

DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

RCRA Corrective Action  
Environmental Indicator (EI) RCRIS code (CA725)

Current Human Exposures Under Control

Facility Name: Burlington Environmental Pier 91  
Facility Address: 2001 West Garfield, Seattle, WA.  
Facility EPA ID #: WAD 000812917

- 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?

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

**BACKGROUND**

**Definition of Environmental Indicators (for the RCRA Corrective Action)**

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future.

**Definition of "Current Human Exposures Under Control" EI**

A positive "Current Human Exposures Under Control" EI determination ("YE" status code) indicates that there are no "unacceptable" human exposures to "contamination" (i.e., contaminants in concentrations in excess of appropriate risk-based levels) that can be reasonably expected under current land- and groundwater-use conditions (for all "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

**Relationship of EI to Final Remedies**

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Current Human Exposures Under Control" EI are for reasonably expected human exposures under current land- and groundwater-use conditions ONLY, and do not consider potential future land- or groundwater-use conditions or ecological receptors. The RCRA Corrective Action program's overall mission to protect human health and the environment requires that Final remedies address these issues (i.e., potential future human exposure scenarios, future land and groundwater uses, and ecological receptors)

**Duration / Applicability of EI Determinations**

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information)

- 2 Are groundwater, soil, surface water, sediments, or air **media** known or reasonably suspected to be “contaminated”<sup>1</sup> 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)?

media	Yes	No	?	Rationale/COCs
Groundwater	X			<ul style="list-style-type: none"> <li>The shallow aquifer is contaminated above the state Model Toxics Control Act (MTCA) action levels and a Light non-aqueous product layer (LNAPL) plume is present</li> <li>Compounds of Concern (COCs) include: Total Petroleum Hydrocarbons (TPH), Polynuclear Aromatic Hydrocarbons (PAHs), Polychlorinated biphenyls (PCBs), Arsenic (As), Lead (Pb), Mercury (Hg), and Zinc (Zn). (*1)</li> </ul>
Air (indoors) <sup>1</sup>		X		Has been assessed, and under the current land use, has been determined to be below risk based standards (*2)
Surface Soil (e.g., <2 ft)	X			Primarily within the former tank farm 4 acre property boundaries, which has a LNAPL plume. The whole ‘facility’ area is presently covered with concrete or asphalt. (*3)
Surface Water		X		Initial findings for three quarters of groundwater sampling at potential point of compliance monitoring wells indicates that only very low levels of COPC (below screening levels) are migrating from the groundwater to the surface water.
Sediments		X		The current levels of COPCs do not indicate that the surface water, and therefore the sediments, are being impacted currently. Historical releases from this site and other upland properties (including City storm sewers and past property owners) have not been evaluated.
Subsurf. Soil (e.g., >2 ft)	X			(see surface soil comments above) (*3)
Air (outdoors)		X		We have assumed that any soil gases releasing to the ambient air have not contributed sufficient mass of COPCs to exceed ambient air PRGs.

<sup>1</sup> “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 appropriately protective risk-based “levels” (for the media, that identify risks within the acceptable risk range).

<sup>2</sup> 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.

	If no (for all media) – check here and skip to #6. Enter “YE,” 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) – check here and 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) – check here and skip to #6. Enter “IN” status code.

Rationale and Reference(s):

- (\*1)--Exceedances of MTCA cleanup levels (for TPH); exceedances of federal and/or state surface water quality criteria (for other chemicals) in onsite groundwater; highest beneficial use of groundwater is surface water (Puget Sound); Final data gaps were filled via the Bridge Documents Reports (3 BD reports from 2001-2004), Final Work Plan for additional data collection (Nov. 2003) and a workplan for groundwater seepage evaluation (July 2004). Currently: The FS workplan was approved in September 2005 with the draft FS report being completed in 2006. The Draft RFI report will be submitted in October 2005. A new Agreed Order and Permit renewal is scheduled for 2006.
- (\*2)—Soil vapor study was completed over a 2 year period from 2003 to 2005. A report was received on September 22, 2004, and after some additional work was performed, it was approved in June 2005. The final results verify the first round of testing, which indicated that this pathway should be removed from consideration, and Current Human Exposure from this pathway appears to be under control based on current land use. (See Final *Soil Vapor Technical Memo No. 2* dated October 2003, and *the Soil Vapor Evaluation of Building M-28 report* dated September 22, 2004)
- (\*3)—Subsurface soil samples have been collected; comparisons with MTCA cleanup levels have not been performed but are expected to be above MTCA levels since the soil is located within an area impacted by the LNAPL plume. However, institutional controls (paved surface, health standards for construction below the surface) are expected to control this exposure pathway. (See the *Draft Remedial Investigation and Data Evaluation Report* dated January 1999 for soil sample results.)
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

Potential **Human Receptors** (Under Current Conditions)

<u>“Contaminated” Media</u>	Residents	Workers	Day-Care	Construction	Trespassers	Recreation	Food <sup>2</sup>
Groundwater	NO	NO	NO	YES	NO	NO	IN
Air (indoors)	NO	NO	NO	IN	NO	NO	IN
Soil (surface, e.g., <2 ft)	NO	NO	NO	YES	NO	NO	NO
Surface Water	NO	NO	NO	NO	NO	NO	IN
Sediment	IN	IN	IN	IN	IN	IN	IN
Soil (subsurface e.g., >2 ft)	NO	NO	NO	YES	NO	NO	NO
Air (outdoors)	NO	NO	NO	NO	NO	NO	IN

Instructions for Summary Exposure Pathway Evaluation Table:

1. Strike-out specific Media including Human Receptors’ spaces for Media which are not “contaminated” as identified in #2 above.

<sup>2</sup> Indirect Pathway/Receptor (e.g., vegetables, fruits, crops, meat and dairy products, fish, shellfish, etc.)

2 enter "yes" or "no" for potential "completeness" under each "Contaminated" Media -- Human Receptor combination (Pathway).

Note: In order to focus the evaluation to the most probable combinations some potential "Contaminated" Media - Human Receptor combinations (Pathways) do not have check spaces ("\_\_\_"). While these combinations may not be probable in most situations they may be possible in some settings and should be added as necessary.

	If no (pathways are not complete for any contaminated media-receptor combination), check here and skip to #6. Enter "YES" status code, after explaining and/or referencing condition(s).
X	If yes (pathways are complete for any "Contaminated" Media - Human Receptor combination) – check here and continue after providing supporting explanation.
	If unknown (for any "Contaminated" Media - Human Receptor combination) – check here and skip to #6. Enter "IN" status code.

Rationale and Reference(s):

- Groundwater: If construction workers dig as deep as the water table (10' bgs), they would encounter groundwater and could become exposed. The Port of Seattle has controls in place on their own property to minimize the occurrence of such a scenario.
- Indoor air: Construction workers could be impacted in uncontrolled conditions, however this is highly unlikely as long as the Port of Seattle has controls in place.
- Surface soil: Soils are contaminated below the asphalt on the former tank farm property. Construction could complete this pathway, but it is highly unlikely as long as the Port of Seattle has controls in place.
- Surface water: There are measured concentrations of contaminants in groundwater on the site that could migrate to the surface water, but the initial assessment of the potential point-of-compliance monitoring wells, indicate that this is not currently the case. This will be further evaluated in the 2006 FS Report.
- Sediments: As stated under surface water, the current site model does not support groundwater impacting sediments. Historical impacts to sediments will be evaluated when an area wide investigation is undertaken for Elliot Bay and all of the potential upland contributions can be investigated together.
- Subsurface soils: as noted above under surface soils, subsurface soils could impact construction workers, but is highly unlikely.

4 Can the exposures from any of the complete pathways identified in #3 be reasonably expected to be "significant"<sup>3</sup> (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)?

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<sup>3</sup> 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.

X	If no (exposures can not be reasonably expected to be significant (i.e , potentially “unacceptable”) for any complete exposure pathway) – check here and skip to #6. Enter “YE” status code after explaining and/or referencing documentation.
	If yes (exposures could be reasonably expected to be “significant” (i.e , potentially “unacceptable”) for any complete exposure pathway) – check here and continue after providing a description of each potentially “unacceptable” exposure pathway and explaining and/or justifying why the exposures (from each of the complete pathways) to “contamination” may be significant/unacceptable.
	If unknown – check here.

Rationale and Reference(s):

- Groundwater: it is unlikely that direct contact with contaminated groundwater will be frequent enough to lead to unacceptable exposures
- Surface soil: soils are contaminated, but covered with asphalt or concrete. It is unlikely that direct contact with any contaminated surface soils will be frequent enough to lead to unacceptable exposures.
- Subsurface soils: soils are contaminated, but covered with asphalt or concrete. It is unlikely that direct contact with any contaminated subsurface soils will be frequent enough to lead to unacceptable exposures. Soils are sufficiently contaminated to pose a threat to underlying groundwater, but the whole site is covered/capped with an impervious surface, which will minimize infiltration of water into the subsurface
- Surface water and sediments: There are measured concentrations of contaminants in groundwater near Elliot Bay, but the most recent data base query for three quarters of groundwater monitoring for the potential point of compliance monitoring wells located to intercept the groundwater prior to entering the salt water of Elliot Bay; indicate that only arsenic exceeds the human health screening levels for fresh surface waters. (Note: Background levels for Arsenic and other metals have not yet been established and could mitigate this exceedance, once the risk assessment has been completed). *Ref. September 13, 2005 data base query of the three downgradient ‘potential point of compliance monitoring wells’ for the Port of Seattle’s Terminal 91 (MW’s GP-8, GP-9, and GP-10).*

**References:** See *Draft Bridge Document Report 2, dated January 2003 and Report 3* dated May 7, 2004; *Final Soil Vapor Technical Memo No. 2* dated October 2003, *Soil Vapor Evaluation of Building M-28* report dated September 22, 2004, *Groundwater Seepage Evaluation Report* dated November 19, 2004, *Annual Ground Water Monitoring report* received July 2005; and the final FS workplan dated August 2005 for screening of exposure pathways .

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) – check here and continue. Enter “YE” after summarizing <u>and</u> 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”)-check here and continue. Enter “NO” status code after providing a description of each potentially unacceptable exposure.
	If unknown – check here.

Rationale and Reference(s):

- 6 Check the appropriate RCRIS status codes for the Current Human Exposures Under Control EI event code (CA725), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (and attach appropriate supporting documentation as well as a map of the facility):

YE	YE, "Current Human Exposures Under Control" has been verified. Based on a review of the information contained in this EI Determination, "Current Human Exposures" are expected to be "Under Control" at the Burlington Environmental Pier 91 facility, EPA ID # WAD000812971, located at 2001 West Garfield, Seattle WA under current and reasonably expected conditions This determination will be re-evaluated when the State becomes aware of significant changes at the facility.
	NO - "Current Human Exposures" are not "under control."
	IN - More info needed.

Completed by	(signature)		Date	September 15, 2005
	(print)	Galen H. Tritt		
	(title)	Hazardous Waste Specialist, NWRO		

Supervisor	(signature)		Date	9/15/05
	(print)	Julie Sellick		
	(title)	Supervisor, Hazardous Waste and Toxics Reduction Section, NWRO		
	EPA Region or State	Washington State Dept. of Ecology		

Locations where References may be found: Department of Ecology's NWRO central files.  
 Washington Department of Ecology,  
 Northwest Regional Office  
 3190 160<sup>th</sup> Ave. SE  
 Bellevue, WA

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**FINAL NOTE: THE HUMAN EXPOSURES EI IS A QUALITATIVE SCREENING OF EXPOSURES AND THE DETERMINATIONS WITHIN THIS DOCUMENT SHOULD NOT BE USED AS THE SOLE BASIS FOR RESTRICTING THE SCOPE OF MORE DETAILED (E.G., SITE-SPECIFIC) ASSESSMENTS OF RISK**

REGION 10 ANNOTATED VERSION – June 12, 2000  
DOCUMENTATION OF ENVIRONMENTAL INDICATOR DETERMINATION

Interim Final 2/5/99

RCRA Corrective Action  
Environmental Indicator (EI) RCRIS code (CA750)

Migration of Contaminated Groundwater Under Control

Facility Name: Burlington Environmental Pier 91  
Facility Address: 2001 West Garfield, Seattle, WA  
Facility EPA ID #: WAD000812971

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 #8 and enter "IN" (more information needed) status code.

**BACKGROUND**

**Definition of Environmental Indicators (for the RCRA Corrective Action)**

Environmental Indicators (EI) are measures being used by the RCRA Corrective Action program to go beyond programmatic activity measures (e.g., reports received and approved, etc.) to track changes in the quality of the environment. The two EI developed to-date indicate the quality of the environment in relation to current human exposures to contamination and the migration of contaminated groundwater. An EI for non-human (ecological) receptors is intended to be developed in the future. \_

**Definition of "Migration of Contaminated Groundwater Under Control" EI**

A positive "Migration of Contaminated Groundwater Under Control" EI determination ("YE" status code) indicates that the migration of "contaminated" groundwater has stabilized, and that monitoring will be conducted to confirm that contaminated groundwater remains within the original "area of contaminated groundwater" (for all groundwater "contamination" subject to RCRA corrective action at or from the identified facility (i.e., site-wide)).

**Relationship of EI to Final Remedies**

While Final remedies remain the long-term objective of the RCRA Corrective Action program the EI are near-term objectives which are currently being used as Program measures for the Government Performance and Results Act of 1993, GPRA). The "Migration of Contaminated Groundwater Under Control" EI pertains ONLY to the physical migration (i.e., further spread) of contaminated ground water and contaminants within groundwater (e.g., non-aqueous phase liquids or NAPLs). Achieving this EI does not substitute for achieving other stabilization or final remedy requirements and expectations associated with sources of contamination and the need to restore, wherever practicable, contaminated groundwater to be suitable for its designated current and future uses

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**Environmental Indicator (EI) RCRIS code (CA750)**  
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**Duration / Applicability of EI Determinations**

EI Determinations status codes should remain in RCRIS national database ONLY as long as they remain true (i.e., RCRIS status codes must be changed when the regulatory authorities become aware of contrary information)

2. Is **groundwater** known or reasonably suspected to be “contaminated”<sup>1</sup> 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?

Yes     If yes - continue after identifying key contaminants, citing appropriate “levels,” and referencing supporting documentation.

\_\_\_\_\_     If no - skip to #8 and enter “YE” status code, after citing appropriate “levels,” and referencing supporting documentation to demonstrate that groundwater is not “contaminated.”

\_\_\_\_\_     If unknown - skip to #8 and enter “IN” status code

Rationale and Reference(s):

- The shallow aquifer is contaminated above the state Model Toxics Control Act (MTCA) action levels and a Light non-aqueous product layer (LNAPL) plume is present.
- Compounds of Concern (COCs) include: Total Petroleum Hydrocarbons (TPH), Polynuclear Aromatic Hydrocarbons (PAHs), Polychlorinated biphenyls (PCBs), Arsenic (As), Lead (Pb), Mercury (Hg), Zinc (Zn).
- Exceedances of MTCA cleanup levels (for TPH, PAHs); exceedances of federal and/or state surface water quality criteria (for other chemicals) in onsite groundwater; highest beneficial use of groundwater is surface water (Puget Sound).

References: Quarterly reports for ‘Terminal 91 Tank Farm Site’ from 2000 through 2005. Annual Ground Water Report for ‘Terminal 91 Tank Farm Site’ from 2000 through 2005

Footnotes:

<sup>1</sup>“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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3. Has the **migration** of contaminated groundwater **stabilized** (such that contaminated groundwater is expected to remain within "existing area of contaminated groundwater"<sup>2</sup> as defined by the monitoring locations designated at the time of this determination)?

This question focuses ONLY on the movement of contaminated groundwater, not the level of contamination. A "YES" response should be arrived at if, through interpretation of groundwater flow data or sound professional judgement, groundwater contamination can be shown to not be expanding in spatial extent. It is perfectly acceptable to have a "YE" groundwater EI if:

- 1) contaminated groundwater is located off-site but not migrating further;
- 2) contaminated groundwater is contaminated above cleanup standards, but not migrating further;
- 3) natural attenuation is occurring such that the rate of attenuation (through any of the acceptable attenuation mechanisms and in accordance with EPA's Monitored Natural Attenuation Guidance, Directive 9200 4-17 - December 1997 Use of Monitored Natural Attenuation at Corrective Action Sites) is such that the outer boundaries of the plume are not expanding.

  X   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 contamination"<sup>2</sup>.

       If no (contaminated groundwater is observed or expected to migrate beyond the designated locations defining the "existing area of groundwater contamination"<sup>2</sup>) - skip to #8 and enter "NO" status code, after providing an explanation.

       If unknown - skip to #8 and enter "IN" status code.

- Rationale and Reference(s): Final data gaps were filled via the Bridge Documents Reports (3 BD reports from 2001-2004); Final Work Plan for additional data collection (Nov. 2003); Groundwater Seepage Evaluation Report (Nov. 2004); Annual Ground Water Monitoring report (July 2005) and September 13, 2005 data base query of the three downgradient 'potential point of compliance monitoring wells' for the Port of Seattle's Terminal 91 (MW's GP-8, GP-9, and GP-10).

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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.





**Migration of Contaminated Groundwater Under Control  
Environmental Indicator (EI) RCRIS code (CA750)**

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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 implemented<sup>4</sup>)?

  X   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’s 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, 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 “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 “IN” status code.

When considering discharge of groundwater to surface water, it is important to remember that some discharges may be considered acceptable - it is not necessary to demonstrate that there are no discharges, or that groundwater meets surface water criteria at the point of discharge, as may be the case with final cleanup levels. As with human exposures controlled and other groundwater criteria, sound professional judgement may be used in evaluating the impact of groundwater to surface water.

The GW/SW component of the 750 EI really has three parts: 1) is there a discharge; 2) is the discharge insignificant; and 3) is the discharge currently acceptable (questions 4-6, respectively). A YE EI may be obtained if appropriate responses can be made through following this three-step analysis (no discharge, discharge insignificant, or discharge acceptable, respectively). Note that the level of supporting analysis and/or data increases as you progress through these three steps - a finding that a discharge is acceptable for a particular water body requires a considerably more complex analysis than a finding that there is no discharge.

Another point to recognize is that surface water issues often involve ecological risk considerations, and that such ecological evaluations often require specialized professional evaluation. Never the less, the quantity of data and effort required for analysis of groundwater/surface water EI questions should not be significantly different than what is required for human exposures or other groundwater questions. Evaluation of surface water from an EI perspective should not require a disproportionate effort.

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Rationale and Reference(s)

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<sup>4</sup> 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.

<sup>5</sup> 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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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?"

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."

If no - enter "NO" status code in #8

If unknown - enter "IN" status code in #8

Rationale and Reference(s): On site exceedances of MTCA cleanup levels (for TPH, PAHs); exceedances of federal and/or state surface water quality criteria (for other chemicals) in onsite groundwater; highest beneficial use of groundwater is surface water (Puget Sound); however as stated above, they do not appear to be migrating to Elliot Bay. This is being monitored by semi-annual groundwater sampling.

Reference: Currently and to be completed in 2006: Final Feasibility Study (FS) workplan dated August 2005 (for screening of exposure pathways) with the FS report being completed in 2006; The Draft Remedial Facility Investigation (RFI) report will be submitted in October 2005; A new Agreed Order and Permit renewal is scheduled for 2006.

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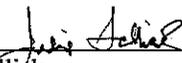
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8. Check the appropriate RCRIS status codes for the Migration of Contaminated Groundwater Under Control EI (event code CA750), and obtain Supervisor (or appropriate Manager) signature and date on the EI determination below (attach appropriate supporting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

- YE** - 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 Burlington Environmental Pier 91 facility, EPA ID # WAD 000812917, located at 2001 West Garfield, Seattle, WA. 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 September 15, 2005  
(print) Galen H. Tritt  
(title) Hazardous Waste Specialist

Supervisor (signature)  Date 9/15/05  
(print) Julie Sellick  
(title) Supervisor, Hazardous Waste and Toxics Reduction Section NWRO  
(EPA Region or State) State Department of Ecology

Locations where References may be found:

Washington State Department of Ecology's NWRO central files.

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