EES
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Aaren Fiedler, L.G.
Washington Department of Ecology Voluntary Cleanup Program – Southwest Region
P.O. Box 47775
Olympia, Washington 98504-7775

Subject: **Remedial Investigation Status Update and Response to Ecology Opinion Letter**
Plaid Pantry Store #112
1002 W. Fourth Plain Boulevard
Vancouver, Washington
Department of Ecology Cleanup Site ID 11759, FS ID 9158935, and VCP #SW1314
EES Project 1179

Dear Mr. Fiedler:

The purpose of this letter is to address and resolve Ecology comments based on the February 20, 2019 Opinion Letter and related discussions with you, and to verify completion of the Remedial Investigation for the Plaid Pantry Store #112 Site. A copy of the Opinion Letter is included in Attachment A for reference. Supporting documentation as discussed on March 1, 2019 is provided in Attachments B and C.

RESPONSE TO ECOLOGY COMMENTS

EES responses to Ecology's specific comments are summarized below.

1. Ecology Comment: The Method B soil cleanup level (CUL) for TPH is a total TPH CUL.

   EES Response: EES acknowledges that the calculated Method B soil CUL [2,619 milligrams per kilogram (mg/kg)] for TPH should be applied to the sum of NWTPH-Gx and NWTPH-Dx results, or it must be demonstrated that the NWTPH-Gx analysis captures all petroleum hydrocarbons at the Site. Confirmatory post-remedy compliance soil sampling data will address this detail.

2. Ecology Comment: Ecology believes using the established background concentration as the CUL for lead in soil is appropriate for this Site.

   EES Response: Site lead concentrations are somewhat variable but generally similar to reasonable expectations for natural background levels. No evidence of gasoline-related lead contamination is observed at the Site. In order to use an established protective cleanup level for lead in soil, EES and Ecology agreed to use the MTCA Method A cleanup level of 250 mg/kg. Maximum lead concentrations measured at the Site (24 mg/kg) are more than 10 times below this Method A cleanup level.

3. Ecology Comment: Naphthalene will need to be analyzed as an individual hazardous substance for the proposed Method B cleanup.

EES Response: Acknowledged. Individual and cumulative risk for all contaminants of interest was evaluated per Ecology's March 1, 2019 request. See below and Attachment B.

4. Ecology Comment: Ecology concurs that the soil-vapor pathway is likely not a complete pathway for Site petroleum contamination.

   EES Response: Acknowledged. Non-petroleum related contamination will be evaluated separately by others.

5. Ecology Comment: Trichloroethylene analytical results should be assessed against the short-term TCE toxicity.

   EES Response: Acknowledged. Non-petroleum related contamination will be evaluated separately by others.

6. Ecology Comment: Closure of the soil-direct contact pathway by utilizing the existing pavement to prevent contact will require an Environmental Covenant.

   EES Response: Plaid intends to pursue a protective cleanup that does not rely on pavement or other controls to achieve MTCA compliance with regard to gasoline-related impacts. EES acknowledges that an Environmental Covenant would be required if contamination exceeding cleanup levels remains in shallow soil after Site cleanup is complete.

7. Ecology Comment: Ecology recommends resubmitting the Terrestrial Ecological Evaluation (TEE) for the Site with additional requested information.

   EES Response: A professional biologist prepared an updated TEE to satisfy additional information needs stated in the Opinion Letter. The TEE is consistent with RI findings, namely that no adverse ecological exposures are anticipated for this Site. A copy of the updated TEE is provided in Attachment C.

8. Ecology Comment: Ecology concurs that expansion of the SVE system is an appropriate next step to cleanup Site petroleum contamination extending beneath the adjoining Fourth Plain roadway.

   EES Response: Acknowledged. Design of the proposed SVE system expansion is underway.

SUPPLEMENTAL ECOLOGY RI COMMENT – HAZARDOUS SUBSTANCE CALCULATION

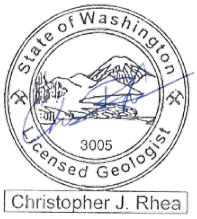
In addition to the Ecology Opinion Letter comments discussed above and as a supplement to item #3, Ecology requested a hazardous screening evaluation to determine whether the proposed soil cleanup levels for individual hazardous substances should be adjusted due to cumulative risk. The supplemental screening indicates no cumulative risk concerns for contaminants of interest. A memo summarizing the results of the evaluation is provided in Attachment B.

CONCLUSION

EES believes that these responses adequately address Ecology's comments regarding the RI report. We request acknowledgement from Ecology that the RI is complete with respect to gasoline contamination at the Site.

Sincerely,

EES ENVIRONMENTAL CONSULTING, INC.



Chris Rhea, LG
Project Manager

Paul Ecker, LHG
President

Copies: Jonathan Polonsky and Brent Chadwick, Plaid Pantries, Inc.

Attachments

Attachment A: Ecology Opinion Letter (February 20, 2019)
Attachment B: Hazardous Chemical Screening Evaluation
Attachment C: Terrestrial Ecological Evaluation

Attachment A

COPY

STATE OF WASHINGTON
DEPARTMENT OF ECOLOGY
PO Box 47775 • Olympia, Washington 98504-7775 • 360-407-6300
Call 711 for Washington Relay Service • Persons with a speech disability can call 877-833-6341

February 20, 2019

Mark Conan
Plaid Pantries Inc.
10025 SW Allen Blvd
Beaverton, OR 97005

Re: Opinion on Remedial Investigation and proposed work at the following Site:

- **Site Name:** Plaid Pantry 112
- **Site Address:** 1002 W Fourth Plain Blvd., Vancouver, Clark County, WA 98660
- **Facility/Site No.:** 9158935
- **Cleanup Site No.:** 11759
- **VCP Project No.:** SW1314

Dear Mark Conan:

The Washington State Department of Ecology (Ecology) received your request for an opinion on your independent cleanup of the Plaid Pantry 112 facility (Site). This letter provides our opinion. We are providing this opinion under the authority of the Model Toxics Control Act[1] (MTCA), chapter 70.105D RCW.[2]

This letter establishes Ecology's assessment of your Site at the time of this review given the information presented and available. This opinion should not prevent you from moving forward with your planned cleanup or sampling activities, but is intended to help focus those activities, close data gaps, and achieve cleanup at your Site.

Issue Presented and Opinion

Ecology is responding to your request to evaluate your *Remedial Investigation Repor*t and Focused Off-Site Remedial Technology Evaluation.

[1] Toxic Cleanup Program's Policy & Technical Support Unit, Model Toxics Control Act Regulation and Statute: MTCA Cleanup Regulation Chapter 173-340 WAC, Model Toxics Control Act Chapter 70.105D RCW, Uniform Environmental Covenants Act Chapter 64.70 RCW, Publication No. 94-06, Revised November 2013. https://fortress.wa.gov/ecy/publications/SummaryPages/9406.html
[2] https://app.leg.wa.gov/RCW/default.aspx?cite=70.105D

Ecology supports your proposal to expand the existing Soil Vapor Extraction System (SVE) to address remaining gasoline impacts in the adjacent right-of-way. While this opinion contains details about how to continue to meet the substantive requirements of MTCA, nothing in this opinion is intended to prevent you from immediately addressing remaining petroleum contamination at the Site.

This opinion is based on an analysis of whether the remedial action meets the substantive requirements of MTCA, chapter 70.105D RCW,[2] and its implementing regulations, Washington Administrative Code (WAC) chapter 173-340[3] (collectively "substantive requirements of MTCA"). The analysis is provided below.

Description of the Site

This opinion applies only to the Site described below. The Site is defined by the nature and extent of contamination associated with the following releases:

- Gasoline range total petroleum hydrocarbons (TPH-G) into the Soil.
- Diesel range petroleum hydrocarbons (TPH-D) into the Soil.
- Benzene, toluene, ethylbenzene, and xylene (BTEX) constituents into the Soil.
- Lead into the Soil.
- Naphthalene into the Soil.
- Tetrachloroethene (PCE) into the soil vapor.
- Freon into the soil vapor.

Enclosure A includes a detailed description and diagram of the Site, as currently known to Ecology. A parcel of real property can be affected by multiple sites. At this time, we have no information that the parcel(s) associated with this Site are affected by other sites.

[3] https://apps.leg.wa.gov/WAC/default.aspx?cite=173-340

Basis for the Opinion

This opinion is based on the information contained in the following documents:

1. EES Environmental Consulting, Inc. (EES), *Remedial Investigation Report*, September 19, 2018.
2. EES, *Technical Memorandum; Focused Off-Site Remedial Technology Evaluation*, September 19, 2018.
3. EES, *Technical Memorandum; Vapor Intrusion Assessment Data Table Revisions*, August 5, 2017.
4. EES, *Technical Memorandum; Vapor Intrusion Assessment*, May 18, 2017.
5. EES, *Technical Memorandum; Subject: Soil Vapor Extraction Monitoring Results*, June 14, 2016.
6. EES, *Technical Memorandum; Subject: Development of Site-Specific MTCA Method B Soil Cleanup Level for Gasoline*, March 31, 2016.
7. EES, *Technical Memorandum; Subject: Perched Groundwater Evaluation*, March 30, 2016.
8. EES, *Interim Remedial Action Status Report*, February 3 2014.
9. Ecology, *Letter to Mr. Mark Conan; Re: Further Action at the following Site:*, October 28, 2013.
10. EES, *Site Assessment Report*, December 31, 2012.
11. EES, *Site Assessment Report*, December 27, 2012.
12. PNG Environmental, Inc. (PNG), *Site Assessment Report*, October 19, 2011.
13. PNG, *Memorandum; Subject: Historic Information Review Summary*, July 29, 2011.

Those documents are kept in the Central Files of the Southwest Regional Office of Ecology (SWRO) for review by appointment only. Information on obtaining those records can be found on Ecology's public records requests web page.[6] Some site documents may be available on Ecology's Cleanup Site Search web page.[7]

[6] https://ecology.wa.gov/About-us/Accountability-transparency/Public-records-requests
[7] https://fortress.wa.gov/ecy/gsp/SiteSearchPage.aspx

Analysis of the Cleanup

Ecology has concluded that **further remedial action** is necessary to clean up contamination at the Site. That conclusion is based on the following analysis:

1. Characterization of the Site.

EES submitted a Remedial Investigation Report (the Report), that demonstrates the delineation of hazardous substances in all media for the Site. Ecology has determined your characterization of the Site is sufficient to establish cleanup standards and select a cleanup action. However, Ecology is concerned that your implementation of the calculated Method B soil cleanup level (CUL) for total petroleum hydrocarbons (TPH) may be incorrect.

The Site is described above and in **Enclosure A**. EES's Figure 3 and Figure 6 are included in **Enclosure A** for reference. Any other Figures or Tables referenced below can be found in the Report unless indicated otherwise.

Ecology understands that Plaid Pantry only intends to remediate the petroleum contamination related to underground petroleum storage and fuel dispensing at the Site and not the PCE (EES; Table 4), Freon,[8] or other contamination that may also be present at the Site and not related to the petroleum release.

The exposure pathways for the Site as Ecology currently understands them are detailed below. When possible, the pathways have been separated into petroleum contamination and halogenated solvents and Freon contamination.

Soil-Direct Contact: Complete. Hazardous substances related to the petroleum release from a previously unknown underground storage tank (UST) are present in the soil between the ground surface and 15 feet below ground surface (bgs) (EES; Table 1). There is also the potential of PCE and Freon contamination at the Site, and the source of this contamination has not been determined.

Soil-Leaching: Incomplete for petroleum. Hazardous substances are only present in the shallow soils, less than 15 feet bgs (EES; Figure 5), and groundwater has not been encountered down to 40 feet bgs, the maximum depth explored at the Site. Based on logs for the area, EES is assuming that groundwater is present at depths greater than 80 feet bgs.

Potentially complete for halogenated solvents and refrigerants. PCE has been observed in soil gas samples for the Site (EES; Table 4 and Table 5). The source of the PCE has not been determined. Freon was indicated as causing matrix interference for some soil gas samples. The source of the Freon has not been determined.

[8] EES, *Technical Memorandum; Vapor Intrusion Assessment Data Table Revisions*, August 5, 2017, p. 1.

Soil-Vapor: Incomplete for petroleum. Petroleum contaminated soil (PCS) is located outside the horizontal and vertical inclusion distances of 6 feet vertically below structures and 30 feet horizontally from structures (EES; Figure 4A and Figure 5). Sub-slab soil gas samples collected below both the Plaid Pantry and Domino's Pizza areas of the building did not show any exceedances of the MTCA Method B sub-slab screening levels.

Potentially complete for halogenated solvents and refrigerants. The source of the PCE observed in some soil gas samples has not been determined and therefore the vapor intrusion pathway cannot be ruled out. Freon was noted as causing matrix interference for some soil gas samples. However, Freon concentrations have not been reported and the source of the Freon has not been determined. Both a dry cleaner and an automotive repair facility have been reported as operating on this Property in the past.

Groundwater: Incomplete for petroleum. Groundwater has not been observed at the Site down to a depth of 40 feet bgs and is believed to only be present at depths greater than 80 feet bgs.

Potentially complete for halogenated solvents and refrigerants. PCS and Freon have been detected in soil vapor sampling conducted at the Site. Because these are dense non-aqueous phase liquids, it may not be possible to rule out groundwater contamination based on separation distance.

Ecological: Potentially Complete. EES submitted a Terrestrial Ecological Evaluation (TEE) with the Report. Ecology is unable to fully assess the TEE at this time since no supporting documentation was submitted to support the claims made in the TEE.

Based on a review of the available information, Ecology has the following comments;

1. The Method B soil CUL for TPH that you calculated in the March 2016 report is a total TPH CUL and should be applied to the sum of NWTPH-Gx and NWTPH-Dx results. Although it was established that the TPH-D identified in TPH HCID analysis is from the TPH-G contamination, it has not been shown that NWTPH-Gx analysis alone is capturing all the contamination that makes up the TPH-G contamination, specifically when the NWTPH-Dx result is greater than the NWTPH-Gx result.

   Either NWTPH-Dx needs to be analyzed in addition to NWTPH-Gx and the results combined for direct comparison to the Method B soil CUL for TPH, or it will need to be demonstrated that NWTPH-Gx analysis alone captures all the petroleum hydrocarbon contamination present at the Site, and that including the NWTPH-Dx would be 'double counting' those carbon ranges.

2. It is stated in the Report[9] that "The observed lead concentrations (2.4 to 24 milligrams/Kilograms [mg/Kg]) are consistent with published data for naturally occurring background lead in Clark County, Washington (Ecology 1994)".[10] Ecology believes using the established background concentrations as the CUL for lead in soil is appropriate for this Site.

   The established background concentrations for lead in both Clark County and the State is 17 mg/Kg. Either the state background 95 Upper Confidence Limit (UCL) concentration or the appropriate region specific 95 UCL concentration can be used as the Site CUL. Background concentrations from regions not associated with a Site are not appropriate for use as CULs.

3. Although naphthalene is considered part of the TPH-G contamination[11] for Method A cleanups, it will need to be analyzed as an individual hazardous substances for your proposed Method B clean up (WAC 173-340-900).[13]

4. Ecology concurs that the soil-vapor pathway in regards to petroleum vapor intrusion (PVI) is likely not a complete pathway at this Site given the reasons below.

   - The horizontal and vertical separation distances of the Sites PCS from the on Site building.
   - Sub-slab soil gas samples that are less than the MTCA Method B sub-slab soil gas screening levels.
   - Indoor air samples appear to more closely resemble outdoor air samples than sub-slab soil gas samples.

   This does not pertain to non-petroleum related contamination at the site. This pathway should be reevaluated if any new information is gathered that could potentially make this pathway complete.

5. Although the information provided does not indicate a short-term trichloroethylene (TCE) risk for this Site, when additional sampling is performed at the Site, particularly for halogenated solvents, TCE analytical results should be assessed against the short-term TCE toxicity.[14, 15, 16]

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[9] EES Environmental Consulting, Inc. (EES), *Remedial Investigation Report*, September 19, 2018, p. 12.
[10] Ecology Toxics Cleanup Program, Natural Background Soil Metals Concentrations in Washington State, Publication No. 94-115, October, 1994.
[11] EES Environmental Consulting, Inc. (EES), *Remedial Investigation Report*, September 19, 2018, p. 13.
[13] MTCA, Table 830-1, Footnote (14)(b).
[14] Ecology, *DRAFT Vapor Intrusion (VI) Investigations and Short-term Trichloroethylene (TCE) Toxicity; Implementation Memorandum No. 22*, Publication No. 18-09-047, Draft for Public Comment November 2018.
[15] EPA, Region 9, *MEMORANDUM; Subject: EPA Region 9 Response Action Levels and Recommendations to address Near-Term Inhalation Exposures to TCE in Air from Subsurface Vapor Intrusion*, July 9, 2014.
[16] EPA, Region 10, *MEMORANDUM; Subject: OEA Recommendations Regarding Trichloroethylene Toxicity in Human Health Risk Assessments*, December 13, 2012.

6. Closure of the soil-direct contact pathway by utilizing the already existing pavement to prevent contact[17] will require the use of an Environmental Covenant to protect that covering.

7. Ecology recommends resubmitting the TEE for the Site with supporting documentation. Specifically;

   - A map demonstrating the estimated area of contiguous undeveloped land on the Site or within 500 feet of the any area of the Site. This should take into account of the full extent of contamination in soil, and not just a centrally located point.
   - County parcel information showing the industrial or commercial status of the Site.
   - Proof that the habitat quality and the likelihood of undeveloped land to attract wildlife have been determined by an experienced field biologist.

8. Two confirmation samples (B-19, and B-20) have been collected that appear to demonstrate that the SVE system that has been operating on the Site since August 2012 has potentially reduced the contamination present in the sub surface soils in a relatively short time frame (EES; Table 1). Samples B-19 and B-20 were collected after three years of SVE operation and show greatly reduced contamination levels when compared to the nearest soil samples (SVE-2 and SVE-3) that were collected prior to implementation of the SVE system.

   The extension of the SVE system that EES proposed in the September 2018, *Technical Memorandum; Focused Off-Site Remedial Technology Evaluation*, is an appropriate next step for the Site in attempting to remove the hazardous substances present in the West Fourth Plain Blvd. corridor, and has potential to meet the cleanup standards for the Site.

   Failure of the proposed cleanup option to meet the cleanup standards for the Site will require additional effort to achieve those standards or the Site may need to seek closure by other means.

[17] Report, p. 19.

2. Establishment of cleanup standards.

Ecology has determined the cleanup levels and points of compliance you established for the Site meet the substantive requirements of MTCA. Site CULs as Ecology currently understands them are given in the table at the end of this section.

Standards points of compliance listed below are currently being used for the Site. Ecology believes that standard points of compliance are applicable for this Site.

- The point of compliance for protection of groundwater is established in the soils throughout the Site (WAC 173-340-740(6)(b)).[3]
- For soil cleanup levels based on protection from vapors, the point of compliance shall be established in the soils throughout the site from the ground surface to the uppermost ground water saturated zone (WAC 173-340-740(6)(c)).[3]
- For soil cleanup levels based on human exposure via direct contact or other exposure pathways where contact with the soil is required to complete the pathway, the point of compliance is established in the soils throughout the Site from the ground surface to 15 feet below ground surface (WAC 173-340-740(6)(d)).[3]
- The point of compliance for the groundwater is established throughout the Site from the uppermost level of the saturated zone extending vertically to the lowest depth that could potentially be affected by the Site (WAC 173-340-720(8)(b)).[3]
- The point of compliance for indoor air is ambient and indoor air throughout the Site (WAC 173-340-750(6)).[3]

Ecology Table 1 – Proposed Site CULs or Screening Levels for Each Media

Constituent of Concern	CAS #	Method A Groundwater CUL	Method B Soil CUL	Method B Indoor Air Screening Levels
		(µg/L)	(mg/Kg)	(µg/m³)
Gasoline & Diesel Related Hazardous Substances:				
TPH		None	2,619[18]	140
Benzene	71-43-2	5	18.2	0.32
Toluene	108-88-3	1,000	6,400	2,285.71
Ethylbenzene	100-41-4	700	8,000	457.14
Xylene	1330-20-7	1,000	16,000	45.71 [19]
Naphthalenes[20]	Various	160	1,600	0.07
Additives:				
EDB	106-93-4	0.01	0.5	0.0042
EDC	107-06-2	5	10.99	0.01
MTBE	1634-04-4	20	555.56	9.62
Metals:				
Total Lead	7439-92-1	15	17 [21]	NONE
Halogenated VOCs:				
PCE	127-18-4	5.0	476.19	9.62
TCE[22]	79-01-6	5.0	12	0.37
1,2-Dichloroethylene[22]	Isomer Dependent	NONE	Isomer Dependent	NONE
Vinyl Chloride[22]	75-01-4	0.20	240	45.7
VOCs:				
Carbon tetrachloride	56-23-5	NONE	14.3	0.417
MEK	78-93-3	NONE	48,000	2,290
1,1,1-Trichloroethane	71-55-6	200	160,000	2,290

[18] EES, *Technical Memorandum; Subject: Development of Site-Specific MTCA Method B Soil Cleanup Level for Gasoline*, March 31, 2016.
[19] For both m-Xylene and o-Xylene.
[20] Naphthalenes includes the total of naphthalene, 1-methyhl naphthalene, and 2-methyl naphthalene.
[21] Washing State and Clark County Background Lead Concentration.
[22] Included as Degradation Daughter Products of PCE.

Ecology Table 2 – MTCA Method B VI Screening Levels

Constituent of Concern	CAS #	Method B Sub-Slab Soil Gas Screening Level	Method B Deep Soil Screening Level	Method B Groundwater Screening Level
		(µg/m³)	(µg/m³)	(µg/L)
Gasoline & Diesel Related Hazardous Substances:				
TPH	NONE	4,700	14,000	140,000
Benzene	71-43-2	10.68	32.05	2.40
Toluene	108-88-3	76,190.48	228,571.43	15,584.42
Ethylbenzene	100-41-4	15,238.10	45,714.29	2,782.61
m-Xylene	108-38-3	1,523.81	4,571.43	310
o-Xylene	95-47-6	1,523.81	4,571.43	440
Naphthalene	91-20-3	2.45	7.35	8.93
Additives:				
EDB	106-93-4	0.14	0.42	0.28
EDC	107-06-2	3.21	9.62	4.20
MTBE	1634-04-4	320.51	961.54	610
Halogenated VOCs:				
PCE	127-18-4	320.51	962	22.9
TCE[22]	79-01-6	12.33	37	1.55
1,2-Dichloroethylene[22]	Isomer Dependent	NONE	NONE	NONE
Vinyl Chloride[22]	75-01-4	9.33	28	0.347
VOCs:				
Carbon Tetrachloride	56-23-5	13.89	41.7	0.539
MEK	78-93-3	76,190.48	228,571.43	1,740,000
1,1,1-Trichloroethane	71-55-6	76,190.48	228,571.43	5,240

3. Selection of cleanup action.

Ecology has determined the cleanup action you selected for the Site may meet the substantive requirements of MTCA. Cleanup at the Site has not been completed, and Site wide confirmation samples that demonstrate the remediation of all of the Sites hazardous substances will need to be completed to demonstrate the effectiveness of the remediation.

4. Cleanup.

Ecology has determined the cleanup you performed does not meet any cleanup standards at the Site. Cleanup has not been completed. The cleanup actions performed at the Site at this time has been removal of a historical UST with limited removal of PCS and the installation of an SVE system that has been in operation since August 2012. Extension of the SVE system has been proposed to attempt remediation of PCS that extends into the Fourth Plain Blvd. corridor.

Limitations of the Opinion

1. Opinion does not settle liability with the state.

Liable persons are strictly liable, jointly and severally, for all remedial action costs and for all natural resource damages resulting from the release or releases of hazardous substances at the Site. This opinion **does not**:

- Resolve or alter a person's liability to the state.
- Protect liable persons from contribution claims by third parties.

To settle liability with the state and obtain protection from contribution claims, a person must enter into a consent decree with Ecology under RCW 70.105D.040(4).[2]

2. Opinion does not constitute a determination of substantial equivalence.

To recover remedial action costs from other liable persons under MTCA, one must demonstrate that the action is the substantial equivalent of an Ecology-conducted or Ecology-supervised action. This opinion does not determine whether the action you performed is substantially equivalent. Courts make that determination.
See RCW 70.105D.080[3] and WAC 173-340-545.[2]

3. State is immune from liability.

The state, Ecology, and its officers and employees are immune from all liability, and no cause of action of any nature may arise from any act or omission in providing this opinion.
See RCW 70.105D.030(1)(i).[2]

Contact Information

Thank you for choosing to clean up the Site under the Voluntary Cleanup Program (VCP). After you have addressed our concerns, you may request another review of your cleanup. Please do not hesitate to request additional services as your cleanup progresses. We look forward to working with you.

For more information about the VCP and the cleanup process, please visit our Voluntary Cleanup Program web site.[23] If you have any questions about this opinion, please contact me by phone at (360) 407-6437 or at aaren.fiedler@ecy.wa.gov.

Sincerely,

Aaren Fiedler

Aaren Fiedler
Southwest Regional Office
Toxics Cleanup Program

AF: tm

Enclosures: A – Description, Diagrams, and Tables of the Site

By certified mail: 9489 0090 0027 6066 5562 59

cc: Richard Piacentini, 1002 West Fourth Plain Blvd LLC
Paul Ecker, EES Environmental consulting, Inc.
Nicholas Acklam, Ecology
Ecology Site File

[23] https://ecology.wa.gov/Spills-Cleanup/Contamination-cleanup/Cleanup-process/Cleanup-options/Voluntary-cleanup-program

Attachment B

EES
ENVIRONMENTAL CONSULTING, INC.
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Technical Memorandum

Hazardous Chemical Risk Screening Evaluation

To: Aaren Fiedler, Washington Department of Ecology Voluntary Cleanup Program

Copies: Jonathan Polonsky and Brent Chadwick, Plaid Pantries, Inc.

From: Paul Ecker, LHG; Chris Rhea, LG; and Regina Skarzinskas (Technical Assessment Services, Inc.)

Date: May 14, 2019

Regarding: Plaid Pantry Store #112
1002 W. Fourth Plain Boulevard
Vancouver, Washington
Department of Ecology Cleanup Site ID 11759, FS ID 9158935, and VCP #SW1314
EES Project 1179

At Ecology's request, EES Environmental Consulting, Inc. (EES) conducted a hazardous chemical screening evaluation for gasoline-related contaminants of interest (COIs) at the Plaid Pantry Store #112 Site. This evaluation confirms RI conclusions that the cited MTCA cleanup levels for individual chemicals are adequately protective of human health and the environment, and no further risk-based adjustments are necessary to account for exposure to multiple hazardous substances or exposure resulting from more than one exposure pathway.

MTCA SCREENING

The data set used for this screening is presented as Table 1. A total of 17 chemicals were analyzed.

Eight chemicals were not detected [1,2-dibromoethane (EDB), 1,2-dichloroethane (EDC), methyl tert-butyl ether (MTBE), tetrachloroethylene (PCE), trichloroethylene (TCE), 2-butanone, carbon tetrachloride, and 1,1,1-tetrachloroethane].

- The minimum laboratory detection limits (DL) for all eight chemicals did not exceed their respective MTCA Method B screening values. These are presented in Table 2.
- The maximum detection limits for all chemicals, except for EDB, did not exceed their respective MTCA Method B screening values. Two EDB samples out of 57 samples, located at B5-6 and PIT S/6, had detection limits which exceeded the MTCA Method B screening levels at full value, but not at ½ of the detection limit value.

Because analytical detection limits were below the applicable MTCA Method B screening levels, these eight chemicals were eliminated from further consideration. The remaining Site contaminants of interest are presented in Table 3.

The remaining nine analytes were selected for screening against MTCA Method B default screening values. For purposes of this conservative preliminary screening exercise, MTCA Method A criteria were compared to Site TPH (gasoline, diesel, and oil) concentrations rather than the calculated cleanup level of 2,619 mg/kg. These Site chemicals and associated data are presented in Table 4.

Table 5 presents the MTCA Screening.

MTCA Statistical Guidance directs that where non-detects represent more than 50% of the total dataset, an exposure point concentration (EPC) cannot be calculated, and the maximum detection should be used as the EPC. Additionally, when the data set is small (<10), the maximum detection should be used as the EPC. Therefore, as shown on Table 5, the EPC in all cases represents the maximum concentration detected. Since a standard MTCA Method B screening value is not established for gasoline, diesel, heavy oil/lube oil, or lead, the MTCA Method A default values were used for initial screening purposes.

Among this dataset, the only chemical that exceeded its respective MTCA screening level was gasoline. Since gasoline did not pass this initial screen, EES calculated a site-specific MTCA Method B soil cleanup level (CUL, 2,619 mg/kg) for gasoline using Ecology's TPH model. Maximum Site gasoline concentrations exceed both the default and site-specific MTCA screening values.

Note that per Ecology's recent Opinion Letter dated February 20, 2019, the site-specific MTCA Method B soil cleanup level (CUL, 2,619 mg/kg) for TPH is a total TPH CUL, which should be compared to the sum of gasoline, diesel, and oil. Future compliance soil sampling will address this detail.

CUMULATIVE RISK

Generally, cumulative risk is calculated when there are a relatively large number of chemicals (>10) of concern (COC) to ensure that while each chemical does not exceed its risk threshold, the combination of chemicals with similar toxic endpoints also does not exceed a toxic threshold. As summarized below and on Tables 6 and 7, a risk characterization was calculated for the five detected analytes (benzene, toluene, ethylbenzene, xylenes and naphthalene) which were detected but at concentrations below their respective MTCA screening criteria.

- Among this dataset, benzene is the only carcinogen. Therefore, no cumulative risk characterization for carcinogens was performed. The ECR for benzene is 2E-07, which is below the regulatory standard of 1E-05.
- Hazard Quotients (HQs) were calculated for the non-carcinogens (toluene, ethylbenzene, xylenes, and naphthalene). All of the HQs were below the regulatory standard of 1. The total Hazard Index (HI) for these noncarcinogenic analytes is 0.08, which is far below the regulatory standard of 1. Because these analytes have different toxic endpoints, a cumulative risk assessment for non-cancer endpoints is not possible.

SUMMARY

Analytes that were not detected had sufficiently low detection limits and were eliminated from the MTCA screening.

The maximum detected chemical concentrations were screened against their respective MTCA screening values. Lead was detected, but the maximum concentration did not exceed the default MTCA Method A screening level, and therefore was eliminated from further characterization. The only chemical (mixture) that exceeded its respective MTCA screening value was gasoline. Since the site-specific MTCA Method B CUL for TPH in soil includes all petroleum hydrocarbons, the focus of future Site cleanup activities by Plaid will demonstrate that both gasoline and total petroleum hydrocarbons (sum of gasoline, diesel, and oil) are below the site-specific MTCA Method B soil cleanup level of 2,619 mg/kg.

As requested by Ecology, a risk characterization was performed for all retained constituents. Neither the ECR for benzene (2E-07) nor the HI of 0.08 for the four noncarcinogens exceeded the regulatory standards of 1E-05 and 1.0 respectively. A cumulative risk assessment was not possible as there was only one carcinogen and only four noncarcinogens, all of which have different toxic endpoints.

Based on this evaluation, the individual hazardous substance soil cleanup levels are adequately protective and do not need to be adjusted. The RI conclusions regarding contaminants of interest protectiveness are validated and no further risk screening is necessary to adopt cleanup levels for soil compliance.

ATTACHMENTS

Table 1: Soil Analytical Results – Gasoline, Diesel, and Other Constituents (mg/kg)
Table 2: Soil Analytical Results – For Chemicals Not detected (mg/kg)
Table 3: Soil Analytical Results – For All Detected Chemicals (mg/kg)
Table 4: Soil Data Set for Detected Chemicals
Table 5: Risk Screening Results
Table 6: Risk Characterization-Carcinogens
Table 7: Risk Characterization-Noncarcinogens

Attachments

TABLE 1
Soil Analytical Results - Gasoline, Diesel, and Other Constituents (mg/kg)
Plaid Pantry No. 112
Vancouver, Washington

Location	Date	Sample Depth (feet bgs)	Gasoline	Diesel	Heavy Oil/Lube	Benzene	Toluene	Ethylbenzene	Xylenes	EDB	EDC	MTBE	Naphthalene	Lead	PCE	TCE	2-Butanone	Carbon Tetrachloride	1,1,1-Trichloroethane
Soil Screening Levels																			
MTCA Method A[1] Unrestricted Use			100/30[2]	2,000	2,000	0.03	7	6	9	0.005	NA	0.10	5	250	0.05	0.03	NA	NA	2
MTCA Method B[3]			2,619[4]	NA	NA	18.2	6,400	8,000	16,000	0.5	11	556	1,600	NC	476	12	NC	14.3	160,000
September 2011 Initial Soil Sampling																			
B1-3	09/08/2011	3	24 U	59 U	118 U	0.011 U	0.044 U	0.022 U	0.065 U	*0.022 U*	0.022 U	0.044 U	0.087 U	-	0.022 U	0.022 U	0.44 U	0.022 U	0.022 U
B1-9	09/08/2011	9	22 U	54 U	108 U	0.013 U	0.051 U	0.026 U	0.077 U	*0.026 U*	0.026 U	0.051 U	0.10 U	8.3	0.026 U	0.026 U	0.51 U	0.026 U	0.026 U
B1-15	09/08/2011	15	21 U	52 U	103 U	0.013 U	0.052 U	0.026 U	0.078 U	*0.026 U*	0.026 U	0.052 U	0.10 U	-	0.026 U	0.026 U	0.52 U	0.026 U	0.026 U
B2-3	09/07/2011	3	21 U	53 U	107 U	0.011 U	0.043 U	0.022 U	0.065 U	*0.022 U*	0.022 U	0.043 U	0.087 U	-	0.022 U	0.022 U	0.43 U	0.022 U	0.022 U
B2-9	09/07/2011	9	25 U	25 U[b1]	54 [b1]	0.0088 U	0.035 U	0.018 U	0.053 U	*0.018 U*	0.018 U	0.035 U	0.010 U[d]	-	0.018 U	0.018 U	0.35 U	0.018 U	0.018 U
B2-15	09/09/2011	15	21 U	53 U	105 U	0.0068 U	0.027 U	0.014 U	0.041 U	*0.014 U*	0.014 U	0.027 U	0.054 U	-	0.014 U	0.014 U	0.27 U	0.014 U	0.014 U
B3-3	09/07/2011	3	23 U	57 U	113 U	0.012 U	0.047 U	0.024 U	0.071 U	*0.024 U*	0.024 U	0.047 U	0.094 U	-	0.024 U	0.024 U	0.47 U	0.024 U	0.024 U
B3-9	09/07/2011	9	26 U	64 U	128 U	0.014 U	0.055 U	0.028 U	0.083 U	*0.028 U*	0.028 U	0.055 U	0.11 U	12	0.028 U	0.028 U	0.55 U	0.028 U	0.028 U
B4-3	09/07/2011	3	23 U	57 U	114 U	0.013 U	0.051 U	0.026 U	0.076 U	*0.026 U*	0.026 U	0.051 U	0.10 U	-	0.026 U	0.026 U	0.51 U	0.026 U	0.026 U
B4-9	09/07/2011	9	21 U	53 U	106 U	0.012 U	0.049 U	0.024 U	0.073 U	*0.024 U*	0.024 U	0.049 U	0.097 U	-	0.024 U	0.024 U	0.49 U	0.024 U	0.024 U
B5-3	09/08/2011	3	22 U	56 U	112 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B5-6	09/08/2011	6	**2,900** [a]	>57 [c]	114 U	*0.28 U*	1.1 U	**12**	**74**	*0.56 U*	0.56 U	*1.1 U*	**14**	21	*0.56 U*	*0.56 U*	11 U	0.56 U	0.56 U
B5-9	09/08/2011	9	**4,070** [a]	>54 [c]	108 U	*0.24 U*	0.95 U	**29**	**121**	*0.48 U*	0.48 U	*0.95 U*	**8.8**	11	*0.48 U*	*0.48 U*	9.5 U	0.48 U	0.48 U
B5-12.5	09/08/2011	12.5	**444** [a]	638 [b,c]	50 U[b]	**2.1**	0.13 U	5.3	**21**	*0.063 U*	0.063 U	*0.13 U*	1.1	13	*0.063 U*	*0.063 U*	1.3 U	0.063 U	0.13 U
B5-20	09/08/2011	20	2.9 U [a]	-	-	0.0073 U	0.029 U	0.015 U	0.044 U	*0.015 U*	0.015 U	0.029 U	0.058 U	-	0.015 U	0.015 U	0.29 U	0.015 U	0.015 U
B6-3	09/08/2011	3	22 U	54 U	107 U	0.0096 U	0.038 U	0.019 U	0.057 U	*0.019 U*	0.019 U	0.038 U	0.077 U	-	0.019 U	0.019 U	0.38 U	0.019 U	0.019 U
B6-9	09/08/2011	9	23 U	58 U	116 U	0.0093 U	0.037 U	0.019 U	0.056 U	*0.019 U*	0.019 U	0.037 U	0.074 U	-	0.019 U	0.019 U	0.37 U	0.019 U	0.019 U
B6-12	09/09/2011	12	26 U	64 U	128 U	0.011 U	0.044 U	0.022 U	0.065 U	*0.022 U*	0.022 U	0.044 U	0.087 U	-	0.022 U	0.022 U	0.44 U	0.022 U	0.022 U
February 2012 Abandoned Tank Decommissioning																			
PIT S/2	02/14/2012	2	**1,320** [a]	54 [c]	109 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-
PIT S/6	02/14/2012	6	**5,800** [a]	62 [c]	124 U	**3.4**	**23**	**78**	**411**	*0.81 U*	0.81 U	*1.6 U*	**34**	-	*0.81 U*	*0.81 U*	16 U	0.81 U	0.81 U
August 2012 Soil Sampling																			
B-7/6	08/16/2012	6	**473** [a]	-	-	*0.18 J*	0.86 U	2.1	**12**	*0.011 U*[e]	0.43 U	*0.51 U*[g]	1.7 U	-	*0.21 U*[g]	*0.31 U*[g]	8.6 U	0.43 U	0.43 U
B-7/9	08/16/2012	9	**1,730** [a]	-	-	**0.80**	0.82 U	0.89	1.2 U	*0.25 U*[g]	0.41 U	*0.49 U*[g]	1.6 U	-	*0.21 U*[g]	*0.30 U*[g]	8.2 U	0.41 U	0.41 U
B-7/13	08/16/2012	13	**303** [a]	-	-	**0.15**	0.089 U	0.17	0.25	*0.0089 U*[e]	0.045 U	0.089 U	0.30	-	0.045 U	*0.032 U*[g]	0.89 U	0.045 U	0.045 U
B-7/14	08/16/2012	14	5.8 U [a]	-	-	0.015 U	0.058 U	0.029 U	0.087 U	0.0029 U[e,g]	0.029 U	0.058 U	0.12 U	-	0.029 U	0.029 U	0.58 U	0.029 U	0.029 U
B-8/6	08/16/2012	6	8.4 U [a]	-	-	0.026	0.084 U	0.072	0.30	0.0042 U[e,g]	0.042 U	0.084 U	0.17 U	-	0.042 U	*0.031 U*[g]	0.84 U	0.042 U	0.042 U
B-8/9	08/16/2012	9	7.4 U [a]	-	-	**0.042**	0.074 U	0.037 U	0.25	*0.023 U*[g]	0.037 U	0.074 U	0.15 U	-	0.037 U	0.027 U[g]	0.74 U	0.037 U	0.037 U
B-8/13	08/16/2012	13	8.9 U [a]	-	-	0.022 U	0.089 U	0.044 U	0.13 U	0.0044 U[e,g]	0.044 U	0.089 U	0.18 U	-	0.044 U	*0.032 U*[g]	0.88 U	0.044 U	0.044 U
B-9/3	08/13/2012	3	5.7 U[a]	59 U	117 U	0.0143 U	0.057 U	0.029 U	0.086 U	*0.017 U*[g]	0.029 U	0.057 U	0.11 U	-	0.029 U	0.029 U	0.57 U	0.029 U	0.029 U
B-9/6	08/13/2012	6	5.2 U[a]	-	-	0.013 U	0.052 U	0.026 U	0.078 U	*0.016 U*[g]	0.026 U	0.052 U	0.10 U	-	0.026 U	0.026 U	0.52 U	0.026 U	0.026 U
B-9/9	08/13/2012	9	8.2 U[a]	-	-	0.020 U	0.082 U	0.041 U	0.12 U	*0.025 U*[g]	0.041 U	0.082 U	0.16 U	-	0.041 U	0.030 U[g]	0.82 U	0.041 U	0.041 U
B-9/13	08/13/2012	13	5.9 U[a]	-	-	0.015 U	0.059 U	0.029 U	0.088 U	*0.018 U*[g]	0.029 U	0.059 U	0.12 U	-	0.029 U	0.029 U	0.59 U	0.029 U	0.029 U
B-10/3	08/13/2012	3	5.4 U[a]	55 U	109 U	0.013 U	0.054 U	0.027 U	0.080 U	*0.016 U*[g]	0.027 U	0.054 U	0.11 U	-	0.027 U	0.027 U	0.54 U	0.027 U	0.027 U
B-10/6	08/13/2012	6	9.2 U[a]	-	-	0.023 U	0.092 U	0.046 U	0.14 U	*0.028 U*[g]	0.046 U	0.092 U	0.18 U	-	0.046 U	*0.033 U*[g]	0.92 U	0.046 U	0.046 U
B-10/9	08/13/2012	9	11 U[a]	-	-	0.028 U	0.11 U	0.056 U	0.17 U	*0.034 U*[g]	0.056 U	0.067 U[g]	0.22 U	-	0.028 U[g]	*0.041 U*[g]	1.1 U	0.056 U	0.056 U
B-10/13	08/13/2012	13	4.7 U[a]	-	-	0.012 U	0.047 U	0.024 U	0.071 U	*0.014 U*[g]	0.024 U	0.047 U	0.095 U	-	0.024 U	0.024 U	0.47 U	0.024 U	0.024 U
B-10/18	08/13/2012	18	20 U	51 U	102 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B-11/3	08/14/2012	3	13 [a]	56 U	113 U	0.017 U	0.068 U	0.034 U	0.10 U	*0.021 U*[g]	0.034 U	0.068 U	0.14 U	-	0.034 U	0.025 U[g]	0.68 U	0.034 U	0.034 U
B-11/6	08/14/2012	6	**20,400** [a]	62 X	123 U	**3.7**	0.81 U	3.9	1.6 U	*0.25 U*[g]	0.41 U	*0.49 U*[g]	**57**	24	*0.20 U*[g]	*0.30 U*[g]	8.1 U	0.41 U	0.41 U
B-11/9	08/14/2012	9	**1,560** [a]	-	-	**0.47**	0.095 U	0.62	0.14 U	*0.029 U*[g]	0.048 U	0.095 U	1.9	-	0.048 U	*0.035 U*[g]	2.7 U	0.048 U	0.048 U
B-11/11	08/14/2012	11	5.7 U[a]	-	-	0.014 U	0.057 U	0.029 U	0.086 U	0.0029 U[e,g]	0.029 U	0.057 U	0.11 U	3.3	0.029 U	0.029 U	0.57 U	0.029 U	0.029 U
B-11/17	08/14/2012	17	5.6 U[a]	-	-	0.014 U	0.056 U	0.028 U	0.084 U	*0.017 U*[g]	0.028 U	0.056 U	0.11 U	-	0.028 U	0.028 U	0.56 U	0.028 U	0.028 U
B-11/23	08/14/2012	23	20 U	51 U	102 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B-11/29	08/14/2012	29	20 U	51 U	102 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B-12/3	08/14/2012	3	5.2 U[a]	58 U	116 U	0.013 U	0.052 U	0.026 U	0.078 U	*0.016 U*[g]	0.026 U	0.052 U	0.10 U	-	0.026 U	0.026 U	0.52 U	0.026 U	0.026 U
B-12/6	08/14/2012	6	8.1 U[a]	-	-	0.020 U	0.081 U	0.040 U	0.12 U	*0.024 U*[g]	0.040 U	0.081 U	0.16 U	-	0.040 U	0.029 U[g]	0.81 U	0.040 U	0.040 U
B-12/9	08/14/2012	9	9.6 U[a]	-	-	0.024 U	0.096 U	0.048 U	0.14 U	*0.029 U*[g]	0.048 U	0.096 U	0.19 U	-	0.048 U	*0.035 U*[g]	0.96 U	0.048 U	0.048 U
B-12/13	08/14/2012	13	8.1 U[a]	-	-	0.020 U	0.081 U	0.040 U	0.12 U	*0.025 U*[g]	0.040 U	0.081 U	0.16 U	-	0.040 U	0.029 U[g]	0.81 U	0.040 U	0.040 U
B-12/18	08/14/2012	18	20 U	50 U	100 U	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TABLE 1
Soil Analytical Results - Gasoline, Diesel, and Other Constituents (mg/kg)
Plaid Pantry No. 112
Vancouver, Washington

Location	Date	Sample Depth (feet bgs)	Gasoline	Diesel	Heavy Oil/Lube	Benzene	Toluene	Ethylbenzene	Xylenes	EDB	EDC	MTBE	Naphthalene	Lead	PCE	TCE	2-Butanone	Carbon Tetrachloride	1,1,1-Trichloroethane
Soil Screening Levels																			
MTCA Method A[1] Unrestricted Use			100/30[2]	2,000	2,000	0.03	7	6	9	0.005	NA	0.10	5	250	0.05	0.03	NA	NA	2
MTCA Method B[3]			2,619[4]	NA	NA	18.2	6,400	8,000	16,000	0.5	11	556	1,600	NC	476	12	NC	14.3	160,000
August 2012 Soil Sampling (continued)																			
B-13/3	08/15/2012	3	7.8 U[a]	-	-	0.019 U	0.078 U	0.039 U	0.12 U	*0.024 U*[g]	0.039 U	0.078 U	0.16 U	-	0.039 U	0.028 U[g]	0.78 U	0.039 U	0.039 U
B-13/6	08/15/2012	6	6.5 U[a]	-	-	0.016 U	0.065 U	0.032 U	0.097 U	*0.020 U*[g]	0.032 U	0.065 U	0.13 U	-	0.032 U	0.023 U[g]	0.65 U	0.032 U	0.032 U
B-13/9	08/15/2012	9	6.9 U[a]	-	-	0.017 U	0.069 U	0.034 U	0.10 U	*0.021 U*[g]	0.034 U	0.069 U	0.14 U	-	0.034 U	0.025 U[g]	0.69 U	0.034 U	0.034 U
B-13/13	08/15/2012	13	8.0 U[a]	-	-	0.020 U	0.080 U	0.040 U	0.12 U	*0.024 U*[g]	0.040 U	0.080 U	0.16 U	-	0.040 U	0.029 U[g]	0.80 U	0.040 U	0.040 U
B-14/3	08/15/2012	3	6.6 U[a]	-	-	0.017 U	0.066 U	0.033 U	0.099 U	*0.020 U*[g]	0.033 U	0.066 U	0.13 U	-	0.033 U	0.024 U[g]	0.66 U	0.033 U	0.033 U
B-14/6	08/15/2012	6	7.0 U[a]	-	-	0.018 U	0.070 U	0.035 U	0.11 U	*0.021 U*[g]	0.035 U	0.070 U	0.14 U	-	0.035 U	0.025 U[g]	0.70 U	0.035 U	0.035 U
B-14/9	08/15/2012	9	7.6 U[a]	-	-	0.019 U	0.076 U	0.038 U	0.11 U	*0.023 U*[g]	0.038 U	0.076 U	0.15 U	-	0.038 U	0.027 U[g]	0.76 U	0.038 U	0.038 U
B-14/13	08/15/2012	13	6.2 U[a]	-	-	0.016 U	0.062 U	0.031 U	0.094 U	*0.019 U*[g]	0.031 U	0.062 U	0.13 U	-	0.031 U	0.023 U[g]	0.62 U	0.031 U	0.031 U
B-15/3	08/15/2012	3	6.6 U[a]	-	-	0.017 U	0.066 U	0.033 U	0.099 U	*0.020 U*[g]	0.033 U	0.066 U	0.13 U	-	0.033 U	0.024 U[g]	0.66 U	0.033 U	0.033 U
B-15/6	08/15/2012	6	7.9 U[a]	-	-	0.020 U	0.079 U	0.040 U	0.12 U	*0.024 U*[g]	0.040 U	0.079 U	0.16 U	-	0.040 U	0.029 U[g]	0.79 U	0.040 U	0.040 U
B-15/9	08/15/2012	9	7.6 U[a]	-	-	0.019 U	0.076 U	0.038 U	0.11 U	*0.023 U*[g]	0.038 U	0.076 U	0.15 U	-	0.038 U	0.027 U[g]	0.76 U	0.038 U	0.038 U
B-15/13	08/15/2012	13	6.2 U[a]	-	-	0.016 U	0.062 U	0.031 U	0.093 U	*0.019 U*[g]	0.031 U	0.062 U	0.12 U	-	0.031 U	0.023 U[g]	0.62 U	0.031 U	0.031 U
B-16/6	08/16/2012	6	5.8 U[a]	-	-	0.015 U	0.058 U	0.029 U	0.087 U	0.0030 U[e,g]	0.029 U	0.058 U	0.17 U	11	0.029 U	0.029 U	0.58 U	0.029 U	0.029 U
B-16/9	08/16/2012	9	8.0 U[a]	-	-	0.020 U	0.080 U	0.040 U	1.2 U	*0.024 U*[g]	0.040 U	0.080 U	0.16 U	12	0.040 U	0.029 U[g]	0.80 U	0.040 U	0.040 U
B-16/13	08/16/2012	13	5.9 U[a]	-	-	0.015 U	0.059 U	0.030 U	0.089 U	0.0030 U[e,g]	0.030 U	0.059 U	0.12 U	-	0.030 U	0.030 U	0.59 U	0.030 U	0.030 U
September 2015 Soil Sampling																			
B-16(3)	09/02/2015	3	3.6 U[a]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B-16(6)	09/02/2015	6	**1,080** J[1,a]	-	-	*0.18 U*	0.73 U	0.37 U	1.1 U	-	-	-	-	-	-	-	-	-	-
B-16(9)	09/02/2015	9	**928** J[1,a]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B-16(12)	09/02/2015	12	5.8 U[a]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B-17(3)	09/02/2015	3	7.0 U[a]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B-17(6)	09/02/2015	6	15 [a]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B-17(9)	09/02/2015	9	**9,180** [a]	-	-	*0.19 U*	0.77 U	0.63	1.2 U	-	-	-	-	-	-	-	-	-	-
B-17(12)	09/03/2015	12	5.8 U[a]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B-18(3)	09/03/2015	3	**4,770** [a]	-	-	*0.66 U*	2.6 U	2.6	3.9 U	-	-	-	-	-	-	-	-	-	-
B-18(6)	09/03/2015	6	**543** [a]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B-18(9)	09/03/2015	9	**7,820** [a]	-	-	*0.19 U*	0.74 U	0.37 U	1.1 U	-	-	-	-	-	-	-	-	-	-
B-18(12)	09/04/2015	12	5.8 U[a]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B-19(3)	09/03/2015	3	5.8 U[a]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B-19(6)	09/03/2015	6	8.4 [a]	-	-	0.019 U	0.077 U	0.039 U	0.12 U	-	-	-	-	-	-	-	-	-	-
B-19(9)	09/03/2015	9	7.9 U[a]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B-19(12)	09/03/2015	12	5.7 U[a]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B-20(6)	09/03/2015	6	5.9 U[a]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
B-20(9)	09/03/2015	9	**475** J[1,a,f]	-	-	0.018 U	0.073 U	0.036 U	0.11 U	-	-	-	-	-	-	-	-	-	-
B-20(12)	09/03/2015	12	5.7 U[a]	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

TABLE 1
Soil Analytical Results - Gasoline, Diesel, and Other Constituents (mg/kg)
Plaid Pantry No. 112
Vancouver, Washington

Notes:

Gasoline, Diesel, and Heavy Oil/Lube by Method by NWTPH-HCID unless otherwise noted.

Volatiles by EPA Method 8260B

[1] Model Toxics Control Act (MTCA) Cleanup Amendments, Method A Soil Cleanup Levels for Unrestricted Land Use (WDOE, CLARC Database, August 2015)

[2] Per MTCA, the cleanup value for gasoline is 30 mg/kg if benzene is detected and/or if the sum of the toluene, ethylbenzene, and xylenes is greater than one percent of the gasoline concentration, and 100 mg/kg for all other gasoline mixtures.

[3] Model Toxics Control Act (MTCA) Cleanup Amendments, Method B Soil Cleanup Levels (cancer endpoint) (WDOE, CLARC Database, August 2015)

[4] MTCA modified Method B cleanup value calculated using Ecology's Workbook Tool for Calculating Soil and Groundwater Cleanup Levels (revised December 2007). The median soil concentration shown is based on site-specific analytical data combined with generic default assumptions.

[5] Stated cleanup level is a non-cancer value. No cancer value available.

[a] Gasoline by Method NWTPH-Gx/EPA 8260B

[b] Diesel and Heavy Oil/Lube by Method NWTPH-Dx

[b1] Diesel and Heavy Oil/Lube by Method NWTPH-Dx with silica-gel cleanup

[c] Results in the diesel organics range are due to overlap from a gasoline range product.

[d] Naphthalene analyzed by EPA Method 8270D SIM. No detections were reported for any of the PAH compounds.

[e] 1,2-Dibromoethane (EDB) analyzed by EPA 8260B SIM.

[f] The chromatographic pattern does not resemble the fuel pattern used for quantitation.

[g] The analyte is reported down to the method detection limit. Result is an estimated concentration.

MTBE = Methyl tert-butyl ether

EDB = 1,2-Dibromoethane

EDC = 1,2-Dichloroethane

PCE = Tetrachloroethene

TCE = Trichloroethene

mg/kg = milligrams per kilogram

Bold values indicate concentrations exceed the Method A cleanup level shown.

Italics indicate analytical reporting limit exceeds lowest cleanup level shown.

U = Undetected at method limit shown

J = Estimated value. Result was below the method reporting limit, but above the method detection limit.

J^1 = Data Validation Qualifier. The result is an estimated quantity. The associated numerical value is the approximate concentration of the analyte in the sample.

X = The detection in the diesel range is due to overlap from a gasoline range product.

NA = Not Applicable/Not Available

NC = Not Calculated

- = Not analyzed for this parameter

TABLE 2
Soil Analytical Results - For Chemicals Not Detected
Plaid Pantry No. 112
Vancouver, Washington

Location	Date	Sample Depth (feet bgs)	EDB	EDC	MTBE	PCE	TCE	2-Butanone	Carbon Tetrachloride	1,1,1-Trichloroethane
Soil Screening Levels										
MTCA Method A[1] Unrestricted Use			0.005	NA	0.10	0.05	0.03	NA	NA	2
MTCA Method B[3]			0.5	11	556	476	12	NC	14.3	160,000
September 2011 Initial Soil Sampling										
B1-3	09/08/2011	3	*0.022 U*	0.022 U	0.044 U	0.022 U	0.022 U	0.44 U	0.022 U	0.022 U
B1-9	09/08/2011	9	*0.026 U*	0.026 U	0.051 U	0.026 U	0.026 U	0.51 U	0.026 U	0.026 U
B1-15	09/08/2011	15	*0.026 U*	0.026 U	0.052 U	0.026 U	0.026 U	0.52 U	0.026 U	0.026 U
B2-3	09/07/2011	3	*0.022 U*	0.022 U	0.043 U	0.022 U	0.022 U	0.43 U	0.022 U	0.022 U
B2-9	09/07/2011	9	*0.018 U*	0.018 U	0.035 U	0.018 U	0.018 U	0.35 U	0.018 U	0.018 U
B2-15	09/09/2011	15	*0.014 U*	0.014 U	0.027 U	0.014 U	0.014 U	0.27 U	0.014 U	0.014 U
B3-3	09/07/2011	3	*0.024 U*	0.024 U	0.047 U	0.024 U	0.024 U	0.47 U	0.024 U	0.024 U
B3-9	09/07/2011	9	*0.028 U*	0.028 U	0.055 U	0.028 U	0.028 U	0.55 U	0.028 U	0.028 U
B4-3	09/07/2011	3	*0.026 U*	0.026 U	0.051 U	0.026 U	0.026 U	0.51 U	0.026 U	0.026 U
B4-9	09/07/2011	9	*0.024 U*	0.024 U	0.049 U	0.024 U	0.024 U	0.49 U	0.024 U	0.024 U
B5-3	09/08/2011	3	-	-	-	-	-	-	-	-
B5-6	09/08/2011	6	*0.56 U*	0.56 U	*1.1 U*	*0.56 U*	*0.56 U*	11 U	0.56 U	0.56 U
B5-9	09/08/2011	9	*0.48 U*	0.48 U	*0.95 U*	*0.48 U*	*0.48 U*	9.5 U	0.48 U	0.48 U
B5-12.5	09/08/2011	12.5	*0.063 U*	0.063 U	*0.13 U*	*0.063 U*	*0.063 U*	1.3 U	0.063 U	0.13 U
B5-20	09/08/2011	20	*0.015 U*	0.015 U	0.029 U	0.015 U	0.015 U	0.29 U	0.015 U	0.015 U
B6-3	09/08/2011	3	*0.019 U*	0.019 U	0.038 U	0.019 U	0.019 U	0.38 U	0.019 U	0.019 U
B6-9	09/08/2011	9	*0.019 U*	0.019 U	0.037 U	0.019 U	0.019 U	0.37 U	0.019 U	0.019 U
B6-12	09/09/2011	12	*0.022 U*	0.022 U	0.044 U	0.022 U	0.022 U	0.44 U	0.022 U	0.022 U
February 2012 Abandoned Tank Decommissioning										
PIT S/2	02/14/2012	2	-	-	-	-	-	-	-	-
PIT S/6	02/14/2012	6	*0.81 U*	0.81 U	*1.6 U*	*0.81 U*	*0.81 U*	16 U	0.81 U	0.81 U
August 2012 Soil Sampling										
B-7/6	08/16/2012	6	*0.011 U*[e]	0.43 U	*0.51 U*[g]	*0.21 U*[g]	*0.31 U*[g]	8.6 U	0.43 U	0.43 U
B-7/9	08/16/2012	9	*0.25 U*[g]	0.41 U	*0.49 U*[g]	*0.21 U*[g]	*0.30 U*[g]	8.2 U	0.41 U	0.41 U
B-7/13	08/16/2012	13	*0.0089 U*[e]	0.045 U	0.089 U	0.045 U	*0.032 U*[g]	0.89 U	0.045 U	0.045 U
B-7/14	08/16/2012	14	0.0029 U[e,g]	0.029 U	0.058 U	0.029 U	0.029 U	0.58 U	0.029 U	0.029 U
B-8/6	08/16/2012	6	0.0042 U[e,g]	0.042 U	0.084 U	0.042 U	*0.031 U*[g]	0.84 U	0.042 U	0.042 U
B-8/9	08/16/2012	9	*0.023 U*[g]	0.037 U	0.074 U	0.037 U	0.027 U[g]	0.74 U	0.037 U	0.037 U
B-8/13	08/16/2012	13	0.0044 U[e,g]	0.044 U	0.089 U	0.044 U	*0.032 U*[g]	0.88 U	0.044 U	0.044 U
B-9/3	08/13/2012	3	*0.017 U*[g]	0.029 U	0.057 U	0.029 U	0.029 U	0.57 U	0.029 U	0.029 U
B-9/6	08/13/2012	6	*0.016 U*[g]	0.026 U	0.052 U	0.026 U	0.026 U	0.52 U	0.026 U	0.026 U
B-9/9	08/13/2012	9	*0.025 U*[g]	0.041 U	0.082 U	0.041 U	0.030 U[g]	0.82 U	0.041 U	0.041 U
B-9/13	08/13/2012	13	*0.018 U*[g]	0.029 U	0.059 U	0.029 U	0.029 U	0.59 U	0.029 U	0.029 U
B-10/3	08/13/2012	3	*0.016 U*[g]	0.027 U	0.054 U	0.027 U	0.027 U	0.54 U	0.027 U	0.027 U
B-10/6	08/13/2012	6	*0.028 U*[g]	0.046 U	0.092 U	0.046 U	*0.033 U*[g]	0.92 U	0.046 U	0.046 U
B-10/9	08/13/2012	9	*0.034 U*[g]	0.056 U	0.067 U[g]	0.028 U[g]	*0.041 U*[g]	1.1 U	0.056 U	0.056 U
B-10/13	08/13/2012	13	*0.014 U*[g]	0.024 U	0.047 U	0.024 U	0.024 U	0.47 U	0.024 U	0.024 U
B-10/18	08/13/2012	18	-	-	-	-	-	-	-	-
B-11/3	08/14/2012	3	*0.021 U*[g]	0.034 U	0.068 U	0.034 U	0.025 U[g]	0.68 U	0.034 U	0.034 U
B-11/6	08/14/2012	6	*0.25 U*[g]	0.41 U	*0.49 U*[g]	*0.20 U*[g]	*0.30 U*[g]	8.1 U	0.41 U	0.41 U
B-11/9	08/14/2012	9	*0.029 U*[g]	0.048 U	0.095 U	0.048 U	*0.035 U*[g]	2.7 U	0.048 U	0.048 U
B-11/11	08/14/2012	11	0.0029 U[e,g]	0.029 U	0.057 U	0.029 U	0.029 U	0.57 U	0.029 U	0.029 U
B-11/17	08/14/2012	17	*0.017 U*[g]	0.028 U	0.056 U	0.028 U	0.028 U	0.56 U	0.028 U	0.028 U
B-11/23	08/14/2012	23	-	-	-	-	-	-	-	-
B-11/29	08/14/2012	29	-	-	-	-	-	-	-	-
B-12/3	08/14/2012	3	*0.016 U*[g]	0.026 U	0.052 U	0.026 U	0.026 U	0.52 U	0.026 U	0.026 U
B-12/6	08/14/2012	6	*0.024 U*[g]	0.040 U	0.081 U	0.040 U	0.029 U[g]	0.81 U	0.040 U	0.040 U
B-12/9	08/14/2012	9	*0.029 U*[g]	0.048 U	0.096 U	0.048 U	*0.035 U*[g]	0.96 U	0.048 U	0.048 U
B-12/13	08/14/2012	13	*0.025 U*[g]	0.040 U	0.081 U	0.040 U	0.029 U[g]	0.81 U	0.040 U	0.040 U
B-12/18	08/14/2012	18	-	-	-	-	-	-	-	-
B-13/3	08/15/2012	3	*0.024 U*[g]	0.039 U	0.078 U	0.039 U	0.028 U[g]	0.78 U	0.039 U	0.039 U

TABLE 2
Soil Analytical Results - For Chemicals Not Detected
Plaid Pantry No. 112
Vancouver, Washington

Location	Date	Sample Depth (feet bgs)	EDB	EDC	MTBE	PCE	TCE	2-Butanone	Carbon Tetrachloride	1,1,1-Trichloroethane
Soil Screening Levels										
MTCA Method A[1] Unrestricted Use			0.005	NA	0.10	0.05	0.03	NA	NA	2
MTCA Method B[3]			0.5	11	556	476	12	NC	14.3	160,000
August 2012 Soil Sampling (cont'd)										
B-13/6	08/15/2012	6	*0.020 U*[g]	0.032 U	0.065 U	0.032 U	0.023 U[g]	0.65 U	0.032 U	0.032 U
B-13/9	08/15/2012	9	*0.021 U*[g]	0.034 U	0.069 U	0.034 U	0.025 U[g]	0.69 U	0.034 U	0.034 U
B-13/13	08/15/2012	13	*0.024 U*[g]	0.040 U	0.080 U	0.040 U	0.029 U[g]	0.80 U	0.040 U	0.040 U
B-14/3	08/15/2012	3	*0.020 U*[g]	0.033 U	0.066 U	0.033 U	0.024 U[g]	0.66 U	0.033 U	0.033 U
B-14/6	08/15/2012	6	*0.021 U*[g]	0.035 U	0.070 U	0.035 U	0.025 U[g]	0.70 U	0.035 U	0.035 U
B-14/9	08/15/2012	9	*0.023 U*[g]	0.038 U	0.076 U	0.038 U	0.027 U[g]	0.76 U	0.038 U	0.038 U
B-14/13	08/15/2012	13	*0.019 U*[g]	0.031 U	0.062 U	0.031 U	0.023 U[g]	0.62 U	0.031 U	0.031 U
B-15/3	08/15/2012	3	*0.020 U*[g]	0.033 U	0.066 U	0.033 U	0.024 U[g]	0.66 U	0.033 U	0.033 U
B-15/6	08/15/2012	6	*0.024 U*[g]	0.040 U	0.079 U	0.040 U	0.029 U[g]	0.79 U	0.040 U	0.040 U
B-15/9	08/15/2012	9	*0.023 U*[g]	0.038 U	0.076 U	0.038 U	0.027 U[g]	0.76 U	0.038 U	0.038 U
B-15/13	08/15/2012	13	*0.019 U*[g]	0.031 U	0.062 U	0.031 U	0.023 U[g]	0.62 U	0.031 U	0.031 U
B-16/6	08/16/2012	6	0.0030 U[e,g]	0.029 U	0.058 U	0.029 U	0.029 U	0.58 U	0.029 U	0.029 U
B-16/9	08/16/2012	9	*0.024 U*[g]	0.040 U	0.080 U	0.040 U	0.029 U[g]	0.80 U	0.040 U	0.040 U
B-16/13	08/16/2012	13	0.0030 U[e,g]	0.030 U	0.059 U	0.030 U	0.030 U	0.59 U	0.030 U	0.030 U
September 2015 Soil Sampling										
B-16(3)	09/02/2015	3	-	-	-	-	-	-	-	-
B-16(6)	09/02/2015	6	-	-	-	-	-	-	-	-
B-16(9)	09/02/2015	9	-	-	-	-	-	-	-	-
B-16(12)	09/02/2015	12	-	-	-	-	-	-	-	-
B-17(3)	09/02/2015	3	-	-	-	-	-	-	-	-
B-17(6)	09/02/2015	6	-	-	-	-	-	-	-	-
B-17(9)	09/02/2015	9	-	-	-	-	-	-	-	-
B-17(12)	09/03/2015	12	-	-	-	-	-	-	-	-
B-18(3)	09/03/2015	3	-	-	-	-	-	-	-	-
B-18(6)	09/03/2015	6	-	-	-	-	-	-	-	-
B-18(9)	09/03/2015	9	-	-	-	-	-	-	-	-
B-18(12)	09/04/2015	12	-	-	-	-	-	-	-	-
B-19(3)	09/03/2015	3	-	-	-	-	-	-	-	-
B-19(6)	09/03/2015	6	-	-	-	-	-	-	-	-
B-19(9)	09/03/2015	9	-	-	-	-	-	-	-	-
B-19(12)	09/03/2015	12	-	-	-	-	-	-	-	-
B-20(6)	09/03/2015	6	-	-	-	-	-	-	-	-
B-20(9)	09/03/2015	9	-	-	-	-	-	-	-	-
B-20(12)	09/03/2015	12	-	-	-	-	-	-	-	-

Notes:

Units are mg/Kg

Values in blue are nondetect

Values in red exceed the MTCA Method B screening level

TABLE 3
Soil Analytical Results - For All Detected Chemicals (mg/kg)
Plaid Pantry No. 112
Vancouver, Washington

Location	Date	Sample Depth (feet bgs)	Gasoline	Diesel	Heavy Oil/Lube	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	Lead
Soil Screening Levels											
MTCA Method A[1] Unrestricted Use			100/30[2]	2,000	2,000	0.03	7	6	9	5	250
MTCA Method B[3]			2,619	NC	NC	18.2	6,400	8,000	16,000	1,600	NC
September 2011 Initial Soil Sampling											
B1-3	09/08/2011	3	24 U	59 U	118 U	0.011 U	0.044 U	0.022 U	0.065 U	0.087 U	-
B1-9	09/08/2011	9	22 U	54 U	108 U	0.013 U	0.051 U	0.026 U	0.077 U	0.10 U	8.3
B1-15	09/08/2011	15	21 U	52 U	103 U	0.013 U	0.052 U	0.026 U	0.078 U	0.10 U	-
B2-3	09/07/2011	3	21 U	53 U	107 U	0.011 U	0.043 U	0.022 U	0.065 U	0.087 U	-
B2-9	09/07/2011	9	25 U	25 U[b1]	54 [b1]	0.0088 U	0.035 U	0.018 U	0.053 U	0.010 U[d]	-
B2-15	09/09/2011	15	21 U	53 U	105 U	0.0068 U	0.027 U	0.014 U	0.041 U	0.054 U	-
B3-3	09/07/2011	3	23 U	57 U	113 U	0.012 U	0.047 U	0.024 U	0.071 U	0.094 U	-
B3-9	09/07/2011	9	26 U	64 U	128 U	0.014 U	0.055 U	0.028 U	0.083 U	0.11 U	12
B4-3	09/07/2011	3	23 U	57 U	114 U	0.013 U	0.051 U	0.026 U	0.076 U	0.10 U	-
B4-9	09/07/2011	9	21 U	53 U	106 U	0.012 U	0.049 U	0.024 U	0.073 U	0.097 U	-
B5-3	09/08/2011	3	22 U	56 U	112 U	-	-	-	-	-	-
B5-6	09/08/2011	6	**2,900** [a]	>57 [c]	114 U	*0.28 U*	1.1 U	**12**	**74**	**14**	21
B5-9	09/08/2011	9	**4,070** [a]	>54 [c]	108 U	*0.24 U*	0.95 U	**29**	**121**	**8.8**	11
B5-12.5	09/08/2011	12.5	**444** [a]	638 [b,c]	50 U[b]	**2.1**	0.13 U	5.3	**21**	1.1	13
B5-20	09/08/2011	20	2.9 U[a]	-	-	0.0073 U	0.029 U	0.015 U	0.044 U	0.058 U	-
B6-3	09/08/2011	3	22 U	54 U	107 U	0.0096 U	0.038 U	0.019 U	0.057 U	0.077 U	-
B6-9	09/08/2011	9	23 U	58 U	116 U	0.0093 U	0.037 U	0.019 U	0.056 U	0.074 U	-
B6-12	09/09/2011	12	26 U	64 U	128 U	0.011 U	0.044 U	0.022 U	0.065 U	0.087 U	-
February 2012 Abandoned Tank Decommissioning											
PIT S/2	02/14/2012	2	**1,320** [a]	54 [c]	109 U	-	-	-	-	-	-
PIT S/6	02/14/2012	6	**5,800** [a]	62 [c]	124 U	**3.4**	**23**	**78**	**411**	**34**	-
August 2012 Soil Sampling											
B-7/6	08/16/2012	6	**473** [a]	-	-	*0.18 J*	0.86 U	2.1	**12**	1.7 U	-
B-7/9	08/16/2012	9	**1,730** [a]	-	-	**0.80**	0.82 U	0.89	1.2 U	1.6 U	-
B-7/13	08/16/2012	13	**303** [a]	-	-	**0.15**	0.089 U	0.17	0.25	0.30	-
B-7/14	08/16/2012	14	5.8 U[a]	-	-	0.015 U	0.058 U	0.029 U	0.087 U	0.12 U	-
B-8/6	08/16/2012	6	8.4 U[a]	-	-	0.026	0.084 U	0.072	0.30	0.17 U	-
B-8/9	08/16/2012	9	7.4 U[a]	-	-	**0.042**	0.074 U	0.037 U	0.25	0.15 U	-
B-8/13	08/16/2012	13	8.9 U[a]	-	-	0.022 U	0.089 U	0.044 U	0.13 U	0.18 U	-
B-9/3	08/13/2012	3	5.7 U[a]	59 U	117 U	0.0143 U	0.057 U	0.029 U	0.086 U	0.11 U	-
B-9/6	08/13/2012	6	5.2 U[a]	-	-	0.013 U	0.052 U	0.026 U	0.078 U	0.10 U	-
B-9/9	08/13/2012	9	8.2 U[a]	-	-	0.020 U	0.082 U	0.041 U	0.12 U	0.16 U	-
B-9/13	08/13/2012	13	5.9 U[a]	-	-	0.015 U	0.059 U	0.029 U	0.088 U	0.12 U	-
B-10/3	08/13/2012	3	5.4 U[a]	55 U	109 U	0.013 U	0.054 U	0.027 U	0.080 U	0.11 U	-
B-10/6	08/13/2012	6	9.2 U[a]	-	-	0.023 U	0.092 U	0.046 U	0.14 U	0.18 U	-
B-10/9	08/13/2012	9	11 U[a]	-	-	0.028 U	0.11 U	0.056 U	0.17 U	0.22 U	-
B-10/13	08/13/2012	13	4.7 U[a]	-	-	0.012 U	0.047 U	0.024 U	0.071 U	0.095 U	-
B-10/18	08/13/2012	18	20 U	51 U	102 U	-	-	-	-	-	-
B-11/3	08/14/2012	3	13 [a]	56 U	113 U	0.017 U	0.068 U	0.034 U	0.10 U	0.14 U	-
B-11/6	08/14/2012	6	**20,400** [a]	62 X	123 U	**3.7**	0.81 U	3.9	1.6 U	**57**	24
B-11/9	08/14/2012	9	**1,560** [a]	-	-	**0.47**	0.095 U	0.62	0.14 U	1.9	-
B-11/11	08/14/2012	11	5.7 U[a]	-	-	0.014 U	0.057 U	0.029 U	0.086 U	0.11 U	3.3
B-11/17	08/14/2012	17	5.6 U[a]	-	-	0.014 U	0.056 U	0.028 U	0.084 U	0.11 U	-
B-11/23	08/14/2012	23	20 U	51 U	102 U	-	-	-	-	-	-
B-11/29	08/14/2012	29	20 U	51 U	102 U	-	-	-	-	-	-
B-12/3	08/14/2012	3	5.2 U[a]	58 U	116 U	0.013 U	0.052 U	0.026 U	0.078 U	0.10 U	-
B-12/6	08/14/2012	6	8.1 U[a]	-	-	0.020 U	0.081 U	0.040 U	0.12 U	0.16 U	-
B-12/9	08/14/2012	9	9.6 U[a]	-	-	0.024 U	0.096 U	0.048 U	0.14 U	0.19 U	-
B-12/13	08/14/2012	13	8.1 U[a]	-	-	0.020 U	0.081 U	0.040 U	0.12 U	0.16 U	-
B-12/18	08/14/2012	18	20 U	50 U	100 U	-	-	-	-	-	-
B-13/3	08/15/2012	3	7.8 U[a]	-	-	0.019 U	0.078 U	0.039 U	0.12 U	0.16 U	-

TABLE 3
Soil Analytical Results - For All Detected Chemicals (mg/kg)
Plaid Pantry No. 112
Vancouver, Washington

Location	Date	Sample Depth (feet bgs)	Gasoline	Diesel	Heavy Oil/Lube	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	Lead
Soil Screening Levels											
MTCA Method A[1] Unrestricted Use			100/30[2]	2,000	2,000	0.03	7	6	9	5	250
MTCA Method B[3]			2,619	NC	NC	18.2	6,400	8,000	16,000	1,600	NC
August 2012 Soil Sampling (cont'd)											
B-13/6	08/15/2012	6	6.5 U[a]	-	-	0.016 U	0.065 U	0.032 U	0.097 U	0.13 U	-
B-13/9	08/15/2012	9	6.9 U[a]	-	-	0.017 U	0.069 U	0.034 U	0.10 U	0.14 U	-
B-13/13	08/15/2012	13	8.0 U[a]	-	-	0.020 U	0.080 U	0.040 U	0.12 U	0.16 U	-
B-14/3	08/15/2012	3	6.6 U[a]	-	-	0.017 U	0.066 U	0.033 U	0.099 U	0.13 U	-
B-14/6	08/15/2012	6	7.0 U[a]	-	-	0.018 U	0.070 U	0.035 U	0.11 U	0.14 U	-
B-14/9	08/15/2012	9	7.6 U[a]	-	-	0.019 U	0.076 U	0.038 U	0.11 U	0.15 U	-
B-14/13	08/15/2012	13	6.2 U[a]	-	-	0.016 U	0.062 U	0.031 U	0.094 U	0.13 U	-
B-15/3	08/15/2012	3	6.6 U[a]	-	-	0.017 U	0.066 U	0.033 U	0.099 U	0.13 U	-
B-15/6	08/15/2012	6	7.9 U[a]	-	-	0.020 U	0.079 U	0.040 U	0.12 U	0.16 U	-
B-15/9	08/15/2012	9	7.6 U[a]	-	-	0.019 U	0.076 U	0.038 U	0.11 U	0.15 U	-
B-15/13	08/15/2012	13	6.2 U[a]	-	-	0.016 U	0.062 U	0.031 U	0.093 U	0.12 U	-
B-16/6	08/16/2012	6	5.8 U[a]	-	-	0.015 U	0.058 U	0.029 U	0.087 U	0.17 U	11
B-16/9	08/16/2012	9	8.0 U[a]	-	-	0.020 U	0.080 U	0.040 U	1.2 U	0.16 U	12
B-16/13	08/16/2012	13	5.9 U[a]	-	-	0.015 U	0.059 U	0.030 U	0.089 U	0.12 U	-
September 2015 Soil Sampling											
B-16(3)	09/02/2015	3	3.6 U[a]	-	-	-	-	-	-	-	-
B-16(6)	09/02/2015	6	**1,080** J[1,a]	-	-	*0.18 U*	0.73 U	0.37 U	1.1 U	-	-
B-16(9)	09/02/2015	9	**928** J[1,a]	-	-	-	-	-	-	-	-
B-16(12)	09/02/2015	12	5.8 U[a]	-	-	-	-	-	-	-	-
B-17(3)	09/02/2015	3	7.0 U[a]	-	-	-	-	-	-	-	-
B-17(6)	09/02/2015	6	15 [a]	-	-	-	-	-	-	-	-
B-17(9)	09/02/2015	9	**9,180** [a]	-	-	*0.19 U*	0.77 U	0.63	1.2 U	-	-
B-17(12)	09/03/2015	12	5.8 U[a]	-	-	-	-	-	-	-	-
B-18(3)	09/03/2015	3	**4,770** [a]	-	-	*0.66 U*	2.6 U	2.6	3.9 U	-	-
B-18(6)	09/03/2015	6	**543** [a]	-	-	-	-	-	-	-	-
B-18(9)	09/03/2015	9	**7,820** [a]	-	-	*0.19 U*	0.74 U	0.37 U	1.1 U	-	-
B-18(12)	09/04/2015	12	5.8 U[a]	-	-	-	-	-	-	-	-
B-19(3)	09/03/2015	3	5.8 U[a]	-	-	-	-	-	-	-	-
B-19(6)	09/03/2015	6	8.4 [a]	-	-	0.019 U	0.077 U	0.039 U	0.12 U	-	-
B-19(9)	09/03/2015	9	7.9 U[a]	-	-	-	-	-	-	-	-
B-19(12)	09/03/2015	12	5.7 U[a]	-	-	-	-	-	-	-	-
B-20(6)	09/03/2015	6	5.9 U[a]	-	-	-	-	-	-	-	-
B-20(9)	09/03/2015	9	**475** J[1,a,f]	-	-	0.018 U	0.073 U	0.036 U	0.11 U	-	-
B-20(12)	09/03/2015	12	5.7 U[a]	-	-	-	-	-	-	-	-

Notes:
Uunits are mg/Kg
Values in blue are nondetect
Bold values exceed MTCA Method A screening level

TABLE 4
Soil Data Set For Detected Chemicals
Plaid Pantry No. 112
Vancouver, Washington

Gasoline	Diesel	Heavy Oil/Lube	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	Lead
24	59	118	0.011	0.044	0.022	0.065	0.087	8.3
22	54	108	0.013	0.051	0.026	0.077	0.10	12
21	52	103	0.013	0.052	0.026	0.078	0.10	21
21	53	107	0.011	0.043	0.022	0.065	0.087	11
25	25	54	0.0088	0.035	0.018	0.053	0.010	13
21	53	105	0.0068	0.027	0.014	0.041	0.054	24
23	57	113	0.012	0.047	0.024	0.071	0.094	3.3
26	64	128	0.014	0.055	0.028	0.083	0.11	11
23	57	114	0.013	0.051	0.026	0.076	0.10	12
21	53	106	0.012	0.049	0.024	0.073	0.097	
22	56	112	*0.28*	1.1	**12**	**74**	**14**	
2,900	57	114	*0.24*	0.95	**29**	**121**	**8.8**	
4,070	54	108	**2.1**	0.13	5.3	**21**	1.1	
444	638	50	0.0073	0.029	0.015	0.044	0.058	
2.9	54	107	0.0096	0.038	0.019	0.057	0.077	
22	58	116	0.0093	0.037	0.019	0.056	0.074	
23	64	128	0.011	0.044	0.022	0.065	0.087	
26	59	117	3.4	**23**	78	488	34	
1,320	55	109	*0.18*	0.86	2.1	**12**	1.7	
5,800	51	102	**0.80**	0.82	0.89	1.2	1.6	
473	56	113	**0.15**	0.089	0.17	0.25	0.30	
1,730	62	123	0.015	0.058	0.029	0.087	0.12	
303	51	102	0.026	0.084	0.072	0.30	0.17	
5.8	51	102	**0.042**	0.074	0.037	0.25	0.15	
8.4	58	116	0.022	0.089	0.044	0.13	0.18	
7.4	50	100	0.0143	0.057	0.029	0.086	0.11	
8.9		54	0.013	0.052	0.026	0.078	0.10	
5.7		62	0.020	0.082	0.041	0.12	0.16	
5.2			0.015	0.059	0.029	0.088	0.12	
8.2			0.013	0.054	0.027	0.080	0.11	
5.9			0.023	0.092	0.046	0.14	0.18	
5.4			0.028	0.11	0.056	0.17	0.22	
9.2			0.012	0.047	0.024	0.071	0.095	
11			0.017	0.068	0.034	0.10	0.14	
4.7			**3.7**	0.81	3.9	1.6	**57**	
20			**0.47**	0.095	0.62	0.14	1.9	
13			0.014	0.057	0.029	0.086	0.11	
20,400			0.014	0.056	0.028	0.084	0.11	

TABLE 4
Soil Data Set For Detected Chemicals
Plaid Pantry No. 112
Vancouver, Washington

Gasoline	Diesel	Heavy Oil/Lube	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	Lead
1,560			0.013	0.052	0.026	0.078	0.10	
5.7			0.020	0.081	0.040	0.12	0.16	
5.6			0.024	0.096	0.048	0.14	0.19	
20			0.020	0.081	0.040	0.12	0.16	
20			0.019	0.078	0.039	0.12	0.16	
5.2			0.016	0.065	0.032	0.097	0.13	
8.1			0.017	0.069	0.034	0.10	0.14	
9.6			0.020	0.080	0.040	0.12	0.16	
8.1			0.017	0.066	0.033	0.099	0.13	
20			0.018	0.070	0.035	0.11	0.14	
7.8			0.019	0.076	0.038	0.11	0.15	
6.5			0.016	0.062	0.031	0.094	0.13	
6.9			0.017	0.066	0.033	0.099	0.13	
8.0			0.020	0.079	0.040	0.12	0.16	
6.6			0.019	0.076	0.038	0.11	0.15	
7.0			0.016	0.062	0.031	0.093	0.12	
7.6			0.015	0.058	0.029	0.087	0.17	
6.2			0.020	0.080	0.040	1.2	0.16	
6.6			0.015	0.059	0.030	0.089	0.12	
7.9			*0.18*	0.73	0.37	1.1		
7.6			*0.19*	0.77	0.63	1.2		
6.2			*0.66*	2.6	2.6	3.9		
5.8			*0.19*	0.74	0.37	1.1		
8.0			0.019	0.077	0.039	0.12		
5.9			0.018	0.073	0.036	0.11		
3.6								
1,080								
928								
5.8								
7.0								
15								
9,180								
5.8								
4,770								
543								
7,820								
5.8								
5.8								

TABLE 4
Soil Data Set For Detected Chemicals
Plaid Pantry No. 112
Vancouver, Washington

Gasoline	Diesel	Heavy Oil/Lube	Benzene	Toluene	Ethylbenzene	Xylenes	Naphthalene	Lead
8.4								
7.9								
5.7								
5.9								
475								
5.7								

Notes:
Units are mg/Kg
Values in blue are nondetect

TABLE 5

Risk Screening Results

Plaid Pantry No. 112

Vancouver, Washington

Analyte	N	Nondetects	% Nondetects	EPC[1]	MTCA Default[2]	Exceeds MTCA?
Gasoline	82	59	72%	20,400	30[3]	YES
Diesel	26	22	85%	638	2,000[3]	no
Heavy Oil/Lube	28	24	86%	62	2,000[3]	no
Benzene	63	54	86%	3.7	18.2	no
Toluene	63	62	98%	23	6,400	no
Ethylbenzene	63	52	98%	78	8,000	no
Xylenes	63	55	87%	411	16,000	no
Naphthalene	57	50	88%	57.4	1,600	no
Lead	9	0	0%	23.6	250[3]	no

Notes:

Units are milligrams per kilogram (mg/Kg)

[1] MTCA Guidance recommends that if > 50% are nondetect or data set is small (<10) use the maximum value detected for the EPC. All EPCs indicated are based on maximum detected concentrations.

[2] Values represent MTCA Method B defaults, except where indicated otherwise.

[3] Since MTCA Method B default screening levels have not been established for gasoline, diesel, oil, or lead in soil, the MTCA Method A default values were used for this screening.

TABLE 6
Excess Cancer Risk for Carcinogens
Plaid Pantry No. 112
Vancouver, Washington

Constituent	C_{soil} (mg/kg)	EF (unitless)	ED (years)	CPFo (kg-day/mg)	SIR (mg/day)	AB1 (unitless)	GI (unitless)	CPFd (kg-day/mg)	SA (cm^2)	AF (mg/cm^2-day)	ABS (unitless)	ABW (kg)	AT (years)	ECR (unitless)	Toxic Endpoint
Benzene	3.7	1.0	6	0.055	200	1.00	0.8	0.04	2,200	0.2	0.0005	16	75	2.0E-07	Decreased Lymphocyte Count
													Regulatory Standard =	1.0E-05	
													Does the ECR Exceed the Regulatory Standard?	**No**	

Example Calculation:

$$C_{soil} = \frac{RISK \times ABW \times AT}{EF \times ED \left[\left(\frac{SIR \times AB1 \times CPFo}{10^6\, mg/kg}\right) + \left(\frac{SA \times AF \times ABS \times CPFd}{10^6\, mg/kg}\right)\right]}$$ [Equation 740-5 from WAC 173-340-740]

$$RISK = \frac{C_{soil} \times EF \times ED \left[\left(\frac{SIR \times AB1 \times CPFo}{10^6\, mg/kg}\right) + \left(\frac{SA \times AF \times ABS \times CPFd}{10^6\, mg/kg}\right)\right]}{ABW \times AT}$$

$$RISK = \frac{3.7 \times 1.0 \times 6\ years \left[\left(\frac{200\ mg/day \times 1.0 \times 0.055\ kg\ day/mg}{10^6\, mg/kg}\right) + \left(\frac{2{,}200\ cm^2 \times 0.2\, mg/cm^2\ day \times 0.0005 \times 0.04\, kg\ day/mg}{10^6\, mg/kg}\right)\right]}{16\ kg \times 75\ years} = 2.04 \times 10^{-7}$$

Notes:

C_{soil}	=	Exposure point concentration in soil (mg/kg)
EF	=	Exposure frequency (1.0)
ED	=	Exposure duration (6 years)
CPFo	=	Oral Cancer Potency Factor (kg-day/mg)
SIR	=	Soil ingestion rate (200 mg/day)
AB1	=	Gastrointestinal absorption fraction (1.0)
GI	=	Gastrointestinal absorption conversion factor - see WAC173-340-740(3)(c)(iii)(A)
CPFd	=	Dermal cancer potency factor derived by CPFo x GI
SA	=	Dermal surface area (2,200 cm^2)
AF	=	Adherence factor (0.2 mg/cm^2-day)
ABS	=	Dermal absorption factor - see WAC173-340-740(3)(c)(iii)(A)
ABW	=	Average body weight over the exposure duration (16 kg)
AT	=	Averaging time (75 years)

TABLE 7
Hazard Index for Noncarcinogens
Plaid Pantry No. 112
Vancouver, Washington

Constituent	C_{soil} (mg/kg)	EF (unitless)	ED (years)	RfDo (mg/kg-day)	SIR (mg/day)	AB1 (unitless)	GI (unitless)	RfDd (mg/kg-day)	SA (cm^2)	AF (mg/cm^2-day)	ABS (unitless)	ABW (kg)	AT (years)	HQ (unitless)	Toxic Endpoint
Toluene	23	1.0	6	0.08	200	1.00	0.8	0.064	2,200	0.2	0.03	16	6	0.004	Increased Kidney Weight
Ethylbenzene	78	1.0	6	0.1	200	1.00	0.8	0.080	2,200	0.2	0.03	16	6	0.01	Liver/Kidney
Xylenes	411	1.0	6	0.2	200	1.00	0.8	0.16	2,200	0.2	0.03	16	6	0.03	Decreased Body Weight
Naphthalene	57	1.0	6	0.02	200	1.00	0.8	0.02	2,200	0.2	0.03	16	6	0.04	Decreased Mean Weight in Males
													HI =	0.08	
													Regulatory Standard =	1	
													Does the HI Exceed the Regulatory Standard?	**No**	

Example Calculation:

$$C_{soil} = \frac{HQ \times ABW \times AT}{EF \times ED \left[\left(\frac{1}{RfDo} \times \frac{SIR \times AB1}{10^6\ mg/kg}\right) + \left(\frac{1}{RfDd} \times \frac{SA \times AF \times ABS}{10^6\ mg/kg}\right)\right]}$$ [Equation 740-4 from WAC 173-340-740]

$$HQ = \frac{C_{soil} \times EF \times ED \left[\left(\frac{1}{RfDo} \times \frac{SIR \times AB1}{10^6\ mg/kg}\right) + \left(\frac{1}{RfDd} \times \frac{SA \times AF \times ABS}{10^6\ mg/kg}\right)\right]}{ABW \times AT}$$

$$HQ = \frac{23 \times 1.0 \times 6\ years \left[\left(\frac{1}{0.08\ mg/kg\ day} \times \frac{200\ mg/day \times 1.0}{10^6\ mg/kg}\right) + \left(\frac{1}{0.064\ mg/kg\ day} \times \frac{2{,}200\ cm^2 \times 0.2\ mg/cm^2\ day \times 0.03}{10^6\ mg/kg}\right)\right]}{16\ kg \times 6\ years} = 0.004$$

Notes:

C_{soil}	=	Exposure point concentration in soil (mg/kg)
EF	=	Exposure frequency (1.0)
ED	=	Exposure duration (6 years)
RfDo	=	Oral reference dose as defined in WAC 173-340-708(7)
SIR	=	Soil ingestion rate (200 mg/day)
AB1	=	Gastrointestinal absorption fraction (1.0)
GI	=	Gastrointestinal absorption conversion factor - see WAC173-340-740(3)(c)(iii)(A)
RfDd	=	Dermal reference dose derived by RfDo x GI
SA	=	Dermal surface area (2,200 cm^2)
AF	=	Adherence factor (0.2 mg/cm^2-day)
ABS	=	Dermal absorption factor - see WAC173-340-740(3)(c)(iii)(A)
ABW	=	Average body weight over the exposure duration (16 kg)
AT	=	Averaging time (6 years)
HQ	=	Hazard quotient
HI	=	Hazard index - sum of hazard quotients

Attachment C

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TECHNICAL MEMORANDUM

To: Paul Ecker
EES Environmental Consultants, Inc.
240 N. Broadway, Suite 203
Portland, OR 97227

From: Tom Dee, PWS, CERP

Date: March 15, 2019

Re: **Plaid Pantry #112 Terrestrial Ecological Evaluation / SWCA Project No. 54211**

INTRODUCTION

SWCA Environmental Consultants (SWCA) conducted a Terrestrial Ecological Evaluation (TEE) on March 5, 2019 at Plaid Pantry Store #112 (site), located at 1002 W Fourth Plain Boulevard, Vancouver, WA 98660. The TEE included desktop analysis and direct observations of the undeveloped land within 500 feet of the site.

TERESTRIAL ECOLOGICAL EVALUATION

Desktop Analysis

The desktop analysis consisted of reviewing aerial photographs in Google Earth to determine the extent of contiguous undeveloped land within 500 feet of the site. Contiguous undeveloped land is defined under Washington Administrative Code 173-340-7491 as:

> "land that is not divided into smaller areas by highways, extensive paving or similar structures that are likely to reduce the potential use of the overall area by wildlife. Roads, sidewalks and other structures that are unlikely to reduce potential use of the area by wildlife shall not be considered to divide a contiguous area into smaller areas."

Undeveloped land is defined under the same code as:

> "land that is not covered by buildings, roads, paved areas or other barriers that would prevent wildlife from feeding on plants, earthworms, insects or other food in or on the soil."

The desktop analysis resulted in 3.48 acres of contiguous undeveloped land within 500 feet of the site (Figure 1).

Habitat Evaluation

A habitat evaluation was conducted on March 5, 2019, by botanist and wetland ecologist, Tom Dee (Professional Wetland Scientist and Certified Ecological Restoration Practitioner).

Mr. Dee recorded observations on plant composition and wildlife sightings from public right-of-ways surrounding the contiguous undeveloped land. A list of plant species observed is provided in Appendix A and photographs are provided in Appendix B. The Habitat Rating System presented in Table 749-1 of the TEE form was used to determine the quality of the habitat of the contiguous undeveloped land. Table 749-1 of the TEE has been completed by SWCA and is provided in Appendix C.

The habitat evaluation resulted in a "low" habitat rating. The "low" rating is defined as:

> "Early successional vegetative stands; vegetation predominantly noxious, nonnative, exotic plant species or weeds. Areas severely disturbed by human activity, including intensively cultivated croplands. Areas isolated from other habitat used by wildlife."

The plant community was dominated by noxious and non-native species such as tree of heaven (*Ailanthus altissima*), Himalayan blackberry (*Rubus armeniacus*), chicory (*Cichorium intybus*), Queen Anne's lace (*Daucus carota*), and tall fescue (*Schedonorus arundinaceus*). Not a single native plant was observed during the habitat evaluation.

Question 3 in Table 749-1 asks "Is the undeveloped land likely to attract wildlife?" The qualifiers for this question listed below the table include the statement:

> "Indicate "yes" if the area attracts wildlife or is likely to do so. Examples: Birds frequently visit the area to feed; evidence of high use by mammals (tracks, scat, etc.); habitat "island" in an industrial area; unusual features of an area that make it important for feeding animals; heavy use during seasonal migrations."

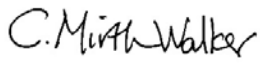
The blackberry thickets present within the contiguous undeveloped land provide habitat that may be visited by birds for feeding or for cover, although the frequency of such visits cannot be determined in one site visit. Wildlife observed during the habitat evaluation included two California scrub jays (*Aphelocoma californica*) and one sparrow (*Passerellidae* sp.). No evidence of mammal usage was observed, and the contiguous undeveloped land does not provide a habitat island.

Based on this finding, and the table in Appendix C, the simplified evaluation may be ended.

PREPARED BY:

Tom Dee, PWS, CERP
Botanist/Wetland Ecologist

REVIEWED BY:

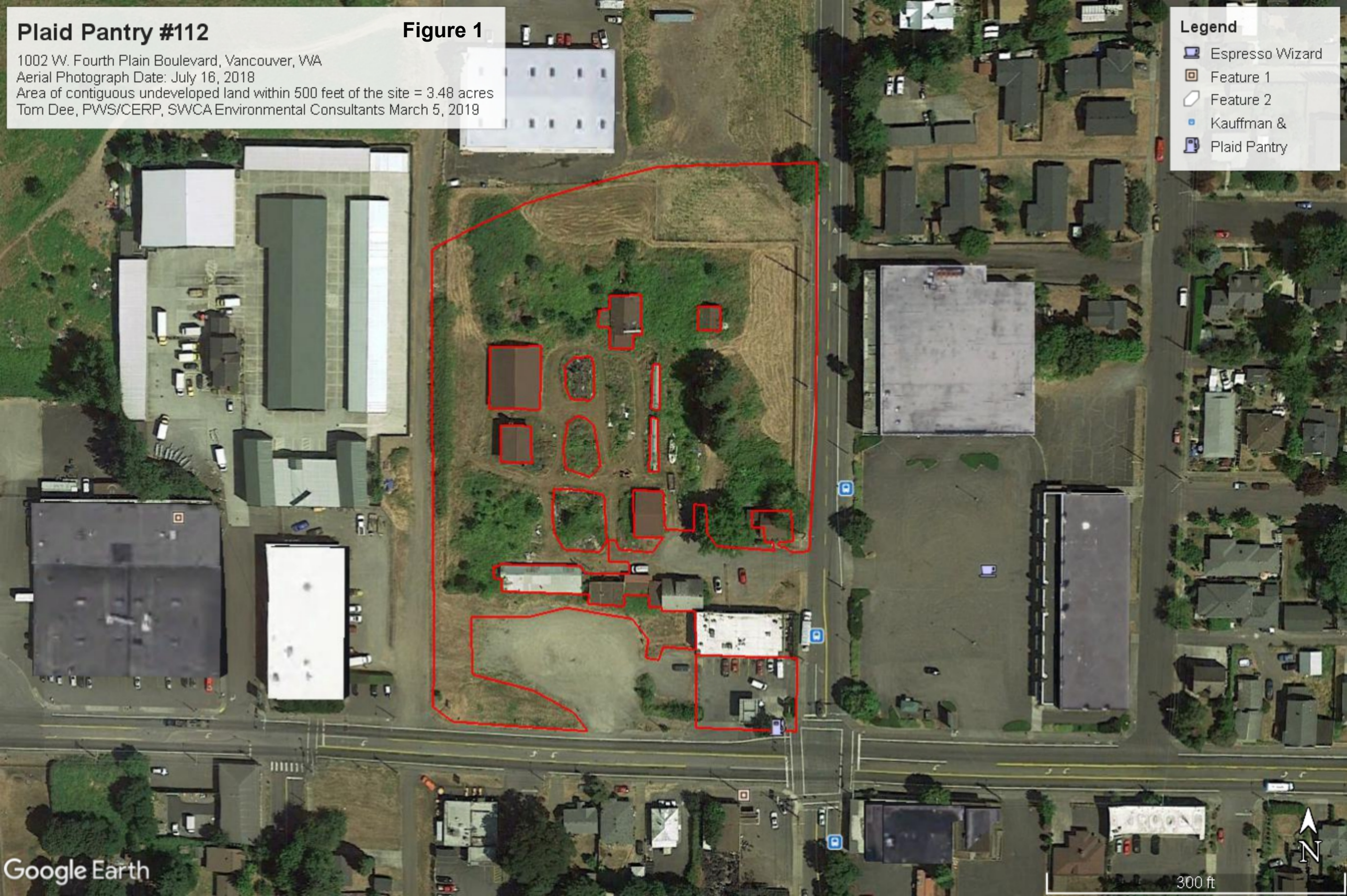


C. Mirth Walker, PWS
Senior Wetland Scientist

Plaid Pantry #112

Figure 1

1002 W. Fourth Plain Boulevard, Vancouver, WA
Aerial Photograph Date: July 16, 2018
Area of contiguous undeveloped land within 500 feet of the site = 3.48 acres
Tom Dee, PWS/CERP, SWCA Environmental Consultants March 5, 2019



APPENDIX A

Plant List

Plaid Pantry #112
Vegetation List
March 5, 2019

Common Name	Scientific Name	Wetland Indicator Status	Native, Non-native, and Noxious
tree-of-heaven	*Ailanthus altissima*	FACU	noxious
field meadow-foxtail	*Alopecurus pratensis*	FAC	non-native
chicory	*Cichorium intybus*	FACU	non-native
orchard grass	*Dactylis glomerata*	FACU	non-native
Queen Anne's-lace	*Daucus carota*	FACU	non-native
hairy cat's-ear	*Hypochaeris radicata*	FACU	non-native
English holly	*Ilex aquifolium*	FACU	non-native
English plantain	*Plantago lanceolata*	FACU	non-native
English laurel	*Prunus laurocerasus*	NOL	non-native
Himalayan blackberry	*Rubus armeniacus*	FAC	noxious
tall fescue	*Schedonorus arundinaceus*	FAC	non-native

Wetland Indicator Status and taxonomy for the Western Mountains, Valleys, and Coast Region per the National Wetland Plant List 2
Accessed May 3, 2016. http://rsgisias.crrel.usace.army.mil/NWPL/

Native per Hitchcock & Cronquist 1973 and http://plants.usda.gov/
Noxious per Washington State Noxious Weed Board 2019:
https://www.nwcb.wa.gov/printable-noxious-weed-list

WETLAND INDICATOR STATUS (WIS)	
OBL	**Obligate Wetland** Plant – Almost always occurs in wetlands (hydrophyte), rarely in uplands
FACW	**Facultative Wetland** Plant - Usually occur in wetlands (hydrophyte), but may occur found in non-wetlands
FAC	**Facultative** Plant – Occurs in wetlands (hydrophyte) and uplands (nonhydrophyte)
FACU	**Facultative Upland** Plant - Usually occur in non-wetlands (non-hydrophyte), but may occur in wetlands
UPL	**Upland** Plant - Almost always occurs in uplands (non-hydrophyte), almost never occurs in wetlands. UPL plants have a WIS in other regions
NOL	**Not Listed** - Plants that are not on the National Wetland Plant List are assumed to be UPL and have no WIS in any region

APPENDIX B

Photographs

Contiguous undeveloped land looking southwest.

Contiguous undeveloped land looking west.

Contiguous undeveloped land looking east.

Contiguous undeveloped land looking northeast.

Contiguous undeveloped land (in background) looking northwest.

Contiguous undeveloped land looking west.

Contiguous undeveloped land looking northeast.

Contiguous undeveloped land looking east.

APPENDIX C

Table 749-1

Table 749-1

Simplified Terrestrial Ecological Evaluation-Exposure Analysis Procedure

Estimate the area of contiguous (connected) undeveloped land on the site or within 500 feet of any area of the site to the nearest 1/2 acre (1/4 acre if the area is less than 0.5 acre).	
1) From the table below, find the number of points corresponding to the area and enter this number in the field to the right.	
Area (acres) / Points 0.25 or less / 4 0.5 / 5 1.0 / 6 1.5 / 7 2.0 / 8 2.5 / 9 3.0 / 10 3.5 / 11 4.0 or more / 12	11
2) Is this an industrial or commercial property? If yes, enter a score of 3. If no, enter a score of 1	3
3)[a] Enter a score in the box to the right for the habitat quality of the site, using the following rating system[b]. High=1, Intermediate=2, Low=3	3
4) Is the undeveloped land likely to attract wildlife? If yes, enter a score of 1 in the box to the right. If no, enter a score of 2.[c]	2
5) Are there any of the following soil contaminants present: Chlorinated dioxins/furans, PCB mixtures, DDT, DDE, DDD, aldrin, chlordane, dieldrin, endosulfan, endrin, heptachlor, benzene hexachloride, toxaphene, hexachlorobenzene, pentachlorophenol, pentachlorobenzene? If yes, enter a score of 1 in the box to the right. If no, enter a score of 4.	4
6) Add the numbers in the boxes on lines 2-5 and enter this number in the box to the right. If this number is larger than the number in the box on line 1, the simplified evaluation may be ended.	12

Notes for Table 749-1

[a] It is expected that this habitat evaluation will be undertaken by an experienced field biologist. If this is not the case, enter a conservative score of (1) for questions 3 and 4.

[b] **Habitat rating system.** Rate the quality of the habitat as high, intermediate or low based on your professional judgment as a field biologist. The following are suggested factors to consider in making this evaluation:

> **Low:** Early successional vegetative stands; vegetation predominantly noxious, nonnative, exotic plant species or weeds. Areas severely disturbed by human activity, including intensively cultivated croplands. Areas isolated from other habitat used by wildlife.

High: Area is ecologically significant for one or more of the following reasons: Late-successional native plant communities present; relatively high species diversity; used by an uncommon or rare species; priority habitat (as defined by the Washington Department of fish and Wildlife); part of a larger area of habitat where size or fragmentation may be important for the retention of some species.

Intermediate: Area does not rate as either high or low.

[c] Indicate "yes" if the area attracts wildlife or is likely to do so. Examples: Birds frequently visit the area to feed; evidence of high use b mammals (tracks, scat, etc.); habitat "island" in an industrial area; unusual features of an area that make it important for feeding animals; heavy use during seasonal migrations.

[Area Calculation Aid] [Aerial Photo with Area Designations] [TEE Table 749-1] [Index of Tables]

[Exclusions Main] [TEE Definitions] [Simplified or Site-Specific?] [Simplified Ecological Evaluation] [Site-Specific Ecological Evaluation] [WAC 173-340-7493]

[TEE Home]