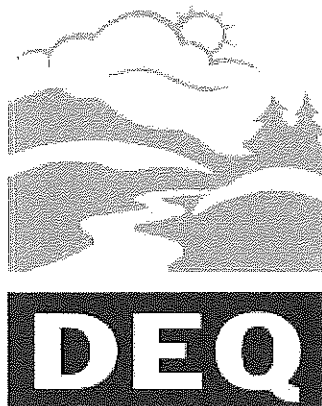


**OREGON
ENVIRONMENTAL QUALITY
COMMISSION MEETING
MATERIALS 02/23/1996**



State of Oregon
**Department of
Environmental
Quality**

A G E N D A

ENVIRONMENTAL QUALITY COMMISSION MEETING

February 23, 1996
DEQ Conference Room 3A
811 S. W. Sixth Avenue
Portland, Oregon

Friday, February 23, 1996: Regular Meeting beginning at 8:30 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 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 **11:30 a.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. The public comment period has already closed for the Rule Adoption items and, in accordance with ORS 183.335(13), no comments can be presented to the Commission on those agenda items. 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. **†Rule Adoption:** Division 22 Delisting of Acetone as a Volatile Organic Compound (VOC)
- D. **Action Item:** James River Corporation, Biochemical Oxygen Demand Effluent Limit Reduction
- E. **Action Item:** Variance Application of Richard C. Gruetter
(This item is scheduled for 9:30 am and may be taken out of order)
- F. **Action Item:** National Marine Fisheries Service Request for Waiver to Total Dissolved Gas Standard
- G. **Informational Item:** Governor's Coastal Salmon Restoration Initiative

H. Commissioners' Report (Oral)

I. Director's Report (Oral)

Hearings have already been held on the Rule Adoption items and the public comment period has closed. In accordance with ORS 183.335(13), no comments can be presented by any party to either the Commission or the Department on these items at any time during this meeting.

The Commission has set aside April 11-12, 1996, 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.

February 12, 1996

Approved ✓
Approved with Corrections

Minutes are not final until approved by the EQC

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

January 11-12, 1996
Regular Meeting

The Environmental Quality Commission meeting was convened at 1:00 p.m. on Thursday, January 11, 1996, in conference room 3B at the Department of Environmental Quality, 811 S.W. Sixth Avenue, Portland, Oregon. The following members were present:

William Wessinger, Chair
Henry Lorenzen, Member
Linda McMahan, Member
Tony Van Vliet, Member
Carol Whipple, Member

Also present were Larry Knudson, Assistant Attorney General, Oregon Department of Justice, 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 at 1:00 p.m.

1. Information Item: Background Briefing on Proposed Umatilla Army Depot Permits for Incineration of Nerve Agent and Munitions

Stephanie Hallock, Eastern Region Administrator, summarized the purpose of the workshop: to provide the Commission with background on the chemical demilitarization program and to explain the Commission's role in the permitting process. The Commission is charged under ORS 466.055 to

determine a proposed facility meets specific criteria prior to issuing a permit for a new facility designed to dispose of or treat hazardous waste or PCB.

Susan Oliver, Umatilla Permits Coordinator with the Department, presented background information on the chemical weapons stockpile at the Umatilla Army Depot. Chemical weapons on site include "GB" (Sarin) and "VX", both nerve agents, and "HD" (Mustard) which is a blister agent. Ms. Oliver indicated that the disposal deadline mandated by law is December 31, 2004. The army has selected incineration as the preferred alternative. She reviewed details of the incineration process. The Army must secure both a Hazardous Waste Treatment Permit and an Air Contaminant Discharge Permit prior to any construction.

Donna Fuzzi, Public Affairs at the Umatilla Army Depot, presented an overview of the Chemical Demilitarization Program. The mission of the program is to "destroy all U.S. Chemical Warfare Related Materiel While Ensuring Maximum Protection of the Public, Personnel involved in the Destruction Effort, and the Environment." Ms. Fuzzi also presented material about alternative technologies and approaches to incineration.

J.R. Wilkinson with the Natural Resources Department of the Confederated Tribes of the Umatilla Indian Reservation reviewed treaty language and tribal interests in alternative disposal of nerve agents. He said the Confederated Tribes support a one year moratorium on the project, while a human health monitoring network can be established and other disposal methods researched.

Karyn Jones, member of the Chemical Demilitarization Advisory Committee, presented information on alternatives to incineration.

Colonel Jim Coverstone, US Army, and Paul Johnston of the University of Exeter, United Kingdom, joined in by conference call for further discussions of alternative methods.

Don Wysocki offered his perspectives as a private citizen.

Representative Chuck Norris of Hermiston spoke briefly about the need for expedient handling of materials at the depot and noted that there is no such thing as a "risk-free" environment.

2. Rule Adoption: 1993-1994 Triennial Water Quality Standards Review: Proposed Revisions to Standards

This agenda item was to be considered for rule adoption at the November 17, 1995, Environmental Quality Commission meeting but was delayed pending further discussions with interested parties. The proposed rule revisions would affect five water quality standards evaluated during the 1992-1994 triennial review: dissolved oxygen (DO), temperature, pH, bacteria and groundwater nitrate.

As a result of the Oregon Administrative Procedures Act (APA) requirements and Commission directive to hold further discussions, the Department extended the public comment period twice between the November 17, 1995 and January 11, 1996 EQC meetings. The time extensions allowed the Department to explain the proposed rules to interested parties and to consider additional information and public comments with meeting the Oregon APA requirements.

The Department recommended the Commission adopt the rule amendments regarding the 1992-1994 Triennial Water Quality Standards Review: Proposed Revisions to Standards as presented in Attachment A of this addendum.

Mike Downs, Administrator of the Department's Water Quality Division, presented an overview of this item and Russell Harding, Water Quality Division, provided an explanation of the changes made to the proposed rules.

Commissioner Whipple moved approval of the 1992-1994 Triennial Water Quality Standards Review: Proposed Revisions to Standards, as presented in Attachment A of the Department's addendum to the November 17, 1995, staff report; Commissioner Van Vliet seconded the motion. The motion was unanimously approved.

The meeting was adjourned by Chair Wessinger at 5:00 p.m. until the following day.

Friday, January 12, 1996

Chair Wessinger called the meeting to order at 8:30 a.m.

A. Approval of minutes

There were no minutes presented for approval.

B. Approval of tax credits

The Department recommended the Commission approve certification for the tax credit applications listed below:

Applicant No.	Applicant	Description
TC 4325	Loren's Sanitation Service, Inc. \$10,123	A Reclaimed Plastic facility consisting of a Plasti-Pac Model FC-60B plastic compactor and a portable unit built by Willamette Fluid Power to power the compactor.
TC 4567	R. Dean Bowers \$46,545	An Air Pollution Control "Field Burning" facility consisting of a 104' x 72' x 22' pole construction grass seed straw storage shed.

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

C. Rule Adoption: Voluntary Wellhead Protection Rules

Michael Downs, Water Quality Division Administrator and Sheree Stewart, Water Quality Division, presented this item to the Commission. Clinton Reeder, Chair of the Wellhead Protection Committee, was also present. Mr. Downs introduced the proposed rule. Ms. Stewart provided a brief summary of the changes to the proposed rule as a result of public comments received during the Public Hearings held in November, 1995. She also provided a description of the Goal 5 process and how delineating a wellhead protection area triggers the groundwater resource element of Goal 5. Sheree explained that any groundwater protection efforts within a wellhead protection area must be done by the Oregon Department of Agriculture under new statutes. Mr. Reeder addressed the Commission briefly, providing further testimony that all issues raised during the public comment period were addressed and resolved.

The Commission recognized and thanked Mr. Reeder for his work as Chair of the Wellhead Protection Committee.

Commissioner Van Vliet moved to approve the staff report as presented. Commissioner McMahan seconded the motion and was unanimously approved.

D. Rule Adoption: Air Quality Industrial Rules (Divisions 21, 25 and 30): Grain Loading and Process Weight Rules; Contingent Hardboard Rule; Board Materials Storage; Sulfur Dioxide Emissions Standard

Greg Green, Air Quality Division Administrator, summarized this item and Ben Allen, Air Quality Division, presented the item. The Department recommended that the Commission adopt the proposed rules. Commissioner Van Vliet moved approval of the Department's recommendation. Commissioner Whipple seconded the motion. The motion was unanimously approved.

E. Rule Adoption: Air Quality Industrial Rules: Hydrogen Sulfide; Medford Hardboard Rule

Greg Green, Air Quality Administrator, summarized the issue. Ben Allen, Air Quality Division, presented the item. The Department recommended that the Commission adopt the proposed rule. Commissioner McMahan moved approval of the Department's recommendation. Commissioner Whipple seconded the motion. The motion was unanimously approved.

Note: The following agenda items were taken out of order

K. Information Item: Enhanced Vehicle Emission Testing Update

Greg Green, Air Quality Division Administrator, and Ed Woods, Air Quality Division, presented this item. Mr. Woods provided background information on enhanced programs, and showed a short video demonstrating Arizona's testing methods and equipment. Mr. Woods indicated enhanced testing would require rebuilding six test stations and hiring additional staff. The Vehicle Inspection program is developing a technical training program with the help of an advisory committee.

L. Information Item: Seventh Annual Environmental Cleanup Report

Mary Wahl, Waste Management and Cleanup Division Administrator, presented this item to the Commission. ORS 465.235 requires that the Department submit an annual report to the Governor, Legislature and Commission outlining the Environmental Cleanup program's previous fiscal year accomplishments, as well as the goals for the current fiscal year.

H. Action Item: Variance Application of Dan and Carol Barry

This case came before the Environmental Quality Commission on Dan and Carol Barry's appeal of the variance officer's approval of a variance with conditions, dated June 8, 1994. On June 27, 1994, the Barry's appealed the conditions of the approval. On September 25, 1995, a hearings officer issued a Preliminary Order and Opinion upholding the variance officer's approval with conditions.

After considering the record in this case, Commissioner Lorenzen moved to affirm the decision of the hearings officers and adopt the hearings officer's Preliminary Order and Opinion. Commissioner Whipple seconded the motion and it was approved unanimously.

N. Commissioners' Report

Commissioner Lorenzen expressed his concerns regarding fugitive dumping, and suggested the Department consider developing model ordinances to assist the counties in the establishment of civil penalties to address this problem. Director Marsh indicated the Department was working with SOLV (Stop Oregon Litter and Vandalism) to identify and assist in the cleanup of the sites in Eastern Oregon.

O. Director's Report

Director Marsh briefed the Commission on Governor Kitzhaber's Community Solutions Team and the selection of the City of Ontario as the pilot project. Ontario and the neighboring communities of Nyssa and Vale were selected for the program because of the effects on this area from the prison expansion.

The Department is finalizing the Ozone Air Quality Maintenance Plan for the Portland area, and the plan will contain several elements requiring Commission approval, either from rulemaking or through adoption of the State Implementation Plan.

Director Marsh reported the Department has appointed an 8 member task force to explore stable funding sources for the orphan site cleanup program. The Department will present funding alternatives for the orphan site program to the 1997 legislature.

The Department expects to receive a request from the Federal fisheries agencies to spill water over the Columbia River dams again this year. This spill

will violate the state's total dissolved gas standard. The Department expects to have a report and recommendation before the Commission at its February meeting.

Chair Wessinger temporarily adjourned the meeting at 10:30 a.m. The meeting was reconvened at 12:45 p.m. by Chair Wessinger.

M. Action Item: Variance for Coos County Municipal Solid Waste Incinerator

Steve Greenwood, Western Region Division Administrator, presented this item to the Commission. Steve Allen of Coos County was also present.

The Department recommended that the Commission approve a proposed variance granting Coos County a four month extension to comply with the requirements of OAR 340-25-885 and Air Contamination Discharge Permit 06-0099.

Following discussions between Commissioners and Mr. Allen, it was proposed by Mr. Greenwood to the Commission that they amend the variance request time specified on page three of the variance document from four months to six months, with the provision that source testing be completed and the report submitted by April 13, 1996.

Commissioner Van Vliet moved to approve the variance recommendation as amended. Commissioner Lorenzen seconded the motion and it was unanimously approved.

Chair Wessinger temporarily adjourned the meeting at 1:00 p.m. and it was reconvened at 1:20 p.m.

I. Action Item: Variance Application of Gordon Herigstad

This case came before the Environmental Quality Commission on Gordon Herigstad's appeal of the variance officer's denial of a variance, dated November 24, 1993. On December 13, 1993, the Applicant appealed the denial. On September 25, 1995, a hearings officer issued a Preliminary Order and Opinion upholding the variance officer's denial.

This appeal was brought before the Commission for consideration. After reviewing the record in this case and statements from Mr. Herigstad and Daryl Johnson, Variance Officer, Eastern Region, Commissioner Lorenzen moved to

affirm the findings of the hearing officer. Commissioner McMahan seconded the motion and it was unanimously approved.

G. Action Item: David A. McInnis dba McInnis and Son Sanitary Service, McInnis Enterprises, Ltd., and Schulz Sanitation, Case No. WQIW-NWR-94-311 -- Appeal of Hearings Order Regarding Violation Assessment of Civil Penalty

This case came before the Environmental Quality Commission on David A. McInnis' appeal of the hearings officer's Hearing Order Regarding Violation and Assessment of Civil Penalty, dated August 7, 1995. The hearings officer had determined that McInnis had discharged waste into the waters of the State on two separate occasions, namely May 19, 1994 and May 24, 1994. In the appeal, Mr. McInnis contended that the Department did not present sufficient evidence that the discharges actually caused pollution to the waters of the State.

After considering the record in this case and statements from Jess Glasier, attorney for David McInnis and Holly Duncan, Northwest Region - Enforcement, Commissioner Lorenzen moved to uphold the findings and conclusions of the hearings officer. Commissioner Van Vliet seconded the motion and it was unanimously approved.

J. Action Item: Variance Application of Mr. and Mrs. Stephen W. Wilkins

This case came before the Environmental Quality Commission on Mr. and Mrs. Stephen Wilkins' appeal of the variance officer's denial of a variance, dated March 3, 1995. On March 17, 1995, the Applicants appealed the denial. On September 25, 1995, a hearings officer issued a Preliminary Order and Opinion upholding the variance officer's denial. Following the Commission's consideration of the record in this case, Commissioner McMahan moved to uphold the variance officer's findings. Commissioner Lorenzen seconded the motion and it was unanimously approved. Commissioner Van Vliet noted that the Department should advise Mr. and Mrs. Wilkins of any potential changes to their specific situation in the future.

There was no further business and the meeting was adjourned at 3:05 p.m.

Approved _____
Approved with Corrections _____

Minutes are not final until approved by the EQC

Environmental Quality Commission

December 28, 1995

Telephone Conference Call

The Environmental Quality Commission telephone conference call was convened at 9:00 a.m. on Thursday, December 28, 1995. The following Commissioners were connected for the call:

William Wessinger, Chair
Henry Lorenzen, Member
Linda McMahan, Member
Tony Van Vliet, Member
Carol Whipple, Member

Also present by phone were Michael Huston, Assistant Attorney General, Oregon Department of Justice, Langdon Marsh, Director, DEQ, and DEQ staff members.

Chair Wessinger called the meeting to order at 9:00 a.m. The purpose of this meeting was to review Tax Credit Applications requiring decisions prior to January 1, 1996.

A. Approval of tax credits

The Department recommended the Commission approve certification for the tax credit applications listed below.

Application No.	Applicant	Description
TC 4432.	Consolidated Metco, Inc. \$47,635	A Water Pollution Control facility consisting of a natural gas fired Landa wastewater evaporator for the elimination of industrial wastewater.
TC 4478	Sabroso Company \$23,519	A Water Pollution Control facility consisting of a 15hp pump, a 750 gallon storage tank, filters, electrical controls and associated plumbing, which functions to allow the reuse of wastewater and to prevent wastewater discharge to the city sewer.

Application No.	Applicant	Description
TC 4480	Sabroso Company \$8,291	A Water Pollution Control facility consisting of three (3) pesticide/fertilizer spill prevention and containment units each consisting of a 10' x 15' concrete pad.
TC 4487	Arthur and Mary Ann Van Veldhuizen \$168,986	A Water Pollution Control facility consisting of a two-cell 83 ac-ft earthen storage lagoon, a manure pumping system and a tractor to move the liquid manure sprinkler and drainage system and to power the pumping system.
TC 4498	Willamette Industries, Inc. \$177,384	An Air Pollution Control facility consisting of three (3) Donaldson Day 160 HPW-8 dust collector baghouses and associated equipment.
TC 4509	International Paper \$45,570	A Water Pollution Control facility consisting of a 260' long 12" diameter wastewater line from the mill's screen room to the firm's effluent treatment facility.
TC 4535	Prince Seed, Inc. \$114,250/54%	A Field Burning facility consisting of a Hesston 60B Loafer w/ Rear's broom, a Kello Built 18' cover crop disc and a John Deere 4960 200hp tractor.
TC 4539	Don and Laura Christensen \$16,195	A Field Burning facility consisting of a Rear's 15' Fine Flail chopper.
TC 4540	WWDD Partnership \$6,950	A Plastic Recycling facility consisting of a used 1985 Fruehauf 48' dry van trailer used for transporting scrap plastic and processed pellets and chips.
TC 4542	Mr./Mrs. Gary Kropf \$ 12,796	A Field Burning facility consisting of a John Deere 3700, high clearance, 9 bottom plow.
TC 4544	Migco Northwest, Inc. \$52,114/99%	An Underground Storage Tank (UST) facility consisting of doublewall fiberglass piping, spill containment basins, sumps, automatic shutoff valves and stage I vapor recovery equipment.

Application No.	Applicant	Description
TC 4548	Farrelly & Farrelly LLC \$135,723/88%	An Underground Storage Tank (UST) facility consisting of three (3) doublewall fiberglass tanks and piping, spill containment basins, a tank gauge system with overfill alarm, turbine leak detectors, sumps, monitoring wells and stage II vapor recovery equipment.
TC 4554	United Disposal Service \$13,046	A Solid Waste Recycling facility consisting of 16 screen front-load containers with lids (model M78SFL) and 4 screen front-load containers without lids for recycling cardboard and six (6) 3-yard roll-dump containers.
TC 4556	United Disposal Service \$6,415	A Solid Waste Recycling facility consisting of five (5) 1-yard roll-dump containers with casters (model M210), two (2) 2-yard roll-dump containers with casters (model M220) and one (1) 20 yard drop box for recycling scrap material.
TC 4559	United Disposal Service \$8,772	A Solid Waste Recycling facility consisting of 8 1.5-yard roll-dump containers with casters (model M215), two (2) 4-yard roll-dump containers with casters (model M240) and four (4) pulltarp systems for covering recycling trucks.

Tax Credit Application Review Reports With Facility Costs Over \$250,000

Application No.	Applicant	Description
TC 4417	Tidewater Barge, Inc. \$237,000	An Air Pollution control facility consisting of the second hull of a double-hulled barge and a vapor recovery system to prevent petroleum and vapor contamination of Oregon waters and air.

Application No.	Applicant	Description
TC 4447	Intel Corporation \$518,155	An Air Pollution Control facility consisting of a wet scrubber tower, delivery systems for processing air and water pollutants and control instrumentation.
TC 4523	Quality Trading Co. \$1,390,483	An Air Pollution Control "field burning" facility consisting of equipment, buildings and land for processing and storing grass straw.

Following discussion regarding percentages allocable to pollution control, Commissioner Lorenzen moved to approve Tax Credit Applications #4432, #4478, #4480, #4487, #4498, #4509, #4535, #4539, #4540, #4542, #4544, #4548, #4554, #4556 and #4559, acknowledging Commissioner Van Vliet's objections to Tax Credit Applications #4432, #4487, #4535, #4539 and #4542. Commissioner McMahan seconded the motion and it was unanimously approved.

At the meeting of November 17, 1995, the Commission deferred taking action on the water pollution portion of TC 4417, Tidewater Barge Lines, pending a determination by the Office of the Attorney General regarding the eligibility of the costs incurred for double-hulling a petroleum barge. Following discussion by Assistant Attorney General Michael Huston, James Weisgerber of Tidewater Barge Lines, and the Commission, Commissioner Lorenzen moved to deny the water pollution, double hull portion of Tax Credit Application #4417. Commissioner Whipple seconded the motion, and a roll call vote was taken. Commissioners Lorenzen, McMahan, Van Vliet and Whipple voted to approve the motion and Chair Wessinger voted against. The motion was passed.

Quality Trading Company, on Tax Credit Application #4523, applied for tax credit which included facilities that were certified for tax relief under a previous owner. The Department recommended revoking the tax credit certificates that covered these facilities. However, the previous owner was in the business of processing straw for resale and the facilities were considered to be integral to the operation of his business. The new owners are not in the grass seed straw business, and the Department recommended that the certificates to be transferred reflect the value of the previously certified facilities less the amount of tax credit actually taken by the previous certificate holder. The applicant also included five acres of land in their claim for tax credit relief.

Commissioner Whipple moved to approve the Department's recommendation with the exception of the portion which included the land cost allocation (5 acres of land at 11325 Ehlen Road, Aurora, Oregon, \$31,666). Commissioner Lorenzen seconded the motion. A roll call was taken and the motion was unanimously approved.

Commissioner Whipple made a motion to approve Tax Credit Application #4447 as recommended by the Department. Commissioner McMahan seconded the motion and it was unanimously approved.

The Department recommended an interpretation of the statutes regarding Chevron Corporation's completed facilities claimed under Tax Credit Applications #4499, #4500 and #4501 that would allow the good-faith submission of an application to satisfy the two-year time requirement. This interpretation would make it unnecessary for the Commission to take any action on the Chevron request to apply for an extension of time to file its application and would allow the Department to continue to process the pending applications without prejudice to the applicant. The Commission agreed to the Department's recommendation.

DEQ Director Marsh gave a brief Director's report, updating the Commission on the status of the Hyundai 401K application process. He also advised the Commission of a meeting being held on January 3, 1996, with members of the agricultural community to review and clarify the proposed Water Quality Standards Revisions to come before the Commission during the January 11-12, 1996, EQC meeting.

The telephone conference call was adjourned by Chair Wessinger at 10:30 a.m.

Approved _____
Approved with Corrections _____

Minutes are not final until approved by the EQC

ENVIRONMENTAL QUALITY COMMISSION
September 28-29, 1995

WORK SESSION

The work session was convened at 1:00 p.m. on Thursday, September 28, 1995, in conference room 3B at the Department of Environmental Quality, 811 S.W. Sixth Avenue, Portland, Oregon.

Neil Mullane and Bob Baumgartner of the Department's Northwest Region and Lynne Kennedy of the Department's Water Quality Division presented this item to the Commission.

In fulfillment of requirements in Section 303 of the Clean Water Act to perform a triennial water quality standards review, the Department evaluated five standards between 1992-1994. The standards selected for review included: temperature, dissolved oxygen, bacteria, pH, and groundwater nitrate. Through extensive consultation with Technical and Policy Advisory Committees representing the best science and a broad range of policy interests, revised standards were proposed. These proposed revisions include:

- Modifications of the temperature and dissolved oxygen standards to link the numeric criteria to presence of specific life stages of sensitive beneficial uses.
- The dissolved oxygen standard which adds numeric criteria for intergravel dissolved oxygen, providing more direct protection to early life stages of salmonids than the existing water-column standard.
- The pH standard which recognizes that natural conditions vary more than was formerly acknowledged.
- The bacteria standard which mandates use of an indicator species that provides adequate protection, while requiring less disinfection than the indicator species that was adopted during the previous Review. The proposed bacteria rule also provides deadlines and design criteria for sewage treatment facilities to minimize risk to swimmers.
- The nitrate standard which provides the final step (for that pollutant) in fulfilling the statutory requirement to adopt maximum measureable levels for groundwater contaminants.

The Commission will be asked to revise five water quality standards at the November 17, 1995, meeting.

Minutes of the Two Hundred and Forty Seventh Meeting

The Environmental Quality Commission meeting was convened at 8:30 a.m. on Friday, September 29, 1995, in conference room 3B at the Department of Environmental Quality, 811 S.W. Sixth Avenue, Portland, Oregon. The following members were present:

William Wessinger, Chair
Henry Lorenzen, Member
Linda McMahan, Member
Tony Van Vliet, Member
Carol Whipple, Member

Also present were Michael Huston, Assistant Attorney General, Oregon Department of Justice, 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.

A. Approval of minutes

Commissioner Whipple moved approval of the July 6-7, 1995 meeting minutes; Commissioner Lorenzen seconded the motion. The motion was unanimously approved.

B. Approval of Tax Credits

The Department recommended the Commission approve certification for the tax credit applications listed below.

Application No.	Applicant	Description
TC 4265	Johnson Controls Battery Group, Inc. \$223,850/93%	A noise pollution control facility consisting of a 4.11 acre land buffer between an industrial plant and a neighboring residential area.
TC 4267	Johnson Controls Battery Group, Inc. \$68,849	An air and noise pollution control facility consisting of two Micropole baghouses, an Auburn International particle sensor and support equipment for a Cycloblower Power Unit.
TC 4328	Owens-Corning Fiberglass Corporation \$239,790	An air pollution control facility consisting of a fume afterburner for the incineration of light hydrocarbons (VOC) and combustible particulate matter, generated in the production of asphalt.
TC 4333	Z West, Inc. \$1,995	An air pollution control CFC facility consisting of a machine that removes and cleans automobile air conditioner coolant.
TC 4336	Willamette Industries, Inc. \$50,951	An air pollution control facility consisting of an Elgin Crosswind recirculating air sweeper for reducing fugitive particulate emissions at a particleboard manufacturing plant.
TC 4344	The Heating Specialist, Inc. \$1,395/50%	An air pollution control CFC facility consisting of a machine that removes and cleans air conditioner and commercial refrigerant coolant.
TC 4349	Silbert Auto Body \$1,995/65%	An air pollution control CFC facility consisting of a machine that removes and cleans automobile air conditioner coolant.
TC 4380	Doug Cousins Auto Repair \$2,500	An air pollution control CFC facility consisting of a machine that removes and cleans automobile air conditioner coolant.
TC 4385	Ernst Hardware d.b.a. Cascade Tractor Co. \$2,245/69%	An air pollution control CFC facility consisting of a machine that removes and cleans automobile air conditioner coolant.

TC 4400	Columbia Steel Casting Company, Inc. \$96,873	An air pollution control facility consisting of a backward inclined, airfoil blade Chicago blower fan, a baghouse and support equipment to control bentonite clay dust emissions at a steel casting foundry.
TC 4402	Portland General Electric Company \$78,217	A water pollution control facility consisting of a water cooling recirculation reservoir to prevent the discharge of heated water to the public water system.
TC 4404	Portland General Electric Company \$62,615	A water pollution control facility consisting of a mobile washdown/oil spill collection system and a liner for an existing vehicle washdown collection basin to reduce the potential for groundwater contamination.
TC 4425	Portland General Electric Company \$23,416	A water pollution control facility consisting of an impermeable membrane liner system to prevent oil contamination of the groundwater in case of a spill.
TC 4426	Portland General Electric Company \$34,006	A water pollution control facility consisting of a double walled aboveground storage tank with a 6-inch concrete liner, an overfill sump, an alarm system, valves, vents and support equipment.
TC 4429	Portland General Electric Company \$77,083	A hazardous waste (oil) pollution control facility consisting of an oil mist eliminator to prevent oil mist emissions from contaminating the biosphere.
TC 4431	Pacific Petroleum Corporation \$172,316/88%	A water quality underground storage tank (UST) facility consisting of three doublewall fiberglass/steel tanks and doublewall fiberglass piping, spill containment basins, a tank gauge system with overfill alarm, line/turbine leak detectors and Stage II vapor recovery equipment.
TC 4438	Portland General Electric Company \$21,284	A water pollution control facility consisting of an impermeable membrane liner and barricade to prevent oil contamination of the groundwater in case of a spill.
TC 4440	Portland General Electric Company \$47,029	A water pollution control facility consisting of an oil/water separator and an oil containment vault to prevent contamination of the groundwater in case of a spill.

TC 4448	Stimson Lumber Company \$100,009	A water pollution control facility consisting of wastewater treatment system.
TC 4479	Sabroso Company \$31,503	A solid waste recycling pollution control facility consisting of a trailer to collect and transport fruit pulp waste.
TC 4486	Flanagan Farms, Inc. \$192,544	An air pollution control field burning facility consisting of a 22' x 124' x 192' pole construction straw storage shed and a 1992 Freeman Big-baler.
TC 4488	Hopton Technologies, Inc. \$37,667	An air pollution control facility consisting of two fume and dust wet scrubbers to control dust and vapors from a paper coating plant.
TC 4497	Golden Valley Farms \$236,155	An air pollution control field burning facility consisting of a 20' x 110' x 200' grass seed straw storage building and a straw press.
TC 4508	JSG, Inc. \$191,284/90%	An air pollution control field burning facility consisting of a Rear's 12' Grass Vacuum, a John Deere 8870 350hp tractor and a John Deere 2810 Moldboard Plow.
TC 4510	JSG, Inc. \$97,006	An air pollution control field burning facility consisting of two grass seed cleaning gravity tables to reduce contamination of grass seed acreage by weeds and fungal blight, thereby supporting a transition from the field burning method of clearing and cleaning grass seed fields.
TC 4512	Golden Valley Farms \$58,000	An air pollution control field burning facility consisting of two 370T Freeman balers.

Tax Credit Application Review Reports With Facility Costs Over \$250,000

Application No.	Applicant	Description
TC 4382	Anodizing, Inc. \$502,920	An air pollution control facility consisting of a regenerative thermal oxidizer, recirculation equipment and controls, two vertical spray booth recirculation filters, fans, system controls, spray booth enclosures and support equipment and a steel building to enclose the oxidizer. The facility controls emissions from an aluminum rod painting plant.

In addition, the Department recommended that the Commission approve Willamette Industries, Inc. request to amend their December 27, 1994, request for an extension to file for their Dalles facility. The Department recommended approval of the proposed methodology for calculating the estimated return on investment (and percent allocable) for land facility investments. Finally, the Department recommended the revocation of the remaining value of the tax credit for the facility identified under Tax Credit Certificate 2552 because the facility is no longer functioning to control pollution.

Following discussion, Tax Credit #4479, Sabroso Company, was withdrawn by the Department to allow for a more complete determination of whether the solid waste recycling facility is eligible for tax credit relief.

Tax Credit #4510, JSG, Inc., was tabled by the Commission to allow for a determination by the Attorney General's Office on the eligibility of seed cleaning gravity beds.

After a discussion of Tax Credit #4265, Johnson Controls Battery Group's noise pollution land facility, Commissioner Whipple moved approval and Commissioner McMahan seconded the motion. Commissioner Lorenzen offered an amendment to Tax Credit #4265 asking that a deed restriction be placed to allow for the recapture of the tax credit (plus interest) if the land was subsequently used for any noise pollution sensitive purpose during its useful life. A roll call vote was taken and passed unanimously (five yes votes).

Commissioner Lorenzen moved to approve all tax credits as recommended with the exception to the amendment to Tax Credit #4265 and the deferral on Tax Credit #4510. Commissioner Van Vliet seconded the motion and it was approved unanimously.

C. Rule Adoption: Deferral of Oregon Title V Operating Permit Requirements for sources with Actual Emissions Below 50 percent of Major Source Levels

Greg Green, Air Quality Administrator, summarized this issue. Ben Allen, Air Quality Division, presented the item.

Title V of the federal Clean Air Act requires "major sources" (sources with potential emissions above certain levels) to apply for Title V permits or synthetic minor permits (standard state permits with federally enforceable limits) by January, 1996. The Environmental Protection Agency has issued guidance allowing a one-year extension of that deadline for sources whose *actual* emissions do not exceed 50 percent of the major source levels. This rule would take advantage of EPA guidance to allow eligible Oregon sources the same extension.

The Department recommended that the Commission adopt the proposed rule.

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

D. Rule Adoption: Permanent Rules: Changing Effective Date for Provision of Financial Assurance for Solid Waste Landfills

Mary Wahl, Waste Management and Cleanup Division Administrator, introduced the proposal to adopt permanent rules setting a new effective date of April 9, 1997, for solid waste landfills to meet financial assurance requirements. The Commission previously adopted this effective date in temporary rules on April 14, 1995. The new effective date matches the date recently adopted by the Environmental Protection Agency.

Commissioner McMahan moved approval of the proposal. Commissioner Van Vliet seconded the motion. The motion was unanimously approved.

E. Information Item: Oregon Coastal Nonpoint Pollution Control Program -- Status Report

Michael Downs, Water Quality Division Administrator, Bobbi Lindberg, Western Region - Eugene, and Kevin Downing, Water Quality presented this information item.

The Coastal Nonpoint Pollution Control Program is coordinated in Oregon by the DEQ and the Department of Land Conservation and Development (DLCD). Oregon has made a timely submittal of its program description to EPA and National Oceanic and Atmospheric Agency (NOAA). However, several management measures are not yet implemented and require administrative rule development.

Erosion from construction sites is a major cause of sedimentation and other pollutants. DEQ's stormwater program regulates sites where more than 5 acres of land is disturbed; currently DEQ does not regulate sites smaller than the 5 acre threshold. The Department plans to convene an advisory group to develop administrative rules and technical assistance packages for local governments to address erosion control through their existing permit processes.

Standard onsite sewage disposal systems are currently not regulated by DEQ after their construction is approved. The Department plans to initiate rulemaking to require that such systems be inspected whenever the property on which they are located is transferred. The Commission recommended a cooperative approach with the Oregon Health Division. The Commission also expressed concern about how to procure the resources necessary for such a program.

Oregon also has no state-level authority addressing the roads, highways, and bridges measures of the Coastal Nonpoint Program, although the Oregon Department of Transportation requires nonpoint source control on state and federally-funded roads. The Department plans to convene an advisory group to develop rules and technical assistance to aid local governments in implementing the roads, highways and bridges measures in their jurisdictions.

F. Information Item: Continuation of Willamette River Basin Water Quality Study Phase II

Russell Harding and Barbara Priest, Water Quality Division, presented this continuation of the review of Phase II of the Willamette River Basin Water Quality Study. Don Sterling, Chair of the Willamette River Study, Colleen Bennett, Co-Chair, Steve Anderson and Dave Leland presented the findings of the technical advisory steering committee to the Commission. The purpose of the study was to establish baselines on the state of health of fish in the river, the habitat alongside, and the status of the various pollutants in the river. In addition, they were tasked with developing mathematical models which the Department can use to carry out its responsibilities for setting total daily minimum loads.

They reviewed their recommendations, emphasizing the importance of further, periodic studies of the baseline data. Although the study has highlighted the status of the river, it is still important to research the river water's effects on humans and wildlife.

G. Commissioners' Reports

Commissioner Lorenzen discussed a topic that has come before the Commission several times in the last few years: the issue of spilling water over the dams and potential impacts upon fish resulting from gas supersaturation. He expressed concern that decision making on this issue is not being done in an open manner in which all stakeholders are brought to the table to work together to try and develop consensus. Commissioner Lorenzen suggested the Commission assume the role of catalyst in organizing a forum to be developed where experts could come together and professionally critique and review scientific reports. He envisioned a situation where various agencies would be invited and would present position papers to be discussed by scientists knowledgeable in the area. Through this interplay, he indicated the Commission could gather the most accurate, up-to-date scientific information on this issue from a broad range of stakeholders.

Michael Downs, Water Quality Division Administrator and Russell Harding, Water Quality Division, responded to Commissioner Lorenzen, indicating that the Army Corps of Engineers had created a sort of forum with its Gas Abatement Study. The study is ongoing in an attempt to gauge results from various spill procedures.

Commissioner Whipple reported on recent changes in the Governor's Watershed Enhancement Board, which is now being chaired by the Governor's Advisor for Natural Resources.

H. Director's Report

Director Marsh reported on the current status of the EPA budget cuts proposed in Congress and their possible effects on the Department, particularly to the Superfund and State Revolving Fund programs.

The Intel permit recently issued allowed pre-approval for certain changes that could be made without coming back to the Department for further public review, assuming the company meets certain pre-approved conditions. In exchange for this flexibility, Intel has agreed to do a considerable amount of effort on pollution prevention which would reduce its levels of pollution below what is permitted. He indicated this innovative approach will be used more often in future permitting processes.

Director Marsh reported a letter had been sent, under Chair Wessinger's signature, to the legislative leadership on the expansion of the Vehicle Inspection Program. This expansion will take place in the Sandy/Estacada area as of October 1, 1995, but the Department will discuss with legislators prior to implementation of any further expansion into the Yamhill, Columbia or Marion County areas.

The Hyundai hearing was completed in two sessions with hundreds of people in attendance. The Department is reviewing the information and will make a decision in October.

Director Marsh reported the Environmental Partnerships for Oregon Communities Program (EPOC) has been very successful with six communities participating plus the recent addition of the City of Oakland to the list. The City of Aurora is involved with a self-help program with use of local resources to come up with the lowest cost solutions to their problems.

He confirmed the indictment of Robert Cyphers for alleged environmental crimes including the falsification of lab reports.

The Department has received an award as Agency of the Year as part of the State's Investing in People program.

Director Marsh reviewed the implementation of a successful program to provide limited amnesty for emitters of volatile organic compounds (VOCs). The program located smaller VOC sources and offered them a limited amnesty from civil penalties if they work with the Department to reduce their emissions and take steps towards achieving compliance.

Director Marsh is involved in the Governor's Community Solutions Team which includes the Departments of Economic Development, Transportation, Housing, Land Conservation and Development and Environmental Quality. The purpose of the team is to work both on generic growth issues around the state and offer specific assistance on an integrated basis to particular communities experiencing growth problems. Ontario has been selected as the pilot to explore how the various agencies can work together to solve growth-related problems.

As a final piece of business, Chair Wessinger presented a plaque to former Commissioner Emery Castle honoring his many years of service to the Environmental Quality Commission.

There was no further business and Chair Wessinger adjourned the meeting at 11:45 a.m.

Approved _____
Approved with Corrections _____

Minutes are not final until approved by the EQC

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

November 17, 1995
Regular Meeting

The Environmental Quality Commission meeting was convened at 8:30 a.m. on Friday, November 17, 1995, in conference room 3B at the Department of Environmental Quality, 811 S.W. Sixth Avenue, Portland, Oregon. The following members were present:

William Wessinger, Chair
Henry Lorenzen, Member
Linda McMahan, Member
Tony Van Vliet, Member
Carol Whipple, Member

Also present were Michael Huston, Assistant Attorney General, Oregon Department of Justice, 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 at 8:30 a.m.

Ken Strong of Texas Instruments presented the Smithsonian Certificate of Nomination to the Environmental Quality Commission. The certificate was issued to the Department in recognition of itsr visionary use of information technology in the field of Environment, Energy and Agriculture.

A. Approval of minutes

Commissioner McMahan moved approval of the August 18, 1995 regular meeting minutes and the September 11, 1995 conference call minutes. Tony Van Vliet seconded the motion and it was unanimously approved.

B. Approval of tax credits

The Department recommended the Commission approve certification for the tax credit applications listed below.

Application No.	Applicant	Description
TC 4302	United Disposal Service \$51,278	A Solid Waste Recycling facility consisting of a Model UD 1800 1995 Nissan truck and a plastic compactor.
TC 4319	United Disposal Service \$119,437/45%	A Reclaimed Plastic facility consisting of a 1995 White GMC drop box truck (model WX64) with a Magnum roll-off system, an hydraulic hook assembly and rear stabilizers.
TC 4334	WWDD Partners \$69,619	A Reclaimed Plastic facility for transforming plastic waste into plastic product feedstock pellets. The facility consists of a Weighmaster Gravimetric Blender, a Turbo mixer and support equipment.
TC 4335	Bassett-Hyland Energy Company \$103,286/99%	An Underground Storage Tank (UST) facility consisting of doublewall fiberglass piping, spill containment basins, line leak detectors, automatic shutoff valves, sumps, an oil/water separator and Stage I and II vapor recovery piping.
TC 4341	Truax Harris Energy Company \$126,856/89%	An Underground Storage Tank (UST) facility consisting of three doublewall fiberglass tanks and piping, spill containment basins, a tank gauge system, automatic shutoff valves, turbine leak detectors, monitoring wells and Stage I vapor recovery equipment.
TC 4355	Chevron USA, Inc. \$36,888	An Underground Storage Tank (UST) facility consisting of spill containment basins, automatic shutoff valves and Stage II vapor recovery equipment.

Application No.	Applicant	Description
TC 4356	Chevron USA, Inc. \$37,800	An Underground Storage Tank (UST) facility consisting of spill containment basins, automatic shutoff valves and Stage II vapor recovery equipment.
TC 4357	Chevron USA, Inc. \$45,436	An Underground Storage Tank (UST) facility consisting of spill containment basins, automatic shutoff valves and Stage II vapor recovery equipment.
TC 4358	Chevron USA, Inc. \$45,088	An Underground Storage Tank (UST) facility consisting of spill containment basins, automatic shutoff valves and Stage II vapor recovery equipment.
TC 4359	Chevron USA, Inc. \$49,061	An Underground Storage Tank (UST) facility consisting of spill containment basins, automatic shutoff valves and Stage II vapor recovery equipment.
TC 4360	Chevron USA, Inc. \$54,169	An Underground Storage Tank (UST) facility consisting of spill containment basins, automatic shutoff valves and Stage II vapor recovery equipment.
TC 4361	Chevron USA, Inc. \$54,966	An Underground Storage Tank (UST) facility consisting of spill containment basins, automatic shutoff valves and Stage II vapor recovery equipment.
TC 4362	Chevron USA, Inc. \$58,696	An Underground Storage Tank (UST) facility consisting of spill containment basins, automatic shutoff valves and Stage II vapor recovery equipment.
TC 4366	Truax Harris Energy Company \$139,179/93%	An Underground Storage Tank (UST) facility consisting of two doublewall fiberglass tanks and piping, spill containment basins, a tank gauge system with overfill alarm, turbine leak detectors, sumps, an oil/water separator and Stage I vapor recovery equipment.

Application No.	Applicant	Description
TC 4384	Ernest R. Rieben \$12,086	A Water Pollution Control facility consisting of an underground manure tank, a PTO agitator, a pump, collection sumps and pipelines and related equipment. The facility prevents manure runoff from contaminating a nearby stream.
TC 4393	Western Stations Company \$111,613/99%	An Underground Storage Tank (UST) facility consisting of cathodic protection for three tanks, doublewall fiberglass piping, spill containment basins, tank gauge and overfill alarm systems, line/turbine leak detectors, automatic shutoff valves, sumps, an oil/water separator and Stage I and II vapor recovery equipment.
TC 4399	Eugene Truck Haven, Inc. \$78,873/77%	An Underground Storage Tank (UST) facility consisting of three doublewall fiberglass/steel tanks and piping, spill containment basins, an automatic tank gauge system with overfill alarm, turbine leak detectors and automatic shutoff valves.
TC 4406	Russell Oil Company \$68,818/88%	An Underground Storage Tank (UST) facility consisting of two fiberglass tanks (one compartmentalized), doublewall fiberglass piping, spill containment basins, a tank gauge system, turbine leak detectors, sumps, an oil/water separator, an overfill alarm system and monitoring wells.
TC 4408	Twigg Farm \$118,557	A Water Pollution Control facility consisting of two sewage water holding lagoons, a D & H manure separator, two concrete manure pits, pumps, an Evergreen irrigation sprinkler and associated equipment. The facility prevents pollution of the nearby stream.

Application No.	Applicant	Description
TC 4420	Truax Harris Energy Company \$154,331/94%	An Underground Storage Tank (UST) facility consisting of two doublewall fiberglass tanks and piping, spill containment basins, a tank gauge system with an overfill alarm, automatic shutoff valves, turbine leak detectors, sumps, an oil/water separator, monitoring wells and Stage I and II vapor recovery equipment.
TC 4435	Intel Corporation \$ 112,189	An Air Pollution Control facility consisting of an engineered flue gas recirculation system to optimize combustion for natural gas-fired boilers.
TC 4437	Weyerhaeuser Company \$177,167	A Water Pollution Control facility consisting of concrete diversions and drains to act as containment in case of a spill of "black liquor" from the applicant's containerboard manufacturing facility in Springfield, OR.
TC 4445	Synthetech, Inc. \$24,845	A Water Pollution Control facility consisting of a closed-loop pump for eliminating the waste stream from a pharmaceutical manufacturing lab in Albany, OR.
TC 4446	Western Stations Company \$145,723/92%	An Underground Storage Tank (UST) facility consisting of three doublewall composite tanks and doublewall fiberglass piping, spill containment basins, a tank gauge system with overfill alarm, line/turbine leak detectors, automatic shutoff valves, sumps and Stage I and II vapor recovery equipment.

Application No.	Applicant	Description
TC 4481	Valentine and Delores Miller \$28,507/64%	A Field Burning facility consisting of a 23' x 60' x 104' grass seed storage shed, which replaces a previously certified facility.
TC 4482	Robert D. MacPherson \$120,498	A Field Burning facility consisting of tile and underground outlet piping for draining farmland to allow for crop rotation in lieu of field burning.
TC 4485	Elwyn D. Bingaman \$17,600	A Field Burning facility consisting of a 596 Tandem Disk Harrow.
TC 4491	May-Slade Oil Company, Inc. \$47,003	An Underground Storage Tank (UST) facility consisting of doublewall fiberglass piping, epoxy tank lining and cathodic protection for four tanks.
TC 4492	May-Slade Oil Company, Inc. \$41,776	An Underground Storage Tank (UST) facility consisting of epoxy lining for four tanks and cathodic protection for five tanks.
TC 4493	May-Slade Oil Company, Inc. \$37,372	An Underground Storage Tank (UST) facility consisting of cathodic protection for four tanks and associated piping.
TC 4494	May-Slade Oil Company, Inc. \$28,770	An Underground Storage Tank (UST) facility consisting of three fiberglass tanks, doublewall fiberglass piping and spill containment basins.
TC 4495	May-Slade Oil Company, Inc. \$20,654	An Underground Storage Tank (UST) facility consisting of doublewall fiberglass piping.
TC 4496	May-Slade Oil Company, Inc. \$20,554	An Underground Storage Tank (UST) facility consisting of doublewall fiberglass piping.

Application No.	Applicant	Description
TC 4502	Chevron USA, Inc. \$103,386/99%	An Underground Storage Tank (UST) facility consisting of spill containment basins, a tank gauge system with overfill alarm, automatic shutoff valves and Stage II vapor recovery equipment.
TC 4503	Chevron USA, Inc. \$195,345/94%	An Underground Storage Tank (UST) facility consisting of a composite tank, doublewall reinforced plastic piping, a spill containment basin, a tank gauge system with overfill alarm, turbine leak detectors, automatic shutoff valves, sumps and Stage II vapor recovery equipment.
TC 4504	Chevron USA, Inc. \$220,198/95%	An Underground Storage Tank (UST) facility consisting of spill containment basins, doublewall piping, a tank gauge system with overfill alarm, turbine leak detectors, automatic shutoff valves, sumps and Stage II vapor recovery equipment.
TC 4507	Winmar of Jantzen Beach, Inc.. \$90,656/89%	An Underground Storage Tank (UST) facility consisting of two doublewall fiberglass tanks and piping, spill containment basins, a tank gauge system with overfill alarm, line/turbine leak detectors, sumps, monitoring wells, automatic shutoff valves and Stage I vapor recovery equipment.
TC 4511	Byrnes Oil Company, Inc. \$71,673/85%	An Underground Storage Tank (UST) facility consisting of two fiberglass tanks and doublewall fiberglass piping, spill containment basins, a tank gauge system with overfill alarm, sumps and automatic shutoff valves.
TC 4513	Byrnes Oil Company, Inc. \$2,440	An Underground Storage Tank (UST) Program facility consisting of secondary containment for three aboveground storage tanks.

Application No.	Applicant	Description
TC 4514	Byrnes Oil Company, Inc. \$1,948	An Underground Storage Tank (UST) Program facility consisting of secondary containment for four aboveground storage tanks.
TC 4515	Byrnes Oil Company, Inc. \$13,083	An Underground Storage Tank (UST) Program facility consisting of epoxy lining for two aboveground storage tanks.
TC 4516	Kurt A. Kayner \$115,752	A Field Burning facility consisting of a 25' x 124' x 180' grass seed straw storage building.
TC 4518	Willamette Industries \$14,085	A Solid Waste Recycling facility consisting of a Dings Model 33 Electromagnet for removing nails and other metal from recovered wood.
TC 4522	Harold & Jim Pliska \$81,897/96%	An Underground Storage Tank (UST) facility consisting of epoxy lining and cathodic protection for three steel tanks, fiberglass piping, spill containment basins, a tank gauge system with overfill alarm, line leak detectors, sumps, monitoring wells and Stage I and II vapor recovery equipment.
TC 4525	Western Stations Company \$118,789/99%	An Underground Storage Tank (UST) facility consisting of epoxy lining and cathodic protection for three steel tanks, doublewall fiberglass piping, spill containment basins, a tank gauge system with overfill alarm, line/turbine leak detectors, sumps, an oil/water separator, automatic shutoff valves and Stage I and II vapor recovery equipment.

Application No.	Applicant	Description
TC 4526	Prewitt's Quality Body and Paint \$1,850/62%	An Air Quality CFC facility consisting of a machine that removes and cleans automobile air conditioner coolant.
TC 4529	Carter's Service Stations, Inc. \$107,273/88%	An Underground Storage Tank (UST) facility consisting of three fiberglass tanks and piping, spill containment basins, a tank gauge system, line leak detectors, automatic shutoff valves, sumps and Stage I and II vapor recovery equipment.
TC 4531	May-Slade Oil Company, Inc. \$25,897	An Underground Storage Tank (UST) facility consisting of doublewall fiberglass piping, spill containment basins, sumps and line leak detectors.
TC 4532	May Slade Oil Company, Inc. \$20,160	An Underground Storage Tank (UST) facility consisting of epoxy lining for two steel tanks, cathodic protection for three tanks and spill containment basins.
TC 4536	Mary Lou Loar \$14,928/99%	An Underground Storage Tank (UST) facility consisting of three doublewall fiberglass/steel tanks, piping, spill containment basins, a tank gauge system with overfill alarm, line/turbine leak detectors and sumps.
TC 4537	Western Stations Company \$125,541/99%	An Underground Storage Tank (UST) facility consisting of epoxy lining and cathodic protection for three steel tanks, doublewall fiberglass piping, spill containment basins, a tank gauge system with overfill alarm, line/turbine leak detectors, automatic shutoff valves, sumps, an oil/water separator and Stage I recovery equipment.

Application No.	Applicant	Description
TC 4541	Eugene Truck Haven, Inc. \$137,527/87%	An Underground Storage Tank (UST) facility consisting of three doublewall fiberglass/steel tanks and piping, spill containment basins, a tank gauge system with overfill alarm, line/turbine leak detectors and sumps.

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

Application No.	Applicant	Description
TC 2329	Simpson Timber Company \$1,431,011	An Air Pollution Control facility consisting of a regenerative thermal oxidizer for the destruction of volatile organic compounds (VOCs) at the applicant's Portland plant.
TC 4339	Weyerhaeuser Company \$1,218,902	A Water Pollution Control facility vacuum seal water recycling system consisting of 2 Gormann Rupp vacuum pumps, a system screen, a 5,000 gallon collection tank, an Alfa heat exchanger, an Evapco cooling tower, three 8" Hayward strainers and associated equipment to reduce wastewater contamination from the applicant's Springfield paper mill.
TC 4363/64	Weyerhaeuser Company \$692,394	An Air Pollution Control facility consisting of continuous emissions monitoring (CEM) systems to control emissions from the applicant's boiler stack, package boiler and lime kiln located in Springfield.

Application No.	Applicant	Description
TC 4371	Weyerhaeuser Company \$392,615	A Water Pollution Control facility consisting of a custom designed outfall diffuser, which reduces wastewater contamination by providing for appropriate mixing of wastewater and river water at the applicant's Springfield mill.
TC 4398	Pope & Talbot \$23,774,824	A Water Pollution Control facility consisting of an oxygen delignification system to replace a portion of the applicant's chlorine bleaching (pulp) system. The facility is designed to reduce wastewater contamination from dioxin, adsorbable halides and effluent color at the applicant's Halsey, OR mill.
TC 4414	Weyerhaeuser Company \$7,049,488	A Water Pollution Control wastewater treatment facility consisting of a 15 acre (58 million gallon) aerated stabilization basin (ASB), nine surface aerators, a double HDPE liner with leak detection and collection capacity and associated equipment.
TC 4417	Tidewater Barge Lines \$1,012,000/64%	A combined Water and Air Pollution Control facility consisting of the second hull of a double-hulled barge and a vapor recovery system to prevent petroleum and vapor contamination of Oregon waters and air.
TC 4418	Elf Atochem North America \$1,850,569	A Water Pollution Control wastewater treatment facility consisting of a 100,000 gallon lined carbon steel primary treatment tank, a 30,000 gallon fiberglass secondary treatment tank and a 480,000 gallon lined carbon steel surge tank and associated pumps and containment structures.

Application No.	Applicant	Description
TC 4419	Truax Harris Energy Company \$285,672/91%	An Underground Storage Tank (UST) facility consisting of five doublewall fiberglass tanks and piping, spill containment basins, a tank gauge system with overfill alarm, automatic shutoff valves, turbine leak detectors, sumps, an oil/water separator, monitoring wells and Stage I vapor recovery equipment.
TC 4490	Willamette Industries, Inc. \$372,840	A Solid Waste Recycling facility consisting of a Model 9100 Norkot Maxigrind Hammermill system that converts waste wood into usable wood shavings for use in producing particleboard.

Following a discussion regarding TC 4417 for Tidewater Barge Lines, Commissioner Lorenzen moved to approve the Air Pollution facility portion (\$237,000) of the tax credit and defer decision on the remaining portion of the tax credit until January or such time as the Commission received the opinion of counsel. Commissioner Van Vliet seconded the motion and it was passed unanimously.

Director Marsh announced Portland General Electric had previously requested to temporarily remove from consideration seven requests for tax credits: #4394, #4396, #4427, #4442, #4469, #4471 and #4474.

Commissioner Lorenzen moved to approve all tax credits less the Portland General Electric requests withdrawn previously, and the deferred portion of Tidewater Barge Lines's application. Commissioner Whipple seconded the motion and it was unanimously approved.

Commissioner Lorenzen moved to deny Matsushita's request for an extension of time to file for tax credit relief. Commissioner Whipple moved seconded the motion. The motion was passed with four yes votes and one no vote (Commissioner Van Vliet).

Commissioner Lorenzen moved to defer approval of Chevron U.S.A.'s request for an extension of time to complete the filing requirements for tax credit applications #4499, #4500, and #4501 pending further information from the

Department. Chair Wessinger seconded the motion. There were three yes votes and two no votes (Commissioner Van Vliet and Commissioner Whipple).

Commissioner Whipple moved to approve the transfer of Willamette Industries tax credit #3344. Commissioner Lorenzen seconded the motion and it was unanimously approved.

Commissioner McMahan moved to revoke four tax credit certificates whose facilities have been replaced and are no longer operating to prevent pollution: #1190 - Valentine and Dolores Miller, #2168 - Pride of Oregon, #2324 - Merritt Truax, Inc. and #2630 - Merritt Truax, Inc. Commissioner Whipple seconded the motion and it was unanimously approved.

The status of JSG Inc.'s tax credit application, which was deferred at a previous Commission meeting pending advice legal counsel, was considered. Following a briefing from counsel, the Commission determined it was unnecessary to make a determination on whether gravity bed grass seed cleaning facilities are eligible for pollution control tax credit because JSG, Inc. subsequently withdrew its application. A Department of Justice opinion on the issue indicated that the Commission has the option to allow or disallow this type of facility depending on their interpretation of the statutes and rules pertaining to "field burning" credits.

C. Rule Adoption: 1992-1994 Triennial Water Quality Standards Review: Proposed Revisions to Standards

The agenda item is about revision to five water quality standards. The standards proposed to be revised during the 1992-1994 triennial review include dissolved oxygen (DO), temperature, pH, bacteria and groundwater nitrate.

Chair Wessinger stated that confusion existed about the standards. He said the Commission would use this time to provide information and education and would not, therefore, take action on the standards until the January Environmental Quality Commission (EQC) meeting. Chair Wessinger as well as the other Commissioners indicated the delay would help achieve a better understanding of the standards around the state. The Commission recognized that the committees and staff had worked very hard to develop the new standards.

Mike Downs, Administrator of the Water Quality Division, gave a brief introduction of this agenda item. He also provided the Commission with a summary of the list of the water quality limited waterbodies (303(d) list) and noted that the proposed pH, temperature and dissolved oxygen rules would all

reduce the number of listed segments as compared to the existing standards. Neil Mullane, Northwest Regional Office, provided the Commission with an example of how the standards would affect other agencies and those activities being regulated. He described how water quality is protected in the state: the regulatory framework that implements control when a waterbody achieves standards and also when a waterbody violates instream standards.

The Commission asked about determining beneficial uses and about the timelines associated with the standards. Mr. Mullane stated that the designation of beneficial uses is required by the federal Clean Water Act. He said the water quality standards protect the most sensitive beneficial uses. He said the advisory committees believed for the temperature standard that two to three years would be needed to develop management plans, then more time would be needed to implement the practices and, finally, still more time would be needed for the plans to mature.

The Commission and staff discussed the number of streams in violation of the current standards and the number in violation under the proposed standards.

Director Marsh said the Department is consulting with other agencies in developing a list of stream priorities. He said that designated management agencies (DMAs) will be responsible for ensuring that management plans are successful. He said the Department has written flexibility into the standards to ensure re-examination and adjustment. Further, Director Marsh indicated the Oregon Department of Agriculture (ODA) does not believe they have adequate resources to implement the standards all at one time. He said the Department will work with the ODA to develop an approach that would allow voluntary procedures. Commissioner Whipple said education would be of great value and stated that she did not think the agricultural community understood the statement on page E-7 of the Department's staff report:

...Staff acknowledge that in most of the state's basins, nonpoint source activities are the greatest contributors to stream warming....

She said the Department needs to share the view that their activities contribute to the water quality problem. She said it was imperative that the agencies understand that nonpoint sources are major contributors to raising water temperatures.

Commissioner McMahan asked staff to talk about chlorination of water. Lynne Kennedy of the Department's Water Quality Division said the cost of chlorine has been increasing; consequently, municipalities are exploring and using alternative disinfection methods. Ms. Kennedy said the bacteria standard

was based more on water contact uses than drinking water uses. Commissioner McMahan suggested that the Department consider both human and non-human water quality needs.

Nina Bell, Executive Director, Northwest Environmental Advocates, and member of the triennial review advisory committee, spoke to the Commission. She said she was unhappy that the Commission would not be taking action on the standards. She said that the advisory committees had worked for years on the standards. Ms. Bell pointed out three issues of concern.

1. The farming community had expressed reservations to Commission members about the temperature standard. Ms. Bell pointed out that agricultural interests had been well represented on the advisory committees. She said the committees had worked around the farming representatives, often delaying voting on issues until they could attend the meetings. She said that based on bylaws adopted by the committee, the farming representatives should have felt obligated to file a grievance if they believed the standards were unsuitable and biased.
2. Protecting and restoring Oregon's waters should be a compelling enough reason for the Commission to act today on the proposed standards.
3. The Commission should adhere to the new provisions of Administrative Procedures Act. She said the law had been violated and that the Commission had been receiving substantive comments and information and had been heavily lobbied. She said the Department's Assistant Attorney General should explain the law to them and that *ex parte* communication had taken place.

Assistant Attorney General Michael Huston said that under this new provision agencies cannot take public comment after the hearing date had passed. He said that serious questions had arisen over whether procedural errors had occurred. Mr. Huston told the Commission that they could not consider comments after the hearing deadline. He said that the Attorney General's Office had been struggling with how to deal with the new provision.

Bill Gaffi, General Manager of the Unified Sewerage Agency, and also a member of the advisory committee, spoke to the Commission. He said the committees had spent three years working on attainability and reasonableness of the bacteria and temperature standards. Mr. Gaffi said that the committees' rationale behind the standards was first to establish the beneficial use to be protected and then identify the criteria to be met. He said the committees struggled with the bacteria and temperature standards. He indicated it was

difficult to know if beneficial uses were ever attainable in some waterbodies; that is, whether the waterbody was ever historically protected. He finished by saying the committees' strategy was to develop standards that would be attainable.

Jim Webb, Columbia River Inter-Tribal Fish Commission, told the Commission he was glad the Commission was concerned about industries and hoped that they were concerned about the fisheries industry. He spoke about treaties and how the Tribes have worked with irrigators to improve stream temperatures. Commissioner Van Vliet asked Mr. Webb if the Tribes had been using casino proceeds to improve streams. Mr. Webb responded that the Tribes had used their own resources for stream improvements long before the casinos had opened.

The Commission will consider this agenda item again at the January 11-12, 1996, meeting.

Public Forum

Alex Mauch of Northwest EZ Lay Drain expressed concern regarding the delays in the approval process for new sewage technologies. He briefly discussed the Oregon On-Site Wastewater Association and emphasized the need to establish a center for training installers and manufacturers in the new technologies.

Larry Tuttle spoke of his 1800+ mile walk across the western United States to highlight mining reform. He expressed concern regarding the potential environmental damage due to current mining practices. He appealed to the Commission to direct Department staff to continue to look carefully at mining impacts.

The meeting was temporarily adjourned at 12:05 p.m. and reconvened at 12:45 p.m.

D. Rule Adoption: Temporary Rules: Delay Effective Date of Requirements for Certain Very Small Landfills

Mary Wahl, Waste Management and Cleanup Division Administrator, introduced a proposal to adopt temporary rules delaying the effective date of requirements for very small municipal landfills. The proposed rules would delay until October 9, 1997, most of the requirements under subtitle D of the Resource Conservation and Recovery Act (RCRA) for very small landfills in dry areas that meet certain criteria. These temporary rules would match the EPA's newly adopted effective date for these requirements. Temporary rules are proposed in

order to allow adoption by Oregon of the new effective date as quickly as possible, since without rule adoption the RCRA subtitle D requirements would go into effect immediately at these very small landfills.

Commissioner Lorenzen moved to approve adoption of the temporary rules. Commissioner Whipple seconded the motion and it was unanimously approved.

E. Rule Adoption: Asbestos Program Requirements, Division 22 Redefinition of Volatile Organic Compound, Primary Aluminum Plant Rules, and Housekeeping Revisions

Greg Green, Air Quality Division Administrator and Ben Allen, Air Quality Division, presented this item to the commission.

The proposed rule package contained a number of unrelated rules.

- The EPA required the Department to make changes to its asbestos regulation and certification rules before the programs could be fully approved.
- The Department recommended changes to the primary aluminum plant rules which would modify testing requirements and clarify applicability of the rules to fugitive emissions.
- The Department recommended a number of minor housekeeping revisions.

Commissioner Van Vliet moved approval of the Department's recommendations. Commissioner McMahan seconded the motion and it was unanimously approved.

F. Action Item: Issuance of Pollution Control Bonds

Barrett MacDougall of the Department's Management Services Division introduced this item which concerned authorization to issue, sell and use the proceeds of not more than \$15 million in pollution control bonds. The Department recommended the Commission adopt the resolution as presented. Bonds to be sold in the immediate future were \$8 million for orphan site cleanup and \$5 million for state match for the State Revolving Fund.

Chair Wessinger asked about which orphan sites would be cleaned up with the bond proceeds and whether the Department ever recovered its costs for orphan site cleanup. Mary Wahl, Waste Management and Cleanup Division

Administrator, responded to the Chair's questions. Commissioner Whipple moved approval of the resolution and findings; Commissioner Van Vliet seconded the motion. The motion was unanimously approved.

NOTE: The following agenda items were taken out of order.

K. Action Item: Deputy Director Position

Director Marsh presented this item to the Commission, recommending the Commission adopt the establishment of a deputy director position for the Department. The person in the proposed position would report directly to the Director and have authority to act on the Director's behalf when he is absent. The position would assist in managing the Department and coordinate efforts within the Department as well as with the general public, private organizations and local, state and federal governments.

Commissioner Van Vliet moved to approve the recommendation. Commissioner Whipple seconded the motion and it was unanimously approved.

J. Action Item: Extension of the Tualatin Sub-basin Nonpoint Source Management Implementation/Compliance Schedule and Order

Tom Bispham, Northwest Region Administrator, and Mike Wiltsey, Northwest Region, presented this item. The item requested the Commission to extend the compliance schedule adopted in the Tualatin Sub-basin Nonpoint Source Management Implementation/Compliance Schedule and Order. Mr. Bispham and Mr. Wiltsey briefed the Commission on the need for a 15 month extension of the Order to allow for a scientific review of the Tualatin Basin Total Maximum Daily Load (TMDL). The Commission was also informed of the significant water quality improvement in the Tualatin River due to management activities resulting from the TMDL process. The Commission directed the Department to keep them apprised of the progress of the TMDL review and of the status of water quality in the Tualatin Basin.

Commissioner Whipple moved to approve the Department's recommendation. Commissioner Van Vliet seconded the motion and it was unanimously approved.

L. Commissioners' Reports

There were no Commissioners' Reports presented.

M. Director's Report

Director Marsh reported the Department appeared before the legislative Emergency Board asking for authority to accept EPA air quality special grants monies and to carry over federal Intermodal Transportation monies. The Department also asked for 10 additional positions in the voluntary cleanup program and one in the on-site program for the Grants Pass office. The items will be before the full Ways and Means Committee on November 17, 1995.

Director Marsh reviewed possible impacts on the Department from the federal budget shutdown, primarily with effects of cuts in EPA funding. He also discussed a proposed modification in the Department's procedure in Public Hearings on Rules, to be presented to the Commission for consideration at a later date..

The Commissioners agreed to hold a telephone conference call on December 28, 1995, to review tax credit applications.

G. Action Item: DEQ v. Oregon Coast Sanitation, Case Numbers HW-WR-94-038 and HW-WR-94-051 - Appeal of Hearings Officer Findings of Fact

This case came before the Environmental Quality Commission on Oregon Coast Sanitation's appeal of the hearings officer's Findings of Fact and Conclusions of Law, and Final Order, dated May 22, 1995. The hearings officer determined that Oregon Coast Sanitation, while unable to pay the entire amount of the penalties at the time, was able to pay the civil penalties under a payment plan. In their appeal, Oregon Coast Sanitation contends that the hearings officer was unable to fully comprehend the complexity of various financial transactions which rendered them unable to pay the civil penalties.

After considering the record in this case and statements from each party, Commissioner Whipple moved to affirm the decision of the hearings officer, dated May 22, 1995. Commissioner Lorenzen seconded the motion and it was unanimously approved.

H. Action Item: Earth Science Technology Inc., Case Number UT-NWR-94-218 - Appeal of Hearing Order Regarding Assessment of Civil Penalty and Revocation of UST License

This case came before the Environmental Quality Commission on the Earth Sciences Technology's appeal of the hearings officer's Hearing Order

Regarding Assessment of Civil Penalty and Revocation of UST License, and Final Order and Judgment, dated April 19, 1995. The hearings officer found that:

- Earth Science Technology's testing of 247 underground storage tanks did not meet federal and state requirements and Earth Science Technology was liable for a civil penalty in the amount of \$370,500 and
- Earth Science Technology was negligent for failing to meet the federal and state requirements and its license to provide underground tank services was revoked. It was further found that Earth Science Technology's negligence stemmed from its failure to provide timely training and equipment for its employees. Earth Science Technology took exception to the finding of negligence.

After considering the record in the case and statements from both parties, Commissioner Van Vliet moved to remove the economic benefit calculation of \$300 per tank, for a revised total penalty of \$296,400, and otherwise uphold the findings of the hearings officer dated April 19, 1995. Commissioner McMahan seconded the motion. A roll call vote was taken and the motion was approved with four yes votes. Commissioner Whipple cast the no vote.

I. Action Item: Citizens Interested in Bull Run, Inc. Appeal of Hearings Officer Denial of Full Party Status

This case came before the Environmental Quality Commission on Citizens Interested in Bull Run, Inc. and Frank Gearhart's appeal of the hearings officer's Order of Party Status of Citizens Interested in Bull Run, Inc. and Frank Gearhart dated September 22, 1995. The hearings officer denied party status to Frank Gearhart and granted limited party status to Citizens interested in Bull Run, Inc.

After considering the record in this case and statements from Citizens Interested in Bull Run, Inc., Frank Gearhart and the Department of Environmental Quality, Commissioner Lorenzen moved to affirm the hearings officer's findings dated September 22, 1995. Commissioner Whipple seconded the motion and it was unanimously approved.

There was no further business and the meeting was adjourned by Chair Wessinger at 3:45 p.m.

Environmental Quality Commission

- ☐ Rule Adoption Item
☒ Action Item
☐ Information Item

Agenda Item B
February 23, 1996 Meeting

Title:

Approval of Tax Credit Applications

Summary:

New Applications - Four (4) tax credit applications with a total facility cost of \$397,852 are recommended for approval as follows:

- 2 Field Burning related facilities recommended by the Department of Agriculture with a total facility cost of: \$134,807
- 2 Water Quality facilities costing: \$263,045

No applications with claimed facility costs exceeding \$250,000 are included in this Report.

Issues pertaining to claims made by the Quality Trading Company and Reidel Environmental Technologies are discussed in the Background and Alternatives sections of this report.

Department Recommendation:

Approve tax credit certificates for 4 applications as presented in Attachment A of the staff report.

Report Author

Division Administrator

Director

February 7, 1996

†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: February 23, 1996

To: Environmental Quality Commission
From: Langdon Marsh, Director
Subject: Agenda Item B, February 23, 1996 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 4550	PED Manufacturing, Ltd. \$51,307	A Water Pollution Control wastewater treatment facility consisting of two 1500 gallon equalization tanks, a 2 cubic foot filter press, a 500 gallon acid tank, a 600 gallon treatment tank and associated equipment.
TC 4552	Northwest Brewers Grain of Oregon, Inc. \$211,738	A Water Pollution Control leachate collection and disposal facility consisting of the construction of trench grades at storage bunkers, piping, a pump station including a PALO Model 480-01 pump, a 52,600 cubic foot bentonite lined lagoon and associated electrical and plumbing equipment.

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

Application No.	Applicant	Description
TC 4566	Knox Seed, Inc. \$24,000/65 %	An Air Pollution Control "field burning" facility consisting of a John Deere 156 hp 4640 tractor for operating a flail chopper and harrowing/rolling equipment.
TC 4576	Larry and Mary Lou Neher \$110,807/52 %	An Air Pollution Control "field burning" facility consisting of a 180' x 124' x 24' pole construction grass seed straw storage building.

Background and Discussion of Issues

Riedel Environmental Technologies

On December 10, 1993, the Environmental Quality Commission approved a solid waste landfill pollution control facility (TC 3810) on the condition that the applicant implement a corrective action plan to bring the facility into compliance with pollution control regulations and permit requirements by December 31, 1995 or have the certificate deemed revoked as of that date. This action was necessitated because a fire had destroyed much of the facility between the time that the application was determined to be complete and the December meeting date. Because corrective action has not been taken to bring the facility into compliance, certificate No. 3221 is deemed to be revoked as of 12/31/95. The applicant is entitled to a contested case hearing, if they choose to pursue the matter.

Quality Trading Company, L.L.C.

The Quality Trading Company, a Limited Liability Corporation, claimed tax credit relief (TC 4523) for machinery, buildings, improvements and land associated with their grass seed straw operations in Aurora, Oregon. The Environmental Quality Commission approved the costs for the majority of the claim at the meeting of December 28, 1995. However, the Commission deferred taking action to approve the costs pertaining to a claim for 5 acres of land valued at \$33,333 pending a reexamination of the issues that pertain to this portion of the claim.

An evaluation of two sets of issues is generally required to determine the certifiable cost for a claim for tax relief for a land facility. First, the land must be eligible as a tax credit facility. In addition, the potential for a return on the investment in the facility must be evaluated and the percentage of the facility's cost that is allocable to pollution control determined.

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Eligibility

For land to be eligible it must meet either the principal or sole purpose eligibility criterion and make a significant contribution to pollution control. In general, this means that the amount of land claimed must be reasonable for a legitimate pollution control purpose. The Quality Trading Company claim presented in the application was based upon an estimate provided by the previous owner of the acreage required for the purpose of grass seed straw and equipment storage and road access to the property.

This estimate was accepted by the Department of Agriculture and the DEQ as being reasonable for those purposes given the nature of the facilities. The Quality Trading Company claim included two 208' x 60' x 26' grass straw storage buildings, an 80' x 200' x 20' compressor building with a loading dock, 9 cement pads for truck containers, two service ramps (60' x 60' and 140' x 60') and space for more than 20 large freightliner trucks, tractor trailers and other grass seed processing equipment. Since the date of application submission the Quality Trading Company has reestimated the acreage dedicated to grass straw operations using actual measurements and has determined that slightly more than 6.4 acres is used for pollution control purposes (see Exhibit A, attached). The applicant wishes to revise its claim based upon the new estimate, which would result in an increase of the claimed facility cost from \$33,333 to \$42,780. Representatives of the Department of Agriculture and the DEQ visited the site to assess the validity of the claim and determined that the acreage claimed appears to be a reasonable estimate of the acreage required as a site for Quality Trading's grass seed straw handling and storage operations.

Allocability (ROI)

To determine the potential return on investment for the land, the Department requested that the accounting firm of Boldt, Carlisle and Smith, L.L.C., use a methodology that was recently applied to a claim made by the Johnson Controls Group for an industrial land facility. The methodology estimates the return on investment for a land facility by calculating the average percentage increase in the assessed costs for the claimed land for the period five years prior to its purchase until the claim was made and applying that growth rate to the purchase price of the land in conformance with the formula presented in the Rules for determining a facility's return on investment (ROI). Under this methodology, the present value expense of future transaction costs to sell the property are allowed in addition to normally allowable expenses e.g., property taxes. A "useful life" for land facilities of 30 years, the longest period presented in the ROI tables, was selected as a representative holding period for land purchased for pollution control purposes. Based upon this methodology it was determined that 95% of the land portion of the Quality Trading Company facility is allocable to pollution control.

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However, in reevaluating the ROI calculation it was discovered that an oversight occurred in that the estimated future transaction expenses were not discounted to present value by a 5% inflation discount factor. This caused the percentage allocable to be overstated. The correct percentage allocable using the current methodology is 68% (see Exhibit C, attached).

Given the facts presented above, it should be noted that a) the land claimed by the Quality Trading Company is restricted to agricultural use and cannot be converted to any other use and b) although a 30 year holding period for an industrial facility may be reasonable, grass seed straw processing operations probably average a much shorter "useful life" i.e., the turnover of average grass seed straw processing businesses is probably closer to 10 than 30 years, although no statistics have been evaluated that bear upon this issue.

A discussion of alternatives that might be considered in evaluating the Quality Trading Company's land facility claim is presented in the Alternatives and Evaluation section of this report.

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

Quality Trading Company, L.L.C.

Eligibility

In as much as there is no guidance in statute, rule or legal precedent that defines the exact nature of what constitutes an eligible land facility claim, it may be possible for the Commission to specify the purposes for which land claims would be allowed. For example, is the fact that pollution control facilities are constructed or equipment stored on a parcel of land sufficient to make the land eligible for tax credit relief? Or perhaps, should land facilities be required to meet a more stringent standard e.g., be "actively" used for the purpose of pollution control, for example, as an area for absorbing wastewater from food processing plants or as a buffer to avoid breaching permit requirements (Johnson Controls Group).

On the issue of whether land makes a significant contribution to pollution control, both the nature and size of the claim are germane. In the case of Quality Trading Company's claim, two access roads are claimed in addition to the space used for building sites and equipment and grass straw storage. Although access areas have been approved in previous claims e.g., TCs 3676, 4016, and 4567, the Commission could determine that acreage that only provides access to a pollution control

facility does not make a significant contribution to pollution control at the site and would be required in any case for the business to function. The Quality Trading Company claims 40,240 sq. ft. of space for access roads in this application. Disallowing costs for access acreage this would reduce the certifiable cost of the applicant's revised acreage estimate by approximately \$6,159.00 to \$36,618.00.

Moreover, the applicant claimed 5 acres of land, instead of 6.417 acres, in their submitted application and is requesting a revision of the claim based upon a more accurate estimate of the size of the claimed facility. The Commission could, perhaps, hold the applicant to the value of claim that was presented in its application.

Cost Allocation

The Department is continuing to evaluate alternative methodologies for calculating the percentage of a given land facility that is allocable to pollution to identify an approach that is fair both to the applicant and to the taxpayer.

As indicated in the Background section, a unique aspect of the current ROI methodology for land facilities is that the present value of future transaction costs are calculated for a sale that would take place after 30 years and an allocation of those costs are used to calculate the average annual cash flow of the facility. This approach is intended to allow credit for expenses in current dollar terms that would be likely to be incurred were the facility to be sold after a holding period of 30 years.

Although this approach represents an accepted approach for determining the holding period return of an investment and may work reasonably well for a certain range of property appreciation rates, a sensitivity analysis performed on a wider range of possible rates indicates that at higher rates of property appreciation the methodology provides for excessive present value expenses when applied to the standard ROI methodology presented in the rules.

To address this anomaly, the Department has evaluated an alternative methodology for calculating the return on investment for land claimed as a pollution control facility. This approach provides the applicant a benefit for the current value of transaction costs (after a one-year investment holding period), which is increased annually at the property's gross appreciation rate for the five year period covered by the standard ROI formula. This cost is amortized over the 30 year estimated useful life of the asset by use of the ROI formula and Table 1 of the rules.

Using this methodology, and the data and assumptions that apply to the Quality Trading Company claim, the percentage allocable for this claim would be 26%. Using the same assumptions, benefits would be phased out at a gross property appreciation rate of approximately 7 1/4%. Of course, each land facility would present differing expense parameters, these results are thought to be representative of the results that might be expected for future claims of this nature.

This approach has the advantages of being straight-forward and is easy for an applicant to calculate. It also avoids the anomalies of the current methodology in that it provides for consistent results over a wide range of property appreciation ranges.

On the other hand, transaction expenses could perhaps be viewed as extraneous to the process of determining the percentage of a facility that is allocable to pollution control. The rules (340-16-030) stipulate that "annual operating expenses" mean the estimated cost of operating a facility including labor, utilities, property taxes, insurance and other cash expenses. Transaction costs are not mentioned and are not, in fact, operating costs. Nevertheless, except where rents are realized, no income or return on investment for land can be realized until the asset is sold, at which time transaction costs are likely to be incurred. In the case of Quality Trading Company's land claim, eliminating transaction costs as an allowable expense in calculating the percentage allocable would reduce the percentage allocable to 15%.

Land has, of course, no useful life in terms of depreciation, depletion or amortization of value over time. The selection of an appropriate useful life is essentially arbitrary. An evaluation of the average facility holding periods (business turnover) by industrial/economic sector could perhaps be performed but applying differing useful life standards to various business sectors of the Oregon economy would create complexity. Moreover, the number of land facility claims are few. However, if it were to be determined that a 40 or 50 year useful life for land is more representative, this would have a significant impact on the results generated by the current methodology. In the Quality Trading Company example, a useful life assumption of 40 years applied to the current methodology would result in a percentage allocable of 0%.

In summary, there are alternatives that the Commission may wish to consider in determining the appropriate certifiable cost for the land portion of the Quality Trading Company application. The Commission could, for example:

- 1) Deny the application on the basis that the claimed facility does not meet the eligibility requirements in law. This would contravene precedent and would probably require a specific definition of eligibility for land facilities by rule.
- 2) Approve the original claim for the cost of the land portion of the facility using the current methodology for determining the allocable cost in which case the certifiable cost would be \$33,333 with 68% allocable to pollution control.
- 3) Approve the applicant's revised request using the current methodology in which case the certifiable cost would be \$42,780 with 68% allocable to pollution control.
- 4) Approve a modified revised request. For example, by denying acreage claimed for access roads. There are precedents, however, for including such claims.

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- 5) Approve alternatives 2, 3, or 4 but require that the current methodology for determining the cost of the facility that is allocable to pollution control be adjusted; for example, by eliminating or reducing expenses for future transaction costs or by lengthening (or shortening) the investment time horizon i.e., useful life of the facility.

The department's recommendation is presented in the Recommendations for Commission Action section of this report.

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

- o 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.

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o Proposed February 23, 1996 Pollution Control Tax Credit Totals:

<u>Certificates</u>	<u>Certified Costs*</u>	<u>Certified Allocable Costs**</u>	<u>No.</u>
Air Quality	\$ 0	\$ 0	0
CFC	0	0	0
Field Burning	134,807	73,220	2
Noise	0	0	0
Hazardous Waste	0	0	0
Plastics	0	0	0
SW - Recycling	0	0	0
SW - Landfill	0	0	0
Water Quality	263,045	263,045	2
UST	<u>0</u>	<u>0</u>	<u>0</u>
TOTALS	\$397,852	\$336,265	4

o Calendar Year Totals Through January 12, 1996:

<u>Certificates</u>	<u>Certified Costs*</u>	<u>Certified Allocable Costs**</u>	<u>No.</u>
Air Quality	0	0	0
CFC	0	0	0
Field Burning	46,545	46,545	1
Noise	0	0	0
Hazardous Waste	0	0	0
Plastics	10,123	10,123	1
SW - Recycling	0	0	0
SW - Landfill	0	0	0
Water Quality	0	0	0
UST	<u>0</u>	<u>0</u>	<u>0</u>
TOTALS	\$56,668	\$56,668	2

*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.

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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) The Department recommends that certificate 3221, Riedel Environmental Technologies, be revoked as of December 31, 1995.
- C) The Department recommends approval of a certifiable cost of \$42,780 with 68% of the cost allocable to pollution control for Quality Trading Company's land portion of pollution control tax credit application 4523. The Department further recommends that the alternative methodology presented in the Alternatives and Evaluation section of this report be applied to future land claims.

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:

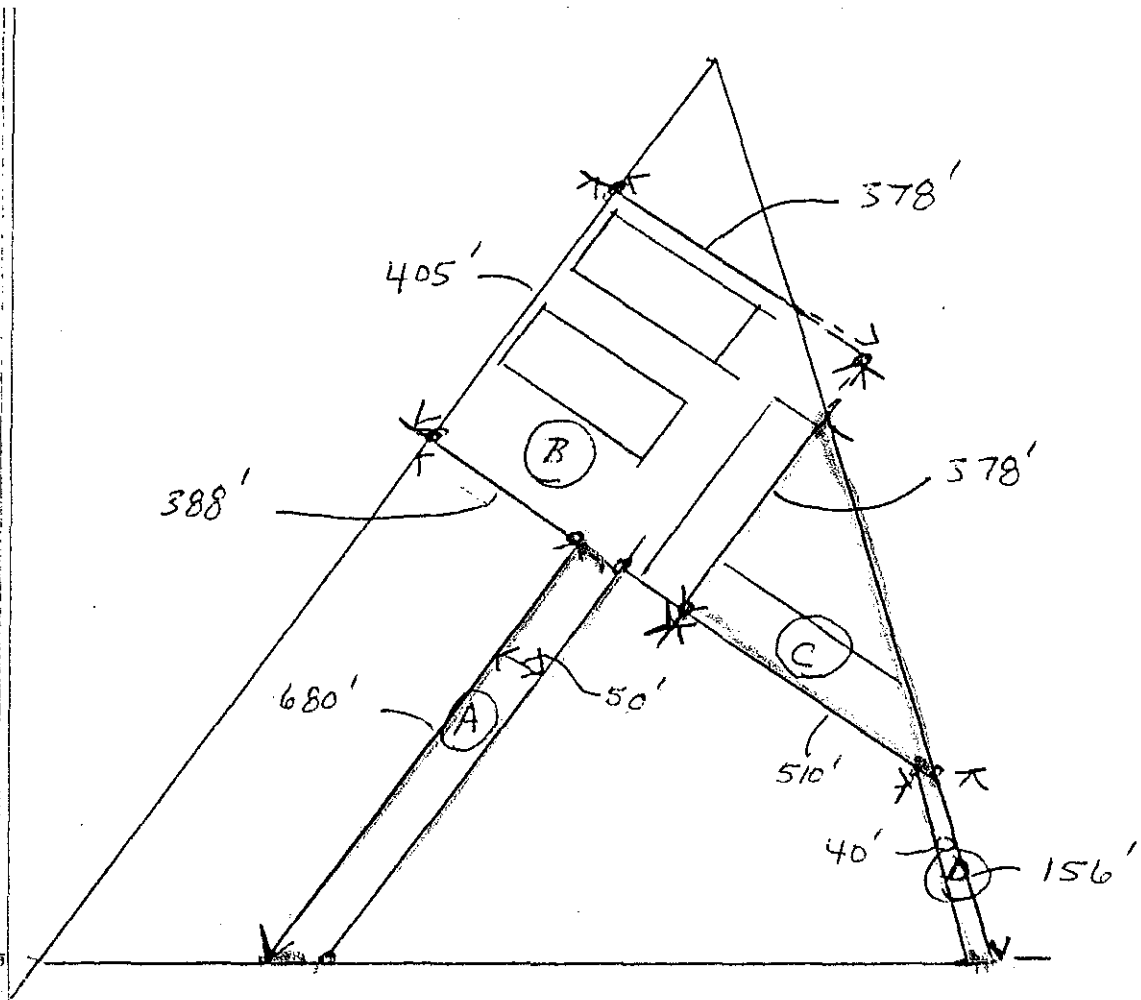
Report Prepared By: Charles Bianchi

Phone: 229-6149

Date Prepared: February 7, 1995

Charles Bianchi
FEBEQC

Quality Trading Company, L.L.C.
TC 4523 (land)



A =	50' x 680'	Road	=	34000	sq ft
B =	378' x 378'	Operation		142884	sq ft
C =	378' x 510'	Δ		96390	sq ft
D =	40' x 156	Road		6240	sq ft
				279514	sq ft

$$279514 \div 43560 \text{ sq ft/A} =$$

6.417 Acres.

Application No. TC-4523

State of Oregon
Department of Agriculture

TAX RELIEF APPLICATION REVIEW REPORT

1. Applicant

Quality Trading Co., L.L.C.
Gerald Mullen, Managing Member
11325 Ehlen Road
Aurora, Oregon 97002

The applicant owns and operates grass seed farm operations in Marion, Washington, Clackamas and Yamhill Counties, Oregon.

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

2. Description of Claimed Facility

The facility described in this application is a straw storage/compressing system, located at 11325 Ehlen Road, Aurora, Oregon. The land and the buildings are owned by the applicant.

Claimed facility cost: \$1,631,416 (see Exhibit C)
(Accountant's Certification was provided.)

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

The member farmers of Quality Trading Co., L.L.C. have 10,555 acres of perennial grass seed under cultivation. At the peak of the field burning limitation (250,000 acres) the member farmers open field burned approximately 80% (8,440 acres) of their total acreage on an annual basis. Their initial alternative to open field burning included obtaining an outside bailing service to remove the bulk straw, then propane flaming and/or stack burning when necessary.

Outside baling services proved to be unreliable in timely removal and storage of straw. Timely removal of straw from harvested grass seed fields is the cornerstone of the farmer members alternatives to open field burning and propane flaming. Further, reliable storage space minimizes the need for stack burning.

Member farmers intend to eliminate all open field burning, propane flaming and stack burning of grass seed straw and this investment is their commitment to bale and remove straw from fields rather than burning it. Prior to purchase, individual member farmers had neither control over or the resources to buy the requisite straw removal system.

4. Procedural Requirements

The facility is governed by ORS 468.150 through 458.190, and by OAR Chapter 340, Division 16. The facility has met all statutory deadlines in that:

5. Evaluation of Application

a. The facility is eligible under ORS 468.150 because the facility 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 OR 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 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 promotes the conversion of a waste product (straw) into a salable commodity by providing the system to store and process the grass seed straw.

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

The actual adjusted cost of the claimed facility (\$1,422,149) divided by the average annual cash flow (\$<91,005>) equals a return on investment factor of 0. Using Table 1 of OAR 340-16-030 for a life of 12 years, the annual percent return on investment is 0. Using the annual percent return of 0 and the reference annual percent return of 4.7, 100% is allocable to pollution control.

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 installation of the facility.

There is an increase in operating cost of \$91,005 to annually maintain and operate the facility. These cost 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 facility properly allocable to the prevention, control or reduction of air pollution.

The Environmental Quality Commission has directed that applications of \$250,000 and grater undergo an accounting review. This was performed by the firm of Bold T, Carlisle and Smith. The review identified costs that were claimed under previously grants tax credit certificates amounting to \$207,600. The claimed cost were further reduced by \$1,677 to account for the potential for the appreciation of land claimed, according to the methodology established by the Department for that purpose.

6. Summation

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

- b. The facility 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 on ORS 468A.005.
- c. The facility complies with DEQ statutes and rules.
- d. The portion of the facility 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 \$1,422,149, with 100% allocated to pollution control, be issued for the facility claimed in Tax Credit Application Number TC-4523.

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

QUALITY TRADING CO., LLC

EIN#: 93-1179858

APPLICATION FOR FINAL CERTIFICATION OF A POLLUTION CONTROL FACILITY

<u>Item</u>	<u>Amount</u>
Machinery & Equipment	
1984 Hay squeeze (Road Runner)	44,000
1994 Hay squeeze (Road Runner)	131,900
1984 Hyster hay squeeze w/ Manceta hay squeeze	67,400
1968 Yard Goat (International)	5,000
1989 Freightliner	36,600
1989 Freightliner	36,600
1989 Freightliner	36,600
32' tractor trailers	20,500
32' tractor trailers	20,500
32' tractor trailers (Comet)	20,500
32' tractor trailers (Comet)	20,500
1990 bale destacker	36,600
1992 bale destacker	44,000
1994 bale destacker	51,300
1994 3/4 rack	5,900
1992 full rack	5,900
1995 Hyster lift truck (#6000)	32,200
1979 Kamatsu lift truck	5,900
1988 yellow bale compressor	366,300
1994 1000 gallon fuel tank	5,900
1994 1000 gallon fuel tank	5,900
Grapple tractor attachment to handle hay	1,333
Ingersoll Rand air compressor	5,000
Brudi carton clamp	3,000
SG-410 hay wrapper	17,650
Sub total-Machinery & Equipment	<u>1,026,983</u>
Buildings & Improvements:	
208'x 60'x 26' storage w/ cement floor & wood construction	92,100
208'x 60'x 26' storage w/ cement floor & steel construction	109,800
80'x 200'x 20' compressor building w/ cement floor, wood construction, loading dock, utilities	275,000
Service ramp - 60'x 60' cement & 140'x 60' cement plus gravel	75,100
9 cement pads for truck containers	19,100
Sub total-Buildings & Improvements	<u>571,100</u>
Land:	
5 acres @ 11325 Ehlen Rd., Aurora, Oregon	<u>33,333</u>
Total	<u><u>1,631,416</u></u>

Quality Trading Co., L.L.C.
Land Cost Allocation
TC 4523

PROPERTY TAX APPRAISALS: Tax lot 40297-000 T04 R1W S08
18 Acres - EFU designation

Year	Appraised Values	Avg Pct Growth
90-91	17,110	
91-92	17,690	
92-93	20,000	
93-94	21,050	
94-95	22,880	6.74%

Value - 5 Acres of Land Claimed on Application \$33,333

		<u>A</u> Dec 28 Report	<u>B</u> Johnson Controls Methodology	<u>C</u> Alternative Approach
Future Value in 30 years	6.74%	235,880	235,880	35,580**
Estimate of Transaction Cost,				
after 30 years (A & B only)	10.00%	23,588	17,217*	3,558
1/30th of transactions cost	30	786	574	119

RETURN ON INVESTMENT CALCULATIONS

				A	B	C	A	B	C
Year	Projected Value	Annual Growth	1.50% Prop Tax	Trans Cost	Trans Cost	Trans Cost	Net Income	Net Income	Net Income
95-96	35,580	2,247	534	786	574	119	927	1,139	1,594
96-97	37,978	2,398	570	786	574	127	1,042	1,154	1,701
97-98	40,537	2,560	608	786	574	135	1,166	1,378	1,851
98-99	43,270	2,732	649	786	574	144	1,297	1,509	1,939
99-00	46,186	2,916	693	786	574	154	1,437	1,649	2,069
Totals							5,869	6,929	9,154
Average Annual Cash Flow							1,174	1,386	1,830
Useful life of facility claimed (years)							30	30	30
Return on Investment Factor							28.393	24.050	18.218
Annual Percent RO (Table 1)							0.25%	1.50%	3.50%
Reference Annual rate (Table 2)							4.70%	4.70%	4.70%
Portion of Costs Allocable to Project							95%	68%	26%

*Transaction cost adjusted to present value at a 5% inflation discount rate.

**Estimated value of facility after 1 year investment holding period.

STATE OF OREGON
DEPARTMENT OF ENVIRONMENTAL QUALITY
POLLUTION CONTROL FACILITY CERTIFICATE

Certificate No: 3221
Date of Issue: 12/10/93
Application No: T-3810

ISSUED TO:

Riedel Environmental Technologies, Inc.
Riedel Waste Systems, Inc.
P.O. Box 5007
Portland, Oregon 97208-5007

LOCATION OF POLLUTION CONTROL FACILITY:

5600 NE 75th
Portland

ATTENTION: Mark McGirr

AS: ☐ LESSEE ☐ OWNER ☐ INDIV ☐ PARTNER ☒ CORP ☐ NON-PROFIT ☐ CO-OP

DESCRIPTION OF POLLUTION CONTROL FACILITY:

Landfill cap and closure including methane gas control system.

TYPE OF POLLUTION CONTROL FACILITY:

☐ AIR ☐ NOISE ☐ WATER ☒ SOLID WASTE ☐ HAZARDOUS WASTE ☐ USED OIL

DATE FACILITY COMPLETED: 11/1/91

PLACED INTO OPERATION: 11/1/91

ACTUAL COST OF POLLUTION CONTROL FACILITY: \$1,438,742.00

PERCENT OF ACTUAL COST PROPERLY ALLOCABLE TO POLLUTION CONTROL: 100%

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: William W. Wessinger (William W. Wessinger, Chairman)

Approved by the Environmental Quality Commission on the 10th day of December, 1993.

State of Oregon
Department of Environmental Quality

TAX RELIEF APPLICATION REVIEW REPORT

1. Applicant

PED Manufacturing, Ltd.
13963 Fir Street PO Box 5299
Oregon City OR 97045-8299

The applicant owns and operates a metal casting facility in Oregon City, Oregon.

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

2. Description of Facility

The claimed wastewater treatment facility is a batch treatment system which includes two 1500 gallon equalization tanks, a 2 cubic foot filter press, a 500 gallon acid tank, a 600 gallon treatment tank and associated electrical control and plumbing system.

Claimed Facility Cost: \$51,307
Accountant's Certification was provided.

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 installation of the facility was substantially completed in September 1994 and the application for certification was found to be complete on December 7, 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 control a substantial quantity of water pollution. This control is accomplished by the use of treatment works for industrial waste as defined in ORS 468B.005.

Prior to the construction of the facility, the applicant had a wastewater treatment facility which consisted of a large holding tank fitted with a recirculation pump. The wastewater collected from the

manufacturing processes is now treated with chemicals and is discharged to the Oregon City sanitary sewer by batch. The batch is tested to insure that limits imposed by the city are met prior to the discharge of the treated wastewater.

The claimed facility is more reliable and efficient and allows for better pretreatment control of wastewater discharge to the sanitary sewer. The company is in compliance with the pretreatment requirements of Oregon City.

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.

There is no annual percent return on the investment.

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

The first alternative researched was recycling the material. No technical solution for recycling was discovered. Consideration was given to ultrasound technology as opposed to the current chemical process producing the waste. It was determined that the process is not technically feasible. An additional alternative was to purchase a larger spinner hanger to mechanically process parts versus the current chemical method. This method might have damaged the parts resulting in higher scrap.

- 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 more than \$21,000 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.

There are no other factors to consider in establishing the actual cost of the facility properly allocable to prevention, control or reduction of 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 tax credit certification in that the sole purpose of the facility is to control a substantial quantity of water pollution. This control is accomplished by the use of treatment works for industrial waste as defined in ORS 468B.005.
- c. The facility complies with DEQ statutes and rules and city pretreatment requirements.
- 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 \$51,307 with 100% allocated to pollution control, be issued for the facility claimed in Tax Credit Application No. T-4550.

Elliot J. Zais
(503) 229-5292
January 2, 1996
PED4550.A

State of Oregon
Department of Environmental Quality

TAX RELIEF APPLICATION REVIEW REPORT

1. Applicant

Northwest Brewer's Grain of Oregon, Inc.
9706 4th Avenue NE, Suite 305
Seattle WA 98115-2157

The applicant owns and operates a recycling storage facility for spent brewery grain in Portland, Oregon.

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

2. Description of Facility

The facility is a leachate collection and disposal system consisting of trench grades at each storage bunker, an 8-inch PVC pipe system, a pump station with a PALO Model 480-01, 3.2 HP, 160 gpm pump, a 52,600 cubic foot bentonite lined lagoon and associated electrical and plumbing system.

Claimed Facility Cost: \$211,738
Accountant's Certification was provided.

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 on August 15, 1995 and the application for certification was found to be complete on November 13, 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 Department to prevent water pollution. The requirement is to comply with Department order Stipulation and Final Order No. WQIN-NWR-93-055 (SFO).

Northwest Brewer's Grains of Oregon, Inc. was issued an SFO dated May 18, 1993 for unpermitted wastewater and contaminated storm water discharges to a Sauvie Island Drainage District ditch which drains into the Columbia River. The SFO required the applicant to construct a collection and disposal system for the spent grain

leachate discharge and to apply for a waste discharge permit.

Leachate from the spent grains stored in covered bunkers is collected by trench grades and is pumped to a 52,600 bentonite lined lagoon for storage. During dry weather conditions leachate is irrigated unto a 10-acre crop land area leased from Northwest Brewers Grains Development Company of Oregon. The claimed cost does not include the land.

All of the conditions of this SFO have been fulfilled. The Department has received an application for a Water Pollution Control Facilities permit and that application is being processed. The permit should be issued within the next six months.

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.

There is no income from this facility and therefore no return on investment.

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

The only alternative was to abandon the existing site and move the operation out of state. The selected alternative met the conditions of the SFO while retaining the existing site.

- 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.

- 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.

There are no other factors to consider in establishing the actual cost of the facility properly allocable to prevention, control or reduction of 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 tax credit certification in that the principal purpose of the facility is to comply with a requirement imposed by the Department and accomplishes this purpose by redesign to control industrial waste as defined in ORS 468B.005.
- c. The facility complies with Commission orders.
- 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 \$211,738 with 100% allocated to pollution control, be issued for the facility claimed in Tax Credit Application No. T-4552.

Elliot J. Zais
(503) 229-5292
January 11, 1996

NWBG4552.B

State of Oregon
Department of Agriculture

TAX RELIEF APPLICATION REVIEW REPORT

1. Applicant

Knox Seed, Inc.
35136 Highway 34
Lebanon, Oregon 97355

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 John Deere, 156hp 4640 tractor, located at 36168 Bohlken Drive, Lebanon, Oregon. The equipment is owned by the applicant.

Claimed equipment cost: \$24,000
(The applicant provided copies of the purchase order.)

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

The applicant has 335 acres of perennial grass seed and 265 acres of annual grass seed under cultivation. During the 1970's and 1980's the applicant open field burned all acreage on a rotational basis at approximately 50 percent per annum.

As alternatives to all open field burning, the applicant has selected these treatments by species:

Annuals-	Flail chop the bulk straw twice, plow the residue under, harrow and roll, re-seed or volunteer alternately, and apply fertilizer and herbicides.
Orchardgrass-	Flail chop the bulk straw twice leaving the residue on the surface to decompose.
Perennial-Ryegrass	Bale the bulk straw and flail chop the residue and apply fertilizer and herbicides. Every three or four years flail chop the bulk straw, plow the residue, harrow and roll, re-seed, and apply fertilizer and herbicides.

The tractor is required to complete fall operations in a timely manner and the wide flotation tires in front and dual radial tires in the rear enable farming in wet conditions with minimum impact on 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 July 1, 1995. The application was submitted on December 11, 1995; and the application for final certification was found to be complete on December 28, 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 \$4,300 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.

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:

<u>Implement</u>	<u>Hours Worked</u>	<u>Acres/ Hour</u>	<u>Annual Operating Hours</u>
Flail Chopper	900 (300+300X2)	6	150
Harrow/Roller	1000 (250x4)	7	<u>143</u>
Total Annual Operating Hours			293

The total annual operating hours of 293 divided by the average annual operating hours of 450 produces an allocation of 65 percent.

The actual cost of the equipment properly allocable to pollution control as determined by using these factors is 65%.

6. Summation

- The equipment was constructed in accordance with all regulatory deadlines.
- 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
- The equipment complies with DEQ statutes and rules.
- The portion of the equipment that is properly allocable to pollution control is 65%.

7. The Department of Agriculture's Recommendation

Based upon these findings, it is recommended that a Pollution Control Facility Certificate bearing the cost of \$24,000, with 65% allocated to pollution control, be issued for the equipment claimed in Tax Credit Application Number TC-4566.

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

JB/rc
December 28, 1995

State of Oregon
Department of Agriculture

TAX RELIEF APPLICATION REVIEW REPORT

1. Applicant

Larry and Mary Lou Neher
28485 Brownsville Road
Brownsville, Oregon 97327

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

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

2. Description of Claimed Facility

The facility described in this application is a 180' x 124' x 22' pole construction, grass seed straw storage building, located at 28485 Brownsville Road, Brownsville, Oregon. The land and the buildings are owned by the applicant.

Claimed facility cost: \$110,807
(Accountant's Certification was provided.)

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

The applicant has 910 acres of perennial grass seed and 922 acres of annual grass seed under cultivation. Prior to investigating alternatives to thermal sanitation, the applicant open field burned as many of those acres as the weather and smoke management program permitted.

The applicant now has a portion of the acreage baled off and follows with flail chopping the remaining stubble. To ensure the timely services of the custom baler, the applicant had the straw storage building constructed.

The applicant certifies that construction of the straw storage building removes 644 acres from open field burning.

4. Procedural Requirements

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

Construction of the facility was substantially completed on July 17, 1995. The application for final certification was found to be complete on January 10, 1996. The application was filed within two years of substantial completion of the facility.

5. Evaluation of Application

- a. The facility is eligible under ORS 468.150 because the facility 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 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 promotes the conversion of a waste product (straw) into a salable commodity by providing protection from inclement weather.

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

The actual cost of claimed facility (\$110,807) divided by the average annual cash flow (\$6,940) equals a return on investment factor of 15.966. Using Table 1 of OAR 340-16-030 for a life of 20 years, the annual percent return on investment is 2.25. Using the annual percent return of 2.25 and the reference annual percent return of 4.7, 52% is allocable to pollution control.

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 installation of the facility.

There is an increase in operating costs of \$2,300 to annually maintain and operate the facility. 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 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 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 52%.

6. Summation

- a. The facility was constructed in accordance with all regulatory deadlines.
- b. The facility 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 facility complies with DEQ statutes and rules.
- d. The portion of the facility that is properly allocable to pollution control is 52%.

7. The Department of Agriculture's Recommendation

Based upon these findings, it is recommended that a Pollution Control Facility Certificate bearing the cost of \$110,807, with 52% allocated to pollution control, be issued for the facility claimed in Tax Credit Application Number TC-4576.

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

JB/rc
January 22, 1996

Environmental Quality Commission

- ☒ Rule Adoption Item
☐ Action Item
☐ Information Item

Agenda Item C
February 22-23, 1996 Meeting

Title:

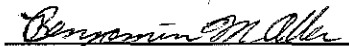
Division 22 Delisting of Acetone as a Volatile Organic Compound (VOC)

Summary:

Redefine "volatile organic compound" (VOC) for Division 22 of the Department's air quality rules. The change would bring Oregon's definition of VOC into line with the current federal definition of VOC for area and Reasonably Achievable Technology (RACT) sources. EPA has dropped acetone from the definition of VOC.

Department Recommendation:

The Department recommends that the Commission adopt the rule amendment regarding acetone as presented in Attachment A of the report.


Report Author


Division Administrator


Director

February 6, 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: February 7, 1996

To: Environmental Quality Commission

From: Langdon Marsh, Director

Subject: Agenda Item C , February 22-23, 1996, EQC Meeting

Division 22 Delisting of Acetone as a Volatile Organic Compound (VOC)

Background

On August 15, 1995, the Director authorized the Air Quality Division to proceed to a rulemaking hearing on proposed rules which would modify the definition of "Volatile Organic Compound" (VOC) in Division 22 sources to reflect EPA's "delisting" of acetone as a VOC.

Pursuant to the authorization, hearing notice was published in the Secretary of State's Bulletin on September 1, 1995. The Hearing Notice and informational materials were mailed on August 21, 1995 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.

A Public Hearing was held September 22, 1995, 11:00 AM, Room 10 A, 811 SW 6th Ave, Portland, OR 97204 with Benjamin M. Allen serving as Presiding Officer. The Presiding Officer's Report (Attachment C) summarizes the hearing.

Written comment was received through September 22, 1995. 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 D). No modifications to the initial rulemaking proposal are being recommended.

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 a summary of how the rule would work and how it is proposed to be implemented, and a recommendation for Commission action.

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

Memo To: Environmental Quality Commission
Agenda Item C
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Issue this Proposed Rulemaking Action is Intended to Address

EPA recently excluded acetone from the definition of Volatile Organic Compound (VOC), due to acetone's negligible photochemical reactivity. Oregon's Division 22 (area and RACT sources) definition is not consistent with the current federal definition of VOC. The Department intends to revise the Division 28 definition (industrial sources), early in 1996.

Relationship to Federal and Adjacent State Rules

EPA's regulations define VOC in 40 CFR §51.100. The federal definition excludes acetone.

Authority to Address the Issue

ORS 468.020, 468A.025.

Process for Development of the Rulemaking Proposal (including Advisory Committee and alternatives considered)

The redefinition of VOC is based on similar federal changes, and is meant to make Oregon area source rules conform to federal definitions. The Department informed the Air Quality Industrial Source Advisory Committee about the proposed rule. Because of interest from some Committee members, the Department delayed proposing adoption of the rule until this time to allow time for discussion.

Summary of Rulemaking Proposal Presented for Public Hearing and Discussion of Significant Issues Involved.

Removal of acetone from the definition of VOC would bring the Departmental definition into line with the federal definition; in certain cases, removal of acetone would allow manufacturers to use acetone in their products as a way to meet Area Source VOC rules which went into effect in January, 1996.

Summary of Significant Public Comment and Changes Proposed in Response

All comments were in support, and the Department made no changes in the proposed language.

Summary of How the Proposed Rule Would Work and How it Would be Implemented

Acetone would no longer be considered a VOC for area and RACT sources. Sources would be able to substitute acetone for compounds which *are* considered VOCs. On adoption, the Department would notify affected sources through trade groups and the Department's "Air

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Time" publication. Air Quality staff and the Lane Regional Air Pollution Authority would also be notified of the change.

Recommendation for Commission Action

It is recommended that the Commission adopt the rule amendments regarding acetone 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. Written Comments Received and Department Response
- E. Advisory Committee Membership and Report
- F. Rule Implementation Plan

Reference Documents (available upon request)

Written Comments Received (listed in Attachment D)

Approved:

Section:

Division:

Report Prepared By: Benjamin M. Allen

Phone: (503) 229-6828

Date Prepared: February 5, 1996

BMA

e:_word\rules\rule_3\acetone\rdocs\acstffrp.doc

Redefinition of "Volatile Organic Compound"

Definitions

340-22-102 As used in OAR 340-22-100 through 340-22-300:

...

- (73) "Volatile Organic Compound" 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) Excluded from the definition of VOC are those compounds which the U.S. Environmental Protection Agency classifies as being of negligible photochemical reactivity, including: Methane; ethane; methylene chloride (dichloromethane); 1,1,1-trichloroethane (methyl chloroform); 1,1,2-trichloro-1,2,2-trifluoroethane (CFC-113); Trichlorofluoromethane (CFC-11); dichlorodifluoromethane (CFC-12); chlorodifluoromethane (HCFC-22); trifluoromethane (HCFC-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); parachlorobenzotrifluoride (PCBTF); cyclic, branched, or linear completely methylated siloxanes; acetone; 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.

...

NOTICE OF PROPOSED RULEMAKING HEARING

(Rulemaking Statements and Statement of Fiscal Impact must accompany this form.)

Department of Environmental Quality

AQ

OAR Chapter 340

DATE: TIME: LOCATION:

September 22, 1995 11:00 AM Room 10A, 811 SW 6th Ave., Portland, OR 97204

HEARINGS OFFICER(s): Benjamin M. Allen

STATUTORY AUTHORITY: 468.020, 468A.025

ADOPT: OAR 340-32-5604, 5605

AMEND: OAR 340-22-102; 340-25-260, 265, 280; 340-32-5630, 5650; 340-33-050, 060

REPEAL: OAR 340-32-210

Amendments or additions to other sections of Divisions 25, 32, or 33 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:

- ASBESTOS

Adopt of a filter type reporting requirement (40 CFR 61.153(a)). Required by EPA in order to approve Oregon's asbestos regulation program.

Adopt by reference of a waste conversion regulation. (40 CFR 61.155). Oregon has no such rule.

Expand liability for those gaining certification from an non-approved training provider.
Required by EPA in order to approve Oregon's asbestos certification program.

- REDEFINITION OF "VOLATILE ORGANIC COMPOUND" FOR AREA SOURCES

Redefine "Volatile Organic Compound" (VOC) in Division 22 to reflect EPA's delisting of acetone and expected delisting of perchloroethylene as VOCs.

- ALUMINUM

Clarify appropriate test methods for aluminum plants. Allow the Department to allow or require decreased or increased frequency of testing. Clarify which rules apply to fugitive emissions.

- HOUSEKEEPING

Delete one of the two identical provisions in Div. 32.

Reinsert the language inadvertently deleted from 32-5630(3)(b) during the last revision.

Delete the redundant wording in OAR 340-33-060(4)(i). —

LAST DATE FOR COMMENT: September 22, 1995

DATE PROPOSED TO BE EFFECTIVE: Upon adoption by the Environmental Quality Commission and subsequent filing with the Secretary of State.

AGENCY RULES COORDINATOR:

Susan Greco, (503) 229-6775

AGENCY CONTACT FOR THIS PROPOSAL: Benjamin M. Allen

ADDRESS:

Air Quality Division
811 S. W. 6th Avenue
Portland, Oregon 97204

TELEPHONE:

(503) 229-6828
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.

Benjamin M. Allen

Aug. 15, 1995

Signature of Author of rulemaking package

Date

Oregon Department of Environmental Quality

A CHANCE TO COMMENT ON...

Asbestos Program Requirements, Division 22 Redefinition of VOC, Primary Aluminum Plant Rules, and Housekeeping Revisions

Date Issued: Aug. 17, 1995
Public Hearings: Sep. 22, 1995
Comments Due: Sep. 22, 1995

WHO IS AFFECTED?

Users of filter-type asbestos emissions controls.
Asbestos waste conversion facilities.
Area source users of VOCs, especially acetone and perchloroethylene.
Aluminum plants.
Asbestos handlers.

WHAT IS PROPOSED?

This proposal would:

- Require that users of asbestos filters report information about the filters. Adopt a regulation concerning asbestos waste conversion facilities. Expand liability for those gaining certification from an non-approved training provider.
- Redefine "Volatile Organic Compound" for area sources to reflect EPA's "delisting" of acetone and expected delisting of perchloroethylene as VOCs.
- Clarify appropriate test methods for aluminum plants. Allow the Department to require decreased or increased frequency of testing. Clarify which provisions include fugitive emissions.
- Delete one of two identical provisions in Division 32. Delete redundant language in an asbestos certification rule. Reinsert language inadvertently deleted from the Asbestos Abatement Notifications requirements during the last rule revision.

HOW TO COMMENT:

Public Hearings to provide information and receive public comment are scheduled as follows:

Room 10A, 811 SW 6th Ave., Portland, OR 97204
September 22, 1995
11:00 AM



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.

Written comments must be received by 5:00 p.m. on September 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 229-5359 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.

BMA:j
LEGAL\AH74688.DOC

Asbestos Program Requirements, Division 22 Redefinition of VOC, Primary Aluminum Plant Rules, and Housekeeping Revisions

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 468.020, 468A.025

2. Need for the Rule

Asbestos

The Department has requested that EPA delegate to the Department authority to implement an asbestos control program, and has submitted such a program to EPA. EPA has responded that the program can be approved if the Department adopts an additional reporting requirement (data on fabric filters). This rulemaking adopts a regulation similar to the federal version. Once the requirement is adopted, EPA will be able to approve the Department's program and delegation request.

Oregon also does not have regulations governing asbestos waste conversion (from asbestos-containing material to asbestos-free material). This rulemaking would adopt federal regulations by reference.

The rulemaking would also increase the liability for those receiving asbestos certification from a non-approved training provider. The change would bring Oregon's asbestos certification program into line with changes in EPA's Model Accreditation Plan.

Redefinition of "Volatile Organic Compound" for Area Sources

EPA recently excluded acetone from the definition of Volatile Organic Compound (VOC), due to acetone's negligible photochemical reactivity, and is in the process of excluding perchloroethylene for the same reason. The perchloroethylene exclusion is expected to become effective in early autumn. To achieve consistency with the federal rules, these compounds are also being excluded from Oregon's VOC definition in Division 22.

Aluminum

The rulemaking would clarify appropriate test methods for Primary Aluminum Plants, delete obsolete test requirements, and clarify when rules are applicable to fugitive emissions. The amendments will also enable the Department to do case-by-case reviews of monitoring data of the

control equipment. If the emissions have been shown to be an insignificant contributor to the plant's total emissions and have been fairly constant throughout the prior permit periods, then the Department may allow the testing frequency to be decreased. Conversely, if the test results warrant, the Department may require increased testing frequency.

Housekeeping

Delete one of the two identical provisions in Div. 32.

Reinsert the language inadvertently deleted from 32-5630(3)(b) during the last revision.

Delete the redundant wording in OAR 340-33-060(4)(i).

3. Principal Documents Relied Upon in this Rulemaking

Asbestos

40 CFR §61.153(a), 61.155

EPA Model Accreditation Plan

Acetone

60 Federal Register 31634

These documents are available for review at DEQ Headquarters, Air Quality Division, 811 S.W. 6th Avenue, Portland, Oregon, 97204.

4. Advisory Committee Involvement

None. The Industrial Source Advisory Committee is in the process of being re-formed.

State of Oregon
DEPARTMENT OF ENVIRONMENTAL QUALITY

Rulemaking Proposal
for

Asbestos Program Requirements, Division 22 Redefinition of VOC, Primary Aluminum Plant
Rules, and Housekeeping Revisions

Fiscal and Economic Impact Statement

Introduction

Asbestos

The revisions will impose some additional costs on sources. However, adoption of the filter data reporting requirement and waste conversion regulation will allow EPA to approve Oregon's asbestos regulation program, which will decrease administrative and compliance costs. Approval of the program will allow sources and the agency comply with or enforce state rules, rather than both federal and state rules.

Adoption of expanded liability may place a financial burden on persons who do not check that their training provider is approved. However, Oregon has not had any reports of unapproved providers, and approval status can be checked with a phone call to the Department. Adoption of the changed language will allow the Department to maintain EPA approval of the state's asbestos certification program. Without approval, certification would be done through EPA.

Redefinition of "Volatile Organic Compound" for Area Sources

The exclusion of acetone and perchloroethylene from the definition of Volatile Organic Compounds (VOC) constitutes a rule relaxation, and is expected to produce a net economic benefit for sources. Also, this change will allow the Oregon area source VOC definition to conform with the federal definition, and thereby enhance regulatory consistency.

Aluminum

Because increased or decreased testing frequency is allowed on Departmental request or approval, some sources may have increased or decreased testing costs.

Housekeeping

No financial impact.

General Public

There will be no financial effect on the general public from these revisions.

Small Business

Asbestos

Businesses will be required to report filter data. This will require a small cost in gathering and submitting the information.

Persons certified by non-approved training providers will have increased liability for enforcement actions, and may have their certification revoked or suspended. The associated costs may be avoided by assuring that the training provider is approved by the Department.

Redefinition of "Volatile Organic Compound" for Area Sources

Current area source VOC emission control regulations affect few small businesses in Oregon, and regulations for Hazardous Air Pollutants (HAPs) will continue to limit the use of perchloroethylene in businesses such as drycleaners. Therefore, small businesses will experience no significant economic impacts.

Aluminum

There are no affected small businesses.

Large Business

Asbestos

Businesses will be required to report filter data. This will require a small cost in gathering and submitting the information.

Waste conversion facilities will have to comply with the adopted regulation.

Persons certified by non-approved training providers will have increased liability for enforcement actions, and may have their certification revoked or suspended. The associated costs may be avoided by assuring that the training provider is approved by the Department.

Redefinition of "Volatile Organic Compound" for Area Sources

For the most part, changes to the VOC definition are expected to produce a positive economic effect as this rule relaxation will increase the number of non-VOC solvents available to area sources required to control their VOC emissions. However, companies that developed low VOC alternatives to acetone will face a loss of their research investment or a reduction of future profits. Also, EPA has not yet decided how to adjust VOC credits accrued from past acetone reductions. When EPA resolves the questions involved, companies could lose the benefit of using or selling emission reduction credits for VOC netting, offsetting or trading.

Aluminum

Because increased or decreased testing frequency is allowed on Departmental request or approval, some sources may have increased or decreased testing costs.

Local Governments

Asbestos

Asbestos filter users will be required to report filter data. This will require a small cost in gathering and submitting the information.

Persons certified by non-approved training providers will have increased liability for enforcement actions, and may have their certification revoked or suspended. The associated costs may be avoided by assuring that the training provider is approved by the Department.

Redefinition of "Volatile Organic Compound" for Area Sources

The removal of these compounds from the definition of VOC in Division 22 will cause no significant effects on local governments.

Aluminum

No financial impact.

State Agencies

No financial impact from these revisions.

Assumptions

State of Oregon
DEPARTMENT OF ENVIRONMENTAL QUALITY

Rulemaking Proposal
for

Asbestos Program Requirements, Division 22 Redefinition of VOC, Primary Aluminum Plant
Rules, and Housekeeping Revisions

Land Use Evaluation Statement

1. Explain the purpose of the proposed rules.

Asbestos

The Department has requested that EPA delegate to the Department authority to implement an asbestos control program, and has submitted such a program to EPA. EPA has responded that the program can be approved if the Department adopts an additional reporting requirement (data on fabric filters). This rulemaking adopts a regulation similar to the federal version. Once the requirement is adopted, EPA will be able to approve the Department's program and delegation request.

Oregon also does not have regulations governing asbestos waste conversion (from asbestos-containing material to asbestos-free material). This rulemaking would adopt federal regulations by reference.

The rulemaking would also increase the liability for those receiving asbestos certification from a non-approved training provider. The change would bring Oregon's asbestos certification program into line with changes in EPA's Model Accreditation Plan.

Redefinition of "Volatile Organic Compound" for Area Sources

EPA recently excluded acetone from the definition of Volatile Organic Compound (VOC), due to acetone's negligible photochemical reactivity, and is in the process of excluding perchloroethylene for the same reason. The perchloroethylene exclusion is expected to become effective in early autumn. To achieve consistency with the federal rules, these compounds are also being excluded from Oregon's VOC definition in Division 22.

Aluminum

The rulemaking would clarify appropriate test methods for Primary Aluminum Plants, delete obsolete test requirements, and clarify when rules are applicable to fugitive emissions. The amendments will also enable the Department to do case-by-case reviews of monitoring data of the control equipment. If the emissions have been shown to be an insignificant contributor to the plant's total emissions and have been fairly constant throughout the prior permit periods, then the

Department may allow the testing frequency to be decreased. Conversely, if the test results warrant, the Department may require increased testing frequency.

Housekeeping

Delete one of the two identical provisions in Div. 32.

Reinsert the language inadvertently deleted from 32-5630(3)(b) during the last revision.

Delete the redundant wording in OAR 340-33-060(4)(i).

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:

Changes to the Aluminum rules affect the following:

Oregon Title V Operating Permit Program

Air Contaminant Discharge Permit Program

The other rules do not affect land use programs.

- 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.

In the space below, state if the proposed rules are considered programs affecting land use. State the criteria and reasons for the determination.

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.

Greg E. Fonde for
Division Administrator
Greg Green

Robert M. Young
Intergovernmental Coord.

8/8/95
Date

Questions to be Answered to Reveal Potential Justification for Differing from Federal Requirements.

The following questions should be clearly answered, so that a decision regarding the stringency of a proposed rulemaking action can be supported and defended:

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?*

Asbestos

EPA has promulgated federal asbestos regulations. Federal regulations allow EPA to delegate enforcement authority for asbestos regulation if a state adopts a program comparable to the federal asbestos regulations in 40 CFR Part 61.

EPA has also promulgated a Model Accreditation Program. Approved state programs can certify asbestos training providers and workers.

Redefinition of "Volatile Organic Compound" for Area Sources

EPA's regulations define VOC in 40 CFR §51.100. The federal definition excludes acetone. EPA is currently conducting rulemaking to exclude perchloroethylene.

Aluminum

The federal Maximum Achievable Control Technology (MACT) requirements for Primary Aluminum plants have not been promulgated yet. Hydrogen fluoride is a hazardous air pollutant which will be regulated under the MACT standard. It is currently regulated under the aluminum rules. Also, while they apply to a different class of sources, the test methods specified by this revision are identical to those in 40 CFR Subpart S (Standards of Performance for Primary Aluminum Reduction Plants).

Housekeeping

N/A.

2. *Are the applicable federal requirements performance based, technology based, or both with the most stringent controlling?*

Asbestos

Performance based.

Redefinition of "Volatile Organic Compound" for Area Sources

Performance based. Organic compounds demonstrated to have negligible photochemical reactivity can be specifically excluded from the definition of Volatile Organic Compound (VOC).

Aluminum

N/A.

Housekeeping

N/A.

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?*

Asbestos

While the federal requirements require Oregon to make some changes in its program, the changes will allow the state to enforce tailored asbestos regulations, rather than federal regulations. The changes also allow the state to continue to run a certification program, rather than requiring certification through EPA. The changes required by EPA are either neutral in effect (previously no state regulation), or are more stringent (increased liability).

Redefinition of "Volatile Organic Compound" for Area Sources

Issues relevant to the federal redefinition of VOC are also relevant to the state redefinition.

Aluminum

N/A.

Housekeeping

N/A.

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?*

Asbestos

Adoption of the reporting requirement would allow the regulated community to base their actions on the Department's rules, rather than having to track both Department and EPA rules.

Revision of the certification rule would allow the Department to maintain EPA approval of its asbestos certification program. Without a state program, certification would have to be obtained through EPA.

Redefinition of "Volatile Organic Compound" for Area Sources

The redefinition is expected to improve regulatory clarity by aligning the state and federal definitions of VOC for Oregon's regulations that apply to "Area Sources" of air pollution. However, the VOC definition that applies to "Stationary Sources" [OAR 340-28-110(122)], is not scheduled for amendment until the first meeting of the Environmental Quality Commission in 1996. Until VOC is also redefined in Division 28, the difference in definitions could generate additional confusion among the regulated community.

Aluminum

The purpose of these changes is to clarify test and rule requirements, and to allow the Department to tailor test frequency to conditions at the source.

Housekeeping

The purpose of these changes is to clarify rule language and correct errors.

Housekeeping

N/A.

5. *Is there a timing issue which might justify changing the time frame for implementation of federal requirements?*

Asbestos

EPA will not approve Oregon's asbestos regulation program until filter data reporting requirement and waste conversion regulation are adopted.

EPA will not continue approval of Oregon's asbestos certification program unless the expanded liability language is adopted.

Redefinition of "Volatile Organic Compound" for Area Sources

Yes. Many manufacturers subject to new Consumer and Commercial product rules (OAR 340-22-700 through 340-22-1130) are interested in having the widest number of exempt VOCs available for their product formulations. As the new rules begin to take effect 1-1-96, prompt modification of the Oregon VOC definition for Area Sources would increase manufacturers' flexibility to meet upcoming requirements.

Housekeeping

N/A.

6. *Will the proposed requirement assist in establishing and maintaining a reasonable margin for accommodation of uncertainty and future growth?*

Asbestos

Adoption of waste conversion regulations will allow for growth in that industry while also ensuring that environmental effects are taken into account.

Redefinition of "Volatile Organic Compound" for Area Sources

Adoption of the revised VOC definition decreases uncertainty by keeping Oregon rules in line with federal rules, and allows area sources more flexibility in using compounds which have been shown to have negligible levels of photochemical reactivity.

Aluminum

The revisions decrease uncertainty by defining test methods, and specifying which rules apply to fugitive emissions. The revisions also allow more flexibility in testing frequency depending on plant conditions. The revisions will not affect future growth.

Housekeeping

N/A.

7. *Does the proposed requirement establish or maintain reasonable equity in the requirements for various sources? (level the playing field)*

Asbestos

N/A.

Redefinition of "Volatile Organic Compound" for Area Sources

Redefinition of VOC would allow Oregon area sources more flexibility in using acetone and perchloroethylene. Since other states will likely also adopt these changes, this removes a competitive disadvantage for Oregon sources.

The rule removes an inequity for product manufacturers to the extent that VOC regulations restrict use of a compound (acetone) shown to be no more photochemically reactive than ethane, which was previously found to have "negligible photochemical reactivity." The anticipated federal delisting of perchloroethylene is expected to be granted on similar grounds.

However, the delisting of these compounds could produce inequities as well. Because these compounds will no longer be considered pollution precursors, those who previously reduced VOC emissions beyond the required amounts may lose the advantage of using those reduction credits for emissions trading, netting, or generation of offsets. The effects in this area will not be known until EPA produces guidance on the matter sometime in the future.

Aluminum

The rules apply to all sources equally.

Housekeeping

N/A.

8. *Would others face increased costs if a more stringent rule is not enacted?*

Asbestos

N/A.

Redefinition of "Volatile Organic Compound" for Area Sources

Because fewer "exempt compounds" would be available for use in products subject to VOC limits, manufacturers and the public could expect somewhat higher costs if this rule change does not occur.

Aluminum

N/A.

Housekeeping

N/A.

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?*

Asbestos

The reporting and waste conversion requirements are identical to the federal

regulations, except that they reference equivalent Oregon regulations in place of federal ones.

The change in the liability provision brings Oregon rules into line with EPA's Model Accreditation Plan.

Redefinition of "Volatile Organic Compound" for Area Sources

The new definition of VOC will not differ from the federal version.

Aluminum

While the proposed requirement applies to different sources than the federal New Source Performance Standards, it specifies the same test methods.

Housekeeping

N/A.

10. Is demonstrated technology available to comply with the proposed requirement?

Yes, in all cases.

11. Will the proposed requirement contribute to the prevention of pollution or address a potential problem and represent a more cost effective environmental gain?

Asbestos

The proposed rules will allow the Department, the public, and sources to more efficiently monitor compliance/comply, because only Oregon rules, rather than both Oregon and federal rules will apply.

Redefinition of "Volatile Organic Compound" for Area Sources

Acetone has been found, and perchloroethylene is expected to soon be found to have negligible photochemical reactivity. Therefore, recognition of this status in the Division 22 regulatory definitions will eliminate an ineffective environmental restriction.

Aluminum

The proposed revisions will clarify the application of current rules, and make environmental gains more cost effective by tailoring testing frequency to source conditions.

Housekeeping

The proposed changes will clarify the application of current rules.

State of Oregon

Department of Environmental Quality

Memorandum

Date: September 23, 1995

To: Environmental Quality Commission

From: Benjamin M. Allen

Subject: Presiding Officer's Report for Rulemaking Hearing

Hearing Date and Time: September 22, 1995, beginning at 11:00 AM

Hearing Location: Room 10 A, 811 SW 6th Ave, Portland, OR 97204

Title of Proposal: Division 22 Delisting of Acetone as a Volatile Organic Compound (VOC)

The rulemaking hearing on the above titled proposal was convened at 11:00 AM.

No one attended.

There was no testimony and the hearing was closed at 11:20 AM.

Written Comments Received and Department Response

on

Division 22 Delisting of Acetone as a Volatile Organic Compound (VOC)

1. Langley A. Spurlock, Chemical Manufacturer's Association

Mr. Spurlock submitted a letter on behalf of the Chemical Manufacturer's Association, including all U.S. producers of acetone, and some large domestic users of acetone. The letter favored an approach focusing on volatile organic compounds (VOCs) that "play a significant role in ozone formation, rather than on acetone emissions which do not." The letter pointed out that states may not include acetone in VOC emissions inventories for determining reasonable further progress under the CAA, or take credit for controlling acetone emissions in their ozone control strategies.

Mr. Spurlock commented that delisting of acetone would encourage industry to use acetone instead of more photochemically reactive or more hazardous compounds. Finally, Mr. Spurlock asked the Department not to regulate acetone as a VOC while the rulemaking is pending, in order to avoid delay and confusion.

Response:

The Department agrees that the focus of ozone control strategies should be on compounds which lead to ozone formation.

The Department supports the use of non-photochemically reactive and non-hazardous compounds.

The Department would continue to regulate acetone as a VOC for Division 22 purposes until the EQC adopts the proposed rule. The likelihood of confusion is small, and the delay is short.

2. J. Mark Morford, Stoel Rives

Mr. Morford submitted a letter supporting the delisting of acetone as a VOC, commenting that this accords with recent scientific understanding.

Mr. Morford felt that the definition of VOC in Division 28 should be similarly and contemporaneously revised. Mr. Morford suggested that the Division 28 definition is more important, and that different definitions between the two divisions would lead to confusion.

Response:

The Department agrees that there is some potential for confusion because of the two definitions. However, new rules regulating area source VOCs went into effect on January 1, 1996, and the Department felt it was important to have the Division 22 (area source and RACT) definitions in this package adopted as soon as possible thereafter. The Division 28 (industrial and permit rules) redefinition is tentatively scheduled for adoption at the March EQC meeting, because the issues related to redefinition for Division 28 are more complex.

3. Thomas J. Donegan, Jr., Cosmetic, Toiletry, and Fragrance Association

Mr. Donegan wrote in support of the Department's proposed delisting of acetone.

Advisory Committee

for

Division 22 Delisting of Acetone as a Volatile Organic Compound (VOC)

The Industrial Sources Advisory Committee was not available to comment on these proposed rules before the public hearing. The Committee was informed of the proposed changes at their first meeting, on October 18, 1995. Due to interest from some members of the Committee, the Department delayed proposing adoption of the rule in order to allow time for further discussion and explanation of the Department's intent.

Some members of the Advisory Committee were concerned about the possible toxicity of acetone. The Air Quality Division agreed to convey information on health effects submitted by Committee members to other Divisions, and reminded the members of the procedure for requesting that a compound be listed as a Hazardous Air Pollutant.

State of Oregon
DEPARTMENT OF ENVIRONMENTAL QUALITY
Rulemaking Proposal
for

Division 22 Delisting of Acetone as a Volatile Organic Compound (VOC)

Rule Implementation Plan

Summary of the Proposed Rule

The proposed revisions would redefine “Volatile Organic Compound” for Division 22 (area sources) to reflect EPA’s “delisting” of acetone as a VOC.

Proposed Effective Date of the Rule

The rule would be effective on filing with the Secretary of State, after adoption by EQC.

Proposal for Notification of Affected Persons

Affected persons would be notified of the rule changes through trade groups and through the Department’s “Air Time” publication. Many individuals and organizations are already aware of the proposed changes through the Department’s extensive public notice mailing for the proposed rule. The Lane Regional Air Pollution Authority would also be notified of the change.

Proposed Implementing Actions

Acetone would no longer be considered a VOC for area and RACT sources. Sources would be able to substitute acetone for compounds which *are* considered VOCs.

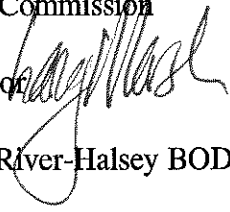
Proposed Training/Assistance Actions

Departmental staff are generally aware of the proposed change, and would be formally notified of adopted language. The Small Business Assistance Program would provide assistance to the regulated community.

State of Oregon
Department of Environmental Quality

Memorandum[†]

Date: February 6, 1996

To: Environmental Quality Commission
From: Langdon Marsh, Director 
Subject: Agenda Item D, James River-Halsey BOD Limit Reduction, EQC Meeting
February 23, 1996

Statement of the Issue

The current National Pollutant Discharge Elimination System (NPDES) permit for the James River paper mill in Halsey contains numeric effluent limits for Biochemical Oxygen Demand (BOD₅). As of March 1, 1996, the numeric limits will be removed and there will be no discharge allowed, unless the EQC takes action to set a new numeric effluent limit. The facility will not be able to operate without having a discharge of wastewater containing some level of BOD₅.

The Department is recommending that numeric effluent limits be placed in the permit to be effective March 1, 1996.

Background

The current James River NPDES permit was issued on February 28, 1992. The permit was issued for a new secondary fiber pulp/paper mill and was needed to authorize the discharge of treated wastewater to the Willamette River at river mile 147.2. Wastewater from the James River treatment system is combined with the wastewater from the neighboring Pope & Talbot mill and is discharged through a common diffuser.

The current NPDES permit for James River contains a requirement for the Department to evaluate the BOD₅ effluent limits by March, 1996. This requirement was included to address the public concern about James River's ability to meet the effluent limits that were placed in their current permit. The wastewater treatment system that was proposed to be used in the new mill

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

was not typical of that used by the pulp/paper industry. Most mills use a semi-passive system which employ large aerated ponds with detention times of many days. James River's system is a highly mechanical activated sludge system and detention times are relatively short. At the time, there was very little known about this type of system and what the expected effluent quality would be. The public stressed the need to have a permit reopener to require additional treatment, or possibly to reduce the effluent limits if the system operated at a much higher efficiency than expected. The latter has been demonstrated and the Department is proposing that the effluent limits for BOD₅ be reduced.

Authority to Address the Issue

James River requested a mass load increase to the Willamette River in 1991. The EQC took final action on the request in March, 1992, by approving a conditional mass load increase. A condition was included in the NPDES permit that allows no discharge of BOD after March, 1996, pending EQC action. The Department is recommending that an effluent BOD limit be placed in the current NPDES permit that would replace the current limit. The recommended limit is a 25% reduction of the current limit. The NPDES permit authorizes the EQC to take final action on the Department's recommendation.

Alternatives and Evaluation

After a complete review of the effluent monitoring data, the studies conducted by James River, and all Department inspection reports, the Department feels that the wastewater treatment system being used by James River is a well designed, and well operated facility.

As required by the current NPDES permit, James River evaluated a number of alternatives for additional treatment. Most of the alternatives employed tertiary type treatment of the wastewater after it was treated in the existing system. Given that the quality of effluent that is produced by the system is already significantly better than standard technology used by the pulp/paper industry, is significantly below the permitted loadings, and the Willamette River has assimilative capacity for the proposed BOD loading, it is the opinion of the Department that additional treatment is not warranted. The effluent from James River is of a high quality and meets all state water quality standards. The Department does feel that the current effluent limits for BOD₅ are set at levels that are in excess of the current treatment system's capability to treat the existing waste stream. A reduction in the limits is therefore being proposed by the Department.

In setting effluent limits for facilities that discharge wastewater to waters of the State of Oregon, two criteria are normally used to ensure that the discharge will meet all applicable standards. All discharges must meet technology based effluent limits and water quality based effluent limits.

The technology based limits are found in the federal register (40 CFR 430.175) and are New Source Performance Standards (NSPS). The NSPS are developed by the United States Environmental Protection Agency (US-EPA) by evaluating similar mills throughout the country and setting limits based on demonstrated technology. The technology based values are used in conjunction with the mills production level to derive the monthly average and daily maximum limits for BOD₅.

The water quality based limits are developed in accordance with the State of Oregon Water Quality Standards (OAR 340-41-445). The limits are set at a point at which all water quality standards will be met at the edge of a defined mixing zone.

Once the technology based limits and water quality based limits have been calculated, the most stringent limit is selected for each parameter of concern. The technology based limits are calculated below:

40 CFR 473.175, Subpart Q, Deink Subcategory, pounds per 1000 pounds produced:

	Maximum Daily	Monthly Average
BOD ₅	9.6 lbs/1000lbs	5.2 lbs/1000lbs
Production.....	600 X 1000 lbs/day	
Monthly Average BOD ₅	3120 lbs/day	
Daily Maximum BOD ₅	5760 lbs/day	

In September, 1992, James River and Pope & Talbot conducted a joint mixing zone study of their combined discharge to the Willamette River. The study concluded that the available dilution at the edge of the mixing zone (300 feet), at 7Q10 flow (the lowest consecutive 7-day flow over a 10-year period), was about 100:1. The impact on dissolved oxygen was evaluated using the mixing zone study results and a computer model (QUAL2E) and was determined to be

Memo To: Environmental Quality Commission

Agenda Item D

February 23, 1996 Meeting

Page 4

no greater than 0.1 mg/l from the point of discharge to Willamette Falls. The current limits are therefore protective of water quality and meet state standards found in OAR 340-41-445(a).

In conclusion, the current effluent limits for BOD₅ meet both the federal technology standards and the state water quality standards. The current summer monthly average effluent limits are set at approximately 60% of the NSPS. Since this is the case, a further reduction in effluent limits is based solely on the fact that the existing treatment system is able to achieve more than is required by federal and state standards. With this in mind, the Department reviewed and evaluated the monitoring data collected over the last three years. The Department has determined that an effluent limit reduction of 25% from the current limit would be achievable and meet the intent of the NPDES permit requirements. A reduction of 25% would result in a summer monthly average limit of 1500 lbs/day and a summer daily maximum of 3900 lbs/day. The Department is proposing that these reductions be made by modification of the James River NPDES permit. The proposed effluent limits are set at about one half, and two thirds, the NSPS monthly average and daily maximum values, respectively. The effluent limit which allowed no discharge after March, 1996, was included to require the Department to evaluate actual treatment plant performance and report back to the EQC regarding the Department's findings. The EQC expressed a desire to revisit the effluent limits after the treatment system had been in operation for four years.

The environmental impact of BOD₅ on receiving streams is the potential reduction in the amount of dissolved oxygen present. Dissolved oxygen is needed within the stream to support aquatic life. The most critical period for dissolved oxygen is in the warmer summer months and at low flow conditions. Biological activity within a receiving stream decreases with decreasing water temperatures. This has a direct impact on the dissolved oxygen within a particular water body. The much higher flow rates during the winter months also lessens the impact of the organic load. The winter limits for BOD₅ therefore are proposed to remain at NSPS levels for the November through April period.

It is urgent that the EQC take action on this item prior to March 1, 1996. The James River mill in Halsey will be unable to operate without have a discharge which contains some amount of BOD. The requirement for James River to have no allowable discharge of BOD after March 1, 1996, was included in the permit to require a complete evaluation of the James River wastewater treatment system performance and set lower effluent limits if achievable.

Summary of Any Prior Public Input Opportunity

As part of the proposed NPDES permit modification, a 30 day public notice period was began on November 15, 1995. A public hearing was held in Corvallis on the Oregon State University campus on December 18, 1995. The hearing was attended by five individuals. The City of Corvallis was represented as well as James River. Those in attendance did not provide any verbal testimony, but written comments were submitted by the City of Corvallis and James River. A summary of the comments and the Department's response to comments are included in Attachment A, Hearings Officer Report, and Attachment B, Response to Comments.

Conclusions

- o The current effluent limits for BOD₅ meet both the federal technology standards and the state water quality standards.
- o The current summer monthly average effluent limits are set at approximately 60% of the NSPS.
- o Further reduction in effluent limits is based solely on the fact that the existing treatment system is able to achieve more than is required by federal and state standards.
- o The Department has determined that an effluent limit reduction of 25% from the current limit would be achievable and meet the intent of the NPDES permit requirements. A reduction of 25% would result in a summer monthly average limit of 1500 lbs/day and a summer daily maximum of 3900 lbs/day. The Department is proposing that these reductions be made by modification to the James River NPDES permit.

Recommendation for Commission Action

It is recommended that the Commission adopt the Department recommendation to set new effluent limits for BOD₅ during the summer period for the James River mill in Halsey. The summer BOD₅ limits would be protective of water quality and would represent a 25% reduction over the current BOD₅ effluent limits.

Memo To: Environmental Quality Commission
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Attachments

- A. Hearings Officer Report
- B. Department Response to Comments
- C. Proposed NPDES Permit Modification

Approved:

Section:

Barbara A. Burton

Division:

Shirley Greenwood

Report Prepared By: Timothy McFetridge

Phone: (503) 378-8240, extension: 235

Date Prepared: January 23 1996

TCM

x:\tmcfetr\jamer96.eqc

January 23, 1996

Attachment A

Hearings Officer Report

State of Oregon
Department of Environmental Quality

Memorandum

Date: January 23, 1996

To: Steve Greenwood, Administrator
From: William Perry, Hearings Officer
Subject: Attachment A - Hearings officer report for the proposed NPDES permit modification for the James River mill in Halsey.

A hearing was held on December 18, 1995, in an effort to accept comments on the proposed modification to the James River NPDES permit. The hearing was attended by five individuals. The attendance list is attached to this report.

There was no verbal testimony provided at the hearing. Comments in support of the Department proposal to modify the James River NPDES permit were received from James River Corporation and the City of Corvallis.

The City of Corvallis also provided written comments on what they view as an inequity in the way pollutant loadings are allocated between municipal and industrial wastewater dischargers.



DEPARTMENT OF ENVIRONMENTAL QUALITY

TOPIC James River
DATE 12/18/95

SIGN-IN SHEET

PLEASE PRINT

=====

NAME	ADDRESS (include city, state & zip)
=====	=====

1. George Appleton P.O. Box 215 Halsey, OR 97348
CITY OF CORVALLIS
2. TOM PENPRAZE BOX 1083 CORVALLIS 97339
3. BOB STEUBENS P.O. Box 215 Halsey OR 97348
4. Dick Sleeter P.O. Box 215 Halsey, OR 97348
5. LARRY CHARVEY 28180 LIBERTY RD. SWEET HOME, OR. 97386
6. _____
7. _____
8. _____
9. _____
10. _____



SIVETZ COFFEE, Inc.
COFFEE BEAN ROASTING MACHINES
Extraction, Engineering & Consulting
349 S.W. 4th ST.
CORVALLIS, OREGON 97333—U.S.A.
Phone 503-753-9713
FAX 503-757-7644

Nov. 19, 1995

RECEIVED

Oregon DEQ-Western Region
Attn: Linda Fry
750 Front St. suite 120
SALEM, OR
97310

WESTERN REGION - SALEM OFFICE

Re: James River 3,000,000 gal/day
Effluent Discharge into Willamette R.
above Corvallis

Dear Sirs;

I and my wife attended the last hearing, and was appalled at the rude, loud and undisciplined behavior of the "stacked" James River employees that attended that hearing at LaSells Ctr., as well as their management's and employees pleadings to allow unbridled pollution of the Willamette river because of their profitable business and jobs.

Unfortunately, I also was confused initially as to whether T. McFetridge of the DEQ was speaking for the DEQ or for Jamer River Corp.

The important point I want to make is that in our business and in our personal lives, the quality of the water we consume is very personal.

In the past 1.5 years we have progressively been consuming more bottled water, because the tap water has been frequently at times continually more unpalatable, colored and un natural tasting.

Not only that, but now as residents of Corvallis, we are faced with a ten million dollar upgrading and expansion of the Corvallis water treatment system, which we are being progressively increasingly taxed on.

This excessive license for James River Corp. to pollute the river must be better controlled.

Every time I buy bottled water, and every time I'm offended by the water quality coming out of our business and home taps, I'm already paying for this excessive corporate pollution, that makes the river a sewer.

Mi_chael Sivetz, President





Office of the Mayor
501 SW Madison
P.O. Box 1083
Corvallis, OR 97339-1083
(503) 757-6985
FAX (503) 757-6780

December 19, 1995

Timothy McFetridge, Permit Writer
Oregon Department of Environmental Quality
Western Region
750 Front Street, Suite 120
Salem, OR 97310

PROPOSED JAMES RIVER CORPORATION NPDES PERMIT MODIFICATION

Dear Mr. McFetridge:

The City of Corvallis appreciates the opportunity to comment on the proposed James River Corporation NPDES discharge permit modification.

As you may know, the City of Corvallis submitted extensive comments to DEQ regarding James River's discharge permit when it was initially issued in 1992. The citizens of Corvallis at that time strongly expressed their desire that DEQ develop permit limits for James River that were fully protective of Willamette River water quality. Not only do citizens of Corvallis view the Willamette River as an integral component of what makes Corvallis a vibrant community, it is also our major source of drinking water.

The City of Corvallis supports DEQ's proposed 25% reduction in summer season BOD limits and requests that they be put into effect before the 1996 summer season. This is certainly an improvement over existing permit conditions. However, according to the data James River has supplied DEQ on the effectiveness of their treatment processes and the quality of the effluent, they are capable of successfully achieving more than a 25% BOD reduction. We believe further reductions in the allowable BOD limit should be considered.

Corvallis continues to be concerned with the apparent inequity in how permitted discharge loads are allocated between municipal and industrial dischargers along the Willamette River. We have made this concern known to DEQ in the past during review and comment on other permits for industrial discharges to the Willamette River, including James River's permit when it was initially issued. We

RECEIVED

DEC 21 1995

WESTERN REGION - SALEM OFFICE

Timothy McFetridge

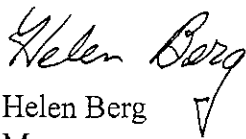
December 18, 1995

Page 2

request that DEQ review its current policies regarding the wasteload allocation process and utilize a process to evaluate the equity among permitted dischargers. I am confident that DEQ, in cooperation with the affected parties, can develop a policy that is fair and equitable to all interests.

The City intends to bring this and other permit terms and condition concerns to DEQ's attention when the full James River permit is opened for renewal in early 1997. Thank you for this opportunity to provide input on this water quality concern.

Sincerely,



Helen Berg
Mayor

C: City Council
Environmental Quality Commission

/bh

PUBLIC WORKS STAFF REPORT

JAMES RIVER CORPORATION WASTEWATER DISCHARGE PERMIT

DECEMBER 12, 1995

INTRODUCTION

The Oregon Department of Environmental Quality (DEQ) has proposed modifying James River Corporation's wastewater discharge permit. DEQ has scheduled a public hearing on December 18, 1995 at the LaSells Stewart Center. Informal discussion begins at 6:30 pm with the formal hearing starting at 7 pm.

BACKGROUND

James River Corporation operates a secondary fiber (recycled paper) pulp mill in Halsey on a site adjacent to the Pope & Talbot pulp mill. They discharge an average of three million gallons of treated process wastewater each day to the Willamette River at river mile 147.2, approximately 13 miles upstream from Corvallis.

DISCUSSION

The existing wastewater discharge permit was issued on February 28, 1992. The permit was issued for a new mill to process primarily recycled paper, and was needed to authorize the discharge of treated industrial wastewater to the Willamette. Because of James River's proximity to the Pope & Talbot discharge line, the wastewater from their plant is discharged to the Willamette River through Pope & Talbot's discharge pipe.

DEQ discharge permits are issued for a five-year period and specify the terms and conditions under which treated wastewater may be released to a receiving stream. James River's permit will be up for renewal in February, 1997. However, James River's 1992 discharge permit contains a requirement for evaluating the biochemical oxygen demand (BOD) limits after four years, or by March, 1996. BOD is a laboratory measurement of the strength (oxygen consuming demand) of the wastewater discharge.

In 1992, when DEQ held public hearings regarding James River's discharge permit request, considerable public concern was expressed in regard to the potential impact the mill's discharge would have on Willamette River water quality. The City of Corvallis submitted extensive testimony at that time, as did a number of individual citizens and interest groups from Corvallis. The City as well as others believed that the permit conditions DEQ proposed for James River were too lenient, and would not be protective of river water quality. The public stressed the need to have the permit reopened before the five-year standard expiration period to require James River to do additional treatment if necessary to protect water quality, or if the limits proved to be too lenient, then to have

them made more stringent. This is why DEQ has opened James River's discharge permit to consider modification of the BOD limits at this time.

When the permit was issued in 1992, limits for BOD (and other constituents) were established, and the permit was issued for the normal five-year permit period. However, a limit of zero was placed in the permit for BOD for the fifth year. The limitation required DEQ to either: (1) reopen the permit and set a final limit, (2) leave the limit the same as the existing permit, (3) require James River to install additional treatment facilities to accomplish more effective treatment, (4) require James River to remove their discharge from the Willamette River, or (5) shut down the mill.

In November 1995, DEQ reviewed James River's discharge monitoring data (which James River is required to submit to DEQ on a monthly basis) and has proposed that James River keep discharging to the Willamette River, but with summertime BOD limits reduced by approximately 25% from current permit limits.

CITY STAFF REVIEW

Public Works staff has completed a review of the proposed modifications to the discharge permit.

Current Permit. The current permit allows James River to discharge treated effluent. The permit has limits on the following pollutants: BOD, Total Suspended Solids, pH, and Dioxin (none allowed in the discharge).

Treatment Plant Performance. According to the information supplied to the City by DEQ, James River's wastewater treatment system has been properly operated and has produced good effluent (discharge water) quality. The monthly average BOD discharge concentrations have been in the 20 milligram per liter (or parts per million) range. For comparison purposes, the Corvallis wastewater plant produces a summertime, low river flow effluent of around 5 milligrams per liter.

Proposed Permit Effluent Limits. Upon review of James River's flow monitoring data, inspection reports, and studies conducted by James River, DEQ believes that their wastewater treatment system is a well designed and operated facility, and is producing an effluent that is protective of Willamette River water quality. However, DEQ's analysis does indicate that the current effluent limits for BOD are too liberal and should therefore be lowered. City staff agree with DEQ on this point.

- **Summer Permit Limits.** The current permit limit for BOD is 2000 pounds/day during the summer, low river flow period (May through October). This means that the James River mill can legally discharge one-ton of BOD to the river per day and be in compliance with their permit. Again for comparison purposes, Corvallis can discharge a maximum of 810 pounds per day during the same period. DEQ proposes to lower James River's allowable discharge to 1500 pounds per day during the summer months, a 25% reduction.
- **Winter Permit Limits.** The James River permit allows them to discharge a monthly average of 3120 pounds of BOD per day in the winter months (November through April). DEQ does not propose to change this limitation.

CITY STAFF ANALYSIS

Summer Permit Limits. In reviewing the information James River submitted to DEQ on performance of their treatment plant regarding BOD, it appears they are discharging an effluent of considerably higher quality than the limits DEQ is proposing. In other words, it appears they could meet an even more stringent permit requirement than proposed. The mill's average BOD discharge is in the 250 to 500 pound per day range. DEQ is proposing a limit of 1500 pounds per day, which is three to six times higher than their average range of BOD discharge. This appears to be excessive and unnecessary. A discharge limit in the range of 1000-1200 pounds per day during the summer season appears more justifiable. This would allow for variations in the quality of their raw materials which might affect effluent quality, as well as giving them some allowance for minor upsets and process disturbances in their biological wastewater treatment system.

Winter Permit Limits. DEQ is not proposing to modify James River's winter discharge limits.

DEQ generally allows wastewater plants to discharge higher amounts of BOD to the river in the winter because there are higher flows in receiving waters and more dissolved oxygen, which provides for more assimilative capacity. The net effect is that there is little to no impact on receiving water quality by allowing this to occur. The reason wastewater plants usually would discharge higher amounts in the winter is because flows increase to plants due to rainwater and snowmelt, and biological treatment processes become less efficient in cold weather, resulting in less effective treatment and higher volumes of wastewater to be treated and discharged.

However, this is not necessarily the case in industrial treatment facilities such as James River's. The flow to their wastewater facilities is fairly constant year-around, as they do not have a wastewater collection system that allows rainwater to enter it like a municipality with an extensive piping system has. Secondly, they have a waste load to treat (recycled paper) that is somewhat uniform in its characteristics, unlike a municipal wastewater treatment plant whose wasteload can fluctuate by the minute depending on the extensive variety of materials that are being discharged to the sewer system.

For these reasons, municipal wastewater dischargers (like Corvallis) have permits that allow more BOD to be discharged to the river in the winter than in the summer. James River uses a biological treatment process to treat their wastewater, so some allowance should be made for winter operating inefficiencies. However, allowing a discharge of 3120 pounds of BOD per day during the winter appears excessive. A monthly average winter BOD discharge in the 2000-2500 pound range appears more reasonable and justifiable. This would still allow James River an allowance for some changes in the waste material quality which they process, and take into account the effects of temperature on the efficiency and effectiveness of their biological wastewater treatment processes.

Equity Issues. DEQ evaluates and issues wastewater discharge permits to industrial and municipal dischargers. Different evaluation criteria are used when reviewing and issuing permits to industry than are used for municipalities. James River's permit allows substantially more pollutant discharge to the river than Corvallis' permit, which has to support a population of 47,000 people.

The Willamette River has a finite capacity to successfully handle (assimilate) waste discharges without degrading water quality. As growth occurs in urbanized areas of Oregon there will be more

pressure to increase discharges to the river. There is an economic value to municipalities and industry associated with the remaining wasteload assimilative capacity of the Willamette River. If this capacity is consumed by relatively few industrial dischargers, there could be negative economic impacts on municipalities that must install and operate additional technologies to meet more stringent permit requirements to accommodate growth.

This is an issue that must be resolved before the remaining assimilative capacity is fully allocated. Staff has raised this issue, as we have in reviewing James River's initial permit request, as it will impact Corvallis in the future. This equity issue needs to be resolved by DEQ on a regional and statewide basis.

STAFF CONCLUSIONS

Upon review of the permit modification proposal, City staff has determined that:

- DEQ is proposing to only modify James River's summertime BOD discharge limit. All other permit limits, including a zero discharge limit for dioxin, will remain the same.
- A reduction in summertime BOD limits of 25% is being proposed.
- Wintertime BOD limits will remain unchanged.
- James River's wastewater system operating data submitted to DEQ indicates that their system is producing an effluent 3 to 6 times cleaner than the proposed summer permit limit.
- Even with the 25% reduction in BOD limits proposed by DEQ, it appears to be an excessive allowance, as James River has shown they can successfully meet more stringent limits and still have allowances for process variations without committing a permit violation.
- An inequity exists in how DEQ allocates allowable discharge loading between municipalities and industry. This issue needs to be resolved on a statewide basis.

STAFF RECOMMENDATIONS

Staff recommends the City comment on the proposed James River wastewater discharge permit modification by communicating the following points to DEQ:

1. Support the proposed 25% reduction in BOD limits as proposed by DEQ. A 25% reduction is an improvement over current permit requirements.
2. Communicate to DEQ that the City will have additional comments on the BOD limits (summer and winter) and other permit terms and conditions when the full permit is up for renewal in early 1997.
3. Communicate to DEQ that the City believes there are inequities in how permitted discharge loads are allocated between municipal and industrial dischargers, and request that DEQ review its current policies regarding its wasteload allocation process.

JAMES RIVER PAPER CO.

CONSUMER PRODUCTS DIVISION

P.O. Box 215

30470 American Drive

Halsey, Oregon 97348

Ph. 541-369-1367

Fax 541-369-1221

DATE: December 18, 1995
TO: Tim McFetridge - ORDEQ
FROM: George Appleton
SUBJECT: Proposed NPDES Permit Modification

The James River Paper Co. facility in Halsey, OR began operating its recycled fiber facility in March of 1992. The facility currently diverts approximately 500 tons of waste paper from landfills each day. The recovered fiber is recycled into towel, tissue and business grades of paper, such as *Brawny*TM paper towels, *Northern*TM tissue, and *Eureka!*TM office copy paper. In addition, James River designed and constructed what we knew to be a conservatively designed, state-of-the-art Activated Sludge waste water treatment plant.

Before the facility started up, all of the employees went through extensive training in its proper operation and in trouble shooting mechanical problems and upset conditions. From the very beginning, we instilled in every employee the belief that protection of the environment and efficient operation of the treatment plant was their primary responsibility. In keeping with this approach, we have consistently worked to improve our knowledge and understanding of the waste water treatment system and the factors which influence its efficiency. With this information, we have implemented several process improvements to the system to better enable us to monitor and fine tune its performance. These include:

- 1.) The addition of flow monitoring devices to the nutrient feed system,
- 2.) The addition of a continuous, on-line dissolved oxygen measurement system,
- 3.) The addition of five (5), floating mechanical mixers to the aeration basin to improve mixing.

James River is committed to conserving natural resources while producing the highest quality products which have the least impact on the environment. Building on past initiatives, the company is continually introducing new products and improved manufacturing processes designed to be more efficient while meeting or exceeding strict environmental standards, as well as the expectations of its customers. James River believes that environmental protection must entail a total quality approach toward natural resource management, energy conservation, solid waste reduction, recycling, innovative product design and manufacture , and improved air and water quality management.

James River believes that the reduced summer BOD permit limits proposed in this permit modification are appropriate for the capabilities of the treatment system at Halsey and reflect our commitment to exercise continuous improvement in all of our processes.

Attachment B

Department Response to Comments

State of Oregon
Department of Environmental Quality

Memorandum

Date: January 23, 1996

To: Steve Greenwood, Administrator

From: Timothy McFetridge, Western Region ^{TCM}

Subject: Attachment B - Department response to comments regarding the proposed modification to the James River NPDES permit.

The following is the Department's response to the comments received during the public participation period for the proposed modification to NPDES permit No. 100861.

Comment:

The City of Corvallis stated that the data supplied to DEQ regarding the quality of the James River effluent indicated that a reduction in the effluent BOD loadings of greater than the proposed 25% was achievable. The City went on to say that they supported the proposed 25% reduction, but that the matter of further reductions should be evaluated at the time of permit renewal.

Department Response:

The Department agrees that it is possible that a reduction of greater than 25% may be achievable by the James River treatment system. The Department made the determination that 25% was a prudent value due to the fact that only two years of acceptable effluent data was available, and the fact that the type of wastewater being treated is highly variable. At the time of permit renewal (expiration date - Feb. 28, 1997) all items will be up for review, including all effluent limits.

Comment:

The City of Corvallis stated their concern about an apparent inequity in how permitted discharge loads are allocated between municipal and industrial discharges along the Willamette River.

Department Response:

The Department is sensitive to this concern but since it is outside the scope of the proposed permit modification, the matter will not be addressed further at this time.

Memo To: Steve Greenwood, Administrator
January 8, 1996
Page 2

Comment:

James River provided comments in support of the proposed NPDES permit modification.

Department Response:

The Department acknowledges James River's comment in support of the proposed permit modification.

Comment:

A member of the public provided comments of concern regarding the level of pollution in the Willamette River. It was stated that: "This excessive license for James River Corp. to pollute the river must be better controlled". Concern was also provided regarding the quality of the Willamette River as a drinking water source for the residents of the City of Corvallis.

Department Response:

The current James River NPDES permit was written with the intent that all beneficial uses of the Willamette River be met, including drinking water. To address this matter, Pope & Talbot and James River have conducted extensive studies regarding their impact on the drinking water of the City of Corvallis. To date there has been no documented impacts on taste and odor in the Corvallis drinking water system caused directly by the James River/Pope & Talbot effluent. Although some impact is likely, it has yet to be documented. A two year joint study conducted by the City of Corvallis, Pope & Talbot, and James River (James River, Pope & Talbot, City of Corvallis, Joint Taste and Odor Study, March-1994, author: Dr. Barry Rosen) actually concluded that there was no detectable impact.

Regarding the recommended need for more control, the proposed modification to the James River NPDES permit would result in a more stringent effluent limit for BOD. It appears that this would at least in part address the recommendation for better control of the discharge.

The above responses to the comments received during the public participation process have been mailed to those providing the comments.

Attachment C

Proposed NPDES permit modification

**NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
WASTE DISCHARGE PERMIT**

Department of Environmental Quality
Western Region
1102 Lincoln St., Suite 210, Eugene, OR 97401
Telephone: (541) 686-7838

Issued pursuant to ORS 468.740 and the Federal Clean Water Act

ISSUED TO:

James River Paper Company, Inc.
P.O. Box 215
Halsey, OR 97348

SOURCES COVERED BY THIS PERMIT:

Type of Waste	Outfall Number	Outfall Location
Combined Effluent (common outfall of James River Co. and Pope & Talbot, Inc)	B	Willamette R. RM 148.4
James River Effluent A (prior to combining with Pope & Talbot's effluent)		Pope & Talbot pipe

PLANT TYPE AND LOCATION:

Secondary Fiber Pulp Mill
30470 American Drive
Halsey, OR 97348

RECEIVING STREAM INFORMATION:

Basin: Willamette
Sub-Basin: Upper Willamette
Stream: Willamette River
Hydro Code: 22=-WILL 148.4 D
County: Linn

EPA REFERENCE NO: OR-003340-5

Issued in response to Application No. 998046 received March 14, 1991.

This permit is issued based on the land use findings in the permit record.

Steve Greenwood, Administrator
Western Region

Date

ADENDUM

The following limitations apply to James River Paper Co., as their permitted discharge after March 1, 1996:

Parameter	Monthly Ave. lb/day	Daily Max. lb/day
BOD ₅		
Summer Period (May 1-Oct.31)	1500	3900
Remainder of Year (Nov. 1-Apr. 30)	3120	5760
TSS	3500	6750
2,3,7,8 TCDD	No permitted discharge	
(Compliance with this limitation will be determined by the process of Schedule C, Item 2.)		

pH

Shall not exceed the range 6.0 to-9.0

Attachment D
Current NPDES Permit

**NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
WASTE DISCHARGE PERMIT**

Department of Environmental Quality
811 S.W. Sixth Avenue, Portland, OR 97204
Telephone: (503) 229-5696

Issued pursuant to ORS 468.740 and the Federal Clean Water Act

ISSUED TO:

James River Paper
Company, Inc.
P.O. Box 215
Halsey, OR 97348

SOURCES COVERED BY THIS PERMIT:

<u>Type of Waste</u>	<u>Outfall Number</u>	<u>Outfall Location</u>
Combined Effluent (common outfall of James River Co. and Pope & Talbot, Inc.)	B	Willamette R. RM 148.4
James River Effluent (prior to combining with Pope & Talbot's effluent)	A	Pope & Talbot pipe

PLANT TYPE AND LOCATION:

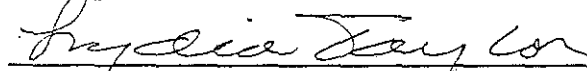
Secondary Fiber Pulp Mill
30470 American Drive
Halsey, OR 97348

RECEIVING STREAM INFORMATION:

Basin: Willamette
Sub-Basin: Upper Willamette
Stream: Willamette River
Hydro Code: 22--WILL 148.4 D
County: Linn

EPA REFERENCE NO: OR-003340-5

Issued in response to Application No. 998046 received March 14, 1991.
This permit is issued based on the land use findings in the permit record.


Lydia Taylor, Administrator

February 28, 1992
Date

PERMITTED ACTIVITIES

Until this permit expires or is modified or revoked, the permittee is authorized to construct, install, modify or operate a wastewater collection, treatment, control and disposal system and discharge to public waters adequately treated wastewaters only from the authorized discharge point or points established in Schedule A and only in conformance with all the requirements, limitations, and conditions set forth in the attached schedules as follows:

	<u>Page</u>
Schedule A - Waste Discharge Limitations not to be Exceeded..	2-3
Schedule B - Minimum Monitoring and Reporting Requirements...	4-5
Schedule C - Compliance Conditions and Schedules.....	6-8
Schedule D - Special Conditions.....	9
General Conditions.....	Attached

Each other direct and indirect waste discharge to public waters is prohibited.

This permit does not relieve the permittee from responsibility for compliance with any other applicable federal, state, or local law, rule, standard, ordinance, order, judgment, or decree.

SCHEDULE A

Waste Discharge Limitations Not to be Exceeded After Permit Issuance:

1. Outfall A (Discharge of process effluent from James River Paper Co. to the outfall pipe of Pope & Talbot, Inc.)

The following limitations apply to James River Paper Co., as their permitted discharge until March 1, 1996:

<u>Parameter</u>	<u>Monthly Ave.</u> <u>lb/day</u>	<u>Daily Max.</u> <u>lb/day</u>
BOD ₅		
Summer Period (May 1-Oct.31)	2000	5200
Remainder of Year (Nov. 1-Apr. 30)	3120	5760
TSS	3500	6750
2,3,7,8 TCDD	No permitted discharge	
(Compliance with this limitation will be determined by the process of Schedule C, Item 2.)		
pH	Shall not exceed the range 6.0-9.0	

The following limitations apply to James River Paper Co., as their permitted discharge after March 1, 1996:

<u>Parameter</u>	<u>Monthly Ave.</u> <u>lb/day</u>	<u>Daily Max.</u> <u>lb/day</u>
BOD5	No permitted discharge, pending EQC action	
TSS	3500	6750
2,3,7,8 TCDD	No permitted discharge	
(Compliance with this limitation will be determined by the process of Schedule C, Item 2.)		
pH	Shall not exceed the range 6.0-9.0	

2. Outfall B (Combined process effluent from James River Paper Company and Pope & Talbot, Inc. at point of discharge to the Willamette River.)

In the event of violation of water quality standards outside the mixing zone that is directly attributable to the combined discharge, James River Paper Co. and Pope & Talbot, Inc. shall be considered to be jointly and severally liable for such violation unless one or the other demonstrates to the Department's satisfaction that their contribution to the combined discharge was not the cause of the violation.

3. Notwithstanding the effluent limitations established by this permit, no wastes shall be discharged and no activities shall be conducted which will violate Water Quality Standards as adopted in OAR 340-41-442 except in the following defined mixing zone:

The mixing zone shall not exceed a portion of the Willamette River extending 300 feet downstream from the outfall diffuser and extending beyond each end of the diffuser by 30 feet.

4. Slimicides and biocides containing trichlorophenol or pentachlorophenol shall not be used at the mill.

SCHEDULE B

Minimum Monitoring and Reporting Requirements (unless otherwise approved in writing by the Department)

1. Outfall A (Discharge of process effluent from James River Paper Co. to the outfall pipe of Pope & Talbot, Inc.)

<u>Parameter</u>	<u>Minimum Frequency</u>	<u>Sample Type</u>
Flow Rate	Three per week	Recording Totalizer
BOD ₅	Three per week	24 hr composite
TSS	Three per week	24 hr composite
pH	Three per week	Grab
Total Phosphorous-P	One per week	24 hr composite
Ammonia-N	One per week	Grab
2,3,7,8 TCDD	Quarterly	24 hr composite
Total recoverable metals Cd, Cu, Se, Tl, Zn	One per month	24 hr composite
Bioassays (See Schedule C)	Jan/Mar/May/Jul Sep/Nov	Per protocol

2. Outfall B (Combined process effluent from James River Paper Company and Pope & Talbot, Inc. at point of discharge to Willamette River.)

<u>Parameter</u>	<u>Minimum Frequency</u>	<u>Sample Type</u>
Bioassays (See Schedule C)	Jan/Mar/May/Jul Sep/Nov	per protocol

3. Outfall A and Outfall B effluents shall be sampled simultaneously. Monitoring of the combined effluent and reporting may be conducted by James River Paper Company or Pope & Talbot, Inc., individually or together, with Department approval.
4. Dioxin (2,3,7,8 TCDD) in the wastepaper furnish and in the pulp and solid waste produced in the wastewater treatment plant shall be monitored as follows:

<u>Parameter</u>	<u>Minimum Frequency</u>	<u>Sample Type</u>
2,3,7,8 TCDD in waste- paper furnish, pulp and solid waste	One per month	Representative composite
2,3,7,8 TCDD discharged	One per month	Calculation

5. Wastepaper Furnish, Pulp and Solid Waste Quantities

- | | |
|----------------------------------|--|
| a. Waste Paper Processed | Average air-dry tons/day for reporting period. |
| b. Secondary Fiber Pulp Produced | Average air-dry tons/day for reporting period. |
| c. Solid Waste Produced | Average air-dry tons/day for reporting period. |

(The average is defined as the total quantity processed or produced during the reporting period divided by the number of days operated during the reporting period.)

6. Reporting Procedures

Monitoring results shall be reported on approved forms. The reporting period, unless otherwise stated, is the calendar month. Reports must be submitted to the Department by the 15th day of the following month; however, results of bioassays may be submitted within 60 days of sampling.

SCHEDULE C

Compliance Conditions and Schedules

1. By March 1, 1994, the permittee shall submit to the Department the results of an engineering study that will define alternative methods, and their implementation costs, to reduce the permitted summer-period BOD loads to the Willamette River by 25 percent and 50 percent. The study shall also estimate the concomitant winter period BOD load reduction resulting from the defined alternative methods.

The Department will use the results of the study to make recommendations to the Environmental Quality Commission regarding continuance or modification of the BOD discharge limits of Schedule A in sufficient time for the permittee to make whatever process or wastewater treatment modifications may be necessary before March 1, 1996, when the permitted BOD limit drops to zero.

2. Compliance with the 2,3,7,8 TCDD discharge limitation shall be determined by as follows:
 - a. The permittee shall, by June 1, 1992, submit for Department approval a proposed 2,3,7,8 TCDD sampling and testing protocol for the collection of long-term-average data on the amount of 2,3,7,8 TCDD in the wastepaper furnish, the secondary fiber pulp produced and the solid waste. The protocol shall address variabilities in raw materials, production processes and rates, wastewater treatment and sampling and analytical procedures.
 - b. The protocol shall define appropriate procedures to determine, by a mass balance, the statistically-significant amount, if any, of 2,3,7,8 TCDD being discharged in the wastewater.
 - c. The permittee shall implement the sampling, analytical procedures and statistical analysis within 30 days of Department approval of the protocol.
3. Beginning September, 1992, the permittee shall conduct six whole-effluent toxicity bioassay tests per year of Outfalls A and B effluent with Ceriodaphnia dubia (water flea), Pimephales promelas (fathead minnow) and Selenastrum capricornutum (green algae).

Monitoring of the combined effluent and reporting may be conducted by James River Paper Company or Pope & Talbot, Inc., individually or together, with Department approval.

Except for the Selenastrum test, these bioassays shall be dual end-point tests in which both acute and chronic end-points can be determined from the results of a single chronic test. The acute end-point (LC50) only applies when significant mortality occurs.

The results of these bioassays will be evaluated by the Department after measurements have been taken for two years (12 measurements).

Bioassays shall be conducted in accordance with Short-term Methods for Estimating the Chronic Toxicity of Effluent and Receiving Waters to Freshwater Organisms, EPA/600/4-89/001 and Methods for Measuring the Acute Toxicity of Effluents to Aquatic Organisms, EPA (most current edition).

The permittee shall make available to the Department Laboratory, on request, the written standard operating procedures (SOPs) they, or the laboratory performing the bioassays, are using for all toxicity tests required by the Department.

4. After the two-year bioassay review, the Department may, if appropriate, reduce the biomonitoring requirements of Item 2 of this schedule, reduce the frequency of testing or discontinue testing.
5. Quality assurance criteria, statistical analyses and data reporting for the bioassays shall be in accordance with the following reference:

Short-Term Methods for Estimating the Chronic Toxicity of Effluent and Receiving Waters to Freshwater Organisms, EPA/600/4-89/001

The raw data and statistical calculations shall be included in the report.

6. The permittee shall evaluate (individually or jointly with Pope & Talbot, Inc.) the degree of dilution that occurs when the combined effluent of Outfall B mixes with ambient river water, according to the following schedule:

By October 1, 1992, the permittee shall submit a plan that outlines the dilution study methodology to the Department for review. The dilution study shall be valid for the river 7Q10 low-flow condition.

By June 1, 1994, a report summarizing the results of the dilution study shall be submitted to the Department. Results will be used to evaluate dilution with respect to the current mixing zone definition and achievement of water-quality standards.

7. If, after the two-year study period, the results of the Ceriodaphnia dubia (water flea) and Pimephales promelas (fathead minnow) bioassay tests of Outfall B indicate a potential violation of water quality standards for toxicity, the permittee, individually or jointly with Pope & Talbot, Inc., shall further evaluate the toxicity of the Outfall B effluent and its effects on the receiving waters. If these subsequent tests confirm a violation of water quality standards due to the effluent, the permittee shall develop a plan to eliminate the violation. Upon approval of the plan by the Department, the permittee, individually or jointly with Pope & Talbot, Inc., shall implement the plan and the process shall be continued until the violation has been eliminated.

The permit may be reopened to set WET discharge limits for Outfalls A and B based on the results of the Ceriodaphnia dubia (water flea) and Pimephales promelas (fathead minnow) bioassay results, if appropriate.

(See Technical Support Document for Water Quality-based Toxics Control, EPA/505/2-90-001, March, 1991)

8. The permittee shall evaluate alternatives to landfilling the solid waste, with emphasis on finding a beneficial use for the waste according to the following schedule:
 - a. By January 1, 1994, a Solid Waste Feasibility Study and Solid Waste Plan shall be completed and submitted to the Department.
 - b. By January 1, 1996, laboratory studies and/or pilot scale studies shall be completed. A written report summarizing the results of these studies shall be submitted to the Department.
 - c. By January 1, 1997, a program and time schedule to implement the selected alternative(s) shall be submitted to the Department for review and approval.
 - d. The permittee shall hold public meetings at each stage (a, b and c, above) of this process to share information and provide an opportunity for public input. The permittee shall summarize the information and input in a report to the Department.
9. The permittee is expected to meet the compliance dates which have been established in this schedule. Either prior to, or no later than, 14 days following any lapsed compliance date, the permittee shall submit to the Department a notice of compliance or noncompliance with the established schedule. The Director may revise a schedule of compliance if good and valid cause over which the permittee has little or no control has been determined.

SCHEDULE D

Special Conditions

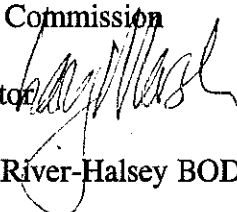
1. Sanitary wastes generated by James River Paper Co. shall be sent to Pope & Talbot, Inc.'s sanitary treatment plant for treatment and discharge.
2. An adequate contingency plan for prevention and handling of spills and unplanned discharges shall be in force at all times. A continuing program of employee orientation and education shall be maintained to ensure awareness of the necessity of good inplant control and quick and proper action in the event of a spill or accident.
3. An environmental supervisor shall be designated to coordinate and carry out all necessary functions related to maintenance and operation of waste collection, treatment, and disposal facilities. This person must have access to all information pertaining to the generation of wastes in the various process areas.

P105814W (2/28/92)

State of Oregon
Department of Environmental Quality

Memorandum[†]

Date: February 6, 1996

To: Environmental Quality Commission
From: Langdon Marsh, Director 
Subject: Agenda Item F, James River-Halsey BOD Limit Reduction, EQC Meeting

February 23, 1996

Statement of the Issue

The current National Pollutant Discharge Elimination System (NPDES) permit for the James River paper mill in Halsey contains numeric effluent limits for Biochemical Oxygen Demand (BOD₅). As of March 1, 1996, the numeric limits will be removed and there will be no discharge allowed, unless the EQC takes action to set a new numeric effluent limit. The facility will not be able to operate without having a discharge of wastewater containing some level of BOD₅.

The Department is recommending that numeric effluent limits be placed in the permit to be effective March 1, 1996.

Background

The current James River NPDES permit was issued on February 28, 1992. The permit was issued for a new secondary fiber pulp/paper mill and was needed to authorize the discharge of treated wastewater to the Willamette River at river mile 147.2. Wastewater from the James River treatment system is combined with the wastewater from the neighboring Pope & Talbot mill and is discharged through a common diffuser.

The current NPDES permit for James River contains a requirement for the Department to evaluate the BOD₅ effluent limits by March, 1996. This requirement was included to address the public concern about James River's ability to meet the effluent limits that were placed in their current permit. The wastewater treatment system that was proposed to be used in the new mill

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

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was not typical of that used by the pulp/paper industry. Most mills use a semi-passive system which employ large aerated ponds with detention times of many days. James River's system is a highly mechanical activated sludge system and detention times are relatively short. At the time, there was very little known about this type of system and what the expected effluent quality would be. The public stressed the need to have a permit reopener to require additional treatment, or possibly to reduce the effluent limits if the system operated at a much higher efficiency than expected. The latter has been demonstrated and the Department is proposing that the effluent limits for BOD₅ be reduced.

Authority to Address the Issue

James River requested a mass load increase to the Willamette River in 1991. The EQC took final action on the request in March, 1992, by approving a conditional mass load increase. A condition was included in the NPDES permit that allows no discharge of BOD after March, 1996, pending EQC action. The Department is recommending that an effluent BOD limit be placed in the current NPDES permit that would replace the current limit. The recommended limit is a 25% reduction of the current limit. The NPDES permit authorizes the ECQ to take final action on the Department's recommendation. -

Alternatives and Evaluation

After a complete review of the effluent monitoring data, the studies conducted by James River, and all Department inspection reports, the Department feels that the wastewater treatment system being used by James River is a well designed, and well operated facility.

As required by the current NPDES permit, James River evaluated a number of alternatives for additional treatment. Most of the alternatives employed tertiary type treatment of the wastewater after it was treated in the existing system. Given that the quality of effluent that is produced by the system is already significantly better than standard technology used by the pulp/paper industry, is significantly below the permitted loadings, and the Willamette River has assimilative capacity for the proposed BOD loading, it is the opinion of the Department that additional treatment is not warranted. The effluent from James River is of a high quality and meets all state water quality standards. The Department does feel that the current effluent limits for BOD₅ are set at levels that are in excess of the current treatment system's capability to treat the existing waste stream. A reduction in the limits is therefore being proposed by the Department.

In setting effluent limits for facilities that discharge wastewater to waters of the State of Oregon, two criteria are normally used to ensure that the discharge will meet all applicable standards. All discharges must meet technology based effluent limits and water quality based effluent limits.

The technology based limits are found in the federal register (40 CFR 430.175) and are New Source Performance Standards (NSPS). The NSPS are developed by the United States Environmental Protection Agency (US-EPA) by evaluating similar mills throughout the country and setting limits based on demonstrated technology. The technology based values are used in conjunction with the mills production level to derive the monthly average and daily maximum limits for BOD₅.

The water quality based limits are developed in accordance with the State of Oregon Water Quality Standards (OAR 340-41-445). The limits are set at a point at which all water quality standards will be met at the edge of a defined mixing zone.

Once the technology based limits and water quality based limits have been calculated, the most stringent limit is selected for each parameter of concern. The technology based limits are calculated below:

40 CFR 473.175, Subpart Q, Deink Subcategory, pounds per 1000 pounds produced:

	Maximum Daily	Monthly Average
BOD ₅	9.6 lbs/1000lbs	5.2 lbs/1000lbs
Production.....	600 X 1000 lbs/day	
Monthly Average BOD ₅	3120 lbs/day	
Daily Maximum BOD ₅	5760 lbs/day	

In September, 1992, James River and Pope & Talbot conducted a joint mixing zone study of their combined discharge to the Willamette River. The study concluded that the available dilution at the edge of the mixing zone (300 feet), at 7Q10 flow (the lowest consecutive 7-day flow over a 10-year period), was about 100:1. The impact on dissolved oxygen was evaluated using the mixing zone study results and a computer model (QUAL2E) and was determined to be

no greater than 0.1 mg/l from the point of discharge to Willamette Falls. The current limits are therefore protective of water quality and meet state standards found in OAR 340-41-445(a).

In conclusion, the current effluent limits for BOD₅ meet both the federal technology standards and the state water quality standards. The current summer monthly average effluent limits are set at approximately 60% of the NSPS. Since this is the case, a further reduction in effluent limits is based solely on the fact that the existing treatment system is able to achieve more than is required by federal and state standards. With this in mind, the Department reviewed and evaluated the monitoring data collected over the last three years. The Department has determined that an effluent limit reduction of 25% from the current limit would be achievable and meet the intent of the NPDES permit requirements. A reduction of 25% would result in a summer monthly average limit of 1500 lbs/day and a summer daily maximum of 3900 lbs/day. The Department is proposing that these reductions be made by modification of the James River NPDES permit. The proposed effluent limits are set at about one half, and two thirds, the NSPS monthly average and daily maximum values, respectively. The effluent limit which allowed no discharge after March, 1996, was included to require the Department to evaluate actual treatment plant performance and report back to the EQC regarding the Department's findings. The EQC expressed a desire to revisit the effluent limits after the treatment system had been in operation for four years.

The environmental impact of BOD₅ on receiving streams is the potential reduction in the amount of dissolved oxygen present. Dissolved oxygen is needed within the stream to support aquatic life. The most critical period for dissolved oxygen is in the warmer summer months and at low flow conditions. Biological activity within a receiving stream decreases with decreasing water temperatures. This has a direct impact on the dissolved oxygen within a particular water body. The much higher flow rates during the winter months also lessens the impact of the organic load. The winter limits for BOD₅ therefore are proposed to remain at NSPS levels for the November through April period.

It is urgent that the EQC take action on this item prior to March 1, 1996. The James River mill in Halsey will be unable to operate without have a discharge which contains some amount of BOD. The requirement for James River to have no allowable discharge of BOD after March 1, 1996, was included in the permit to require a complete evaluation of the James River wastewater treatment system performance and set lower effluent limits if achievable.

Summary of Any Prior Public Input Opportunity

As part of the proposed NPDES permit modification, a 30 day public notice period was began on November 15, 1995. A public hearing was held in Corvallis on the Oregon State University campus on December 18, 1995. The hearing was attended by five individuals. The City of Corvallis was represented as well as James River. Those in attendance did not provide any verbal testimony, but written comments were submitted by the City of Corvallis and James River. A summary of the comments and the Department's response to comments are included in Attachment A, Hearings Officer Report, and Attachment B, Response to Comments.

Conclusions

- o The current effluent limits for BOD₅ meet both the federal technology standards and the state water quality standards.
- o The current summer monthly average effluent limits are set at approximately 60% of the NSPS.
- o Further reduction in effluent limits is based solely on the fact that the existing treatment system is able to achieve more than is required by federal and state standards.
- o The Department has determined that an effluent limit reduction of 25% from the current limit would be achievable and meet the intent of the NPDES permit requirements. A reduction of 25% would result in a summer monthly average limit of 1500 lbs/day and a summer daily maximum of 3900 lbs/day. The Department is proposing that these reductions be made by modification to the James River NPDES permit.

Recommendation for Commission Action

It is recommended that the Commission adopt the Department recommendation to set new effluent limits for BOD₅ during the summer period for the James River mill in Halsey. The summer BOD₅ limits would be protective of water quality and would represent a 25% reduction over the current BOD₅ effluent limits.

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Attachments

- A. Hearings Officer Report
- B. Department Response to Comments
- C. Proposed NPDES Permit Modification

Approved:

Section: Barbara A. Burton

Division: Shirley Greenwood

Report Prepared By: Timothy McFetridge

Phone: (503) 378-8240, extension: 235

Date Prepared: January 23 1996

TCM
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January 23, 1996

Attachment A

Hearings Officer Report

State of Oregon
Department of Environmental Quality

Memorandum

Date: January 23, 1996

To: Steve Greenwood, Administrator
From: William Perry, Hearings Officer
Subject: Attachment A - Hearings officer report for the proposed NPDES permit modification for the James River mill in Halsey.

A hearing was held on December 18, 1995, in an effort to accept comments on the proposed modification to the James River NPDES permit. The hearing was attended by five individuals. The attendance list is attached to this report.

There was no verbal testimony provided at the hearing. Comments in support of the Department proposal to modify the James River NPDES permit were received from James River Corporation and the City of Corvallis.

The City of Corvallis also provided written comments on what they view as an inequity in the way pollutant loadings are allocated between municipal and industrial wastewater dischargers.



DEPARTMENT OF ENVIRONMENTAL QUALITY

TOPIC James River
DATE 12/18/95

SIGN-IN SHEET

PLEASE PRINT

=====

NAME

ADDRESS (include city, state & zip)

=====

1. George Appleton P.O. Box 215 Halsey, OR 97348
CITY OF CORVALLIS
2. TOM PENRAZE BOX 1083 CORVALLIS 97339
3. BOB STEVENS P.O. Box 215 Halsey OR 97348
4. Dick Sleeter P.O. Box 215 Halsey, OR 97348
5. LARRY CHARNEY 28150 LIBERTY RD. SWEET HOME, OR 97331
6. _____
7. _____
8. _____
9. _____
10. _____



SIVETZ COFFEE, Inc.
COFFEE BEAN ROASTING MACHINES
Extraction, Engineering & Consulting
349 S.W. 4th ST.
CORVALLIS, OREGON 97333—U.S.A.
Phone 503-753-9713
FAX 503-757-7644

Nov. 19, 1995

RECEIVED

Oregon DEQ-Western Region
Attn: Linda Fry
750 Front St. suite 120
SALEM, OR
97310

WESTERN REGION - SALEM OFFICE

Re: James River 3,000,000 gal/day
Effluent Discharge into Willamette R.
above Corvallis

Dear Sirs;

I and my wife attended the last hearing, and was appalled at the rude, loud and undisciplined behavior of the "stacked" James River employees that attended that hearing at LaSells Ctr., as well as to our management's and employees pleadings to allow unbridled pollution of the Willamette river because of their profitable business and jobs.

Unfortunately, I also was confused initially as to whether T. McPetridge of the DEQ was speaking for the DEQ or for Jamer River Corp.

The important point I want to make is that in our business and in our personal lives, the quality of the water we consume is very personal.

In the past 1.5 years we have progressively been consuming more bottled water, because the tap water has been frequently at times continually more unpalatable, colored and un natural tasting.

Not only that, but now as residents of Corvallis, we are faced with a ten million dollar upgrading and expansion of the Corvallis water treatment system, which we are being progressively increasingly taxed on

This excessive license for James River Corp. to pollute the river must be better controlled.

Every time I buy bottled water, and every time I'm offended by the water quality coming out of our business and home taps, I'm already paying for this excessive corporate pollution, that makes the river a sewer.

Mi_chael Sivetz, President





Office of the Mayor
501 SW Madison
P.O. Box 1083
Corvallis, OR 97339-1083
(503) 757-6985
FAX (503) 757-6780

December 19, 1995

Timothy McFetridge, Permit Writer
Oregon Department of Environmental Quality
Western Region
750 Front Street, Suite 120
Salem, OR 97310

PROPOSED JAMES RIVER CORPORATION NPDES PERMIT MODIFICATION

Dear Mr. McFetridge:

The City of Corvallis appreciates the opportunity to comment on the proposed James River Corporation NPDES discharge permit modification.

As you may know, the City of Corvallis submitted extensive comments to DEQ regarding James River's discharge permit when it was initially issued in 1992. The citizens of Corvallis at that time strongly expressed their desire that DEQ develop permit limits for James River that were fully protective of Willamette River water quality. Not only do citizens of Corvallis view the Willamette River as an integral component of what makes Corvallis a vibrant community, it is also our major source of drinking water.

The City of Corvallis supports DEQ's proposed 25% reduction in summer season BOD limits and requests that they be put into effect before the 1996 summer season. This is certainly an improvement over existing permit conditions. However, according to the data James River has supplied DEQ on the effectiveness of their treatment processes and the quality of the effluent, they are capable of successfully achieving more than a 25% BOD reduction. We believe further reductions in the allowable BOD limit should be considered.

Corvallis continues to be concerned with the apparent inequity in how permitted discharge loads are allocated between municipal and industrial dischargers along the Willamette River. We have made this concern known to DEQ in the past during review and comment on other permits for industrial discharges to the Willamette River, including James River's permit when it was initially issued. We

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DEC 21 1995

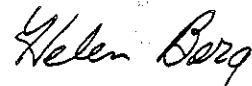
WESTERN REGION - SALEM OFFICE

Timothy McFetridge
December 18, 1995
Page 2

request that DEQ review its current policies regarding the wasteload allocation process and utilize a process to evaluate the equity among permitted dischargers. I am confident that DEQ, in cooperation with the affected parties, can develop a policy that is fair and equitable to all interests.

The City intends to bring this and other permit terms and condition concerns to DEQ's attention when the full James River permit is opened for renewal in early 1997. Thank you for this opportunity to provide input on this water quality concern.

Sincerely,


Helen Berg
Mayor

C: City Council
Environmental Quality Commission

/bh

PUBLIC WORKS STAFF REPORT

JAMES RIVER CORPORATION WASTEWATER DISCHARGE PERMIT

DECEMBER 12, 1995

INTRODUCTION

The Oregon Department of Environmental Quality (DEQ) has proposed modifying James River Corporation's wastewater discharge permit. DEQ has scheduled a public hearing on December 18, 1995 at the LaSells Stewart Center. Informal discussion begins at 6:30 pm with the formal hearing starting at 7 pm.

BACKGROUND

James River Corporation operates a secondary fiber (recycled paper) pulp mill in Halsey on a site adjacent to the Pope & Talbot pulp mill. They discharge an average of three million gallons of treated process wastewater each day to the Willamette River at river mile 147.2, approximately 13 miles upstream from Corvallis.

DISCUSSION

The existing wastewater discharge permit was issued on February 28, 1992. The permit was issued for a new mill to process primarily recycled paper, and was needed to authorize the discharge of treated industrial wastewater to the Willamette. Because of James River's proximity to the Pope & Talbot discharge line, the wastewater from their plant is discharged to the Willamette River through Pope & Talbot's discharge pipe.

DEQ discharge permits are issued for a five-year period and specify the terms and conditions under which treated wastewater may be released to a receiving stream. James River's permit will be up for renewal in February, 1997. However, James River's 1992 discharge permit contains a requirement for evaluating the biochemical oxygen demand (BOD) limits after four years, or by March, 1996. BOD is a laboratory measurement of the strength (oxygen consuming demand) of the wastewater discharge.

In 1992, when DEQ held public hearings regarding James River's discharge permit request, considerable public concern was expressed in regard to the potential impact the mill's discharge would have on Willamette River water quality. The City of Corvallis submitted extensive testimony at that time, as did a number of individual citizens and interest groups from Corvallis. The City as well as others believed that the permit conditions DEQ proposed for James River were too lenient, and would not be protective of river water quality. The public stressed the need to have the permit reopened before the five-year standard expiration period to require James River to do additional treatment if necessary to protect water quality, or if the limits proved to be too lenient, then to have

them made more stringent. This is why DEQ has opened James River's discharge permit to consider modification of the BOD limits at this time.

When the permit was issued in 1992, limits for BOD (and other constituents) were established, and the permit was issued for the normal five-year permit period. However, a limit of zero was placed in the permit for BOD for the fifth year. The limitation required DEQ to either: (1) reopen the permit and set a final limit, (2) leave the limit the same as the existing permit, (3) require James River to install additional treatment facilities to accomplish more effective treatment, (4) require James River to remove their discharge from the Willamette River, or (5) shut down the mill.

In November 1995, DEQ reviewed James River's discharge monitoring data (which James River is required to submit to DEQ on a monthly basis) and has proposed that James River keep discharging to the Willamette River, but with summertime BOD limits reduced by approximately 25% from current permit limits.

CITY STAFF REVIEW

Public Works staff has completed a review of the proposed modifications to the discharge permit.

Current Permit. The current permit allows James River to discharge treated effluent. The permit has limits on the following pollutants: BOD, Total Suspended Solids, pH, and Dioxin (none allowed in the discharge).

Treatment Plant Performance. According to the information supplied to the City by DEQ, James River's wastewater treatment system has been properly operated and has produced good effluent (discharge water) quality. The monthly average BOD discharge concentrations have been in the 20 milligram per liter (or parts per million) range. For comparison purposes, the Corvallis wastewater plant produces a summertime, low river flow effluent of around 5 milligrams per liter.

Proposed Permit Effluent Limits. Upon review of James River's flow monitoring data, inspection reports, and studies conducted by James River, DEQ believes that their wastewater treatment system is a well designed and operated facility, and is producing an effluent that is protective of Willamette River water quality. However, DEQ's analysis does indicate that the current effluent limits for BOD are too liberal and should therefore be lowered. City staff agree with DEQ on this point.

- **Summer Permit Limits.** The current permit limit for BOD is 2000 pounds/day during the summer, low river flow period (May through October). This means that the James River mill can legally discharge one-ton of BOD to the river per day and be in compliance with their permit. Again for comparison purposes, Corvallis can discharge a maximum of 810 pounds per day during the same period. DEQ proposes to lower James River's allowable discharge to 1500 pounds per day during the summer months, a 25% reduction.
- **Winter Permit Limits.** The James River permit allows them to discharge a monthly average of 3120 pounds of BOD per day in the winter months (November through April). DEQ does not propose to change this limitation.

CITY STAFF ANALYSIS

Summer Permit Limits. In reviewing the information James River submitted to DEQ on performance of their treatment plant regarding BOD, it appears they are discharging an effluent of considerably higher quality than the limits DEQ is proposing. In other words, it appears they could meet an even more stringent permit requirement than proposed. The mill's average BOD discharge is in the 250 to 500 pound per day range. DEQ is proposing a limit of 1500 pounds per day, which is three to six times higher than their average range of BOD discharge. This appears to be excessive and unnecessary. A discharge limit in the range of 1000-1200 pounds per day during the summer season appears more justifiable. This would allow for variations in the quality of their raw materials which might affect effluent quality, as well as giving them some allowance for minor upsets and process disturbances in their biological wastewater treatment system.

Winter Permit Limits. DEQ is not proposing to modify James River's winter discharge limits.

DEQ generally allows wastewater plants to discharge higher amounts of BOD to the river in the winter because there are higher flows in receiving waters and more dissolved oxygen, which provides for more assimilative capacity. The net effect is that there is little to no impact on receiving water quality by allowing this to occur. The reason wastewater plants usually would discharge higher amounts in the winter is because flows increase to plants due to rainwater and snowmelt, and biological treatment processes become less efficient in cold weather, resulting in less effective treatment and higher volumes of wastewater to be treated and discharged.

However, this is not necessarily the case in industrial treatment facilities such as James River's. The flow to their wastewater facilities is fairly constant year-around, as they do not have a wastewater collection system that allows rainwater to enter it like a municipality with an extensive piping system has. Secondly, they have a waste load to treat (recycled paper) that is somewhat uniform in its characteristics, unlike a municipal wastewater treatment plant whose wasteload can fluctuate by the minute depending on the extensive variety of materials that are being discharged to the sewer system.

For these reasons, municipal wastewater dischargers (like Corvallis) have permits that allow more BOD to be discharged to the river in the winter than in the summer. James River uses a biological treatment process to treat their wastewater, so some allowance should be made for winter operating inefficiencies. However, allowing a discharge of 3120 pounds of BOD per day during the winter appears excessive. A monthly average winter BOD discharge in the 2000-2500 pound range appears more reasonable and justifiable. This would still allow James River an allowance for some changes in the waste material quality which they process, and take into account the effects of temperature on the efficiency and effectiveness of their biological wastewater treatment processes.

Equity Issues. DEQ evaluates and issues wastewater discharge permits to industrial and municipal dischargers. Different evaluation criteria are used when reviewing and issuing permits to industry than are used for municipalities. James River's permit allows substantially more pollutant discharge to the river than Corvallis' permit, which has to support a population of 47,000 people.

The Willamette River has a finite capacity to successfully handle (assimilate) waste discharges without degrading water quality. As growth occurs in urbanized areas of Oregon there will be more

pressure to increase discharges to the river. There is an economic value to municipalities and industry associated with the remaining wasteload assimilative capacity of the Willamette River. If this capacity is consumed by relatively few industrial dischargers, there could be negative economic impacts on municipalities that must install and operate additional technologies to meet more stringent permit requirements to accommodate growth.

This is an issue that must be resolved before the remaining assimilative capacity is fully allocated. Staff has raised this issue, as we have in reviewing James River's initial permit request, as it will impact Corvallis in the future. This equity issue needs to be resolved by DEQ on a regional and statewide basis.

STAFF CONCLUSIONS

Upon review of the permit modification proposal, City staff has determined that:

- DEQ is proposing to only modify James River's summertime BOD discharge limit. All other permit limits, including a zero discharge limit for dioxin, will remain the same.
- A reduction in summertime BOD limits of 25% is being proposed.
- Wintertime BOD limits will remain unchanged.
- James River's wastewater system operating data submitted to DEQ indicates that their system is producing an effluent 3 to 6 times cleaner than the proposed summer permit limit.
- Even with the 25% reduction in BOD limits proposed by DEQ, it appears to be an excessive allowance, as James River has shown they can successfully meet more stringent limits and still have allowances for process variations without committing a permit violation.
- An inequity exists in how DEQ allocates allowable discharge loading between municipalities and industry. This issue needs to be resolved on a statewide basis.

STAFF RECOMMENDATIONS

Staff recommends the City comment on the proposed James River wastewater discharge permit modification by communicating the following points to DEQ:

1. Support the proposed 25% reduction in BOD limits as proposed by DEQ. A 25% reduction is an improvement over current permit requirements.
2. Communicate to DEQ that the City will have additional comments on the BOD limits (summer and winter) and other permit terms and conditions when the full permit is up for renewal in early 1997.
3. Communicate to DEQ that the City believes there are inequities in how permitted discharge loads are allocated between municipal and industrial dischargers, and request that DEQ review its current policies regarding its wasteload allocation process.

JAMES RIVER PAPER CO.

CONSUMER PRODUCTS DIVISION

P.O. Box 215

30470 American Drive

Halsey, Oregon 97348

Ph. 541-369-1367

Fax 541-369-1221

DATE: December 18, 1995

TO: Tim McFetridge - ORDEQ

FROM: George Appleton

SUBJECT: Proposed NPDES Permit Modification

The James River Paper Co. facility in Halsey, OR began operating its recycled fiber facility in March of 1992. The facility currently diverts approximately 500 tons of waste paper from landfills each day. The recovered fiber is recycled into towel, tissue and business grades of paper, such as *Brawny*TM paper towels, *Northern*TM tissue, and *Eureka*TM office copy paper. In addition, James River designed and constructed what we knew to be a conservatively designed, state-of-the-art Activated Sludge waste water treatment plant.

Before the facility started up, all of the employees went through extensive training in its proper operation and in trouble shooting mechanical problems and upset conditions. From the very beginning, we instilled in every employee the belief that protection of the environment and efficient operation of the treatment plant was their primary responsibility. In keeping with this approach, we have consistently worked to improve our knowledge and understanding of the waste water treatment system and the factors which influence its efficiency. With this information, we have implemented several process improvements to the system to better enable us to monitor and fine tune its performance. These include:

- 1.) The addition of flow monitoring devices to the nutrient feed system,
- 2.) The addition of a continuous, on-line dissolved oxygen measurement system,
- 3.) The addition of five (5), floating mechanical mixers to the aeration basin to improve mixing.

James River is committed to conserving natural resources while producing the highest quality products which have the least impact on the environment. Building on past initiatives, the company is continually introducing new products and improved manufacturing processes designed to be more efficient while meeting or exceeding strict environmental standards, as well as the expectations of its customers. James River believes that environmental protection must entail a total quality approach toward natural resource management, energy conservation, solid waste reduction, recycling, innovative product design and manufacture , and improved air and water quality management.

James River believes that the reduced summer BOD permit limits proposed in this permit modification are appropriate for the capabilities of the treatment system at Halsey and reflect our commitment to exercise continuous improvement in all of our processes.

Attachment B

Department Response to Comments

State of Oregon
Department of Environmental Quality

Memorandum

Date: January 23, 1996

To: Steve Greenwood, Administrator

From: Timothy McFetridge, Western Region ^{TEM}

Subject: Attachment B - Department response to comments regarding the proposed modification to the James River NPDES permit.

The following is the Department's response to the comments received during the public participation period for the proposed modification to NPDES permit No. 100861.

Comment:

The City of Corvallis stated that the data supplied to DEQ regarding the quality of the James River effluent indicated that a reduction in the effluent BOD loadings of greater than the proposed 25% was achievable. The City went on to say that they supported the proposed 25% reduction, but that the matter of further reductions should be evaluated at the time of permit renewal.

Department Response:

The Department agrees that it is possible that a reduction of greater than 25% may be achievable by the James River treatment system. The Department made the determination that 25% was a prudent value due to the fact that only two years of acceptable effluent data was available, and the fact that the type of wastewater being treated is highly variable. At the time of permit renewal (expiration date - Feb. 28, 1997) all items will be up for review, including all effluent limits.

Comment:

The City of Corvallis stated their concern about an apparent inequity in how permitted discharge loads are allocated between municipal and industrial discharges along the Willamette River.

Department Response:

The Department is sensitive to this concern but since it is outside the scope of the proposed permit modification, the matter will not be addressed further at this time.

Memo To: Steve Greenwood, Administrator
January 8, 1996
Page 2

Comment:

James River provided comments in support of the proposed NPDES permit modification.

Department Response:

The Department acknowledges James River's comment in support of the proposed permit modification.

Comment:

A member of the public provided comments of concern regarding the level of pollution in the Willamette River. It was stated that: "This excessive license for James River Corp. to pollute the river must be better controlled". Concern was also provided regarding the quality of the Willamette River as a drinking water source for the residents of the City of Corvallis.

Department Response:

The current James River NPDES permit was written with the intent that all beneficial uses of the Willamette River be met, including drinking water. To address this matter, Pope & Talbot and James River have conducted extensive studies regarding their impact on the drinking water of the City of Corvallis. To date there has been no documented impacts on taste and odor in the Corvallis drinking water system caused directly by the James River/Pope & Talbot effluent. Although some impact is likely, it has yet to be documented. A two year joint study conducted by the City of Corvallis, Pope & Talbot, and James River (James River, Pope & Talbot, City of Corvallis, Joint Taste and Odor Study, March-1994, author: Dr. Barry Rosen) actually concluded that there was no detectable impact.

Regarding the recommended need for more control, the proposed modification to the James River NPDES permit would result in a more stringent effluent limit for BOD. It appears that this would at least in part address the recommendation for better control of the discharge.

The above responses to the comments received during the public participation process have been mailed to those providing the comments.

Attachment C

Proposed NPDES permit modification

**NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
WASTE DISCHARGE PERMIT**

Department of Environmental Quality
Western Region
1102 Lincoln St., Suite 210, Eugene, OR 97401
Telephone: (541) 686-7838

Issued pursuant to ORS 468.740 and the Federal Clean Water Act

ISSUED TO:

James River Paper Company, Inc.
P.O. Box 215
Halsey, OR 97348

SOURCES COVERED BY THIS PERMIT:

<u>Type of Waste</u>	<u>Outfall Number</u>	<u>Outfall Location</u>
Combined Effluent (common outfall of James River Co. and Pope & Talbot, Inc)	B	Willamette R. RM 148.4
James River Effluent A (prior to combining with Pope & Talbot's effluent)		Pope & Talbot pipe

PLANT TYPE AND LOCATION:

Secondary Fiber Pulp Mill
30470 American Drive
Halsey, OR 97348

RECEIVING STREAM INFORMATION:

Basin: Willamette
Sub-Basin: Upper Willamette
Stream: Willamette River
Hydro Code: 22=-WILL 148.4 D
County: Linn

EPA REFERENCE NO: OR-003340-5

Issued in response to Application No. 998046 received March 14, 1991.

This permit is issued based on the land use findings in the permit record.

Steve Greenwood, Administrator
Western Region

Date

ADENDUM

The following limitations apply to James River Paper Co., as their permitted discharge after March 1, 1996:

<u>Parameter</u>	<u>Monthly Ave. lb/day</u>	<u>Daily Max. lb/day</u>
BOD ₅		
Summer Period (May 1-Oct.31)	1500	3900
Remainder of Year (Nov. 1-Apr. 30)	3120	5760
TSS	3500	6750
2,3,7,8 TCDD (Compliance with this limitation will be determined by the process of Schedule C, Item 2.)	No permitted discharge	
pH	Shall not exceed the range 6.0 to-9.0	

Attachment D
Current NPDES Permit

NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM
WASTE DISCHARGE PERMIT

Department of Environmental Quality
811 S.W. Sixth Avenue, Portland, OR 97204
Telephone: (503) 229-5696

Issued pursuant to ORS 468.740 and the Federal Clean Water Act

ISSUED TO:

James River Paper
Company, Inc.
P.O. Box 215
Halsey, OR 97348

SOURCES COVERED BY THIS PERMIT:

Type of Waste	Outfall Number	Outfall Location
Combined Effluent (common outfall of James River Co. and Pope & Talbot, Inc.)	B	Willamette R. RM 148.4
James River Effluent (prior to combining with Pope & Talbot's effluent)	A	Pope & Talbot pipe

PLANT TYPE AND LOCATION:

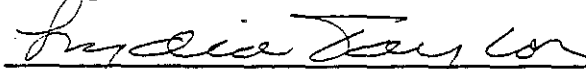
Secondary Fiber Pulp Mill
30470 American Drive
Halsey, OR 97348

RECEIVING STREAM INFORMATION:

Basin: Willamette
Sub-Basin: Upper Willamette
Stream: Willamette River
Hydro Code: 22=-WILL 148.4 D
County: Linn

EPA REFERENCE NO: OR-003340-5

Issued in response to Application No. 998046 received March 14, 1991.
This permit is issued based on the land use findings in the permit record.


Lydia Taylor, Administrator

February 28, 1992
Date

PERMITTED ACTIVITIES

Until this permit expires or is modified or revoked, the permittee is authorized to construct, install, modify or operate a wastewater collection, treatment, control and disposal system and discharge to public waters adequately treated wastewaters only from the authorized discharge point or points established in Schedule A and only in conformance with all the requirements, limitations, and conditions set forth in the attached schedules as follows:

	Page
Schedule A - Waste Discharge Limitations not to be Exceeded..	2-3
Schedule B - Minimum Monitoring and Reporting Requirements...	4-5
Schedule C - Compliance Conditions and Schedules.....	6-8
Schedule D - Special Conditions.....	9
General Conditions.....	Attached

Each other direct and indirect waste discharge to public waters is prohibited.

This permit does not relieve the permittee from responsibility for compliance with any other applicable federal, state, or local law, rule, standard, ordinance, order, judgment, or decree.

SCHEDULE A

Waste Discharge Limitations Not to be Exceeded After Permit Issuance:

1. Outfall A (Discharge of process effluent from James River Paper Co. to the outfall pipe of Pope & Talbot, Inc.)

The following limitations apply to James River Paper Co., as their permitted discharge until March 1, 1996:

<u>Parameter</u>	<u>Monthly Ave. lb/day</u>	<u>Daily Max. lb/day</u>
BOD ₅		
Summer Period (May 1-Oct.31)	2000	5200
Remainder of Year (Nov. 1-Apr. 30)	3120	5760
TSS	3500	6750
2,3,7,8 TCDD	No permitted discharge	
(Compliance with this limitation will be determined by the process of Schedule C, Item 2.)		
pH	Shall not exceed the range 6.0-9.0	

The following limitations apply to James River Paper Co., as their permitted discharge after March 1, 1996:

<u>Parameter</u>	<u>Monthly Ave.</u> <u>lb/day</u>	<u>Daily Max.</u> <u>lb/day</u>
BOD5	No permitted discharge, pending EQC action	
TSS	3500	6750
2,3,7,8 TCDD	No permitted discharge	
(Compliance with this limitation will be determined by the process of Schedule C, Item 2.)		
pH	Shall not exceed the range 6.0-9.0	

2. Outfall B (Combined process effluent from James River Paper Company and Pope & Talbot, Inc. at point of discharge to the Willamette River.)

In the event of violation of water quality standards outside the mixing zone that is directly attributable to the combined discharge, James River Paper Co. and Pope & Talbot, Inc. shall be considered to be jointly and severally liable for such violation unless one or the other demonstrates to the Department's satisfaction that their contribution to the combined discharge was not the cause of the violation.

3. Notwithstanding the effluent limitations established by this permit, no wastes shall be discharged and no activities shall be conducted which will violate Water Quality Standards as adopted in OAR 340-41-442 except in the following defined mixing zone:

The mixing zone shall not exceed a portion of the Willamette River extending 300 feet downstream from the outfall diffuser and extending beyond each end of the diffuser by 30 feet.

4. Slimicides and biocides containing trichlorophenol or pentachlorophenol shall not be used at the mill.

SCHEDULE B

Minimum Monitoring and Reporting Requirements (unless otherwise approved in writing by the Department)

1. Outfall A (Discharge of process effluent from James River Paper Co. to the outfall pipe of Pope & Talbot, Inc.)

<u>Parameter</u>	<u>Minimum Frequency</u>	<u>Sample Type</u>
Flow Rate	Three per week	Recording Totalizer
BOD ₅	Three per week	24 hr composite
TSS	Three per week	24 hr composite
pH	Three per week	Grab
Total Phosphorous-P	One per week	24 hr composite
Ammonia-N	One per week	Grab
2,3,7,8 TCDD	Quarterly	24 hr composite
Total recoverable metals Cd, Cu, Se, Tl, Zn	One per month	24 hr composite
Bioassays (See Schedule C)	Jan/Mar/May/Jul Sep/Nov	Per protocol

2. Outfall B (Combined process effluent from James River Paper Company and Pope & Talbot, Inc. at point of discharge to Willamette River.)

<u>Parameter</u>	<u>Minimum Frequency</u>	<u>Sample Type</u>
Bioassays (See Schedule C)	Jan/Mar/May/Jul Sep/Nov	per protocol

3. Outfall A and Outfall B effluents shall be sampled simultaneously. Monitoring of the combined effluent and reporting may be conducted by James River Paper Company or Pope & Talbot, Inc., individually or together, with Department approval.
4. Dioxin (2,3,7,8 TCDD) in the wastepaper furnish and in the pulp and solid waste produced in the wastewater treatment plant shall be monitored as follows:

<u>Parameter</u>	<u>Minimum Frequency</u>	<u>Sample Type</u>
2,3,7,8 TCDD in waste- paper furnish, pulp and solid waste	One per month	Representative composite
2,3,7,8 TCDD discharged	One per month	Calculation

5. Wastepaper Furnish, Pulp and Solid Waste Quantities

- | | |
|----------------------------------|--|
| a. Waste Paper Processed | Average air-dry tons/day for reporting period. |
| b. Secondary Fiber Pulp Produced | Average air-dry tons/day for reporting period. |
| c. Solid Waste Produced | Average air-dry tons/day for reporting period. |

(The average is defined as the total quantity processed or produced during the reporting period divided by the number of days operated during the reporting period.)

6. Reporting Procedures

Monitoring results shall be reported on approved forms. The reporting period, unless otherwise stated, is the calendar month. Reports must be submitted to the Department by the 15th day of the following month; however, results of bioassays may be submitted within 60 days of sampling.

SCHEDULE C

Compliance Conditions and Schedules

1. By March 1, 1994, the permittee shall submit to the Department the results of an engineering study that will define alternative methods, and their implementation costs, to reduce the permitted summer-period BOD loads to the Willamette River by 25 percent and 50 percent. The study shall also estimate the concomitant winter period BOD load reduction resulting from the defined alternative methods.

The Department will use the results of the study to make recommendations to the Environmental Quality Commission regarding continuance or modification of the BOD discharge limits of Schedule A in sufficient time for the permittee to make whatever process or wastewater treatment modifications may be necessary before March 1, 1996, when the permitted BOD limit drops to zero.

2. Compliance with the 2,3,7,8 TCDD discharge limitation shall be determined by as follows:
 - a. The permittee shall, by June 1, 1992, submit for Department approval a proposed 2,3,7,8 TCDD sampling and testing protocol for the collection of long-term-average data on the amount of 2,3,7,8 TCDD in the wastepaper furnish, the secondary fiber pulp produced and the solid waste. The protocol shall address variabilities in raw materials, production processes and rates, wastewater treatment and sampling and analytical procedures.
 - b. The protocol shall define appropriate procedures to determine, by a mass balance, the statistically-significant amount, if any, of 2,3,7,8 TCDD being discharged in the wastewater.
 - c. The permittee shall implement the sampling, analytical procedures and statistical analysis within 30 days of Department approval of the protocol.
3. Beginning September, 1992, the permittee shall conduct six whole-effluent toxicity bioassay tests per year of Outfalls A and B effluent with Ceriodaphnia dubia (water flea), Pimephales promelas (fathead minnow) and Selenastrum capricornutum (green algae).

Monitoring of the combined effluent and reporting may be conducted by James River Paper Company or Pope & Talbot, Inc., individually or together, with Department approval.

Except for the Selenastrum test, these bioassays shall be dual end-point tests in which both acute and chronic end-points can be determined from the results of a single chronic test. The acute end-point (LC50) only applies when significant mortality occurs.

The results of these bioassays will be evaluated by the Department after measurements have been taken for two years (12 measurements).

Bioassays shall be conducted in accordance with Short-term Methods for Estimating the Chronic Toxicity of Effluent and Receiving Waters to Freshwater Organisms, EPA/600/4-89/001 and Methods for Measuring the Acute Toxicity of Effluents to Aquatic Organisms, EPA (most current edition).

The permittee shall make available to the Department Laboratory, on request, the written standard operating procedures (SOPs) they, or the laboratory performing the bioassays, are using for all toxicity tests required by the Department.

4. After the two-year bioassay review, the Department may, if appropriate, reduce the biomonitoring requirements of Item 2 of this schedule, reduce the frequency of testing or discontinue testing.
5. Quality assurance criteria, statistical analyses and data reporting for the bioassays shall be in accordance with the following reference:

Short-Term Methods for Estimating the Chronic Toxicity of Effluent and Receiving Waters to Freshwater Organisms, EPA/600/4-89/001

The raw data and statistical calculations shall be included in the report.

6. The permittee shall evaluate (individually or jointly with Pope & Talbot, Inc.) the degree of dilution that occurs when the combined effluent of Outfall B mixes with ambient river water, according to the following schedule:

By October 1, 1992, the permittee shall submit a plan that outlines the dilution study methodology to the Department for review. The dilution study shall be valid for the river 7Q10 low-flow condition.

By June 1, 1994, a report summarizing the results of the dilution study shall be submitted to the Department. Results will be used to evaluate dilution with respect to the current mixing zone definition and achievement of water-quality standards.

7. If, after the two-year study period, the results of the Ceriodaphnia dubia (water flea) and Pimephales promelas (fathead minnow) bioassay tests of Outfall B indicate a potential violation of water quality standards for toxicity, the permittee, individually or jointly with Pope & Talbot, Inc., shall further evaluate the toxicity of the Outfall B effluent and its effects on the receiving waters. If these subsequent tests confirm a violation of water quality standards due to the effluent, the permittee shall develop a plan to eliminate the violation. Upon approval of the plan by the Department, the permittee, individually or jointly with Pope & Talbot, Inc., shall implement the plan and the process shall be continued until the violation has been eliminated.

The permit may be reopened to set WET discharge limits for Outfalls A and B based on the results of the Ceriodaphnia dubia (water flea) and Pimephales promelas (fathead minnow) bioassay results, if appropriate.

(See Technical Support Document for Water Quality-based Toxics Control, EPA/505/2-90-001, March, 1991)

8. The permittee shall evaluate alternatives to landfilling the solid waste, with emphasis on finding a beneficial use for the waste according to the following schedule:
 - a. By January 1, 1994, a Solid Waste Feasibility Study and Solid Waste Plan shall be completed and submitted to the Department.
 - b. By January 1, 1996, laboratory studies and/or pilot scale studies shall be completed. A written report summarizing the results of these studies shall be submitted to the Department.
 - c. By January 1, 1997, a program and time schedule to implement the selected alternative(s) shall be submitted to the Department for review and approval.
 - d. The permittee shall hold public meetings at each stage (a, b and c, above) of this process to share information and provide an opportunity for public input. The permittee shall summarize the information and input in a report to the Department.
9. The permittee is expected to meet the compliance dates which have been established in this schedule. Either prior to, or no later than, 14 days following any lapsed compliance date, the permittee shall submit to the Department a notice of compliance or noncompliance with the established schedule. The Director may revise a schedule of compliance if good and valid cause over which the permittee has little or no control has been determined.

SCHEDULE D

Special Conditions

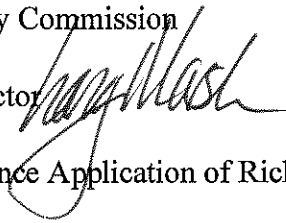
1. Sanitary wastes generated by James River Paper Co. shall be sent to Pope & Talbot, Inc.'s sanitary treatment plant for treatment and discharge.
2. An adequate contingency plan for prevention and handling of spills and unplanned discharges shall be in force at all times. A continuing program of employee orientation and education shall be maintained to ensure awareness of the necessity of good inplant control and quick and proper action in the event of a spill or accident.
3. An environmental supervisor shall be designated to coordinate and carry out all necessary functions related to maintenance and operation of waste collection, treatment, and disposal facilities. This person must have access to all information pertaining to the generation of wastes in the various process areas.

P105814W (2/28/92)

State of Oregon
Department of Environmental Quality

Memorandum

Date: February 7, 1996

To: Environmental Quality Commission
From: Langdon Marsh, Director 
Subject: Agenda Item E, Variance Application of Richard C. Gruetter, EQC Meeting:
February 23, 1996

Background

On December 2, 1992 Richard Gruetter (hereinafter "Appellant") applied for a variance from the requirements for subsurface sewage disposal systems. A variance hearing was held by Sherman Olson, a DEQ variance officer on April 29, November 19 and December 17, 1993. By seeking a variance, the Appellant concedes that the property can not meet all of the requirements for a sewage disposal system.

The variance application proposed the installation of a conventional sand filter disposal trench system, with an initial 56 linear feet of trench. There will be approximately 84 linear feet available for future repair/replacement disposal trench. The system would allow the use of seepage trenches to compensate for the trench length normally required within a sand filter system.

The system would require variance from 6 different administrative rules. (See "Variance Denial Letter dated June 28, 1994") The variance officer was particularly concerned with the instability of the site, the close proximity of the system to an intermittent stream, and the length of the disposal trenches. Due to these concerns, the request for a variance was denied on June 28, 1994. The Appellant timely appealed the denial and the appeal was forwarded to Lawrence Smith, Administrative Law Judge for the drafting of a Preliminary Order and Opinion.

The Appellant submitted further information regarding the stability of the site in December 1994 and January 1995. It is the Department's position that for new information to be considered, a new application for a variance must be submitted. Mr. Smith held that since the new information alleged no new grounds for the variance, it would be considered in his decision. Mr. Smith then held that strict compliance would be burdensome and unreasonable on this site and the variance request should be allowed.

Authority of the Commission with Respect to the Issue

ORS 454.605 to 454.745; OAR 340-71-415

Alternatives and Evaluation

Memo To: Environmental Quality Commission
Agenda Item E, Variance Application of Richard Gruetter
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The Commission may either uphold or reverse either part or all of the Hearings Officer's Preliminary Order and Opinion. The Variance Officer recommends that the Commission deny the variance request as per his denial dated June 28, 1994.

Attachments

1. Letter to Richard Gruetter from Susan M. Greco, dated January 17, 1996.
2. Preliminary Order and Opinion, dated December 13, 1995.
3. Letter to Lawrence Smith from Todd Bradley, dated October 18, 1995.
4. Letter to Lawrence Smith from Sherman Olson, dated September 29, 1995.
5. Letter to Christopher Rich from Todd Bradley, dated January 18, 1995.
6. Letter to Christopher Rich from Todd Bradley, dated December 19, 1994.
7. Letter to Linda Zucker from Todd Bradley, dated July 18, 1994.
8. Letter denying variance request, dated June 28, 1994.
9. Letter to Sherman O. Olson, Jr., R.S. from John L. Smits, R.S. of Smits & Associates, dated November 30, 1992.
10. Application for Variance, dated November 20, 1992, and attachments thereto.
11. Geological Evaluation from Paul D. See, dated June 16, 1992.
12. Geological Evaluation from Paul D. See, dated November 20, 1990.
13. Letter to City of Cannon Beach from John L. Smits, R.S., dated August 6, 1990.
14. Letter to John L. Smits, R.S. from Don Howell, City of Cannon Beach, dated August 28, 1990.
15. Field Sheet for Soil Test, dated June 26, 1990.
16. Site Evaluation Field Worksheet, dated June 7 and June 14, 1990.
17. Letter to Richard Gruetter from Colin O. Handforth, P.E., P.L.S., dated April 17, 1990.
18. Letter to Richard Gruetter from Eldon L. Everton, Department of Transportation, dated February 3, 1989.
19. Geologic Investigation by Paul D. See, dated October 24, 1986.

Report Prepared By: Susan M. Greco
Phone: (503) 229-5213

January 17, 1996

Richard Gruetter
c/o Todd A. Bradley
Gaylord & Eyerman, P.C.
1400 SW Montgomery
Portland OR 97201

RE: Variance Application
1 Silver Point Terrace, Lots 8 & 9 and Lot 13
Clatsop County

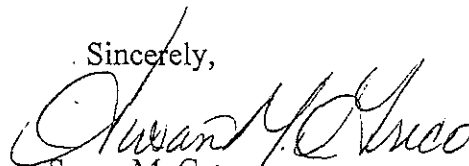
Dear Mr. Gruetter:

The Environmental Quality Commission will be considering the Preliminary Order and Opinion of the hearings officer in your variance application for the property located in Clatsop County at their regularly scheduled meeting to be held February 23, 1996. The meeting will be held at 811 S.W. 6th Avenue, Portland, Oregon in Conference Room 3A and will begin at 8:30 a.m. Your application will be heard in the regular course of the meeting. At this meeting the Commission will be making a final determination on your variance application.

If you do not agree with the hearings officer's order, I will need to receive, in writing, any objections that you have to the proposed order prior to January 31, 1996. Please forward to the Environmental Quality Commission, c/o Susan M. Greco, 811 S.W. 6th Avenue, Portland, Oregon, 97204. Similarly, if the Department has any objections to the hearings officer's order, those objections will be forwarded to you prior to January 31, 1996.

If you should have any questions or require special accommodations for the meeting, please feel free to call me at (503) 229-5213 or (800) 452-4011 extension 5213 within the state of Oregon.

Sincerely,


Susan M. Greco
Rules Coordinator

cc: Sherm Olson, WQ



Regarding the variance application of

PRELIMINARY ORDER AND
OPINION

RICHARD C. GRUETTER
c/o Todd A. Bradley
Gaylord & Eyerman, P.C.
Attorneys at Law
1400 S.W. Montgomery
Portland, OR 97201-6093

WQ-WC-VARIANCE APPLICATION:
1 Silver Point Terrace, Lots 8 & 9,
Block 7, and Lot 13, Block 8;
aka Tax Lots 1300, 1400, and 2400;
Section 6 CC; Township 4 North;
Range 10 West, W.M.; Clatsop County

HISTORY

On December 2, 1992, the application of Richard Gruetter (hereinafter, applicant) for a variance from the requirements for subsurface sewage disposal systems, was received by the Department of Environmental Quality (DEQ). After hearings on the property on April 29, November 19 and December 17, 1993, a Variance Officer issued a Variance Denial on June 28, 1994. On July 18, 1994, applicant appealed the Denial. On December 19, 1994, and January 18, 1995, applicant provided further information for review.

On July 10, 1995, the Environmental Quality Commission (EQC) referred the appeal to Hearings Officer Lawrence Smith for initial review and preliminary order under ORS 454.660 and OAR 340-71-440. On July 21, 1995, the Hearings Officer gave the applicant until August 14, 1995, to submit further written information. On August 10, 1995, further written information was received from applicant.

On September 5, 1995, the Hearings Officer requested that DEQ respond to the subsequent information provided by the applicant. DEQ's response was received on October 2, 1995. Applicant's reply to this response was received October 18, 1995.

This Preliminary Order and Opinion is based on a complete review of the file and the documents stated above.

ISSUE

Whether the requirements of specific rules concerning the siting and construction of a conventional sand filter treatment and disposal system should be waived.

OPINION

The applicant's request for standard variance is allowed because strict compliance to the rules was unreasonable due to the special physical conditions of the site.

DISCUSSION

ORS 454.657 states in part:

(1) After hearing the Environmental Quality Commission may grant to applicants for permits required under ORS 454.655 specific variances from the particular requirements of any rule or standard pertaining to subsurface sewage disposal systems for such period of time and upon such conditions as it may consider necessary to protect the waters of the state, as defined in ORS 468B.005. The commission shall grant such specific variance only where after hearing it finds that strict compliance with the rule or standard is inappropriate for cause or because special physical conditions render strict compliance unreasonable, burdensome or impractical.

Section (2) of the rule allows for variance based on hardship. Applicant did not request such a variance.

OAR 340-71-415(3) states:

No variance may be granted unless the Commission or a special variance officer finds that:

(a) Strict compliance with the rule or standard is inappropriate for cause; or

(b) Special physical conditions render strict compliance unreasonable, burdensome, or impractical.

By seeking a variance, applicant concedes that its application cannot meet all of the requirements for subsurface sewage disposal systems. Applicant is the proponent of certain facts to establish a variance from the requirements, so applicant has the burden of proof. The standard of proof is not stated in the law, so it is therefore the civil standard of probability or more likely than not. Applicant does not have to show beyond a reasonable doubt that its proposed system will not harm the environment.

Applicant provided information after receiving the denial of its variance application. DEQ declined to respond to the new information and suggested a reapplication for a variance and another inspection of the site. Applicant applied on December 2, 1992. DEQ visited the site three times in 1993. Applicant's new information is mainly supporting evidence and alleges no new grounds to support his variance request. In the interest of administrative efficiency and fairness, applicant's new information will be considered without requiring reapplication. All the information by applicant and DEQ is considered, as stated above.

The Variance Denial listed six specific grounds for variance. DEQ's later response on September 29, 1995, listed five grounds. Two of the grounds deny the application because of the lack of adequate absorptive area, so they are combined. These grounds will be treated separately below.

1. Sufficient absorptive area to install a sand filter

Applicant conceded that it does not have enough area around the proposed site to accomodate an initial and replacement system required by the rules. Applicant argues that the purpose of the applicable rules is to make sure any such system processes 300 gallons of waste per day. DEQ has determined that the average discharge from single family homes is 173.5 gallons per day, so the standard of 300 gallons per day for a system should adequately cover extraordinary problems. Applicant asserts that its proposed system can handle about 400 gallons per day, based on an infiltration rate less efficient than the listed rate for the type of soil on the site. Applicant proposes to install a timer for constant rate dosing over 24 hours so that maximum absorption can be accomplished. DEQ disagrees with the amount of absorption alleged by applicant, but if applicant modifies its proposal, it will achieve higher absorption rates. Based on this evidence, applicant has established that strict compliance is unreasonable and that the lack of trench area would not pose a significant threat to the public's health and safety if applicant installs the proposed system, including a timer and other devices to insure maximum absorption.

2. Topography and soil profile

DEQ concedes that the soil texture and depth are compatible for use of a sand filter system. DEQ had a concern that after organic waste is removed from the site, applicant will have even less area for the trenches because slope variations on the site will affect the depth of such trenches. Applicant's contention that the site is flat is supported by its experts. The findings of these experts regarding the flatness of the site was not contradicted earlier by DEQ. For that reason, the slope variations will not interfere with the installation of maximum trench length.

DEQ expressed concern regarding the significant slope below the site, but conceded that the distance of the site from the steep slope in effect met the 50-foot minimum under 340-71-220(2)(i)(Table 1).

3. Separation from streams and drainageways

DEQ also concedes that the separation distance (40 feet) from the the drainage way on the property is adequate because disposal area will not likely be saturated by the drainage way.

4. Geologic limitations

Much of the evidence provided by both sides deals with this basis for denial. This issue is technically not a variance issue because applicant is in effect contesting the denial of its application on this basis, but in any event, OAR 340-71-220(1)(f) (formerly OAR 340-71-220(2)(f)) prohibits placement on unstable landforms, where operation of the system may be adversely affected. The evidence from applicant is more detailed and from experts, including a geologist. No expert could guarantee complete stability of the landforms for eternity. The potential for earthquakes throughout many parts of Oregon precludes such a guarantee. The main issue is whether evidence from other sites can be used to deny a variance request. DEQ conceded that there is little evidence of actual land movement on applicant's site, but argued about the potential of movement, based on a slide on other property about 250 feet

away and other evidence of instability on surrounding property. To rely on evidence of land movement on neighboring lots would in effect prevent installation of systems throughout that area. Such a preclusion would be unreasonable, burdensome and impractical. There is a risk of slides on the site, based on what happened on neighboring sites, but each site should be treated differently. Based on the lack of definite evidence of movement on applicant's lot, strict compliance would be burdensome and unreasonable. A variance should be allowed with the understanding that applicant shall clean up any contamination from a slide on the property that causes any threat to water quality.

Applicant requested a hearing on the denial of his variance request. DEQ has decided to handle these issues informally, based only on the submitted documentation. The review here is de novo, based on those documents. This recommendation is subject to review by the Environmental Quality Commission, who is in no way bound by these conclusions.

An issue that was not addressed is whether the applicant has substantially changed his building plans for the lot. The above conclusions and conditions are for installing a system for a single family home on the lot and no other buildings.

PROPOSED ORDER

Applicant's variance request is allowed under ORS 454.657, subject to the above conditions as stated above.

Dated this 13th day of December, 1995.

ENVIRONMENTAL QUALITY COMMISSION



Lawrence S. Smith, Hearings Officer

This Proposed Order and Opinion was mailed to the applicant and DEQ on:

FURTHER REVIEW

If the applicant and DEQ agrees with this preliminary order and opinion, the director of the Environmental Quality Commission (EQC) will enter a final order. If the applicant and/or DEQ disagrees with this preliminary order and opinion, the proposed order will be sent to the EQC for review and action. You will be notified of the EQC meeting date when this preliminary order and opinion will be considered.

STATEMENT OF MAILING

AGENCY CASE NO. WQ-WC-DEQ
HEARINGS CASE NO. 95-DEQ-014

I certify that the attached Preliminary Order was served through the mail to the following parties in envelopes addressed to each at their respective addresses, with postage fully prepaid:

Richard Gruetter (Certified Mail)
c/o Todd Bradley, Attorney
1400 SW Montgomery
Portland, OR 97201

Todd Bradley, Attorney (Certified Mail)
1400 SW Montgomery
Portland, OR 97201

Sherman Olson
Water Quality Division, DEQ
811 SW 6th Avenue
Portland, OR 97204

DEQ
811 SW Sixth Avenue
Portland, OR 97204

Mailing/Delivery Date: 12-13-95
Hearings Clerk: AH

VILLIAM A. GAYLORD
LINDA K. EYERMAN
TODD A. BRADLEY

GAYLORD & EYERMAN, P.C.
ATTORNEYS AT LAW
1400 S.W. MONTGOMERY
PORTLAND, OREGON 97201-6093



TELEPHONE
(503) 222-3526
FAX
(503) 228-3628

October 18, 1995

Lawrence S. Smith, Administrative Law Judge
Hearings Section, Suite 225
Oregon Employment Department
800 NE Oregon Street, #6
Portland, OR 97232

RE: WQ-WC-DEQ Variance Denial Appeal of Richard Gruetter

Dear Judge Smith:

This letter is the Applicant's reply to Mr. Olson's submission dated September 29, 1995.

Before I address the specific concerns raised by Mr. Olson, let me say that the applicant agrees that the basic purpose of the variance process is to ensure that the public health and welfare, and the waters of the state, are adequately protected. We believe that the system proposed in the variance application meets this test. Moreover, it is our position that Mr. Olson has never identified any specific risk of harm to these protected interests that would probably arise if the variance is allowed.

I have never before heard it argued that an applicant for a variance must prove "beyond a reasonable doubt" that a request should be granted. Certainly, it is a fundamental principle of administrative procedure that an agency action must not be arbitrary, that it must be supported by evidence in the record, and that a final order must contain specific findings of fact and explain how those facts support any conclusions. In other words, whatever the burden of proof may be, an applicant who has submitted a completed application supported by plans and opinions from professional engineers and geologists, to the effect that a proposed system will work as designed and will not present any danger to the public, is entitled to a legally sufficient explanation for a denial. This requires, at a minimum, that the denial contain an identified basis in fact to support a conclusion that adequate protection is not provided by the system being proposed. Mr. Olson has not done this.

Mr. Olson has declined to comment on any "new information," which in this case would consist of updated reports on the geologic condition of the property, not relating to the design of the system, but only to the factual issue of the stability of the landform. Instead, he proposes that a new application be made which would incorporate what has been determined since the date of the initial application. This is the type of position which serves only to increase the public frustration with government services. Suppose that Mr. Olson had thought the landform was stable, but before final determination a slide occurred on the

Lawrence S. Smith
October 18, 1995

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property. Would that information not be considered? Would he consider such obviously important information in denying a variance, but not consider it if the information supports an approval? The new information is relevant to the issue of whether Mr. Olson's factual determination about stability is correct, and does not constitute a change in the application. Therefore, the information should be taken into account in this review.

Based on Mr. Olson's letter of September 29, 1995, it appears that there is no issue regarding separation distances from streams, drainageways or escarpments. Mr. Olson agrees that the 40-foot separations from the escarpment and the drainageway are adequate. The remaining issues are trench placement, adequacy of absorptive surface area, and geologic stability. I will address each of these issues in order.

1. Trench placement is not impaired by decaying wood waste on the surface.

Mr. Olson has expressed some vague concern that wood waste "at the end of one of the proposed disposal trenches" could interfere with placement of the trench. Presumably, he is referring to the need to maintain a level trench bottom from end to end.

The record reflects that this potential problem was investigated during a site visit by Mr. Olson and John Smits, and found to be not a problem. This conclusion was confirmed in my letter to Mr. Olson dated February 24, 1994, (contained in the record) as follows:

"I mentioned to John Smits that you expressed concern about the depth of wood waste in some spots on the property. He recalled that the two of you had discussed this issue during a site visit and that after inspection you had agreed that the soil profile is of sufficient depth to allow deepening of the trench where necessary to ensure that the sidewall will be entirely in soil. I am aware that you did not have your file in front of you when we spoke, but your notes should reflect the fact that this concern has been resolved. Please call John if your recollection differs from his."

Mr. Smits is prepared to testify, if necessary, that Mr. Olson never raised this concern again. The denial does not contain any finding to suggest that level placement of trenches cannot be accomplished due to wood waste.

The proposal as submitted does not involve installation of trenches into organic waste. Topographic dimensions shown in the application, together with soil profile measurements, demonstrate that level placement of trenches can be constructed as proposed. Thus, Mr. Olson's statement that "placement is further exacerbated," does not provide a basis to conclude that the

Lawrence S. Smith
October 18, 1995

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designed trench length cannot be achieved. Indeed, Mr. Olson does not state any such conclusion in his most recent letter.

2. The proposed trenching provides adequate absorptive surface area to meet the intent of the rules.

Mr. Olson's discussion of the absorption potential of the proposed system is basically immaterial, because he has not tied his calculations to the applicable criteria. In particular, he has not specifically addressed any of the calculations made by Mr. Smits in the November 30, 1992, narrative, other than to misconstrue the use of theoretical estimates for infiltration rates.

A sand filter system is required to be able to accept 300 gallons per day. (See Denial letter dated June 28, 1994, page 3). It should be noted that this figure contains a safety factor of almost two, as DEQ's own studies demonstrate that single family homes (three and four bedroom dwellings) discharge an average of 173.5 gallons per day. (See Mr. Smits' narrative dated November 30, 1992, page 3).

With the absorptive area shown in the application, using a conservative infiltration rate (hydraulic conductivity rate or permeability) of 0.15 inches per hour per square foot, a total of 823 gallons per day can be processed. (See computations in Mr. Smits' narrative dated November 30, 1992, page 2). If this theoretical rate is, in fact, eventually blinded or otherwise reduced by 50% as Mr. Olson asserts, the system can still accept more than 400 gallons per day, which is more than twice the average discharge from a three or four bedroom home.

Furthermore, the infiltration rate of 0.15 is well below the actual rated permeability of the soil on the Gruetter site. The Soil Survey of Clatsop County, published by the Soil Conservation Service in 1984, assigns a "moderate permeability" to this soil type. Moderate permeability is defined as 0.6 to 2.0 inches/hr/sq.ft., or more than four times the conservative theoretical estimate used by Mr. Smits in his narrative to illustrate the effectiveness of the proposed system. (See Mr. Smits' narrative dated November 30, 1992, page 2)¹ In other words, whether one accepts Mr. Olson's assumptions, or relies on actual soil data, there can be no serious argument about whether the system can handle the required amount of daily discharge with the absorptive area provided.

Concerning the rate and amount of effluent discharged into the system per cycle, these factors are largely controllable in the

¹ This figure is based on standard, published reference material. Excerpts from the Soil Survey pertaining to silt loam, loam, and silty clay loam soil textures are attached.

Lawrence S. Smith
October 18, 1995

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construction process, and are not properly characterized as "design features" which must be in the variance application. In fact, I am told that modern dosing tanks can be fitted with timers, so that the sand filter will be dosed at a constant rate over 24 hours, if deemed necessary to permit complete absorption between cycles. Thus, the concerns expressed by Mr. Olson on page 4 of his letter, can be addressed by the simple expedient of controlling the dosing rate, and do not furnish a basis to deny the variance.

3. Denial based on geologic considerations is not supported by the record.

There is not much to add to what has previously been submitted on this issue. In significant measure, a policy decision is implicated, since the position advocated by Mr. Olson is essentially a value judgment that would significantly impair the ability of landowners to develop their property in many parts of the state.

It must be emphasized that the decision to deny Mr. Gruetter's variance is apparently not based on instability of his particular site. Moreover, there is no claim that the construction of on-site sewage facilities will have any adverse effect on the stability of the area. This means that a single variance officer has declared, in effect, that no construction of sewage disposal systems will be allowed in the larger area in which the Gruetter property is situated. This should be deemed outside of the discretionary authority of a variance officer.

ORS 454.685 requires the DEQ, whenever it has determined that construction of such facilities should be limited in an area, to provide notice and a public hearing before issuing an order. To my knowledge, the DEQ has never followed this process in the Silver Point area. The statute is an indication that an individual application to develop a site which is not itself unstable, should not be denied based on concerns that a large area in the vicinity may be generally unstable.

In considering the general suitability of the Gruetter site, the DEQ might also accord some deference to other government agencies who have reviewed the issue of Mr. Gruetter's development and given their approval, including the Clatsop County Planning Commission and the State Highway Commission. The decision to disregard the determinations of these other agencies should not be within the discretion of an individual variance officer.

Offer to present further testimony

When this matter was first assigned to an Appeals Officer, it was expected that the factfinder would be a DEQ employee with specialized knowledge of sewage disposal systems. Based on that understanding, it was my belief that all issues could be

Lawrence S. Smith
October 18, 1995

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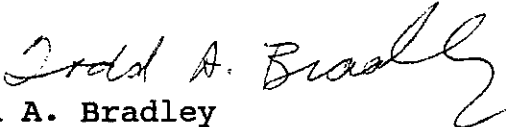
determined based on written submissions, without need for testimony by experts about the technical foundation for their opinions. I did not, for example, think it would be necessary to present evidence on the basics of sand filtration systems.

I do not know what experience you have with these matters, and I hope you will not take any offence by this offer to present further expert testimony to assist you in your fact-finding role. I know that I could not have responded to the DEQ position without consulting with experts, although I have tried to make sure that my arguments are based on evidence in the record.

It has been my position that you are required to conduct an evidentiary hearing and reach an independent determination on the variance application. If you believe that expert testimony would be of assistance to you in this process, if only to decipher and interpret the various calculations involved and to hear Mr. Olson and Mr. Smits in person, I would be more than happy to appear with Mr. Smits at a scheduled proceeding.

Very truly yours,

GAYLORD & EYERMAN, P.C.


Todd A. Bradley

TAB:rw

Enclosure

cc: Richard Gruetter
Sherman Olson (w/enc.)

United States
Department of
Agriculture

Soil
Conservation
Service

In cooperation with
Oregon Agricultural Experiment
Station

Soil Survey of Clatsop County, Oregon



This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other federal agencies, state agencies including the Agricultural Experiment Stations, and local agencies. The Soil Conservation Service has leadership for the federal part of the National Cooperative Soil Survey. In line with Department of Agriculture policies, benefits of this program are available to all, regardless of race, color, national origin, sex, religion, marital status, or age.

Major fieldwork for this soil survey was completed in 1983. Soil names and descriptions were approved in 1984. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1984. This survey was made cooperatively by the Soil Conservation Service and the Oregon Agricultural Experiment Station. It is part of the technical assistance furnished to the Clatsop Soil and Water Conservation District. Financial assistance was provided by Clatsop-Tillamook Intergovernmental Council.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

Cover: View of Oregon Coast from Ecola Park. Murtip and Laderly soils are on higher slopes; Klottchie and Necanicum soils are in background.

Soil temperature - 47 to 52 degrees F (varies less than 9 degrees from summer to winter)
Frost-free period - 100 to 210 days

Woodland

Mean site index for stated species: Western hemlock - 159 (based on 100-year site curve); 112 (based on 50-year site curve)

Growth at culmination of mean annual increment (CMAI): 252 cubic feet per acre in a stand of 50-year-old trees 1.5 inches or larger in diameter at breast height

Estimated total production per acre: 110,110 board feet (International rule, one-fourth-inch kerf) from a fully stocked stand of trees 70 years old

General management considerations:

Wheeled and tracked equipment can be used in the more gently sloping areas, but cable yarding generally is safer and disturbs the soil less.

Using wheeled and tracked equipment when the soil is wet produces ruts, compacts the soil, and damages the roots of trees.

Disturbing the soil excessively in harvesting timber and building roads increases the loss of soil, which in turn leaves a greater number of rock fragments on the surface.

Steep yarding paths, skid trails, and firebreaks are subject to rilling and gullyng. A plant cover or water bars are needed.

The soil is subject to sliding and slumping because it is very plastic and is underlain by highly fractured bedrock.

Spoil from excavations is subject to rill and gully erosion and to sloughing.

Susceptibility of cut and fill areas to erosion is moderate.

Adequately designed road drainage reduces the risk of erosion.

Logging roads require suitable surfacing for year-round use.

The waste material from roadbuilding can damage vegetation. It is also a potential source of sedimentation.

Reforestation occurs naturally in cutover areas if a seed source is present.

Plant competition delays natural regeneration but does not prevent the eventual development of a fully stocked, normal stand of trees.

Carefully managed reforestation reduces competition from undesirable understory plants.

Reforestation can be accomplished by planting western hemlock, Sitka spruce, or Douglas-fir seedlings.

Suitable management practices:

Use conventional equipment in harvesting, but limit its use when the soil is wet.

Reduce the risk of erosion by seeding roads, cutbanks, and landings and installing water bars and culverts.

Avoid excessive damage to the soil and to the vegetation downslope from roadbuilding sites by removing waste material.

Prepare the site carefully to control competing vegetation.

Hand plant nursery stock to establish or improve a stand.

Improve stands by thinning before trees reach commercial size and by selective cutting of mature trees.

* 58E—Skipanon gravelly silt loam, 30 to 60 percent slopes.

Composition

Skipanon soil and similar inclusions - 80 percent

Contrasting inclusions - 20 percent

Skipanon Soil

Position on landscape: Mountainsides

Slope range: 30 to 60 percent

Elevation: 100 to 1,600 feet

Native plants: Western hemlock, Sitka spruce, Douglas-fir, red alder, red huckleberry, western swordfern, salal, salmonberry, Oregon oxalis

Organic mat on surface: Moss, needles, and twigs 2 inches thick

Typical profile:

0 to 19 inches - dark brown gravelly silt loam

19 to 36 inches - brown cobbly silt loam

36 to 53 inches - variegated, light yellowish brown and yellowish brown silty clay loam

53 inches - weathered siltstone

Depth class: Deep (40 to 60 inches)

Drainage class: Well drained

* *Permeability:* Moderate

Available water capacity: 7 to 11 inches

Potential rooting depth: 40 to 60 inches

Runoff: Rapid

Hazard of erosion by water: Severe

Included Areas

Soils that have weathered siltstone at a depth of less than 40 inches

Soils that have basalt at a depth of 40 to 60 inches

Soils that have more than 35 percent rock fragments throughout the profile

Soils that have less than 15 percent rock fragments throughout the profile

greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Mountain. A natural elevation of the land surface, rising more than 1,000 feet above surrounding lowlands, commonly of restricted summit area (relative to a plateau) and generally having steep sides and considerable bare-rock surface. A mountain can occur as a single, isolated mass or in a group forming a chain or range.

Muck. Dark colored, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Munsell notation. A designation of color by degrees of the three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color in hue of 10YR, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Outwash, glacial. Stratified sand and gravel produced by glaciers and carried, sorted, and deposited by glacial melt water.

Outwash plain. A landform of mainly sandy or coarse textured material of glaciofluvial origin. An outwash plain is commonly smooth; where pitted, it is generally low in relief.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan*, *fragipan*, *claypan*, *plowpan*, and *traffic pan*.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percolates slowly (in tables). The slow movement of water through the soil, adversely affecting the specified use.

Permeability. The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

Very slow.....	less than 0.06 inch
Slow.....	0.06 to 0.2 inch
Moderately slow.....	0.2 to 0.6 inch
Moderate.....	0.6 inch to 2.0 inches
Moderately rapid.....	2.0 to 6.0 inches
Rapid.....	6.0 to 20 inches
Very rapid.....	more than 20 inches

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Pitting (in tables). Pits caused by melting around ice. They form on the soil after plant cover is removed.

Plateau. An extensive upland mass with relatively flat summit area that is considerably elevated (more than 100 meters) above adjacent lowlands and separated from them on one or more sides by escarpments.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. The water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid permeability or an impermeable layer near the surface, the soil may not adequately filter effluent from a waste disposal system.

Poor outlets (in tables). Refers to areas where surface or subsurface drainage outlets are difficult or expensive to install.

Potential rooting depth (effective rooting depth).

Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as—

	pH
Extremely acid.....	Below 4.5
Very strongly acid.....	4.5 to 5.0
Strongly acid.....	5.1 to 5.5
Medium acid.....	5.6 to 6.0
Slightly acid.....	6.1 to 6.5
Neutral.....	6.6 to 7.3
Mildly alkaline.....	7.4 to 7.8
Moderately alkaline.....	7.9 to 8.4
Strongly alkaline.....	8.5 to 9.0
Very strongly alkaline.....	9.1 and higher

Residuum (residual soil material). Unconsolidated, weathered, or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

= HC Hydraulic Conductivity

TABLE 12.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments > 3 inches Pct	Percentage passing sieve number--				Liquid limit Pct	Plasticity index
			Unified	AASHTO		4	10	40	200		
	<u>In</u>										
54F*: Newanna-----	0-12	Gravelly loam----	GM	A-5	0-15	65-80	60-75	55-65	40-50	50-60	NP-5
	12-21	Very gravelly loam, very cobbly loam.	GM	A-2	15-45	45-90	40-90	35-85	30-65	50-70	NP-5
	21-26	Very stony loam, extremely cobbly loam, very cobbly loam.	GM	A-5	55-75	60-80	50-70	40-60	35-50	50-70	5-10
	26	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
55B, 55C----- Northrup	0-18	Silt loam-----	ML	A-4	0	100	100	90-100	70-90	30-35	5-10
	18-44	Silty clay loam, silt loam.	CL	A-6	0	100	100	95-100	85-95	30-40	10-20
	44-60	Silt loam-----	CL-ML	A-4	0	95-100	85-95	80-90	75-85	25-30	5-10
56D, 56E, 56F---- Rinearson	0-15	Silt loam-----	ML	A-4	0	95-100	95-100	95-100	85-90	30-35	5-10
	15-34	Silty clay loam, clay loam, silt loam.	CL	A-7	0	95-100	95-100	95-100	85-95	40-50	15-25
	34-48	Loam, silt loam, silty clay loam.	ML, CL	A-4, A-6, A-7	0	95-100	90-95	90-95	75-90	30-50	5-25
	48	Weathered bedrock	---	---	---	---	---	---	---	---	---
57E*: Scaponia-----	0-6	Silt loam-----	ML	A-4	0	100	100	90-100	60-75	20-30	NP-5
	6-43	Silt loam, loam	ML	A-4	0	100	100	90-100	60-75	30-35	0
	43	Weathered bedrock	---	---	---	---	---	---	---	---	---
Braun-----	0-3	Silt loam-----	ML	A-4	0	100	100	90-100	60-75	20-30	NP-5
	3-20	Silt loam-----	ML	A-4	0	100	100	90-100	60-75	30-35	5-10
	20-35	Silt loam, loam	ML	A-4	0	100	100	90-100	60-75	30-35	5-10
	35	Weathered bedrock	---	---	---	---	---	---	---	---	---
* 58D, 58E----- Skipanon	0-19	Gravelly silt loam.	ML, GM, SM	A-4	0-5	65-85	55-75	45-65	40-60	25-35	NP-5
	19-36	Cobbly silt loam, gravelly silt loam.	ML, GM, SM	A-4	0-25	65-85	55-75	45-65	40-60	30-35	5-10
	36-53	Silt loam, silty clay loam.	CL	A-6	0	100	100	90-100	70-85	35-40	15-20
	53	Weathered bedrock	---	---	---	---	---	---	---	---	---
59D, 59E, 59F---- Svensen	0-17	Loam-----	CL-ML	A-4	0	100	95-100	85-95	60-75	20-30	5-10
	17-38	Loam, clay loam	CL	A-6	0	100	90-100	80-95	60-75	30-40	10-15
	38-60	Fine sandy loam, loam, sandy loam.	CL-ML, SM-SC, SC, CL	A-4, A-6	0	90-100	75-100	50-90	35-65	20-35	5-15
60D----- Templeton	0-12	Silt loam-----	ML	A-5	0	100	100	95-100	75-90	40-50	5-10
	12-58	Silty clay loam, silt loam.	CL	A-6	0	100	100	95-100	75-95	35-50	15-30
	58	Weathered bedrock	---	---	---	---	---	---	---	---	---
61E*: Templeton-----	0-12	Silt loam-----	ML	A-5	0	100	100	95-100	75-90	40-50	5-10
	12-58	Silty clay loam, silt loam.	CL	A-6	0	100	100	95-100	75-95	35-50	15-30
	58	Weathered bedrock	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 13.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors		Organic matter
								K	T	
	In	Pct	G/cc	In/hr	In/in	pH				Pct
56D, 56E, 56F--- Rinearson	0-15	20-27	0.90-1.00	0.6-2.0	0.19-0.21	4.5-5.5	Low-----	0.32	4	3-5
	15-34	25-35	1.00-1.20	0.6-2.0	0.19-0.21	3.6-5.5	Moderate----	0.37		
	34-48	22-35	1.00-1.20	0.6-2.0	0.19-0.21	3.6-5.5	Moderate----	0.43		
	48	---	---	---	---	---	---	---		
57E*: Scaponia-----	0-6	12-18	1.00-1.20	0.6-2.0	0.17-0.19	4.5-6.0	Low-----	0.32	3	2-4
	6-43	18-27	1.10-1.30	0.6-2.0	0.14-0.15	4.5-5.5	Low-----	0.20		
	43	---	---	---	---	---	---	---		
Braun-----	0-3	14-18	1.00-1.20	0.6-2.0	0.19-0.21	6.1-6.5	Low-----	0.28	2	2-3
	3-20	18-25	1.10-1.30	0.6-2.0	0.15-0.17	5.6-6.0	Low-----	0.24		
	20-35	18-25	1.10-1.30	0.6-2.0	0.12-0.13	5.6-6.0	Low-----	0.15		
	35	---	---	---	---	---	---	---		
* 58D, 58E----- Skipanon	0-19	18-25	0.85-0.95	0.6-2.0	0.16-0.19	3.6-5.0	Low-----	0.15	4	7-12
	19-36	20-27	0.95-1.10	0.6-2.0	0.13-0.16	3.6-5.0	Low-----	0.20		
	36-53	25-30	1.20-1.30	0.6-2.0	0.19-0.21	3.6-5.0	Moderate----	0.32		
	53	---	---	---	---	---	---	---		
59D, 59E, 59F--- Svensen	0-17	15-20	1.10-1.40	2.0-6.0	0.16-0.18	3.6-5.5	Low-----	0.28	5	4-6
	17-38	20-30	1.35-1.45	2.0-6.0	0.16-0.18	3.6-5.0	Low-----	0.28		
	38-60	15-25	1.35-1.60	2.0-6.0	0.13-0.15	3.6-5.0	Low-----	0.37		
	---	---	---	---	---	---	---	---		
60D----- Templeton	0-12	18-27	0.85-0.95	0.6-2.0	0.19-0.24	3.6-5.5	Low-----	0.32	4	10-15
	12-58	25-35	0.90-1.10	0.6-2.0	0.20-0.25	3.6-5.0	Moderate----	0.20		
	58	---	---	---	---	---	---	---		
61E*: Templeton-----	0-12	18-27	0.85-0.95	0.6-2.0	0.19-0.24	3.6-5.5	Low-----	0.32	4	10-15
	12-58	25-35	0.90-1.10	0.6-2.0	0.20-0.25	3.6-5.0	Moderate----	0.20		
	58	---	---	---	---	---	---	---		
Ecota-----	0-7	18-25	0.85-0.95	0.6-2.0	0.19-0.21	3.6-5.5	Low-----	0.32	3	7-12
	7-37	22-35	1.00-1.10	0.6-2.0	0.19-0.21	3.6-5.5	Moderate----	0.28		
	37	---	---	---	---	---	---	---		
62D----- Tolany	0-12	10-15	0.75-0.85	0.6-2.0	0.25-0.35	4.5-6.0	Low-----	0.37	5	8-10
	12-58	15-25	0.75-0.85	0.6-2.0	0.20-0.30	4.5-6.0	Low-----	0.49		
63D----- Tolke	0-11	18-27	0.75-0.85	0.6-2.0	0.25-0.35	4.5-5.5	Low-----	0.28	5	2-5
	11-60	20-35	0.70-0.85	0.6-2.0	0.20-0.30	4.5-5.0	Low-----	0.37		
64D*: Tolke-----	0-11	18-27	0.75-0.85	0.6-2.0	0.25-0.35	4.5-5.5	Low-----	0.28	5	2-5
	11-60	20-35	0.70-0.85	0.6-2.0	0.20-0.30	4.5-5.0	Low-----	0.37		
Alstony-----	0-7	12-18	0.85-0.95	0.6-2.0	0.20-0.25	4.5-6.0	Low-----	0.28	3	10-12
	7-47	18-27	0.75-0.85	0.6-2.0	0.10-0.12	4.5-6.0	Low-----	0.15		
	47-53	18-27	0.80-1.10	0.6-2.0	0.07-0.09	4.5-6.0	Low-----	0.15		
	53	---	---	---	---	---	---	---		
65A----- Treharne	0-15	15-25	1.10-1.30	0.6-2.0	0.18-0.22	4.5-6.5	Low-----	0.37	5	1-2
	15-41	18-35	1.20-1.30	0.6-2.0	0.18-0.22	4.5-5.5	Moderate----	0.37		
	41-61	18-45	1.20-1.30	0.2-0.6	0.16-0.22	4.5-5.5	Moderate----	0.43		
66*. Tropofluvents										
67*. Tropopsamments										

See footnote at end of table.

September 29, 1995

DEPARTMENT OF
ENVIRONMENTAL
QUALITY

Lawrence S. Smith
Administrative Law Judge
Oregon Employment Department
Hearings Section, Suite 225
800 N.E. Oregon Street, #6
Portland, Oregon 97232

Re: WQ-WC-DEQ
Variance Appeal
Richard Gruetter



Dear Mr. Smith:

I have considered your recent request that I respond to new information that has been submitted with respect to this appeal since my written decision was rendered by letter dated June 28, 1994. In order for me to consider this new information, the variance proceeding would have to be re-opened and conducted a second time. It has been the Department's position that if new information is submitted after the decision is rendered, it may be considered only as part of a new variance application. I must, therefore, respectfully decline to comment on all new information.

It is my opinion the June 28, 1994 letter accurately and clearly summarizes the issues considered in reaching the decision to deny Mr. Gruetter's variance request. However, Mr. Bradley has identified five (5) specific areas he believes were improperly or incompletely evaluated by the variance officer, and variance from the administrative rules should have been granted so that a sand filter system could be installed. I will comment on each of these.

1. **The application for a variance meets the statutory standards.** The statutory requirements pertaining to variance applications are found in ORS 454.657 through 454.662. Mr. Gruetter submitted a variance application to the Department. Presumably, by submitting the application, Mr. Gruetter concurred that the proposed site did not comply with the minimum standards regulating the siting and construction of an on-site sewage system, as adopted by the Environmental Quality Commission. A premise of this special and discretionary process is that if variance is granted, it is done so consistent with the basic tenant to protect the public health and welfare, and also provide for protection of waters of the state. The burden of proof falls upon the applicant to show beyond reasonable doubt that the request should be granted. It was and is my opinion, and therefore my finding, that Mr. Gruetter failed to justify waiver of the rules. Mr. Bradley apparently acknowledges the area available to install the sand filter system is limited. It is too small an area to accommodate a standard system. It is also too small an area to place a conventional sand filter treatment unit and the minimum amount of disposal trench specified in the rule, given the soil texture present. To meet the rule, there must be an area large enough to install at least 200 linear feet of trench (the initial



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DEQ-1



disposal facility and its future replacement). It was determined the area could accommodate about 140 feet of trench. The 60 feet of difference is a significant deviation from the rule.

2. **The topography and soil profile are suitable for a sand filtration system.** I concur that the soil texture and depth are compatible for use of a sand filter system that discharges effluent to disposal trenches. The proposed disposal trench area, however, does not have a planar surface that allows the simplified placement of disposal trenches. Without variance, trench depth into mineral soil is limited to a minimum depth of 24 inches and a maximum depth of 36 inches. Across and through the disposal area there are significant slope variations. The factors of trench depth and slope variability restrict trench placement across the selected area, particularly so due to a requirement that the bottom of each trench be level from one end to the other. Trench placement is further exacerbated by the presence of organic waste (decaying wood) observed as deep as 17 inches at the end of one of the proposed disposal trenches. Trench locations were staked out using surface features, not taking into account the need to remove the organic waste prior to the construction of the system. Trenches are not installed into organic waste primarily because the ongoing decay of that material will undermine the physical integrity of the trench. In my experience it is unlikely that room for additional disposal trench will be found after removal of the organic waste, it is more probable that the area will accommodate less total trench length.

Downslope from the proposed disposal trench location there is a significant slope change on the landform. The slope exceeds 50 percent, thereby the top of that slope is by definition an escarpment. Because there is a potential risk that partially or untreated effluent might breakout to the land surface below an escarpment, minimum separation distances are to be maintained between disposal areas and escarpments. OAR 340-71-260(3) requires that the minimum separation distance listed in OAR 340-71-220(2)(i)(Table 1) pertaining to escarpments be maintained. The minimum would be not less than 25 feet or not less than 50 feet, given the presence or lack thereof of a layer limiting effective soil depth. Due to the lush vegetative cover, steepness of the land surface, and other factors, it was not possible to determine if a layer limiting the effective soil depth was intersected by the face of the landform. It was my opinion, however, that the maintenance of a 40 foot separation distance (as proposed in the variance) would be sufficiently protective of the public interest. The applicant did not present information to suggest that a 25 foot separation was warranted.

3. **Separation distances from streams and drainageways are sufficient.** The drainage way located north of the proposed disposal area is a well established and easily recognized feature on the land surface. To be considered as an intermittent stream, water would need to flow continuously for at least 2 months in any year. I have not visited the property often enough to know if the drainage way meets the definition. Mr. Gruetter provided me with an evaluation report that describes the

drainage way as an "intermittent stream with standing water." The 1990 report was prepared by Department staff in response to Mr. Gruetter's application for the report. I believe a prudent person would assume water flows down this drainage way during the wet months of winter. However, I concur with my understanding of Mr. Bradley's view that as proposed the disposal area is not at all likely to be subjected to excessive saturation due to the presence and location of the drainage way. The 40 foot setback proposed by Mr. Gruetter is reasonable given my observations at the property.

4. **The proposed trenching provides adequate absorptive surface area to meet the intent of the rules.** If the proposal had been to install a standard system to serve a two bedroom dwelling, the disposal area would need to be large enough to accommodate 500 linear feet of disposal trench (this total includes both the initial and the required future replacement disposal trench). Because use of a sand filter treatment unit significantly improves the quality of the effluent that passes through it, the on-site rules recognize this improvement by reducing the total trench length to 200 linear feet. In Mr. Gruetter's revised plans, it is suggested that there is room to install 56 feet of disposal trench for the initial system, and 84 linear feet of disposal trench for the future replacement. The rules do not provide for a further reduction of the required footage for sand filter units built without water-tight containment vessels, when placed on and above soil with textural features like those present at the Gruetter property. If the Gruetter site had complied fully with the on-site regulations, a water-tight containment vessel would not have been a requirement of construction because both the permanent and temporary water tables are sufficiently deep below the filter bottom (more than 18 inches) that the operation of the system is not likely to be impaired due to the presence of either type of water table. Use of such a vessel prevents high groundwater levels from flooding the base of the sand filter, and thereby prevents groundwater flooding in the disposal trenches as well.

Mr. Gruetter proposed the construction of a sand filter treatment unit that would not have a water-tight containment vessel. Although it is reasonable to expect that some quantity of the effluent that has passed through the sand filter will infiltrate the underlying soil and receive further treatment as the wastewater moves downgradient, the actual quantity may be considerable less than theoretical estimates described in the proposal. The theoretical estimates fail to mention that the hydraulic conductivity (HC) value used in the calculation (0.15 inches/hour) will become lower over time due to several factors. As the filter is used, fines are flushed through the filter media, and much of this will accumulate at the filter/soil contact zone. Some of these fines, and fines within the soil below the infiltrative surface, will carry into the macropores that transmit the treated wastewater and cause a reduction of the HC value. Other factors, including biological growth that occurs as a consequence of the treatment process, will further lower this value as well. The calculation further assumes the soil infiltrative surface below and in contact with the filter bottom to be about 366 square feet. However, this surface is actually less (often estimated at 50 percent) when you compensate for the blinding of that surface due to underdrain

media contact.

Many of the design features for the proposed sand filter were not included with the variance application. Several of these features (such as the pumping frequency, duration, volume, and the location of the underdrain pipe) directly effect the quantity of wastewater that may infiltrate the underlaying soil. It is very uncommon for a sand filter to be dosed at a constant rate over a 24 hour period. Rather, the norm is that effluent will pass from a residential filter at a flow rate of approximately 20 gallons per minute, with a total discharge per cycle that may range from 30 to 60 gallons, depending on the control settings. If we assume the HC value is 0.15 inches per hour, and that the infiltrative surface at the base of the filter is blinded by 50 percent, only about 0.3 gallons will infiltrate into the soil below the filter per minute, while more than 19 gallons per minute should be collected by the filter's underdrain pipe (if it is placed on top of the underlaying soil) and be discharged to the disposal trenches. Ponding at the filter base can be induced by elevating the underdrain pipe, thereby altering this estimate for a time. It is, therefore, my opinion Mr. Gruetter did not provide a convincing discussion to support a reduction of the disposal trench length.

5. **Geologic considerations do not provide a basis for denial of a variance in this case.** The 1990 site evaluation report Mr. Gruetter provided with the variance application states that the site shows evidence of being an unstable landform and was part of the reason the site was not approved for placement of an on-site system. Other documents provided by Mr. Gruetter (including but not limited to the detailed site investigation report prepared by Paul D. See in 1986) also attest to the instability of the landform. I viewed portions of the landform the property is located on and also came to the conclusion that the landform exhibits signs of instability, to the extent it would not be prudent to allow installation of the proposed sand filter system.

Please feel free to contact me if I may be of additional assistance in this matter. My phone number is (503) 229-6443.

Sincerely,



Sherman O. Olson, Jr.
Environmental Specialist

soo

cc: Todd Bradley, Attorney at Law

RECEIVED

JAN 18 1995

WILLIAM A. GAYLORD
JINDA K. EYERMAN
TODD A. BRADLEY
PEGGY M. TOOLE

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ATTORNEYS AT LAW
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*ALSO ADMITTED IN WASHINGTON

January 18, 1995

HAND DELIVERED

Mr. Christopher Rich
Department of Environmental Quality
811 S.W. Sixth Avenue
Portland, Oregon 97204-1390

RE: Richard Gruetter, Clatsop County, DEQ Variance Appeal

Dear Mr. Rich:

Enclosed is a letter from James Atkins, of the engineering firm of Handforth, Larson & Barrett. Since that firm has been recently involved in several other development issues concerning the property, I asked for their assessment of the stability, in light of Mr. Olson's concerns.

I respectfully request that Mr. Atkins' letter be made a part of the record in this case, and that you give it due consideration in your review of this matter.

A copy has been sent to Mr. Olson.

Very truly yours,

GAYLORD & EYERMAN, P.C.



Todd A. Bradley

TAB:rw

Enclosure

cc: Sherman Olson
Richard Gruetter
James Atkins

**HANDFORTH
LARSON &
BARRETT, INC.**

4253-A Hwy 101 North
Seaside, OR 97138

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JAN 18 1995

Surveying & Civil Engineering

TEL: 503-738-34
FAX: 503-738-7455

9 January 1995

Gaylord & Eyerman, P.C.
Attorneys at Law
ATTN: Todd A. Bradley
1400 S.W. Montgomery
Portland, Oregon 97201-6093

JAN 12 1995

RE: Mr. Richard Gruetter, Clatsop County, DEQ Variance Appeal

Dear Mr. Bradley:

At the request of Mr. Richard Gruetter, I have reviewed the information prepared by Mr. John Smits, Registered Sanitarian, Mr. Paul See, licensed Geologist and yourself. I have also conducted a review of available mapping information of the area (i.e. ODOT Highway Maps), and conducted a site investigation.

I concur with the conclusions noted by Mr. Paul See in his report dated June 16, 1992, November 20, 1990, and October 24, 1986. I would add that during my site visit in December, 1994 I observed no evidence of recent movement in the area, nor did I observe any evidence of localized creep in the area of the proposed septic system.

OAR 340-71-100 (92) defines an unstable landform as meaning:

"(an area) showing evidence of mass downslope movement, such as debris flow, landslides, rockfalls, and hummocky hillslopes with undrained depressions upslope. Unstable landforms may exhibit slip surfaces roughly parallel to the hillside; landslide scars and curving debris ridges; fences, trees and telephone poles which appear tilted; or tree trunks which bend uniformly as they enter the ground. Active sand dunes are unstable landforms. (See Diagrams 21, 22, 23.)"

Diagram #22 shows a 50' minimum setback from the extent of an unstable landform to the proposed septic system. I would contend that the land mass meeting the definition of an unstable landform, as defined by DEQ, is a minimum of 150 feet to the south. This information is shown graphically on the attached copy of a ODOT Highway Map, detailing the location of the 1974 slide area.

Mr. Gruetter's property is composed of irregular topography. This is as much the result of historic logging operations as movement in the ancient geologic past. The presence of large spruce stumps and straight, younger trees attests to the long term stability of this site. Furthermore, while there is likely "highly plastic laminated mudstone" under the site, this does not automatically indicate the potential for future movement. The fact that this site has remained stable, relative to the land mass to the south, is evidence that the mudstone layer exists at a more horizontal plane. I interpret this to mean that the land mass surrounding the property has moved in the ancient geologic past, but has reached a point of equilibrium, and is now relatively stable. It is important to point out, that no sedimentary slope, no matter how gentle can be considered immune from

JAN 18 1995

Handforth Larson & Barrett, Inc. for Gaylord & Eyerman, P.C.

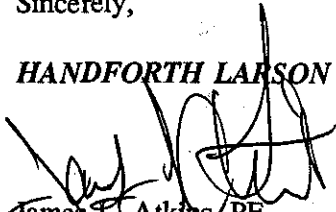
failure given the recent evidence concerning the potential for severe seismic events on the North Oregon Coast. However, the DEQ regulations clearly apply only to land masses undergoing mass movement, not to areas subject to the *potential* for movement.

I would suggest that the requirements of the Clatsop County Planning Department, and specifically Section 4.030 of the Land Use Ordinance, will address the considerations for this property given that it lies within an area that has the potential for mass movement. The DEQ regulations do not restrict development of an on-site sewage disposal system because the land is not an unstable landform, as defined by OAR.

I trust this information is helpful for your application and appeal. If I can provide any additional information, or documentation, please call me at your convenience.

Sincerely,

HANDFORTH LARSON AND BARRETT, INC.



James L. Atkins, PE
Engineering / Planning Manager

INT.ms<A:\GRUETT3.LET>

cc: Mr. Richard Gruetter
Mr. John Smits
Mr. Paul See
Project File

enc.

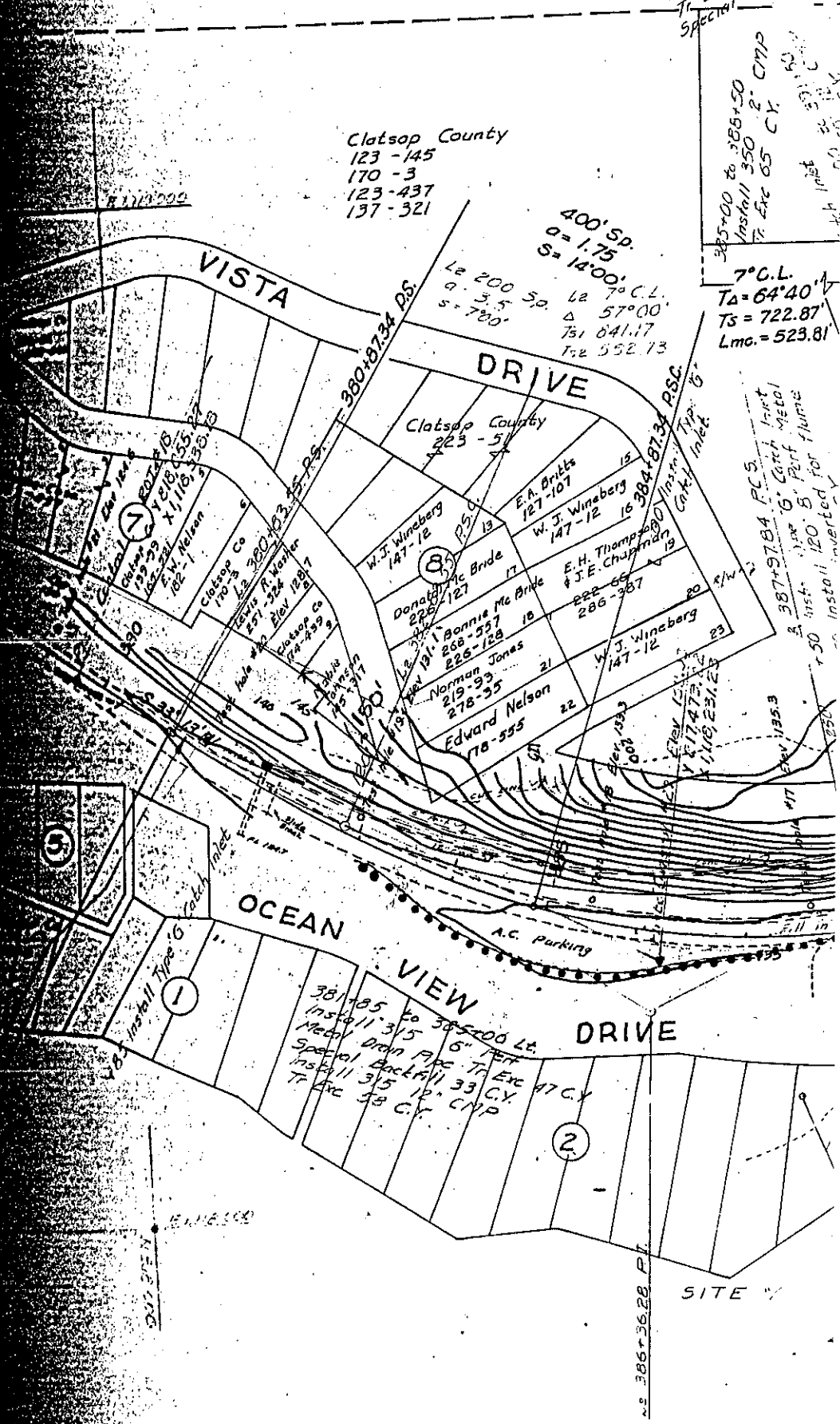
389+00 to 391+50 ft
Install Metal Drain
Tr. Exc 48 C.Y.
Special Bankfill 46

385+00 to 386+50
Install 350 2" CMP
Tr. Exc 65 C.Y.

7° C.L.
TΔ = 64° 40'
Ts = 722.87'
Lmc = 523.81'

Clatsop County
123 - 145
170 - 3
123 - 437
137 - 321

400' Sp.
a = 1.75
S = 1400'
LΔ 200 Sp. LΔ 7° C.L.
a = 3.5 Δ 57° 00'
S = 780' Ts 841.17
TΔ 552.13



OCEAN VIEW DRIVE

381+85 to 385+00 LΔ
Install 3/5 6" Pipe
Special Drain Pipe Tr. Exc 47 C.Y.
Install 3/5 12" CMP
Tr. Exc 35 C.Y.

SITE Y

GAYLORD & EYERMAN, P.C.

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*ALSO ADMITTED IN WASHINGTON

December 19, 1994

HAND DELIVERED

Mr. Christopher Rich, Hearings Officer
Department of Environmental Quality
811 S.W. Sixth Ave.
Portland, OR 97204-1390

RE: Applicant's statement on appeal

Dear Mr. Rich:

I have been advised that you are now in charge of this appeal, in place of Linda Zucker. If this is not correct, please let me know immediately, so that I can direct future correspondence to the appropriate office.

Having reviewed the documents submitted by Mr. Olson, the Applicant has no other documents to present at this time. However, should you find during your review that you would like additional evidence on a particular issue, I would appreciate the opportunity to supplement the record to respond to your concerns.

It continues to be the Applicant's position that the denial is not supported by substantial evidence. In the remainder of this letter, I will address the points raised in Mr. Olson's denial, dated June 28, 1994, and attempt to demonstrate that his concerns are unfounded.

1. The Application for a variance meets the statutory standards

ORS 454.657 provides that a variance from the administrative rules for On-Site Sewage Disposal may be granted when strict compliance is inappropriate for cause, or where special physical conditions make strict compliance unreasonable, burdensome, or impractical. The record establishes that the criteria for a variance have been met.

As Mr. Olson acknowledges, the property is not large enough to accommodate a standard system. After a previous application was denied in 1990, Mr. Gruetter acquired additional adjacent

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property in order to provide more stable area for development of an on-site system. However, there is still not enough area for a standard system, which is why a sand-filtration system is being proposed.

The property is outside the city limits of Seaside. Efforts to obtain permission from the City to connect to its sewer system were unsuccessful. (See letter from City of Seaside dated August 28, 1990).

The site is zoned for single-family residential use, but without a variance Mr. Gruetter will not be able to construct a dwelling on his property, even though he now owns three adjoining lots. Thus, requiring strict compliance with the OAR's is inappropriate for cause, as well as unreasonable, burdensome or impractical due to physical conditions.

2. The topography and soil profile are suitable for a sand filtration system.

Mr. Olson's denial letter notes that the soil is silt loam, loam, and silty clay loam. These are good soil profiles for on-site sewage disposal, as they can be dug with a backhoe to depths greater than 24 inches, and would be suitable for a standard disposal system if the site were larger. (OAR 340-71-290(3)(d)). As engineer John Smits explained in the application, the use of a sand filter system increases the treatment efficiency in these soil textures beyond that provided by a standard system, so that the same (or better) level of treatment can be met on a smaller site.

There is no relevance to Mr. Olson's remarks concerning wood debris on the property. Trenches can be up to 42 inches deep under standard system rules. Thus, there is plenty of room for the trenches to be placed in the soil beneath any wood debris and still have effective sidewalls of at least 12 inches. (OAR 340-71-220(8)(a)(D)).

Temporary groundwater at a depth of 42 inches in one of the pits is mentioned in Mr. Olson's letter. It should be noted that the rules allow for groundwater up to 18 inches below the surface. Therefore, this comment is properly interpreted as establishing compliance with the rules relating to groundwater. (OAR 340-71-290(3)(a)(C)).

Trenches following a sand filter are allowed on slopes up to 30%. (OAR 340-71-290(3)(e)). Measured slopes at the site range from 13% to 23%. Mr. Olson relates that an area downslope from the

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lowest pit is "very steep." This is obviously not a measurement of slope, and therefore cannot be used to support a finding that the slope exceeds the permissible 30%. Assuming, however, that the slope exceeds the maximum permitted, the system plan shows that the lowest trench is set back 40 feet from the "escarpment," which is only 10 feet less than the standard requirement. OAR 340-71-290(3)(f)(Table 1)(8)). Taking into consideration the fact that there is no limit to the effective depth of the trenches resulting from the steepness of slope, a set back of as little as 25 feet would be warranted.

Based on these factors, no justification is found for denying a variance based on soil or topography.

3. Separation distances from streams and drainageways are sufficient.

Assuming that the spring-fed stream on the southern part of the site is year-round, the required separation distance is 50 feet. (OAR 340-71-290(3)(f)(Table 1)(5)). Reference to the submitted Plan shows that this requirement is met.

North of the site is a drainage way that carries storm run-off. No water has been observed in this drainage way during any of Mr. Olson's visits to the site, nor does the record contain any other evidence to suggest that this drainage way ever contains water except during storms. Therefore, there is no evidence to support a finding that this is an "intermittent stream" as that term is defined in the Rules. (OAR 340-71-100(68)).

There is no Rule requiring any set back at all from a drainage way that is less than an intermittent stream. Nevertheless, the proposed system is separated from the drainage way by 40 feet, which is certainly more than minimal and is only 10 feet less than would be required for a year-round stream. Furthermore, given the soil profile on the site, the distance is far more than is necessary to meet any concerns about excessive saturation. (OAR 340-71-220(2)(h)).

Based on the above, there is no support in the record for denial of a variance on the basis of separation from waterways.

4. The proposed trenching provides adequate absorptive surface area to meet the intent of the Rules.

The purpose of requiring 100 linear feet of disposal trench is to obtain at least 200 square feet of absorptive surface area. From

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a standard disposal system, it is assumed that solid waste will plug the bottom of the trench, which means that the required 12-inch sidewalls must provide the absorption area. In other words, assuming that the bottom is plugged, each linear foot of trench will provide two square feet of absorption area.

As the record shows, the proposed system consists of a bottomless sand filter, which by itself will provide 366 square feet of absorptive surface. The effluent flowing to the trenches from this type of system is basically water, and will not plug the bottom of the trench like solid waste from a standard system. Therefore, each linear foot of trench is capable of providing 3 square feet of effective surface, for a total in this case of 420 square feet (140 x 3). If the bottom of the sand filter is also counted, the system as designed will have almost 800 square feet of absorptive surface area. This is more than enough to treat the design flow from a single family dwelling in this soil profile.

Although Mr. Olson also mentioned seepage trenches in his denial letter, the application does not seek a variance to allow the use of seepage trenches. This was simply a suggestion made at one point during an exchange between Mr. Olson and the system engineer, Mr. Smits. (See Smits letter to Olson, dated July 6, 1993).

Conclusion: The record does not support a denial of the application based on adequacy of disposal trenching. The observations and remarks in the record do not support a finding that the proposed system would not provide a satisfactory level of sewage treatment and disposal.

5. Geologic considerations do not provide a basis for denial of a variance in this case.

Contrary to Mr. Olson's assertions, the evidence in the record does not establish that the Gruetter property is "unstable" as that term is defined in the Rules. The proposed site itself does not exhibit any of the characteristics of unstable landforms, as that term is defined in OAR 340-71-100(125) and its accompanying diagrams, nor was there a landslide "immediately" south of the property.

Mr. Olson states in his denial letter that " The small drainage basin within which the property is located exhibits several of these characteristics." However, he cites no specifics in

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support of this statement, nor does he explain or define what area he examined, nor how the characteristics he observed might relate to the subject property.

The 1986 report of professional registered geologist Paul See noted that several stumps from early-day logging stand erect on the property and show "no evidence of ground creep". Mr. Olson confirmed this observation in his denial letter, stating that "[t]he trees at the site are large, suggesting they have been present for several decades. They are also straight, which suggests their orientation to the ground has not changed appreciably in recent times".

Mr. See revisited the site in 1992, in connection with the present application. In his report, dated June 16, 1992, he stated as follows:

"[F]ollowing periodic inspection of conditions along adjacent Highway 101...I find no evidence of continued motion since that date. The Highway offset and bulge remains as it was in 1986. No sloughing has occurred on the embankments directly downslope from these lots, although the denuded hillside has continued to erode and slough several hundred feet to the south."
(emphasis added)

The geologist's report also noted, as did Mr. Olson, that the proposed area for the sand filter is locally flat and that the system in question will have no effect on slope stability. Regarding the general risk of slope failure, Mr. See made it clear that he was not speaking of the subject site specifically, but rather of the regional hazard on the Oregon coast based on historical evidence, with the most recent event of a disastrous magnitude occurring approximately three hundred years ago. He acknowledges that he sticks his neck way out by forecasting a 20% chance of a major earthquake in the next 50 years. Thus, Mr. See concludes:

"No sedimentary slope, however gentle, can be considered immune from failure under worst-case circumstances. Risks associated with great Cascadia earthquakes must naturally be considered in light of the long and varied intervals between events....the timing of future events can only be broadly estimated."

The fact that slides have occurred on dissimilar and denuded terrain hundreds of feet away and that the site is located within an area of general instability are not grounds to deny a variance application in this case. There is no evidence that the Gruetter

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site itself is unstable or that it is likely to fail in the absence of a catastrophic event. If Mr. See's report provides a basis for denial of the present application, then it would equally well apply to every proposed development on the Oregon coast. Indeed, if "unstable landform" is equated with likelihood of slope failure during a catastrophe, which in turn is to be determined on a regional basis and a geologic time scale, then no development west of the Cascade range from here to Mexico would be permitted.

The evidence establishes that the subject site itself is stable, and is not likely to fail except in the event of a catastrophic slope failure that would affect hundreds of property owners, including the City of Cannon Beach. This is a risk that exists in many places throughout the state, and should not be used as a basis to deny individual variance requests for specific sites that are otherwise stable, as defined by DEQ rules. No specific instability or risk has been identified on the subject property that would affect the effectiveness or integrity of the system as designed.

Scope of Review

There have apparently been no rules or case law developed specifically to govern the conduct of this intra-agency review of a denial of a variance request. It is the applicant's position that there is not substantial evidence to support the variance denial. It is also his position that he is entitled to *de novo* review of the variance officer's denial. In other words, the appeals officer should identify the evidentiary "record" and make her own findings and conclusions on the basis of the entire record, rather than simply reviewing Mr. Olson's decision for substantial evidence and compliance with legal requirements.

The most closely analogous authority I have been able to locate is the case I cited in my letter of August 31, 1994. In Rural Dell School District v. Board of Education, 97 Or App 31, 775 P2d 852 (1989), a district boundary board, after conducting a "hearing," had denied the request of property owners to transfer their land to another school district. The owners appealed to the State Board of Education, pursuant to ORS 330.090(8), which appointed a hearings officer to conduct the review. Although the statute did not specify the scope of review, the hearings officer held an evidentiary hearing, and subsequently entered an order approving the requested boundary change.

On appeal, the school district asserted that the Board should have conducted only a "substantial evidence review." The Court

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of Appeals rejected the argument, concluding that the legislature had implicitly created a requirement for a *de novo* review when it did not require an evidentiary record at the local boundary board level. The Court stated:

"Without an adequate record, it would be impossible for the [School] Board to conduct substantial evidence review. The necessary consequence is that the Board had to create its own record and reach its own conclusions on the basis of that record. It could not even give deference to Clackamas ESD's findings, as petitioners suggest that it should have done, because it could not know all of the evidence on which those findings were based." supra, at 36.

I could also point out that when the courts conduct substantial evidence review under the Administrative Procedures Act (ORS 183.482(8)), the courts require specific findings of fact and conclusions of law from the agency. The Court of Appeals has remanded many appeals from agency proceedings because of the lack of a reviewable order, the minimum requirements of which are generally described as including detailed findings of fact, reference to the specific parts of the record supporting those findings, and conclusions of law which discuss how the findings lead to the conclusions reached.

Under the standards established by the courts in other administrative proceedings, the denial letter of June 28, 1994, would not be deemed sufficient for purposes of substantial evidence review. It does not contain identifiable findings of fact, it does not identify the specific evidence relied upon, it does not explain why some evidence was apparently weighed more heavily than others, and it does not address how the evidence or the conclusions support the decision to deny the variance.

As in the Rural Dell case, a "hearing" on the variance request was held. Exactly what the hearing consisted of, and what evidence was considered, is not ascertainable. Also as in the cited case, Mr. Olson was not required to develop an evidentiary record. ORS 454.657 and 454.660 provide only for a hearing on a variance request, delegation of authority to a variance officer, and appeal of any decision to the Environmental Quality Commission. If the Court of Appeals were reviewing this case now, it would not be able to conduct a substantial evidence review, due to the lack of a record. For these reasons, it is submitted that a *de novo* review must be conducted in this case.

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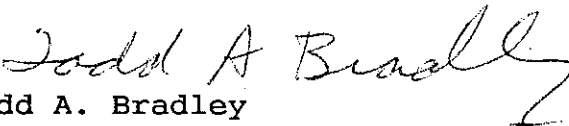
Conclusion

The evidence in this case is ample to justify approval of the variance requested, and there is not substantial evidence in the materials submitted to support the denial. Regardless of the scope of review, the decision of the variance officer to deny the variance should be reversed.

The applicant requests that this letter be made a part of your record of this proceeding.

Very truly yours,

GAYLORD & EYERMAN, P.C.


Todd A. Bradley

TAB:rw

cc: Sherman O. Olson, Jr.
Richard Gruetter

GAYLORD & EYERMAN, P. C.

ATTORNEYS AT LAW

1400 S.W. MONTGOMERY

PORTLAND, OREGON 97201-6093

WILLIAM A. GAYLORD

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(503) 222-3526

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*ALSO ADMITTED IN WASHINGTON

July 18, 1994

HAND DELIVERED

Ms. Linda K. Zucker, Hearings Officer
Department of Environmental Quality
811 S.W. Sixth Avenue
Portland, Oregon 97204-1390

Re: Appeal of Variance Denial

Dear Ms. Zucker:

I represent Richard Gruetter, a Clatsop County property owner, in regard to land use matters. On his behalf, I respectfully appeal from the recent decision of variance officer Sherman Olson, Jr., denying Mr. Gruetter's request for a variance, and request a hearing. A copy of Mr. Olson's decision is attached.

The specific grounds for appeal are:

1. The application established, and the variance officer's investigation confirmed, that strict compliance with the rules is inappropriate for cause, or that special physical conditions render strict compliance unreasonable, burdensome, or impractical. Unless a variance is granted, development of the property permitted by the applicable zoning will not be possible.

2. Mr. Olson's conclusion that "there does not appear to be an adequate means to overcome the physical limitations to provide reasonable assurance that an on-site system could perform a satisfactory level of sewage treatment and disposal at the subject property" is not supported by the evidence. The sand filter system designed by the engineering firm of Smits & Associates addresses all reasonable concerns, and there is no basis to assert that the system will not adequately perform.

3. The site is not "unstable by definition". The proposed site does not exhibit any of the characteristics of unstable landforms, as that term is defined in OAR 340-71-100(125) and its accompanying diagrams. The 1986 report of professional registered geologist Paul See noted that several stumps from early-day logging stand erect on the property. This is consistent with the variance officer's observation that "[t]he trees at the site are large, suggesting they have been present for several decades. They are also straight, which suggests their orientation to the ground has not changed appreciably in recent times".

Linda K. Zucker
July 18, 1994

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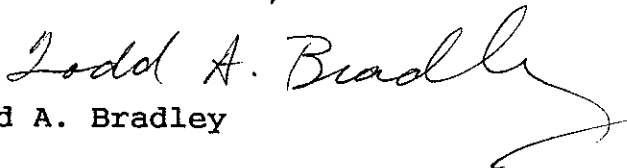
A subsequent report from Mr. See, dated June 16, 1992, confirmed that there continued to be no evidence of movement of the subject site. Specifically, he found no sloughing of the embankments downslope from the site, although he identified some erosion and sloughing of "denuded" hillside several hundred feet to the south. The geologist's report also noted that the proposed area for the disposal system is locally flat and that the system will have no effect on slope stability.

The fact that slides have occurred hundreds of feet away and that the site is located within an area of general instability are not grounds to deny a variance application in this case. The evidence establishes that the subject site is stable, and is not likely to fail except in the event of a catastrophic slope failure that would affect hundreds of property owners, including the City of Cannon Beach. This is a risk that exists in many places throughout the state, and should not be used as a basis to deny individual variance requests for specific sites that are otherwise stable, as defined by DEQ rules.

Please send any notices or other correspondence regarding this matter to my attention.

Very truly yours,

GAYLORD & EYERMAN, P.C.



Todd A. Bradley

TAB:cb

Enclosure

cc: Richard Gruetter

June 28, 1994

CERTIFIED MAIL

DEPARTMENT OF
ENVIRONMENTAL
QUALITY

JUN 30 1994

Richard C. Gruetter
c/o Todd A. Bradley
Gaylord & Eyerman, P.C.
Attorneys at Law
1400 S.W. Montgomery
Portland, Oregon 97201-6093

Re: WQ-WC-VARIANCE DENIAL: 1 Silver Point Terrace, Lots 8 & 9, Block 7, and Lot 13, Block 8; also known as Tax Lots 1300, 1400, and 2400; Section 6 CC; Township 4 North; Range 10 West, W.M.; Clatsop County.

Dear Mr. Gruetter:

This correspondence confirms that, in response to a variance application received by the Department on December 2, 1992, an information gathering hearing was held on the above described property on the morning of April 29, 1993. Additional visits to the property were made that same year, on November 19th and December 17th. At issue was whether the requirements of specific administrative rules concerning the siting and construction of a conventional sand filter treatment and disposal system should be waived.

Staff with the Department's Northwest Region evaluated portions of the property to determine suitability for placement of an on-site sewage disposal system in June of 1990. Field notes indicate silt loam, loam, and silty clay loam soil textures were observed within the two pits examined. Temporary groundwater was observed at 42 inches below the surface in the lowest pit examined. The evaluation report also states the site is in an area of highly variable topography, with measured slope ranging from 13 percent to 23 percent. An area downslope from the lowest pit is identified as "very steep," although the slope measurement is not given. Staff believed the landform to be unstable, due to their observations of tree growth patterns, numerous blow-downs, and a recent landslide immediately south from the property.

My observations at the site are somewhat similar. The area to place the system (including the future repair/replacement disposal facility) is very limited because of the size of the property and other factors. There are drainage ways located north and south from the site, and there is an escarpment (slope exceeding 50 percent) immediately downslope from the proposed site. The southern drainage is spring-fed, and appears to flow most if not all of the year. The seasonal drainage way to the north is likely to



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DEQ-1



carry and discharge waters from storm events, but was not observed to be carrying water during my visits. Much old wood debris is apparent over portions of the site, perhaps as much as 2 feet deep where part of the sand filter treatment unit is proposed to be constructed. At the northern ends of the disposal trenches the wood debris was found to range up to 17 inches in depth.

With respect to landform stability, I initially looked only at the proposed site and not at the surrounding landform. The trees at the site are large, suggesting they have been present for several decades. They are also straight, which suggests their orientation to the ground has not changed appreciably in recent times. However, for the purpose of regulating the placement of on-site sewage disposal systems, an unstable landform means an area showing evidence of mass downslope movement, such as debris flow, landslides, rockfalls, etc. Unstable landforms may exhibit slip surfaces roughly parallel to the hillside, landslide scars and curving debris ridges, trees which appear tilted, or tree trunks that bend uniformly as they enter the ground. The small drainage basin within which the property is located exhibits several of these characteristics.

Mr. John Smits, Smits & Associates, proposed the placement of a conventional sand filter-disposal trench system on lots 8 and 9 of Block 7, Silver Point Terraces, to serve a proposed dwelling to be placed on Lot 13, Block 8 of that subdivision. A dedicated (but not yet constructed) road (Vista Drive) separates the dwelling site from the sand filter-disposal trench system location. The sand filter treatment unit would be constructed with concrete walls, and the unlined bottom of the filter unit would be within the first six inches of the natural soil. An underdrain collection pipe at the filter base would be positioned to allow shallow ponding (to promote absorption of the treated effluent into the underlying soils) before collecting and discharging the treated effluent into the downgradient disposal trench facility. The initial disposal trench area will accommodate approximately 56 linear feet of trench, while the future repair/replacement disposal trench area has room for 84 linear feet (or slightly more) of disposal trench. Mr. Smits requested consideration to allow the use of seepage trenches in the initial disposal trench facility, with a 20 inch depth of filter material below the perforated pipe, to compensate for the trench length normally required within a sand filter system. As presented, the proposal will require variance from the following administrative rules:

1. OAR 340-71-150(4)(a)--which limits the use of standard and/or alternative sewage treatment and disposal systems to properties that comply with the requirements of OAR 340-71-220 and/or the requirements of OAR 340-71-260 through OAR 340-71-360 (as appropriate for a specific type of alternative system). The rule also requires the property to contain sufficient area to accommodate an initial and replacement system, both in full compliance with the on-site rules. The site does not comply with these requirements.
2. OAR 340-71-220 (2)(f)--which prohibits the placement of sewage systems on

landforms that are unstable. The site is considered unstable by definition.

3. OAR 340-71-260(3)--which requires that unless otherwise allowed by specific rule, alternative sewage treatment and disposal systems must comply with all rules that pertain to site criteria, construction and maintenance of standard systems. The site does not meet the requirements of this section.
4. OAR 340-71-290(3)(f)(Table 1)(5)--which requires a minimum separation distance of 50 feet be maintained between an intermittent stream and the sewage disposal area. The proposed disposal area is located 40 feet south from a intermittent stream (drainage way).
5. OAR 340-71-290(4)--which establishes the minimum length of standard disposal trench following a sand filter unit in different soil textural groups. A single family dwelling with two or fewer bedrooms (with a design flow of 300 gpd) installed in silty clay loam soil textures is required to have not less than 100 linear feet of disposal trench, and the future repair/replacement would have the area to install an equal amount. However, the limited useable area at the site will accommodate a total trench length of approximately 140 feet.
6. OAR 340-71-280--which establishes that before the use of seepage trenches can be authorized the site must meet all the requirements applicable to a standard system, and there must be insufficient area to accommodate use of standard disposal trenches when the system's design flow is 450 gpd. The site does not meet the qualifications for use of a standard subsurface system.

The property has been investigated for geologic hazards by Mr. Paul D. See, Registered Professional Geologist. In Mr. See's report of October 24, 1986, he states the property is on a west-facing slope of Silver Point, located less than 250 feet north of the 1974 Silver Point slide. The lower property line appears to approximate the top of a cutbank created by the Oregon State Highway Division during construction of an access road and drainage ditch. He identifies the subsoil sediments on the property and in the cut bank below the property as "typical tertiary landslide material." North from the property, test hole borings by the Highway Division in 1985 encountered a "highly plastic laminated mudstone" material. Mr. See states that because this same material is also present in the exposed face of the 1974 slide, it is presumed to lie under the property. Consequently, the potential for similar massive sliding can't be dismissed here.

Mr. See also reports the Highway Division has been concerned about the deformation of a portion of the highway located directly downslope from the property. The asphalt paving and concrete curb were being offset, requiring periodic maintenance. This deformation is termed "creep," and may involve much of the slope between the highway and the property. This factor suggests the risk of slope failure is relatively high in the general area. Mr. See

Richard C. Gruetter
June 28, 1994
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states he did not observe evidence of creep on the subject property, with the "exception of a very limited conifer distortion in the immediate vicinity of the minor stream."

In later correspondence, Mr. See stresses the property is located on a "notoriously unstable headland'" and that "the potential for mass movement remains very real on this entire slope." The risk of slope failure is, however, independent of the proposed development activity. The sand filter unit would be placed in the southeast (upper) corner of lot 9, on a locally flat area. At that location, the weight of the unit would not be expected to be a factor effecting slope stability. With respect to the discharge of wastewater through the proposed system, Mr. See expresses his professional opinion that this should be of no concern for decreased stability since the net infusion of water on the slope would not be changed. In any case, the projected volume of wastewater spread over the drainfield area is "insignificant compared to the periodic intensity of seasonal rainfall."

Variance from particular requirements of the Oregon Administrative Rules for On-Site Sewage Disposal may be granted if a finding can be made that strict compliance with the rules is inappropriate for cause, or that special physical conditions render strict compliance to be unreasonable, burdensome or impractical. Based upon the information and evidence obtained relevant to this matter, there does not appear to be an adequate means to overcome the physical limitations to provide reasonable assurance that an on-site system could perform a satisfactory level of sewage treatment and disposal at the subject property. Nor can I find it reasonable to authorize construction of a wastewater treatment and disposal system in a location that is by definition unstable, and is apparently viewed as unstable by a Registered Professional Geologist. In my judgement development of the proposed system would not be in the best interest of public health or environmental concerns. As a result, I am regretfully unable to grant your variance request.

Pursuant to OAR 340-71-440, my decision to deny your variance request may be appealed to the Environmental Quality Commission. Requests for appeal must be made by letter, and must clearly state the technical grounds for the appeal. The appeal must be directed to the Environmental Quality Commission, in care of Ms. Linda K. Zucker, Hearings Officer, Department of Environmental Quality, 811 S.W. Sixth Avenue, Portland, Oregon, 97204-1390, within twenty (20) days of the certified mailing date of this letter.

Sincerely,



Sherman O. Olson, Jr.
Variance Officer
On-Site Sewage Disposal Program
Water Quality Division

Richard C. Gruetter

June 28, 1994

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WC\WQ

cc: Todd A. Bradley
John Smits, Smits & Associates
Clatsop County Planning Director
Dewey Darold, North Coast Branch:DEQ
Kent Ashbaker, Northwest Region:DEQ

R & ASSOCIATES, INC.

SE Kingston Ave.
Wauke, OR 97267-1943
(503) 659-5623

Mr. Sherman O. Olson, Jr., R.S.
Dept. of Environmental Quality
Water Quality Division
Municipal and Industrial Waste Section
811 S.W. Sixth Ave.
Portland, Oregon 97204-1390

Nov. 30, 1992

Re: On-Site Sewage Disposal
Variance Application
Clatsop County

Dear Mr. Olson,

Enclosed please find an application for variances to Oregon Administrative Rules Regulating On-Site Sewage Disposal Systems prepared for Richard C. Gruetter. The property is located in the Tolovana Park area near Cannon Beach in Clatsop County. The legal reference for the parcel is listed on the application. Hopefully, the required exhibits are complete enough to meet the needs of the Department.

Mr. Gruetter resides in a small cabin adjacent to the site. The dwelling to be served will consist of the relocated structure. Efforts to obtain public sewer service have proved fruitless even though the site is close to the city limits of Cannon Beach.

The most recent activity relating to on-site sewage disposal for this site occurred on June 18, 1990 when Chuck Hopkins issued a denial based on his and Bruce Henderson's field visits June 7th and June 14th of 1990. The approval was denied based on the Department's representative opinion the site occupies an unstable landform. Horizontal setbacks are also a limiting factor although they were not listed as a reason for denial. Additionally, at the time of the evaluation, Mr. Gruetter only owned 2 small lots and since that time has acquired another parcel to siting the small dwelling. The acquisition essentially provides more space for development of an on-site sewage disposal system.

ance proposes use of a bottomless concrete "box" sand filter constructed mostly above ground as a 12 ft. by 30.5 ft. 366 sq. ft. unit. gravity underdrain collecting pipe will discharge to 92 feet of standard disposal trench available for overflow if the filter infiltrative surface cannot accept all the treated effluent. If a replacement filter is ever needed, the concrete structure could be reloaded. Replacement trenches are shown on the plot plan

The system is staked out on site and test pits are available. A number of variances will be needed to allow system development. The most significant variance relates to the stability of the site and as such Paul See, local geologist report is included for your review. Additional variances include allowance of a bottomless filter at a site having silt loam soil textures. The plan proposes a 5 ft. to 10 ft. setback between sand filter, and property line at the road as well as around 30 feet separation between "overflow" trench No. 2 and a seasonal stream.

An above ground bottomless sand filter will provide a depth of unsaturated soil below the absorptive surface for treated, high quality, sand filter effluent to pass through before reaching the water table some 42" or more below the surface. The upper soil profile is well drained silt loam with a strong near granular structure. The effluent will flow to the filter in doses. This will facilitate conditions of unsaturated flow through the filter and into the profile.

Even using a conservative infiltration rate, the infiltrative surface of 366 ft.² will have the capacity to infiltrate 823 to 1,647 gallons of sand filtered effluent per day ($366 \text{ ft.}^2 \times 0.15"/\text{hr}/\text{ft.}^2 \times 24 \text{ hrs./day} \times 0.625 \text{ gal./ft.}^2/\text{d}/1" = 823 \text{ gpd}$; $184 \text{ ft.}^2 \times 0.3"/\text{hr}/\text{ft.}^2 \times 24 \text{ hrs./day} \times 0.625 \text{ gal./ft.}^2/\text{d}/1" = 1,647 \text{ gpd}$). The "overflow" trenches as 92 lineal feet (184 sq. ft. sidewall) will accept, conservatively speaking, an additional 414 to 828 gallons of sand filtered effluent per day ($184 \text{ ft.}^2 \times 0.15"/\text{hr}/\text{ft.}^2 \times 24 \text{ hrs./day} \times 0.625 \text{ gal./ft.}^2/\text{d}/1" = 414 \text{ gpd}$; $184 \text{ ft.}^2 \times 0.3"/\text{hr}/\text{ft.}^2 \times 24 \text{ hrs./day} \times 0.625 \text{ gal./ft.}^2/\text{d}/1" = 828 \text{ gpd}$).

As you know, Oregon Experimental intermittent sand filter studies revealed 2.3 to 7.7 gal./ft.²/d sand filtered effluent were assimilated where gravity serial disposal trenches were installed and studied in Western Oregon (1). Information from those studies suggest 1,540 to 4,235 gallons or more of sand filtered effluent could be assimilated by the sand filter gravel infiltrative surface and overflow trenches ($550 \text{ ft.}^2 \times 2.8 \text{ gal./ft.}^2/\text{day} = 1,540 \text{ gpd}$; $550 \text{ ft.}^2 \times 7.7 \text{ gal./ft.}^2/\text{day} = 4,235 \text{ gpd}$) constructed on this site.

Sewage flow data from the Oregon Experimental Systems study of 81 single family homes (three and four bedroom units) showed the homes normally discharged an average of 173.5 gallons of wastewater per day (1). Using the highest flow observed in the study of 384 gpd., the proposed system would apparently be capable of accepting up to 11 times the maximum anticipated discharge. Please note a home with not more than 2 bedrooms is anticipated.

When conditions that promote unsaturated flow are maintained, maximum sand filter effluent treatment can take place, reducing the likelihood of groundwater or surface water contamination from bacteria or nutrients. The Oregon experimental systems study of sand filters showed BOD₅, suspended solids, total nitrogen, fecal coliform and total coliform were reduced 98%, 93%, 43%, 3 logs and 2 logs, respectively. (1)

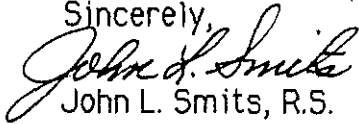
Several laboratory and field studies have shown fecal and total coliform (1, 2, and 3) and virus (4,5, and 6) were readily removed in sand columns and through sand filtration of septic tank effluent. The removal of the constituents typically occurred within 24" of the point where the wastewater was applied. In the sand column studies the application of bacteria and virus to the sand surface was at a level much greater than the number of these organisms normally found in residential septic tank effluent.

At this site, the filtered wastewater having been dosed to the filter will first pass through 24" of medium sand, the treated liquid will in effect be dosed to the soil infiltrative surface. Bacterial populations in the wastewater having been markedly reduced by the medium sand, would be expected to be reduced further in an unsaturated, biologically and chemically active soil horizon. Several investigators have suggested that while 60-cm (about 24") of separation to a water table, in example, provides sufficient microbial treatment and a margin of safety, even 30-cm separation (slightly less than 12") can also provide a fairly high degree of treatment. (7) A 1982 study showed again the importance of utilizing designs that maximize conditions of unsaturated flow and uniform distribution of effluent to the upper most biologically active and aerobic soil horizons. A more recent study showed limited migration of fecal coliform even during high watertable periods. (8) This again supported the earlier work of Reneau (1979), Stewart and Reneau (1981) and Otis et al (1974) where they established early on support for using low pressure distribution to maintain unsaturated flow.

For the reasons cited, there should be little environmental or public health concern for siting an above ground, concrete bottomless sand filter with overflow standard disposal trenches on this site.

If you have any questions, or need additional exhibits please call me at 659-5623.

Sincerely,

A handwritten signature in cursive script, appearing to read "John L. Smits".

John L. Smits, R.S.

Registered Sanitarian

Oregon No. 335

encl:

cc: Richard C. Gruetter

LITERATURE CITED

1. M. P. Ronayne, R. C. Paeth, and S. A. Wilson. Final Report - Oregon On-Site Experimental Systems Program. State of Oregon, Department of Environmental Quality, Portland, Oregon, December 1982.
2. W. A. Ziebell, "Removal of Fecal Bacteria from Wastewater of Individual Homes During Treatment by Conventional and Experimental Methods." Master's Thesis, Department of Civil and Environmental Engineering, University of Wisconsin, Madison, Wis., 1975.
3. E. McCoy and W. A. Ziebell, "The Effects of Effluents on Groundwater; Bacteriological Aspects," Individual On-Site Wastewater Systems, Proceedings of the Second National Conference, National Sanitation Foundation, Ann Arbor, Mich., Nov., 1975
4. K. M. Green, "Sand Filtration for Virus Purification of Septic Tank Effluent." Doctoral Dissertation, Department of Bacteriology, University of Wisconsin, Madison, Wis., 1976.
5. J. C. Lance, C. P. Gerba, and J. L. Melnick, "Virus Movement in Soil Columns with Secondary Sewage Effluent." Applied and Environmental Microbiology, 32, 54, 520-526, Oct., 1976.
6. K. M. Green and D. O. Cliver, "Removal of Virus from Septic Tank Effluent." Home Sewage Disposal, Proc. Am. Soc. Ag. Eng., 175, Dec., 1974.
7. C. G. Cogger, L. M. Hajjar, C. L. Moe, and M. D. Sobsey, "Septic System Performance on a Coastal Barrier Island." J. Environ. Qual. Vol. 17, No. 3, 401-408, 1988.
8. L. W. Stewart and R. B. Reneau, Jr., "Shallowly Placed, Low Pressure Distribution System to Treat Domestic Wastewater in Soils with Fluctuating High Water Tables." J. Environ. Qual. Vol. 17, No. 3, 499-504, 1988.

Application for Variance from Administrative Rules
Regulating On-Site Sewage Disposal Systems

CR#1102 \$225⁰⁰

Please complete this application form and submit the application fee* (\$225) and required attachments to:
Department of Environmental Quality, Sewage Disposal Section, 811 S.W. Sixth Avenue, Portland, Oregon 97204

REFERENCE INFORMATION—Please Print

<u>RICHARD C. GRUETTER</u> Name of Owner	<u>4N</u> Township	<u>10W</u> Range	<u>6CC</u> Section
<u>P.O. BOX 71</u> Address	<u>1300 + 1400</u> Tax Lot or Account No.		<u>0.18 AC.</u> Parcel Size
<u>TOLAJANA PARK</u> <u>OR</u> <u>97145</u> City State Zip Code	<u>SILVER POINT TERRACES</u> Subdivision Name		
<u>436-0711</u> Business Phone	<u>819</u> Lot	<u>7</u> Block	

ATTACHMENTS

Provide The Following Items:

1. Complete and accurate directions to the property. A locator map would be helpful.
2. Two (2) copies of the parcel's legal description (metes and bounds, warranty deed, sales contract, or approved subdivision plat). Include the protective covenants, deed restrictions and easements, if applicable.
3. Two (2) copies of an assessor or title company plat map or a surveyor plat map.
4. Two (2) copies of a land use compatibility statement from the appropriate land use authority that your proposed land use is compatible with the LCDC acknowledged comprehensive plan or statewide planning goals.
5. Copies of all correspondence and field notes relating to past evaluations for septic tank-drainfield development on the subject property. A copy of the site evaluation report must be included.
6. Two (2) copies of narrative description of your variance proposal including the system construction specifications. Please list the step-by-step procedures that you propose to be followed for the installation of this system.
7. On a plot plan draw to a defined scale not smaller than one inch equals thirty feet, show the location and dimensions of the proposed drainfield and its replacement area. Indicate separation distances between disposal trenches, wells, springs, water courses, agricultural drainage tile, ditches, drainage ways, waterlines, buildings, roads, embankments, and other identifying features which help demonstrate parcel to drainfield relationships. Please provide two (2) copies.
8. Two (2) copies of a profile view of the proposal which illustrates the projected drainfield layout, trench dimensions, backfill depth, boundaries, (in cases where a crown over the drainfield is proposed), slope direction and percent of slope.

Hardship variances may be considered in cases of extreme and unusual hardship. The following factors may be considered: Advanced age or bad health of applicant; need of applicant to care for aged, incapacitated or disabled relative; and relative insignificance of the environmental impact of granting a variance. Documentation of hardship must be provided. FOR HARDSHIP CONSIDERATION MARK THIS BOX. []

A minimum of two test pits must be provided within the specific area where the actual variance system is being proposed. The pits should be approximately two feet wide, four feet long, and excavated to either bedrock or to a depth of five (5) feet. Similar pits must be provided in the area of the repair system. The Variance Officer may require the proposed drainfield and the future replacement drainfield be staked out.

Please note that it is your responsibility to present all of the facts and the reasoning which you feel justifies the granting of the variance.

By my (our) signature(s), I (we) request the Department of Environmental Quality act on this application and hereby grant permission to enter onto the above described property.

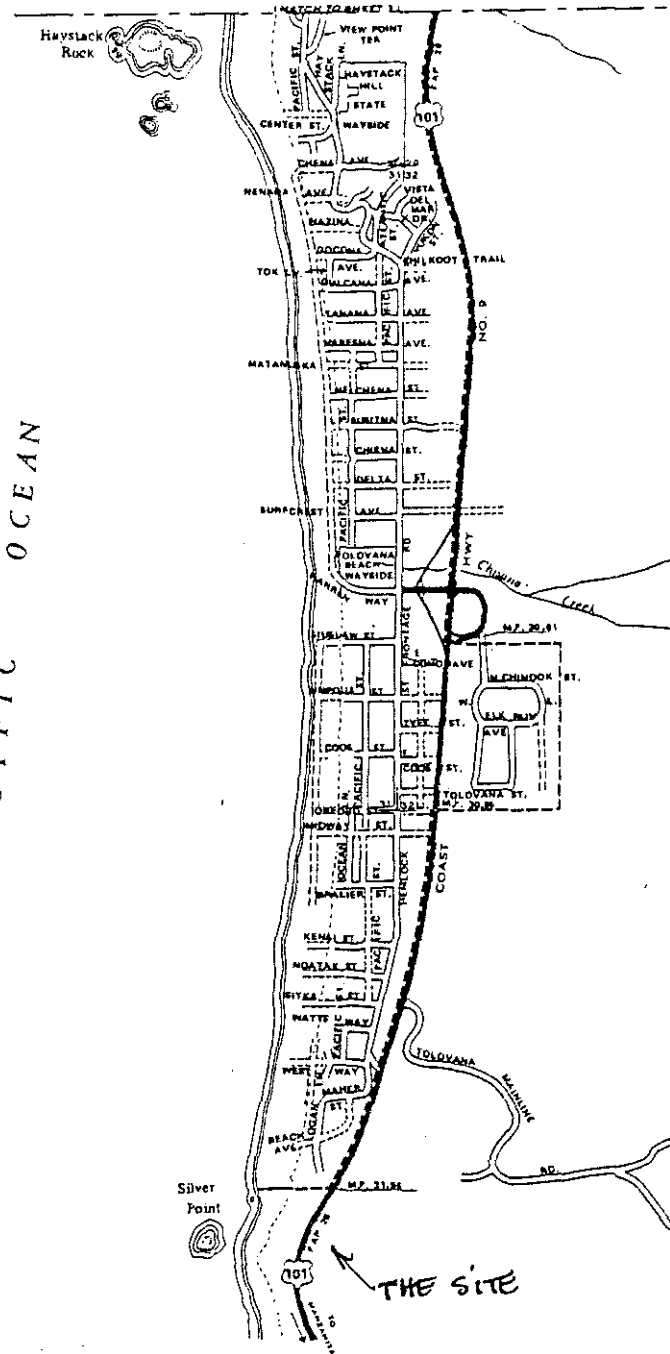
Richard Gruetter 11/20/92
Signature of Owner Date

Signature of Owner Date

NOTE: All owners must sign this application form. If there are more than two (2) owners, attach additional duplicate applications.

* Pursuant to ORS 454.662, the applicant is not required to submit the application fee if, at the time of filing the application, the applicant is 65 years of age or older, is a resident of the State of Oregon, and has an annual household income, as defined in ORS 310.630, of \$15,000 or less. Appropriate documentation must be submitted with the application.

PACIFIC OCEAN



T4N T5N R10W W.M.
LEGEND

- FEDERAL AID INTERSTATE SYSTEM
- FEDERAL AID PRIMARY SYSTEM
- FEDERAL AID SECONDARY SYSTEM-STATE
- FEDERAL AID SECONDARY SYSTEM-COUNTY
- OTHER FEDERAL AID SECONDARY-LOCAL
- TERMINATION OF FA SYSTEM
- DIVIDED HIGHWAY
- UNDIVIDED HIGHWAY-NO. OF LANES
- STREET OPEN FOR TRAVEL
- STREET DEDICATED BUT NOT OPEN

- INTERSTATE NUMBERED ROUTE (FAI)
- U.S. NUMBERED ROUTE
- STATE NUMBERED ROUTE
- POST OFFICE
- SCHOOL
- CITY CENTER
- R.R. DEPOT
- CITY LIMITS
- PUBLIC BLDG.
- CITY HALL
- COURT HOUSE
- ARMORY
- LIBRARY

CANNON BEACH CLATSOP COUNTY, OREGON

DESIGNED BY
OREGON STATE HIGHWAY DEPARTMENT
AND
U.S. DEPARTMENT OF TRANSPORTATION
FEDERAL HIGHWAY ADMINISTRATION

Population 799

Scale: 1" = 100'

Revised December 1970

SHEET
ARRANGEMENT



ONE TWO

WARRANTY DEED

KNOW ALL MEN BY THESE PRESENTS, That Richard C. Gruetter

hereinafter called the grantor, for the consideration hereinafter stated, to grantor paid by Richard C. Gruetter hereafter called the grantee, does hereby grant, bargain, sell and convey unto the said grantee and grantee's heirs, successors and assigns, that certain real property, with the tenements, hereditaments and appurtenances thereto belonging to and pertaining, situated in the County of Clatsop and State of Oregon, described as follows, to wit:

County of Clatsop, State of Oregon, to wit:
Lot 8, Block 7
Silver Point Terraces

THIS INSTRUMENT WILL NOT ALLOW USE OF THE PROPERTY DESCRIBED IN THIS INSTRUMENT IN VIOLATION OF APPLICABLE LAND USE LAWS AND REGULATIONS BEFORE SIGNING OR ACCEPTING THIS INSTRUMENT. THE PERSON ACQUIRING FEE TITLE TO PROPERTY SHOULD CHECK WITH THE APPROPRIATE CITY OR COUNTY PLANNING DEPARTMENT TO VERIFY APPROVED USES.

To Have and to Hold the same unto the said grantee and grantee's heirs, successors and assigns forever.

And said grantor hereby covenants to and with said grantee and grantee's heirs, successors and assigns, that grantor is lawfully seized in fee simple of the above granted premises, free from all encumbrances

and that

grantor will warrant and forever defend the said premises and every part and parcel thereof against the lawful claims and demands of all persons whomsoever, except those claiming under the above described encumbrances.

The true and actual consideration paid for this transfer, stated in terms of dollars, is \$ 1,050.00

However, the actual consideration consists of or includes other property received or promised which is the whole consideration (indicate which): (The sentence between the symbols and not applicable should be deleted) (LRS-11-1-84)

In construing this deed and where the context so requires, the singular includes the plural and all grammatical changes shall be implied to make the provisions hereof apply equally to corporations and to individuals.

In Witness Whereof, the grantor has executed this instrument this 6 day of JANUARY 1986; if a corporate grantor, it has caused its name to be signed and seal affixed by its officers, duly authorized thereto by order of its board of directors



[Handwritten signature]

STATE OF OREGON, County of Clatsop, ss. 1-6-86

STATE OF OREGON, County of Clatsop, ss. 1-6-86

Personally appeared the above named Richard C. Gruetter

and who, being duly sworn, each for himself and not one for the other, did say that the former is the president and that the latter is the secretary of

and acknowledged the foregoing instrument to be his voluntary act and deed

and that the seal affixed to the foregoing instrument is the corporate seal of said corporation and that said instrument was signed and sealed in full of said corporation by authority of its board of directors; and each of them acknowledged said instrument to be its voluntary act and deed.

(OFFICIAL SEAL) Notary Public for Oregon My commission expires: 1-14-89

Notary Public for Oregon My commission expires: (OFFICIAL SEAL) (If executed by a corporation, affix corporate seal)

Richard C. Gruetter
2449 Pine Street
Seaside, Oregon 97138

STATE OF OREGON,

Richard C. Gruetter
7123 SE 29th Ave
Portland, Oregon 97202

Richard C. Gruetter
7123 SE 29th Ave
Portland, Oregon 97202

Richard C. Gruetter
7123 SE 29th Ave
Portland, Oregon 97202

I hereby certify that the within instrument was received for record and recorded in the County of Clatsop State of Oregon

550073

JAN 6 3 58 PM '86

Book 649 Page 389
NORMA HUSSINGER County Clerk
By [Signature] Deputy
FEB 1 16 1986

Deputy

STATE OF OREGON, }
County of Clatsop, } ss.

649 916

This indenture made this 4TH day of DECEMBER, 1985, between Clatsop County, State of Oregon, a political subdivision of the State of Oregon, acting by and through its Board of County Commissioners, sitting for the transaction of county business, the party of the first part, and RICHARD C. GRUETTER

the part Y of the second part:

WITNESSETH: That, Whereas, the County of Clatsop, State of Oregon, acquired the real property hereinafter described by means of tax sale and has received a deed therefore, and,

Whereas, the Board of County Commissioners of Clatsop County, State of Oregon, sitting for the transaction of county business, by order duly made and entered on the 4TH day of DECEMBER, 1985, in pursuance of Oregon Revised Statutes Chapter 275,

declared it to be for the best interest of said county to sell the hereinafter described real property, and by said order fixed the terms and price for the sale thereof, and directed the said Sheriff of said county to publish notice and make sale of the said hereinafter described real property in accordance with the terms of said order, and,

Whereas, the said Sheriff, pursuant to the terms of said order, has published said notice of as required by law, and,

Whereas, in pursuance of said order of the said Board of County Commissioners of Clatsop County, sitting for the transaction of county business, and of the laws of the state of Oregon, and in consideration of the sum of SEVEN HUNDRED AND NO/100----- Dollars, lawful money of the United States of America, paid to the Sheriff of Clatsop County, the receipt whereof is hereby acknowledged, said consideration being not less than the minimum price fixed and determined by said Board of County Commissioners, in its said order duly made and entered as aforesaid, the said Sheriff sold to RICHARD C. GRUETTER

the following described real property situated in Clatsop County, State of Oregon, more particularly described as follows, to-wit:

LOT 9, BLOCK 7, SILVER POINT TERRACES. 410 06CC 01400.

EXCEPT ALL MINERAL RIGHTS WHICH ARE RETAINED BY CLATSOP COUNTY.

I hereby certify that the within instrument was received for record and recorded in the County of Clatsop, State of Oregon



Book 649 Page 916
NORMA HUNSINGER, County Clerk
By Mary P. Gurnish, Deputy

Fees \$ 10.00

the said RICHARD C. GRUETTER being the highest and best bidder at said sale and that being the best bid at said sale.

NOW, THEREFORE, Know Ye, that Clatsop County, State of Oregon, in consideration of the premises and by virtue of the statutes of the State of Oregon in such cases made and provided, does hereby grant, bargain, sell and convey unto the said RICHARD C. GRUETTER

heirs and assigns forever, the said real property hereinbefore described, as fully and completely as it can by virtue of the premises convey the same.

IN WITNESS WHEREOF, said grantor has caused this instrument to be executed this 30TH day of DECEMBER, 1985:

CLATSOP COUNTY, OREGON

By *Roger D. Long* County Commissioner

By *R. C. Gruetter* County Commissioner

By *Joan M. Duker* County Commissioner

ATTEST: *Norma Hunsinger*
County Clerk, Clatsop County, Oregon.



**First American Title
INSURANCE COMPANY**

THIS SPACE RESERVED FOR RECORDER'S USE.

Filed for Record at Request of

Name RICHARD C. GRUETTER

Address 1 SILVER POINT - 4

City and State TOLVANIA PARK OREGON 97145-
0091

BOOK 780 PAGE 480

Quit Claim Deed

THE GRANTOR

Ellen Leigh
for and in consideration of one partial painting of "Language of Love"
conveys and quit claims to Richard C. Gruetter
the following described real estate, situated in the County of Oregon
together with all after acquired title of the grantor(s) therein: Clatsop State of Washington

Lot 13 Block 8, Silver Point Terrace

CO ORDINANCE #91-2 REQUIRES:

ASSESSOR'S ACCOUNT #: 410 GCE-2400

SUB ADDRESS: 115th DEER, ARCH CAPE

I hereby certify that the within instrument was received for record and recorded in Clatsop County, State of Oregon, Book of Records as indicated herein.

'92 APR -1 13:38

922407

LORI D. DAVIDSON, County Clerk

Lori D. Davidson
Fees \$ 5/10/20-35
Form 103

Dated this

31st

day of

March

, 19 92

Ellen Leigh

STATE OF WASHINGTON, }

County of Clark } ss.

On this day personally appeared before me

Ellen Leigh
to me known to be the individual described in and who executed the within and foregoing instrument, and acknowledged that she signed the same as her free and voluntary act and deed, for the uses and purposes therein mentioned.

GIVEN under my hand and official seal this 31st day of March, 1992

[Signature]
Notary Public in and for the State of Washington,
residing at Vancouver

VISTA

DRIVE

OCEAN

VIEW

DRIVE

Clatsop Co
222-66
265-640

Martha Case
123-457

Clatsop County
223-51

W.J. Wineberg
147-12

E.A. Britts
127-107

W.J. Wineberg
147-12

E.H. Thompson
& J.E. Chapman
222-66
286-387

Donna Mc Bride
226-127

Bonnie Mc Bride
268-557
226-128

Norman Jones
219-93
276-35

Edward Nelson
178-555

W.J. Wineberg
147-12

Clatsop Co
170-3

Install Type "G"

381+85 to 385+00 L.T.
Install 315 6" Tr
Special Drain R.P.C Tr Exc 47 CY
Install 315 12" Tr Exc 38 CY
Tr Exc 38 CY CMP

A.C. Parking

2" POLYESTERITE "A"
30" x 83.55" R/W

ELLIPSO

36.28

Elmer

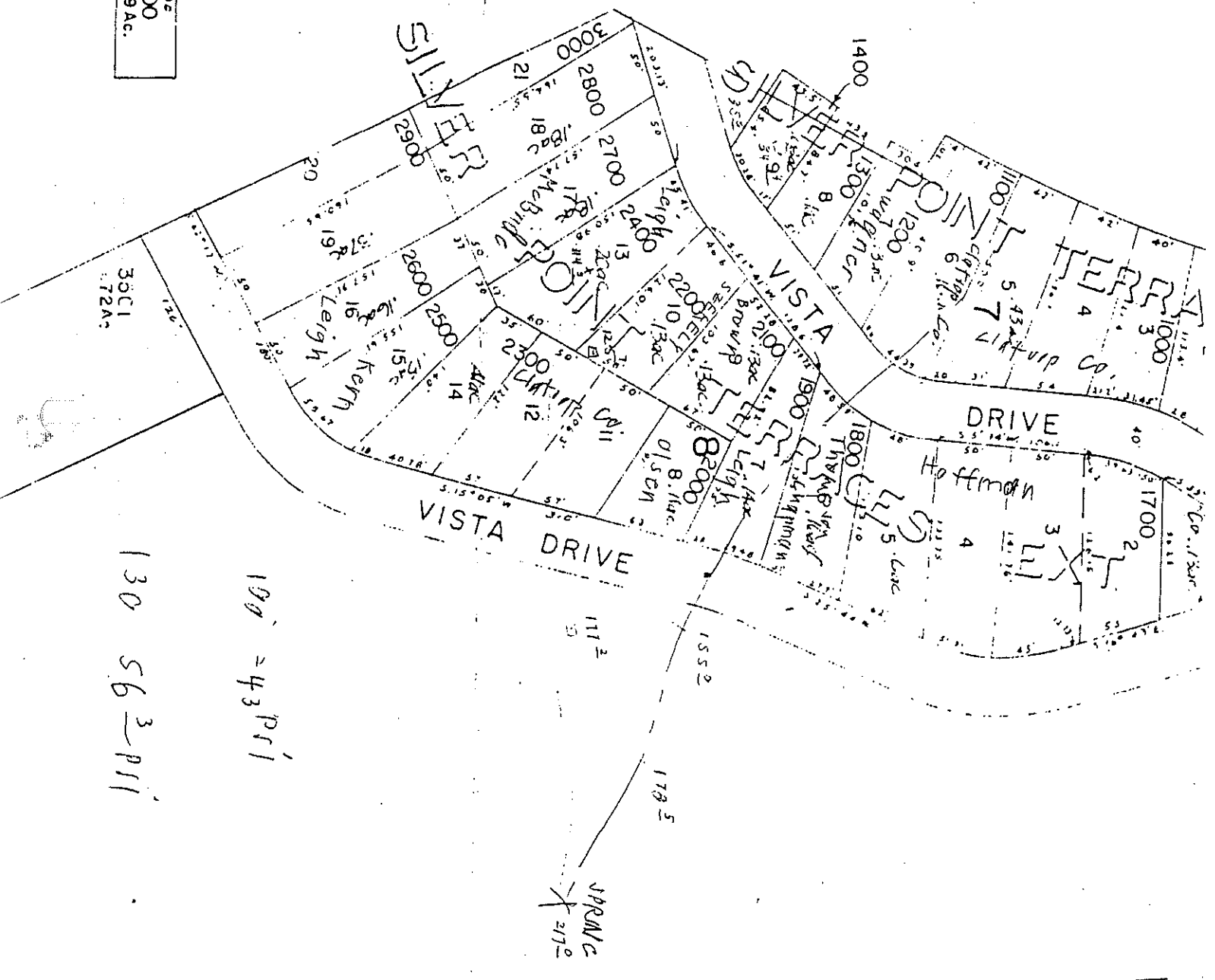
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EAST HIGHWAY 101

10-10

LOT 7

10c
3600
0.09Ac.



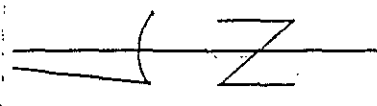
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4 10

130 563-P11

100 = 43 P11

SPRUC
2770

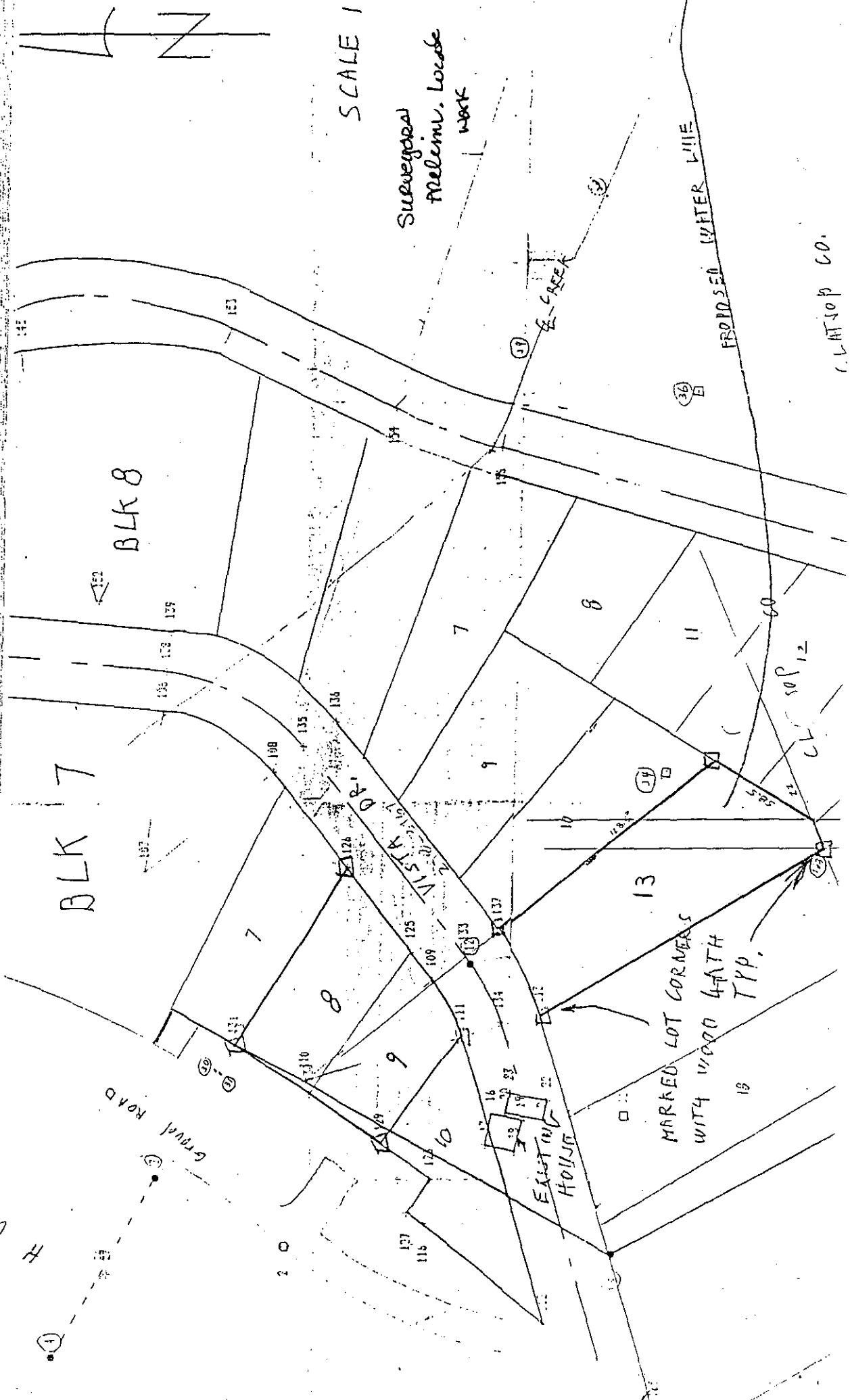


SCALE 1" = 100'

Surveyed
Melm. Locs
work

PROPOSED WATER LINE

CLATSOP CO.



BLK 8

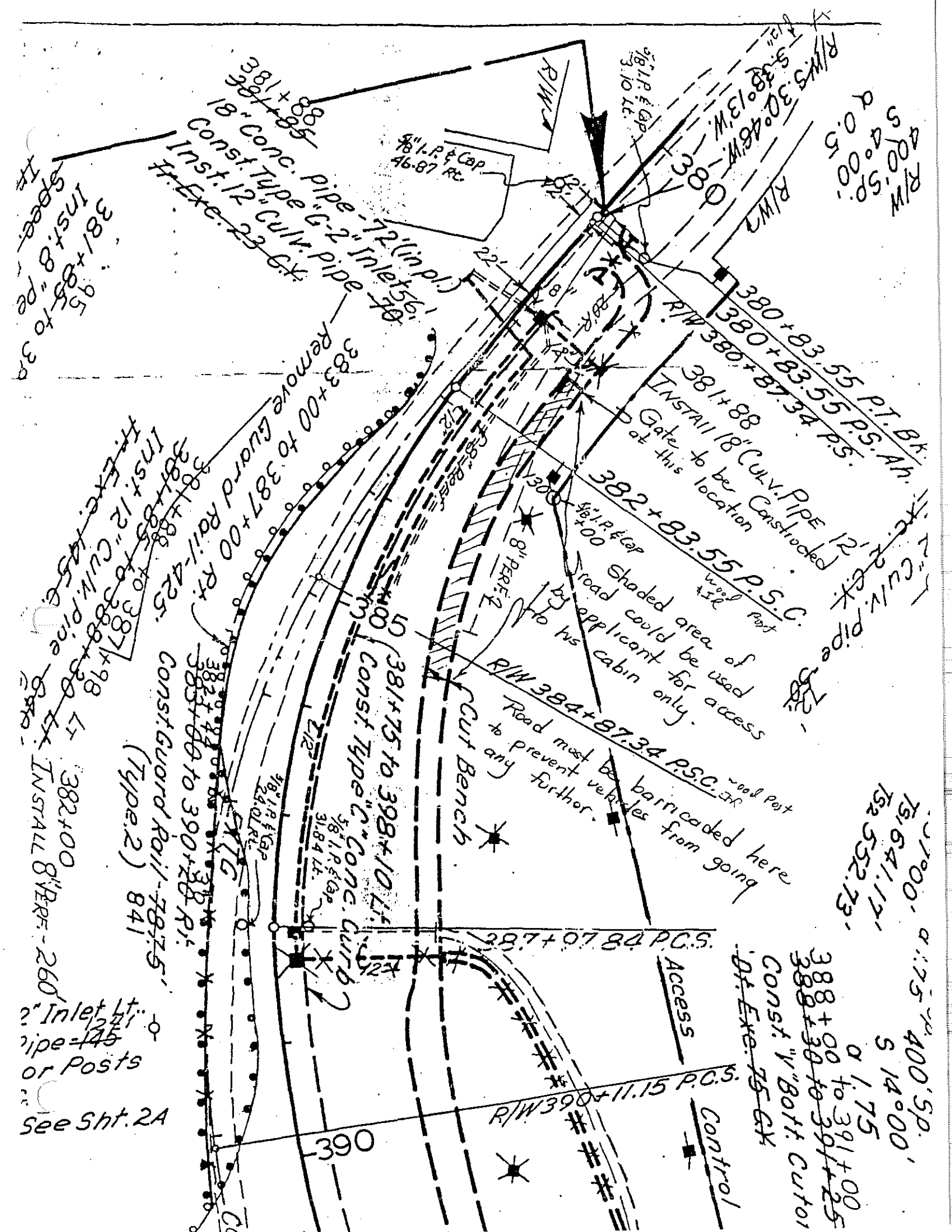
BLK 7

Gravel Road

VISTA DR

EXISTING
HOLLY

MARKED LOT CORNERS
WITH WOOD 4-ATH
TYP.



LAND USE COMPATIBILITY STATEMENT FOR ON-SITE SEWAGE DISPOSAL SYSTEMS

APPLICANT'S NAME <i>Richard Gruetter</i>		MAILING ADDRESS <i>P.O. Box 71</i> <i>Tolovana Park</i> CITY <i>Oregon</i> STATE <i>97145</i> ZIP <i>4360711</i>		PHONE <i>4360711</i>
PROPERTY LOCATION	TOWNSHIP <i>4</i>	RANGE <i>10</i>	SECTION <i>6 CC</i>	TAX LOT OR ACCT NO. <i>1300 & 1400</i>
	SUBDIVISION/PROJECT		LOT	BLOCK
				COUNTY
☐ PROPERTY IS A LOT OF RECORD CREATED BEFORE AUGUST 1, 1981.				
PROPOSED LAND USE <i>Single Family Dwelling</i>				

STATEMENT OF COMPATIBILITY FROM APPROPRIATE LAND USE AUTHORITY
(An equivalent statement may be provided in lieu of this form)

PROPERTY'S ZONING DESIGNATION

CR- CLATSOP COUNTY DEPT. OF PLANNING & DEVELOPMENT Coastal Residence

THE ABOVE PROPOSAL HAS BEEN REVIEWED AND FOUND TO BE:

- | | |
|---|---|
| ☐ COMPATIBLE WITH THE LCDC ACKNOWLEDGED COMPREHENSIVE PLAN | ☐ CONSISTENT WITH THE STATEWIDE PLANNING GOALS |
| ☐ NOT COMPATIBLE WITH THE LCDC ACKNOWLEDGED COMPREHENSIVE PLAN | ☐ NOT CONSISTENT WITH THE STATEWIDE PLANNING GOALS |

REASON FOR FINDING OF COMPATIBILITY/INCOMPATIBILITY

Permitted use in zone

PROPERTY IS LOCATED (CHECK ONE)

☐ INSIDE CITY

☐ INSIDE URBAN GROWTH BOUNDARY
☐ OUTSIDE CITY LIMITS

☒ OUTSIDE URBAN GROWTH BOUNDARY

LAND USE AUTHORITY

CLATSOP COUNTY DEPT. OF PLANNING & DEVELOPMENT

SIGNED

Danella Corn 11/7/78

TITLE

Planner

DATE

15 Oct 90
26 July 90

☐ CITY/COUNTY CONCURRENCE IF INSIDE URBAN GROWTH BOUNDARY

SIGNED

TITLE

DATE



Department of Environmental Quality

811 SW SIXTH AVENUE, PORTLAND, OREGON 97204-1390 PHONE (503) 229-5696

June 18, 1990

Richard C. Gruetter
9 Silver Point, Box 71
Tolovana Park, OR 97145

Re: OSS - Clatsop County
Site Evaluation, DENIAL
T4N, R10W, Sec.6CC,
TL 1300 & 1400

Dear Mr. Gruetter:

On June 7, and 14, 1990, I met with you on the above referenced property and evaluated the parcel for suitability for on-site sewage disposal. Topographic and physical features of the site were checked. Soil information was collected by examining soil pits. Copies of the field work sheets are attached for your review.

The site is DENIED approval for on-site sewage disposal. The site shows evidence of being an unstable landform. The site is also in an area of highly variable topography. Oregon law [Oregon Administrative Rules (OAR) 340-71-220(2)(f)] prohibits the installation of an on-site sewage disposal system in an unstable landform. Oregon law [OAR 340-71-220(2)(e)] further requires that on-site sewage disposal systems must be installed in undisturbed soil.

You may request a review of this denial by completing and submitting an application for a Site Evaluation Report Review with payment of a \$100 fee within 30 days of the date of this denial. If you wish the review, please contact Mr. George Davis in Portland at 229-6872.

You may also apply for a formal variance to the on-site rules (OAR 340-71-415) by submitting an application with payment of a \$225 fee. Variances from any rule contained in OAR Chapter 340, Division 71, may be granted to applicants for permits by special variance officers appointed by the Director. If you wish to apply for a variance, please contact Mr. Sherman Olson in Portland at 229-6443.

If you have any questions regarding this matter, please call me in Portland at 229-6053.

Sincerely,

Chuck Hopkins

CH

cc: Ind. & On-site Sect., DEQ
Astoria Office, DEQ
Clatsop County

Chuck Hopkins
Environmental Specialist
Northwest Region

NARRATIVE

(Richard C. Gruetter)

T.4N.,R.10W.,Sec.6CC, T.L. 1300 & 1400
Clatsop County

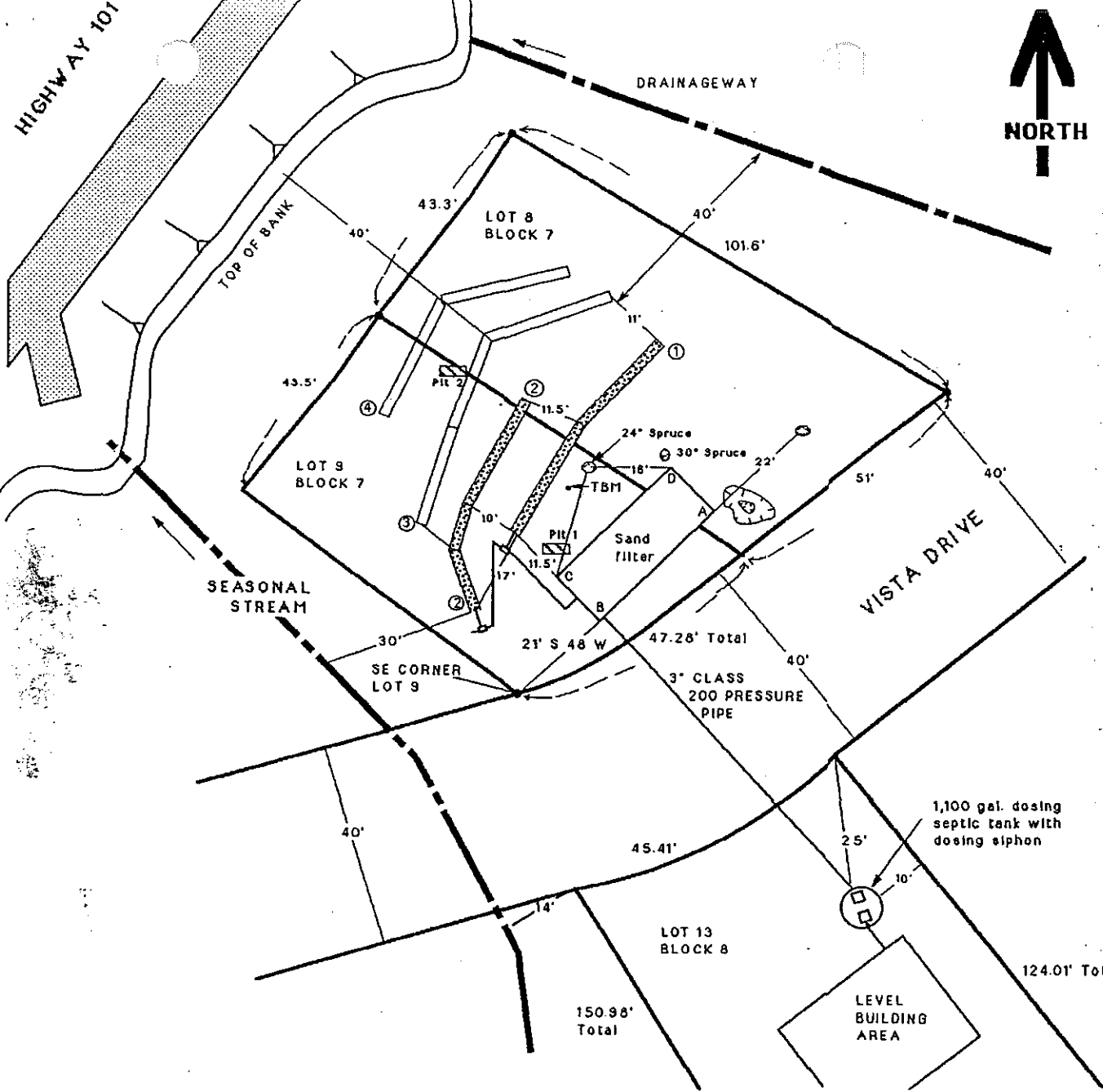
The system could be constructed during most any season. Preferably, it would be built close to either normal lawn planting season so the sand filter soil crown and area disturbed by trench construction can be well vegetated before rains erode soil cover. Additionally, since stability is a concern on this site, maintenance of vegetation and protection of disturbed areas is very important.

The system could be built by starting with the dosing septic tank area. First, a approved new polyethylene or fiberglass 1,100 gal. dosing septic tank will be placed near the dwelling. If access roads are made, perhaps a concrete dosing septic tank can be used. Risers will extend to ground surface (in this case about 12"). The outlet will consist of a Orenco Systems, Inc. dosing siphon Model 204. The siphon will discharge periodically through a 3" diameter Class 200 PVC transport pipe to discharge to the sand filter manifold and laterals.

The next step will be construction of an above ground, concrete sand filter following the enclosed plans. The area for the filter would first be prepared by excavating a 12 ft. by 31 ft. area a minimum of 4" deep. The underdrain piping would be placed through the concrete footing with typical washed round gravel 1" below and 2" above the pipe. The filter would be built in the typical manner. The 2" PVC manifold and the pressure laterals in the filter will be supplied by 3" transport pipe from the dosing siphon vault in the dosing septic tank. The 3" pressure transport pipe and the 4 inch tight line from the filter underdrain will be buried with 18 gage green jacketed tracer wire in the pipe ditch. Construction details are included.

Following construction and inspection of the sand filter, the gravel with filter fabric and then covered with silt loam soil sloping from the center of the filter to the edges in a crown shape. This will promote runoff of precipitation.

The overload disposal trenches will be dug 24" wide by 24" deep and then about 6" of typical drainrock will be placed in the trench. Next, 4" PVC perforated pipe meeting or exceeding ASTM D-2729 will be placed on the layer of rock. The first lateral would be supplied with treated effluent by a 4" transport pipe meeting ASTM D-3033, 3034 running from the sand filter underdrain to a drop box. The underdrain pipe will be laid level and extend level 5 ft. beyond the edge of the underdrain gravel before dropping to the first trench (refer to the detail). This will force effluent downward as much as possible before "overflowing" to the trenches. The perforated drainfield pipe would then be covered with not less than 2" more drain rock. The other trench will be built as the first and then covered with filter fabric following the final inspection and then backfilled.



STANDARD SERIAL TRENCH SYSTEM
 FOLLOWING BOTTOMLESS SAND FILTER
 BY VARIANCES
 INITIAL TRENCHES 92 FT.
 REPAIR TRENCHES 114 FT.

Elevations:

TBM = 100.0' assumed top of 2 x 2

Initial Trenches

- 1 = 99.30' 47' net
- 2 = 97.30' 45' net

G.S. elevations @ concrete "box" sand filter
Box top above ground surface

- A = 101.40' 2.8'
- B = 100.70' 3.5'
- C = 100.20' 4.0'
- D = 102.20' 2.0'

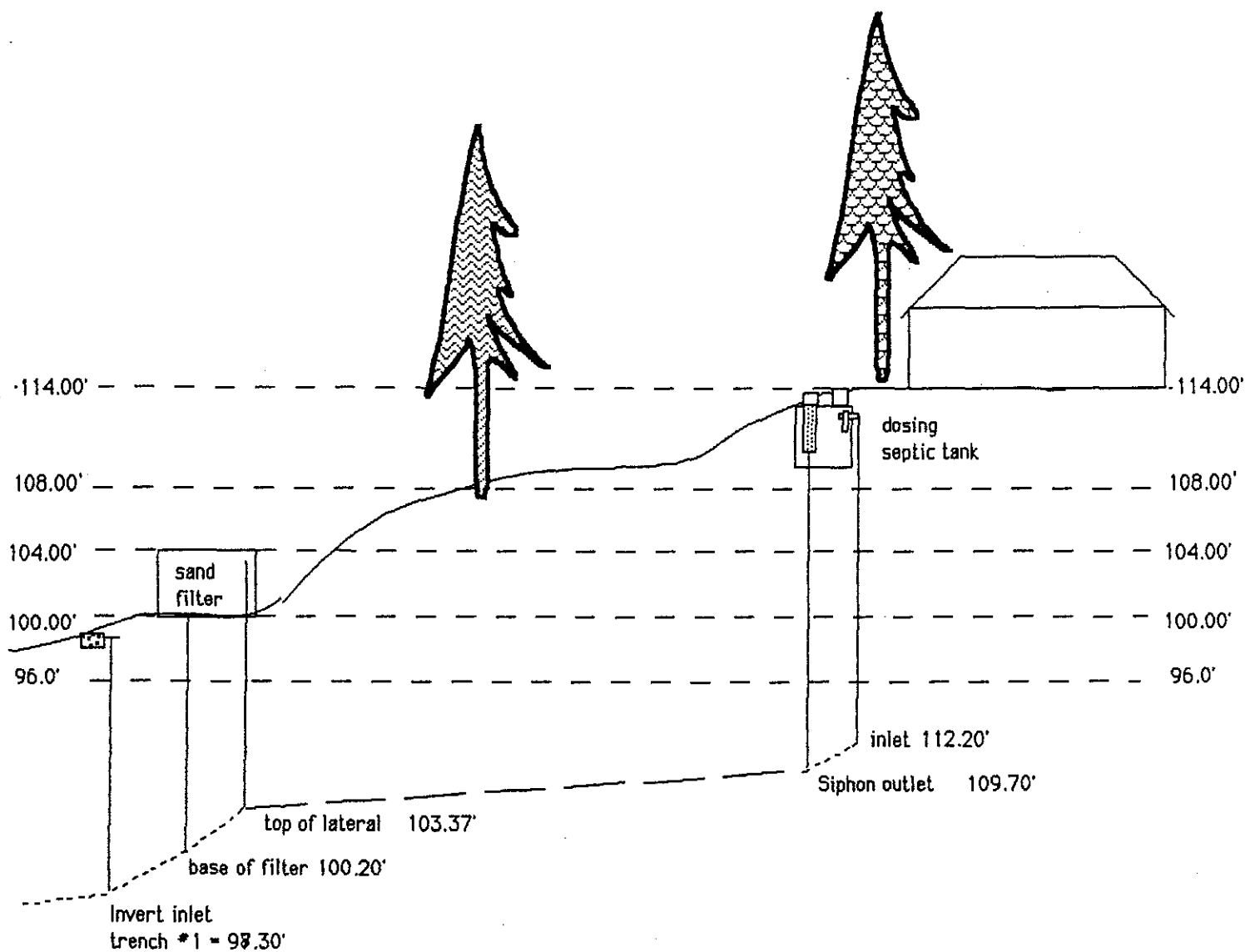
Top concrete box to be: 104.20'
 Top of pressure laterals: 103.37'
 Invert of underdrain to be: 100.20'
 Fall to first drop box = 1.90'

Future Replacement trenches

- 3 = 95.60' 64' net
- 4 = 94.90' 50' net

G.S. @ dosing septic tank ~ 114.20'
 Top = 113.20'
 Inlet invert = 112.20'
 Siphon out = 109.70'
 Static head on laterals of sf = 6.33'
 Riser length = 12"

RICHARD C. GRUETTER T.4N., R.10W., Sec. 6CC, TL 1300, 1400 & 2400 CLATSOP COUNTY	
SITE PLAN	
Scale: 1" = 20 ft.	OCT. 26, 1992
SHUTS & ASSOCIATES, INC. CONSULTANTS & DESIGNERS 14687 SE KINGSTON AVE. MILWAUKEE, OR 97267 (503) 658-5623	



HORZ. 1" = 20'
VERT. 1" = 10'

RICHARD C. GRUETTER
T.4N., R.10W., Sec. 6CC, TL 1300,
1400 & 2400 CLATSOP COUNTY

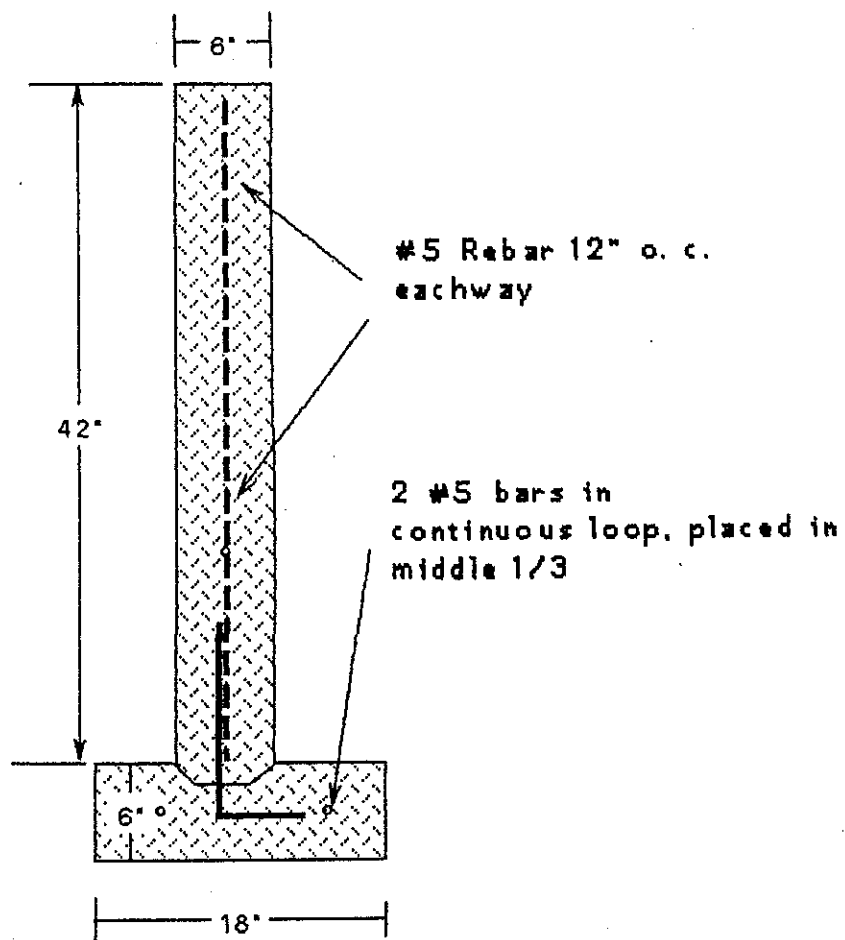
Section view

Scale: INDICATED

Oct. 29, 1992

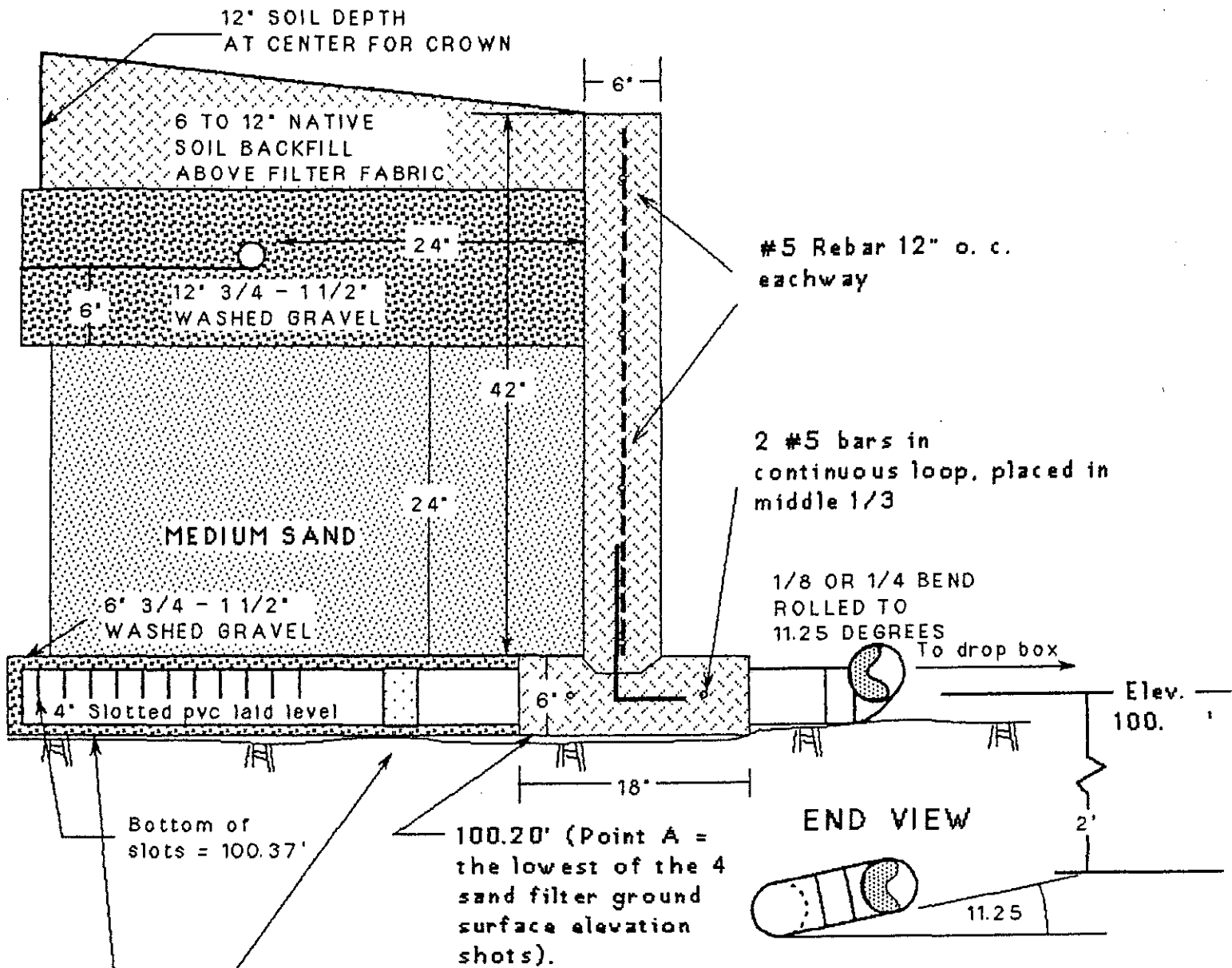
SMITS & ASSOCIATES
CONSULTANTS & DESIGNERS
14687 SE KINGSTON AVE.
MILWAUKIE, OR 97267
(503) 659-5623

CONCRETE WALL SECTION



* NOTE: CONCRETE SHALL BE READY-MIX WITH CEMENT CONFORMING TO ASTM C150, TYPE II. AND HAVE A CEMENT CONTENT OF NOT LESS THAN SIX (6) SACKS PER CUBIC YARD AND MAXIMUM AGGREGATE SIZE OF 3/4". THE CONCRETE SHALL ACHIEVE A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI IN 28 DAYS. ALL REBARS TO BE A MIN. OF #5 IN SIZE.

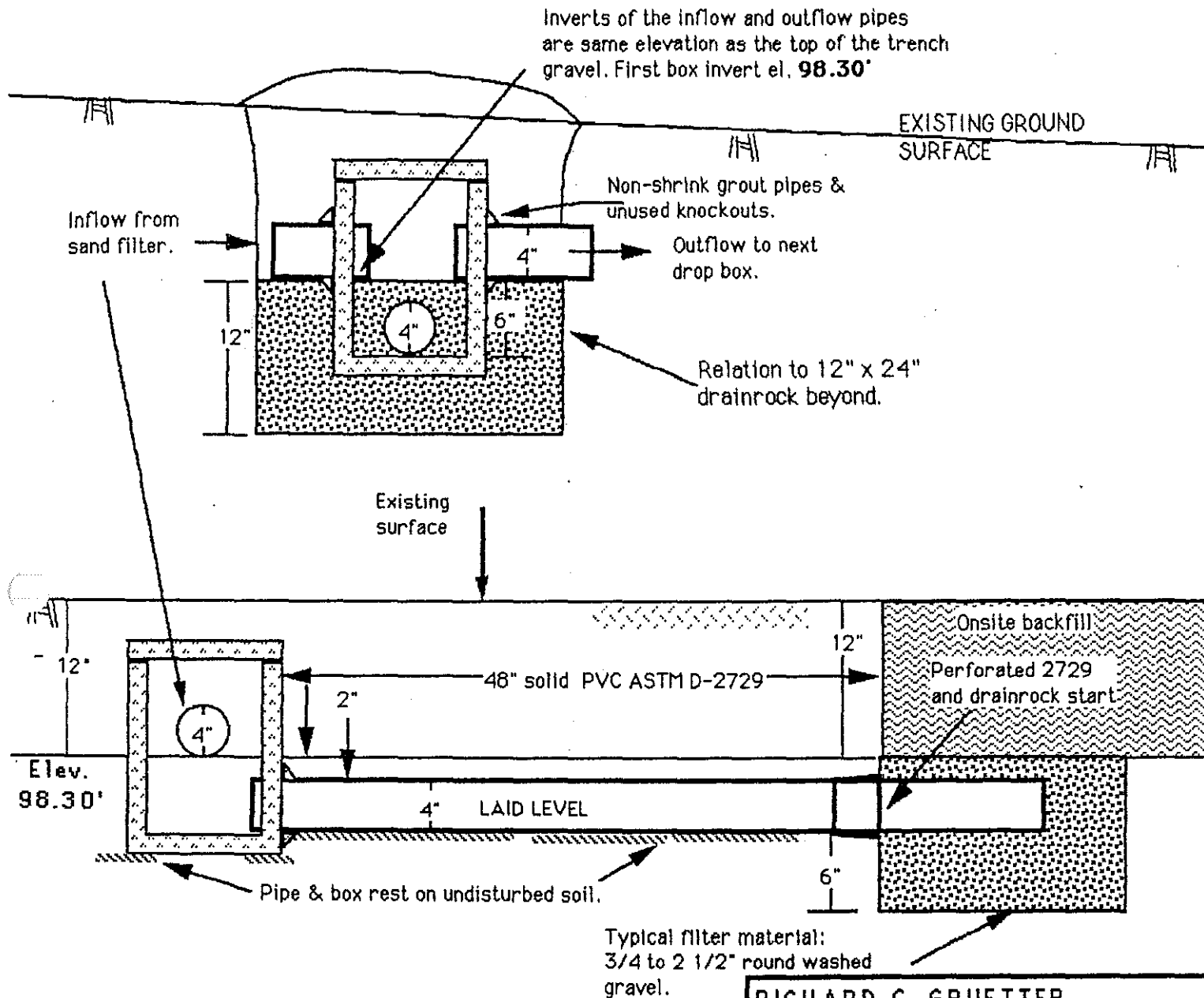
CONCRETE WALL SECTION



The sand filter to be built without a bottom or liner. Prepare surface by rototilling the 12 x 12.5 area 4" deep. Then place footings on ground with footing base at elevation 100.30'.

*NOTE: CONCRETE SHALL BE READY-MIX WITH CEMENT CONFORMING TO ASTM C150, TYPE II. AND HAVE A CEMENT CONTENT OF NOT LESS THAN SIX (6) SACKS PER CUBIC YARD AND MAXIMUM AGGREGATE SIZE OF 3/4". THE CONCRETE SHALL ACHIEVE A MINIMUM COMPRESSIVE STRENGTH OF 3,000 PSI IN 28 DAYS. ALL REBARS TO BE A MIN. OF #5 IN SIZE.

DROP BOX



RICHARD C. GRUETTER T.4N., R.10W., Sec. 6CC, TL 1300. 1400 & 2400 CLATSOP COUNTY	
Profile with elevations	
Scale: 1" = 12"	Oct. 26, 1992
SMITS & ASSOCIATES CONSULTANTS & DESIGNERS 14687 SE KINGSTON AVE. MILWAUKIE, OR 97267 (503) 659-5623	

PAUL D. SEE AND ASSOCIATES, INC.

300 SURF PINES ROAD
SEASIDE, OREGON 97138
738-5869



June 16, 1992

#9062

Richard Gruetter
9 Silver Point Terrace
Cannon Beach, OR 97110

RE: Geologic inspection, Lots 8, 9, & 13, Blk. 7, and lot 13, Blk. 8,
Silver Point Terraces. T4N, R10W, Sec. 6CC, Clatsop County.

Dear Mr. Gruetter:

At your request, I inspected the above described property and vicinity with you on Wednesday, June 10, to evaluate geologic hazards with respect to siting a sand filter septic system on lots 8 and 9, and a dwelling on lot 13. I understand that the existing structure, built on what was thought to be lot 9, has been found by resurvey to lie on adjacent State property. Subsequent plans for a permanent dwelling requiring a septic system have resulted in a recommendation by John Smits to reserve all of lots 8 and 9 for the sand filter and effluent distribution trenches. Depending on State approval to sell the occupied portion of undeveloped Vista Drive, the existing structure will either be moved upslope to lot 13, or will remain at its present location. In either event, I understand it is your desire to establish a permanent dwelling on the upper third of lot 13, and that you will derive potable water from a spring higher on the slope.

In reviewing my detailed report to the County dated October 24, 1986, and following periodic inspection of conditions along adjacent Highway 101 as outlined in that report, I find no evidence of continued motion since that date. The Highway offset and bulge remains as it was in 1986. No sloughing has occurred on the embankments directly downslope from these lots, although the denuded hillside has continued to erode and slough several hundred feet to the south.

LOTS 8 AND 9

I understand Mr. Smits has recommended a sand filter at the southeast (upper) corner of lot 9 as currently identified, with drain trenches arcing to the north along existing contours on lots 8 and 9. Native vegetation here is a dense mat of salal growing on a foot or more of organic soil, with occasional decayed logs from an ancient clearcut. Although the overall slope averages 20 percent in the drainfield area, the sand filter area is locally flat. Because of its location, the weight of the proposed sand filter is not seen as having an effect on slope stability.

Because it will be necessary to remove the salal cover to install the drain system, it is imperative that vegetation be immediately restored to this area to minimize erosion and undue surface water absorption. As proposed,

See/Gruetter
6/16/92

Placement of a septic system on lots 8 and 9 is not expected to aggravate the general instability of this area as detailed in my 10/24/86 report.

LOT 13

Overall slope of lot 13 is 28 percent, although quite erratic from early day logging and long term erosion around abandoned logs. That portion of the lot designated for construction is relatively flat. The area remains forested, with a number of mature spruces growing on old stumps or nurse logs. Because they are inherently less firmly rooted than trees growing directly in the soil, it would be prudent to either remove these trees or top them to reduce wind drag during winter storms. The several trees firmly rooted in the soil show no evidence of ground creep, and appear to pose a minimal risk of windfall unless upwind buffer trees are removed.

GENERAL AREA STABILITY

You are aware that this slope lies above and adjacent to areas of known ground motion, as described in my earlier report. Although no new evidence of local ground motion is observed, the potential for massive slope failure remains as valid as it did in 1986. The threat has increased, in fact, as a result of new understandings about Northwest seismicity.

REGIONAL HAZARD

Oregon coastal property owners are advised that contrary to long-held assumption, there is now abundant evidence for a series of geologically recent and severe local earthquakes. Recent discoveries in the coastal embayments of Oregon and Washington (1, 2, 5) and in offshore drill cores (4) appear to confirm a history of as many as thirteen major earthquakes, probably originating in the local Cascadia subduction zone, during the past 7700+/- years. Most seem to have been accompanied by widespread underwater sliding on the continental slope and abrupt subsidence of the coastline by several inches to several feet, followed by a series of massive waves that buried marshland peat (1), prehistoric human occupation sites (3) and coastal cedar forests (6) under wave-deposited sand.

If we are to accept the calculated time span between such events, (approximately 600 years average, 370 years minimum) (4, 6), it follows that a disastrous coastal earthquake and tsunami are indeed possible in the foreseeable future. Based on tree-ring and peat horizon dating, the most recent event seems to have occurred about the year 1690 (4, 6). Current projections estimate a 20 percent chance of a magnitude 8 or greater local quake in the next 50 years (7).

Strong seismic acceleration is expected to precipitate widespread land-sliding in the Coast Range (8). No sedimentary slope, however gentle, can be considered immune from failure under worst-case circumstances.

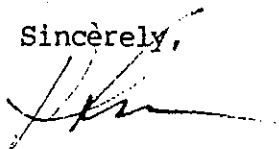
See/Gruetter
6/16/92

Risks associated with great Cascadia earthquakes must naturally be considered in light of the long and varied intervals between events. Our understanding of Northwest seismicity is expanding rapidly, but the timing or magnitude of future events can only be broadly estimated. I am nevertheless professionally obliged to apprise clients of this newly recognized potential for earthquake damage, remote as it may be.

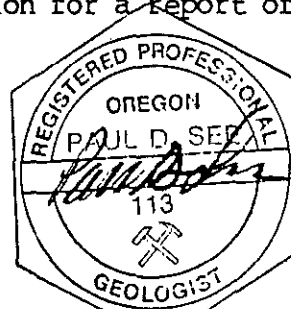
LIMITATIONS

Observations and recommendations incorporated in this letter report are the result of personal site inspection, the works of other specialists, and generally accepted principles of geologic investigation for a report of this nature. No warranties are expressed or implied.

Sincerely,


Paul D. See

references cited:



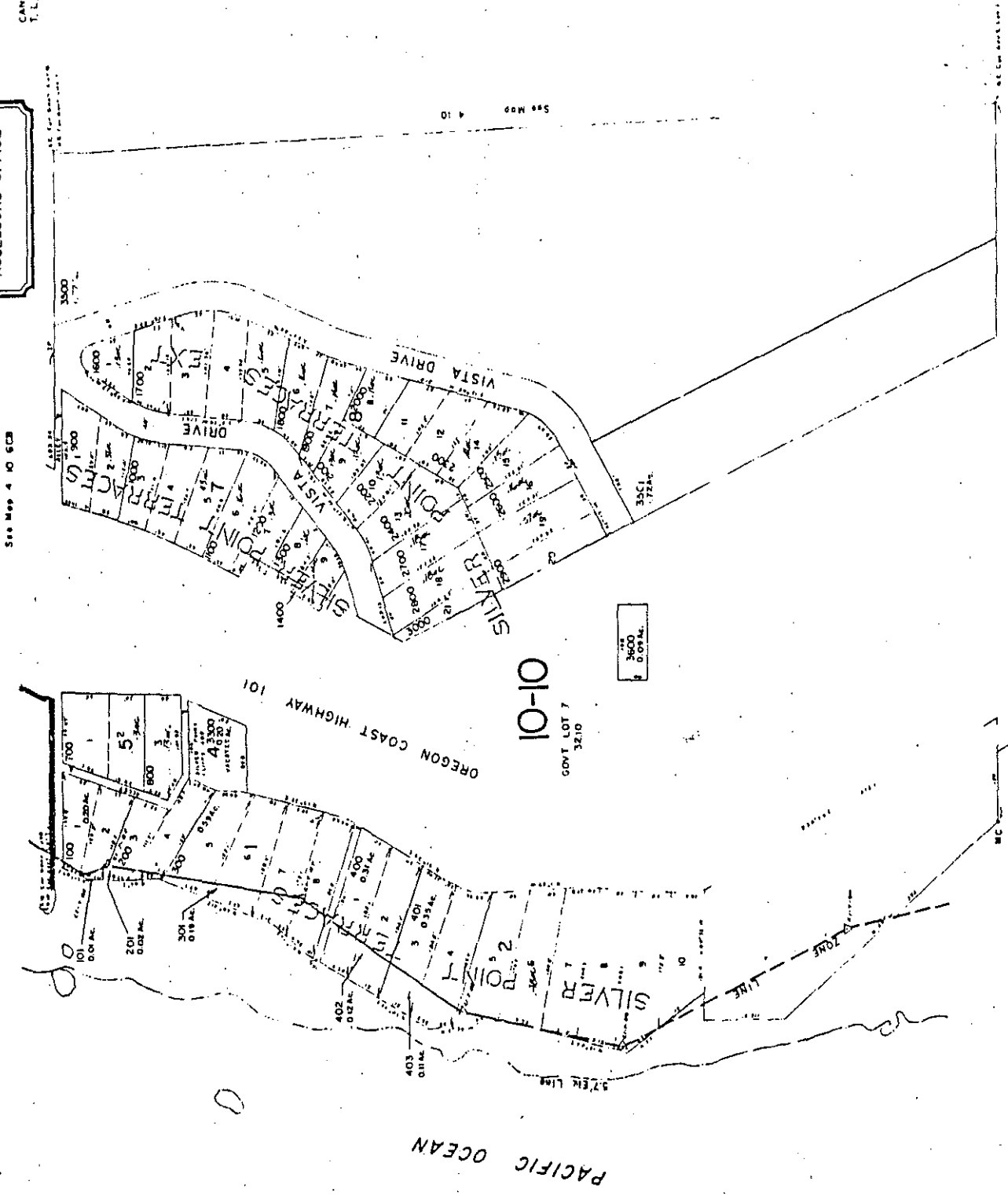
- 1) Atwater, B., "Evidence for Great Holocene Earthquakes Along the Outer Coast of Washington State", AAAS Science Magazine, Vol. 236, 22 May, 1987.
- 2) Petersen, C.D., Darienzo, M.E., & Parker, M., "Coastal Neotectonic Field Guide for Netarts Bay, Oregon", Oregon Geology, Vol. 50, 1988.
- 3) Woodward, J., "Paleoseismicity and the Archeological Record: Areas of Investigation on the Northern Oregon Coast", Oregon Geology, Vol. 52 #3, May 1990.
- 4) Adams, John, Geol. Survey of Canada, "Paleoseismicity of the Cascadia Subduction Zone ---", American Geophysical Union journal "Tectonics", Vol. 9 #4, August, 1990.
- 5) Savage, J.C. & Lisowski, M., "Strain Measurements and the Potential for Great Subduction Earthquakes off the Coast of Washington", AAAS Science Magazine Vol. 252, 5 April 1991.
- 6) Yamaguchi, D.K., Woodhouse, C.A., & Reid, M.S., "Tree-ring Evidence for Synchronous Rapid Submergence of the Southwest Washington Coast, 300 years B.P." Eos Trans. American Geophysical Union Vol 70, 1989.
- 7) Madin, Ian, (Panel Discussion), Pacific NW Earthquake, Tsunami and Landslide Hazards, Coastal Natural Hazards Conference, Newport, Oct. 1, 1991.
- 8) Cornforth, D.H., Landslide Technology, Portland; "Earthquake Induced Landslides" (w/ ensuing group discussion). Presentation at Coastal Natural Hazards Conference, Newport, Oct. 1, 1991.

CLATSOP COUNTY
SW 1/4 S 4 Sec. 6 T.4N. R.10W. W.M.
1"=100'

4 10 6CC

PROPERTY
OF THE
CLATSOP COUNTY
ASSESSORS OFFICE

CANCELLED NOS.
T.L. 600
1500
3100
3200
3400
500



See Map 4 10 788

PLAT 10-10
CLATSOP COUNTY
ASSESSORS OFFICE
1968

0 6CC

PAUL D. SEE AND ASSOCIATES, INC.

300 SURF PINES ROAD
SEASIDE, OREGON 97138
738-5869

#9110



November 20, 1990

Richard Gruetter
P. O. Box 71
Tolovana Park, OR 97145

RE: Geologic evaluation, impact of adding septic drainfield on property
at Silver Point. (Lots 8 & 9, Blk 7, Silver Point Terraces, 4N10 6CC)

Dear Richard:

At your request I have given due consideration to the potential for decreased slope stability on your property as a result of the proposed sand filter and septic drain system. I have just talked to John Smits by telephone to obtain dimension data and the anticipated rate of charge for the system he expects to design.

As you are aware, the property is located on a notoriously unstable headland, described in detail in my report to you of October 24, 1986. Much of the past movement on this slope has been due to infusion of meteoric water into the very soft sediments at depth. This has been a source of trouble for the Highway Department, and a significant bulge developed several years ago on the highway immediately below the property. You have built a limited occupancy dwelling on the property, obtaining water from a local source on the slope.

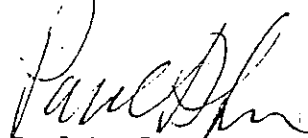
It is my opinion that the potential for mass movement remains very real on this entire slope. However, since the net infusion of water on this slope is not changed by routing as portion of it through a filter system, I find no concern for decreased stability as a result of saturation.

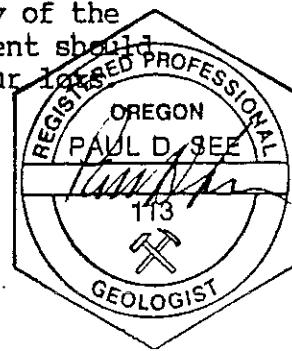
I understand from conversation with Smits that the average charge to the system will be in the vicinity of 200 gallons per day, or 0.14 gallons per minute spread over the dimensions of the drainfield. This is insignificant compared to the periodic intensity of seasonal rainfall.

The only other consideration is loading of the slope caused by addition of the sand filter. With the understanding that this filter will be placed on the topographic high north of the building, (lot 8), I would not expect the additional weight to measurably increase the risk of earth movement.

The risk of slope failure remains, however, primarily at the mercy of the elements and independent of the proposed activity. If such an event should occur, I would expect it to encompass an area much larger than your lot.

Sincerely,


Paul D. See



CITY OF CANNON BEACH

P. O. BOX 368
CANNON BEACH
OREGON 97110

August 28, 1990

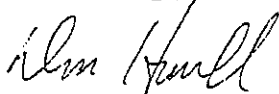
John L. Smits, R.S.
Smits & Associates
14687 SE Kingston Avenue
Milwaukie, Oregon 97267-1943

Dear Mr. Smits,

This letter is in response to your letter dated 8/6/90 regarding the Richard Gruetter property, Tax Lot 1300 & 1400.

I have discussed this situation with Rainmar Bartl, City Planner, and City sewer is not available to this property. This property is not in the City limits nor is it in the Urban Growth Boundary. If you have further questions, please contact Rainmar Bartl at 436-1156.

Sincerely,



Don Howell
Public Works Director

DH:bm



"The Beach of a Thousand Wonders"

SMITS & ASSOCIATES
Environmental Consultants . Designers

To: City of Cannon Beach
City Recorder/Public Works Director

Aug. 6, 1990

From: *J. L. Smits*
John L. Smits, R.S.
Smits & Associates

Subject: Extra territorial sewer service
Richard Gruetter property
T. 4N., R. 10W., Sec. 6CC., TL 1300 & 1400
Clatsop County

Richard Gruetter has constructed an art studio on the property listed above. At this time he is in need of sanitary facilities. Application to DEQ for an on-site sewage disposal system has resulted in a denial of approval due to apparent instability of the site.

It appears from a site visit to the area and tax maps that there is a sewer manhole at the end of gravity sewer located in the area of T. 4N., R. 10W., Sec. 6CB., TL 3401 or 3406 at the end of Logan Lane. That manhole is about 600 feet from the site of the studio. It seems that the building could be served by installing a 1,000 dosing septic tank equipped with a siphon and a 2" class 200 PVC gravity line to pipe effluent to the sewer. This is similar to a STEP (Septic Tank Effluent Pumping) system used to serve small communities or outlying areas.

This project would require permits from the State Highway Division including a permit to push a 3 or 4" pipe under the highway. An easement to cross tax lot 3405 may also be needed. We think the construction details can be worked out.

Obviously, the main issue involves permission to connect to the public sewer system. Would you kindly advise the procedure that we might follow to obtain sewer service beyond the City boundary? Do you have a provision in your sewer ordinance to provide extra territorial service? Would it be necessary to seek annexation of the property? Of course, if

this is possible, we would like to know the expected connection fee as well as the monthly service fee.

We would be pleased to meet with the Council any time in the near future to discuss this project.

If you need additional information or have questions, please feel free to call me at 659-5623.

encl:

cc: Richard Gruetter

**John L. Smits, R.S.
Registered Sanitarian
Oregon-Washington**

**14687 S.E. Kingston Ave.
Milwaukie, OR 97267-1943
(503) 659-5623**

FIELD SHEET FOR SOIL TEST

Applicant Smits & Associates for: GRUETTER

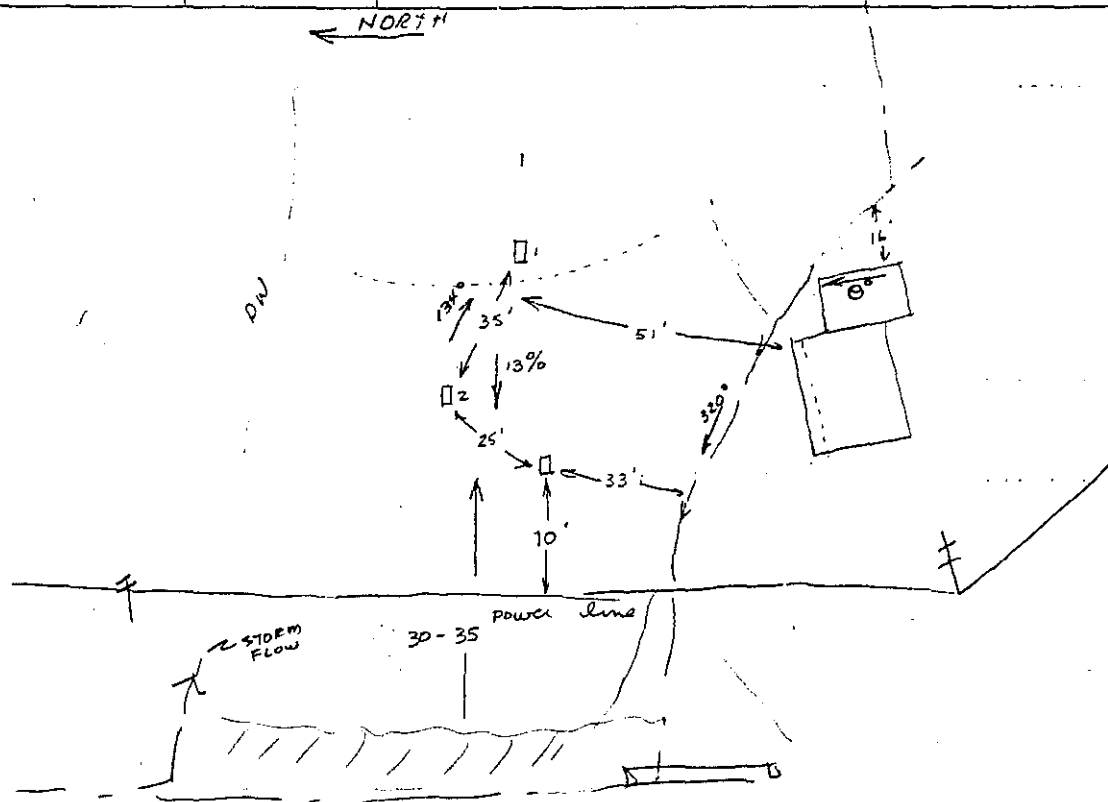
Tax Lot _____ Section _____ T. _____ R. _____ Acreage _____

Soil Scientist SMITS Weather _____ Date 6/26/90

	Depth	Texture	Mottling	Soil Matrix Color, % Coarse Fragments, Roots, Structure, Layer Limiting Effective Soil Depth, Etc.
East	0-12"	Silt	NO	V. DK GRAY BRN - STRONG med & COARSE SCLB
Pit 1	12-54"	Silt	NO	Yel BRN STRONG med + COARSE SCLB
	54"+	Silt	NO	Likely same
				ROOTS TO 40" FEW COBBLES FEW Large gray RCON

MIDDL	0-14	Silt	NO	V. DK GRAY BRN
Pit 2	14-38	Silt	NO	V. DK BRN
	38"+	SEDS	RELIC PROM	DENSE UPLIFTED sediments

WEST	0-38	Silt	NO	DK BRN, strong - fine med → COARSE SCLB
Pit 3	38"+	Silt	NO	WEATHERED BRN yellow M. sediments



SITE EVALUATION FIELD WORKSHEET

Tax Reference T4N, R10W, SEC. 6CC, TL 1300 & 1400 Evaluator BRUCE HENDERSON
 Applicant GRUETTER, RICHARD C. Date 6-7-90 & 6-14-90 Parcel Size 0.18 Ac.

Soil Matrix Color and Mottling (Notation), % Coarse Fragments, Roots, Structure, Layer Limiting Effective Soil Depth, etc.

Depth	Texture	
Pit 1		
0-12	SILT (+) LOAM	10YR 2/2 / MF-CR
12-25	"	10YR 4/3 / MF-CR
25-56	" (-)	10YR 5/6 / C-VF-F-CR

Pit 2		
0-28	LOAM	10YR 2/1 / MF-CR
28-42	SILTY CLAY LOAM	10YR 4/6 W / 5Y 5/3 MOTT. / VFC-NOR
42-48	SILT LOAM	10YR 4/4 W / 7.5YR 4/6 & 2.5Y 5/4 MOTT. / NOR

Pit 3		

Pit 4		

Landscape Notes TYPICAL COASTAL 2ND GROWTH SPRUCE, SILAL, ETC.
 Slope 13% / 23% Aspect NW/SW Groundwater Type TEMPORARY @ 42" (T.P. 2)
 Other Site Notes HIGHLY VARIABLE TOPOGRAPHY - EVIDENCE OF UNSTABLE LANDFORM IN VICINITY OF PROPOSED OS SITE- RECENT LANDSLIDE JUST SOUTH OF PROPERTY. NUMEROUS TREI BLOWDOWNS/GROW.

DENIED

SYSTEM SPECIFICATIONS

Type System: _____ Design Flow _____ gpd Disposal Field Size _____ Linear Feet
 Initial _____ System Sizing _____ /150 g. Max. Depth Absorption Facility (in) _____
 Replacement _____ System Sizing _____ /150 g. Max. Depth Absorption Facility (in) _____
 Special Conditions _____

Tax Reference T4N, R10W, SEC.

GCC, TL 1300 & 1400

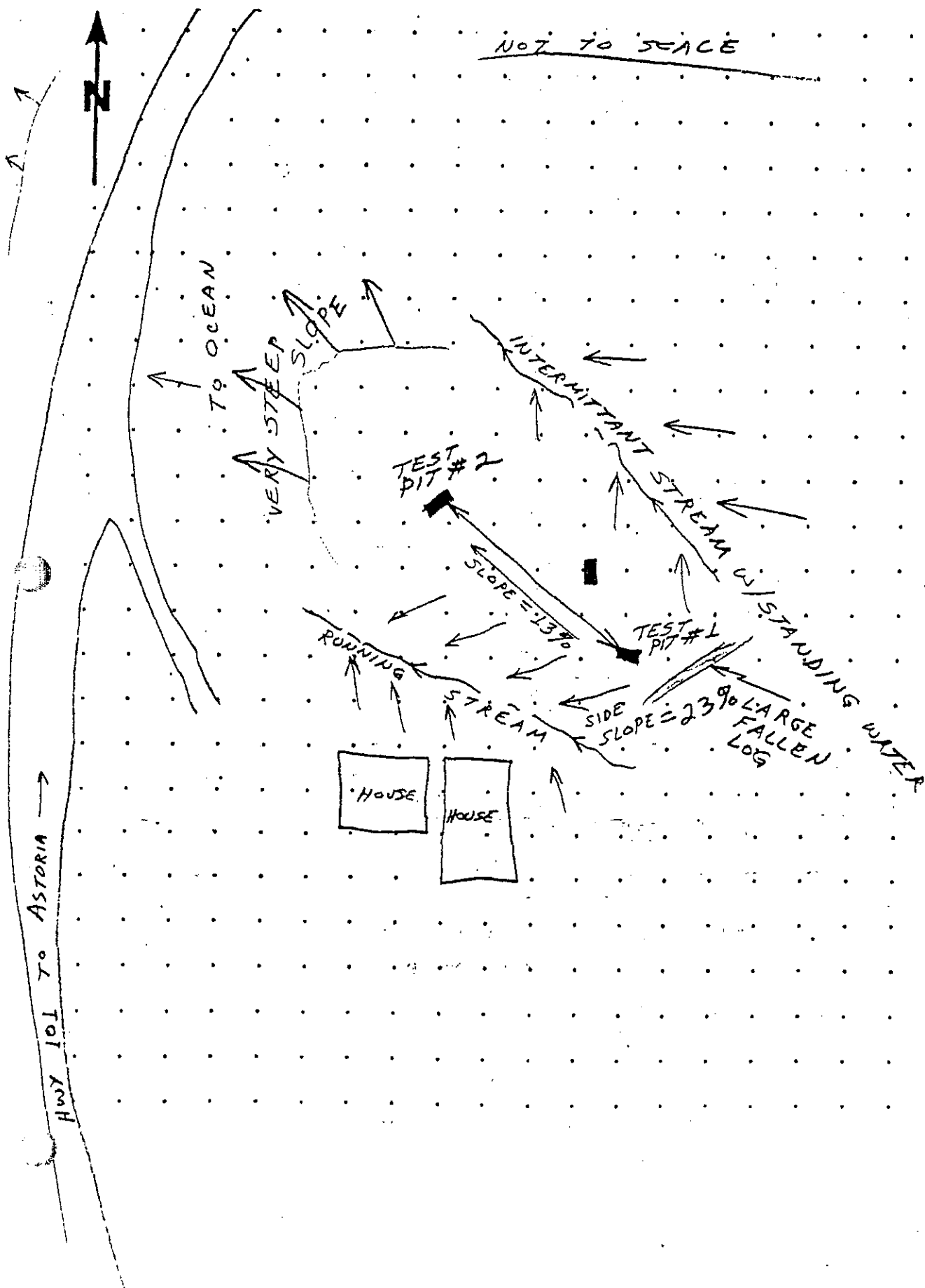
Evaluated

BRUCE HENDERSON
CHUCK HOPKINS

Applicant GRUETTER, RICHARD C.

Date: 6-7-90

& 6-14-90



**HANDFORTH
LARSON &
BARRETT, INC.**

Civil Engineering & Surveying

P.O. Box 219

Manzanita, Oregon 97130

503-368-5394

April 17, 1990

Mr. Richard Gruetter
Box 71
Tolovana Park OR 97145

RE: Partially completed building on which a "No Permit" stop order has been issued, located in Section 7, T4N, R10W, SILVER POINT, above U.S. 101, Clatsop County, Oregon.

Dear Mr. Gruetter:

Pursuant to your request, I have examined the subject building with a view to determine what measures, if any, can be taken to make it structurally adequate to meet Uniform Building Code requirements, as well as to be a reasonably safe structure on this potentially unstable site.

THE STRUCTURE

The structure at present is a 10x18 foot, two story building, framed, roofed, and partly sheathed with plywood sheathing. Subfloor is in place. The building rests on three rows of four concrete piers, varying from 3'-9" high at the downhill end of the building to 1'-3" high at the uphill end. There is no lateral bracing between these eight inch columns, which each have four, 1/2 inch diameter reinforcing bars. Each column rests on a square concrete base pad about 16 inches square. The pads are connected by reinforced concrete grade beams, in both directions.

The building is set so that part of its 18 foot long wall is 12 inches from the east wall of the existing finished building on the property, and the east edge of the roof overhang on the finished building is only one inch from the sheathing of the new building. Most of the plywood sheathing is hung with the sheets horizontal, but the vertical joints are not staggered. Two narrow sheets are hung vertically. Nails average about six inches on center. The sills are bolted to the concrete columns and also to the rim joists and headers. Studs are on 16 inch centers.

THE SITE

The structure is located on the north slope of SILVER POINT, but there is also slope down to the west. This site is outside the area of the main SILVER POINT slide, but not far from it.

When you built the first building, we recommended a roughly cubical structure, strongly sheathed, which could be tilted and moved a good deal without extensive damage to the structure. The same general recommendations apply to the second structure.

5. Because no frame structure could withstand impact from a large mass of earth moving downslope on it, the only available assurance against such a hazard is to minimize it by not leaving a steep bank immediately upslope from the house.

RECOMMENDATIONS

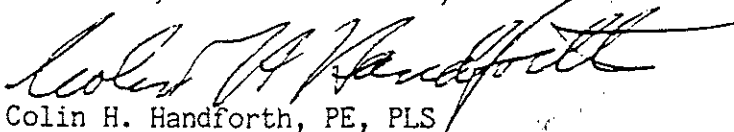
1. Improve the lateral strength of the foundation either by:
 - a) diagonal treated 3x10 inch timbers in the northernmost column bays on the east and west sides, and on the north end of the building. These should be bolted to the rim joist or header at the top and fastened to the bottom of the column with a 3/4 inch U-bolt going around the eight inch column, or
 - b) an eight inch concrete shear wall from grade beam to six inches below floor system, formed between the last two northernmost columns on the east and west side and across the north end. This shear wall should have 1/2 inch steel on eight inch centers both directions.
2. Improve the lateral strength of the building as a whole by sheathing the inside of the first story walls with 5/8 inch plywood sheathing. It should be hung with the outside grain horizontal and with vertical joints staggered. Nails should be 8d galvanized on five inch centers.
3. Cut back roof overhang on older structure so as to leave a full eight inch clearance between buildings at roof overhang.
4. Wherever existing outside sheathing nail spacing is over six inches, put in more 8d galvanized nails.
5. Terrace back the steep cut bank south of the house so that:
 - a) The nearest cut above rim joist level is four feet horizontally from the house. Then raise not more than one foot vertical for every three feet horizontal until 12 feet from the house. Then daylight at 2:1 slope if possible, no steeper than 1-3/4:1 in any case.

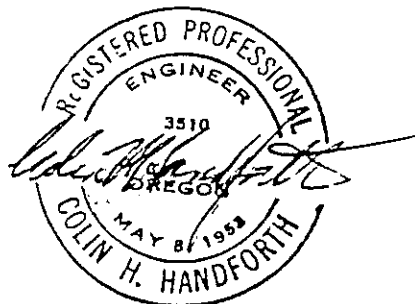
CONCLUSIONS

1. Additional hazard has not been created by this additional structure on this site, since it is a separate structure, provided these recommendations are followed.
2. The subject structure is basically well built, and by following these recommendations, will not only meet UBC structural requirements, but also be a reasonably safe structure, compared to other frame residence structures on the Oregon Coast.

Should you have any questions, please contact our office and I will be happy to discuss them with you.

Very truly yours,
HANDFORTH, LARSON & BARRETT, INC.


Colin H. Handforth, PE, PLS



DETAILED SITE INVESTIGATION FOR GEOLOGIC HAZARDS

LOTS 8 & 9, BLOCK 7, SILVER POINT TERRACES

T4N, R10W, SEC 6CC, CLATSOP COUNTY

RICHARD GRUETTER, OWNER AND APPLICANT

184 COOS ST, TOLOVANA PARK, OR. 97145

OCTOBER 24, 1986

PAUL D. SEE

REGISTERED PROFESSIONAL GEOLOGIST

300 SURF PINES ROAD

SEASIDE, OREGON 97138

The following report is organized according to the sequence specified by Clatsop County Dept. of Planning and Development.

(1) a.) METHOD OF INVESTIGATION AND MANHOURS

Personal surface inspection of property and surrounding area, including surrounding comparison of surface exposures to sediments encountered in nearby boreholes, and measurement of all pertinent slopes. Three hours on site, four different dates in January and October, 1986. In addition, approximately four and one-half hours of office research and investigation relative to site, and six hours preparation, including preliminary study dated January 28, 1986.

b.) ANALYSIS OF TOPOGRAPHY AND GEOLOGY

The subject property lies on the west-facing slope of Silver Point, at a maximum elevation of 189 feet +/-, or 60 +/- feet above the level of adjacent Highway 101 (Refer to contour map, fig. #1). Average slope on the lots is about 15 degrees (27%), but ranges from nearly horizontal to greater than 100% in part of the notch created by a very minor springfed stream traversing lot 9 (Photo #1). As no current survey is available, property corners were estimated from an iron pipe presumed by the owner to fix the upslope corner common to lots 8 & 9. The lower property line appears to be nearly coincident with the top of a cut bank created by the Oregon State Highway Division during construction of an access road and drainage ditch subsequent to the nearby Silver Point slide of February, 1974.

Subsoil sediments on the subject property and in the cut bank immediately below the property is typical tertiary landslide material, commonly identified as "Toms". This highly weathered siltstone and clay contains angular fragments of basalt derived from minor igneous sills and dikes and redeposited as an unbedded mixture during landsliding in the prehistoric past. This unit is presumed to be less than 25 feet in thickness locally, as it is completely absent 200 feet to the north in the drainage ditch cut bank, and was encountered only in the upper 10 +/- feet of the several Highway Division test holes drilled in 1985. Because the entire exposed face of the 1974 Silver Point slide, less than 250 feet to the south, is highly plastic laminated gray mudstone identified as the Silver Point member of the Astoria Formation by Schlicker, et al,¹ and because this same material was encountered at 10 +/- feet in test bores 85-1 through 85-4 (refer to map and photo #3), this unit is presumed to lie under the subject property at a depth of 25 +/- feet.

c.) HISTORY OF PROBLEMS:

The adjacent Silver Point slide of 1974 is well documented. Neim² describes the lithology of this unit and notes the 1200 foot width of the slide. Ross³ refers to trial testimony which places the depth of the slip plane near the center of the slide at approximately 60 feet.

The subject lots lie north of the Silver Point slide, but presumably on the same material at depth. It is important to note that the headscarp of this slide lies considerably farther

upslope than the subject lots. Although the original slope of the slide area was considerably steeper than the area of the subject lots, the potential for similar massive sliding cannot be ruled out here.

The Highway Division has been concerned about a section of highway directly downslope from the subject lots. In January, 1986, a Division representative⁴ advised the writer of a zone of deformation at M.P. 31.6, wherein asphalt and concrete curb was being offset, requiring periodic patching and ditching. Photographs 4 through 7 taken in October, 1986, reveal about 18 inches of lateral offset at the south end of the deformation zone, with perhaps 3 inches of vertical shear in the paving. The disturbance appears to have affected about 200 feet of highway, resulting in a broad, gentle bulge reaching perhaps one foot in height.

Because the highway grade is affected, this "creep" is presumed to involve an area greater than one acre, and quite possibly much of the slope between the subject lots and the highway.

Figure #2 is a copy of drill logs for test bores 85-1 through 85-4. All holes encountered Silver Point member mudstones. Peizometers were not installed in these holes, so the rate or degree of offset has not been determined.

No evidence of creep exists on the subject lots, with the exception of very limited conifer distortion in the immediate vicinity of the minor stream. Several stumps from early-day logging stand erect on the property.

d.) SOILS

Because of the dense vegetative cover, a very organic humus has developed to a depth of approximately one foot. Clay-based soil underlies the humus for an additional six inches. Hemlock, spruce, elderberry, salal and berry vines form the bulk of the vegetation.

e.) PHOTOGRAPHS

The following photographs are indexed on Fig. #3



Photo #1 View northwest across lot 8. Recent clearing mostly limited to underbrush. Creek notch at extreme left.



Photo #2 View southeast across lot 9. Proposed structure at board. SE corner lot 9 near top center. Minor creek in foreground.



Photo #3 View north along slide access road, parallel to and 10 +/- feet above Highway 101. Flagging in center of photo marks site of test bore 85-4. Subject property upslope to right.

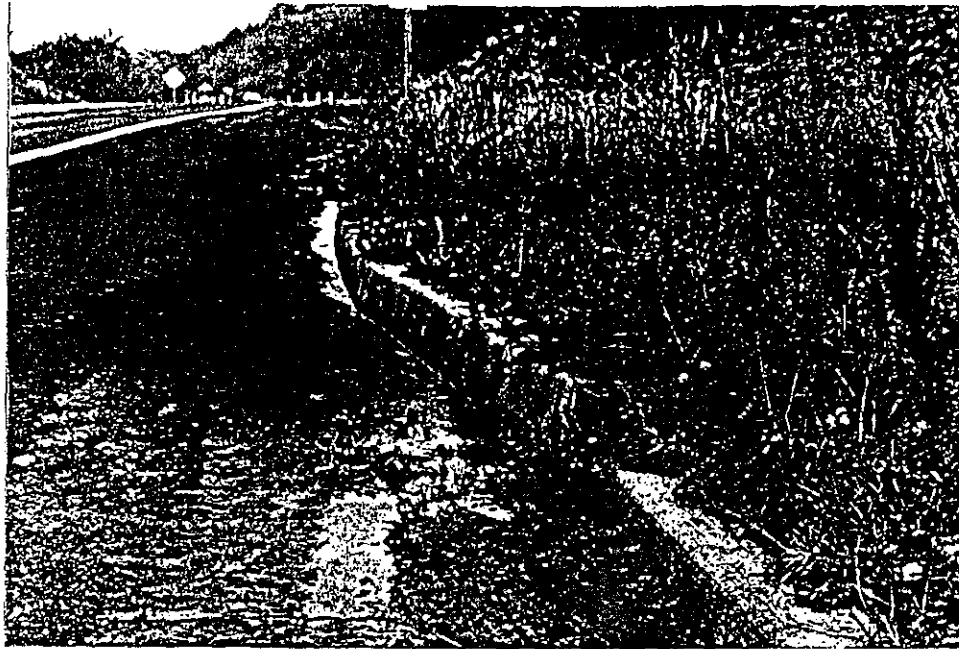


Photo #4 View north, Highway 101 directly below subject property. Note uplifted and laterally offset curb. Highway bulges on left.



Photo #5 Close-up of Highway 101 directly across from offset curb. Note fractures, some patched. About 3" uplift, 18" lateral shear.

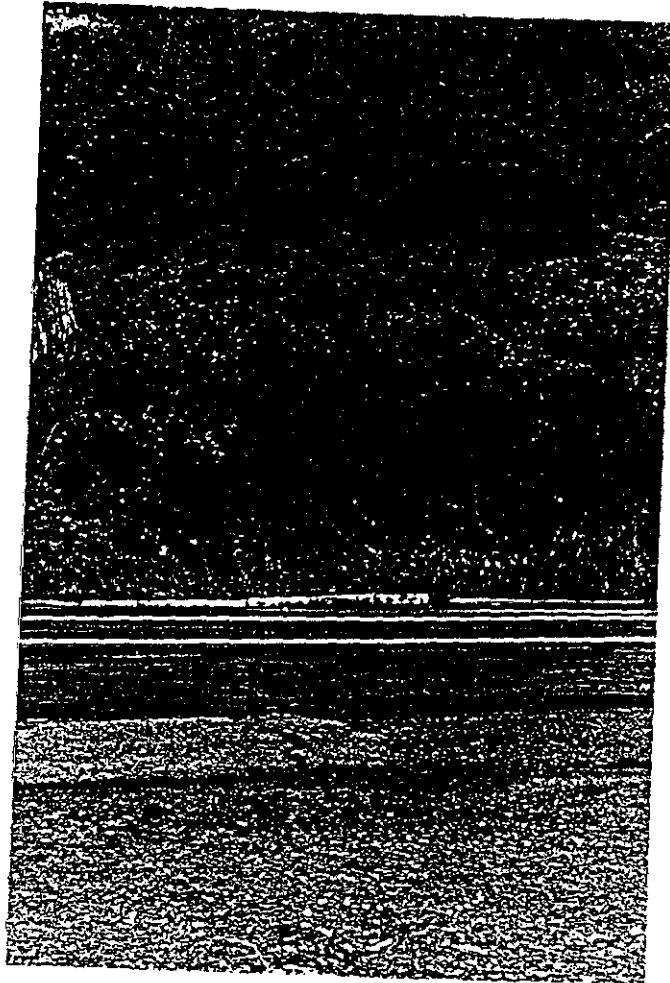


Photo #6 View east across highway showing shear zone. Test bore 85-4 to right of stump. Subject property begins at row of spruces, top of photo.



Photo #7 View north along highway. Shear coincident with beginning of fresh paving. Automobiles at approximate crest of bulge.

(2) TOPOGRAPHIC MAP, 1" = 100'

- a.,b.) Lot lines, property boundaries shown.
- c.) Major plant communities; see 1) d.) above.
- d.) A small stream fed by springs immediately upslope from the property traverses lot 9 (Photo #2). The January, 1986 flow rate did not exceed 3 gallons per minute. Flow in October, 1986 approximates 1/4 gallon per minute. Nevertheless, the stream channel is incised several feet deep in a sharp notch as it leaves lot 9.

- e.) No areas are subject to flooding.
- f.) With exception of the very local incised channel noted above, no part of the subject property is subject to significant erosion provided vegetative cover is not removed.

(3) SUBSURFACE ANALYSIS

(Incorporated in discussion of hazards, 1) c.), above).

(4) DEVELOPMENT PROPOSAL

- a.) A copy of plans for the 21x17 foot structure is attached.
(Figs. 4, 5, and 6.)
- b.) Approximately eight percent of the property will be covered by the structure. No other impermeable surfaces are planned.
- c.) Public access not applicable.
- d.) Minimal impact on biological habitats. Nature of structure and its planned use is compatible with pristine environment.
- e.) Although dense stands of salal have been cut, as well as some smaller conifers, the area has not been denuded, and salal will rapidly recover the surface. The owner has discussed the addition of native and domestic trees and shrubs. Construction area surface has been prepared by hand and does not appreciably exceed the area of the structure.
- f.) No special safeguards applicable.
- g.) Logging and farming, N.A.

(5) SPECIAL REVIEW FOR WATER SUPPLY OR SEWERAGE:

Neither a well nor an on-site drain field disposal system is proposed at this time. The owner proposes to install a composting toilet, and the minor amount of required domestic water could be obtained from the stream or the feeder springs.

- a.) Water table seasonal extremes, N.A.
- b.) Daily water needs anticipated at less than 25 gal. per day.
- c.) At 1/4 gal./minute seasonal minimum, the stream source is providing about 15 times the amount expected to be consumed.
- d.) Since only "gray water" is expected to be released, a small dry well could accommodate the need. This may not be acceptable to D.E.Q.

(6) CONCLUSIONS

- a-1) I understand that the proposed structure is not a dwelling but an artist's retreat or creative studio. Its limited size (21'x17') and placement south of the stream on lot 9 is compatible with the slope and natural vegetation.

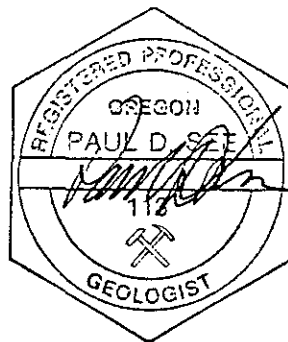
- 2) Placement of the structure on the property will not in itself affect the stability of the slope. The risk of massive slope failure is relatively high in the general area, as evidenced by creep taking place at highway level. The owner has declared his recognition of this risk, and his willingness to accept the consequences.
 - 3) For the type of structure, no additional measures are perceived as necessary to achieve compliance with applicable development criteria.
- b) Safeguards and mitigation. No measures taken on this property will affect the risk of massive sliding. The ditch along the slide access road on public property should be kept free of talus and vegetation to avoid impoundment of surface water which could percolate into the subsoil. Presumably this is the responsibility of the State Highway Division. Minor sloughing of the cut bank between the ditch and the subject property can be expected to occur, blocking the ditch.

LIMITATIONS

The conclusions and recommendations incorporated in this report are the result of personal site inspection, the works of other cited specialists, and generally accepted principles of geologic investigation for a report of this nature. Conditions described are believed to accurately represent circumstances at the time of inspection. No warranties are expressed or implied.

REFERENCES CITED

- (1) Schlicker, H.G., et al Environmental Geology of the Coastal Portions of Tillamook and Clatsop Counties, Oregon. Oreg. Dept. of Geol. & Mineral Industries Bull. 74, 1972.
- (2) Neim, Alan Geology of Hug Point State Park, Northern Oregon Coast. D.O.G.A.M.1. OREBIN Vol. 37, No. 2, Feb. 1975.
- (3) Ross, Martin A A Field Inventory of Geologic Hazards from Silver Point To Cove Beach, Clatsop Co., Oreg. Report to County Dept. of Planning and Development, Feb., 1975.
- (4) West, Robert, Region 2 Geologist, Oregon State Highway Division, personal communication January 31, 1986.



PAUL D. SEE

300 SURF PINES ROAD
SEASIDE, OREGON 97138
738-5869

1106

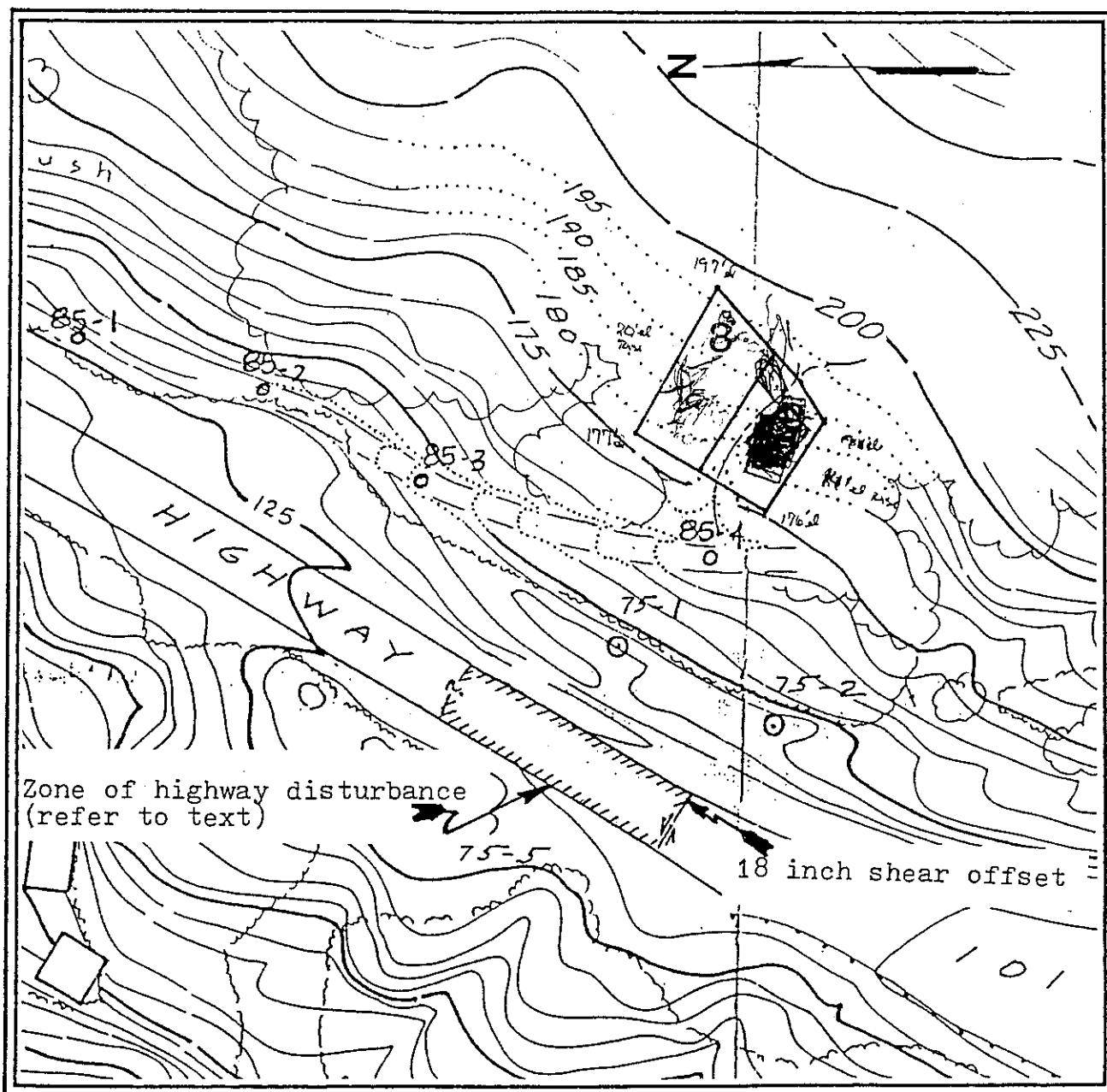


FIGURE # 1

VICINITY MAP
SCALE 1" = 100'

GEOLOGIC HAZARD REPORT

Lots 8 & 9, Blk 7, Silver Pt.
Terraces, 4N10 6CC, Clatsop Co.
Pre-1974 contours by Oreg.
State Highway Div., modified
locally to show post-1974 road
and on-site detail (dotted).
1975 & 1985 test bore locations
approximate.

Richard Gruetter
182 Coos St.
Tolovana Park, OR 97145

10" = 64'

Z

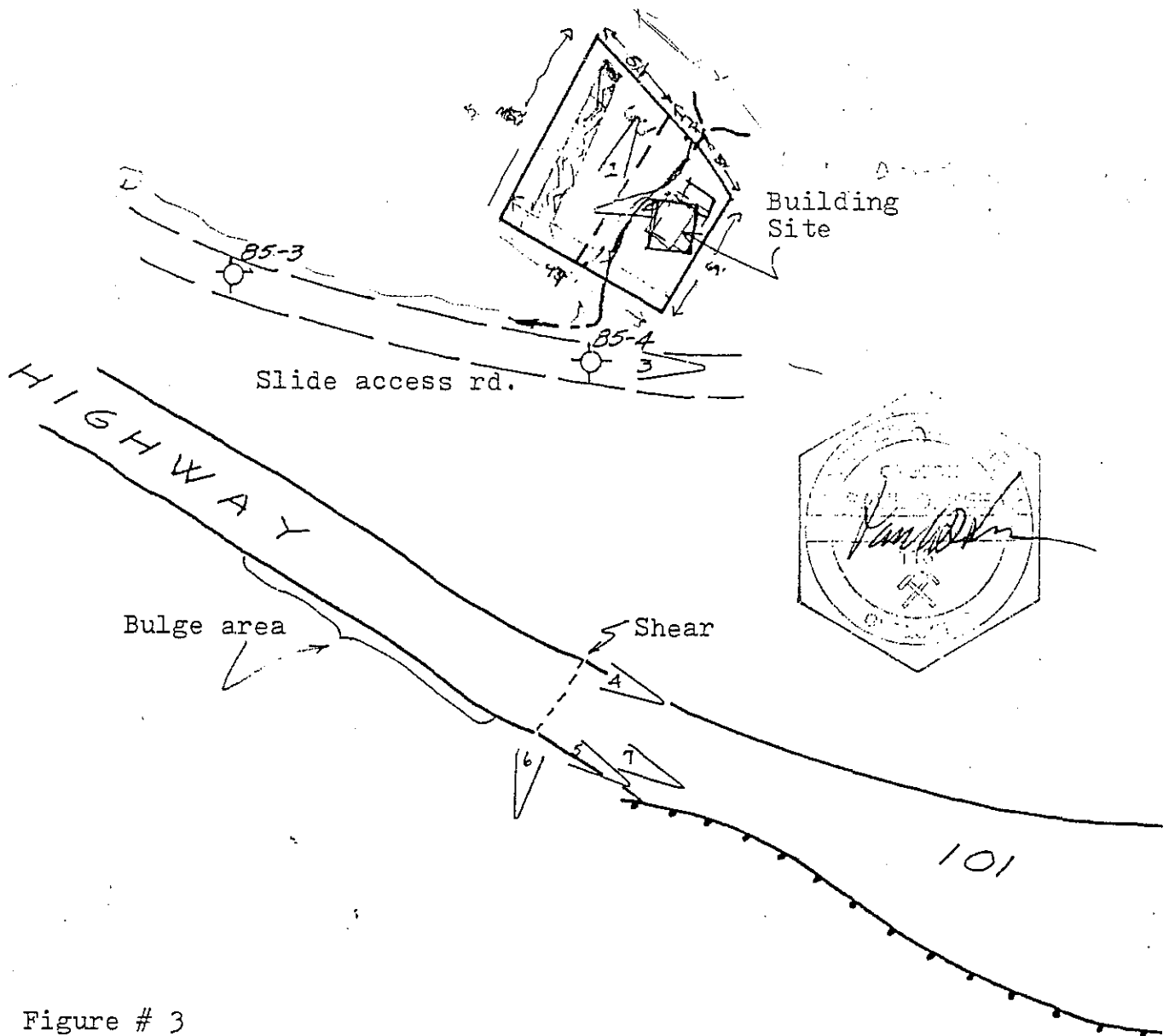
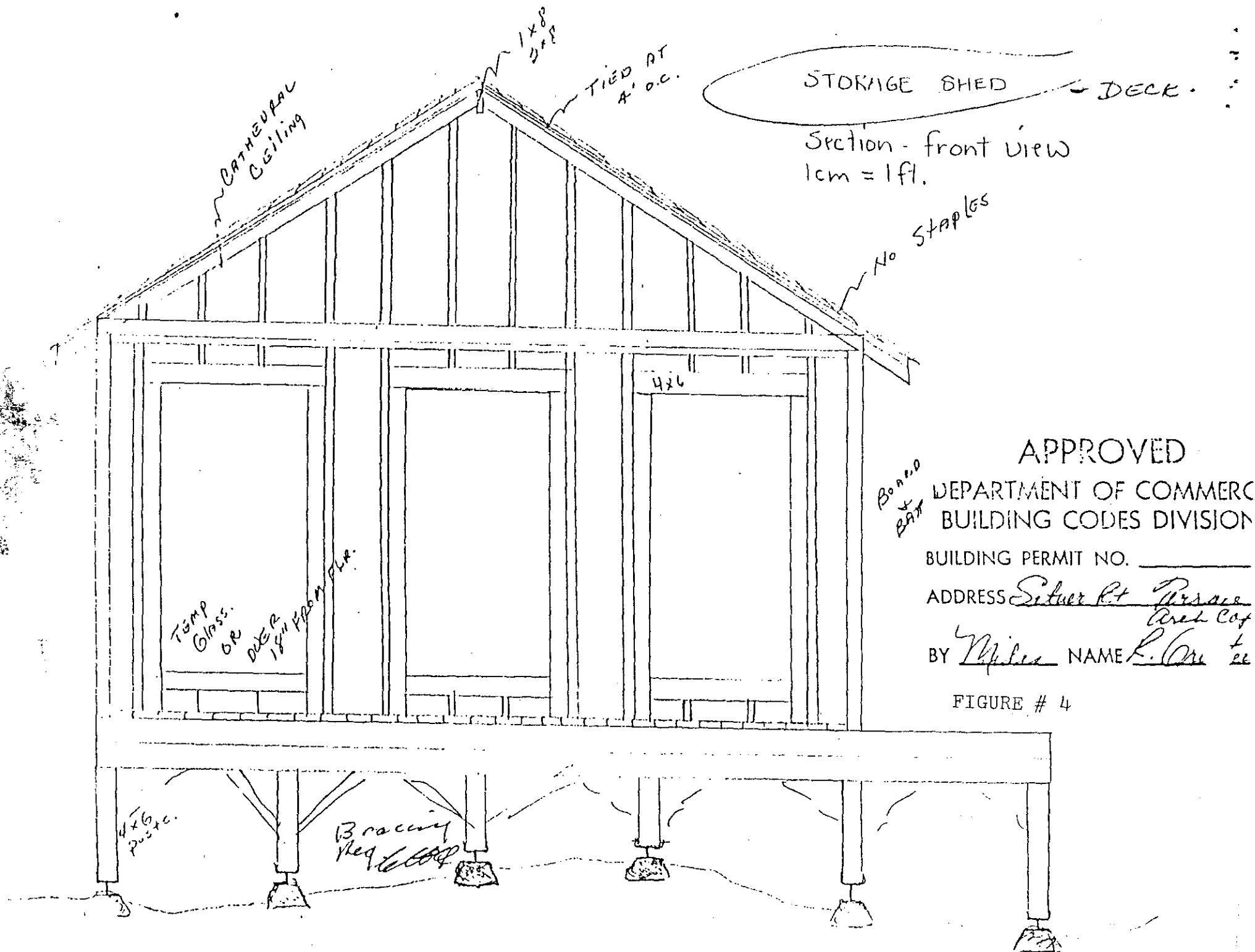
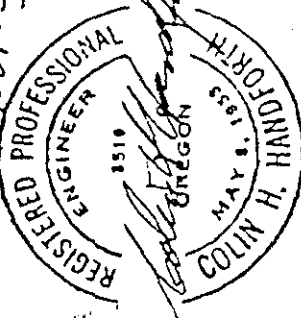


Figure # 3
 Photo index, lots 8 & 9, Blk 7, Silver
 Point Terraces and Vicinity.
 4N10 6CC, Clatsop County
 P. See 10/86 Scale: 1" = 80' (approx.)
 #1106



Back SHELLER
 Section: Side View

This is to certify that
 I have reviewed these
 plans and find that
 the structure is
 appropriate structurally
 for the location and
 geology hazard situation
 (See Attached Notes)



Colin H. Hannforth

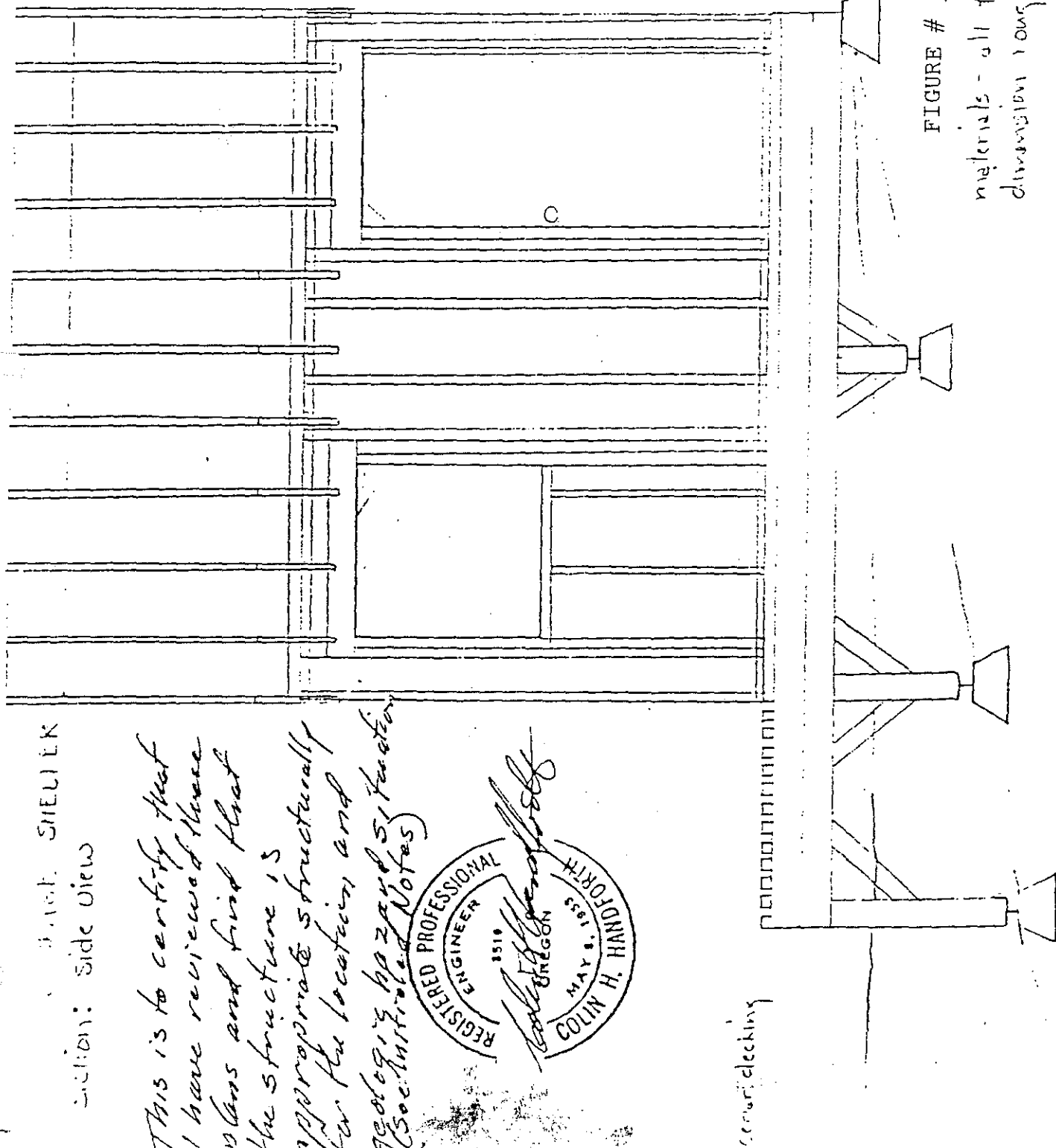


FIGURE # 5

materials - all framing materials are full
 dimension rough cut vertical grain fir.

Scale: 1/4" = 1 ft.

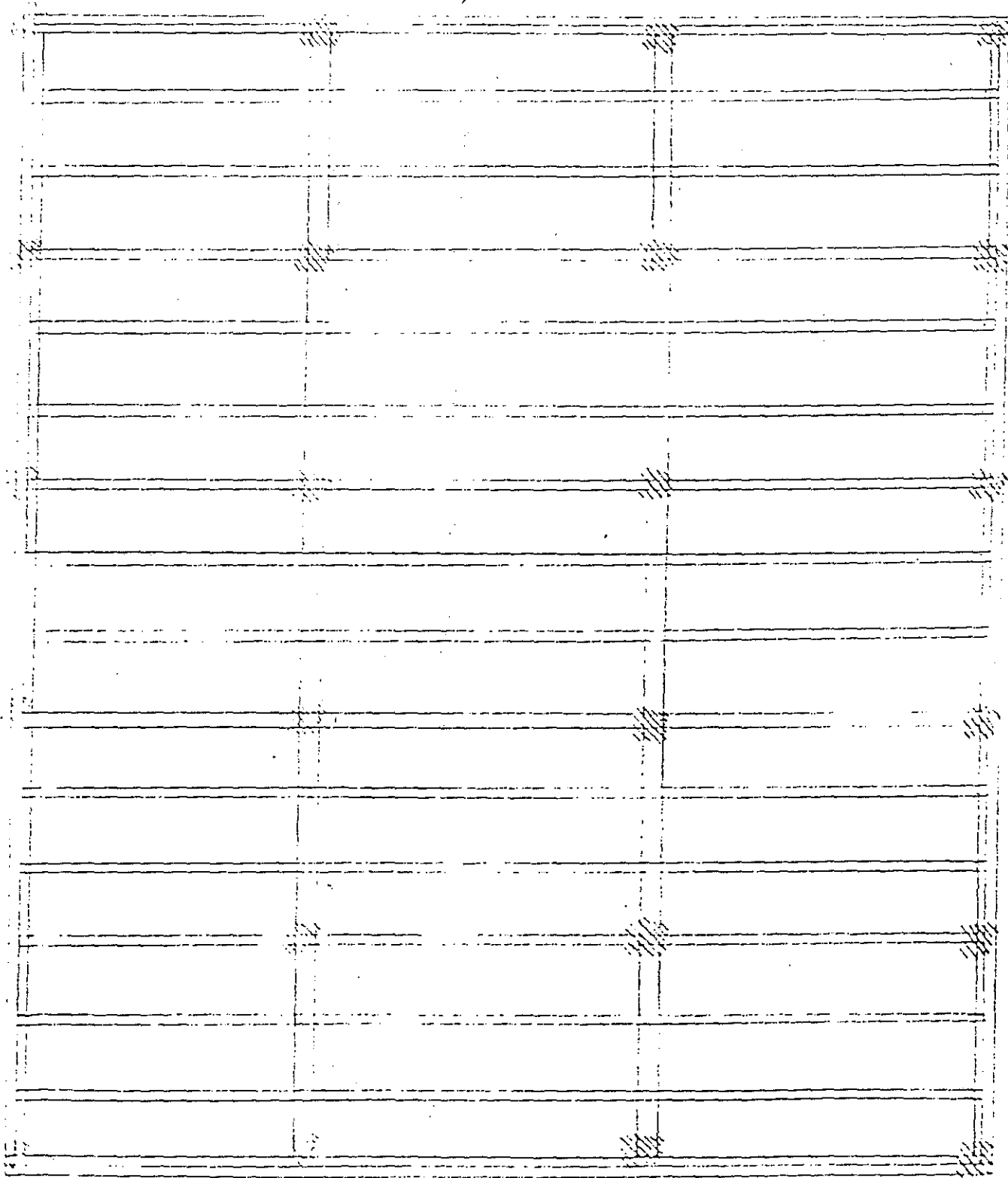
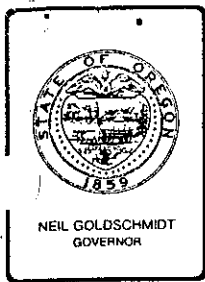


FIGURE # 6

materials: full dimension rough cut vertical grain fir.



Department of Transportation

HIGHWAY DIVISION

DISTRICT 1

PO BOX 686, ASTORIA, OREGON 97103 PHONE (503) 325-7222

3 February 1989

In Reply Refer to
File No.:

Richard C. Gruetter
2255 N.W. Johnson, Apt. 305
Portland, OR 97210

Dear Mr. Gruetter:

I have finally had the opportunity to review your access situation at Silver Point with the Region Engineer from Salem.

The Region Engineer concurs that no road approach permit nor permanent legal access from the Oregon Coast Highway can be granted to your property, however it was felt that a miscellaneous permit could be issued to you that should help your situation.

The miscellaneous permit would allow you at your expense to construct a gate across the existing road where the guardrail is. The gate would have to remain locked at all times and would have to be locked with two locks, one yours and one the State Highway Divisions. This would allow either you or the Highway Division to open the gate at anytime and have access to this road. The miscellaneous permit would then allow you to drive your vehicle on this road on Highway Division right of way as far as to where your cabin is located. No excavation on Highway Division right of way will be allowed. If you want to develop an area for turning your vehicle around, the State would allow for you at your expense to place a culvert in the existing ditch and fill that area in for parking and turning around. The miscellaneous permit would not allow you to use the road beyond your cabin and a barrier must be placed across the road so that no vehicles coming to your cabin would be able to proceed any further up this road.

If you are agreeable to this it will be necessary for you to sign the attached miscellaneous permit application and return to this office. Before any gate can be constructed you will have to submit plans to this office of the type of gate that you will be installing. The same would be true before you could place a culvert in the existing ditch.

Please note that if at any time in the future that the Highway Division needs this property for Highway construction or any other use that your permission to use this can be terminated without any obligation on the part of the Oregon State Highway Division. At this time there are no plans for any work in this area, however with the unstable condition of this entire area no one can project just when something could occur that would require use of this property.

If you have any further questions in regards to this miscellaneous permit please feel free to call me at my office in Astoria at 325-7222.


Eldon L. Everton

Form 734-2097 (11-87)
District Maintenance Supervisor

APPLICATION AND PERMIT TO OCCUPY OR PERFORM OPERATIONS UPON A STATE HIGHWAY.

HIGHWAY DIVISION

See Ore. Administrative Rule, Chapter 734, Division 55

PERMIT NUMBER

GENERAL LOCATION

PURPOSE OF APPLICATION (TO CONSTRUCT/OPERATE/MAINTAIN)

HIGHWAY NAME <u>Oregon Coast Highway</u>			☐ POLE LINE TYPE													
HIGHWAY NUMBER <u>9</u>	COUNTY <u>Clatsop</u>		☐ BURIED CABLE TYPE													
BEGIN OR NEAR LANDMARKS <u>annon Beach</u> AND <u>Arch Cape</u>			☐ PIPE LINE TYPE													
REFERENCE MAP NUMBER	DESIGNATED FREEWAY ☐ YES ☒ NO	IN U.S. FOREST ☐ YES ☒ NO	☐ NON-COMMERCIAL SIGN													
APPLICANT NAME AND ADDRESS Richard C. Gruetter 2255 N.W. Johnson, Apt. 305 Portland, OR 97210			☒ MISCELLANEOUS OPERATIONS AND/OR FACILITIES AS DESCRIBED BELOW. <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 30%;">BOND REQUIRED</td> <td style="width: 30%;">REFERENCE</td> <td style="width: 40%;">AMOUNT OF BOND</td> </tr> <tr> <td>☐ YES ☒ NO</td> <td>OAR 734-55-035 (2)</td> <td>\$</td> </tr> <tr> <td>INSURANCE REQUIRED</td> <td>REFERENCE</td> <td>SPECIFIED COMP. DATE</td> </tr> <tr> <td>☐ YES ☒ NO</td> <td>OAR 734-55-035 (1)</td> <td></td> </tr> </table>		BOND REQUIRED	REFERENCE	AMOUNT OF BOND	☐ YES ☒ NO	OAR 734-55-035 (2)	\$	INSURANCE REQUIRED	REFERENCE	SPECIFIED COMP. DATE	☐ YES ☒ NO	OAR 734-55-035 (1)	
BOND REQUIRED	REFERENCE	AMOUNT OF BOND														
☐ YES ☒ NO	OAR 734-55-035 (2)	\$														
INSURANCE REQUIRED	REFERENCE	SPECIFIED COMP. DATE														
☐ YES ☒ NO	OAR 734-55-035 (1)															

DETAIL LOCATION OF FACILITY

(For more space use back of application or attach additional sheets)

MILE POINT	MILE TO POINT	ENGINEERS STATION	ENGINEERS TO STATION	SIDE OF HIGHWAY OR ANGLE OF CROSSING	DISTANCE FROM		BURIED CABLE OR PIPE		OPEN CUT	SPAN LENGTH
					CENTER LINE	R/W LINE	DEPTH	SIZE AND KIND		

DESCRIPTION AND LOCATION OF NON-COMMERCIAL SIGNS OR MISCELLANEOUS OPERATIONS/FACILITIES

Install gate across access road to Silver point Slide area on each side of Oregon Coast highway at STA 381+50. Applicant can use access road to park in front of his cabin. The State may cancel this permission at any time with no obligation to furnish access.

ADDITIONAL PROVISIONS (For more space use back of application or attach additional sheets)

OPEN CUTTING OF PAVED OR SURFACED AREAS ALLOWED?

☐ YES [OAR 734-55-040 (10)] ☒ NO [OAR 734-55-040 (9)]

TRAFFIC CONTROL REQUIRED?

☐ YES [OAR 734-55-025 (6)] ☒ NO

No excavation allowed on OSHD right of way due to unstable condition.

Applicant to furnish plans of gate for approval before any work on highway right of way. Gate to be kept locked at all times with 2 locks that will allow with OSHD or applicant entry and OSHD will furnish State lock.

After gate installed OSHD will remove existing guardrail blocking this road.

OSHD has no obligation to allow access on this road and if conditions of this permit not followed, the road will again be blocked with guardrail and access not allowed.

This permit does not allow for applicant to drive any vehicle beyond the front of his property on this road. If applicant want to develop a turnaround he may install 18 inch culvert in existing ditch and fill in an area in front of cabin.

If this application is approved by the Department, the applicant is subject to, accepts and approves the terms and provisions contained and attached; and the terms of Oregon Administrative Rule, Chapter 734, Division 55, which is by this reference made a part of this permit.

DISTRICT MAINTENANCE SUPERVISOR

DATE COMPLETE APPLICATION RECEIVED

APPLICANT

APPLICATION DATE

X

REGION ENGINEER

DATE

X

UTILITY PERMIT SUPERVISOR

APPROVAL DATE

X

Environmental Quality Commission

- ☐ Rule Adoption Item
☒ Action Item
☐ Information Item

Agenda Item **F**
February 23, 1996 Meeting

Title:

National Marine Fisheries Service Request for a Variance to the Total Dissolved Gas Standard

Summary:

The National Marine Fisheries Service has requested a variance to the total dissolved gas standard for the Columbia River to spill water over dams to assist outmigrating salmonid smolts. The variance sought would enable gas levels to rise to 115 percent of saturation in the forebays of spilling dams and 120 percent in the tail races. This is the the same request as in 1995, with one notable exception. The U.S. Fish and Wildlife Service has petitioned jointly with the National Marine Fisheries Service for spill over Bonneville Dam to assist out-migrating Spring Creek Hatchery salmonid smolts. The U.S. Fish and Wildlife Service is seeking the same level of waiver as the National Marine Fisheries Service.

Department Recommendation:

The Department recommends that the Commission approve the waiver to the total dissolved gas standard for the Columbia River for the period March 14, 1996 to August 31, 1996 to enable spill over dams to assist out-migrating salmonid smolts


Report Author


Division Administrator


Director

February 20, 1996

State of Oregon
Department of Environmental Quality

Memorandum

Date: February 23, 1996

To: Environmental Quality Commission
From: Langdon Marsh, Director 
Subject: Agenda Item F, February 23, 1996, EQC Meeting

Statement of Purpose

The Commission has been petitioned jointly by the National Marine Fisheries Service (NMFS) and the United States Fish and Wildlife Service (USFWS) for a variance to the state's total dissolved gas standard to enable spill over Columbia River hydroelectric dams to assist outmigrating salmon smolts.

The petition falls into two distinct parts:

1. the period from March 14 to March 23, 1996 during which spill over Bonneville Dam is requested for outmigrating Spring Creek Hatchery smolts; and
2. the period from April 10 to August 31, 1996 during which spill over all Columbia River projects is requested for outmigrating threatened and endangered Snake and Columbia River salmon smolts.

The variance requested is from a standard of 110 percent saturation to 115 percent saturation in the forebays of the spilling dam and 120 percent in the tailrace. The petition seeks a "period" average at these levels. Verbal communication with the petitioner indicates that this is the same request as last year, *i.e.* a twelve hour average. No maximum saturation level is sought in the petition. The request for 1996, as was the request in 1995, is based on NMFS's *1994-98 Federal Columbia River Power System Biological Opinion* in which spill is a component of salmon recovery.

Background

1995 Spill

In 1995 both Federal fisheries agencies petitioned the Commission for a waiver to the standard. In the case of USFWS, the Commission denied the petition on the grounds that there was insufficient monitoring to determine compliance with the waiver or to assure that damage to fish, both migrating and resident, from dissolved gas would not occur. In the case of NMFS, the

Commission approved, on April 14, 1995, a variance from the standard from April 20, 1995 to August 31, 1995.

The 1995 spill season proceeded between the dates approved by the Commission with a combination of intentional spill for salmonid migration and involuntary spill during which the hydraulic capacity of the dams was exceeded during snowmelt and runoff and due to mechanical failures at Ice Harbor. In-river conditions were more favorable in 1995 than in 1994. River flows were much higher, and spill volume at Snake River dams was higher.

1995 Monitoring Results

Generally, the proposed monitoring in 1995 proceeded smoothly. There were difficulties early in the season with physical monitoring. The problems surrounded broken instruments or faulty readings. The Department maintained close communication with the United States Army Corps of Engineers (USACE) during this period, and by the middle of the spill season, many of these difficulties had been overcome.

On May 26, 1995, the Department issued a Notice of Noncompliance to both USACE and NMFS citing 30 violations of the variance. Following that notice and a series of meetings with NMFS and USACE, compliance with the variance improved. While there was still the occasional violation involving dissolved gas levels at one to two percent above the approved waiver, they tended to be minor and isolated. Staff continued to meet with their counterparts from the Corps to ensure that adequate steps were being taken to remain within the variance.

The biological monitoring of migrating smolts and resident populations proceeded smoothly with a total of 71,745 juvenile salmonids being observed. Of these, 242 fish (0.3 percent) showed signs of gas bubble disease (GBD). No fish showed signs above the lowest severity rating, *i.e.* less than 25 percent of the affected area showing signs of bubbles.

Two incidents stood out during the season. The first is the netpen mortalities that occurred below Ice Harbor Dam in May 1995. The mortalities occurred between May 8 and June 20, 1995 when two turbines at the Ice Harbor project were out of commission, and uncontrolled spill was occurring. There were difficulties with the physical monitoring instruments, but estimates put the levels of dissolved gas between 127 and 138 percent. One of the notable observations from this incident is that mortalities were significant even in the deeper netpen in which fish had the opportunity to sound to obtain the higher hydrostatic pressure that could have given some relief from the elevated level of dissolved gas. While not conclusive, this suggests that fish may not be able to detect supersaturated water and either avoid it or sound to compensate. Alternatively, the depth and/or volume of water available in the netpen was insufficient to provide protective hydraulic pressure for the gas levels produced. The second incident occurred at Bonneville Dam, again with mortalities of fish held in netpens. Experts disagree on the causes of death. NMFS, the agency conducting the research, reported that mortalities were not caused by GBD because

there were no signs of GBD in either the dead fish or live fish retrieved from the netpens. Mortalities were attributed to in-pen predation and algae. Opponents of spill claim it was from GBD.

Resident species monitoring occurred between April 13, 1995 and August 15, 1995. During this period 84 salmonid fish, 7,202 non-salmonid fish and 1,303 invertebrates were examined for signs of GBD. Signs of GBD were extremely high immediately downstream from Ice Harbor dam but were rare in other river reaches

Smolt Survival Studies

Much emphasis has been placed on smolt survival using 1995 pit tag monitoring data. The Direct Service Industries (DSIs) commissioned a report from Cramer and Associates, and the fisheries agencies and Fish Passage Center have performed work both in response to Cramer's report and in their own studies.

Cramer has submitted three iterations of a report using Chinook salmon smolt pit tag data to estimate daily/weekly survivorship. The first report, *Assessment of the Effects of Spill on Survival of Anadromous Salmonids in the Columbia Basin*, contained methodological errors in estimating survivorship that made the conclusions invalid. The second report, *Response to Comments by Fish Passage Center of, "Assessment of the Effects of Spill on Survival of Anadromous Salmonids in the Columbia Basin"* reported averages without confidence intervals that made determining statistical significance impossible, thus making the conclusions invalid. The latest version, *Seasonal Changes in Survival of Yearling Chinook Smolts Emigrating Through the Snake River in 1995 as Estimated from Detections of PIT Tags*, uses statistical methodology that has not been peer reviewed. The Fish Passage Center (FPC) and NMFS are currently in the process of reviewing the third report. If the methodology stands in the third report there are complications with the conclusions drawn, as in a complex system like the Columbia River, effects of a single pollutant (TDG) are difficult to determine from in-stream monitoring data due to confounding physical, chemical and biological variables.

The FPC has estimated survival from the head of Lower Granite reservoir to the Lower Monumental Dam tailrace as a weighted average of 61 percent in 1994 for yearling Chinook to 77 percent in 1995, and from 62 percent to 78 percent for steelhead. On a per dam basis, this translates to approximately 82-84 percent for yearling Chinook and steelhead in 1994 to 92 percent for both species in 1995. Increased survival has been attributed to a spill program extending throughout the season in 1995, along with better riverine conditions, *i.e.* more water in the river.

While uncertainty continues to exist in the data surrounding spill, indications from these studies suggest that there was increased survival of salmon smolts in 1995 which may, in part, be a result of spill.

National Research Council Report

In 1995 the National Research Council (NRC) released a prepublication version of its report on salmon in the Northwest. The report is valuable as a assemblage of options and current thought on Northwest salmon stocks, but is less helpful as a basis for action. The committee has recommended that salmon smolts be transported because of stress, post by-pass losses and delayed arrival of smolts to the ocean due to decreased water velocities. They believed the most appropriate use of by-pass facilities is to collect smolts for transportation (NRC, 1995, p. 315). On the other hand, the committee also recognizes that despite the paucity of information, reliance on a single technique for salmon recovery is risky. The committee also warned against any action that could jeopardize all of the fish in a stream. The committee believed that not all fish should be transported (NRC, 1995, p. 9).

The current petition appears to meet both viewpoints. The majority of smolts would be collected for transportation, while leaving 20-25 percent instream.

Spring Creek Hatchery

The USFWS has joined with NMFS in 1996 to petition for spill at Bonneville Dam to assist outmigrating Spring Creek Hatchery salmon smolts. The Spring Creek Hatchery is located immediately above Bonneville Dam. A similar request was denied by the Commission last year due to insufficient monitoring, either physical or biological. USFWS has overcome this problem this year by petitioning jointly with NMFS and having the physical and biological monitoring program proposed for the system-wide spill applied to Spring Creek Hatchery.

The benefit of spilling for this outmigration is that returning hatchery adults will coincide with the return of threatened and endangered Snake and Columbia River salmon. The presence of hatchery fish will reduce the harvest pressure on the endangered fish.

Authority of the Commission with Respect to the Issue

The authority of the Commission to address this issue is contained in Oregon Administrative Rules - OAR 340-41-205, 445, 485, and 525 (2)(n). A copy of the rule is attached at Appendix A.

At its meeting of February 16, 1995, the Commission modified the Oregon Administrative Rules to enable it to modify the total dissolved gas standard for the Columbia River for the purpose of assisting juvenile in-river salmon migration.

If the Commission is to grant this variance, it is required to make four findings under the rules. These are:

- (i) that failure to act would result in greater harm to salmonid stock survival through in-river migration than would occur by increased spill;
- (ii) that the modified total dissolved gas criteria associated with the increased spill provides a reasonable balance of the risk of impairment due to elevated total dissolved gas to both resident biological communities and other migrating fish and to migrating adult and juvenile salmonids when compared to other options for in-river migration of salmon;
- (iii) that adequate data will exist to determine compliance with the standards; and
- (iv) that biological monitoring is occurring to document that the migratory salmonid and resident biological communities are being protected.

The rule also allows the Commission to consider alternative modes of migration at its discretion.

Summary of Public Input Opportunity

Following receipt of the petition on January 16, 1996, the Department issued a public notice, advising receipt of the petition and inviting interested parties to submit either oral testimony at a public hearing that was held at 1:00 p.m. on February 16, 1996 in room 3A at DEQ Headquarters, or in writing by 5:00 p.m. on February 16, 1996.

A summary of public comment and written submissions is attached at Appendix B.

The parties choosing to comment, either orally or in writing, are the same as last year. Generally, commercial fishing interests, environmental groups, tribes and state and Federal agencies support the granting of the variance, and representatives of industry oppose it.

The DSIs remain opposed to spill for salmonid in-river migration. They point to Cramer's conclusions that despite critical peer review, his conclusions of mortality increasing as gas levels increase has remained unchanged. The DSIs propose a series of options for the Commission. These include:

- (i) denying the request;
- (ii) conditioning any variation to the standard on demonstrable proof of benefit;
- (iii) allowing only a partial increase such as 110 percent in the forebay and 115 percent in the tailrace;
- (iv) limiting the number and/or duration of projects spilling;

- (v) providing a safe haven from gas supersaturation at an intermediate project by limiting gas exposure and duration; or
- (vi) conditioning approved gas levels on rigorous real-time monitoring data.

Proponents of the variance point to the success of the program in 1995, and to the role played by spill in a risk-spreading strategy for salmon recovery, in which spill plays an important part, but is by no means the only strategy to be employed for salmonid survival. Some tribal and sport fishing representatives sought levels of spill above those petitioned for by NMFS to improve fish passage efficiencies.

Alternatives and Evaluation

There are four main methods of salmonid migration down the Columbia River. These are transportation, turbine passage, dam by-pass passage, and spill. In practice all four of these modes will be used in 1996 as they were in 1995. The fisheries agencies will continue to collect and transport between 75 and 80 percent of smolts. The remaining 20 to 25 percent of smolts will remain in-river and will proceed either through by-pass facilities at the dams or through turbines or over the spill way via a spill program.

Turbine mortalities have been estimated at between 10 and 15 percent, and the by-pass facilities at dams are imperfect at guiding all in-river smolts away from turbines. The spill program is designed to minimize mortalities for fish which are not guided away from turbines by the by-pass devices. Mortalities from spill are estimated at between 2 and 3 percent.

In relation to the four findings required to be made under the total dissolved gas rule, the following are supported by the petition:

- (i) failure to act will result in more salmonid passage via hydroelectric dam turbines. Estimated mortalities from fish passing through turbines is between 10 and 15 percent. Fish passing over spillways as a result of spill experience 2 to 3 percent mortality. The Commission is, therefore able to make the first finding;
- (ii) the balance of risk of impairment to fish due to elevated dissolved gas levels needs to be balanced against mortality of turbine passage. It is clear from the netpen mortalities at Ice Harbor in May and June 1995 that elevated dissolved gas levels do result in significant mortality. Dissolved gas levels experience at Ice Harbor in May and June 1995 are well above the range within which instream bioassays indicate mortalities will occur. Correspondence from Oregon Department of Fish and Wildlife (ODFW) and the Tribes in relation to last year's petition equated the mortality from turbines with elevated dissolved gas at around 120 percent, although is considered a conservative estimate. Given the conservative nature of this estimate along with the data yielded by the netpen mortalities at

Ice Harbor, the balance of the risk of impairment at the levels sought in the petition is tipped in favor of granting the variance;

- (iii) NMFS has submitted a detailed physical monitoring plan which is the same as last year. Physical monitoring will occur at 37 sites in the mainstem Columbia, lower Snake and lower Clearwater Rivers in the forebays and tailraces of all spilling dams. The physical monitoring plan seeks to overcome the difficulties encountered last year with equipment failures and unreliable readings through rapid equipment repair including the use of properly calibrated backup equipment, and weekly instrument verification. Hourly data will be posted electronically, as it was last year. Implementation of the physical monitoring plan will ensure that data will exist to determine compliance with the standards;
- (iv) NMFS has submitted a detailed biological monitoring program which also mirrors that of last year. Significant differences are that resident invertebrates will not be monitored in 1996. The incidence of GBD in resident invertebrate populations was so low in previous years that no benefit is seen from continuing with it. Smolt monitoring will continue as it did last year with examination of smolts being undertaken with 10X to 40X dissecting microscopes. Signs of GBD will be sought on non-paired fins, eyes and lateral lines. The presence of gas bubbles in these tissues has proven to correlate more reliably with mortality than the presence of bubbles in gill lamellae. In addition, a non-lethal method of examining gill lamellae has not been found. A copy of the monitoring plan is attached at Appendix C. Implementation of the attached plan will ensure that biological monitoring is occurring to document that salmonid and resident populations are being protected.

With these findings, the Commission is able to approve the variation to the total dissolved gas standard as sought by NMFS and USFWS.

Alternative Commission Actions

The petition is such that the required findings can be made, and the petition approved. Clearly, any level of action less than approval can also be undertaken by the Commission. As outlined in the DSI's submissions, there are a number of alternatives the Commission could adopt, as follows (this is not an exhaustive list):

1. Denying the request. If the Commission declines the variance sought in the petition, the majority of smolts will still be transported, some fish will proceed through the by-pass systems, and the balance will go through the turbines with associated mortalities;
2. Condition approval on demonstrable proof of benefit. The Commission is able to impose any conditions on its approval as it sees fit. Doubtless the fisheries agencies believe proof

of benefit has been demonstrated through improved survival of smolts in 1995. If the Commission requires a further demonstration it could require it:

3. Allow a Partial Variance. Clearly the Commission can approve a variance at any point along the scale from 110 percent and up. Staff would caution that significant mortalities are experienced at levels above 125 percent. The fisheries agencies, along with staff of this agency, believe that the level being petitioned here provides the most appropriate balance between in-river migration and mortalities from GBD. Any lower level will reduce GBD mortalities, but will also decrease the number of fish spilled over dams, forcing more fish through turbines;
4. Limiting the Number and/or Duration of Projects Spilling. Again, adoption of this option requires various trade-offs. There are distinct benefits from reducing exposure of fish to elevated dissolved gas levels. In 1995 spill was restricted to 12 hour periods to enable returning adults to swim upstream. NMFS proposes the same regime for 1996. These breaks benefited migrating salmonid smolts also. Any reduction in spilling at a project, again, needs to be weighed against fish passage efficiency. The Commission is able to impose the twelve hour restriction as a condition of its approval.
5. Providing a Safe Haven. This option is very close to the one above, and the comments above apply here also.
6. Conditioning Approval on Real-Time Monitoring Data. The Commission has two options here. Either it can condition the variance on receipt of real-time data, or it can condition the variance not only on real-time receipt but also on what the data indicates. The Commission could condition its approval on real-time receipt of data that shows compliance with the variance, or on data that shows continued survival of smolts. The Corps is proposing to post its physical monitoring data electronically.

Any of the above options can be applied to either the request for the Spring Creek Hatchery or to the system-wide Columbia River variance request.

Conclusions

The petition from NMFS for a variance to the total dissolved gas standard for the Columbia River is the same as the one the Commission approved last year. The 1995 spill season produced more data from the physical and biological monitoring, but this is subject to the same disputes of interpretation that the Commission has seen before on this issue. Cramer's reviews of his study on smolt survival, and the resort to an untested methodology do not prove as convincing as survival estimates produced by the Fish Passage Center.

Based on the improved survival of smolts in 1995, the low incidence of GBD in smolts and resident populations in 1995, and the ability of the Commission to make all the required findings under the rule, the Department concludes that the Commission is in a position to approve this variance if it so desires.

Intended Future Actions

Over the course of the past year Departmental officials have met with representatives from the Washington Department of Ecology, the state and federal fisheries agencies, tribes, and USACE. Staff believe the long term approach to this problem is for the Corps to physically and operationally modify the projects to enable spill for fish at agreed upon fish passage efficiencies while remaining within the total dissolved gas standard established by the states of Idaho, Washington and Oregon. The Corps is proceeding with a gas abatement study, an important component of which is a timetable for carrying out these modifications.

Staff believe there is a willingness on the part of all participants in this issue to participate in a Mutual Agreement and Order under which the Commission would grant a variance to the dissolved gas standard under strict and enforceable conditions, in return for which the Corps will undertake specified operational and structural modifications within a tightly defined timetable. Opportunity for modification of the conditions and timetable would be structured to accommodate new data or scientific conclusions.

Staff will continue these discussions if the Commission wishes to pursue this further as an alternative to the annual airing of this issue. Any proposed action should be subject to public scrutiny and input.

Department Recommendation

The Department recommends that the Commission grant this petition by adopting the findings contained in the Draft Order attached at Appendix D, subject to implementation of the physical and biological monitoring regime as detailed in the monitoring plan submitted by the National Marine Fisheries Service dated January 25, 1996, and:

- (i) Approve a revised total dissolved gas standard for the Columbia River at Bonneville Dam for the period from midnight on March 14, 1996 to midnight on March 23, 1996;
- (ii) Approve a revised total dissolved gas standard for the Columbia River for the period from midnight on April 10, 1996 to midnight on August 31, 1996;

- (iii) Approve a total dissolved gas standard for the Columbia River of a daily (12 highest hours) average of 115 percent as measured at established monitors at the forebay of the next dam downstream from the spilling dam during this time;
- (iv) Approve a further modification of the total dissolved gas standard for the Columbia River to allow for a daily (12 highest hours) average of 120 percent as measured at established tailrace monitors below the spilling dams during this time;
- (v) Approve a cap on total dissolved gas 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 this time; and
- (vi) Require that the Director halt the spill program if *either* 15 percent of the fish examined show signs of gas bubble disease 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, whichever is the less.

Attachments

- A. Copy of EQC rule, OAR 340-41-205, 445, 485, and 525 (2)(n)
- B. Summary of Public Comment
- C. 1996 Gas Bubble Disease Monitoring Program
- D. Draft Commission Order
- E. Dissolved Gas Monitoring Stations Location Map

Reference Documents (available upon request)

National Research Council (1995) *Upstream: Salmon and Society in the Pacific Northwest*,
National Academy Press, Washington D.C. (Prepublication copy)
National Marine Fisheries Service (1995) *Proposed Recovery Plan for Snake River Salmon*,
United States Department of Commerce, Washington D.C.

Approved:

Section:

Division:

Russell Harding
Michael Downs

Report Prepared By: Russell Harding

Phone: 229-5284

Date Prepared: February 20, 1996

- (B) The Commission may modify the total dissolved gas criteria in the Columbia River for the purpose of allowing increased spill for salmonid migration. The Commission must find that:
- (i) Failure to act would result in greater harm to salmonid stock survival through in-river migration than would occur by increased spill;
 - (ii) The modified total dissolved gas criteria associated with the increased spill provides a reasonable balance of the risk of impairment due to elevated total dissolved gas to both resident biological communities and other migrating fish and to migrating adult and juvenile salmonids when compared to other options for in-river migration of salmon;
 - (iii) Adequate data will exist to determine compliance with the standards; and
 - (iv) Biological monitoring is occurring to document that the migratory salmonid and resident biological communities are being protected.
- (C) The Commission will give public notice and notify all known interested parties and will make provision for opportunity to be heard and comment on the evidence presented by others, except that the Director may modify the total dissolved gas criteria for emergencies for a period not exceeding 48 hours;
- (D) The Commission may, at its discretion, consider alternative modes of migration.

National Marine Fisheries Service

Total Dissolved Gas Petition

Summary of Public Comment

On Friday February 16, 1996 a public hearing was held at 1:00 p.m. in room 3A at DEQ Headquarters. The hearing officer was Mr. Bill Young of the Department, assisted by Russell Harding. Oral testimony was taken from 13 persons. That testimony is summarized below.

Rick Applegate, Trout Unlimited

Mr. Applegate supported the petition, and requested that the Commission grant the variance. He believed there is a need to improve in-river conditions, and that spill is the safest means to by-pass fish around turbines. He associated a two percent mortality with spill versus a 10-30 percent mortality for turbine passage, per project. He did not advocate uncontrolled spill due to the incidence of gas bubble disease. He believed the monitoring should be intensified, and noted that no significant mortalities were recorded as a result of the 1995 spill.

Spill is part of the risk-spreading experiment which includes transport. Fish runs continue to decline because we have not returned the river to its natural flow. Even opponents of spill agree that in a good water year, spill survival approximates the projected estimates. During 1995 55,000 fish were monitored, and less than one percent had signs of gas bubble disease. Resident populations showed some signs, but overall these were no large.

We need to take action. No action is risk free. Our biggest mistake is taking too much time.

Stephen Phillips, Habitat Committee, Pacific Fishery Management Council

Mr. Phillips read a 1994 resolution adopted by the Council supporting spill.

Thane Tiensen, Salmon for All

The Columbia River commercial fishery is all but extinct. It needs fish put back in the river. Spring salmon are the most valuable, and they are caught at a time when seasonal jobs are at their low point. For the past two years there has been no fishery at all due to no returning adults.

We need to balance risks to get fish back in the river. The opponents of spill have been proven wrong. The fisheries agencies unanimously support spill because they believe it will improve the situation.

If there is no fishery, there is no reason to bring fish back. Fish have survived high dissolved gas levels for tens of thousands of years.

Liz Hamilton and Merritt Tuttle, Northwest Sport Fishing Industry Association

Ms. Hamilton recorded her resentment at not being able to directly address the Commission, an opportunity that had been afforded to others, including spill opponents. She requested that in future she be allowed to address the Commission directly. Ms. Hamilton read two letters into the record. The first is from Susan Foster, Ph.D. Dr. Foster is a teacher at Mount Hood Community College. She is concerned for the passage of fish. She believes that fish belong in the river, and that spill is the safest passage for getting fish past dams. The second letter is from Frank Warren of the Pacific Fishery Management Council in which he requests approval of the variance.

Merritt Tuttle introduced himself as the science and policy advisor to the Northwest Sport Fishing Industry Association. The Association represents hundreds of businesses and thousands of waged jobs. He explained that business is outcome oriented and that it is in strong support of the variance because it believes it will result in a positive outcome.

He believes that a five percent higher dissolved gas level would be required to achieve an 80 percent fish passage efficiency. Survival rates in 1995 were 18 percent higher than the previous year with steelhead being 24 percent higher, according to Fish Passage Center data.

The question is not whether to grant the variance since all salmon advocates support the granting of it. He questioned the motivation of those opposing the variance. He stated that Bonneville Power Administration has a cap on what it can spend for salmon recovery and that the Direct service Industries have cut their deals with Bonneville. Tuttle alluded to testimony presented last year by spill opponents and the dire predictions they made. These predictions were not supported by the 1995 spill results.

The spring 1995 netpen mortalities on the Willamette River were not monitored for TDG. The pens were buckled leaving the smolts unable to sound. The survivors which were 70 percent of the fish showed no incidence of gas bubble disease. Fish need cold, clear water and safe passage to the ocean. Dr. Anderson, from last year, predicted a two percent loss of smolts, versus an almost 25 percent improvement in fact.

There were no walleye or squawfish floating in the river. Fish need water. We need to put common sense back into the equation. Spill can provide conditions in the Columbia River for all users.

Charles Ray, Idaho Sport Fishermen and Conservation, and Idaho Rivers United

We want to restore salmon and steelhead in Idaho. Spill is part of a broader interest in salmon and steelhead. An important aspect of spill is to enable salmon to pass the dams. The evidence of its efficacy is incontrovertible. We support spill. We support the variance. Oregon state needs to look at the broader picture rather than just one element of it. Is the State of Oregon committed to improving this river and honoring the treaties of 1855 and the promises made to restore fish? I urge the Commission to grant the variance but with a five percent higher level of dissolved gas in both the forebays and the tailraces in the spirit of adaptive management. There have been significant increases in adult returns benefiting from spill in previous years.

Spill needs to be high enough to obtain an 80 percent fish passage efficiency at all dams.

Brent Bowler, Columbia River Coordinator, Idaho Department of Fish and Game

Mr. Bowler stated that he is representing the State of Idaho which supports the variance for smolt migration. One of the key measures that can be taken to improve salmon migration is spill until such time as modifications are made to dams. Spillway passage is currently the best means of passing fish by dams. The State of Idaho supports an 80 percent fish passage efficiency as a risk-spreading strategy.

Controlled spill is important from a research point of view. It is part of looking for long term options for salmon. A spill program must have adequate monitoring. Mr. Bowler is confident that the monitoring and research conducted in 1995 was adequate. He urged the Corps of Engineers to complete the repairs to the damaged turbines at Ice Harbor as soon as possible. Improved survival accompanied the higher spill in 1995 as compared with 1994.

Margaret Filardo, Fish Passage Center

The Fish Passage center compiles fish passage statistics, and since 1994 has been tasked with collecting TDG data. In 1995 17,725 juvenile salmon smolts were observed. Of these, 242 fish (or 3/10 of 1 percent) showed any signs of gas bubble disease. No signs were above the lowest in severity.

The Fish Passage Center provided a critique of the Cramer report commissioned by the DSI's. The Fish Passage Center met with the contractor on December 15, 1995 to discuss the lack of confidence intervals in the study. This report is now in its third iteration, and the Fish Passage Center is currently reviewing it. Riverine conditions were comparatively better in 1995 than they were in 1994. While there were higher gas levels, there was also higher survival. Survival of year old salmon was 61 percent in 1994 compared to 77 percent in 1995. The same rates for steelhead were 62 percent in 1994 compared to 78 percent in 1995. Survival for both species in 1995 was 92 percent.

Jim Myron, Interim Conservation Director, Oregon Trout

Oregon Trout was the lead agency in a petition to save the fish. Mr. Myron asked, how are the fish doing? He replied that they are going extinct. He agrees with Mr. Applegate that we need to take some risks on behalf of the fish.

Dianne Valentine, Oregon Natural Resources Council

Ms. Valentine believed the Commission should grant the variance because the higher flow and spill, along with the monitoring indicating no signs of gas bubble disease, suggests that 1995 was a success. Ms. Valentine supports the achievement of an 80 percent fish passage efficiency as being necessary to implement the NMFS biological opinion.

She stated that it would be nice to get away from the yearly circus. Now that adequate monitoring is underway, the Commission should consider a multi-year variance next year.

Tony Nigro, Oregon Department of Fish and Wildlife

ODFW supports the request for a variance for seven reasons.

1. Snake and Columbia River runs of salmon are in crisis. Wild spring Chinook salmon that used to number 2,000,000 in the 1880s presently number 2,000. If this trend is not reversed, recovery of these fish cannot be assured.
2. Survival must be improved immediately. Current long term average survival needs to be doubled or tripled.
3. Survival past dams needs to be improved. There is no single measure that can assure this. Survival can be improved if fish can avoid the turbines.
4. Means other than mechanical by-pass systems are needed to achieve a passage of 80 to 90 percent of fish past the turbines.
5. Spill is the only means of routing fish past turbines. The number of fish avoiding turbines increases with spill. At 110 percent, only 65 percent of fish are routed away from turbines.
6. NMFS's monitoring has proven to be responsible and provides real-time monitoring of the spill program. Various detection levels were used in searching for gas bubbles ranging from 4X to 40X magnification. One third of one percent showed any signs of gas bubbles. Of 1,200 fish sampled at Bonneville and Ice Harbor, none showed signs of gas bubble trauma.
7. The benefits of decreasing turbine mortality overcome the dangers from dissolved gas. Survival was higher in 1995 than in 1994 when both spill levels and gas were less.

Consistent with last year's testimony, the 1995 spill demonstrated that fish can sound and have lower mortality. Juvenile and adult fish may be able to avoid supersaturated water. The sub-lethal effects of elevated levels of total dissolved gas are likely no more than the sub-lethal effects of turbine passage.

Last year's scientific predictions stated that there would be significant mortalities associated with spill. They failed to discuss their assumptions. The facts are that there were no mortalities in migrating fish, and overall survival was high. There are technical flaws in the Cramer studies. Reviews of the *1995 Project Spill Review* suggest that there are difficulties with the confidence intervals.

It is time to act. The monitoring program is in place. The NMFS petition is reasonable but conservative. Approving it will bring about significant improvements.

Raphael Bill, Confederated Tribes of Umatilla

The Confederated Tribes of Umatilla have lived in the Columbia Basin for tens of thousands of years hunting, picking berries and fishing in the streams. The Tribes are close to the land and the salmon. They did not attempt to manage the salmon because they lived in harmony with them. The salmon belong in the river, not in trucks or in barges. Dams have changed the rivers for the worse. The best way to the ocean is through spill over the dams.

Mr. Bill requests that the Commission grant the variance. Spill is required to avoid fish being crunched in turbines or suffocating in trucks. Removing fish from the river results in them dying or suffocating, or they do not receive an imprint. Mortalities from spill are less than other methods. The only safer method is to tear out the dams, but Mr. Bill is not asking for that, he is asking for spill.

The treaty of 1855 asks for Tribal rights and for salmon at the usual and accustomed places. If this were not to be protected, Tribal ancestors would not have signed the treaty. Scientists are telling us what the elders already know, that fish belong in the river. Industry groups using junk science have deliberately misled the issue. There were 90,000 mortalities in 1994 due to transport, but no mortalities from spill.

Mr. Bill urged the Commission to consider an even more generous variance than the one sought.

Jim Griggs, Confederated Tribes of Warm Springs, and Columbia River Inter-Tribal Fish Commission

The Commission is faced with two requests to benefit outmigrating salmon. Neither of these requests go far enough. Mr. Griggs requests at least 125 percent supersaturation. Salmon survive better at 125 percent or higher than they do in trucks or through turbine passage. Salmon is important to the tribes. It is culturally important.

Industry predictions on spill last year were wrong.

The Spring Creek Hatchery tle Chinook contribute to the ocean fisheries. They are a full commercial treaty fishery. The Tribes have sacrificed their commercial fisheries. The

Spring Creek fish would provide additional fish for commercial fishing. These fish will also reduce harvesting pressure on the threatened and endangered species.

Spill is also important for the migration of the Pacific Lamprey. We need to focus on fixing the problems so that we can achieve an 80 percent fish passage efficiency and a 90 percent survival and a 110 percent total dissolved gas standard. The Corps needs to provide gas abatement devices. The Commission should ask the Corps to install these to help meet high runoff situations or low power market conditions.

Jonathan Poisner, Conservation Chair, Sierra Club

The Sierra Club supports the spill. Mr. Poisner agrees with all previous speakers. He wishes to see the annual process stopped in favor of a more permanent solution.

In addition to the above oral testimony, written testimony, as summarized below, was received from the following persons:

Raphael Bill, Confederated Tribes of Umatilla

As summarized above.

Jim Griggs, Confederated Tribes of Warm Springs and Columbia River Inter-Tribal Fish Commission

As summarized above.

Merritt Tuttle, Northwest Sport Fishing Industry Association

As summarized above.

Susan A. Foster, Ph.D., Mount Hood Community College

As summarized under the testimony of Liz Hamilton, Northwest Sport Fishing Industry Association.

Frank Warrens, Pacific Fishery Management Council

As summarized under the testimony of Liz Hamilton, Northwest Sport Fishing Industry Association.

Rick Applegate, Trout Unlimited

as summarized above.

Don Weitkamp, Ph.D., Parametrix, Inc.

Allowing the gas levels to reach 120 percent in the forebay of dams poses a considerable risk to biological resources. A level of 120 percent in the forebay means the level in the tailrace of the dam upstream has been considerably higher for 12 hours. Gas levels of 125-130 percent will risk as much damage to salmon as will be caused by turbine passage. These losses will not be measured because dead fish will disappear in reservoirs.

Dr. Weitkamp urges that 120 percent be established as the maximum level of dissolved gas for spill.

Alan Henning, Acting manager, water Quality Unit, EPA

Region 10 of the U.S. Environmental protection Agency supports the NMFS request for a short term variance. EPA believes that granting the requested variance will benefit salmon recovery efforts.

James Buchal, Ball, Janik & Novack

The terms of reference presented to the NMFS expert panel on gas bubble disease are too restrictive. They confine themselves to whether the smolt monitoring program provides enough data to protect migrating juvenile and adult salmonids, rather than broader questions about whether spill is benefiting fish. The Commission should not grant this waiver.

In a separate communication, Mr. Buchal alludes to results obtained from ODFW's FLUSH model. He also enclosed a memorandum from the Department of Justice explaining that results obtained from the model, and any modifications made to it, violated a court order. Neither the model nor results obtained from it may be presented to the EQC. Mr. Buchal notes that in court, concealed evidence is deemed to be adverse to the party concealing it, and he hopes we will draw the same inference here.

James Conley, North Santiam Watershed Council

Mr. Conley thinks the NMFS request is too conservative, and the Commission should approve a waiver for TDG not to exceed 125 percent at tailwater monitors below dams. This would enable an 80 percent fish passage efficiency.

Margaret Filardo, Fish Passage Center

As summarized above.

Tony Nigro, Oregon Department of Fish and Wildlife

As summarized above.

Ted Strong, Columbia River Inter-Tribal Fish Commission

CRITFC recommends the Commission approve a variance for the Spring Creek Hatchery Release of 120-125 percent dissolved gas. The Commission believes levels of up to 130 percent where supersaturated water mixes with river currents is reasonable. CRITFC recommends this along with a number of conditions including that monitoring should occur all year round, that the Corps should install gas abatement devices on its dams, that physical and biological monitoring should accommodate adaptive management whereby experiments could be run to answer critical uncertainties.

Much of the rationale for this request is contained in ODFW and the Tribe's *1995 Spill and Risk Assessment*. CRITFC has provided a table in summary of its scientifically based evidence that higher levels of gas benefit fish that shows that with gas levels up to 125 percent fish passage efficiencies increase and juvenile fish mortality conversely decreases.

Nanci Tester, Direct Service Industries

The Direct service Industries forwarded the latest report by S.P. Cramer and Associates entitled *Seasonal Changes in Survival of Yearling Chinook Smolts Emigrating Through the Snake River in 1995 as estimated from Detections of Pit Tags*. The report is dated February 1996.

Despite four iterations of Cramer's report, the conclusions have remained constant, *i.e.* that there is a significant decrease in survival of fish exposed to elevated gas levels. Snake River endangered fish were left in-river the longest and were subject to the greatest exposure to elevated levels of gas.

The fisheries agencies requesting the variance should provide a full justification for the request rather than relying on critiques of work commissioned by others. Direct Service Industries offer the following alternatives for Commission action:

- (i) denying the request;
- (ii) conditioning any variation to the standard on demonstrable proof of benefit;
- (iii) allowing only a partial increase such as 110 percent in the forebay and 115 percent in the tailrace;
- (iv) limiting the number and/or duration of projects spilling;
- (v) providing a safe haven from gas supersaturation at an intermediate project by limiting gas exposure and duration; or
- (vi) conditioning approved gas levels on rigorous real-time monitoring data.

Revised 25 January 1996

DRAFT
NATIONAL MARINE FISHERIES SERVICE
GAS BUBBLE DISEASE MONITORING PROGRAM

1.0 Introduction

The goal of this program is to establish a comprehensive biological and physical monitoring program to determine the prevalence of signs of gas bubble disease in migrating salmonids resulting from increased spill at lower Snake and lower Columbia River hydropower projects to achieve an 80% fish passage efficiency (80% of the fish pass through non-turbine routes) established in the 1995 Federal Columbia River Power System (FCRPS) Biological Opinion (for further information regarding this opinion see Appendix A), and to provide real-time information regarding the effects of spill on total dissolved gas levels throughout these rivers. Biological (aquatic biota) and dissolved gas monitoring is necessary to ensure that any potential adverse effects from increased spill can be identified and evaluated against the expected increases in survival from spill.

This document is intended to provide a description of the activities and methods the National Marine Fisheries Service (NMFS) is employing in 1996 to manage FCRPS Biological Opinion spill and resulting total dissolved gas levels. The activities described below are the culmination of numerous preseason meetings and working sessions involving the regional fish, water quality, and hydropower management agencies. Information collected as a result of these monitoring activities will be used to craft future gas monitoring and spill management activities.

The spring and summer spill operations contained in the 1995-1998 FCRPS Biological Opinion are scheduled to be initiated in 1996 at selected lower Snake River hydropower projects on April 10 and selected lower Columbia River projects on April 20 and are scheduled to continue in both river reaches through August 31. The selection of spilling dams will differ between spring and summer migration periods and will depend on projected flow conditions. This is further explained in Appendix A. Management of spill operations will be coordinated through a technical management team (TMT) consisting of representatives of the federal agencies responsible for hydrosystem operations. The total dissolved gas management criteria they will use for guidance are further described in section 6 below.

1.1 Review of the 1995 Monitoring Season

The following is a brief review of the results of the 1995 monitoring season activities. More comprehensive reviews are available from the U.S. Army Corps of Engineers (COE) and Columbia Basin Fish and Wildlife Authority's Fish Passage Center (FPC).

1.1.1 Biological Monitoring

During the 1995 spill season, a total of 55,782 juveniles were examined at six lower Snake and lower Columbia River Dams. Twenty percent of these were examined using 10-20 power dissecting microscopes and 80 percent were examined under four power lenses. Less than 1% (231) of the total showed GBD signs (1.9% of those examined with dissecting scope showed signs) between April 15 and July 1. All signs were rank 1 in severity (Rank 1 = 1-25% of affected area covered with bubbles). Observations of juvenile migrants in the reservoirs was limited in 1995. However, the juvenile salmon that were examined did not exhibit a noticeable difference in GBD signs from those examined at the dams. More reservoir investigations will be conducted in 1996.

Adult salmon were examined at Bonneville, Lower Granite and Priest Rapids Dams. At Bonneville Dam, 1,223 adult chinook, and sockeye salmon and steelhead were sampled, with none exhibiting signs of GBD. This represented 3.2% of the combined adult run for these species at this site. At Lower Granite Dam, 518 adult chinook salmon, or about 14% of the chinook run, were sampled, also without showing any signs of GBD. However, 6.4% of these fish exhibited a condition known as "head burn". Although head burn has not been demonstrated to be a sign of GBD, but its occurrence does appear to be correlated to periods of high spill and flow. Although not a formal component of the 1995 GBD monitoring plan, the Columbia River Intertribal Fish Commission examined adult salmonids at Priest Rapids Dam as part of other ongoing work. As a result of this effort, 691 adult chinook, and sockeye salmon and steelhead were sampled, with signs of GBD noted in 1.6%. The majority (8 of 11 or 73%) of these signs were observed in adult sockeye salmon.

Resident species were monitored by NMFS at sites below Bonneville and Ice Harbor dams and above Priest Rapids Dam. Below Bonneville Dam, 2,886 resident fish were monitored with only 2 (0.07%) showing signs of GBD. A much higher prevalence of GBD was noted below Ice Harbor Dam where 261 (9.4%) of 2,761 resident species showed signs of GBD. Of these, 88% of the signs were observed between May 9 and June 16 when Ice Harbor tailwater TDG was involuntarily well above the 120% limit due to turbine outages and involuntary spill. Upstream from Priest Rapids Dam,

signs of GBD in fish were observed only during the weekly sampling period ending on 1 June, when about 5% of resident fish sampled exhibited signs of GBD. Very few invertebrates were found to exhibit GBD signs at any monitoring site.

1.1.2 Dissolved Gas Monitoring

Dissolved gas monitoring at 26 lower Snake and Columbia river monitoring sites by the COE revealed that TDG was held at or below the modified state water quality standards for the majority of the 1995 spill season at all projects, except during periods when the total river flow exceeded the powerhouse plus voluntary spill capacity of the project. This involuntary condition occurred most frequently at the three lowest Snake River dams and at McNary and John Day Dams in the lower Columbia River during late May and early June.

Difficulty in maintaining and operating new dissolved gas monitoring equipment limited data availability and usefulness at several monitoring sites, primarily at Ice Harbor and McNary Dams. A post season study by the Northwest Power Planning Council (Bisbal and Ruff, 1995) indicated that "A wide range of anomalies (data missing or in error) was detected in over one third of the COE's gas data base. Severe anomalies (extending over 8 h in a day) were found in 16% of the records." While most of the difficulties that caused these anomalous data were addressed and corrected inseason by the COE, the data reported on the CROHMS data base were not corrected on a real-time basis. This lack of real-time error checking was the cause of some confusion among the co-managing agencies during inseason management activities.

Both the Walla Walla and Portland Districts of the COE collected extensive TDG data from horizontal and vertical transects throughout the river to better understand how well the fixed monitoring sites represented the local river conditions. These data continue to be analyzed at this time and final reports will be available from the COE as they are completed.

1.2 1996 Dissolved Gas and Biological Research

To gain a better appreciation of the degree of effort the regional fishery, water and hydropower management agencies are using to address TDG supersaturation issues, it is necessary to touch briefly on work elements outside of the scope of the monitoring program per se. The following is a very brief treatment of the various investigative efforts that will be employed during the 1996 spill season to improve our knowledge of how TDG supersaturation affects the physical and biological parameters of aquatic environments. Through these investigations, NMFS intends to validate and improve the monitoring program and ultimately reduce the scope and need for

this currently cumbersome and costly monitoring effort.

1.2.1 Dissolved Gas Research

1.2.1.1 Transect Measurements

Both the Walla Walla and the Portland Districts of the COE will continue conducting transect measurements in selected reaches of the lower Snake and lower Columbia Rivers in 1996. These efforts are focused on developing a better understanding of how fixed monitoring site data relates to other locations in the river and how TDG mixes and changes downstream from a spilling hydroelectric project. More detailed information, including transect locations and data collection protocol, is available from the two COE district offices.

1.2.1.2 Gas Abatement Program

The COE is also conducting an extensive effort to determine and implement methods of reducing TDG caused by spill at FCRPS hydroelectric projects. This program includes development and installation of spillway flow deflectors at selected projects, assessment of spillway stilling basin modifications, and an analysis that may identify other potential TDG reducing modifications. Extensive dissolved gas data will be collected and used to develop tools such as predictive dissolved gas distribution models to assist in predicting and managing dissolved gas in problem areas.

1.2.2. Biological Research

Research necessary to address critical assumptions inherent to the biological element of this monitoring program will be conducted in 1996 under a separate program (see NMFS Gas Bubble Disease Research Program; available from the NMFS Portland office). Projects that relate to primary concerns regarding monitoring effectiveness and the relevance of the signs of gas bubble disease are the focus of this research program. The critical assumptions being investigated are 1) dam passage causes no changes in GBD signs of juvenile salmonids, 2) sampling and sampling sites are sufficient to discern mortality, 3) GBD signs accurately index biological impacts and 4) parameters and protocols of clinical assessments most effectively characterize GBD. Often asked questions regarding the relevancy of specific signs of GBD such as bubbles in gill filaments for estimating potential mortality, and what magnification is appropriate for the early detection of GBD signs are addressed in this program. The results of these projects will be thoroughly reviewed by a scientific review group and will be considered by NMFS for addition to future monitoring programs.

2.0 Dissolved Gas Monitoring

The U.S. Army Corps of Engineers is responsible for measuring and reporting concentrations of TDG in water at selected locations on the Columbia and Snake rivers as described in the Dissolved Gas Monitoring Program Plan of Action for 1996 included in the COE's updated Fish Passage Plan, and referenced in the FCRPS Biological Opinion. It is critical that the COE maintain monitoring instruments and telemetry equipment and that all available data be entered onto the Columbia River Operational Hydromet Management System (CROHMS) on a timely basis during this spill program. Dissolved gas monitoring instrumentation will be checked and calibrated regularly, as described in 2.3 below. The following is a brief overview of the COE's monitoring plan. For more information, see Appendix B.

2.1 Monitoring Locations

For the 1996 monitoring season, the North Pacific Division (NPD) COE, has established a network of 37 dissolved gas monitoring sites in the mainstem Columbia, lower Snake and lower Clearwater Rivers. These monitors are located in the forebays and tailraces of all mainstem dams. In addition there are backup and supplementary monitors downstream from Dworshak, Ice Harbor, Priest Rapids, and Bonneville dams. Twenty-eight of these monitors were installed and maintained by the COE, two by the Bureau of Reclamation and seven by the mid-Columbia Public Utility Districts.

2.2 Measurement Technique and Frequency

Total dissolved gas pressure, TDG saturation percent, barometric pressure, water temperature, and pertinent project operating data will be recorded hourly using state-of-the-art automated dissolved gas monitoring devices. These data will then be transmitted, either every four hours or twice per day depending on the level of monitor automation, through Geosynchronous Operational Environmental and Domestic Communications Satellites to the COE, NPD CROHMS data base in Portland, Oregon. Daily reports are available to authorized users through the CROHMS Automated Front End (CAFE) on a real-time basis. These data will ultimately be available to all interested parties via Fish Passage Center daily reports as explained in section 5 below.

2.3 Quality Assurance/Quality Control

Data accuracy and consistency are critical to successful spill management. Quality control of data collection and reporting is the responsibility of the COE.

The accuracy of each monitoring instrument will be verified

at least once each week. Measurements will be made of barometric and TDG pressure, water temperature, and dissolved-oxygen concentration using a portable field instrument that has been previously calibrated to local conditions. If the monitoring instrument values are found to yield TDG values greater than three percent different than those provided by the calibrating equipment, the magnitude of corrections will be reported to the fisheries and water quality management agencies within 24 hours.

In addition to instrument verification, data verification will be accomplished by the COE's NPD Reservoir Control Center (RCC) through comparison with expected model or empirical values. Raw data will be immediately posted on the CROHMS system upon receipt from the field. However, by noon of each day, suspect data will be identified and, when possible, corrected by the RCC personnel and reported to the Fish Passage Center for their use in meeting the reporting requirements outlined in section 5 below.

Data continuity will be assured through rapid repair of faulty instruments and the deployment of at least one backup monitoring instrument at selected key spill management locations. For 1996, these locations are Ice Harbor tailwater and McNary-Oregon forebay. The backup monitors that were placed below Bonneville Dam and in The Dalles forebay in 1995 and the primary Hood Park monitor (below Ice Harbor Dam) will not be deployed in 1996. Data from these sites were of limited value to river managers in 1995 and are not expected to be necessary in 1996. Their elimination will allow limited maintenance funding and time to be spent on more important monitors. At least one backup monitor will be made available for deployment as necessary in each COE district. In any case, a malfunctioning monitor will be repaired within 24 hours, if TDG is expected to meet or exceed the current state standard at that site and within 48 hours at sites where TDG levels are expected to stay below state standards.

3.0 Biological Monitoring Program

The biological monitoring program will include assessment of signs of GBD in migrating juvenile and adult salmonids, and in resident fish species. Many of the tasks that were placed in this section in previous descriptions of the NMFS GBD Monitoring program have been more appropriately relocated to the NMFS research program document referenced in section 1.2 above. These include net pen holding experiments, adult and juvenile salmon distribution experiments, and monitoring protocol development. In addition, resident invertebrate monitoring will not be conducted in 1996. Few signs of gas bubble disease were found in invertebrate species monitored in several river reaches during 1993, 1994, and 1995, despite periods of high TDG supersaturation. Additional river sampling in 1996 would be

unlikely to provide additional information. However, alternative sampling methods at other sites and laboratory studies will continue as described in the NMFS research program document.

3.1 Salmonid Gas Bubble Disease Monitoring

Juvenile salmonids will be routinely monitored for signs of GBD by the Smolt Monitoring Program and by NMFS in planned river reach resident monitoring efforts. Adult salmon will be monitored by selected agencies and/or their contractors for signs of GBD as they ascend fish ladders at selected Snake and Columbia River Dams.

3.1.1 Smolt Monitoring

3.1.1.1. Fish Passage Center Monitoring

The Fish Passage Center (FPC) conducts a system-wide juvenile salmonid smolt monitoring program (SMP) on the Snake and Columbia Rivers. The FPC is responsible for maintaining extensive historical and real-time databases of dissolved gas and biological monitoring data pertaining to the juvenile outmigration. Under the direction of the FPC, GBD monitoring will be conducted at seven sites - Lower Granite, Little Goose, Lower Monumental Dams on the Snake River, Rock Island Dam on the mid-Columbia River, and McNary, John Day and Bonneville Dams on the lower Columbia River.

Specific information regarding smolt monitoring protocol is contained in Appendix C. Briefly, a daily maximum of 200 juvenile salmonids will be examined at each monitoring site (except at Rock Island where the maximum will be 100 chinook). This sample will consist of chinook and steelhead at all Snake River sites and will include other salmonid species at lower Columbia River sites. A sample size of 100 fish will result in an estimate of the prevalence of GBD with a 95% confidence interval of $\pm 6\%$.

The sampled fish will be examined using a variable magnification (10X to 40X) dissecting scope. Unpaired fins, eyes, and lateral line will be examined for the presence of bubbles. At each dam, fish to be sampled will be taken from the separators (Snake River dams and McNary) or sampling device (Rock Island, John Day and Bonneville), held in water from the bypass system, and examined within 15 minutes. For each fish, time of day the fish was examined, species origin (hatchery, wild, etc.), fork length, rank of GBD in each fin, rank of GBD in the eye with the greatest rank, length of lateral line occluded, total length of lateral line (if occlusion is present), and comments on general fish condition will be recorded. These data will then be faxed and transmitted by modem to FPC's data center on a daily basis.

Research addressing relationships of bubbles in gill filaments to other signs of GBD and mortality will be conducted at McNary and Bonneville Dams and in the laboratory. This research will include evaluation of methods for non-invasive examination as well as evaluation of the power of magnification necessary for proper examinations.

3.1.1.2. Smolt Monitoring at Ice Harbor Dam

A new bypass system and smolt sampler will be operational at Ice Harbor Dam in 1996. In the process of evaluating this new system, NMFS biologists may be able to examine a limited number of outmigrating juvenile salmon. The ability to obtain samples at this location would greatly reduce the concern that McNary Dam samples do not adequately assess the condition of smolts exiting the lower Snake River. NMFS is currently investigating the feasibility of this option.

3.1.2 Adult Monitoring

Adult salmon migrating upstream will be sampled in the fish ladders at Bonneville and Lower Granite Dams. Additional sampling may occur at Ice Harbor Dam depending on observations of signs of GBD in adult salmonids at dams above and/or below this site. See Appendix D for further information on sampling and examination protocol.

3.1.2.1 Bonneville Dam

The ongoing Pacific Salmon Treaty research of adult chinook and sockeye salmon stock identification and scale pattern analyses conducted by the Columbia River Inter-Tribal Fish Commission (CRITFC) will include an assessment of signs of GBD.

Evaluations will be conducted on adult salmonids entering the trap in the north shore fish ladder of Bonneville Dam. Intercepted fish will be anesthetized and examined visually for external signs of GBD. Following recovery, fish will be released back to the fish ladder.

Sampling will be conducted 3 days per week, 6 to 8 hours per day. Even with a fixed sampling rate, the percentage of the project passage of upstream migrating adults that is intercepted will depend largely on flow distribution between the powerhouses and spillway. It is expected that this percentage will be well under 5%.

If any signs of GBD are noted in adult salmonids at Bonneville Dam, the monitoring frequency will be increased to daily and CRITFC will notify NMFS and the FPC as soon as possible. The duration of daily monitoring will be determined by the TMT with consideration for the ESA directed take allowance

for this activity.

3.1.2.2 Ice Harbor Dam

Because of the concerns regarding the impacts of handling adults in the limited trapping facilities at Ice Harbor Dam, adult sampling will be conducted there only to confirm signs of GBD noted at Lower Granite Dam. The final decision to implement adult migrant sampling at Ice Harbor Dam will be made in-season by the TMT. If necessary, a sampling effort similar to that at Bonneville Dam can be implemented at Ice Harbor Dam. If in-season conditions indicate the need for extensive sampling, the adult sampling facilities and/or procedures will require modification to ensure an unbiased evaluation. Holding time for adult salmonids at ambient reservoir dissolved gas levels should not exceed 30 minutes prior to examination.

Sampling of adult migrant salmonids will be not be conducted during the summer spill period. Water temperatures in the lower Snake River are expected to be above 21° C. in late July and August. Adults are easily stressed and killed when handled at these temperatures.

3.1.2.3 Lower Granite Dam

Adult fish passing Lower Granite Dam are routinely trapped, anesthetized, and examined for marks and to assess general physical condition. For the duration of the proposed 1996 spill program, trapped adult salmonids will be anesthetized and examined for external signs of GBD. After recovery from the anesthetic, adults will be returned to the ladder to continue their migration. The trap is operated about 8 hours per day and 7 days per week; overall sampling rate is about 10 percent of fish passing Lower Granite Dam.

3.1.2.4 Mid-Columbia River

Monitoring adult salmonids for signs of gas bubble disease in this section of the Columbia River will occur only on fish obtained for other fishery management or research purposes. It is expected that adults will be collected for broodstock purposes at Wells Dam. These fish will be examined for signs of GBD. (Coordination of this effort has not been completed at this time.)

3.2 Monitoring of Resident Fish Species

During the 1996 spill season, NMFS will monitor for signs of GBD in resident fish species at three river reaches; Priest Rapids Reservoir, downstream from Ice Harbor Dam, and downstream from Bonneville Dam. Sampling will occur once each week from

April through July or August (depending on site location). Up to 100 individuals of the predominant taxa will be collected and examined at each site. If TDG levels exceed 115% and/or signs of GBD are detected, sampling effort will be increased to include additional sites in the affected river reach. Data collected will include fish species, life-history stage, size, location of capture, macroscopic and microscopic external signs of GBD including examinations of lateral lines, fins, and eyes and dissolved gas supersaturation at the sample site.

For a more complete description of 1996 resident aquatic species monitoring and evaluation, see Appendix E.

3.3 Quality Assurance/Quality Control

Each biological monitoring agency will be responsible for an internal quality assurance/quality control function. These efforts are explained for each element of the monitoring program in the appendices at the end of this document.

Briefly, several quality assurance/quality control checks will be included in the salmon and resident fish monitoring efforts. In the early weeks of the spill program, a supervisory fishery biologist, with expertise in the GBD examination process will visit each monitoring site on a weekly basis to assess the accuracy of the examinations and data recording process. Daily, throughout the spill season, data entered at the monitoring site will be checked by the person entering the data. Data faxed to the FPC will be checked by the person sending the fax against raw data to insure that the summary data are correct. Data summaries sent to the FPC data center will be faxed and sent in spreadsheet format via modem. The raw data will also be transmitted in spreadsheet format via E-Mail to the data center. This data will be checked against the summary data prior to transfer to the permanent database. Any errors will be corrected and documented.

4.0 Program Quality Assurance/Quality Control

Individuals knowledgeable in the field of dissolved gas research and management were invited to participate in discussions regarding dissolved gas issues by NMFS in early 1995. This Gas Bubble Disease Technical Work Group (GBDTWG) was recommended by the Gas Bubble Disease Working Group convened by NMFS in November, 1994. The GBDTWG is co-chaired by NMFS and the Environmental Protection Agency. It includes participation by the state and federal agencies and tribal governments that share responsibility for managing water quality and fisheries in the Pacific Northwest, and other interested parties. This working group will consider the monitoring program, the quality and interpretation of the monitoring data and short-term and long-term research needs.

The GBDTWG will establish a monitoring oversight team of scientists knowledgeable in physical and biological aspects of dissolved gas monitoring to review the GBD monitoring program during the period of increased spill. This monitoring subgroup will conduct routine on-site reviews of sampling and monitoring protocols. These reviews will be independent of any quality control/quality assurance efforts implemented by the monitoring agencies. Any problems or deficiencies identified by the monitoring oversight team will be reported to the GBDTWG for immediate coordination and response by the responsible entities or cooperating agencies.

5.0 Reporting

The Fish Passage Center will serve as the central repository for information collected from GBD biological monitoring in the Columbia River Basin. The COE will continue to serve as the central repository for dissolved gas monitoring data.

Results of monitoring activities will be compiled daily by the FPC and COE; the FPC will then assemble these data sets into an agreed-upon format (see Appendix C) and provide the compiled information on a daily basis to the fisheries managers and all interested parties including the TMT, Oregon DEQ and Washington DOE.

Included in the compiled information will be 1) 12⁰⁰ and 24⁰⁰ hour average and maximum TDG levels for the forebay and tailrace of each mainstem dam, river locations downstream from Bonneville Dam, and backup monitors and 2) sample size, prevalence and rank of external signs of GBD among juvenile and adult salmonids sampled at each sampling site and resident fish sampled in river reach monitoring. A cover memo will also be included which will include any caveats or other items of interest pertaining to the TDG monitoring program or report data.

6.0 Action Levels

6.1 Total Dissolved Gas Concentrations

6.1.1 Lower Snake and Lower Columbia River

Specific monitoring sites for the purposes of in-season dissolved gas management should be selected on the basis of data consistency and relationship to expected fish exposure. Until it can be determined how tailrace monitoring stations relate to the river reaches between monitoring sites and how TDG data collected at these sites relates to fish experience, NMFS recommends the use of forebay monitoring data for in-season management. Water quality agencies, however, have recommended that monitoring occur

in the dam tailraces where highest TDG concentrations occur. While NMFS believes that tailrace monitors are of limited usefulness at this time, they probably best estimate maximum acute exposure, particularly for adults. In 1996, TDG management will utilize both monitoring locations as explained below.

The management action calls for spill levels necessary to meet the FCRPS Biological Opinion requirements of 80% fish passage efficiency at each spilling project below Lower Granite Dam on the lower Snake and lower Columbia Rivers. Regardless of spill requirement, spill will be reduced as necessary when the 12-hour average TDG concentration exceeds 115% of saturation (or as limited by state water quality standard modifications) at the forebay monitor of any Snake or lower Columbia river dam or at the Camas/Washougal station below Bonneville Dam. Spill will also be reduced when 12 hour average TDG levels exceed 120% of saturation (or as limited by state water quality standard modifications) at the tailrace monitor at any Snake or lower Columbia River dams. Average concentrations of dissolved gas will be calculated using the 12 highest hourly measurements per calendar day.

6.2 Prevalence of GBD

Steps will be taken to reduce total dissolved gas levels in the river above the monitoring location(s) when external signs of GBD on juvenile salmon exceed the following action levels. If such a reduction becomes necessary, forebay and tailrace dissolved gas level readings should be adjusted through methods recommended by the TMT, subject to review and approval by the DOE, DEQ, and the NMFS Regional Director, as described in section 1.0.

6.2.1. Action Levels Based on Monitoring of Juvenile Salmonids

With the current level of scientific understanding, the biological signs of GBD observed at a particular level of TDG are difficult to correlate to in-river mortality of juvenile salmonids. Prior to the spill season, the NBS began experiments at the Columbia River Field Station to correlate signs of GBD and mortality levels with dissolved gas exposure history. The preliminary results of these studies based on limited data indicated that, although bubbles in gill lamellae did not appear to be a reliable indicator of either exposure history or impending mortality, bubbles in the lateral line and unpaired fins showed promise. The NBS was also unable to develop a reliable non-lethal method of examining gill lamellae in salmonids prior to the spill season. Results to date, based on limited data suggest that, at least for the 1995 season, unpaired fin bubble content was probably the best GBD sign to use for determining the risk of mortality due to exposure to high levels of TDG.

Action to reduce the level of dissolved gas supersaturation should be taken if 15% of the fish examined exhibit any bubbles on unpaired fins or 5% of the fish examined exhibit bubbles covering 25% or more of the surface of any unpaired fin. These action levels are a conservative interpretation of the recent NBS results which indicated that significant mortality did not occur in the test fish until approximately 60% exhibited bubbles in the fins or 30% exhibited bubbles covering 25% or more of any unpaired fin. These levels were reduced primarily because the NBS tests were limited in scope and the results were preliminary. Further modification of these action levels may occur in-season as the NBS and other research efforts progress.

6.2.2. Action Levels Based on Monitoring of Adult Salmonids

Very little information is currently available to help determine biological action levels for adult salmonids. Therefore, NMFS recommends that actions to reduce dissolved gas levels be taken when any of the adult salmon examined at adult monitoring locations described in section 3.1.3. above exhibit external signs of gas bubble disease. To be certain an observation is not an anomaly, this action threshold will only be triggered with observations on two or more fish during the same day at the same sampling site or one fish on two or more successive sampling periods at the same sampling site.

Survival of upstream migrating adult salmon is especially critical. The above limit is based on a no-harm standard.

6.3. Dissolved Gas Management

The Working Group of Gas Bubble Disease Experts assembled by NMFS in June, 1994, advised that, based on our current level of understanding primary dissolved gas management should occur on the basis of dissolved gas monitoring results. This expert working group believed that current biological monitoring methods and our understanding of the biological signs were not sufficiently developed for inseason management purposes. Research programs conducted in 1995 and those scheduled for 1996 address these deficiencies. For the 1996 spill management season, however, dissolved gas measurements will again be used as the primary parameter for dissolved gas management, as outlined in section 6.1.1 above. Biological indicators will serve a fail safe function, indicating a failure in our assumption that our chosen TDG limits are unlikely to cause harm greater than the benefits of spill, as indicated in the FCRPS Biological Opinion.

Dissolved gas and biological effects of spill will be evaluated in-season on a daily basis by the members of the Technical Management Team. This team includes technical representatives from the National Marine Fisheries Service, U.S.

Fish and Wildlife Service, U.S. Army Corps of Engineers, Bureau of Reclamation, Bonneville Power Administration. At weekly meetings (Wednesdays) or on an emergency basis, recommendations to continue or adjust spill will be reviewed by the TMT as identified in the FCRPS Biological Opinion. The TMT will forward operational recommendations to the COE for implementation. The recommendations to modify spill will be based on the results of dissolved gas and biological monitoring using the criteria described above.

Endangered Species Act - Section 7
Consultation

BIOLOGICAL
OPINION

Reinitiation of Consultation on 1994-1998
Operation of the Federal Columbia River
Power System and Juvenile Transportation
Program in 1995 and Future Years

Agencies: U.S. Army Corps of Engineers
Bonneville Power Administration
Bureau of Reclamation
National Marine Fisheries Service

Consultation Conducted By: National Marine Fisheries Service,
Northwest Region

Date Issued: 3-2-95

2. The COE shall spill at the Snake and Columbia River projects in order to increase fish passage efficiency and survivals at the dams.

The COE, during the juvenile spring/summer chinook migration season (April 10 - June 20 in the Snake River and April 20 - June 30 in the Columbia River), shall spill at all projects, including collector projects, to achieve a fish passage efficiency target of 80%, except under the following low flow conditions: During any week in which unregulated weekly average flows at Lower Granite Dam are projected to be less than 100 kcfs, no spill shall occur at Lower Granite Dam; during any week in which unregulated weekly average flows at Lower Granite Dam are projected to be less than 85 kcfs, no spill shall occur at Lower Granite, Little Goose, and Lower Monumental dams, unless the TMT recommends that spill occur. During the fall chinook migration season (June 21 to August 31 in the Snake River and July 1 to August 31 in the Columbia River) the COE shall spill at all non-collector projects to achieve a fish passage efficiency target of 80%.

It is NMFS' view that the best condition for an evaluation of the effects and efficacy of spill to improve inriver survival would be for a single spill regime to prevail throughout the spring migration season. NMFS' first draft of the biological opinion used a volume runoff forecast in the Snake River to trigger spill operations, which would then remain constant during the season. In making recommendations to spill at collector projects when flows are below target levels, the TMT should take into consideration the objective of having a credible evaluation of the spill program. Accordingly, TMT recommendations to spill at the above projects in the Snake and Columbia rivers at flows below the triggers specified should take into account past flow conditions and future flow projections, how close flows are to the trigger levels and how much augmentation is planned, the timing of the juvenile migration, and the need for a credible evaluation. If the use of weekly flow triggers compromises an evaluation, NMFS will consider returning to a volume runoff approach.

During low flow periods, spill at collector projects is reduced or eliminated in order to increase the proportion of fish transported. The discussion under measure 3 explains the rationale for increasing transportation under low flow conditions.

Spill levels calculated to obtain an 80 percent fish passage efficiency are listed below for each lower Snake and lower Columbia River dam. These levels are expressed in percent of instantaneous project flow during the spill period and were calculated with the best available information regarding spring and fall chinook salmon guidance efficiency, spill efficiency,

fish passage diel and project operating conditions. Spill periods are 24 hours at Ice Harbor, The Dalles and Bonneville Dams and 12 hours (1800-0600) at all others.

DAM	LGR	LGS	LMN	IHR	MCN	JDA	TDA	BON
% Flow, Spring	80	80	81	27	50	33	64	*
% Flow, Summer	**	**	**	70	**	86	64	*

* An 80% FPE level is not obtainable at Bonneville Dam given a day time spill cap of 75 kcfs and the current low fish guidance efficiency levels. This spill cap (in place to reduce adult fallback) limits obtainable spring FPE to 74% and summer FPE to 59% at 100 percent nighttime spill.

** Spill is not recommended at these projects for summer migrants.

The spill levels necessary to obtain this FPE may be limited by total dissolved gas (TDG) in the river between each project. Specific monitoring sites for the purposes of in-season dissolved gas management should be selected on the basis of data consistency and relationship to fish exposure. Until it can be determined how tailrace monitoring stations relate to the river reaches between monitoring sites and how TDG data collected at these sites relate to fish experience, forebay monitoring data will be used for in-season management. Water quality and other fishery management agencies have recommended that monitoring sites be located below mixing areas, the forebay monitors are the only presently established monitors that consistently provide mixed flow data. Tailrace monitors are of limited usefulness at this time, however, they probably best estimate maximum acute exposure, particularly for adults.

Spill will be reduced as necessary when the 12 hour average TDG concentration exceeds 115% of saturation (or as limited by state water quality standard modifications) at the forebay monitor of any Snake or lower Columbia river dam or at the Camas/Washougal station below Bonneville Dam or another suitable location to measure accurately chronic exposure levels. Spill will also be reduced when 12 hour average TDG levels exceed 120% of saturation (or as limited by state water quality standard modifications) at the tailrace monitor at any Snake or lower Columbia River dams. Average concentrations of dissolved gas will be calculated using the 12 highest hourly measurements per calendar day. The use of 12-hour averages, rather than 24-hour averages, is an attempt to set a more conservative standard, and to relate the measured concentrations of dissolved gas to the 12-hour spill cycles. Spill will also be reduced when instantaneous TDG levels exceed 125% of saturation (or as limited by state water quality standard modifications) for any two hours during the 12 highest hourly

measurements per calendar day at any Snake or lower Columbia River monitor.

The intent of these gas caps is to ensure that the long term exposure of adult and juvenile migrants is to TDG levels that do not exceed 115%. NMFS concludes this operation accomplishes that goal for several reasons. Radio telemetry studies indicate that juvenile salmonids tend to move out of tailrace areas within a few hours (Snelling and Schreck unpublished) and that adults tend to move about laterally in tailraces prior to ascending ladders (Johnson et al. 1982, Turner et al. 1983). These movement patterns limit exposure to high spill basin TDG levels. As spilled water moves out of the tailrace the TDG level decreases at some point below the project (depending on ratio of these flows and river topography) because the spilled water mixes with water from the powerhouse. For instance, Blahm (1974) found that, given moderate spill levels, the river was well mixed within 2.5 miles of The Dalles Dam and 15 miles below Bonneville Dam. The requirement that TDG levels in the forebay be limited to 115% will help ensure that areas where migrating juveniles may spend long periods of time do not have TDG levels in excess of 115%. Radio tag studies have indicated that some spring migrating juvenile salmon may be delayed from several hours to several days in these areas (Snelling and Schreck unpublished, D. Rondorf, NBS, February 24, 1995, pers. comm.). Finally, the fact that spill is intermittent at many projects will help limit dissolved gas exposure of fish holding in the forebays and other areas between the projects. This is particularly true for adult migrants.

After reviewing available information on dissolved gas exposure as well as information and recommendations submitted by the parties during the IDFG v. NMFS discussions, NMFS concluded that 115% TDG measured in the forebays was a reasonable interim measure to adopt. Several commenters argued that the Environmental Protection Agency's recommended water quality limit of 110% represented an appropriate level and should not be varied. State and tribal entities developed a risk assessment that suggested that long term exposure to 120% did not pose significant risks to migrating fish and that the benefits of improved dam passage outweighed these minimal risks of TDG exposure at 120%. Still other commenters noted the spill at collector projects reduced the numbers of fish transported and that any risk assessment had to consider the benefits of transportation. The issue of transportation is addressed more fully in measure 3 below.

NMFS concluded that it was appropriate to seek an operation that would result in the EPA criteria of 110% being exceeded primarily because of: 1) the ability of fish in a river environment to compensate hydrostatically for the effects of dissolved gas supersaturation, and 2) the daily fluctuation in levels of

dissolved gas throughout most of the river. In a river environment, depth of migration reduces TDG effects on migrants. Each meter of depth provides pressure compensation equal to a 10% reduction in TDG. Shew et al. (Undated) and Turner et al. (1984b) noted through tunnel studies that net entry rates through McNary and Bonneville dam ladder entrance tunnels were highest for the deepest (3.4m) tunnels. Other studies indicate that adult and juvenile salmon tend to spend most of their time at or below one meter of depth (Smith 1974). Blahm (1975) concluded that shallow water tests were "not representative of all river conditions that directly relate to mortality of juvenile salmon and trout in the Columbia River." In deep tank tests, salmonids exposed to 115% TDG levels did not experience significant mortality until exposure time exceeded approximately 60 days (Dawley et al. 1976).

NMFS also concluded that it was not appropriate as an initial interim level to seek an operation that would result in chronic exposure to TDG level of 120%, as recommended by the states and tribes. In general, chronic exposure to TDG levels of 120% with hydrostatic compensation does not cause significant mortality until exposure time exceeds 40 days (Dawley et al. 1976). This is generally more time than it takes Snake River juvenile and adult migrants to travel between Lower Granite and Bonneville dam. Nevertheless, NMFS concluded that the more conservative level of 115% is appropriate because of concerns about the potential sublethal effects of gas bubble disease. The state and tribal report on "Spill and 1995 Risk Management" summarized the studies showing evidence that swimming performance, growth and blood chemistry are affected by high dissolved gas levels. The report correctly states that it is only inferential that these symptoms may result in susceptibility to predation, disease and delay. In fact, studies conducted in 1993 and 1994 by the National Biological Service indicated that juvenile chinook salmon that have been exposed for eight hours to high TDG (and exhibiting microscopic signs of gas bubble disease) are no more vulnerable to northern squawfish predation than control fish that had been held in equilibrated water (Mesa and Warren, in review). Ultimately the analysis in the state and tribal report did not assume any level of mortality as a result of these sublethal effects.

NMFS concludes that the impairments to migrating fish as a result of the sublethal effects of dissolved gas may be sufficiently grave to warrant caution in setting long term exposure levels above 110%. In particular, long term exposure to levels in excess of 110% decrease swimming ability (Dawley and Ebel, 1975); fish stressed with high levels of dissolved gas have been reported to have less swimming stamina (Dawley et al., 1975); and gas bubbles in the lateral line can impair sensory ability. In addition, although fish in deep tank studies are less affected by high levels of TDG than fish in shallow tanks, some mortalities

still occur despite a water depth that is apparently adequate for protection. There is no evidence that fish can 'sense" TDG supersaturated water and deliberately sound to compensate.

At specific projects where specific levels of spill, particularly daytime spill have been shown to be detrimental to fish passage, timing and/or amounts of spill may have to be adjusted (for specific details see NMFS 1994b). Spill may also be limited at projects where it can be demonstrated that spill may be detrimental to system spill allocation. One such project is John Day Dam, where very low amounts of spill result in very high TDG levels. These high TDG levels then limit the amount of spill possible at dams downstream. For instance, by reducing spill by 10 to 20 kcfs at John Day Dam, it may be possible to increase spill at The Dalles or Bonneville dams by 20 to 40 kcfs. The exact relationship will need to be developed through in-season spill/TDG testing. The limitation of spill may also apply at The Dalles Dam to minimize the passage of spilled flow and fish over the high predation risk area in the shoals below the dam (see specific details in NMFS (1994b). The details regarding this limitation will be decided in-season through consultation with predation experts and will likely depend on ambient flow and the spill levels obtainable under the TDG limitations. In 1995, spill at Ice Harbor, The Dalles, and John Day Dams may be modified to accommodate research activities if NMFS determines that the spill modifications will not affect the validity of the transport vs. in-river survival study. These spill operations should be treated as interim until the effects of TDG on migrating salmonids are more fully evaluated and until a spill/transport rule curve can be developed. The rationale for flow targets associated with spill at collector projects is related to transportation policy and discussed under measure 3 below.

Migration over the spillways or through the bypass systems are the safest routes of passage at the dams. Injury and mortality can occur through each route of passage (turbines, spillways, ice and trash sluiceways, juvenile fish bypass systems), but loss rates via the spillways and bypass systems are low relative to passage by the turbines. For both spring/summer and fall chinook salmon, mortality of fish passing over the spillways or through the bypass systems generally ranges from 0-3% (Schoeneman et al. 1961; Heinle 1981; Ledgerwood et al. 1990; Raymond and Sims 1980; Iwamoto et al. 1994). Direct turbine mortality can range from 8-19% for yearling chinook salmon and 5-15% for subyearling chinook salmon (Holmes 1952; Long 1968; Ledgerwood et al. 1990; Iwamoto et al. 1994). Values of turbine and spill mortality are not available for sockeye salmon. However, it is reasonable to assume that these values are similar to or greater than values for yearling chinook salmon due to size and timing of migration and due to the greater susceptibility of sockeye to physical injury and mortality in project passage and handling (Gessel et

al. 1988; Johnsen et al. 1990; Koski et al. 1990; Parametrix 1990; Hawkes et al. 1991).

This spill program is experimental due to uncertainties about benefits of transportation of smolts relative to in-river migration, as well as uncertainties about the effect of nitrogen supersaturation on free-swimming fish in the river. Gas supersaturation is a negative effect of spill and the precise relationship between spill levels and gas bubble disease in juvenile and adult salmon migrating in the Columbia and Snake Rivers is not known. The spill program will be accompanied by an extensive physical and biological dissolved gas monitoring effort (see measure 16) as well as studies to assess reach survival and to compare survival of transported versus in-river migrants, as well as studies that compare adult returns from transported fish versus fish that migrate in-river under improved in-river migration conditions (i.e., improved flows and improved passage survival at dams through spill). Ideally a spill program, rather than setting a gas cap across all projects, would be based on a project-by-project analysis, with the benefits of spill passage balanced against the risks of gas bubble disease at each project. Such an analysis will require more information about the TDG levels that result at different levels of spill at each project, in relation to spill at other projects, and more information about the lethal and sublethal effects of creating supersaturated conditions through the river.

Appendix C

DISSOLVED GAS MONITORING PROGRAM
PLAN OF ACTION FOR 1996

Draft/blv/17dec95

INTRODUCTION

The total dissolved gas (TDG) monitoring program consists of a range of activities designed to provide management information about dissolved gas and spill conditions. These activities include time-series measurements, data analysis, synthesis and interpretation, and calibration of numerical models. Four broad categories of objectives are involved:

- data acquisition, to provide decision-makers with synthesized and relevant information to control dissolved gas supersaturation on a real-time basis,
- compliance, to ascertain the extent to which existing state dissolved gas standards and federal criteria are being met;
- trend monitoring, to identify long-term changes in basinwide dissolved gas saturation levels resulting from water management decisions; and
- model refinement, to enhance predictive capability of existing models used to evaluate management objectives.

As part of the overall Corps of Engineers' restructuring, Portland, Seattle and Walla Walla Districts will assume direct responsibilities for TDG monitoring at their respective projects, including data collection, transmission, analysis and reporting. The Division's Reservoir Control Center (RCC) will continue to coordinate this activity with the Districts and other State and Federal agencies and private parties as needed to insure the information received meet all real-time operational and regulatory requirements. Districts and Division roles and functions are described in more detail in later sections of this document.

The Corps considers TDG monitoring a high priority activity with considerable potential for adversely affecting reservoir operations and ongoing regional efforts to save the salmon. It will make all reasonable efforts toward achieving at least a data quality and reliability level comparable to that provided in 1995. Furthermore, the Corps believes it is important to maintain a two-way communication between those conducting the monitoring and the users of monitoring information. These interactions give decision-makers and managers an understanding of the limitations of monitoring and, at the same time, provide the technical staff with an understanding of what questions should be

ENCLOSURE 8.

answered. Therefore, comments and recommendations received from users were and continue to be very useful in establishing monitoring program priorities and defining areas requiring special attention.

This Plan of Action for 1996 summarizes the role and responsibilities of the Corps of Engineers as they relate to dissolved gas monitoring, and identifies channels of communication with other cooperating agencies and interested parties. The Plan summarizes what to measure, how, where, and when to take the measurements and how to analyze and interpret the resulting data. It also provides for periodic review and alteration or redirection of efforts when monitoring results and/or new information from other sources justify a change.

DIVISION/DISTRICT RESPONSIBILITIES

Districts Functions. Each District will perform all the activities required at their TDG monitoring sites. Data will be collected and transmitted from those sites systematically and without interruption to the Columbia River Operational Hydromet Management System (CROHMS) (or any alternate data base as may be specified) year between 1 March and 15 September. This includes but is not limited to the following tasks:

- preparing annual monitoring plan of action and schedule
- procuring data collection/transmission instruments
- preparing and awarding equipment and service contracts
- performing initial instrument installation and testing
- setting up permanent monitoring installations, if requested
- collecting and transmitting raw TDG data to CROHMS
- reviewing data for early detection of instrument malfunction
- making periodic biweekly service and maintenance calls
- providing emergency service calls as needed and/or when so notified
- performing special TDG measurements if needed
- keeping records of instrument calibration and/or adjustments
- retrieving, servicing, and storing instruments at the end of the season
- making final data correction and posting in separate data base
- performing data analysis to establish/strengthen spill vs. TDG relationship
- preparing an annual activity report for inclusion in Annual TDG Monitoring Report

Each District will also be responsible for (1) preparing an annual report on instrument performances, and (2) providing the necessary material including test and data analyses, charts, maps, etc. for incorporation in the Corps Annual TDG Report, which will be finalized by the Division. Additional monitoring at selected locations may also be required on an as-needed-basis. Dissemination of data to outside users will remain a Division responsibility to avoid duplication and uncoordinated service.

Division's Functions. Close coordination will be maintained between the Program Coordinator at the division and his/her counterparts at the districts, the contractors helping with field monitoring, and other cooperating agencies. The Program Coordinator will be the main point of contact for technical issues related to the TDG monitoring at Corps projects. Problems of common interest will be discussed at relevant forums such as the NMFS/EPA Gas Bubble Disease Technical Work Group (TWG) for peer review and open discussion. Final decision on technical issues will be made by the Program Coordinator after considering all input received from all interested parties.

The Corps' TDG Monitoring will be coordinated by a Program Coordinator. The Chief, Fish & Water Quality Section, CENPD-ET-WM(RCC), is the designated TDG Program Coordinator. He will report through the chain of command through Chief, Reservoir Control Center and Chief, Water Management Division to Director, Engineering & Technical Services Directorate. He will consult as needed with interested environmental staff in Planning Division, Pacific Salmon Coordination Office, Construction-Operations Division, and others. His role is to provide overall guidance and coordination to his District counterparts to ensure that the monitoring program is carried out according to the plan outlined in this document, including adherence to a general schedule and operating QA/QC protocols.

The TDG Program Coordinator will meet with his District counterparts in January to discuss detailed implementation plan and schedule for the current year. Discussion will address selection of monitoring sites, equipment and procedures to be used for data collection and transmission, service and maintenance program priorities, budget, etc. Following discussion and acceptance by District representatives, the Division will issue a set of specific performance standards to supplement and/or strengthen existing QA/QC protocols. The TDG Program Coordinator will review and monitor District performances based on those standards. An annual performance review meeting will be held annually to provide a critique of the operations and identify areas needing changes and/or improvements.

Division will initially maintain a shadow operation with existing minimum standby staff to fill any vacuum that may occur in the early 1996 introductory phase of the Division-to-Districts Program transfer. This will ensure that the Reservoir Control center continues to get real-time data it needs for its daily scheduling of reservoir operation at selected critical locations.

1996 ACTION PLAN

The 1996 Action Plan consists of the usual seven phases observed in previous years, namely :

- (1) Program start-up;
- (2) Instrument Installation;

- (3) In-season Monitoring and Problem Fixing;
- (4) Instrument Removal and Storage;
- (5) Data Compilation, Analysis and Storage;
- (6) Program Evaluation and Report; and
- (7) Special Field Studies

Based in part on discussions held at the 5 and 8 December 1995 TWG meetings, changes and/or adjustments to the Program will include the following:

- Sutron DCP 8200 models will continue to be used throughout the network to the maximum extent possible to avoid going through another learning curve period. These models were first introduced in 1995 and have provided satisfactory results once initial installation and programming problems were resolved;
- backup instruments and infrequently used stations will be eliminated so that O&M efforts can be concentrated on the remaining stations and instruments within the allocated fixed budgets;
- current fixed stations will not be changed to avoid relocation costs and having to establish new baseline conditions. If, based on transect studies, readings at those stations need corrections for operational and regulatory purposes, final decision on the nature and extent of the corrections will be deferred to NMFS and the States;
- in the interest of time, raw data received from the field will be immediately posted on the CROHMS without delay. Data corrections, if and when applicable, will be done as soon as possible thereafter.

Phase 1: Program Start-Up

Responsible parties (See Table 1) will be invited for topical peer review discussions on TDG monitoring in a forum provided by TWG. Discussions will include preliminary instrument deployment plan for the next monitoring season. This is to ensure a good and mutual understanding of the objectives of the dissolved gas monitoring program, including data to be collected, instrument location, procedures to be used, etc. The meeting also provides an opportunity to objectively assess the adequacy of past, present and anticipated monitoring efforts; and consequently, to recommend commensurate program changes if deemed necessary.

As stated above, the Corps will finalize its monitoring plan at the January 1996 meeting between interested Division and Districts staff. Instrument maintenance and service contracts are renewed in early January. Land owners are also contacted in early January to ensure the continued site availability of Warrendale, Oregon and other Lower Columbia River locations below Bonneville Dam. Orders for new TDG instruments and DCPs, if applicable, will be placed in January. At this writing, outside contracting is

being considered by all three Districts for conducting TDG monitoring at their projects. Portland is planning to contract with the USGS, Seattle with Common Sensing, and Walla Walla with a yet-to-be-defined qualified party.

Phase 2: Instrument Installation

Instruments to be installed and their assigned locations are listed in Table 2 and shown in Figure 1. There will be one forebay and one tailwater fully automated instrument at each of the Columbia/Snake River Corps dam, with the following exceptions:

- Dworshak: tailwater only
- McNary: two forebay stations, on Oregon and Washington sides respectively,
- Bonneville: Warrendale and Skamania used as tailwater station substitutes

This is basically the same instrument setup as in 1995. However, as discussed at the 5 December 1995 TWG meeting, there is a need to reduce the number of instruments to a strict minimum to ensure an adequate level of service and maintenance can be provided to the remaining instruments. In that context, the following steps will be taken:

- remove infrequently used stations: Hood Park, Kalama and Wauna Mills
- eliminate backup instruments at Warrendale, The Dalles, McNary-OR and Ice Harbor tailwater.

The Plan also includes the Bureau of Reclamation's (USBR) instruments located at the International Boundary and below Grand Coulee, the Corps' instrument located at Chief Joseph reservoir forebay, the mid-Columbia Public Utility Districts' (PUD) forebay instruments at Rocky Reach, Rock Island, Wanapum, and Priest Rapids Dams, plus the tailwater instruments below Wanapum and Priest Rapids dams. Monitoring requirement below Libby Dam and in the Clearwater River below the North Fork Clearwater confluence will be determined later on as-needed basis.

The instruments are scheduled for installation and, if applicable, interface with SUTRON Data Collection Platforms no later than 1 April at all Corps projects. Monitoring stations below Bonneville are scheduled to be in place first, prior to the release of Spring Creek Hatchery fish, which is scheduled to start in mid-March. District Water Quality staff, together with maintenance and service contractors, if applicable, will jointly perform the installation, calibration and testing of all equipment at those stations. Selected project personnel may also be requested to assist as needed.

Phase 3: In-season Monitoring and Problem Fixing

Actual data collection and transmission activities will start prior to the first Spring Creek Hatchery release, but no later than 15 March for stations below Bonneville, and no later than 1 April for the remainder of the monitoring network. Exact starting dates will be

coordinated with the Corps' Reservoir Control Center (CENPD-ET-WM), project biologists and cooperating agencies, based on run-off, spill, and fish migration conditions.

The following data will be collected approximately every hour:

- WC, Water Temperature (°C)
- BH, Barometric Pressure (mm of Hg)
- NT, Total Dissolved Gas Pressure (mm of Hg)
- OP, Dissolved Oxygen Pressure (mm of Hg)
- NP, Nitrogen + Argon Pressure (mm of Hg)

The 2-channel stations will monitor WC and NT; the 3-channel: WC, BH and NT; the 4-channel: WC, NT, OP, and NP; and the 5-channel stations will monitor all five parameters. The minimum required for forebay stations are WC, BH and NT. At tailwater stations, when BH is not measured; BH forebay values will be used instead.

Data transmission from nonautomated instruments via Columbia Basin Teletype (CBT) network will be done twice a day, between 0915 to 1100 and 2115 to 2300 hours. CBT coding sheets should be made available to the RCC for data reconciliation purposes. Data transmission from automated stations interfaced with a Sutron data collection platform will be transmitted automatically every four hours. This will be done via the GOES Satellite, to the Corps' ground-receive station in Portland or any other proven and reliable mode. After decoding, all data will be stored in the CROHMS data base.

Daily reports summarizing TDG and related information will be posted on the CROHMS system. To the extent feasible, the measured TDG data will be compared with model predicted values so that suspicious values can be flagged and/or discarded before they are released. Information provided in CROHMS Reports 101, 102, and 103 will include the following data:

- Station Identifier
- Date and Time of the Tensionometer Probe Readings
- Water Temperature, °C
- Barometric Pressure, mm of Hg
- TDG Pressure, mm of Hg
- Calculated TDG Saturation Percent (%)
- Project Hourly Spill, Kcfs (QS)
- Project Total Hourly Outflow, Kcfs (QR)
- Number of Spillway Gates Open

Stop settings, if different from the numbers provided in the Fish Passage Plan, will also be given.

This information will be available for viewing by all those who have access to CROHMS. Reconciliation between data received via the CBT and those manually recorded on the coding sheets will be made by the RCC) before the data are permanently stored in the Corps' Water Quality Data Base.

To improve instrument reliability and accuracy, a systematic service and maintenance program will be implemented. Every two weeks on the average a contractor will visit the monitoring sites to check for and, if necessary, fix site problems (probes clogging, instruments out of calibration, etc.) using a portable calibration instrument as reference.

To better understand the physical process of dissolved gas distribution across the reservoirs and its dissipation along the various pools, selected transect studies will continue to be conducted on an as-time-permits basis. An additional objective for this activity is to be able to define how representative readings from current monitoring sites are with respect to the entire river reach. Model runs using GASSPILL and other acceptable tools such as a Neural Network model will be performed as needed to define the range of expected/acceptable TDG levels under various spill conditions.

Phase 4: Instrument Removal and Storage

Tensionometers will be removed shortly after the end of the monitoring season (15 September) by the contractors and relevant Corps district/project personnel. They will be serviced by the maintenance and service contractors and stored at a convenient location until the beginning of the next monitoring season. They may also be available for off-season special monitoring activities upon request.

Phase 5: Data Compilation, Analysis and Storage

Time and staff availability permitting, statistical analyses will be conducted to develop trends and relationships between spill and TDG saturation. Efforts will continue to be expanded on the calibration and application of GASSPILL (Dissolved Gas) and COLTEMP (Water Temperature) models, and finding ways to facilitate and/or improve user access to the TDG and TDG-related data base. The GASSPILL model will be modified to accommodate calculation time step shorter than the current daily time increment. Work will continue in training Neural Network models to simulate different flow and spill conditions for all river reaches of interest. Data collected at and transmitted from all network stations will be ultimately stored at CENPD-ET-WM, where they can be accessed through a data management system such as HEC-DSS.

Phase 6: Program Evaluation and Summary Report

An annual report will be prepared after the end of the monitoring season to summarize the yearly highlights of the TDG monitoring program. It will include a general program

evaluation of the adequacy and timeliness of the information received from the field, and how that information is used to help control TDG supersaturation and high water temperature in the Columbia River basin. Information on the performance of the instruments and the nature and extent of instrument failures will also be documented. The Annual TDG Monitoring Report will be prepared by Division staff, based on field input and other material provided by each District

Phase 7: Special Field Studies

As provided for in Phase 3, additional monitoring of dissolved gas saturation will be conducted on a as-needed basis. Current plan for additional monitoring includes transect measurements below selected dams to : 1) establish the relationship between various spill amounts and TDG saturation, and 2) plot TDG variations within a given cross-section of the river. Efforts will also be expanded in learning more about dissolved gas saturation dissipation along the fish migration route, using monitoring made from moving fish barges and deployment of self-contained wireless probes. These on-going efforts are expected to continue for several years.

TABLE 1. List of Contact Persons

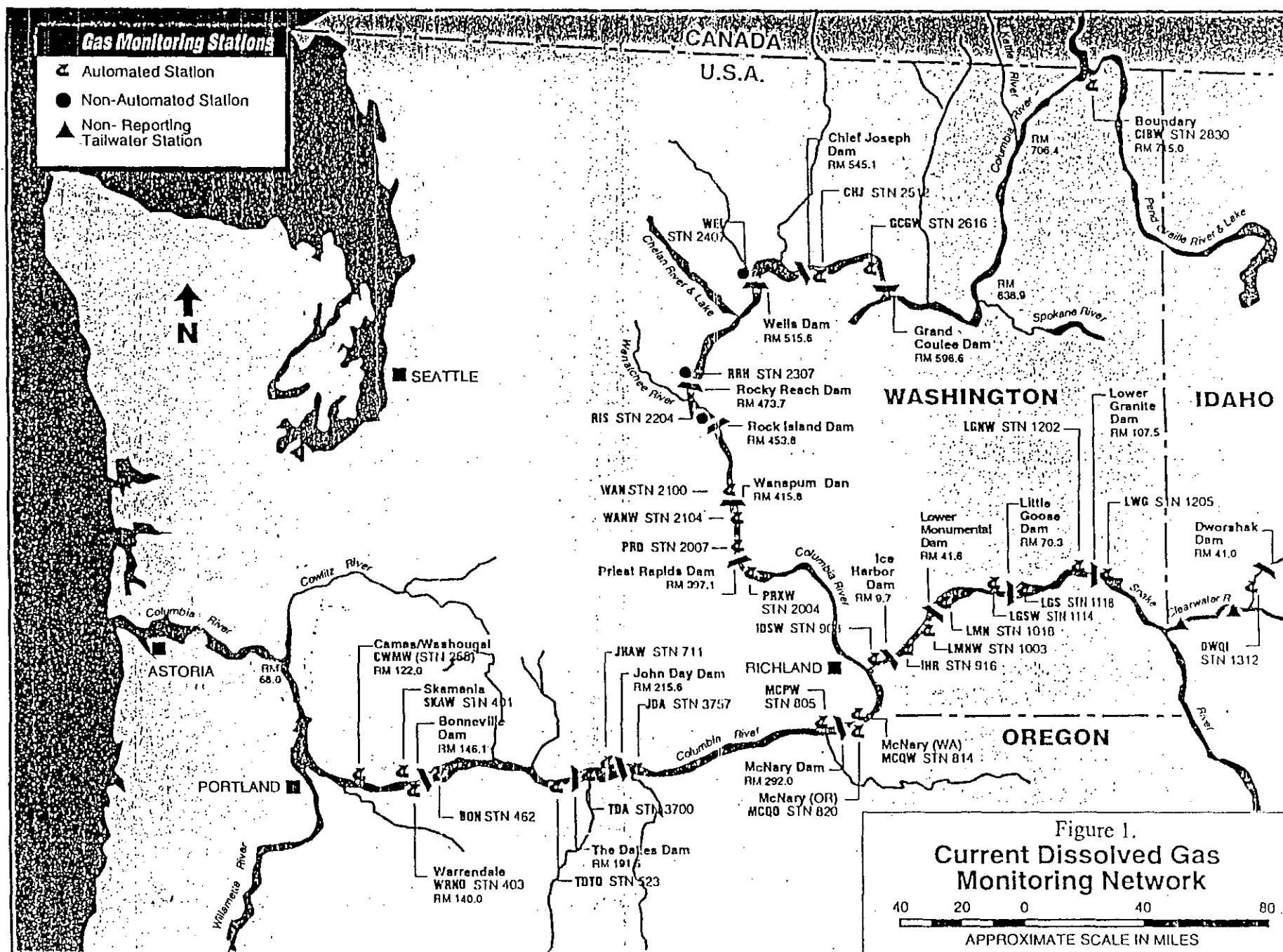
<u>Projects</u>	<u>Names</u>	<u>Position</u>	<u>Phone Nos.</u>
Int'l Boundary	Dan Lute	Hydrologist	(208) 378-5272
	Dave Zimmer	Limnologist	(208) 378-5088
Grand Coulee	Dan Lute	Hydrologist	(208) 334-1970
	Dave Zimmer	Limnologist	(208) 334-9035
Chief Joseph	Joe Munk	Ch. of Operations	(509) 686-5501
	Marian Valentine	Hydraulic Engineer	(206) 764-3529
Wells	Rick Klinge	Biologist	(509) 884-7191
Rocky Reach	Steve Hays	Biologist	(509) 663-8121
Rock Island	Steve Hays	Biologist	(509) 663-8121
Wanapum	Stuart Hammond	Biologist	(509) 754-3541
	Mike Taylor	Telecom.Engr.	(509) 754-2138
Priest Rapids	Stuart Hammond	Biologist	(509) 754-3541
	Mike Taylor	Telecom.Engr.	(509) 754-2138
Dworshak	Tom Miller	Limnologist	(509) 527-7279
Lower Granite	Tom Miller	Limnologist	(509) 527-7279
Little Goose	Tom Miller	Limnologist	(509) 527-7279
Lo.Monumental	Tom Miller	Limnologist	(509) 527-7279
Ice Harbor	Tom Miller	Limnologist	(509) 527-7279
McNary	Tom Miller	Limnologist	(509) 527-7279
John Day	Faith Ruffing	Biologist.	(503) 362-6184
The Dalles	Faith Ruffing	Biologist.	(503) 326-6184
Bonneville	Faith Ruffing	Biologist.	(503) 326-6184
Warrendale	Faith Ruffing	Biologist	(503) 326-6184
Camas/Washougal	Faith Ruffing	Biologist	(503) 326-6184
Kalama	Faith Ruffing	Biologist	(503) 326-6184

TABLE 2 1996 Dissolved Gas Monitoring Network

Sta. ID	Location	Owners/Operators
CIBW	Boundary	USBR
GCGWD/s	GCL	USBR
CHJ	Forebay	NPS
WEL	Forebay	Douglas County PUD
RRH	Forebay	Chelan County PUD
RIS	Forebay	Chelan County PUD
WAN	Forebay	Grant County PUD
WAN	Tailwater	Grant County PUD
PRD	Forebay	Grant County PUD
PRXW	Tailwater	Grant County PUD
DWQI	Tailwater	NPW
LWG	Forebay	NPW
LWG	Tailwater	NPW
LGS	Forebay	NPW
LGS	Tailwater	NPW (.7 mi RB)
LMN	Forebay	NPW
LMN	Tailwater	NPW (.8 mi LB)
IHR	Forebay	NPW
IHR	Tailwater	NPW (3.6 mi RB)
MCQW	Forebay-WA	NPW
MCQO	Forebay-OR	NPW
MCN	Tailwater	NPW (1.4 mi RB)
JDA	Forebay	NPP
JDA	Tailwater	NPP
TDA	Forebay	NPP
TDA	Tailwater	NPP
BON	Forebay	NPP
WRNO	Warrendale	NPP
SKAW	Skamania	NPP
CWMW	Camas	NPP

USBR= U.S. Bureau of Reclamation
 NPS= Seattle District
 LB=Left bank RB=Right bank

NPP= Portland District
 NPW= Walla Walla District
 MC=mid-channel



JAN-16-96 13:01 TUESDAY PASADENA CALIF. 92-10000-0000
DRAFT

1/16/96

1996 GBT Monitoring Protocol for Signs of GBT in Juvenile Salmon

Fish will be examined externally for signs of gas bubble trauma (GBT). The examination will involve examining fins, eyes, and lateral line for the presence of bubbles. Monitoring will be conducted at Bonneville, John Day, McNary, Rock Island, Lower Monumental, Little Goose, and Lower Granite dams. Monitoring will also be conducted in the Clearwater River in Idaho, below Dworshak Dam. The goal of the examinations is to determine the relative extent to which the juvenile salmon passing the dam or sampling location have been exposed to harmful levels of total dissolved gases based upon the presence and severity of bubbles on the fish. The data will be reported to the management entities, the state water quality agencies as well as other interested parties on a daily basis during the spill season.

Method of fish examination for GBT

Fish will be examined using a variable magnification (10X to 40X) dissecting scope. Unpaired fins, eyes, and lateral line will be examined for the presence of bubbles. Fish to be examined will be netted at the separator (or removed from the sampling apparatus Rock Island, John Day and Bonneville) and put into an anesthetic bucket (see section on methods of anesthetic below for more detailed description). These fish will be carried to the location where examinations will occur. Each fish as it is to be examined will be held in an examination tray (see anesthetic section for detailed description). The fish will be examined on one side (right side first) entirely before being turned over to examine the eye on the opposite side.

The examination will begin with the lateral line. With the fish on its side, the examiner will search the lateral line for bubbles. The level of magnification required for this examination is between 15X and 30X. The magnification must be great enough to discern the canal of the lateral line as well as determine if bubbles are present. The entire length of the lateral line from the anterior end near the operculum to the caudal fin will be examined.

If bubbles are found in the lateral line, then the percent length of the lateral line occluded by bubbles will be measured. A transparent plastic ruler with an uniform grid on it will be used to measure the total length of the lateral line (measured as the distance from the posterior end of the operculum to the anterior end of the caudal fin). The length will be expressed in bubble units which are the unit of measure of the ruler. The total length of the lateral line that is occluded by bubbles will be measured in the same way and that number will be expressed in bubble units also. A percent occlusion will be calculated by dividing total length occluded by the total length of the lateral line.

$$\text{Percent Occlusion} = \left(\frac{\text{Length of lateral line occluded by bubbles}}{\text{Total length of lateral line}} \right) \times 100$$

Next the fins and eyes will be examined and data recorded based upon area of the fin or eye covered with bubbles. The area covered will be estimated using the examiners best judgement. A visual technique for estimating the area of fin covered by bubbles is illustrated in Figure 1. Each unpaired fin, will be examined starting with the caudal, then anal and finally dorsal fin. Finally the eye on the right side of the fish will be examined for the presence of bubbles. Once the right side examination is completed the fish will be turned over and the left eye examined for the presence of bubbles. The magnification used to search for bubbles in fins varies with the fin being examined and the eyes of the examiner. However, it is recommended that a minimum of 10X be used to insure that small bubbles in the fins would be visible to the eye under magnification. A rank will be assigned based upon the percent area of the fin or eye covered with bubbles. A

rank 0 is assigned if no bubbles occur. Rank 1 if greater than 0 and less than or equal to 25% of fin or eye is covered. Rank 2 is assigned if bubbling occupies 26 to 50% of the fin or eye. And rank 3 is assigned if greater than 50% of the fin or eye is covered. If bubbles occur in one eye the rank will be for that eye only. If bubbling occurs in both eyes the eye with the greatest area having bubbles will be ranked and recorded. If the area covered by bubbles is estimated to be near 25% or near 50% (i.e. at a boundary between rank 1 and 2 or rank 2 and 3), then the higher rank should be reported. A summary of ranks to be used in recording GBT data for fins and eyes is listed below.

Rank	Percent area affected
0	0
1	1 to 25
2	26 to 50
3	greater than 50%

These rank criteria are being re-evaluated through laboratory experiments at NBS during the winter of 1995 and 1996. An additional rank from 0 to 5% is being considered for its relevance to onset of mortality in laboratory fishes and also its applicability to the monitoring program. It is possible that there will be a fifth rank in 1996 if this additional rank is deemed important based upon ongoing research.

While the body and paired fins are not included as part of the examination, if any bubbles are seen in these areas, this should be recorded in the comments. Any fish showing signs in the body or the paired fins should be reported as one of the fish showing signs of GBT in the daily summary sent to the FPC (see data reporting section below).

Other information will be collected on fish in addition to GBT data; time examined, fork length (mm), species, origin (hatchery, wild, or unknown), comments on presence of disease or injury and descaling information will also be included. See section on data recording for more information. A sample data sheet is included in the appendices for demonstration purposes.

Sample Size

The target number of fish to be examined at each site is 200 juvenile salmonids (except at Rock Island where only chinook are examined and the target will be only 100 chinook). This target is a maximum daily number based upon the availability of fish at the monitoring site. This will consist of 100 chinook salmon and 100 steelhead or other prevalent species at John Day and Bonneville Dam. At Snake River dams and McNary dam the target number of fish will be restricted to chinook and steelhead. We believe that this number is sufficiently large to detect signs of GBT that would indicate significant mortality occurring in the fish population.

National Biological Service calculated the sample size required to achieve various levels of error (expressed in percent) around the detected rate of occurrence of GBT in the population sampled at each site. Two levels of occurrence of GBT (50% and 10%) were calculated versus sample size (Figure 1). In each case the percent error L at 95% probability was the independent variable and sample size was the dependent variable. The percent error L was calculated by the equation

$$L = 2 \sqrt{\frac{pq}{n}}$$

where n is a given sample size and p and q are the probability of a fish having signs of GBT (or

not having signs). Based on our calculations a sample size of 100 fish should be able to detect within 6% accuracy the percentage of fish in a population showing signs of GBT based on a population where $p = 0.1$ (10% of the population showing signs of GBT) and $q = 0.9$. We consider this level of detection more than adequate for the monitoring program.

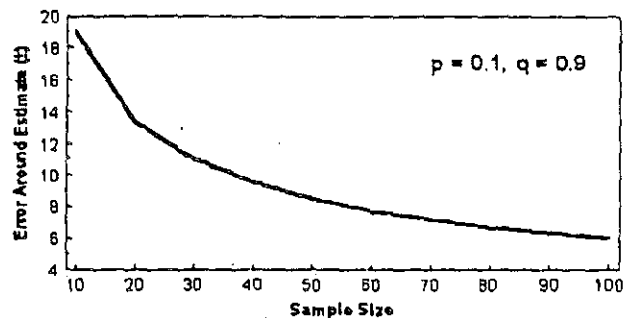


Figure 1. Percent error associated with sample size given a 10% prevalence (of GBT) in the population.

Method of "collection" (fish off separator where appropriate)

Fish to be examined for GBT will be collected at the separator at transportation sites and by the standard collection methods at Rock Island, John Day and Bonneville dams. At transportation sites fish will be netted and placed in a dark colored bucket (not white) to reduce potential for stress. No more than the number of fish that can be examined in a 15 minute time period, after the first fish is captured, will be netted off the separator at one time. Given that the examination takes about 2 minutes, this means the maximum number of fish should not exceed seven. Fish netted off the separator will be placed in a bucket containing a solution of 80 mg/l MS-222 and 80 mg/l sodium bicarbonate buffer (see method of anesthetic below).

Method of anesthetic

Each site will have five 5-gal plastic buckets. Three buckets will be used for holding fish and two will be used to irrigate fish gills while fish are being examined for GBT. Fish to be examined will be held in MS-222 buffered solution. The initial anesthetic solution will have 80 mg/l MS-222 and 80mg/l sodium bicarbonate buffer. Once fish are all anesthetized they will be transferred to a bucket containing a solution of 30 mg/l MS-222 and 30mg/l sodium bicarbonate buffer. During examination a solution of 30mg/l MS-222 and 30mg/l sodium bicarbonate buffer will be washed over fish gills to keep fish under anesthetic during the GBT exam. The fish will be held in a semicircular PVC pipe during examination. The pipe will be modified to hold a syphon tube that will carry anesthetic water over the animal's gills. The anesthetic water will drain out of the PVC tray into another bucket via a drain tube. After the examination fish will be placed in a recovery bucket of fresh water containing an air stone. The recovery bucket will have a lid and the air stone will vigorously pump air into the bucket.

Fish Release and counting procedures

Several issues are bundled together in this topic and will be resolved prior to the season but have not yet been resolved. One issue is what to do with the fish after examination. Second, is how the large sample size (100 steelhead and 100 chinook) will affect smolt monitoring efforts toward the end of the season at each site as the numbers of fish sampled decreases and GBT fish examinations become a significant proportion of the total number of fish handled at the site. Third is the need to interrogate GBT fish for PIT tags at transportation sites from Lower Granite Dam down to McNary Dam. Based on quick calculations we estimate 3% of the fish examined at Little Goose will be PIT tagged. There is some question about the impact handling in-river control fish could have on survival estimates if these fish are returned to the river. These issues will be brought to the attention of state agencies, tribes and researchers to determine the best method for handling the fish and a resolution sought prior to the beginning of monitoring season.

Data Recording Procedures

As each fish is examined data will be recorded on a data sheet. The following information will be recorded for each fish: Time of day fish was examined; species, origin (hatchery, wild or unknown), fork length (in mm), rank of GBT in each fin, rank of GBT in eye with greatest rank, length of lateral line occluded, total length of lateral line (if any occlusion is present), and comments on fish condition. See data sheet below.

The data recorded on the data sheet will be entered onto a spreadsheet. The entered data will then be checked versus the original data and any errors corrected. The data will then be transferred to FPC and this information recorded in a QA/QC log by the person who entered the data and checked it.

Data Transfer Procedures

Data will be transferred to Fish Passage Center in two formats. Faxed data sheets will be sent as soon as possible after sampling to allow for timely reporting of the data. Data will then be entered into a spreadsheet and that entered data will be sent via to FPC. The file transfer method will be worked out with each site in order to allow some flexibility. Once the file is transferred this information will be recorded in a QA/QC log.

Faxed data sheets will have a cover page that summarizes the data on the data sheets. The following information should be included on summary page; Date, site, number of each species examined, number showing signs of GBT. This information should be checked against the raw data and after check is complete and errors are removed this should be recorded in QA/QC log.

Data Reporting Procedures

Once the data is received at FPC it will be checked again and reported. Because of the need for timely reporting the faxed copy of the data will be used to create the daily GBT reports. The data summary will be checked versus the faxed data sheets. Any errors will be corrected (and these errors reported to the site), the data will be entered into a spreadsheet that will be used to generate the daily report. Once the spreadsheet data file is received this will be checked versus the faxed data file. Any errors in the data file will be corrected, this activity will be recorded in QA/QC log and reported to the site. Any errors that would have affected the data reported in daily GBT reports will be corrected in the first possible daily GBT report after the error has been found. This will also be entered into the QA/QC log.

5. QA/QC

A QA/QC document will be added to the monitoring program as an appendix prior to the start of the monitoring season. Below is an outline of the QA/QC efforts that will be undertaken during the season and the documentation that will be created as a part of the monitoring program. A final QA/QC document is forthcoming and will include protocol, procedures and QA/QC forms that will be used.

Field QA/QC

In order to assure quality control/quality assurance several checks will be included as part of the monitoring program. At the first step in the process, fish examinations, there will be biweekly visits to each monitoring site to assess the accuracy of examinations and the data recorded from those examinations. A supervising fish biologist will visit a site and examine a portion of the fish sampled from the total number examined on that day. The results of the examinations will be logged on a QA/QC data sheet and the results will be forwarded to FPC for documentation purposes.

Data faxed to FPC will be checked by person sending fax against raw data to insure that the summary data is correct. This will be entered into the QA/QC log.

Data entered at the site will be checked by the person entering the data. Any errors will be corrected prior to the data being sent on to FPC. This error checking will be logged in a QA/QC data sheet to be kept by the person examining fish at the site.

Data Center QA/QC

Data sent to FPC for reporting will be sent in two forms. A faxed copy of each data sheet and a spreadsheet file containing all the data on the data sheet.

Faxed data sheets will have a summary sheet attached and this will be checked versus the raw data faxed along with the summary sheet.

Raw data will be sent via E-mail spreadsheet file. This data will be transferred to the permanent database from E-mailed spreadsheet files and checked versus raw data sheets again. Any errors will be changed, documented and reported (if the change affects the reported GBT data).

DRAFT

1/16/96

QA/QC Procedures for GBT Examinations of Juvenile Salmon in 1996

Field QA/QC

Oversight

In order to assure quality control/quality assurance several checks will be included as part of the monitoring program. At the first step in the process, fish examinations, there will be biweekly visits to each monitoring site to assess the accuracy of examinations and the data recorded from those examinations. A supervising fish biologist will visit a site and examine a portion of the fish sampled from the total number examined on that day. The results of the QA/QC oversight will be logged on a QA/QC data sheet and the results will be forwarded to FPC for documentation purposes.

The QA/QC oversight will focus on examination procedures as well as results of examinations. The overseeing biologist will observe the technique used to monitor the fish for signs of GBT. The overseeing biologist will note on the procedures check and oversight form (see Form 2) whether the examiner properly anesthetized the fish, length of time fish were held in anesthetic, average length of time for exam, maximum time fish held for exams, magnification used in exams, and information regarding if data entry and QA/QC log were filled out properly.

The overseeing biologist will also examine a subsample of fish being examined for GBT and fill in the results of their exams on procedures check and oversight form (see Form 2). During the oversight visit if any fish are found to have signs of GBT the supervisor will also examine those fish for signs. The results of the two exams will be compared and any discrepancies reported and the cause of the discrepancy identified and corrected.

QA/QC log

Field biologists conducting GBT exams will fill out a QA/QC log (see Form 1). The log will be used to keep track of when each step in from fish examination to final data checking and transmission were completed. When each step, as identified on the form, is completed the person completing the step will initial and date the log. Data faxed to FPC will be checked by the person sending fax against raw data to insure that the summary data is correct. This will be entered into the QA/QC log. Data entered at the site will be checked by the person entering the data. Any errors will be corrected prior to the data being sent on to FPC. This error checking will be logged in a QA/QC data sheet to be kept by the person examining fish at the site.

Data Center QA/QC

Data sent to FPC for reporting will be sent in two forms. A faxed copy of each data sheet and a spreadsheet file containing all the data on the data sheet. Faxed data sheets will have a summary sheet attached and this will be checked versus the raw data faxed along with the summary sheet. Raw data will be sent via E-mail spreadsheet file. This data will be transferred to the permanent database from E-mailed spreadsheet files and checked versus raw data sheets again. Any errors will be changed, documented and reported (if the change affects the reported GBT data).

Form 2. GBT monitoring QA\QC Procedures Check and Oversight Log.

[illegible]

Form 3. GBT Monitoring Data sheet

1996 Juvenile Salmon Monitoring Examinations for GBT Using 6X to 40X Dissecting Scope										
Date				Examiner		Site				Comments
Record	Time	Species	Origin H, W or U	L.L. Length in BU	L.L. Occl. in BU	Rank of GBT in Unpaired Fins and Eyes 0 to 3				
						CA	AN	DO	EY	
1										
2										
3										
4										
5										
6										
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DRAFT

1/16/96

1996 GBT Monitoring Protocol for Signs of GBT in Adult Salmon

Fish will be examined externally for signs of gas bubble trauma (GBT). The examination will involve examining mouth, fins, eyes, opercula and the body of fish for the presence of bubbles. Monitoring will be conducted at Bonneville, Lower Granite, and Preist Rapids dams. The goal of the examinations is to determine the extent to which adult salmon passing through the hydrosystem or sampling location have been exposed to harmful levels of total dissolved gases based upon the presence and severity of bubbles on the fish. The data will be reported to the management entities and the state water quality agencies as well as other interested parties on a daily basis during the spill season.

Method of fish examination for GBT

Fish will be examined using a magnification device of at least 2.5X. Fish fins, eyes, mouth, opercula and body will be examined for the presence of bubbles. Fish to be examined will be collected from the fish ladder at each site and put into an anesthetic trough (see section on methods of anesthetic below for more detailed description). These fish will be carried to the location where examinations will occur. Each fish as it is to be examined will be held on an examination table. The fish will be examined on one side (right side first) entirely before being turned over to examine the opposite side.

The examination will begin with the mouth. With the fish on its side, the examiner will search the interior of the mouth for bubbles in the soft tissues. If bubbles are present in the mouth the extent of bubbling should be ranked as is done for fins. Next the fins will be examined and data recorded based upon area of the fin or eye covered with bubbles. Beginning with the caudal fin, as the fin is fanned out, look for bubbles at the posterior end of the tail and between the rays. Also, the examiner should run their fingers over the surface of the fin to feel for the presence of bubbles. Repeat this observation method for all fins. The area of the fin covered with bubbles should be estimated using the examiners best judgement. A visual technique for estimating the area of fin covered by bubbles is illustrated in Figure 1. Next the eye and operculum on the right side of the fish should be examined for signs of GBT. Finally the body of the fish will be examined for the presence of bubbles. Once the right side examination is completed the fish will be turned over and the left side examined in the same way for the presence of bubbles.

A rank will be assigned based upon the percent area of the fin or other body part covered with bubbles. A rank 0 is assigned if no bubbles occur. Rank 1 if greater than 0 and less than or equal to 5% of fin or eye is covered. Rank 2 is assigned if bubbling occupies 6 to 25% of the fin or eye. A rank 3 is assigned if between 26% and 50% of the fin or eye is covered. And a rank of 4 will be assigned if greater than 50% of the fin (or other body part is covered with bubbles). If bubbles occur in one eye the rank will be for that eye only. If bubbling occurs in both eyes the eye with the greatest area having bubbles will be ranked and recorded. If the area covered by bubbles is estimated to be near 25% or near 50% (i.e. at a boundary between rank 2 and 3 or rank 3 and 4), then the higher rank should be reported. A summary of ranks to be used in recording GBT data for fins and eyes is listed below.

Rank	Percent area affected
0	0
1	1 to 5
2	6 to 25
3	26 to 50%
4	greater than 50% affected

If bubbling occurs in the body this should be noted. It is not necessary to estimate the area covered with bubbles. Presence or absence is sufficient for bubbles occurring in the body. Any comments regarding fish condition that may be related to GBT should be included (such as head burns or "characteristic" sores on the body that may have been caused by bubble damaged tissue sloughing off, or popcye -- the protusion of the eye from the socket). This information should be recorded as comments (see data reporting section below).

Other information will be collected on fish in addition to GBT data; time examined, fork length (mm), species, origin (hatchery, wild, or unknown), presence of disease or injury and descaling information will also be included. See section on data recording for more information. A sample data sheet is included in the appendices for demonstration purposes.

Sample Size

The target number of fish to be examined at each site is not determined at this point.

Method of anesthetic

Fish will be anesthetized using MS-222. Fish will be anesthetized prior to being examined to minimize stress.

Data Recording Procedures

As each fish is examined data will be recorded on a data sheet. The following information will be recorded for each fish: Time of day fish was examined; species, origin (hatchery, wild or unknown), fork length (in mm), greatest rank of GBT in any fin, greatest rank of GBT in either eye, rank of GBT in mouth, presence or absence of GBT in body, comments on severity of bubbling if appropriate (in body), and information on fish condition (presence of disease, injury, or predation scars, See data sheet below).

The data recorded on the data sheet will be entered onto a spreadsheet. The entered data will then be checked versus the original data and any errors corrected. The data will then be transferred to FPC and this information recorded in a QA/QC log by the person who entered the data and checked it.

Data Transfer Procedures

Data will be transferred to Fish Passage Center in two formats. Faxed data sheets will be sent as soon as possible after sampling to allow for timely reporting of the data. Data will then be entered into a spreadsheet and that entered data will be sent via to FPC. The file transfer method will be worked out with each site in order to allow some flexibility. Once the file is transferred this information will be recorded in a QA/QC log.

Faxed data sheets will have a cover page that summarizes the data on the data sheets. The following information should be included on summary page; Date, site, number of each species examined, number showing signs of GBT. This information should be checked against the raw data and after check is complete and errors are removed this should be recorded in QA/QC log.

Data Reporting Procedures

Once the data is received at FPC it will be checked again and reported. Because of the need for

timely reporting the faxed copy of the data will be used to create the daily GBT reports. The data summary will be checked versus the faxed data sheets. Any errors will be corrected (and these errors reported to the site), the data will be entered into a spreadsheet that will be used to generate the daily report. Once the spreadsheet data file is received this will be checked versus the faxed data file. Any errors in the data file will be corrected, this activity will be recorded in QA/QC log and reported to the site. Any errors that would have affected the data reported in daily GBT reports will be corrected in the first possible daily GBT report after the error has been found. This will also be entered into the QA/QC log.

QA/QC

A QA/QC document will be added to the monitoring program as an appendix prior to the start of the monitoring season. Below is an outline of the QA/QC efforts that will be undertaken during the season and the documentation that will be created as a part of the monitoring program. A final QA/QC document is forthcoming and will include protocol, procedures and QA/QC forms that will be used.

Field QA/QC

In order to assure quality control/quality assurance several checks will be included as part of the monitoring program. At the first step in the process, fish examinations, there will be biweekly visits to each monitoring site to assess the accuracy of examinations and the data recorded from those examinations. A supervising fish biologist will visit a site and examine a portion of the fish sampled from the total number examined on that day. The results of the examinations will be logged on a QA/QC data sheet and the results will be forwarded to FPC for documentation purposes.

Data faxed to FPC will be checked by person sending fax against raw data to insure that the summary data is correct. This will be entered into the QA/QC log.

Data Center QA/QC

A faxed copy of each data sheet will be sent to FPC for reporting.

FISH HANDLING AND GAS BUBBLE DISEASE ASSESSMENT PROTOCOLS

FOR: Evaluation of the Effects of Dissolved Gas Supersaturation on Fish and Invertebrates in the Mainstem Columbia and Snake Rivers

BY: National Marine Fisheries Service

DATE: January 11, 1996

INTRODUCTION

The objectives of this study are to assess some of the impacts of ambient levels of gas supersaturated water on the aquatic biota in the lower Snake and mid- and lower Columbia Rivers and to augment the existing database on the tolerance of resident nonsalmonid species to high dissolved gas levels. We propose to survey selected reservoir and free-flowing river reaches and conduct in situ bioassays of the effects of ambient levels of dissolved gas using resident fish species, benthic and epibenthic invertebrates, and hatchery-reared salmonids. The final product of research will be an analysis of the relationship between levels of dissolved gas and duration of exposure to gas-supersaturated conditions, and observed impacts on free-swimming and captive organisms. We propose that this study be repeated annually during the spring freshet/juvenile salmonid outmigration to bracket a wide range of river flows and gas supersaturation levels.

Assessment of GBD in 1996 is a continuation of a study initiated in 1993 at in the Columbia River downstream from Bonneville Dam (Toner and Dawley 1995). In 1994 and 1995, the study was expanded to assess the effects of ambient dissolved gas saturation levels and prevalence of GBD in juvenile salmonids, resident fish, and invertebrates in three river reaches (Toner et al. 1995 and Schrank et al. manuscript in prep.). In addition, test organisms (excluding migrant and resident salmonids) were held for 4 days in net-pens and cages at restricted depths under ambient river conditions in each river reach. The net pens were in deep water at locations of highest dissolved gas levels.

In 1996, the river sections to be sampled and rationales for their selection are as follows: 1) Priest Rapids Reservoir and the Hanford reach--We expect that cumulative effects of dissolved gas from spill throughout the mid-Columbia River will be represented in this section; resident fish species were previously sampled for GBD (Dell et al. 1974). A large population of juvenile fall chinook salmon may also be severely impacted by dissolved gas supersaturation; 2) Ice Harbor Dam tailrace--We expect that cumulative effects of dissolved gas from spill from the lower Snake River dams will be represented in this reach; 3) downstream from Bonneville Dam--In a high flow year, spill volumes are expected to be high in this reach, and no other biological sampling is being conducted. Within each of the three river reaches, several sites will be sampled on regular intervals.

METHODS

Sampling Intensity

Several sites within each of the three river reaches will be sampled once each week from April through June or July. Sampling will begin prior to any major spill (early April), and continue throughout the period of spill (probably through July at sites upstream from Bonneville Dam and through mid-August at sites downstream from Bonneville Dam). In addition, downstream from Bonneville Dam, daily sampling will be conducted during the late March spill period. At each site we will collect and examine for signs of GBD up to 100 individuals of the predominant taxa.

If total dissolved gas (TDG) saturation levels exceed 120%, and/or if signs of GBD are observed in the collected aquatic organisms, sampling effort will be increased to include additional sites in the affected river reach to augment observations for signs of GBD.

Sampling Protocols

In 1996, sampled organisms will include migrant salmonids and resident fish only. Gear will include 150-m purse, 50-m beach, and 7.5-m 2-person seines, and electrofishing equipment. Sampling will generally be conducted during the day, but occasionally in the early morning before dawn.

Sampled organisms will be examined immediately (within 15 minutes of capture), visually and microscopically for external signs of GBD. Species will be identified to the lowest practical taxon, and life-history stage, fork length or total length, and location time and date of capture recorded. Dissolved gas saturation will be measured and recorded when biological samples are collected. Dissolved gas levels will also be monitored hourly at established sites through the COE dissolved gas monitoring program and at the net pens used for 4-day in situ holding tests in each river reach. Dissolved gas monitors will be checked against other units weekly, and differences documented. When differences are greater than 3% TDG, measures will be taken to repair and recalibrate the monitors.

Upon capture, fish will be held in 76-L plastic containers containing river water maintained within 3°C of river temperature. Subsamples of fish will be anesthetized with 30 to 80 mg/L solution of tricaine methanesulfonate (MS-222). The concentration depends on species and water temperature. When fish have lost equilibrium, examination for external signs of GBD will be conducted using a 2.5- to 5-power magnification headband goggles. All external surfaces will be examined (each fin, the head, eyes, and body surface). Documentation of subcutaneous emphysema will include: estimated percentage of external surface involved, as well as description of location and approximate size of blisters. Injuries and deformities and obvious secondary infections will also be documented. In a subsample of fish, lateral lines will be examined under a 10-to 40-power magnification dissecting microscope and an estimate

of percentage of line length occlusion will be recorded. At conclusion of the exams, fish will be placed in river water for 15 to 30 minutes for recovery prior to release or transfer.

In situ Bioassays of Dissolved Gas

In 1996, once each week, a subsample of up to 100 organisms per taxon of the resident fish (excluding salmonids) and invertebrates sampled from the river will be placed in net-pens or cages located in each of the three river reaches. Organisms will be apportioned between shallow water (0-1 m) cages, and the 0 to 4-m deep net pens. Large individuals (greater than 140 mm total length) will not be placed in shallow cages and will be placed in a separate 0-4-m-deep net-pen by themselves. Subgroups of hatchery chinook salmon will also be placed in deep (2-3 m) cages. Signs of GBD, physical condition, and size will be recorded for all fish introduced into the net-pens and cages. Dissolved gas levels will be recorded continuously in the net-pens. Dissolved gas levels will be measured in the surface cage at the beginning and end of the 4-day holding period.

At the end of a 4-day holding period, test organisms will be brought to the surface, anesthetized, and examined for signs of GBD. External examination will be the same as with river samples, except that only fish with signs of GBD will be measured. After recovery from the anesthetic, resident species will be released. Any dead fish will be examined externally and internally for signs of GBD.

The results of these in situ bioassays will not be extrapolated to represent river-wide populations of the same taxa, but will provide comparative data on selected taxa relative to the occurrence and duration of dissolved gas supersaturation at the holding locations.

Reporting

After sampling and holding data have been reviewed by the Program Leader, reports of GBD, in Fish Passage Center (FPC) format, will be electronically transmitted or faxed to the Corps of Engineers (COE), FPC, Technical Management Team, and other interested parties on Wednesday of each week.

A written abstract and oral presentation of field results will be provided at the COE October Research Review. The annual report will be available in the winter.

Facilities and Equipment

Three rafts and existing net-pens will be used for mobile in-river holding facilities. A laboratory is available for bioassays of dissolved gas supersaturation. Three dissolved gas recorders will be provided by the COE, North Pacific Division, Water Quality Section to

supplement the three non-logging TDG meters and two Weiss-style satrometers retained by NMFS. Electrofishing boats, nets, microscopes, magnification visors, and fish handling equipment are available.

DATA ANALYSIS AND STATISTICS

Our goal is to develop a multiparameter model relating dissolved gas supersaturation levels (related to water flow and spill volumes) with signs of GBD and mortality in juvenile salmonids and other shallow-water organisms. Using regression analysis, we will compare exposure (duration and concentration) to ambient dissolved gas levels with signs of GBD and mortality on organisms sampled from the river and on organisms held in net-pens during the 12 to 16 weeks of tests at the three river reaches. Numerous observations of organisms held in net-pens or exposed to different dissolved gas levels in laboratory bioassays will provide the range of data necessary to calculate a 95% prediction interval for signs of GBD on organisms in shallow-water habitats.

KEY PERSONNEL

Boyd Schrank	Principal Investigator
Earl Dawley	Project Manager
Robert Iwamoto	Program Manager

REFERENCES

- Dell, M. B., M. W. Erho, and B. D. Leman. 1974. Occurrence of gas bubble disease symptoms on fish in mid-Columbia River reservoirs, 49 p. (Available from Public Utility District of Grand County, P.O. Box 878, Ephrata, WA 98823.)
- Toner, M. A., and E. M. Dawley. 1995. Evaluation of the effects of dissolved gas supersaturation on fish and invertebrates downstream from Bonneville Dam, 1993. Report to the U.S. Army Corps of Engineers, Contract DACW57-85-H-0001, E96930036, 39 p.
- Toner, M. A., E. M. Dawley, and B. Ryan. 1995. Evaluation of the effects of dissolved gas supersaturation on fish and invertebrates downstream from Bonneville, Ice Harbor, and Priest Rapids Dams, 1994. Report to the U.S. Army Corps of Engineers, Contract E96940029, 43p. (Available from Northwest Fisheries Science Center, 2725 Montlake Blvd. E., Seattle, WA 98112-2097.)
- Schrank, B. P., B. Ryan, and E. M. Dawley. In preparation. Evaluation of the effects of dissolved gas supersaturation on fish and invertebrates in Priest Rapids Reservoir, and downstream from Bonneville and Ice Harbor Dams, 1995. Report to the U.S. Army Corps of Engineers, Contract E96940029, 45 p. (Available from Northwest Fisheries Science Center, 2725 Montlake Blvd. E., Seattle, WA 98112-2097.)

BEFORE THE ENVIRONMENTAL QUALITY COMMISSION

In the matter of the National Marine Fisheries Service's request to spill water to assist out-migrating Snake and Columbia River salmon smolts	(	ORDER
	(	
	(	
	(	

And

In the matter of the United States Fish and Wildlife Service's request to spill water to assist out-migrating Spring Creek Hatchery salmon smolts	(
	(
	(
	(

WHEREAS the Department of Environmental Quality received a request from the National Marine Fisheries Service dated January 12, 1996, to adjust the Total Dissolved Gas standard as necessary to spill water over Bonneville Dams on the Columbia River, commencing at midnight on March 14, 1996, and finishing at midnight on March 23, 1996, to assist out-migrating Spring Creek Hatchery salmon smolts.

WHEREAS the Department of Environmental Quality received a request from the National Marine Fisheries Service dated January 12, 1996, to adjust the Total Dissolved Gas standard as necessary to spill over dams on the Columbia River, commencing at midnight on April 10, 1996, and finishing at midnight on August 31, 1996, to assist out-migrating Snake and Columbia River salmon smolts.

WHEREAS the public was notified of the request on January 22, 1996, and given the opportunity to provide testimony at 1:00 p.m. on February 16, 1996, and the opportunity to provide written comments until 5:00 p.m. on February 16, 1996.

WHEREAS the Environmental Quality Commission met on February 23, 1996 and considered the request, justification and public comment:

THEREFORE the Environmental Quality Commission orders as follows:

1. The Commission found that:
 - (i) failure to act will result in more salmonids swimming through hydroelectric dam turbines. Estimated mortalities from fish passing through turbines is between 10 and 15 percent. Fish passing over spillways as a result of spill experience 2 to 3 percent mortality. The Commission is, therefore able to make the first finding;

- (ii) the balance of risk of impairment to fish due to elevated dissolved gas levels needs to be balanced against mortality of turbine passage. It is clear from the netpen mortalities at Ice Harbor in May and June 1995 that elevated dissolved gas levels do result in significant mortality. This is well above the range that instream bioassays indicate that mortalities will occur. Correspondence from Oregon Department of Fish and Wildlife (ODFW) and the Tribes in relation to last year's petition equated the mortality from turbines with elevated dissolved gas at around 120 percent. This is considered a conservative estimate. Given the conservative nature of this estimate along with the data yielded by the netpen mortalities at Ice Harbor, the balance of the risk of impairment at the levels sought in the petition is tipped in favor of granting the variance;
 - (iii) NMFS has submitted a detailed physical monitoring plan which is the same as last year. Physical monitoring will occur at 37 sites in the mainstem Columbia, lower Snake and lower Clearwater Rivers in the forebays and tailraces of all spilling dams. The physical monitoring plan seeks to overcome the difficulties encountered last year with equipment failures and unreliable readings through rapid equipment repair including the use of properly calibrated backup equipment, and weekly instrument verification. Hourly data will be posted electronically, as it was last year. Implementation of the physical monitoring plan will ensure that data will exist to determine compliance with the standards;
 - (iv) NMFS has submitted a detailed biological monitoring program which also mirrors that of last year. Significant differences are the resident invertebrates will not be monitored in 1996. The incidence of GBD in resident invertebrate populations was so low in previous years that no benefit is seen from continuing with it. Smolt monitoring will continue as it did last year with examination of smolts being undertaken with 10X to 40X dissecting microscopes. Signs of GBD will be sought on non-paired fins, eyes and lateral lines. The presence of gas bubbles in these tissues has proven to correlate more reliably with mortality than the presence of bubbles in gill lamellae. In addition, a non-lethal method of examining gill lamellae has not been found. Implementation of the monitoring plan will ensure that sufficient biological monitoring is occurring to document that salmonid and resident populations are being protected.
2. The Environmental Quality Commission approves a modification to the Total Dissolved Gas standard for spill over the Columbia River dams subject to the following conditions:
- (i) a revised total dissolved gas standard for the Columbia River at Bonneville Dam for the period from midnight on March 14, 1996 to midnight on March 23, 1996;
 - (ii) a revised total dissolved gas standard for the Columbia River for the period from midnight on April 10, 1996 to midnight on August 31, 1996;

- (iii) a total dissolved gas standard for the Columbia River of a daily (12 highest hours) average of 115 percent as measured at established monitors at the forebay of the next dam downstream from the spilling dam during this time;
- (iv) a further modification of the total dissolved gas standard for the Columbia River to allow for a daily (12 highest hours) average of 120 percent as measured at established tailrace monitors below the spilling dams during this time;
- (v) a cap on total dissolved gas 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 this time; and
- (vi) that the Director halt the spill program if *either* 15 percent of the fish examined show signs of gas bubble disease 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, whichever is the less. show signs of gas bubble trauma.

Dated: _____

ON BEHALF OF THE COMMISSION

Director

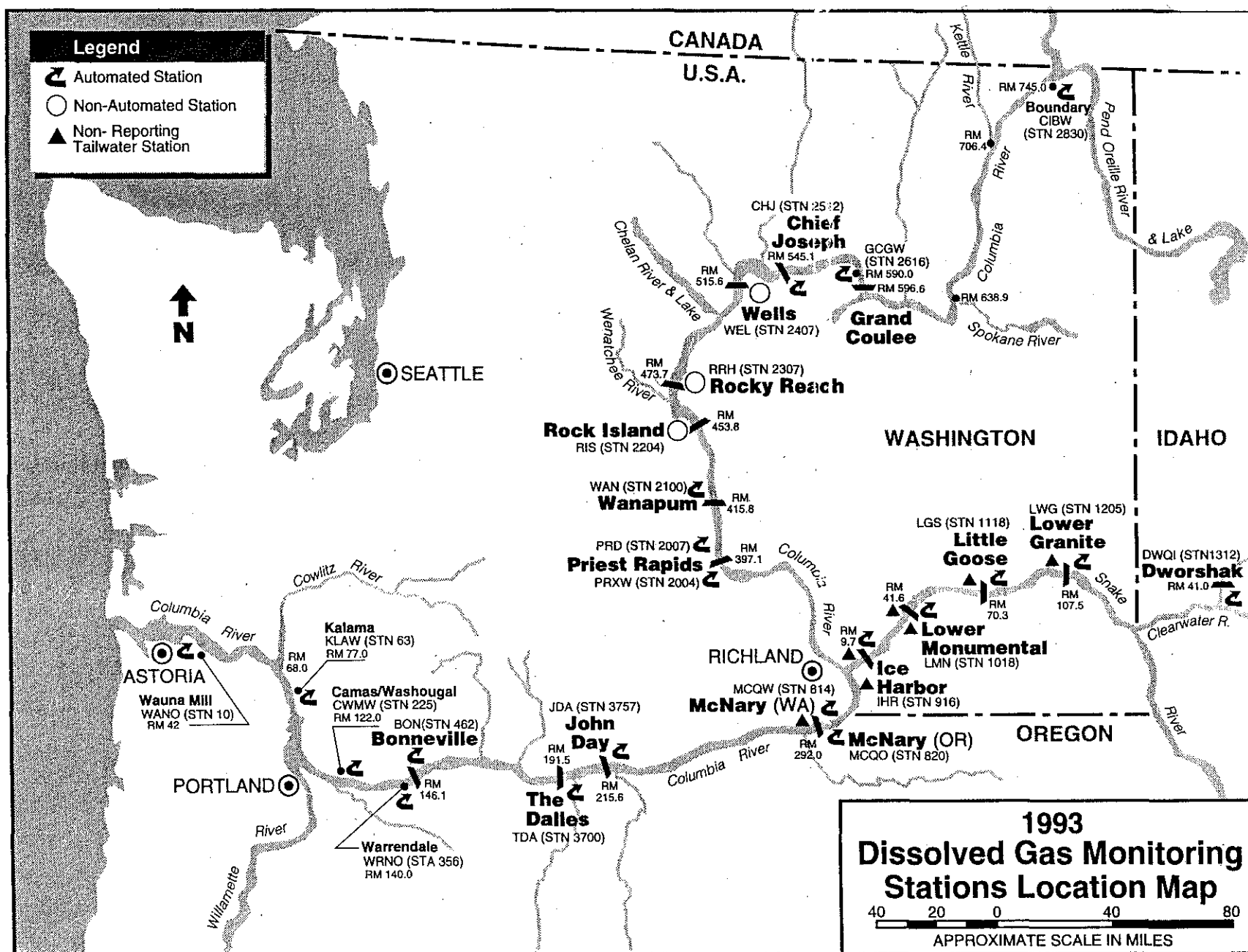


Figure 1. Locations of Dissolved Gas Monitoring Stations.

Environmental Quality Commission

- ☐ Rule Adoption Item
- ☒ Action Item
- ☐ Information Item

Agenda Item **F**
February 23, 1996 Meeting

Title:

National Marine Fisheries Service Request for a Variance to the Total Dissolved Gas Standard

Summary:

The National Marine Fisheries Service has requested a variance to the total dissolved gas standard for the Columbia River to spill water over dams to assist outmigrating salmonid smolts. The variance sought would enable gas levels to rise to 115 percent of saturation in the forebays of spilling dams and 120 percent in the tail races. This is the the same request as in 1995, with one notable exception. The U.S. Fish and Wildlife Service has petitioned jointly with the National Marine Fisheries Service for spill over Bonneville Dam to assist out-migrating Spring Creek Hatchery salmonid smolts. The U.S. Fish and Wildlife Service is seeking the same level of waiver as the National Marine Fisheries Service.

Department Recommendation:

The Department recommends that the Commission approve the waiver to the total dissolved gas standard for the Columbia River for the period March 14, 1996 to August 31, 1996 to enable spill over dams to assist out-migrating salmonid smolts


Report Author


Division Administrator

Director 

February 20, 1996

Endangered Species Act - Section 7
Consultation

BIOLOGICAL
OPINION

Reinitiation of Consultation on 1994-1998
Operation of the Federal Columbia River
Power System and Juvenile Transportation
Program in 1995 and Future Years

Agencies: U.S. Army Corps of Engineers
Bonneville Power Administration
Bureau of Reclamation
National Marine Fisheries Service

Consultation Conducted By: National Marine Fisheries Service,
Northwest Region

Date Issued: 3-2-95

2. The COE shall spill at the Snake and Columbia River projects in order to increase fish passage efficiency and survivals at the dams.

The COE, during the juvenile spring/summer chinook migration season (April 10 - June 20 in the Snake River and April 20 - June 30 in the Columbia River), shall spill at all projects, including collector projects, to achieve a fish passage efficiency target of 80%, except under the following low flow conditions: During any week in which unregulated weekly average flows at Lower Granite Dam are projected to be less than 100 kcfs, no spill shall occur at Lower Granite Dam; during any week in which unregulated weekly average flows at Lower Granite Dam are projected to be less than 85 kcfs, no spill shall occur at Lower Granite, Little Goose, and Lower Monumental dams, unless the TMT recommends that spill occur. During the fall chinook migration season (June 21 to August 31 in the Snake River and July 1 to August 31 in the Columbia River) the COE shall spill at all non-collector projects to achieve a fish passage efficiency target of 80%.

It is NMFS' view that the best condition for an evaluation of the effects and efficacy of spill to improve inriver survival would be for a single spill regime to prevail throughout the spring migration season. NMFS' first draft of the biological opinion used a volume runoff forecast in the Snake River to trigger spill operations, which would then remain constant during the season. In making recommendations to spill at collector projects when flows are below target levels, the TMT should take into consideration the objective of having a credible evaluation of the spill program. Accordingly, TMT recommendations to spill at the above projects in the Snake and Columbia rivers at flows below the triggers specified should take into account past flow conditions and future flow projections, how close flows are to the trigger levels and how much augmentation is planned, the timing of the juvenile migration, and the need for a credible evaluation. If the use of weekly flow triggers compromises an evaluation, NMFS will consider returning to a volume runoff approach.

During low flow periods, spill at collector projects is reduced or eliminated in order to increase the proportion of fish transported. The discussion under measure 3 explains the rationale for increasing transportation under low flow conditions.

Spill levels calculated to obtain an 80 percent fish passage efficiency are listed below for each lower Snake and lower Columbia River dam. These levels are expressed in percent of instantaneous project flow during the spill period and were calculated with the best available information regarding spring and fall chinook salmon guidance efficiency, spill efficiency,

fish passage diel and project operating conditions. Spill periods are 24 hours at Ice Harbor, The Dalles and Bonneville Dams and 12 hours (1800-0600) at all others.

DAM	LGR	LGS	LMN	IHR	MCN	JDA	TDA	BON
% Flow, Spring	80	80	81	27	50	33	64	*
% Flow, Summer	**	**	**	70	**	86	64	*

* An 80% FPE level is not obtainable at Bonneville Dam given a day time spill cap of 75 kcfs and the current low fish guidance efficiency levels. This spill cap (in place to reduce adult fallback) limits obtainable spring FPE to 74% and summer FPE to 59% at 100 percent nighttime spill.

** Spill is not recommended at these projects for summer migrants.

The spill levels necessary to obtain this FPE may be limited by total dissolved gas (TDG) in the river between each project. Specific monitoring sites for the purposes of in-season dissolved gas management should be selected on the basis of data consistency and relationship to fish exposure. Until it can be determined how tailrace monitoring stations relate to the river reaches between monitoring sites and how TDG data collected at these sites relate to fish experience, forebay monitoring data will be used for in-season management. Water quality and other fishery management agencies have recommended that monitoring sites be located below mixing areas, the forebay monitors are the only presently established monitors that consistently provide mixed flow data. Tailrace monitors are of limited usefulness at this time, however, they probably best estimate maximum acute exposure, particularly for adults.

Spill will be reduced as necessary when the 12 hour average TDG concentration exceeds 115% of saturation (or as limited by state water quality standard modifications) at the forebay monitor of any Snake or lower Columbia river dam or at the Camas/Washougal station below Bonneville Dam or another suitable location to measure accurately chronic exposure levels. Spill will also be reduced when 12 hour average TDG levels exceed 120% of saturation (or as limited by state water quality standard modifications) at the tailrace monitor at any Snake or lower Columbia River dams. Average concentrations of dissolved gas will be calculated using the 12 highest hourly measurements per calendar day. The use of 12-hour averages, rather than 24-hour averages, is an attempt to set a more conservative standard, and to relate the measured concentrations of dissolved gas to the 12-hour spill cycles. Spill will also be reduced when instantaneous TDG levels exceed 125% of saturation (or as limited by state water quality standard modifications) for any two hours during the 12 highest hourly

measurements per calendar day at any Snake or lower Columbia River monitor.

The intent of these gas caps is to ensure that the long term exposure of adult and juvenile migrants is to TDG levels that do not exceed 115%. NMFS concludes this operation accomplishes that goal for several reasons. Radio telemetry studies indicate that juvenile salmonids tend to move out of tailrace areas within a few hours (Snelling and Schreck unpublished) and that adults tend to move about laterally in tailraces prior to ascending ladders (Johnson et al. 1982, Turner et al. 1983). These movement patterns limit exposure to high spill basin TDG levels. As spilled water moves out of the tailrace the TDG level decreases at some point below the project (depending on ratio of these flows and river topography) because the spilled water mixes with water from the powerhouse. For instance, Blahm (1974) found that, given moderate spill levels, the river was well mixed within 2.5 miles of The Dalles Dam and 15 miles below Bonneville Dam. The requirement that TDG levels in the forebay be limited to 115% will help ensure that areas where migrating juveniles may spend long periods of time do not have TDG levels in excess of 115%. Radio tag studies have indicated that some spring migrating juvenile salmon may be delayed from several hours to several days in these areas (Snelling and Schreck unpublished, D. Rondorf, NBS, February 24, 1995, pers. comm.). Finally, the fact that spill is intermittent at many projects will help limit dissolved gas exposure of fish holding in the forebays and other areas between the projects. This is particularly true for adult migrants.

After reviewing available information on dissolved gas exposure as well as information and recommendations submitted by the parties during the IDFG v. NMFS discussions, NMFS concluded that 115% TDG measured in the forebays was a reasonable interim measure to adopt. Several commenters argued that the Environmental Protection Agency's recommended water quality limit of 110% represented an appropriate level and should not be varied. State and tribal entities developed a risk assessment that suggested that long term exposure to 120% did not pose significant risks to migrating fish and that the benefits of improved dam passage outweighed these minimal risks of TDG exposure at 120%. Still other commenters noted the spill at collector projects reduced the numbers of fish transported and that any risk assessment had to consider the benefits of transportation. The issue of transportation is addressed more fully in measure 3 below.

NMFS concluded that it was appropriate to seek an operation that would result in the EPA criteria of 110% being exceeded primarily because of: 1) the ability of fish in a river environment to compensate hydrostatically for the effects of dissolved gas supersaturation, and 2) the daily fluctuation in levels of

dissolved gas throughout most of the river. In a river environment, depth of migration reduces TDG effects on migrants. Each meter of depth provides pressure compensation equal to a 10% reduction in TDG. Shew et al. (Undated) and Turner et al. (1984b) noted through tunnel studies that net entry rates through McNary and Bonneville dam ladder entrance tunnels were highest for the deepest (3.4m) tunnels. Other studies indicate that adult and juvenile salmon tend to spend most of their time at or below one meter of depth (Smith 1974). Blahm (1975) concluded that shallow water tests were "not representative of all river conditions that directly relate to mortality of juvenile salmon and trout in the Columbia River." In deep tank tests, salmonids exposed to 115% TDG levels did not experience significant mortality until exposure time exceeded approximately 60 days (Dawley et al. 1976).

NMFS also concluded that it was not appropriate as an initial interim level to seek an operation that would result in chronic exposure to TDG level of 120%, as recommended by the states and tribes. In general, chronic exposure to TDG levels of 120% with hydrostatic compensation does not cause significant mortality until exposure time exceeds 40 days (Dawley et al. 1976). This is generally more time than it takes Snake River juvenile and adult migrants to travel between Lower Granite and Bonneville dam. Nevertheless, NMFS concluded that the more conservative level of 115% is appropriate because of concerns about the potential sublethal effects of gas bubble disease. The state and tribal report on "Spill and 1995 Risk Management" summarized the studies showing evidence that swimming performance, growth and blood chemistry are affected by high dissolved gas levels. The report correctly states that it is only inferential that these symptoms may result in susceptibility to predation, disease and delay. In fact, studies conducted in 1993 and 1994 by the National Biological Service indicated that juvenile chinook salmon that have been exposed for eight hours to high TDG (and exhibiting microscopic signs of gas bubble disease) are no more vulnerable to northern squawfish predation than control fish that had been held in equilibrated water (Mesa and Warren, in review). Ultimately the analysis in the state and tribal report did not assume any level of mortality as a result of these sublethal effects.

NMFS concludes that the impairments to migrating fish as a result of the sublethal effects of dissolved gas may be sufficiently grave to warrant caution in setting long term exposure levels above 110%. In particular, long term exposure to levels in excess of 110% decrease swimming ability (Dawley and Ebel, 1975); fish stressed with high levels of dissolved gas have been reported to have less swimming stamina (Dawley et al., 1975); and gas bubbles in the lateral line can impair sensory ability. In addition, although fish in deep tank studies are less affected by high levels of TDG than fish in shallow tanks, some mortalities

still occur despite a water depth that is apparently adequate for protection. There is no evidence that fish can "sense" TDG supersaturated water and deliberately sound to compensate.

At specific projects where specific levels of spill, particularly daytime spill have been shown to be detrimental to fish passage, timing and/or amounts of spill may have to be adjusted (for specific details see NMFS 1994b). Spill may also be limited at projects where it can be demonstrated that spill may be detrimental to system spill allocation. One such project is John Day Dam, where very low amounts of spill result in very high TDG levels. These high TDG levels then limit the amount of spill possible at dams downstream. For instance, by reducing spill by 10 to 20 kcfs at John Day Dam, it may be possible to increase spill at The Dalles or Bonneville dams by 20 to 40 kcfs. The exact relationship will need to be developed through in-season spill/TDG testing. The limitation of spill may also apply at The Dalles Dam to minimize the passage of spilled flow and fish over the high predation risk area in the shoals below the dam (see specific details in NMFS (1994b). The details regarding this limitation will be decided in-season through consultation with predation experts and will likely depend on ambient flow and the spill levels obtainable under the TDG limitations. In 1995, spill at Ice Harbor, The Dalles, and John Day Dams may be modified to accommodate research activities if NMFS determines that the spill modifications will not affect the validity of the transport vs. in-river survival study. These spill operations should be treated as interim until the effects of TDG on migrating salmonids are more fully evaluated and until a spill/transport rule curve can be developed. The rationale for flow targets associated with spill at collector projects is related to transportation policy and discussed under measure 3 below.

Migration over the spillways or through the bypass systems are the safest routes of passage at the dams. Injury and mortality can occur through each route of passage (turbines, spillways, ice and trash sluiceways, juvenile fish bypass systems), but loss rates via the spillways and bypass systems are low relative to passage by the turbines. For both spring/summer and fall chinook salmon, mortality of fish passing over the spillways or through the bypass systems generally ranges from 0-3% (Schoeneman et al. 1961; Heinle 1981; Ledgerwood et al. 1990; Raymond and Sims 1980; Iwamoto et al. 1994). Direct turbine mortality can range from 8-19% for yearling chinook salmon and 5-15% for subyearling chinook salmon (Holmes 1952; Long 1968; Ledgerwood et al. 1990; Iwamoto et al. 1994). Values of turbine and spill mortality are not available for sockeye salmon. However, it is reasonable to assume that these values are similar to or greater than values for yearling chinook salmon due to size and timing of migration and due to the greater susceptibility of sockeye to physical injury and mortality in project passage and handling (Gessel et

al. 1988; Johnsen et al. 1990; Koski et al. 1990; Parametrix 1990; Hawkes et al. 1991).

This spill program is experimental due to uncertainties about benefits of transportation of smolts relative to in-river migration, as well as uncertainties about the effect of nitrogen supersaturation on free-swimming fish in the river. Gas supersaturation is a negative effect of spill and the precise relationship between spill levels and gas bubble disease in juvenile and adult salmon migrating in the Columbia and Snake Rivers is not known. The spill program will be accompanied by an extensive physical and biological dissolved gas monitoring effort (see measure 16) as well as studies to assess reach survival and to compare survival of transported versus in-river migrants, as well as studies that compare adult returns from transported fish versus fish that migrate in-river under improved in-river migration conditions (i.e., improved flows and improved passage survival at dams through spill). Ideally a spill program, rather than setting a gas cap across all projects, would be based on a project-by-project analysis, with the benefits of spill passage balanced against the risks of gas bubble disease at each project. Such an analysis will require more information about the TDG levels that result at different levels of spill at each project, in relation to spill at other projects, and more information about the lethal and sublethal effects of creating supersaturated conditions through the river.

Appendix 2

DISSOLVED GAS MONITORING PROGRAM
PLAN OF ACTION FOR 1996

Draft/blv/17dec95

INTRODUCTION

The total dissolved gas (TDG) monitoring program consists of a range of activities designed to provide management information about dissolved gas and spill conditions. These activities include time-series measurements, data analysis, synthesis and interpretation, and calibration of numerical models. Four broad categories of objectives are involved:

- data acquisition, to provide decision-makers with synthesized and relevant information to control dissolved gas supersaturation on a real-time basis,
- compliance, to ascertain the extent to which existing state dissolved gas standards and federal criteria are being met;
- trend monitoring, to identify long-term changes in basinwide dissolved gas saturation levels resulting from water management decisions; and
- model refinement, to enhance predictive capability of existing models used to evaluate management objectives.

As part of the overall Corps of Engineers' restructuration, Portland, Seattle and Walla Walla Districts will assume direct responsibilities for TDG monitoring at their respective projects, including data collection, transmission, analysis and reporting. The Division's Reservoir Control Center (RCC) will continue to coordinate this activity with the Districts and other State and Federal agencies and private parties as needed to insure the information received meet all real-time operational and regulatory requirements. Districts and Division roles and functions are described in more detail in later sections of this document.

The Corps considers TDG monitoring a high priority activity with considerable potential for adversely affecting reservoir operations and ongoing regional efforts to save the salmon. It will make all reasonable efforts toward achieving at least a data quality and reliability level comparable to that provided in 1995. Furthermore, the Corps believes it is important to maintain a two-way communication between those conducting the monitoring and the users of monitoring information. These interactions give decision-makers and managers an understanding of the limitations of monitoring and, at the same time, provide the technical staff with an understanding of what questions should be

ENCLOSURE 8.

answered. Therefore, comments and recommendations received from users were and continue to be very useful in establishing monitoring program priorities and defining areas requiring special attention.

This Plan of Action for 1996 summarizes the role and responsibilities of the Corps of Engineers as they relate to dissolved gas monitoring, and identifies channels of communication with other cooperating agencies and interested parties. The Plan summarizes what to measure, how, where, and when to take the measurements and how to analyze and interpret the resulting data. It also provides for periodic review and alteration or redirection of efforts when monitoring results and/or new information from other sources justify a change.

DIVISION/DISTRICT RESPONSIBILITIES

Districts Functions. Each District will perform all the activities required at their TDG monitoring sites. Data will be collected and transmitted from those sites systematically and without interruption to the Columbia River Operational Hydromet Management System (CROHMS) (or any alternate data base as may be specified) year between 1 March and 15 September. This includes but is not limited to the following tasks:

- preparing annual monitoring plan of action and schedule
- procuring data collection/transmission instruments
- preparing and awarding equipment and service contracts
- performing initial instrument installation and testing
- setting up permanent monitoring installations, if requested
- collecting and transmitting raw TDG data to CROHMS
- reviewing data for early detection of instrument malfunction
- making periodic biweekly service and maintenance calls
- providing emergency service calls as needed and/or when so notified
- performing special TDG measurements if needed
- keeping records of instrument calibration and/or adjustments
- retrieving, servicing, and storing instruments at the end of the season
- making final data correction and posting in separate data base
- performing data analysis to establish/strengthen spill vs. TDG relationship
- preparing an annual activity report for inclusion in Annual TDG Monitoring Report

Each District will also be responsible for (1) preparing an annual report on instrument performances, and (2) providing the necessary material including test and data analyses, charts, maps, etc. for incorporation in the Corps Annual TDG Report, which will be finalized by the Division. Additional monitoring at selected locations may also be required on an as-needed-basis. Dissemination of data to outside users will remain a Division responsibility to avoid duplication and uncoordinated service.

Division's Functions. Close coordination will be maintained between the Program Coordinator at the division and his/her counterparts at the districts, the contractors helping with field monitoring, and other cooperating agencies. The Program Coordinator will be the main point of contact for technical issues related to the TDG monitoring at Corps projects. Problems of common interest will be discussed at relevant forums such as the NMFS/EPA Gas Bubble Disease Technical Work Group (TWG) for peer review and open discussion. Final decision on technical issues will be made by the Program Coordinator after considering all input received from all interested parties.

The Corps' TDG Monitoring will be coordinated by a Program Coordinator. The Chief, Fish & Water Quality Section, CENPD-ET-WM(RCC), is the designated TDG Program Coordinator. He will report through the chain of command through Chief, Reservoir Control Center and Chief, Water Management Division to Director, Engineering & Technical Services Directorate. He will consult as needed with interested environmental staff in Planning Division, Pacific Salmon Coordination Office, Construction-Operations Division, and others. His role is to provide overall guidance and coordination to his District counterparts to ensure that the monitoring program is carried out according to the plan outlined in this document, including adherence to a general schedule and operating QA/QC protocols.

The TDG Program Coordinator will meet with his District counterparts in January to discuss detailed implementation plan and schedule for the current year. Discussion will address selection of monitoring sites, equipment and procedures to be used for data collection and transmission, service and maintenance program priorities, budget, etc. Following discussion and acceptance by District representatives, the Division will issue a set of specific performance standards to supplement and/or strengthen existing QA/QC protocols. The TDG Program Coordinator will review and monitor District performances based on those standards. An annual performance review meeting will be held annually to provide a critique of the operations and identify areas needing changes and/or improvements.

Division will initially maintain a shadow operation with existing minimum standby staff to fill any vacuum that may occur in the early 1996 introductory phase of the Division-to-Districts Program transfer. This will ensure that the Reservoir Control center continues to get real-time data it needs for its daily scheduling of reservoir operation at selected critical locations.

1996 ACTION PLAN

The 1996 Action Plan consists of the usual seven phases observed in previous years, namely :

- (1) Program start-up;
- (2) Instrument Installation;

- (3) In-season Monitoring and Problem Fixing;
- (4) Instrument Removal and Storage;
- (5) Data Compilation, Analysis and Storage;
- (6) Program Evaluation and Report; and
- (7) Special Field Studies

Based in part on discussions held at the 5 and 8 December 1995 TWG meetings, changes and/or adjustments to the Program will include the following:

- Sutron DCP 8200 models will continue to be used throughout the network to the maximum extent possible to avoid going through another learning curve period. These models were first introduced in 1995 and have provided satisfactory results once initial installation and programming problems were resolved;
- backup instruments and infrequently used stations will be eliminated so that O&M efforts can be concentrated on the remaining stations and instruments within the allocated fixed budgets;
- current fixed stations will not be changed to avoid relocation costs and having to establish new baseline conditions. If, based on transect studies, readings at those stations need corrections for operational and regulatory purposes, final decision on the nature and extent of the corrections will be deferred to NMFS and the States;
- in the interest of time, raw data received from the field will be immediately posted on the CROHMS without delay. Data corrections, if and when applicable, will be done as soon as possible thereafter.

Phase 1: Program Start-Up

Responsible parties (See Table 1) will be invited for topical peer review discussions on TDG monitoring in a forum provided by TWG. Discussions will include preliminary instrument deployment plan for the next monitoring season. This is to ensure a good and mutual understanding of the objectives of the dissolved gas monitoring program, including data to be collected, instrument location, procedures to be used, etc. The meeting also provides an opportunity to objectively assess the adequacy of past, present and anticipated monitoring efforts; and consequently, to recommend commensurate program changes if deemed necessary.

As stated above, the Corps will finalize its monitoring plan at the January 1996 meeting between interested Division and Districts staff. Instrument maintenance and service contracts are renewed in early January. Land owners are also contacted in early January to ensure the continued site availability of Warrendale, Oregon and other Lower Columbia River locations below Bonneville Dam. Orders for new TDG instruments and DCPs, if applicable, will be placed in January. At this writing, outside contracting is

being considered by all three Districts for conducting TDG monitoring at their projects. Portland is planning to contract with the USGS, Seattle with Common Sensing, and Walla Walla with a yet-to-be-defined qualified party.

Phase 2: Instrument Installation

Instruments to be installed and their assigned locations are listed in Table 2 and shown in Figure 1. There will be one forebay and one tailwater fully automated instrument at each of the Columbia/Snake River Corps dam, with the following exceptions:

- Dworshak: tailwater only
- McNary: two forebay stations, on Oregon and Washington sides respectively,
- Bonneville: Warrendale and Skamania used as tailwater station substitutes

This is basically the same instrument setup as in 1995. However, as discussed at the 5 December 1995 TWG meeting, there is a need to reduce the number of instruments to a strict minimum to ensure an adequate level of service and maintenance can be provided to the remaining instruments. In that context, the following steps will be taken:

- remove infrequently used stations: Hood Park, Kalama and Wauna Mills
- eliminate backup instruments at Warrendale, The Dalles, McNary-OR and Ice Harbor tailwater.

The Plan also includes the Bureau of Reclamation's (USBR) instruments located at the International Boundary and below Grand Coulee, the Corps' instrument located at Chief Joseph reservoir forebay, the mid-Columbia Public Utility Districts' (PUD) forebay instruments at Rocky Reach, Rock Island, Wanapum, and Priest Rapids Dams, plus the tailwater instruments below Wanapum and Priest Rapids dams. Monitoring requirement below Libby Dam and in the Clearwater River below the North Fork Clearwater confluence will be determined later on as-needed basis.

The instruments are scheduled for installation and, if applicable, interface with SUTRON Data Collection Platforms no later than 1 April at all Corps projects. Monitoring stations below Bonneville are scheduled to be in place first, prior to the release of Spring Creek Hatchery fish, which is scheduled to start in mid-March. District Water Quality staff, together with maintenance and service contractors, if applicable, will jointly perform the installation, calibration and testing of all equipment at those stations. Selected project personnel may also be requested to assist as needed.

Phase 3: In-season Monitoring and Problem Fixing

Actual data collection and transmission activities will start prior to the first Spring Creek Hatchery release, but no later than 15 March for stations below Bonneville, and no later than 1 April for the remainder of the monitoring network. Exact starting dates will be

coordinated with the Corps' Reservoir Control Center (CENPD-ET-WM), project biologists and cooperating agencies, based on run-off, spill, and fish migration conditions.

The following data will be collected approximately every hour:

- WC, Water Temperature (°C)
- BH, Barometric Pressure (mm of Hg)
- NT, Total Dissolved Gas Pressure (mm of Hg)
- OP, Dissolved Oxygen Pressure (mm of Hg)
- NP, Nitrogen + Argon Pressure (mm of Hg)

The 2-channel stations will monitor WC and NT; the 3-channel: WC, BH and NT; the 4-channel: WC, NT, OP, and NP; and the 5-channel stations will monitor all five parameters. The minimum required for forebay stations are WC, BH and NT. At tailwater stations, when BH is not measured; BH forebay values will be used instead.

Data transmission from nonautomated instruments via Columbia Basin Teletype (CBT) network will be done twice a day, between 0915 to 1100 and 2115 to 2300 hours. CBT coding sheets should be made available to the RCC for data reconciliation purposes. Data transmission from automated stations interfaced with a Sutron data collection platform will be transmitted automatically every four hours. This will be done via the GOES Satellite, to the Corps' ground-receive station in Portland or any other proven and reliable mode. After decoding, all data will be stored in the CROHMS data base.

Daily reports summarizing TDG and related information will be posted on the CROHMS system. To the extent feasible, the measured TDG data will be compared with model predicted values so that suspicious values can be flagged and/or discarded before they are released. Information provided in CROHMS Reports 101, 102, and 103 will include the following data:

- Station Identifier
- Date and Time of the Tensionometer Probe Readings
- Water Temperature, °C
- Barometric Pressure, mm of Hg
- TDG Pressure, mm of Hg
- Calculated TDG Saturation Percent (%)
- Project Hourly Spill, Kcfs (QS)
- Project Total Hourly Outflow, Kcfs (QR)
- Number of Spillway Gates Open

Stop settings, if different from the numbers provided in the Fish Passage Plan, will also be given.

This information will be available for viewing by all those who have access to CROHMS. Reconciliation between data received via the CBT and those manually recorded on the coding sheets will be made by the RCC) before the data are permanently stored in the Corps' Water Quality Data Base.

To improve instrument reliability and accuracy, a systematic service and maintenance program will be implemented. Every two weeks on the average a contractor will visit the monitoring sites to check for and, if necessary, fix site problems (probes clogging, instruments out of calibration, etc.) using a portable calibration instrument as reference.

To better understand the physical process of dissolved gas distribution across the reservoirs and its dissipation along the various pools, selected transect studies will continue to be conducted on an as-time-permits basis. An additional objective for this activity is to be able to define how representative readings from current monitoring sites are with respect to the entire river reach. Model runs using GASSPILL and other acceptable tools such as a Neural Network model will be performed as needed to define the range of expected/acceptable TDG levels under various spill conditions.

Phase 4: Instrument Removal and Storage

Tensionometers will be removed shortly after the end of the monitoring season (15 September) by the contractors and relevant Corps district/project personnel. They will be serviced by the maintenance and service contractors and stored at a convenient location until the beginning of the next monitoring season. They may also be available for off-season special monitoring activities upon request.

Phase 5: Data Compilation, Analysis and Storage

Time and staff availability permitting, statistical analyses will be conducted to develop trends and relationships between spill and TDG saturation. Efforts will continue to be expanded on the calibration and application of GASSPILL (Dissolved Gas) and COLTEMP (Water Temperature) models, and finding ways to facilitate and/or improve user access to the TDG and TDG-related data base. The GASSPILL model will be modified to accommodate calculation time step shorter than the current daily time increment. Work will continue in training Neural Network models to simulate different flow and spill conditions for all river reaches of interest. Data collected at and transmitted from all network stations will be ultimately stored at CENPD-ET-WM, where they can be accessed through a data management system such as HEC-DSS.

Phase 6: Program Evaluation and Summary Report

An annual report will be prepared after the end of the monitoring season to summarize the yearly highlights of the TDG monitoring program. It will include a general program

evaluation of the adequacy and timeliness of the information received from the field, and how that information is used to help control TDG supersaturation and high water temperature in the Columbia River basin. Information on the performance of the instruments and the nature and extent of instrument failures will also be documented. The Annual TDG Monitoring Report will be prepared by Division staff, based on field input and other material provided by each District

Phase 7: Special Field Studies

As provided for in Phase 3, additional monitoring of dissolved gas saturation will be conducted on a as-needed basis. Current plan for additional monitoring includes transect measurements below selected dams to : 1) establish the relationship between various spill amounts and TDG saturation, and 2) plot TDG variations within a given cross-section of the river. Efforts will also be expanded in learning more about dissolved gas saturation dissipation along the fish migration route, using monitoring made from moving fish barges and deployment of self-contained wireless probes. These on-going efforts are expected to continue for several years.

TABLE 1. List of Contact Persons

<u>Projects</u>	<u>Names</u>	<u>Position</u>	<u>Phone Nos.</u>
Int'l Boundary	Dan Lute	Hydrologist	(208) 378-5272
	Dave Zimmer	Limnologist	(208) 378-5088
Grand Coulee	Dan Lute	Hydrologist	(208) 334-1970
	Dave Zimmer	Limnologist	(208) 334-9035
Chief Joseph	Joe Munk	Ch. of Operations	(509) 686-5501
	Marian Valentine	Hydraulic Engineer	(206) 764-3529
Wells	Rick Klinge	Biologist	(509) 884-7191
Rocky Reach	Steve Hays	Biologist	(509) 663-8121
Rock Island	Steve Hays	Biologist	(509) 663-8121
Wanapum	Stuart Hammond	Biologist	(509) 754-3541
	Mike Taylor	Telecom.Engr.	(509) 754-2138
Priest Rapids	Stuart Hammond	Biologist	(509) 754-3541
	Mike Taylor	Telecom.Engr.	(509) 754-2138
Dworshak	Tom Miller	Limnologist	(509) 527-7279
Lower Granite	Tom Miller	Limnologist	(509) 527-7279
Little Goose	Tom Miller	Limnologist	(509) 527-7279
Lo.Monumental	Tom Miller	Limnologist	(509) 527-7279
Ice Harbor	Tom Miller	Limnologist	(509) 527-7279
McNary	Tom Miller	Limnologist	(509) 527-7279
John Day	Faith Ruffing	Biologist.	(503) 362-6184
The Dalles	Faith Ruffing	Biologist.	(503) 326-6184
Bonneville	Faith Ruffing	Biologist.	(503) 326-6184
Warrendale	Faith Ruffing	Biologist	(503) 326-6184
Camas/Washougal	Faith Ruffing	Biologist	(503) 326-6184
Kalama	Faith Ruffing	Biologist	(503) 326-6184

TABLE 2 1996 Dissolved Gas Monitoring Network

Sta. ID	Location	Owners/Operators
CIBW	Boundary	USBR
GCGWD/s	GCL	USBR
CHJ	Forebay	NPS
WEL	Forebay	Douglas County PUD
RRH	Forebay	Chelan County PUD
RIS	Forebay	Chelan County PUD
WAN	Forebay	Grant County PUD
WAN	Tailwater	Grant County PUD
PRD	Forebay	Grant County PUD
PRXW	Tailwater	Grant County PUD
DWQI	Tailwater	NPW
LWG	Forebay	NPW
LWG	Tailwater	NPW
LGS	Forebay	NPW
LGS	Tailwater	NPW (.7 mi RB)
LMN	Forebay	NPW
LMN	Tailwater	NPW (.8 mi LB)
IHR	Forebay	NPW
IHR	Tailwater	NPW (3.6 mi RB)
MCQW	Forebay-WA	NPW
MCQO	Forebay-OR	NPW
MCN	Tailwater	NPW (1.4 mi RB)
JDA	Forebay	NPP
JDA	Tailwater	NPP
TDA	Forebay	NPP
TDA	Tailwater	NPP
BON	Forebay	NPP
WRNO	Warrendale	NPP
SKAW	Skamania	NPP
CWMW	Camas	NPP

USBR= U.S. Bureau of Reclamation

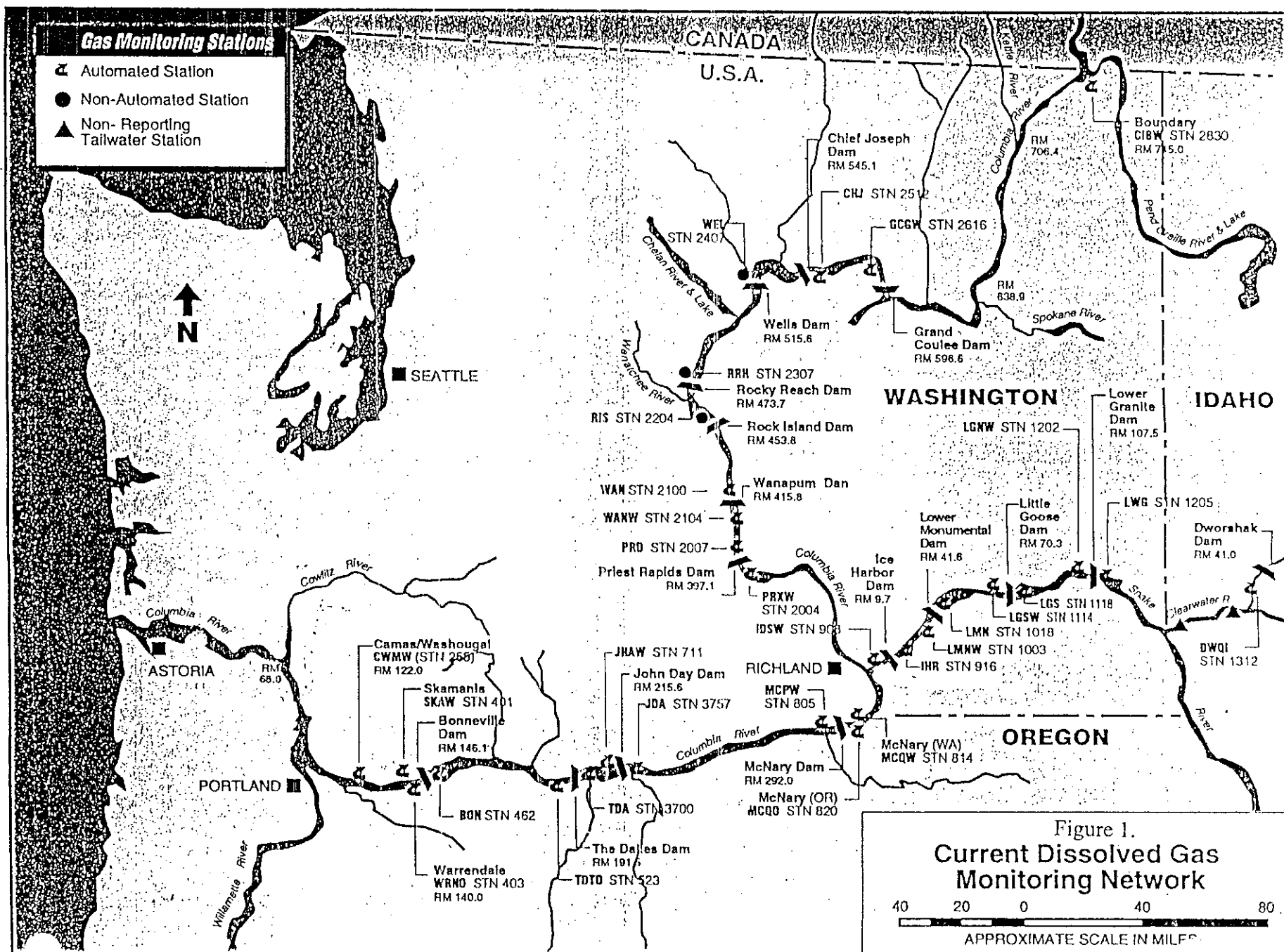
NPS= Seattle District

LB=Left bank RB=Right bank

NPP= Portland District

NPW= Walla Walla District

MC=mid-channel



Appendix C

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1/16/96

1996 GBT Monitoring Protocol for Signs of GBT in Juvenile Salmon

Fish will be examined externally for signs of gas bubble trauma (GBT). The examination will involve examining fins, eyes, and lateral line for the presence of bubbles. Monitoring will be conducted at Bonneville, John Day, McNary, Rock Island, Lower Monumental, Little Goose, and Lower Granite dams. Monitoring will also be conducted in the Clearwater River in Idaho, below Dworshak Dam. The goal of the examinations is to determine the relative extent to which the juvenile salmon passing the dam or sampling location have been exposed to harmful levels of total dissolved gases based upon the presence and severity of bubbles on the fish. The data will be reported to the management entities, the state water quality agencies as well as other interested parties on a daily basis during the spill season.

Method of fish examination for GBT

Fish will be examined using a variable magnification (10X to 40X) dissecting scope. Unpaired fins, eyes, and lateral line will be examined for the presence of bubbles. Fish to be examined will be netted at the separator (or removed from the sampling apparatus Rock Island, John Day and Bonneville) and put into an anesthetic bucket (see section on methods of anesthetic below for more detailed description). These fish will be carried to the location where examinations will occur. Each fish as it is to be examined will be held in an examination tray (see anesthetic section for detailed description). The fish will be examined on one side (right side first) entirely before being turned over to examine the eye on the opposite side.

The examination will begin with the lateral line. With the fish on its side, the examiner will search the lateral line for bubbles. The level of magnification required for this examination is between 15X and 30X. The magnification must be great enough to discern the canal of the lateral line as well as determine if bubbles are present. The entire length of the lateral line from the anterior end near the operculum to the caudal fin will be examined.

If bubbles are found in the lateral line, then the percent length of the lateral line occluded by bubbles will be measured. A transparent plastic ruler with an uniform grid on it will be used to measure the total length of the lateral line (measured as the distance from the posterior end of the operculum to the anterior end of the caudal fin). The length will be expressed in bubble units which are the unit of measure of the ruler. The total length of the lateral line that is occluded by bubbles will be measured in the same way and that number will be expressed in bubble units also. A percent occlusion will be calculated by dividing total length occluded by the total length of the lateral line.

$$\text{Percent Occlusion} = \left(\frac{\text{Length of lateral line occluded by bubbles}}{\text{Total length of lateral line}} \right) \times 100$$

Next the fins and eyes will be examined and data recorded based upon area of the fin or eye covered with bubbles. The area covered will be estimated using the examiners best judgement. A visual technique for estimating the area of fin covered by bubbles is illustrated in Figure 1. Each unpaired fin, will be examined starting with the caudal, then anal and finally dorsal fin. Finally the eye on the right side of the fish will be examined for the presence of bubbles. Once the right side examination is completed the fish will be turned over and the left eye examined for the presence of bubbles. The magnification used to search for bubbles in fins varies with the fin being examined and the eyes of the examiner. However, it is recommended that a minimum of 10X be used to insure that small bubbles in the fins would be visible to the eye under magnification. A rank will be assigned based upon the percent area of the fin or eye covered with bubbles. A

rank 0 is assigned if no bubbles occur. Rank 1 if greater than 0 and less than or equal to 25% of fin or eye is covered. Rank 2 is assigned if bubbling occupies 26 to 50% of the fin or eye. And rank 3 is assigned if greater than 50% of the fin or eye is covered. If bubbles occur in one eye the rank will be for that eye only. If bubbling occurs in both eyes the eye with the greatest area having bubbles will be ranked and recorded. If the area covered by bubbles is estimated to be near 25% or near 50% (i.e. at a boundary between rank 1 and 2 or rank 2 and 3), then the higher rank should be reported. A summary of ranks to be used in recording GBT data for fins and eyes is listed below.

Rank	Percent area affected
0	0
1	1 to 25
2	26 to 50
3	greater than 50%

These rank criteria are being re-evaluated through laboratory experiments at NBS during the winter of 1995 and 1996. An additional rank from 0 to 5% is being considered for its relevance to onset of mortality in laboratory fishes and also its applicability to the monitoring program. It is possible that there will be a fifth rank in 1996 if this additional rank is deemed important based upon ongoing research.

While the body and paired fins are not included as part of the examination, if any bubbles are seen in these areas, this should be recorded in the comments. Any fish showing signs in the body or the paired fins should be reported as one of the fish showing signs of GBT in the daily summary sent to the FPC (see data reporting section below).

Other information will be collected on fish in addition to GBT data; time examined, fork length (mm), species, origin (hatchery, wild, or unknown), comments on presence of disease or injury and descaling information will also be included. See section on data recording for more information. A sample data sheet is included in the appendices for demonstration purposes.

Sample Size

The target number of fish to be examined at each site is 200 juvenile salmonids (except at Rock Island where only chinook are examined and the target will be only 100 chinook). This target is a maximum daily number based upon the availability of fish at the monitoring site. This will consist of 100 chinook salmon and 100 steelhead or other prevalent species at John Day and Bonneville Dam. At Snake River dams and McNary dam the target number of fish will be restricted to chinook and steelhead. We believe that this number is sufficiently large to detect signs of GBT that would indicate significant mortality occurring in the fish population.

National Biological Service calculated the sample size required to achieve various levels of error (expressed in percent) around the detected rate of occurrence of GBT in the population sampled at each site. Two levels of occurrence of GBT (50% and 10%) were calculated versus sample size (Figure 1). In each case the percent error L at 95% probability was the independent variable and sample size was the dependent variable. The percent error L was calculated by the equation

$$L = 2 \sqrt{\frac{pq}{n}}$$

where n is a given sample size and p and q are the probability of a fish having signs of GBT (or

not having signs). Based on our calculations a sample size of 100 fish should be able to detect within 6% accuracy the percentage of fish in a population showing signs of GBT based on a population where $p = 0.1$ (10% of the population showing signs of GBT) and $q = 0.9$. We consider this level of detection more than adequate for the monitoring program.

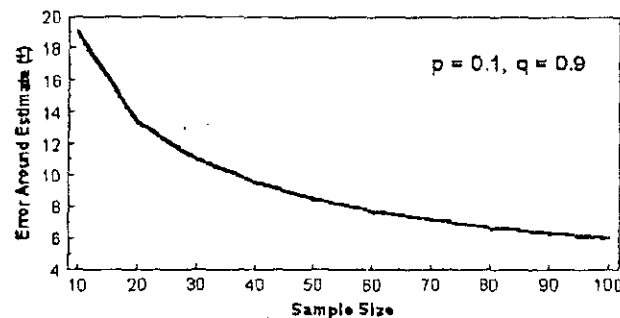


Figure 1. Percent error associated with sample size given a 10% prevalence (of GBT) in the population.

Method of "collection" (fish off separator where appropriate)

Fish to be examined for GBT will be collected at the separator at transportation sites and by the standard collection methods at Rock Island, John Day and Bonneville dams. At transportation sites fish will be netted and placed in a dark colored bucket (not white) to reduce potential for stress. No more than the number of fish that can be examined in a 15 minute time period, after the first fish is captured, will be netted off the separator at one time. Given that the examination takes about 2 minutes, this means the maximum number of fish should not exceed seven. Fish netted off the separator will be placed in a bucket containing a solution of 80 mg/l MS-222 and 80 mg/l sodium bicarbonate buffer (see method of anesthetic below).

Method of anesthetic

Each site will have five 5-gal plastic buckets. Three buckets will be used for holding fish and two will be used to irrigate fish gills while fish are being examined for GBT. Fish to be examined will be held in MS-222 buffered solution. The initial anesthetic solution will have 80 mg/l MS-222 and 80mg/l sodium bicarbonate buffer. Once fish are all anesthetized they will be transferred to a bucket containing a solution of 30 mg/l MS-222 and 30mg/l sodium bicarbonate buffer. During examination a solution of 30mg/l MS-222 and 30mg/l sodium bicarbonate buffer will be washed over fish gills to keep fish under anesthetic during the GBT exam. The fish will be held in a semicircular PVC pipe during examination. The pipe will be modified to hold a syphon tube that will carry anesthetic water over the animal's gills. The anesthetic water will drain out of the PVC tray into another bucket via a drain tube. After the examination fish will be placed in a recovery bucket of fresh water containing an air stone. The recovery bucket will have a lid and the air stone will vigorously pump air into the bucket.

Fish Release and counting procedures

Several issues are bundled together in this topic and will be resolved prior to the season but have not yet been resolved. One issue is what to do with the fish after examination. Second, is how the large sample size (100 steelhead and 100 chinook) will affect smolt monitoring efforts toward the end of the season at each site as the numbers of fish sampled decreases and GBT fish examinations become a significant proportion of the total number of fish handled at the site. Third is the need to interrogate GBT fish for PIT tags at transportation sites from Lower Granite Dam down to McNary Dam. Based on quick calculations we estimate 3% of the fish examined at Little Goose will be PIT tagged. There is some question about the impact handling in-river control fish could have on survival estimates if these fish are returned to the river. These issues will be brought to the attention of state agencies, tribes and researchers to determine the best method for handling the fish and a resolution sought prior to the beginning of monitoring season.

Data Recording Procedures

As each fish is examined data will be recorded on a data sheet. The following information will be recorded for each fish: Time of day fish was examined; species, origin (hatchery, wild or unknown), fork length (in mm), rank of GBT in each fin, rank of GBT in eye with greatest rank, length of lateral line occluded, total length of lateral line (if any occlusion is present), and comments on fish condition. See data sheet below.

The data recorded on the data sheet will be entered onto a spreadsheet. The entered data will then be checked versus the original data and any errors corrected. The data will then be transferred to FPC and this information recorded in a QA/QC log by the person who entered the data and checked it.

Data Transfer Procedures

Data will be transferred to Fish Passage Center in two formats. Faxed data sheets will be sent as soon as possible after sampling to allow for timely reporting of the data. Data will then be entered into a spreadsheet and that entered data will be sent via to FPC. The file transfer method will be worked out with each site in order to allow some flexibility. Once the file is transferred this information will be recorded in a QA/QC log.

Faxed data sheets will have a cover page that summarizes the data on the data sheets. The following information should be included on summary page; Date, site, number of each species examined, number showing signs of GBT. This information should be checked against the raw data and after check is complete and errors are removed this should be recorded in QA/QC log.

Data Reporting Procedures

Once the data is received at FPC it will be checked again and reported. Because of the need for timely reporting the faxed copy of the data will be used to create the daily GBT reports. The data summary will be checked versus the faxed data sheets. Any errors will be corrected (and these errors reported to the site), the data will be entered into a spreadsheet that will be used to generate the daily report. Once the spreadsheet data file is received this will be checked versus the faxed data file. Any errors in the data file will be corrected, this activity will be recorded in QA/QC log and reported to the site. Any errors that would have affected the data reported in daily GBT reports will be corrected in the first possible daily GBT report after the error has been found. This will also be entered into the QA/QC log.

5. QA/QC

A QA/QC document will be added to the monitoring program as an appendix prior to the start of the monitoring season. Below is an outline of the QA/QC efforts that will be undertaken during the season and the documentation that will be created as a part of the monitoring program. A final QA/QC document is forthcoming and will include protocol, procedures and QA/QC forms that will be used.

Field QA/QC

In order to assure quality control/quality assurance several checks will be included as part of the monitoring program. At the first step in the process, fish examinations, there will be biweekly visits to each monitoring site to assess the accuracy of examinations and the data recorded from those examinations. A supervising fish biologist will visit a site and examine a portion of the fish sampled from the total number examined on that day. The results of the examinations will be logged on a QA/QC data sheet and the results will be forwarded to FPC for documentation purposes.

Data faxed to FPC will be checked by person sending fax against raw data to insure that the summary data is correct. This will be entered into the QA/QC log.

Data entered at the site will be checked by the person entering the data. Any errors will be corrected prior to the data being sent on to FPC. This error checking will be logged in a QA/QC data sheet to be kept by the person examining fish at the site.

Data Center QA/QC

Data sent to FPC for reporting will be sent in two forms. A faxed copy of each data sheet and a spreadsheet file containing all the data on the data sheet.

Faxed data sheets will have a summary sheet attached and this will be checked versus the raw data faxed along with the summary sheet.

Raw data will be sent via E-mail spreadsheet file. This data will be transferred to the permanent database from E-mailed spreadsheet files and checked versus raw data sheets again. Any errors will be changed, documented and reported (if the change affects the reported GBT data).

DRAFT

1/16/96

QA/QC Procedures for GBT Examinations of Juvenile Salmon in 1996

Field QA/QC

Oversight

In order to assure quality control/quality assurance several checks will be included as part of the monitoring program. At the first step in the process, fish examinations, there will be biweekly visits to each monitoring site to assess the accuracy of examinations and the data recorded from those examinations. A supervising fish biologist will visit a site and examine a portion of the fish sampled from the total number examined on that day. The results of the QA/QC oversight will be logged on a QA/QC data sheet and the results will be forwarded to FPC for documentation purposes.

The QA/QC oversight will focus on examination procedures as well as results of examinations. The overseeing biologist will observe the technique used to monitor the fish for signs of GBT. The overseeing biologist will note on the procedures check and oversight form (see Form 2) whether the examiner properly anesthetized the fish, length of time fish were held in anesthetic, average length of time for exam, maximum time fish held for exams, magnification used in exams, and information regarding if data entry and QA/QC log were filled out properly.

The overseeing biologist will also examine a subsample of fish being examined for GBT and fill in the results of their exams on procedures check and oversight form (see Form 2). During the oversight visit if any fish are found to have signs of GBT the supervisor will also examine those fish for signs. The results of the two exams will be compared and any discrepancies reported and the cause of the discrepancy identified and corrected.

QA/QC log

Field biologists conducting GBT exams will fill out a QA/QC log (see Form 1). The log will be used to keep track of when each step in from fish examination to final data checking and transmission were completed. When each step, as identified on the form, is completed the person completing the step will initial and date the log. Data faxed to FPC will be checked by the person sending fax against raw data to insure that the summary data is correct. This will be entered into the QA/QC log. Data entered at the site will be checked by the person entering the data. Any errors will be corrected prior to the data being sent on to FPC. This error checking will be logged in a QA/QC data sheet to be kept by the person examining fish at the site.

Data Center QA/QC

Data sent to FPC for reporting will be sent in two forms. A faxed copy of each data sheet and a spreadsheet file containing all the data on the data sheet. Faxed data sheets will have a summary sheet attached and this will be checked versus the raw data faxed along with the summary sheet. Raw data will be sent via E-mail spreadsheet file. This data will be transferred to the permanent database from E-mailed spreadsheet files and checked versus raw data sheets again. Any errors will be changed, documented and reported (if the change affects the reported GBT data).

Form 2. GBT monitoring QA\QC Procedures Check and Oversight Log.

[illegible]

I 3. GBT Monitoring Data sheet

1996 Juvenile Salmon Monitoring Examinations for GBT Using 6X to 40X Dissecting Scope										
Date				Examiner		Site				Comments
Record	Time	Species	Origin H, W or U	L.L. Length in BU	L.L. Ocul. in BU	Rank of GBT in Unpaired Fins and Eyes 0 to 3				
						CA	AN	DO	EY	
1										
2										
3										
4										
5										
6										
7										
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Revised 25 January 1996

DRAFT
NATIONAL MARINE FISHERIES SERVICE
GAS BUBBLE DISEASE MONITORING PROGRAM

1.0 Introduction

The goal of this program is to establish a comprehensive biological and physical monitoring program to determine the prevalence of signs of gas bubble disease in migrating salmonids resulting from increased spill at lower Snake and lower Columbia River hydropower projects to achieve an 80% fish passage efficiency (80% of the fish pass through non-turbine routes) established in the 1995 Federal Columbia River Power System (FCRPS) Biological Opinion (for further information regarding this opinion see Appendix A), and to provide real-time information regarding the effects of spill on total dissolved gas levels throughout these rivers. Biological (aquatic biota) and dissolved gas monitoring is necessary to ensure that any potential adverse effects from increased spill can be identified and evaluated against the expected increases in survival from spill.

This document is intended to provide a description of the activities and methods the National Marine Fisheries Service (NMFS) is employing in 1996 to manage FCRPS Biological Opinion spill and resulting total dissolved gas levels. The activities described below are the culmination of numerous preseason meetings and working sessions involving the regional fish, water quality, and hydropower management agencies. Information collected as a result of these monitoring activities will be used to craft future gas monitoring and spill management activities.

The spring and summer spill operations contained in the 1995-1998 FCRPS Biological Opinion are scheduled to be initiated in 1996 at selected lower Snake River hydropower projects on April 10 and selected lower Columbia River projects on April 20 and are scheduled to continue in both river reaches through August 31. The selection of spilling dams will differ between spring and summer migration periods and will depend on projected flow conditions. This is further explained in Appendix A. Management of spill operations will be coordinated through a technical management team (TMT) consisting of representatives of the federal agencies responsible for hydrosystem operations. The total dissolved gas management criteria they will use for guidance are further described in section 6 below.

1.1 Review of the 1995 Monitoring Season

The following is a brief review of the results of the 1995 monitoring season activities. More comprehensive reviews are available from the U.S. Army Corps of Engineers (COE) and Columbia Basin Fish and Wildlife Authority's Fish Passage Center (FPC).

1.1.1 Biological Monitoring

During the 1995 spill season, a total of 55,782 juveniles were examined at six lower Snake and lower Columbia River Dams. Twenty percent of these were examined using 10-20 power dissecting microscopes and 80 percent were examined under four power lenses. Less than 1% (231) of the total showed GBD signs (1.9% of those examined with dissecting scope showed signs) between April 15 and July 1. All signs were rank 1 in severity (Rank 1 = 1-25% of affected area covered with bubbles). Observations of juvenile migrants in the reservoirs was limited in 1995. However, the juvenile salmon that were examined did not exhibit a noticeable difference in GBD signs from those examined at the dams. More reservoir investigations will be conducted in 1996.

Adult salmon were examined at Bonneville, Lower Granite and Priest Rapids Dams. At Bonneville Dam, 1,223 adult chinook, and sockeye salmon and steelhead were sampled, with none exhibiting signs of GBD. This represented 3.2% of the combined adult run for these species at this site. At Lower Granite Dam, 518 adult chinook salmon, or about 14% of the chinook run, were sampled, also without showing any signs of GBD. However, 6.4% of these fish exhibited a condition known as "head burn". Although head burn has not been demonstrated to be a sign of GBD, but its occurrence does appear to be correlated to periods of high spill and flow. Although not a formal component of the 1995 GBD monitoring plan, the Columbia River Intertribal Fish Commission examined adult salmonids at Priest Rapids Dam as part of other ongoing work. As a result of this effort, 691 adult chinook, and sockeye salmon and steelhead were sampled, with signs of GBD noted in 1.6%. The majority (8 of 11 or 73%) of these signs were observed in adult sockeye salmon.

Resident species were monitored by NMFS at sites below Bonneville and Ice Harbor dams and above Priest Rapids Dam. Below Bonneville Dam, 2,886 resident fish were monitored with only 2 (0.07%) showing signs of GBD. A much higher prevalence of GBD was noted below Ice Harbor Dam where 261 (9.4%) of 2,761 resident species showed signs of GBD. Of these, 88% of the signs were observed between May 9 and June 16 when Ice Harbor tailwater TDG was involuntarily well above the 120% limit due to turbine outages and involuntary spill. Upstream from Priest Rapids Dam,

signs of GBD in fish were observed only during the weekly sampling period ending on 1 June, when about 5% of resident fish sampled exhibited signs of GBD. Very few invertebrates were found to exhibit GBD signs at any monitoring site.

1.1.2 Dissolved Gas Monitoring

Dissolved gas monitoring at 26 lower Snake and Columbia river monitoring sites by the COE revealed that TDG was held at or below the modified state water quality standards for the majority of the 1995 spill season at all projects, except during periods when the total river flow exceeded the powerhouse plus voluntary spill capacity of the project. This involuntary condition occurred most frequently at the three lowest Snake River dams and at McNary and John Day Dams in the lower Columbia River during late May and early June.

Difficulty in maintaining and operating new dissolved gas monitoring equipment limited data availability and usefulness at several monitoring sites, primarily at Ice Harbor and McNary Dams. A post season study by the Northwest Power Planning Council (Bisbal and Ruff, 1995) indicated that "A wide range of anomalies (data missing or in error) was detected in over one third of the COE's gas data base. Severe anomalies (extending over 8 h in a day) were found in 16% of the records." While most of the difficulties that caused these anomalous data were addressed and corrected inseason by the COE, the data reported on the CROHMS data base were not corrected on a real-time basis. This lack of real-time error checking was the cause of some confusion among the co-managing agencies during inseason management activities.

Both the Walla Walla and Portland Districts of the COE collected extensive TDG data from horizontal and vertical transects throughout the river to better understand how well the fixed monitoring sites represented the local river conditions. These data continue to be analyzed at this time and final reports will be available from the COE as they are completed.

1.2 1996 Dissolved Gas and Biological Research

To gain a better appreciation of the degree of effort the regional fishery, water and hydropower management agencies are using to address TDG supersaturation issues, it is necessary to touch briefly on work elements outside of the scope of the monitoring program per se. The following is a very brief treatment of the various investigative efforts that will be employed during the 1996 spill season to improve our knowledge of how TDG supersaturation affects the physical and biological parameters of aquatic environments. Through these investigations, NMFS intends to validate and improve the monitoring program and ultimately reduce the scope and need for

this currently cumbersome and costly monitoring effort.

1.2.1 Dissolved Gas Research

1.2.1.1 Transect Measurements

Both the Walla Walla and the Portland Districts of the COE will continue conducting transect measurements in selected reaches of the lower Snake and lower Columbia Rivers in 1996. These efforts are focused on developing a better understanding of how fixed monitoring site data relates to other locations in the river and how TDG mixes and changes downstream from a spilling hydroelectric project. More detailed information, including transect locations and data collection protocol, is available from the two COE district offices.

1.2.1.2 Gas Abatement Program

The COE is also conducting an extensive effort to determine and implement methods of reducing TDG caused by spill at FCRPS hydroelectric projects. This program includes development and installation of spillway flow deflectors at selected projects, assessment of spillway stilling basin modifications, and an analysis that may identify other potential TDG reducing modifications. Extensive dissolved gas data will be collected and used to develop tools such as predictive dissolved gas distribution models to assist in predicting and managing dissolved gas in problem areas.

1.2.2. Biological Research

Research necessary to address critical assumptions inherent to the biological element of this monitoring program will be conducted in 1996 under a separate program (see NMFS Gas Bubble Disease Research Program; available from the NMFS Portland office). Projects that relate to primary concerns regarding monitoring effectiveness and the relevance of the signs of gas bubble disease are the focus of this research program. The critical assumptions being investigated are 1) dam passage causes no changes in GBD signs of juvenile salmonids, 2) sampling and sampling sites are sufficient to discern mortality, 3) GBD signs accurately index biological impacts and 4) parameters and protocols of clinical assessments most effectively characterize GBD. Often asked questions regarding the relevancy of specific signs of GBD such as bubbles in gill filaments for estimating potential mortality, and what magnification is appropriate for the early detection of GBD signs are addressed in this program. The results of these projects will be thoroughly reviewed by a scientific review group and will be considered by NMFS for addition to future monitoring programs.

2.0 Dissolved Gas Monitoring

The U.S. Army Corps of Engineers is responsible for measuring and reporting concentrations of TDG in water at selected locations on the Columbia and Snake rivers as described in the Dissolved Gas Monitoring Program Plan of Action for 1996 included in the COE's updated Fish Passage Plan, and referenced in the FCRPS Biological Opinion. It is critical that the COE maintain monitoring instruments and telemetry equipment and that all available data be entered onto the Columbia River Operational Hydromet Management System (CROHMS) on a timely basis during this spill program. Dissolved gas monitoring instrumentation will be checked and calibrated regularly, as described in 2.3 below. The following is a brief overview of the COE's monitoring plan. For more information, see Appendix B.

2.1 Monitoring Locations

For the 1996 monitoring season, the North Pacific Division (NPD) COE, has established a network of 37 dissolved gas monitoring sites in the mainstem Columbia, lower Snake and lower Clearwater Rivers. These monitors are located in the forebays and tailraces of all mainstem dams. In addition there are backup and supplementary monitors downstream from Dworshak, Ice Harbor, Priest Rapids, and Bonneville dams. Twenty-eight of these monitors were installed and maintained by the COE, two by the Bureau of Reclamation and seven by the mid-Columbia Public Utility Districts.

2.2 Measurement Technique and Frequency

Total dissolved gas pressure, TDG saturation percent, barometric pressure, water temperature, and pertinent project operating data will be recorded hourly using state-of-the-art automated dissolved gas monitoring devices. These data will then be transmitted, either every four hours or twice per day depending on the level of monitor automation, through Geosynchronous Operational Environmental and Domestic Communications Satellites to the COE, NPD CROHMS data base in Portland, Oregon. Daily reports are available to authorized users through the CROHMS Automated Front End (CAFE) on a real-time basis. These data will ultimately be available to all interested parties via Fish Passage Center daily reports as explained in section 5 below.

2.3 Quality Assurance/Quality Control

Data accuracy and consistency are critical to successful spill management. Quality control of data collection and reporting is the responsibility of the COE.

The accuracy of each monitoring instrument will be verified

at least once each week. Measurements will be made of barometric and TDG pressure, water temperature, and dissolved-oxygen concentration using a portable field instrument that has been previously calibrated to local conditions. If the monitoring instrument values are found to yield TDG values greater than three percent different than those provided by the calibrating equipment, the magnitude of corrections will be reported to the fisheries and water quality management agencies within 24 hours.

In addition to instrument verification, data verification will be accomplished by the COE's NPD Reservoir Control Center (RCC) through comparison with expected model or empirical values. Raw data will be immediately posted on the CROHMS system upon receipt from the field. However, by noon of each day, suspect data will be identified and, when possible, corrected by the RCC personnel and reported to the Fish Passage Center for their use in meeting the reporting requirements outlined in section 5 below.

Data continuity will be assured through rapid repair of faulty instruments and the deployment of at least one backup monitoring instrument at selected key spill management locations. For 1996, these locations are Ice Harbor tailwater and McNary-Oregon forebay. The backup monitors that were placed below Bonneville Dam and in The Dalles forebay in 1995 and the primary Hood Park monitor (below Ice Harbor Dam) will not be deployed in 1996. Data from these sites were of limited value to river managers in 1995 and are not expected to be necessary in 1996. Their elimination will allow limited maintenance funding and time to be spent on more important monitors. At least one backup monitor will be made available for deployment as necessary in each COE district. In any case, a malfunctioning monitor will be repaired within 24 hours, if TDG is expected to meet or exceed the current state standard at that site and within 48 hours at sites where TDG levels are expected to stay below state standards.

3.0 Biological Monitoring Program

The biological monitoring program will include assessment of signs of GBD in migrating juvenile and adult salmonids, and in resident fish species. Many of the tasks that were placed in this section in previous descriptions of the NMFS GBD Monitoring program have been more appropriately relocated to the NMFS research program document referenced in section 1.2 above. These include net pen holding experiments, adult and juvenile salmon distribution experiments, and monitoring protocol development. In addition, resident invertebrate monitoring will not be conducted in 1996. Few signs of gas bubble disease were found in invertebrate species monitored in several river reaches during 1993, 1994, and 1995, despite periods of high TDG supersaturation. Additional river sampling in 1996 would be

unlikely to provide additional information. However, alternative sampling methods at other sites and laboratory studies will continue as described in the NMFS research program document.

3.1 Salmonid Gas Bubble Disease Monitoring

Juvenile salmonids will be routinely monitored for signs of GBD by the Smolt Monitoring Program and by NMFS in planned river reach resident monitoring efforts. Adult salmon will be monitored by selected agencies and/or their contractors for signs of GBD as they ascend fish ladders at selected Snake and Columbia River Dams.

3.1.1 Smolt Monitoring

3.1.1.1. Fish Passage Center Monitoring

The Fish Passage Center (FPC) conducts a system-wide juvenile salmonid smolt monitoring program (SMP) on the Snake and Columbia Rivers. The FPC is responsible for maintaining extensive historical and real-time databases of dissolved gas and biological monitoring data pertaining to the juvenile outmigration. Under the direction of the FPC, GBD monitoring will be conducted at seven sites - Lower Granite, Little Goose, Lower Monumental Dams on the Snake River, Rock Island Dam on the mid-Columbia River, and McNary, John Day and Bonneville Dams on the lower Columbia River.

Specific information regarding smolt monitoring protocol is contained in Appendix C. Briefly, a daily maximum of 200 juvenile salmonids will be examined at each monitoring site (except at Rock Island where the maximum will be 100 chinook). This sample will consist of chinook and steelhead at all Snake River sites and will include other salmonid species at lower Columbia River sites. A sample size of 100 fish will result in an estimate of the prevalence of GBD with a 95% confidence interval of $\pm 6\%$.

The sampled fish will be examined using a variable magnification (10X to 40X) dissecting scope. Unpaired fins, eyes, and lateral line will be examined for the presence of bubbles. At each dam, fish to be sampled will be taken from the separators (Snake River dams and McNary) or sampling device (Rock Island, John Day and Bonneville), held in water from the bypass system, and examined within 15 minutes. For each fish, time of day the fish was examined, species origin (hatchery, wild, etc.), fork length, rank of GBD in each fin, rank of GBD in the eye with the greatest rank, length of lateral line occluded, total length of lateral line (if occlusion is present), and comments on general fish condition will be recorded. These data will then be faxed and transmitted by modem to FPC's data center on a daily basis.

Research addressing relationships of bubbles in gill filaments to other signs of GBD and mortality will be conducted at McNary and Bonneville Dams and in the laboratory. This research will include evaluation of methods for non-invasive examination as well as evaluation of the power of magnification necessary for proper examinations.

3.1.1.2. Smolt Monitoring at Ice Harbor Dam

A new bypass system and smolt sampler will be operational at Ice Harbor Dam in 1996. In the process of evaluating this new system, NMFS biologists may be able to examine a limited number of outmigrating juvenile salmon. The ability to obtain samples at this location would greatly reduce the concern that McNary Dam samples do not adequately assess the condition of smolts exiting the lower Snake River. NMFS is currently investigating the feasibility of this option.

3.1.2 Adult Monitoring

Adult salmon migrating upstream will be sampled in the fish ladders at Bonneville and Lower Granite Dams. Additional sampling may occur at Ice Harbor Dam depending on observations of signs of GBD in adult salmonids at dams above and/or below this site. See Appendix D for further information on sampling and examination protocol.

3.1.2.1 Bonneville Dam

The ongoing Pacific Salmon Treaty research of adult chinook and sockeye salmon stock identification and scale pattern analyses conducted by the Columbia River Inter-Tribal Fish Commission (CRITFC) will include an assessment of signs of GBD.

Evaluations will be conducted on adult salmonids entering the trap in the north shore fish ladder of Bonneville Dam. Intercepted fish will be anesthetized and examined visually for external signs of GBD. Following recovery, fish will be released back to the fish ladder.

Sampling will be conducted 3 days per week, 6 to 8 hours per day. Even with a fixed sampling rate, the percentage of the project passage of upstream migrating adults that is intercepted will depend largely on flow distribution between the powerhouses and spillway. It is expected that this percentage will be well under 5%.

If any signs of GBD are noted in adult salmonids at Bonneville Dam, the monitoring frequency will be increased to daily and CRITFC will notify NMFS and the FPC as soon as possible. The duration of daily monitoring will be determined by the TMT with consideration for the ESA directed take allowance

for this activity.

3.1.2.2 Ice Harbor Dam

Because of the concerns regarding the impacts of handling adults in the limited trapping facilities at Ice Harbor Dam, adult sampling will be conducted there only to confirm signs of GBD noted at Lower Granite Dam. The final decision to implement adult migrant sampling at Ice Harbor Dam will be made in-season by the TMT. If necessary, a sampling effort similar to that at Bonneville Dam can be implemented at Ice Harbor Dam. If in-season conditions indicate the need for extensive sampling, the adult sampling facilities and/or procedures will require modification to ensure an unbiased evaluation. Holding time for adult salmonids at ambient reservoir dissolved gas levels should not exceed 30 minutes prior to examination.

Sampling of adult migrant salmonids will be not be conducted during the summer spill period. Water temperatures in the lower Snake River are expected to be above 21° C. in late July and August. Adults are easily stressed and killed when handled at these temperatures.

3.1.2.3 Lower Granite Dam

Adult fish passing Lower Granite Dam are routinely trapped, anesthetized, and examined for marks and to assess general physical condition. For the duration of the proposed 1996 spill program, trapped adult salmonids will be anesthetized and examined for external signs of GBD. After recovery from the anesthetic, adults will be returned to the ladder to continue their migration. The trap is operated about 8 hours per day and 7 days per week; overall sampling rate is about 10 percent of fish passing Lower Granite Dam.

3.1.2.4. Mid-Columbia River

Monitoring adult salmonids for signs of gas bubble disease in this section of the Columbia River will occur only on fish obtained for other fishery management or research purposes. It is expected that adults will be collected for broodstock purposes at Wells Dam. These fish will be examined for signs of GBD. (Coordination of this effort has not been completed at this time.)

3.2 Monitoring of Resident Fish Species

During the 1996 spill season, NMFS will monitor for signs of GBD in resident fish species at three river reaches; Priest Rapids Reservoir, downstream from Ice Harbor Dam, and downstream from Bonneville Dam. Sampling will occur once each week from

April through July or August (depending on site location). Up to 100 individuals of the predominant taxa will be collected and examined at each site. If TDG levels exceed 115% and/or signs of GBD are detected, sampling effort will be increased to include additional sites in the affected river reach. Data collected will include fish species, life-history stage, size, location of capture, macroscopic and microscopic external signs of GBD including examinations of lateral lines, fins, and eyes and dissolved gas supersaturation at the sample site.

For a more complete description of 1996 resident aquatic species monitoring and evaluation, see Appendix E.

3.3 Quality Assurance/Quality Control

Each biological monitoring agency will be responsible for an internal quality assurance/quality control function. These efforts are explained for each element of the monitoring program in the appendices at the end of this document.

Briefly, several quality assurance/quality control checks will be included in the salmon and resident fish monitoring efforts. In the early weeks of the spill program, a supervisory fishery biologist, with expertise in the GBD examination process will visit each monitoring site on a weekly basis to assess the accuracy of the examinations and data recording process. Daily, throughout the spill season, data entered at the monitoring site will be checked by the person entering the data. Data faxed to the FPC will be checked by the person sending the fax against raw data to insure that the summary data are correct. Data summaries sent to the FPC data center will be faxed and sent in spreadsheet format via modem. The raw data will also be transmitted in spreadsheet format via E-Mail to the data center. This data will be checked against the summary data prior to transfer to the permanent database. Any errors will be corrected and documented.

4.0 Program Quality Assurance/Quality Control

Individuals knowledgeable in the field of dissolved gas research and management were invited to participate in discussions regarding dissolved gas issues by NMFS in early 1995. This Gas Bubble Disease Technical Work Group (GBDTWG) was recommended by the Gas Bubble Disease Working Group convened by NMFS in November, 1994. The GBDTWG is co-chaired by NMFS and the Environmental Protection Agency. It includes participation by the state and federal agencies and tribal governments that share responsibility for managing water quality and fisheries in the Pacific Northwest, and other interested parties. This working group will consider the monitoring program, the quality and interpretation of the monitoring data and short-term and long-term research needs.

The GBDTWG will establish a monitoring oversight team of scientists knowledgeable in physical and biological aspects of dissolved gas monitoring to review the GBD monitoring program during the period of increased spill. This monitoring subgroup will conduct routine on-site reviews of sampling and monitoring protocols. These reviews will be independent of any quality control/quality assurance efforts implemented by the monitoring agencies. Any problems or deficiencies identified by the monitoring oversight team will be reported to the GBDTWG for immediate coordination and response by the responsible entities or cooperating agencies.

5.0 Reporting

The Fish Passage Center will serve as the central repository for information collected from GBD biological monitoring in the Columbia River Basin. The COE will continue to serve as the central repository for dissolved gas monitoring data.

Results of monitoring activities will be compiled daily by the FPC and COE; the FPC will then assemble these data sets into an agreed-upon format (see Appendix C) and provide the compiled information on a daily basis to the fisheries managers and all interested parties including the TMT, Oregon DEQ and Washington DOE.

Included in the compiled information will be 1) 12^{hr} and 24^{hr} hour average and maximum TDG levels for the forebay and tailrace of each mainstem dam, river locations downstream from Bonneville Dam, and backup monitors and 2) sample size, prevalence and rank of external signs of GBD among juvenile and adult salmonids sampled at each sampling site and resident fish sampled in river reach monitoring. A cover memo will also be included which will include any caveats or other items of interest pertaining to the TDG monitoring program or report data.

6.0 Action Levels

6.1 Total Dissolved Gas Concentrations

6.1.1 Lower Snake and Lower Columbia River

Specific monitoring sites for the purposes of in-season dissolved gas management should be selected on the basis of data consistency and relationship to expected fish exposure. Until it can be determined how tailrace monitoring stations relate to the river reaches between monitoring sites and how TDG data collected at these sites relates to fish experience, NMFS recommends the use of forebay monitoring data for in-season management. Water quality agencies, however, have recommended that monitoring occur

in the dam tailraces where highest TDG concentrations occur. While NMFS believes that tailrace monitors are of limited usefulness at this time, they probably best estimate maximum acute exposure, particularly for adults. In 1996, TDG management will utilize both monitoring locations as explained below.

The management action calls for spill levels necessary to meet the FCRPS Biological Opinion requirements of 80% fish passage efficiency at each spilling project below Lower Granite Dam on the lower Snake and lower Columbia Rivers. Regardless of spill requirement, spill will be reduced as necessary when the 12-hour average TDG concentration exceeds 115% of saturation (or as limited by state water quality standard modifications) at the forebay monitor of any Snake or lower Columbia river dam or at the Camas/Washougal station below Bonneville Dam. Spill will also be reduced when 12 hour average TDG levels exceed 120% of saturation (or as limited by state water quality standard modifications) at the tailrace monitor at any Snake or lower Columbia River dams. Average concentrations of dissolved gas will be calculated using the 12 highest hourly measurements per calendar day.

6.2 Prevalence of GBD

Steps will be taken to reduce total dissolved gas levels in the river above the monitoring location(s) when external signs of GBD on juvenile salmon exceed the following action levels. If such a reduction becomes necessary, forebay and tailrace dissolved gas level readings should be adjusted through methods recommended by the TMT, subject to review and approval by the DOE, DEQ, and the NMFS Regional Director, as described in section 1.0.

6.2.1. Action Levels Based on Monitoring of Juvenile Salmonids

With the current level of scientific understanding, the biological signs of GBD observed at a particular level of TDG are difficult to correlate to in-river mortality of juvenile salmonids. Prior to the spill season, the NBS began experiments at the Columbia River Field Station to correlate signs of GBD and mortality levels with dissolved gas exposure history. The preliminary results of these studies based on limited data indicated that, although bubbles in gill lamellae did not appear to be a reliable indicator of either exposure history or impending mortality, bubbles in the lateral line and unpaired fins showed promise. The NBS was also unable to develop a reliable non-lethal method of examining gill lamellae in salmonids prior to the spill season. Results to date, based on limited data suggest that, at least for the 1995 season, unpaired fin bubble content was probably the best GBD sign to use for determining the risk of mortality due to exposure to high levels of TDG.

Action to reduce the level of dissolved gas supersaturation should be taken if 15% of the fish examined exhibit any bubbles on unpaired fins or 5% of the fish examined exhibit bubbles covering 25% or more of the surface of any unpaired fin. These action levels are a conservative interpretation of the recent NBS results which indicated that significant mortality did not occur in the test fish until approximately 60% exhibited bubbles in the fins or 30% exhibited bubbles covering 25% or more of any unpaired fin. These levels were reduced primarily because the NBS tests were limited in scope and the results were preliminary. Further modification of these action levels may occur in-season as the NBS and other research efforts progress.

6.2.2. Action Levels Based on Monitoring of Adult Salmonids

Very little information is currently available to help determine biological action levels for adult salmonids. Therefore, NMFS recommends that actions to reduce dissolved gas levels be taken when any of the adult salmon examined at adult monitoring locations described in section 3.1.3. above exhibit external signs of gas bubble disease. To be certain an observation is not an anomaly, this action threshold will only be triggered with observations on two or more fish during the same day at the same sampling site or one fish on two or more successive sampling periods at the same sampling site.

Survival of upstream migrating adult salmon is especially critical. The above limit is based on a no-harm standard.

6.3. Dissolved Gas Management

The Working Group of Gas Bubble Disease Experts assembled by NMFS in June, 1994, advised that, based on our current level of understanding primary dissolved gas management should occur on the basis of dissolved gas monitoring results. This expert working group believed that current biological monitoring methods and our understanding of the biological signs were not sufficiently developed for inseason management purposes. Research programs conducted in 1995 and those scheduled for 1996 address these deficiencies. For the 1996 spill management season, however, dissolved gas measurements will again be used as the primary parameter for dissolved gas management, as outlined in section 6.1.1 above. Biological indicators will serve a fail safe function, indicating a failure in our assumption that our chosen TDG limits are unlikely to cause harm greater than the benefits of spill, as indicated in the FCRPS Biological Opinion.

Dissolved gas and biological effects of spill will be evaluated in-season on a daily basis by the members of the Technical Management Team. This team includes technical representatives from the National Marine Fisheries Service, U.S.

Fish and Wildlife Service, U.S. Army Corps of Engineers, Bureau of Reclamation, Bonneville Power Administration. At weekly meetings (Wednesdays) or on an emergency basis, recommendations to continue or adjust spill will be reviewed by the TMT as identified in the FCRPS Biological Opinion. The TMT will forward operational recommendations to the COE for implementation. The recommendations to modify spill will be based on the results of dissolved gas and biological monitoring using the criteria described above.

DRAFT

1/16/96

1996 GBT Monitoring Protocol for Signs of GBT in Adult Salmon

Fish will be examined externally for signs of gas bubble trauma (GBT). The examination will involve examining mouth, fins, eyes, opercula and the body of fish for the presence of bubbles. Monitoring will be conducted at Bonneville, Lower Granite, and Preist Rapids dams. The goal of the examinations is to determine the extent to which adult salmon passing through the hydrosystem or sampling location have been exposed to harmful levels of total dissolved gases based upon the presence and severity of bubbles on the fish. The data will be reported to the management entities and the state water quality agencies as well as other interested parties on a daily basis during the spill season.

Method of fish examination for GBT

Fish will be examined using a magnification device of at least 2.5X. Fish fins, eyes, mouth, opercula and body will be examined for the presence of bubbles. Fish to be examined will be collected from the fish ladder at each site and put into an anesthetic trough (see section on methods of anesthetic below for more detailed description). These fish will be carried to the location where examinations will occur. Each fish as it is to be examined will be held on an examination table. The fish will be examined on one side (right side first) entirely before being turned over to examine the opposite side.

The examination will begin with the mouth. With the fish on its side, the examiner will search the interior of the mouth for bubbles in the soft tissues. If bubbles are present in the mouth the extent of bubbling should be ranked as is done for fins. Next the fins will be examined and data recorded based upon area of the fin or eye covered with bubbles. Beginning with the caudal fin, as the fin is fanned out, look for bubbles at the posterior end of the tail and between the rays. Also, the examiner should run their fingers over the surface of the fin to feel for the presence of bubbles. Repeat this observation method for all fins. The area of the fin covered with bubbles should be estimated using the examiners best judgement. A visual technique for estimating the area of fin covered by bubbles is illustrated in Figure 1. Next the eye and operculum on the right side of the fish should be examined for signs of GBT. Finally the body of the fish will be examined for the presence of bubbles. Once the right side examination is completed the fish will be turned over and the left side examined in the same way for the presence of bubbles.

A rank will be assigned based upon the percent area of the fin or other body part covered with bubbles. A rank 0 is assigned if no bubbles occur. Rank 1 if greater than 0 and less than or equal to 5% of fin or eye is covered. Rank 2 is assigned if bubbling occupies 6 to 25% of the fin or eye. A rank 3 is assigned if between 26% and 50% of the fin or eye is covered. And a rank of 4 will be assigned if greater than 50% of the fin (or other body part) is covered with bubbles. If bubbles occur in one eye the rank will be for that eye only. If bubbling occurs in both eyes the eye with the greatest area having bubbles will be ranked and recorded. If the area covered by bubbles is estimated to be near 25% or near 50% (i.e. at a boundary between rank 2 and 3 or rank 3 and 4), then the higher rank should be reported. A summary of ranks to be used in recording GBT data for fins and eyes is listed below.

Rank	Percent area affected
0	0
1	1 to 5
2	6 to 25
3	26 to 50%
4	greater than 50% affected

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If bubbling occurs in the body this should be noted. It is not necessary to estimate the area covered with bubbles. Presence or absence is sufficient for bubbles occurring in the body. Any comments regarding fish condition that may be related to GBT should be included (such as head burns or "characteristic" sores on the body that may have been caused by bubble damaged tissue sloughing off, or popcye -- the protusion of the eye from the socket). This information should be recorded as comments (see data reporting section below).

Other information will be collected on fish in addition to GBT data; time examined, fork length (mm), species, origin (hatchery, wild, or unknown), presence of disease or injury and descaling information will also be included. See section on data recording for more information. A sample data sheet is included in the appendices for demonstration purposes.

Sample Size

The target number of fish to be examined at each site is not determined at this point.

Method of anesthetic

Fish will be anesthetized using MS-222. Fish will be anesthetized prior to being examined to minimize stress.

Data Recording Procedures

As each fish is examined data will be recorded on a data sheet. The following information will be recorded for each fish: Time of day fish was examined; species, origin (hatchery, wild or unknown), fork length (in mm), greatest rank of GBT in any fin, greatest rank of GBT in either eye, rank of GBT in mouth, presence or absence of GBT in body, comments on severity of bubbling if appropriate (in body), and information on fish condition (presence of disease, injury, or predation scars, See data sheet below.

The data recorded on the data sheet will be entered onto a spreadsheet. The entered data will then be checked versus the original data and any errors corrected. The data will then be transferred to FPC and this information recorded in a QA/QC log by the person who entered the data and checked it.

Data Transfer Procedures

Data will be transferred to Fish Passage Center in two formats. Faxed data sheets will be sent as soon as possible after sampling to allow for timely reporting of the data. Data will then be entered into a spreadsheet and that entered data will be sent via to FPC. The file transfer method will be worked out with each site in order to allow some flexibility. Once the file is transferred this information will be recorded in a QA/QC log.

Faxed data sheets will have a cover page that summarizes the data on the data sheets. The following information should be included on summary page; Date, site, number of each species examined, number showing signs of GBT. This information should be checked against the raw data and after check is complete and errors are removed this should be recorded in QA/QC log.

Data Reporting Procedures

Once the data is received at FPC it will be checked again and reported. Because of the need for

timely reporting the faxed copy of the data will be used to create the daily GBT reports. The data summary will be checked versus the faxed data sheets. Any errors will be corrected (and these errors reported to the site), the data will be entered into a spreadsheet that will be used to generate the daily report. Once the spreadsheet data file is received this will be checked versus the faxed data file. Any errors in the data file will be corrected, this activity will be recorded in QA/QC log and reported to the site. Any errors that would have affected the data reported in daily GBT reports will be corrected in the first possible daily GBT report after the error has been found. This will also be entered into the QA/QC log.

QA/QC

A QA/QC document will be added to the monitoring program as an appendix prior to the start of the monitoring season. Below is an outline of the QA/QC efforts that will be undertaken during the season and the documentation that will be created as a part of the monitoring program. A final QA/QC document is forthcoming and will include protocol, procedures and QA/QC forms that will be used.

Field QA/QC

In order to assure quality control/quality assurance several checks will be included as part of the monitoring program. At the first step in the process, fish examinations, there will be biweekly visits to each monitoring site to assess the accuracy of examinations and the data recorded from those examinations. A supervising fish biologist will visit a site and examine a portion of the fish sampled from the total number examined on that day. The results of the examinations will be logged on a QA/QC data sheet and the results will be forwarded to FPC for documentation purposes.

Data faxed to FPC will be checked by person sending fax against raw data to insure that the summary data is correct. This will be entered into the QA/QC log.

Data Center QA/QC

A faxed copy of each data sheet will be sent to FPC for reporting.

FISH HANDLING AND GAS BUBBLE DISEASE ASSESSMENT PROTOCOLS

FOR: Evaluation of the Effects of Dissolved Gas Supersaturation on Fish and Invertebrates in the Mainstem Columbia and Snake Rivers

BY: National Marine Fisheries Service

DATE: January 11, 1996

INTRODUCTION

The objectives of this study are to assess some of the impacts of ambient levels of gas supersaturated water on the aquatic biota in the lower Snake and mid- and lower Columbia Rivers and to augment the existing database on the tolerance of resident nonsalmonid species to high dissolved gas levels. We propose to survey selected reservoir and free-flowing river reaches and conduct in situ bioassays of the effects of ambient levels of dissolved gas using resident fish species, benthic and epibenthic invertebrates, and hatchery-reared salmonids. The final product of research will be an analysis of the relationship between levels of dissolved gas and duration of exposure to gas-supersaturated conditions, and observed impacts on free-swimming and captive organisms. We propose that this study be repeated annually during the spring freshet/juvenile salmonid outmigration to bracket a wide range of river flows and gas supersaturation levels.

Assessment of GBD in 1996 is a continuation of a study initiated in 1993 at in the Columbia River downstream from Bonneville Dam (Toner and Dawley 1995). In 1994 and 1995, the study was expanded to assess the effects of ambient dissolved gas saturation levels and prevalence of GBD in juvenile salmonids, resident fish, and invertebrates in three river reaches (Toner et al. 1995 and Schrank et al. manuscript in prep.). In addition, test organisms (excluding migrant and resident salmonids) were held for 4 days in net-pens and cages at restricted depths under ambient river conditions in each river reach. The net pens were in deep water at locations of highest dissolved gas levels.

In 1996, the river sections to be sampled and rationales for their selection are as follows: 1) Priest Rapids Reservoir and the Hanford reach--We expect that cumulative effects of dissolved gas from spill throughout the mid-Columbia River will be represented in this section; resident fish species were previously sampled for GBD (Dell et al. 1974). A large population of juvenile fall chinook salmon may also be severely impacted by dissolved gas supersaturation; 2) Ice Harbor Dam tailrace--We expect that cumulative effects of dissolved gas from spill from the lower Snake River dams will be represented in this reach; 3) downstream from Bonneville Dam--In a high flow year, spill volumes are expected to be high in this reach, and no other biological sampling is being conducted. Within each of the three river reaches, several sites will be sampled on regular intervals.

METHODS

Sampling Intensity

Several sites within each of the three river reaches will be sampled once each week from April through June or July. Sampling will begin prior to any major spill (early April), and continue throughout the period of spill (probably through July at sites upstream from Bonneville Dam and through mid-August at sites downstream from Bonneville Dam). In addition, downstream from Bonneville Dam, daily sampling will be conducted during the late March spill period. At each site we will collect and examine for signs of GBD up to 100 individuals of the predominant taxa.

If total dissolved gas (TDG) saturation levels exceed 120%, and/or if signs of GBD are observed in the collected aquatic organisms, sampling effort will be increased to include additional sites in the affected river reach to augment observations for signs of GBD.

Sampling Protocols

In 1996, sampled organisms will include migrant salmonids and resident fish only. Gear will include 150-m purse, 50-m beach, and 7.5-m 2-person seines, and electrofishing equipment. Sampling will generally be conducted during the day, but occasionally in the early morning before dawn.

Sampled organisms will be examined immediately (within 15 minutes of capture), visually and microscopically for external signs of GBD. Species will be identified to the lowest practical taxon, and life-history stage, fork length or total length, and location time and date of capture recorded. Dissolved gas saturation will be measured and recorded when biological samples are collected. Dissolved gas levels will also be monitored hourly at established sites through the COE dissolved gas monitoring program and at the net pens used for 4-day in situ holding tests in each river reach. Dissolved gas monitors will be checked against other units weekly, and differences documented. When differences are greater than 3% TDG, measures will be taken to repair and recalibrate the monitors.

Upon capture, fish will be held in 76-L plastic containers containing river water maintained within 3°C of river temperature. Subsamples of fish will be anesthetized with 30 to 80 mg/L solution of tricaine methanesulfonate (MS-222). The concentration depends on species and water temperature. When fish have lost equilibrium, examination for external signs of GBD will be conducted using a 2.5- to 5-power magnification headband goggles. All external surfaces will be examined (each fin, the head, eyes, and body surface). Documentation of subcutaneous emphysema will include: estimated percentage of external surface involved, as well as description of location and approximate size of blisters. Injuries and deformities and obvious secondary infections will also be documented. In a subsample of fish, lateral lines will be examined under a 10-to 40-power magnification dissecting microscope and an estimate

of percentage of line length occlusion will be recorded. At conclusion of the exams, fish will be placed in river water for 15 to 30 minutes for recovery prior to release or transfer.

In situ Bioassays of Dissolved Gas

In 1996, once each week, a subsample of up to 100 organisms per taxon of the resident fish (excluding salmonids) and invertebrates sampled from the river will be placed in net-pens or cages located in each of the three river reaches. Organisms will be apportioned between shallow water (0-1 m) cages, and the 0 to 4-m deep net pens. Large individuals (greater than 140 mm total length) will not be placed in shallow cages and will be placed in a separate 0-4-m-deep net-pen by themselves. Subgroups of hatchery chinook salmon will also be placed in deep (2-3 m) cages. Signs of GBD, physical condition, and size will be recorded for all fish introduced into the net-pens and cages. Dissolved gas levels will be recorded continuously in the net-pens. Dissolved gas levels will be measured in the surface cage at the beginning and end of the 4-day holding period.

At the end of a 4-day holding period, test organisms will be brought to the surface, anesthetized, and examined for signs of GBD. External examination will be the same as with river samples, except that only fish with signs of GBD will be measured. After recovery from the anesthetic, resident species will be released. Any dead fish will be examined externally and internally for signs of GBD.

The results of these in situ bioassays will not be extrapolated to represent river-wide populations of the same taxa, but will provide comparative data on selected taxa relative to the occurrence and duration of dissolved gas supersaturation at the holding locations.

Reporting

After sampling and holding data have been reviewed by the Program Leader, reports of GBD, in Fish Passage Center (FPC) format, will be electronically transmitted or faxed to the Corps of Engineers (COE), FPC, Technical Management Team, and other interested parties on Wednesday of each week.

A written abstract and oral presentation of field results will be provided at the COE October Research Review. The annual report will be available in the winter.

Facilities and Equipment

Three rafts and existing net-pens will be used for mobile in-river holding facilities. A laboratory is available for bioassays of dissolved gas supersaturation. Three dissolved gas recorders will be provided by the COE, North Pacific Division, Water Quality Section to

supplement the three non-logging TDG meters and two Weiss-style satrometers retained by NMFS. Electrofishing boats, nets, microscopes, magnification visors, and fish handling equipment are available.

DATA ANALYSIS AND STATISTICS

Our goal is to develop a multiparameter model relating dissolved gas supersaturation levels (related to water flow and spill volumes) with signs of GBD and mortality in juvenile salmonids and other shallow-water organisms. Using regression analysis, we will compare exposure (duration and concentration) to ambient dissolved gas levels with signs of GBD and mortality on organisms sampled from the river and on organisms held in net-pens during the 12 to 16 weeks of tests at the three river reaches. Numerous observations of organisms held in net-pens or exposed to different dissolved gas levels in laboratory bioassays will provide the range of data necessary to calculate a 95% prediction interval for signs of GBD on organisms in shallow-water habitats.

KEY PERSONNEL

Boyd Schrank	Principal Investigator
Earl Dawley	Project Manager
Robert Iwamoto	Program Manager

REFERENCES

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- Toner, M. A., E. M. Dawley, and B. Ryan. 1995. Evaluation of the effects of dissolved gas supersaturation on fish and invertebrates downstream from Bonneville, Ice Harbor, and Priest Rapids Dams, 1994. Report to the U.S. Army Corps of Engineers, Contract E96940029, 43p. (Available from Northwest Fisheries Science Center, 2725 Montlake Blvd. E., Seattle, WA 98112-2097.)
- Schrank, B. P., B. Ryan, and E. M. Dawley. In preparation. Evaluation of the effects of dissolved gas supersaturation on fish and invertebrates in Priest Rapids Reservoir, and downstream from Bonneville and Ice Harbor Dams, 1995. Report to the U.S. Army Corps of Engineers, Contract E96940029, 45 p. (Available from Northwest Fisheries Science Center, 2725 Montlake Blvd. E., Seattle, WA 98112-2097.)

Environmental Quality Commission

- ☐ Rule Adoption Item
☐ Action Item
☒ Information Item

Agenda Item G
February 23, 1996 Meeting

Title:

Governor's Coastal Salmon Restoration Initiative

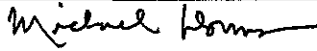
Summary:

At a December 7, 1995 speech in Newport, Governor Kitzhaber announced that the state would work cooperatively with NMFS to develop a plan "to restore all our salmon and trout populations to productivity and to restore fishing as an important part of our economy." "Our primary goal is to restore these fish, not just avoid a listing." The Governor has established a Coastal Salmon Restoration Planning Team under the direction of Jim Martin of his office and comprised of all the state natural resource agencies, plus NMFS, Oregon Department of Transportation (ODOT), Oregon Economic Development Department (OEDD), Oregon Coastal Zone Management Agency (OCZMA), 4 The Sake of Salmon, and the Rogue Valley Council of Governments (RVCOG). The objective of the planning team is to develop a restoration plan that will recover the salmonid stocks without the need for a federal listing. The plan will address habitat restoration, hatchery operations, harvest management, and hydropower/dams as appropriate. It will be submitted to NMFS in September.

Department Recommendation:

It is recommended that the Commission accept this informational report, discuss the matter, and provide advice and guidance to the Department as appropriate.


Report Author


Division Administrator

Director



2/7/96

State of Oregon
Department of Environmental Quality

Memorandum

Date: February 7, 1996

To: Environmental Quality Commission
From: Langdon Marsh, Director
Subject: Agenda Item G, February 23, 1996, EQC Meeting Governor's Coastal Salmon Restoration Initiative

Statement of Purpose

The purpose of this agenda item is to brief the Commission on the Governor's Coastal Salmon Restoration Initiative and how Department programs will be affected by the initiative.

Background

In October 1993, in response to three petitions seeking protection for coho salmon under the federal Endangered Species Act (ESA), the National Marine Fisheries Service (NMFS) initiated a status review of coho salmon in Washington, Oregon, and California. NMFS identified six distinct population segments, or evolutionary significant units (ESUs), of coho salmon in Washington, Oregon and California. Three of these ESUs include portions of the Oregon Coast (Southern Oregon/Northern California Coasts, Oregon Coast, and Lower Columbia River/Southwest Washington Coast). (See attached map).

NMFS' Biological Review Team (BRT) found that coho salmon in the Southern Oregon/Northern California Coast and Oregon Coast ESUs are not presently in danger of extinction but are likely to become endangered in the foreseeable future if present trends continue. Based upon this information, coho salmon in these ESUs may be considered as "threatened" under the ESA. The BRT concluded it did not have adequate information to determine the status of natural populations of coho salmon in the Lower Columbia/Southwest Washington Coast ESU, so they are not presently proposed for listing as either threatened or endangered. (See attached Executive Summary from "Status Review of Coho Salmon from Washington, Oregon, and California", NOAA Technical Memorandum NMFS-NWFSC-24, September 1995).

At a December 7, 1995 speech in Newport, Governor Kitzhaber announced that the state would work cooperatively with NMFS to develop a plan "to restore all our salmon and trout populations to productivity and to restore fishing as an important part of our economy." "Our primary goal is to restore these fish, not just avoid a listing." The Governor has established a Coastal Salmon Restoration Planning Team under the direction of Jim Martin of his office and comprised of all the state natural resource agencies, plus NMFS, Oregon Department of Transportation (ODOT), Oregon Economic Development Department (OEDD), Oregon Coastal Zone Management

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Agency (OCZMA), 4 The Sake of Salmon, and the Rogue Valley Council of Governments (RVCOG). The objective of the planning team is to develop a restoration plan that will recover the salmonid stocks without the need for a federal listing. The plan will address habitat restoration, hatchery operations, harvest management, and hydropower/dams as appropriate. It will be submitted to NMFS in September.

The mission of the Coastal Salmon Restoration Initiative is to restore our coastal salmon populations to productive and sustainable levels based on their natural, cultural and economic values to the people of Oregon. The goals of the Initiative follow:

- Retain state and local management flexibility for lands, waters and fish.
- Remove the need for a federal threatened or endangered species listing if possible.
- Process will rely on grassroots involvement, ownership and commitment in a cooperative environment.
- Focus on voluntary versus regulatory approach.
- Reestablish sport and commercial fisheries as an important part of our economy.
- Manage hatchery and wild fish in a compatible manner.
- Review and evaluate existing fish management and habitat protection laws, rules and policies.
- Recognize salmon as an integral part of our cultural identity.
- The Initiative will serve as a model for intergovernmental and community-based collaboration and partnership.
- All parties share in the problem and the solution.
- This Initiative will address multiple species.

The approach of the Governor's Planning Team will be to:

1. Summarize progress to date (describe existing programs such as the Oregon Forest Practices Act);
2. Describe recent, new state initiatives and programs that will make a difference;
3. List existing voluntary efforts that are having a positive effect on restoring and protecting salmonids;
4. Solicit additional voluntary efforts where necessary;
5. Avoid a heavy-handed regulatory approach; and
6. Recognize the critical role of grassroots citizen involvement and stakeholder ownership, and encourage these resource stewardship activities.

The Planning Team is committed to work with local governments, watershed groups, stakeholders and other interest groups. The Team is comprised of three components with the following responsibilities:

"Public Outreach Team" - will engage local watershed councils and other community groups to assist in developing and implementing a recovery plan that is founded on a collaborative approach to restoring coastal coho salmon populations. The team will develop project message, a grassroots network approach, and a media strategy.

"Science Team" - will develop criteria against which the plan can be measured to determine if it will adequately protect Coastal salmonids. The team of biologists will be composed primarily from Oregon Department of Fish & Wildlife (ODFW) and NMFS staff, but will work closely with, and be peer reviewed by, independent scientists.

"Planning Team" - will develop a plan to recover declining fish species through changes in existing state regulatory programs and voluntary efforts in the public and private sectors.

- a. Team members will work within their own agencies to identify which agency programs will be included in the plan, emphasizing how improvements to those programs have or will protect salmonids.
- b. Team members will brief agency stakeholder groups and work with group leaders to reach the grassroots of the stakeholder groups.

- c. Team members will work with stakeholders to identify and describe voluntary efforts directed at restoring or protecting salmonid habitat.
- d. Team members will work with grassroots groups, such as watershed councils, to identify local problems and solutions.
- e. Team members will develop draft plan describing how changes to regulatory programs and implementation of existing or new voluntary programs will result in recovery of salmon.

The Department is currently identifying its stakeholder groups and briefing them on the Initiative. In addition, the Department is reviewing its programs to determine how they are affecting salmonid habitat in the Coastal region and which should be included in the plan. Thus far, the Department has identified the following programs that should result in significant improvements to salmonid habitat:

Tillamook National Estuary Project - This locally based and federally funded project has identified salmonid habitat within the basin as one of its environmental issues of concern. The NEP is developing a management plan to address the environmental problems identified in the estuary. One of the primary benefits for salmonid restoration is that the process also serves as an organizing mechanism for local citizens to take action. Several early action projects have been identified and are being implemented. The final management plan will also identify other strategies needed to ensure success.

Revised Water Quality Standards - The Commission recently revised water quality standards for temperature and dissolved oxygen, including an intergravel dissolved oxygen standard specifically designed to protect spawning and incubating salmonids. The revised standards will more effectively address the effect water quality has on salmonid life histories. The temperature standard will be more protective of salmonid habitat because it is more readily implemented and enforced. The dissolved oxygen standard will provide greater protection for salmonid spawning areas than before.

Revised 303(d) List - The Department is revising its list of water quality limited waterbodies and is developing a priority list for TMDL development, under Section 303(d) of the Clean Water Act. Waterbodies are being listed due to sediment or habitat degradation where this leads to impairment of salmonids, in addition to exceedances of Oregon water quality standards such as temperature and dissolved oxygen. Also, the 303(d)(1) list will be used in part to identify DEQ's priorities for 319 Nonpoint Source grant projects. The 303 (d) list serves as an organizing tool to direct resources to critical water systems facing the greatest pressures. The list is more extensively researched than in

previous years and so provides a more accurate presentation of current water quality conditions. Restoration efforts can be more effectively directed at problem areas.

Coastal Nonpoint Source Management Program - The Coastal Nonpoint Pollution Control Program, being developed under Section 6217 of the Coastal Zone Act Reauthorization Amendments, is a comprehensive approach to achieving water quality goals in sensitive coastal environments. Oregon has already implemented many of the minimum elements of this program and will be taking steps within the next year to develop the remaining components. Successful completion of the entire effort will serve to reduce nonpoint effects on salmonid habitat to acceptable levels.

Watershed restoration projects - The Department devotes technical and financial resources to identify, develop and support watershed restoration projects throughout the state, but coastal areas have served as a focus for much of this effort. Regional staff work with watershed councils and other local groups to hone project ideas so as to obtain the most efficient use of the resources available. Staff have also been successful in identifying other grants that can be leveraged to expand the scope. Projects undertaken on the Coos and Coquille Rivers have been successful in restoring salmon runs in degraded streams. Similar results can be expected in other areas where existing and expanded resources are deployed.

Each of these programs includes recently revised or new elements that represent improvements in water quality management in the Coastal area. These are the types of program improvements NMFS has indicated they are looking for in the state plan. NMFS has made it clear that if the state merely lists its current programs in the plan it will not be acceptable, without also showing how those programs are being changed to address the factors adversely affecting coho salmon.

Authority of the Commission with Respect to the Issue

The Commission has the authority to approve any new or revised regulations or policies the Department may propose to implement to assist in the restoration of coastal salmonids.

Alternatives and Evaluation

This report is only a briefing for the Commission on the Governor's Coastal Salmon Restoration Initiative. No Department action is anticipated at this time other than participation with other natural resource agencies in the planning process. The Department will bring proposed revisions to regulations and policies to the Commission at a later date for consideration.

Summary of Public Input Opportunity

No public input has been sought on this informational report.

Conclusions

Coastal coho salmon have declined considerably over time and will be listed as threatened under the ESA if the state does not act.

The state is committed from the top down to restore coastal salmonids to productivity.

The Department is participating on the Governor's Coastal Salmon Restoration Planning Team and will do its part to see that salmonid habitat is restored and protected.

Intended Future Actions

Over the next eight months the Department will work with its stakeholders and the Governor's Planning Team to develop a restoration plan. Rule and policy changes that are elements of the plan will be brought to the Commission for action at the appropriate time. Does the Commission wish to be briefed on the plan as it is developed and review the Department's portion of it before it is finalized?

Department Recommendation

It is recommended that the Commission accept this report, discuss the matter, and provide advice and guidance to the Department as appropriate.

Attachments

Attachment 1 - Map of current range of proposed ESUs for Coho Salmon, NMFS.

Attachment 2 - Coastal Salmon Restoration Initiative Flyer, Governor's Office.

Attachment 3 - Executive Summary from "Status Review of Coho Salmon from Washington, Oregon, and California", NOAA Technical Memorandum NMFS-NWFSC-24, September 1995.

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Reference Documents (available upon request)

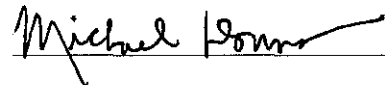
Status Review of Coho Salmon from Washington, Oregon, and California, NOAA Technical Memorandum NMFS-NWFSC-24, September 1995.

Oregon Coho Salmon Biological Status Assessment and Staff Conclusion For Listing Under The Oregon Endangered Species Act, Oregon Department of Fish & Wildlife, February 22, 1995.

Approved:

Section:

Division:



Report Prepared By: Mike Downs

Phone: 503-229-5324

Date Prepared: January 26, 1996

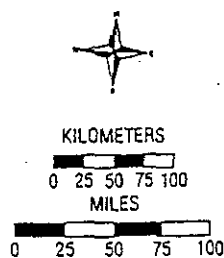
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1/22/96



NATIONAL MARINE
FISHERIES SERVICE

COHO SALMON
CURRENT RANGE OF
PROPOSED ESUs

Pacific Ocean



LEGEND
PROPOSED COHO STATUS

- NOT LISTED
- CANDIDATE FOR LISTING
- THREATENED

~ SPOTTED OWL
RANGE BOUNDARY

Map Date - June 26, 1995



OLYMPIC
PENINSULA
ESU

PUGET SOUND/
STRAIT OF GEORGIA
ESU

COLUMBIA RIVER/
S.W. WASHINGTON
ESU

OREGON
COAST
ESU

SOUTHERN OREGON/
NORTHERN CALIFORNIA
ESU

CENTRAL
CALIFORNIA
ESU

San Francisco

San Lorenzo
River

Coastal Salmon Restoration Initiative



Background Statement

The Governor's Coastal Salmon Restoration Initiative is focused on ensuring the preservation and restoration of native coastal coho populations and preventing the need for a federal threatened or endangered listing of coho salmon populations under the Endangered Species Act (ESA).

Governor Kitzhaber has directed that the state's natural resource agencies, joined by the Oregon Department of Transportation (ODOT) and the Economic Development Department (EDD), develop a program based on existing laws and voluntary activities which maintain, conserve, restore or otherwise protect coastal salmon habitat. Therefore, local and state programs that affect coastal land uses will become part of the Governor's salmon restoration strategy.

The completion of the Governor's strategy is targeted for early fall in anticipation of a decision by the National Marine Fisheries Service regarding the listing of coho as an endangered species. A listing of coastal coho salmon would result in lengthy and constant review with federal agencies on many activities which occur in the coastal zone including land use (public and private), release of hatchery fish and regulation of fisheries.

Mission

It is the mission of the Oregon Coastal Salmon Restoration Initiative to restore our coastal salmon populations to productive and sustainable levels based on their natural, cultural and economic values to the people of Oregon.

Goals

- ☐ Retain state and local management flexibility for lands, waters and fish.
- ☐ Remove the need for a federal threatened or endangered species listing if possible.
- ☐ Process will rely on grassroots involvement, ownership and commitment in a cooperative environment.
- ☐ Focus on a voluntary versus regulatory approach.
- ☐ Reestablish sport and commercial fisheries as an important part of our economy.
- ☐ Manage hatchery and wild fish in a compatible manner.
- ☐ Review and evaluate existing fish management and habitat protection laws, OARs and policies.
- ☐ Recognize salmon as an integral part of our cultural identity.
- ☐ This initiative will serve as a model for inter-government and community-based collaboration and partnership.
- ☐ All parties share in the problem and the solution.
- ☐ This initiative will address multiple species.

Who and What

State agencies in Oregon are banding together with a network of grassroots organizations up and down the coast in an unprecedented effort to protect and restore coho salmon. As a statewide plan is assembled, each agency will be making its own list of programs, both regulatory and voluntary, that can be counted as beneficial to fish habitat. These programs will be part of the plan

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submitted to the National Marine Fisheries Service (NMFS). It is certain there will be other programs and measures yet to be identified that will fill in the gaps. Many of the components of the plan will come from the grassroots — local governments, watershed councils, private land-owners and other members of the general public who live in Oregon's coastal zone. The initiative is truly a partnership with several entities working together to protect salmon habitat.

Timelines

All items listed here are tentative and subject to change.

- Draft plan by mid-summer
- Final plan by September
- Science team is now in the formative stage but not together yet
- Planning and outreach teams will meet approximately every two weeks
- Natural Resource directors will meet and give feedback monthly
- Watershed councils and local groups are working or forming and receiving updates from planning team

Action Plans

State agencies involved in this process will be preparing action plans that define roles and contributions to the recovery initiative. This

effort will include program measures, provide a review of existing regulations, policies and programs and identify potential new partnerships and programs.

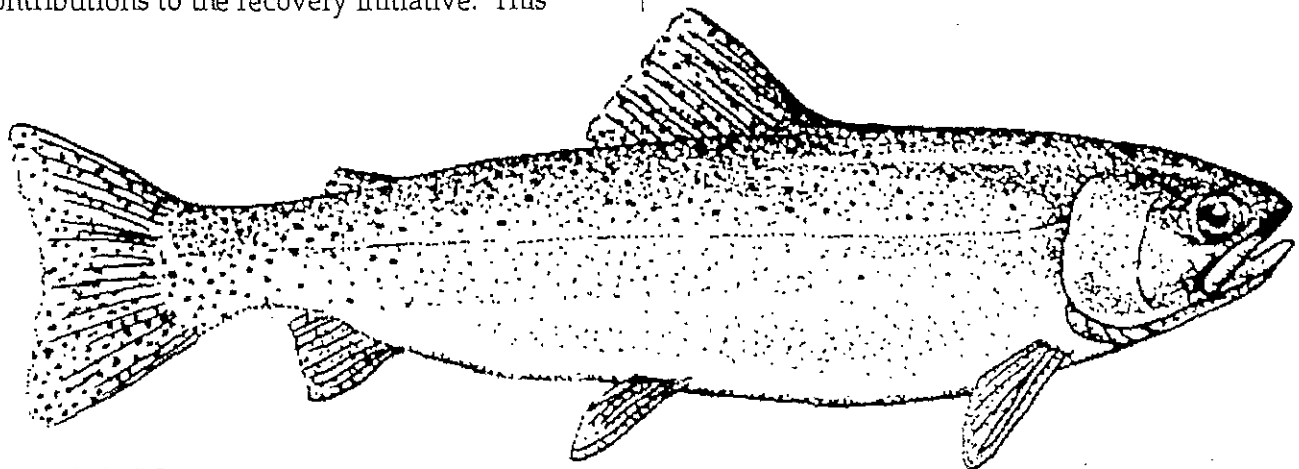
They will also outreach to local and statewide stakeholders, watershed councils and governing bodies.

Grassroots Efforts

Local ownership and involvement is key to the restoration initiative. Grassroots efforts will be the key to developing and implementing habitat protection plans as well as maintaining local communication. Immediate efforts are underway to work with watershed councils and other local partnerships that will be the foundation for this effort.

Contact

Governor's Natural Resource Office, 503-378-3589 ext. 834.



EXECUTIVE SUMMARY

The Endangered Species Act (ESA) allows listing of "distinct population segments" of vertebrates as well as named species and subspecies. The policy of the National Marine Fisheries Service (NMFS) on this issue for Pacific salmon and steelhead is that a population will be considered "distinct" for purposes of the ESA if it represents an evolutionarily significant unit (ESU) of the species as a whole. To be considered an ESU, a population or group of populations must 1) be substantially reproductively isolated from other populations, and 2) contribute substantially to ecological/genetic diversity of the biological species. Once an ESU is identified, a variety of factors related to population abundance are considered in determining whether a listing is warranted.

In October 1993, in response to three petitions seeking protection for coho salmon under the ESA, NMFS initiated a status review of coho salmon in Washington, Oregon, and California, and formed a Biological Review Team (BRT) to conduct the review. This report summarizes biological and environmental information gathered in that process.

Proposed Coho Salmon ESUs

The BRT examined genetic, life history, biogeographic, geologic, and environmental information to identify where ESU boundaries should be located. In particular, physical environment and ocean conditions/upwelling patterns, estuarine and freshwater fish distributions, and coho salmon river entry and spawn timing and marine coded-wire-tag recovery patterns were found to be the most informative for this process. Based on this examination, the BRT identified six coho salmon ESUs in Washington, Oregon, and California. The geographic boundaries of the six proposed ESUs are as follows:

- 1) Central California coast. The geographic boundaries of this ESU extend from Punta Gorda in northern California south to and including the San Lorenzo River in central California, and include tributaries to San Francisco Bay, excluding the Sacramento-San Joaquin River system.
- 2) Southern Oregon/northern California coasts. This ESU includes coho salmon from Cape Blanco in southern Oregon to Punta Gorda in northern California.
- 3) Oregon coast. This ESU covers coastal drainages along most of the Oregon coast from Cape Blanco to the mouth of the Columbia River.
- 4) Lower Columbia River/southwest Washington coast. Historically, this ESU probably included coho salmon from all tributaries of the Columbia River below the Klickitat River on the Washington side and below the Deschutes River on the Oregon side (including Willamette River as far upriver as the Willamette Falls), as well as coastal drainages in southwest Washington between the Columbia River and Point Grenville (between the Copalis and Quinault Rivers).

5) Olympic Peninsula. The geographic boundaries of this ESU are entirely within Washington, including coastal drainages from Point Grenville to and including Salt Creek (directly west of the Elwha River).

6) Puget Sound/Strait of Georgia. This ESU includes coho salmon from drainages of Puget Sound and Hood Canal, the eastern Olympic Peninsula (east of Salt Creek), and the Strait of Georgia from the eastern side of Vancouver Island and the British Columbia mainland (north to and including Campbell and Powell Rivers), excluding the upper Fraser River above Hope.

Assessment of Extinction Risk

The ESA (section 3) defines the term "endangered species" as "any species which is in danger of extinction throughout all or a significant portion of its range." The term "threatened species" is defined as "any species which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range." According to the ESA, the determination whether a species is threatened or endangered should be made on the basis of the best scientific information available regarding its current status, after taking into consideration conservation measures that are proposed or are in place. In this review, the BRT did not evaluate likely or possible effects of conservation measures and, therefore, did not make recommendations as to whether identified ESUs should be listed as threatened or endangered species; rather, the BRT drew scientific conclusions about the risk of extinction faced by identified ESUs under the assumption that present conditions will continue. The resulting conclusions for each ESU follow.

1) Central California coast. There was unanimous agreement among the BRT that natural populations of coho salmon in this ESU are presently in danger of extinction. The chief reasons for this assessment were extremely low current abundance, especially compared to historical abundance, widespread local extinctions, clear downward trends in abundance, extensive habitat degradation and associated decreased carrying capacity, and a long history of artificial propagation with the use of non-native stocks. In addition, recent droughts and current ocean conditions may have further reduced run sizes.

2) Southern Oregon/northern California coasts. There was unanimous agreement among the BRT that coho salmon in this ESU are not in danger of extinction but are likely to become endangered in the foreseeable future if present trends continue. Current run size, the severe decline from historical run size, the frequency of local extinctions, long-term trends that are clearly downward, degraded habitat and associated reduction in carrying capacity, and widespread hatchery production using exotic stocks are all factors that contributed to the assessment. Like the central California ESU, recent droughts and current ocean conditions may have further reduced run sizes.

3) Oregon coast. The BRT concluded that coho salmon in this ESU are not in danger of extinction but are likely to become endangered in the future if present trends continue. The BRT reached this conclusion based on low recent abundance estimates that are 5-10% of

historical abundance estimates, clearly downward long-term trends, recent spawner-to-spawner ratios that are below replacement, extensive habitat degradation, and widespread hatchery production of coho salmon. Drought and current ocean conditions may have also reduced run sizes.

4) Lower Columbia River/southwest Washington coast. Previously, NMFS concluded that it could not identify any remaining natural populations of coho salmon in the lower Columbia River (excluding the Clackamas River) that warranted protection under the ESA. The Clackamas River produces moderate numbers of natural coho salmon. The BRT could not reach a definite conclusion regarding the relationship of Clackamas River late-run coho salmon to the historic lower Columbia River ESU. However, the BRT did conclude that *if* the Clackamas River late-run coho salmon is a native run that represents a remnant of a lower Columbia River ESU, the ESU is not presently in danger of extinction but is likely to become so in the foreseeable future if present conditions continue.

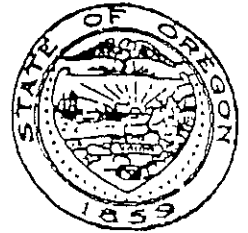
For southwest Washington coho salmon, uncertainty about the ancestry of coho salmon runs given high historical and current levels of artificial production prevented the BRT from reaching a definite conclusion regarding the relationship between coho salmon in that area and the historical lower Columbia River/southwest Washington ESU. If new information becomes available, the relationship and status of the ESU will be reexamined.

5) Olympic Peninsula. While there is continuing cause for concern about habitat destruction and hatchery practices within this ESU, the BRT concluded that there is sufficient native, natural, self-sustaining production of coho salmon that this ESU is not in danger of extinction and is not likely to become endangered in the foreseeable future unless conditions change substantially.

6) Puget Sound/Strait of Georgia. The BRT was concerned that if present trends continue, this ESU is likely to become endangered in the foreseeable future. Although current population abundance is near historical levels and recent trends in overall population abundance have not been downward, there is substantial uncertainty relating to several of the risk factors considered. These risk factors include widespread and intensive artificial propagation, high harvest rates, extensive habitat degradation, a recent dramatic decline in adult size, and unfavorable ocean conditions. Further consideration of this ESU is warranted to attempt to clarify some of these uncertainties.



Coastal Salmon Restoration Initiative



OFFICE OF THE DIRECTOR

Background Statement

The Governor's Coastal Salmon Restoration Initiative is focused on preserving and restoring native coastal salmon populations and preventing the need for a federal threatened or endangered listing of coho salmon under the Endangered Species Act (ESA).

Governor Kitzhaber has directed the following state agencies to develop a program in partnership with coastal communities, local governments and others. This will be based on existing laws and voluntary activities which maintain, conserve, restore or otherwise protect coastal salmon:

- Oregon Department of Fish and Wildlife (ODFW)
- Oregon Economic Development Department (OEDD)
- Department of Agriculture (ODA)
- Oregon Water Resources Department (OWRD)
- Oregon Department of Environmental Quality (DEQ)
- Oregon Department of Forestry (ODF)
- Oregon Department of Transportation (ODOT)
- Oregon State Marine Board (SMB)
- Oregon Parks and Recreation Department (OPRD)
- Division of State Lands (DSL)

Therefore, local and state programs that affect coastal salmon will become part of the Governor's salmon restoration strategy.

The completion of the Governor's strategy is targeted for early fall in anticipation of a decision by the National Marine Fisheries Service regarding the listing of coho under the ESA. A listing of coastal coho salmon would result in lengthy and constant review with federal agencies on many activities which occur in the coastal zone including land use (public and private), release of hatchery fish and regulation of fisheries.

Mission

It is the mission of the Oregon Coastal Salmon Restoration Initiative to restore our coastal salmon populations and fisheries to productive and sustainable levels which will provide substantial environmental, cultural and economic benefits.

Goals

- ☐ Retain state and local management flexibility for lands, waters and fish.
- ☐ Remove the need for a federal threatened or endangered species listing if possible.
- ☐ Process will rely on grassroots involvement, ownership and commitment in a cooperative environment.
- ☐ Focus on a voluntary versus regulatory approach.
- ☐ Reestablish sport and commercial fisheries as an important part of our economy.
- ☐ Manage hatchery and wild fish in a compatible manner.
- ☐ Review and evaluate existing fish management and habitat protection laws, rules, regulations and policies.
- ☐ Recognize salmon as an integral part of our cultural identity.
- ☐ Serve as a model for inter-government and community-based collaboration and partnership.
- ☐ All partners will share in addressing the problems and creating solutions.

Who and What

State agencies in Oregon are banding together in partnership with organizations up and down the coast in an unprecedented effort to protect and restore coho salmon. As a statewide plan is assembled, each agency will be making its own list of programs, both regulatory and voluntary, that can be counted as beneficial to fish habitat. These programs will be part of the plan submitted to the National Marine Fisheries Service (NMFS). It is certain there will be other programs and measures yet to be identified that will fill in the gaps. Many of the components of the plan will come from the grassroots — local governments, watershed councils, private land-owners and other members of the general public who live in Oregon's coastal zone.

Action Plans

State agencies involved in this process will be preparing action plans that define roles and contributions to the recovery initiative. This effort will include program measures, provide a review of existing regulations, policies, programs and voluntary efforts as well as identifying potential new partnerships. State agencies will

outreach to local and statewide stakeholders, watershed councils and governing bodies.

Grassroots Efforts

Local ownership and involvement is key to the restoration initiative. Grassroots efforts will be the key to developing and implementing habitat protection plans as well as maintaining local communication. Immediate efforts are underway to work with watershed councils and other local partnerships that will be the foundation for this effort.

Timelines

The National Marine Fisheries Service (NMFS) requires that a final plan be presented to them for review by October 1, 1996. Science, Planning and Outreach Teams are meeting bi-weekly to complete a draft report by mid-summer. The Governor is also meeting bi-weekly with agency directors to review progress.

Contact

Governor's Natural Resource Office,
503-378-3589 ext. 834.

