

Current Human Exposures Under Control
Environmental Indicator (EI) RCRIS code (CA725)
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DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION
RCRA Corrective Action
Environmental Indicator (EI) RCRIS code (CA725)

Current Human Exposures Under Control - Revised 12/6/01

Facility Name: Wah Chang (formerly Oremet-Wah Chang, Teledyne Industries)
Facility Address: 1600 NE Old Salem Road Albany, Oregon 97321
Facility EPA ID #: ORD 05095 5848

1. Has **all** available relevant/significant information on known and reasonably suspected releases to soil, groundwater, surface water/sediments, and air, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

If yes - check here and continue with #2 below.
 If no - re-evaluate existing data, or
 If data are not available skip to #6 and enter a IN (more information needed) status code.

Rationale and References: Two CERCLA Records of Decision, one for surface and subsurface soil and the second for groundwater and sediments, have been implemented. The soil and sediment remedies have been completed, and will be certified by EPA pending completion of an Explanation of Significant Differences for the soil operable unit and a five year performance monitoring program for the sediment operable unit. Remedial action for the groundwater operable unit is ongoing. Pre-and post ROD activities are well documented, and the documentation reviewed and approved by USEPA Region 10 and Oregon Department of Environmental Quality (ODEQ) representatives. The EPA library in Seattle, Washington and ODEQ library in Eugene, Oregon contain many of the references cited herein. The current EPA Site Manager is Kevin Rochlin (206-553-2106), and the DEQ Site Manager is Don Hanson (541-686-7838).

2. Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be “**contaminated**”¹ above appropriately protective risk-based “levels” (applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action (from SWMUs, RUs or AOCs)?

<u>Media</u>	<u>Yes</u>	<u>No</u>	<u>?</u>	<u>Rationale / Key Contaminants</u>
Air (indoors) ²		x		Facility buildings have design and/or active venting measures to prevent vapor accumulation.

¹ Contamination and contaminated describe media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriately protective risk-based levels (for the media, that identify risks within the acceptable risk range).

² Recent evidence (from the Colorado Dept. of Public Health and Environment, and others) suggests that unacceptable indoor air concentrations are more common in structures above groundwater with volatile contaminants than previously believed. This is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration necessary to be reasonably certain that indoor air (in structures located above (and adjacent to) groundwater with volatile contaminants) does not present unacceptable risks.

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<u>Media</u>	<u>Yes</u>	<u>No</u>	<u>?</u>	<u>Rationale / Key Contaminants</u>
Air (outdoors)		x		Partitioning of volatile contaminants detected in soil and groundwater at the site does not pose an outdoor air risk.
Surface Water			x	Periodic surface water sampling performed concurrently with groundwater remedial action performance assessments.
Sediment			x	Annual performance monitoring sampling events.
Surface Soil (e.g., <2 ft)	x			Sampling conducted during the 1993 RI/FS and under the Environmental Evaluation Protocol has detected PCBs, metals, and radionuclides.
Subsurface Soil (e.g., >2 ft)	x			Sampling conducted during the 1993 RI/FS and under the Environmental Evaluation Protocol has detected PCBs, metals, radionuclides and VOCs.
Groundwater	x			Groundwater monitoring has detected PCE, TCE, 1, 1-DCE, pH, chloride and ammonia.

___ If no (for all media) - skip to #6, and enter a yes, and status code after providing or citing appropriate "levels", and referencing sufficient supporting documentation demonstrating that these "levels" are not exceeded.

x If yes (for any media) - continue after identifying key contaminants in each "contaminated" medium, citing appropriate "levels" (or provide an explanation for the determination that the medium could pose an unacceptable risk), and referencing supporting documentation.

___ If unknown (for any media) - skip to #6 and enter "IN" status code.

Rationale and Reference(s): Justification for "no" determinations made in this section are based on information provided in the following references:

- Indoor/Outdoor Air. Open-air construction and active ventilation systems, in facility buildings overlying areas with subsurface volatile organic compound (VOC) occurrences, prevents accumulation of these vapors in indoor air. Preliminary work associated with development of a draft Indoor Air Investigation Work Plan (CH2M HILL 1999) revealed no evidence of VOCs above screening levels in outdoor air (Relevant plan information available upon request from CH2MHILL/Wah Chang)
- Surface Water. Laboratory analysis of surface water samples collected in 1998, 2000 and 2001 as described in the August 1998 Surface Water Sampling Results (CH2M HILL Memorandum October 1998), Fabrication Groundwater Remedial Action Construction Report (CH2M HILL November 2001) and Fabrication Area 1st Semester Performance Evaluation Report (CH2M HILL Memorandum January 2002).
- Sediment. Laboratory analysis of sediment samples collected to document effectiveness of the removal and bank stabilization remedial action (Truax Creek Annual Monitoring Report CH2M HILL, 1998, 1999, 2000 and 2001).

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Information forming the basis for the “yes” determinations made in this section is provided in the following references:

- Surface/Subsurface Soil. Remedial Investigation/Feasibility Study Report (CH2M HILL 1993), Surface/Subsurface Soils Status Report (CH2M HILL November 2000), Draft Explanation of Significant Differences (EPA 2001), Year 1999 Biennial Report on Environmental Evaluations (Wah Chang 1999), Year 2001 Biennial Report on Environmental Evaluations (CH2M HILL 2001).
 - Groundwater. Farm Ponds Year 2000 Annual Groundwater Remedial Action Report (CH2M HILL January 2001), Solids Area Year 2001 Annual Groundwater Remedial Action Report (CH2M HILL January 2001), South Extraction Area 4th Quarter Groundwater Remedial Action Report (CH2M HILL Memorandum December 2001), Feed Makeup Area Remedial Design Modification No. 2 (CH2M HILL Memorandum September 2001), Fabrication Area Groundwater Remedial Action Construction Report (CH2M HILL November 2001), Fabrication Area 1st Semester Groundwater Remedial Action Report (CH2M HILL Memorandum January 2002).
3. Are there **complete pathways** between “contamination” and human receptors such that exposures can be reasonably expected under the current (land- and groundwater-use) conditions?

Summary Exposure Pathway Evaluation Table

<u>Contaminated Media</u>	<u>Potential Human Receptors (Under Current Site Use Conditions)</u>						
	Workers (onsite)	Construction	Tres-passers	Residents	Recreation	Daycare	Food ³
Air (indoors)	Yes	Yes	No	No	No	No	No
Air (outdoors)	Yes	Yes	No	No	No	No	No
Surface Water	No	No	No	No	No	No	No
Sediment	No	No	No	No	No	No	No
Soil (surface, e.g., <2 ft)	No	No	No	No	No	No	No
Soil (subsurface e.g., >2 ft)	No	No	No	No	No	No	No
Groundwater	No	No	No	No	No	No	No

___ If no (pathways are not complete for any contaminated media-receptor combination) - skip to #6 and enter a YES status code, after explaining and/or referencing condition(s) in-place, whether natural or man-made, preventing a complete exposure pathway from each contaminated medium (e.g., use optional Pathway Evaluation Work Sheet to analyze major pathways).

x If yes (pathways are complete for any Contaminated Media - Human Receptor combination) continue after providing supporting explanation.

___ If unknown (for any Contaminated Media - Human Receptor combination) skip to #6 and enter a IN status code.

Rationale and Reference(s): Open air construction and engineered ventilation systems prevent accumulation and

³ Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

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worker exposure to indoor vapors potentially associated with off-gassing from subsurface VOC plumes present beneath facility buildings. Confined space entry procedures also require screening for organic vapors, oxygen, and other gases prior to worker entry into below grade basements and vaults. Paved surfaces and natural ventilation prevent vapor outdoors. Engineering and institutional controls, in the form of a pre-excavation Environmental Evaluation Protocol and notification in the Wah Chang Facilities Plan prevent occupational and construction worker exposure to residual or uncharacterized soil contamination. Monitor well locks, a Wah Chang Facilities Plan notification, and deed restrictions for onsite and affected offsite properties prevent exposure to contaminated groundwater. Perimeter fences and a 24-hour security guard prevent public access to the site.

4. Can the **exposures** from any of the complete pathways identified in #3 be reasonably expected to be **significant**⁴ (i.e., potentially unacceptable because exposures can be reasonably expected to be: 1) greater in magnitude (intensity, frequency and/or duration) than assumed in the derivation of the acceptable levels used to identify the contamination); or 2) the combination of exposure magnitude (perhaps even though low) and contaminant concentrations (which may be substantially above the acceptable levels) could result in greater than acceptable risks)?

- If no (exposures can not be reasonably expected to be significant (i.e., potentially unacceptable) for any complete exposure pathway) - skip to #6 and enter [YE] status code after explaining and/or referencing documentation justifying why the exposures (from each of the complete pathways) to contamination (identified in #3) are not expected to be significant.
- If yes (exposures could be reasonably expected to be significant) (i.e., potentially unacceptable) for any complete exposure pathway) - continue after providing a description (of each potentially unacceptable exposure pathway) and explaining and/or referencing documentation justifying why the exposures (from each of the remaining complete pathways) to contamination (identified in #3) are not expected to be significant
- If unknown (for any complete pathway) - skip to #6 and enter [IN] status code

Rationale and Reference(s): Based on same rationale and reference in no. 3 above.

5. Can the significant **exposures** (identified in #4) be shown to be within **acceptable** limits?

- If yes (all significant exposures have been shown to be within acceptable limits) - continue and enter a YES after summarizing and referencing documentation justifying why all significant exposures to contamination are within acceptable limits (e.g., a site-specific Human Health Risk Assessment).
- If no (there are current exposures that can be reasonably expected to be unacceptable) continue and enter a NO status code after providing a description of each potentially unacceptable exposure.
- If unknown (for any potentially unacceptable exposure) - continue and enter status code

Rationale and Reference(s): Based on response to no. 3 above, no response required here.

⁴ If there is any question on whether the identified exposures are significant (i.e., potentially unacceptable) consult a human health Risk Assessment specialist with appropriate education, training and experience.

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**Documentation of Environmental Indicator Determination
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Migration of Contaminated Groundwater Under Control – Revised 01/07/02

Facility Name: Wah Chang (formerly Oremet-Wah Chang, Teledyne Industries)
Facility Address: 1600 NE Old Salem Road Albany, Oregon 97321
Facility EPA ID #: ORD 05095 5848

1. Has **all** available relevant/significant information on known and reasonably suspected releases to the groundwater media, subject to RCRA Corrective Action (e.g., from Solid Waste Management Units (SWMU), Regulated Units (RU), and Areas of Concern (AOC)), been **considered** in this EI determination?

If yes - check here and continue with #2 below.
 If no - re-evaluate existing data, or
 If data are not available skip to #6 and enter "IN" (more information needed) status code.

2. Is **groundwater** known or reasonably suspected to be **contaminated**¹ above appropriately protective levels (i.e., applicable promulgated standards, as well as other appropriate standards, guidelines, guidance, or criteria) from releases subject to RCRA Corrective Action, anywhere at, or from, the facility?

If yes - continue after identifying key contaminants, citing appropriate levels, and referencing supporting documentation.
 If no - skip to #8 and enter a YES status code, after citing appropriate levels, and referencing supporting documentation to demonstrate that groundwater is not contaminated.
 If unknown - skip to #8 and enter a IN status code.

Rationale and Reference(s): There is an extensive monitoring network containing over 100 monitor wells in four different (Farm Ponds, Solids, Extraction and Fabrication) remedial sectors. The nature of contaminants present and their concentration was initially mapped and the results presented in the Remedial Investigation and Feasibility Study Report (CH2M HILL 1993). Additional design investigations and periodic assessment monitoring, performed since issuance of the Groundwater and Sediments Operable Unit Record of Decision (EPA 1994), have refined the contaminant plume boundaries and generated a comprehensive understanding of contaminant occurrences at the site. The primary contaminants of concern for the four remedial sectors, and the maximum detected concentration observed in 2000, are as follows:

- Farm Ponds. Tetrachloroethene (PCE) – 0.023 mg/L, trichloroethene (TCE) – 0.022 mg/L, and chloride – 1700 mg/L. PCE, TCE and their breakdown products were detected at only 4 of 33 monitor well locations. Chloride is present above background levels at 11 of 33 well locations.

¹ Contamination and contaminated describes media containing contaminants (in any form, NAPL and/or dissolved, vapors, or solids, that are subject to RCRA) in concentrations in excess of appropriate levels (appropriate for the protection of the groundwater resource and its beneficial uses).

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- Solids. Chloride - 3360 mg/L, iron - 65.7 mg/L, manganese – 17.5 mg/L and magnesium 893 mg/L. Concentrations exceed background levels in each of the 17 monitor wells present in this area.
 - Extraction Area (South Extraction). TCE – 0.038 mg/L, 1, 1-dichloroethene (DCE) 0.012 mg/L. Concentrations exceed the ROD performance standards at 8 of 10 extraction and monitor well locations present in this area.
 - Extraction Area (Feed Makeup). pH – 1.25 units, arsenic 0.239 mg/L, radium 226 – 69 pCi/L and chloride 10,767 mg/L. These constituents are present in one or more of the eight extraction and monitor wells located in this area.
 - Fabrication Area. 1,1,1-trichlorethane (TCA) – 8.1 mg/L, DCE 9.83 mg/L, TCE 0.432 mg/L, vinyl chloride 0.166 mg/L, ammonium 407 mg/L, nitrate 36.3 mg/L and fluoride 50 mg/L.
3. Has the **migration** of contaminated groundwater **stabilized** (such that contaminated groundwater is expected to remain within existing area of contaminated groundwater² as defined by the monitoring locations designated at the time of this determination)?

- If yes - continue, after presenting or referencing the physical evidence (e.g., groundwater sampling/measurement/migration barrier data) and rationale why contaminated groundwater is expected to remain within the (horizontal or vertical) dimensions of the existing area of groundwater contamination²).
- If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the existing area of groundwater contamination²) - skip to #8 and enter a NO status code, after providing an explanation.
- If unknown - skip to #8 and enter [IN] status code.

Rationale and Reference(s): Contaminant concentration summary tables (see Table 1 at end of this form) and contaminant distribution maps presented in documents referenced herein, prepared from laboratory analysis of samples collected between 1997 and 2001, show no significant plume growth or migration beyond the facility property boundary. Plume expansion and migration has been arrested through an integrated series of remedial actions, which have included groundwater extraction and treatment at 12 locations within the Extraction and Fabrication sectors, removal and offsite disposal of 90,000 cubic yards of source material from the Farm Ponds Sector, and stabilization, removal and offsite disposal of approximately 110,000 cubic yards (132,015 tons) of source material from the Solids sector. Ongoing remedial action will result in further retraction of the VOC plume.

4. Does contaminated groundwater **discharge** into **surface water** bodies?

² existing area of contaminated groundwater is an area (with horizontal and vertical dimensions) that has been verifiably demonstrated to contain all relevant groundwater contamination for this determination, and is defined by designated (monitoring) locations proximate to the outer perimeter of contamination that can and will be sampled/tested in the future to physically verify that all contaminated groundwater remains within this area, and that the further migration of contaminated groundwater is not occurring. Reasonable allowances in the proximity of the monitoring locations are permissible to incorporate formal remedy decisions (i.e., including public participation) allowing a limited area for natural attenuation.

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- x If yes - continue after identifying potentially affected surface water bodies.
- If no - skip to #7 (and enter a YES status code in #8, if #7 = yes) after providing an explanation and/or referencing documentation supporting that groundwater contamination does not enter surface water bodies.
- If unknown - skip to #8 and enter [IN] status code.

Rationale and Reference(s): Groundwater with potential to migrate to surface water is monitored by an extensive network of wells, which include perimeter wells located near surface water bodies. Laboratory analysis of groundwater samples collected from the perimeter wells indicates that contaminant concentrations at most locations are well below a level of 10 times the ROD cleanup standard(s). Though DCE concentrations have exceeded this criteria (see Table 2 at the end of this form) at three monitoring well sites, testing of Murder Creek, Truax Creek, and Second Lake surface water samples collected downstream of these locations demonstrates that the presence of DCE in groundwater does not result in an exceedance of instream ambient water quality criteria. In accordance with Section 3.3.3.3 (p. 18) of the Groundwater and Sediment Operable Unit ROD (EPA 1994), remedial action objectives for groundwater may be achieved through a combination of active onsite source control, groundwater remediation (hot spot pumping), natural attenuation, low-level discharge to surface water and institutional controls.

5. Is the **discharge** of contaminated groundwater into surface water likely to be **insignificant** (i.e., the maximum concentration³ of each contaminant discharging into surface water is less than 10 times their appropriate groundwater level), and there are no other conditions (e.g., the nature, and number, of discharging contaminants, or environmental setting), which significantly increase the potential for unacceptable impacts to surface water, sediments, or eco-systems at these concentrations.

- x If yes - skip to #7 and enter a YES status code in #8 if #7 = yes, after documenting: 1) the maximum known or reasonably suspected concentration³ of key contaminants discharged above their groundwater level, the value of the appropriate level(s), and if there is evidence that the concentrations are increasing; and 2) provide a statement of professional judgement/explanation (or reference documentation) supporting that the discharge of groundwater contaminants into the surface water is not anticipated to have unacceptable impacts to the receiving surface water, sediments, or eco-system.
- If no - (the discharge of contaminated groundwater into surface water is potentially significant) - continue after documenting: 1) the maximum known or reasonably suspected concentration³ of each contaminant discharged above its groundwater level, the value of the appropriate level(s), and if there is evidence that the concentrations are increasing; and 2) for any contaminants discharging into surface water in concentrations³ greater than 100 times their appropriate groundwater levels, the estimated total amount (mass in kg/yr) of each of these contaminants that are being discharged (loaded) into the surface water body (at the time of the determination), and identify if there is evidence that the amount of discharging contaminants is increasing.
- If unknown - enter a IN status code in #8.

Rationale and Reference(s): See rationale and reference in number 4 above.

³ As measured in groundwater prior to entry to the groundwater-surface water/sediment interaction (e.g., hyporheic) zone.

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6. Can the **discharge** of contaminated groundwater into surface water be shown to be **currently acceptable** (i.e., not cause impacts to surface water, sediments or eco-systems that should not be allowed to continue until a final remedy decision can be made and implemented⁴)?

_____ If yes - continue after either: 1) identifying the Final Remedy decision incorporating these conditions, or other site-specific criteria (developed for the protection of the site surface water, sediments, and eco-systems), and referencing supporting documentation demonstrating that these criteria are not exceeded by the discharging groundwater; OR 2) providing or referencing an interim-assessment,⁵ appropriate to the potential for impact, that shows the discharge of groundwater contaminants into the surface water is (in the opinion of a trained specialists, including ecologist) adequately protective of receiving surface water, sediments, and eco-systems, until such time when a full assessment and final remedy decision can be made. Factors which should be considered in the interim-assessment (where appropriate to help identify the impact associated with discharging groundwater) include: surface water body size, flow, use/classification/habitats and contaminant loading limits, other sources of surface water/sediment contamination, surface water and sediment sample results and comparisons to available and appropriate surface water and sediment levels, as well as any other factors, such as effects on ecological receptors (e.g., via bio-assays/benthic surveys or site-specific ecological Risk Assessments), that the overseeing regulatory agency would deem appropriate for making the EI determination.

_____ If no - (the discharge of contaminated groundwater can not be shown to be **currently acceptable**) - skip to #8 and enter a NO status code, after documenting the currently unacceptable impacts to the surface water body, sediments, and/or eco-systems.

_____ If unknown - skip to 8 and enter a IN status code.

Rationale and Reference(s): Based on yes answer to nos. 4 and 5 above, no response is required here.

7. Will groundwater **monitoring** / measurement data (and surface water/sediment/ecological data, as necessary) be collected in the future to verify that contaminated groundwater has remained within the horizontal (or vertical, as necessary) dimensions of the existing area of contaminated groundwater?

x
_____ If yes - continue after providing or citing documentation for planned activities or future sampling/measurement events. Specifically identify the well/measurement locations which will be tested in the future to verify the expectation (identified in #3) that groundwater contamination will not be migrating horizontally (or vertically, as necessary) beyond the existing area of groundwater contamination

⁴ Note, because areas of inflowing groundwater can be critical habitats (e.g., nurseries or thermal refugia) for many species, appropriate specialist (e.g., ecologist) should be included in management decisions that could eliminate these areas by significantly altering or reversing groundwater flow pathways near surface water bodies.

⁵ The understanding of the impacts of contaminated groundwater discharges into surface water bodies is a rapidly developing field and reviewers are encouraged to look to the latest guidance for the appropriate methods and scale of demonstration to be reasonably certain that discharges are not causing currently unacceptable impacts to the surface waters, sediments or eco-systems.

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_____ If no - enter a NO status code in #8.

_____ If unknown - enter a IN status code in #8.

Rationale and Reference(s): Groundwater sampling at monitor and extraction wells is currently performed on a semi-annual basis at a majority of the monitor well sites, and the data evaluated and reported quarterly for the Feed Makeup area, semiannually for the South Extraction area, semiannually for the Fabrication Sector and annually for the Farm Ponds and Solids Sectors (See Tables 2 and 3 for supportive monitoring and extraction wells utilized in rationale and reference). The scope of these monitoring and reporting activities is described in the following documents:

- Farm Ponds. Farm Ponds Groundwater Remedial Design and Remedial Action Work Plan (CH2M HILL 1998), Farm Ponds Year 1999 Annual Groundwater Summary Report (CH2M HILL 2000), Farm Ponds Year 2000 Annual Groundwater Summary Report (2001).
- Solids. Draft Solids Area Remedial Design Report and Remedial Action Work Plan (CH2M HILL October 1999 2000).
- Extraction Sector – South Extraction. Remedial Action Construction Report for the South Extraction Area (CH2M HILL 2001), 1st 2nd and 3rd Quarter Remedial Action Monitoring Reports for the South Extraction Area (CH2M HILL Memorandums February, June and September 2001).
- Fabrication Sector. Remedial Action Construction Report for the Fabrication Area (CH2M HILL 2001).

The scope of the monitoring and reporting efforts includes water level measurements, contouring of groundwater elevation data, and delineation of extraction well capture zones in the Feed Makeup, South Extraction and Fabrication areas to evaluate the effectiveness of groundwater extraction with respect to hydraulic capture of remedial action target areas. These evaluations indicate full capture of the South Extraction and Fabrication⁵ target areas. Evaluation of the Feed Makeup area is in progress.

8. Check the appropriate RCRIS status codes for the Migration of Contaminated Groundwater Under Control EI (event code CA750), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting documentation as well as a map of the facility).

 x YES - Yes, "Migration of Contaminated Groundwater Under Control" has been verified. Based on a review of the information contained in this EI determination, it has been determined that the "Migration of Contaminated Groundwater" is "Under Control" at the Wah Chang facility, EPA ID # ORD 05095 5948, located at 1600 Old Salem Road, Albany, Oregon. Specifically, this determination indicates that the migration of "contaminated" groundwater is under control, and that monitoring will be conducted to confirm that contaminated groundwater remains within the "existing area of contaminated groundwater" This determination will be re-evaluated when the Agency becomes aware of significant changes at the facility.

_____ NO - Unacceptable migration of contaminated groundwater is observed or expected.

_____ IN - More information is needed to make a determination.

Completed by _____ (signature)

Date 3/12/02

⁶ Portions of the remedial action target area for FW-6 were not included in this determination.

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Completed by	(signature) _____	Date	3/12/02
	(print) Nancy Gramlich/ODEQ		RCRAinfo
	(prepared by Wah Chang)		date
	(title) Project Manager		

Supervisor	(signature) _____	Date	_____
	(print) Keith Andersen /ODEQ		
	(title) Manager ODEQ Cleanup Section		
	(EPA Region or State) Oregon		

Locations where hard-copy References may be found:

EPA Region 10 – Seattle, Washington

ODEQ – Eugene, Oregon

Facility map(s) provided in references

Contact phone number to access references cited herein is also listed in number 1 above

Contact telephone and e-mail numbers

(name)	<u>Nancy Gramlich/ODEQ</u>
(phone #)	<u>503-378-8240 x 259</u>
(e-mail)	<u>Gramlich.nancy@deq.state.or.us</u>

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Table 1 – Supporting Information for Documenting that Contaminant Plume is Not Expanding						
Wah Chang Albany, Oregon						
Perimeter Monitor Well No.	Concentration (mg/L)					
	DCE or TCE			Ammonia or Chloride		
	Fall 1997	Fall 2000	Fall 2001	Fall 1997	Fall 2000	Fall 2001
EXTRACTION SECTOR						
PW-22A	10 U	0.0179	NS	570	252	229
PW-23A	NA	0.001 U	NS	NA	81.5	NS
PW-24A	NA	NS	NS	NS	NS	NS
PW-25A	0.005	0.0065	0.0076	NA	NA	NA
PW-57A	NI	0.0328	0.0386	NA	NA	NA
PW-26A	0.0068	0.0081	0.0067	NA	NA	NA
PW-49A	0.005	0.0084	0.0055	NA	NA	NA
FABRICATION SECTOR						
PW-15A/R	0.005 U	0.005 U	NS	NA	NA	NA
PW-76A	NI	0.0069	0.0014	NA	NA	NA
PW-77A	NI	0.0907	0.0963	NA	NA	NA
PW-78A	NI	0.067	0.0951	NA	NA	NA
PW-79A	NI	0.0166	0.0105	NA	NA	NA
PW-19A	0.002	NS	NS	NA	NA	NA
PW-20A	NA	0.001 U	NS	NA	NA	NA
PW-03A	0.14	0.0266	0.198	NA	NA	NA
PW-89A	NI	0.0203	0.0013	NA	NA	NA
PW-88A	NI	0.001 U	0.001 U	NA	NA	NA
PW-74B	NI	0.0051	0.0094	NA	NA	NA
PW-75A	NI	0.0514	0.001 U	NA	NA	NA
MW-10A	NI	0.001 U	0.001 U	NA	NA	NA
MW-11A	NI	0.001 U	0.001 U	NA	NA	NA
FARM PONDS SECTOR						
PW-40s	0.037	0.016	0.0085	1900	1700	1490
PW-64s	NI	0.001 U	0.001 U	NI	7.92	8.46
PW-65s	NI	0.001 U	0.001 U	NI	397	386
PW-66s	NI	0.001 U	0.001 U	NI	15.1	20.8
PW-67s	NI	0.001 U	0.001 U	NI	337	374
PW-40a	0.005 U	0.001 U	0.001 U	390	370	268
PW-64a	NI	0.001 U	0.001 U	NI	11.1	11.3
PW-65a	NI	0.001 U	0.001 U	NI	8.88	9.42
PW-66a	NI	0.001 U	0.001 U	NI	6.47	6.79
PW-67a	NI	0.001 U	0.001 U	NI	33.9	35.9
SOLIDS SECTOR						
PWF-1	NA	NA	NA	NA	67.8	831
PW-09	NA	NA	NA	NA	262	1520
PWD-1	NA	NA	NA	NA	1770	2380
PWF-2	NA	NA	NA	NA	NA	NA
PWD-2	NA	NA	0.001 U	NA	397	587
PW-17B	NA	NA	NA	NS	997	2110
PW-18B	NA	NA	NA	NA	1650	477

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Table 1 – Supporting Information for Documenting that Contaminant Plume is Not Expanding Wah Chang Albany, Oregon						
Perimeter Monitor Well No.	Concentration (mg/L)					
	DCE or TCE			Ammonia or Chloride		
	Fall 1997	Fall 2000	Fall 2001	Fall 1997	Fall 2000	Fall 2001
NA = not analyzed. NS = not sampled. NI = well not installed yet. U = constituent not detected at concentration greater than reporting limit shown.						

Table 2 – Supporting Information to Document Insignificant Groundwater Discharge										
Sample Location	ROD Groundwater Criteria		10 * ROD Groundwater Criteria		DCE Concentration (mg/L)			TCE Concentration (mg/L)		
	DCE	TCE	DCE	TCE	Summer-Fall 1997	Fall 2000	Fall 2001	Summer-Fall 1997	Fall 2000	Fall 2001
Murder Creek										
PW-77A	0.007	0.005	0.07	0.05	NI	0.0907	0.0963	NI	0.05 U	0.0063
PW-78A	0.007	0.005	0.07	0.05	NI	0.067	0.0951	NI	0.002 U	0.0016
PW-79A	0.007	0.005	0.07	0.05	NI	0.0166	0.0105	NI	0.0014	0.001 U
MC-2 (4)	0.002	0.081			<i>0.00007 U</i>	<i>0.001 U</i>	<i>0.0015</i>	<i>0.00005 U</i>	<i>0.0033</i>	<i>0.0033</i>
Truax Creek										
PW-03A	0.007	0.005	0.07	0.05	0.14	0.0156	0.198	0.017	0.0064	0.0446
PW-20A	0.007	0.005	0.07	0.05	NA	0.001U	NS	NA	0.001 U	NS
PW-75A	0.007	0.005	0.07	0.05	NI	0.0514	0.001 U	NI	0.0063	0.001 U
PW-88A	0.007	0.005	0.07	0.05	NI	0.001 U	0.001 U	NI	0.001 U	0.001 U
PW-89A	0.007	0.005	0.07	0.05	NI	0.0035	0.0013	NI	0.0203	0.0056
TC-5 (4)	0.002	0.081			NS	<i>0.0016</i>	<i>0.001 U</i>	NS	<i>0.0062</i>	<i>0.001 U</i>
Second Lake										
PW-25A	0.007	0.005	0.07	0.05	0.005 U	0.0026	0.0022	0.005	0.0065	0.0076
PW-26A	0.007	0.005	0.07	0.05	0.005 U	0.001 U	0.001 U	0.068	0.0081	0.0067
PW-57A	0.007	0.005	0.07	0.05	NI	0.0081	0.0119	NI	0.0328	0.0386
SL-2 (4)	0.002	0.081			<i>0.00016 U</i>	NS	NS	<i>0.00005 U</i>	NS	NS
Notes:										
1. NA = not analyzed. NS = not sampled. NI = well not installed yet U = constituent not detected at concentration greater than reporting limit shown.										
2. Shaded cells show values greater than 10 * ROD groundwater criteria. These samples were collected when portions of the groundwater extraction system (FW-6 and FW-5) were not in operation.										
3. <i>Italicized</i> text show results for surface water sample taken downstream of groundwater discharge area.										
4. The values shown under the ROD Groundwater Criteria are OAR 340-41 Table 20 ambient water quality criteria.										