

December 14, 2022

Project No. 104-21028

Mr. David Unruh
Washington Department of Ecology
Northwest Region Office
PO Box 330316
Shoreline, WA 98133

RE: **Addendum to the February 2022 Remedial Investigation Report**
FSID 39159928
VCP Project ID NW 3340
Twelve Trees Business Park
26276 Twelve Trees Lane NW, Suite B
Poulsbo, Washington 98370

VIA email: david.unruh@ecy.wa.gov

Dear Mr. Unruh:

We have reviewed the opinion letter from the Washington Department of Ecology regarding the Twelve Trees Business Park Remedial Investigation Report, dated February 22, 2022. The purpose of this addendum letter is to provide Ecology with a summary of the additional sampling of Monitoring Well No. 2 and other requested documentation in relation to the referenced report. The work done in this letter was conducted in general accordance with a letter from the Department of Ecology, dated August 18, 2022.

Completed Terrestrial Ecological Evaluation Form

The Remedial Investigation report did not include a Terrestrial Ecological Evaluation (TEE) Form. A TEE Form was completed by Krista Webb and is attached to this letter.

Updated Groundwater Analytical Summary Tables

In their opinion letter, Ecology had requested an updated summary table for the groundwater analytical results including historical depth to water measurements for all monitoring events as well as results for trichloroethylene (TCE) breakdown products cis-1,2-dichloroethene and vinyl chloride. The updated initial quarterly monitoring results are listed in Table 1, the updated annual monitoring results are listed in Table 2, and the updated quarterly monitoring results are listed in Table 3.

TABLE 1: SUMMARY OF GROUNDWATER ANALYSES INITIAL QUARTERLY MONITORING					
Sample Event and Number	Date Sampled	Groundwater Level from Top of Casing (ft)	Trichloro-ethylene (µg/L)	Cis-1,2-dichloroethene (µg/L)	Vinyl Chloride (µg/L)
First Quarter-1999					
99113-MW-2-GW-1	5/25/1999	Not Recorded	6	--	--
99113-MW-4-GW-2	5/25/1999	Not Recorded	<1	--	--
Second Quarter-1999					
99113-MW-2-GW-3	9/1/1999	55.60	15	3	<1
99113-MW-4-GW-4	9/1/1999	56.24	<1	<1	<1
Third Quarter-1999					
99113-MW-2-GW-5	11/21/1999	58.20	9	<1	<1
99113-MW-4-GW-6	11/21/1999	58.25	<1	<1	<1
Fourth Quarter-2000					
99113-MW-2-GW-7	2/25/2000	57.66	15	<1	<1
99113-MW-4-GW-8	2/25/2000	57.10	<1	<1	<1
MTCA Method A Cleanup Level (µg/L)			5	70 (MCL)	0.2

TABLE 2: SUMMARY OF GROUNDWATER ANALYSES ANNUAL MONITORING					
Sample Event and Number	Date Sampled	Groundwater Level from Top of Casing (ft)	Trichloro-ethylene (µg/L)	Cis-1,2-dichloroethene (µg/L)	Vinyl Chloride (µg/L)
Annual-2001					
01011-MW-2-GW-6*	3/28/2001	62.30	1*	<1*	<1*
Annual-2002					
02005-MW-2-GW-10	4/8/2002	58.94	13	<1	<1
Annual-2003					
03012-MW-2-GW-11	3/18/2003	61.65	14	ND(<2)	ND(<2)
Annual-2004					
04002-MW-2 GW-12	3/10/2004	63.85	5	~	~
Annual-2005					
ACL05-03-E015-MW-2-GW-13	3/31/2005	65.50	ND(<2)	ND(<2)	ND(<2)
Annual-2006					
ACL06-04-E012-MW2-GW-14	4/27/2006	67.50	13	3	ND(<2)

Annual 2007					
ACL07-04-E049-MW2-GW-15	4/30/2007	62.30	15	7	ND (<0.2)
Annual 2008					
ESC08-E005-MW2-GW-16	4/21/2008	61.15	8	8	ND (<0.2)
Annual 2009					
ESC09-E005-MW2-GW-17	3/30/2009	63.37	4	9	ND (<0.2)
Annual 2010					
ESC10-E006-MW2-GW-18	4/15/2010	62.40	14	6.7	ND (<0.2)
Annual 2011					
ESC011-E003-MW2-GW-19	5/13/2011	59.55	ND(<2)	ND (<2)	ND (<0.2)
Annual 2012					
ESC012-E002-MW2-GW-20	4/25/2012	59.55	14	6.9	ND (<0.2)
Annual 2013					
ESC013-E002-MW2-GW-21	5/2/2013	59.40	22	ND (<2)	ND (<0.2)
Annual 2014					
ESC014-E002-MW2-GW-22	4/16/2014	63.10	13.9	6.5	<1
Annual 2015					
ESC015-E002-MW2-GW-23	4/17/2015	64.45	12.3	<1	<1
Annual 2016					
ESC016-E002-MW2-GW-24	4/12/2016	60.60	12.2	4.2	<1
Annual 2017					
ESC017-E017-MW2-GW-25	5/1/2017	60.20	2.2	9.1	<1
Annual 2018					
ESC18-15008-MW2-GW-26	5/1/2018	60.20	1.5	7.3	<1
MTCA Method A Cleanup Level (µg/L)			5	70 (MCL)	0.2

TABLE 3: SUMMARY OF GROUNDWATER ANALYSES QUARTERLY MONITORING					
Sample Event and Number	Date Sampled	Groundwater Level from Top of Casing (ft)	Trichloroethylene (µg/L)	Cis-1,2-dichloroethene (µg/L)	Vinyl Chloride (µg/L)
First Quarter-2019					
ESC19-TW2-GW-27	3/19/2019	63.00	<1	9.3	<1
Second Quarter-2019					
ESC19-E019-MW2-GW-28	6/25/2019	63.25	1.6	6	<0.2
Third Quarter-2019					
ESC19-E019-MW2-GW-29	9/26/2019	62.40	0.56	6	<0.2
Fourth Quarter-2020					
ESC19-E019-MW2-GW-30	1/9/2020	64.14	1	6.3	<0.2
Fifth Quarter-2022					
KA028-MW2-GW-31	10/4/2022	62.00	3.3	3.9	<0.02
MTCA Method A Cleanup Level (µg/L)			5	70 (MCL)	0.2

* = QA Duplicate Sample Analyzed

-- = Not Tested For

~ = Data Missing

Updated Well Construction Table

The Remedial Investigation report did not have a well construction table including historical depth to water measurements, total well depth, well diameter, top of casing elevation, and well screen intervals. The information regarding all of the monitoring wells are listed in Table 4.

TABLE 4: WELL CONSTRUCTION					
Monitoring Well Number	7/26/1993 Groundwater Level from Top of Casing (ft)	Total Well Depth (ft)	Well Diameter (in)	Approximate Top of Casing Elevation (ft)	Well screen Interval (ft)
MW1	65.79	76.00	8	256	5
MW2	58.45	67.50	8	252	~
MW3	69.20	~	~	251	~
MW4	59.91	99.00	6	252	10
MW5	65.10	106.6	6	253	10
MW6	61.80	118.3	2	260	10

~ = Data Missing

Documentation of Well Sampling Procedures

The Remedial Investigation report did not have documentation of well sampling procedures for the additional sampling of Monitoring Well Number 2. Well No. 2 was sampled on October 4, 2022. Prior to sampling, the static water level was measured at a depth of 62.00 feet with the bottom of the well measured at 67.50 feet. The groundwater sample was then collected utilizing a Proactive Supernova 70 Pump with low flow control and dispensed into three 40-milliliter volatile organic analysis (VOA) vials. All three vials were labeled and stored on ice until delivery to the laboratory. The water sample was submitted to Friedman & Bruya, Inc (FBI) in Seattle, Washington for analysis of Volatile Organic Compounds by EPA method 8260C. The associated groundwater sampling field data log is attached to this letter.

Environmental Monitoring Results

The TCE concentration in the October 2022 Well No. 2 water sample was 3.3 micrograms per liter ($\mu\text{g/L}$), which is below the MTCA Method A Cleanup Level ($5 \mu\text{g/L}$). The sample also contained $3.9 \mu\text{g/L}$ of is-1,2-dichloroethene, a likely breakdown product of the TCE which has been encountered periodically in the past. The detected level of cis-1,2-dichloroethene is below the Maximum Contaminant Level of $70.0 \mu\text{g/L}$. The certified Analytical Results and Chain-of-Custody Record are attached to this letter.

Limitations

The findings of this letter were based upon the results of our field and laboratory investigations, coupled with the interpretation of conditions associated with the groundwater samples. Therefore, the statements are accurate only to the degree implied by review of the data obtained and by professional interpretation.

A laboratory, certified by the State of Washington Department of Ecology, performed the chemical testing. The results of the chemical analysis are accurate only to the degree of care of ensuring the testing accuracy and the representative nature of the soil samples obtained.

The findings presented herewith are based on professional interpretation using state-of-the-art methods and equipment, and a degree of conservatism deemed proper as of this report date. It is not warranted that such findings cannot be superseded by future environmental, geotechnical, or technical developments.

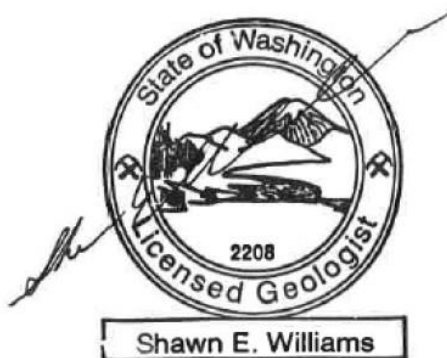
Closing

We appreciate the opportunity to be of service. If you have any questions, please do not hesitate to contact our office at (360) 598-2126.

Respectfully submitted,
Krazan and Associates, Inc.



Shawn E. Williams
Senior Hydrogeologist



12/14/22

Attachments: Terrestrial Ecological Evaluation Form, Groundwater Sampling Field Data Log, certified FBI Analytical Results, and Chain-of-Custody Record

Attachment

Terrestrial Ecological Evaluation Form



Voluntary Cleanup Program

Washington State Department of Ecology Toxics Cleanup Program

TERRESTRIAL ECOLOGICAL EVALUATION FORM

Under the Model Toxics Control Act (MTCA), a terrestrial ecological evaluation is necessary if hazardous substances are released into the soils at a Site. In the event of such a release, you must take one of the following three actions as part of your investigation and cleanup of the Site:

1. Document an exclusion from further evaluation using the criteria in WAC 173-340-7491.
2. Conduct a simplified evaluation as set forth in WAC 173-340-7492.
3. Conduct a site-specific evaluation as set forth in WAC 173-340-7493.

When requesting a written opinion under the Voluntary Cleanup Program (VCP), you must complete this form and submit it to the Department of Ecology (Ecology). The form documents the type and results of your evaluation.

Completion of this form is not sufficient to document your evaluation. You still need to document your analysis and the basis for your conclusion in your cleanup plan or report.

If you have questions about how to conduct a terrestrial ecological evaluation, please contact the Ecology site manager assigned to your Site. For additional guidance, please refer to <https://ecology.wa.gov/Regulations-Permits/Guidance-technical-assistance/Terrestrial-ecological-evaluation>.

Step 1: IDENTIFY HAZARDOUS WASTE SITE

Please identify below the hazardous waste site for which you are documenting an evaluation.

Facility/Site Name: 12 Trees Business Park

Facility/Site Address: 26273, 26279, 26285 Twelve Trees Lane, NW, Poulsbo, WA

Facility/Site No: 39159928

VCP Project No.: NW3340

Step 2: IDENTIFY EVALUATOR

Please identify below the person who conducted the evaluation and their contact information.

Name: Krista Webb

Title: Environmental Scientist

Organization: Krista Webb Consulting for Krazan and Associates

Mailing address: 5045 NE Minder Road

City: Poulsbo

State: WA

Zip code: 98370

Phone: 360-265-3984

Fax:

E-mail: kristalewebb@gmail.com

Step 3: DOCUMENT EVALUATION TYPE AND RESULTS

A. Exclusion from further evaluation.

1. Does the Site qualify for an exclusion from further evaluation?

- ☒ Yes *If you answered "YES," then answer **Question 2**.*
- ☐ No or Unknown *If you answered "NO" or "UNKNOWN," then skip to **Step 3B** of this form.*

2. What is the basis for the exclusion? Check all that apply. Then skip to **Step 4** of this form.

Point of Compliance: WAC 173-340-7491(1)(a)

- ☒ All soil contamination is, or will be,* at least 15 feet below the surface.
- ☐ All soil contamination is, or will be,* at least 6 feet below the surface (or alternative depth if approved by Ecology), and institutional controls are used to manage remaining contamination.

Barriers to Exposure: WAC 173-340-7491(1)(b)

- ☐ All contaminated soil, is or will be,* covered by physical barriers (such as buildings or paved roads) that prevent exposure to plants and wildlife, and institutional controls are used to manage remaining contamination.

Undeveloped Land: WAC 173-340-7491(1)(c)

- ☐ There is less than 0.25 acres of contiguous[#] undeveloped[±] land on or within 500 feet of any area of the Site and any of the following chemicals is present: chlorinated dioxins or furans, PCB mixtures, DDT, DDE, DDD, aldrin, chlordane, dieldrin, endosulfan, endrin, heptachlor, heptachlor epoxide, benzene hexachloride, toxaphene, hexachlorobenzene, pentachlorophenol, or pentachlorobenzene.
- ☐ For sites not containing any of the chemicals mentioned above, there is less than 1.5 acres of contiguous[#] undeveloped[±] land on or within 500 feet of any area of the Site.

Background Concentrations: WAC 173-340-7491(1)(d)

- ☒ Concentrations of hazardous substances in soil do not exceed natural background levels as described in WAC 173-340-200 and 173-340-709.

* An exclusion based on future land use must have a completion date for future development that is acceptable to Ecology.

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

"Contiguous" undeveloped land is an area of undeveloped land that is not divided into smaller areas of highways, extensive paving, or similar structures that are likely to reduce the potential use of the overall area by wildlife.

B. Simplified evaluation.

1. Does the Site qualify for a simplified evaluation?

- ☐ Yes *If you answered "YES," then answer **Question 2** below.*
- ☐ No or Unknown *If you answered "NO" or "UNKNOWN," then skip to **Step 3C** of this form.*

2. Did you conduct a simplified evaluation?

- ☐ Yes *If you answered "YES," then answer **Question 3** below.*
- ☐ No *If you answered "NO," then skip to **Step 3C** of this form.*

3. Was further evaluation necessary?

- ☐ Yes *If you answered "YES," then answer **Question 4** below.*
- ☐ No *If you answered "NO," then answer **Question 5** below.*

4. If further evaluation was necessary, what did you do?

- ☐ Used the concentrations listed in Table 749-2 as cleanup levels. *If so, then skip to **Step 4** of this form.*
- ☐ Conducted a site-specific evaluation. *If so, then skip to **Step 3C** of this form.*

5. If no further evaluation was necessary, what was the reason? Check all that apply. Then skip to **Step 4** of this form.

Exposure Analysis: WAC 173-340-7492(2)(a)

- ☐ Area of soil contamination at the Site is not more than 350 square feet.
- ☐ Current or planned land use makes wildlife exposure unlikely. Used Table 749-1.

Pathway Analysis: WAC 173-340-7492(2)(b)

- ☐ No potential exposure pathways from soil contamination to ecological receptors.

Contaminant Analysis: WAC 173-340-7492(2)(c)

- ☐ No contaminant listed in Table 749-2 is, or will be, present in the upper 15 feet at concentrations that exceed the values listed in Table 749-2.
- ☐ No contaminant listed in Table 749-2 is, or will be, present in the upper 6 feet (or alternative depth if approved by Ecology) at concentrations that exceed the values listed in Table 749-2, and institutional controls are used to manage remaining contamination.
- ☐ No contaminant listed in Table 749-2 is, or will be, present in the upper 15 feet at concentrations likely to be toxic or have the potential to bioaccumulate as determined using Ecology-approved bioassays.
- ☐ No contaminant listed in Table 749-2 is, or will be, present in the upper 6 feet (or alternative depth if approved by Ecology) at concentrations likely to be toxic or have the potential to bioaccumulate as determined using Ecology-approved bioassays, and institutional controls are used to manage remaining contamination.

C. Site-specific evaluation. A site-specific evaluation process consists of two parts: (1) formulating the problem, and (2) selecting the methods for addressing the identified problem. Both steps require consultation with and approval by Ecology. See WAC 173-340-7493(1)(c).

1. Was there a problem? See WAC 173-340-7493(2).

- ☐ Yes *If you answered “YES,” then answer **Question 2** below.*
- ☐ No *If you answered “NO,” then identify the reason here and then skip to **Question 5** below:*
- ☐ No issues were identified during the problem formulation step.
- ☐ While issues were identified, those issues were addressed by the cleanup actions for protecting human health.

2. What did you do to resolve the problem? See WAC 173-340-7493(3).

- ☐ Used the concentrations listed in Table 749-3 as cleanup levels. *If so, then skip to **Question 5** below.*
- ☐ Used one or more of the methods listed in WAC 173-340-7493(3) to evaluate and address the identified problem. *If so, then answer **Questions 3 and 4** below.*

3. If you conducted further site-specific evaluations, what methods did you use?
Check all that apply. See WAC 173-340-7493(3).

- ☐ Literature surveys.
- ☐ Soil bioassays.
- ☐ Wildlife exposure model.
- ☐ Biomarkers.
- ☐ Site-specific field studies.
- ☐ Weight of evidence.
- ☐ Other methods approved by Ecology. If so, please specify:

4. What was the result of those evaluations?

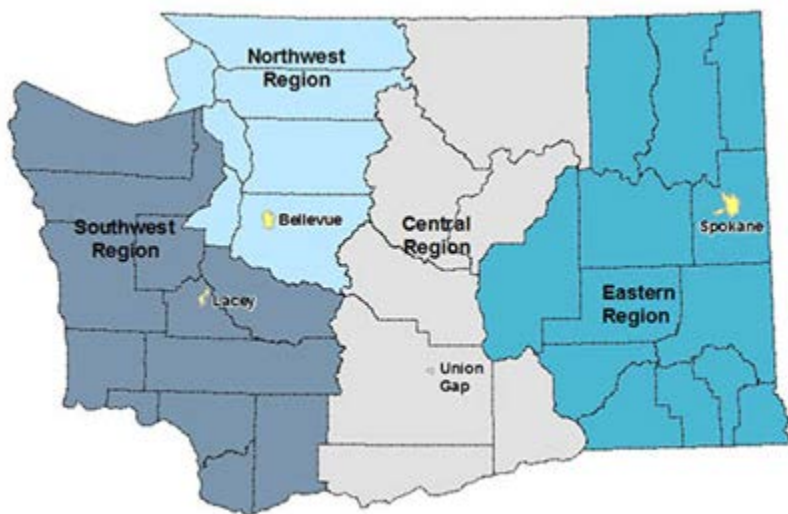
- ☐ Confirmed there was no problem.
- ☐ Confirmed there was a problem and established site-specific cleanup levels.

5. Have you already obtained Ecology’s approval of both your problem formulation and problem resolution steps?

- ☐ Yes If so, please identify the Ecology staff who approved those steps:
- ☐ No

Step 4: SUBMITTAL

Please mail your completed form to the Ecology site manager assigned to your Site. If a site manager has not yet been assigned, please mail your completed form to the Ecology regional office for the County in which your Site is located.



Northwest Region: Attn: VCP Coordinator 3190 160 th Ave. SE Bellevue, WA 98008-5452	Central Region: Attn: VCP Coordinator 1250 West Alder St. Union Gap, WA 98903-0009
Southwest Region: Attn: VCP Coordinator P.O. Box 47775 Olympia, WA 98504-7775	Eastern Region: Attn: VCP Coordinator N. 4601 Monroe Spokane WA 99205-1295

If you need this publication in an alternate format, please call the Toxics Cleanup Program at 360-407-7170. People with hearing loss can call 711 for Washington Relay Service. People with a speech disability can call 877-833-6341.

Attachments

Groundwater Sampling Field Data Log

Certified FBI Analytical Results

Chain-of-Custody Record

WATER SAMPLING LOG

Project Name: 12 TREES NFA Project No.: 104-21028
 Site Name: DAHL GLASS/12 TREES BUSINESS PARK Sample Location: MW-2
 Inspector(s): AG Date/Time: 10/3/22 9:42
 Company: KRAZAN & ASSOCIATES
 Weather/Temperature: _____

Well Data

Diameter of Well Casing (inches): 8"
 Depth to Water Below Top of Casing (feet): 62
 Total Depth of Well Below Top of Casing (feet): 67.5
 Product Thickness (feet): — Sampling/Purge Method: LOW flow pump
 Calculate if well parameters do not stabilize per the work plan:
 Length of Water Column in Well (feet): —
 Liters per Foot: — Liters in Well: —
 3 Times Casing Volume (liters): ✓ Liters Purged from Well: —

Water Sample Data

Sample ID: KA028-MW2-GW-31 Time Sample Collected: 10:00
 Remarks (Color/Odor): clear, no odor Sheen on purge water? no
 Stabilized? — 3 Casing Volumes Removed? —

Purge Vol. (liters)	Time (min)	pH (pH units)	Cond. (mS/cm)	Turbidity (NTU)	DO (mg/L)	Temp (C)	Salinity (%)	Redox (mv)
Criteria for three consecutive readings		±0.1 SU	±3%	±10% or <10 NTU	±10%	±10%	±10%	±10 mV
10:00	10:09	13.91	0.126	45.4	146.7	71.4°F		52

Notes: _____

Well Casing Volumes

Liters/Foot ½" = 0.04 1-1/4" = 0.24 2" = 0.62 3" = 1.39 4" = 2.47
 1-1/2" = 0.35 2-1/2" = 0.97 3-1/2" = 1.89 6" = 5.56

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Vineta Mills, M.S.
Eric Young, B.S.

3012 16th Avenue West
Seattle, WA 98119-2029
(206) 285-8282
fbi@isomedia.com
www.friedmanandbruya.com

October 17, 2022

Shawn Williams, Project Manager
Krazan & Associates (Poulsbo)
1230 Finn Hill Rd NW, Suite A
Poulsbo, WA 98370

Dear Mr Williams:

Included are the results from the testing of material submitted on October 6, 2022 from the 12 Trees NFA 104-21028, F&BI 210078 project. There are 5 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

We appreciate this opportunity to be of service to you and hope you will call if you should have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.



Michael Erdahl
Project Manager

Enclosures
KZP1017R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

CASE NARRATIVE

This case narrative encompasses samples received on October 6, 2022 by Friedman & Bruya, Inc. from the Krazan & Associates (Poulsbo) 12 Trees NFA 104-21028, F&BI 210078 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID

210078 -01

Krazan & Associates (Poulsbo)

KA028-MW2-GW-31

The 8260D calibration standard failed the acceptance criteria for methylene chloride. The data were flagged accordingly.

Methylene chloride in the 8260D laboratory control sample and laboratory control sample duplicate failed the acceptance criteria. The data were flagged accordingly.

All other quality control requirements were acceptable.

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	KA028-MW2-GW-31	Client:	Krazan & Associates (Poulsbo)
Date Received:	10/06/22	Project:	12 Trees NFA 104-21028
Date Extracted:	10/12/22	Lab ID:	210078-01
Date Analyzed:	10/12/22	Data File:	101210.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	LM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	97	78	126
Toluene-d8	95	84	115
4-Bromofluorobenzene	96	72	130

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.02	Dibromochloromethane	<0.5
Bromomethane	<5	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<50	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<5	o-Xylene	<1
Methylene chloride	<5 ca jl	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<5
1,1-Dichloroethane	<1	n-Propylbenzene	<1
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	3.9	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<0.2
2-Butanone (MEK)	<20	1,2,3-Trichloropropane	<1
1,2-Dichloroethane (EDC)	<0.2	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<0.5	1,2,4-Trimethylbenzene	<1
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	3.3	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1	1,3-Dichlorobenzene	<1
Bromodichloromethane	<0.5	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<10
cis-1,3-Dichloropropene	<0.4	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<0.5
trans-1,3-Dichloropropene	<0.4	Naphthalene	<1
1,1,2-Trichloroethane	<0.5	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Analysis For Volatile Compounds By EPA Method 8260D Dual Acquisition

Client Sample ID:	Method Blank	Client:	Krazan & Associates (Poulsbo)
Date Received:	Not Applicable	Project:	12 Trees NFA 104-21028
Date Extracted:	10/12/22	Lab ID:	02-2329 mb
Date Analyzed:	10/12/22	Data File:	101207.D
Matrix:	Water	Instrument:	GCMS11
Units:	ug/L (ppb)	Operator:	LM

Surrogates:	% Recovery:	Lower Limit:	Upper Limit:
1,2-Dichloroethane-d4	101	78	126
Toluene-d8	94	84	115
4-Bromofluorobenzene	96	72	130

Compounds:	Concentration ug/L (ppb)	Compounds:	Concentration ug/L (ppb)
Dichlorodifluoromethane	<1	1,3-Dichloropropane	<1
Chloromethane	<10	Tetrachloroethene	<1
Vinyl chloride	<0.02	Dibromochloromethane	<0.5
Bromomethane	<5	1,2-Dibromoethane (EDB)	<1
Chloroethane	<1	Chlorobenzene	<1
Trichlorofluoromethane	<1	Ethylbenzene	<1
Acetone	<50	1,1,1,2-Tetrachloroethane	<1
1,1-Dichloroethene	<1	m,p-Xylene	<2
Hexane	<5	o-Xylene	<1
Methylene chloride	<5 ca jl	Styrene	<1
Methyl t-butyl ether (MTBE)	<1	Isopropylbenzene	<1
trans-1,2-Dichloroethene	<1	Bromoform	<5
1,1-Dichloroethane	<1	n-Propylbenzene	<1
2,2-Dichloropropane	<1	Bromobenzene	<1
cis-1,2-Dichloroethene	<1	1,3,5-Trimethylbenzene	<1
Chloroform	<1	1,1,2,2-Tetrachloroethane	<0.2
2-Butanone (MEK)	<20	1,2,3-Trichloropropane	<1
1,2-Dichloroethane (EDC)	<0.2	2-Chlorotoluene	<1
1,1,1-Trichloroethane	<1	4-Chlorotoluene	<1
1,1-Dichloropropene	<1	tert-Butylbenzene	<1
Carbon tetrachloride	<0.5	1,2,4-Trimethylbenzene	<1
Benzene	<0.35	sec-Butylbenzene	<1
Trichloroethene	<0.5	p-Isopropyltoluene	<1
1,2-Dichloropropane	<1	1,3-Dichlorobenzene	<1
Bromodichloromethane	<0.5	1,4-Dichlorobenzene	<1
Dibromomethane	<1	1,2-Dichlorobenzene	<1
4-Methyl-2-pentanone	<10	1,2-Dibromo-3-chloropropane	<10
cis-1,3-Dichloropropene	<0.4	1,2,4-Trichlorobenzene	<1
Toluene	<1	Hexachlorobutadiene	<0.5
trans-1,3-Dichloropropene	<0.4	Naphthalene	<1
1,1,2-Trichloroethane	<0.5	1,2,3-Trichlorobenzene	<1
2-Hexanone	<10		

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Date of Report: 10/17/22

Date Received: 10/06/22

Project: 12 Trees NFA 104-21028, F&BI 210078

QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF WATER SAMPLES FOR VOLATILES BY EPA METHOD 8260D

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Percent Recovery LCSD	Acceptance Criteria	RPD (Limit 20)
Dichlorodifluoromethane	ug/L (ppb)	10	99	101	46-206	2
Chloromethane	ug/L (ppb)	10	105	105	70-142	0
Vinyl chloride	ug/L (ppb)	10	103	104	70-130	1
Bromomethane	ug/L (ppb)	10	102	103	56-197	1
Chloroethane	ug/L (ppb)	10	105	105	70-130	0
Trichlorofluoromethane	ug/L (ppb)	10	94	94	70-130	0
Acetone	ug/L (ppb)	50	95	91	10-140	4
1,1-Dichloroethene	ug/L (ppb)	10	93	94	70-130	1
Hexane	ug/L (ppb)	10	103	100	54-136	3
Methylene chloride	ug/L (ppb)	10	28 vo	24 vo	43-134	15
Methyl t-butyl ether (MTBE)	ug/L (ppb)	10	93	94	70-130	1
trans-1,2-Dichloroethene	ug/L (ppb)	10	91	92	70-130	1
1,1-Dichloroethane	ug/L (ppb)	10	98	99	70-130	1
2,2-Dichloropropane	ug/L (ppb)	10	110	112	70-130	2
cis-1,2-Dichloroethene	ug/L (ppb)	10	98	99	70-130	1
Chloroform	ug/L (ppb)	10	94	95	70-130	1
2-Butanone (MEK)	ug/L (ppb)	50	103	99	17-154	4
1,2-Dichloroethane (EDC)	ug/L (ppb)	10	94	94	70-130	0
1,1,1-Trichloroethane	ug/L (ppb)	10	94	95	70-130	1
1,1-Dichloropropene	ug/L (ppb)	10	94	91	70-130	3
Carbon tetrachloride	ug/L (ppb)	10	89	95	70-130	7
Benzene	ug/L (ppb)	10	95	94	70-130	1
Trichloroethene	ug/L (ppb)	10	94	92	70-130	2
1,2-Dichloropropane	ug/L (ppb)	10	95	94	70-130	1
Bromodichloromethane	ug/L (ppb)	10	90	88	70-130	2
Dibromomethane	ug/L (ppb)	10	92	95	70-130	3
4-Methyl-2-pentanone	ug/L (ppb)	50	101	99	68-130	2
cis-1,3-Dichloropropene	ug/L (ppb)	10	92	86	69-131	7
Toluene	ug/L (ppb)	10	96	94	70-130	2
trans-1,3-Dichloropropene	ug/L (ppb)	10	89	87	70-130	2
1,1,2-Trichloroethane	ug/L (ppb)	10	94	92	70-130	2
2-Hexanone	ug/L (ppb)	50	112	112	45-138	0
1,3-Dichloropropane	ug/L (ppb)	10	101	99	70-130	2
Tetrachloroethene	ug/L (ppb)	10	95	93	70-130	2
Dibromochloromethane	ug/L (ppb)	10	92	93	60-148	1
1,2-Dibromoethane (EDB)	ug/L (ppb)	10	98	96	70-130	2
Chlorobenzene	ug/L (ppb)	10	94	91	70-130	3
Ethylbenzene	ug/L (ppb)	10	97	97	70-130	0
1,1,1,2-Tetrachloroethane	ug/L (ppb)	10	95	95	70-130	0
m,p-Xylene	ug/L (ppb)	20	97	96	70-130	1
o-Xylene	ug/L (ppb)	10	98	98	70-130	0
Styrene	ug/L (ppb)	10	95	94	70-130	1
Isopropylbenzene	ug/L (ppb)	10	97	98	70-130	1
Bromoform	ug/L (ppb)	10	93	93	69-138	0
n-Propylbenzene	ug/L (ppb)	10	94	92	70-130	2
Bromobenzene	ug/L (ppb)	10	89	88	70-130	1
1,3,5-Trimethylbenzene	ug/L (ppb)	10	91	91	70-130	0
1,1,2,2-Tetrachloroethane	ug/L (ppb)	10	99	98	70-130	1
1,2,3-Trichloropropane	ug/L (ppb)	10	99	99	70-130	0
2-Chlorotoluene	ug/L (ppb)	10	94	93	70-130	1
4-Chlorotoluene	ug/L (ppb)	10	93	92	70-130	1
tert-Butylbenzene	ug/L (ppb)	10	93	91	70-130	2
1,2,4-Trimethylbenzene	ug/L (ppb)	10	90	89	70-130	1
sec-Butylbenzene	ug/L (ppb)	10	94	91	70-130	3
p-Isopropyltoluene	ug/L (ppb)	10	93	91	70-130	2
1,3-Dichlorobenzene	ug/L (ppb)	10	93	91	70-130	2
1,4-Dichlorobenzene	ug/L (ppb)	10	96	94	70-130	2
1,2-Dichlorobenzene	ug/L (ppb)	10	93	92	70-130	1
1,2-Dibromo-3-chloropropane	ug/L (ppb)	10	102	95	70-130	7
1,2,4-Trichlorobenzene	ug/L (ppb)	10	90	92	70-130	2
Hexachlorobutadiene	ug/L (ppb)	10	91	92	70-130	1
Naphthalene	ug/L (ppb)	10	94	95	70-130	1
1,2,3-Trichlorobenzene	ug/L (ppb)	10	89	92	70-130	3

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

Data Qualifiers & Definitions

a - The analyte was detected at a level less than five times the reporting limit. The RPD results may not provide reliable information on the variability of the analysis.

b - The analyte was spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful.

ca - The calibration results for the analyte were outside of acceptance criteria. The value reported is an estimate.

c - The presence of the analyte may be due to carryover from previous sample injections.

cf - The sample was centrifuged prior to analysis.

d - The sample was diluted. Detection limits were raised and surrogate recoveries may not be meaningful.

dv - Insufficient sample volume was available to achieve normal reporting limits.

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

fc - The analyte is a common laboratory and field contaminant.

hr - The sample and duplicate were reextracted and reanalyzed. RPD results were still outside of control limits. Variability is attributed to sample inhomogeneity.

hs - Headspace was present in the container used for analysis.

ht - The analysis was performed outside the method or client-specified holding time requirement.

ip - Recovery fell outside of control limits due to sample matrix effects.

j - The analyte concentration is reported below the lowest calibration standard. The value reported is an estimate.

J - The internal standard associated with the analyte is out of control limits. The reported concentration is an estimate.

jl - The laboratory control sample(s) percent recovery and/or RPD were out of control limits. The reported concentration should be considered an estimate.

js - The surrogate associated with the analyte is out of control limits. The reported concentration should be considered an estimate.

lc - The presence of the analyte is likely due to laboratory contamination.

L - The reported concentration was generated from a library search.

nm - The analyte was not detected in one or more of the duplicate analyses. Therefore, calculation of the RPD is not applicable.

pc - The sample was received with incorrect preservation or in a container not approved by the method. The value reported should be considered an estimate.

ve - The analyte response exceeded the valid instrument calibration range. The value reported is an estimate.

vo - The value reported fell outside the control limits established for this analyte.

x - The sample chromatographic pattern does not resemble the fuel standard used for quantitation.

22/06/22 VW1

Page # () of 1

Company Leazar & Associates

Address 1230 NW Furr Hill Rd, Seizet

City, State, ZIP Peulsbo, WA 98370

Phone # (360) 598-2126 Fax # (360) 598-2127

SAMPLERS (signature)	
PROJECT NAME/NO.	PO#
12 TREES NFA	104-21028
REMARKS	
EMAIL: SHAWWILLIAMS@KATZAN.COM	

TURNAROUND TIME
☒ Standard (2 Weeks)
☐ RUSH _____
 Rush charges authorized by _____

SAMPLE DISPOSAL

☐ Dispose after 30 days
☐ Return samples
☐ Will call with instructions

[illegible]

Friedman & Bruya, Inc.

3012 16th Avenue West

Seattle, WA 98119-2029

Ph. (206) 285-8282

Fax (206) 283-5044

FORMS\COCC\COCC.DOC

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: <i>Andrew Guern</i>	<i>Andrew Guern</i>	KRAZANO ASSOCIATES	10/5/12	8:30
Received by: <i>[Signature]</i>	AN/4 PHAN	FSB	10/06/12	15:47
Relinquished by:				
Received by:		Samples received at	4	00