at points. Humans have cleared forests, drained marshes, and made the channel narrower, deeper, and straighter. Snags were cleared, streamside trees removed, dams built, and banks stabilized. The Willamette was transformed from a wild river into a useful waterway for human purposes. It is unlikely that this process will be reversed and the Willamette made wild again.

Concern about the water quality and general health of the Willamette goes back at least to the turn of the century. The Willamette Valley was the part of the Oregon Territory first settled by European Americans, and the river served the settlers as a major transportation artery, water source, and sewer. These roles, especially the dumping of waste, resulted in a serious degradation of water quality. By the 1920s, the river was badly polluted with raw sewage and industrial wastes from paper mills, sugar beet processors, and meat packers. Dissolved oxygen fell low enough to prevent the passage of game fish, and bacteria levels made the water unsafe for any human use. Cleanup efforts began in the 1940s, but it wasn't until secondary wastewater treatment was instituted in the 1970s that the river again became a place where people could swim and salmon could spawn. It was a striking success story and a highlight of national environmental protection efforts. But recent studies have found other problems like trace metals, synthetic organic compounds, suspended sediments, soil nutrients, and altered habitats at a number of places in the Willamette and its tributaries. Despite the great improvements of the last 50 years, continued concern about the health of the Willamette is justified.

THE WILLAMETTE RIVER AND BASIN

The Willamette is the largest river in Oregon (not counting the Columbia) and in many respects the most important. It drains a basin in northwestern Oregon between the Coast Range and the Cascades that covers 11,500 square miles, about 12% of Oregon's land area, but has a population approaching 2 million, well over half the state's population, and the proportion is growing. Population growth is especially rapid in the basin's urban areas centered in Portland, Salem, and Eugene—the state's three largest cities. Fertile soil and abundant rainfall have made the valley the most important agricultural region in the state, and along with urban population growth has come industry of all kinds.

The river flows 295 miles north from its headwaters in southwestern Oregon to the Columbia River. Based on average water volume (23,000 cfs at Salem), it is the tenth largest river in the U.S. This is the result of annual precipitation that ranges from 40 inches in the valley up to as high as 90 in the mountains. The river system includes the main stem, which is 187 miles long, and 13 major tributaries.

For the purposes of this study, the Willamette has been divided into four reaches, or regions:

- **The Tidal Reach**—from the Columbia to Willamette Falls; 26.5 miles. Pacific tides sometimes cause Columbia River water (not Pacific water) to flow up into this reach.

- **The Newberg Pool**—from the Falls to a short ways above Newberg; 35.5 miles. This is the area where water gathers behind Willamette Falls.

- **The Salem Reach**—from the top of the Newberg Pool to Corvallis; 71 miles. The river is shallower, faster, and harder-bottomed here than in the lower reaches.

- **The Headwaters**—above Corvallis; 56 miles. Also fast, shallow, and hard-bottomed.

Figure 1 is a map of the basin showing the four reaches.

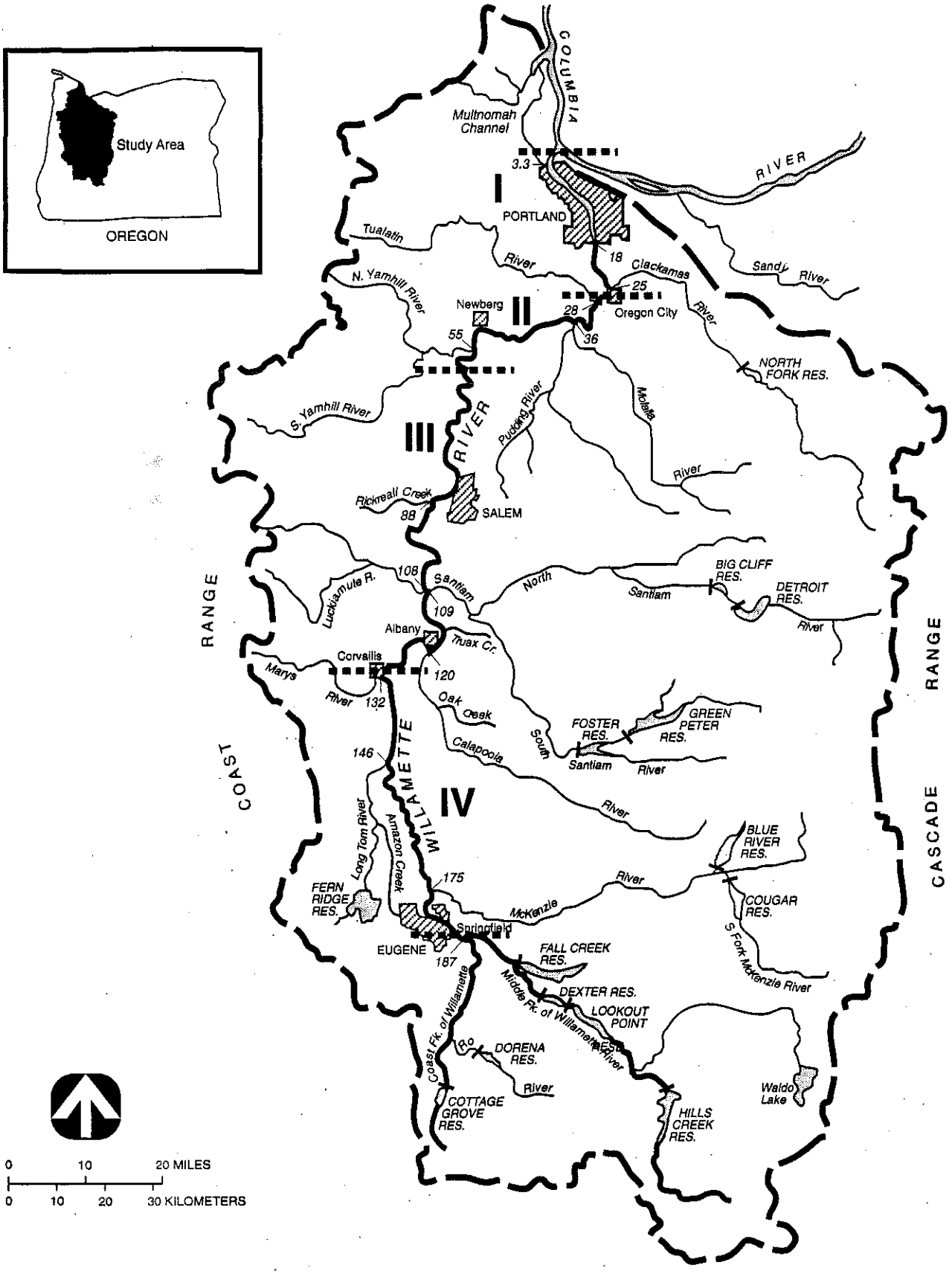


Figure 1. Willamette River Basin Water Quality Study Area and the Four River Regions.

OBJECTIVES OF THE STUDY

The Department of Environmental Quality (DEQ) has identified the protection of the Willamette River as one of the most important resource management goals of the state. The purpose of this study is to support this goal by giving DEQ and others concerned with the health of the river better tools for planning and decisionmaking, and allow them to take a proactive approach to river management rather than just reacting to identified water quality problems. It was authorized by the Oregon Joint Legislative Emergency Board in April 1990. The study has two related objectives:

- Develop tools to help water managers assess current water quality and predict how future changes might impact that water quality

- Collect data necessary to develop, test, and refine these tools

The tools being developed are predictive water quality models, sophisticated computer simulations that use what is currently known about the river and how it has changed in the past to predict how it will change under future pressures. This lets river managers have a good idea of what will happen to water quality if, for instance, river flows are changed or new industries are granted permits to discharge wastewater to the river. It also lets them predict the effects of changes in population and land use, and plan for crises before they arise.

CHAPTER 2: FINDINGS

The purpose of this study was not to assess the health of the Willamette River; it was to develop tools to allow river managers to assess and predict changes in water quality. However, a good deal of information that relates to the health of the river was collected in the process of developing and refining these tools, and it is possible to organize this into a preliminary assessment of the health of the river.

Four different areas or aspects of the river were studied:

- Water quality
- The health of bottom dwelling organisms
- The health of fish
- The quality of natural habitats in the river

WATER QUALITY: POLLUTANTS AND BALANCES

In looking at how clean or polluted water is, we consider pollutants from two general sources. *Point source pollutants* are the kind that can (and usually do) come out of a pipe. There's a specific, identifiable source, like a factory or a sewage treatment plant. *Nonpoint source pollutants* are not so trackable. They come out of the soil as water flows over it, or settle out of the air, or seep out of many small sources, or get washed off roadways when it rains.

Nonpoint source pollutants can be substances that occur naturally at that site, such as soil nutrients like nitrogen or phosphorus that are necessary for plant growth, but which act as pollutants when too much of them gets in the water. Or they can be toxic substances that have spilled on the soil or leaked into the atmosphere, and then entered the water by leaching or settling. Point sources of pollutants in the Willamette, like sewage treatment plants and pulp and paper mills, are closely monitored and regulated

by the Department of Environmental Quality, and contribute significantly less pollution to the river than they did in the past. Nonpoint sources, like runoff from agricultural land and roadways are much more difficult to regulate because of the difficulty of determining accurately the amounts and sources of pollutants entering the river.

As the amount of pollutants entering the river from point sources has been reduced, the relative contribution of nonpoint pollutants has increased. However, the relative importance of these two pollutant sources can vary seasonally. Most of the nonpoint pollution occurs in the winter and spring, when heavy rains wash pollutants into the river. Most point sources, on the other hand, discharge year round, and during summer low water periods, they can have a greater impact on the river than point sources.

A common nonpoint source pollutant in the Willamette River is soil particles eroded from river banks or otherwise washed into the river. In undisturbed conditions, most rivers and streams have few suspended particles because forests and grasslands hold the soil in place. Soil particles become a problem when the soil or vegetation is disturbed, by logging, agriculture, building, road construction, and so forth. In general, suspended particle loads in the Willamette River Basin are highest in areas where the main land use is agriculture. Table 1 ranks the tributary basins of the Willamette according to the amount of suspended particles they were found to contain.

In urbanized areas like the Tidal Reach, nonpoint sources are more varied, and pollutants more numerous. Some of the most polluted water tested was runoff from Interstate 5 near Portland.

Another kind of water pollution has to do with chemical balances. Clean water has a variety of physical and chemical factors—dissolved oxygen, hardness, pH, temperature—that act as pollutants when they're out of balance: too far one way or the other. Historically, Willamette River water was often very low in dissolved oxygen, a common effect of sewage and other organic wastes. Levels were low enough to create a barrier that salmon could not pass through. Dissolved oxygen levels are generally good now that wastes receive secondary treatment, but river managers still watch this factor closely, to make sure water quality is maintained.

TABLE 1. RANKING OF THE NONPOINT SOURCE POLLUTANT LOADS IN THE WILLAMETTE RIVER BASIN

Sub-Basin (Rivers)	Region	TSS	TP	NO_3
Severe Water Quality Problems				
Pudding	II	1	1	1
Columbia	I	2	2	5
Tualatin	II	3	3	4
Long Tom	IV	4	4	2
Coast Range (Yamhill, Luckiamute, Marys)	II, III, IV	5	5	3
Moderate Water Quality Problems				
Santiam	III	6	6	6
Clackamas	I	7	7	7
Mild Water Quality Problems				
Coast Fork (Willamette)	IV	8	8	8
Middle Fork (Willamette)	IV	9	9	9
McKenzie, lower	IV	10	10	10

THE HEALTH OF BOTTOM DWELLERS

Organisms that live in or on the bottoms of rivers—mostly insects, worms, and shellfish—can indicate a lot about the health of the river. Pollutants tend to accumulate in the sediments they live in, and unlike fish, bottom dwellers tend to have a very limited range. Their health thus reflects more specifically the health of that specific part of the river. Considerable scientific research has been devoted to evaluating these organisms and the changes that pollutants cause among them. Research done in this area for the WRBWQS has focused on developing tools and procedures: which organisms to measure and how to do it. The information generated by this research has provided a valuable baseline for comparing future findings with. It has also been used to compare the relative health of one part of the river with another. Generally, bottom dwellers were found to be healthier in the upper reaches of the river.

FISH HEALTH

Two complementary approaches were taken in assessing fish health: community and individual assessment. For the community assessment, different areas of the river were studied to see what species predominated; certain species require very clean water to thrive, while others can adapt to considerable amounts of pollution. Also of interest is the proportion of native versus introduced species. Individual assessments involved capturing and examining individual fish to detect specific abnormalities that have been associated with poor water quality. One study focused on skeletal deformities, while another did full autopsies on fish, looking at a wide array of health indicators.

The fish community assessment showed some impairment in all areas of the river, but with impairment increasing as you moved from the headwaters downriver. Skeletal deformities were within the normal, unimpaired range in the two upriver reaches (above Newberg), but showed widespread impairment in the Newberg Pool and the upper part of the Tidal Reach. The fish autopsy study was limited by migrational factors: most of the fish captured had moved upstream to spawn and thus did not necessarily represent the river region they were captured in. More information is needed about the life cycles and migrational patterns of these fish to do such a study.

HABITAT QUALITY

The health or quality of a river is not dependent solely on water quality. It can also decline with such changes in habitat as dredging, channel straightening, removing snags and streamside trees, and filling wetlands. An important part of the WRBWQS was developing a scale to measure the value of a particular site on the river as habitat for fish and other aquatic life. This scale showed impairment in all areas when compared to an ideal habitat, and the same general decrease in quality from the headwaters to the mouth.

CHAPTER 3: THE HEALTH OF THE WILLAMETTE RIVER

The State of Oregon has the general responsibility to protect the quality of rivers and other bodies of water in the public interest. What this means is spelled out in detail in a section of the Oregon Administrative Rules that lists the "beneficial uses" of the Willamette River that are to be protected by state agencies, particularly the Department of Environmental Quality. In summary form, these uses are:

- Water supply (public, private, and industrial)
- Irrigation and livestock watering
- Anadromous (migratory) fish passage, spawning, and rearing
- Resident fish, aquatic life, and wildlife
- Hunting and fishing
- Boating and water contact recreation
- Esthetic quality
- Hydro power
- Commercial navigation and transportation

In an attempt to synthesize the information provided by the WRBWQS, a river health index was developed. This index addresses each of the major aspects of river health that has been studied and assigns each of the four river reaches a score for each aspect of health. These individual scores were then averaged to derive an overall score for each reach and one for the river as a whole. Table 2 shows the score that each river region received for each aspect of health measured.

Many of these characteristics of river health are subjective or difficult to measure unambiguously. In creating a health index scale for the Willamette, the focus was on measurable criteria, and especially on established standards or suggested guidelines. Where no standards or guidelines existed, for instance for habitat quality, measurement was combined with professional judgment. Each factor studied—water and sediment quality, bottom dwellers, fish, habitats, and nonpoint sources—was scored on a scale from 1-9

TABLE 2. INDEX OF WILLAMETTE RIVER HEALTH

River Region	Health Indicators										Average
	Water Quality Standards and Guidelines				Benthic Communities		Fish		Habitat	Nonpoint Sources	
	Dissolved Oxygen	Chlorophyll *a*	Toxics - Water	Toxics - Sediment	Soft-bottom	Riffle	Index of Biotic Integrity	Skeletal Deformity			
4	9	9	4.9	4.5	6.5	5.8	5.7	9	5.5	5.9	6.6
3	7	9	5.5	3.8	4.9	5	5.2	2.5	5	4.5	5.2
2	9	9	3	2.3	5	--	4.3	1	4.7	3	4.6
1	9	9	3.3	1.2	4.6	--	3.8	4.5	2.8	4.3	4.7
Indicator Average	8.5	9	4.2	3.0	5.3	5.4	4.7	4.3	4.5	4.4	
Overall Willamette River Health Index Score											5.3

RIVER HEALTH INDEX	Score
Scoring Criteria:	
Excellent Health; No Evidence of Impairment or Exceedance of Available Standards or Guidance Values	9
Good Health; Occasional Exceedances of Available Standards or Guidance Values	7
Marginal Health; Common Exceedances of Available Standards or Guidance Values	5
Poor Health; Consistent Exceedances of Available Standards or Guidance Values	3
Highly Impaired; Almost Always Exceeds Available Standards or Guidance Values	1

for each of the four river reaches. These were the scores then averaged to arrive at an overall score for the river. The scores were defined as follows:

River Health Index Score	Description
9	Excellent Health; No Evidence of Impairment or Exceedance of Available Standards or Guidance Values
7	Good Health; Occasional Exceedances of Available Standards or Guidance Values
5	Marginal Health; Common Exceedances of Available Standards or Guidance Values
3	Poor Health; Consistent Exceedances of Available Standards or Guidance Values
1	Highly Impaired; Almost Always Exceeds Available Standards or Guidance Values

The Tidal Reach (the Columbia to Willamette Falls) : **4.8**

This is the most urbanized and industrialized area of the river, with drainage mostly from the Portland area. Standards and guidelines for toxics in water and sediments were commonly exceeded. Overall fish health was poor, and the quality of habitat was also impaired in many areas. The overall score of 4.8 indicates a marginal-to-poor condition overall.

The Newberg Pool (Willamette Falls to Newberg) : **4.7**

Fish health, as measured by skeletal deformities, was worse in this reach than in any other, with as many as 50% of all fish captured showing deformities at some sites. Standards and guidelines for toxics in water and sediments were commonly exceeded, particularly below Newberg. Dissolved oxygen levels were lowest in this region, and nonpoint source pollution, probably related to agriculture, was most pronounced. With an overall score of 4.7 the health of the Newberg Pool was about as marginal as that of the Tidal Reach, for slightly different reasons.

The Salem Reach (Newberg to Corvallis) : **5.3**

This reach had some exceedances of toxics guidelines and standards, and some evidence of fish health problems, but less so than the lower reaches. Most problems were noted near Salem or Albany. The overall score of 5.3 indicates marginal health.

The Headwaters (above Corvallis) : **6.5**

There were a few exceedances of toxics standards in this region, and some evidence of fish health problems, but overall the river health here is good. The overall score of 6.5 is good but not excellent.

The River as a Whole

The Willamette River has been extensively managed and shaped to serve the needs of the human population. Historical severe pollution problems from sewage have been controlled, and the river is dramatically healthier than it was 30 years ago. However, concern for its health is still justified by the presence of pollutants in water and sediments and the alteration of habitats. The health status of the river declines as you move downstream, from good in the headwaters to marginal-to-poor in the lower regions. Overall, the river is marginally healthy.

APPENDIX A: WILLAMETTE RIVER BASIN WATER QUALITY STUDY REPORTS

PHASE I:

COMPONENT 1: SCOPE OF WORK

Tetra Tech. 1992. Willamette River Basin Water Quality Study: Scope of Work. Final Report. Prepared for Oregon Department of Environmental Quality, Portland, OR. Tetra Tech Inc., Redmond, WA. 69 pp.

COMPONENT 2: TOXICS MODELING

Tetra Tech. 1992. Willamette River Basin Water Quality Study. Component 2: Review and summary of toxic pollutants in the Willamette River and major tributaries. Final Report. Prepared for Oregon Department of Environmental Quality, Portland, OR. Tetra Tech, Inc., Redmond, WA. 39 pp. + appendices.

Tetra Tech and Limno Tech. 1992. Willamette River Basin Water Quality Study. Water quality model selection recommendation. Submitted by Limno-Tech, Inc. to Tetra Tech. Final Report. Prepared for Oregon Department of Environmental Quality, Portland, OR. Tetra Tech, Inc., Redmond, WA. 22 pp.

Tetra Tech and Limno-Tech. 1993. Willamette River Basin Water Quality Study. Component 2: Toxic chemical model application report. Submitted by Limno-Tech, Inc. to Tetra Tech. Final Report. Prepared for Oregon Department of Environmental Quality, Portland, OR. Tetra Tech, Inc., Redmond, WA. 67 pp. + appendices.

Tetra Tech and Limno-Tech. 1993. Willamette River Basin Water Quality Study. Component 2: Toxic chemical monitoring recommendations. Final Report. Prepared for Oregon Department of Environmental Quality, Portland, OR. Tetra Tech, Inc., Redmond, WA. 33 pp.

Tetra Tech and Limno Tech. 1993. Willamette River Basin Toxics Component Report. Final Report. Prepared for Oregon Department of Environmental Quality, Portland, OR. Tetra Tech, Inc., Redmond, WA. 24 pp.

COMPONENT 3: DISSOLVED OXYGEN MODELING

Tetra Tech. 1992. Willamette River Basin Water Quality Study. Component 3: Data review and summary for dissolved oxygen modeling on the Willamette River. Final Report. Prepared for Oregon Department of Environmental Quality, Portland, OR. Tetra Tech, Inc., Redmond, WA. 54 pp. + appendices.

Tetra Tech. 1993. Willamette River Basin Water Quality Study. Willamette River dissolved oxygen modeling component report. Volumes 1 and 2. Final Report. Prepared for Oregon Department of Environmental Quality, Portland, OR. Tetra Tech, Inc., Redmond, WA. 135 pp. + appendices.

COMPONENT 4: NUTRIENTS AND ALGAL GROWTH MODELING

Tetra Tech. 1992. Willamette River Basin Water Quality Study. Component 4: Review and summary of nutrient and phytoplankton growth data for the Willamette River. Final Report. Prepared for the Oregon Department of Environmental Quality, Portland, OR. Tetra Tech, Inc., Redmond, WA. 68 pp. + appendices.

Tetra Tech. 1993. Willamette River Basin Water Quality Study. Willamette River nutrient and phytoplankton growth modeling component report. Final Report. Prepared for the Oregon Department of Environmental Quality, Portland, OR. Tetra Tech, Inc., Redmond, WA. 131 pp. + appendices.

Gregory, S.V. 1993. Willamette River Basin Study. Water quality dynamics—periphyton algal dynamics. Final Report. Prepared for Oregon Department of Environmental Quality, Portland, OR. Department of Fisheries and Wildlife, Oregon State University, Corvallis, OR. 88 pp.

COMPONENT 5: BACTERIA MODELING

Tetra Tech. 1992. Willamette River Basin Water Quality Study. Component 5: Review and summary of bacterial conditions in the Willamette River and major tributaries. Final Report. Prepared for Oregon Department of Environmental Quality, Portland, OR. Tetra Tech, Inc., Redmond, WA.

Tetra Tech. 1993. Willamette River Basin Water Quality Study. Component 5: Bacteria monitoring recommendations. Final Report. Prepared for Oregon Department of Environmental Quality, Portland, OR. Tetra Tech, Inc., Redmond, WA. 33 pp.

Tetra Tech. 1993. Willamette River Basin Water Quality Study. Willamette River basin bacteria component report. Final Report. Prepared for Oregon Department of Environmental Quality, Portland, OR. Tetra Tech, Inc., Redmond, WA. 55 pp.

COMPONENT 6: BIOLOGICAL RESPONSES TO STRESSORS

Tetra Tech. 1993. Willamette River Basin Water Quality Study. Willamette River basin biological responses to stressors component report. Final Report. Prepared for Oregon Department of Environmental Quality, Portland, OR. Tetra Tech, Inc., Redmond, WA. 37 pp. + appendices.

COMPONENT 7: POINT SOURCES

Tetra Tech. 1992. Willamette River Basin Water Quality Study. Component 7: Point source discharges and waste loading to the Willamette River Basin during 1991. Final Report. Prepared for Oregon Department of Environmental Quality, Portland, OR. Tetra Tech, Inc., Redmond, WA. 61 pp. + appendices.

COMPONENT 8: NONPOINT SOURCES

Tetra Tech and E&S Environmental Chemistry. 1992. Willamette River Basin Water Quality Study. Component 8: Literature review and summary of nonpoint source pollution in the Willamette River Basin. Final Report. Prepared for Oregon Department of Environmental Quality, Portland, OR. Tetra Tech, Inc., Redmond, WA. 77 pp. + appendices.

Tetra Tech and E&S Environmental Chemistry. 1992. Willamette River Basin Water Quality Study. Component 8: Nonpoint source pollution model recommendation. Final Report. Prepared for Oregon Department of Environmental Quality, Portland, OR. Tetra Tech, Inc., Redmond, WA. 36 pp.

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Tetra Tech and E&S Environmental Chemistry. 1993. Willamette River Basin Water Quality Study. Component 8: Nonpoint source pollution monitoring design. Final Report. Prepared for Oregon Department of Environmental Quality, Portland, OR. Tetra Tech, Inc., Redmond, WA. 38 pp.

Tetra Tech and E&S Environmental Chemistry. 1993. Willamette River Basin Water Quality Study. Willamette River Basin nonpoint source component report. Final Report. Prepared for Oregon Department of Environmental Quality, Portland, OR. Tetra Tech, Inc., Redmond, WA. 34 pp.

COMPONENT 9: ECOLOGICAL SYSTEMS INVESTIGATIONS

Tetra Tech. 1992. Willamette River Basin Water Quality Study. Component 9: Characterization of Willamette River main-stem ecoregions. Final Report. Prepared for Oregon Department of Environmental Quality, Portland, OR. Tetra Tech, Inc., Redmond, WA. 27 pp.

Tetra Tech. 1993. Willamette River Basin Water Quality Study. Willamette River ecological systems investigation component report. Final Report. Prepared for Oregon Department of Environmental Quality, Portland, OR. Tetra Tech, Inc., Redmond, WA. 164 pp. + appendices.

COMPONENT 10: PROJECT SUMMARY REPORT

Tetra Tech. 1993. Willamette River Basin Water Quality Study: Summary Report. Final Report. Prepared for Oregon Department of Environmental Quality, Portland, OR. Tetra Tech, Inc., Redmond, WA. 167 pp. + appendices.

COMPONENT 11: FIELD SURVEY

Tetra Tech. 1992. Willamette River Basin Water Quality Study. Component 11: Field sampling plan: Water quality model calibration and ecological assessment. Final Report. Prepared for Oregon Department of Environmental Quality, Portland, OR. Tetra Tech, Inc., Redmond, WA. 69 pp. + appendices.

Tetra Tech. 1992. Willamette River Basin Water Quality Study. Component 11: Water quality survey data. Final Report. Prepared for Oregon Department of Environmental Quality, Portland, OR. Tetra Tech, Inc., Redmond, WA. 56 pp. + appendices.

PHASE II:

Tetra Tech. 1994. Willamette River Basin Water Quality Study. Phase II: Biological Sampling Data Report. Final Report. Prepared for Oregon Department of Environmental Quality, Portland, OR. Tetra Tech Inc., Redmond, WA. 47 pp. + appendices.

Tetra Tech. 1994. Willamette River Basin Water Quality Study. Phase II: Scope of Work. Final Report. Prepared for Oregon Department of Environmental Quality, Portland, OR. Tetra Tech Inc., Redmond, WA. 79 pp.

NONPOINT SOURCE COMPONENT

Tetra Tech and E&S Environmental Chemistry. 1994. Willamette River Basin Water Quality Study. Phase II: Nonpoint Source Sampling and Analysis Plan. Final Report. Prepared for Oregon Department of Environmental Quality, Portland, OR. Tetra Tech, Inc., Redmond, WA. 45 pp.

Tetra Tech and E&S Environmental Chemistry. 1994. Willamette River Basin Water Quality Study. Phase II: Land use characterization of the Pudding River sub-basin and selected watersheds. Final Report. Prepared for Oregon Department of Environmental Quality, Portland, OR. Tetra Tech, Inc., Redmond, WA. 37 pp.

Tetra Tech and E&S Environmental Chemistry. 1995. Willamette River Basin Water Quality Study. Phase II: Non-point source pollution in the Pudding River sub-basin of the Willamette River. Final Report. Prepared for Oregon Department of Environmental Quality, Portland, OR. Tetra Tech, Inc., Redmond, WA. 254 pp.

ECOLOGICAL MONITORING COMPONENT

Tetra Tech. 1994. Willamette River Basin Water Quality Study. Phase II: Ecological monitoring component: Benthic metric selection and data evaluation. Final Report. Prepared for Oregon Department of Environmental Quality, Portland, OR. Tetra Tech Inc., Redmond, WA. 70 pp. + appendices.

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Curtis, L.R. and L.K. Siddens. 1995. Study of the teratogenic qualities of whole effluent and Willamette River water near river mile 56. Interim Data Report. Prepared for Oregon Department of Environmental Quality, Portland, OR. Oregon State University, Corvallis, OR.

INTEGRATION COMPONENT

Tetra Tech. 1995. Willamette River Basin Water Quality Study: Summary and Synthesis of Study Findings. Final Report. Prepared for Oregon Department of Environmental Quality, Portland, OR. Tetra Tech Inc., Redmond, WA.

Tetra Tech. 1995. Findings of the Willamette River Basin Water Quality Study. Final Report. Prepared for Oregon Department of Environmental Quality, Portland, OR. Tetra Tech Inc., Redmond, WA.

STEADY-STATE MODEL REFINEMENT COMPONENT

Tetra Tech. 1995. Willamette River Basin Water Quality Study. Phase II: Steady-State Model Refinement Component: QUAL2E-UNCAS Dissolved Oxygen Model Calibration and Verification, Volumes I and II. Final Report. Prepared for Oregon Department of Environmental Quality, Portland, OR. Tetra Tech Inc., Redmond, WA. 55 pp. + appendices.

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Laenen, A. 1995. Willamette River Water Quality Study--Sediment Transport in the Main Stem and Major Tributaries. In: The Cutting Edge of Water Research, Vol. 1, No. 1, 1995. U.S. Geological Survey, Water Resources Division, Portland, OR. 4 pp.

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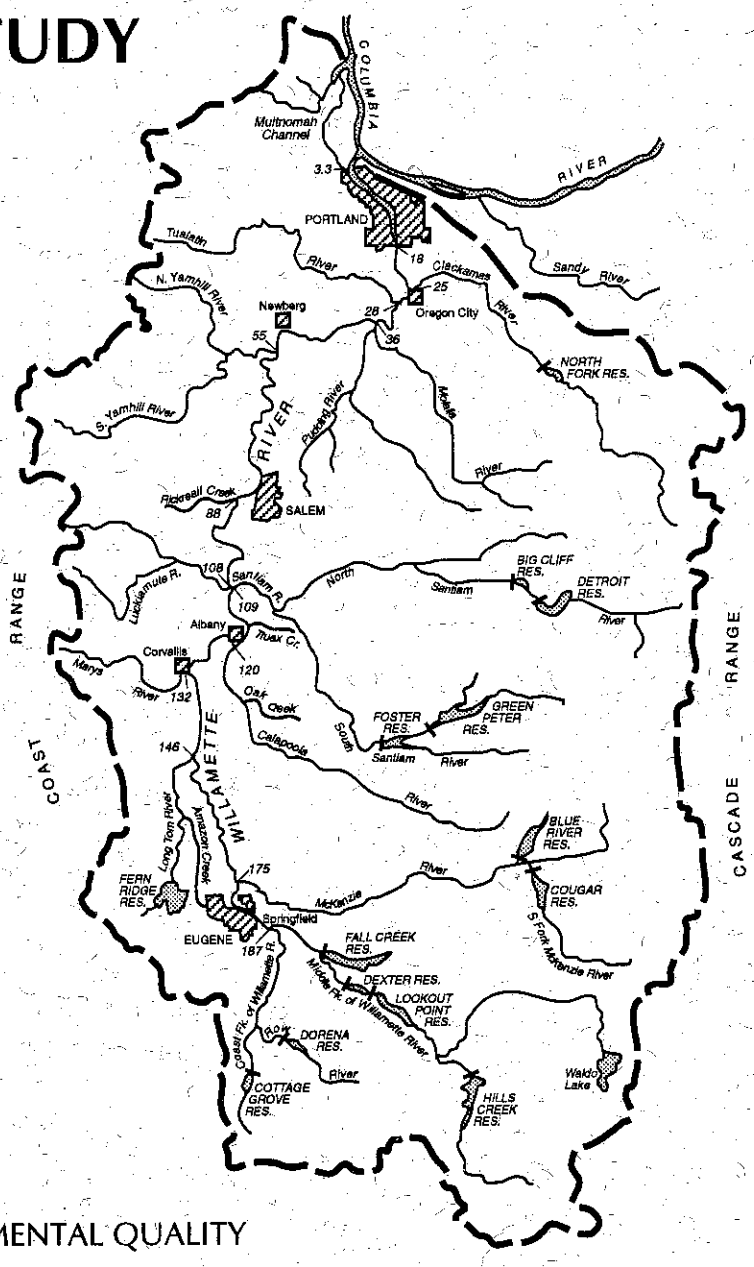
U.S. Geological Survey. 1995b. Ancillary Information and Data Tables for the Pesticide and Trace Element Study by the US Geological Survey as Task 1 of the Phase II Willamette River Basin Water Quality Study, 1994. Preliminary Draft. Prepared for Oregon Department of Environmental Quality, Portland, OR. U.S. Geological Survey, Water Resources Division, Portland, OR.

DEQ Contract No. 97-094
Tetra Tech Contract No. 9925-04
Final Report

WILLAMETTE RIVER BASIN WATER QUALITY STUDY

Summary and Synthesis of Study Findings



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WATER QUALITY DIVISION
PORTLAND, OREGON 97204

TETRA TECH

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WILLAMETTE RIVER BASIN WATER QUALITY STUDY

Summary and Synthesis of Study Findings

AUGUST 11, 1995

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This report summarizes the technical studies that have been conducted as part of Phases I and II of the Willamette River Basin Water Quality Study (WRBWQS) for the Oregon Department of Environmental Quality (DEQ). Tetra Tech, Inc. has been DEQ's prime contractor for the studies conducted under this program. E&S Environmental Chemistry, Taxon Aquatic Monitoring Service, and Limno Tech, Inc. have assisted Tetra Tech in completing the studies conducted for DEQ. This report also summarizes work conducted by the U.S. Geological Survey, and Dr. Stan Gregory, Dr. Dave Markle, and Dr. Lary Curtis of Oregon State University.

The principal authors of this report were Dr. Steve Ellis, Mr. Gary Braun, and Mr. Curtis DeGasperi of Tetra Tech, Inc., and Mr. Joe Eilers of E&S Environmental Chemistry. Mr. Chauncey Anderson and Mr. Dennis Wentz of the U.S. Geological Survey also contributed material that was incorporated into this report. Technical editing was provided by Mr. Bejurin Cassady of Tetra Tech, Inc. Word processing and document production were performed by Ms. Lisa Fosse and Ms. Rosemary O'Brien.

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TABLES

LIST OF ACRONYMS

AVHRR	Advanced Very High Resolution Radar
AGNPS	Agriculture Nonpoint Source Pollution Model
BOD	Biochemical Oxygen Demand
CBOD	Carbonaceous Biochemical Oxygen Demand
DO	Dissolved Oxygen
DMR	Discharge Monitoring Report
EPT Index	Number of Ephemeroptera, Plecoptera, and Trichoptera Taxa
GIS	Geographic Information System
IBI	Index of Biotic Integrity
MUSLE	Modified Universal Soil Loss Equation
NAWQA	National Water Quality Assessment
NBOD	Nitrogenous Biochemical Oxygen Demand
NPDES	National Pollution Discharge Elimination System
NPS	Nonpoint Source
ODEQ	Oregon Department of Environmental Quality
PAH	Polycyclic Aromatic Hydrocarbon
PCB	Polychlorinated Biphenyl
RK	River Kilometer
RM	River Mile
RBP	Rapid Bioassessment Protocols
RPD	Relative Percent Difference
SMPTOX3	Simplified Method Program - Two Phase Toxics Model with Bed Interactions
SOD	Sediment Oxygen Demand
STP	Sewage Treatment Plant
TKN	Total Kjeldahl Nitrogen
TMDL	Total Maximum Daily Load

TN	Total Nitrogen
TP	Total Phosphorus
TSS	Total Suspended Solids
QUAL2EU	Enhanced Stream Water Quality Model with Uncertainty Analysis (QUAL2E-UNCAS)
SWRRB	Simulator for Water Resources in Rural Basins
USACOE	U.S. Army Corps of Engineers
U.S.EPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
WRBWQS	Willamette River Basin Water Quality Study
WRTASC	Willamette River Technical Advisory Steering Committee
WWTP	Wastewater Treatment Plant

1.0 INTRODUCTION

This is the final integrated report of the Phases I and II of Willamette River Basin Water Quality Study, authorized by the Oregon state legislature in April 1990. It brings together in summary the findings of a number of government agencies and private contractors that contributed to this project. This report is intended to provide an overview of the study and only a brief summary of findings. References to more detailed reports are included in the text, and the reader is encouraged to refer to the individual report (see Appendix A) for a fuller discussion of any area of interest.

Chapter 1 introduces the area studied, the reasons for the study, and the study objectives. Chapter 2 summarizes the findings of each major component of the study. Chapter 3 integrates all of these findings to make a series of summary statements about the health of the river. A list of all the reports that have been published as part of this study is provided in Appendix A.

1.1 THE IMPORTANCE OF THE WILLAMETTE RIVER

Protecting and improving the water quality and overall health of the Willamette River and its tributaries has been identified as one of the most important long-range resource management goals for the State of Oregon (ODEQ 1990). The Willamette River basin includes the largest population centers in the state, supporting a total population of almost two million as of 1990. It is the fastest growing and most economically developed region of the state, with growth concentrated in the large urban centers of Eugene, Salem, and Portland at river miles 185, 85, and 10, respectively (Figure 1-1). Pressure on the river from population growth and economic development is likely to increase. The river is vulnerable to these pressures, and requires careful management and protection; the purpose of this study is to provide tools and information to assist the Department of Environmental Quality in managing and protecting this very important resource.

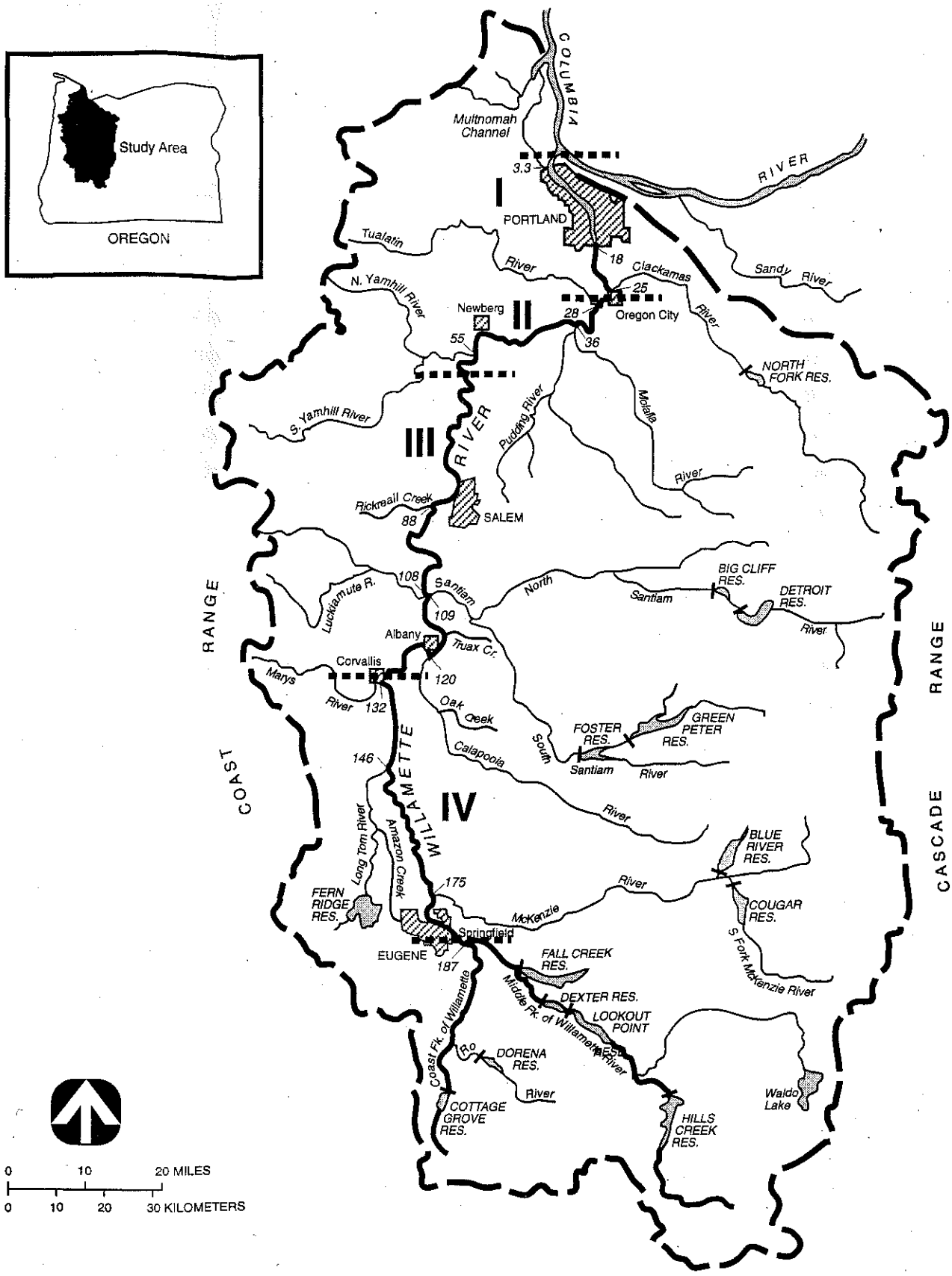

Figure 1-1. Willamette River Basin Water Quality Study Area and the Four River Regions.

1.2 DESCRIPTION OF THE STUDY AREA

The Willamette River drainage basin covers approximately 11,500 mi^2 (30,000 km^2) in northwest Oregon between the Coast and Cascade mountain ranges (Figure 1-1). The mainstem of the river meanders north approximately 187 mi (300 km) through an alluvial valley to the Columbia River. At its mouth the Willamette is the 10th largest river in the continental U.S. in terms of total discharge (Sedell and Frogatt 1984), and the discharge per unit area is the highest of large U.S. rivers. This is due to heavy rainfall at lower elevations in the basin during the winter months (Rickert and Hines 1978), and snow accumulation higher up which extends high flows into spring and early summer. Intermittent heavy rainfall is a key factor in introducing suspended solids and toxic chemicals to the river. Most of the rainfall occurs in the fall, winter, and spring, with little rainfall during June, July, and August. Lowest river flows occur during the late summer, when rainfall is lowest and air temperature highest. This has historically been the most critical period for dissolved oxygen levels.

Seasonal variations in flow are managed for flood control, irrigation, and navigation purposes by impoundments on a number of the large tributaries. Willamette Falls provides a natural flow control at river mile (RM) 26.5 [river kilometer (RK) 42]. A lock, powerhouse, and fish ladder have been constructed at this location. The 26.5-mi (42-km) stretch of river below the falls is tidally influenced via the Columbia River which flows into the Pacific Ocean approximately 100 river miles (160 km) to the west. The tides occasionally result in Columbia River water mixing into the lower Willamette River.

Significant changes have occurred in the drainage basin since European-American immigrants began to arrive in the 1800s (Gleeson 1972; Sedell and Frogatt 1984; Berger 1992). Originally mostly forest, about half the basin is still forested. One-third of the basin is currently used for agriculture, and about 5 percent is urbanized or is in residential use. The river receives direct inputs of treated municipal wastes and industrial effluents. Nonpoint source inputs from agricultural, silvicultural, residential, urban, and industrial land uses are also significant, especially during rainfall runoff.

1.2.1 River Regions

The mainstem of the river may be divided into four distinct regions, based on hydraulic and physical characteristics (see Figure 1-1):

- Region I [RM 0-26.5 (RK 0-42)]: Mouth to Willamette Falls
- Region II [RM 26.5-60 (RK 42-96)]: Willamette Falls to above Newberg
- Region III [RM 60-130 (RK 96-208)]: Above Newberg to Corvallis
- Region IV [RM 130-187 (RK 208-300)]: Upstream of Corvallis

A brief description of each of these regions is provided in the following sections.

1.2.1.1 River Region I - Mouth to Willamette Falls. This river reach (Tidal Reach) is unique in that it is tidally influenced. Flow reversals in this 26.5 mi (42 km) reach can cause intrusions of Columbia River water into the Willamette (Rickert 1984). The riverbed is mixed clay, sand, and gravel. The bed slope is less than 0.000019 [0.1 ft/mi (0.019 m/km)]; a representative depth for this reach is 40 ft (12.2 m). During summer low-flow conditions, the current speed is approximately 0.11 mi/hour (0.05 m/sec), giving a reach travel time of 241 hours (Rickert et al. 1975).

1.2.1.2 River Region II - Willamette Falls to Above Newberg. This reach (Newberg Pool) is 35.5 mi (54 km) long and is a deep, slow-moving area of the river. The river bed is composed of intermixed clay, sand, and gravel with some cobbles. The bed slope is approximately 0.000023 [0.12 ft/mi (0.023 m/km)], with a representative depth of 25 ft (7.6 m). During summer low-flow conditions, the current speed of this reach is approximately 0.27 mi/hour (0.12 m/sec), giving a reach travel time of 124 hours (Rickert et al. 1975).

1.2.1.3 River Region III - Above Newberg to Corvallis. This river reach is 71 mi (116 km) long, with fast-moving currents flowing over a shallow cobble and gravel riverbed. Average bed slope is approximately 0.00034 [1.8 ft/mi (0.34 m/km)]. During the summer low-flow period, water depth in Region III averages approximately 8 ft (2.4 m) and a typical current speed is 1.9 mi/hour (0.85 m/sec), with a reach travel time of approximately 38 hours (Rickert et al. 1975).

1.2.1.4 River Region IV - Upstream of Corvallis. This 56 mi (96 km) river reach is also characterized by fast-moving currents flowing over a shallow riverbed composed of cobbles and gravel. The bed slope is approximately 0.00072 [3.8 ft/mi (0.72 m/km)]. During the summer low-flow period, water depth in this reach averages approximately 6 ft (1.83 m); current speed is approximately 2.1 mi/hour (0.94 m/sec), giving a reach travel time of 26 hours (Rickert et al. 1975).

1.3 ORIGINS OF THIS STUDY

Water pollution has been an issue in the Willamette basin for decades. Before the implementation of wastewater treatment regulations in the 1970s, severe water quality problems were caused by sewage and industrial discharge. Dissolved oxygen levels were sometimes low enough to kill salmon attempting to migrate along the river, and coliform bacteria made the water unsafe for swimming (Gleeson and Merryfield 1936; Merryfield and Wilmot 1945; Merryfield et al. 1947). Today the river is visibly much improved; water contact sports and salmon migration are once again possible, at least in much of the river. Despite this success story, recent surveys have found levels of toxic chemicals in water, sediments, and fish tissue at certain locations in the river basin.

These surveys (ODEQ 1994) have found levels of metals (arsenic, barium, cadmium, chromium, copper, lead, mercury, nickel, silver, and zinc), pesticides (chlordane and DDT), other organic chemicals (carbon tetrachloride, creosote, dichloroethylene, dioxin, PAHs, PCBs, phenol, pentachlorophenol, phenanthrene, phthalates, trichloroethane, trichloroethylene, and trichlorophenol), and bacteria in at least one location within the basin that exceed regulatory or guidance criteria for the protection of aquatic life and human health. There are also high levels of suspended particles and agricultural nutrients in some sections of the river. So while the situation has improved greatly, there is still reason for concern.

In April 1990, the Oregon Joint Legislative Emergency Board directed the Oregon Department of Environmental Quality (ODEQ) to form the Willamette River Technical Advisory Steering Committee (WTRASC). The WRTASC was charged with developing a comprehensive study to generate the relevant technical and regulatory understanding and an information base on the river system that would be used to protect and enhance its water quality. The WRTASC decided that the studies needed to accomplish

the legislative mandate of preserving the Willamette and protecting its beneficial uses should accomplish the following two objectives:

- Develop tools, based on sound scientific methodology, that will 1) provide reliable assessments of current water quality in the basin, and 2) provide a means for assessing how future changes in land use within the basin and different river management options may impact water quality

- Collect data necessary to 1) identify and characterize water quality problems within the basin, and 2) support the implementation and development of the river management tools.

The conceptual diagram for this study, which became known as the Willamette River Basin Water Quality Study (WRBWQS) is shown in Figure 1-2. The studies undertaken to date to achieve these objectives were accomplished in two phases. Phase I began in 1992 and was completed in 1993. The findings and recommendations from Phase I were used to formulate Phase II, which began in 1994 and was completed in 1995. A third phase of further refinement of models began in 1995 and is scheduled to be completed in 1997. See Appendix A for a complete list of publications from both phases.

1.3.1 The Willamette NAWQA

The WRBWQS was designed to complement an ongoing federal study, the Willamette Basin National Water-Quality Assessment (NAWQA). This is one component of a program of the U.S. Geological Survey (USGS) designed to characterize the current status and long-term trends of water quality in a majority (60-70 percent) of the nation's utilized surface water and groundwater resources, and to provide a solid, scientific foundation for evaluating natural and anthropogenic impacts on these resources (Leahy et al. 1990; Leahy and Thompson 1994). Full implementation of the program began in 1991 in 20 study units — combinations of river basins and associated aquifer systems. One of these was the Willamette Basin study unit, which comprises the Willamette and Sandy River basins. In 1995, the Willamette NAWQA study was in its fifth year; this was the third and last year of intensive data collection scheduled for the first 10-year cycle of the program. Water quality issues focused on by the Willamette Basin NAWQA include biological degradation of the aquatic ecosystem, soil erosion from changing land use, impacts of groundwater/surface water interaction, and elevated concentrations of nutrients, synthetic organic compounds (including pesticides), and trace elements (Wentz and McKenzie 1991). All data will be published in standard USGS series reports after quality assurance review is completed.

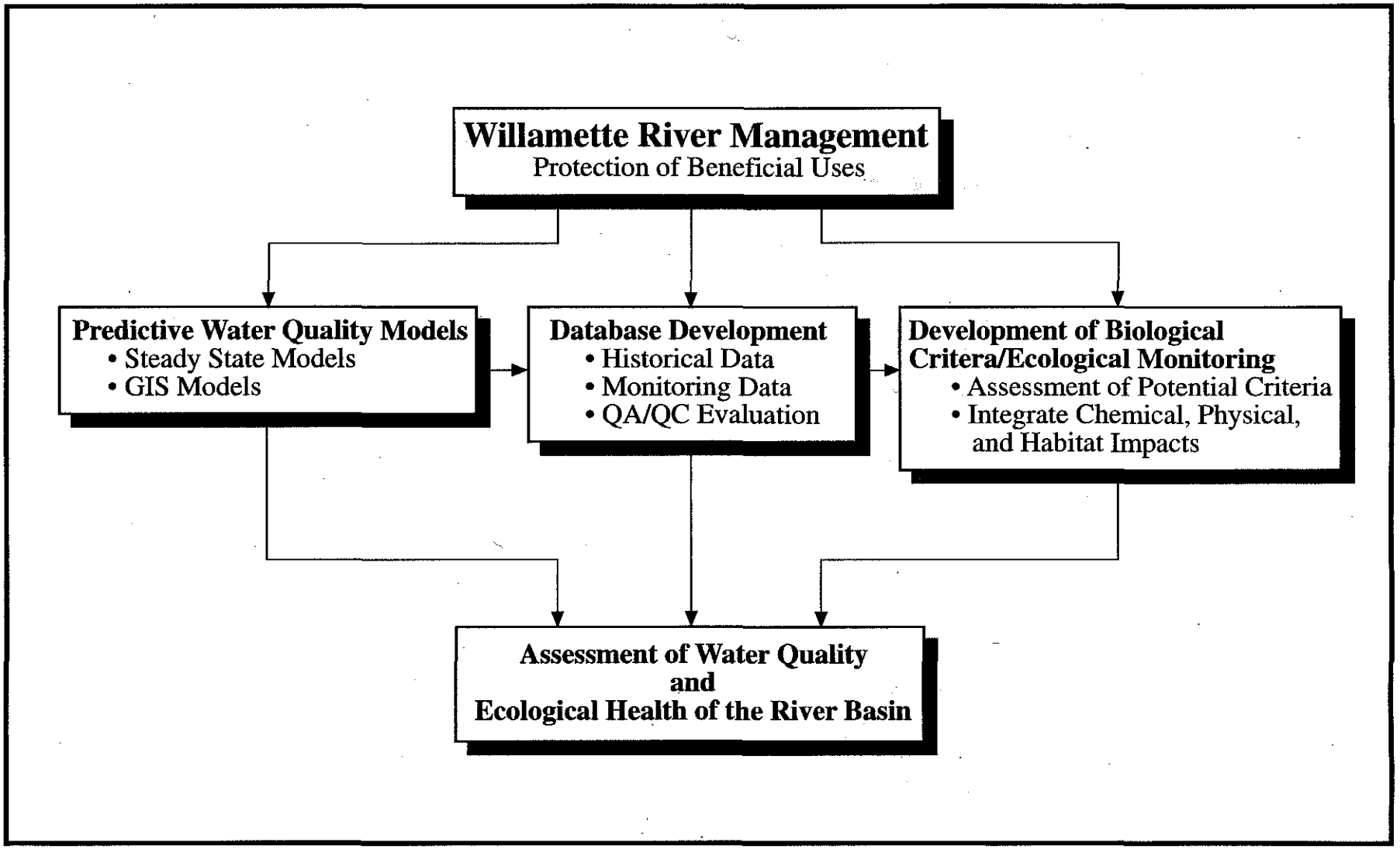

Figure 1-2. Conceptual Diagram of Willamette River Basin Water Quality Study Objectives.

2.0 FINDINGS OF THE WILLAMETTE RIVER BASIN WATER QUALITY STUDY

The primary purpose of the WRBWQS has been to develop tools for river management. Tool development has involved two separate yet complementary activities. One of these has been selecting and calibrating predictive water quality models, to allow river managers to understand more precisely the likely outcome of specific management decisions. Model development has focused on several water quality parameters (dissolved oxygen, nutrients, chlorophyll, bacteria, toxic chemicals, and suspended sediments) and has addressed both point and nonpoint sources. The other area of tool development has been evaluating and refining biological indices that can be used by ODEQ to develop biological criteria for assessing water quality. Biological criteria measure ecological and physiological characteristics of organisms and communities that are known to change under the pressure of physical, chemical, or biological stresses. These measurements are used as diagnostic indicators of water quality from the point of view of aquatic life.

2.1 DEVELOPMENT OF PREDICTIVE WATER QUALITY MODELS

Predictive water quality models developed in this study will be used by ODEQ to achieve three broad objectives:

- Review existing river basin management policies.
- Develop a water quality based river management approach.
- Define future monitoring requirements.

Water quality managers can use these models in a number of ways. In general, they help managers take into account the underlying physical and biochemical processes that control the quality of river water and make decisions on a more rational basis. Models can be used to predict the effect of possible changes in river conditions (e.g., changes in flow regime) or wasteloads (e.g., increases in oxygen-demanding

waste inputs) on water quality. They can be used to design new or refine existing water quality monitoring programs by identifying sensitive river reaches or locations where maxima or minima in critical water quality variables may occur. By simulating the outcomes of various management scenarios, models allow managers to preview the impact of their decisions. They can help managers weight the costs of increased pollution control against the benefits of expected water quality improvements.

Any water quality model is a simplification of the complex interactions that actually occur in nature. A model's ability to predict accurately the response of a river system to changing conditions depends both on its level of complexity—that is, how well it models real life in a river—and on the quality of the field data used to calibrate and verify it. The level of complexity of a water quality model is determined by the available project resources, the spatial and temporal resolution required, the availability and types of data available for model development, the cost of obtaining additional data if necessary, and the types of environmental conditions which need to be evaluated. Because of these tradeoffs, no model will be without some limitations. Water quality managers need to understand the limitations of the model they are using.

The WRTASC recognized that management tools were necessary to balance current and future demands on the water resources in the Willamette River basin, and focused Phase I studies on developing predictive water quality models for the following variables:

- Dissolved oxygen, nutrients, and phytoplankton
- Fecal coliform bacteria
- 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin (2,3,7,8-TCDD)
- DDT
- Arsenic
- Chromium
- Copper
- Lead
- Zinc

Historically, dissolved oxygen (DO) has been a factor of great concern in the Willamette. While the situation has improved tremendously with the advent of secondary wastewater treatment, it was felt that

modeling DO and related conventional variables (nutrients and phytoplankton) was important so that managers could prevent a possible resurgence of this problem caused by such pressures as population growth and increased industrial discharge. The other variables (toxic constituents) were chosen because they had all been detected in water, fish, or sediments at one or more sites along the Willamette River at levels indicating potential impairment of beneficial uses (ODEQ 1990).

The development of these predictive water quality models involved the following steps:

- Model selection
- Data compilation
- Model calibration and verification
- Model application

First, a number of models of varying complexity were reviewed to identify the best candidates (Tetra Tech and Limno Tech 1992). Existing data were then reviewed and summarized to provide the foundation for developing the selected models. A synoptic field survey was designed and implemented in August 1992 to provide recent data for calibrating the selected models (Tetra Tech 1992a,b). During Phase II, additional field data were collected for further refinement and verification of the dissolved oxygen/phytoplankton model, which was then applied to several management scenarios to demonstrate its use as a river management tool (Tetra Tech 1995a).

2.1.1 Model Selection

The models identified for review and selection were critically compared based on six selection criteria:

- Dimensionality — a one-dimensional model was considered adequate for the needs of this project.

- Temporal characteristics — a steady-state model was considered appropriate for the critical summer low-flow period of interest, especially for DO.

- Consideration of relevant processes — these included the capability to model phytoplankton growth effects on DO for the dissolved oxygen/phytoplankton model and the partitioning of toxic chemicals between water and sediments for the toxics model.

- Suitability for a range of applications — the models selected needed to be adaptable to model other water quality variables (e.g., water temperature or other toxic constituents).

- Data requirements — the data required for developing and calibrating of the model had to be within the resources of the WRBWQS.

- Ease of use — the models selected needed to be user friendly so water quality managers could easily use the models as decision making tools.

Two one-dimensional steady-state water quality models were selected for application to the Willamette River. More complex two- or three-dimensional dynamic models were considered unnecessary and inappropriate in light of the available data and project objectives. For dissolved oxygen/phytoplankton modeling, the EPA-supported QUAL2E-UNCAS (QUAL2EU) model was selected because it simulates all relevant processes, predicts the diurnal variability around the steady-state average DO concentration, is user-friendly, and is one of the most widely used and accepted water quality models. It is also capable of simulating water column fecal coliform bacteria concentrations, and supports powerful routines for model sensitivity and uncertainty analyses, which the other models evaluated did not have (Tetra Tech and Limno Tech 1992). For toxic constituents, the EPA-supported model SMPTOX3 was selected because it is designed for the Total Maximum Daily Load/Waste Load Allocation process, is user-friendly, and simulates all of the relevant processes.

The advantages of these relatively simple models included ease of use and the availability of data for their development and calibration. A disadvantage was some sacrifice in flexibility of application. More complex models (i.e., two- or three-dimensional dynamic models) would provide additional flexibility for application to non-steady-state conditions, but developing and calibrating these models would require collecting additional data at much greater expense, and also a sacrifice in ease of use. Because the models were intended to be developed and transferred to ODEQ for application to river quality management problems, ease of use was an important factor in final selection.

2.1.2 Data Compilation

Phase I data compilation included a review of historical data and modeling studies (Tetra Tech 1992c,d,e,f), an inventory of point source discharges to the river (Tetra Tech 1992g), and synoptic field sampling conducted by Tetra Tech and ODEQ in August 1992 (Tetra Tech 1992b). These data, and additional flow and river channel geometry data provided by the USGS formed the database used to develop and calibrate the models selected in Phase I. Additional point source data compilation and field sampling was conducted in August 1994 as part of Phase II to further refine and calibrate the dissolved oxygen/phytoplankton model. The findings of these data compilation efforts are summarized below.

2.1.2.1 Dissolved Oxygen. Historically, DO levels in the Willamette had been severely affected by municipal and industrial point source discharges of oxygen-demanding wastes. Following implementation of basin-wide secondary treatment requirements in the 1970s, the river experienced a substantial increase in DO. However, concern for DO in the Willamette River continues due to projected population and industrial growth in the basin which could threaten the gains established during the 1970s.

Historical data review for this task identified four previous modeling studies of the Willamette River (Tetra Tech 1992c). All of these models have been one-dimensional steady-state models applied to the summer low-flow season, the critical period for DO. However, previous models did not address the effects of algal photosynthesis on DO levels. The developers of these models assumed that DO production and consumption by algae over a 24-hour period was approximately balanced, and therefore would not be significant and could be ignored. These modeling studies identified river flow as the most effective means of managing DO levels in the Willamette.

2.1.2.2 Nutrients and Phytoplankton. The historical data review for this task indicated that in the shallow, fast-moving portion of the river above RM 50 (RK 80), the biomass of phytoplankton is relatively low, but that of periphyton is relatively high (Tetra Tech 1992d). The photosynthetic activity of periphyton in the upper reach causes relatively large diurnal variations in DO. The sloughing of periphyton is largely responsible for what concentration of suspended phytoplankton there is in the water column. Below RM 50 (RK 80) phytoplankton biomass increases as the channel deepens behind Willamette Falls (Newberg Pool). The low nutrient concentrations of the headwaters increase here to levels that are more than adequate for phytoplankton growth.

Former DO modeling studies have not accounted for the effects of phytoplankton or periphyton on DO. The investigators in these studies assumed that oxygen produced in daylight would be balanced by oxygen respired at night. Conceptual models and field studies conducted by USGS in the 1970s also suggested that phytoplankton biomass in the lower river was controlled primarily by changes in the hydraulic residence time (i.e., river flow), not by the availability of essential nutrients such as nitrogen or phosphorus.

2.1.2.3 Fecal Coliform Bacteria. Historical data indicated that bacterial conditions of the river have been monitored since the 1920s in response to public health concerns stemming from the release of raw sewage into the river (Tetra Tech 1992e). Sanitary surveys of the river conducted between 1929 and 1963 showed extremely high levels of coliform bacteria downstream of population centers, with much lower bacterial levels in river sections between these population centers. In contrast, later bacterial surveys conducted during the recreational seasons (June-August) of 1969-1971 showed significantly reduced fecal coliform levels in the river due to improvements in wastewater treatment and chlorination of municipal effluents.

Despite the apparent long-term trend of improvement in bacterial conditions resulting from treatment of point source effluents, significant portions of the Willamette River and selected tributaries and creeks have been classified as "partially supporting" or "not supporting" water contact activities based on high indicator bacteria levels (ODEQ 1990). However, the available monitoring data that were reviewed were collected too infrequently for a strict comparison to the Oregon water quality standards (Tetra Tech 1993a,b).

2.1.2.4 Toxic Pollutants. Significant data gaps were found that would make the calibration of any toxics model difficult (Tetra Tech 1992f; Tetra Tech and Limno Tech 1993a). Available water and sediment toxics data were limited both spatially and temporally, with many available data indicating water column toxics concentrations below analytical detection limits. Differences were also noted in the field and analytical methods used, especially for water column metals results, which were reported variously as total, total recoverable, and dissolved metals (Tetra Tech and Limno Tech 1993b).

In analyses conducted for Oregon's 1990 water quality status assessment report (ODEQ 1990), seven pollutants caused the Willamette River to be classified as 'water quality limited'. Six of these (arsenic, chromium, copper, lead, zinc, and DDT) were detected in Portland Harbor sediments at levels exceeding

U.S. EPA draft sediment guidelines. Arsenic had also been detected in surface water samples from the Willamette basin waters at levels exceeding Oregon's water quality standard. The seventh pollutant causing the Willamette River to be water quality limited is 2,3,7,8-TCDD.

2.1.2.5 Point Source Loading. Phase I summarized point source pollutant loading information for 1991 for 33 major National Pollutant Discharge Elimination System (NPDES) permittees in the Willamette River Basin (Tetra Tech 1992g). The summarized information was derived from discharge monitoring reports (DMRs) submitted by the permittees, major industrial and municipal facilities located in the basin. These data, plus supplemental data from the August 1992 synoptic water quality study described below, were used to estimate point source inputs model the development. Available DMR data were relatively limited. Data were most complete for flow rate, biochemical oxygen demand (BOD), and total suspended solids (TSS). Data for nutrients were less complete, especially for soluble reactive phosphorus (i.e., dissolved or orthophosphate phosphorus) and nitrite nitrogen. Data for fecal coliform bacteria were only available for municipal facilities, although the available literature suggests that pulp and paper mill effluent can be a significant source of these bacteria as well. Data for metals and organic contaminants were the least complete, complicating the calibration of the toxics model.

As part of Phase II studies, additional DMR data from 1992 through mid-1994 were compiled by ODEQ for all major facilities and selected minor facilities that discharge to the mainstem of the Willamette River. These data were compiled to update model point source inputs for Phase II refinement of the dissolved oxygen/phytoplankton model.

2.1.2.6 Synoptic Water Quality Surveys. In Phase I, a synoptic water quality survey was conducted under steady low-flow conditions in August 1992 to provide a data set for developing and calibrating the models (Tetra Tech 1992b). Tetra Tech and ODEQ both collected water quality samples for laboratory analysis for carbonaceous BOD (CBOD), chlorophyll *a*, nutrients, fecal coliform and enterococcus bacteria, and TSS at a location within the upstream boundary segment at RM 185.3 (RK 296). Tetra Tech sampled an additional 13 locations and ODEQ sampled 9 additional locations along the length of the river between RM 7 and 177 (RK 11-283). Tetra Tech conducted diurnal temperature and DO measurements (5 or 6 triplicate DO profiles over a 24-hour period) at all 14 stations and at an additional station located at RM 86 (RK 138). ODEQ performed single measurements of DO and temperature at all 10 of their stations.

Additional field studies were conducted in August 1994 by ODEQ and USGS as part of Phase II studies conducted to refine the dissolved oxygen/phytoplankton model and to provide additional information on the influence of periphyton productivity on river DO in the upper river. ODEQ sampled monitoring stations included in ODEQ's Ambient Monitoring Program and made field measurements of sediment oxygen demand (SOD) in the lower river at 15 locations between RM 3.1 and 50.5 (RK 5-81). USGS sampled periphyton biomass, CBOD, nutrients, and diurnal oxygen fluctuations at five locations in the upper Willamette River and selected tributaries.

2.1.3 Model Calibration and Verification

Using the historical and synoptic field sampling data described above, the QUAL2EU dissolved oxygen/phytoplankton model was calibrated to predict levels of nutrients, phytoplankton biomass, and DO in Phase I (Tetra Tech 1993c,d). This model was further refined, calibrated, and verified in Phase II (Tetra Tech 1995a).

Primarily because of limitations in available point source data, the bacteria model could not be calibrated to the August 1992 fecal coliform bacteria sampling data. However, initial evaluations conducted with the model provided useful suggestions for improving existing monitoring programs of indicator bacteria in point sources and receiving waters of the Willamette River (Tetra Tech 1993a).

Due to limited historical sampling data, the SMPTOX3 toxics model could only be calibrated to river TSS concentrations measured in August 1992 (Tetra Tech and Limno Tech 1993c). However, one of the most important mechanisms for the movement of many toxic constituents in aquatic ecosystems is the adsorption of these constituents to particulate matter. Because this partitioning process (between water and particles) can be so significant, knowledge of the transport and fate of TSS is essential in toxics modeling.

An overview of the Phase I and II development of the models is provided below.

2.1.3.1 Dissolved Oxygen/Phytoplankton. During Phase I the dissolved oxygen/phytoplankton model was successfully calibrated to the August 1992 synoptic water quality survey data. However, the model was not considered completely verified due to limitations in historical data. Based on Phase I model sensitivity and uncertainty analyses, a number of recommendations were made for refinement in Phase II,

including field studies of SOD, studies of diurnal DO variation in the upper river and tributaries, additional monitoring data on minor NPDES permittees, and a comprehensive survey of NPDES-permitted point sources to better determine effluent concentrations of nutrients. Following completion of the recommended Phase II field studies, Tetra Tech updated the Phase I model to the latest QUAL2EU model version (3.20), separated tributary and point source inputs, further subdivided the original river reaches, and incorporated minor point sources. The refined model was then calibrated to the August 1992 synoptic survey data (Figure 2-1) and verified using the USGS and ODEQ field data collected in August 1994 (Figure 2-2) (Tetra Tech 1995a).

In general, the model predicted the exponential increase in chlorophyll *a* beginning in the Newberg Pool, but did not predict the elevated concentrations in the upper river. The chlorophyll *a* measured in the upper river has been attributed to the sloughing of periphyton, a process that is not considered in the present model. The August 1992 model-predicted DO concentrations also fit the Tetra Tech field DO data well. The relative percent difference (RPD - the difference between the two measurements divided by their mean expressed as a percent) between the Tetra Tech field data and the model predictions ranged from 0-11 percent with a mean RPD of 3.1 percent. The model also predicted the August 1994 DO concentrations relatively well. The RPD between the ODEQ August 1994 field DO data and model-predicted values ranged from 1-35 percent with a mean RPD of 13 percent.

A number of limitations in the Phase II model were noted during model calibration and verification. At present, model output below RM 10 (RK 16) is not considered valid for a number of possible reasons that include: 1) the influence of tidal mixing with the Columbia River (which is not simulated by the QUAL2EU model) and 2) zooplankton grazing of phytoplankton in the lower tidal reach of the river (also not simulated by the model).

In the upper river reaches, the steady-state model predictions do not incorporate the effect of periphyton production or respiration, which may be significant processes in these shallow, fast-flowing reaches. Phase II studies conducted by the USGS at upper river reach locations and tributaries were designed to address this problem, but their conclusions were not available to use for model refinement. If periphyton production and respiration are balanced (i.e., daytime oxygen production is offset by nighttime respiration), the steady-state model prediction should accurately predict the average dissolved oxygen concentration in the upper river.

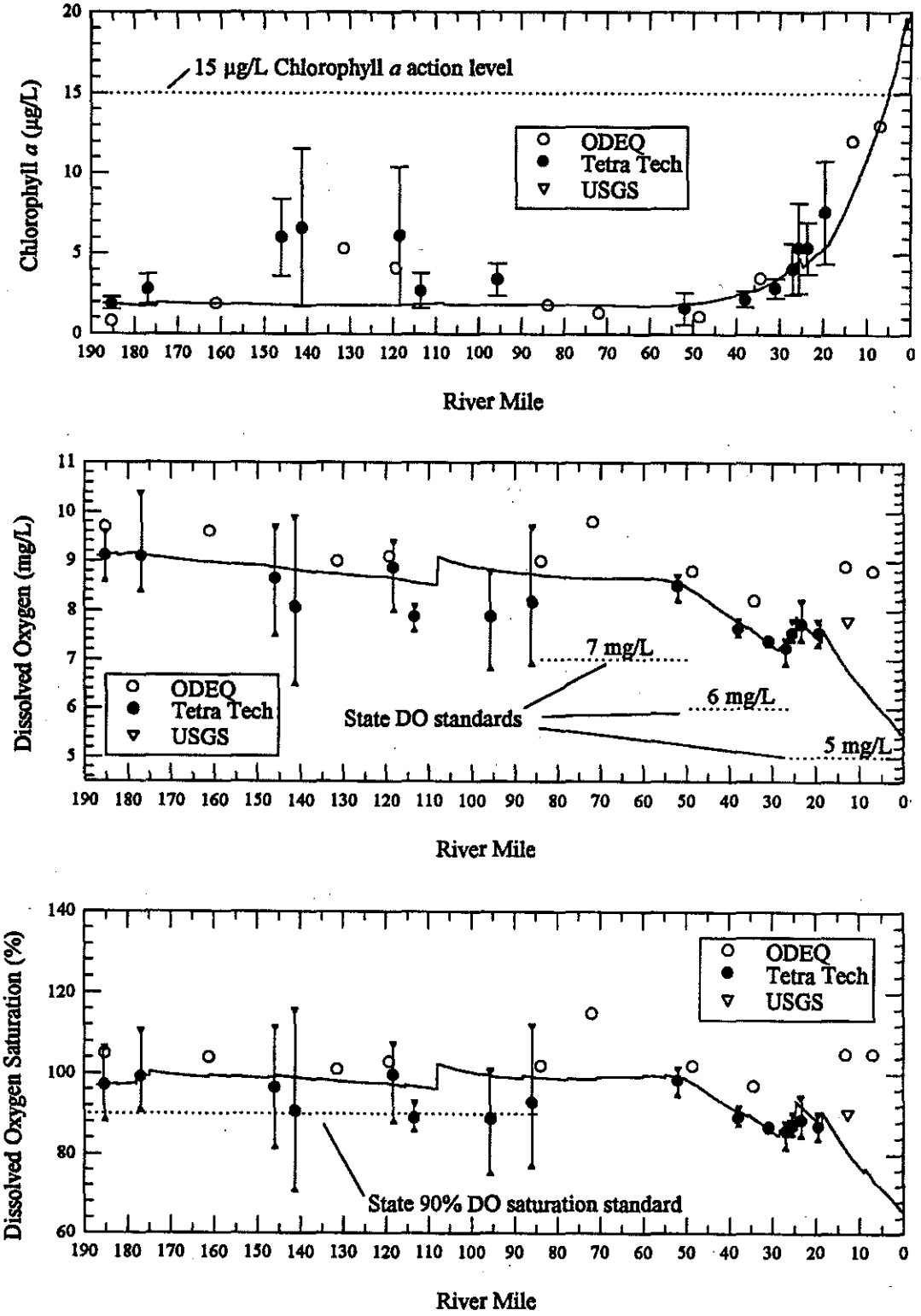

Figure 2-1. Comparison of the Calibrated QUAL2EU Model Output to the August 1992 Field Data for Chlorophyll *a* and Dissolved Oxygen. *The model has been calibrated to the Tetra Tech (solid circles) data. Error bars are the 95% confidence limits of the Tetra Tech chlorophyll a data (n=3). Minimum and maximum dissolved oxygen concentrations measured by Tetra Tech over the 24-hr sampling period are also shown. ODEQ data (open circles) and USGS NASQUAN data (open triangles) are also shown.*

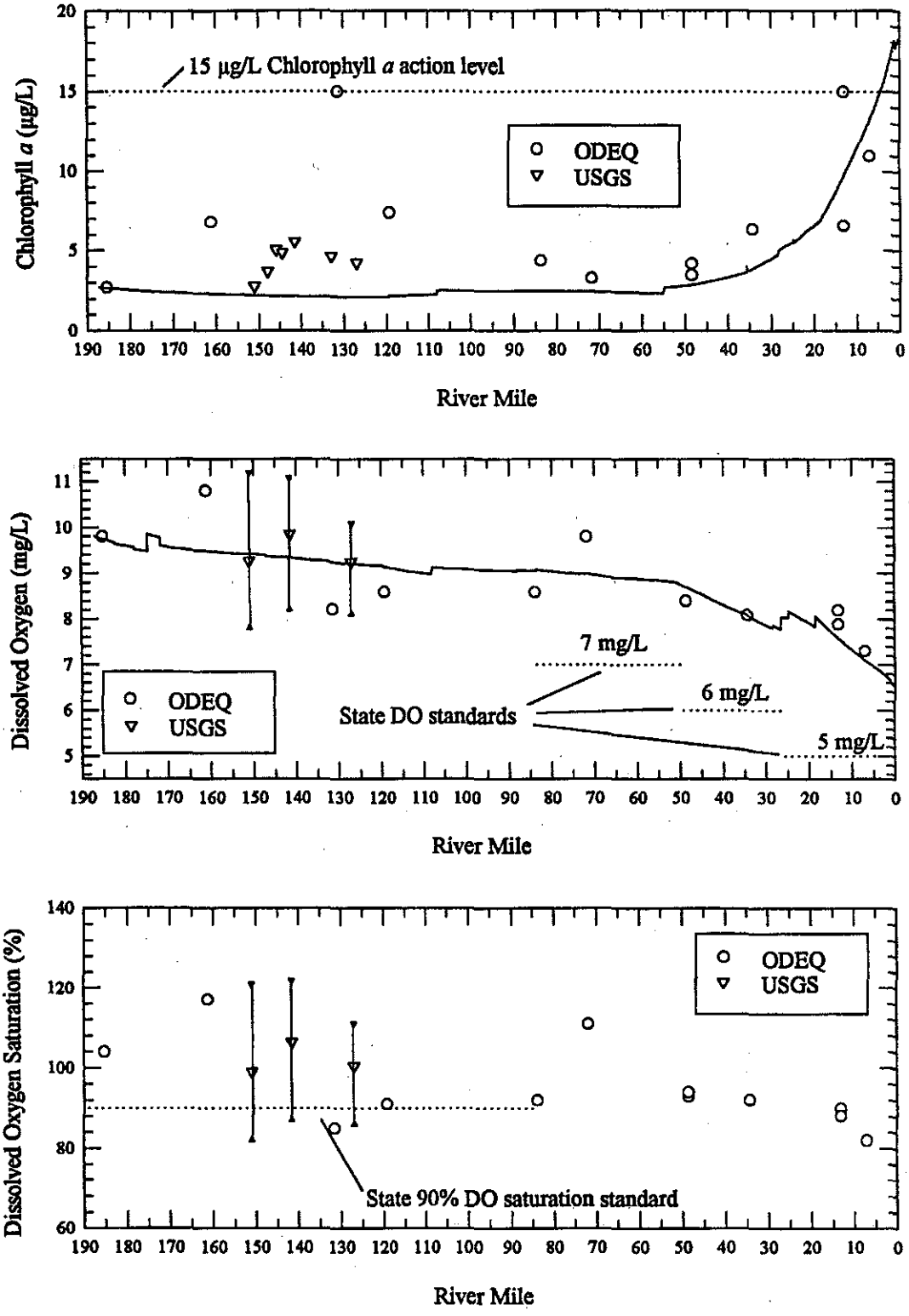

Figure 2-2. Verification of the Calibrated QUAL2EU Model Against August 1994 ODEQ and USGS Data for Chlorophyll *a* and Dissolved Oxygen. *The bars shown for the USGS data (open triangles) are the range between the minimum and maximum dissolved oxygen concentrations measured over their 24-hr sampling period.*

The Phase II QUAL2EU dissolved oxygen/phytoplankton model has been calibrated and verified for summer low-flow conditions in the Willamette River—the critical period for dissolved oxygen. The Phase II model should provide a useful water quality management tool for assessing future water quality problems and for the design of future monitoring programs. However, the limitations of the model should be considered by water quality managers when applying the model to specific management questions. Depending on the specific questions asked by water quality managers, further refinement of the existing model or development of additional models may be warranted.

Possible Phase III studies that would reduce the uncertainty in model predictions of dissolved oxygen and chlorophyll *a* are:

- Develop basin-specific estimates of the statistical distribution and coefficient of variation of input variables for analyzing model sensitivity and uncertainty.

- Conduct additional field studies and modeling to refine the steady-state model predictions in the lower Tidal Reach of the river.

- Conduct field studies and modeling to further evaluate the influence of periphyton productivity on steady-state dissolved oxygen concentrations in the upper river reaches.

*2.1.3.2 **Fecal Coliform Bacteria.*** During Phase I, the QUAL2EU model was developed to simulate fecal coliform bacteria levels in the mainstem of the Willamette River. However, the model could not be calibrated to the field measured concentrations which were higher than could be predicted based on the available point source input data (Tetra Tech 1993b). Unmonitored industrial sources, especially pulp and paper mills, were suspected to be additional sources of fecal indicator bacteria needed to calibrate the model to the observed water column concentrations. This hypothesis was tested using the model.

Pulp and paper mill effluent concentrations of fecal coliforms measured in August 1992 supported the hypothesis these effluents were the unaccounted source of fecal coliform bacteria to the river. However, fecal coliform concentrations in pulp and paper mill effluent sampled in June 1993 were much lower than those required to balance the model. It was possible that other significant sources of indicator bacteria, as yet unidentified, exist during the low-flow period, including fecal waste from agricultural sources,

failing septic tanks, or waste discharges from boats. It is also possible that sediment, which was not considered in the QUAL2EU model, was a significant source of bacteria.

Phase I recommendations included improving point source and water column bacteria monitoring to improve the bacteria model that was developed. Although the bacteria model could not be calibrated, it still provides ODEQ with a management tool that can be used to guide management decisions and refine existing monitoring programs.

2.1.3.3 Toxic Pollutants. Because of lack of adequate field data, calibration of the toxics model for the toxic constituents was outside of the scope of the Phase I study. However, one of the most important mechanisms for the movement of many toxic chemicals in aquatic ecosystems, and one which must be accounted for in toxic chemical modeling, is the adsorption of toxic chemicals to particulate matter (chemical partitioning). Therefore, the SMPTOX3 model was calibrated to the August 1992 water column TSS data collected during the synoptic water quality survey (Figure 2-3). The model was then applied to the seven pollutants of concern using the available input data (Tetra Tech and Limno Tech 1993a). Model process rates (e.g., dissolved and solid phase partitioning coefficients) were calculated or estimated based on published literature values. The SMPTOX3 model output for 2,3,7,8-TCDD is presented in Figure 2-3. Variations by river mile of water column and sediment concentrations of 2,3,7,8-TCDD reflect the discharge of dioxin from a pulp and paper mill and the resuspension of dioxin-contaminated sediments. Toxic constituent results are considered baseline only because resource limitations precluded collection of field data for model calibration.

Additional synoptic, long-term, and special research studies were recommended to provide a data set for model calibration and to reduce the uncertainty of predictions of the calibrated model (Tetra Tech and Limno Tech 1993b). These recommendations may be implemented as part of Phase III WRBWQS investigations.

2.1.4 Model Application

In both Phase I and Phase II, Tetra Tech evaluated a number of hypothetical case scenarios to demonstrate the management capabilities of the QUAL2EU dissolved oxygen/phytoplankton model. In Phase I, four model case scenarios were evaluated: 1) maximum NPDES-permitted discharge, 2) point source

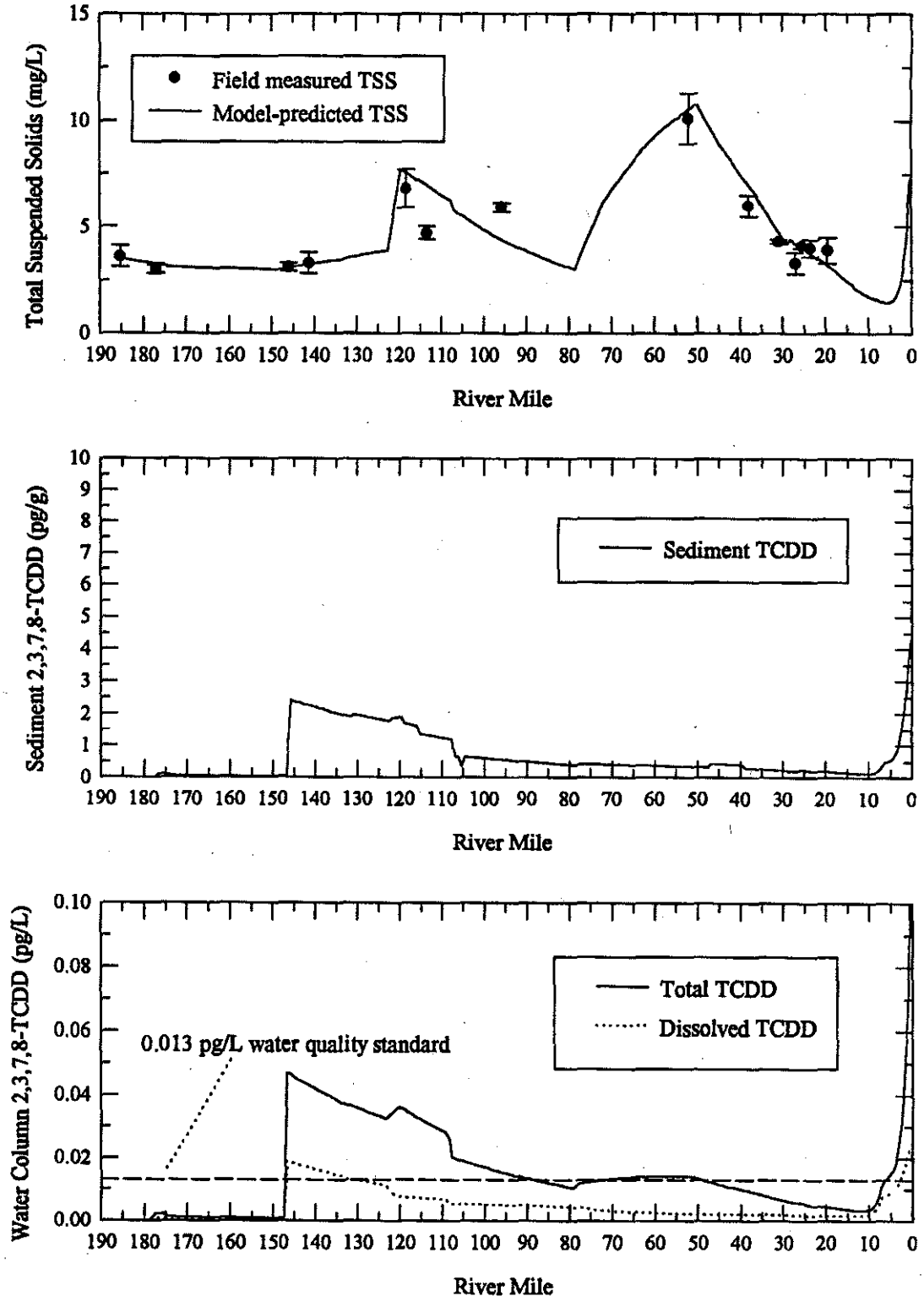

Figure 2-3. Calibration of the SMPTOX3 Model to the August 1992 Water Column Total Suspended Solids Data Collected by Tetra Tech. *(Error bars are 95% Confidence Limits, n=3). Also shown are baseline model predictions for sediment and water concentrations of dioxin (2,3,7,8-TCDD) in the Willamette during August 1992 low-flow conditions.*

reductions in phosphorus discharge, 3) increased water transparency, and 4) variation in the Willamette River flow regime (Tetra Tech 1993c,d).

In Phase II, two model case scenarios were evaluated using the refined and calibrated dissolved oxygen/ phytoplankton model (Tetra Tech 1995a). These two case scenarios included the effect of 1) variation of flow at existing and maximum-permitted discharge levels and 2) specified reductions in tributary flows. The effect of various flow conditions at existing (August 1992) and maximum NPDES-permitted discharge levels on the model-predicted concentrations of DO and chlorophyll *a* are shown in Figures 2-4 and 2-5. The effect of flow on model-predicted DO and chlorophyll *a* is evident below RM 50 (RK 80). The effect of flow is most significant for chlorophyll *a*, especially in the lower tidal reach of the river. The largest change in river DO concentration due to flow variation was predicted by the model to occur at RM 27 (RK 43).

The models developed in Phase I and Phase II of the WRBWQS may ultimately be applied by ODEQ to the following management tasks:

Dissolved Oxygen/Phytoplankton

- Estimate effects of proposed regulatory policies on water quality.
- Develop a Waste Load Allocation or Total Maximum Daily Load (TMDL) to meet DO and chlorophyll standards in the Willamette River.
- Set minimum flow levels to ensure adequate assimilation of oxygen-demanding wastes and nutrients.
- Address requests for oxygen-demanding waste load increases from municipalities and industries.
- Assist in the triennial review of DO standards for the Willamette River.

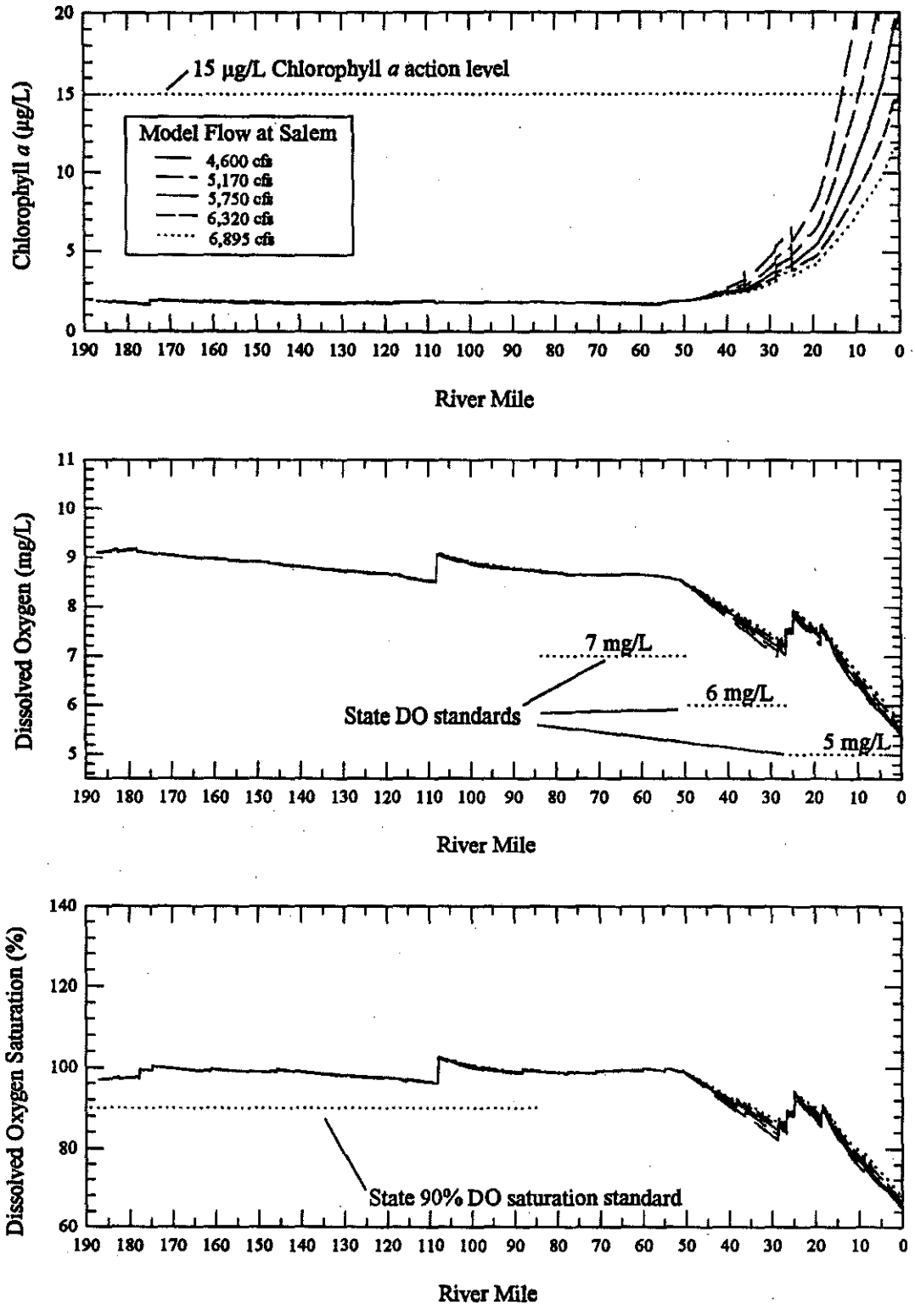

Figure 2-4. Simulation of the Effect of Various Flow Conditions on the QUAL2EU-Predicted August 1992 Chlorophyll *a* and Dissolved Oxygen Concentrations in the Willamette River.

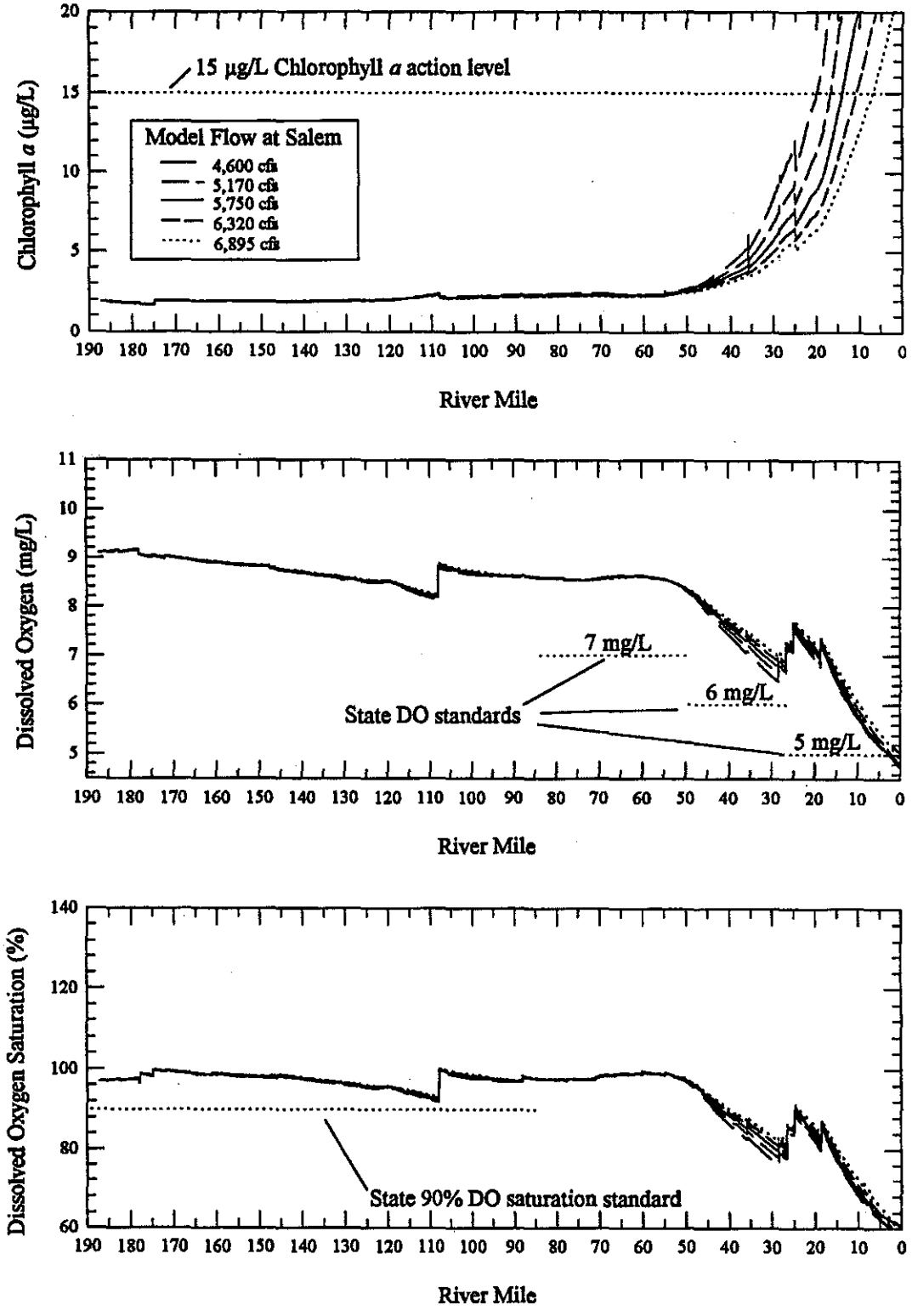

Figure 2-5. Simulation of the Effect of Discharge at Maximum NPDES-Permitted Levels Under Various Flow Conditions on the QUAL2EU-Predicted Chlorophyll *a* and Dissolved Oxygen Concentrations in the Willamette River.

Fecal Coliform Bacteria

- Assist in the refinement of the existing monitoring program for indicator bacteria.

Toxics

- Establish a Wasteload Allocation for 2,3,7,8-TCDD to comply with EPA's TMDL process.

- Establish additional TMDLs for pollutants for which the river is determined to be water quality limited.

- Address requests for pollutant load increases from municipalities and industries.

- Assist in the evaluation and implementation of sediment quality criteria.

2.2 NONPOINT SOURCE POLLUTION STUDIES

Nonpoint source (NPS) pollution is pollution that enters lakes, streams, wetlands, estuaries, oceans, and groundwater from diffuse sources, e.g., surface runoff and atmospheric deposition. It is often analyzed by linking pollutant loading to a type of land use. For example, estimates of surface runoff may be segregated into urban, industrial, and agricultural sources. By contrast, point sources can be linked to process discharges from specific industrial plants or municipal wastewater treatment plants. Any serious disturbance of the land can cause pollutants such as sediment or nutrients to enter waterways at a rate greater than experienced under natural undisturbed conditions. Suspended sediments from erosion and soil nutrients are the major nonpoint source pollutants, although other materials such as organic wastes, fertilizers, pesticides, and toxic heavy metals can be constituents of NPS water pollution.

NPS pollution is a concern in the Willamette River basin because the majority of suspended solids and nutrient loads in the basin are from this category. Prior to about 1970, the Willamette River suffered from poor water quality, including major episodes of oxygen depletion which killed many migrating fish.

Water quality was dramatically improved by reducing pollutant loads from industrial and municipal point sources and increasing summer flows (Gleeson 1972). This improvement in water quality has been cited as an example of the benefits that can be achieved by applying sound scientific principles to water quality management (Rickert et al. 1976b). Despite the well-publicized successes, however, portions of the Willamette River and its tributaries are still viewed as seriously impaired (ODEQ 1990, 1994). Although some water quality problems are still attributed to insufficient treatment of point sources, many of the problems in the basin are attributed to nonpoint sources of pollution (ODEQ 1978, 1988).

Common constituents evaluated as part of NPS studies are suspended solids (sediments), total phosphorus, and some forms of nitrogen. In urban areas, a much wider array of constituents is analyzed, including heavy metals, bacteria, and oil and grease. Errors in measuring and modeling nonpoint source pollution loads are expected to be lower for suspended solids and nutrients, and greater for such parameters as trace contaminants, pesticides, and bacteria.

2.2.1 Model Approach

A large number of models are available for evaluating NPS pollution. They are classified here into screening models and simulation models. The screening models operate primarily as spreadsheets for calculating unit loads, e.g. the amount of a given pollutant generated per hectare in a basin. Screening models, especially when combined with a geographic information system (GIS), offer an alternative to data-intensive simulation models, and are of greatest use in applications where input data are sparse and larger errors in estimating pollutant loads are not acceptable. They can be used to compare pollutant loads among subdivisions of a large area, and to evaluate strategies for pollution controls based on relative effectiveness. Because they often work from estimates, screening models are generally inappropriate where absolute pollutant loadings are required, or for a short time step (e.g., quantifying the effect of storms). Because they usually operate on a long time frame (average annual loading), calibration in the traditional sense does not apply. Screening models are simple statistical tools for estimating pollutant loads rather than models of physical systems. They can play an important role in determining both general levels of pollutant loading and pollution load variation by area, neither of which can be determined by hydrologic-based simulation models.

On the other hand, more accurate estimates of nonpoint source loads are sometimes better derived from process-based simulation models. These models typically incorporate climatic conditions, runoff, and

transport of pollutants using time steps short enough to simulate variations caused by individual storms. This high degree of temporal and spatial resolution can be achieved only if comparably detailed data are available.

One of the most important issues in studying NPS modeling is scale. Scale is often the critical factor that affects which model is appropriate for a given application. Detailed nonpoint source simulation modeling at this stage is limited to relatively small areas. As the watershed area or complexity of land uses (percent cover and disturbance) increases, so does the potential for modeling error; scale of application and error rates for predictive models are closely linked.

Existing NPS models were reviewed, focusing on accuracy, type, and scale, to find one or more models that: 1) was applicable to a basin the size of the Willamette Basin, Pudding River sub-basin, and smaller watersheds; 2) was adaptable for multiple land use classes; 3) incorporated major physical processes; and 4) was easy to use for parameter estimates and model simulations (Tetra Tech and E&S Environmental Chemistry 1992).

Based on these constraints and criteria, a process-based GIS model was chosen to estimate annual pollutant loads for the basin, sub-basins, and watersheds. The complexity of the basin and the scarcity of water quality data made a more rigorous simulation model impractical.

2.2.1.1 Phase I: Modeling at All Scales. In Phase I, modeling to compute annual pollutant loads was done at three scales: 1) entire Willamette basin; 2) sub-basin (Yamhill River); and 3) large-scale watershed (Elkins Road). A physical-based GIS model was used at all scales, and at the watershed scale two additional simulation models, the Agricultural Nonpoint Source Model (AGNPS) and the Simulator for Water Resources in Rural Basins (SWRRB), were used to refine unit loading estimates derived from the GIS. Watershed modeling was conducted first and the model was calibrated against published water quality data. Output from the watershed model (Level III) was used to refine land use coefficients for application at the sub-basin (Level II) and basin (Level I) levels. Unit loadings for all sub-basins were summed to yield annual basin loadings for selected NPS pollutants (e.g., sediment, total phosphorus, total nitrogen) (Tetra Tech and E&S Environmental Chemistry 1993a,b,c).

2.2.1.2 Phase II: Modeling at the Watershed Scale. A generalized water quality model was developed, using the GIS framework initially developed in Phase I to predict hydrologic budgets, erosion, and nutrient transport within the four watersheds in the Pudding River sub-basin. This model was calibrated to monitoring data collected as part of Phase II and results were extrapolated to other watersheds in the Pudding River sub-basin. Model estimates were compared to measured load in the Pudding River sub-basin (Tetra Tech and E&S Environmental Chemistry 1995).

The primary model developed for the sub-basin includes a hydrologic budget and application of the Modified Universal Soil Loss Equation (MUSLE) for rural areas. Inputs include soil attributes and distribution, land use, and precipitation. The model was calibrated to measured values of streamflow, total suspended solids, total phosphorus, and nitrogen. The principal objective was to predict hydrology, sediment transport, and nutrient transport mechanisms within the Pudding River sub-basin.

2.2.2 Data Compilation

Data were compiled on water quality and quantity, land use, and soils for the purpose of calibrating the NPS model (Tetra Tech and E&S Environmental Chemistry 1994a,b).

2.2.2.1 Water Quality/Quantity. Development of the NPS model during Phase I was based on historical published values, and no new data were collected for model calibration. This caused uncertainty to be high: no measured loads were available for the basin, sub-basin, or watershed. Phase II was designed to collect water quality and quantity information for calculating loads and refining the model.

In Phase II, stream samples were collected at five primary sites and over 30 supplementary sites in the Pudding River drainage. The sites were sampled during five storms and under five baseflow conditions. Each primary site was sampled 10 to 14 times per storm with the majority of samples allocated to the rising limb of the hydrograph. Samples were measured for:

- Total Suspended Solids (TSS)
- Total Phosphorus (TP)
- Total Kjeldahl Nitrogen (TKN)
- Ammonia (NH_3)
- Nitrate (NO_3^-)

- Potassium (K^+)
- Conductivity

Supplemental analytes measured on approximately 20% of the samples included:

- pH
- Calcium (Ca^{2+})
- Magnesium (Mg^{2+})
- Sodium (Na^+)
- Chloride (Cl^-)
- Sulfate (SO_4^{2-})
- Alkalinity
- Silica
- Coliform bacteria

Three types of monitoring sites were selected: primary monitoring sites for intense monitoring of specific watersheds; auxiliary sites in each primary watershed for characterizing water quality from various portions of the watershed; and supplemental sites at other locations in the sub-basin for evaluating water quality from non-primary monitored watersheds. Monitoring sites were selected by the following criteria:

1. Suitable access
2. Relatively homogeneous land use
3. Suitable stream channel features for measuring discharge
4. Spatial allocation of sites throughout the sub-basin
5. Colocation with other studies where possible

The watersheds monitored and modeled were Zollner Creek near Mt. Angel, Upper and Lower Beaver Creeks east of Salem, and the North Fork of Silver Creek near Silver Falls State Park. An additional monitoring site was selected at Aurora near the mouth of the Pudding River.

2.2.2.2 Land Use. Land use data for Phase I model calibration was obtained largely through the Oregon State Service Center. The scale of available data only allowed for coarse classification of land use into forest, agriculture, and urban uses.

During Phase II detailed information on land use, soils, and slopes were obtained for calibrating the non-point source model (Tetra Tech and E&S Environmental Chemistry 1994a,b). The data were compiled at two scales, corresponding to the watershed (approximately 1:24,000) and the sub-basin (1:250,000). The use of dual scales allowed researchers to compare the relative merits of large scale and small scale data. The purpose of this detailed characterization was to create a primary data base on land uses that could refine the NPS model and lead to a better understanding of land use impacts on water quality. The objectives of the task were to: 1) characterize general land use and associated soils for the Pudding River sub-basin; and 2) characterize in detail land uses, soil types, and associated impacts on water quality in four monitored watersheds in the Pudding River sub-basin.

*2.2.2.3 **Soils.*** Soil information for the Phase I NPS study were derived from existing small scale thematic soil association maps of Oregon (1:500,000). During Phase II, soil characteristics in the Pudding River sub-basin were derived from the STATSGO soils data base (scale: 1:250,000). Soils data for the four watersheds in the Pudding River sub-basin were derived from the Marion County Soil Survey. These data are currently the only available data source at 1:20,000 scale. These data include soil series, soil attributes, and general slope classes.

2.2.3 Model Calibration

During Phase I, the NPS model was adjusted to match expected unit loads from various land uses, based largely on pollutants loads published for similar land use classes elsewhere. In Phase II, NPS pollutant loads in the Pudding River sub-basin were estimated by calibrating flows and pollutant concentrations for each individual watershed and collectively for the entire sub-basin. The primary model was MUSLE (Modified Universal Soil Loss Equation) for the rural areas. The inputs to the modeling consisted of:

- Land use
- Precipitation (Salem, Mt. Angel, Woodburn, Silverton)
- Stream discharge (USGS at Aurora and Zollner Creek, instantaneous flow measured at other sampling sites)
- Stream chemistry (456 samples)

The model outputs included:

- Precipitation/flow relationships
- Discharge/pollutant concentration relationships for the core parameters of the monitoring sites
- Specific land use contributions of NPS in the Pudding River sub-basin at baseflow and high flow

Model estimates of infiltration, surface runoff, peak flow, overland flow, upland erosion, delivery ratios, and pollutant loads were compared with measured or estimated values.

2.2.4 Model Prediction and Uncertainties

Predictions and associated uncertainties for the two phases of NPS modeling are presented separately and then compared to the extent possible.

2.2.4.1 Phase I. NPS loads for the Willamette River Basin were estimated using the parameters selected for the sub-basin and watershed modeling (Table 2-1). For pollutant loads from agriculture and forested land use, total suspended solids (TSS) was estimated based on a GIS modeling approach. Estimates of nutrient loads from agricultural use were based on empirical relationships among nutrients, TSS, and runoff. Estimates of TSS loads from urban areas were based on unit loads. Errors in model predictions were estimated using variability measurements associated with estimated pollutant loads and published values.

Based on these estimates, the Pudding River sub-basin is the sub-basin with the highest pollutant loadings. This sub-basin has a high percentage of land in agricultural use, reflected in high TN and TSS loads. The highest phosphorus contributions per unit area were predicted from the Portland metropolitan area (1.25 kg/ha) in the form of urban runoff, although relatively high unit loads are also estimated for the Long Tom (0.90) and Tualatin (0.89) Rivers. Lower yields of all constituents were consistently estimated for the sub-basins with a high percentage of forested lands, such as the headwaters of the Willamette River. Furthermore, the loadings from a number of the forested watersheds are probably overestimates

TABLE 2-1. NONPOINT SOURCE POLLUTION ANNUAL LOADS AND YIELDS FOR SUB-BASINS OF THE WILLAMETTE BASIN USING THE GIS APPROACH (PHASE 1)

Sub-basin		TP		TN		TSS	
		kg	kg/ha	kg	kg/ha	ks	kg/ha
1	Coast Fork	80,000	0.48	310,000	1.78	82,000,000	480
2	Middle Fork	170,000	0.49	530,000	1.51	170,000,000	490
3	McKenzie	165,000	0.48	760,000	2.22	170,000,000	480
4	Long Tom	125,000	0.90	730,000	5.30	98,000,000	710
5	Santiam	495,000	0.78	3,460,000	5.47	490,000,000	770
6	Coast Range	385,000	0.82	3,080,000	6.62	370,000,000	800
7	Pudding	350,000	1.14	2,770,000	8.99	330,000,000	1090
8	Tualatin	165,000	0.89	1,000,000	5.38	130,000,000	690
9	Clackamas	115,000	0.45	490,000	1.87	110,000,000	430
10	Columbia	135,000	1.25	470,000	4.25	60,000,000	540
TOTAL		2,185,000	0.74	13,600,000	4.57	2,010,000,000	680

because the GIS approach used here does not account for the storage of TSS and TP that occurs in the reservoirs that impound runoff from significant portions of these areas. An alternative method for estimating NPS loads for large regional areas is to apply unit loads to various land uses. This approach follows the form:

$$Total\ Load = \Sigma\ (unit\ load * area) \quad (1)$$

where unit load is for a specific land use.

Table 2-2 presents land use loading coefficients that are based on available water quality data, tabulated summaries of nonpoint source yields, and modeling efforts in smaller watersheds. The loading coefficients were assigned to areas in the basin based on the seven land use classes previously used for nonpoint source pollution in the basin (WBTF 1969).

TABLE 2-2. ESTIMATED UNIT LOADS (KG/HA/YR) FOR LAND USE CLASSES IN THE WILLAMETTE BASIN (WBTF CLASSIFICATION)

	Total Nitrogen TN	Total Phosphorus TP	Total Suspended Solids TSS
Forest	3	0.5	300
Forest/Grazing	4	0.6	400
Rangeland	5	0.7	500
Cropland, Dry	6	1.3	2000
Cropland, Irrigated	10	1.9	1000
Cropland, Potential	5	0.7	600
Urban	8	3	500

This screening model suggests that sediment and nutrient loads are largely produced in agricultural areas in River Regions II and III, the middle and lower portions of the basin (Table 2-3). These results are consistent with water quality data for the Willamette River, which show substantial increases in nutrients

TABLE 2-3. ESTIMATED NONPOINT SOURCE POLLUTION LOADS AND YIELDS FOR SUB-BASINS OF THE WILLAMETTE RIVER BASIN USING THE UNIT LOAD APPROACH (PHASE 1)

Sub-basin		TP		TN		TSS	
		Kg/yr	Kg/ha	Kg/yr	Kg/ha	Kg/yr	Kg/ha
1	Coast Fork	125,000	0.74	870,000	5.06	96,000,000	560
2	Middle Fork	230,000	0.66	1,590,000	4.54	160,000,000	460
3	McKenzie	230,000	0.66	1,570,000	4.46	160,000,000	460
4	Long Tom	120,000	0.88	670,000	4.95	120,000,000	900
5	Santiam	530,000	0.84	3,320,000	5.26	490,000,000	780
6	Coast Range	400,000	0.92	2,330,000	5.34	430,000,000	980
7	Pudding	305,000	0.99	1,710,000	5.55	330,000,000	1070
8	Tualatin	165,000	0.89	970,000	5.19	170,000,000	940
9	Clackamas	195,000	0.76	1,330,000	5.10	160,000,000	630
10	Columbia	85,000	0.77	510,000	4.60	70,000,000	640
TOTAL		2,385,000	0.81	14,870,000	5.00	2,186,000,000	740

in the mid-basin area. Both modeling results and monitoring data suggest that tributaries such as the Pudding, Long Tom, Tualatin, and Santiam rivers are strong candidates for further investigation. Contributions from major urban areas such as Portland, Eugene, and the Tualatin watershed are currently being investigated as part of NPDES permitting programs. These studies should provide much-needed information on nonpoint source runoff from urban and urbanizing areas in the basin. For future NPS work conducted in the basin, agricultural and urban areas should probably receive higher priority than watersheds with high percentages of forested land.

Pollutant loads and yields estimated by the unit-load approach show less variability among sub-basins for TP and TN (Table 2-3) than those shown previously for the GIS approach (Table 2-1). Estimated sub-basin yields of TSS show closer agreement with GIS-based yields: the highest yields from both models were for the Pudding River sub-basin and low yields were estimated for the headwaters of the Willamette River (< 500 kg/ha). Both models also predicted relatively high TSS yields for the Tualatin, Coast Range (includes the Yamhill River), Long Tom, and Santiam sub-basins (River Region II and III). Estimated loads of TP showed a pattern similar to that observed for TSS, although the upper and lower bounds on the yields were about 0.25 kg/ha less than that observed for the GIS-based model estimates. Variation in sub-basin TN loads was considerably greater in the GIS-based model than in the estimated unit load model. Nevertheless, basin loads for TP, TN, and TSS estimated by the two different approaches were within 10% of each other.

NPS estimates for the Willamette River Basin from both models were in general agreement with expected loads for similar land use types. The runoff and unit loading values used in preparing these model estimates are supported to some degree by site-specific research studies for agricultural and forestry land uses in the basin. The weight of evidence indicates that nonpoint sources are adding considerable pollutant loads to surface waters in the Willamette River Basin. In addition to the model output, this evidence includes:

1) Professional judgement of aquatic scientists based on degraded streams and lakes in watersheds lacking point source contributions (ODEQ 1988);

2) Site-specific water quality studies on agricultural, urban, and forest land uses in the basin; and

3) Quantification of pollutant yields for similar land uses elsewhere in the United States.

In summary, the basin-level modeling estimates for nonpoint source pollutant loads prepared under Phase I were within the range of estimates observed for areas with similar land use types. However, specific water quality data for calibrating or verifying model outputs were unavailable, giving these estimates high and unquantifiable uncertainty.

Information needs include specific pollutant contributions from individual land use types, biological and chemical evidence of nonpoint source pollution impacts, contributions from major sub-basins, an assessment of the contributions to total loading by pollutant type (e.g., nutrients, organics, sediment, toxics) and, the specific contribution of pollutants to water quality degradation. Information on the contribution of specific land use types and the presence of specific NPS contaminants can be obtained by collecting additional water quality data during high flow events.

Finally, annual estimates of NPS loads fail to address the issue of timing of the pollutant transport and its impact on receiving water quality. Unlike point sources of pollution, which are reasonably stable, NPS loads are notoriously erratic and highly related to stream discharge. The critical period of impact for organic wastes and nutrients is during low-flow, low dissolved oxygen (DO) conditions in the summer. However, the vast majority of NPS are delivered in the winter when flow is high and DO concentrations approach saturation. It is unclear how reducing of NPS loads in the winter might contribute to overall improvement in water quality. Future efforts to address water quality issues in the Willamette River basin should address NPS impacts on water quality during critical low flow periods.

2.2.4.2 Phase II. Water quality monitoring involved sampling during baseflow and stormflow at five primary sites and over 31 supplemental sites. Each primary site was sampled five times during baseflow and 10 to 14 times during each of five storms in the period from October to February.

Results showed a strong relationship between water quality and land use activities within the watersheds. Water quality of runoff from the forested site was generally excellent, although some elevated loads of

TSS were measured, particularly during the first major storm in the fall. Water from agricultural sites was moderately to highly polluted (see below). Overall Pudding River water quality was of intermediate quality, reflecting these diverse inputs.

Water quality at the two low-intensity agricultural sites on Beaver Creek showed higher concentrations of TSS, TP, nitrate (NO_3), and major ions than that from the forested site. However, the predominant crop in the Beaver Creek watershed, grass seed, promotes adequate vegetative cover during high flow periods, resulting in only modest increases in pollutant loads above those measured in the forested watershed. The greatest concentrations and loads of NPS pollutants were generated by the high-intensity agricultural watershed. Concentrations of TSS, TP, NO_3, NH_4, major ions, and bacteria in Zollner Creek were all indicative of highly polluted water. Concentrations of TSS, TP, and total Kjeldahl nitrogen in Zollner Creek increased with runoff and generally reached maximum concentrations just prior to maximum streamflow. Concentrations of NO_3 increased dramatically during the first storm and continued to increase as the stormflow receded, ultimately reaching a maximum of 27 mg/L (as NO_3-N). Nitrate concentrations in Zollner Creek were often well above the drinking water standard (10 mg/L). Nitrate in subsequent storms was diluted by the surface runoff, but increased again during decreasing stream flow. These dynamics indicate that most of the NO_3 in Zollner Creek was derived from accumulations in deep soils (below the rooting zone) gradually being flushed from the groundwater during storms.

The water quality data collected in this study were used to calibrate NPS models, based on the modified universal soil loss equation (MUSLE) and spatial characteristics of the watersheds (land use, soils, hydrography) in a geographic information system (GIS) framework. Water quality was modeled on a time step equivalent to the duration of a storm, typically about 100 hours. Pollutant loads in most storms were well-represented by the model. The greatest calibration problem was associated with the first major storm in October in which measured runoff was far less than predicted and the concentrations of some NPS pollutants were underpredicted. The former was caused by the inability of the model to reflect the substantial moisture deficit of the soils associated with the dry summer and early fall. The calibration process revealed that the intensity of agricultural practices was more important than general land use categories in assigning pollutant loading coefficients. For example, the pollutant load associated with runoff from grass seed farms appeared to be substantially less than runoff from wheat and grain crops. However, grain crops and grass seed fields appear similar on the aerial photographs typically used to

characterize land use. NPS modeling in the agricultural watershed was difficult, in part because of extensive modifications to surface and sub-surface hydrology caused by ditches and tile drains.

Modeling was conducted for the entire Pudding River sub-basin using more generalized data inputs for land use, soils, and watershed features. Results for the Pudding River basin showed fair to poor agreement with measured values for individual storms. For all storms combined, however, the model results were in reasonable agreement, with measured values differing by 20%, 14%, and 46% for TSS, TP, and NO_3, respectively.

The monitoring and modeling activities conducted within this study demonstrated that NPS pollution seriously impairs water quality in portions of the Willamette Valley. Among the more intensive agricultural watersheds, water quality problems include high suspended solids, high nutrients, bacterial contamination, and a complete alteration of the major ion chemistry. Additionally, very high concentrations of NO_3 measured in stormflow downstream from intensive agriculture strongly suggest that aquifers in some areas of the valley are receiving excessive loads of NO_3 that could lead to groundwater pollution problems.

2.2.4.3 Phase I vs. Phase II. The modeling results for the Pudding River sub-basin from Phases I and II are not directly comparable because Phase I loads included the Molalla River and several tributaries to the Willamette River. However, a comparison of the modeled unit loads shows a major difference in predicted TSS loads for the study area (Table 2-4). TSS loads estimated from Phase II are only 29% of the loads estimated in Phase I. This dramatic difference is attributed to inefficiencies in sediment transport not adequately addressed in Phase I, and the presence of non-irrigated farmland in crops such as grass seed. These crops result in less erosion than do row crops and other more intensive agricultural practices. The results from Phase II underscore the need to distinguish among the various classes of agriculture to better estimate the magnitude of nonpoint source pollution. Estimated unit loads of TP in Phase II were 58% greater than values estimated for the Pudding River sub-basin in Phase I. In Phase I, loads of TSS and TP were estimated based on empirical data from Elkins Road. Results in the Pudding River sub-basin (Phase II) indicate that larger concentrations of TP can be associated with TSS. One possible reason for the greater unit loads of TP estimated in Phase II is the contribution of livestock and point sources, neither of which were reflected in the data from Elkins Road watershed used in Phase I. The nitrogen loads in Phase II were more than three times as great as those estimated in Phase I. Under

Phase I, model estimates were prepared for total nitrogen (TN), whereas only nitrate (NO_3) was modeled in Phase II. If organic N and NH_4 were added to the Phase II results, the disparity in N model estimates would be greater yet. The high N loads in the Pudding River sub-basin most likely reflect contributions from high rates of fertilizer application associated with irrigated agriculture, and from livestock wastes.

TABLE 2-4. MODEL ESTIMATES OF ANNUAL LOADS (IN KG/HA) OF TOTAL SUSPENDED SOLIDS (TSS), TOTAL PHOSPHORUS (TP), AND NITROGEN (N). FORMS OF N MODELED ARE INDICATED IN PARENTHESES.

	Phase I		Phase II
	Unit Loads	MUSLE Model	GIS-MUSLE
TSS	1071	1085	318
TP	0.99	1.14	1.69
N	(TN) 5.55	(TN) 8.98	(NO_3) 35.7

2.2.5 U.S. Geological Survey Trace-Contaminant Study

This section describes the U.S. Geological Survey (USGS) trace-contaminant studies from Phases I and II. The study, funded cooperatively by the USGS and Oregon Department of Environmental Quality (ODEQ), was conducted under the auspices of the Willamette River Technical Advisory Steering Committee (TASC) from 1992 to 1995.

2.2.5.1 Background. The overall objective for the TASC was "to develop a complete database for the river basin that is coupled with operative water-quality models that will enable federal, state, and local agencies to cooperatively ensure the preservation and the beneficial uses of the Willamette River Basin and its associated biota" (Tetra Tech 1993a). Specific work items included: 1) creation of predictive models of water quality, hydrology, and sediment transport; 2) calibration of these models using field collected data; and 3) application of biological-community-assessment methods, and other biological indices, to assist ODEQ in future development of numerical biological criteria (Tetra Tech 1993a).

Work conducted by the USGS during Phase I included: 1) modeling of the hydrology of the basin (Lee, in press; Laenen and Risley, in preparation); 2) investigating sediment transport (Laenen 1995); and 3) collecting samples for analysis of trace elements and organic compounds in water, bottom sediment,

and suspended sediment. Additional work conducted by USGS during Phase II included: 1) additional investigating of trace elements and organic chemicals and associated land uses; 2) measuring sediment oxygen demand (SOD) in bottom sediments of the Willamette River from Newberg to Portland (river miles 50.5 to 3.1); and 3) investigating factors controlling dissolved oxygen and pH in the upper Willamette River and its major tributaries upstream from Salem. Data from Phases I and II are stored electronically in the WATer STOrage and REtrieval system (WATSTORE) and are also available through U.S. EPA's STOrage and RETrievel system (STORET).

The objective of the Phase I toxics study was to collect reconnaissance data to identify trace elements and organic compounds in bed sediments and surface water in the Willamette River Basin. The objective of the Phase II study was to expand the spatial coverage of water-column data for toxic constituents in the basin. Sites were sampled when constituent concentrations were expected to be at the highest, during storm runoff in the spring and fall after application of pesticides. Sites were located in subbasins containing a variety of land uses in an attempt to identify contaminant source areas and associated land and water uses.

2.2.5.2 Scope. Several reports are being prepared by the USGS addressing results of the Phase II study components: 1) a data report on trace elements and organic compounds analyzed in the Phase I and II studies; 2) an interpretive report, primarily covering the Phase II toxics study as well as analogous data from Phase I; 3) the SOD study in the lower Willamette River; and 4) the investigation of DO and pH in the upper Willamette and tributaries. These four reports are expected to receive USGS approval for publication by July, 1995.

This section presents summary results from the Phases I and II toxics studies; consult the individual reports mentioned above for information on other USGS study components from the WRBWQS or for more detailed information on toxics. Given the complexity and scope of the toxics investigations and the size of the resulting database, this summary is limited to a brief description of the sampling methods, sites and constituents sampled, and exceedances of State or federal guidelines for water and sediment quality. Sites where a large number of constituents exceeded guidelines, and constituents that exceeded guidelines at a large number of sites, are noted. A brief discussion is also included on trace elements and organic

compounds that were prevalent in streams in the Willamette River Basin for which State and federal guidelines have not been established.

Several concurrent projects have contributed to the database used for this study. In addition to the WRBWQS, the Willamette River Basin study unit of USGS' NAWQA program (see 1.3.1 above) includes assessments of many sites and constituents that were also sampled during the WRBWQS. The USGS Phase I and II study components were designed to integrate with the Willamette NAWQA program. In addition, the USGS is involved in a cooperative study on the lower Columbia River with the States of Oregon and Washington (Columbia River Bi-State Study -- Tetra Tech 1993b). That study included sampling at the Willamette River at Portland, which also was sampled by the WRBWQS and NAWQA studies. For this reason, additional data that were collected by the Willamette NAWQA or Columbia River Bi-State projects are considered here and in the interpretive report for toxics.

2.2.5.3 Methods. Sampling plans, including sites sampled, dates of sampling, and constituents analyzed for the WRBWQS are discussed in greater detail in the analytical data report for this project (Harrison et al. In press). Fifty sampling sites were located throughout the Willamette River main stem and tributaries for the toxics study during Phase I and II (Figure 2-6).

Owing to the two-and-a-half-year time frame covered by Phases I and II (spring 1992 - fall 1994), there were some differences in protocols used in the Phase I and II studies. Those differences are discussed in the analytical data report (Harrison et al. In press). A brief description of the methods is included below.

Field measurements of water temperature, pH, specific conductance, and DO were made using Hydrolab multiparameter probes. Discharge measurements were made in accordance with standard USGS procedures (Rantz et al. 1983) or determined from stage-discharge relations. Water samples were collected using a D-77 or a DH-81 depth-integrating sampler specially fitted to minimize sample contamination. Water was collected using depth- and width-integrated sampling techniques (Edwards and Glysson 1988). Water-quality sampling for trace elements was conducted using clean procedures as outlined by Horowitz et al. (1994). Bed-sediment samples were collected using methods described by Shelton and Capel (1994). All sampling was conducted by at least two field personnel using "clean hands/dirty hands" methods similar to those outlined by Horowitz et al. (1994). Quality-control samples included field and laboratory

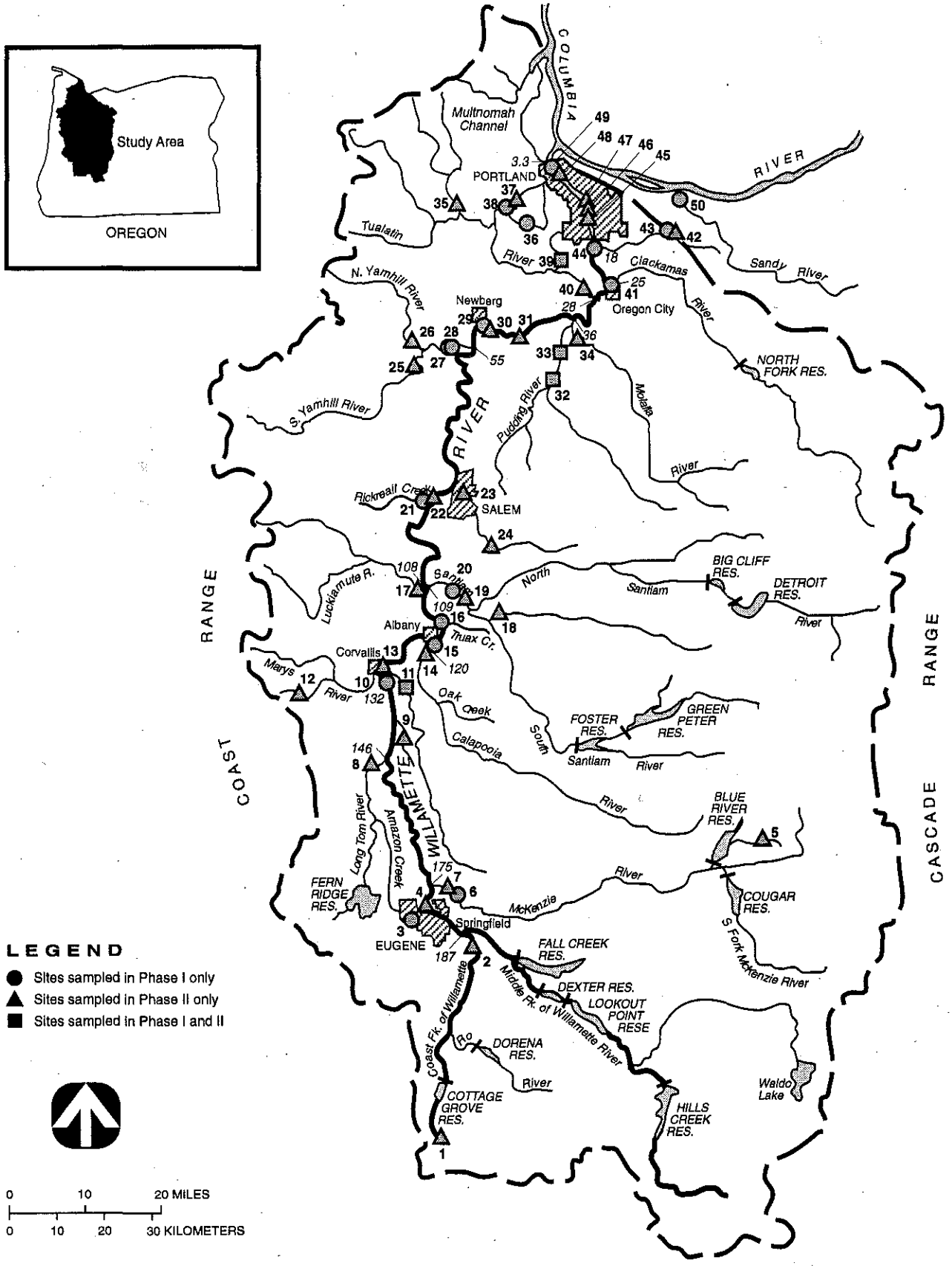

Figure 2-6. Willamette River Basin Water Quality Study USGS Sampling Sites, 1991-1994.

equipment blanks, replicate field samples, spiked field samples, and laboratory spikes of organic-free water.

2.2.5.4 Exceedances of Water and Sediment Quality Guidelines. Exceedances of water-quality criteria for trace elements and organic compounds in water are listed in Tables 2-5 and 2-6, respectively. Exceedances of State of Oregon criteria and Ontario Ministry of Health guidelines for trace elements and organic compounds in bed sediments are listed in Tables 2-7 and 2-8, respectively. Sites are listed by land-use type to aid in interpretation of results. Land-use types included: 1) urban (commercial, residential, and industrial sites); 2) agriculture (row crop, pasture, grain, orchard, and nursery sites); 3) reference (forested, wilderness, or largely undisturbed sites), and 4) integrator sites that include a mixture of urban, agricultural, and reference areas upstream. Guidelines and criteria were specified by ODEQ: constituent concentrations in water are compared to the freshwater aquatic life criteria for acute and chronic toxicity (ODEQ 1994) and the U.S. EPA's (1995) criteria for the protection of human health for water and fish ingestion (risk level one in one million). For bed sediments, guidelines were limited to the Ontario Ministry of the Environment and Energy (OME) Guidelines (Persaud et al. 1993) or the Oregon Interim Dredge Disposal Guidelines (ODEQ 1990).

Some caution must be used in applying these criteria to water data from the Phase I and II toxics studies. The criteria for acute and chronic toxicity are time dependent. Acute criteria are based on either instantaneous concentrations or concentrations lasting 1 hour once every 3 years, depending on the constituent. Chronic criteria are concentrations not to be exceeded for more than 24 hours or 4 days once every 3 years, depending on the constituent. These temporal aspects were not designed into the sampling plans because documentation of criteria or guidelines exceedances was not an objective of the studies. There are also some cautions for the use of Phase I bed sediment data. Guidelines are based on a particle size of two millimeters, whereas bed-sediment samples for trace elements were sieved at 62 microns during Phase I. Additionally, the Phase I sediment samples were analyzed using a more complete digestion than is specified for the ODEQ or OME guidelines for sediment quality. All of these factors will likely produce higher readings, and thus more exceedances than might otherwise have been found.

Results for several constituents are listed in Tables 2-5 through 2-8 as inconclusive because the minimum analytical limits for those constituents were higher than their respective guideline values. In those cases, although the compound may not have been detected, it may have been present, and if so, the guideline

TABLE 2-5. EXCEEDANCES OF OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY/ U.S. ENVIRONMENTAL PROTECTION AGENCY CRITERIA FOR TRACE ELEMENTS IN WHOLE AND FILTERED WATER FOR STREAMS SAMPLED DURING PHASES I AND II OF THE WILLAMETTE RIVER BASIN WATER QUALITY STUDY
(Page 1 of 2)

Site	Criteria Exceeded									
	Arsenic	Cadmium	Chromium	Copper	Iron	Lead	Manganese	Silver	Zinc	Mercury
Urban/Residential/Industrial Sites										
Urban Outfall at Greenway Bicycle Bridge, at Eugene	c	e		e				e		
A-3 Channel at Wallis & 5th St., Eugene	c	d,e	a,b	a,b	b,c	a,b	c	d,e	a,b	b
Pringle Creek at Bush Park at Salem	f	d,e		a,b	NS	a,b	NS	d,e	a,b	NS
Beaverton Creek at 216th Ave near Orenco	f				c		c	e		e
Bronson Creek at 185th Ave near Aloha	f	e			NS		NS	e		NS
Fanno Creek at Durham	c	d,e		b	b,c	b	c	e	a,b	e
Johnson Creek at Milwaukie	f	e			c	b		e		e
Urban Runoff at Harbor Way at Portland	c	a,b		a,b	NS	a,b		d,e	a,b	NS
I-84 Runoff at Portland	c	a,b	b	a,b	NS	a,b,c		d,e	a,b	NS
Agricultural Sites										
Muddy Creek near Peoria	f	e			c		c	e		e
Mill Creek at Delaney Road near Turner	NS				NS			NS		NS
S. Yamhill River at McMinneville	NS	e			NS	e		NS		NS
Palmer Creek at Dayton	f	e			c		c	d,e		e
Zollner Creek near Mount Angel	c				b,c		c	e		e
Pudding River at Aurora	f	d,e			b,c	b	c	d,e		e
Dairy Creek at Rte. 8 near Hillsboro	c	e			NS	b	NS	NS		NS
Johnson Creek at Palmblad Rd near Gresham	NS				NS		NS	NS		NS
Integrator Sites										
C.F. Willamette R. at Seavey Loop Rd near Eugene	NS	d,e			NS		NS	NS		e
Marys River at Corvallis	NS	e			NS	e	NS	NS		NS
Willamette River below Corvallis WWTP	f	d,e				e		d,e		e
Willamette River upstrm Hwy 219 at Newberg	f	d,e			NS	e		d,e		NS
Tualatin River at West Linn	NS	e			NS	b	c	NS		NS
Willamette River at Portland	f	d,e		a,b	NS	e	NS	d,e		NS
Willamette R. above St. Johns Bridge at Portland	NS	e			NS	e	NS	NS		NS
Willamette River at Linnton	f				b,c			d,e		e
Forest/Reference Sites										
C.F. Willamette R. below Big River near London		d,e				e		NS		e

TABLE 2-5. EXCEEDANCES OF OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY/ U.S. ENVIRONMENTAL PROTECTION AGENCY CRITERIA FOR TRACE ELEMENTS IN WHOLE AND FILTERED WATER FOR STREAMS SAMPLED DURING PHASES I AND II OF THE WILLAMETTE RIVER BASIN WATER QUALITY STUDY

Sources: 1) Oregon Department of Environmental Quality (1994), Oregon Administrative Rules, Chapter 340, Division 41, variously paged.
2) U.S. Environmental Protection Agency - Region IV, 1995 - written communication, Update to 304(a) criteria toxic substances spreadsheet, 13 p.

[Trace elements for which no criteria exist, and sites for which no trace element samples were collected, have been excluded. Chromium is assumed to be entirely in the hexavalent state. Nickel has been omitted because criteria were not exceeded. Freshwater criteria for acute and chronic toxicity values for cadmium, copper, lead, nickel, silver, and zinc are calculated based on measured hardness.

[a] ODEQ (1994) freshwater aquatic life criteria for acute toxicity.

[b] ODEQ (1994) freshwater aquatic life criteria for chornic toxicity.

[c] U.S. EPA (1995) criteria for protection of human health for water and fish ingestion (carcinogenic risk level of 1 in one million).

[d] Results inconclusive because Minimum Reporting Limits (MRLs) were larger than criteria for acute toxicity.

[e] Results inconclusive because MRLs were larger than criteria for chronic toxicity.

[d] Results inconclusive because MRLs were larger than the human health criteria.

NS = Not sampled.

Blank Cells = Sampled with no exceedance detected.

TABLE 2-6. EXCEEDANCES OF OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY/ U.S. ENVIRONMENTAL PROTECTION AGENCY CRITERIA FOR ORGANIC CHEMICALS IN WATER FOR STREAMS SAMPLED DURING PHASES I AND II OF THE WILLAMETTE RIVER BASIN WATER QUALITY STUDY
(Page 1 of 2)

Site	Criteria Exceeded												
	Organochlorine Compounds						Pesticides			Volatile Organic Compounds			
	DDT+DDE +DDD	Dieldrin	Dioxin (TCDD)	Heptachlor	Lindane	PCBs	Chlor-pyrifos	Malathion	Parathion	Benzene	Chloro-form	Dichloro-ethylene	Tetrachloro-ethylene
Urban/Residential/Industrial Sites													
Urban Outfall at Greenway Bicycle Bridge, at Eugene	f	f	NS	f		e,f					c	c	
A-3 Channel at Wallis & 5th St., Eugene	b,c	f	b,c	f		e,f					c	c	c
Pringle Creek at Bush Park at Salem	b,c	a,b	NS	f		b,c				NS	NS	NS	NS
Beaverton Creek at 216th Ave near Orenco	f	f	NS	f		e,f							
Bronson Creek at 185th Ave near Aloha	f	f	NS	f		e,f							
Fanno Creek at Durham	f	b,c	NS	f		e,f							
Johnson Creek at Milwaukie	c	b,c	NS	f		e,f							
Urban Runoff at Harbor Way at Portland	f	f	NS	f		e,f							
I-84 Runoff at Portland	b,c	b,c	NS	f		b,c		b		c			
Agricultural Sites													
Long Tom River at Bundy Bridge near Monroe	f	f	NS	f		e,f				NS	NS	NS	NS
Lake Camous Creek at Pine Grove Drive	f	f	NS	f		e,f				NS	NS	NS	NS
Muddy Creek near Peoria	f	e,c	NS	f		e,f							
Calapooia River at Albany	f	f	NS	f		e,f				NS	NS	NS	NS
Thomas Creek at Kelly Rd near Jefferson	f	f	NS	f		e,f				NS	NS	NS	NS
Rickreal Creek at mouth near Salem	f	f	NS	f		e,f				NS	NS	NS	NS
Mill Creek at Delaney Road near Turner	f	e,c	NS	f		e,f				NS	NS	NS	NS
S. Yamhill River at McMinneville	f	f	NS	f		e,f				NS	NS	NS	NS
N. Yamhill River near McMinneville	f	f	NS	f		e,f				NS	NS	NS	NS
Palmer Creek at Dayton	f	f	NS	f		e,f							
Champoeg Cr blw Mission Creek near Butteville	b,c	b,c	NS	f	c	e,f				NS	NS	NS	NS
Zollner Creek near Mount Angel	b,c	b,c	NS	f	c	e,f		b	a,b				
Pudding River at Aurora	b,c	e,c	NS	f		e,f							
Dairy Creek at Rte. 8 near Hillsboro	f	c	NS	f		e,f				NS	NS	NS	NS
Johnson Creek at Palmblad Rd near Gresham	b,c	b,c	NS	f		e,f	b			NS	NS	NS	NS

TABLE 2-6. EXCEEDANCES OF OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY/ U.S. ENVIRONMENTAL PROTECTION AGENCY CRITERIA FOR ORGANIC CHEMICALS IN WATER FOR STREAMS SAMPLED DURING PHASES I AND II OF THE WILLAMETTE RIVER BASIN WATER QUALITY STUDY

Site	Criteria Exceeded												
	Organochlorine Compounds						Pesticides			Volatile Organic Compounds			
	DDT+DDE +DDD	Dieldrin	Dioxin (TCDD)	Heptachlor	Lindane	PCBs	Chlor-pyrifos	Malathion	Parathion	Benzene	Chloro-form	Dichloro-ethylene	Tetrachloro-ethylene
Integrator Sites													
C.F. Willamette R. at Seavey Loop Rd near Eugene	f	f	NS	f		e,f				NS	NS	NS	NS
Marys River at Corvallis	b,c	f	NS	f		e,f				NS	NS	NS	NS
Willamette River below Corvallis WWTP	f	f	NS	f	b,c	e,f							
Luckiamute River near Buena Vista	f	f	NS	f		e,f				NS	NS	NS	NS
Santiam River at Jefferson	f	f	NS	f		e,f				NS	NS	NS	NS
Willamette River upstrm Hwy 219 at Newberg	f	f	NS	f		e,f							
Molalla River near Canby	f	f	NS	f		e,f				NS	NS	NS	NS
Tualatin River at West Linn	b,c	c	NS	f		e,f				NS	NS	NS	NS
Willamette River at Portland	b,c	f	NS	f		e,f				NS	NS	NS	NS
Willamette R. above St. Johns Bridge at Portland	f	f	NS	f		e,f				NS	NS	NS	NS
Willamette River at Linnton	f	f	NS	f		e,f							
Forest/Reference Sites													
C.F. Willamette R. below Big River near London	f	f	NS	f		e,f				NS	NS	NS	NS
Mack Creek near Blue River	f	f	NS	f		e,f				NS	NS	NS	NS
McKenzie River at mouth near Eugene	f	f	NS	f		e,f				NS	NS	NS	NS
Rock Creek near Philomath	f	f	NS	f		e,f							

Sources: 1) Oregon Department of Environmental Quality (1994), Oregon Administrative Rules, Chapter 340, Division 41, variously paged.
2) U.S. Environmental Protection Agency - Region IV, 1995 - written communication, Update to 304(a) criteria toxic substances spreadsheet, 13 p.

[Constituents for which no criteria exist are not included. Methoxychlor has been omitted because criteria were not exceeded. 2,4-Dinitro-O-cresol had one estimated detection at Mill Creek at Delaney Rd. near Turner which equalled the freshwater aquatic life criteria for chronic toxicity but is considered inconclusive due to matrix interferences. The Method Detection Levels (MDLs) for mirex and toxaphene exceed all three ODEQ/U.S. EPA criteria: these compounds were not detected, so that results are inconclusive at all sites.

[a] ODEQ (1994) freshwater aquatic life criteria for acute toxicity.

[b] ODEQ (1994) freshwater aquatic life criteria for chornic toxicity.

[c] U.S. EPA (1995) criteria for protection of human health for water and fish ingestion (carcinogenic risk level of 1 in one million).

[d] Results inconclusive because MDLs were larger than criteria for acute toxicity.

[e] Results inconclusive because MDLs were larger than criteria for chronic toxicity.

[f] Results inconclusive because MDLs were larger than the human health criteria.

NS = Not sampled.

Blank Cells = Sampled with no exceedance detected.

TABLE 2-7. EXCEEDANCES OF OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY/ ONTARIO MINISTRY OF ENVIRONMENT (OME) GUIDELINES FOR TRACE ELEMENTS IN BED SEDIMENT IN STREAMS SAMPLED DURING PHASE I OF THE WILLAMETTE RIVER BASIN WATER QUALITY STUDY

Site	Guidelines Exceeded									
	Arsenic	Cadmium	Chromium	Copper	Lead	Manganese	Mercury	Nickel	Silver	Zinc
Urban/Residential/Industrial Sites										
A-3 Channel at Wallis & 5th St., Eugene	b	a,b	a,b,c	a,b,c	a,b	b,c	a,b	b	b	a,b,c
Middle Fourth Lake near Albany			a,b	a,b			a,b	b	b	b
Beaverton Creek at 216th Ave near Orenco	b	a,b	a,b,c	a,b,c	a,b	b,c	a,b	b	b	a,b
Agricultural Sites										
Calapooia River at Albany	b		a,b	b		b,c		b		
Rickreal Creek near Rickreal			a,b,c	a,b,c		b		b		
Yamhill River at Dayton	b		a,b,c	a,b		b,c		b		
Johnson Creek near Hogan Rd at Gresham			a,b	b		b		b		
Integrator Sites										
Willamette River below Corvallis WWTP			a,b	a,b		b,c		b		
Santiam River at Jefferson	b		a,b	a,b		b,c		b		
Willamette River at Newberg			a,b,c	b		b		b	b	
Clackamas River at Oregon City	b		a,b	b		b,c		b		
Willamette River at Portland			a,b,c	a,b		b,c		b	b	b
Willamette River at Linnton	b		a,b	a,b		b,c		b	b	b
Beaver Creek near Troutdale (*Sandy River Basin*)			a,b	b		b,c		b		b
Forested Sites										
McKenzie River at Coburg Rd near Eugene			a,b	b		b,c		b		

Sources: 1) Oregon Department of Environmental Quality (1990), Oregon interim sediment quality guidelines: Issue paper #12, 6 pp.
2) Persaud, D., Jaagumagi, R., and Hayton, A. 1993. Guidelines for the protection and management of aquatic sediment quality in Ontario: Ontario Ministry of the Environment and Energy (variously paged).

[Trace elements for which no guidelines exist are not included. Analysis was for total trace elements. Cobalt and iron have been omitted because guidelines were not exceeded.

[a] ODEQ (1990) Interim dredge disposal guidelines.

[b] OME (1993) Lowest Observable Effect Level (LOEL) Guideline for protection of benthic organisms.

[c] OME (1993) Severe Effect Level (SEL) Guideline for protection of benthic organisms.

Blank Cells = Sampled with no exceedance detected.

TABLE 2-8. EXCEEDANCES OF OREGON DEPARTMENT OF ENVIRONMENTAL QUALITY/ONTARIO MINISTRY OF ENVIRONMENTAL (OME) GUIDELINES FOR ORGANIC CHEMICALS IN BED SEDIMENTS FOR STREAMS SAMPLED DURING PHASE I OF THE WILLAMETTE RIVER BASIN WATER QUALITY STUDY

Site	Guidelines Exceeded																
	Polynuclear Aromatic Hydrocarbons (PAHs)												Organochlorine Compounds				
	Anthracene	Benzo (a)anthracene	Benzo (g,h,i)-perylene	Benzo (k)fluoranthene	Benzo (a)pyrene	Chrysene	Dibenzo-(a,h)anthracene	Fluoranthene	Indeno-(1,2,3-cd)-pyrene	Phenanthrene	Pyrene	Total PAHs	Chlordane	DDT, DDE, DDD	Dieldrin	Hexachlorobenzene	PCBs
Urban/Residential/Industrial Sites																	
A-3 Channel at Wallis & 5th St., Eugene																b	a,b
Middle Fourth Lake near Albany		b	b	b	b	b	b	b	b	b	b	b,c	b	b,c	b	d	b
Beaverton Creek at 216th Ave near Orenco																	
Agricultural Sites																	
Calapooia River at Albany																	
Rickreal Creek near Rickreal																	
Yamhill River at Dayton																	
Johnson Creek near Hogan Rd at Gresham			b				b		b					a,b	b	d	
Integrator Sites																	
Willamette River below Corvallis WWTP	e		e			e	e		e								
Santiam River at Jefferson																	
Willamette River at Newberg																	
Clackamas River at Oregon City																d	b
Willamette River at Portland																	
Willamette River at Linnton	b	b	b	b	b	b	b	b	b	b	b	b,c		b		d	
Beaver Creek near Troutdale													b	b	b	d	
(Sandy River Basin)																	
Forested Sites																	
McKenzie River at Coberg Rd near Eugene																	

Sources: 1) Oregon Department of Environmental Quality (1990), Oregon interim sediment quality guidelines: Issue paper #12, 6 pp.
2) Persaud, D., Jaagumagi, R., and Hayton, A. 1993. Guidelines for the protection and management of aquatic sediment quality in Ontario: Ontario Ministry of the Environment and Energy (variously paged).

[Constituents for which no criteria exist are not included. Aldrin, Alpha-BHC, Endrin, Heptachlor epoxide, Lindane, and Mirex have been omitted because guidelines were not exceeded.

[a] ODEQ (1990) Interim dredge disposal guidelines.

[b] OME (1993) Lowest Observable Effect Level (LOEL) Guideline for protection of benthic organisms.

[c] OME (1993) Severe Effect Level (SEL) Guideline for protection of benthic organisms.

[d] Results inconclusive because Method Detection Levels (MDLs) were larger than LOEL guideline value.

[e] Results inconclusive because MDLs were larger than the SEL guideline value.

Blank Cells = Sampled with no exceedance detected.

may or may not have been exceeded. This was particularly true for the human health criteria, which are generally very low. In the case of trace elements in water (Table 2-5), the acute and chronic criteria for cadmium, copper, lead, nickel, silver, and zinc, are calculated based on the measured hardness of the water. The lower the hardness, the lower the criterion. Where hardness was low, comparisons with calculated toxicity criteria may have been inconclusive even if the element was not detected.

The criteria for trace elements in water (Table 2-5) were exceeded more frequently at urban sites than agricultural or integrator sites. Copper, lead, and zinc exceeded either the acute or chronic criteria at five of eight sites sampled. Among all sites, lead and iron exceeded at least one criterion most frequently, whereas arsenic, cadmium, and mercury results were inconclusive at many sites because their criterion values are particularly low.

Samples from A-3 Channel at Wallis and Fifth Street in Eugene exceeded criteria for eight out of eleven trace elements sampled, and were inconclusive for cadmium and silver due to low hardness. Samples from Fanno Creek at Durham Road, in the Tualatin Basin, exceeded criteria for six of eleven constituents sampled, and were inconclusive for cadmium and mercury. Of the sites draining predominantly agricultural areas, Pudding River at Aurora and Zollner Creek near Mount Angel had the largest number of exceedances, including iron and manganese at both sites. Of the integrator sites, the Tualatin River at West Linn, a site not far downstream from the mouth of Fanno Creek, exceeded the chronic toxicity and the human health criteria for lead and manganese, respectively.

EPA and ODEQ criteria for organic constituents in water (Table 2-6) were exceeded most frequently for dieldrin and for DDT plus metabolites (DDT+DDE+DDD). These compounds were detected at several urban/industrial sites as well as agricultural and integrator sites. Results for several compounds were inconclusive with respect to water-quality criteria at almost all sites because analytical limits were higher than criterion values; these include mirex and toxaphene, which were not detected at any sites, heptachlor, which was detected only at the Interstate-84 runoff site in Portland, and PCBs, which were detected only at the Interstate-84 runoff site and at Pringle Creek at Bush Park in Salem. Dioxins and furans were analyzed for in the water column at only one site, A-3 Channel at Wallis and Fifth Street in Eugene, and one congener of dioxin (2,4,7,8-tetrachlorodibenzo-dioxin, or TCDD) was detected in excess of both the chronic criteria and the human health criteria. Methyl tert-butyl ether (MTBE), a fuel

additive which has recently been found to be present in excess of federal guidelines in water in several cities across the country (Squillace et al. 1995), was not detected at any sites.

Several urban sites were noteworthy with respect to organic constituents. Runoff from Interstate-84 at Southeast Third Avenue in Portland, which is subsequently pumped into the Willamette River, exceeded criteria for chronic toxicity and for human health for DDT+DDE+DDD, dieldrin, heptachlor, PCBs, malathion, and benzene. At A-3 Channel exceedances of the human health criteria for organochlorine compounds (dioxin, DDT+DDE+DDD) and several volatile organic compounds (chloroform, dichloroethylene, and tetrachloroethylene) were detected.

Of the agricultural sites, Zollner Creek near Mount Angel had exceedances for several organochlorine compounds (DDT+DDE+DDD, dieldrin, and lindane) as well as two other pesticides (malathion and parathion). Parathion exceeded both the acute and chronic criteria at the Zollner Creek site. Many additional pesticides for which water-quality guidelines do not exist, including triazine herbicides, other organochlorine compounds, carbamates, and organophosphates were also detected at Zollner Creek. Other agricultural sites at which exceedances of criteria were noted and numerous pesticides were detected included Muddy Creek near Peoria, Mill Creek near Turner, Champoeg Creek near Butteville, the Pudding River near Aurora, and Johnson Creek at Palmblad Road.

Chromium, copper, manganese, and nickel in bed sediments exceeded ODEQ interim dredge disposal guidelines (1990) or OME guidelines for trace elements at every or almost every site sampled during the Phase I survey (Table 2-7). Manganese exceeded the OME Severe-Effect Level (SEL) guideline at 11 of 15 sites, and nickel exceeded the OME Lowest Observable-Effect Level (LOEL) guideline at every site. Mercury exceeded ODEQ guidelines and the LOEL at each of the three urban/industrial sites.

The sites with the greatest number of exceedances of ODEQ or OME guidelines were A-3 Channel at Fifth and Wallis Streets in Eugene and Beaverton Creek at 216th Avenue near Orenco; exceedances were found at these industrial sites for each trace element sampled for which bed-sediment guidelines exist except cobalt and iron. Integrator sites, reflecting the mixture of both urban and agricultural land uses upstream, had similar patterns of exceedances as the agricultural sites (largely chromium, copper, lead, and nickel) with additional violations of the SEL guidelines for arsenic, silver, and zinc, depending on

the site. Willamette River at Portland and Willamette River at Linnton had exceedances of bed-sediment guidelines for six and seven of twelve trace elements, respectively.

Aldrin, alpha-BHC, endrin, heptachlor epoxide, lindane, and mirex were omitted from Table 2-8 because they did not exceed bed sediment guidelines at any site sampled. None of the organic constituents listed exceeded ODEQ or OME guidelines at more than 4 of the 15 sites; DDT+DDE+DDD and PCBs exceeded their respective LOELs at four sites each. Although moderately high bed sediment concentrations were detected for toxaphene at one site (Johnson Creek near Hogan Road at Gresham) and for cis- and trans-nonachlor at three sites (Johnson Creek near Hogan Road, Beaverton Creek at 216th Avenue, and Beaver Creek near Troutdale), their impacts could not be evaluated because guidelines for these compounds have not been established.

At least 1 of the 65 semivolatile (SV) compounds analyzed was found in every bed-sediment sample. Overall, 45 SV compounds were detected. Twenty-seven or more SV compounds were detected in samples collected from five sites (A-3 Channel at Wallis 5th Street at Eugene [27 SV compounds], Beaverton Creek at Beaverton [29], Middle Fourth Lake near Albany [31], Johnson Creek at Gresham [35], and Willamette River at Linnton [36]). Concentrations for three of the polynuclear aromatic hydrocarbons (PAHs) detected in a sample from the Johnson Creek at Gresham site, 11 of the PAHs detected in a sample from the Beaverton Creek at Beaverton site, and 12 of the PAHs detected in a sample from the Willamette River at Linnton site exceeded their respective LOELs. In addition, relatively high concentrations were observed at five sites for benzo[b]fluoranthene, bis(2-ethyl-hexyl)phthalate, butylbenzophthalate, naphthalene, phenol, p-cresol, anthraquinone, and methyl-pyrene; their toxicity to benthic organisms could not be evaluated because LOELs have not been established for these compounds.

Samples for dioxins and furans in bed sediment were taken at eight sites during Phase I. Concentrations at three industrial sites (A-3 Channel, Middle Fourth Lake near Albany, and Beaverton Creek near Orenco) ranged from 9.3 to 32,000 parts per trillion and were approximately 2 to 87 times greater than concentrations observed at the other sites. The most toxic of the PCDD compounds (2,3,7,8-TCDD) was observed in bed sediment only from the A-3 Channel site at 3 parts per trillion. This is in agreement with the finding of 2,3,7,8-TCDD in water, in excess of the human health criteria, at the same site (Table 2-6) during a high flow-sample. Toxicity guidelines have not been established for PCDDs or PCDFs in bed sediment, and hence these results are not shown in Table 2-8.

Many additional organic compounds were analyzed at each site for which no criteria or guidelines exist. Some of these compounds were detected at many sites, and periodically at high concentrations. Included among these compounds are: 1) triazine herbicides -- atrazine (detected in 93 of 102 samples), simazine (83 of 102 samples), and prometon (29 of 102 samples); 2) chloro-acetamide herbicides -- metolachlor (83 of 102 samples), napropamide (27 of 102 samples), and pronamide (19 of 102 samples); 3) carbamate pesticides -- EPTC (32 of 102 samples), carbaryl (23 of 102 samples), and carbofuran (22 of 102 samples); 4) organophosphate insecticides -- diazinon (46 of 92 samples), fonofos (25 of 101 samples), and ethoprop (24 of 102 samples); and 5) urea herbicides -- diuron (50 of 91 samples) and tebuthiuron (23 of 102 samples). These and additional data will be interpreted in more detail in future reports from the USGS.

Just as a listing of criterion exceedances provides a limited interpretation of the compounds present in stream water and bed sediments within the Willamette River Basin, the listing of sites in Tables 2-5 through 2-8 does not fully indicate all of the sites which have been found to have the most numerous detections or highest concentrations of trace elements or organic compounds in water. Many organic compounds were detected at certain agricultural sites, especially Zollner Creek near Mount Angel, Muddy Creek near Peoria, Mill Creek near Turner, Champoeg Creek near Butteville, Dairy Creek near Hillsboro, and Johnson Creek (either of two sites near Gresham). The following urban sites also had many detections for pesticides, VOCs, SVs, OCs, and trace elements: A-3 Channel at Wallis and 5th Street, Fanno Creek near Durham, Pringle Creek at Bush Park at Salem, Beaverton Creek near Orenco, and the runoff from Interstate-84 near 3rd Avenue at Portland.

This section has concentrated on highlights from the Phase I and Phase II Willamette River Basin Water-Quality Study toxics investigations in relation to water-quality criteria and guidelines. Consult specific reports, from all contributors to the WRBWQS, for more details concerning results from the study.

2.3 ECOLOGICAL INVESTIGATIONS

This section summarizes the results of the Ecological Systems Investigation Component, which was a series of preliminary investigations of aquatic species dependent upon the Willamette River system. The goal of this component was to provide information to Oregon Department of Environmental Quality (ODEQ) to assist in developing biological criteria that would help assess water quality of the Willamette River Basin. This section discusses studies conducted during 1992-1995 to contribute to the development of biological indices.

The 1972 Clean Water Act mandated the development of programs that would evaluate, restore, and maintain the chemical, physical, and biological integrity of the nation's waters. In response to this directive, the states established water quality programs based on chemical-specific numeric water quality standards and narrative criteria to protect public health and aquatic life. While this approach successfully addressed significant water quality problems, it did not identify or address all surface water problems (U.S. EPA 1987; 1990). In 1990, the U.S. Environmental Protection Agency issued a policy document that strongly recommended that states develop biological water quality criteria (biocriteria) to supplement existing chemical-specific water quality programs (U.S. EPA 1991a). Biocriteria are numerical or narrative expressions that describe the biological integrity of aquatic communities inhabiting waters that have a given aquatic life use (U.S. EPA 1990). They are intended to enhance existing chemical-specific numeric water quality standards by providing a direct measure of ambient aquatic life and overall biological integrity in a waterbody (U.S. EPA 1991b).

To develop numerical biocriteria, U.S. EPA (1990) recommends that states: 1) identify unimpaired reference conditions for waterbodies, 2) characterize the aquatic communities inhabiting reference surface waters, and 3) evaluate the biological integrity of reference sites using quantifiable biological surveys that measure diagnostic indicators of chemical, physical, and biological stress. Two key aspects of this process are the careful selection of the components of the aquatic community that will be evaluated (e.g., fish, benthic invertebrates, algae) and the selection of the particular diagnostic indicators that will be measured to assess biological integrity. Application of biological criteria typically involves the statistical comparison of these indicators measured at test locations and reference locations.

Diagnostic indicators were developed in four general areas, summarized below.

- Benthic algae (periphyton) were assessed in Phase I of the WRBWQS using historical information, field measurements, and laboratory analyses (Section 2.3.1).

- Benthic macroinvertebrates were assessed in both shallow riffle habitats (kicknet techniques) and deeper pools and backwaters (sediment grab sampling) in both phases (Sections 2.3.2).

- Fish and fish assemblages were assessed in both phases using a modified index of biotic integrity (IBI) and a survey of skeletal abnormalities in individual fish species. In Phase I, an additional study of fish health was conducted (Section 2.3.3).

- Physical habitat was assessed qualitatively in Phase I and quantitatively in Phase II (Section 2.3.4).

Of these four areas, benthic macroinvertebrates and fish were selected for further development of biocriteria for eventual use by ODEQ in river management. These communities were selected because methodologies exist for developing biocriteria for these taxonomic groups (e.g., Plafkin et al. 1989) and because the Oregon Department of Environmental Quality has ongoing monitoring programs for fish and benthic invertebrates. The advantages associated with using benthic macroinvertebrates and fish for biocriteria development have been summarized by Plafkin et al. (1989) and are summarized below.

The advantages of using benthic macroinvertebrates in developing biocriteria include:

- Macroinvertebrate communities are good indicators of localized conditions.

- Macroinvertebrate communities integrate the effects of short-term environmental conditions.

- Macroinvertebrate sampling is relatively easy and inexpensive, and has no detrimental effects on the resident biota.

- Benthic macroinvertebrates are abundant in most water bodies.

- Benthic macroinvertebrates serve as the primary food source for many recreationally and commercially important fish.

While benthic macroinvertebrate communities had been sampled at many locations within the Willamette River before the WRBWQS, no consistent protocol for the analysis and interpretation of these data had been established for the mainstem of the Willamette River. Benthic macroinvertebrate communities inhabiting shallow riffle habitats were sampled using kicknet techniques, while deeper upstream pools, backwater areas, and the lower river were sampled by taking sediment grab samples. During Phase II of the WRBWQS, potential metrics in four categories (diversity, taxonomic composition, sensitivity to physical and chemical perturbation, and trophic status) were evaluated for inclusion in a biological index for macrobenthic invertebrate communities found in Willamette River riffle habitats. Thirty-two potential metrics were screened to eliminate indices that were redundant or displayed low discriminatory power and 10 metrics were recommended for inclusion in the index (Tetra Tech 1994c). These 10 metrics were evaluated by adapting U.S. EPA's rapid bioassessment protocols for benthic macroinvertebrate communities.

The advantages of using fish in developing biocriteria include:

- Fish are good indicators of long-term effects and broad habitat conditions because they are relatively long-lived and mobile.

- Fish communities generally include a range of species that represent a variety of trophic levels. Thus, fish community structure is reflective of integrated environmental health.

- Fish are relatively easy to collect and identify.

- Fish are consumed by humans, which makes them important subjects in assessing contamination.

levels of nutrients and light. It was intended that these data be used in developing periphyton models to predict the effect of various water quality management decisions on periphyton biomass and DO in the Willamette River Basin.

Periphyton assemblages in the upper Willamette River varied in abundance, but generally decreased downstream. Abundances were lowest in the middle reach (RM 52-140) and increased below Newberg. Periphyton patterns in the middle and lower reaches coincide with nutrient increases below RM 50. In the upper river, abundances of periphyton were extremely variable, encompassing the full range of abundances observed in the mainstem and tributaries. Differences in the physical environment in the more complex shallow reaches of the upper river and biotic influences, particularly grazing by invertebrates and fish, may account for much of the variation. Periphyton abundance and production increased below Cottage Grove on the Coast Fork. These changes are consistent with influence of sewage additions, but direct causes cannot be proven with these data.

Both chlorophyll *a* and biomass of periphyton increased from Irish Bend (RM 151) to Snag Boat Bend (RM 143), but rates of primary production and respiration decreased at the downstream site. Several factors related to physiological condition of the algae or lack of consumption by herbivores may be responsible. Interpretation is confounded by both the influence of pulp mill effluents and entry of the Long Tom River. Highest rates of benthic metabolism are projected to occur in the upper sections of the river. Rates of production in the lower reach of the river are substantially lower than rates in the shallower upper section.

Laboratory results demonstrate that periphyton assemblages in the upper Willamette River are potentially limited by the availability of nitrogen during late summer. The initial experiments demonstrate an effective approach for evaluating potential nutrient limitation.

The Stream Ecosystem Model simulated algal abundances within ranges observed in the Willamette River and its tributaries. The model simulation clearly demonstrated that aquatic herbivores can greatly alter periphyton dynamics and should be considered in future monitoring efforts. Models based solely on algal responses to physical and chemical factors may indicate potential changes, but such models have little chance of accurately reflecting algal dynamics in a complex aquatic ecosystem like the Willamette River.

Analysis of habitat structure, both in-channel and floodplain, is needed to develop appropriate frameworks for interpreting resource monitoring information and for managing the Willamette River ecosystem.

The state of Oregon has no historical context for interpreting changes in abundance, taxonomic composition, or metabolism of periphyton communities in the Willamette River. Monitoring of the Willamette River ecosystem to date has included only meager consideration or measurement of benthic algae. This less transient but ecologically fundamental component of the Willamette River ecosystem reflects long-term changes in habitat, water quality, and discharge patterns. The evaluation of periphyton dynamics in late 1992 pointed to key patterns and relationships essential to managing the Willamette River ecosystem. Data collection over a longer term is needed to show seasonal and year-to-year variations in such periphyton community characteristics as the timing and development of abundance and production. The summer of 1992 was a period of near-record low stream flows in Oregon. Determination of whether the patterns observed are anomalous is not possible without additional studies. Development of a long-term monitoring program for the Willamette River ecosystem is critical.

Periphyton communities exhibited distinct spatial patterns along the Willamette River. The general trend of downstream decreases in abundance in the upper reaches was expected, but the extremely high variation from site to site was surprising. Spatial patterns may be more interpretable if sampling occurred across several gravel bars within a reach rather than at several sites within a gravel bar; it would also be helpful to survey the distribution of the shallow habitats in which periphyton play a major ecological role.

2.3.2 Assessment of Benthic Macroinvertebrate Communities

Benthic communities in riffle and soft-bottom sediment habitats were sampled over a period of three years from locations throughout the mainstem Willamette River and several tributaries in order to assist DEQ in developing biological criteria for the Willamette River and to identify potential water quality problems (Figure 2-7). Field sampling of benthic macroinvertebrate communities in soft-bottom habitats was designed to collect unbiased, random, representative samples of macroinvertebrates from specific Willamette River sites. Benthic macroinvertebrates were selected for evaluation during the WRBWQS because methodologies exist for developing biocriteria for aquatic benthic communities and because DEQ has ongoing monitoring programs for macroinvertebrates. The studies conducted during the WRBWQS focused on four general objectives:

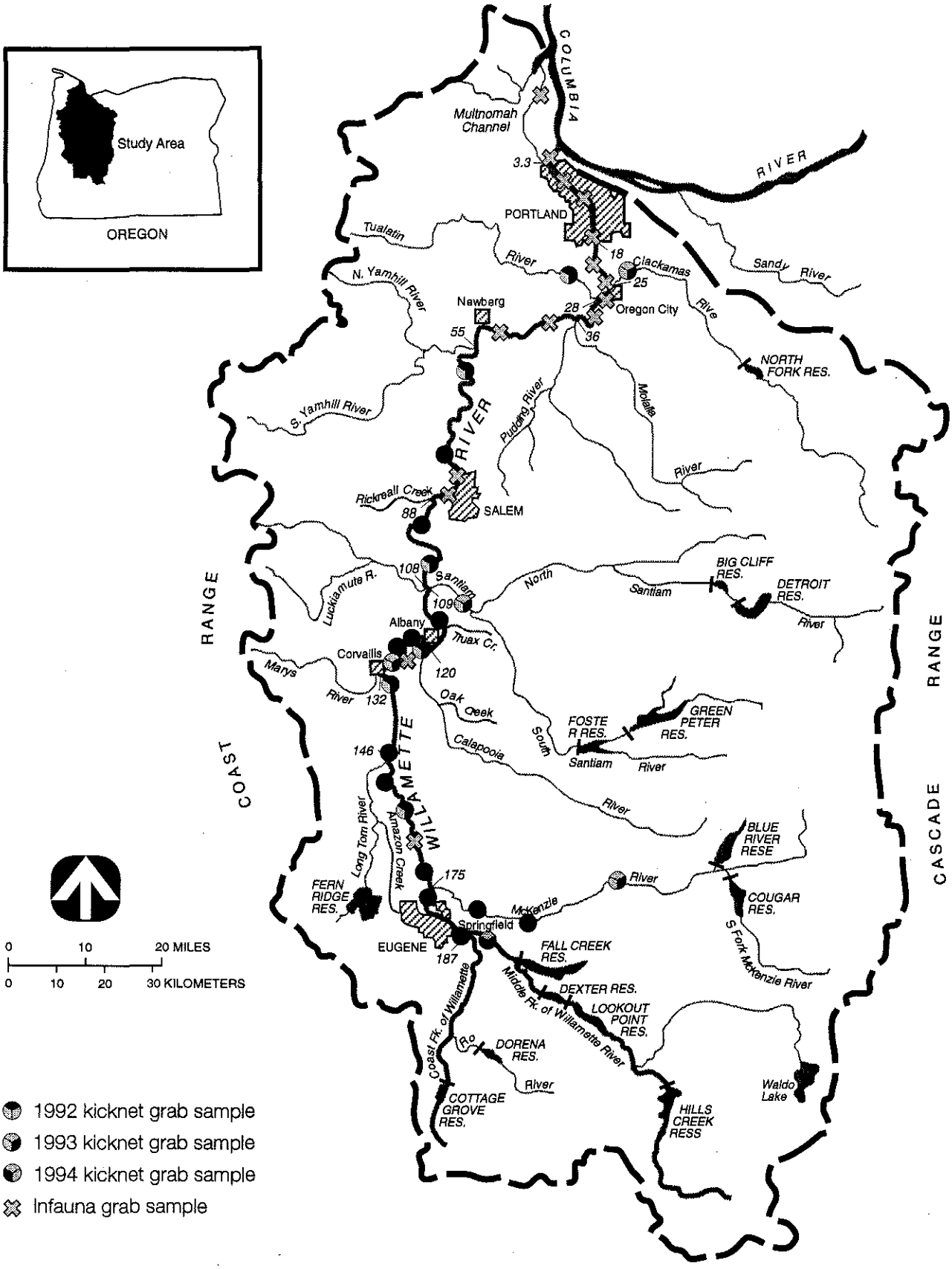

Figure 2-7. Willamette River Basin Benthic Macroinvertebrate Sampling Stations, 1992-1994.

- Select, in accordance with U.S. EPA's guidance on rapid bioassessment protocols for use in streams and rivers, a suite of metrics (diagnostic indicators) for calculating a biological index to assess impacts to benthic communities along the mainstem of the Willamette River.

- Characterize the spatial and temporal variability associated with the biological index for benthic communities.

- Characterize a reference condition for assessing impacts to benthic communities.

- Apply the biological index to characterize the biological condition of benthic communities.

2.3.2.1 Riffle Habitats. Shallower, harder-bottom riffle habitats were sampled throughout the Willamette mainstem plus several tributaries.

Sampling and Analysis Methods--Benthic macroinvertebrates were sampled using a kicknet at locations distributed in river reaches where riffles were found (e.g., no stations were located in the Portland Harbor area). A total of 18, 23, and 13 stations were sampled in 1992, 1993, and 1994, respectively (Figure 2-7). Previous reports describe the station locations in greater detail (Tetra Tech 1993b; 1994a). Twelve stations were sampled in all three years. Five of these stations (RM77, RM93, RM113, RM120.5, and RM128) were located in river reach III and seven stations (RM145, RM150, RM173, RM176, RM185, and miles 7 and 22 of the tributary McKenzie River) were located in river reach IV.

During each of the three years, 3 replicate samples were collected at each station. Five replicate samples were collected at three stations in 1992. A sample is defined as four separate 0.18 m^2 (2 ft^2) kicknet samples that have been randomly collected within the riffle and composited. The field collection methods were modified slightly from the EPA RBP (Plafkin et al. 1989) and ODEQ (1992) protocols. These modifications were described in the sampling plan (Tetra Tech 1992) and included water depth and current speed constraints. Collection of macroinvertebrates was accomplished by disturbing a 30 x 60 cm (1 ft x 2 ft) area of river bottom directly in front of a D-shaped hoop net so that the current carried the

animals into the net. The contents of the net were placed into a sieve bucket and the sampling repeated at three other plots. All four samples were composited to form a single replicate. Laboratory methods involved subsampling of the composite samples to obtain a minimum of 300 individuals, sample sorting, and macroinvertebrate identification. The methods used were consistent for all three years of analyses. Data from all three years were converted to 3-sample composites (i.e., raw data from the three replicate samples were combined) and the metrics were calculated based on these composited samples.

Biological Index Development--Benthic community data collected during 1992 and 1993 (Tetra Tech 1993; 1994b) were evaluated to select a suite of diagnostic indicators (metrics) for the Willamette River (Tetra Tech 1994c). Thirty-two potential metrics that characterize community diversity, taxonomic composition, sensitivity to physical or chemical perturbation, and trophic status were evaluated to develop a biological index. These metrics (see Table 2-9) were screened to eliminate indices that were redundant or displayed low discriminatory power and the following 10 metrics were recommended for calculating a biological index for Willamette River benthic communities.

TABLE 2-9. EPIFAUNAL (KICK-NET) MACROINVERTEBRATE METRICS FOR THE WILLAMETTE RIVER

Richness Measures	Composition Measures	Tolerance Measures	Trophic Measures
# of Total Taxa	% (Chironomidae + Oligochaeta)	Hilsenhoff Biotic Index	% Collector-Gatherers
EPT Index	% Trichoptera	Baetis/Ephemeroptera	% Collector-Filterers
# of Chironomidae Taxa		Hydropsychidae/Trichoptera	

Application of the biological index consists of selecting a score of 1, 3, or 5 for each individual metric based on the taxonomic information collected at a given site, and then summing the resulting scores for all ten metrics. Possible scores thus range from 10 to 50, with higher scores representing less impaired communities (Tetra Tech 1994c).

Multiple regression analysis of the ten metric scores for samples collected during late summer-fall of 1992, 1993, and 1994 showed that the relative importance of the individual metrics to the total index score varied from year to year (Tetra Tech 1995). The most predictive metric for 1992 was percent gatherers; for 1993 it was percent chironimidae plus percent oligochaeta; and for 1994, percent filterers.

This annual variation in the relative importance of individual metrics provides a strong rationale for developing a biological index composed of multiple metrics.

Spatial and Temporal Variability--The biological index scores for benthic macroinvertebrate communities located in riffle habitat found in the upper Willamette River (RM 77 - RM 185) and the lower McKenzie River (RM 7 and RM 22) varied by 18 to 26 points during the three survey years: 1992 (22 - 44), 1993 (22 - 48), 1994 (24 - 42). Index scores at individual sites varied by 4 to 14 points. The average annual range in index scores calculated for 12 sites sampled in all three years was 6.8 $\pm$ 3.0 (Tetra Tech 1995).

Characterizing a Reference Condition. The reference condition is used for determining community impairment. Ideally, it is either the biological index for pristine locations within the same river system, or the biological index for communities in pristine locations in river systems of similar magnitude and habitat. Unfortunately, neither of these approaches is possible for the mainstem of the Willamette River. The least disturbed habitat in the Willamette system is located in the headwaters of the major tributaries. These regions have different flow and habitat characteristics than the mainstem, and are therefore not suitable as reference locations. A regional reference condition does not exist for large rivers.

A reference condition for each year's survey data was developed by dividing the range of calculated index scores into quartiles. Index scores which fell into the upper quartile were assumed to represent an optimal biological condition. River locations with biological index scores above 30, 32, and 34 were classified as optimal during 1992, 1993, and 1994, respectively. The average score for an optimal classification for all three years of data was 32 $\pm$ 2.

This approach to developing a reference condition has several limitations. In particular, the assessment of site impairment using the reference condition (as defined above) is relative to the best sites sampled during each survey rather than to pristine locations. No information is available to determine the historical index score of undisturbed benthic communities in the mainstem of the Willamette. Thus it is not possible to evaluate whether scores may have approached the theoretical maximum score of 50. The mean optimal classification score of 32 calculated in this study is 36 percent lower than the theoretical maximum score.

Assessment of Benthic Communities--Sites classified as optimal during 1992-1994 were located in the upper Willamette River above RM 113 [1992 (RM 113, RM 185), 1993 (RM 185, RM 190), 1994 (RM 150, RM 185, RM 190)] and in the lower McKenzie River [1992 (RM 7, RM 22), 1993 (RM 7, RM 22, RM 27), 1994 (RM 22)] (Figure 2-8). Three sites that consistently scored low relative to other stations were located downstream from major point sources: RM 176, RM 93, and RM 77.

Evaluation of the benthic community data collected during 1992-1994 suggests that water quality of the Willamette River above RM 185 and in the lower McKenzie is not impaired. However, there is a consistent drop (over the three years of data) in biological index scores below RM 185 (Figure 2-8).

Recommendations for Future Studies--These recommendations support the need for further study to further refine methods/analyses or resolve outstanding issues.

- Refine the bioassessment used to classify sites as optimal vs. sub-optimal. Collecting additional sets of data from the same sites, during the same season, and under similar flow conditions would assist in refining the bioassessment score used to identify optimal biological conditions by reducing the variability of the mean value. Regular monitoring at a core set of stations would also accomplish the goal of establishing a biological assessment database.

- Evaluate the necessity of using the 3-sample kicknet composite to assess biological condition at a site. The 1994 data set could be used to examine the variance of using 1, 2, or 3 sample composites in assessing biological conditions.

- Determine the need for sample replication. If a single sample composite could be shown to provide robust assessments of biological condition (when compared to the 3-sample composite), then the data collected from 1992 to 1994 could be used to address this question and to test for statistical differences among sampling sites.

- Reexamine the suite of metrics used to compute the bioassessment scores, if indicated by multiple regression analyses. It may be possible to reduce further the analytical effort necessary to classify a site.

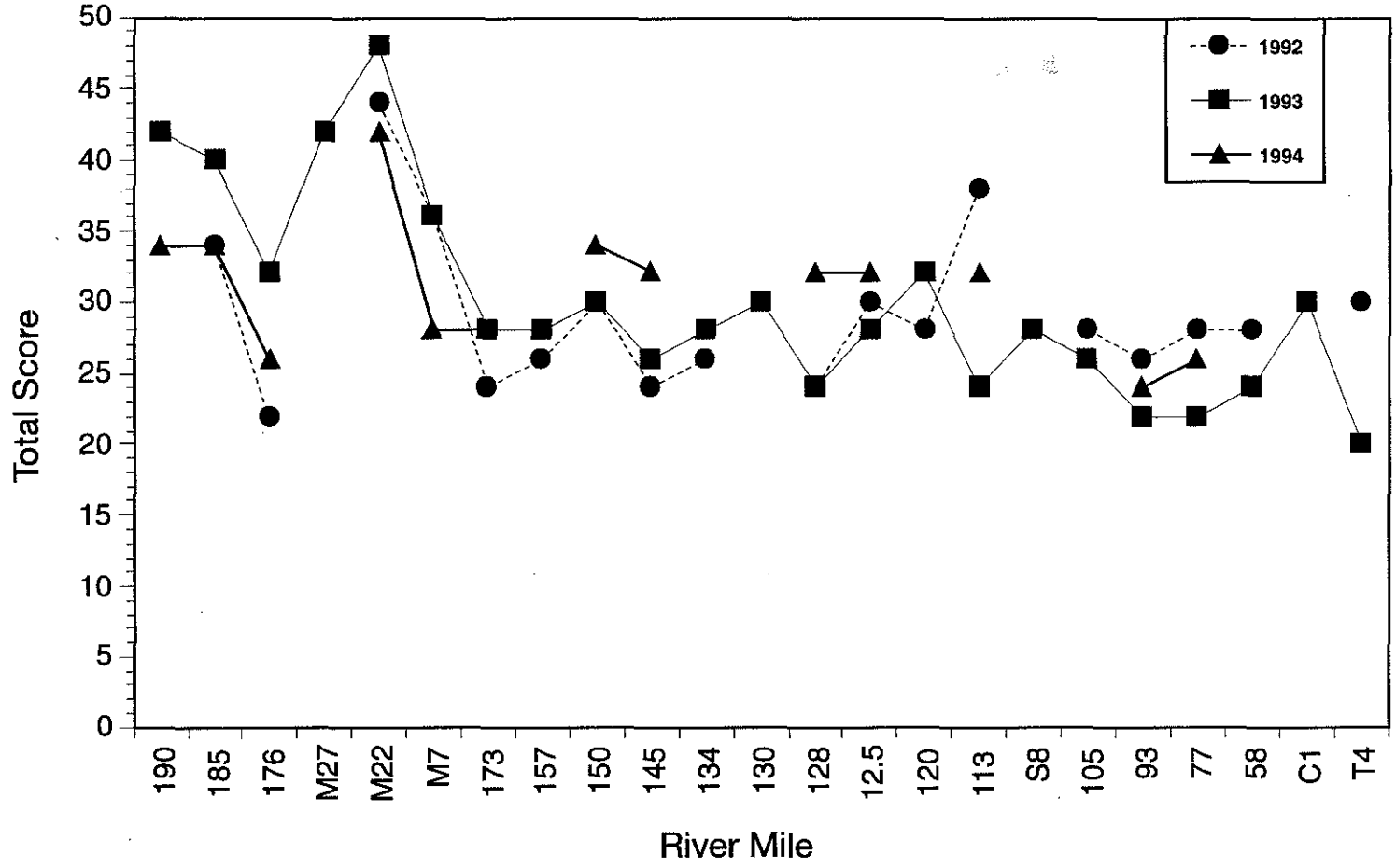

Figure 2-8. Comparison of Total Metric Scores for Kicknet Sampling Between August-September 1992, October 1993, and October 1994.

2.3.2.2 Soft-Bottom Sediment Habitats. In contrast to riffle habitats, which generally harbor the most diverse benthic assemblages, soft-bottom habitat is typically considered the most depauperate and least diverse benthic habitat. Benthic communities in soft-bottom sediments were sampled in August 1992 and October 1993 from locations throughout the mainstem Willamette River.

Sampling and Analysis Methods--Sampling locations for benthic sediment grab samples were selected to provide adequate coverage in the river regions, and to account for the locations of major tributaries and major municipal and industrial dischargers to the river (Figure 2-7). Sampling was focused on the lower river below RM50.

Fifteen soft-bottom sediment habitat stations were sampled for benthic macroinvertebrates using a van Veen grab sampler. Three replicate samples were collected at each station. Additional details on the collection methods are provided in Tetra Tech (1992).

Biological Index Development--Benthic community data collected from soft-bottom sediments during 1992 and 1993 (Tetra Tech 1993, 1994b) were evaluated to select a suite of diagnostic indicators (metrics) for the Willamette River (Tetra Tech 1994c). A suite of 25 potential metrics that characterize community diversity, taxonomic composition, sensitivity to physical or chemical perturbation, and trophic status were evaluated. These metrics were screened to eliminate indices that were redundant or displayed low discriminatory power. Soft-bottom sites were classified by location along the river and sediment grain size. The grain size classification was retained based in the observed differences in the distributions of metrics. No discrimination between reference and impaired sites was possible with these data because no *a priori* identification of reference and impaired sites was possible. This weakens the strength of the metrics in conducting an assessment. Five metrics were recommended for calculating a biological index for Willamette River soft-bottom benthic communities: total taxa, number of Chironomidae taxa, percent Oligochaeta, Hilsenhoff Biotic Index (HBI), and percent gatherers.

The biological index is applied by selecting a score of either 1, 3, or 5 for each individual metric based on the taxonomic information collected at a given site, and then summing the resulting scores for all five metrics. Possible scores range from 5 to 25, with higher scores representing less impaired conditions

(Tetra Tech 1994c). It is not clear whether five metrics will be sufficient to ascertain biological conditions. The results of this index should be viewed as a preliminary evaluation until additional data can be collected and analyzed.

Spatial and Temporal Variability--Scores ranged from 9 to 19 in fine sediment and from 9 to 23 in coarse sediment in August 1992, and from 11 to 21 in fine sediment and from 5 to 11 in coarse sediment in October 1993. Index scores at individual sites varied from 9 to 19 points for fine sediments and from 13 to 23 points for coarse sediments between the two sampling periods.

Characterizing a Reference Condition. The reference condition is used for determining community impairment. As with the riffle habitat data set, ideally it is either the biological index for pristine locations within the same river system, or the biological index for communities in pristine locations in other river systems of similar magnitude and habitat. Again, neither of these approaches is possible for the mainstem of the Willamette River. Least disturbed habitat in the Willamette River system is located in the headwaters of the major tributaries. These regions have different flow and habitat conditions and do not support soft-bottom sediments and are therefore not suitable as reference locations. A regional reference condition does not exist for large rivers.

A reference condition for survey data from each year was developed by dividing the range of calculated index scores into quartiles. Index scores that fell into the upper quartile were assumed to represent an optimal biological condition. The upper quartile was 17 (fine-sediment site class) and 15 (coarse-sediment site class) for the August 1992 index period and 13 (fine sediment) and 15 (coarse sediment) for the October 1993 index period. Optimal sites for soft-bottom sediments for the August 1992 index period were RM17 for fine sediment and RMs 160 and 25 for coarse sediments; for the October 1993 index period, RMs 49, 29.5, and 26.5 were considered optimal for fine sediments, and RM 84b for coarse sediments.

The approach used to develop a reference condition has the same limitations described above for the riffle habitats, plus the additional limitations imposed by the limited data set obtained for soft-bottom sediments, as described above.

Assessment of Benthic Communities--Stations RM 84 (coarse sediment) and RM 29.5 and RM 26.5 (fine sediments) were classified as poor in the August 1992 index period. All other station (except RMs 160, 25, and 17) were considered sub-optimal. In the October 1993 index period, RM 49, 29.5 and 26.5 (fine sediment) and RM 84b (coarse sediment) were considered optimal. All other sites were considered sub-optimal. No obvious cause and effect scenarios were evident to account for the observed patterns.

Recommendations for Future Studies--These recommendations are provided that support the need for further study to resolve outstanding issues.

- Locate additional fine-grained sediment sampling locations in the upper Willamette to strengthen the sediment size classification for soft-bottom sediments. The differences observed in discriminatory ability of infaunal metrics between index periods may be partially explained by the lack of fine-grained sediments from the upper Willamette River station in the August 1992 index period. Fine sediments were only sampled at one upstream station in the October 1993 index period.

- Use a 2-sample grab composite rather than a 1-sample composite in evaluating benthic assemblages in soft-bottom sediments. Additional expenditure of time and resources to analyze 3-sample composites is not likely to provide sufficient increase in data resolution to be justified.

- Perform more detailed taxonomy of the oligochaete fauna. The oligochaetes are the most abundant group of macroinvertebrates in the soft sediments, and information is lost by not identifying them. Some tubificids are found in clean water. Naidids are detrital feeders and are found in moderately clean water. The purpose of classifying oligochaetes into lower taxonomic levels is to determine their diversity, and thus judge more accurately the ecological condition of soft-bottom habitat in the Willamette River. Revisions of the suite of metrics may be required to account for the increased information.

- Further validate the suite of metrics identified when a second collection from one of the index periods is obtained. This analysis will strengthen results obtained to date, which are only from single index periods.

2.3.3 Fish Assemblages

Three assessment techniques were used to evaluate fish community health. To obtain an overall assessment of fish community structure and variation within the river, the diversity and abundance of species were quantified by electrofishing. Two other fish assessment techniques (fish health and skeletal abnormalities) were conducted on individual fish species. Fish health was assessed by exterior and interior observations of tissues and organs using protocols developed by Geode (1988). Juvenile squawfish were examined and the prevalence of skeletal abnormalities assessed.

2.3.3.1 Fish Community Assessment. Fish communities were selected for evaluation during the WRBWQS because fish community health was proven to be a valuable measure of the health of ecological systems in several regions of the country. Fish communities were sampled over a period of three years (1992-1994) from various locations throughout the mainstem Willamette River and several tributaries (Figure 2-9) in order to assist ODEQ in developing biological criteria for the Willamette River and identifying potential water quality problems (Tetra Tech 1995). Fish abundance and distribution data were measured using U.S. EPA's rapid bioassessment protocols (RBP V) (Plafkin et al. 1989). The technique involves careful, standardized field collection, species identification and enumeration in the field, and community analyses using biological indices or quantification of the biomass and numbers of key species. RBP V is based primarily on the Index of Biotic Integrity (IBI) (Plafkin et al. 1989; Hughes and Gammon 1987; Karr et al. 1986). The IBI is a broadly-based index firmly grounded in fisheries ecology (Karr et al. 1986). As with the benthic invertebrate indices, the IBI is applied by assigning a score of 1, 3, or 5 to each of a number of specific measures then summing the results, with higher scores representing great biotic integrity. The IBI has proven to be a valuable indicator of the health of many ecological systems.

A summary of the results of the three years of sampling can be divided into three sections in accordance with the following objectives:

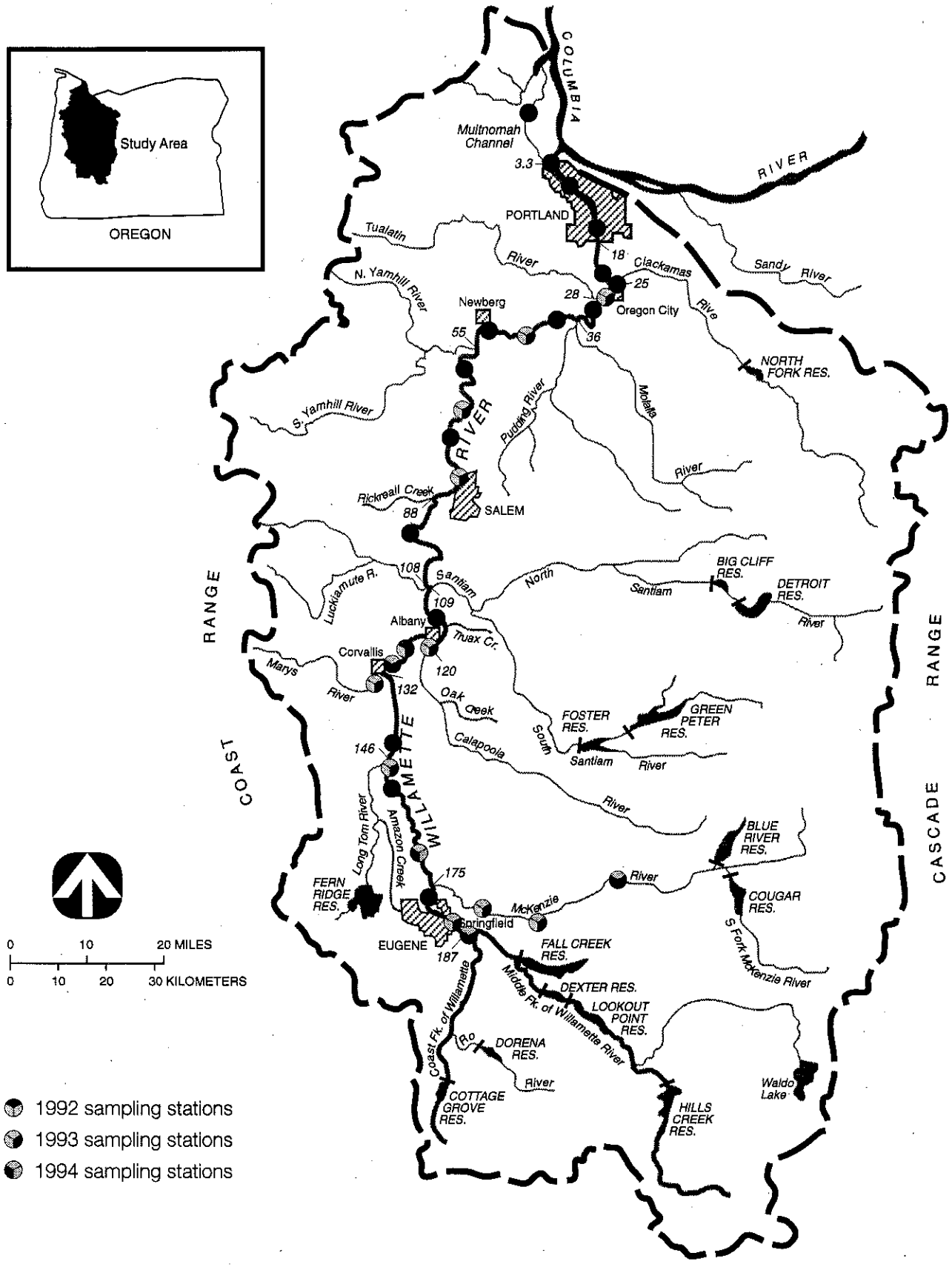

Figure 2-9. Fish Community Sampling Locations for the Willamette River Basin Water Quality Study (1992-1994).

- Further evaluate the use of the IBI for developing potential biological criteria to use in assessing water quality on the Willamette River

- Evaluate temporal variability in IBI scores among the three recent years of sampling (1992, 1993, and 1994) and previous sampling reported by Hughes and Gammon (1987)

- Describe spatial variability in IBI scores as a function of river reach.

Sampling and Analysis Methods--Stations were sampled along the entire stretch of the main stem (Figure 2-9). Sixteen sites included in the WRBWQS were chosen to coincide with stations from previous sampling efforts by Hughes and Gammon (1987) and Dimick and Merryfield (1945). An additional eleven stations not previously sampled were included. These stations were chosen based upon their proximity to urban/industrial areas and to provide expanded coverage of the river. A total of 19, 28, and 20 stations were sampled in 1992, 1993, and 1994, respectively.

Sampling locations were located along the river bank approximately 2 m offshore wherever possible, to be consistent with both Hughes and Gammon (1987) and Dimick and Merryfield (1945). Each site was approximately 500 m in length. Sites were sampled with a boat-mounted electroshocker while moving downstream. Two replicates passes were conducted at each station. All captured fish were placed in a live-well and identified to species in the field using appropriate taxonomic keys (Wydoski and Whitney 1979, Oregon State University 1973). Total abundance, anomalies, weights, and lengths (total) of all individuals of each species were recorded.

Evaluation of Metrics--Thirteen metrics were used to calculate the IBI for the Willamette River (Tetra Tech 1995). Of those metrics, only 3 or 4 appeared to be sensitive indicators of fish community health (as measured by the IBI) for a particular year. The most important metrics for the Willamette River appear to be those measuring species richness (e.g., native species and salmonids) and trophic composition (e.g., percent insectivores). The fact that the most important metrics were not the same from year to year, however, argues for the continued inclusion of metrics which have the potential to yield useful information, but may not have done so for a particular data set.

Temporal Variability in IBI Scores--The average range of IBI scores at stations sampled in all three years (1992-1994) was 9.2 points. Overall, scores ranged from 18 to 52. The mean IBI scores over all stations for each of the three years were between 30 and 35 and were not significantly different from each other. Compared to the fish community data collected in 1983 by Hughes and Gammon (1987), the 1992-1994 mean IBI scores were significantly higher in Region I, not significantly different in Regions II and III, and significantly lower in Region IV. The individual metrics responsible for the higher IBI scores in Region I in 1992-1994 were percent carp and percent omnivores. The individual metrics responsible for the lower IBI scores in Region IV in 1992-1994 were the number of native, catostomid, and cottid species, and the number of individuals.

Spatial Variability in IBI Scores--The range of IBI scores for all three years overlapped for many of the stations, but the mean IBI scores for the stations downstream of Newberg were 8-15 points lower than the mean IBI scores for the stations upstream of Corvallis (Figure 2-10). The largest range in IBI scores occurred between Newberg and Corvallis. The mean IBI scores in the lower two regions (i.e., Portland to Newberg) were not significantly different from each other, but were significantly different from the mean IBI scores in the upper two Regions (i.e., Newberg to Eugene).

Recommendations for Future Research--One of the primary objectives of this study was to develop methods to assess the "ecological health" of the Willamette River. While considerable progress has been made toward achieving this objective, additional research and monitoring is warranted because there is still some uncertainty in the IBI method and the classification of IBI scores into assessment categories as applied to a large river system. The emphasis for future monitoring should not be on developing additional metrics which may be more sensitive indicators of biotic integrity (although this may be useful), but on developing a more extensive database of IBI scores that can be used to refine the classification of the IBI scores into assessment categories. A standard suite of stations located throughout the river should be established for long-term monitoring. These long-term monitoring stations will assist in developing the database of IBI scores, as well as helping to better define the annual and spatial variability of the fish community data.

The question of seasonal variability in biotic integrity for the Willamette River has not been adequately addressed in past research efforts. This issue is important for determining whether the differences seen from year to year at a particular site are due to significant changes in water quality and/or habitat or are

IBI	Integrity Class	Characteristics
58-60	Excellent	Comparable to pristine conditions, exceptional assemblage of species
48-52	Good	Decreased species richness, intolerant species in particular; sensitive species present
40-44	Fair	Intolerant and sensitive species absent; skewed trophic structure
28-34	Poor	Top carnivores and many expected species absent or rare; omnivores and tolerant species dominant
12-22	Very Poor	Few species and individuals present; tolerant species dominant; diseased fish frequent

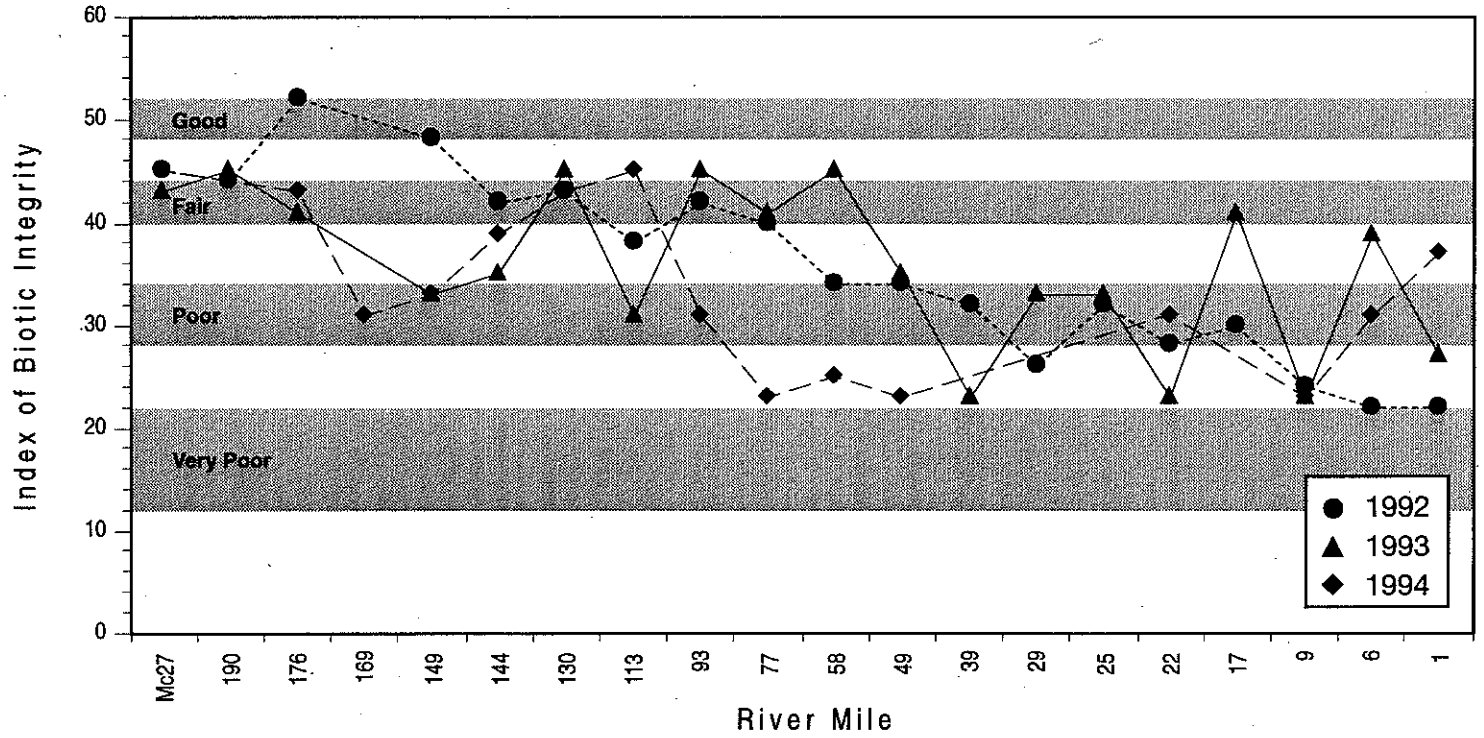

Figure 2-10. Comparison of Index of Biotic Integrity Values.

simply a function of normal seasonal variation. At a small number of sampling sites representative of various habitats in the Willamette River mainstem, fish community sampling should be conducted during several seasons within a given year.

2.3.3.2 Measurement of Fish Skeletal Deformities. The incidence of skeletal deformities in fish has been used as an indicator of overall fish health and indirectly of water quality (e.g., Baumann and Hamilton 1984; Bengtsson 1988; Bengtsson 1991; Lindesjöö and Thulin 1992; Mayer et al. 1988; Mehrle et al. 1982; Slooff 1982). This is an uncomplicated methodology, and much supporting research indicates which environmental stressors may cause skeletal deformities. The incidence of fish skeletal deformities was studies as a component of the WRBWQS (Tetra Tech 1995b).

Tables 2-10 and 2-11 and Figures 2-11 and 2-12 give an overview of the results of the skeletal deformity study. Sampling was designed to focus on River Region II, the Newberg Pool area (where elevated incidence was noted in the preliminary survey in 1992 and confirmed in subsequent studies), to determine whether incidence of skeletal deformities was higher downstream of urbanized areas, and to compare incidence above and below the Pope & Talbot/James River bleached kraft pulp and paper mill discharge site at RM 147.

Skeletal defects have been attributed to a wide range of causes, including genetic factors (Gill and Fisk 1966), nutritional deficiencies (Mayer et al. 1978; Roberts and Shepherd 1974), parasitism (Bucke and Andrews 1985), elevated water temperatures (Brungs 1971; Gabriel 1944; Hubbs 1959), low oxygen concentrations (Blaxter 1969; Turner and Farley 1971), heavy metals (Bengtsson et al. 1988; Bengtsson 1974; Bengtsson et al. 1975; Holcombe et al. 1976; Muramoto 1981; Pickering and Gast 1972), herbicides (Couch et al. 1979; Wells and Cowan 1982), pesticides (Couch et al. 1977; Hansen et al. 1977; McCann and Jasper; Mehrle and Mayer 1975; Meyer 1966; Weis and Weis 1976), PCBs (Mauck et al. 1978; Merhle et al. 1982), bleached kraft pulp and paper mill effluent (Bengtsson 1988; Härdig et al. 1988; Lindesjöö and Thulin 1922; Mayer et al. 1988; Thulin et al. 1988), and ore smelter effluent (Bengtsson and Larsson 1986; Mayer et al. 1988).

Sampling design and analysis were intended to study some of these factors specifically. Results indicate that a number of these causes had no significant correlation with the incidence of skeletal deformities, including hybridization (genetic factors), water temperature, dissolved oxygen, and exposure to bleached

TABLE 2-10. SKELETAL DEFORMITIES IN JUVENILE NORTHERN SQUAWFISH COLLECTED ON THE WILLAMETTE RIVER DURING 1992

River Mile	Collection Date	Number Examined	Mean Size (mm)	Size Range (mm)	Percent Deformed
185.4	8/13/92	250	29.9	21-39	1.6
125.5	8/11/92	250	27.9	21-39	3.2
49.7[a]	8/10/92	256	27.5	21-41	25.8
3.0	8/12/92	285	39.5	21-60	1.1

[a] West Bank.

TABLE 2-11. SKELETAL DEFORMITIES IN JUVENILE NORTHERN SQUAWFISH COLLECTED ON THE WILLAMETTE RIVER DURING 1993

River Mile	Collection Date	Number Examined	Mean Size (mm)	Size Range (mm)	Percent Deformed
185.4	8/20/93	336	18.5	13-25	3.0
147.4	8/23/93	270	25.5	13-65	2.2
144.8	8/23/93	315	23.6	13-35	2.5
125.5	8/19/93	327	23.2	13-29	1.8
51.0	8/17/93	259	21.4	13-29	48.6
49.7[a]	8/17/93	318	22.6	15-31	30.8
49.7[b]	8/17/93	271	22.6	15-29	52.0
48.5	8/17/93	300	21.4	13-29	51.0
40.5	8/17/93	339	21.8	15-27	33.3
38.5	8/18/93	311	21.3	13-35	32.8
34.0	8/18/93	318	21.3	13-31	28.6
28.5	8/18/93	332	23.1	17-45	22.6
25.5	8/18/93	331	23.4	17-31	22.7
3.0	8/19/93	147	31.6	17-60	2.7
Luckiamute River[c]	8/30/93 and 9/4/93	312	37.3	19-65	1.6

[a] West Bank.
[b] East Bank.
[c] Helmick State Park.

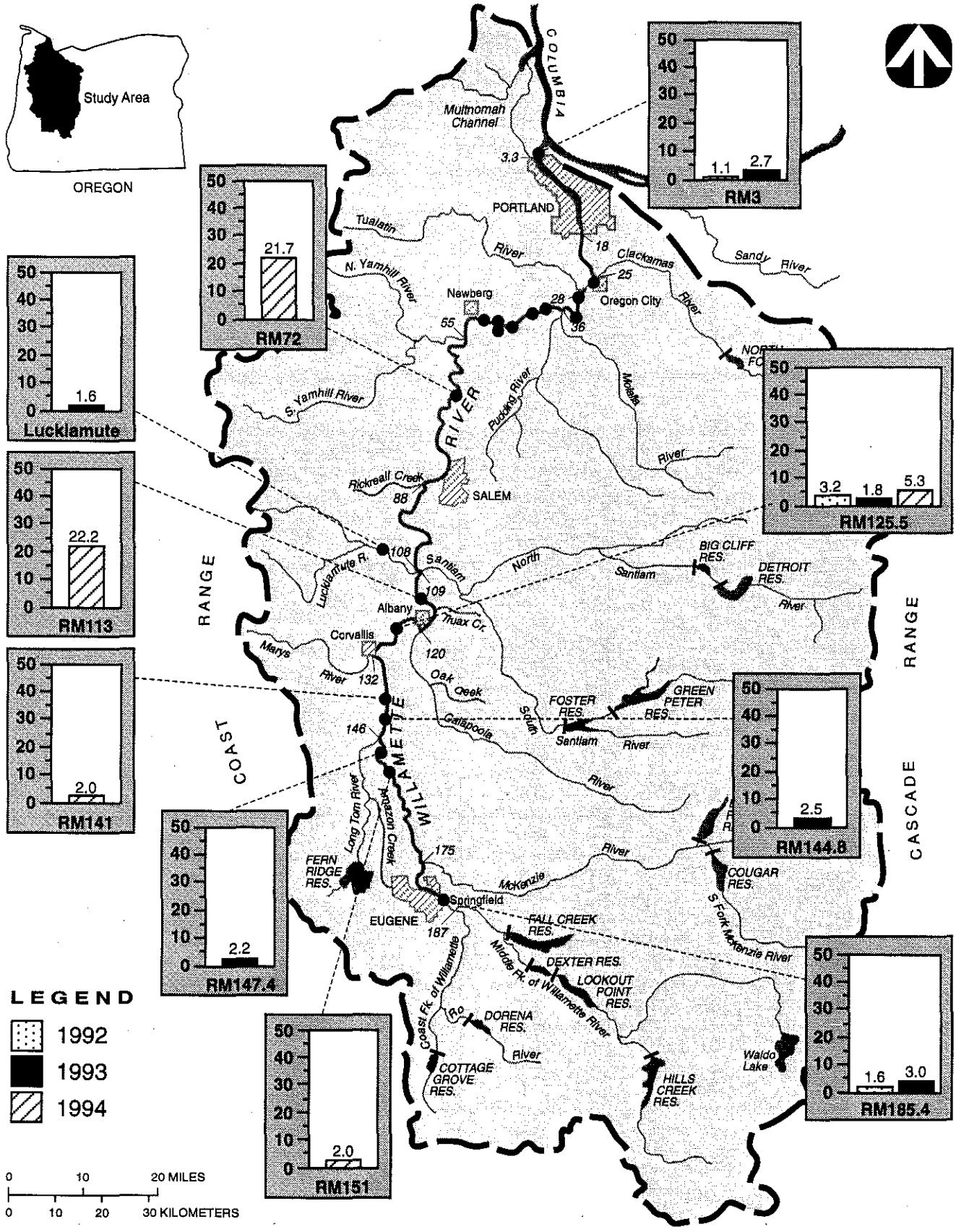

Figure 2-11. Incidence (Percent) of Fish Skeletal Deformities in the Willamette River, 1992-1994.

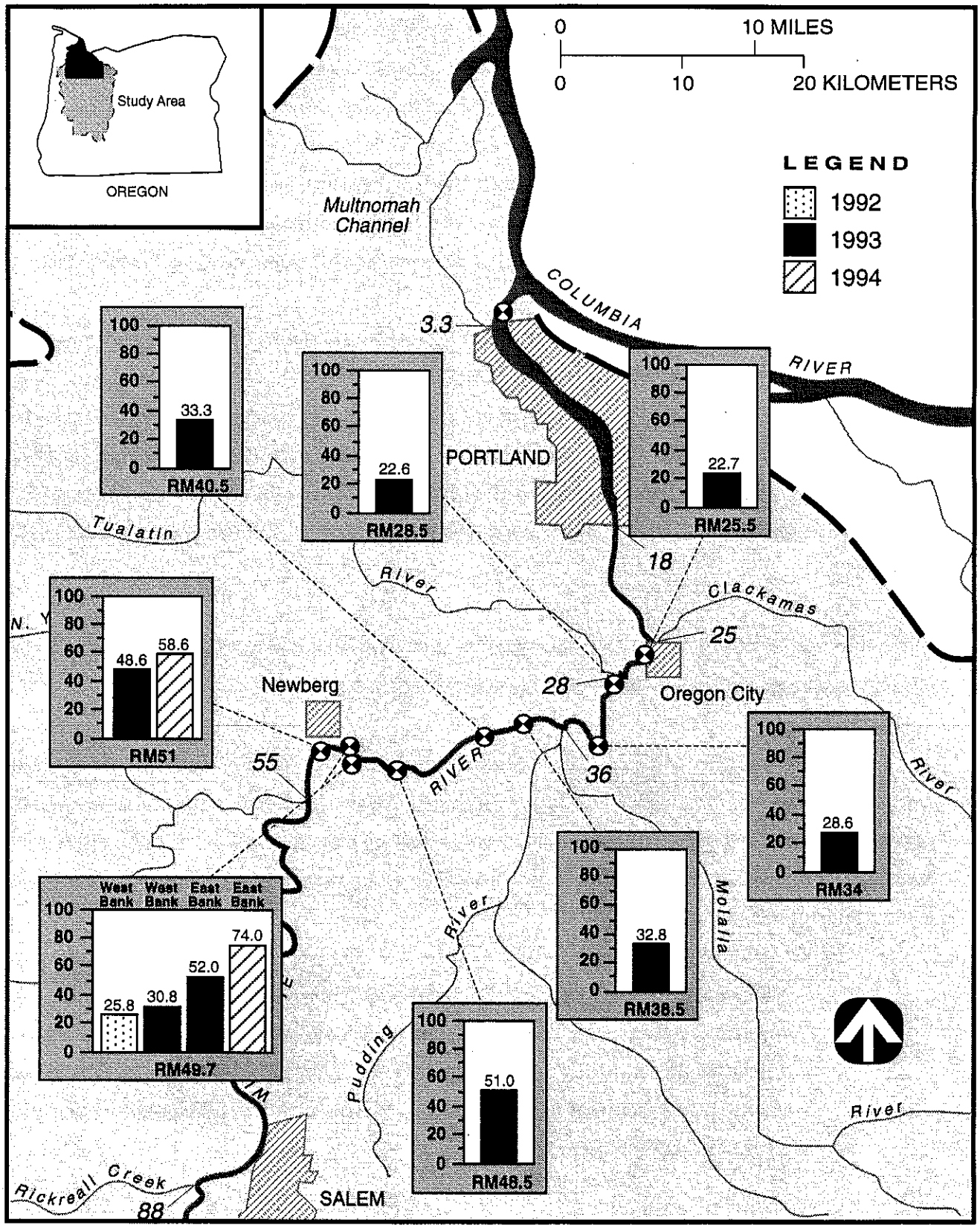

Figure 2-12. Incidence (Percent) of Fish Skeletal Deformities in the Willamette River, River Mile 25.5 to River Mile 51, 1992-1994.

kraft mill effluent. Even with these causes ruled out, the large suite of physical, chemical, or biological factors that can cause skeletal defects in fish makes it difficult to pinpoint the cause, or causes, of the elevated incidence of deformities observed in the Willamette River. Nevertheless, the high frequency of skeletal defects in the upper Newberg Pool and the gradual decline in values downstream strongly suggest that a local source is the cause of these skeletal defects. This hypothesis is also supported by the observation that the incidence of deformities at RM 49.7 is significantly higher for fish collected along the east bank (side nearest the City of Newberg) of the river than fish collected along the west bank.

Other factors that remain as possible causes of the elevated incidence of skeletal deformity include exposure to heavy metals, especially arsenic (Bengtsson et al. 1988), cadmium (Bengtsson 1974; Bengtsson et al. 1975; Muramoto 1981; Pickering and Gast 1972), lead (Bengtsson et al. 1988; Holcombe et al. 1976), and zinc (Bengtsson 1974); or exposure to organic chemicals such as herbicides (Couch et al. 1979; Wells and Cowan 1982), pesticides (Couch et al. 1977; Hansen et al. 1977; McCann and Jasper; Mehrle and Mayer 1975; Meyer 1966; Weis and Weis 1976) or PCBs (Mauck et al. 1978; Merhle et al. 1982).

Currently, data are insufficient to determine whether any of these toxic constituents correlate with the marked increase in fish skeletal deformities in the Newberg Pool.

Recommendations--The incidence of skeletal deformities has proven to be a useful biological indicator for screening fish populations in the Willamette River. However, because a large suite of physical, chemical, and biological factors can induce skeletal defects, determining the cause of elevated skeletal defects is difficult. The following recommendations are provided to guide the future use and interpretation of this indicator.

- Additional sampling is recommended in the stretch of river between RM 51 and RM 125 to better characterize the incidence of skeletal deformities in this stretch of river. It is recommended that paired upstream/downstream sampling be conducted for the major municipal and industrial point sources and mouths of major tributaries entering this segment of the Willamette River.

- Additional sampling is recommended in the stretch of river between RM 3 and RM 25 to determine whether there is a gradual, or abrupt decline in the incidence of skeletal deformities in the downstream direction of this river segment.

- It is recommended that local sources of pollution (e.g., landfills, creek discharges) in the upper Newberg Pool be thoroughly characterized to assist in evaluating the skeletal deformity data collected in this study.

- It is recommended that additional measurements of skeletal deformities also include simultaneous measurements of water quality parameters and sediment contaminants.

- It is recommended that toxic chemical concentrations in the major tributaries and four segments of the mainstem Willamette River be summarized and compared to assist in interpreting longitudinal trends in skeletal deformities.

2.3.3.3 Application of the Fish Health Assessment. Seven of the nineteen stations sampled for fish communities were also sampled for fish health using an autopsy-based condition assessment system developed by Goede (1993). This assessment technique was used to determine if differences in water quality could be correlated with differences in the health of fish populations during August 1992. The fish health assessment technique was not conducted in Phase II of the WRBWQS because of the number of unresolved issues raised as part of the 1992 study (as discussed below).

Sampling and Analysis Methods--For this survey, both largescale sucker (*Catastomus macrocheilus*) and Northern squawfish (*Ptychocheilus oregonensis*) were examined because neither species could be obtained in sufficient numbers at all stations. Squawfish were collected at three stations, while suckers were collected at five stations (Figure 2-13).

The fish used for the fish health assessment were obtained by electrofishing in conjunction with the fish community assessment sampling described above. Fish health assessment was performed on 20 specimens at each station. All fish were kept alive in live wells aboard the boat until the time of the autopsies. The fish health assessment methods have been described in detail in Goede (1993) and the WRBWQS Field Sampling Plan (Tetra Tech 1992k). The AUSUM computer program developed by Goede and Houghton

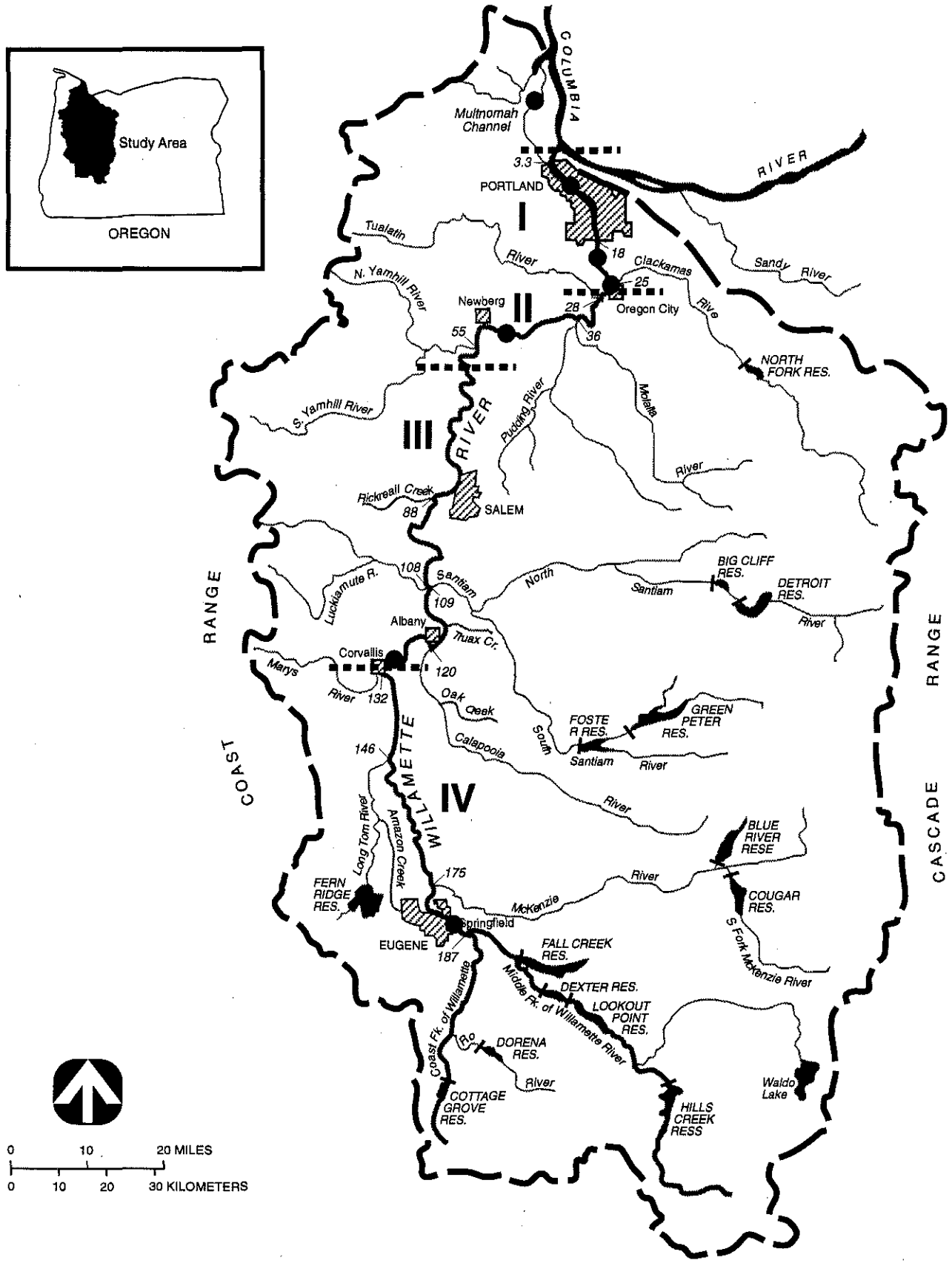

Figure 2-13. 1992 Fish Health Sampling Stations.

(1987) provides a standard reporting format for the fish health data and facilitates interpretation of the results. All data were entered into this program.

Results--The measured parameters can be broken down into external features (length, weight, eyes, gills, pseudobranch, thymus, fins, and opercles), which can be evaluated without cutting into the fish; internal features (fat, spleen, hindgut, kidney, liver, and bile), which require an autopsy; and blood parameters (hematocrit, leucocrit, and plasma protein). The percent abnormality for external and internal features at each station is determined.

The fish health assessment protocols utilized in this study were designed for salmonid fishes. Inter-species comparison of fish health data is probably not appropriate given the physiological differences both between these two species and between these species and salmonid species. Also, the degree to which a given index reflects a meaningful physiological condition for non-salmonid fishes is unknown.

Two major limitations to the fish health data presented herein should be noted before any conclusions can be drawn.

- Very few fish health data for suckers and squawfish exist with which to compare the results of the present study. It is difficult to know whether the parameters measured are within the "normal" variation for these species in this region.

- The target species may not represent the environment in which they were captured. Squawfish and suckers, although often found on or near the bottom, are known to migrate distances on the order of kilometers (Lee, H., 22 October 1992, personal communication).

With the above qualifications, some general statements can be made regarding the fish health data collected for this study.

The suckers collected from the two most upstream sites, Stations RM185 and RM128, were markedly less healthy than those suckers collected at the downstream sites. Percent abnormal gills at these two stations were 80 and 40 percent, respectively; 35 and 40 percent had abnormal thymus, respectively; and

four individuals were completely missing at least one eye. Since the most upstream site, Station RM185, was located upstream of all the major point source discharges on the main stem of the river, the cause of the adverse health effects is difficult to identify. These results serve to highlight the uncertainty associated with this type of data. At least three possible explanations could explain these results.

- The suckers captured at Station RM185 could have spent much of their lives at a different, possibly more polluted, location.

- Nonpoint sources of pollution could have contributed to the adverse health effects.

- The applicability of the fish health assessment to suckers has yet to be determined.

The squawfish data collected for this study can be discussed in conjunction with the squawfish data collected by ODEQ in 1989 (Hafele, R., unpublished data). In that study, four stations (Portland Harbor, Newberg, Wheatland Ferry, and Wilsonville) were sampled for fish health assessment using squawfish. For the Portland and Newberg stations, three of the indices showed at least 15 percent abnormality. At both of these stations, the abnormal indices were gills (50 and 41 percent, respectively), thymus (15 and 53 percent), and kidney (20 and 24 percent). At Wheatland Ferry and Wilsonville, only one index at each station showed greater than 15 percent abnormality: gills at Wheatland Ferry (25 percent), and thymus at Wilsonville (20 percent). In contrast, the Portland squawfish station sampled in this study (RM6.5) had only one index with greater than 15 percent abnormality (hindgut = 40 percent). At the Newberg station (RM49), three indices (fins, gills, and hindgut) showed between 15 and 20 percent abnormality. The Wilsonville and Wheatland Ferry stations were sampled not for squawfish, but for suckers. It is difficult to draw any conclusions based on only a few sampling events. Comparison between the ODEQ data and the data presented here should be done cautiously because different individuals were responsible for collecting the two data sets. Although both studies were based on similar protocols (Goede 1993), the quantification of each index is rather subjective, particularly for a species with which the investigators had little experience.

Because of the many uncertainties surrounding the fish health data collected in this study, conclusions regarding the appropriateness of the defined river reaches and the water quality conditions in the

Willamette River cannot be made. The fish health data collected for squawfish and suckers, however, may serve as valuable reference data for future fish health studies using these two species.

Recommendations--

- Additional studies at a future date using identical methods, species, stations, and investigators could yield valuable information for comparison with existing data.

- Until additional information is known regarding the migratory habits of suckers and squawfish, any conclusions regarding fish communities and fish health must be qualified as estimates. Tagging studies would yield a wealth of information that could lend precision to studies using these two fish species.

2.3.4 Physical Habitat Assessment

The quality of habitat available to aquatic communities is an important component for interpreting and developing biological criteria. This section describes the rationale and methods used to develop an index to quantify habitat quality for aquatic communities in the mainstem of the Willamette River.

Habitat assessment is the evaluation of the structure of the surrounding habitat that influences the quality of the water resource and the condition of the aquatic community. Physical habitat assessment includes assessment of human-induced perturbation to the physical structure of the habitat. The ultimate goals of habitat assessments are varied (e.g., to monitor habitat improvements, predict potential fish abundance or the success of introductions, identify limiting factors), but the immediate objective is typically to document the relative quality and/or quantity of habitat available for fish within a given stream reach (Simonson et al. 1994). A "macrohabitat" assessment of physical habitat, as used herein, measures several parameters at a site to arrive at an overall assessment of habitat conditions or availability for that site. Individual parameters are selected that represent specific components of the habitat structure, and the information derived from the individual parameters is integrated into an overall assessment.

The objectives of the 1994 habitat field sampling efforts include:

- Developing a more quantitative physical habitat quality assessment procedure for use within the Willamette River mainstem

- Using habitat data collected as part of the protocol development to assist in the interpretation of the 1994 fish community data (habitat was evaluated at the sites where fish community data were collected)

- Testing an approach for gathering quantitative bathymetric information on the physical habitat of the river channel on the mainstem of the Willamette River.

It should be noted that the only established quantitative habitat assessment protocols for rivers as large as the Willamette were developed by USGS for the NAWQA program. These protocols are very detailed and time intensive. Elements of these protocols plus elements of protocols developed for wadable streams were combined to develop a habitat assessment protocol for the Willamette River, which should be considered preliminary.

Sampling and Analytical Methods--Physical habitat was assessed at 13 sites throughout the mainstem and in the McKenzie River from October 27 to November 4, 1994 (Figure 2-14). Sites assessed were those of the fish community assessment, and were 0.5 km (0.3 mi) in length. Each site was divided into six transects, all parameters measured in each transect, and then overall scores for each parameter for that site derived from the transect measurements. The habitat assessment methods used were based on a combination of methods from ODEQ (1992), EPA (Plafkin et al. 1989; Hayslip 1993), and Simonson et al. (1994) and are described in greater detail in Tetra Tech (1995b). Because this habitat assessment approach was intended to support biological assessments, parameters were selected that have been reported to be biologically significant in other streams and rivers.

In addition, a special pilot study using state-of-art bathymetric mapping equipment was conducted at the same 13 sites. This technique generated well over 1,000 individual depth measurements for each habitat site. Several measures of spatial variability associated with depth (i.e., measures of physical complexity) were calculated (mean, median, maximum, standard deviation, interquartile range, coefficient of

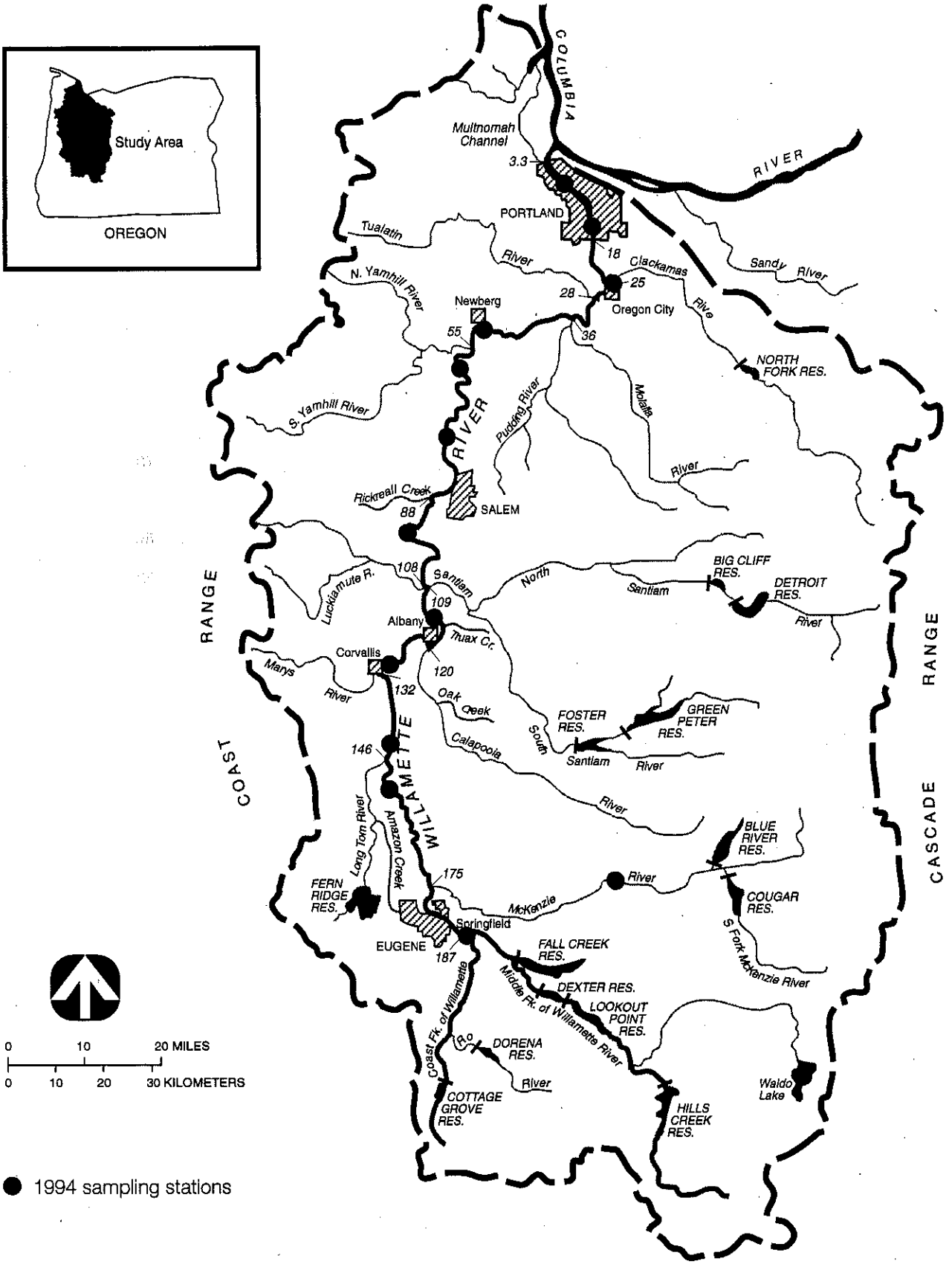

Figure 2-14. Habitat and Bathymetry Sampling Locations for the Willamette River Basin Water Quality Study, 1994.

variation, skewness, and kurtosis) for each site. Physical complexity of the stream channel appeared to be best described by the coefficient of variation.

Habitat Index Development--Habitat assessment data were evaluated to select a suite of parameters for the Willamette River index (Tetra Tech 1995b). A suite of 16 habitat parameters were selected, representative of substrate, instream cover, channel morphology, and riparian conditions. Scores (0-20) were assigned to each of the 16 mean parameter values at each of the 13 assessment sites based on common use in the literature. The scoring ranges were also generally based on literature citations, but were modified to account for the range of conditions found in the mainstem of the Willamette River. These 16 parameters were screened to eliminate those that were redundant or displayed low discriminatory power. Five of the 16 were eliminated leaving 11 potential habitat parameters.

Application of the habitat index consists of selecting a score of 0-20 for each individual parameter based on the defined scoring criteria (see Tetra Tech 1995b), and then summing the resulting scores for all 11 parameters. The theoretical maximum habitat score possible for this index is 220. The habitat site scores were classified based on quartiles of the total possible score. Therefore, the habitat score for the optimal habitat condition was >165; for a sub-optimal habitat condition, a value between 111 and 165; for a marginal condition, a habitat value between 56 and 110; and a poor habitat was determined by a score <56.

Multiple regression analysis of the 11 habitat parameter scores was used to test their relative contribution to the total habitat site score. This analysis indicates which parameter or combination of parameters best predicts the variation of the total habitat score among sites, thus providing a check on the value of the various parameters. The best single-parameter predictor was channel complexity, as represented by the coefficient of variation (CV). This parameter had an r^2 of 0.977. The information gain from additional parameters dropped after the first two parameters (complexity and % bank cover) were included in the regression model. Additional parameters may enable the habitat score to classify a wider range of river conditions and should increase its sensitivity. In addition, this habitat assessment was a first step analysis. Further data collection, parameter refinement, and analysis may indicate that habitat conditions change sufficiently that other parameters become more important in explaining the total habitat scores.

Habitat Evaluation Results--Applying the classification criteria to the calculated habitat site scores results in habitat assessment scores that ranged from 58 to 170 for the October 1995 habitat evaluation. Only one site, representing 7.6 percent of sampled sites and located on the McKenzie River (Mc27), was considered to have an optimal habitat condition. Six sites, representing 46 percent of the sampled sites, were classified sub-optimal, and six sites (46 percent of sampled sites) were classified marginal. No sites were classified poor, but the site at RM6 was very close to being poor habitat.

Habitat scores generally increased from the mouth to the headwaters (Figure 2-15). However, this progression in habitat quality from downstream to upstream was not linear or monotonic (Figure 2-15). Habitat quality is generally better above and including RM49 than below RM49, based on the total habitat index score (Figure 2-15). Habitat quality at stations from RM49 to RM190 (excluding the McKenzie River) was rated slightly marginal to sub-optimal, while habitat quality at station RM6 through RM25 was clearly marginal (Figure 2-15). Lower habitat scores were noted in the vicinity of Corvallis (RM130 and RM145) compared to the other upstream sites (Figure 2-15). The maximum habitat score on the mainstem of the Willamette was found at RM77, while the minimum habitat score was found at RM6 in the lower Portland Harbor area.

Habitat Scores vs. IBI--Habitat index scores were not highly correlated with the fish community IBI scores, indicating that habitat alone was not responsible for the condition of the fish communities at the measured sites. Comparison of habitat index score and IBI scores showed that, as expected, the habitat quality at the McKenzie River site was considered optimal and the IBI also scored high; however, the low IBI scores for fish communities at sites RM77 and RM49 did not appear to be attributable to the habitat conditions.

Usefulness of Bathymetric Procedures--The results of the bathymetric data show that the complexity of the river channel increases from the mouth to the headwaters. However, this progression in complexity from downstream to upstream is also not linear or monotonic. The Willamette River appeared to increase in complexity upstream of RM58. Subsequent decreases in complexity were noted in the vicinity of Corvallis, perhaps in response to channel maintenance activities for flood control purposes. The lower complexity in the lower river may be due to the natural widening and deepening of the channel which tends to smooth out the bottom. Maintenance dredging that occurs in the lower river, may also be responsible for the lack of complexity. Useful and easy to obtain metrics for

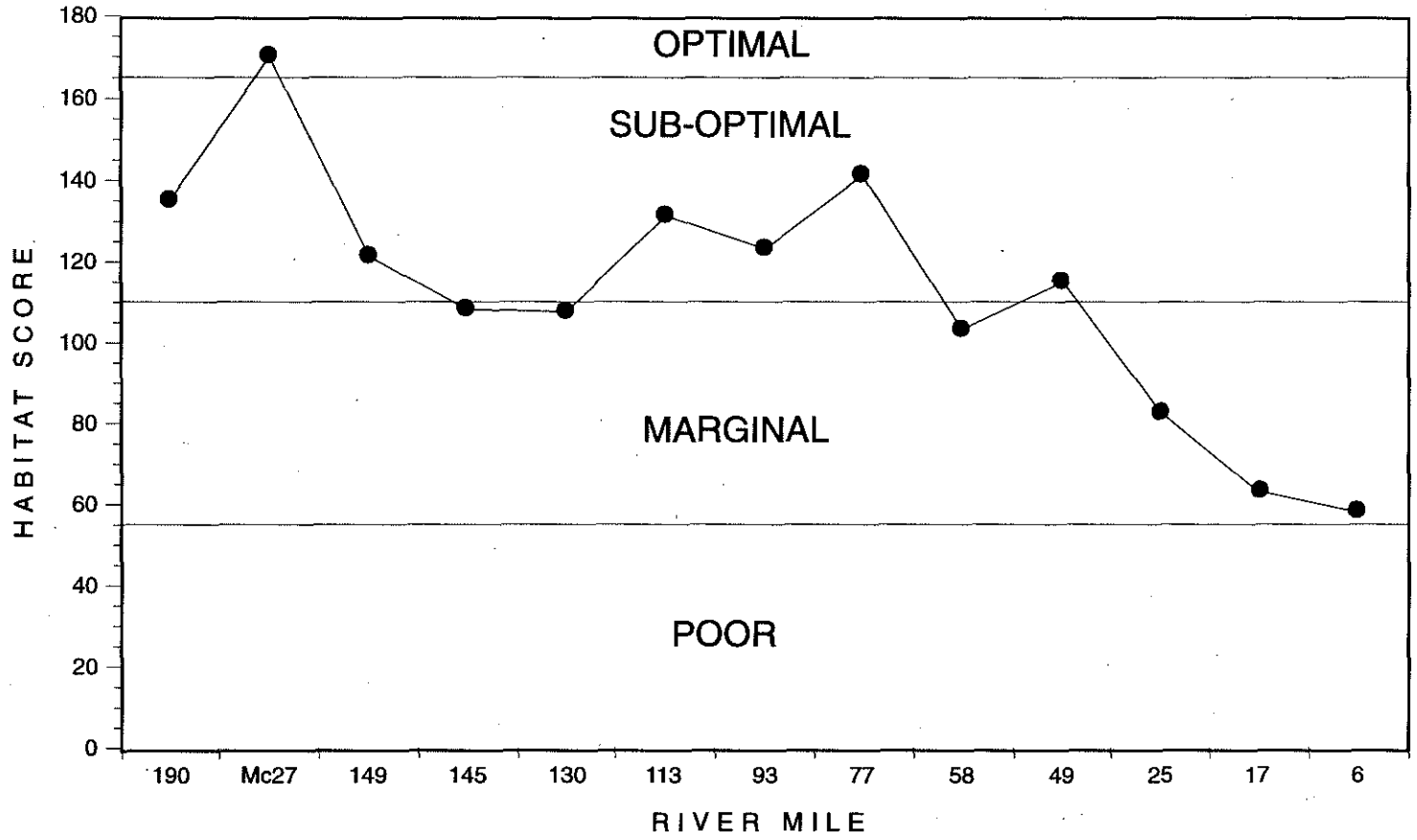

Figure 2-15. Overall Total Score vs River Mile.

representing complexity include depth and the coefficient of variation in depth. The CV was selected as the best descriptor for physical complexity of the river bottom and was used in the habitat assessment. This was the most important parameter used in the index, explaining over 97 percent of the total variation in habitat score. It is important to note that measures of channel complexity will vary with river stage: complexity usually increases with lower river stages. The greatest increases in channel complexity between fall and winter periods were generally found at the shallower sites.

The characterization of physical channel habitat is important in comparing biological communities from similar sites. Combining these physical measures of complexity with systematic measures of the bottom substrate and current velocity will lead to a more complete assessment of the physical environment influencing biological communities.

Recommendations for Future Studies--These recommendations support the need for further study to investigate outstanding issues.

- Station locations throughout the river should be randomly selected to characterize more adequately the range of habitat conditions in the Willamette River mainstem. In addition, the inclusion of additional sites beyond the initial 13 assessed here would be advisable.

- Habitat site assessments were limited to 0.5 km and were associated with fish assemblage sampling sites. Habitat conditions upriver from the sites can greatly influence the conditions at a site but were not assessed. It would not be practical to perform the intensive habitat assessment, as performed for this study, at additional upstream locations. However, expansion of the site to 1.0 km with six transects may be appropriate. In addition, evaluation of areal photographs may be useful to determine additional channel morphology parameters (e.g., channel sinuosity) that may be more useful at greater scales than used for this study.

- Reevaluate the suite of habitat parameters selected for inclusion into the habitat index once additional data are available. If the range of habitat quality is expanded, some of the initial habitat parameter ranges may increase and become appropriate parameters for

inclusion in the index. In addition, additional parameters not assessed during this study (e.g., channel sinuosity, channel alteration) may also be appropriate.

- The approach used in developing the habitat index compared the same habitat variables from the lower reaches of the river to the upper river. A number of variables measured appeared to be influenced by channel width and gradient, and therefore would be expected to show a gradient from upstream to downstream. The river probably has a continuum of habitat conditions, and variables that may be relatively important in the upper reaches may be relatively unimportant in the lower reaches. Future refinements of the index should attempt to account for these gradients.

- The quantitative bathymetric gathering technique proved to be very useful for explaining variation in habitat site scores; however, this is a fairly complex and expensive technique. Additional analysis of the data to evaluate the minimum number of depth measurements needed at a site to provide the same information would make this measure of complexity more useful for general use.

- The IBI and habitat assessment scores were not highly correlated. The habitat index is a composite of individual habitat parameters. Additional regression analyses of individual habitat parameters with IBI values may indicate a different suite of parameters to use in evaluating the influence of habitat on fish assemblage condition.

3.0 WATER QUALITY OF THE WILLAMETTE RIVER

3.1 WATER QUALITY HEALTH ASSESSMENT APPROACH

The purpose of this chapter is to integrate information about the Willamette River collected during the WRBWQS to create a summary statement of the health status of the Willamette River. This is a difficult task for a number of reasons. Rivers are very complex systems, and under the best of circumstances our knowledge of them is limited. Under the real world circumstances of limited time and financial resources, any assessment of river health is at best a careful generalization from necessarily limited data (Haslam 1990).

An overall health assessment is difficult for another, more philosophical reason: the definition of "health" depends very much on the point of view of the user or inhabitant of the river. What seems healthy to one party may not seem healthy to another party.

One way of defining the river health would be to compare the river's present condition with its "pristine" state prior to any anthropogenic influences. While this definition sounds appealing, the reality is that data on the pristine condition of the Willamette River are not available. The Willamette River is a highly regulated and managed river, has been for a long time, and will likely remain highly regulated and managed for the foreseeable future. Given this reality, the approach taken here is to evaluate the health of the river within the confines of its present regulated state to determine whether the water and the habitat available for biota and wildlife are of sufficient quality to meet water quality standards and protect beneficial uses.

Chapter 340, Division 41 of Oregon Administrative Rules defines the beneficial uses of the Willamette River which relevant state agencies are charged with protecting. There are slight variations regarding which uses are protected in which stretch of the river or tributary (see Table 3-1), but in summary the protected beneficial uses are as follows:

TABLE 3-1. PROTECTED BENEFICIAL USES OF THE WILLAMETTE RIVER SYSTEM[a]

Beneficial Uses	Willamette River Tributaries						Main Stem Willamette River				
	Clackamas River	Molalla River	Santiam River	McKenzie River	Tualatin River	All Other Streams & Tributaries	Mouth to Willamette Falls, including Multnomah Channel	Willamette Falls to Newberg	Newberg to Salem	Salem to Coast Fork	Main Stem Columbia River RM 86 to 120
Public Domestic Water Supply[b]	X	X	X	X	X	X	X	X	X	X	X
Private Domestic Water Supply[b]	X	X	X	X	X	X	X	X	X	X	X
Industrial Water Supply	X	X	X	X	X	X	X	X	X	X	X
Irrigation	X	X	X	X	X	X	X	X	X	X	X
Livestock Watering	X	X	X	X	X	X	X	X	X	X	X
Anadromous Fish Passage	X	X	X	X	X	X	X	X	X	X	X
Salmonid Fish Rearing	X	X	X	X	X	X	X	X	X	X	X
Salmonid Fish Spawning	X	X	X	X	X	X			X	X	X
Resident Fish & Aquatic Life	X	X	X	X	X	X	X	X	X	X	X
Wildlife & Hunting	X	X	X	X	X	X	X	X	X	X	X
Fishing	X	X	X	X	X	X	X	X	X	X	X
Boating	X	X	X	X	X	X	X	X	X	X	X
Water Contact Recreation	X	X	X	X	X	X	X	X	X	X	X
Aesthetic Quality	X	X	X	X	X	X	X	X	X	X	
Hydro Power	X	X	X	X	X	X	X	X			
Commercial Navigation & Transportation							X	X	X		X

[a] From Oregon Administrative Rules, Chapter 340 Division 41 - Department of Environmental Quality, exhibits, Table 6.
[b] With adequate pre-treatment and natural quality that meets drinking water standards.
[c] Not to conflict with commercial activities in Portland Harbor.

- Water supply (public, private, and industrial)
- Irrigation and livestock watering
- Anadromous fish passage, spawning, and rearing
- Resident fish, aquatic life, and wildlife
- Hunting and fishing
- Boating and water contact recreation
- Esthetic quality
- Hydro power
- Commercial navigation and transportation

These categories provide a good summary of the users of the river, and thus of the points of view from which river health might be defined. The Oregon Administrative Rules give no guidance on how to reconcile uses if they are in conflict. It should be noted that one major use of the river, waste disposal, is not a listed beneficial use.

The overall assessment of health, then, will look at river health from the points of view of commercial uses (water supply, agricultural users, hydro power, and navigation and transportation), fish and wildlife uses, and recreational uses (hunting, fishing, boating, water contact recreation, and aesthetics).

The original goals of the WRBWQS were to develop tools to assist ODEQ in managing the river and not to evaluate compliance with water quality standards and criteria or protection of beneficial uses. However, some of the data collected as part of the program can be used to assess the levels of compliance and protection. The data collected as part of Phases I and II of the WRBWQS useful for this assessment include:

- Synoptic water quality data (i.e., dissolved oxygen, chlorophyll *a*, and bacteria)
- Toxic contaminant data in water and bed sediments collected by USGS
- Nonpoint source pollution loading data

- Ecological data
  - Benthic invertebrates (in riffle and soft-bottom habitats)
  - Fish assemblage data
  - Fish juvenile skeletal abnormality data
  - Fish health assessment

- Habitat Assessment data

In subsequent sections, data collected within the above categories will be evaluated separately with regard to river health for each of the four river regions. Some of the data, such as DO and toxics measurements, are easily quantified and then transformed into a scale. Other data, especially the ecological assessment, are more subjective, requiring some degree of professional judgment. These too have been quantified into a similarly based scale. The overall health assessment of each region and the entire river is made by adding and comparing each of the assessments for each data type.

Table 3-2 shows the evaluation of impairment for each data type averaged by river region and gives an overall numeric score of river "health." Assessment of each data type has been normalized to the following health index scale from 1 to 9, with 9 indicating no impairment and 1 indicating widespread impairment.

River Health Index Score	Description
9	Excellent Health; No Evidence of Impairment or Exceedance of Available Standards or Guidance Values
7	Good Health; Occasional Exceedances of Available Standards or Guidance Values
5	Marginal Health; Common Exceedances of Available Standards or Guidance Values
3	Poor Health; Consistent Exceedances of Available Standards or Guidance Values
1	Highly Impaired; Almost Always Exceeds Available Standards or Guidance Values

TABLE 3-2. INDEX OF WILLAMETTE RIVER HEALTH

River Region	Health Indicators										Average
	Water Quality Standards and Guidelines				Benthic Communities		Fish		Habitat	Nonpoint Sources	
	Dissolved Oxygen	Chlorophyll *a*	Toxics - Water	Toxics - Sediment	Soft-bottom	Riffle	Index of Biotic Integrity	Skeletal Deformity			
4	9	9	4.9	4.5	6.5	5.8	5.7	9	5.5	5.9	6.6
3	7	9	5.5	3.8	4.9	5	5.2	2.5	5	4.5	5.2
2	9	9	3	2.3	5	--	4.3	1	4.7	3	4.6
1	9	9	3.3	1.2	4.6	--	3.8	4.5	2.8	4.3	4.7
Indicator Average	8.5	9	4.2	3.0	5.3	5.4	4.7	4.3	4.5	4.4	
Overall Willamette River Health Index Score											5.3

RIVER HEALTH INDEX	Score
Scoring Criteria:	
Excellent Health; No Evidence of Impairment or Exceedance of Available Standards or Guidance Values	9
Good Health; Occasional Exceedances of Available Standards or Guidance Values	7
Marginal Health; Common Exceedances of Available Standards or Guidance Values	5
Poor Health; Consistent Exceedances of Available Standards or Guidance Values	3
Highly Impaired; Almost Always Exceeds Available Standards or Guidance Values	1

A discussion of the methods used to determine health status scores for each data type and a more specific discussion of the health assessment for that data type is included in the following sections. The results of the overall assessment are discussed in a final summary section.

3.2 WATER QUALITY DATA

Water quality data consist of conventional data (e.g., DO, chlorophyll) that were collected as part of the Phase I synoptic water quality survey conducted in August 1992, and contaminant data collected by USGS in Phases I and II.

Only dissolved oxygen and chlorophyll *a* data are useful for comparing directly to water quality standards. Bacteria data collected were not used for several reasons: 1) ODEQ are in the process of switching their bacterial indicator organisms from fecal coliforms to an *E. coli*, and no *E. coli* data were collected in 1992; 2) to evaluate compliance with the old standard, multiple samples over several days are required, which was not part of the sampling plan for this study; and 3) the *Enterococcus* data collected do not have a state standard for comparison.

The toxic contaminant study conducted by USGS collected both water and bed-sediment samples. These will be discussed further in Section 3.2.3.

3.2.1 Dissolved Oxygen

Dissolved oxygen was measured by both ODEQ and Tetra Tech in August 1992. The state standard for water DO is 90 percent saturation. Violations of this standard occurred at several stations, according to the diurnal measurements collected. However, the 24-hour average concentration was greater than the standard except at two stations in Region III. DO concentrations measured by the two studies did not fall below state standards in the lower river reaches at any station. Therefore, for the health assessment, river reaches IV, II, and I were assigned scores of 9 indicating no exceedances of water quality standards; and Region III was assigned a score of 7 based on the two exceedances of the DO standard.

3.2.2 Chlorophyll *a*

The state action level for chlorophyll *a* is 15 ug/L. None of the chlorophyll *a* concentrations reported by Tetra Tech or ODEQ exceeded the state action level. Therefore, each region was assigned a score of 9 indicating no impairment.

3.2.3 Toxic Contaminant Data Collected by USGS

The toxic contaminant study conducted by USGS collected both water and bed-sediment samples. Exceedances of water-quality criteria for trace elements and organic compounds in water are listed in Tables 2-4 and 2-5, respectively. Exceedances of State of Oregon criteria and Ontario Ministry of Health guidelines for trace elements and organic compounds in bed sediments are listed in Tables 2-6 and 2-7, respectively. A total of 49 stations were sampled within the Willamette River mainstem and tributaries. Stations, including tributaries, were grouped into the four river regions. The number of stations at which exceedances were measured for trace metals and for organic contaminants in each river region were determined and normalized to the 1-9 impairment scale. The average of the normalized scores for trace metals and organic contaminants were computed for each river region to give an overall "toxics-water" or "toxics-sediment" score for that region.

Results for several constituents are listed in Tables 2-4 through 2-7 as inconclusive because the minimum analytical limits for those constituents were higher than their respective guideline values. In those cases, even though the compound was not detected, it could still have been present in concentrations exceeding the guideline. This was particularly true for human health criteria, which are generally very low. Nevertheless, for the purposes of assessing river health, those constituents listed as inconclusive due to detection limits were treated as having a concentration of zero and were not included in the counts of exceedances.

3.2.3.1 Contaminants in Water. Guidelines and criteria for water were specified by ODEQ: constituent concentrations in water are compared to the freshwater aquatic life criteria for acute and chronic toxicity (ODEQ 1994) and the U.S. EPA's (1995) criteria for the protection of human health for water and fish ingestion (risk level one in one million). Some caution must be used in the application of these criteria to water data from the Phase I and II toxics studies. The criteria for acute and chronic toxicity are time dependent. The concentrations used in "acute" criteria are based on either instantaneous exposures or exposures for no longer than 1 hour once every 3 years, depending on the constituent. Likewise "chronic" criteria are not to be exceeded for more than 24 hours or 4 days once every 3 years, depending

on the constituent. Nevertheless, these standards and criteria were used to evaluate measurements that did not specify an exposure time.

Health index scores are generally low indicating that at least one of the criteria listed above was exceeded fairly often. The lower two regions (I and II) appear to have more exceedances than Regions III and IV and show clear evidence of impairment. In Region IV, a total of eight stations were sampled for either trace metals, organics, or both; two of those stations had exceedances: the A3 Channel in Eugene, and the station near the urban outfall. In Region III, 6 of 14 stations showed exceedances; the station located near Salem had the most exceedances of individual constituents. In Region II, 7 of 10 stations had exceedances; the Zollner Creek and Pudding River stations had the most exceedances. In Region I, 6 of 7 stations sampled showed at least one exceedance; the station located near I-84 in Portland had the most exceedances.

*3.2.3.2 **Contaminants in Bed Sediments**.* For bed sediments, guidelines were limited to the Ontario Ministry of the Environment and Energy (OME) Guidelines (Persaud et al. 1993) or the Oregon Interim Dredge Disposal Guidelines (ODEQ 1990). Note that these are only guidelines and are used to put the detected concentrations into perspective; they carry no regulatory authority. There are also some cautions for the use of Phase I bed-sediment data. The guidelines are based on a particle size of two millimeters, whereas bed-sediment samples for trace elements were sieved at 62 microns during Phase I. Additionally, the Phase I sediment samples were analyzed using a more complete digestion than is specified for the ODEQ or OME guidelines for sediment quality. Both of these factors will likely result in higher estimates of criteria or guideline exceedances than might otherwise have been found.

Health index scores for sediments generally decline from Region IV to Region I. Low scores indicate that at least one criterion was exceeded often and that impairment is clearly evident. The low health index scores are driven by exceedances of trace metal guidelines at all sites. Exceedances of organic constituent guidelines were much less prevalent, except in Region I where 3 of the 4 stations sampled had exceedances. In Region IV, both of the stations sampled for both trace metals and organics exceeded metals guidelines but not organics guidelines. The station located at the A3 Channel in Eugene exceeded guidelines for all 10 metals analyzed. In Region III, six stations were sampled; all showed exceedances of metals guidelines and one station had organic exceedances. The station located near Salem had the most exceedances of individual constituents. Both stations in Region II had exceedances; the station on

Beaverton Creek in the Tualatin River sub-basin had exceedances of all 10 metals and 15 of the 17 organic constituents that were measured. As stated above, in Region I, all four stations sampled had exceedances of metals and three had exceedances of organics; the station located the farthest downriver had 7 metals and 13 organics exceedances.

3.3 BENTHIC COMMUNITIES

Benthic communities were assessed in both riffle and soft-sediment habitats during Phases I and II: riffle habitats were sampled in 1992, 1993, and 1994 at a total of 23 stations; and soft-sediment habitats in 1992 and 1993. As discussed above in Section 2.4, these communities were assessed to assist ODEQ in developing biocriteria for the Willamette River. Bioassessment indices were developed for both habitat types during Phase II; however, the limitations of the soft-sediment data (e.g., limited number of stations, lack of adequate taxonomy of oligochaetes, no fine-grained reference) limited the usefulness of this index.

Both bioassessment indices were developed using multiple metrics. Each metric was assigned a score and then the metric scores were summed to arrive at an overall bioassessment score. The theoretical maximum scores were 50 for riffle habitats and 25 for soft sediment habitats. The range of scores was divided into quartiles and the upper quartile selected to represent optimal conditions. No specific criteria exist with which to compare these values; the health evaluation for these indices is subjectively based on best professional judgement. For this evaluation, comparison of the index scores with the theoretical maximum was performed. Station bioassessment scores from all stations, in all years sampled were normalized to the health index scale and then averaged within each river region. These are the impairment scores used in Table 3-2.

3.3.1 Benthic Invertebrates in Soft-Bottom Sediment Habitats

Keeping in mind the limitations of the data as discussed above and in Section 2.4, health index scores were assigned for the soft-sediment stations. A total of 16 stations were sampled in depositional areas of the mainstem, backwaters, and sloughs of the Willamette River. Most stations were located in Regions I and II but several stations were located in Region III and a single station in Region IV. Therefore, health index scores for all four regions were calculated.

Health index scores are highest at the single station in Region IV, are similar in Regions III and II, and are lowest in Region I. Overall, the scores indicate that these communities are somewhat impaired.

3.3.2 Benthic Invertebrates in Riffle Habitats

Benthic communities in riffle habitats were sampled only in the upper river Regions III and IV, because no suitable riffle habitat was found between the Newberg Pool and the mouth. Health index scores in Region IV are only slightly higher than in Region III. However, this is somewhat an artifact of the scoring procedure. Stations located above river mile 185 and on the McKenzie River consistently had higher bioassessment index scores. If Region IV is further subdivided into two groups [those stations above RM 185 and on the McKenzie (Region IVa), and those located below RM 185 (Region IVb)], then a pattern more similar to the bioassessment indices classification is seen. Region IVa shows relatively unimpaired conditions with a score of 7.1, while the Region IVb health index score is 5, the same as the Region III score. This impairment scoring better reflects what is shown in Figure 2-8. Examination of this figure also shows that because benthic invertebrates are essentially stationary, the pattern of impairment is more variable and indicative of site specific conditions.

3.4 FISH

Both fish communities and the health of individual fish were assessed as part of the study. Fish communities were sampled by electrofishing during 1992, 1993, and 1994. Individual fish were assessed in two separate studies. Juvenile skeletal abnormalities were examined during all three years; in 1992 fish health was assessed via external examination and an autopsy procedure.

Impairment scoring for the fish community assessment was performed as for the benthic communities. As part of the fish community assessment, the IBI, a multi-metric bioassessment index, was calculated by scoring individual metrics and summing the metric scores. These scores were normalized to the health index scale (1-9) in the same way as described for the benthic communities and the average of all health index scores at the stations within each river region was computed.

The health index scores for the other two techniques were determined subjectively by examining the results and using best professional judgement to assign a score for each region.

3.4.1 Fish Assemblages - IBI

Health index scores for fish assemblages decrease from Region IV to Region I and tend to reflect the same pattern seen in Figure 2-10 for individual IBI scores. However, all regions show signs of impairment when compared to the theoretical maximum score.

3.4.2 Juvenile Fish Skeletal Abnormalities

Skeletal deformities were measured in juvenile northern squawfish during all three sampling periods. Overall, the results of the three years of data collection have shown that a background deformity rate of up to 3 percent was not uncommon. This rate (or lower) has been measured in juvenile fish from a reference location on the Luckiamute River and from stations in Region IV. In Region III, the sampling has not been as complete and there are data gaps to be filled. Available data indicates some impairment in this region. Stations within Region II have shown very high percentages of deformities and clearly indicate impairment is widespread within the region. Skeletal deformities were noted in the upper reaches of Region I but not in the lower reaches. The distribution of sampling stations in this region did not allow an evaluation of whether the decrease in deformities was gradual or sharp.

3.4.3 Fish Health Assessment

The fish health autopsy technique was one of the assessment tools used in 1992. Many of the fish sampled were gravid females that may have migrated upriver to spawn, and would thus not represent the river region they were found in. It was felt that more research on fish movements was needed before the usefulness of this tool could be further evaluated. Therefore, the data collected in 1992 for largescale sucker and northern squawfish could not be used to assess relative health status of different river regions. In the 1992 data, the two most upriver stations had the highest incidences of external and internal abnormalities, but because no readily identifiable contaminant source could be found and it was unclear where the abnormal fish had come from, a clear designation of impairment was not possible.

3.5 HABITAT ASSESSMENT

Physical habitat was quantitatively assessed at 13 sites in 1994 during Phase II and a preliminary habitat assessment protocol and index were developed to assist with the interpretation of the biological data. The habitat index is based on the same techniques used in benthic community assessment and the IBI. It

consists of multiple parameters, each of which is scored based on predetermined scoring criteria, with the parameter scores being summed to arrive at the habitat assessment score. For this analysis, the assessment scores were normalized to the health index scale and averaged by river region to arrive at the regional health index scores.

Health index scores for physical habitat decrease from Region IV to Region I and tend to reflect the same pattern seen in Figure 2-14 for individual habitat assessment scores. However, the magnitude of the impairment scores indicates that compared to the theoretical maximum score, all regions show signs of impairment and the habitat in Region I shows clear evidence of impairment. The station at RM6 probably had the most impaired habitat that was measured.

3.6 NONPOINT SOURCE POLLUTION

Nonpoint source pollution (NPS) studies could not be assessed in the same manner as the other data discussed above because the NPS studies provided pollutant loadings but did not provide any assessment of impairment that might be associated with the loading levels. Therefore, estimated pollutant loading levels for the sub-basins within the Willamette River basin are presented and the sub-basins identified as having the highest loadings within a river reach are discussed.

NPS loading from the tributaries contributes the majority of pollutants to the mainstem. For comparison, point source loading of TSS from the major dischargers in the basin contribute less than one percent of the annual TSS load to the river. This estimate is based on comparison of the point source data summarized from 1991 with the sub-basin loading estimates predicted in Phase I (updated to account for the Phase II work in the Pudding sub-basin). However, this NPS loading is not constant and the majority of the annual average pollutant loads are discharged during a few large storms. In addition, during the summer months of low flow, point source contributions of nutrients can provide the majority of the pollutant loads (see Tetra Tech and E&S Environmental Chemistry 1995).

Based on average annual pollutant loading estimates, five sub-basins were identified as contributing the highest unit loads: the Pudding, Columbia (Portland), Tualatin, Long Tom, and Coast Range (Yamhill, Luckiamute, and Marys Rivers) sub-basins. The Pudding River was estimated to have the highest loading

during both Phase I and II. Due to their relatively larger basin areas, the total model-estimated NPS pollutant loading from the Coast Range and Santiam basins were the greatest. However, projected loads for these basins were qualified because they did not account for retention of particulate pollutants in the large reservoirs impounding runoff from significant portions of upland drainage areas.

The Columbia sub-basin comprises the Portland metropolitan area; nonpoint pollutants are derived largely from urban runoff. The Long Tom River is located in Region IV and is one of four major tributaries in that reach. The Coast Range basin and the Santiam River are both in Region III and account for two of the six tributaries in the reach. Three of the five sub-basins with the highest pollutant loadings (Pudding and Coast Range) enter the Willamette River in Region II. The Columbia sub-basin is in Region I.

During Phase II, an intensive monitoring effort to evaluate NPS loading was focused in the Pudding River sub-basin. The data from the monitoring sites revealed major differences in water quality that are associated with land use and related practices. Water quality in forested areas was generally excellent, except for a few occasions of elevated TSS during storms. Most of the water quality problems associated with NPS pollution identified in the Pudding River are related to agricultural land use. Water quality problems in the low-intensity agricultural sites are relatively modest in comparison to other agricultural sites and do not exceed standards, e.g., for NO_3. In high intensity agricultural sites water quality is poor in all respects. Sediment loss is elevated, nutrient transport is high, fecal contamination is widespread, and ion chemistry is totally altered compared to natural conditions. The quality of the surface runoff is severely degraded with respect to requirements for aquatic life. NO_3 levels are in excess of human health standards, and groundwater contamination with nitrates is of concern. Water quality degradation at the intensive agricultural sites is the result of a number of factors including crop type, fertilization practices, hydrologic modifications, and loss of riparian zones.

The Pudding River integrates high quality water from forested areas with low quality water from agricultural and urban land uses. Parameters such as fecal coliform bacteria that are present in large concentrations in some agricultural areas remain elevated throughout the Pudding River because of high values in some tributaries. Other parameters such as NO_3 show concentrations proportional to flow-based loads from tributaries. Water quality criterion values for the Willamette River Basin such as TP (0.19 mg/L) and fecal coliforms (max #/100 mL = 400) were routinely violated during storms. For other parameters

such as TSS and NO_3, measured concentrations in the sub-basin were incompatible with high water quality. Thus, the results from the sub-basin study indicate that the Pudding River contributes substantial NPS pollutant loads to the Willamette River in Region II and that during storms, water quality standards are commonly exceeded.

Estimates of nonpoint source pollution problems in the Willamette River Basin were derived by applying modified unit loads based on the previously assembled research studies and the results of the Phase II monitoring in the Pudding River (Table 3-3). The estimated annual unit loads were generated using the land use classes determined in the GAP vegetation database (Kagan and Calcco 1992) and an Advanced Very High Resolution Radar (AVHRR) image (Loveland, et al 1991). The major land uses were urban, forest, open water, riparian vegetation, dry pasture, pasture, dry agricultural cropland (associated with large grasslands) and agriculture. The resulting estimates of annual pollutant loads were used to rank the ten sub-basins in terms of their relative contributions of NPS pollutants (Table 3-4). The unit loads using the revised Willamette-wide land uses for TSS, TP and NO_3 are still greatest in the Pudding River sub-basin, despite the use of conservative average unit loads (which were substantially smaller than loads actually measured for portions of this sub-basin during the Phase II monitoring). The unit loads for five of the ten Willamette sub-basins are judged to be high, resulting in severe water quality problems in portions of these sub-basins. In some of these sub-basins, water quality problems in the highly disturbed watersheds are severe enough to cause significant water quality problems downstream in the major tributary. Such is the case for the Pudding, Tualatin, and Long Tom sub-basins. The Columbia and Coast Range sub-basins have no single major collector tributary although rivers such as the Yamhill and Luckiamute experience significant NPS pollution effects (ODEQ 1994). Note that the ranking of pollutant loads varies among parameters. In particular, the NO_3 loads are more highly related to areas with significant irrigated agriculture. The Columbia sub-basin, which drains a largely urban area, is expected to have lower relative contribution of NO_3 compared to TSS and TP.

The NPS unit loads drop considerably between the Coast Range sub-basins and the Santiam sub-basin. The Santiam, Clackamas, and Coast Fork sub-basins all contain a high percentage of forested land uses and logging activities which are a significant source of TSS to the streams. Only a small fraction of the erosion generated in the these sub-basins reaches the Willamette River, in part because of sediment traps created by the major impoundments. Localized NPS problems can be severe, particularly in urbanized area of the Clackamas sub-basin, but are very limited in size.

TABLE 3-3. ESTIMATED ANNUAL UNIT LOADS OF TSS, TP, AND NO_3 FOR:
(A) LAND USE CLASSES IN THE WILLAMETTE BASIN,
(B) WATERSHEDS IN THE PUDDING RIVERS, AND
(C) LITERATURE VALUES REPORTED IN PHASE I AND PHASE II

	TSS	TP	NO_3
A. Land Use Classes*			
Open water	0	0	0
Forests	10	0.5	1
Riparian	5	0.25	0.5
Dry Pasture	20	0.5	5
Pasture	30	0.75	7
Dry Agriculture	60	1	5
Agriculture	75	2	20
Urban	75	2	5
B. Pudding River (1994-1995, Phase II)**			
Silver (forested)	79	0.5	0.6
Upper Beaver (Dry Agric.)	12	0.2	6.6
Beaver (Dry Agric.)	84	0.4	8.9
Zollner (Irrigated Agric.)	679	4.1	35.0
C. Literature Ranges***			
Agricultural Cropland	30-5100	0.2-4.0	4-3-31
Feedlots	14000	77	510
Pasture	30-500	0.1-1.7	3-11
Urban	30-3000	0.4-5.9	2-11

* Using Figure 1.
** Assuming the five storms measured in the study represent 50% of the annual load.
*** See Table 34 Phase I Model Application Report (from Novoty and Chesters 1981).

TABLE 3-4. RANKING OF THE NONPOINT SOURCE POLLUTANT LOADS IN THE WILLAMETTE RIVER BASIN

Sub-Basin (Rivers)	Region	TSS	TP	NO_3
Severe Water Quality Problems				
Pudding	II	1	1	1
Columbia	I	2	2	5
Tualatin	II	3	3	4
Long Tom	IV	4	4	2
Coast Range (Yamhill, Luckiamute, Marys)	II, III, IV	5	5	3
Moderate Water Quality Problems				
Santiam	III	6	6	6
Clackamas	I	7	7	7
Mild Water Quality Problems				
Coast Fork (Willamette)	IV	8	8	8
Middle Fork (Willamette)	IV	9	9	9
McKenzie, lower	IV	10	10	10

The Middle Fork (of the Willamette) and McKenzie River sub-basins have low incidence of NPS water quality problems. Once again, logging effects continue to pose a threat to fish habitat, but the sediment and nutrients generated by the logging are retained to a large degree by major impoundments in both of these sub-basins.

Assessment scores for each sub-basin within the four river regions along with the major NPS concerns are summarized in Table 3-5. These scores are based on the rankings of the pollutant load estimates and adjusted to fit the 1-9 health index scale. Average assessment scores were calculated and used in Table 3-2 to calculate the overall health index for the river.

Region II had the lowest score (3) mainly due to contribution from the Pudding and Tualatin. Regions I and III were in better condition (4.3 and 4.5, respectively), but still reflect only marginal quality. Region IV had the highest score (5.9). The Long Tom and Mary's River sub-basins, classified as having severe water quality problems in Table 3-4, mediated the overall score for the region. The three other sub-basins within Region IV would have averaged 7.5 and indicated generally good health.

In summary, most of the sub-basins on the west side of the Willamette Valley have watersheds experiencing severe water quality problems associated with nonpoint source pollution. Water quality problems on the east side of the valley are generally less severe, with the major exception of the Pudding River sub-basin which appears to be the most severe NPS concern in the Willamette Basin.

3.7 OVERALL ASSESSMENT

As discussed earlier, providing a statement about the overall health of the Willamette River is difficult. Nonetheless, given the data limitations discussed above and using the subjective scoring system proposed, general statements can be made about the health of each region of the river by averaging the health status scores from each data type within a region. The scoring integrates effects over different spatial and temporal scales. An acknowledged major limitation associated with this approach is that all the indicators are weighted equally. For example, NPS scores integrate the effects of major land uses (e.g., urban, forest, agriculture) and associated pollutant loads over large areas (sub-basins). Scores from the biological indicators also integrate effects of various pollutants and land uses because the organisms (especially

TABLE 3-5. EVALUATION OF WILLAMETTE RIVER TRIBUTARIES AND ASSOCIATED WATER QUALITY PROBLEMS

	Score[a]	Major NPS Issues
Region I		
Columbia	3	Major urban and urbanizing area, some agriculture.
Clackamas	5.5	Logging, urbanization in lower portions.
Region I Mean	4.3	
Region II		
Pudding	2	Several tributaries with extremely severe degradation all associated with irrigated agriculture and livestock operations.
Tualatin	3	Major urban and urbanizing areas, intensive agriculture operations.
Yamhill	4	Mixed agriculture, livestock some urbanization.
Region II Mean	3	
Region III		
Luckiamute	4	Mixed agriculture, livestock, some urbanization.
Santiam	5	Mixed agriculture, livestock, some urbanization.
Region III Mean	4.5	
Region IV		
Long Tom	3	Intensive and light agriculture, some livestock.
Mary's	4	Mixed agriculture, livestock, some urbanization.
Coast Fork	7	Logging, dryland agriculture.
Middle Fork	7.5	Logging, light agriculture in lowlands.
McKenzie	8	Logging, urbanizing corridor along river, light agriculture in sections.
Region IV Mean	5.9	

[a] Scoring Criteria (1-9)

9 - Excellent Health; unimpaired no exceedance of available standards or guidance values
7 - Good Health; occasional exceedance of available standards or guidance values
5 - Marginally Health; common exceedance of available standards or guidance values
3 - Poor Health; consistent exceedance of available standards or guidance values
1 - Highly impaired; almost always exceeds available standards or guidance values

in benthic communities) tend to be present in specific areas that are subject to pollutant impacts. However, overall assessment scores appear to be consistent with individual data types, showing a gradual decline from the upper regions to the lower regions (Table 3-2).

3.7.1 Region IV

Region IV had the highest overall health status score of 6.6 (5 = marginal, 7 = good). This score indicates that within the region, exceedances of water quality standards are occasionally observed. Lowest individual scores for this region were for the toxics exceedances and the low scores for the Long Tom and Mary's Rivers. Exceedances of metal standards (water) and guidelines (sediment) at three stations within the region accounted for the low scores. Additionally, although not used in the index, the fish health assessment during Phase I found the highest incidences of abnormal fish in this region. In general, however, while specific locations within the region showed some exceedances and other evidence of health problems, the region as a whole had the highest water quality conditions observed in the basin (e.g., benthic invertebrates in riffle habitats above RM185 and in the McKenzie River; NPS scores for the Coast Fork, Middle Fork, and McKenzie Rivers).

3.7.2 Region III

The Region III health status score of 5.2 (marginal health) indicated that river health problems are more commonly observed here than in Region IV. This lower health status score was driven by exceedances of DO, toxics standards for water, toxics guidelines for sediments, and the incidence of skeletal abnormalities. The greatest number of toxics exceedances occurred at stations in the vicinity of Albany and Salem. Similarly, the incidence of skeletal deformities at a station below Albany was approximately 22 percent while at a station located above Albany, the incidence was 3.4 percent, similar to background conditions. Benthic invertebrates in riffle habitats tended to have lower bioassessment scores below large point sources (e.g., Salem STP). The NPS scores reflect the severe to moderate water quality problems in the Luckiamute and Santiam sub-basins.

3.7.3 Region II

The health status score for Region II of 4.5 (poor to marginal) indicates that river health problems are commonly observed. As in Region III, low health status scores were driven by exceedances of toxics standards for water, toxics guidelines for sediments, the incidence of skeletal deformities, and the low NPS scores. The most toxics exceedances occurred at stations located in the Pudding and Tualatin River

sub-basins, and at certain sites on the mainstem. Both metals and organics in water and sediment showed exceedances. A score of 1 for skeletal abnormalities was given for this region. Nine stations in this region were sampled over the three year period. The incidence of skeletal abnormalities was consistently high, ranging from 22 to 74 percent. The incidence of abnormality was highest near Newberg and decreased down river. A specific causal agent has not yet been identified. A study by Curtis and Siddens (1995) conducted as part of the WRBWQS on the whole effluent toxicity of known discharges from the Smurfit newsprint mill and the Newberg City outfall showed that the effluent was not toxic to the aquatic biota tested. The low NPS scores are due to the influence of the Pudding, Tualatin, and Yamhill sub-basins which were all identified as having severe water quality problems (see Table 3-4). This region appears to have the most commonly observed water quality problems.

3.7.4 Region I

The health status score for Region I of 4.7 (poor to marginal) is similar to that of Region II, indicating common exceedances of standards. This score was lowered by exceedances of water standards for toxics and sediment guidelines for toxics, poor physical habitat, low IBI scores, and low NPS scores. Toxic exceedances were commonest at stations located in the Portland area, specifically the Interstate 84 runoff station and the station farthest downriver. Multiple exceedances for both metals and organics were found in waters and especially in sediments. The IBI health status score was lowest in this region, indicating fish assemblages in poor condition. Most IBI stations in this region showed low scores (Figure 2-10). The physical habitat index score was also lowest in this region, due predominantly to a very low habitat score at the RM6 station. The NPS score was low due to the poor water quality of the Columbia sub-basin.

3.7.5 Overall Health of the Willamette River

As noted above, the Willamette River has been extensively regulated and managed. The historical severe water quality problems have been controlled and water quality has improved dramatically. However, concern about the river's health is still justified because of the presence of toxic constituents in water and sediments, suspended sediment and nutrient loads, and the alteration of habitats. Health status scores in the river decline from "marginal-to-good" (5.2-6.6) in the upper regions, to "marginal-to-poor" (4.5-4.7) in the lower regions. The overall health status score for the river is 5.3, marginally healthy.

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APPENDIX A

Appendix A: WILLAMETTE RIVER BASIN WATER QUALITY STUDY REPORTS

PHASE I:

COMPONENT 1: SCOPE OF WORK

Tetra Tech. 1992. Willamette River Basin Water Quality Study: Scope of Work. Final Report. Prepared for Oregon Department of Environmental Quality, Portland, OR. Tetra Tech Inc., Redmond, WA. 69 pp.

COMPONENT 2: TOXICS MODELING

Tetra Tech. 1992. Willamette River Basin Water Quality Study. Component 2: Review and summary of toxic pollutants in the Willamette River and major tributaries. Final Report. Prepared for Oregon Department of Environmental Quality, Portland, OR. Tetra Tech, Inc., Redmond, WA. 39 pp. + appendices.

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COMPONENT 3: DISSOLVED OXYGEN MODELING

Tetra Tech. 1992. Willamette River Basin Water Quality Study. Component 3: Data review and summary for dissolved oxygen modeling on the Willamette River. Final Report. Prepared for Oregon Department of Environmental Quality, Portland, OR. Tetra Tech, Inc., Redmond, WA. 54 pp. + appendices.

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COMPONENT 4: NUTRIENTS AND ALGAL GROWTH MODELING

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The Willamette River Basin Water Quality Study

Committee Report - Draft 4 (8/18/95)

Willamette River Technical Advisory Steering Committee

DRAFT

Willamette River Basin - Yesterday and Today

Basin Description/History

The Willamette River Basin is located in northwestern Oregon between the Coast Range and the Cascade mountains (Figure 1). General land activities and topography are shown in Figure 2. The river system within the basin includes the Willamette River and 13 major tributaries. It is the largest river basin in the state, encompassing about 11,500 square miles, or about 12% of the land area of the state. From the joining of its headwater streams in the southern part of the basin near Eugene, the Willamette River flows 187 miles north, where it empties into the Columbia River. In terms of total annual flow, the Willamette River is the tenth largest river in the U.S. On average, the basin produces more than 24 million acre-ft (M ac-ft) of water each year. The average annual flow (for 1972-93) of the Willamette River at Portland is 31,900 cubic feet per second (cfs). This results from an average annual precipitation in the basin that ranges from 40-50 inches per year in the valley to over about 175 inches in the mountains. Precipitation in the basin consists mostly of heavy intermittent rainfall, primarily in the fall, winter, and spring. Very little rainfall occurs in the summer months. River flow follows this precipitation pattern, with natural flows ranging from a summer low of 4,200 cfs up to 283,000 cfs (1972-92). The pattern of precipitation and flows directly influences water quality in the river. Summer periods are critical times for dissolved oxygen levels because of low flows and higher water temperature. High intensity rainfall and runoff events tend to transport sediments and toxics from the land and tributary streams to the Willamette River and downstream locations.

The first European-American settlers began arriving in the basin during the 1830s. At that time, the river flowed freely from the mountain headwaters through the valley floor. The lower reaches of the river wandered through a wide area of floodplain and multiple channels; flow volume varied substantially over the year, with very low flows during summer dry periods and very high flows and frequent flooding during periods of high rainfall and mountain snowmelt. The upland and mountain regions of the basin were covered with mature evergreen forest; the valley floor consisted of valley prairie and oak groves, with mixed evergreen and deciduous forest primarily along the river and tributaries.

The population of the basin increased dramatically during the "Great Migration" of European-American settlers (Figure 3). The small local Indian population of the mid-1800s subsisted on local plant foods, fish, and animal populations There were three settler farms in 1831, 12,000 people in 1850, 99,000 in 1880, and 234,000 in 1900. In 1990, the population of nine counties in the basin was 1.96 million. During this time period, many physical changes were made to the river system by the expanding human population. Land was cleared and bottom land was drained for small farms. Later, the upland forests were cut, and the river was used for floating logs downstream. Some river tributaries were routinely dammed using logs and debris so that when these dams were broken by winter flows, the resultant flood was magnified enough to transport large numbers of logs down the river channel, causing extreme scouring of the river channel and disruption of wildlife habitat. As development increased, the river became important for commercial transportation, and channel changes were made, such as clearing snags and woody debris, removing stream side trees, channel dredging and deepening, and construction of revetments to constrain the river to a single flow channel.

In addition to physical changes in the basin and its river system, the activities of people have had major impacts on the water quality. Towns and cities early on established water supply intakes on the Willamette tributaries in upland areas above human habitation, and used the mainstem river for disposal of raw sewage. Industrial activities related to processing of wood and agricultural products, including pulp and paper mills, sugar beet processors, and meat

packers, discharged additional wastes to the river. By the 1920s and 1930s, it became clear that the river was unable to assimilate this amount of raw waste; the river became increasingly acidic, and readings on the pH scale commonly fell as low as 3.5 to four. Levels of dissolved oxygen routinely fell to zero near waste discharge points, making stretches of the river nearly lifeless. In response to public concern, cleanup efforts were begun in earnest in the late 1940s with public health as the main focus. These efforts included requirements for cities to provide primary sewage treatment year-round with disinfection in the summer, and for pulp mills to reduce summertime waste discharges. A dissolved oxygen standard was established of 5 milligrams per liter (mg/L) minimum. Water quality improvements made through this effort were short-lived because urban and industrial growth resulted in increased waste discharge volume to the point where the waste-handling capability of the river was overwhelmed.

As the scale of agriculture, urban development, and transportation increased, attention turned to controlling the annual flooding of the river. Between 1940 and 1969, 13 flood-control dams were constructed by the US Army Corps of Engineers (COE) on major tributaries of the Willamette River upstream of Salem (Figure 1). These dams eliminated downstream floodplain habitat and natural disturbance processes. Today, nearly one-quarter of the length of the mainstem river channel from Eugene to Albany and 18% of the channel from Eugene to Newberg has fixed rip-rap embankments or retaining walls (revetments) on one or both banks of the river. About 70% of the mainstem river channel length between Eugene and Harrisburg has been eliminated by river straightening and restriction of the channel width. Fifty percent of the channel has been lost Between Eugene and Albany. The channel network in some places has been reduced in width from miles to hundreds of feet.

Even though waste discharges received some minimal treatment, the established standards were never fully met and the river's ability to assimilate the wastes had been exhausted by the mid-1960s. The Willamette was once again plagued by low dissolved oxygen levels and fish kills. These conditions that again raised public concern and alarm, and mobilized the state to action. A new strategy to "install the highest and best practicable treatment and control of wastes" was

begun. Cities were required to install secondary wastewater treatment facilities. Food processing wastewater was treated and used as crop irrigation. Industrial discharges were cleaned up through installation of treatment and waste streams were reduced through recycling and use of alternative chemical processes. At the same time, water released from the flood control dams increased flows in the river for dilution of wastes. This effort was highly successful from a water quality standpoint; by the 1970s the "Willamette River Cleanup" was a dramatic highlight of national environmental protection efforts.

Today, much of the valley floor has been cleared and converted to urban and agricultural use (Figure 4). Land use in the basin is about 70% forest, 22% in farmland, and 8% urban and residential. Forty-one percent of the basin is publicly-owned, primarily by the federal government, with federal holdings managed by the U.S. Forest Service and Bureau of Land Management.

Importance of the Resource Today - Beneficial Uses

Human uses of the river changed over time as the basin's population grew and the needs and values of society changed. Originally, the river was important for transportation and commerce. After railroads were built, attention turned to irrigation and flood control. Today, the Willamette River and its tributaries serve a variety of often competing uses. These include municipal and industrial water supply, irrigation and livestock watering, hunting and fishing, boating, swimming and other water contact recreation, esthetics and scenic purposes, hydroelectric power generation, commercial navigation and transportation, pollution abatement, fish migration and spawning, and support of fish, aquatic life and wildlife.

Under the code of water law which evolved with the settlement of the American West, called the prior appropriation doctrine, water was required to be diverted from a stream and applied to a beneficial use in order for the user to receive a legal right to use of the water. Water law in Oregon has continued to evolve to recognize the importance and benefits of maintaining

water in stream for fish and for waste discharge dilution. Now, water rights for in stream purposes have the same legal status as rights that withdraw water out of the stream. Water rights, whether for in stream or out of stream uses, are assigned a priority date in the order of the date that the water right was initiated. When stream flows are low, the most recent or junior water rights may be restricted or stopped from using water so that the rights of the prior or more senior water users may be satisfied. As overall demand for water reaches the volume of water available, particularly in the summer, competition for water intensifies. In recent times, the need for maintaining stream flows adequate to support water quality and the beneficial uses dependent on clean water has been recognized as a critical issue. However, most in stream water rights in Oregon are junior in priority to many older established water rights. This limits the effectiveness of in stream water rights to maintain flow levels sufficient for water quality purposes in some streams, especially during low flow periods.

In much of the Willamette Basin, the natural flow of rivers and streams is fully or nearly fully allocated to a variety of existing in stream and out of stream uses during the summer months when flows are lowest and demand greatest. The Willamette system of reservoirs operated by the U.S. Army Corps of Engineers stores about 2.3 million acre-feet (M ac-ft) of water; about 1.85 M ac-ft of this water is actually usable. About 1.6 M ac-ft is currently dedicated for irrigation purposes, but less than 3 percent of this stored water has been purchased and used by irrigators (Figure 5). The Corps of Engineers has discretion to manage the unpurchased stored water; COE has used this water to increase flows in the river for water quality, fishery, and recreation purposes. Of the 1.2 million acres of cropland in the basin, 541,000 acres are currently irrigated. These lands produce a wide variety of crops and other products, and possess considerable potential for increased production of high-value crops such as vegetables, fruits and berries, and nursery stock. The agricultural sector projects that by 2020, 850,000 acres could be irrigated, requiring 0.55 million additional acre-feet of water, or a total of 0.6 M ac-ft. Oregon municipal water suppliers also project the need for additional water. Rapid population growth, mainly from in migration to Oregon from other states, is occurring and an additional 500,000 residents are expected to reside in the basin by 2015. Urban water suppliers

in the basin expect to serve about three million people by 2050, and project a need for an additional 0.3 M ac-ft of water. Water stored in the COE reservoirs could supply a significant amount of this need. However, use of the stored water for municipal and industrial needs may require congressional action authorizing this use. While out of stream uses are projected to increase, additional in stream flows may be necessary to maintain productive fish and wildlife populations, to maintain and improve water quality through dilution of waste flows, and to meet recreation needs. For example, the river still supports significant steelhead and chinook salmon runs. As growth continues and fish and wildlife needs are more fully understood, the available water supply is likely to be insufficient to meet all needs.

Water Management in the Basin

Over the years, a system of water management has evolved in Oregon that spreads the various aspects of water management among 21 state agencies, six regional organizations, and 18 federal agencies (Figure 6). Different agencies have lead or coordinating roles in specific water management activities, and frequently the legislative authorities for these agencies create overlapping authorities, as well as gaps in authorities.

In recent years, it has become clear that water management must be done on a more coordinated, whole-basin approach. In an effort to coordinate the activities of these agencies into more of a whole, the Strategic Water Management Group was established in 1985, consisting of the directors of the 12 major state water management agencies and headed by the governor's policy advisor for natural resources. Willamette River basin issues considered by the group in the past years include review of management activities and the operation of the Corps of Engineers reservoirs and impacts of these operations on water temperature and fish. Most water management functions of the SWMG were transferred to designated state agencies by the legislature in 1995.

Relationship to Total Water Management - How to Manage a Large River System?

The time is right to make needed changes in policies for managing water in the Willamette River basin. The physical environment has been substantially altered by human activities, with both known and unknown impacts on water quality, fish and wildlife populations, and habitats. Water quantity and water quality can no longer be considered as separate issues. Management decisions about the overall basin and each subbasin must be integrated since decisions about subbasins affect the whole basin. Water management and land-use planning decisions must be integrated. The public must be involved in water management decisions because water management success is increasingly dependent on the behaviors of individuals and local groups. Potential for increased impacts on the river system will increase as population grows.

The Willamette River Basin Water Quality Study

Background of Study and Technical Advisory Committee

In the mid-1980s, the Oregon Department of Environmental Quality (DEQ) concluded that a comprehensive study of water quality in the Willamette River basin was necessary. The agency identified this need in its proposed 1985-87 budget, but the Legislature did not appropriate the necessary funds. In 1987, amendments to the federal Clean Water Act required DEQ to list state water bodies that exceeded DEQ standards for toxics, to update this report every two years, to establish total maximum daily loads (TMDLs) for these contaminants, and to design and implement associated management plans to achieve the TMDLs and allocate waste loads to dischargers. The 1988 listing prepared by DEQ, and based on data collected by federal and state agencies, identified dioxin discharge in the Willamette basin as a contaminant in excess of DEQ standards. Pulp and paper mill discharges were identified as the major sources of dioxin in this preliminary listing.

Environmental groups, industry, and cities were understandably concerned about these preliminary findings and expressed strong interest in participating in the process of setting maximum daily loads for contaminants discharged to the river, and in the allocation of these

loads among dischargers. There was a recognition that available information was not sufficient to support setting these complex new standards. In response to these concerns, the Legislative Emergency Board in the spring of 1990 authorized funds to Oregon State University (OSU) to prepare a plan to identify toxics in the river and to DEQ to form a technical advisory committee to plan a comprehensive study of water quality in the basin. The Legislative Emergency Board set aside $100,000 for OSU to fund a toxics identification study, pending approval of the advisory committee. A major pulp and paper manufacturer located in the basin agreed to match the legislative appropriation to support a larger and more comprehensive basin study.

The Willamette River Technical Advisory Steering Committee (WRTASC) was established in April 1990. Its past and present members (Figure 7) represent the public, industry, sewage agencies, environmental organizations, public health, and natural resource agencies. Representatives of many other groups and interests attended and participated in the committee's meetings, including federal agencies, public water suppliers, farmers, water recreation enthusiasts, and members of the general public. In May 1990, WRTASC reported its recommendation to the Legislative Emergency Board that funds be allocated to a specific, though limited, study by OSU of river toxics that was compatible with the preliminary plan prepared by DEQ for a comprehensive water quality study of the river basin. While the OSU toxics study progressed, WRTASC provided consultation and oversight, and continued to work closely with DEQ to refine and complete the comprehensive basin study plan for presentation to the 1991 Legislative Assembly. This proved to be a formidable task; WRTASC meetings included presentations by national, regional, state, and local water experts suggesting that existing available study methods, models, and tools were developed primarily for small watersheds. Adaptation of these to a large river system like the Willamette would be far from easy. Another difficulty was that no unimpacted stretch of the river system remained to use as a reference for comparison with current conditions.

Study Scope and Focus ("Questions")

The committee presented its comprehensive basin study plan to the Legislature in April 1991. This plan recognized that a large river system is more than a channel of water flowing to the sea. It is an environment in which a chain of many organisms live and feed, including bacteria, algae, crustaceans, insects, fish, and birds. Everything that goes into the river can affect that complex web of life. Humans have the ability to alter the physical environment to affect habitats, or to introduce chemical contaminants into the environment that can persist in bottom sediments and accumulate in certain forms of life. A river system is very complex, and many aspects of how the system works are not fully understood.

The long-range goal of the study was to assess and understand the health of the Willamette River and its basin sufficiently to 1) construct a complete database of water quality and other information, 2) use these data to develop predictive models which can be used by federal, state, and local agencies and the public to make policy decisions about preservation and best use of the river, and 3) develop biologic standards and criteria to evaluate river health (Figure 8). There were a variety of specific short-term goals of the study, including:

1) Develop the capability, using computer based mathematical models, to predict how the river will respond to varying pollutant loads and to other changes in the system which could result from a broad range of policy decisions.

2) Gather information that will allow the State to most fully integrate its efforts with ongoing federal basin studies and any other cooperative efforts that arise in the near future.

3) Encourage interagency coordination and cooperation among federal, State, and local agencies.

4) Respond to pressing policy issues in the Willamette River Basin that cannot be delayed, including:

-Establish wasteload allocations for pollutants

-Establish biological standards for water quality

-Establish minimum stream flows needed to support fish, wildlife, and other uses

-Develop plans to minimize impacts of combined sewer overflows

-Develop the capability to answer questions about wasteload allocation increases and water quality management policies

Interagency/Interorganizational Approach to Study and Funding

A unique feature of the Willamette River Basin Water Quality Study is its reliance on partnerships for both project funding and study work. Project funding for Phases I and II of the study, carried out over the four-year period of 1991-1995, consisted of a mix of State and federal funds as well as funds contributed by private industry and municipal sewage agencies (Figure 9).

Study work was also carried out by a partnership. Early on, the basin study plan was integrated with a larger national effort by the U.S. Geological Survey (USGS) to assess the quantity and quality of waters in 60 areas around the country, called the National Water-Quality Assessment Program (NAWQA). The NAWQA study of the Willamette Basin was started in 1991, with a planned 10-year study period. Integration with the NAWQA program allowed efficient use of overall available funds for basin study. The NAWQA intensive monitoring period for the Willamette basin was completed in 1995; less intensive monitoring will occur during the next six years. The USGS also participated in the study as a direct funding partner through a state-federal cooperative program. The remaining portion of the work was largely carried out by a major study consultant (Tetra Tech, Inc., Redmond, WA),

with participation by subcontractor consultants, Oregon State University, and DEQ program and laboratory staff.

Related Studies by Others

The technical advisory steering committee (WRTASC) soon found that a variety of other smaller and more specific research projects were underway in the basin, and additional studies were actually initiated during the basin study period. The committee kept informed on this work throughout the project by inviting researchers to present status reports at regular committee meetings. There was a host of ecological investigations of various species of wildlife in the basin, as well as studies of impacts of specific land uses and management practices. Several other concurrent studies of interest included one commissioned by public drinking water suppliers in the basin to develop a water supply needs forecast to support reserving or allocating water now to meet future needs. Another was a treatability study of Willamette River water for a large Portland area public drinking water supplier.

Related Issues Not Included in Study Scope

The Willamette River Basin Water Quality Study is comprehensive in scope but limited. A number of issues were not included; they raise important questions that study results should be helpful in answering separately or later on. First and foremost was the assessment of risks and potential impacts on the health of humans and wildlife of contaminants in river water, sediments, aquatic organisms, and fish. Second, the tributaries were considered for their impact on the main river, but the condition of the tributary rivers themselves was not evaluated except in the Pudding River subbasin. The study did not attempt to determine the effects of water quality on the various individual beneficial uses of the river; existing standards were considered to be protective of these uses. Another issue not addressed is the impact of river flow characteristics on water quality and habitat. The study did not address the quality of groundwater and the interchange of groundwater and surface water in the basin, an important

consideration since about one-third of the river flow is from groundwater. There was not a detailed comprehensive inventory of habitat and biological populations. There also was no attempt to characterize the pristine historical condition of the river of the river prior to its modification by people.

Other issues not addressed included impacts of introduced species on native species, effects on the river of in stream activities (gravel mining, dredging), life cycles of fish and other aquatic species, solutions to specific identified water quality problems, assessment of specific land use management practices, trash dumping, and impacts of specific hazardous waste cleanup sites. The study did not attempt to construct a comprehensive Geographic Information System database for the basin and did not attempt to evaluate the river channel structure in detail.

Study Methods

Study Phases - Objectives

The Willamette River Basin Water Quality Study has been carried out in two-year phases to accommodate the State biennial budget process, Phase I from July 1991 to June 1993 and Phase II from July 1993 to June 1995. Phase III began in July 1995 and will extend through June 1997.

The study was designed to build a database by collecting and analyzing samples of water, sediment, fish, and aquatic insects from the main stem of the river from which the health of the river and the life dependent on it could be assessed. This information was also used to select and begin to calibrate or test computer-based mathematical models that could predict existing and future conditions of the river under different conditions. Models were adapted and calibrated for dissolved oxygen, nutrients, chlorophyll, bacteria, toxics, and suspended sediments. The database and the models are intended to be made available to regulatory agencies, local agencies, interest groups, industry, and the public to assist in making land and

water use decisions with consideration of the health of the river. In addition, work was done to evaluate biological communities in the river, determine the numbers and types of organisms and the condition of their health, and to combine this information into a numerical "biologic index" so that indices from different sites or from the same site over time can be compared and used as an indicator of overall water quality status and changes.

Project management and oversight has primarily been carried out by DEQ staff with the assistance of the committee. The committee and DEQ have made use of an extensive peer review panel of local, regional, and national experts to review the study plan and draft reports on study results. In addition, the committee reached out to the public though a series of public meetings in the basin to present study results. Two public meeting series have been held, one series in 1993 to present Phase I results and another series in 1995 to present Phase II results. The committee also has sent information regularly to an extensive list of interested parties.

The Phase I basin study work was divided into ten components:

Toxics Modeling
Dissolved Oxygen Modeling
Nutrient and Periphyton Growth Modeling
Nutrient and Phytoplankton Growth Modeling
Bacterial Modeling
Biologic Responses
Point Source Loading
Nonpoint Source Loading
Ecological Systems Investigations
USGS Study of Hydrologic Modeling, Sediment Transport, and Toxics

Phase II work was designed to build on and complete work begun in Phase I, including:

Calibration of models for dissolved oxygen, nutrients, and chlorophyll,
Nonpoint source modeling and calibration in a specific subbasin,

Additional field sampling of aquatic organisms and fish populations, and

USGS study of pesticides, trace elements, sediment oxygen demand, and dissolved oxygen.

Proposed subjects for Phase III include nonpoint source modeling and model calibration for an additional subbasin (Long Tom or Yamhill), monitoring of sediments and toxics to calibrate the toxics model, and additional collection to validate the toxics model. All the predictive models originally planned will then be up and running with the exception of the bacteria model; this will be completed on a lower priority and calibrated as routine monitoring of the river generates sufficient data.

Focus on Mainstem, River Study Reaches and Descriptions

A major river system is a very complex subject for study. There are many interrelationships between the mainstem river, its floodplain corridor, its tributaries, and the lands of the basin. The Willamette River Basin Water Quality Study is the beginning of an attempt to understand these interrelationships. The study has focused most of its initial effort on the 187-mile mainstem of the river, from Portland to Eugene.

Due to substantial differences in physical, chemical, and biological characteristics from the headwaters to the mouth, an initial effort of the basin study was to divide the river mainstem into logical study segments that considered these differences. These segments were then used in selecting sampling sites and for comparing results of sampling. The river segments are described generally below and are shown in Figure 10.

River Segment I extends 27 miles from the Willamette Falls (RM 26.5) to the confluence of the Willamette with the Columbia River at Portland. This section of the river is influenced by ocean tides, and flow reversals can occur along the channel bottom from the Columbia into the Willamette. The river is about 40 feet deep and very slow moving, 0.1 miles per hour (mi/hr)

at low flow, and the riverbed is mixed clay, sand, and gravel. Dissolved oxygen increases below the Willamette Falls due to turbulence and aeration by the Falls, but decreases to about 63% saturation (5.4 milligrams per liter or mg/L) near the river mouth. At the river mouth, Willamette and Columbia River waters mix, and dissolved oxygen increases again to near saturation. Pollution tolerant fish (bass, carp, perch) are present, with few pollution intolerant species.

River Segment II extends 35 miles from above Newberg (RM 60) to the Willamette Falls (RM 26.5). This section of the river, known as the Newberg Pool, is deep and slow moving, and flows over a riverbed of mixed clay, sand, and gravel, with some stone cobbles. The river is about 25 feet deep and flows at about 0.3 mi/hr under low flow conditions. Dissolved oxygen levels are relatively constant and are about 75-80% of saturation (7.0-7.5 mg/L).

River Segment III extends 71 miles from the city of Corvallis (RM 131) to the Newberg Pool (RM 60). This section of the river transitions from deep and slow moving at the lower section to shallow and swift in the upper section. For most of this distance, the river flows over a shallow bed of gravel and stone cobbles. The river is about 8 feet deep, on average, and flows at about 1.9 mi/hr in summer. Dissolved oxygen levels are about 30% lower than in River Segment IV, described next. Fish populations include a mix of pollution tolerant and intolerant species.

River Segment IV extends 56 miles from the upstream beginning of the mainstem channel near Eugene (River Mile 187) to Corvallis (River Mile 131). In this segment, the river flows quickly over a shallow riverbed made up of stone cobbles and gravel. The average river depth is 6 feet, and the current runs at about two mi/hr at low flow. Dissolved oxygen levels are at or near saturation (9.4 mg/L), because waste loadings of all kinds are low, and because the river is turbulent and rapidly reaerates along its length. Fish found in this section include some species that are intolerant of pollution, such as cutthroat trout and Chinook salmon.

Study Accomplishments and Needs for Further Work

As discussed above, the study work was organized into two major areas, collection and analysis of field data, and development of predictive models. Study accomplishments to date and needs for further work are summarized below.

A substantial amount of new data were gathered on chemistry, hydrology, and biological communities. Water quality models were developed for dissolved oxygen, nutrients, chlorophyll, bacteria, toxics, and suspended solids. Point and nonpoint sources of pollution were investigated. The models for dissolved oxygen, nutrients, and chlorophyll (QUAL2EU) are sufficiently developed for regulatory use, although further calibration and refinement is recommended in the future. The model for chlorophyll did not calibrate in the lower river. A model was also attempted for fecal coliform bacteria, but could not be calibrated due to the discharges of pulp and paper mills that contain a particular species of coliform bacteria (*Klebsiella*) that is detected as a fecal coliform without indicating fecal contamination. The model for toxics (SYMPTOX) was developed for water and sediments, but study funding was insufficient to gather new field data to calibrate it, and this work is to occur in Phase III. The USGS developed, calibrated, and verified a steady-state streamflow model for the entire river basin, collected suspended sediment samples below the dams to compare to pre-reservoir conditions, and collected substantial data on toxics in bed sediment, suspended sediment, and water during low flows and high flows. Finally, development of an electronic database for storage and easy access and retrieval of basin study data and information is needed.

A nonpoint source pollution predictive model was completed for the entire basin to generate initial estimates of basin-wide pollution loading rates. The Pudding River subbasin and two of its tributaries (Zollner Creek and Beaver Creek), were modeled on a more detailed scale and were calibrated using collected field data. Continued application of the model to other subbasins will result in a much greater understanding of nonpoint source pollution.

Considerable work was done using various indexes to evaluate water quality by looking at numbers and condition of living organisms at specific locations in the river. Populations of bottom dwelling organisms in the two upper segments of the river were evaluated successfully. The need remains to find reference locations with which to compare these findings, to determine seasonal and annual variability of populations, and determine the relationship between the derived indexes and habitat condition. Populations of bottom dwellers in the lower segments of the river where the water is deep and the riverbed consists of soft materials need more sampling to better identify existing conditions. Fish population evaluation concentrated on squawfish and largescale sucker, species found throughout the river. More needs to be known about migration patterns, genetic variations in populations, impacts of pollutant stressors on these fish, and impacts of habitats on population numbers.

Key Findings

Over the past several years of study participation, WRTASC has struggled with the major question of the comprehensive study - "Is the Willamette River healthy?", and has evolved a consensus on what the term "healthy river" means. A "healthy river system" is one with the following characteristics:

1) Meets established water quality standards for microorganisms (especially disease-causing ones), chemical contaminants, physical properties (such as temperature), and aesthetics (such as taste, odor, and appearance).

2) Supports fishing and swimming.

3) Current condition compares closely to its original condition.

4) The biological community is natural and diverse, and the populations are productive.

5) There are an adequate quantity and quality of riparian and other habitat available to support the biologic community. The habitat is complex and experiences natural disturbances such as flooding.

6) Relationships and linkages of the land to the water are maintained, preserved, and functional.

7) Scenic qualities are maintained - in other words, the river "looks good."

8) The water supports human needs and uses, including drinking water (without extensive or elaborate treatment), swimming and contact recreation, industrial water use, and irrigation. It has capacity to assimilate pollution with an adequate margin of safety and reserve capacity.

9) It has adequate capacity in water quality and quantity to meet current and future needs, even under seasonal low streamflow conditions or drought.

General Findings. Contamination found in the mainstem of the Willamette River was localized in specific areas rather than widespread throughout the basin. The study showed that there are frequent instances where available standards and guidelines for water quality are not met, primarily in the localized areas and during critical rather than normal conditions, such as during low flows or after heavy rainstorms. The local areas of concern include the Newberg Pool (fish skeletal abnormalities), Albany (toxics in sediment, fish abnormalities), Salem (toxics in sediment), and the Portland Harbor (poor fish assemblages and habitat, toxics in sediment). Toxics were found more readily in water and sediments in tributaries at points very near pollutant sources (Zollner Creek, Amazon Creek, I-84). Toxics were rarely found in water samples from the mainstem river, and while this is encouraging, toxics were found in sediments and fish tissue.

Biologic Communities and Habitat. The sampling of fish and aquatic insects in the

mainstem of the river shows that their condition ranges from good in the upper river segment, to fair in Segment III, and to poor in the lower two segments. Although some fish abnormalities were noted at all locations, significantly more skeletal deformities were noted in fish from the Newberg Pool (in river segment 2). Additional studies at the end of the report period to evaluate the toxicity of discharges from point sources in the Newberg Pool area showed that local mill discharge and municipal wastewater effluent were not toxic to aquatic organisms tested. More work is needed to identify the cause of the fish skeleton abnormalities. Observations of fish numbers and species types showed that the overall fish population is somewhat impaired throughout the river length, with more impairment in downstream river segments. No changes were noted in the variety of species and numbers of fish compared to a similar study in 1983 (Figure 11).

Studies of aquatic insects showed impairment throughout the river with increasing impairment at downstream locations (Figure 12). Assessments of habitats showed some impairment at all locations with increasing impairment downstream. It is not surprising that biological communities would degrade as the river flows through a populated valley, but whether this degradation is due to chemical inputs, alteration of habitats, physical water changes such as temperature, or interbreeding of fish populations is not known.

Physical habitats were assessed throughout the length of the mainstem river. This assessment showed that habitat was impaired throughout the river length, and the degree of impairment increased steadily from the headwaters to the river mouth (Figure 13). In terms of historical conditions, habitat losses between Eugene and Corvallis have probably been greater than from Salem to Portland.

Water and Sediment Data and Contaminants. Trace organic and inorganic contaminants were detected at a variety of sites within the basin in both water and sediment (Figure 14). In general, EPA or state water quality criteria (footnote) for surface waters were exceeded more often at urban sampling sites than at agricultural sites or mixed land use sites. Some individual

sites located on tributary streams and close to point source and nonpoint pollution sources showed significant detections of organics such as organochlorines and pesticides, especially after storm runoff events. Samples of water from the mainstem river had the lowest frequency of detections of these contaminants, although the lower two river segments had more detections than the upper two river segments. No established drinking water standards were exceeded in the mainstem river, although criteria for toxicity to aquatic life were exceeded in a few samples.

Dioxin was an original concern that led to the basin study. The 1991 Oregon State study of fish tissue showed detectable, but generally low, concentrations of dioxin in fish at six sites on the river from the mouth to the headwaters, with higher levels in fish from the lower river segment. In the basin study, dioxins and furans were analyzed in bed sediment samples at eight sites, and levels from 9.3 to 32,000 parts per trillion (ppt) were found at three industrial sites located not on the mainstem river but in small tributary streams. These were two to 87 times higher than levels at the other sites. Dioxin (TCDD) was found in water at one of the sites with high sediment dioxin levels. No criteria or standards for dioxin or furans in river sediments have been established.

More detections of trace contaminants were noted in bed sediments than in water, again primarily at tributary sites near sources of contamination, but also from sediments in the lower segment of the mainstem river. Some detections exceeded sediment quality guidelines, and the frequency of exceeding guideline levels in the mainstem river increased from upstream to downstream. Contaminants detected in sediments at various locations include triazine herbicides, carbamate pesticides, organophosphate insecticides, and urea herbicides. Aquatic life toxicity criteria for water and sediments have not been established for these compounds.

Dissolved oxygen, chlorophyll, and fecal coliform bacteria are conventional measures of water quality. The basin study showed few apparent problems; dissolved oxygen was nearly always greater than 90% of saturation and chlorophyll never exceeded the state action level of 15

mg/L. This means that dissolved oxygen levels are sufficient to meet needs of aquatic life, and that nutrient inputs to the river are not causing excessive or problematic algae growth. Fecal coliform bacteria have been historically used as indicators of fecal pollution presence in rivers. Using the existing standard of 200 fecal coliforms per 100 mL (monthly average), the river and some tributaries are listed as not supporting water contact recreation at times when sewage treatment facilities break down or excessive storm water runoff enters combined storm and sanitary sewers causing direct discharge to the river. A difficulty with use of fecal coliform was highlighted by the study; pulp mill discharge contains large numbers of coliforms that are detected as fecal coliforms but do not arise from fecal material. The committee recommended that future work with bacteria monitoring and modeling use *E. coli*, a more specific indicator of fecal pollution.

Nonpoint Source Pollution. The study gave pollutant loadings for the basin as a whole, but could not match water quality problems specifically to these loadings basin-wide. Loading from the tributaries was found to contribute the majority of the pollutants in the mainstem river; the majority of this load is contributed during a few major storms each year. Ranking of the tributary subbasins in terms of pollutant loadings showed four basins with high loadings from intensive agriculture and urbanized areas with serious water quality problems, five subbasins with less intensive agriculture and urban areas, and three subbasins with mainly forest lands with mild water quality problems expected (Figure 15). A comparison of sediment loading from nonpoint sources and point sources of pollution was developed by river segment (Figure 16); this shows the overwhelming significance of nonpoint source pollution in this basin.

The intensive modeling of the Pudding River basin did indicate the water quality associated with general types of land uses; water quality in forested areas was excellent, was lower in areas of moderately intensive agriculture, and was very poor in areas of high intensity agriculture. Water quality samples collected during storm runoff from intensively farmed areas in the Pudding River subbasin showed levels of nitrogen from fertilizer application which

exceeded drinking water standards. In addition, detections of trace metals and organic chemicals including pesticides were found in this area.

Is the River "Healthy?"

Findings by River Segment (How healthy is each segment?)

The study consultant constructed a "River Health Index" for the Willamette River by evaluating the ten data types collected in the study and considering water quality standards and guidelines, aquatic insect community assessment results, fish community assessment results, and habitat assessment results. All ten data types were ranked on a 1-9 scale for each river segment, weighted equally, and combined to an average score as shown in Figure 17. A gradual decline in the river health index is evident from the upper river segments to the lower segments. Overall, based on the information collected, analyzed, and assessed in this study, the river health is rated marginal, especially in lower, more industrialized, and more populated river segments.

So, how "Healthy" is the Willamette?

An overall objective assessment of a river's health is difficult to make. Many rivers, including the Willamette, have been substantially altered. These alterations may have occurred so far in the past that there is very little in the way of written descriptions or data available to form a picture of original river conditions. Many river systems, including the Willamette, are so altered today that reference sites to use for comparison with conditions elsewhere in the river basin do not exist. River basins have sufficient natural differences that use of reference sites located in other less disturbed basins may cause misleading analyses. Finally, the available indicators of river health are themselves composed of many subjective elements and criteria, even though they are based on best available science and information.

The WRTASC debated these difficulties at length during the study, particularly the question "what reference or original conditions of the Willamette should the current conditions be compared to." One option was to make an attempt to use the original pre-settlement conditions. Another was to use the river conditions after physical changes had been made in the river system (construction of dams, channel deepening and straightening), but before current pollution loadings, accepting that these physical changes, on a practical level, probably cannot be undone. The committee decided on a combination approach. In this approach, the presettlement Willamette basin is used as the measure of ideal and fully unimpaired health of the river. This condition was rated a nine on the river health scale. The committee then recognized a maximum level of attainable river health less than the ideal level, because of the physical changes to the river system. This condition of maximum attainable river health was rated an eight on the river health scale. This approach recognizes that improvements in river health are possible, reminds the public that fragments of original river conditions that exist rarely today were commonplace before the river was altered, and recognizes that the river may never be returned to its original state.

WRTASC then debated the current health of the river overall with respect to the level of attainable health, using the committee's nine characteristics of a healthy river discussed above. The WRTASC assessment is that the current health of the Willamette River is slightly better than marginal, with an overall rating of 5.5 out of nine. This means that there are frequent instances where available standards and guidelines for water quality, health of biological populations, and condition of habitats are not met. The committee also rated each river segment; these ratings are shown in Figure 18. River health can be improved in the future, as described in the policy recommendations given below.

Policy Recommendations

Based on the findings to date of the Willamette River Basin Water Quality study, the Technical Advisory Steering Committee developed two major policy recommendations for consideration

by state and local decision-makers including 1) incentive-based basin planning and management, and 2) monitoring and standards.

Basin Planning and Management

The first policy recommendation is to implement a more market-based incentive approach to basin planning and management where costs of development are assigned according to impact on the river, allowing more locally and individually based decision making and accountability about resource use. Specific recommendations are:

1) Require that impacts on river health be considered when making land use and economic development decisions in the basin. Use pricing of resource use to purchase critical land areas or fund stream side restoration projects. Use funds raised within each subbasin to fund projects in that subbasin.

2) Develop a comprehensive project review process that integrates and coordinates agency project reviews, considers quality and quantity issues together, considers impacts on groundwater and surface water in the basin, and takes into account cumulative impacts on river health.

3) Develop a market-based incentive approach to pricing water rights and discharge permits to make individuals accountable and responsible for costs associated with use of basin resources and specific impacts on the river basin health. Make discharge and water rights "tradable," and apply surcharges for water use and chemical and pesticides use to support agency regulatory work and fund purchase of critical land areas.

5) Complete the reauthorization of Corps of Engineers reservoir water to open up its use as needed in the future.

6) Fund local pilot programs to reduce nonpoint source pollution.

Monitoring and Standards

The second policy recommendation is to establish standards related to river health, and conducting ongoing monitoring and analysis to track progress and status of river health. Specific recommendations are:

1) Implement an ongoing monitoring and evaluation strategy for key water quality parameters and indicators to track future trends in the health of the river. Assure availability of staff and laboratory resources. Example:

Key Water Quality Parameter	Monitoring Frequency	Evaluation Frequency
Riparian habitat assessment	5 years	5 years
Fish health and assemblage	5 years	5 years
Aquatic insects	5 years	5 years
Bacteria (*E. coli*)	Monthly	2 years
Trace inorganics/organics - water	5 years	5 years
Trace inorganics/organics - sediment	5 years	5 years
Fish Tissue	5 years	5 years
Dissolved oxygen/chlorophyll/ temperature/sediment oxygen demand	Monthly	5 years

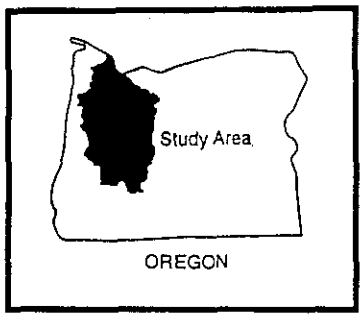
2) Develop staffing and begin using the predictive water quality models and to manage waste load limits. Move proactively to establish Total Maximum Daily Loads (TMDLs) for all major pollutants in the basin and tributaries and move aggressively to allocate waste loads for those pollutants for which standards are not met now.

3) Complete the establishment of minimum stream flows in the basin.

4) Complete a health risk assessment analysis of drinking water and fish consumption for the basin.

Outlook for the Future

The immediate concern for water quality and overall health of the Willamette River basin is the increase in the human population. Figure 19 shows the total population of the nine counties in the basin from 1850, and the projected population to the year 2050. Increased population leads to increased waste loads of all types, and at two points in the history of the basin, population increases have been associated with very significant reductions in the health of the river (Figure 20). Actions taken today and in the near future will determine the health of the river in the future, as illustrated by the three alternative river health curves in the Figure. Simply continuing the current level of effort is likely to result in a third episode of deteriorating river health. Significant new effort would be needed to maintain river health at the current level in the face of an expanding population. Finally, major efforts would be needed to improve river health, recognizing that improvement to presettlement conditions cannot realistically be achieved. The choice is ours as a society.



Willamette River Basin Characteristics

Largest river Basin in Oregon
Basin area - 11,500 square miles (12% of Oregon)
Major tributaries - 13
Mainstem river length - 187 miles
Flood control reservoirs - 13
Total reservoir storage - 2.3 million acre-feet
Average annual water production - 24 million acre-feet
Average annual flow - 31,900 cubic feet per second
Flow range - 4,200 cfs (summer) to 283,000 cfs (winter)
Average annual valley precipitation - 40-50 inches
Average annual mountain precipitation - 175 inches
Population - 1.96 million (1990)
Total cropland - 1.2 million acres
Irrigated cropland - 541,000 acres
Land use - forest (70%), farmland (22%), urban (8%)
Public land ownership - 41%

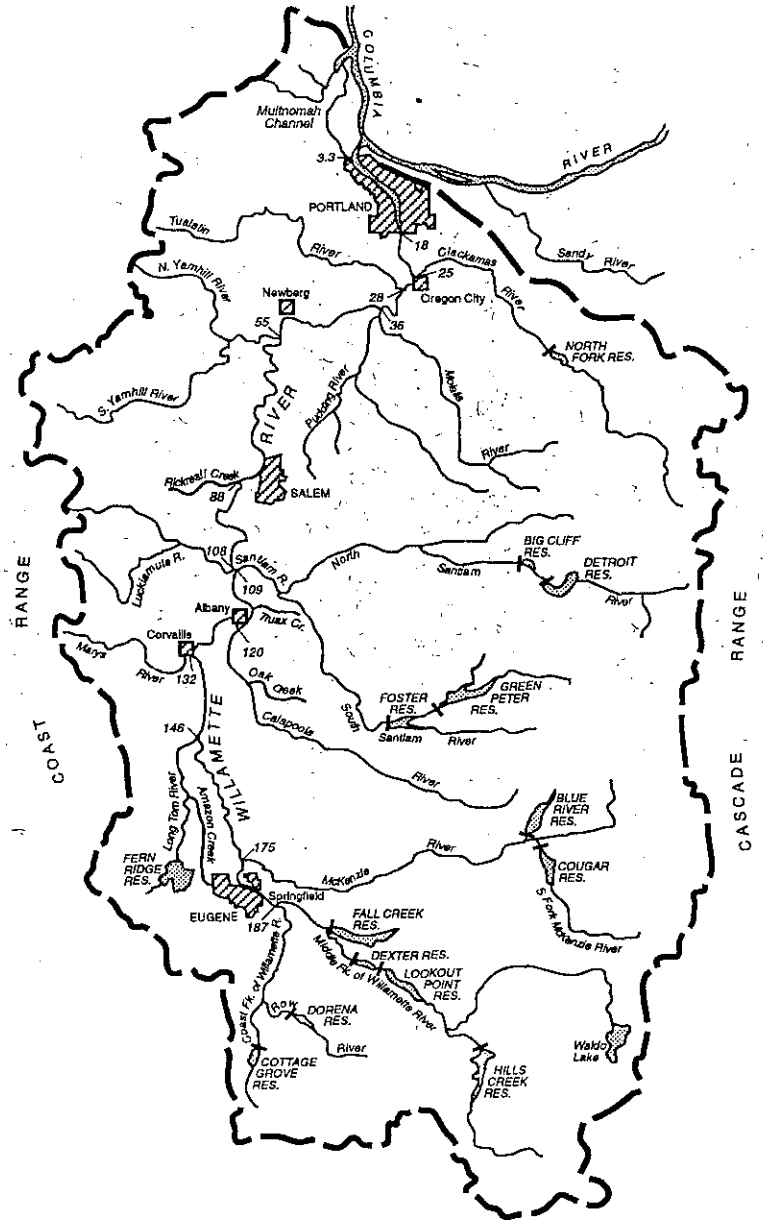
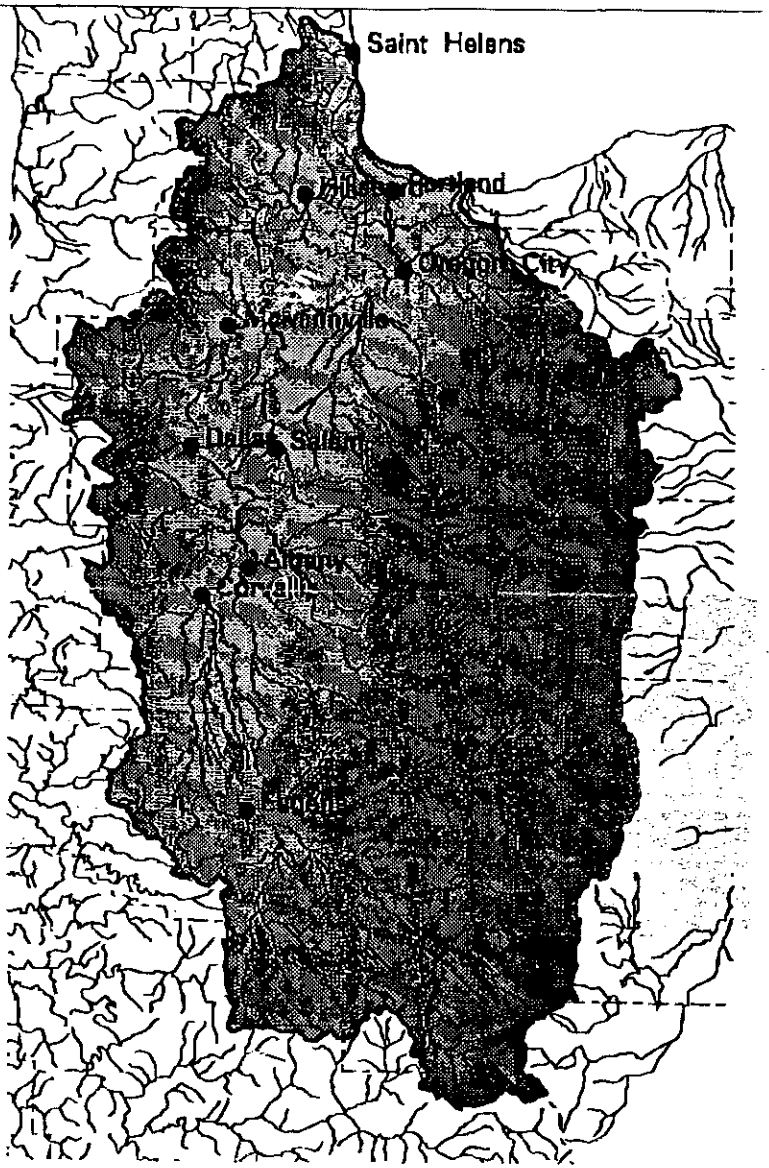
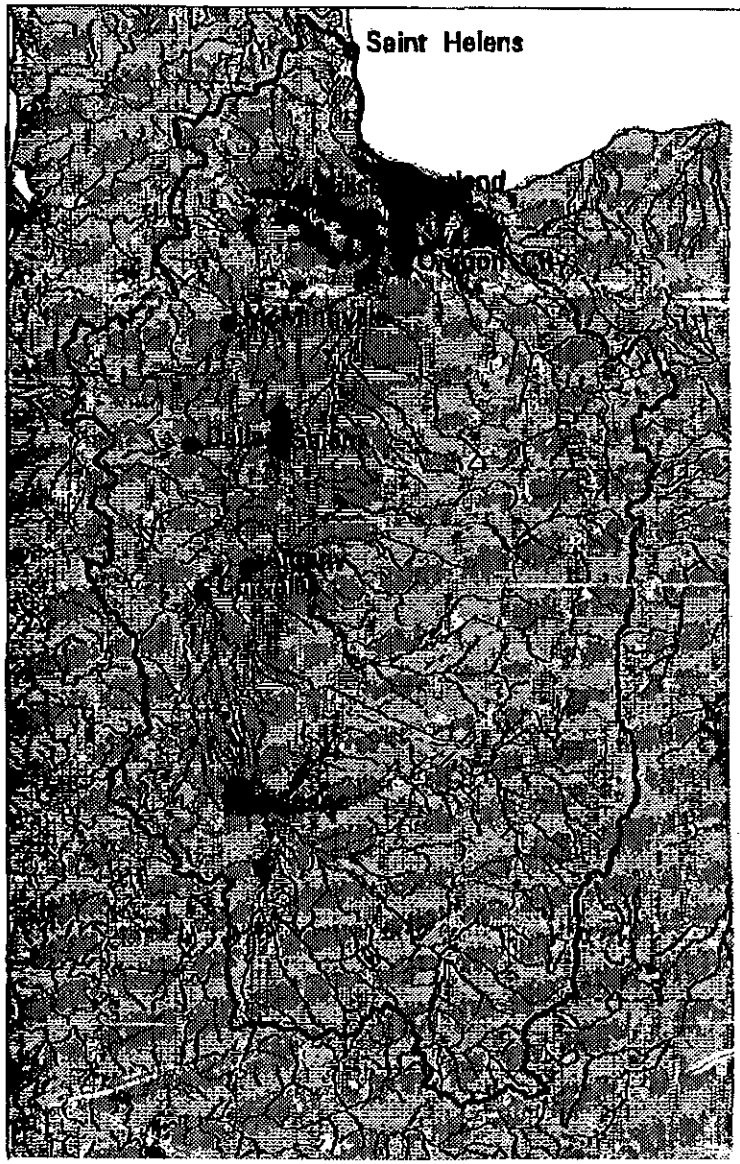


FIGURE 1



Elevation

100 meter intervals

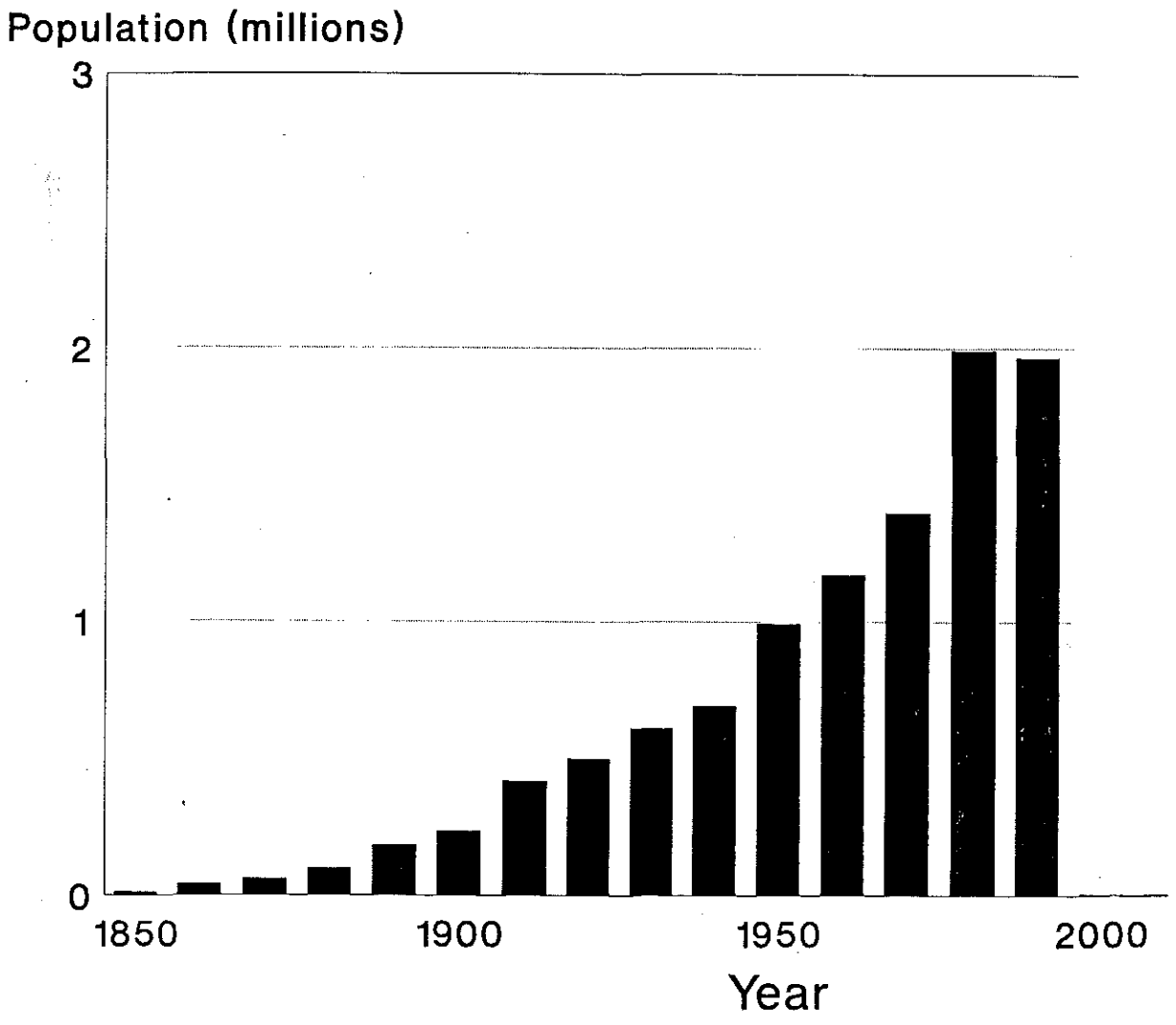


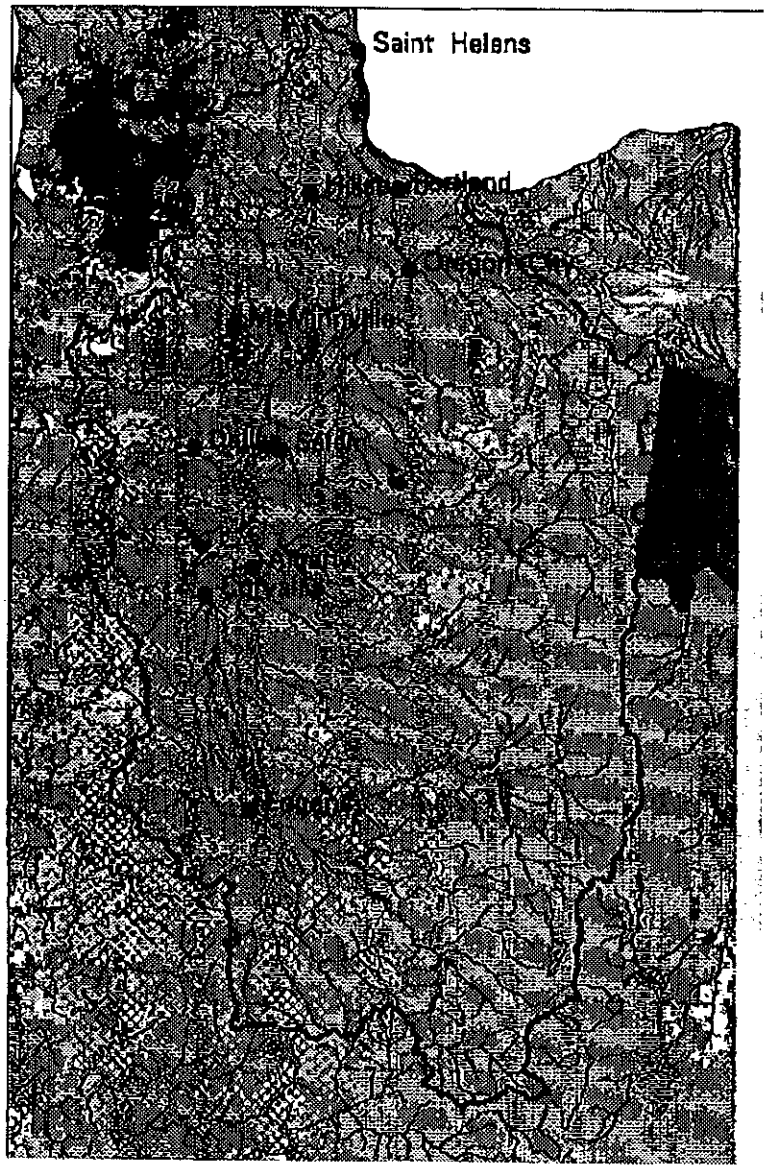
General Land Activities

- Urban or Industrial
- Agricultural
- Woodlands or forests
- Shrublands or other non-forested
- Bare fields, recent clear cuts, grass seedings, grasslands, meadows, riparian woodlands or other communities
- Mixed vegetation
- Wetlands or marshes
- Water

FIGURE (2)

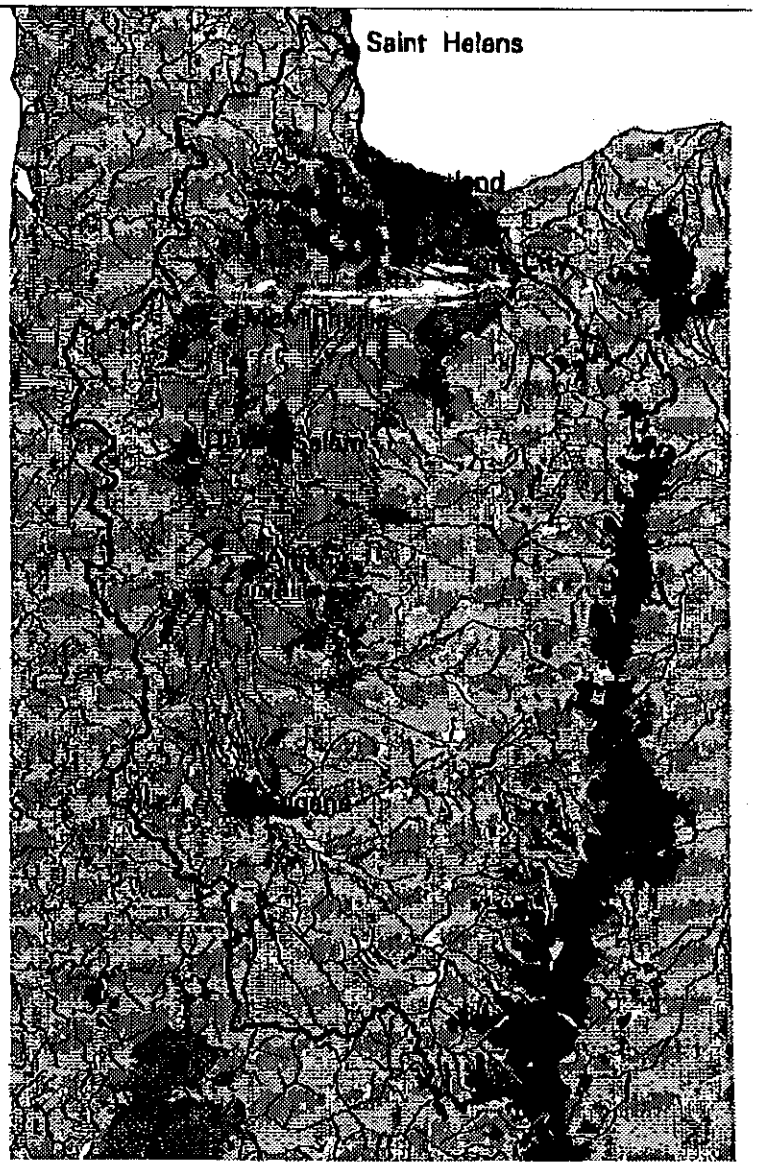
FIGURE (3)





Land Ownership

- Private or non-government
- County
- State
- Oregon and California Lands
- Oregon and California Lands administered by U.S. Forest Service
- Military or Corps of Engineers
- Bankhead - Jones Land Use
- Reservation
- Bureau of Land Management
- National Forest
- National Grasslands
- National Parks and Monuments
- National Wildlife Refuge



Vegetation and Land Cover

Cultural Land Cover

- Urban and industrial use
- Agricultural cropland; improved pasturelands
- Rural pasture
- Grass seedings; grasslands after clearing or fire
- Brush fields; clearcuts

Natural Land Cover

- Coastal features: shoreline grasses, salt marsh
- Playa
- Lava and alpine communities

Vegetation Land Cover

- Riparian woodlands
- Grasslands
- Wetlands and marshes
- Scrub and sagebrush
- Shrubland
- Aspen groves
- Coniferous woodlands
- Coastal forest
- Foothills hardwood forests and woodlands
- Montane mixed evergreen
- Lowland and montane mixed conifer forests and woodlands
- Upper montane and subalpine forests, woodlands and parklands
- Mixed mosaic

FIGURE 4

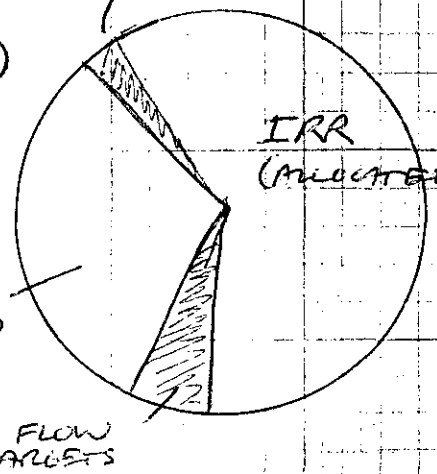
ALLOCATION OF STORED WATER AT CORPS OF ENGINEERS RESERVOIRS

(2.3 M ac-ft TOTAL)

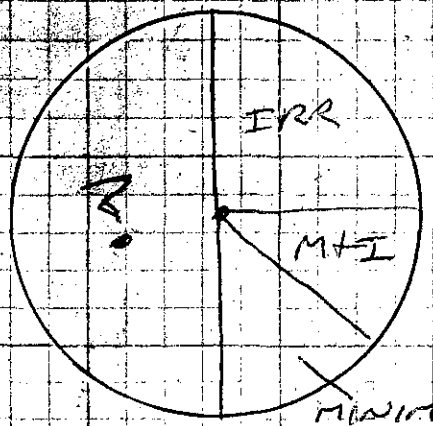
1.85 USEABLE STORAGE

55,000 acre-ft

1.6 - IRR (3% USED)
Ø - M+I
Ø - INSTREAM
Ø - FLATWATER RECREATION
0.3 - MINIMUM FLOW TARGETS



PRESENT



FUTURE

0.6 - IRR
0.3 - M+I
VARIES - INSTREAM
? - FLATWATER RECREATION
0.3 - MINIMUM FLOW TARGET

MINIMUM FLOW TARGETS
- ALBANY 5,000 CFS
- SALEM 6,500 CFS

(THIS REQUIRES ABOUT 0.3 M ac-ft)

INSTREAM = WATER QUALITY, FISHERIES

FIGURE (5)

~~Table 1~~ State Agency Areas of Responsibility in Water Management

FIGURE (6)

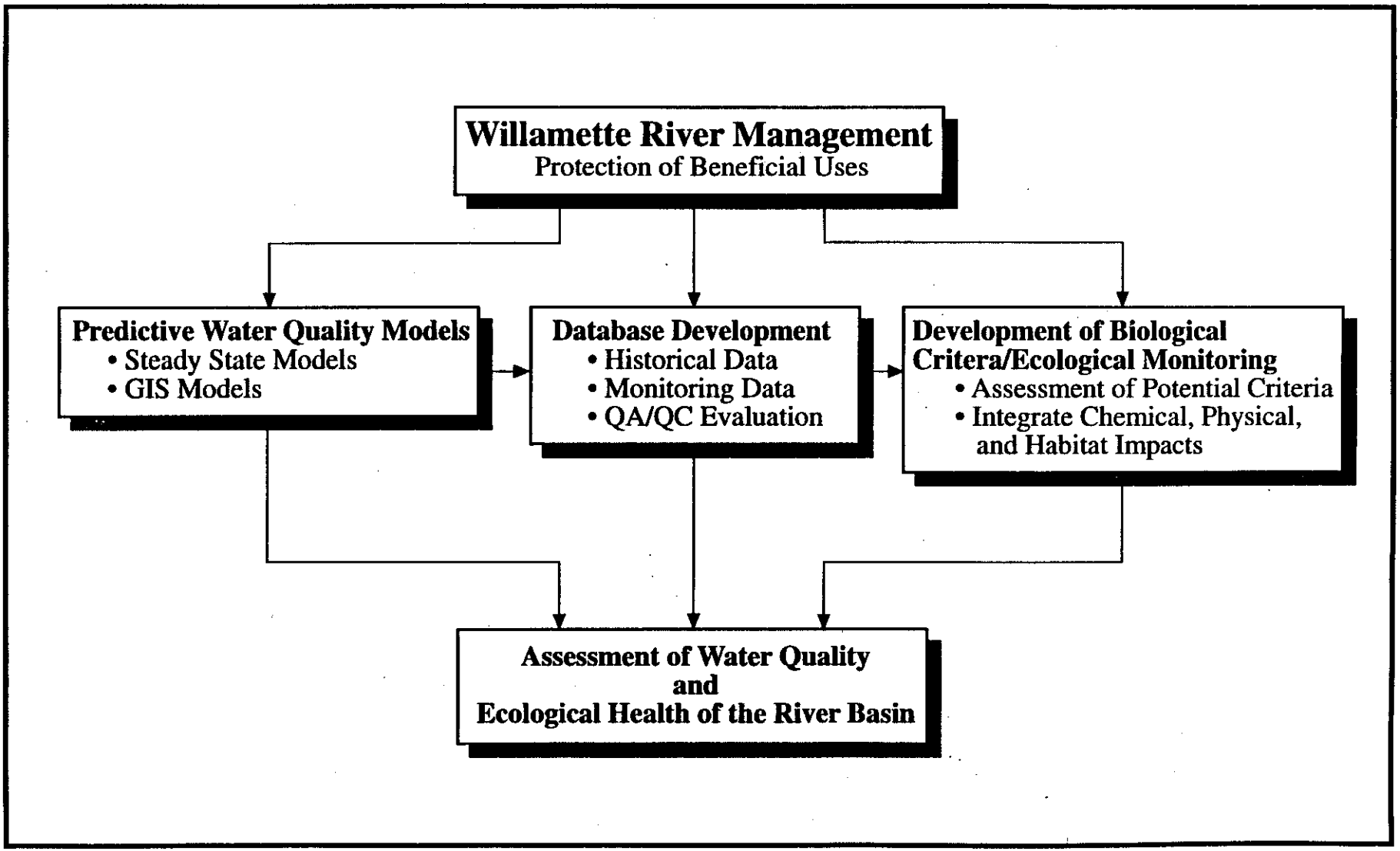
L = Lead Agency
C = Coordinating Agency in the 1991-1993 Biennial Water Program

AGENCY		Water Conservation	Water Allocation	Water Quality	Groundwater Mgt	Instream Water Resources	Dams, Reservoirs and Hydropower	Watershed and Riparian Mgt	Wetlands Mgt	Ocean Resources	Urban Water Mgt	Drought and Flood Mgt	Water Planning Coordination
Oregon Department of Agriculture	(ODA)	C	C	C	C	C	C	C	C	C		C	C
Department of Environmental Quality	(DEQ)	C	C	L	L	L	C	C	L	C	C		C
Oregon Department of Fish and Wildlife	(ODFW)	C	C	C		L	C	L	C	L	C		C
Oregon Department of Forestry	(ODF)			C			C	L	C				C
Dept. of Geology and Mineral Industries	(DOGAMI)				L			C	C	L			C
Dept. of Land Conservation and Development	(DLCD)		C	C	C	C	C	C	C	L	C	L	L
Division of State Lands	(DSL)					L	C	C	L	L			C
Economic Development Department	(OEDD)	C	C	C					C		L		C
Executive Department	(ED)												C
Health Division	(OSHD)	C	C	C	C			C			C		C
Oregon Department of Energy	(ODOE)	C			L		C			C	C		C
Parks and Recreation Department	(PRD)		C			L	C	C	C		C		C
Water Resources Department	(WRD)	L	L	C	L	L	L	L	C		C	C	L
Building Codes Agency	(BCA)	C											
Bureau of Gov. Research and Service, University of Oregon	(BGRS)										C		C
Emergency Management Division, Exec. Dept.	(EMD)											L	
Governor's Watershed Enhancement Board	(GWEB)							L					
Marine Board	(MB)			C		C		C					C
Oregon Department of Transportation	(ODOT)							C	C		C		
Oregon State University	(OSU)	C		C	C	C		C		C		C	
Public Utility Commission	(PUC)	C		C			C						

AGENCY/ ENTITY		WATER RELATED ACTIVITIES	Water Conservation	Water Allocation	Water Quality	Groundwater Mgt	Instream Water Resources	Dams, Reservoirs and Hydropower	Watershed and Ripanan Mgt	Wetlands Mgt	Ocean Resources	Urban Water Mgt	Drought and Flood Mgt	Water Planning Coordin
REGIONAL														
COLUMBIA GORGE COMMISSION	(CGC)							X	X					
COLUMBIA RIVER INTERTRIBAL FISH COMMISSION	(CRITF)			X		X	X	X		X				
KLAMATH COMPACT COMMISSION	(KCC)		X											
NORTHWEST POWER PLANNING COUNCIL	(NPPC)	X				X	X	X						X
PACIFIC MARINE FISHERIES COUNCIL	(PMFC)					X				X				
WESTERN STATES WATER COUNCIL	(WSWC)													X
FEDERAL														
AGRICULTURAL STABILIZATION & CONSERVATION SERVICE	(ASCS)	X		X	X		X	X	X			X		
BONNEVILLE POWER ADMINISTRATION	(BPA)	X	X	X	X	X	X	X			X	X	X	
BUREAU OF LAND MANAGEMENT	(BLM)		X	X		X		X	X	X			X	
BUREAU OF RECLAMATION	(BOR)	X	X	X	X	X	X	X	X		X	X	X	
COAST GUARD	(USCG)			X		X	X			X				
CORPS OF ENGINEERS	(COE)		X	X		X	X	X	X	X		X	X	
DEPARTMENT OF ENERGY	(USDOE			X	X									
ENVIRONMENTAL PROTECTION AGENCY	(EPA)			X	X		X	X	X	X	X		X	
FEDERAL EMERGENCY MANAGEMENT ADMINISTRATION	(FEMA)											X		
FEDERAL ENERGY REGULATORY COMMISSION	(FERC)						X							
FISH AND WILDLIFE SERVICE	(USFWS	X		X		X	X	X	X	X			X	
FOREST SERVICE	(USFS)	X	X	X		X	X	X	X				X	
GEOLOGICAL SURVEY	(USGS	X	X	X	X	X	X	X	X		X	X		
NATIONAL MARINE FISHERY SERVICE	(NMFS)					X	X	X	X	X				
NATIONAL OCEANIC ATMOSPHERIC ADMINISTRATION	(NOAA)					X	X					X	X	
NATIONAL PARK SERVICE	(NPS)					X	X	X					X	
OFFICE OF OCEAN & COASTAL RESOURCE MANAGEMENT	(OCRM)							X	X	X			X	
SOIL CONSERVATION SERVICE	(SCS)	X		X	X	X	X	X	X		X	X	X	

FIGURE (7)

WRTASC
ROSTER



~~Figure 1-2~~. Conceptual Diagram of Willamette River Basin Water Quality Study Objectives.

Figure 8

STUDY EXPENDITURES
STARTUP, PHASE 1, PHASE 2
1990 - 1995
$2,612,500

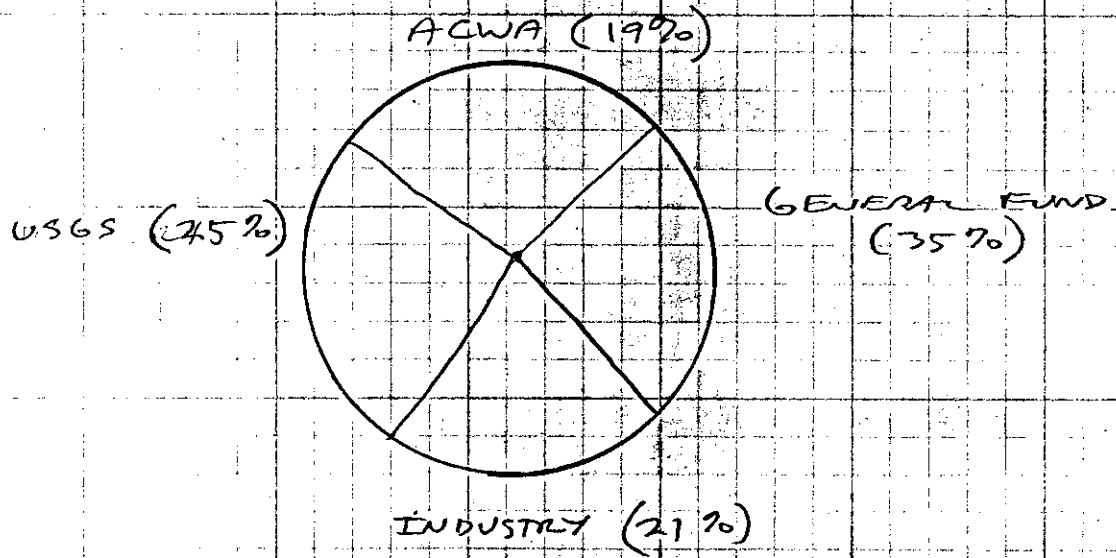


FIGURE 4

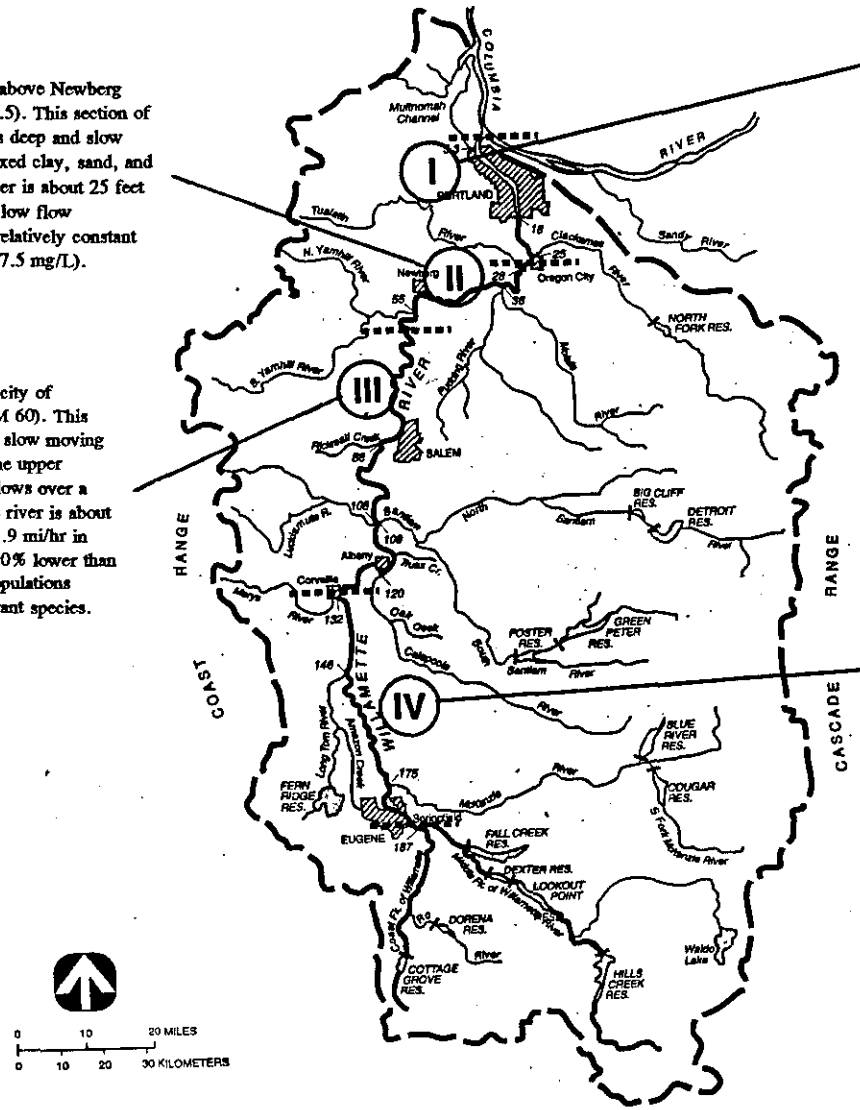
Willamette River Basin Water Quality Study Area and the Four River Regions.

River Segment I extends 27 miles from the Willamette Falls (RM 26.5) to the confluence of the Willamette with the Columbia River at Portland. This section of the river is influenced by ocean tides, and flow reversals can occur along the channel bottom from the Columbia into the Willamette. The river is about 40 feet deep and very slow moving , 0.1 miles per hour (mi/hr) at low flow, and the riverbed is mixed clay, sand, and gravel. Dissolved oxygen increases below the Willamette Falls due to turbulence and aeration by the Falls, but decreases to about 63% saturation (5.4 milligrams per liter or mg/L) near the river mouth. At the river mouth, Willamette and Columbia River waters mix, and dissolved oxygen increases again to near saturation. Pollution tolerant fish (bass, carp, perch) are present, with few pollution intolerant species.

River Segment II extends 35 miles from above Newberg (RM 60) to the Willamette Falls (RM 26.5). This section of the river, known as the Newberg Pool, is deep and slow moving, and flows over a riverbed of mixed clay, sand, and gravel, with some stone cobbles. The river is about 25 feet deep and flows at about 0.3 mi/hr under low flow conditions. Dissolved oxygen levels are relatively constant and are about 75-80% of saturation (7.0-7.5 mg/L).

River Segment III extends 71 miles from the city of Corvallis (RM 131) to the Newberg Pool (RM 60). This section of the river transitions from deep and slow moving at the lower section to shallow and swift in the upper section. For most of this distance, the river flows over a shallow bed of gravel and stone cobbles. The river is about 8 feet deep, on average, and flows at about 1.9 mi/hr in summer. Dissolved oxygen levels are about 30% lower than in River Segment IV, described next. Fish populations include a mix of pollution tolerant and intolerant species.

River Segment IV extends 56 miles from the upstream beginning of the mainstem channel near Eugene (River Mile 187) to Corvallis (River Mile 131). In this segment, the river flows quickly over a shallow riverbed made up of stone cobbles and gravel. The average river depth is 6 feet, and the current runs at about 2 mi/hr at low flow. Dissolved oxygen levels are at or near saturation (9.4 mg/L), because waste loadings of all kinds are low, and because the river is turbulent and rapidly reaerates along its length. Fish found in this section include some species that are intolerant of pollution, such as cutthroat trout and Chinook salmon.



IBI	Integrity Class	Characteristics
58-60	Excellent	Comparable to pristine conditions, exceptional assemblage of species
48-52	Good	Decreased species richness, intolerant species in particular; sensitive species present
40-44	Fair	Intolerant and sensitive species absent; skewed trophic structure
28-34	Poor	Top carnivores and many expected species absent or rare; omnivores and tolerant species dominant
12-22	Very Poor	Few species and individuals present; tolerant species dominant; diseased fish frequent

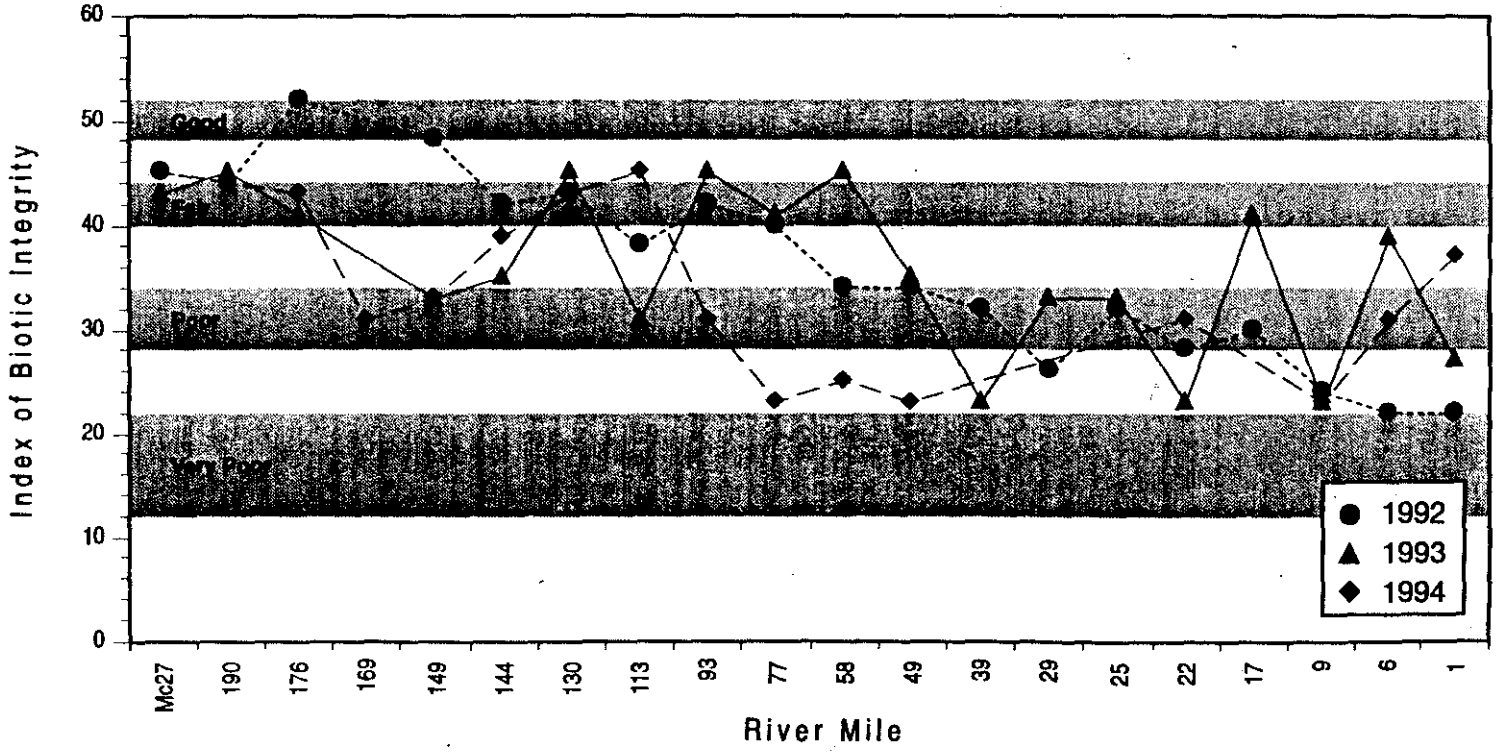
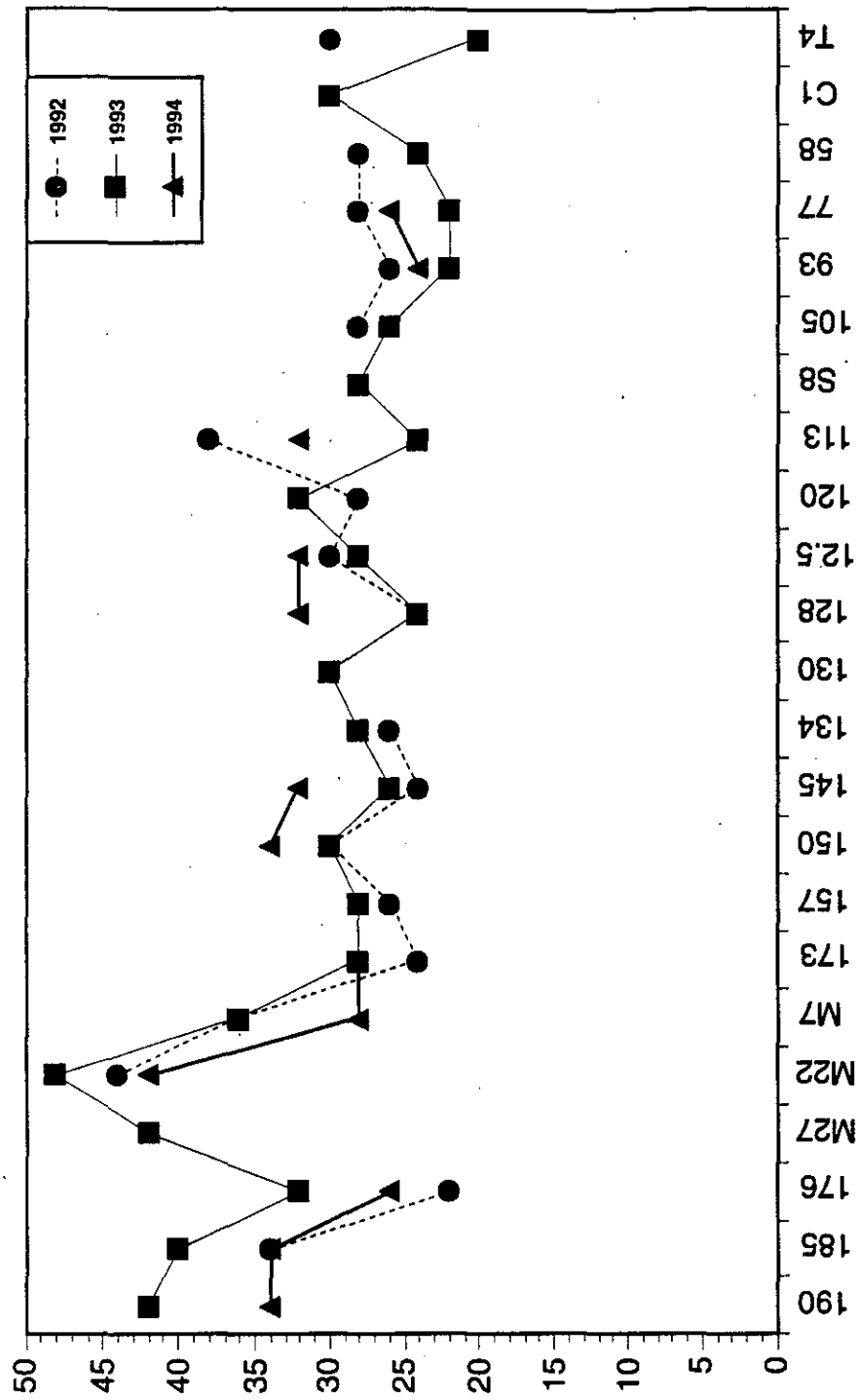


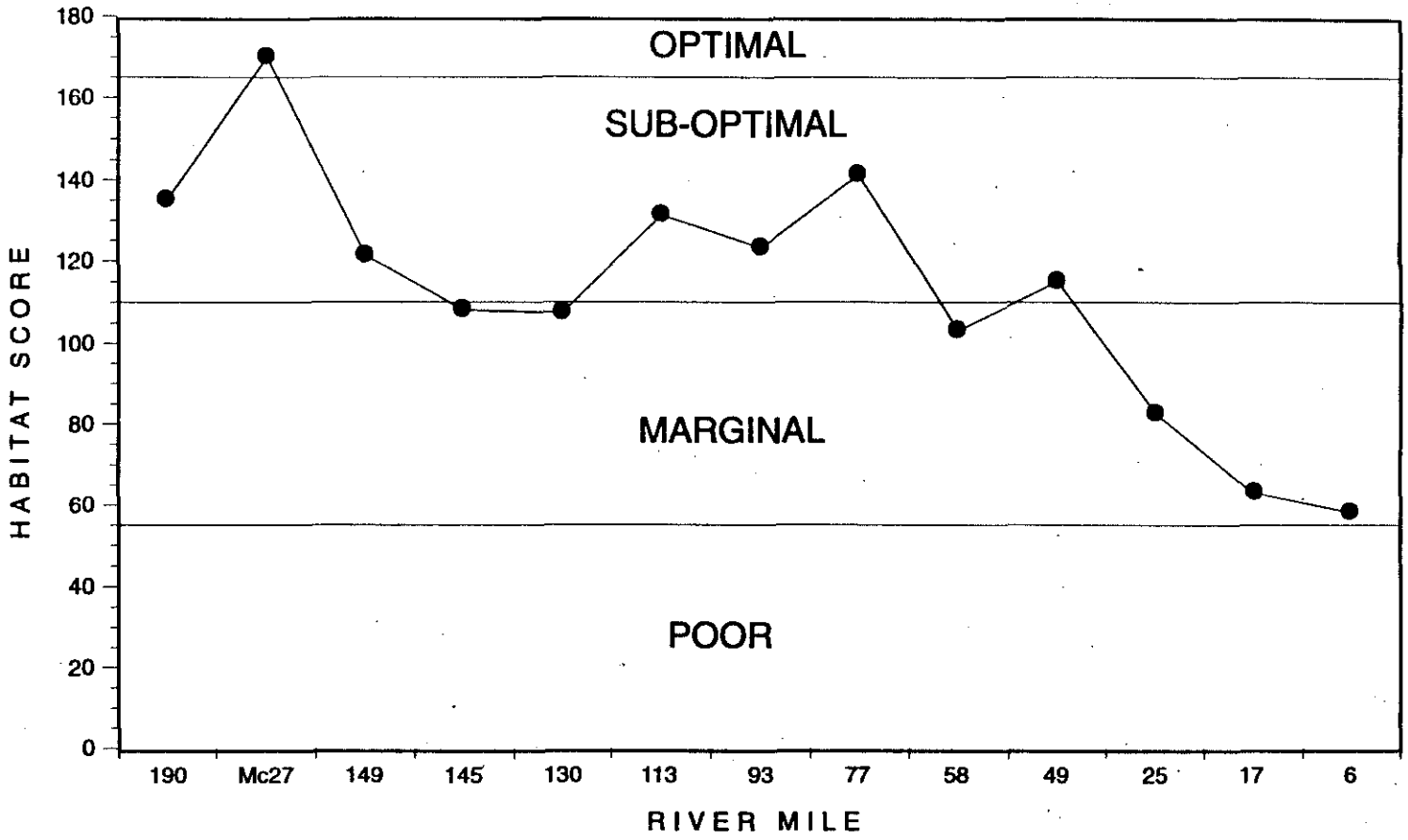
Figure 2-10. Comparison of Index of Biotic Integrity Values.

FIGURE (11)

FIGURE (12)



~~Figure 2-18.~~ Comparison of Total Metric Scores for Kicknet Sampling Between August-September 1992, October 1993, and October 1994.



~~Figure 2-14~~. Overall Total Score vs River Mile.

FIGURE 13

FIGURE (14)

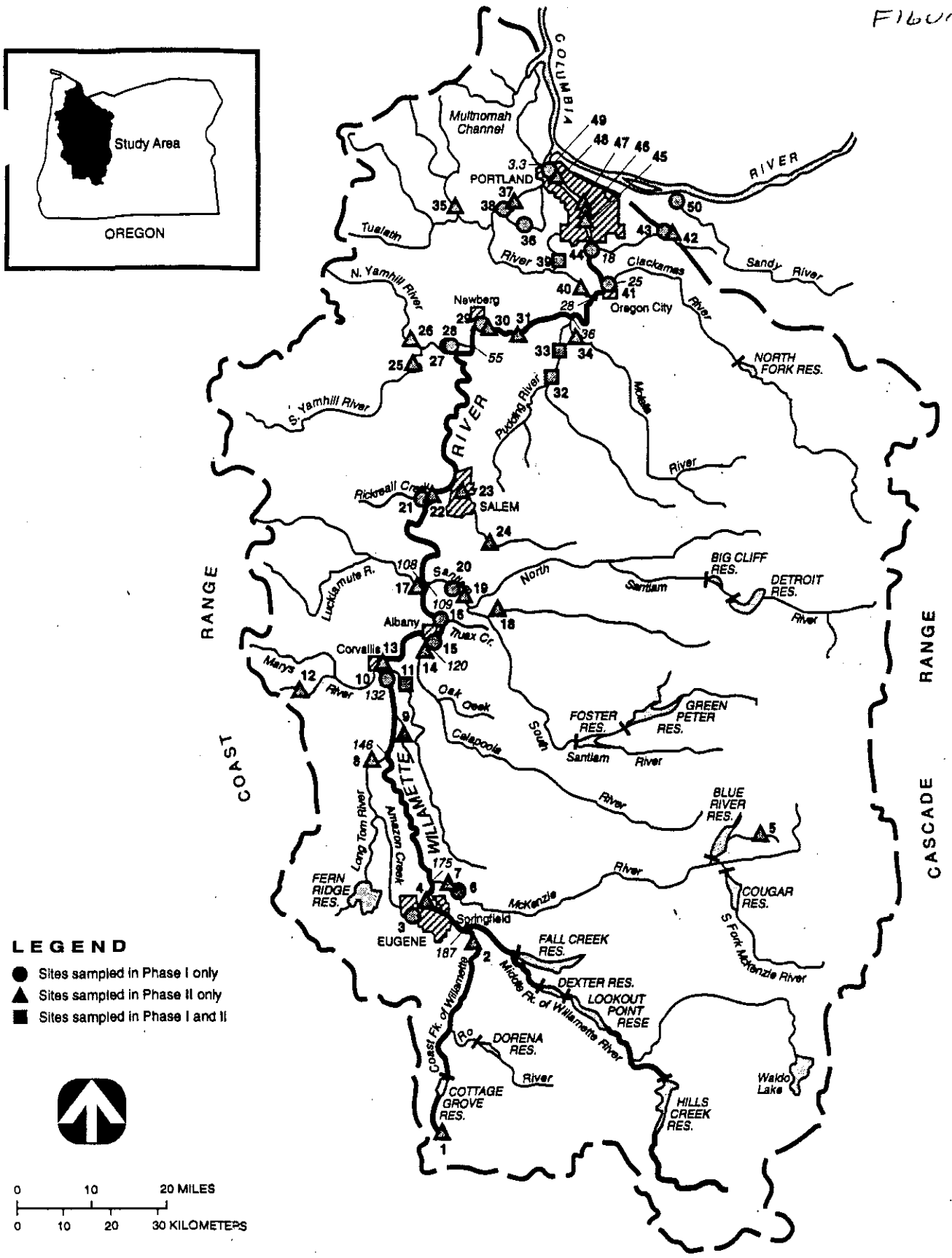


Figure 2-6. Willamette River Basin Water Quality Study USGS Sampling Sites, 1991-1994.

FIGURE (15)

TABLE 3-5. EVALUATION OF WILLAMETTE RIVER TRIBUTARIES AND ASSOCIATED WATER QUALITY PROBLEMS

	Score[a]	Major NPS Issues
Region I		
Columbia	3	Major urban and urbanizing area, some agriculture.
Clackamas	5.5	Logging, urbanization in lower portions.
Region I Mean	4.3	
Region II		
Pudding	2	Several tributaries with extremely severe degradation all associated with irrigated agriculture and livestock operations.
Tualatin	3	Major urban and urbanizing areas, intensive agriculture operations.
Yamhill	4	Mixed agriculture, livestock some urbanization.
Region II Mean	3	
Region III		
Luckiamute	4	Mixed agriculture, livestock, some urbanization.
Santiam	5	Mixed agriculture, livestock, some urbanization.
Region III Mean	4.5	
Region IV		
Long Tom	3	Intensive and light agriculture, some livestock.
Mary's	4	Mixed agriculture, livestock, some urbanization.
Coast Fork	7	Logging, dryland agriculture.
Middle Fork	7.5	Logging, light agriculture in lowlands.
McKenzie	8	Logging, urbanizing corridor along river, light agriculture in sections.
Region IV Mean	5.9	

[a] Scoring Criteria (1-9)
- 9 - Excellent Health; unimpaired no exceedance of available standards or guidance values
- 7 - Good Health; occasional exceedance of available standards or guidance values
- 5 - Marginally Health; common exceedance of available standards or guidance values
- 3 - Poor Health; consistent exceedance of available standards or guidance values
- 1 - Highly impaired; complete exceedance of available standards or guidance values

1 - 3 (4)
4 - 6 (5)
7 - 9 (3)

FIGURE (16)

COMPARISON OF TSS LOADING FROM POINT SOURCES AND NONPOINT SOURCES IN THE WILLAMETTE RIVER			
	Point Source (kg/yr)	Nonpoint Source (kg/yr)	Total (kg/yr)
Region IV	3,671,170 (0.7%)	516,419,050 (99.3%)	520,090,220
Region III	1,234,430 (0.1%)	862,365,530 (99.9%)	863,599,960
Region II	3,905,865 (1.1%)	369,253,369 (98.9%)	373,159,234
Region I	1,140,990 (0.7%)	171,246,350 (99.3%)	172,387,340
Overall	9,952,455 (0.5%)	1,919,284,299 (99.5%)	1,929,236,754

annual basis

dry/wet season pattern could be intensified

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TABLE 3-2. INDEX OF WILLAMETTE RIVER HEALTH

River Region	Health Indicators: Water Quality Standards and Guidelines				Benthic Communities		Fish				Average
	Dissolved Oxygen	Chlorophyll a	Toxics - Water	Toxics - Sediment	Soft-bottom	Riffle	Index of Biotic Integrity	Skeletal Deformity	Habitat	Nonpoint Sources	
4	9	9	4.9	4.5	6.5	5.8	5.7	9	5.5	5.9	6.6
3	7	9	5.5	3.8	4.9	5	5.2	2.5	5	4.5	5.2
2	9	9	3	2.3	5	--	4.3	1	4.7	3	4.6
1	9	9	3.3	1.2	4.6	--	3.8	4.5	2.8	4.3	4.7
Indicator Average	8.5	9	4.2	3.0	5.3	5.4	4.7	4.3	4.5	4.4	
Overall Willamette River Health Index Score											5.3

RIVER HEALTH INDEX
Scoring Criteria:

Scoring Criteria	Score
Excellent Health; No Evidence of Impairment or Exceedance of Available Standards or Guidance Values	9
Good Health; Occasional Exceedances of Available Standards or Guidance Values	7
Marginal Health; Common ~~Exceedances of~~ Available Standards or Guidance Values *one ... not met*	5
Poor Health; Consistent Exceedances of Available Standards or Guidance Values	3
Highly Impaired; Almost Always Exceeds Available Standards or Guidance Values	1

Frequent exceedances where

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FIGURE (17)

FIGURE (18)

Willamette River Health by River Section

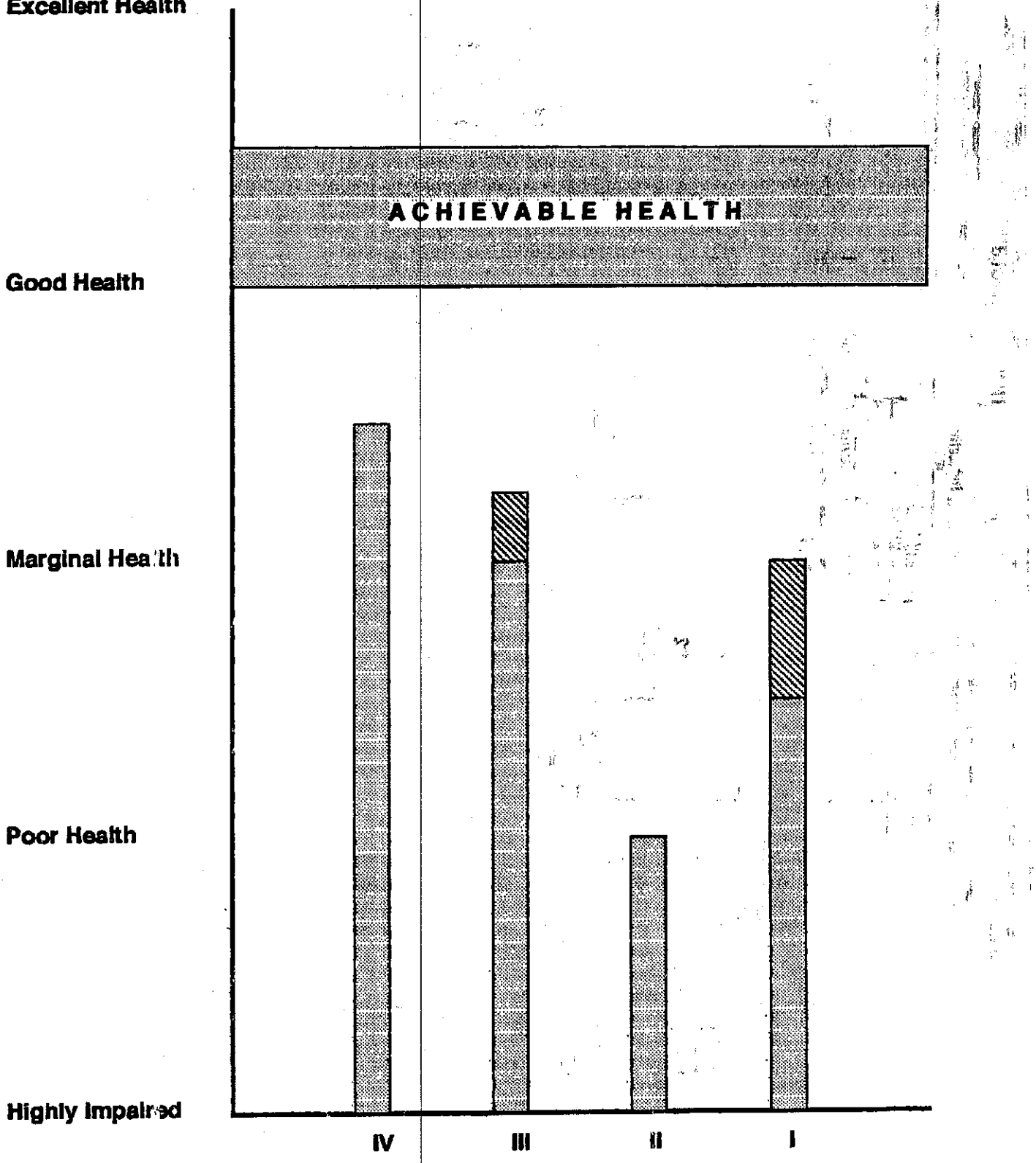

FIGURE 19

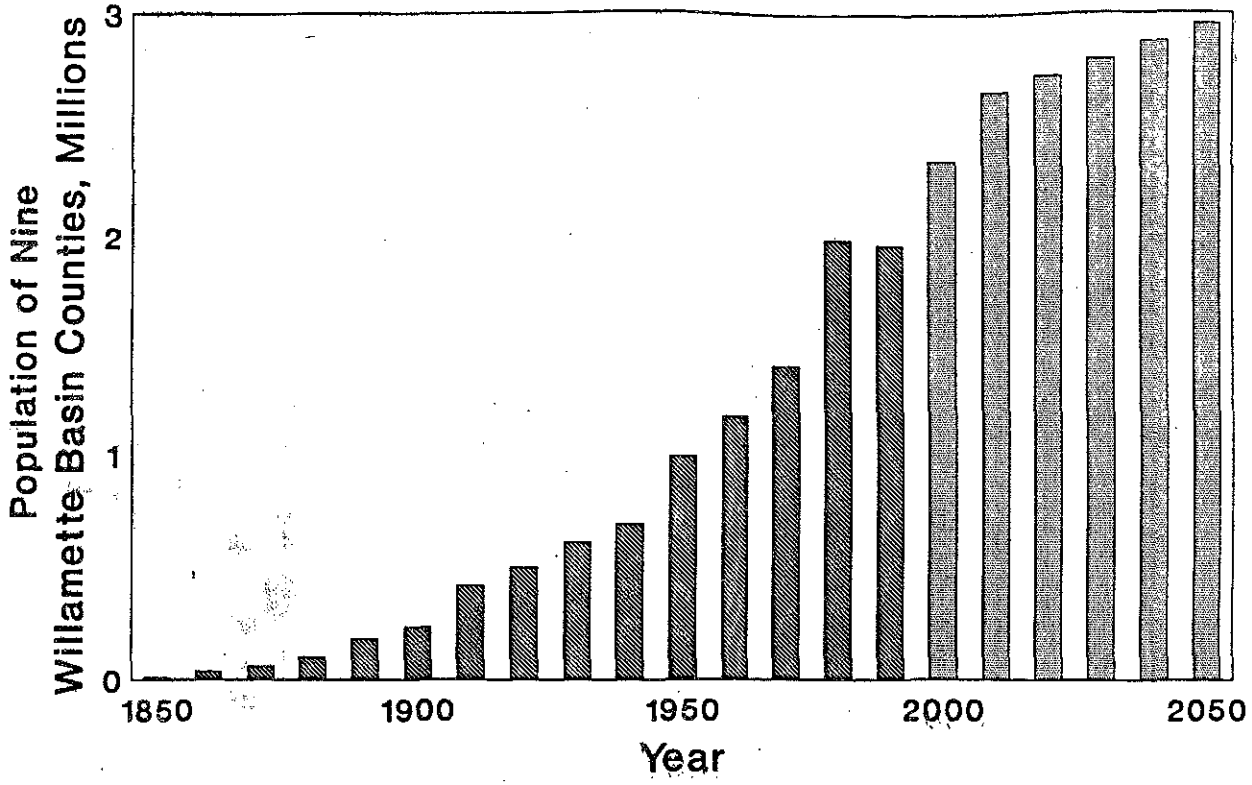

FIGURE 20