Selected Remedial Action
Record of Decision
for the
Former Dip Tank Area of the Floragon Site
Molalla, Oregon

1.0 INTRODUCTION AND PURPOSE

This document presents the Oregon Department of Environmental Quality (DEQ) selected remedial action at the former Dip Tank Area, representing a portion of the former Floragon Forest Products (Floragon) site in Molalla, Oregon. The selected remedial action was chosen in accordance with Oregon Revised Statute (ORS) 465.200 et seq. and is based on the administrative record for this site. This Record of Decision (ROD) summarizes the more detailed information presented in investigation reports and other documents in the administrative record.

Avison Lumber Company (Avison) signed a Letter Agreement in 2010, as requested by DEQ, to complete the investigation and cleanup actions at the Floragon site, formerly owned and operated by Avison. Investigation and remediation work was previously completed in two other portions of the approximately 105-acre site; DEQ issued a no further action (NFA) determination for the 82-acre northern site in 2014, and issuance of a conditional NFA for the 16-acre Southeast Corner of the site is pending. After completion of the former Dip Tank Area remediation work, only cleanup work associated with the on-site portion of Bear Creek will remain. Remedial planning for Bear Creek is ongoing as of 2018.

This ROD is confined to selection of a remedy to address environmental contamination in the former Dip Tank Area.

2.0 SUMMARY OF SELECTED REMEDIAL ACTION

Selected remedial actions for the former Dip Tank Area contamination are:

- Removal of sediment from catch basins and associated storm sewer lines discharging to Bear Creek.
- Excavation and offsite disposal of contaminated (hot spot) soil near AB-06, where a dip tank was formerly located. An estimated 200 tons of soil will be removed, followed by confirmation sampling and excavation backfilling.
- Vegetation removal and asphalt re-paving over the existing hardscape surface throughout the Dip Tank Area, with the exception of concrete foundations that are present and determined to be competent.
- Preparation of a Contaminated Media Management Plan (CMMP).
- Preparation and filing of a deed restriction prohibiting the non-conforming use of the property (for residential use, for example), detailing the nature and extent of residual contamination, and requiring cap inspections and maintenance.

In addition, habitat enhancement will occur in two portions of the subject area adjoining Bear Creek.

A more detailed description of the selected remedy is presented in Section 8: Selected Remedial Action.

3.0 SITE DESCRIPTION

The former Dip Tank Area comprises 3.19 acres in the southeast portion of the approximately 105-acre Floragon site, located at 250 W. 7th Street in Molalla (Clackamas County), Oregon (see Attachments 1 and 2 for figures showing the site vicinity and Dip Tank Area). A portion of the site is located within the city of Molalla, Oregon and is zoned for heavy industrial use (M2). Other portions of the site are located outside Molalla and are in unincorporated Clackamas County, Oregon. Unincorporated portions are designated for rural industrial use (RI). The former Dip Tank Area is located within tax parcel 01107340 designated for rural industrial use.

The former Dip Tank Area is currently vacant and covered by three to four inches of weathered asphalt concrete pavement underlain by up to two feet of ravel fill. Exposed Portland cement concrete foundation slabs remain at two former mill building locations. Mill buildings formerly present throughout the Floragon site, including the Dip Tank Area, were demolished and removed by Floragon in 2005. Three storm water catch basins and associated conveyance piping are present and appear to discharge to the north at Bear Creek. No other underground utilities are known to exist at the former Dip Tank Area.

Lumber-related manufacturing occurred at Floragon beginning in the 1940s and was largely discontinued by 2009. The mill site was owned and operated by Avison Lumber until 1998-1999 when it was purchased and operated by Floragon.

From approximately 1970 to 1985, Avison Lumber applied a water-based pentachlorophenol (PCP) solution on lumber in the area of former Dip Tank Area #1 for anti-fungal purposes prior to shipment in containers. Based on the manufacturer's recommended 100:1 dilution, PCP was used at working concentrations of approximately 1,400 parts per million (ppm) (0.14%). It was later discovered that this solution contained manufacturing impurities including a family of related chemicals called chlorinated dibenzo-*p*-dioxin and chlorinated dibenzofurans, commonly referred to as dioxin. Lumber was prepared for shipping by being dipped into one of two tanks containing the water-based anti-fungal solution. The lumber, after dipping, was allowed to drain over the tanks on forks to recover any residual solution. In approximately 1985, Dip Tank #1 was removed from service and a second dip tank system (Dip Tank #2) was installed. The new dip tank system reportedly used an alternate treatment fluid referred to as NP-1, which does not contain chlorophenol compounds or dioxin. Avison used NP-1 until approximately 1998, when the site was sold to Floragon. Use of Dip Tank #2 was reportedly discontinued within six months following Floragon's acquisition of the site.

No buildings are currently present within the RI study area, but remnant concrete building foundations remain at the former Dip Tank Area parcel. These buildings were designated as "Re-Saw #2" to the west, and "Drying Kilns #2" to the east. The two dip tanks were located at/adjacent to these buildings.

4.0 SITE INVESTIGATION

Remedial investigation for the former Dip Tank Area of the Floragon property was conducted over three phases: Phase 1 was conducted across the 105-acre mill property in 2010; Phase 2 was conducted to address specific data gaps beginning in 2012; and Phase 3 was conducted in the onsite section of Bear

Creek and former Dip Tank Area beginning in 2014. These efforts are discussed, in brief, below. Sampling locations are shown in Attachment 3, and compiled analytical results are presented in Tables 2 through 7 included as Attachment 4.

2010 Phase 1 Remedial Investigation. Following DEQ approval of the 2009 RI/FS work plan, extensive site investigation efforts were conducted across the entire 105-acre Floragon property. These Phase I investigations supplemented the data collected prior to 2010. The Phase 1 RI further evaluated site-wide conditions and indicated that limited and localized environmental impacts were present at certain portions of the former mill property. In general, the greatest concentrations of primary contaminants of interest were identified at the former Dip Tank Area, former Log Pond Area, and former Hyster Shop Area. The Phase 1 RI included baseline human health and ecological risk characterization tasks.

2012 Phase 2 Remedial Investigation. A series of supplemental activities were conducted to address data gaps identified during the first phase of investigation. Based on Phase 2 RI and risk assessment findings, the DEQ issued an NFA determination for the 84-acre Northern Parcels Area in March 2014 and a separate NFA is currently pending for the 16-acre SE Corner Area. Investigation tasks conducted in 2012 focused on sediment contaminant characterization including (1) on-site portions of Bear Creek, and (2) surficial soil/sediment materials within the site's industrial North Ditch, and among related catch basin and drainage pipe features located near the Northern Ditch and former Hyster Shop areas. The sediment characterization effort focused on dioxin, since other COIs including non-PCP chlorophenols, polynuclear aromatic hydrocarbons (PAHs), and metals were generally concluded to not present unacceptable risks based on the Phase 1 RI risk assessment. Groundwater quality samples collected from the network of shallow and intermediate-depth monitoring wells, including within the Dip Tank Area, showed that, where detected, none of the contaminant concentrations in groundwater exceed their respective risk-based concentrations (RBCs) for applicable exposure pathways.

2014 Phase 3 Remedial Investigation. In accordance with a DEQ-approved work plan, Phase 3 RI activities were conducted in 2014 and 2015. The purpose of this phase was to further delineate the magnitude and extent of contaminants in Bear Creek sediment and former Dip Tank Area soils (surface soils and catch basin sediments). From the former Dip Tank Area, sixteen composite soil samples were analyzed for dioxins as part of the Phase 3 RI. In combination with data from 2010-2014, one localized dioxin hot spot was identified in soil at the site, adjacent to former Dip Tank #1. Among the 16 composite soil samples analyzed during Phase 3, dioxin mammalian toxicity equivalent (TEQ) concentrations in all but two were at or below 63 pg/g, with the exceptions occurring at the B13-16 composite area surrounding the identified hot spot.

A summary discussion of former Dip Tank Area sampling results is presented in the following section.

5.0 NATURE AND EXTENT OF CONTAMINATION

Dioxins in shallow soil are the primary contaminants of concern in the former Dip Tank Area. A range of potential contaminants including dioxins, volatile and semi-volatile organic compounds (VOCs and SVOCs), metals, hydrocarbon-based lubricants and fuels (gasoline, diesel, and heavy oil) and their constituents were evaluated.

Tabulated results are presented in Attachment 4 along with DEQ RBCs. A discussion of soil sampling results follows.

Dioxins

- Elevated dioxin levels (2,221 pg/g TEQ) detected at soil sample location AB-06 in 2010, were further delineated during the Phase 3 RI by evaluating composite soil samples collected at increasing lateral and vertical distances from this location. These samples indicated dioxin ranges between 19 pg/g and 489 pg/g TEQ up to a depth of 1.5 feet and a distance of 50 feet from sample location AB-06.
- Around the margins of the former Dip Tank Area, additional four-point shallow soil (up to 1.5 feet depth) composite samples collected during Phase 3 identified dioxin concentrations in soil of between 0.6 pg/g and 63 pg/g TEQ.

Petroleum Hydrocarbons

- Diesel was not detected in any of the Phase 3 soil samples
- Oil, where present, was detected at concentrations ranging from 52 mg/kg to 3,860 mg/kg

Chlorophenols

- PCP was detected at a depth of 1.5 feet in samples B1-4 and B17-20 at 0.021 mg/kg and 0.090 mg/kg, respectively. This compound was also detected in the B1-B4 composite at a concentration of 0.193 mg/kg (0.5 feet) and 0.017 mg/kg (3.0 feet).

SVOCs

- With the exception of naphthalene and phenanthrene (0.0068 mg/kg and 0.0019 mg/kg, respectively), SVOCs were not detected.

Metals

- Total metals concentrations were detected at levels generally expected in Willamette Valley soils or below applicable DEQ RBCs, with one slightly elevated arsenic concentration (9.4 mg/kg, versus DEQ's background concentration of 9 mg/kg) in soil sample composite B9-B12.

6.0 RISK ASSESSMENT

A baseline risk assessment conducted as part of the Phase 1 RI activities evaluated the entire 105-acre mill property. During 2015, discussions with DEQ concluded that remaining data gaps were limited to the former Dip Tank Area and Bear Creek sediments, collectively encompassing approximately five acres. This "study area" was the focus of 2015-2016 Phase 3 RI activities including a residual risk assessment for identified receptors.

The site is zoned for industrial use. Occupational workers, construction workers, excavation workers, and trespassers were identified as the reasonably likely human receptors. At present, the Dip Tank Area is vacant and only trespasser exposure is expected to occur. Sale and reuse of the parcel is, however, expected to occur. Both current and likely future use scenarios were considered in risk assessment. Neither residential nor recreational use of the site is allowable by zoning, nor are such exposures reasonably likely.

Site-specific human health risks are governed by dioxin. Beginning with the Phase 1 RI in 2011, human health risk characterization for this chemical group was evaluated using DEQ's approved approach based on the cumulative 2,3,7,8-TCDD "toxic equivalent quotient" (TEQ) concentration values. DEQ's policy of applying the acceptable excess cancer risk to individual chemicals (as applied during initial phases of site risk characterization in 2011-2012) was replaced in December 2015 with a policy to evaluate a chemical class such as dioxin as a single carcinogenic substance.

Risk exceedances for soil in the former Dip Tank Area were identified in the following areas by receptor:

Occupational Worker: Shallow surficial soil (0-0.5 feet) beneath the pavement at AB-03, AB-05, AB-06, and the B13-B16 composite, subsurface (1.5 foot deep) soil at the B13-16 composite, catch basin sediments at AB-19A and AB-19B.

Construction Worker: Shallow soil at one paved location (AB-06 at 0-0.5 feet) and one catch basin (AB-19B).

No ecological receptors are anticipated for the former Dip Tank Area given that it is largely paved and zoned for industrial use. Ecological receptors are, of course, considered for the adjoining Bear Creek, and the potential for soil contamination to migrate to the creek was considered. Identification of cleanup measures for the on-site portion of Bear Creek impacted by dioxins will be addressed in a separate document. Dip Tank Area cleanup is being completed prior to Bear Creek work to eliminate the upland area as a recontamination source.

7.0 FEASIBILTY STUDY/EVALUATION OF REMEDIAL ALTERNATIVES

A Focused Feasibility Study was completed as part of the Remedial Investigation/Feasibility Study dated July 24, 2017 and approved by DEQ.

As described in the DEQ's *Final Guidance for Feasibility Studies*, Remedial Action Objectives (RAOs) are media-specific goals for protecting human health and the environment (DEQ 1998a). RAOs provide the underlying basis for developing and evaluating remedial actions, as any remedy that is selected must achieve the site-specific RAOs.

Remedial action objectives (RAOs) identified in the FS to address dioxin in soil at the former Dip Tank Area included:

- Protection of occupational, construction, and excavation workers at the site from direct contact with shallow subsurface dioxins in soil within the approximately three-acre area. The occupational worker direct contact RBC for dioxin TEQ is 16 pg/g.
- Prevention of migration of dioxins from the Dip Tank Area soil to the adjacent Bear Creek. DEQ has established a site-specific ecological PRG for dioxin TEQ in sediments of 20 pg/g.
- Address the hot spot of dioxin contamination [as defined in Oregon Administrative Rules (OAR) 340-122-0115 (32)] to the extent feasible.

The evaluation of remedial action alternatives includes the following three criteria:

- The protectiveness of the alternative based on the standards of OAR 340-122-0040;
- The feasibility of the alternative based on the balancing factors set forth in OAR 340-122-0090(3);
- Remediation of hot spots of contamination to the extent feasible based on the criteria set forth in OAR 340-122-0090(4).

All remedial actions must be protective, provide a balance of remedy selection factors, and treat Hot Spots of contamination [as defined in Oregon Administrative Rules (OAR) 340-122-0115 (32)] to the extent feasible. Impacted soil at in the former Dip Tank Area has been evaluated for hot spots as per DEQ guidance (DEQ 1998a).

Based on the screening of soils, the only exposure scenario for soil where a potentially unacceptable risk exists is for occupational and/or construction excavation worker direct contact to dioxin, a carcinogen. One soil sample, AB-06 at 0-0.5 feet bgs, is considered a hot spot as it exceeds DEQ's occupational screening value (dioxin TEQ 16 pg/g) by a factor of over 100. This evaluation is based on total TEQ, consistent with DEQ's current policy on chemical classes. Nearby data indicate that the hot spot is localized around the former Dip Tank #1 location.

Based on the beneficial uses of groundwater, no significant adverse risks were identified. Accordingly, hot spots of groundwater are not currently present or reasonably likely in the former Dip Tank Area in the future.

Remedial alternatives were developed based on the nature and extent of contamination, likely future use of the site, technological feasibility, and engineering/logistical considerations. Considering the continued industrial site use, nature of contamination, and lack of proven in-situ treatment technologies to practically reduce dioxin concentrations in soil, remedial action alternatives identified for soil were generally limited to the physical removal of contaminated material (excavation/offsite disposal) or engineering/institutional controls (i.e., capping). The following four remedial action alternatives were identified for detailed evaluation in the FS:

Alternative RA-1 - No action

Alternative RA-2 – Storm sewer cleaning, enhancement of a protective cap over the entire Former Dip Tank Area, institutional controls, and habitat enhancement.

Alternative RA-3 – Storm sewer-cleaning, excavation of Hot Spot soil, enhancement of a protective cap over the remainder of the Former Dip Tank Area, institutional controls, and habitat enhancement.

Alternative RA-4: Storm sewer cleaning/replacement, and excavation of all soil exceeding the occupational direct contact and DEQ adjusted mammalian receptor RBCs.

Alternative RA-1. The No Action option was included for comparison purposes only following DEQ guidance. It would not include any actions to remove, treat, or contain site contaminants. It is not protective, and there is no cost associated with this action.

Alternative RA-2. This alternative consists of removal of sediment from catch basins and associated sewer lines. Additionally, the existing surface would be prepared and cleared, and a two-inch asphalt concrete overlay over the existing weathered asphalt concrete cover in the Dip Tank Area would be added. Habitat enhancement would be completed in the northwest and northeast corners of the former Dip Tank Area. This alternative also consists of engineering/institutional controls such as preparation of a Contaminated Media Management Plan (CMMP), deed restrictions, and future cap inspections and maintenance.

The estimated cost of this action is $519,000.

Alternative RA-3. This alternative consists of removal of sediment from catch basins and associated sewer lines. Additionally, a small area (approximately 1,600 square feet to a depth of two feet) would be excavated in the region of sample AB-06 where dioxin concentrations exceed the hot spot soil level of 1,600 pg/g, with excavated soil to be disposed of offsite. The existing surface outside of the hot spot soil excavation would be prepared and cleared, and a two-inch asphalt concrete overlay would be constructed over the existing weathered asphalt concrete cover in the Dip Tank Area. Habitat enhancement would be completed in the northwest and northeast corners of the former Dip Tank Area. This alternative also consists of engineering/institutional controls such as preparation of a Contaminated Media Management Plan (CMMP), deed restrictions, and future cap inspections and maintenance.

The estimated cost of this action is $648,000.

Alternative RA-4. This alternative includes excavation and offsite disposal of all soil within the former Dip Tank Area that exceeds the occupational direct contact RBC (dioxin TEQ 16 pg/g) and the DEQ-adjusted mammalian receptor RBC (dioxin TEQ 20 pg/g). The excavation is estimated to vary between one and two feet in depth over an area of approximately 2.7 acres. Excavated soil would be transported offsite for disposal. For cost estimating purposes, it was assumed that soil from the two former dip tank area locations would be segregated and managed as RCRA hazardous waste, while the remaining excavated soil would be managed as non-hazardous special waste. This alternative also consists of removal of sediment from catch basins and associated sewer lines. Following removal of contaminated soil and sediment, restoration of the excavated area elevation and grade and reconstruction of the site storm water drainage would be completed.

The estimated cost of this action is $2,720,000.

Per Oregon Administrative Rule (OAR) 340-122-090, evaluation of remedial alternative included an assessment of whether it is protective, and how it "performs" relative to the following balancing factors: effectiveness; long-term reliability; implementability; implementation risk; and reasonableness of cost.

A brief discussion of each remedial alternative is presented below, followed by an analysis of their relative merits/drawback in relation to the balancing factors. A comparison of remedial alternatives is presented in Attachment 5.

Alternative RA-1. This alternative was included as a baseline alternative in the FS consistent with DEQ guidance and the National Contingency Plan (NCP). This alternative will allow a comparison of health risks assuming no corrective measures are undertaken. Because no remedial activities would be implemented with the "No Action" alternative, long-term human risks for the site would be the same (the remedy is not protective). There is no cost associated with this alternative.

Alternative RA-2. This alternative consists of predominately capping and engineering/institutional controls. Additionally, this alternative includes sediment removal from catch basins and associated sewer lines. Alternative RA-2 prevents direct contact with shallow soil within the former Dip Tank Area and migration of dioxin contamination to the adjacent Bear Creek.

Effectiveness will be achieved for soil through capping of the existing weather asphalt concrete surface and sediment removal from the catch basins. RA-2 would be effective at limiting the migration of dioxins from the former Dip Tank Area and preventing direct contact with soil containing dioxin

concentrations greater than 16 pg/g. However, RA-2 would not be effective at reducing dioxin concentrations on site. The Dip Tank Area average dioxin concentration in shallow soil would remain approximately 100 pg/g. RA-2 would be easy to implement and institutional controls with cap/cover maintenance would be reliable in maintaining the protective cover. This alternative has good cost reasonableness compared to other alternatives.

Alternative RA-3. This alternative is similar to alternative RA-2; however, it includes the excavation of the soil hot spot around sample AB-06.

Protectiveness would be achieved through removal of hot spot soil and capping the remaining former Dip Tank Area's existing weathered asphalt concrete. The Dip Tank Area remaining average shallow soil contamination would be approximately 60 pg/g for dioxin TEQ. Similar to Alternative RA-2, RA-3 would be relatively easy to implement. Hot spot soil would be removed from the subsurface, managed on site, and transported off site. Implementation risks associated with RA-3 are relatively low. The costs for implementation are considered commensurate with the level of protectiveness provided, greater than Alternative RA-2 but well below those for RA-4.

Alternative RA-4. This alternative consists of full excavation with an approximately 2.7-acre area to address contaminated sediment (in catch basins and storm sewers) and soil. All waste must be segregated and managed to facilitate offsite disposal. A portion of the generated waste is expected to quality as a RCRA listed waste and require special handling and disposal.

Effectiveness will be achieved through removal of soil, resulting in an average shallow soil dioxin concentration of less than 16 pg/g. Alternative RA-4 is expected to be reliable over the long term at preventing migration and managing direct contact risk from dioxins; no soil exceeding applicable RBCs will remain on site. RA-4 is relatively more difficult to implement as it involves soil excavation over a larger area than RA-3, as well as reconstruction of site storm water drainage following soil removal activities. RA-4 also involves greater handling, segregation, and management of both hazardous and non-hazardous soil. RA-4 has poor cost reasonableness compared to the other alternatives.

8.0 SELECTED REMEDIAL ACTION

The selected remedial action for former Dip Tank Area of the Floragon property, Alternative RA-3, is shown on Attachment 6 and consists of the following:

- Removal of sediment from catch basins and associated storm sewer lines connected/discharging to Bear Creek.
- Excavation of an area (approximately 1,600 square feet to a depth of two feet) in the region of sample AB-06 where a hot spot level concentration of dioxins was found. This alternative involves excavation of an estimated 178 tons of soil and offsite disposal. DEQ has determined that excavated material is not a RCRA hazardous waste.
- Collection of confirmation soil samples from the excavation pit floor and walls.
- Backfill and restoration of the excavated area.
- Outside of the hot spot soil excavation, removal of vegetation and debris from the existing asphalt concrete surface.

be necessary. See Attachment 9 for a complete response to comments. The selected remedy has not been modified as the result of public comment.

10.0 FINAL DECISION OF THE REGIONAL CLEANUP MANAGER

The selected remedial action for the Dip Tank Area portion of the Floragon site is protective of present and future public health, safety, and welfare, and of the environment; is based on the balancing of the remedy selection factors; and addresses hot spots of contamination to the extent feasible and necessary. The selected remedial action, therefore, satisfies the requirements of ORS 465-315 and OAR 340-122-0040 and 0090.

10.1 DEQ Signature

Paul Seidel, NWR Cleanup Section
Department of Environmental Quality

6/15/2018
Date

- Asphalt paving over the existing asphalt concrete surface throughout the former Dip Tank Area, with the exception of areas where former building Portland cement concrete foundations are in good condition and are already protective.
- Habitat enhancement adjacent to Bear Creek in the northwest and northeast corners of the former Dip Tank Area.
- Preparation of a CMMP.
- Filing of a deed restriction prohibiting the non-conforming use of the property and detailing the extent and magnitude of the soil contamination remaining on site.
- Future inspections and maintenance to ensure protection of the asphalt concrete surface.

This remedial action provides a protective and cost-effective approach to remediating contaminated soil that can be easily implemented, and has long-term reliability through deed restrictions and future inspections and maintenance. Protectiveness is achieved by excavation of soil hot spots and installation of an asphalt cover over the existing weathered asphalt pavement to prevent direct contact and migration of contamination to the adjacent Bear Creek. The estimated cost of this action is $648,000.

Details regarding implementation of the remedial action for the former Dip Tank Area (such as storm sewer cleaning methodology, soil excavation confirmation sampling and analysis, and habitat enhancement plans) will be provided in a Remedial Design/Remedial Action (RD/RA) Work Plan. A CMMP will also be drafted and submitted for DEQ approval.

The selected remedial action is protective of human health and the environment. The remedy, if properly implemented, will achieve acceptable levels of risk, as defined by OAR 340-122-0115.

Pursuant to ORS 465.320 and OAR 340-122-0100, notice of DEQ's decision on a proposed remedial action for the site will be published in the Oregon Secretary of State's Bulletin and a newspaper of local distribution, and a 30-day comment period provided. A public meeting will also be convened during the public comment period, providing an opportunity for the Molalla community and other concerned citizens to ask questions and comment on the proposed remedy.

9.0 RESPONSE TO PUBLIC COMMENTS

Public comment on the recommended remedial action was initially held from September 1 through 30, 2017. Prior to this time, a public meeting was convened (September 18, 2017) and an opportunity provide for initial public feedback.

During the public comment period, two parties – Bear Creek Recovery (BCR) and the Pudding River Watershed Council (PRWC), provided comments on the proposed remedy. Comments are included as Attachments 7 and 8 to this document. DEQ responses to comments are included as Attachment 9. Concerns on the part of BCR and PRWC centered, in part, on the need for a comprehensive approach to management/restoration of the Bear Creek watershed. To the extent allowed under the current regulatory framework, DEQ has done so in selecting the site remedy. A second concern on the part of BCR is the reliability of capping in the Dip Tank Area. While it may not be considered esthetically pleasing, capping of (modest) residual soil contamination in the area is protective and reliable if maintained. BCR is correct that long-term reliability is based on ongoing cap inspection and maintenance, to be documented in a forthcoming easement and equitable servitude for the site. Long-term monitoring will

APPENDIX A
ADMINISTRATIVE RECORD INDEX

Bear Creek Recovery. 2017 (September 29). Comments on proposed remedial action for former Dip Tank Area.

DEQ. 1998b (April 23). *Guidance for Identification of Hot Spots.* Land Quality Division. Oregon Department of Environmental Quality

DEQ. 2010 (October). *Human Health Risk Assessment Guidance.* Oregon Department of Environmental Quality.

DEQ. 2013 (March). *Default Background Concentrations for Metals in Soil.* Oregon Department of Environmental Quality.

DEQ. 2015a (November 1). *Oregon DEQ Table of Risk-Based Concentrations.* Oregon Department of Environmental Quality.

DEQ. 2015b (February 18; Received May 1). *Floragon Risk Assessment: Site-Specific Bear Creek Ecological Risk Bioaccumulation Model Results, Floragon Property, Molalla, Oregon.* Oregon Department of Environmental Quality Risk Assessment Email - Draft.

DEQ. 2015c (April 20). *Site-Specific Bear Creek Risk Evaluation.* DEQ Review. Email. Oregon Department of Environmental Quality.

DEQ. 2015d (September 3). *Bear Creek – Floragon. Skewed residual 90UCL is adequate.* Email. Oregon Department of Environmental Quality.

DEQ. 2015e (October 7). *Final Phase 3 RI Work Plan (Floragon, Molalla).* DEQ approval. Email. Oregon Department of Environmental Quality.

DEQ. 2015f (November 13). *August 2015 Sampling Results, South Parcel, Avison Lumber Company, Mill #1.* Letter. Oregon Department of Environmental Quality.

DEQ. 2015g (December 9). *Remediation Goals – South Parcel; Avison Lumber Company, Mill #1.* Letter. Oregon Department of Environmental Quality. PA. 1988. *Guidance for Conducting Remedial Investigations and Feasibility Studies under CERCLA.* Office of Emergency and Remedial Response, Washington, D.C. Interim Final. OSWER Directive 9355.3-01.

DEQ. 2017 (September 29). Staff Report, Proposed Remedial Action for Former Dip Tank Area. Report. Oregon Department of Environmental Quality.

PNG. 2011 (June 30). *Phase 1 Remedial Investigation Report.* PNG Environmental, Inc.

PNG. 2013 (June 18). Remedial Investigation Status Report, Floragon Property. PNG Environmental, Inc.

PNG. 2017. *Remedial Investigation Report*. PNG Environmental, Inc.

Pudding Creek Watershed Council. 2017 (September 29). Comments on proposed remedial action for former Dip Tank Area.

SWCA. 2015 (June 10). Floragon Forest Products Site Waters Delineation Report (Reach 3). SWCA Environmental Consultants.

SWCA. 2016 (March 30). *Floragon Forest Products Site Wetland and Waters* Delineation Report. SWCA Environmental Consultants.

Urban et al. 2014. A Review of Background Concentrations in Urban/Suburban and *Rural Soils across the United States: Implications for Site Assessments and Establishment of Soil Cleanup Levels.* Science of the Total Environment. January 2014.

APPENDIX B
LIST OF ATTACHMENTS

Attachment 1: Site Vicinity Map

Attachment 2: Overview Map – Aerial 2012

Attachment 3: Soil Dioxin TEQ in Former Dip Tank Area Soils – 0.5 Feet Depth and 1.5 Feet Depth Summary Figures

Attachment 4: Former Dip Tank Area Soil Analytical Results Summary Tables

Attachment 5: Detailed Evaluation of Alternatives Summary Table

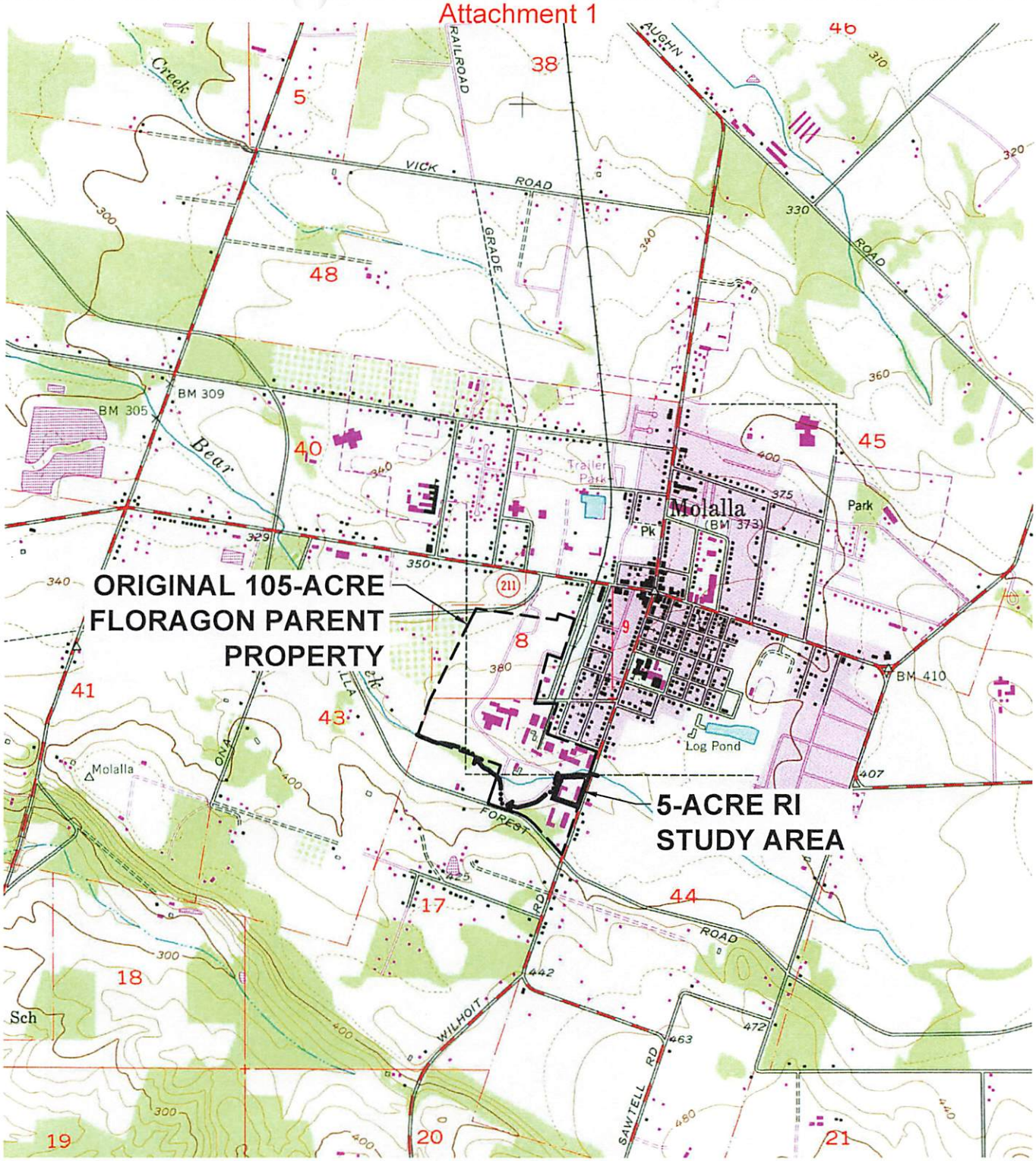
Attachment 6: Selected Alternative RA-3 Summary Figure

Attachment 7: Bear Creek Recovery Comments

Attachment 8: Pudding Creek Watershed Council Comments

Attachment 9: DEQ Response to Comments

Attachment 1

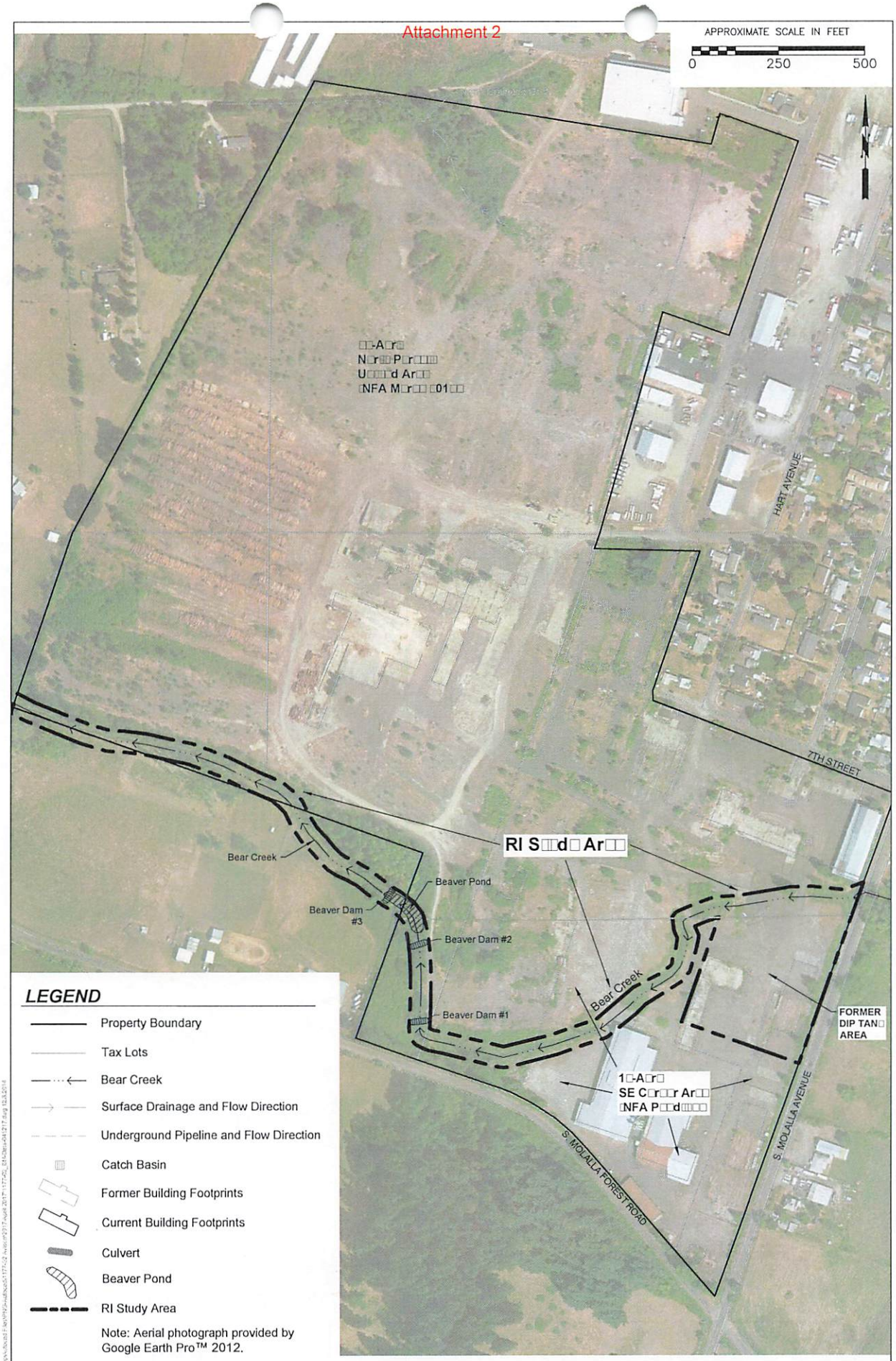


NOTE: USGS, MOLALLA QUADRANGLE
OREGON - CLACKAMAS CO.
7.5 MINUTE SERIES (TOPOGRAPHIC)

PNG ENVIRONMENTAL, INC. 6665 SW Hampton St., Ste. 101 TEL (503) 620-2387 Tigard, OR 97223 FAX (503) 620-2977	DATE: 10-27-16 FILE NAME: 1177-01 DRAWN BY: JJT APPROVED BY: PE	FLORAGON PROPERTY 7TH & HART STREET MOLALLA, OREGON	SITE VICINITY MAP	Project No. 1177-01 Figure No. 1

C:\Users\Josh\Desktop\Autocad Files\PNG-Autocad\1177-01 Avison\2016\Mar 2016\1177-01_VM-071416.dwg 2.17.2014

Attachment 2



LEGEND

- Property Boundary
- Tax Lots
- Bear Creek
- Surface Drainage and Flow Direction
- Underground Pipeline and Flow Direction
- Catch Basin
- Former Building Footprints
- Current Building Footprints
- Culvert
- Beaver Pond
- RI Study Area

Note: Aerial photograph provided by Google Earth Pro™ 2012.

PNG ENVIRONMENTAL, INC.
6665 SW Hampton St., Ste. 101
Tigard, OR 97223
TEL (503) 620-2387
FAX (503) 620-2977

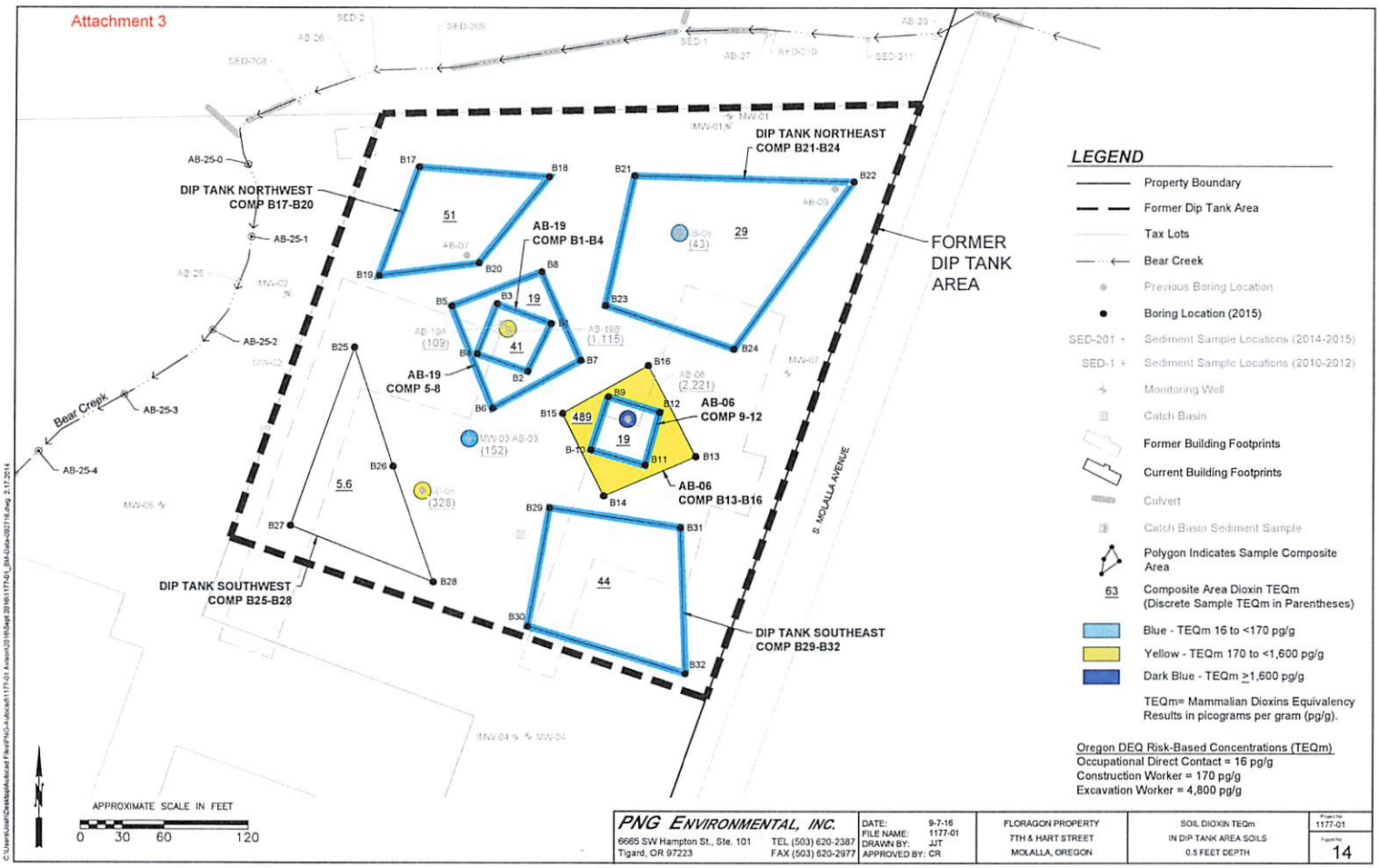
DATE:	5-18-17
FILE NAME:	1177-02
DRAWN BY:	JJT
APPROVED BY:	SV

FLORAGON PROPERTY
7TH & HART STREET
MOLALLA, OREGON

OVERVIEW MAP
AERIAL 2012

Project No. 1177-02
Figure No. 2

Attachment 3



LEGEND

- Property Boundary
- Former Dip Tank Area
- Tax Lots
- Bear Creek
- Previous Boring Location
- Boring Location (2015)
- SED-201 Sediment Sample Locations (2014-2015)
- SED-1 Sediment Sample Locations (2010-2012)
- Monitoring Well
- Catch Basin
- Former Building Footprints
- Current Building Footprints
- Culvert
- Catch Basin Sediment Sample
- Polygon Indicates Sample Composite Area
- 63 Composite Area Dioxin TEQm (Discrete Sample TEQm in Parentheses)
- Blue - TEQm 16 to <170 pg/g
- Yellow - TEQm 170 to <1,600 pg/g
- Dark Blue - TEQm ≥1,600 pg/g

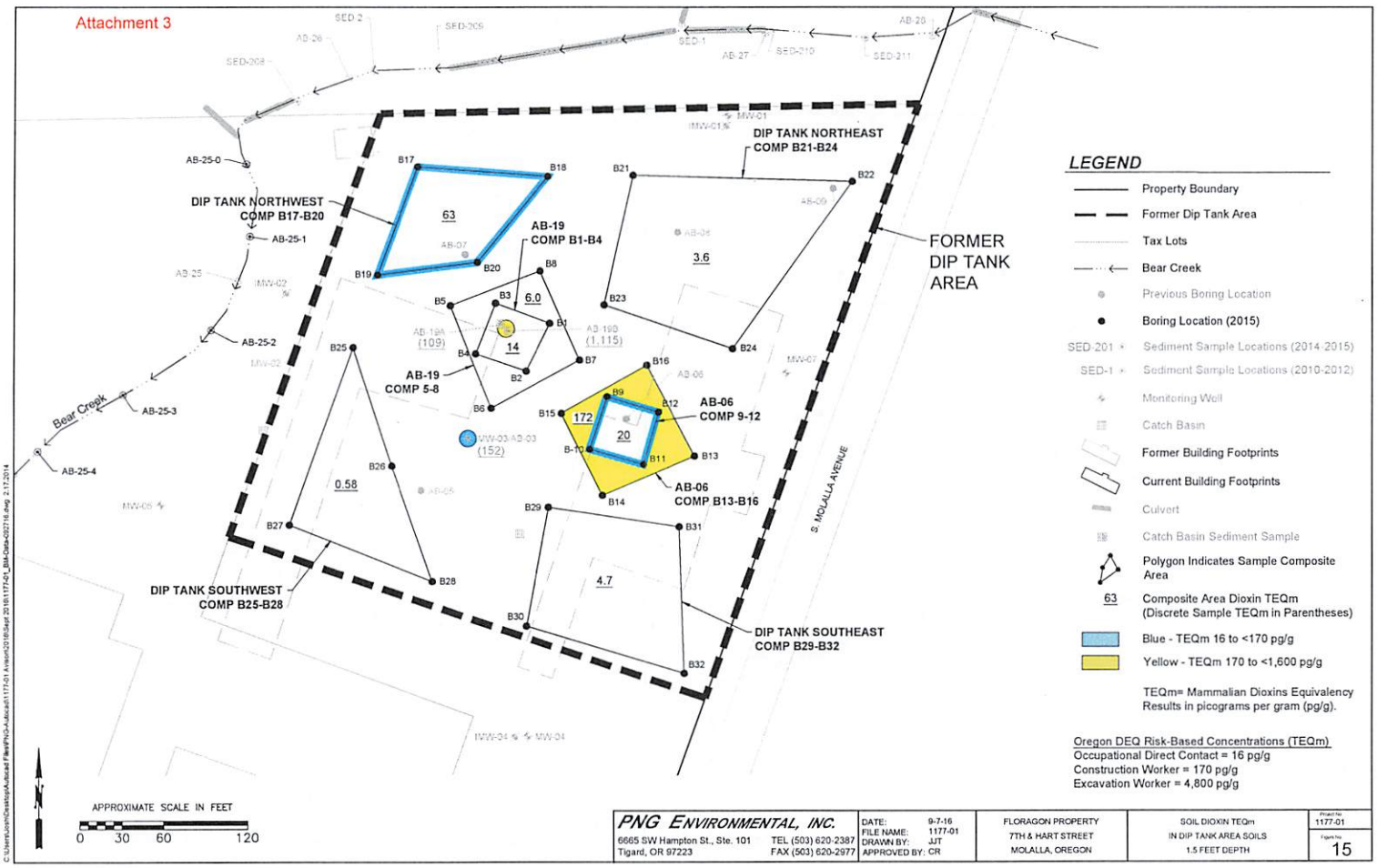
TEQm= Mammalian Dioxins Equivalency Results in picograms per gram (pg/g).

Oregon DEQ Risk-Based Concentrations (TEQm)
Occupational Direct Contact = 16 pg/g
Construction Worker = 170 pg/g
Excavation Worker = 4,800 pg/g

PNG ENVIRONMENTAL, INC. 6665 SW Hampton St., Ste. 101 Tigard, OR 97223 TEL (503) 620-2387 FAX (503) 620-2977	DATE: 9-7-16 FILE NAME: 1177-01 DRAWN BY: JJT APPROVED BY: CR	FLORAGON PROPERTY 7TH & HART STREET MOLALLA, OREGON	SOIL DIOXIN TEQm IN DIP TANK AREA SOILS 0.5 FEET DEPTH	Project No 1177-01 Figure No 14

C:\Users\Josh\Desktop\Autocad Files\PNG-Autocad\1177-01 Arsenic\2016\Sept 2016\1177-01_BM-Data-092716.dwg, 2.17.2014

Attachment 3



PNG ENVIRONMENTAL, INC. 6665 SW Hampton St., Ste. 101 Tigard, OR 97223 TEL (503) 620-2387 FAX (503) 620-2977	DATE: 9-7-16 FILE NAME: 1177-01 DRAWN BY: JJT APPROVED BY: CR	FLORAGON PROPERTY 7TH & HART STREET MOLALLA, OREGON	SOIL DIOXIN TEQm IN DIP TANK AREA SOILS 1.5 FEET DEPTH	Project No 1177-01 Figure No 15	

Attachment 4

Table 2-1

Dip Tank Area Soil Analytical Results Summary - Dioxin Equivalent Concentrations - Mammalian TEQ (pg/g)

Floragon Property

Molalla, Oregon

Sample ID	Depth (feet)	Sample Date	2,3,7,8-TCDD TEQ with EDLs	2,3,7,8-TCDD TEQ with 1/2 EDLs	2,3,7,8-TCDD TEQ without non-detects
AB-03/1	1	02/02/2010	152	152	152
AB-05/0-6	0.5	02/03/2010	328	328	328
AB-06/0-6	0.5	02/03/2010	2,221	2,221	2,221
AB-08/0-6	0.5	02/03/2010	43	43	43
B1-4 (0.5) COMP	0.5	10/14/2015	41	41	41
B1-4 (1.5) COMP	1.5	10/14/2015	14	14	14
B5-8 (0.5) COMP	0.5	10/14/2015	19	19	19
B5-8 (1.5) COMP	1.5	10/14/2015	6.0	6.0	6.0
B9-12 (0.5) COMP	0.5	10/13/2015	19	19	19
B9-12 (1.5) COMP	1.5	10/13/2015	20	19	19
B13-16 (0.5) COMP	0.5	10/13/2015	489	489	489
B13-16 (1.5) COMP	1.5	10/13/2015	172	171	171
B17-20 (0.5) COMP	0.5	10/14/2015	51	51	51
B17-20 (1.5) COMP	1.5	10/14/2015	63	63	63
B21-24 (0.5) COMP	0.5	10/14/2015	29	29	29
B21-24 (1.5) COMP	1.5	10/14/2015	3.6	3.5	3.5
B25-28 (0.5) COMP	0.5	10/14/2015	5.6	5.5	5.5
B25-28 (1.5) COMP	1.5	10/14/2015	0.58	0.44	0.29
B29-32 (0.5) COMP	0.5	10/14/2015	44	44	44
B29-32 (1.5) COMP	1.5	10/14/2015	4.7	4.6	4.5
Catch Basin Samples					
AB-19A**	-	02/02/2010	109	109	109
AB-19B**	-	02/02/2010	1,115	1,115	1,115

Notes:

** Catch Basin Sample

pg/g = picograms per gram

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-p-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TCDD = Tetrachlorinated Dibenzo-p-Dioxin(s)

EDL = Estimated Detection Limit

Attachment 4

Table 2-2
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample AB-03/1', February 2010						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	1.65 J	0.00000165 J	1.7E-06 J	1	1.65 J	1.7E-06 J
1,2,3,7,8-PeCDD	6.37 J	0.00000637 J	6.4E-06 J	1	6.4 J	6.4E-06 J
1,2,3,4,7,8-HxCDD	13.2	0.0000132	1.3E-05	0.1	1.32	1.3E-06
1,2,3,6,7,8-HxCDD	264	0.000264	2.6E-04	0.1	26.4	2.6E-05
1,2,3,7,8,9-HxCDD	67.9	0.0000679	6.8E-05	0.1	6.79	6.8E-06
1,2,3,4,6,7,8-HpCDD	7,980	0.00798	8.0E-03	0.01	79.8	8.0E-05
OCDD	46,800	0.0468	4.7E-02	0.0003	14.04	1.4E-05
2,3,7,8-TCDF	7.76	0.00000776	7.8E-06	0.1	0.78	7.8E-07
1,2,3,7,8-PeCDF	6.44 J	0.00000644 J	6.4E-06 J	0.03	0.193 J	1.9E-07 J
2,3,4,7,8-PeCDF	8.36 J	0.00000836 J	8.4E-06 J	0.3	2.5 J	2.5E-06 J
1,2,3,4,7,8-HxCDF	18.3	0.0000183	1.8E-05	0.1	1.83	1.8E-06
1,2,3,6,7,8-HxCDF	20.3	0.0000203	2.0E-05	0.1	2.03	2.0E-06
2,3,4,6,7,8-HxCDF	21.8	0.0000218	2.2E-05	0.1	2.2	2.2E-06
1,2,3,7,8,9-HxCDF	1.24 J	0.00000124 J	1.2E-06 J	0.1	0.12 J	1.2E-07 J
1,2,3,4,6,7,8-HpCDF	565	0.000565	5.7E-04	0.01	5.7	5.7E-06
1,2,3,4,7,8,9-HpCDF	17.3	0.0000173	1.7E-05	0.01	0.173	1.7E-07
OCDF	320	0.00032	3.2E-04	0.0003	0.096	9.6E-08
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					152	1.5E-04
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					152	1.5E-04
2,3,7,8-TCDD TEQ (without non-detects)					152	1.5E-04

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Attachment 4

Table 2-3
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample AB-05/0-6", February 2010						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	1.52 J	0.00000152 J	1.5E-06 J	1	1.52 J	1.5E-06 J
1,2,3,7,8-PeCDD	33.6	0.0000336	3.4E-05	1	33.60	3.4E-05
1,2,3,4,7,8-HxCDD	33.8	0.0000338	3.4E-05	0.1	3.380	3.4E-06
1,2,3,6,7,8-HxCDD	991	0.000991	9.9E-04	0.1	99.10	9.9E-05
1,2,3,7,8,9-HxCDD	241	0.000241	2.4E-04	0.1	24.10	2.4E-05
1,2,3,4,6,7,8-HpCDD	7,470	0.00747	7.5E-03	0.01	74.70	7.5E-05
OCDD	8,720	0.00872	8.7E-03	0.0003	2.616	2.6E-06
2,3,7,8-TCDF	20.2	0.0000202	2.0E-05	0.1	2.020	2.0E-06
1,2,3,7,8-PeCDF	18.3	0.0000183	1.8E-05	0.03	0.549	5.5E-07
2,3,4,7,8-PeCDF	17.1	0.0000171	1.7E-05	0.3	5.130	5.1E-06
1,2,3,4,7,8-HxCDF	103	0.000103	1.0E-04	0.1	10.300	1.0E-05
1,2,3,6,7,8-HxCDF	161	0.000161	1.6E-04	0.1	16.100	1.6E-05
2,3,4,6,7,8-HxCDF	122	0.000122	1.2E-04	0.1	12.200	1.2E-05
1,2,3,7,8,9-HxCDF	7.29 J	0.00000729 J	7.3E-06 J	0.1	0.729 J	7.3E-07 J
1,2,3,4,6,7,8-HpCDF	3,960	0.00396	4.0E-03	0.01	39.60	4.0E-05
1,2,3,4,7,8,9-HpCDF	133	0.000133	1.3E-04	0.01	1.3300	1.3E-06
OCDF	1,870	0.00187	1.9E-03	0.0003	0.5610	5.6E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					328	3.3E-04
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					328	3.3E-04
2,3,7,8-TCDD TEQ (without non-detects)					328	3.3E-04

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

E = Estimated concentration. Reported value is above the instrument calibration range.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Attachment 4

Table 2-4
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample AB-06/0-6", February 2010						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	24.3 J	0.0000243 J	2.4E-05 J	1	24.30 J	2.4E-05 J
1,2,3,7,8-PeCDD	294	0.000294	2.9E-04	1	294.0	2.9E-04
1,2,3,4,7,8-HxCDD	157 J	0.000157 J	1.6E-04 J	0.1	15.70 J	1.6E-05 J
1,2,3,6,7,8-HxCDD	5,000	0.005	5.0E-03	0.1	500.0	5.0E-04
1,2,3,7,8,9-HxCDD	680	0.00068	6.8E-04	0.1	68.00	6.8E-05
1,2,3,4,6,7,8-HpCDD	85,000	0.085	8.5E-02	0.01	850.0	8.5E-04
OCDD	162,000	0.162	1.6E-01	0.0003	48.60	4.9E-05
2,3,7,8-TCDF	346	0.000346	3.5E-04	0.1	34.60	3.5E-05
1,2,3,7,8-PeCDF	106 J	0.000106 J	1.1E-04 J	0.03	3.180 J	3.2E-06 J
2,3,4,7,8-PeCDF	188 J	0.000188 J	1.9E-04 J	0.3	56.4 J	5.6E-05 J
1,2,3,4,7,8-HxCDF	640	0.00064	6.4E-04	0.1	64.00	6.4E-05
1,2,3,6,7,8-HxCDF	333	0.000333	3.3E-04	0.1	33.30	3.3E-05
2,3,4,6,7,8-HxCDF	274	0.000274	2.7E-04	0.1	27.4	2.7E-05
1,2,3,7,8,9-HxCDF	13.6 J	0.0000136 J	1.4E-05 J	0.1	1.36 J	1.4E-06 J
1,2,3,4,6,7,8-HpCDF	14,900	0.0149	1.5E-02	0.01	149.0	1.5E-04
1,2,3,4,7,8,9-HpCDF	2,640	0.00264	2.6E-03	0.01	26.400	2.6E-05
OCDF	82,000	0.082	8.2E-02	0.0003	24.600	2.5E-05
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					2,221	2.2E-03
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					2,221	2.2E-03
2,3,7,8-TCDD TEQ (without non-detects)					2,221	2.2E-03

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Attachment 4

Table 2-5
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample AB-08/0-6", February 2010						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	1.88 J	0.00000188 J	1.9E-06 J	1	1.88 J	1.9E-06 J
1,2,3,7,8-PeCDD	13.3	0.0000133	1.3E-05	1	13.3	1.3E-05
1,2,3,4,7,8-HxCDD	6.85 J	0.00000685 J	6.9E-06 J	0.1	0.69 J	6.9E-07 J
1,2,3,6,7,8-HxCDD	79.7	0.0000797	8.0E-05	0.1	8.0	8.0E-06
1,2,3,7,8,9-HxCDD	22.3	0.0000223	2.2E-05	0.1	2.23	2.2E-06
1,2,3,4,6,7,8-HpCDD	368	0.000368	3.7E-04	0.01	3.7	3.7E-06
OCDD	988	0.000988	9.9E-04	0.0003	0.30	3.0E-07
2,3,7,8-TCDF	22.6	0.0000226	2.3E-05	0.1	2.26	2.3E-06
1,2,3,7,8-PeCDF	12.2	0.0000122	1.2E-05	0.03	0.366	3.7E-07
2,3,4,7,8-PeCDF	9.65 J	0.00000965 J	9.7E-06 J	0.3	2.9 J	2.9E-06 J
1,2,3,4,7,8-HxCDF	11.9	0.0000119	1.2E-05	0.1	1.19	1.2E-06
1,2,3,6,7,8-HxCDF	20.5	0.0000205	2.1E-05	0.1	2.05	2.1E-06
2,3,4,6,7,8-HxCDF	11.2	0.0000112	1.1E-05	0.1	1.1	1.1E-06
1,2,3,7,8,9-HxCDF	1.52 J	0.00000152 J	1.5E-06 J	0.1	0.15 J	1.5E-07 J
1,2,3,4,6,7,8-HpCDF	309	0.000309	3.1E-04	0.01	3.1	3.1E-06
1,2,3,4,7,8,9-HpCDF	13.4	0.0000134	1.3E-05	0.01	0.134	1.3E-07
OCDF	181	0.000181	1.8E-04	0.0003	0.054	5.4E-08
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					43	4.3E-05
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					43	4.3E-05
2,3,7,8-TCDD TEQ (without non-detects)					43	4.3E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Attachment 4

Table 2-6
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample B1-4 (0.5) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.186	0.000000186	1.9E-07	1	0.19	1.9E-07
1,2,3,7,8-PeCDD	1.54	0.00000154	1.5E-06	1	1.5	1.5E-06
1,2,3,4,7,8-HxCDD	90.9	0.0000909	9.1E-05	0.1	9.09	9.1E-06
1,2,3,6,7,8-HxCDD	87.6	0.0000876	8.8E-05	0.1	8.8	8.8E-06
1,2,3,7,8,9-HxCDD	10.1	0.0000101	1.0E-05	0.1	1.01	1.0E-06
1,2,3,4,6,7,8-HpCDD	791	0.000791	7.9E-04	0.01	7.9	7.9E-06
OCDD	3,120	0.00312	3.1E-03	0.0003	0.94	9.4E-07
2,3,7,8-TCDF	0.972	0.000000972	9.7E-07	0.1	0.10	9.7E-08
1,2,3,7,8-PeCDF	1.11	0.00000111	1.1E-06	0.03	0.033	3.3E-08
2,3,4,7,8-PeCDF	1.01	0.00000101	1.0E-06	0.3	0.3	3.0E-07
1,2,3,4,7,8-HxCDF	18.5	0.0000185	1.9E-05	0.1	1.85	1.9E-06
1,2,3,6,7,8-HxCDF	12.4	0.0000124	1.2E-05	0.1	1.24	1.2E-06
2,3,4,6,7,8-HxCDF	7.68	0.00000768	7.7E-06	0.1	0.8	7.7E-07
1,2,3,7,8,9-HxCDF	0.672	0.000000672	6.7E-07	0.1	0.07	6.7E-08
1,2,3,4,6,7,8-HpCDF	673	0.000673	6.7E-04	0.01	6.7	6.7E-06
1,2,3,4,7,8,9-HpCDF	22.1	0.0000221	2.2E-05	0.01	0.221	2.2E-07
OCDF	882	0.000882	8.8E-04	0.0003	0.265	2.6E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					41	4.1E-05
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					41	4.1E-05
2,3,7,8-TCDD TEQ (without non-detects)					41	4.1E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Attachment 4

Table 2-7
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample B1-4 (1.5) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.28	0.00000028	2.8E-07	1	0.28	2.8E-07
1,2,3,7,8-PeCDD	1.46	0.00000146	1.5E-06	1	1.5	1.5E-06
1,2,3,4,7,8-HxCDD	1.78	0.00000178	1.8E-06	0.1	0.18	1.8E-07
1,2,3,6,7,8-HxCDD	47.7	0.0000477	4.8E-05	0.1	5	4.8E-06
1,2,3,7,8,9-HxCDD	5.71	0.00000571	5.7E-06	0.1	0.6	5.7E-07
1,2,3,4,6,7,8-HpCDD	259	0.000259	2.6E-04	0.01	3	2.6E-06
OCDD	1,060	0.00106	1.1E-03	0.0003	0.3	3.2E-07
2,3,7,8-TCDF	2.75	0.00000275	2.8E-06	0.1	0.28	2.8E-07
1,2,3,7,8-PeCDF	0.895	0.000000895	9.0E-07	0.03	0.03	2.7E-08
2,3,4,7,8-PeCDF	1.14	0.00000114	1.1E-06	0.3	0.3	3.4E-07
1,2,3,4,7,8-HxCDF	3.96	0.00000396	4.0E-06	0.1	0.4	4.0E-07
1,2,3,6,7,8-HxCDF	4.64	0.00000464	4.6E-06	0.1	0.5	4.6E-07
2,3,4,6,7,8-HxCDF	3.29	0.00000329	3.3E-06	0.1	0.3	3.3E-07
1,2,3,7,8,9-HxCDF	0.099 U	0.000000099 U	9.9E-08 U	0.1	0.01 U	9.9E-09 U
1,2,3,4,6,7,8-HpCDF	222	0.000222	2.2E-04	0.01	2.2	2.2E-06
1,2,3,4,7,8,9-HpCDF	7.14	0.00000714	7.1E-06	0.01	0.07	7.1E-08
OCDF	335	0.000335	3.4E-04	0.0003	0.101	1.0E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					14	1.4E-05
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					14	1.4E-05
2,3,7,8-TCDD TEQ (without non-detects)					14	1.4E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Attachment 4

Table 2-8
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample B5-8 (0.5) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.187 U	0.000000187 U	1.9E-07 U	1	0.19 U	1.9E-07 U
1,2,3,7,8-PeCDD	0.943	0.000000943	9.4E-07	1	0.9	9.4E-07
1,2,3,4,7,8-HxCDD	1.7	0.0000017	1.7E-06	0.1	0.2	1.7E-07
1,2,3,6,7,8-HxCDD	46.9	0.0000469	4.7E-05	0.1	5	4.7E-06
1,2,3,7,8,9-HxCDD	7.82	0.00000782	7.8E-06	0.1	0.8	7.8E-07
1,2,3,4,6,7,8-HpCDD	445	0.000445	4.5E-04	0.01	4	4.5E-06
OCDD	3,630	0.00363	3.6E-03	0.0003	1.1	1.1E-06
2,3,7,8-TCDF	0.755	0.000000755	7.6E-07	0.1	0.08	7.6E-08
1,2,3,7,8-PeCDF	0.782	0.000000782	7.8E-07	0.03	0.02	2.3E-08
2,3,4,7,8-PeCDF	0.939	0.000000939	9.4E-07	0.3	0.3	2.8E-07
1,2,3,4,7,8-HxCDF	6.58	0.00000658	6.6E-06	0.1	0.7	6.6E-07
1,2,3,6,7,8-HxCDF	5.16	0.00000516	5.2E-06	0.1	0.5	5.2E-07
2,3,4,6,7,8-HxCDF	4.43	0.00000443	4.4E-06	0.1	0.4	4.4E-07
1,2,3,7,8,9-HxCDF	0.296	0.000000296	3.0E-07	0.1	0.0	3.0E-08
1,2,3,4,6,7,8-HpCDF	418	0.000418	4.2E-04	0.01	4.2	4.2E-06
1,2,3,4,7,8,9-HpCDF	7.3	0.0000073	7.3E-06	0.01	0.07	7.3E-08
OCDF	328	0.000328	3.3E-04	0.0003	0.098	9.8E-08
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					19	1.9E-05
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					19	1.9E-05
2,3,7,8-TCDD TEQ (without non-detects)					19	1.9E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Attachment 4

Table 2-9

Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ

Floragon Property

Molalla, Oregon

Sample B5-8 (1.5) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.426	0.000000426	4.3E-07	1	0.43	4.3E-07
1,2,3,7,8-PeCDD	0.984	0.000000984	9.8E-07	1	1.0	9.8E-07
1,2,3,4,7,8-HxCDD	1.37	0.00000137	1.4E-06	0.1	0.14	1.4E-07
1,2,3,6,7,8-HxCDD	12.4	0.0000124	1.2E-05	0.1	1	1.2E-06
1,2,3,7,8,9-HxCDD	2.61	0.00000261	2.6E-06	0.1	0.3	2.6E-07
1,2,3,4,6,7,8-HpCDD	108	0.000108	1.1E-04	0.01	1	1.1E-06
OCDD	971	0.000971	9.7E-04	0.0003	0.3	2.9E-07
2,3,7,8-TCDF	0.454	0.000000454	4.5E-07	0.1	0.05	4.5E-08
1,2,3,7,8-PeCDF	0.248	0.000000248	2.5E-07	0.03	0.01	7.4E-09
2,3,4,7,8-PeCDF	0.268	0.000000268	2.7E-07	0.3	0.1	8.0E-08
1,2,3,4,7,8-HxCDF	2.45	0.00000245	2.5E-06	0.1	0.2	2.5E-07
1,2,3,6,7,8-HxCDF	1.69	0.00000169	1.7E-06	0.1	0.2	1.7E-07
2,3,4,6,7,8-HxCDF	1.07	0.00000107	1.1E-06	0.1	0.1	1.1E-07
1,2,3,7,8,9-HxCDF	0.117 U	0.000000117 U	1.2E-07 U	0.1	0.01 U	1.2E-08 U
1,2,3,4,6,7,8-HpCDF	83.3	0.0000833	8.3E-05	0.01	0.8	8.3E-07
1,2,3,4,7,8,9-HpCDF	2.94	0.00000294	2.9E-06	0.01	0.03	2.9E-08
OCDF	133	0.000133	1.3E-04	0.0003	0.040	4.0E-08
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					6.0	6.0E-06
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					6.0	6.0E-06
2,3,7,8-TCDD TEQ (without non-detects)					6.0	6.0E-06

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Attachment 4

Table 2-10
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample B9-12 (0.5) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.101 U	0.000000101 U	1.0E-07 U	1	0.10 U	1.0E-07 U
1,2,3,7,8-PeCDD	0.925	0.000000925	9.3E-07	1	0.93	9.3E-07
1,2,3,4,7,8-HxCDD	1.12	0.00000112	1.1E-06	0.1	0.11	1.1E-07
1,2,3,6,7,8-HxCDD	77.1	0.0000771	7.7E-05	0.1	7.7	7.7E-06
1,2,3,7,8,9-HxCDD	24.5	0.0000245	2.5E-05	0.1	2.45	2.5E-06
1,2,3,4,6,7,8-HpCDD	475	0.000475	4.8E-04	0.01	4.8	4.8E-06
OCDD	2,170	0.00217	2.2E-03	0.0003	0.65	6.5E-07
2,3,7,8-TCDF	0.354	0.000000354	3.5E-07	0.1	0.04	3.5E-08
1,2,3,7,8-PeCDF	0.449	0.000000449	4.5E-07	0.03	0.013	1.3E-08
2,3,4,7,8-PeCDF	0.445	0.000000445	4.5E-07	0.3	0.13	1.3E-07
1,2,3,4,7,8-HxCDF	2.64	0.00000264	2.6E-06	0.1	0.26	2.6E-07
1,2,3,6,7,8-HxCDF	2.85	0.00000285	2.9E-06	0.1	0.29	2.9E-07
2,3,4,6,7,8-HxCDF	2.41	0.00000241	2.4E-06	0.1	0.24	2.4E-07
1,2,3,7,8,9-HxCDF	0.189	0.000000189	1.9E-07	0.1	0.02	1.9E-08
1,2,3,4,6,7,8-HpCDF	157	0.000157	1.6E-04	0.01	1.57	1.6E-06
1,2,3,4,7,8,9-HpCDF	4	0.000004	4.0E-06	0.01	0.040	4.0E-08
OCDF	135	0.000135	1.4E-04	0.0003	0.041	4.1E-08
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					19	1.9E-05
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					19	1.9E-05
2,3,7,8-TCDD TEQ (without non-detects)					19	1.9E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Attachment 4

Table 2-11
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample B9-12 (1.5) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.0834 U	8.34E-08 U	8.3E-08 U	1	0.08 U	8.3E-08 U
1,2,3,7,8-PeCDD	0.602	0.000000602	6.0E-07	1	0.60	6.0E-07
1,2,3,4,7,8-HxCDD	1.8	0.0000018	1.8E-06	0.1	0.18	1.8E-07
1,2,3,6,7,8-HxCDD	85.5	0.0000855	8.6E-05	0.1	8.6	8.6E-06
1,2,3,7,8,9-HxCDD	34.5	0.0000345	3.5E-05	0.1	3.45	3.5E-06
1,2,3,4,6,7,8-HpCDD	476	0.000476	4.8E-04	0.01	4.8	4.8E-06
OCDD	2,640	0.00264	2.6E-03	0.0003	0.79	7.9E-07
2,3,7,8-TCDF	0.182	0.000000182	1.8E-07	0.1	0.02	1.8E-08
1,2,3,7,8-PeCDF	0.227	0.000000227	2.3E-07	0.03	0.007	6.8E-09
2,3,4,7,8-PeCDF	0.182 U	0.000000182 U	1.8E-07 U	0.3	0.05 U	5.5E-08 U
1,2,3,4,7,8-HxCDF	1.16	0.00000116	1.2E-06	0.1	0.12	1.2E-07
1,2,3,6,7,8-HxCDF	1.35	0.00000135	1.4E-06	0.1	0.14	1.4E-07
2,3,4,6,7,8-HxCDF	1.16	0.00000116	1.2E-06	0.1	0.12	1.2E-07
1,2,3,7,8,9-HxCDF	0.116	0.000000116	1.2E-07	0.1	0.01	1.2E-08
1,2,3,4,6,7,8-HpCDF	59.3	0.0000593	5.9E-05	0.01	0.59	5.9E-07
1,2,3,4,7,8,9-HpCDF	1.78	0.00000178	1.8E-06	0.01	0.018	1.8E-08
OCDF	69.5	0.0000695	7.0E-05	0.0003	0.021	2.1E-08
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					20	2.0E-05
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					19	4.2E-02
2,3,7,8-TCDD TEQ (without non-detects)					19	1.9E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Attachment 4

Table 2-12
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample B13-16 (0.5) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	2.36	0.00000236	2.4E-06	1	2.36	2.4E-06
1,2,3,7,8-PeCDD	58.3	0.0000583	5.8E-05	1	58.30	5.8E-05
1,2,3,4,7,8-HxCDD	84.7	0.0000847	8.5E-05	0.1	8.47	8.5E-06
1,2,3,6,7,8-HxCDD	1,530	0.00153	1.5E-03	0.1	153.0	1.5E-04
1,2,3,7,8,9-HxCDD	307	0.000307	3.1E-04	0.1	30.70	3.1E-05
1,2,3,4,6,7,8-HpCDD	10,400	0.0104	1.0E-02	0.01	104.0	1.0E-04
OCDD	64,100	0.0641	6.4E-02	0.0003	19.23	1.9E-05
2,3,7,8-TCDF	64.7	0.0000647	6.5E-05	0.1	6.47	6.5E-06
1,2,3,7,8-PeCDF	58.8	0.0000588	5.9E-05	0.03	1.764	1.8E-06
2,3,4,7,8-PeCDF	60.1	0.0000601	6.0E-05	0.3	18.03	1.8E-05
1,2,3,4,7,8-HxCDF	188	0.000188	1.9E-04	0.1	18.80	1.9E-05
1,2,3,6,7,8-HxCDF	201	0.000201	2.0E-04	0.1	20.10	2.0E-05
2,3,4,6,7,8-HxCDF	135	0.000135	1.4E-04	0.1	13.50	1.4E-05
1,2,3,7,8,9-HxCDF	14.9	0.0000149	1.5E-05	0.1	1.49	1.5E-06
1,2,3,4,6,7,8-HpCDF	3,030	0.00303	3.0E-03	0.01	30.30	3.0E-05
1,2,3,4,7,8,9-HpCDF	143	0.000143	1.4E-04	0.01	1.430	1.4E-06
OCDF	2,340	0.00234	2.3E-03	0.0003	0.702	7.0E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					489	4.9E-04
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					489	4.9E-04
2,3,7,8-TCDD TEQ (without non-detects)					489	4.9E-04

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Attachment 4

Table 2-13
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample B13-16 (1.5) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.834	0.000000834	8.3E-07	1	0.83	8.3E-07
1,2,3,7,8-PeCDD	11.7	0.0000117	1.2E-05	1	11.70	1.2E-05
1,2,3,4,7,8-HxCDD	22.1	0.0000221	2.2E-05	0.1	2.21	2.2E-06
1,2,3,6,7,8-HxCDD	542	0.000542	5.4E-04	0.1	54.2	5.4E-05
1,2,3,7,8,9-HxCDD	72.3	0.0000723	7.2E-05	0.1	7.23	7.2E-06
1,2,3,4,6,7,8-HpCDD	4,060	0.00406	4.1E-03	0.01	40.6	4.1E-05
OCDD	23,300	0.0233	2.3E-02	0.0003	6.99	7.0E-06
2,3,7,8-TCDF	43.2	0.0000432	4.3E-05	0.1	4.32	4.3E-06
1,2,3,7,8-PeCDF	26.2	0.0000262	2.6E-05	0.03	0.786	7.9E-07
2,3,4,7,8-PeCDF	30.6	0.0000306	3.1E-05	0.3	9.18	9.2E-06
1,2,3,4,7,8-HxCDF	65.5	0.0000655	6.6E-05	0.1	6.55	6.6E-06
1,2,3,6,7,8-HxCDF	44.4	0.0000444	4.4E-05	0.1	4.44	4.4E-06
2,3,4,6,7,8-HxCDF	56.7	0.0000567	5.7E-05	0.1	5.67	5.7E-06
1,2,3,7,8,9-HxCDF	2.4	0.0000024	2.4E-06	0.1	0.24	2.4E-07
1,2,3,4,6,7,8-HpCDF	1,540	0.00154	1.5E-03	0.01	15.40	1.5E-05
1,2,3,4,7,8,9-HpCDF	67.9	0.0000679	6.8E-05	0.01	0.679	6.8E-07
OCDF	2,390 U	0.00239 U	2.4E-03 U	0.0003	0.717 U	7.2E-07 U
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					172	1.7E-04
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					171	1.7E-04
2,3,7,8-TCDD TEQ (without non-detects)					171	1.7E-04

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Attachment 4

Table 2-14
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample B17-20 (0.5) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.317	0.000000317	3.2E-07	1	0.32	3.2E-07
1,2,3,7,8-PeCDD	3.81	0.00000381	3.8E-06	1	3.81	3.8E-06
1,2,3,4,7,8-HxCDD	5.51	0.00000551	5.5E-06	0.1	0.55	5.5E-07
1,2,3,6,7,8-HxCDD	161	0.000161	1.6E-04	0.1	16.1	1.6E-05
1,2,3,7,8,9-HxCDD	22.8	0.0000228	2.3E-05	0.1	2.28	2.3E-06
1,2,3,4,6,7,8-HpCDD	1,250	0.00125	1.3E-03	0.01	12.5	1.3E-05
OCDD	10,200	0.0102	1.0E-02	0.0003	3.06	3.1E-06
2,3,7,8-TCDF	3.6	0.0000036	3.6E-06	0.1	0.36	3.6E-07
1,2,3,7,8-PeCDF	4.54	0.00000454	4.5E-06	0.03	0.136	1.4E-07
2,3,4,7,8-PeCDF	5.36	0.00000536	5.4E-06	0.3	1.61	1.6E-06
1,2,3,4,7,8-HxCDF	19.6	0.0000196	2.0E-05	0.1	1.96	2.0E-06
1,2,3,6,7,8-HxCDF	17.1	0.0000171	1.7E-05	0.1	1.71	1.7E-06
2,3,4,6,7,8-HxCDF	14.3	0.0000143	1.4E-05	0.1	1.43	1.4E-06
1,2,3,7,8,9-HxCDF	0.982	0.000000982	9.8E-07	0.1	0.10	9.8E-08
1,2,3,4,6,7,8-HpCDF	486	0.000486	4.9E-04	0.01	4.86	4.9E-06
1,2,3,4,7,8,9-HpCDF	9.81	0.00000981	9.8E-06	0.01	0.098	9.8E-08
OCDF	339	0.000339	3.4E-04	0.0003	0.102	1.0E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					51	5.1E-05
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					51	5.1E-05
2,3,7,8-TCDD TEQ (without non-detects)					51	5.1E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Attachment 4

Table 2-15
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample B17-20 (1.5) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.275	0.000000275	2.8E-07	1	0.28	2.8E-07
1,2,3,7,8-PeCDD	5.13	0.00000513	5.1E-06	1	5.13	5.1E-06
1,2,3,4,7,8-HxCDD	7.65	0.00000765	7.7E-06	0.1	0.77	7.7E-07
1,2,3,6,7,8-HxCDD	218	0.000218	2.2E-04	0.1	21.8	2.2E-05
1,2,3,7,8,9-HxCDD	28.4	0.0000284	2.8E-05	0.1	2.84	2.8E-06
1,2,3,4,6,7,8-HpCDD	1,530	0.00153	1.5E-03	0.01	15.3	1.5E-05
OCDD	11,800	0.0118	1.2E-02	0.0003	3.54	3.5E-06
2,3,7,8-TCDF	6.92	0.00000692	6.9E-06	0.1	0.69	6.9E-07
1,2,3,7,8-PeCDF	7.22	0.00000722	7.2E-06	0.03	0.217	2.2E-07
2,3,4,7,8-PeCDF	8.74	0.00000874	8.7E-06	0.3	2.62	2.6E-06
1,2,3,4,7,8-HxCDF	22.5	0.0000225	2.3E-05	0.1	2.25	2.3E-06
1,2,3,6,7,8-HxCDF	20	0.00002	2.0E-05	0.1	2.00	2.0E-06
2,3,4,6,7,8-HxCDF	18.5	0.0000185	1.9E-05	0.1	1.85	1.9E-06
1,2,3,7,8,9-HxCDF	0.823	0.000000823	8.2E-07	0.1	0.08	8.2E-08
1,2,3,4,6,7,8-HpCDF	352	0.000352	3.5E-04	0.01	3.52	3.5E-06
1,2,3,4,7,8,9-HpCDF	10.1	0.0000101	1.0E-05	0.01	0.101	1.0E-07
OCDF	255	0.000255	2.6E-04	0.0003	0.077	7.7E-08
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					63	6.3E-05
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					63	6.3E-05
2,3,7,8-TCDD TEQ (without non-detects)					63	6.3E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Attachment 4

Table 2-16
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample B21-24 (0.5) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.162 U	0.000000162 U	1.6E-07 U	1	0.16 U	1.6E-07 U
1,2,3,7,8-PeCDD	2.64	0.00000264	2.6E-06	1	2.64	2.6E-06
1,2,3,4,7,8-HxCDD	4.47	0.00000447	4.5E-06	0.1	0.45	4.5E-07
1,2,3,6,7,8-HxCDD	79.6	0.0000796	8.0E-05	0.1	8.0	8.0E-06
1,2,3,7,8,9-HxCDD	18.9	0.0000189	1.9E-05	0.1	1.89	1.9E-06
1,2,3,4,6,7,8-HpCDD	595	0.000595	6.0E-04	0.01	6.0	6.0E-06
OCDD	3,840	0.00384	3.8E-03	0.0003	1.15	1.2E-06
2,3,7,8-TCDF	1.33	0.00000133	1.3E-06	0.1	0.13	1.3E-07
1,2,3,7,8-PeCDF	1.64	0.00000164	1.6E-06	0.03	0.049	4.9E-08
2,3,4,7,8-PeCDF	1.85	0.00000185	1.9E-06	0.3	0.56	5.6E-07
1,2,3,4,7,8-HxCDF	9.73	0.00000973	9.7E-06	0.1	0.97	9.7E-07
1,2,3,6,7,8-HxCDF	10.4	0.0000104	1.0E-05	0.1	1.04	1.0E-06
2,3,4,6,7,8-HxCDF	7.99	0.00000799	8.0E-06	0.1	0.80	8.0E-07
1,2,3,7,8,9-HxCDF	0.313	0.000000313	3.1E-07	0.1	0.03	3.1E-08
1,2,3,4,6,7,8-HpCDF	470	0.00047	4.7E-04	0.01	4.70	4.7E-06
1,2,3,4,7,8,9-HpCDF	12	0.000012	1.2E-05	0.01	0.120	1.2E-07
OCDF	469	0.000469	4.7E-04	0.0003	0.141	1.4E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					29	2.9E-05
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					29	2.9E-05
2,3,7,8-TCDD TEQ (without non-detects)					29	2.9E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Attachment 4

Table 2-17

Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ

Floragon Property

Molalla, Oregon

Sample B21-24 (1.5) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.0725 U	7.25E-08 U	7.3E-08 U	1	0.07 U	7.3E-08 U
1,2,3,7,8-PeCDD	0.479	0.000000479	4.8E-07	1	0.48	4.8E-07
1,2,3,4,7,8-HxCDD	0.873	0.000000873	8.7E-07	0.1	0.09	8.7E-08
1,2,3,6,7,8-HxCDD	7.85	0.00000785	7.9E-06	0.1	0.8	7.9E-07
1,2,3,7,8,9-HxCDD	2.27	0.00000227	2.3E-06	0.1	0.23	2.3E-07
1,2,3,4,6,7,8-HpCDD	81.5	0.0000815	8.2E-05	0.01	0.8	8.2E-07
OCDD	889	0.000889	8.9E-04	0.0003	0.27	2.7E-07
2,3,7,8-TCDF	0.306	0.000000306	3.1E-07	0.1	0.03	3.1E-08
1,2,3,7,8-PeCDF	0.305	0.000000305	3.1E-07	0.03	0.009	9.2E-09
2,3,4,7,8-PeCDF	0.319	0.000000319	3.2E-07	0.3	0.10	9.6E-08
1,2,3,4,7,8-HxCDF	1.06	0.00000106	1.1E-06	0.1	0.11	1.1E-07
1,2,3,6,7,8-HxCDF	1.27	0.00000127	1.3E-06	0.1	0.13	1.3E-07
2,3,4,6,7,8-HxCDF	0.886	0.000000886	8.9E-07	0.1	0.09	8.9E-08
1,2,3,7,8,9-HxCDF	0.0827 U	8.27E-08 U	8.3E-08 U	0.1	0.01 U	8.3E-09 U
1,2,3,4,6,7,8-HpCDF	36.1	0.0000361	3.6E-05	0.01	0.36	3.6E-07
1,2,3,4,7,8,9-HpCDF	1.42	0.00000142	1.4E-06	0.01	0.014	1.4E-08
OCDF	48.7	0.0000487	4.9E-05	0.0003	0.015	1.5E-08
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					3.6	3.6E-06
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					3.5	3.5E-06
2,3,7,8-TCDD TEQ (without non-detects)					3.5	3.5E-06

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Attachment 4

Table 2-18
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample B25-28 (0.5) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.0945 U	9.45E-08 U	9.5E-08 U	1	0.09 U	9.5E-08 U
1,2,3,7,8-PeCDD	0.822	0.000000822	8.2E-07	1	0.82	8.2E-07
1,2,3,4,7,8-HxCDD	0.936	0.000000936	9.4E-07	0.1	0.09	9.4E-08
1,2,3,6,7,8-HxCDD	16.5	0.0000165	1.7E-05	0.1	1.7	1.7E-06
1,2,3,7,8,9-HxCDD	4.13	0.00000413	4.1E-06	0.1	0.41	4.1E-07
1,2,3,4,6,7,8-HpCDD	110	0.00011	1.1E-04	0.01	1.1	1.1E-06
OCDD	642	0.000642	6.4E-04	0.0003	0.19	1.9E-07
2,3,7,8-TCDF	0.692	0.000000692	6.9E-07	0.1	0.07	6.9E-08
1,2,3,7,8-PeCDF	0.537	0.000000537	5.4E-07	0.03	0.016	1.6E-08
2,3,4,7,8-PeCDF	0.511	0.000000511	5.1E-07	0.3	0.15	1.5E-07
1,2,3,4,7,8-HxCDF	1.43	0.00000143	1.4E-06	0.1	0.14	1.4E-07
1,2,3,6,7,8-HxCDF	2.76	0.00000276	2.8E-06	0.1	0.28	2.8E-07
2,3,4,6,7,8-HxCDF	1.24	0.00000124	1.2E-06	0.1	0.12	1.2E-07
1,2,3,7,8,9-HxCDF	0.0953 U	9.53E-08 U	9.5E-08 U	0.1	0.01 U	9.5E-09 U
1,2,3,4,6,7,8-HpCDF	38.9	0.0000389	3.9E-05	0.01	0.39	3.9E-07
1,2,3,4,7,8,9-HpCDF	1.31	0.00000131	1.3E-06	0.01	0.013	1.3E-08
OCDF	29.8	0.0000298	3.0E-05	0.0003	0.009	8.9E-09
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					5.6	5.6E-06
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					5.5	5.5E-06
2,3,7,8-TCDD TEQ (without non-detects)					5.5	5.5E-06

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Attachment 4

Table 2-19
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample B25-28 (1.5) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.109 U	0.000000109 U	1.1E-07 U	1	0.11 U	1.1E-07 U
1,2,3,7,8-PeCDD	0.11 U	0.00000011 U	1.1E-07 U	1	0.11 U	1.1E-07 U
1,2,3,4,7,8-HxCDD	0.119 U	0.000000119 U	1.2E-07 U	0.1	0.01 U	1.2E-08 U
1,2,3,6,7,8-HxCDD	0.692	0.000000692	6.9E-07	0.1	0.1	6.9E-08
1,2,3,7,8,9-HxCDD	0.406	0.000000406	4.1E-07	0.1	0.04	4.1E-08
1,2,3,4,6,7,8-HpCDD	9.67	0.00000967	9.7E-06	0.01	0.1	9.7E-08
OCDD	98.5	0.0000985	9.9E-05	0.0003	0.03	3.0E-08
2,3,7,8-TCDF	0.105 U	0.000000105 U	1.1E-07 U	0.1	0.01 U	1.1E-08 U
1,2,3,7,8-PeCDF	0.116 U	0.000000116 U	1.2E-07 U	0.03	0.003 U	3.5E-09 U
2,3,4,7,8-PeCDF	0.113 U	0.000000113 U	1.1E-07 U	0.3	0.03 U	3.4E-08 U
1,2,3,4,7,8-HxCDF	0.113	0.000000113	1.1E-07	0.1	0.01	1.1E-08
1,2,3,6,7,8-HxCDF	0.151	0.000000151	1.5E-07	0.1	0.02	1.5E-08
2,3,4,6,7,8-HxCDF	0.095	0.000000095	9.5E-08	0.1	0.01	9.5E-09
1,2,3,7,8,9-HxCDF	0.0852 U	8.52E-08 U	8.5E-08 U	0.1	0.01 U	8.5E-09 U
1,2,3,4,6,7,8-HpCDF	1.87	0.00000187	1.9E-06	0.01	0.02	1.9E-08
1,2,3,4,7,8,9-HpCDF	0.137	0.000000137	1.4E-07	0.01	0.001	1.4E-09
OCDF	2.05	0.00000205	2.1E-06	0.0003	0.001	6.2E-10
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					0.58	5.8E-07
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					0.44	4.4E-07
2,3,7,8-TCDD TEQ (without non-detects)					0.29	2.9E-07

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Attachment 4

Table 2-20
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample B29-32 (0.5) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.144 U	0.000000144 U	1.4E-07 U	1	0.14 U	1.4E-07 U
1,2,3,7,8-PeCDD	1.72	0.00000172	1.7E-06	1	1.72	1.7E-06
1,2,3,4,7,8-HxCDD	8.66	0.00000866	8.7E-06	0.1	0.87	8.7E-07
1,2,3,6,7,8-HxCDD	165	0.000165	1.7E-04	0.1	16.5	1.7E-05
1,2,3,7,8,9-HxCDD	38.1	0.0000381	3.8E-05	0.1	3.81	3.8E-06
1,2,3,4,6,7,8-HpCDD	1,220	0.00122	1.2E-03	0.01	12.2	1.2E-05
OCDD	12,400	0.0124	1.2E-02	0.0003	3.72	3.7E-06
2,3,7,8-TCDF	4.39	0.00000439	4.4E-06	0.1	0.44	4.4E-07
1,2,3,7,8-PeCDF	2.15	0.00000215	2.2E-06	0.03	0.065	6.5E-08
2,3,4,7,8-PeCDF	2.58	0.00000258	2.6E-06	0.3	0.77	7.7E-07
1,2,3,4,7,8-HxCDF	5.78	0.00000578	5.8E-06	0.1	0.58	5.8E-07
1,2,3,6,7,8-HxCDF	7.07	0.00000707	7.1E-06	0.1	0.71	7.1E-07
2,3,4,6,7,8-HxCDF	7.2	0.0000072	7.2E-06	0.1	0.72	7.2E-07
1,2,3,7,8,9-HxCDF	0.447	0.000000447	4.5E-07	0.1	0.04	4.5E-08
1,2,3,4,6,7,8-HpCDF	112	0.000112	1.1E-04	0.01	1.12	1.1E-06
1,2,3,4,7,8,9-HpCDF	12.4	0.0000124	1.2E-05	0.01	0.124	1.2E-07
OCDF	434	0.000434	4.3E-04	0.0003	0.130	1.3E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					44	4.4E-05
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					44	4.4E-05
2,3,7,8-TCDD TEQ (without non-detects)					44	4.4E-05

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Attachment 4

Table 2-21
Dip Tank Area Soil Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample B29-32 (1.5) COMP, October 2015						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	0.185 U	0.000000185 U	1.9E-07 U	1	0.19 U	1.9E-07 U
1,2,3,7,8-PeCDD	0.384	0.000000384	3.8E-07	1	0.38	3.8E-07
1,2,3,4,7,8-HxCDD	0.604	0.000000604	6.0E-07	0.1	0.06	6.0E-08
1,2,3,6,7,8-HxCDD	13.6	0.0000136	1.4E-05	0.1	1.4	1.4E-06
1,2,3,7,8,9-HxCDD	3.32	0.00000332	3.3E-06	0.1	0.33	3.3E-07
1,2,3,4,6,7,8-HpCDD	140	0.00014	1.4E-04	0.01	1.4	1.4E-06
OCDD	1,530	0.00153	1.5E-03	0.0003	0.46	4.6E-07
2,3,7,8-TCDF	0.45	0.00000045	4.5E-07	0.1	0.05	4.5E-08
1,2,3,7,8-PeCDF	0.308	0.000000308	3.1E-07	0.03	0.009	9.2E-09
2,3,4,7,8-PeCDF	0.319	0.000000319	3.2E-07	0.3	0.10	9.6E-08
1,2,3,4,7,8-HxCDF	0.726	0.000000726	7.3E-07	0.1	0.07	7.3E-08
1,2,3,6,7,8-HxCDF	0.755	0.000000755	7.6E-07	0.1	0.08	7.6E-08
2,3,4,6,7,8-HxCDF	0.740	0.00000074	7.4E-07	0.1	0.07	7.4E-08
1,2,3,7,8,9-HxCDF	0.121	0.000000121	1.2E-07	0.1	0.01	1.2E-08
1,2,3,4,6,7,8-HpCDF	14.9	0.0000149	1.5E-05	0.01	0.15	1.5E-07
1,2,3,4,7,8,9-HpCDF	0.879 U	0.000000879 U	8.8E-07 U	0.01	0.009 U	8.8E-09 U
OCDF	29.2	0.0000292	2.9E-05	0.0003	0.009	8.8E-09
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					4.7	4.7E-06
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					4.6	4.6E-06
2,3,7,8-TCDD TEQ (without non-detects)					4.5	4.5E-06

Notes:

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Attachment 4

Table 2-22
Dip Tank Area Catch Basin Analytical Results - Dioxins - Mammalian TEQ
Floragon Property
Molalla, Oregon

Sample AB-19A**, February 2010						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	3.17	0.00000317	3.2E-06	1	3.17	3.2E-06
1,2,3,7,8-PeCDD	29.3	0.0000293	2.9E-05	1	29.3	2.9E-05
1,2,3,4,7,8-HxCDD	29.4	0.0000294	2.9E-05	0.1	2.94	2.9E-06
1,2,3,6,7,8-HxCDD	200	0.0002	2.0E-04	0.1	20.0	2.0E-05
1,2,3,7,8,9-HxCDD	112	0.000112	1.1E-04	0.1	11.20	1.1E-05
1,2,3,4,6,7,8-HpCDD	1,980	0.00198	2.0E-03	0.01	19.8	2.0E-05
OCDD	11,300	0.0113	1.1E-02	0.0003	3.39	3.4E-06
2,3,7,8-TCDF	16.9	0.0000169	1.7E-05	0.1	1.69	1.7E-06
1,2,3,7,8-PeCDF	10.5	0.0000105	1.1E-05	0.03	0.315	3.2E-07
2,3,4,7,8-PeCDF	13.1	0.0000131	1.3E-05	0.3	3.9	3.9E-06
1,2,3,4,7,8-HxCDF	22.2	0.0000222	2.2E-05	0.1	2.22	2.2E-06
1,2,3,6,7,8-HxCDF	38.9	0.0000389	3.9E-05	0.1	3.89	3.9E-06
2,3,4,6,7,8-HxCDF	26.2	0.0000262	2.6E-05	0.1	2.6	2.6E-06
1,2,3,7,8,9-HxCDF	0.889 J	0.000000889 J	8.9E-07 J	0.1	0.09 J	8.9E-08 J
1,2,3,4,6,7,8-HpCDF	424	0.000424	4.2E-04	0.01	4.2	4.2E-06
1,2,3,4,7,8,9-HpCDF	24.1	0.0000241	2.4E-05	0.01	0.241	2.4E-07
OCDF	553	0.000553	5.5E-04	0.0003	0.166	1.7E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					109	1.1E-04
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					109	1.1E-04
2,3,7,8-TCDD TEQ (without non-detects)					109	1.1E-04

Notes:

** Catch Basin Sample

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Attachment 4

Table 2-23

Dip Tank Area Catch Basin Analytical Results - Dioxins - Mammalian TEQ

Floragon Property

Molalla, Oregon

Sample AB-19B**, February 2010						
	Totals			Mammalian TEF	Equivalent Concentration (pg/g)	Equivalent Concentration (mg/Kg)
Analyte	pg/g	mg/Kg	mg/Kg			
2,3,7,8-TCDD	27.2	0.0000272	2.7E-05	1	27.20	2.7E-05
1,2,3,7,8-PeCDD	297	0.000297	3.0E-04	1	297.0	3.0E-04
1,2,3,4,7,8-HxCDD	269	0.000269	2.7E-04	0.1	26.90	2.7E-05
1,2,3,6,7,8-HxCDD	2,370	0.00237	2.4E-03	0.1	237.0	2.4E-04
1,2,3,7,8,9-HxCDD	899	0.000899	9.0E-04	0.1	89.90	9.0E-05
1,2,3,4,6,7,8-HpCDD	21,500	0.0215	2.2E-02	0.01	215.0	2.2E-04
OCDD	98,300	0.0983	9.8E-02	0.0003	29.49	2.9E-05
2,3,7,8-TCDF	152	0.000152	1.5E-04	0.1	15.20	1.5E-05
1,2,3,7,8-PeCDF	116	0.000116	1.2E-04	0.03	3.480	3.5E-06
2,3,4,7,8-PeCDF	136	0.000136	1.4E-04	0.3	40.8	4.1E-05
1,2,3,4,7,8-HxCDF	215	0.000215	2.2E-04	0.1	21.50	2.2E-05
1,2,3,6,7,8-HxCDF	419	0.000419	4.2E-04	0.1	41.90	4.2E-05
2,3,4,6,7,8-HxCDF	270	0.00027	2.7E-04	0.1	27.0	2.7E-05
1,2,3,7,8,9-HxCDF	9.63 J	0.00000963 J	9.6E-06 J	0.1	0.96 J	9.6E-07 J
1,2,3,4,6,7,8-HpCDF	3,880	0.00388	3.9E-03	0.01	38.8	3.9E-05
1,2,3,4,7,8,9-HpCDF	196	0.000196	2.0E-04	0.01	1.960	2.0E-06
OCDF	1,920	0.00192	1.9E-03	0.0003	0.576	5.8E-07
Total Toxic Equivalency (TEQ)						
2,3,7,8-TCDD TEQ (with EDLs)					1,115	1.1E-03
2,3,7,8-TCDD TEQ (with 1/2 EDLs)					1,115	1.1E-03
2,3,7,8-TCDD TEQ (without non-detects)					1,115	1.1E-03

Notes:

** Catch Basin Sample

pg/g = picogram per gram

mg/Kg = milligram per kilogram

U = Undetected at EDL shown

J = Sample result is qualified as an estimated value. Result was below the RDL, but above the EDL.

TEF = Toxicity equivalent factor (EPA's Recommended Toxicity Equivalence Factors (TEFs) for Human Health Risk Assessments of 2,3,7,8-Tetrachlorodibenzo-*p*-dioxin and Dioxin-Like Compounds, EPA/100/R 10/005. December 2010.)

TEQ = Sum of dioxin-like congener concentrations multiplied by their respective TEF values, expressed as a single 2,3,7,8-TCDD equivalent

EDL = Estimated Detection Limit

RDL = Reportable Detection Limit

Attachment 4

Table 3-1

Dip Tank Area Soil Analytical Results - Total Petroleum Hydrocarbons (mg/Kg)

Floragon Property
Molalla, Oregon

Sample ID	Sample Depth (feet)	Sample Date	Gasoline	Diesel	Oil
GP5-8*	8	10/05/2005	3.4 U	20 U	68 U
GP6-8*	8	10/05/2005	3.6 U	21 U	71 U
GP7-7*	7	10/05/2005	3.3 U	20 U	65 U
GP8-8*	8	10/05/2005	3.2 U	19 U	65 U
AB-02/MW-02	1	02/02/2010	18 U	25 U[a]	51 U[a]
AB-03/MW-03	1	02/02/2010	18 U	221 [a]	1,030 [a]
IMW-1-1	1	03/04/2013	-	8.6 U[a]	29 [a],X
IMW-2-1	1	03/05/2013	-	11 U[a]	21 U[a]
IMW-2-6	6	03/05/2013	-	9.7 U[a]	20 U[a]
MW-7-1	1	03/07/2013	-	19 U[a]	486 [a],J
MW-7-3	3	03/07/2013	-	8.4 U[a]	17 U[a],UJ
B1-4(0.5) COMP	0.5	10/13/2015	-	25 U	98
B1-4(1.5) COMP	1.5	10/13/2015	-	25 U	50 U
B5-8(0.5) COMP	0.5	10/13/2015	-	104 U	817
B5-8(1.5) COMP	1.5	10/13/2015	-	25 U	153
B9-12(0.5 COMP	0.5	10/13/2015	-	96 U	1,040
B9-12(1.5) COMP	1.5	10/13/2015	-	25 U	231
B13-16(0.5) COMP	0.5	10/13/2015	-	191 U	3,860
B13-16(1.5) COMP	1.5	10/13/2015	-	182 U	3,550
B17-20(0.5) COMP	0.5	10/14/2015	-	25 U	210
B17-20(1.5) COMP	1.5	10/14/2015	-	25 U	81
B21-24(0.5) COMP	0.5	10/14/2015	-	92 U	1,320
B21-24(1.5) COMP	1.5	10/14/2015	-	25 U	52
B25-28(0.5) COMP	0.5	10/14/2015	-	202 U	2,540
B25-28(1.5) COMP	1.5	10/14/2015	-	25 U	50 U
B29-32(0.5) COMP	0.5	10/14/2015	-	204 U	2,210
B29-32(1.5) COMP	1.5	10/14/2015	-	25 U	110
Catch Basin Samples					
AB-19A**	-	02/02/2010	156 U	390 U	4,190 [a1]
AB-19B**	-	02/02/2010	30 U	701 [a]	4,260 [a]
RBC Screening Level Criteria for Soil					
Ingestion, Dermal Contact, & Inhalation:					
Occupational[b]			20,000	14,000	14,000
Construction Worker[c]			9,700	4,600	4,600
Excavation Worker[d]			>Max	>Max	>Max
Volatilization to Outdoor Air:					
Occupational[e]			69,000	>Max	>Max
Vapor Intrusion into Buildings:					
Occupational[f]			>Max	>Max	>Max

Attachment 4

Table 3-1

Dip Tank Area Soil Analytical Results - Total Petroleum Hydrocarbons (mg/Kg)

Floragon Property

Molalla, Oregon

Notes:

* Data from NWES Assessment (2005)

** Catch Basin Sediment

Gasoline, Diesel and Oil Range hydrocarbon identification screen by Method NWTPH-HCID unless indicated otherwise

[a] Diesel and Oil Range Hydrocarbons by Method NWTPH-Dx (with silica-gel cleanup[a1])

[b] Oregon Department of Environmental Quality (DEQ), Generic Risk Based Concentration (RBC) for ingestion, dermal contact, and inhalation in an occupational setting (revised November 1, 2015)

[c] DEQ, RBC for ingestion, dermal contact, and inhalation by a construction worker (revised November 1, 2015)

[d] DEQ, RBC for ingestion, dermal contact, and inhalation by an excavation worker (revised November 1, 2015)

[e] DEQ, RBC for volatilization to outdoor air in an occupational setting (revised November 1, 2015)

[f] DEQ, RBC for vapor intrusion into buildings in an occupational setting (revised November 1, 2015)

mg/Kg = Milligrams per kilogram

>Max = The constituent RBC for this pathway is greater than 100,000 mg/kg or 100,000 mg/L and is considered unlikely to be encountered.

- = Not analyzed for this parameter

X = (Laboratory Qualifier) No fuel pattern detected.

J = (PNG Qualifier) Result is estimated. See corresponding data validation report for further explanation.

UJ = (PNG Qualifier) Analyte was not detected, but should be considered estimated. See corresponding data validation report for further explanation.

U = Undetected at the method reporting limit shown

Attachment 4

Table 3-2

Dip Tank Area Groundwater Analytical Results - Total Petroleum Hydrocarbons (ug/L)

Floragon Property

Molalla, Oregon

Sample ID	Sample Date	Gasoline	Diesel	Oil
GP5-W*	10/05/2005	100 U	470	1,300
GP6-W*	10/05/2005	100 U	510	1,260
GP8-W*	10/05/2005	100 U	880	1,740
AB-06/GW	02/02/2010	94 U	1,110 [b]	12,500 [b]
AB-77	04/14/2010	94 U	485 [a]	1,120 [a]
AB-78	04/14/2010	100 U	250 U	500 U
MW-1	02/04/2010	94 U	236 U	472 U
	03/25/2013	-	77 U[b]	295 [b]
	06/24/2013	-	77 U[b]	142 [b]
IMW-1	03/25/2013	-	239 [b,g]	164 [b]
	06/24/2013	-	76 U[b]	151 U[b]
MW-2	02/04/2010	94 U	236 U	472 U
MW-99 (MW-2 duplicate)	02/04/2010	94 U	236 U	472 U
	03/25/2013	-	104 [b,h]	126 J[b]
	06/24/2013	-	76 J[1,b]	152 UJ[1,b]
MW-99 (MW-2 duplicate)	06/24/2013	-	76 U[b]	152 U[b]
IMW-2	03/25/2013	-	41 J[b]	85 J[b]
	06/24/2013	-	52 [b]	82 [b]
IMW-99 (IMW-2 duplicate)	03/25/2013	-	75 U[b]	150 U[b]
MW-3	02/04/2010	94 U	236 U	472 U
	03/25/2013	-	245 [b,h]	337 [b]
	06/24/2013	-	183 J[1,b]	149 J[1,b]
MW-7	03/25/2013	-	84 [b,h]	106 J[b]
	06/24/2013	-	78 U[b]	131 [b]
RBC Screening Level Criteria for Groundwater				
Groundwater Volitilization to Outdoor Air Occupational[d]		>S	>S	>S
Groundwater Vapor Intrusion into Buildings Occupational[e]		>S	>S	>S
Groundwater in Excavation Construction/Excavation Worker[f]		14,000	>S	>S

Attachment 4

Table 3-2
Dip Tank Area Groundwater Analytical Results - Total Petroleum Hydrocarbons (ug/L)
Floragon Property
Molalla, Oregon

Notes:

* Data from NWES Assessment (2005)

Gasoline, Diesel and Oil Range hydrocarbon identification screen by Method NWTPH-HCID unless indicated otherwise

[a] Gasoline detected but flagged by laboratory (F-09) as overlap from a heavier fuel hydrocarbon product. Gasoline range hydrocarbons were not quantified.

[b] Diesel and Oil Range Hydrocarbons by Method NWTPH-Dx

[c] Reference removed

[d] Oregon Department of Environmental Quality (DEQ), Generic Risk-Based Concentration (RBC) for groundwater volitilization to outdoor air in an occupational setting (revised November 1, 2015)

[e] DEQ Generic RBC for groundwater vapor intrusion into buildings in an occupational setting (revised November 1, 2015)

[f] DEQ Generic RBC for groundwater in excavation for a construction/excavation worker (revised November 1, 2015)

[g] The sample chromatographic pattern does not resemble the fuel standard used for quanitation

[h] The hydrocarbon pattern indicates possible weathered diesel, or contribution from a related component.

ug/L = Micrograms per liter

>S = This groundwater RBC exceeds the solubility limit. Groundwater in excess of S indicates that free product may be present.

J = (Laboratory Qualifier) Estimated value. Detection was below the reporting limit, but above the method detection limit.

J^1 = (PNG Qualifier) Result is estimated. See corresponding data validation report for further explanation.

- = not analyzed for this parameter

U = Not detected at the method reporting limit shown

NA = Not applicable (no screening levels published for these chemicals)

Attachment 4

Table 4-1

Dip Tank Area Soil Analytical Results - Chlorophenols (mg/Kg)

Floragon Property

Molalla, Oregon

Sample ID	Sample Depth (feet)	Sample Date	Pentachlorophenol	2-Chlorophenol	3+4-Chlorophenols	2,4-Dichlorophenol	3,4-Dichlorophenol	2,3,4,5-Tetrachlorophenol	2,3,4,6-Tetrachlorophenol	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol
GP5-8*	8	10/05/2005	0.333 U	-	-	-	-	-	-	-	-
GP6-8*	8	10/05/2005	0.333 U	-	-	-	-	-	-	-	-
GP7-7*	7	10/05/2005	0.333 U	-	-	-	-	-	-	-	-
GP8-8*	8	10/05/2005	0.333 U	-	-	-	-	-	-	-	-
AB-02/MW-02	1	02/02/2010	0.0506 U	0.0506 U	0.101 U	0.0506 U	0.0506 U	0.0506 U	0.0506 U	0.0506 U	0.0506 U
AB-03/MW-02	1	02/02/2010	3.63	0.0506 U	0.127 U	0.0506 U	0.466	0.0651	0.637	0.0896	0.0506 U
AB-05	0-0.5	02/03/2010	2.57	0.460 U	0.921 U	0.460 U	0.460 U	0.460 U	6.96	0.460 U	0.460 U
AB-05	1-2	02/03/2010	0.0903 U	0.0903 U	0.181 U	0.0903 U	0.0903 U	0.0903 U	0.0903 U	0.0903 U	0.0903 U
AB-05	2-3	02/03/2010	0.0236 U	0.0236 U	0.0473 U	0.0236 U	0.0236 U	0.0236 U	0.0236 U	0.0236 U	0.0236 U
AB-05	3-5	02/03/2010	0.105	0.0725 U	0.145 U	0.0725 U	0.0725 U	0.0725 U	0.0725 U	0.0725 U	0.0725 U
AB-06	0-0.5	02/03/2010	5.10	0.259 U	0.518 U	0.259 U	0.259 U	0.259 U	0.259 U	0.259 U	0.259 U
AB-06	1-2	02/03/2010	3.28	0.105 U	0.210 U	0.105 U	0.105 U	0.105 U	0.240	0.105 U	0.105 U
AB-06	2-3	02/03/2010	0.914	0.120 U	0.240 U	0.120 U	0.120 U	0.120 U	0.120 U	0.120 U	0.120 U
AB-06	3-5	02/03/2010	0.143	0.0639 U	0.128 U	0.0639 U	0.0639 U	0.0639 U	0.0639 U	0.0639 U	0.0639 U
AB-07	0-0.5	02/03/2010	0.436 U	0.436 U	0.873 U	0.436 U	0.436 U	0.436 U	0.436 U	0.436 U	0.436 U
AB-08	0-0.5	02/03/2010	0.471 U	0.471 U	0.943 U	0.471 U	0.471 U	0.471 U	0.471 U	0.471 U	0.471 U
AB-09	0-0.5	02/03/2010	0.0235 U	0.0235 U	0.047 U	0.0235 U	0.0235 U	0.0235 U	0.0235 U	0.0235 U	0.0235 U
AB-09 (DUP)	0-0.5	02/03/2010	0.0231 U	0.0231 U	0.0461 U	0.0231 U	0.0231 U	0.0231 U	0.0231 U	0.0231 U	0.0231 U
IMW-1-1	1	03/04/2013	0.106 U	0.0317 U	0.106 U	0.0317 U	0.0200 J	0.0317 U	0.0317 U	0.0317 U	0.0317 U
IMW-2-1	1	03/05/2013	0.100 U	0.0301 U	0.100 U	0.0301 U	0.0301 U	0.0301 U	0.0301 U	0.0301 U	0.0301 U
IMW-2-6	6	03/05/2013	0.102 U	0.0306 U	0.102 U	0.0306 U	0.0306 U	0.0306 U	0.0306 U	0.0306 U	0.0306 U
MW-7-1	1	03/07/2013	0.209 U	0.0626 U	0.209 U	0.0626 U	0.0626 U	0.0626 U	0.0626 U	0.0626 U	0.0626 U
MW-7-3	3	03/07/2013	0.094 U	0.0282 U	0.094 U	0.0282 U	0.0282 U	0.0282 U	0.0282 U	0.0282 U	0.0282 U
B1-4(0.5) COMP	0.5	10/13/2015	0.193 J	-	-	-	-	-	-	-	-
B1-4(1.5) COMP	1.5	10/13/2015	0.021 J	0.0074 U	0.0037 U	0.00735 U	-	-	0.0287	0.0112 J	0.00735 U
B1-4(3) COMP	3	10/13/2015	0.017 J	-	-	-	-	-	-	-	-
B5-8(1.5) COMP	1.5	10/13/2015	0.057 U	0.0284 U	0.014 U	0.0284 U	-	-	0.0284 U	0.0284 U	0.0284 U
B9-12(1.5) COMP	1.5	10/13/2015	0.139 U	0.0697 U	0.035 U	0.0697 U	-	-	0.0697 U	0.0697 U	0.0697 U
B13-16(1.5) COMP	1.5	10/13/2015	0.560 U	0.281 U	0.140 U	0.281 U	-	-	0.281 U	0.281 U	0.281 U
B17-20(1.5) COMP	1.5	10/14/2015	0.090 J	-	-	-	-	-	-	-	-
B21-24(1.5) COMP	1.5	10/14/2015	0.059 U	-	-	-	-	-	-	-	-
B25-28(1.5) COMP	1.5	10/14/2015	0.014 U	-	-	-	-	-	-	-	-
B29-32(1.5) COMP	1.5	10/14/2015	0.142 U	-	-	-	-	-	-	-	-
Catch Basin Samples											
AB-19A**	-	02/02/2010	0.585 U	0.585 U	1.17 U	0.585 U	0.585 U	0.585 U	0.585 U	0.585 U	0.585 U
AB-19B**	-	02/02/2010	0.598 U	0.598 U	1.2 U	0.598 U	0.598 U	0.598 U	0.598 U	0.598 U	0.598 U
RBC Screening Level Criteria for Soil											
Ingestion, Dermal Contact, and Inhalation:											
Occupational[a]			4	NA	NA	NA	NA	NA	NA	NA	210
Construction Worker[b]			34	NA	NA	NA	NA	NA	NA	NA	270
Excavation Worker[c]			960	NA	NA	NA	NA	NA	NA	NA	7,400
Volatilization to Outdoor Air											
Occupational[d]			NV	NA	NA	NA	NA	NA	NA	NA	NV
Vapor Intrusion into Buildings											
Occupational[e]			NV	NA	NA	NA	NA	NA	NA	NA	NV

Attachment 4

Table 4-1
Dip Tank Area Soil Analytical Results - Chlorophenols (mg/Kg)
Floragon Property
Molalla, Oregon

Notes:
* Data from NWES Assessment (2005)
** Catch Basin Sample
Chlorophenols by EPA Method 8270C SIM
[a]Oregon Department of Environmental Quality (DEQ), Generic Risk Based Concentration (RBC) for soil injestion, dermal contact, and inhalation in an occupational setting (revised November 1, 2015)
[b] DEQ, RBC for soil ingestion, dermal contact, and inhalation by a construction worker (revised November 1, 2015)
[c] DEQ, RBC for soil ingestion, dermal contact, and inhalation by an excavation worker (revised November 1, 2015)
[d] DEQ, RBC for volatilization to outdoor air in an occupational setting (revised November 1, 2015)
[e] DEQ, RBC for vapor intrusion into buildings in an occupational setting (revised November 1, 2015)
Phenols by EPA Method 8270D was used for April 2012 sampling event (4-Chloro-3-methylphenol, 2,4-Dimethylphenol, 4,6-Dinitro-2-methylphenol, 2,4-Dinitrophenol, 2-Methylphenol, 3+4-Methylphenol, 2-Nitrophenol, 4-Nitrophenol, Phenol and 2,3,5,6-Tetrachlorophenol were not detected by the laboratory).
mg/Kg = Milligrams per kilogram
NA = Not applicable (no screening levels published for these chemicals)
NV = This chemical is considered "nonvolatile" for purposes of the exposure calculations
- = Undetected at method reporting limit shown
U = Not detected at the method reporting limit shown
J = (Laboratory Qualifier) Estimated concentration. Reported result is below the reporting limit, but above the Method Detection Limit (MDL).
UJ = (PNG Qualifier) Analyte was not detected, but should be considered estimated. See corresponding data validation report for further explanation.
UX = (PNG Qualifier) Estimated values, results should be used for screening purposes only. See corresponding laboratory report and data validation report for further information.

Attachment 4

Table 4-2

Dip Tank Area Groundwater Analytical Results - Chlorophenols (ug/L)

Floragon Property

Molalla, Oregon

Sample ID	Sample Date	Pentachlorophenol	2-Chlorophenol	3,4-Chlorophenols	2,4-Dichlorophenol	2,6-Dichlorophenol	3,4-Dichlorophenol	2,3,4,5-Tetrachlorophenol	2,3,4,6-Tetrachlorophenol	2,4,5-Trichlorophenol	2,4,6-Trichlorophenol	3&4-Methylphenol	IPBC
GP5-W*	10/05/2005	12	-	-	-	-	-	-	16	-	-	14 U	-
GP6-W*	10/05/2005	9.6 U	-	-	-	-	-	-	-	-	-	19 U	-
GP8-W*	10/05/2005	21 U	-	-	-	-	-	-	-	-	-	42 U	-
AB-06/GW	02/03/2010	1.97	1.41 U	2.82 U	1.41 U	-	1.41 U	1.41 U	1.41 U	1.41 U	1.41 U	-	1.41 U
AB-77/GW	04/14/2010	0.708 U	0.283 U	0.943 U	0.283 U	-	0.283 U	0.283 U	0.283 U	0.283 U	0.283 U	-	-
AB-78/GW	04/14/2010	0.708 U	0.283 U	0.943 U	0.283 U	-	0.283 U	0.283 U	0.283 U	0.283 U	0.283 U	-	-
MW-1	02/04/2010	0.282 U	0.282 U	0.563 U	0.282 U	-	0.282 U	0.282 U	0.282 U	0.282 U	0.282 U	-	0.282 U
	03/25/2013	0.113 J	0.057 U	0.189 U	0.057 U	0.056 U	0.057 U	0.057 U	0.057 U	0.057 U	0.057 U	-	-
	06/24/2013	0.192 U	0.058 U	0.192 U	0.058 U	0.058 U	0.058 U	0.058 U	0.058 U	0.058 U	0.058 U	-	-
IMW-1	03/25/2013	0.187 U	0.056 U	0.187 U	0.056 U	0.056 U	0.056 U	0.075 U	0.075 U	0.056 U	0.056 U	-	-
	06/24/2013	0.200 U	0.060 U	0.200 U	0.060 U	0.060 U	0.060 U	0.060 U	0.060 U	0.060 U	0.060 U	-	-
MW-2	02/04/2010	0.284 U	0.284 U	0.569 U	0.284 U	-	0.284 U	0.284 U	0.284 U	0.284 U	0.284 U	-	0.284 U
MW-99 (MW-2 duplicate)	02/04/2010	0.282 U	0.282 U	0.563 U	0.282 U	-	0.282 U	0.282 U	0.282 U	0.282 U	0.282 U	-	0.282 U
	03/25/2013	0.187 U	0.056 U	0.187 U	0.056 U	0.056 U	0.056 U	0.075 U	0.056 U	0.056 U	0.056 U	-	-
	06/24/2013	0.190 U	0.057 U	0.190 U	0.057 U	0.057 U	0.057 U	0.057 U	0.057 U	0.057 U	0.057 U	-	-
MW-99 (MW-2 duplicate)	06/24/2013	0.190 U	0.057 U	0.190 U	0.057 U	0.057 U	0.057 U	0.057 U	0.057 U	0.057 U	0.057 U	-	-
IMW-2	03/25/2013	0.187 U	0.056 U	0.187 U	0.056 U	0.056 U	0.056 U	0.075 U	0.056 U	0.056 U	0.056 U	-	-
	06/24/2013	0.190 U	0.057 U	0.190 U	0.057 U	0.057 U	0.057 U	0.057 U	0.057 U	0.057 U	0.057 U	-	-
IMW-99 (IMW-2 duplicate)	03/25/2013	0.187 U	0.056 U	0.187 U	0.056 U	0.056 U	0.056 U	0.075 U	0.056 U	0.056 U	0.056 U	-	-
MW-3	02/04/2010	256	1.61 U	3.23 U	1.61 U	-	2.74	6.38	87.7	9.38	1.61 U	-	1.61 U
	03/25/2013	0.187 U	0.056 U	0.187 U	0.056 U	0.056 U	0.056 U	0.075 U	0.056 U	0.056 U	0.056 U	-	-
	06/24/2013	0.190 U	0.057 U	0.190 U	0.057 U	0.057 U	0.057 U	0.057 U	0.057 U	0.057 U	0.057 U	-	-
MW-7	03/25/2013	0.187 U	0.056 U	0.187 U	0.056 U	0.056 U	0.056 U	0.075 U	0.056 U	0.056 U	0.056 U	-	-
	06/24/2013	0.194 U	0.058 U	0.194 U	0.058 U	0.058 U	0.058 U	0.058 U	0.058 U	0.058 U	0.058 U	-	-
RBC Screening Level Criteria for Groundwater													
Groundwater Volitilization to Outdoor Air													
Occupational[b]		NV	NA	NA	NA	NA	NA	NA	NA	NA	NV	NA	NA
Groundwater Vapor Intrusion into Buildings													
Occupational[c]		NV	NA	NA	NA	NA	NA	NA	NA	NA	NV	NA	NA
Groundwater in Excavation													
Construction/Excavation Worker[d]		53	NA	NA	NA	NA	NA	NA	NA	NA	1,700	NA	NA

Notes:

* Data from NWES Assessment (2005)

Chlorophenols by EPA Method 8270C SIM

* Reference removed

[b] Oregon Department of Environmental Quality (DEQ), Generic Risk-Based Concentration (RBC) for groundwater volitilization to outdoor air in an occupational setting (revised November 1, 2015)

[c] DEQ Generic RBC for groundwater vapor intrusion into buildings in an occupational setting (revised November 1, 2015)

[d] DEQ Generic RBC for groundwater in excavation for a construction/excavation worker (revised November 1, 2015)

ug/L = Micrograms per liter

- = Undetected at method reporting limit shown

IPBC = 3-Iodo-2-propynyl N-butylcarbamate

NA = Not applicable (no screening levels published for these chemicals)

NV = This chemical is considered "nonvolatile" for purposes of the exposure calculations

J' = (PNG Qualifier) Result is estimated. See corresponding data validation report for further explanation.

J = (Laboratory Qualifier) Estimated value. Detection was below the reporting limit, but above the method detection limit.

U = Not detected at the method reporting limit shown

Attachment 4

Table 5-1

Dip Tank Area Soil Analytical Results - Metals (mg/Kg)

Floragon Property

Molalla, Oregon

Sample ID	Sample Depth (feet)	Sample Date	Antimony	Arsenic	Barium	Beryllium	Cadmium	Chromium[#1]	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
AB-02/MW-02	1	02/02/2010	1.13 U	2.26 U	-	1.13 U	1.13 U	28.2	65.2	4.62	0.090 U	23.5	2.26 U	1.13 U	1.13 U	42.4
AB-03/MW-03	1	02/02/2010	1.35	2.45 U	-	1.23 U	1.23 U	37.8	53.2	69.4	0.098 U	17.5	2.45 U	1.23 U	1.23 U	127
IMW-1-1	1	03/04/2013	0.174 J	4.13	-	1.23 J	0.362	52.7	34.2	12.2	0.061 J	22.8	0.724 J	1.34 U	0.161 J	45.3
IMW-2-1	1	03/05/2013	1.42 U	2.79 J	-	1.08 J	0.385	44.2	31.0	7.28	0.057 U	22.4	2.85 U	1.42 U	1.42 U	39.3
IMW-2-6	6	03/05/2013	1.46 U	4.80	-	1.36 J	0.423	56.4	23.3	10.9	0.117 U	10.4	1.18 J	1.46 U	1.46 U	31.7
MW-7-1	1	03/07/2013	0.268 U	1.92 J	-	0.752 J	0.403 J[1]	25.7	22.8	8.39	0.107 U	14.8	1.34 U	0.268 U	0.268 U	83.2
MW-7-3	3	03/07/2013	0.246 U	1.32 J	-	0.725 J	0.211 J	19.9	13.8	5.68	0.098 U	10.6	1.23 U	0.246 U	0.246 U	19.0
B1-4(1.5) COMP	1.5	10/13/2015	-	1.2 U	52	-	0.23 U	18	-	3.4	0.092 U	-	2.3 U	0.23 U	-	-
B5-8(1.5) COMP	1.5	10/13/2015	-	1.1	67	-	0.22 U	18	-	5.8	0.088 U	-	2.2 U	0.22 U	-	-
B9-12(1.5) COMP	1.5	10/13/2015	-	9.4	67	-	0.22 U	24	-	11	0.087 U	-	2.2 U	0.22 U	-	-
B13-16(1.5) COMP	1.5	10/13/2015	-	1.2 U	36	-	0.23 U	19	-	2.8	0.092 U	-	2.3 U	0.23 U	-	-
Catch Basin Samples																
AB-19A**	-	02/02/2010	10.8 U	21.6 U	-	10.8 U	10.8 U	68.5	263	25.0	0.973	32.8	21.6 U	10.8 U	10.8 U	3,680
AB-19B**	-	02/02/2010	2.29	3.73	-	1.85 U	3.84	39.7	109	100	0.203	29.7	3.69 U	1.85 U	1.85 U	707
RBC Screening Level Criteria for Soil																
Ingestion, Dermal Contact, and Inhalation:																
Occupational[b]			NA	1.9	220,000	2,300	1,100	6.3[#2]/>Max[#3]	47,000	800 L	350	22,000	NA	5,800	NA	NA
Construction Worker[c]			NA	15	69,000	700	350	49[#2]/530,000[#3]	14,000	800 L	110	7,000	NA	1,800	NA	NA
Excavation Worker[d]			NA	420	>Max	19,000	9,700	1,400[#2]/>Max[#3]	390,000	800 L	2,900	190,000	NA	49,000	NA	NA
Volatilization to Outdoor Air																
Occupational[e]			NA	NV	NV	NV	NV	NV[#2]/NV[#3]	NV	NV	NV	NV	NA	NV	NA	NA
Vapor Intrusion into Buildings																
Occupational[f]			NA	NV	NV	NV	NV	NV[#2]/NV[#3]	NV	NV	NV	NV	NA	NV	NA	NA
Default Background Concentrations																
Oregon (soil)[g]			0.56	8.8	790	2	0.63	76[#3]	34	79	0.23	47	0.71	0.82	5.2	180
Freshwater (sediment)[h]			1	7.9	-[1]	NA	<0.5	30	12	2	0.2	20	0.4	0.4	NA	53

Notes:

Metals analyzed by EPA Method 6020

[#1] Total Chromium (III + VI)

[#2] Chromium (VI)

[#3] Chromium (III)

[b] Oregon Department of Environmental Quality (DEQ), Generic Risk-Based Concentration (RBC) for soil ingestion, dermal contact, and inhalation in an occupational setting (revised November 1, 2015)

[c] DEQ, RBC for soil ingestion, dermal contact, and inhalation by a construction worker (revised November 1, 2015)

[d] DEQ, RBC for soil ingestion, dermal contact, and inhalation by an excavation worker (revised November 1, 2015)

[e] DEQ, RBC for volatilization to outdoor air in an occupational setting (revised November 1, 2015)

[f] DEQ, RBC for vapor intrusion into buildings in an occupational setting (revised November 1, 2015)

[g] DEQ Default Background Concentrations for Metals Fact Sheet (March 20, 2013)

[h] DEQ Human Health Risk Assessment Guidance, Table 1 - Oregon Default Background Concentrations for Inorganic Chemicals, (DEQ, October 2010)

mg/Kg = Milligrams per kilogram

NA = Not applicable (no screening levels published for these chemicals)

- = Leaching to groundwater RBCs not provided for inorganic chemicals

L = Values for lead reported as milligrams per liter rather than mg/Kg since they are the results of leaching tests, not soil measurements

U = Not detected at the method reporting limit shown

J = (Laboratory Qualifier) Estimated value. The analyte was detected above the method detection limit, but below the method reporting limit.

J[1] = (PNG Qualifier) The analyte was not detected, but the reported quantitation limit should be considered an estimate. See corresponding data validation report for further information.

>Max = The constituent RBC for this pathway is greater than 100,000 mg/kg or 100,000 mg/L and is considered unlikely to be encountered.

Attachment 4

Table 5-1a
Dip Tank Area Soil Analytical Results - TCLP Metals (mg/Kg)
Floragon Property
Molalla, Oregon

Sample ID	Sample Depth (feet)	Sample Date	Arsenic	Barium	Cadmium	Chromium	Lead	Mercury	Selenium	Silver
B1-4(1.5) COMP	1.5	10/13/2015	0.10 U	0.60	0.050 U	0.10 U	0.050 U	0.0040 U	0.10 U	0.050 U
B5-8(1.5) COMP	1.5	10/13/2015	0.10 U	0.50	0.050 U	0.10 U	0.050 U	0.0040 U	0.10 U	0.050 U
B9-12(1.5) COMP	1.5	10/13/2015	0.10 U	0.69	0.050 U	0.10 U	0.050 U	0.0040 U	0.10 U	0.050 U
B13-16(1.5) COMP	1.5	10/13/2015	0.10 U	0.50 U	0.050 U	0.10 U	0.050 U	0.0040 U	0.10 U	0.050 U

Notes:
TCLP Metals analyzed by EPA Method 1311/6020
TCLP = Toxicity Characteristic Leaching Procedure
mg/Kg = Milligrams per kilogram
U = Not detected at the method reporting limit shown

Attachment 4

Table 5-2
Dip Tank Area Groundwater Analytical Results - Metals (ug/L)
Floragon Property
Molalla, Oregon

Sample ID	Sample Date	Antimony	Arsenic	Beryllium	Cadmium	Chromium[a1]	Copper	Lead	Mercury	Nickel	Selenium	Silver	Thallium	Zinc
AB-06/GW (total)	02/03/2010	1 U	2.3	1 U	1 U	21	45	6.5	0.08 U	20	2 U	1 U	1 U	150
AB-06/GW (dissolved)	02/03/2010	1 U	2 U	1 U	1 U	2 U	4 U	1 U	0.08 U	2.5	2 U	1 U	1 U	4 U
MW-1 (total)	02/04/2010	1 U	2 U	1 U	1 U	2 U	4 U	1 U	0.08 U	2 U	2 U	1 U	1 U	4 U
	06/24/2013	1 U	2 U	1 U	1 U	2 U	3.8	1 U	0.08 U	2 U	2 U	1 U	1 U	4 U
MW-1 (dissolved)	02/04/2010	1 U	2 U	1 U	1 U	2 U	4 U	1 U	0.08 U	2 U	2 U	1 U	1 U	4 U
IMW-1 (total)	06/24/2013	1 U	2 U	1 U	1 U	2 U	2 U	1 U	0.08 U	2 U	2 U	1 U	1 U	4 U
MW-2 (total)	02/04/2010	1 U	2 U	1 U	1 U	2 U	4 U	1 U	0.08 U	2 U	2 U	1 U	1 U	4 U
MW-99 (MW-2 duplicate) (total)	02/04/2010	1 U	2 U	1 U	1 U	2 U	4 U	1 U	0.08 U	2 U	2 U	1 U	1 U	9.9
MW-2 (dissolved)	02/04/2010	1 U	2 U	1 U	1 U	2 U	4 U	1 U	0.08 U	2 U	2 U	1 U	1 U	4 U
MW-2 (total)	06/24/2013	1 U	2.6	1 U	1 U	2 U	1.3 J	1 U	0.08 U	2.0	2 U	1 U	1 U	3.5 J
MW-99 (MW-2 duplicate) (total)	06/24/2013	1 U	2 U	1 U	1 U	2 U	2 U	1 U	0.08 U	2 U	2 U	1 U	1 U	4 U
IMW-2 (total)	06/24/2013	1 U	2 U	1 U	1 U	2 U	2 U	1 U	0.08 U	2 U	2 U	1 U	1 U	4 U
MW-3 (total)	02/04/2010	1 U	2 U	1 U	1 U	2 U	4 U	1 U	0.08 U	4.0	2 U	1 U	1 U	55
	06/24/2013	1 U	5.7	1 U	1 U	1.7 J	2.0	0.78 J	0.08 U	8.5	1.2 J	1 U	1 U	33
MW-3 (dissolved)	02/04/2010	1 U	2 U	1 U	1 U	2 U	4 U	1 U	0.08 U	3.2	2 U	1 U	1 U	23
MW-7 (total)	06/24/2013	1 U	0.89 J	1 U	1 U	2 U	2 U	1 U	0.08 U	5.0	2 U	1 U	1 U	2.1 J
RBC Screening Level Criteria for Groundwater														
Volatilization to Outdoor Air Occupational[c]		NA	NV	NV	NV	NV[a2]/NV[a3]	NV	NV	NV	NV	NA	NV	NA	NA
Vapor Intrusion into Buildings Occupational[d]		NA	NV	NV	NV	NV[a2]/NV[a3]	NV	NV	NV	NV	NA	NV	NA	NA
Groundwater in Excavation Construction/Excavation Worker[e]		NA	6,300	270,000	130,000	9,400[a2]/>S[a3]	5,400,000	>S	>S	13,446,802	NA	1,100,000	NA	NA

Notes:
Total Metals analyzed by EPA 6020
[a1] Total Chromium (III + VI)
[a2] Chromium (VI)
[a3] Chromium (III)
[b] Reference removed
[c] Oregon Department of Environmental Quality (DEQ), Generic Risk-Based Concentration (RBC) for groundwater volatilization to outdoor air in an occupational setting (revised November 1, 2015)
[d] DEQ, RBC for groundwater vapor intrusion into buildings in an occupational setting (revised November 1, 2015)
[e] DEQ, RBC for groundwater in excavation for a construction/excavation worker (revised November 1, 2015)
ug/L = Micrograms per liter
U = Not detected at the reporting limit shown
J = (Laboratory Qualifier) Estimated value. Detection was below the reporting limit, but above the method detection limit.
NA = Not applicable (no screening levels published for these chemicals)
NV = This chemical is considered "nonvolatile" for purposes of the exposure calculations
>S = This groundwater RBC exceeds the solubility limit. Groundwater in excess of S indicates that free product may be present.

Attachment 4

Table 6-1
Dip Tank Area Soil Analytical Results - Semivolatile Organic Compounds (mg/Kg)
Floragon Property
Molalla, Oregon

Sample ID	Sample Depth (feet)	Date Sampled	Acenaphthene	Acenaphthylene	Anthracene	Benz(a) anthracene	Benzo(a) pyrene	Benzo(b) fluoranthene	Benzo(g,h,i) perylene	Benzo(k) fluoranthene	Chrysene	Dibenz(a,h) anthracene	Fluoranthene	Fluorene	Indeno(1,2,3-cd) pyrene
GP5-8*	8	10/05/2005	-	-	-	0.067 U	-	-	-	-	-	-	0.067 U	-	-
GP6-8*	8	10/05/2005	-	-	-	0.067 U	-	-	-	-	-	-	0.067 U	-	-
GP7-7*	7	10/05/2005	-	-	-	0.067 U	-	-	-	-	-	-	0.067 U	-	-
GP8-8*	8	10/05/2005	-	-	-	0.067 U	-	-	-	-	-	-	0.067 U	-	-
AB-02/MW-02	1	02/02/2010	0.0169 U	0.0169 U	0.0169 U	0.0169 U	0.0169 U	0.0169 U	0.0169 U	0.0169 U	0.0169 U	0.0169 U	0.0169 U	0.0169 U	0.0169 U
AB-03/MW-03	1	02/02/2010	0.0169 U	0.0169 U	0.0169 U	0.0236	0.0169 U	0.0169 U	0.0169 U	0.0169 U	0.0241	0.0169 U	0.0169 U	0.0169 U	0.0169 U
MW-1-1	1	03/04/2013	0.0052 U	0.0052 U	0.0052 U	0.0052 U	0.0052 U	0.0052 U	0.0052 U	0.0052 U	0.0052 U	0.0052 U	0.0031 J[1]	0.0052 U	0.0052 U
MW-7-1	1	03/07/2013	0.0425 U,X,UJ	0.0425 U,X,UJ	0.0425 U,X,UJ	0.0425 U,X,UJ	0.0638 U,X,UJ	0.0638 U,X,UJ	0.0425 U,X,UJ	0.0638 U,X,UJ	0.0425 U,X,UJ	0.0425 U,X,UJ	0.0425 U,X,UJ	0.0425 U,X,UJ	0.0425 U,X,UJ
B1-4(1.5) COMP	1.5	10/13/2015	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0022 U	0.0022 U	0.0015 U	0.0022 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U	0.0015 U
B5-8(1.5) COMP	1.5	10/13/2015	0.0057 U	0.0057 U	0.0057 U	0.0057 U	0.0085 U	0.0085 U	0.0057 U	0.0085 U	0.0057 U	0.0057 U	0.0057 U	0.0057 U	0.0057 U
B9-12(1.5) COMP	1.5	10/13/2015	0.0139 U	0.0139 U	0.0139 U	0.0139 U	0.0209 U	0.0209 U	0.0139 U	0.0209 U	0.0139 U	0.0139 U	0.0139 U	0.0139 U	0.0139 U
B13-16(1.5) COMP	1.5	10/13/2015	0.0560 U	0.0560 U	0.0560 U	0.0560 U	0.0842 U	0.0842 U	0.0560 U	0.0842 U	0.1730 U	0.0560 U	0.0560 U	0.0560 U	0.0560 U
Catch Basin Samples															
AB-19A**	-	02/02/2010	0.195 U	0.195 U	0.195 U	0.195 U	0.195 U	0.195 U	0.195 U	0.195 U	0.195 U	0.195 U	0.195 U	0.195 U	0.195 U
AB-19B**	-	02/02/2010	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U	0.200 U
RBC Screening Level Criteria for Soil															
Ingestion, Dermal Contact, and Inhalation:															
Occupational[a]			70,000	NA	350,000	2.9	0.29	2.9	NA	29	290	0.29	30,000	47,000	2.9
Construction Worker[b]			21,000	NA	110,000	24	2.4	24	NA	240	2,400	2.4	10,000	14,000	24
Excavation Worker[c]			590,000	NA	>Max	660	67	670	NA	6,700	67,000	67	280,000	390,000	670
Volatilization to Outdoor Air															
Occupational[d]			>Max	NA	>Max	>Csat	NV	>Csat	NA	NV	NV	NV	NV	>Max	NV
Vapor Intrusion in to Buildings															
Occupational[e]			>Max	NA	>Max	>Csat	NV	>Csat	NA	NV	NV	NV	NV	>Max	NV

Attachment 4

Table 6-1

Dip Tank Area Soil Analytical Results - Semivolatile Organic Compounds (mg/Kg)

Floragon Property

Molalla, Oregon

Sample ID	Sample Depth (feet)	Date Sampled	Naphthalene	Phenanthrene	Pyrene	Benzo(b+k) fluoranthene(s)	Bis (2-ethylhexyl) phthalate	Carbazole
GP5-8*	8	10/05/2005	-	0.067 U	-	-	-	-
GP6-8*	8	10/05/2005	-	0.067 U	-	-	-	-
GP7-7*	7	10/05/2005	-	0.067 U	-	-	-	-
GP8-8*	8	10/05/2005	-	0.067 U	-	-	0.131	-
AB-02/MW-02	1	02/02/2010	0.0337 U	0.0169 U	0.0169 U	-	-	-
AB-03/MW-03	1	02/02/2010	0.0483	0.0169 U	0.0169 U	-	-	-
IMW-1-1	1	03/04/2013	0.0058 J[1]	0.0031 J[1]	0.0031 J[1]	-	-	-
MW-7-1	1	03/07/2013	0.0850 U,X,UJ	0.0425 U,X,UJ	0.0425 U,X,UJ	-	-	-
B1-4(1.5) COMP	1.5	10/13/2015	0.0068	0.0019 J[1]	0.0015 U	-	-	-
B5-8(1.5) COMP	1.5	10/13/2015	0.0114 U	0.0057 U	0.0057 U	-	-	-
B9-12(1.5) COMP	1.5	10/13/2015	0.0279 U	0.0139 U	0.0139 U	-	-	-
B13-16(1.5) COMP	1.5	10/13/2015	0.1120 U	0.0560 U	0.0560 U	-	-	-
Catch Basin Samples								
AB-19A**	-	02/02/2010	0.389 U	0.195 U	0.195 U	-	-	-
AB-19B**	-	02/02/2010	0.398 U	0.200 U	0.200 U	-	-	-
RBC Screening Level Criteria for Soil								
Ingestion, Dermal Contact, and Inhalation:								
Occupational[a]			23	NA	23,000	NA	NA	NA
Construction Worker[b]			580	NA	7,500	NA	NA	NA
Excavation Worker[c]			16,000	NA	210,000	NA	NA	NA
Volatilization to Outdoor Air								
Occupational[d]			83	NA	>Csat	NA	NA	NA
Vapor Intrusion in to Buildings								
Occupational[e]			83	NA	>Csat	NA	NA	NA

Attachment 4

Table 6-1

Dip Tank Area Soil Analytical Results - Semivolatile Organic Compounds (mg/Kg)

Floragon Property

Molalla, Oregon

Notes:

* Data from NWES Assessment (2005)

** Catch Basin Sample

Polynuclear aromatic hydrocarbons (PAHs) analyzed by EPA Method 8270C SIM

[a] Oregon Department of Environmental Quality (DEQ), Generic Risk Based Concentration (RBC) for soil ingestion, dermal contact, and inhalation in an occupational setting (revised November 1, 2015)

[b] DEQ, RBC for soil ingestion, dermal contact, and inhalation by a construction worker (revised November 1, 2015)

[c] DEQ, RBC for soil ingestion, dermal contact, and inhalation by an excavation worker (revised November 1, 2015)

[d] DEQ, RBC for volatilization to outdoor air in an occupational setting (revised November 1, 2015)

[e] DEQ, RBC for vapor intrusion into buildings in an occupational setting (revised November 1, 2015)

[f] Peak separation for Benzo(b) and Benzo(k)fluoranthenes does not meet method specified criteria.
Reported laboratory result includes the combined area of the two isomers and should be considered the total of Benzo(b+k)fluoranthenes.

mg/Kg = Milligrams per kilogram

- = Not analyzed for this parameter

NV = This chemical is considered "nonvolatile" for purposes of the exposure calculations

NA = Not applicable (no screening levels published for these chemicals)

>Max = The constituent RBC for this pathway is greater than 100,000 mg/kg or 100,000 mg/L and is considered unlikely to be encountered.

>Csat = This soil RBC exceeds the limit of three-phase equilibrium partitioning. Soil concentrations in excess of Csat indicate that free product might be present. See Section B.2.1.4 for additional information.

UJ = (PNG Qualifier) Analyte was not detected, but should be considered estimated. See corresponding data validation report for further explanation.

J = (PNG Qualifier) Result is estimated. See corresponding data validation report for further explanation.

J[1] = (Laboratory Qualifier) Result is estimated. Reported detection is below the reporting limit, but above the Method Detection Limit (MDL).

U = Not detected at the method reporting limit shown

X = (Laboratory Qualifier) Sample was extracted past the recommended holding time.

Attachment 4

Table 6-2
Dip Tank Area Groundwater Analytical Results - Semivolatile Organic Compounds (ug/L)
Floragon Property
Molalla, Oregon

Sample ID	Sample Date	Acenaphthene	Acenaphthylene	Anthracene	Benz(a) anthracene	Benzo(a) pyrene	Benzo(b) fluoranthene	Benzo(k) fluoranthene	Benzo(g,h,i) perylene	Chrysene	Dibenz(a,h) anthracene	Dibenzofuran	Fluoranthene	Fluorene
GP5-W*	10/05/2005	-	-	-	-	-	-	-	-	-	-	-	-	-
GP6-W*	10/05/2005	-	-	-	-	-	-	-	-	-	-	-	-	-
GP8-W*	10/05/2005	-	-	-	-	-	-	-	-	-	-	-	-	-
AB-77/GW	04/14/2010	0.0187 U	0.0187 U	0.0187 U	0.0187 U	0.0187 U	0.0187 U	0.0187 U	0.0187 U	0.0187 U	0.0187 U	-	0.0187 U	0.0187 U
MW-1	03/25/2013	0.0189 U	0.0189 U	0.0189 U	0.0189 U	0.0283 U	0.0283 U	0.0283 U	0.0189 U	0.0189 U	0.0189 U	0.0189 U	0.0189 U	0.0189 U
	06/24/2013	0.0192 U	0.0192 U	0.0192 U	0.0192 U	0.0288 U	0.0288 U	0.0288 U	0.0192 U	0.0192 U	0.0192 U	-	0.0192 U	0.0192 U
IMW-1	03/25/2013	0.0748 U	0.0748 U	0.0748 U	0.0748 U	0.112 U	0.112 U	0.112 U	0.0748 U	0.0748 U	0.0748 U	0.0748 U	0.0748 U	0.0748 U
MW-2	03/25/2013	0.0187 U	0.0187 U	0.0187 U	0.0187 U	0.028 U	0.028 U	0.028 U	0.0187 U	0.0187 U	0.0187 U	0.0187 U	0.0187 U	0.0187 U
	06/24/2013	0.0190 U	0.0190 U	0.0190 U	0.0190 U	0.0286 U	0.0286 U	0.0286 U	0.0190 U	0.0190 U	0.0190 U	-	0.0190 U	0.0190 U
IMW-2	03/25/2013	0.0187 U	0.0187 U	0.0187 U	0.0187 U	0.028 U	0.028 U	0.028 U	0.0187 U	0.0187 U	0.0187 U	0.0187 U	0.0187 U	0.0187 U
	06/24/2013	0.0190 U	0.0190 U	0.0190 U	0.0190 U	0.0286 U	0.0286 U	0.0286 U	0.0190 U	0.0190 U	0.0190 U	-	0.0102	0.0190 U
MW-3	03/25/2013	0.0748 U	0.0748 U	0.0748 U	0.0748 U	0.112 U	0.112 U	0.112 U	0.0748 U	0.0748 U	0.0748 U	0.0748 U	0.0748 U	0.0748 U
	06/24/2013	0.0190 U	0.0190 U	0.0190 U	0.0190 U	0.0286 U	0.0286 U	0.0286 U	0.0190 U	0.0190 U	0.0190 U	-	0.0119	0.0190 U
MW-7	03/25/2013	0.0187 U	0.0187 U	0.0187 U	0.0187 U	0.028 U	0.028 U	0.028 U	0.0187 U	0.0187 U	0.0187 U	0.0187 U	0.0101 J	0.0187 U
	06/24/2013	0.0194 U	0.0194 U	0.0194 U	0.0194 U	0.0291 U	0.0291 U	0.0291 U	0.0194 U	0.0194 U	0.0194 U	-	0.0194 U	0.0194 U
RBC Screening Level Criteria for Groundwater														
Groundwater Volitilization to Outdoor Air Occupational[b]		>S	NA	>S	>S	NV	NV	NV	NA	NV	NV	NA	NV	>S
Groundwater Vapor Intrusion into Buildings Occupational[c]		>S	NA	>S	>S	NV	NV	NV	NA	NV	NV	NA	NV	>S
Groundwater in Excavation Construction/Excavation Worker[d]		>S	NA	>S	>S	>S	>S	>S	NA	>S	>S	NA	>S	>S

Attachment 4

Table 6-2

Dip Tank Area Groundwater Analytical Results - Semivolatile Organic Compounds (ug/L)

Floragon Property

Molalla, Oregon

Sample ID	Sample Date	Indeno (1,2,3-cd) pyrene	Naphthalene	Phenanthrene	Pyrene	Butyl benzyl Phthalate	Bis (2-ethylhexyl) phthalate	Di-n-butyl phthalate	Diethyl phthalate	Dimethyl phthalate	1,4-Dichlorobenzene	2-Methyl naphthalene	Benzoic Acid	Phenol
GP5-W*	10/05/2005	-	1.4 U	-	-	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	1.4 U	27 U	2.7 U
GP6-W*	10/05/2005	-	1.9 U	-	-	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	1.9 U	39 U	3.9 U
GP8-W*	10/05/2005	-	4.2 U	-	-	-	4.2 U	4.2 U	4.2 U	4.2 U	4.2 U	4.2 U	83 U	8.3 U
AB-77/GW	04/14/2010	0.0187 U	0.0374 U	0.0374 U	0.0187 U	-	-	-	-	-	-	-	-	-
MW-1	03/25/2013	0.0189 U	0.0262 J	0.00999 J	0.0189 U	-	-	-	-	-	-	-	-	-
	06/24/2013	0.0192 U	0.0449	0.0192 U	0.0192 U	-	-	-	-	-	-	-	-	-
IMW-1	03/25/2013	0.0748 U	0.150 U	0.0748 U	0.0748 U	-	-	-	-	-	-	-	-	-
MW-2	03/25/2013	0.0187 U	0.0269 J	0.0187 U	0.0187 U	-	-	-	-	-	-	-	-	-
	06/24/2013	0.0190 U	0.0367	0.0190 U	0.0190 U	-	-	-	-	-	-	-	-	-
IMW-2	03/25/2013	0.0187 U	0.0346 J	0.0187 U	0.0187 U	-	-	-	-	-	-	-	-	-
	06/24/2013	0.0190 U	0.0381 U	0.0190 U	0.0190 U	-	-	-	-	-	-	-	-	-
MW-3	03/25/2013	0.0748 U	0.150 U	0.0748 U	0.0748 U	-	-	-	-	-	-	-	-	-
	06/24/2013	0.0190 U	0.0258	0.0122	0.0190 U	-	-	-	-	-	-	-	-	-
MW-7	03/25/2013	0.0187 U	0.0192 J	0.0125 J	0.0187 U	-	-	-	-	-	-	-	-	-
	06/24/2013	0.0194 U	0.0196	0.0194 U	0.0194 U	-	-	-	-	-	-	-	-	-
RBC Screening Level Criteria for Groundwater														
Groundwater Volitilization to Outdoor Air Occupational[b]		NV	16,000	NA	>S	NA	NV	NA	NA	NA	21,000	NA	NA	NA
Groundwater Vapor Intrusion into Buildings Occupational[c]		NV	11,000	NA	>S	NA	NV	NA	NA	NA	7,100	NA	NA	NA
Groundwater in Excavation Construction/Excavation Worker[d]		>S	500	NA	>S	NA	>S	NA	NA	NA	1,500	NA	NA	NA

Attachment 4

Table 6-2

Dip Tank Area Groundwater Analytical Results - Semivolatile Organic Compounds (ug/L)

Floragon Property

Molalla, Oregon

Notes:

Polynuclear Aromatic Hydrocarbons (PAHs) analyzed by EPA Method 8270

[a] Reference removed

[b] Oregon Department of Environmental Quality (DEQ), Generic Risk-Based Concentration (RBC) for groundwater volatilization to outdoor air in an occupational setting (revised November 1, 2015)

[c] DEQ, RBC for groundwater vapor intrusion into buildings in an occupation setting (revised November 1, 2015)

[d] DEQ, RBC for groundwater in excavation for a construction/excavation worker (revised November 1, 2015)

ug/L = Micrograms per liter

NA = Not applicable (no screening levels published for these chemicals)

NV = This chemical is considered "nonvolatile" for purposes of the exposure calculations

>S = This groundwater RBC exceeds the solubility limit. Groundwater in excess of S indicates that free product may be present

J = (Laboratory Qualifier) Estimated value. Detection was below the reporting limit, but above the method detection limit.

U = Not detected at the method reporting limit shown

Attachment 4

Table 7-1

Dip Tank Area Soil Analytical Results - Volatile Organic Compounds (mg/Kg)

Floragon Property

Molalla, Oregon

Sample ID	Depth (feet)	Sample Date	Acetone	Benzene	Bromobenzene	Bromochloromethane	Bromodichloromethane	Bromoform	Bromomethane	2-Butanone	n-Butylbenzene	sec-Butylbenzene	tert-Butylbenzene	Carbon tetrachloride	Chlorobenzene	Chloroethane
IMW-1-1	1	03/04/2013	1.64 U	0.02 U	0.04 U	0.08 U	0.08 U	0.08 U	0.82 U	0.82 U	0.08 U	0.08 U	0.08 U	0.04 U	0.04 U	0.82 U
MW-7-1	1	03/07/2013	1.45 UJ	0.02 U	0.04 U	0.07 U	0.07 U	0.07 U	0.72 U	0.72 U	0.07 U	0.07 U	0.07 U	0.07 U	0.04 U	0.72 U
MW-7-3	3	03/07/2013	1.27 UJ	0.02 U	0.03 U	0.06 U	0.06 U	0.06 U	0.63 U	0.63 U	0.06 U	0.06 U	0.06 U	0.06 U	0.03 U	0.63 U
RBC Screening Level Criteria for Soil																
Ingestion, Dermal Contact, and Inhalation:																
Occupational[a]			NA	37	NA	NA	15	260	750	NA	NA	NA	NA	34	8,700	>Max
Construction Worker[b]			NA	380	NA	NA	230	2,700	370	NA	NA	NA	NA	230	4,700	>Max
Excavation Worker[c]			NA	11,000	NA	NA	6,300	74,000	10,000	NA	NA	NA	NA	8,900	130,000	>Max
Volatilization to Outdoor Air																
Occupational[d]			NA	50	NA	NA	11	360	700	NA	NA	NA	NA	65	>Csat	>Csat
Vapor Intrusion into Buildings:																
Occupational[e]			NA	2.1	NA	NA	0.53	110	17	NA	NA	NA	NA	1.6	>Max	>Csat

Attachment 4

Table 7-1
Dip Tank Area Soil Analytical Results - Volatile Organic Compounds (mg/Kg)
Floragon Property
Molalla, Oregon

Sample ID	Depth (feet)	Sample Date	Chloroform	Chloromethane	2-Chlorotoluene	4-Chlorotoluene	1,2-Dibromo-3-chloropropane	Dibromochloromethane	1,2-Dibromoethane	Dibromomethane	1,2-Dichlorobenzene	1,3-Dichlorobenzene	1,4-Dichlorobenezene	Dichlorodifluoromethane	1,1-Dichloroethane
IMW-1-1	1	03/04/2013	0.08 U	0.41 U	0.08 U	0.08 U	0.41 U	0.16 U	0.04 U	0.08 U	0.04 U	0.04 U	0.04 U	0.16 U	0.04 U
MW-7-1	1	03/07/2013	0.07 U	0.36 U	0.07 U	0.07 U	0.36 U	0.15 U	0.04 U	0.07 U	0.04 U	0.04 U	0.04 U	0.15 U	0.04 U
MW-7-3	3	03/07/2013	0.06 U	0.32 U	0.06 U	0.06 U	0.32 U	0.13 U	0.03 U	0.06 U	0.03 U	0.03 U	0.03 U	0.13 U	0.03 U
RBC Screening Level Criteria for Soil															
Ingestion, Dermal Contact, and Inhalation:															
Occupational[a]			26	25,000	NA	NA	NA	17	0.73	NA	36,000	NA	64	NA	260
Construction Worker[b]			410	25,000	NA	NA	NA	210	9	NA	20,000	NA	1,300	NA	3,200
Excavation Worker[c]			11,000	700,000	NA	NA	NA	2,800	250	NA	560,000	NA	36,000	NA	89,000
Volatilization to Outdoor Air															
Occupational[d]			17	>Csat	NA	NA	NA	14	0.65	NA	>Csat	NA	36	NA	240
Vapor Intrusion into Buildings:															
Occupational[a]			0.41	300	NA	NA	NA	2.9	0.16	NA	>Csat	NA	13	NA	5.9

Attachment 4

Table 7-1

Dip Tank Area Soil Analytical Results - Volatile Organic Compounds (mg/Kg)

Floragon Property

Molalla, Oregon

Sample ID	Depth (feet)	Sample Date	1,2-Dichloroethane	1,1-Dichloroethene	cis-1,2-Dichloroethene	trans-1,2-Dichloroethene	1,2-Dichloropropane	1,3-Dichloropropane	2,2-Dichloropropane	1,1-Dichloropropene	cis-1,3-Dichloropropene	trans-1,3-Dichloropropene	Ethylbenzene	Hexachlorobutadiene	2-Hexanone	Isopropylbenzene
IMW-1-1	1	03/04/2013	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.08 U	0.08 U	0.08 U	0.08 U	0.04 U	0.16 U	0.82 U	0.08 U
MW-7-1	1	03/07/2013	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.04 U	0.07 U	0.07 U	0.07 U	0.07 U	0.04 U	0.15 U	0.72 U	0.07 U
MW-7-3	3	03/07/2013	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.03 U	0.06 U	0.06 U	0.06 U	0.06 U	0.03 U	0.13 U	0.63 U	0.06 U
RBC Screening Level Criteria for Soil																
Ingestion, Dermal Contact, and Inhalation:																
Occupational[a]			16	29,000	2,300	23,000	NA	NA	NA	NA	NA	NA	150	NA	NA	57,000
Construction Worker[b]			200	13,000	710	7,100	NA	NA	NA	NA	NA	NA	1,700	NA	NA	27,000
Excavation Worker[c]			5,600	370,000	20,000	200,000	NA	NA	NA	NA	NA	NA	49,000	NA	NA	750,000
Volatilization to Outdoor Air																
Occupational[d]			15	>Csat	>Max	>Max	NA	NA	NA	NA	NA	NA	160	NA	NA	>Csat
Vapor Intrusion into Buildings:																
Occupational[e]			1.0	680	>Max	>Max	NA	NA	NA	NA	NA	NA	17	NA	NA	>Csat

Attachment 4

Table 7-1

Dip Tank Area Soil Analytical Results - Volatile Organic Compounds (mg/Kg

Floragon Property

Molalla, Oregon

Sample ID	Depth (feet)	Sample Date	4-Isopropyltoluene	4-Methyl-2-pentanone	Methyl tert-butyl ether	Methylene Chloride	Naphthalene	n-Propylbenzene	Styrene	1,1,1,2-Tetrachloroethane	1,1,2,2-Tetrachloroethane	Tetrachloroethene	Toluene	1,2,3-Trichlorobenzene	1,2,4-Trichlorobenzene
IMW-1-1	1	03/04/2013	0.08 U	0.82 U	0.08 U	0.41 U	0.16 U	0.04 U	0.08 U	0.04 U	0.04 U	0.04 U	0.08 U	0.41 U	0.41 U
MW-7-1	1	03/07/2013	0.07 U	0.72 U	0.07 U	0.36 U	0.15 U	0.04 U	0.07 U	0.04 U	0.04 U	0.04 U	0.07 U	0.36 U	0.36 U
MW-7-3	3	03/07/2013	0.06 U	0.63 U	0.06 U	0.32 U	0.13 U	0.03 U	0.06 U	0.03 U	0.03 U	0.03 U	0.06 U	0.32 U	0.32 U
RBC Screening Level Criteria for Soil															
Ingestion, Dermal Contact, and Inhalation:															
Occupational[a]			NA	NA	1,100	NA	23	NA	130,000	NA	NA	1,000	88,000	NA	NA
Construction Worker[b]			NA	NA	12,000	NA	580	NA	56,000	NA	NA	1,800	28,000	NA	NA
Excavation Worker[c]			NA	NA	320,000	NA	16,000	NA	>Max	NA	NA	50,000	770,000	NA	NA
Volatilization to Outdoor Air															
Occupational[d]			NA	NA	1,500	NA	83	NA	>Csat	NA	NA	>Csat	>Csat	NA	NA
Vapor Intrusion into Buildings:															
Occupational[e]			NA	NA	110	NA	83	NA	>Csat	NA	NA	36	>Csat	NA	NA

Attachment 4

Table 7-1
Dip Tank Area Soil Analytical Results - Volatile Organic Compounds (mg/Kg)
Floragon Property
Molalla, Oregon

Sample ID	Depth (feet)	Sample Date	1,1,1-Trichloroethane	1,1,2-Trichloroethane	Trichloroethene	Trichlorofluoromethane	1,2,3-Trichloropropane	1,2,4-Trimethylbenzene	1,3,5-Trimethylbenzene	Vinyl chloride	m,p-Xylene	o-Xylene
IMW-1-1	1	03/04/2013	0.04 U	0.04 U	0.04 U	0.16 U	0.08 U	0.08 U	0.08 U	0.04 U	0.08 U	0.04 U
MW-7-1	1	03/07/2013	0.04 U	0.04 U	0.04 U	0.15 U	0.07 U	0.07 U	0.07 U	0.04 U	0.07 U	0.04 U
MW-7-3	3	03/07/2013	0.03 U	0.03 U	0.03 U	0.13 U	0.06 U	0.06 U	0.06 U	0.03 U	0.06 U	0.03 U
RBC Screening Level Criteria for Soil												
Ingestion, Dermal Contact, and Inhalation:												
Occupational[a]			870,000	26	51	130,000	NA	2,000	12,000	4.4	25,000 [f]	25,000 [f]
Construction Worker[b]			470,000	54	470	69,000	NA	2,000	3,500	34	20,000 [f]	20,000 [f]
Excavation Worker[c]			>Max	1,500	13,000	>Max	NA	54,000	98,000	950	560,000 [f]	560,000 [f]
Volatilization to Outdoor Air												
Occupational[d]			>Csat	24	96	>Csat	NA	980	>Max	89	>Csat [f]	>Csat [f]
Vapor Intrusion into Buildings:												
Occupational[e]			>Csat	4.2	2.3	>Csat	NA	210	>Max	2.2	>Csat [f]	>Csat [f]

Attachment 4

Table 7-1

Dip Tank Area Soil Analytical Results - Volatile Organic Compounds (mg/Kg)

Floragon Property

Molalla, Oregon

Notes:

Volatile organic compounds (VOCs) analyzed by EPA Method 8260B

[a] Department of Environmental Quality (DEQ), Generic Risk Based Concentration (RBC) for ingestion, dermal contact, and inhalation in an occupational setting (revised November 1, 2015)

[b] DEQ Generic RBC for ingestion, dermal contact, and inhalation by a construction worker (revised November 1, 2015)

[c] DEQ Generic RBC for ingestion, dermal contact, and inhalation by an excavation worker (revised November 1, 2015)

[d] DEQ Generic RBC for volatilization to outdoor air by in an occupational setting (revised November 1, 2015)

[e] DEQ Generic RBC for for vapor intrusion into buildings in an occupational setting (revised November 1, 2015)

[f] DEQ RBC screening level value for Total Xylenes

mg/Kg = Milligrams per kilogram

NA = Not applicable (no screening levels published for these chemicals)

UJ = (PNG Qualifier) Analyte was not detected, but should be considered estimated. See corresponding data validation report for further explanation.

U = Not detected at the method reporting limit shown

>Max = The constituent RBC for this pathway is greater than 100,000 mg/kg or 100,000 mg/L and is considered unlikely to be encountered.

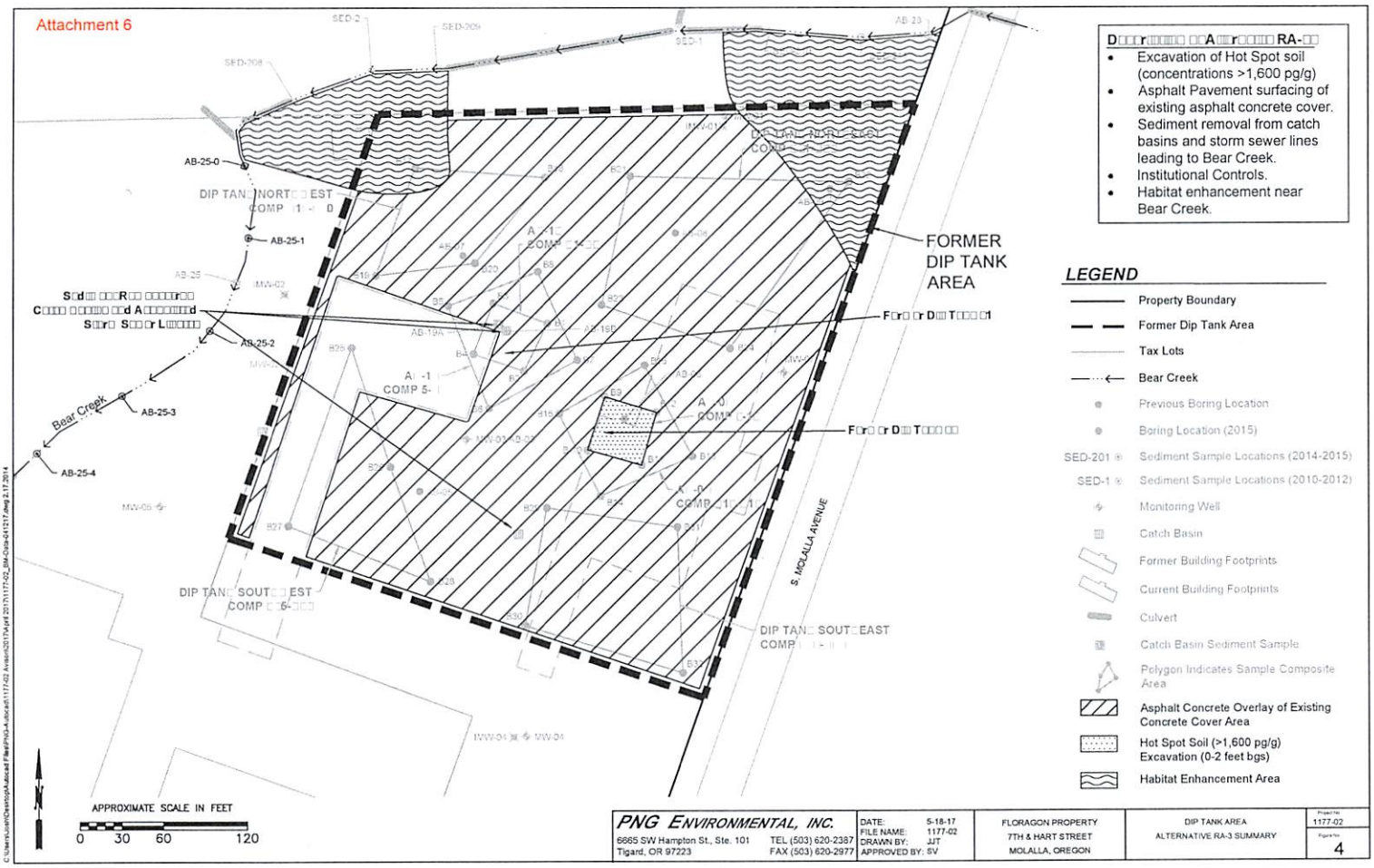
>Csat = This soil RBC exceeds the limit of three-phase equilibrium partioning, soil concentrations in excess of Csat indicate that free product might be present

Attachment 5

Table 1
Detailed Evaluation of Alternatives - Former Dip Tank Area
Floragon Property
Molalla, Oregon

ALTERNATIVE	PROTECTIVENESS	REMEDY BALANCING FACTORS					HOT SPOT TREATMENT
		Effectiveness	Long Term Reliability	Implementability	Implementation Risk	Cost Reasonableness	
RA-1 **No Action**	RA-1 does not meet RAOs. RA-1 is not protective of human health and the environment.	RA-1 is not effective at reducing dioxin concentrations in soil or storm sewer sediment. RA-1 does not prevent future migration to Bear Creek of dioxin concentrations exceeding the PRG (TEQ of 20 pg/g) or potential future direct contact exposure to dioxin conc. greater than the occupational RBC (16 pg/g). The Dip Tank area average dioxin soil concentration would remain at 100 pg/g. A relatively small area (less than 2000 sq. ft.) of the Former Dip Tank Area would contain soil with dioxin concentrations greater than 1600 pg/g.	RA-1 has relatively low reliability over the long term due to the persistence of dioxins in the environment and uncertainties regarding future migration and direct contact potential to dioxin concentrations greater than acceptable risk based standards.	RA-1 is relatively easy to implement.	The implementation risk of RA-1 is relatively low.	No costs are associated with No Action.	The No Action Alternative (RA-1) does not actively treat the Hot Spot soil.
RA-2 **Storm Sewer Cleaning, Cap (Asphalt Concrete Pavement over Existing Weathered Asphalt Concrete), Institutional Controls, and Habitat Enhancement**	RA-2 would meet the project specific RAOs and is protective.	RA-2 would be effective at limiting the migration of dioxins from the Former Dip Tank Area soil to Bear Creek and preventing potential direct contact exposure. RA-2 would be protective of human health and Bear Creek through storm sewer cleaning and maintenance of the existing concrete cover over the residual contaminated soil. However, RA-2 would not be effective at reducing dioxin concentrations in soil. The Dip Tank area average dioxin soil concentration would remain at 100 pg/g. A relatively small area (less than 2000 sq. ft.) of the Former Dip Tank Area would contain soil with dioxin concentrations slightly greater than 1600 pg/g((i.e. one sample location with dioxin concentration of 2,221 pg/g).	RA-2 is expected to be reliable over the long term at preventing migration and managing direct contact risk from dioxins. Institutional controls and cap/cover maintenance would be reliable in maintaining protective cap.	RA-2 is relatively straightforward to implement. RA-2 involves asphalt paving over the existing asphalt concrete cover and storm sewer cleaning. Pavement activities limited to dry and warm weather conditions. Habitat enhancement activities will require timing considerations such as growing season and creek flow condition. Experienced contractors are commonly available.	RA-2 would involve the installation of an asphalt concrete overlay over the existing three to four inch weathered asphalt concrete surface. The implementation risks associated with RA-2 are relatively low.	The estimated present worth cost for RA-2 is $519,000. Capital costs are estimated at $443,000 and the present worth cost of long term inspection and maintenance activities is estimated at $76,000. RA-2 has good cost reasonableness compared to RA-3 and RA-4.	RA-2 does not actively treat the Hot Spot soil.
RA-3 **Hot Spot Soil Removal, Storm Sewer Cleaning, Cap (Asphalt Concrete Pavement over Existing Weathered Asphalt Concrete), Institutional Controls, and Habitat Enhancement**	RA-3 would meet the project specific RAOs and is protective.	RA-3 would be effective at limiting the migration of dioxins from the Former Dip Tank Area soil and preventing potential direct contact exposure. RA-3 would be effective at mass removal in the small Hot Spot (dioxin concentration greater than 1600 pg/g) through soil excavation. Mass removal using RA-3 would occur over a relatively short period of time. RA-3 would be protective of human health and Bear Creek through the removal of hot spot soil, storm sewer cleaning, and maintenance of the existing concrete cover over the residual contaminated soil. The Dip Tank area average dioxin soil concentration would be reduced to 60 pg/g from 100 pg/g.	RA-3 is expected to be reliable over the long term at preventing migration and managing direct contact risk from dioxins. Institutional controls and cap/cover maintenance would be reliable in maintaining protective cap.	RA-3 is relatively more difficult to implement than RA-2. RA-3 involves soil excavation, installation of an asphalt concrete overlay over the existing three to four inch weathered asphalt concrete surface and storm sewer cleaning. Pavement activities limited to dry and warm weather conditions. Habitat enhancement activities will require timing considerations such as growing season and creek flow condition. Equipment and experienced contractors to implement RA-3 are commonly available.	RA-3 involves the excavation of an asphalt concrete overlay over the existing three to four inch weathered asphalt concrete surface. Although Hot Spot contaminated soil is removed from the subsurface, managed on site, and transported off site, the implementation risks associated with RA-3 are relatively low.	The estimated present worth cost for RA-3 is $648,000. Capital costs are estimated at $572,000 and the present worth cost of long term inspection and maintenance activities is estimated at $76,000. For cost estimating purposes soil excavated from the Hot Spot location is assumed to be transported and disposed of at a regulated landfill, Chemical Waste Management (Arlington facility), as hazardous waste. Avison Lumber believes the excavated soil from the Hot Spot area should be able to go to the Hillsboro Landfill as special waste. Avison Lumber is continuing to coordinate with DEQ regarding the appropriate profiling and disposal of the excavated soil. RA-3 has good cost reasonableness compared to RA-4.	RA-3 will remove dioxin in soil Hot Spot from the site. However, dioxin would not be treated or destroyed, but rather transferred to an offsite landfill facility.
RA-4 **Storm Sewer Cleaning/Replacement and Contaminated Soil Removal**	RA-4 would meet the project specific RAOs and is protective.	RA-4 would be effective at dioxin mass removal through soil excavation. Mass removal using RA-4 would occur over a relatively short period of time. RA-4 would remove all soils in the Former Dip Tank Area that contain dioxin concentrations above the occupational direct contact RBC and DEQ Bear Creek sediment PRG. The Dip Tank area average dioxin soil concentration would be reduced to less than 16 pg/g from 100 pg/g.	RA-4 is expected to be reliable over the long term at preventing migration and managing direct contact risk from dioxins. Soil dioxin concentrations would be substantially reduced (i.e., dioxin concentrations less than sediment PRG and direct contact RBC).	RA-4 is relatively more difficult to implement than RA-2 and RA-3. RA-4 involves soil excavation over a larger area than RA-3, as well as reconstruction of site storm water drainage following soil removal activities. RA-4 involves handling, segregation, and management of both hazardous and non-hazardous soil.	Although contaminated soil is removed from the subsurface, managed on site, and transported off site, the implementation risks associated with RA-4 are relatively low.	The estimated present worth cost for RA-4 is $2,720,000. For cost estimating purposes soil excavated from adjacent to the former Dip Tank #1 and Dip Tank #2 is assumed to be transported and disposed of at a regulated landfill, Chemical Waste Management (Arlington facility), as hazardous waste. Avison Lumber believes the excavated soil from the former dip tank locations should be able to go to the Hillsboro Landfill as special waste. Avison Lumber is continuing to coordinate with DEQ regarding the appropriate profiling and disposal of the excavated soil. RA-4 has poor cost reasonableness compared to RA-2 and RA-3.	RA-4 will remove all soil where dioxin concentrations that exceed applicable RBCs from the site. However, dioxins would not be destroyed but rather transferred to an offsite landfill facility.

Attachment 6



D[illegible] RA-[illegible]

- Excavation of Hot Spot soil (concentrations >1,600 pg/g)
- Asphalt Pavement surfacing of existing asphalt concrete cover.
- Sediment removal from catch basins and storm sewer lines leading to Bear Creek.
- Institutional Controls.
- Habitat enhancement near Bear Creek.

LEGEND

- Property Boundary
- Former Dip Tank Area
- Tax Lots
- Bear Creek
- Previous Boring Location
- Boring Location (2015)
- SED-201 Sediment Sample Locations (2014-2015)
- SED-1 Sediment Sample Locations (2010-2012)
- Monitoring Well
- Catch Basin
- Former Building Footprints
- Current Building Footprints
- Culvert
- Catch Basin Sediment Sample
- Polygon Indicates Sample Composite Area
- Asphalt Concrete Overlay of Existing Concrete Cover Area
- Hot Spot Soil (>1,600 pg/g) Excavation (0-2 feet bgs)
- Habitat Enhancement Area

PNG ENVIRONMENTAL, INC. 6665 SW Hampton St., Ste. 101 Tigard, OR 97223 TEL (503) 620-2387 FAX (503) 620-2977	DATE: 5-18-17 FILE NAME: 1177-02 DRAWN BY: JJT APPROVED BY: SV	FLORAGON PROPERTY 7TH & HART STREET MOLALLA, OREGON	DIP TANK AREA ALTERNATIVE RA-3 SUMMARY	Project No. 1177-02 Figure No. 4

C:\Users\Joan\Desktop\Autocad Files\PNG-Autocad\1177-02 Aviation\2017\April 2017\1177-02_SM-Data-041517.dwg 2.17.2014

Attachment 7

September 29, 2017

Comments for Decision of Record for proposed cleanup at the Floragon property

Dear Mr. Hafley,

Bear Creek Recovery (BCR) has commented for several years regarding the need for cleanup of the dioxin contamination at Floragon, Avison Mill One and in Bear Creek. We advocate for the health of entire watershed. We cannot support the proposed "clean-up" of Floragon's Dip Tank Area and the inadequate habitat restoration.

BCR has read the Pudding River Watershed objections and we endorse their public comments.

Bear Creek's dioxin contamination begins on Avison Mill One site and continues through Floragon, picking up more dioxin contamination. BCR cannot endorse any mitigation or habitat enhancement on the downstream portion of Bear Creek without a concurrent mitigation and enhancement on Avison Mill One. After three decades of investigation, this apparent sudden rush to "mitigate" Floragon seems more driven by the interest of the owner of Floragon to be able to sell/lease that site than in sound mitigation which would look at the Bear Creek drainage as a whole.

We urge DEQ to step back and look at the entire watershed, instead of piecemeal sections. We have furnished with DEQ many photos of the extensive flooding that happens regularly on Bear Creek. By leaving the upstream contamination in place, there is a risk of re-contaminating the downstream section of Bear Creek via future floods. We also noted Clackamas County's future project to improve the section of S. Molalla Ave x Bear Creek – has DEQ interfaced with CC Roads to understand what kind of risk a culvert replacement or bridge in that area might pose to this "mitigation"?

BCR also rejects capping as a solution to the Dip Tank seepage. DEQ itself notes it does not have time or staff to commit to regular inspections of the proposed capping. Self-inspection on the honor system could easily allow the cap to fail.

The proposed habitat enhancement is not adequate to provide any meaningful habitat, especially since the "enhancement" is proposed on two tiny parcels separated by a culvert. There is no agreement for maintenance of these "habitat enhancements" which could easily be wiped out in early years by floods or overcome by weedy invasives.

Please consider requiring concurrent and meaningful mitigation of the entire Bear Creek Watershed rather than this entirely inadequate downstream mitigation.

Sincerely,
The Board of Directors of Bear Creek Recovery
PO Box 50, Molalla Oregon 97038
503-789-7179

Attachment 8

190 Garfield Street, Woodburn, OR 97071
cleanpuddingriver@gmail.com (503) 548-7159

Dan Hafley
DEQ Project Manager
700 NE Multnomah, Suite 600
Portland, Oregon 97232

Dear Mr. Hafley:

Re: Request for public comments for Decision of Record for proposed cleanup at the Dip Tank Area portion of the Floragon property

The Pudding River Watershed Council requests that DEQ not issue a Decision of Record at this time for the proposal submitted by PNG Environmental regarding contaminated soil associated in the Dip Tank Area portion of the Floragon property. The most obvious concerns in the proposal are the absence of comprehensive, coordinated planning for the cleanup of Bear Creek and the indefinite need for monitoring. The September 18th DEQ meeting material noted the low to moderate contamination in Bear Creek, and the need to address it with a cleanup plan. If a DOR is obtained at this time and a Conditional No Further Action issued, there is a high likelihood that any habitat enhancement actions will be premature resulting in long-term failure of habitat function, and the potential lack of incentive for responsible parties to continue the necessary work to complete all cleanup actions in all areas.

Additionally, if the proposal is accepted and contaminated soil is permanently capped (requiring maintenance and monitoring in perpetuity), the low gradient, low elevation Bear Creek will continue to top its banks during high flows. With known contaminated sediment transport a potential risk, the calculation estimating short-term exposure risk of 104 days over two years is inadequate. The neighborhood adjacent (100 meters) to the property provides too many opportunities for trespassing and would pose as an attractive nuisance to neighborhood kids that want to play in the creek.

For the benefit of Molalla, its residents, and fish and wildlife, PRWC recommends that any Decision of Record require coordination of the cleanup of Bear Creek, including planning and implementation with the groups listed below.

- Molalla River Watch
- City of Molalla
- Pudding River Watershed Council
- Bear Creek Recovery

Thank you for the opportunity to provide these comments.

Anna Rankin

Anna Rankin
Executive Director

Attachment 9

DEQ Response to Citizen Comments; September 2017

The following are comments received by DEQ during the September 2017 public comment period on a proposed remedy for the Dip Tank Area portion of the Floragon Forest Products site located in Molalla, Oregon, ECSI# 0009. Two sets of comments were received, and are included as Attachments 7 and 8 to DEQ's ROD.

For each comment, comment language has been presented verbatim, in italics. A separate DEQ response is presented for each comment. A numbering system has been applied to the comments for the sake of clarity.

SECTION 1 - BEAR CREEK RECOVERY COMMENTS

Comment #1. *Bear Creek Recovery (BCR) has commented for several years regarding the need for cleanup of the dioxin contamination at Floragon, Avison Mill One and in Bear Creek. We advocate for the health of entire watershed. We cannot support the proposed "clean-up" of Floragon's Dip Tank Area and the inadequate habitat restoration.*

DEQ Response. We understand and appreciate your interest in, and focus on, the entire watershed, and will continue to factor this issue into cleanup decision-making to the degree possible. Investigation and cleanup actions under DEQ's Cleanup Program are, however, completed on a site-specific basis consistent with DEQ's authority under Oregon Statute. We have and will consider ways in which cleanup action at the Avison and Floragon sites can be done in a "complementary" manner. It is important to note that DEQ does not have the regulatory authority to require habitat restoration.

Comment #2. *BCR has read the Pudding River Watershed objections and we endorse their public comments.*

DEQ Response. Thank you. See DEQ responses to Pudding River Watershed Council (PCWC) comments below.

Comment #3. *Bear Creek's dioxin contamination begins on Avison Mill One site and continues through Floragon, picking up more dioxin contamination. BCR cannot endorse any mitigation or habitat enhancement on the downstream portion of Bear Creek without a concurrent mitigation and enhancement on Avison Mill One. After three decades of investigation, this apparent sudden rush to "mitigate" Floragon seems more driven by the interest of the owner of Floragon to be able to sell/lease that site than in sound mitigation, which would look at the Bear Creek drainage as a whole.*

DEQ Response. As indicated in the comment, dioxins have been detected in Bear Creek sediment on both the Avison (upstream) and Floragon (downstream) sites. Data collected over a number years indicate that dioxin impacts to the segment of Bear Creek adjacent to the Avison site are modest, with a maximum concentration of 190 parts per trillion (ppt) detected. The average dioxin concentration in Bear Creek as it leaves the Avison property is 51 ppt. Bear Creek sediment data indicate that, under current conditions, Avison South Parcel contamination does not present a recontamination concern to the segment of Bear Creek located (downstream) at the Floragon site. *If* cleanup at Avison South Parcel is completed before similar work at Floragon, measures will be put in place to prevent off-site contaminant migration including to Bear Creek. DEQ *is* working to complete cleanup work as soon as possible, both for protection of public health and the environment, allow for productive reuse of the property, and ongoing public concerns that cleanup is "taking too long."

Comment #4. *We urge DEQ to step back and look at the entire watershed, instead of piecemeal sections. We have furnished with DEQ many photos of the extensive flooding that happens regularly on Bear Creek. By leaving the upstream contamination in place, there is a risk of re-contaminating the downstream section of Bear Creek via future floods. We also noted Clackamas County's future project to improve the section of S. Molalla Ave x Bear Creek – has DEQ interfaced with CC Roads to understand what kind of risk a culvert replacement or bridge in that area might pose to this "mitigation"?*

DEQ Response. We have looked at the watershed to the degree allowed within the regulatory framework under which DEQ operates. As noted in the response for the previous comment, data indicate that flooding of Bear Creek at the Avison site has not resulted in "recontamination" downstream. Dioxin contamination in the South Parcel area has been present for decades, yet concentrations in the adjacent and downstream creek bed are generally at acceptable levels. DEQ contacted Clackamas County regarding the potential for improvements to or redevelopment of S. Molalla Avenue at or near Bear Creek. No work is planned or contemplated.

Comment #5. *BCR also rejects capping as a solution to the Dip Tank seepage. DEQ itself notes it does not have time or staff to commit to regular inspections of the proposed capping. Self-inspection on the honor system could easily allow the cap to fail.*

DEQ Response. DEQ has determined excavation of hot spot contamination and capping to be protective and effective on a long-term basis. Cap inspections will be the responsibility of the site owner, with review and approval of inspection reports by DEQ. Ongoing cap inspection and maintenance are required, in perpetuity, and will be documented in an easement to be recorded with the property. If controls are not maintained, DEQ can rescind any no further action decision for the Dip Tank Area.

Comment #6. *The proposed habitat enhancement is not adequate to provide any meaningful habitat, especially since the "enhancement" is proposed on two tiny parcels separated by a culvert. There is no agreement for maintenance of these "habitat enhancements" which could easily be wiped out in early years by floods or overcome by weedy invasives.*

DEQ Response. We agree that the proposed habitat enhancement is modest. There is no regulatory basis for DEQ requiring habitat enhancement in the Dip Tank Area, nor are we aware of any requirement on the part of the Oregon Division of State Lands or other regulatory agency. DEQ *suggested* the inclusion of natural areas within the cleanup area and adjacent to Bear Creek, acknowledging habitat concerns on the part of Bear Creek Recovery and others. Avison included natural areas in cleanup planning. DEQ cannot require maintenance of these areas as "habitat enhancements", only that they continue to function as protective caps (and be resistant to flooding). We agree that, over time, invasive plant species including reed canary grass, may invade the habitat enhancements. DEQ will recommend (but cannot require) ongoing efforts to keep invasive plants out of habitat enhancement areas.

Comment #7. *Please consider requiring concurrent and meaningful mitigation of the entire Bear Creek Watershed rather than this entirely inadequate downstream mitigation.*

DEQ Response. Please see our responses for comments #1 and #4 above.

SECTION 2 – PUDDING CREEK WATERSHED COUNCIL COMMENTS

Comment #1. *The Pudding River Watershed Council requests that DEQ not issue a Decision of Record at this time for the proposal submitted by PNG Environmental regarding contaminated soil associated in the Dip Tank Area portion of the Floragon property. The most obvious concerns in the proposal are the absence of comprehensive, coordinated planning for the cleanup of Bear Creek and the indefinite need for monitoring. The September 18th DEQ meeting material noted the low to moderate contamination in Bear Creek, and the need to address it with a cleanup plan. If a DOR is obtained at this time and a Conditional No Further Action issued, there is a high likelihood that any habitat enhancement actions will be premature resulting in long-term failure of habitat function, and the potential lack of incentive for responsible parties to continue the necessary work to complete all cleanup actions in all areas.*

DEQ Response. Please see our responses for BCR comments #1 and #4 above.

Comment #2. *Additionally, if the proposal is accepted and contaminated soil is permanently capped (requiring maintenance and monitoring in perpetuity), the low gradient, low elevation Bear Creek will continue to top its banks during high flows. With known contaminated sediment transport a potential risk, the calculation estimating short-term exposure risk of 104 days over two years is inadequate. The neighborhood adjacent (100 meters) to the property provides too many opportunities for trespassing and would pose as an attractive nuisance to neighborhood kids that want to play in the creek.*

DEQ Response. We agree that Bear Creek will continue to flood on a seasonal basis. Site data do not indicate that this has resulted in contamination of upland areas through flooding, while cleanup of Bear Creek contamination on the Floragon site is expected to occur no later than 2019, which would eliminate the potential for "displacement" of Bear Creek contamination on the Floragon site. Downstream of the Floragon site, dioxin contamination in Bear Creek does not pose a risk to either public health or the environment. DEQ feels that the exposure assumptions developed for Bear Creek are appropriately conservative.

Comment #3. *For the benefit of Molalla, its residents, and fish and wildlife, PRWC recommends that any Decision of Record require coordination of the cleanup of Bear Creek, including planning and implementation with the groups listed below.*

- *Molalla River Watch*
- *City of Molalla*
- *Pudding River Watershed Council*
- *Bear Creek Recovery*

DEQ Response. DEQ will continue to engage the local government and the public, including BCR and PCWC, regarding cleanup activities at the former Avison and Floragon lumber sites, in particular as they relate to actions within or around Bear Creek.