# SURFACE SOIL INVESTIGATION AND SCREENING LEVEL ECOLOGICAL RISK ASSESSMENT


**GRAMOR - FUTURE FARM USE PROPERTY**

Map and Tax Lot T2SR3E S03 TL03302
Damascus, Clackamas County, Oregon
Parcel No.: 00603617
Lat ~45.418659N; Long -122.418580E

**Prepared for:**

T & K Sester Family, LLC
Attn: Ted Sester
24200 SE Highway 212
Damascus, Oregon

**Issued on:**

October 13, 2024

EVREN NORTHWEST, INC.
Project No. 1972-24001-03

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*This*

# *Surface Soil Investigation and Screening Level Ecological Risk Assessment*

**Gramor – Future Farm Use Property**

Map and Tax Lot T2SR3E S03 TL03302
N side of Hwy 212, 2 Miles W of
Boring, Oregon

*Report for:*

**T & K Sester Family, LLC**
24200 SE Highway 212
Damascus, Oregon

*and its assignees*

*Issued* October 13, 2024 *by:*

EVREN NORTHWEST INC.
environmental & natural resource consultants


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# List of Acronyms and Abbreviations

| | |
|---|---|
| Alliance | Alliance Technical Group Laboratory |
| ASTM | American Society for Testing and Materials |
| bgs | below ground surface |
| BUD | Beneficial Use Determination |
| CEEM | Conceptual Ecological Exposure Model |
| CFSLs | clean fill screening levels |
| CHs | chlorinated herbicides |
| Client | T & K Sester Family, LLC |
| CMMP | Contaminated Media Manage a |
| COIs | contaminants of interest |
| COPCs | Constituents of Potential Concern |
| CRBG | Columbia River Basalt Group |
| CV | coefficient of variance |
| DDD | 4,4'-dichlorodiphenyldichloroethane |
| DDE | 4,4'-dichlorodiphenyldichloroethene |
| DDT | 4,4'-dichlorodiphenyltrichloroethane |
| DU | decision unit |
| ENW | EVREN Northwest, Inc. |
| EPA | US Environmental Protection Agency |
| EPCs | exposure point concentrations |
| ERA | Ecological Risk Assessment |
| ERBSC | ecological risk-based screening concentration |
| ESA | Environmental Site Assessment |
| F&BI | Freidman and Bruya, Inc. |
| In/hr | inch per hour |
| IS | incremental sample |
| ISM | Incremental Sampling Methodology |
| ITRC | Interstate Technology & Regulatory Council |
| Ksat | saturated hydraulic conductivity |
| mg/Kg | milligrams per kilogram |
| MRL | method reporting limit |
| NRCS | Natural Resources Conservation Service |
| OAR | Oregon Administrative Rules |
| OCPs | organochlorine pesticides |
| ODEQ | Oregon Department of Environmental Quality |
| OWRD | Oregon Water Resources Department |
| QTs | Quaternary-Tertiary Springwater Formation |
| REC | recognized environmental condition |
| SEE | Sound Ecological Endeavors, LLC |
| SLERA | Screening Level Ecological Risk Assessment |
| SOW | scope of work |
| T&E | threatened and endangered |
| TPP | Topsoil Placement Plan |
| USDA | U.S. Department of Agriculture |
| USGS | U.S. Geological Society |
| UST | underground storage tank |
| VOC | volatile organic compounds |

# 1.0 Introduction

At the request of T&K Sester Family, LLC (Client), EVREN Northwest, Inc. (ENW) investigated surface soils at the future farm use property identified by Clackamas County Assessor as parcel no. 00603617, map no 23E03, and tax lot number 23E03 03302 (subject site, see Figure 1 for Site Vicinity Map). This 28.67-acre subject site is located in Damascus, Oregon, north of Highway 212 and two miles east of Boring, Oregon.

Pursuant to a recently approved Tier 2 case-specific Beneficial Use Determination (BUD), completion of an Ecological Risk Assessment (ERA) is required prior to blending virgin topsoil at the subject site with low-level pesticide impacted soil received from the Bull Run Filtration Facility[1] and Finished Water Pipeline[2] in Gresham, Oregon. Client proposes to grow rotational grass seed and nursery stock crops in the amended topsoil at the subject site.

The ERA assesses constituent of interest (COI) exposure point concentrations (EPCs) derived from blending three parts (e.g., 3-ft) of low-level pesticide impacted topsoil from the Bull Run Filtration Facility and Finished Water Pipeline with one and one-half part (e.g., 1.5-ft) of virgin topsoil at the subject site.[3]

- COI concentrations in impacted Bull Run Facility and Finished Water Pipeline soil were determined from analyses of surface soil samples collected in November 2023 by PBS[4] using incremental sampling methodology (ISM). PBS' data is summarized in this surface soil investigation report.
- COI concentrations in virgin topsoil at the subject were determined from analyses of surface soil samples collected in July 2024 by ENW using ISM as presented in this surface soil investigation report.

This report presents the methodology and results of the surface soil investigation at the subject site, a summary of PBS' Bull Run Filtration Facility and Finished Water Pipeline assessment, soil blending results, and summary of the attached Screening Level Ecological Risk Assessment Report (SLERA), conclusions, and recommendations.

# 2.0 Background

Pursuant to Oregon Department of Environmental Quality's (ODEQ's) approved BUD for the filtration facility and the finished water pipeline, the subject site is approved to receive low-level impacted topsoil stripped from a fallow former agricultural property owned by the City of Portland and identified as Tax

[1] Letter from Obrien, A. (ODEQ) to Fraley R. (PWB), September 6, 2024. *Beneficial Use Determination (BUD-20240906), PWB – Bull Run Filtration Facility Contaminated Soils*.

[2] Letter from Obrien, A. (ODEQ) to Fraley R. (PWB), September 6, 2024. *Beneficial Use Determination (BUD-20240906), PWB – Bull Run Finished Water Pipeline Contaminated Soils*.

[3] ENW, June 28, 2024. Topsoil Placement Plan, Receiving Facility: Tax Lot 3302 2S3E03 (Clackamas County Parcel ID 00603617) Damascus, OR 97089, Source Facility: Tax Lots 400 and 600 1S4E22D (Multnomah County Parcel IDs R342603 and R342619) Gresham, OR 97009.

[4] PBS, January 2024. *Clean Fill Determination Report*, Bull Run Filtration Facility, Gresham, Oregon: Prepared for: Integrated Water Solutions, LLC, 15715 Paddock Green, Sisters, Oregon 97759.

Lots 100 and 400 of Township 1 South, Range 4 East, Section 22 of the Willamette Meridian in Gresham, Oregon, and associated finished water pipeline. Portland Water Bureau is developing the Bull Run Filtration Facility at the source property and finished water pipeline.

PBS' assessment[4] of the Bull Run Filtration Facility property and Finished Water South, Center, and North pipeline sections identified organochlorine pesticide (OCP) impacts to topsoil (0 to 1.5 feet) from historical agricultural use of these properties. Data from analysis of ISM samples collected at corresponding properties detected the OCPs shown in Table 1 as summarized below:

- DDE (4,4'-dichlorodiphenyldichloroethene)
    - Bull Run Filtration Facility: up to 0.0586 milligrams per kilogram (mg/Kg), which is greater than ODEQ's clean fill screening level (CFSL) of 0.01 mg/Kg and ecological risk-based screening concentration (ERBSC) of 0.02 mg/Kg.
    - Finished Water Pipeline: up to 0.0731 mg/Kg, which is greater than ODEQ's CFSL of 0.01 mg/Kg and ERBSC of 0.02 mg/Kg
- DDT (4,4'-dichlorodiphenyltrichloroethane):
    - Bull Run Filtration Facility: up to 0.053 mg/Kg, which is greater than ODEQ's CFSL of 0.01 mg/Kg and ERBSC of 0.02 mg/Kg.
    - Finished Water Pipeline: up to 0.0760 mg/Kg, which is greater than ODEQ's CFSL of 0.01 mg/Kg and ERBSC of 0.02 mg/Kg
- Dieldrin:
    - Bull Run Filtration Facility: up to 0.0366 mg/Kg, which is greater than ODEQ's CFSL of 0.0045 mg/Kg and ERBSC of 0.0045 mg/Kg.
    - Finished Water Pipeline: up to 0.0207 mg/Kg, which is greater than ODEQ's CFSL of 0.0045 mg/Kg and ERBSC of 0.0045 mg/Kg.

Several agricultural use metals were also analyzed, e.g., arsenic, barium, cadmium, chromium (total), copper, lead, mercury, nickel, and silver. OCPs, chlorinated herbicides (CHs) and these metals comprise the COIs at the subject site.

An ERA is required by ODEQ as a condition of BUD approval to import Bull Run Filtration Facility topsoil at the subject site. Since the ERA needs to evaluate the risk posed to various ecological receptors by these COIs in blended soils, an investigation of surface soils is needed at the subject site. Baseline COI concentrations determined during this surface soil investigation will then be used to calculate mixed COI concentrations in blended soil for use in the ERA.

A proposed scope of work (SOW) to investigate these COIs was presented to the Client and authorized on July 16, 2024.

## 2.1 Scope of Work

ENW directed or completed the following SOW for this project:

- Ordered utility clearance (One Call) to provide clearance for this project's sampling program.
- Collected surface soil samples from the undeveloped subject site using incremental sampling methodology (ISM) developed by the Interstate Technology & Regulatory Council (ITRC; 2012).[5]
- Submitted samples to an independent laboratory for analysis of COIs.
- Complete a SLERA, following ODEQ guidance.
- Completed this report describing the above activities and findings.

# 3.0 Site Description

## 3.1 Site and Vicinity General Description

The 28.67-acre subject farm property is identified as Clackamas County parcel 00603617 and is currently being prepared to cultivate rotational crops of grass seed and nursery stock by T & K Sester Family, LLC. The subject farm property is located on the north side of Highway 212, west of SE 242nd Avenue and east of SE 222nd Drive, in Damascus, Clackamas County, Oregon (Figures 1 and 2). Surrounding properties are residential, agricultural, and commercial in use.

The subject property location and legal description are further summarized in Table 3-1 below.

**Table 3-1. Property Identification**

| Situs | Tax Account | Tax Lot | Current Occupancy/Use | Owner | Size (acres) |
|---|---|---|---|---|---|
| No situs address | 00603617 | 2S3E03 03302 | Exclusive Farm Use | Sester T&K Family LLC signed a PSA with ODC Development, LLC | 28.67 |

The 28.67-acre property is a rectangular shaped parcel of land in an agricultural use area of northern Clackamas County, Oregon. The site is currently developed with a single-family residence, a pole barn, shop, and an asphalt driveway. Grassy fields with scattered trees and landscaped areas occupy the remainder of the property.

The subject property was entirely forested until the eastern half of the site began to be cleared in early 2005. By August 2005, the site had been entirely cleared along with most of the north-adjacent property. It appears that the site had been seeded with pasture grass, which began to take hold during the next three years. Then in July 2008, vegetation was entirely cleared and site graded up to the drainage crossing the northwest corner of the property. Thereafter, pasture grass and other vegetation began to take hold, and within about eight years brush, blackberry brambles, and volunteer trees such as cottonwoods began

[5] ITRC, 2012. Incremental Sampling Methodology, Technical and Regulatory Guidance: Prepared by the Interstate Technology & Regulatory Council Incremental Sampling Methodology Team. February 2012.

to voluntarily spring up across the entirety of the subject site. The site as it appears today is shown in the Site Plan in Figure 2.

## 3.2 Topography

The subject site is located within the US Geological Survey Damascus, OR 7.5-minute quadrangle, at an approximate elevation of between 585 and 620 feet above mean sea level (see Figure 1). The subject property slopes gently to the north to northeast. The subject property slopes gently to the north to northeast. The slope is relatively consistent at about 4 percent from north to south with a slight bench and gentle slope to the south beginning within approximately 100 meters north of Highway 212. An ephemeral drainage cuts diagonally northeast to southwest across the northwest corner of the property. This non-channelized swale appears to drain southwestward to Richardson Creek, though topography suggests a northeastward trend to Noyer Creek near the intersection of SE Hoffmeister Road and SE 242nd Avenue (Figure 1). Noyer Creek flows southeastward at this point.

## 3.3 Geologic and Hydrogeologic Setting

The site is located in the Portland Basin. The Portland Basin is a low-lying area between the Oregon Cascade Range to the east and the Portland Hills and Tualatin Mountains to the west. The Columbia and Willamette Rivers are the principal rivers within the basin. The site is located near the northeastern margin of the basin between Johnson Creek to the north and Clackamas River to the south, named the central domain by Madin (1994),[6] which is dominated by conical to elongate hills known as the Boring Hills. Doubly plunging folds, fault-bounded folds, or fault blocks comprise the structure of the Boring Hills. While Boring Lava flows or vents are almost exclusively associated with the folded and faulted hills, most of the Boring Hills consist largely of sedimentary rock. Boring Lava occurs along the flanks of the hills. Thus, it appears that Boring Lava had erupted from vents localized by faulting.[6]

The site is mapped [6] as Pleistocene to Pliocene to Springwater Formation (QTs), which is described as fluvial conglomerate, volcaniclastic sandstone, siltstone, and debris flows derived from the Cascade Range to the east. The conglomerate is massively and profoundly weathered red, brown, gray-green and orange and moderately indurated. Clasts are well-rounded pebble to boulder-sized basalt, andesite and dacite rock, with rare exotic Columbia River provenance metamorphic and plutonic rock compositions. Feldspathic, volcanic lithic, and vitric sediments comprise the conglomerate's silt and sand matrix. Angular to rounded basalt, andesite and dacite lava, scoria, and pumice in a clay, ash and sand matrix comprise debris flow materials. Quartzofeldspathic silt, ash and clay materials comprise siltstones and mudstones. The base of the Springwater Formation is conformable with conglomerates and volcaniclastic sandstones of the Pliocene to Miocene Troutdale Formation.

According to the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey (WSS), 83% of the site area is mapped as Bornstedt silt loam (8B), while the remaining 17% of area is mapped as Delena silt loam (30C).

- Bornstedt silt loam occurs on 0-6% slopes, is moderately well drained, has a saturated hydraulic conductivity (Ksat) of 0.06 to 0.20 inch per hour (in/hr.), and has the following profile: H1: 0- to 8-

[6] Madin, I.P., 1994, *Geology of the Damascus Quadrangle, Clackamas and Multnomah Counties, Oregon*: Oregon Department of Geology and Mineral Industries Geologic Maps Series GMS-60, 1:24,000.

in silt loam, H2: 8- to 33-in silty clay loam, and H3: 33- to 71-in silty clay. Estimated depth to ground water is 24- to 36-in, and depth to a restrictive feature is greater than 80-in.

- Delena silt loam occurs on 3-12% slopes, is poorly drained, has a Ksat of 0.0 to 0.06 in/hr., and has the following profile: H1: 0- to 12-in silt loam, H2: 12- to 25-in silty clay loam, and H3: 25- to 60-in silty clay loam. Estimated depth to ground water is 0- to 18-in, and depth to the fragipan is 20- to 30-in.

**Surface Water and Ground Water.** Other than an ephemeral drainage that cuts across the northwest property corner, Noyer Creek is the closest perennial surface water body, located approximately 1,500 feet to the east of the subject property. An unnamed potentially ephemeral tributary of Noyer Creek is approximately 700 feet southeast of the subject property. Noyer Creek flows southward to its confluence with Deep Creek, approximately 1.6 mi south of the subject site. From this confluence, Deep Creek meanders 0.90 miles southwestward to where it discharges into the westward-flowing Clackamas River.

Richardson Creek, a perennial surface water body, is approximately 0.5 miles west and southwest of the subject property. The northwest ephemeral drainage located on the subject site is sloped toward Richardson Creek and when flow is present in the drainage during some rain events, the water would flow toward Richardson Creek. However, given this drainage is ephemeral and there is no channel within the drainage on the subject property, it is not a Regulatory Stream/Watercourse.

Records of nearby wells located on the Oregon Water Resources Department's online Well Report Query indicate depth to regional ground water in the vicinity of the subject site to be greater than 100 feet below ground surface (bgs). No water wells were registered to the subject property during a search of the State of Oregon Water Resources Department (OWRD) online database.

For the purposes of this report, it is assumed that shallow subsurface interflow resulting from infiltration, being gravitational in nature and still infiltrating (Klaus & Jackson, 2018),[7] generally mimics topography surface water flow (i.e., from topographic highs to lows). However, as noted earlier multiple factors can affect the direction of ground-water flow in unsaturated subsurface layers including, but not limited to, sediment/rock type, subsurface utility lines, buried river valleys, and stream beds, folds, fractures, and faults. The direction of shallow subsurface water flow in the subject area is generally expected to be to the northeast, based on the local and regional topography. Subsurface flows near Highway 212 may flow from the subject property to the south.

# 4.0 Methods

This section describes the methods used to conduct this surface soil investigation. Field activities for this project are documented in the photographic log included as Appendix A.

## 4.1 Work Objectives

ENW developed and conducted the scope of work (SOW) with the following general objectives:

[7] Klaus, J., & Jackson, C. R. 2018. Interflow is not binary: A continuous shallow perched layer does not imply continuous connectivity. *Water Resources Research*, *54*, 5921–5932. https://doi.org/10.1029/2018WR022920

- To perform all work conducted at the subject site in a safe manner for technical personnel.
- To perform all work efficiently and cost-effectively, without interfering or otherwise affecting the condition and operation of the property.
- To document information and data generated under this Scope of Work that is valid for the intended use.

## 4.2 Preparation Activities

ENW performed the following activities prior to conducting site characterization activities:

**Plan Preparation.** An in-house Sampling and Analysis Plan was prepared for the project.

**One Call Notification.** Prior to any subsurface site work, a call was placed with One Call Utility Notification Service to identify and locate all public utilities near each of the proposed sampling locations.

**Planning.** ENW scheduled and coordinated with the Client to begin site work.

## 4.3 Surface Soil Sample Collection

### 4.3.1 Grab Sampling

On July 17, 2024, the client used an excavator to collect approximately one cubic yard of surface soil (0-1.5-ft) near the center of the subject site. The soil was transported to Sester Farm's Paradise Acres Garden Center, across Highway 212 from the site. The client collected a 5-gallon bucket of soil from the subject soil pile (SP01) and delivered it to ENW's office in Portland, Oregon. Using new nitrile gloves, ENW transferred the soil into a sample jar provided by the laboratory, uniquely labeled the sample, and submitted the sample with a chain-of-custody to an independent laboratory for analysis. The grab sample was designated SP01-Gramor. The sampling objective was to determine at first glance whether pesticides are present in surface soil at the subject site. Later, the client in consultation with ENW decided to conduct a comprehensive ISM surface soil investigation, as described in this report.

### 4.3.2 ISM Investigation

ENW used ISM[8] sampling methods to characterize surface soils (upper 2.5-ft) throughout the subject site. ISM is a sampling approach developed to provide an unbiased and precise estimate of the mean contaminant concentration within the target sample area (i.e., "decision unit" or DU). ISM was developed to reduce sampling error caused by the heterogeneous nature of contaminants in soil. For a full explanation of the ISM methods and theory, please reference the ITRC guidance document provided on their website.[9]

For the purpose of this investigation, one decision unit (DU01) was identified for sampling:

- ❖ DU01 – the entirety of the subject property except for the ephemeral drainage that crosses the northwest corner of the site.

[8] The ISM protocol is explained in detail in a February 2012 guidance document issued by the Interstate Technology Regulatory Council.

[9] https://www.itrcweb.org/Guidance/ListDocuments?topicID=11&subTopicID=16

The prescribed area comprising decision unit DU01 is illustrated on the Sample Location Diagram in Figure 3.

Prior to sampling, ENW divided DU01 into six north-south lines that run the entire length of the subject property. Ten nodes were equally spaced along each line, for a total of 60 nodes. Three depths were targeted at each node, namely, 0.5-ft, 1.5-ft, and 2.5-ft below ground surface (bgs). A 0.5-ft soil sample increment and two replicates (Rep01 and Rep02) were collected at the approximate center of each node using a decontaminated stainless-steel hand auger. A mini tracked excavator operated by Sester Farms employee assisted with collection of the 1.5-ft and 2.5-ft sample increments. Following collection of the 0.5-foot soil increment, a shallow test pit centered over each node was excavated to 1.5-ft depth and ENW personnel used a decontaminated stainless-steel hand auger to collect a 1.5-ft sample increment from the bottom of the test pit. Next, the excavator operator advanced the test pit to 2.5-ft bgs, after which ENW used a decontaminated stainless-steel hand auger to collect a 2.5-ft sample increment from the bottom of the test pit. Each soil increment, weighing approximately 40 grams, was placed into a laboratory-provided one-gallon glass sample jar using fresh Nitrile gloves. A separate dedicated (and labeled) 1-gallon glass sample jar was provided for the original 0.5-ft incremental sample, each of the two 0.5-ft incremental sample replicates, the 1.5-ft incremental sample, and the 2.5-ft incremental sample, for a total of five one-gallon glass jars. For protection, each one-gallon glass jar was carried in a clean 5-gallon bucket during sampling. After collecting the full 60 increments in each of the five ISM samples, the one-gallon sample jars were sealed with a Teflon-lined lid, uniquely labelled, recorded onto a chain-of-custody, and immediately placed in cooled storage pending delivery to the project laboratory. Samples were uniquely labeled as follows:

DU0X-yymmdd-d, where:

X = 1
yy = year
mm = month
dd = day
d = depth

Additionally, Rep01 was appended to the sample name for replicate 1, and Rep02 was appended to the sample name for replicate 2. Thus, DU01-240719-0.5-Rep01 indicates the incremental sample was collected from DU01 on July 19, 2024, at 0.5-ft depth and is the first replicate.

## 4.4 Laboratory Sub-sampling, Compositing, and Analytical Methods

One grab sample (SP01-Gramor), three ISM samples (DU01-0.5, DU01-1.5, and DU01-2.5) and two replicate samples (DU01-0.5-Rep01, DU01-0.5-Rep02) were delivered under formal chain-of-custody protocols to Friedman & Bruya, Inc. (F&BI) of Seattle, Washington. Prior to analysis, F&BI processed the ISM samples in accordance with ITRC protocols (air dried, sieved, subsampled, and composited). F&BI analyzed the processed samples for OCPs and select metals. Analysis of CHs was sub-contracted to Alliance Technical Group (Alliance) of Seattle, Washington.

The analytical schedule for the selected constituents and analytical methods are presented in Table 4-1. Copies of the F&BI and Alliance laboratory analytical reports and chain-of-custody documentation are provided in Appendix B.

**Table 4-1. Analytical Methods**

| Analytical Method | Constituents | Soil |
|---|---|---|
| EPA 6020B | Select Total Metals (As, Ba, Cd, Cr, Cu, Pb, Hg, Ni, and Ag) | SP01, DU01-0.5, DU01-0.5-Rep01, DU01-0.5-Rep02, and DU01-1.5 (DU01-2.5 was held pending analysis of the shallower ISM samples) |
| EPA 8081B | Organochlorine pesticides (OCPs) | |
| EPA 8151A | Chlorinated Herbicides (CHs) | |

## 4.5 Cleanup Standards and Other Numeric Criteria

### 4.5.1 Cleanup Standards

The assessment and remediation of hazardous substances in Oregon are conducted according to OAR 340, Division 122, *Hazardous Substance Remedial Action Rules*. The following cleanup standards and numeric criteria may be applied in evaluating site assessment results.

**Ecological Risk-Based Screening.** Ecological risk-based screening concentrations (ERBSCs) selected for the initial screening were the lowest available from ODEQ's Ecological Risk-Based Screening Concentrations Table, for terrestrial receptors, including threatened and endangered (T&E) and Top Consumer/Predator receptor types.

**Other Numeric Criteria.** In addition to the above risk-based cleanup standards, concentrations were also compared to the following numeric criteria to determine if possible enrichment was occurring, and/or determine if there may be offsite soil disposal restrictions.

- ***Background Metals.*** Analytical data were compared with background concentrations established by the ODEQ.[10] ODEQ does not require cleanup for metals concentrations below default background concentrations.
- ***Clean Fill Screening Levels.*** Analytical data for organics were compared to clean fill screening levels (CFSLs) for upland sites established by the ODEQ.[11] ODEQ does not require materials in which contaminant concentrations are less than or equal to CFSLs to be regulated as a solid waste. Rather, these materials may be placed at upland locations that are far enough away from a surface water body, or where there are sufficient controls to avoid erosion into surface water. CFSLs are used to determine if impacts to soil may require future management and are not used for risk screening.

# 5.0 Findings

This section describes the results of site activities. The results of laboratory analysis of one grab soil sample and four of the five ISM soil samples from DU01 are summarized in Table 1 (following the Tables Tab after

[10] ODEQ. March 20, 2013, Fact Sheet: Background Levels of Metals in Soils for Cleanups.

[11] ODEQ. July 2014. Clean Fill Determinations: Internal Management Directive, last updated February 21, 2019, by Heather Kuoppamaki.

text). Photographs of field activities are included in Appendix A, and copies of the F&BI and Alliance Laboratory Reports, chain of custody, and data validation sheets are included in Appendix B.

## 5.1 Soil Sample Locations and General Subsurface Conditions

Sixty ISM soil increments were collected from decision unit DU01 at depths of 0.5-ft (original and two replicates), 1.5-ft, and 2.5-ft. No evidence of chemical staining or odors were observed during sampling. A summary of ISM sample locations is presented on Table 5-1.

**Table 5-1. Soil Sample Summary**

| Borehole / Test Pit Location ID | Replicate No. | Date Sampled | Depth Sampled (feet) | Location |
|---|---|---|---|---|
| DU01 | -- | 7/19/2025 | 0.5 | Entire Property Excepth Ephemeral Drainage Crossing the NW Corner |
| DU01 | 01 | 7/19/2025 | 0.5 | |
| DU01 | 02 | 7/19/2025 | 0.5 | |
| DU01 | -- | 7/19/2025 | 1.5 | |
| DU01 | -- | 7/19/2025 | 2.5 | |

ISM sample DU01-2.5 was submitted to the laboratory but held pending analysis of the shallower samples. This sample was never analyzed.

## 5.2 Laboratory Results

Analytical results of the soil samples are presented in Table 1, behind the Tables tab following text. Results are screened in Table 1 against ODEQ's CFSLs, default regional background concentrations for metals in the Portland Basin, and ERBSCs. The decision unit boundary is shown on the Sample Location Diagram on Figure 3.

**Organochlorine Pesticides (OCPs) and Chlorinated Herbicides (CHs).** No OCPs or CHs were detected above laboratory MRLs in any of the samples collected from DU01.

**Select Total Metals.** Select metals associated with pesticide use metals were analyzed and results were as follows:

- Arsenic was detected at a concentration of 3.0 mg/Kg in the grab sample SP01 and 2.0 mg/Kg in all ISM samples. These concentrations are below ODEQ's CFSL (8.8 mg/Kg), which is based on the regional background concentration in the Portland Basin. These results suggest arsenic is unlikely to have been enriched in 0-1.5-ft surface soil at the subject site.
- Barium, chromium (total) and lead were detected in the grab sample and ISM samples at concentrations less than their respective ODEQ CFSLs, suggesting each metal is unlikely to have been enriched in 0-1.5-ft surface soil at the subject site.
- Copper was detected at 8.6 mg/Kg in the grab sample and estimated (J-flagged) concentrations of 6.1 to 6.7 mg/Kg in the four ISM samples. These concentrations are below ODEQ's CFSL (34 mg/Kg), which is based on the regional background concentration in the Portland Basin. These results suggest copper is unlikely to have been enriched in 0-1.5-ft surface soil at the subject site.

- Beryllium, cadmium, mercury, and silver were not detected above laboratory method reporting limits (MRLs) in the grab and/or ISM soil samples collected at the site, suggesting these four metals are unlikely to have been enriched in 0-1.5-ft surface soil at the site.
- Nickel was detected in two of the five samples at concentrations less than ODEQ's CFSL. Nickel was not detected above the laboratory MRL in the remaining samples. These concentrations are below ODEQ's CFSL (47 mg/Kg), which is based on the regional background concentration in the Portland Basin. These results suggest nickel is unlikely to have been enriched in 0-1.5-ft surface soil at the subject site.

### 5.2.1 Quality Assurance/Quality Control Review

A review of the laboratory report indicates samples were analyzed within appropriate quality assurance/quality control procedures and specified holding times (see Appendix B for laboratory data validation forms completed for this project).

Laboratory results of replicate samples reported a coefficient of variance (CV) ranging from 0% (As and Ba) to 19% (total nickel) of the calculated mean, suggesting low variability between sample and replicate data (see Table 5-2).

**Table 5-2. Quality Control – Analysis of ISM Replicates**

| Analyte | Arsenic | Barium | Chromium | Copper | Lead | Nickel |
|---|---|---|---|---|---|---|
| DU01 | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg | mg/Kg |
| DU01-240719-0.5 | 2.0 | 180 | 29 | 6.2 J | 17 | <10 (ND) |
| DU01-240719-Rep01 | 2.0 | 180 | 21 | 6.3 J | 16 | 7.1 |
| DU01-240719-Rep02 | 2.0 | 180 | 25 | 6.7 J | 16 | <10 (ND) |
| Arithmetic Mean | 2.0 | 180 | 25.0 | 6.4 | 16.3 | 9.03 |
| Standard Deviation | 0.00 | 0.00 | 4.00 | 0.26 | 0.58 | 1.67 |
| CV = SD / mean | 0.00 | 0.00 | 0.16 | 0.04 | 0.04 | 0.19 |
| count (r) | 3 | 3 | 3 | 3 | 3 | 3 |
| alpha (90% = 0.1) | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 | 0.10 |
| t(alpha, df=r-1) | 1.89 | 1.89 | 1.89 | 1.89 | 1.89 | 1.89 |

## 6.0 Soil Blending Strategy

In general accordance with ENW's *Topsoil Placement Plan (TPP)*,[3] approximately 3-ft of low-level impacted soil from the Bull Run Filtration Facility and associated Finished Water Pipeline will be blended with the upper 1.5-ft of virgin topsoil at the subject site. Accordingly, ENW calculated predicted blended soil concentrations for each of the COIs (OCPs, CHs, and metals) at a ratio of 1.5 parts subject Gramor site soil to 3 parts Bull Run Filtration Facility and Finished Water Pipeline soil. Estimated blended COI concentrations were calculated using the following formula:

Estimated blended COI concentration equals:

$$= (3 / 4.5 * COI_{1a}) + (1.5 / 4.5 * COI_{2a})$$

Where:

- $COI_{1a}$ = average COI concentration in low-level pesticide impacted Bull Run Filtration Facility soils or Finished Water Pipeline soils
- $C_{2a}$ = average COI concentration in virgin subject site soils
- Non-detect values were included in the calculation at a value of one-half the MRL. Estimated blended COI concentrations for Bull Run Filtration Facility soils / Subject Site soils and Finished Water Pipeline soils / Subject Site soils presented in Table 1

## 7.0 Screening Level Ecological Risk Assessment

Client contracted SEE and ENW to conduct an SLERA for the 28.67-acre subject Gramor property. This SLERA was conducted as part of a BUD for low-level pesticide impacted soils to be received from Portland Water Bureau's Bull Run Filtration Project in Gresham, Oregon. Primary aspects of the SLERA were conduct of a Problem Formulation promoting an adequate Conceptual Ecological Exposure Model (CEEM) and a preliminary Exposure Assessment as guide for appropriate ecological risk-based screening, in an initial highly protective determination of potential for unacceptable risk posed by previously documented COIs in Bull Run Filtration Facility soils and associated Finished Water Pipeline soils. A scoping checklist was completed during a site visit on August 13, 2024, in connection with this SLERA. Results of this SLERA are presented in a report included as Appendix C.

The SLERA concluded the following:

- Deposition of farm soils from the Bull Run Filtration Facility / Finished Water Pipeline are predicted to result in a very slight potential for risk to insectivorous mammal populations living within receiving soils of exposure to dieldrin. Hazard Quotients of 0.8 and 1.4 were calculated for dieldrin in Bull Run Filtration Facility blended soils and Finished Water Pipeline blended soils, respectively. These simplest, still highly protective results show there is no risk predicted for the Finished Water Pipeline soils but a slight potential risk for blended Bull Run Filtration Facility soils. The slight potential risk predicted for insectivorous mammal exposure to blended Bull Run Filtration Facility soils are unlikely to be realized in further consideration of the following:
    - Toxicity predicted by the ODEQ ERBSCs is established based on a "no-observed-effect" or "zero-risk" threshold for individual mammals, often based on a most sensitive species and from a most sensitive laboratory testing result and often including "safety factors" resulting in lower thresholds of toxicity than predicted by studied results. Since research studies consistently show that most species in the wild are less susceptible and/or less exposed to most toxins compared to laboratory dosing conditions, reduction in the applied safety factor, e.g., from 5 to 3, would reduce the HQ from 1.4 to less than 1, suggesting it is highly unlikely that the predicted level of toxicity would be realized in nature at the population level.
    - The default ODEQ ERBSCs assume 100% exposure of all individuals of a particular species or genus as representative of an entire wildlife "population" as those individuals inhabiting the subject property only, without factoring in background/additional risk, that adjacent wildlife populations are similarly impacted or not, and the balancing of risks associated with lawful Beneficial Uses of the land.

  - Burrowing omnivorous or herbivorous small mammal and other similarly foraging species will be less exposed to dieldrin because insects (as food) are known to concentrate dieldrin at higher levels than plants.
  - While shrews and other insectivorous burrowing mammals (e.g. moles) may currently be present at the subject Gramor property, the intended beneficial use of the land is actively managed/tilled farmland. This allowed use will exclude many, if not most burrowing small mammals, thus reducing exposure and number of individual small mammals, and reducing the risk of toxic effects. The allowed physical effects of farming notably reduce the potential toxic effects of dieldrin imported to the property. Since the land is managed farmland, the number and exposure of insectivorous as well as all other wildlife will be much lower than the defined "local population" considered present for ERBSC calculation.

- Larger mammals, including top predators such as owls, hawks, foxes, and coyotes are less susceptible to dieldrin and have larger home ranges so will be less exposed to soil at the subject property. These reductions in direct toxicity and exposure eliminate concern for predicted risks to species other than insectivorous small burrowing mammals.
- Absent the use of dieldrin on the subject property in the future, the farming activity will promote natural and microbial/bacteriological break down of the dieldrin over time, thus reducing the potential for future risks should the farmland be returned to more natural invertebrate and wildlife exposure conditions. Thus, moving the legally-existing dieldrin containing soils from the Bull Run Facility, and leaving cleaner soils at the Bull Run Facility, results in both a short term and long-term reduction in the potential for toxic impacts due to dieldrin currently in the Bull Run Soils. The Gramor subject property becomes long term containment, exposure reduction, and treatment for the dieldrin bound in Bull Run soils.
- Given the Bull Run soils were legal farmland prior to removal and will contain lower mixed concentrations of the COIs at a new farmland location, then with application of Best Farming Practices to avoid runoff/NpSS, within a Beneficial Use Determination process, there should be some consideration of the improved conditions within an extremely helpful public benefit of the Bull Run Filtration facility.

# 8.0 Conclusions

Based upon evaluation of laboratory results and field observations, the following conclusions may be made.

- Laboratory analysis of surface soil samples collected from DU01 at the subject property were not found to contain detectable levels of OCPs or CHs. Metals typically associated with legacy pesticides were either not detected or were detected at concentrations below regional background concentrations for the project area.
- ENW calculated predicted blended soil concentrations for each of the COIs (OCPs, CHs, and metals) at a ratio of 1.5 parts subject Gramor site soil to 3 parts Bull Run Filtration Facility and Finished Water Pipeline soil.

  - **OCPs**. Only predicted dieldrin concentrations for Bull Run Filtration Facility blended soils and Finished Water Pipeline blended soils exceeded the minimum ERBSC. Dieldrin risk is further evaluated in the SLERA in Appendix C.
  - **Metals**. Predicted concentrations for select metals, i.e., Ba, Cr, Cu, Pb, Hg, and Ni, in blended soils that exceeded minimum ERBSCs were less than ODEQ's regional default background concentrations. Therefore, the risk for these metals was not further evaluated in the SLERA in Appendix C.

- Blending of Bull Run Filtration and Finished Pipeline soils with virgin Gramor property soils will result in a reduction of the potential for widespread exposure at multiple sites, and an overall reduction in dieldrin concentrations at the more limited Gramor property area. Given the proposed farm use and the other factors described, the very minimal ecological risks predicted for the Bull Run Filtration soils are unlikely to be realized and even so, would represent a reduced risk compared to current conditions, within a highly beneficial and more protective use of Finished Pipeline and Bull Run soils. Larger mammals, including top predators such as owls, hawks, foxes, and coyotes are less susceptible to dieldrin and have larger home ranges so will be less exposed to soil at the subject property. These reductions in direct toxicity and exposure eliminate concern for predicted risks to species other than insectivorous small burrowing mammals.

# 9.0 Recommendations

Based on the findings of this *Surface Soil Investigation and Screening Level Ecological Risk Assessment*, no further surface soil investigation or ecological risk assessment is recommended at this time. ENW recommends that the ODEQ approve the proposed beneficial use of low-level pesticide impacted soil received from the Bull Run Filtration Facility and Finished Water Pipeline in Gresham, Oregon, to be blended with virgin topsoil at the subject Gramor site. Transportation, deposition, blending, and management of these soils shall be in accordance with ENW's TPP[3] and *Contaminated Media Management Plan* (CMMP).[12]

*We recommend this report is kept as part of the permanent property records*.

[12] ENW, June 28, 2024. *Contaminated Media Management Plan*, Gramor Property, Map and Tax Lot 2S3E03 03302, Damascus, Clackamas County, Oregon: Prepared for: T&K Sester Family, LLC, 24200 SE Highway 212, Damascus, Oregon.

# 10.0 Limitations

The scope of this report is limited to observations made during on-site work; interviews with knowledgeable sources; and review of readily available published and unpublished reports and literature. As a result, these conclusions are based on information supplied by others as well as interpretations by qualified parties.

The focus of the site closure does not extend to the presence of the following conditions unless they were the express concerns of contacted personnel, report and literature authors or the work scope.

- Naturally occurring toxic or hazardous substances in the subsurface soils, geology, and water,
- Toxicity of substances common in current habitable environments, such as stored chemicals, products, building materials and consumables,
- Contaminants or contaminant concentrations that are not a concern now but may be under future regulatory standards,
- Unpredictable events that may occur after ENW's site work, such as illegal dumping or accidental spillage.

There is no practice that is thorough enough to absolutely identify the presence of all hazardous substances that may be present at a given site. ENW's investigation has been focused only on the potential for contamination that was specifically identified in the Scope of Work. Therefore, if contamination other than that specifically mentioned is present and not identified as part of a limited Scope of Work, ENW's environmental investigation shall not be construed as a guaranteed absence of such materials. ENW have endeavored to collect representative analytical samples for the locations and depths indicated in this report. However, no sampling program can thoroughly identify all variations in contaminant distribution.

We have performed our services for this project in accordance with our agreement and understanding with the client. This document and the information contained herein have been prepared solely for the use of the client.

ENW performed this study under a limited scope of services per our agreement. It is possible, despite the use of reasonable care and interpretation, that ENW may have failed to identify regulation violations related to the presence of hazardous substances other than those specifically mentioned at the closure site. ENW assumes no responsibility for conditions that we did not specifically evaluate or conditions that were not generally recognized as environmentally unacceptable at the time this report was prepared.

# *Tables*

**Table 1 - Summary of Analytical Data, Soil (Sampled at Source and Receiving Facility)**

| Location ID | | DU-1 | DU-1 | DU-1 | DU-2 | DU-2 | DU-2 | FWS-DU-1 | FWS-DU-2 | FWC-DU-1 | FWC-DU-2 | FWN-DU-1 | FWN-DU-1 | FWN-DU-1 | FWN-DU-2 | SP01 | DU01 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | | DU-1A | DU-1B | DU-1C | DU-2A | DU-2B | DU-2C | FWS-DU-1 | FWS-DU-2 | FWC-DU-1 | FWC-DU-2 | FWN-DU-1A | FWN-DU-1B | FWN-DU-1C | FWN-DU-2 | SP01-Gramor | DU01-240719-0.5 |
| Date Sampled | | 11/6/2023 | 11/6/2023 | 11/6/2023 | 11/6/2023 | 11/6/2023 | 11/6/2023 | 11/16/2023 | 11/16/2023 | 11/20/2023 | 11/20/2023 | 11/21/2023 | 11/21/2023 | 11/21/2023 | 11/21/2023 | 7/17/2024 | 7/19/2024 |
| Depth Sampled (feet) | | 0-1.5 | 0-1.5 | 0-1.5 | 1.5-5.0 | 1.5-5.0 | 1.5-5.0 | 0-1.5 | 1.5-5 | 0-1.5 | 1.5-5 | 0-1.5 | 0-1.5 | 0-1.5 | 1.5-5 | -- | 0.5 |
| Sampled By | | PBS | PBS | PBS | PBS | PBS | PBS | PBS | PBS | PBS | PBS | PBS | PBS | PBS | PBS | ENW | ENW |
| Location | | Bull Run Filtration Facility | | | | | | Finished Water South | | Finished Water Center | | Finished Water North | | | | Center of the subject Gramor 29-acre property | Subject Gramor 29-acre property |
| Constituent of Interest | Note | mg/Kg (ppm) | mg/Kg (ppm) | mg/Kg (ppm) | mg/Kg (ppm) | mg/Kg (ppm) | mg/Kg (ppm) | mg/Kg (ppm) | mg/Kg (ppm) | mg/Kg (ppm) | mg/Kg (ppm) | mg/Kg (ppm) | mg/Kg (ppm) | mg/Kg (ppm) | mg/Kg (ppm) | mg/Kg (ppm) | mg/Kg (ppm) |
| **Pesticides** | | | | | | | | | | | | | | | | | |
| Aldrin | c, v | <0.00204 (ND) | <0.00204 (ND) | <0.00203 (ND) | <0.00204 (ND) | <0.00204 (ND) | <0.00204 (ND) | <0.00201 (ND) | <0.00199 (ND) | <0.00197 (ND) | <0.00197 (ND) | <0.00196 (ND) | <0.00199 (ND) | <0.00195 (ND) | <0.00201 (ND) | <0.01 (ND) | <0.01 (ND) |
| Chlordane | c, v | <0.00204 (ND) | <0.00204 (ND) | <0.00203 (ND) | <0.00204 (ND) | <0.00204 (ND) | <0.00204 (ND) | <0.00201 (ND) | <0.00199 (ND) | <0.00197 (ND) | <0.00197 (ND) | <0.00196 (ND) | <0.00199 (ND) | <0.00195 (ND) | <0.00201 (ND) | <0.01 (ND) | <0.01 (ND) |
| DDD (4,4'-Dichlorodiphenyldichloroethane) | c, nv | 0.00240 | 0.00204 | 0.00212 | <0.00204 (ND) | <0.00204 (ND) | <0.00204 (ND) | <0.00201 (ND) | <0.00199 (ND) | 0.00421 | <0.00197 (ND) | <0.00196 (ND) | <0.00199 (ND) | <0.00195 (ND) | <0.00201 (ND) | <0.01 (ND) | <0.01 (ND) |
| DDE (4,4'-Dichlorodiphenyldichloroethene) | c, v | **0.0586** | **0.0382** | **0.0357** | 0.00357 | 0.00387 | 0.00476 | **0.0112** | <0.00199 (ND) | **0.0731** | 0.00995 | **0.0232** | **0.0216** | **0.0223** | <0.00201 (ND) | <0.01 (ND) | <0.01 (ND) |
| DDT (4,4'-Dichlorodiphenyltrichloroethane) | c, nv | **0.053** | **0.0339** | **0.0337** | 0.00473 | 0.00474 | 0.00546 | <0.00201 (ND) | <0.00199 (ND) | **0.076** | 0.00781 | **0.0216** | **0.0177** | **0.0198** | <0.00201 (ND) | <0.01 (ND) | <0.01 (ND) |
| 2,4-Dichlorophenoxyacetic acid (2,4-D) | nc, nv | <0.1 (ND) | <0.1 (ND) | <0.1 (ND) | <0.1 (ND) | <0.1 (ND) | <0.1 (ND) | <0.13 (ND) | <0.1 (ND) | <0.1 (ND) | <0.1 (ND) | <0.1 (ND) | <0.1 (ND) | <0.1 (ND) | <0.1 (ND) | <0.0246 (ND) | <0.0232 (ND) |
| Dieldrin | c, nv | **0.0366** | **0.0266** | **0.0239** | 0.00228 | 0.00320 | 0.00337 | <0.00201 (ND) | <0.00199 (ND) | **0.0185** | <0.00197 (ND) | **0.0115** | **0.0078** | **0.0207** | <0.00201 (ND) | <0.01 (ND) | <0.01 (ND) |
| Endosulfan (alpha-beta) | nc, v | <0.00204 (ND) | <0.00204 (ND) | <0.00203 (ND) | <0.00204 (ND) | <0.00204 (ND) | <0.00204 (ND) | <0.00201 (ND) | <0.00199 (ND) | <0.00197 (ND) | <0.00197 (ND) | <0.00196 (ND) | <0.00196 (ND) | <0.00195 (ND) | <0.00201 (ND) | <0.01 (ND) | <0.01 (ND) |
| Endrin | nc, nv | <0.00204 (ND) | <0.00204 (ND) | <0.00203 (ND) | <0.00204 (ND) | <0.00204 (ND) | <0.00204 (ND) | <0.00201 (ND) | <0.00199 (ND) | <0.00197 (ND) | <0.00197 (ND) | <0.00206 (ND) | <0.00239 (ND) | <0.00195 (ND) | <0.00201 (ND) | <0.01 (ND) | <0.01 (ND) |
| Heptachlor | c, v | <0.00204 (ND) | <0.00204 (ND) | <0.00203 (ND) | <0.00204 (ND) | <0.00204 (ND) | <0.00204 (ND) | <0.00201 (ND) | <0.00199 (ND) | <0.00197 (ND) | <0.00197 (ND) | <0.00196 (ND) | <0.00199 (ND) | <0.00195 (ND) | <0.00201 (ND) | <0.01 (ND) | <0.01 (ND) |
| Heptachlor Epoxide | c, v | <0.00204 (ND) | <0.00204 (ND) | <0.00203 (ND) | <0.00204 (ND) | <0.00204 (ND) | <0.00204 (ND) | <0.00201 (ND) | <0.00199 (ND) | <0.00197 (ND) | <0.00197 (ND) | <0.00196 (ND) | <0.00199 (ND) | <0.00195 (ND) | <0.00201 (ND) | <0.01 (ND) | <0.01 (ND) |
| gamma-Hexachlorocyclohexane (Lindane) | c, nv | <0.00204 (ND) | <0.00204 (ND) | <0.00203 (ND) | <0.00204 (ND) | <0.00204 (ND) | <0.00204 (ND) | <0.00201 (ND) | <0.00199 (ND) | <0.00197 (ND) | <0.00197 (ND) | <0.00196 (ND) | <0.00199 (ND) | <0.00195 (ND) | <0.00201 (ND) | <0.01 (ND) | <0.01 (ND) |
| Toxaphene | c, nv | <0.0612 (ND) | <0.0611 (ND) | <0.0608 (ND) | <0.0612 (ND) | <0.0611 (ND) | <0.0611 (ND) | <0.0603 (ND) | <0.0598 (ND) | <0.0590 (ND) | <0.0592 (ND) | <0.0588 (ND) | <0.0598 (ND) | <0.0586 (ND) | <0.0603 (ND) | <1 (ND) | <1 (ND) |
| **Metals** | | | | | | | | | | | | | | | | | |
| Arsenic | c, nv | 5.18 | 5.09 | 5.02 | 4.98 | 4.88 | 4.95 | 4.40 | 4.85 | 4.18 | 3.67 | 3.40 | 3.66 | 2.94 | 3.72 | 3.0 | 2.0 |
| Barium | nc, nv | 226 | 220 | 221 | 160 | 156 | 164 | 171 | 170 | 182 | 157 | 142 | 146 | 142 | 116 | 200 | 180 |
| Beryllium | c, nv | 0.882 | 0.880 | 0.865 | 0.994 | 0.996 | 1.03 | 0.784 | 0.846 | 0.705 | 0.816 | 0.732 | 0.719 | 0.679 | 0.671 | <1 (ND) | --- |
| Cadmium | nc, nv | <0.208 (ND) | <0.216 (ND) | <0.221 (ND) | <0.218 (ND) | <0.212 (ND) | <0.217 (ND) | <0.205 (ND) | <0.208 (ND) | <0.197 (ND) | <0.210 (ND) | <0.202 (ND) | <0.215 (ND) | <0.204 (ND) | <0.211 (ND) | <1 (ND) | <1 (ND) |
| Chromium (III) | nc, nv | 42.0 | 43.1 | 42.8 | 42.8 | 42.4 | 46.5 | 30.7 | 36.5 | 23.1 | 27.1 | 25.9 | 24.7 | 23.4 | 29.8 | 17 | 29 |
| Copper | nc, nv | 30.5 | 31.6 | 30.2 | 28.5 | 28.5 | 32.0 | 26.4 | 23.0 | 19.4 | 14.3 | 15.4 | 18.0 | 22.0 | 13.3 | 8.6 | 6.2 J |
| Lead | NA, nv | 12.4 | 12.8 | 11.7 | 11.9 | 11.9 | 12.1 | 28.3 | 12 | 10 | 10.1 | 15.0 | 20.8 | 20.3 | 8.66 | 15 | 17 |
| Mercury | nc, nv | <0.0832 (ND) | <0.0864 (ND) | <0.0886 (ND) | <0.087 (ND) | <0.0848 (ND) | <0.0869 (ND) | <0.0819 (ND) | <0.0833 (ND) | 0.0800 | <0.0839 (ND) | 0.1580 | <0.086 (ND) | <0.0816 (ND) | <0.0844 (ND) | <1 (ND) | <0.2 (ND) j |
| Nickel | c, nv | 26.5 | 26.9 | 26.8 | 25.0 | 25.9 | 32.5 | 17.6 | 18.2 | 11.5 | 11.4 | 11.4 | 13.1 | 11.5 | 10.4 | <5 (ND) | <10 (ND) |
| Silver | nc, nv | <0.208 (ND) | <0.216 (ND) | <0.221 (ND) | <0.218 (ND) | <0.212 (ND) | <0.217 (ND) | <0.205 (ND) | <0.208 (ND) | <0.197 (ND) | <0.210 (ND) | <0.202 (ND) | <0.215 (ND) | <0.204 (ND) | <0.211 (ND) | <1 (ND) | <1 (ND) |

Notes:
mg/Kg = milligram per kilogram or parts per million (ppm).
<# (ND) = not detected at or above the laboratory method reporting limit shown.
NE = not established.
— = not analyzed or not applicable.
c = carcinogenic
nc = noncarcinogenic
v = volatile
nv = nonvolatile

**Shaded** concentrations exceed clean fill screening levels and default regional background concentrations, as applicable.

[1] Lowest Risk-Based Concentration for soil (screening level assumes residential use, from ODEQ RBCs dated May 2018).
(Y) indicates analyte not detected, but detection limit is above screening concentration.
BKG = constituent exceeded its SLRBC; however, was not detected above default background concentrations in soil

**Table 1 - Summary of Analytical Data, Soil (Sampled at Source and Receiving Facility)**

| Location ID | | DU01 | DU01 | DU01 | Maximum Soil Concentration (Finished Water Line Soil) 0-1.5' | Average Concentration (Finished Water Line Soil). Note, non-detected concentrations were entered at 1/2 the MRL 0-1.5' | Estimated Maximum Blended Soil Concentration [Calculated using the Average Soil Concentration of Finished Water Line and Gramor (1.5:3)] Note, Gramor non-detected concentrations were entered at 1/2 the MRL | Maximum Soil Concentration (Bull Run Infiltration Facility Soil) 0-1.5' | Average Concentration (Bull Run Infiltration Facility Soil). Note, non-detected concentrations were entered at 1/2 the MRL 0-1.5' | Estimated Maximum Blended Soil Concentration [Calculated using the Average Soil Concentration of Bullrun Filtration Facility and Gramor (1.5:3)] Note, Gramor non-detected concentrations were entered at 1/2 the MRL | Average Concentration (Gramor Soil) DU01-0.5-1.5' | Background Concentrations (Regional Default) | Clean Fill Screening Levels or Background Concentrations (as applicable) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | | DU01-240719-Rep01 | DU01-240719-Rep02 | DU01-240719-1.5 | | | | | | | | | |
| Date Sampled | | 7/19/2024 | 7/19/2024 | 7/19/2024 | | | | | | | | | |
| Depth Sampled (feet) | | 0.5 | 0.5 | 1.5 | | | | | | | | | |
| Sampled By | | ENW | ENW | ENW | | | | | | | | | |
| Location | | Subject Gramor 29-acre property | Subject Gramor 29-acre property | Subject Gramor 29-acre property | | | | | | | | Portland Basin | |
| Constituent of Interest | Note | mg/Kg (ppm) | mg/Kg (ppm) | mg/Kg (ppm) | mg/Kg (ppm) | mg/Kg (ppm) | mg/Kg (ppm) | mg/Kg (ppm) | mg/Kg (ppm) | mg/Kg (ppm) | mg/Kg (ppm) | mg/Kg (ppm) | mg/Kg (ppm) |
| **Pesticides** | | | | | | | | | | | | | |
| Aldrin | c, v | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | <0.00201 (ND) | <0.000991 (ND) | 0.0023 | <0.00204 (ND) | <0.001019 (ND) | 0.0023 | <0.01 (ND) | --- | 0.023 |
| Chlordane | c, v | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | <0.00201 (ND) | <0.000991 (ND) | 0.0023 | <0.00204 (ND) | <0.001019 (ND) | 0.0023 | <0.01 (ND) | --- | 0.91 |
| DDD (4,4'-Dichlorodiphenyldichloroethane) | c, nv | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | 0.00421 | 0.00139 | 0.0026 | 0.0024 | 0.00160 | 0.0027 | <0.01 (ND) | --- | 0.0063 |
| DDE (4,4'-Dichlorodiphenyldichloroethene) | c, v | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | 0.0731 | 0.02042 | 0.0153 | 0.0586 | 0.02412 | 0.0177 | <0.01 (ND) | --- | 0.01 |
| DDT (4,4'-Dichlorodiphenyltrichloroethane) | c, nv | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | 0.0760 | 0.01824 | 0.0138 | 0.0530 | 0.02259 | 0.0167 | <0.01 (ND) | --- | 0.01 |
| 2,4-Dichlorophenoxyacetic acid (2,4-D) | nc, nv | <0.0233 (ND) | <0.0232 (ND) | <0.0231 (ND) | <0.13 (ND) | <0.051875 (ND) | 0.0385 | <0.1 (ND) | <0.05 (ND) | 0.0372 | <0.02348 (ND) | --- | 2.3 |
| Dieldrin | c, nv | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | 0.0207 | 0.00781 | 0.0069 | 0.0366 | 0.0160 | 0.0123 | <0.01 (ND) | --- | 0.0045 |
| Endosulfan (alpha-beta) | nc, v | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | <0.00201 (ND) | <0.000989 (ND) | 0.0023 | <0.00204 (ND) | <0.001019 (ND) | 0.0023 | <0.01 (ND) | --- | 0.64 |
| Endrin | nc, nv | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | <0.00239 (ND) | <0.001022 (ND) | 0.0023 | <0.00204 (ND) | <0.001019 (ND) | 0.0023 | <0.01 (ND) | --- | 0.0014 |
| Heptachlor | c, v | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | <0.00201 (ND) | <0.000991 (ND) | 0.0023 | <0.00204 (ND) | <0.001019 (ND) | 0.0023 | <0.01 (ND) | --- | 0.017 |
| Heptachlor Epoxide | c, v | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | <0.00201 (ND) | <0.000991 (ND) | 0.0023 | <0.00204 (ND) | <0.001019 (ND) | 0.0023 | <0.01 (ND) | --- | 0.0042 |
| gamma-Hexachlorocyclohexane (Lindane) | c, nv | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | <0.00201 (ND) | <0.000991 (ND) | 0.0023 | <0.00204 (ND) | <0.001019 (ND) | 0.0023 | <0.01 (ND) | --- | 0.0095 |
| Toxaphene | c, nv | <1 (ND) | <1 (ND) | <1 (ND) | <0.0603 (ND) | <0.029738 (ND) | 0.1865 | <0.0612 (ND) | <0.030542 (ND) | 0.1870 | <1 (ND) | --- | 0.36 |
| **Metals** | | | | | | | | | | | | | |
| Arsenic | c, nv | 2.0 | 2.0 | 2.0 | 4.85 | 3.85 | 3.30 | 5.18 | 5.02 | 4.08 | 2.2 | 8.8 | 8.8 |
| Barium | nc, nv | 180 | 180 | 69 | 182 | 153 | 156 | 226 | 191 | 181 | 162 | 790 | 790 |
| Beryllium | c, nv | --- | --- | --- | 0.846 | 0.74 | 0.58 | 1.03 | 0.94 | 0.71 | <0.5 (ND) | 2 | 2 |
| Cadmium | nc, nv | <1 (ND) | <1 (ND) | <1 (ND) | <0.215 (ND) | <0.103 (ND) | 0.152 | <0.221 (ND) | <0.108 (ND) | 0.155 | <0.5 (ND) | 0.63 | 0.63 |
| Chromium (III) | nc, nv | 21 | 25 | 23 | 36.5 | 27.7 | 26.1 | 46.5 | 43.3 | 36.5 | 23.0 | 76 | 76 |
| Copper | nc, nv | 6.3 J | 6.7 J | 6.1 J | 26.4 | 19.0 | 14.9 | 32.0 | 30.2 | 22.4 | 6.8 J | 34 | 34 |
| Lead | NA, nv | 16 | 16 | 11 | 28.3 | 15.6 | 15.4 | 12.8 | 12.1 | 13.1 | 15 | 79 | 28 |
| Mercury | nc, nv | <0.2 (ND) j | <0.2 (ND) j | <0.2 (ND) j | 0.158 | 0.0611 | 0.0707 | <0.0886 (ND) | 0.043075 | 0.0587 | <0.18 (ND) | 0.23 | 0.23 |
| Nickel | c, nv | 7.1 | <10 (ND) | 5.9 | 18.2 | 13.1 | 10.5 | 32.5 | 27.3 | 19.9 | 5.1 | 47 | 47 |
| Silver | nc, nv | <1 (ND) | <1 (ND) | <1 (ND) | <0.215 (ND) | <0.103 (ND) | 0.152 | <0.221 (ND) | <0.108 (ND) | 0.155 | <1 (ND) | 0.82 | 0.82 |

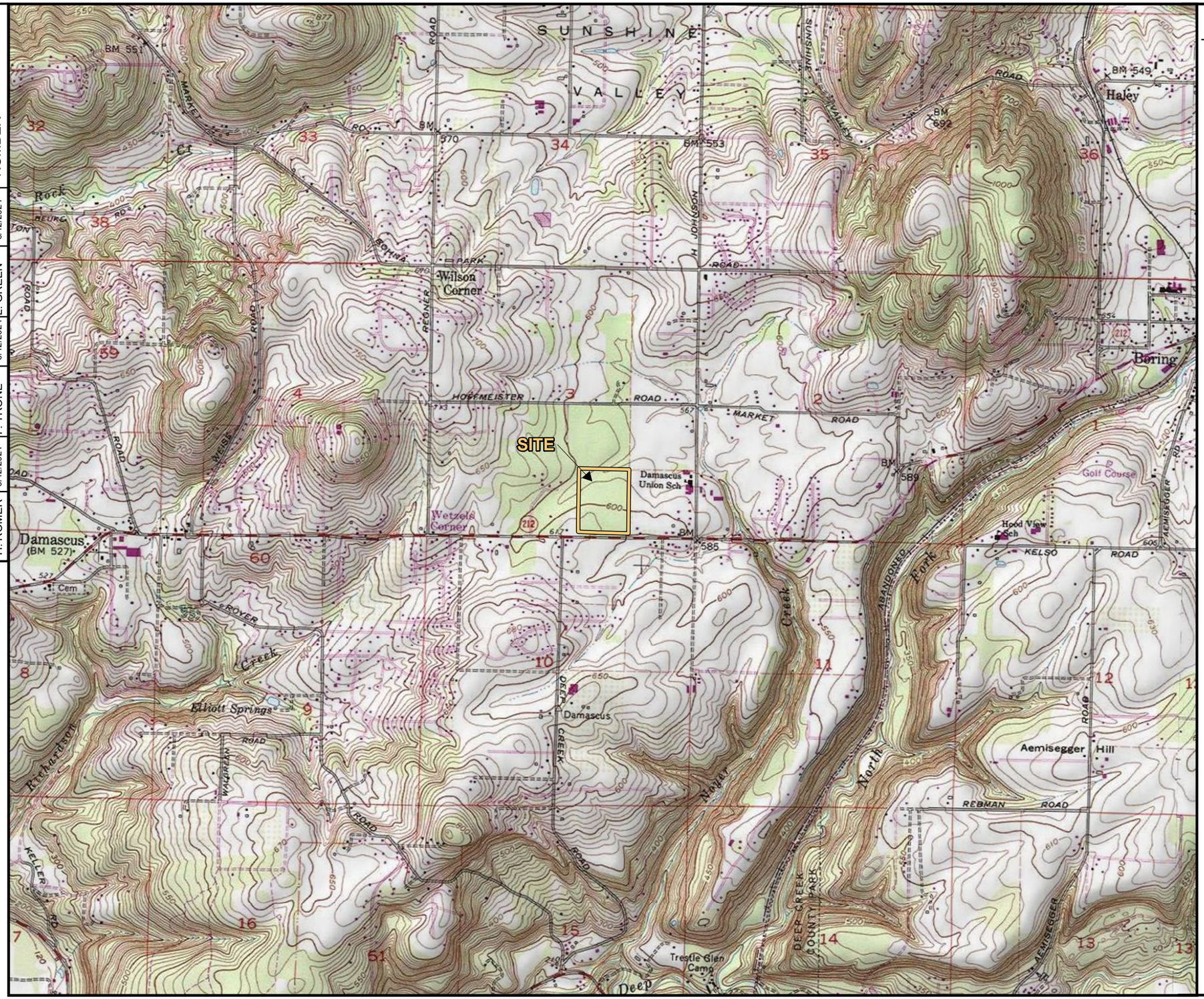
Notes:
mg/Kg = milligram per kilogram or parts per million (ppm).
<# (ND) = not detected at or above the laboratory method reporting limit shown.
NE = not established.
— = not analyzed or not applicable.
c = carcinogenic
nc = noncarcinogenic
v = volatile
nv = nonvolatile

**Shaded** concentrations exceed clean fill screening levels and default regional background concentrations, as applicable.

[1] Lowest Risk-Based Concentration for soil (screening level assumes residential use, from ODEQ RBCs dated May 2018).
(Y) indicates analyte not detected, but detection limit is above screening concentration.
BKG = constituent exceeded its SLRBC; however, was not detected above default background concentrations in soil

# *Figures*

| DRAWING NUMBER | 1972-24001(V01) |
|---|---|
| APPROVED BY | L. GREEN 6/12/2024 |
| CHECKED BY | P. TRONE 6/12/2024 |
| DRAWN BY | H. ROMER 6/12/2024 |




**LEGEND:**

SUBJECT PROPERTY BOUNDARY

**NOTES:**

1. BASE MAP DEVELOPED BY THE USGS (DAMASCUS, 1:24000, 2013)

0 950 1,900 3,800

Feet

(APPROXIMATE 1" = 1900 FEET WHEN PRINTED 11x17)

N

EVREN NORTHWEST INC.
environmental natural resource consultants

**FIGURE 1**

**SITE VICINITY MAP**

**RECEIVING FARM PROPERTY**
**CLACKAMAS COUNTY PARCEL**
**00603617 HIGHWAY 212, DAMASCUS**
**OREGON**

| DRAWN BY | CHECKED BY | APPROVED BY | DRAWING NUMBER |
|---|---|---|---|
| H. ROMER 6/12/2024 | P. TRONE 6/12/2024 | L. GREEN 6/12/2024 | 1972-24001(V01) |


**LEGEND:**

- SUBJECT PROPERTY BOUNDARY
- WATERWAY

**NOTES:**

1. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH MAP DATED 2023 AND ENW FIELD NOTES.

2. ALL BUILDING, STREET, AND FEATURE LOCATIONS ARE APPROXIMATE.

3. SYMBOLS REPRESENT LOCATION AND DO NOT ALWAYS REPRESENT EXACT SHAPE, SIZE, OR ORIENTATION.

0 80 160 320

Feet

(APPROXIMATE 1" = 160 FEET WHEN PRINTED 11x17)

N

EVREN NORTHWEST INC.
environmental / natural resource consultants

**FIGURE 2**

**SITE PLAN**

**RECEIVING FARM PROPERTY**
**CLACKAMAS COUNTY PARCEL**
**00603617 HIGHWAY 212, DAMASCUS**
**OREGON**

| DRAWING NUMBER | APPROVED BY | CHECKED BY | DRAWN BY |
|---|---|---|---|
| 1972-24001(V02) | L. GREEN 9/12/2024 | P. TRONE 9/12/2024 | M. FERRY 9/12/2024 |


**LEGEND:**

- SUBJECT PROPERTY BOUNDARY
- DECISION UNITS
- WATERWAY

**NOTES:**

1. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH MAP DATED 2023 AND ENW FIELD NOTES.
2. ALL BUILDING, STREET, AND FEATURE LOCATIONS ARE APPROXIMATE.
3. SYMBOLS REPRESENT LOCATION AND DO NOT ALWAYS REPRESENT EXACT SHAPE, SIZE, OR ORIENTATION.

0 70 140 280

Feet

(APPROXIMATE 1" = 140 FEET WHEN PRINTED 11x17)

N

EVREN NORTHWEST INC.
environmental & natural resource consultants

**FIGURE 3**

**SAMPLE LOCATION DIAGRAM**

**RECEIVING FARM PROPERTY**
**CLACKAMA COUNTY PARCEL 00603617**
**HIGHWAY 212, DAMASCUS OREGON**

# *Appendix A*

## Site Photographs


Incremental sampling was done with the assistance of a mini-excavator. Sixty test pits were excavated.


Using a decontaminated stainless-steel hand auger, soil increments were collected at 0.5-ft (shown here), 1.5-ft, and 2.5-ft. Two sample replicates (Rep01 and Rep02) were collected at 0.5-ft.


The 1.5-ft sample depth being measured in a test pit.


Sampling at the 2.5-foot depth interval in a test pit. The 2.5-ft sample was held pending results of the shallower samples.

| | | | |
|---|---|---|---|
| EVREN NORTHWEST INC. environmental / natural resource consultants | Gramor Field Property<br>T2SR3E S03 TL03302<br>Damascus, Oregon | **Site Photographs** | Project No.<br>1972-24001-03<br>Appendix<br>**A** |

Sixty (60) soil increments, each weighing approximately 40 grams, were collected at each depth interval.

# *Appendix B*

## Laboratory Analytical Reports

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.

5500 4th Ave South
Seattle, WA 98108-2419
(206) 285-8282
office@friedmanandbruya.com
www.friedmanandbruya.com

July 23, 2024

Lynn Green, Project Manager
Evren Northwest, Inc.
PO Box 14488
Portland, OR 97293

Dear Mr Green:

Included are the results from the testing of material submitted on July 17, 2024 from the Sester Farms SWLA 1972-24001-03, F&BI 407227 project. There are 9 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 have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Neil Woller, Paul Trone, Evan Bruggeman
ENW0723R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on July 17, 2024 by Friedman & Bruya, Inc. from the Evren Northwest Sester Farms SWLA 1972-24001-03, F&BI 407227 project. Samples were logged in under the laboratory ID's listed below.

| Laboratory ID | Evren Northwest |
|---|---|
| 407227 -01 | SP01-Gramor |

The sample was sent to Alliance Technical Group for chlorinated herbicide analysis. The report is enclosed.

All quality control requirements were acceptable.

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | SP01-Gramor | Client: | Evren Northwest |
| Date Received: | 07/17/24 | Project: | 1972-24001-03, F&BI 407227 |
| Date Extracted: | 07/17/24 | Lab ID: | 407227-01 |
| Date Analyzed: | 07/17/24 | Data File: | 407227-01.162 |
| Matrix: | Soil | Instrument: | ICPMS3 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | 3.0 |
| Barium | 200 |
| Beryllium | <1 |
| Cadmium | <1 |
| Chromium | 17 |
| Copper | 8.6 |
| Lead | 15 |
| Mercury | <1 |
| Nickel | <5 |
| Selenium | <1 |
| Silver | <1 |
| Zinc | 28 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | Method Blank | Client: | Evren Northwest |
| Date Received: | Not Applicable | Project: | 1972-24001-03, F&BI 407227 |
| Date Extracted: | 07/17/24 | Lab ID: | I4-579 mb |
| Date Analyzed: | 07/17/24 | Data File: | I4-579 mb.106 |
| Matrix: | Soil | Instrument: | ICPMS3 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | <1 |
| Barium | <1 |
| Beryllium | <1 |
| Cadmium | <1 |
| Chromium | <1 |
| Copper | <5 |
| Lead | <1 |
| Mercury | <1 |
| Nickel | <5 |
| Selenium | <1 |
| Silver | <1 |
| Zinc | <5 |

## Analysis For Organochlorine Pesticides By EPA Method 8081B

| | | | |
|---|---|---|---|
| Client Sample ID: | SP01-Gramor | Client: | Evren Northwest |
| Date Received: | 07/17/24 | Project: | 1972-24001-03, F&BI 407227 |
| Date Extracted: | 07/17/24 | Lab ID: | 407227-01 1/30 |
| Date Analyzed: | 07/18/24 | Data File: | 071811.D |
| Matrix: | Soil | Instrument: | GC7 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | VM |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Tetrachlorometaxylene | 58 | 32 | 117 |
| Decachlorobiphenyl | 66 | 32 | 150 |

| Compounds: | Concentration mg/kg (ppm) |
|---|---|
| alpha-BHC | <0.01 |
| gamma-BHC (Lindane) | <0.01 |
| beta-BHC | <0.01 |
| delta-BHC | <0.01 |
| Heptachlor | <0.01 |
| Aldrin | <0.01 |
| Heptachlor Epoxide | <0.01 |
| trans-Chlordane | <0.01 |
| cis-Chlordane | <0.01 |
| 4,4'-DDE | <0.01 |
| Endosulfan I | <0.01 |
| Dieldrin | <0.01 |
| Endrin | <0.01 |
| 4,4'-DDD | <0.01 |
| Endosulfan II | <0.01 |
| 4,4'-DDT | <0.01 |
| Endrin Aldehyde | <0.01 |
| Methoxychlor | <0.01 |
| Endosulfan Sulfate | <0.01 |
| Endrin Ketone | <0.01 |
| Toxaphene | <1 |

## Analysis For Organochlorine Pesticides By EPA Method 8081B

| | | | |
|---|---|---|---|
| Client Sample ID: | Method Blank | Client: | Evren Northwest |
| Date Received: | Not Applicable | Project: | 1972-24001-03, F&BI 407227 |
| Date Extracted: | 07/17/24 | Lab ID: | 04-1677 mb 1/30 |
| Date Analyzed: | 07/18/24 | Data File: | 071810.D |
| Matrix: | Soil | Instrument: | GC7 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | VM |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Tetrachlorometaxylene | 82 | 32 | 117 |
| Decachlorobiphenyl | 81 | 32 | 150 |

| Compounds: | Concentration mg/kg (ppm) |
|---|---|
| alpha-BHC | <0.01 |
| gamma-BHC (Lindane) | <0.01 |
| beta-BHC | <0.01 |
| delta-BHC | <0.01 |
| Heptachlor | <0.01 |
| Aldrin | <0.01 |
| Heptachlor Epoxide | <0.01 |
| trans-Chlordane | <0.01 |
| cis-Chlordane | <0.01 |
| 4,4'-DDE | <0.01 |
| Endosulfan I | <0.01 |
| Dieldrin | <0.01 |
| Endrin | <0.01 |
| 4,4'-DDD | <0.01 |
| Endosulfan II | <0.01 |
| 4,4'-DDT | <0.01 |
| Endrin Aldehyde | <0.01 |
| Methoxychlor | <0.01 |
| Endosulfan Sulfate | <0.01 |
| Endrin Ketone | <0.01 |
| Toxaphene | <1 |

Date of Report: 07/23/24
Date Received: 07/17/24
Project: Sester Farms SWLA 1972-24001-03, F&BI 407227

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR TOTAL METALS USING EPA METHOD 6020B

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Percent Recovery LCSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|
| Arsenic | mg/kg (ppm) | 10 | 100 | 94 | 80-120 | 6 |
| Barium | mg/kg (ppm) | 50 | 99 | 93 | 80-120 | 6 |
| Beryllium | mg/kg (ppm) | 5 | 95 | 91 | 80-120 | 4 |
| Cadmium | mg/kg (ppm) | 10 | 100 | 97 | 80-120 | 3 |
| Chromium | mg/kg (ppm) | 50 | 108 | 105 | 80-120 | 3 |
| Copper | mg/kg (ppm) | 50 | 106 | 102 | 80-120 | 4 |
| Lead | mg/kg (ppm) | 50 | 99 | 96 | 80-120 | 3 |
| Mercury | mg/kg (ppm) | 5 | 95 | 91 | 80-120 | 4 |
| Nickel | mg/kg (ppm) | 25 | 109 | 107 | 80-120 | 2 |
| Selenium | mg/kg (ppm) | 5 | 98 | 92 | 80-120 | 6 |
| Silver | mg/kg (ppm) | 10 | 101 | 98 | 80-120 | 3 |
| Zinc | mg/kg (ppm) | 50 | 104 | 101 | 80-120 | 3 |

Date of Report: 07/23/24
Date Received: 07/17/24
Project: Sester Farms SWLA 1972-24001-03, F&BI 407227

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR ORGANOCHLORINE PESTICIDES BY EPA METHOD 8081B

Laboratory Code: 407227-01 1/30 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result | Percent Recovery MS | Percent Recovery MSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|---|
| alpha-BHC | mg/kg (ppm) | 0.1 | <0.01 | 61 | 51 | 20-126 | 18 |
| gamma-BHC (Lindane) | mg/kg (ppm) | 0.1 | <0.01 | 61 | 51 | 29-117 | 18 |
| beta-BHC | mg/kg (ppm) | 0.1 | <0.01 | 58 | 50 | 32-122 | 15 |
| delta-BHC | mg/kg (ppm) | 0.1 | <0.01 | 61 | 51 | 24-128 | 18 |
| Heptachlor | mg/kg (ppm) | 0.1 | <0.01 | 63 | 52 | 24-131 | 19 |
| Aldrin | mg/kg (ppm) | 0.1 | <0.01 | 59 | 51 | 36-126 | 15 |
| Heptachlor Epoxide | mg/kg (ppm) | 0.1 | <0.01 | 61 | 52 | 33-130 | 16 |
| trans-Chlordane | mg/kg (ppm) | 0.1 | <0.01 | 60 | 53 | 10-228 | 12 |
| cis-Chlordane | mg/kg (ppm) | 0.1 | <0.01 | 58 | 50 | 31-126 | 15 |
| 4,4'-DDE | mg/kg (ppm) | 0.1 | <0.01 | 60 | 51 | 14-150 | 16 |
| Endosulfan I | mg/kg (ppm) | 0.1 | <0.01 | 60 | 51 | 31-123 | 16 |
| Dieldrin | mg/kg (ppm) | 0.1 | <0.01 | 61 | 52 | 10-176 | 16 |
| Endrin | mg/kg (ppm) | 0.1 | <0.01 | 72 | 61 | 31-145 | 17 |
| 4,4'-DDD | mg/kg (ppm) | 0.1 | <0.01 | 61 | 52 | 10-171 | 16 |
| Endosulfan II | mg/kg (ppm) | 0.1 | <0.01 | 58 | 49 | 34-131 | 17 |
| 4,4'-DDT | mg/kg (ppm) | 0.1 | <0.01 | 61 | 47 | 10-146 | 26 vo |
| Endrin Aldehyde | mg/kg (ppm) | 0.1 | <0.01 | 48 | 38 | 21-120 | 23 vo |
| Methoxychlor | mg/kg (ppm) | 0.1 | <0.01 | 63 | 49 | 15-149 | 25 vo |
| Endosulfan Sulfate | mg/kg (ppm) | 0.1 | <0.01 | 57 | 48 | 28-133 | 17 |
| Endrin Ketone | mg/kg (ppm) | 0.1 | <0.01 | 59 | 49 | 41-147 | 19 |
| Toxaphene | mg/kg (ppm) | 4 | <0.1 | 41 | 40 | 36-133 | 2 |

Date of Report: 07/23/24
Date Received: 07/17/24
Project: Sester Farms SWLA 1972-24001-03, F&BI 407227

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR ORGANOCHLORINE PESTICIDES BY EPA METHOD 8081B

Laboratory Code: Laboratory Control Sample 1/30

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|---|---|---|---|---|
| alpha-BHC | mg/kg (ppm) | 0.1 | 85 | 42-131 |
| gamma-BHC (Lindane) | mg/kg (ppm) | 0.1 | 81 | 47-129 |
| beta-BHC | mg/kg (ppm) | 0.1 | 80 | 53-130 |
| delta-BHC | mg/kg (ppm) | 0.1 | 83 | 47-134 |
| Heptachlor | mg/kg (ppm) | 0.1 | 84 | 49-130 |
| Aldrin | mg/kg (ppm) | 0.1 | 80 | 49-133 |
| Heptachlor Epoxide | mg/kg (ppm) | 0.1 | 81 | 55-130 |
| trans-Chlordane | mg/kg (ppm) | 0.1 | 80 | 54-132 |
| cis-Chlordane | mg/kg (ppm) | 0.1 | 78 | 56-132 |
| 4,4'-DDE | mg/kg (ppm) | 0.1 | 81 | 58-134 |
| Endosulfan I | mg/kg (ppm) | 0.1 | 79 | 54-132 |
| Dieldrin | mg/kg (ppm) | 0.1 | 81 | 59-134 |
| Endrin | mg/kg (ppm) | 0.1 | 93 | 57-153 |
| 4,4'-DDD | mg/kg (ppm) | 0.1 | 81 | 54-137 |
| Endosulfan II | mg/kg (ppm) | 0.1 | 77 | 42-140 |
| 4,4'-DDT | mg/kg (ppm) | 0.1 | 84 | 25-169 |
| Endrin Aldehyde | mg/kg (ppm) | 0.1 | 78 | 21-135 |
| Methoxychlor | mg/kg (ppm) | 0.1 | 86 | 44-160 |
| Endosulfan Sulfate | mg/kg (ppm) | 0.1 | 80 | 39-148 |
| Endrin Ketone | mg/kg (ppm) | 0.1 | 79 | 46-134 |
| Toxaphene | mg/kg (ppm) | 4 | 82 | 50-146 |

# 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, biased low; or, the calibration results for the analyte were outside of acceptance criteria, biased high, with a detection for the analyte in the sample. 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 standard reporting limit. 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.

k – The calibration results for the analyte were outside of acceptance criteria, biased high, and the analyte was not detected in the sample.

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.

407227

# SAMPLE CHAIN OF CUSTODY 07/17/24 MI

Page # 1 of 1

Report To Paul Trone

Company EVREN Northwest Inc

Address PO Box 14488

City, State, ZIP Portland, OR 97293

Phone 503-452-5501 Email paul@evren-nw.com

SAMPLERS (*signature*): Paul M Trone

PROJECT NAME: Sester Farms SWLA

PO #: 1972-24001-02

REMARKS:

INVOICE TO: ENW

Project specific RLs? - Yes / No

TURNAROUND TIME
- ☐ Standard turnaround
- ☒ RUSH 24-H12

Rush charges authorized by:

SAMPLE DISPOSAL
- ☑ Archive samples
- ☐ Other

Default: Dispose after 30 days

| Sample ID | Lab ID | Date Sampled | Time Sampled | Sample Type | # of Jars | NWTPH-Dx | NWTPH-Gx | BTEX EPA 8021 | NWTPH-HCID | VOCs EPA 8260 | PAHs EPA 8270 | PCBs EPA 8082 | RCRA 8 + Be, Cu, Ni | OCPs 8081B | Chlor. Herb 8151A | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SP01-Grab-0 | 01 | 7-16-24 | 1200 | Soil | 1 | | | | | | | | ✓ | ✓ | ✓ | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | Samples received at 3 °C | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |

| SIGNATURE | PRINT NAME | COMPANY | DATE | TIME |
|---|---|---|---|---|
| Relinquished by: Paul M Trone | Paul M. Trone | ENW | 7-16-24 | 1600 |
| Received by: | Anh Phan | FBI | 07/17/24 | 10:39 |
| Relinquished by: | | | | |
| Received by: | | | | |

*Friedman & Bruya, Inc.*
*Ph. (206) 285-8282*

# SAMPLE CONDITION UPON RECEIPT CHECKLIST

PROJECT # 407227 CLIENT ENW INITIALS/ AP DATE: 07/17/24

If custody seals are present on cooler, are they intact? ☑ NA ☐ YES ☐ NO

Cooler/Sample temperature 3 °C
Thermometer ID: Fluke 96312917

Were samples received on ice/cold packs? ☑ YES ☐ NO

How did samples arrive?
☐ Over the Counter ☐ Picked up by F&BI ☑ FedEx/UPS/GSO

Is there a Chain-of-Custody* (COC)? ☑ YES ☐ NO Initials/ AP
*or other representative documents, letters, and/or shipping memos Date: 07/17/24

Number of days samples have been sitting prior to receipt at laboratory 1 days

Are the samples clearly identified? (explain "no" answer below) ☑ YES ☐ NO

Were all sample containers received intact (i.e. not broken, leaking etc.)? (explain "no" answer below) ☑ YES ☐ NO

Were appropriate sample containers used? ☑ YES ☐ NO ☐ Unknown

If custody seals are present on samples, are they intact? ☑ NA ☐ YES ☐ NO

Are samples requiring no headspace, headspace free? ☑ NA ☐ YES ☐ NO

Is the following information provided on the COC, and does it match the sample label?
(explain "no" answer below)

| | | |
|---|---|---|
| Sample ID's | ☑ Yes ☐ No | ☐ Not on COC/label |
| Date Sampled | ☑ Yes ☐ No | ☐ Not on COC/label |
| Time Sampled | ☑ Yes ☐ No | ☐ Not on COC/label |
| # of Containers | ☑ Yes ☐ No | |
| Relinquished | ☑ Yes ☐ No | |
| Requested analysis | ☑ Yes ☐ On Hold | |

Other comments (use a separate page if needed)

Air Samples: Were any additional canisters/tubes received? ☑ NA ☐ YES ☐ NO

Number of unused TO15 canisters _____ Number of unused TO17 tubes _____

about:blank

5/16/24, 8:52 AM

GLS.

800-322-5555
www.gls-us.com

PDS

Tracking #: 561429819

Ship From
EVREN NW
DAN SAJKO
40 SE 24TH AVE
PORTLAND, OR 97214

Ship To
FRIEDMAN & BRUYA, INC
SAMPLE RECEIVING
5500 4TH AVE S
SEATTLE, WA 98108

COD: $0.00
Weight: 0 lb(s)
Reference:

Delivery Instructions:

Signature Type: NOT REQUIRED

SEATTLE

S06437C

9175917

KNT WA980-7C0

Print Date: 5/16/2024 8:52 AM

3600 Fremont Ave N
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

**Friedman & Bruya**
Michael Erdahl
5500 4th Ave S
Seattle, WA 98108

**RE: 407227,**
**Work Order Number: 2407281**

July 19, 2024

**Attention Michael Erdahl:**

Fremont Analytical, Inc, an Alliance Technical Group company, received 1 sample(s) on 7/17/2024 for the analyses presented in the following report.

***Herbicides by EPA 8151A (GC/MS)***
***Sample Moisture (Percent Moisture)***

All analyses were performed according to our accredited Quality Assurance program. Please contact the laboratory if you should have any questions about the results.

Please note, while the appearance of our logo and branding will update, our commitment to accuracy, speed, and customer service remain values celebrated and shared by Alliance Technical Group. Thank you for the opportunity to serve you.

Sincerely,

Brianna Barnes
Project Manager

**CC:**
Evan Bruggeman
Lynn Green
Paul Trone

*DoD-ELAP Accreditation #79636 by PJLA, ISO/IEC 17025:2017 and QSM 5.4 for Environmental Testing*
*ORELAP Certification: WA 100009 (NELAP Recognized) for Environmental Testing*
*Washington State Department of Ecology Accredited for Environmental Testing, Lab ID C910*

Original

**Date:** *07/19/2024*

**CLIENT:** Friedman & Bruya
**Project:** 407227
**Work Order:** 2407281

# Work Order Sample Summary

| Lab Sample ID | Client Sample ID | Date/Time Collected | Date/Time Received |
|---|---|---|---|
| 2407281-001 | SP01-Gransor | 07/16/2024 12:00 PM | 07/17/2024 3:58 PM |

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

Original

# Case Narrative

WO#: **2407281**

Date: **7/19/2024**

**CLIENT:** Friedman & Bruya
**Project:** 407227

I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below Reporting Limit
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit
R - High relative percent difference observed

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
DUP - Sample Duplicate
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MCL - Maximum Contaminant Level
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
REP - Sample Replicate
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

# Analytical Report

Work Order: **2407281**
Date Reported: **7/19/2024**

**CLIENT:** Friedman & Bruya
**Project:** 407227

**Lab ID:** 2407281-001 **Collection Date:** 7/16/2024 12:00:00 PM
**Client Sample ID:** **SP01-Gransor** **Matrix:** Soil

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **Herbicides by EPA 8151A (GC/MS)** | | | | Batch ID: 44570 | | Analyst: RG |
| Dicamba | ND | 24.6 | | µg/Kg-dry | 1 | 7/19/2024 1:11:30 PM |
| 2,4-D | ND | 24.6 | | µg/Kg-dry | 1 | 7/19/2024 1:11:30 PM |
| 2,4-DP | ND | 18.4 | | µg/Kg-dry | 1 | 7/19/2024 1:11:30 PM |
| 2,4,5-TP (Silvex) | ND | 18.4 | | µg/Kg-dry | 1 | 7/19/2024 1:11:30 PM |
| 2,4,5-T | ND | 18.4 | | µg/Kg-dry | 1 | 7/19/2024 1:11:30 PM |
| Dinoseb | ND | 61.4 | | µg/Kg-dry | 1 | 7/19/2024 1:11:30 PM |
| Dalapon | ND | 61.4 | | µg/Kg-dry | 1 | 7/19/2024 1:11:30 PM |
| 2,4-DB | ND | 18.4 | | µg/Kg-dry | 1 | 7/19/2024 1:11:30 PM |
| MCPP | ND | 36.9 | | µg/Kg-dry | 1 | 7/19/2024 1:11:30 PM |
| MCPA | ND | 61.4 | | µg/Kg-dry | 1 | 7/19/2024 1:11:30 PM |
| Picloram | ND | 197 | | µg/Kg-dry | 1 | 7/19/2024 1:11:30 PM |
| Bentazon | ND | 12.3 | | µg/Kg-dry | 1 | 7/19/2024 1:11:30 PM |
| Chloramben | ND | 12.3 | | µg/Kg-dry | 1 | 7/19/2024 1:11:30 PM |
| Acifluorfen | ND | 61.4 | | µg/Kg-dry | 1 | 7/19/2024 1:11:30 PM |
| 3,5-Dichlorobenzoic acid | ND | 18.4 | | µg/Kg-dry | 1 | 7/19/2024 1:11:30 PM |
| 4-Nitrophenol | ND | 24.6 | | µg/Kg-dry | 1 | 7/19/2024 1:11:30 PM |
| Dacthal (DCPA) | ND | 18.4 | | µg/Kg-dry | 1 | 7/19/2024 1:11:30 PM |
| Surr: 2,4-Dichlorophenylacetic acid | 126 | 14.7 - 155 | | %Rec | 1 | 7/19/2024 1:11:30 PM |
| **Sample Moisture (Percent Moisture)** | | | | Batch ID: R93108 | | Analyst: GHG |
| Percent Moisture | 19.1 | 0.500 | | wt% | 1 | 7/18/2024 1:14:49 PM |

**Work Order:** 2407281
**CLIENT:** Friedman & Bruya
**Project:** 407227

# QC SUMMARY REPORT

## Herbicides by EPA 8151A (GC/MS)

Sample ID: **MB-44570** SampType: **MBLK** Units: **µg/Kg** Prep Date: **7/18/2024** RunNo: **93138**
Client ID: **MBLKS** Batch ID: **44570** Analysis Date: **7/19/2024** SeqNo: **1944230**

| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dicamba | ND | 20.0 | | | | | | | | | |
| 2,4-D | ND | 20.0 | | | | | | | | | |
| 2,4-DP | ND | 15.0 | | | | | | | | | |
| 2,4,5-TP (Silvex) | ND | 15.0 | | | | | | | | | |
| 2,4,5-T | ND | 15.0 | | | | | | | | | |
| Dinoseb | ND | 50.0 | | | | | | | | | |
| Dalapon | ND | 50.0 | | | | | | | | | |
| 2,4-DB | ND | 15.0 | | | | | | | | | |
| MCPP | ND | 30.0 | | | | | | | | | |
| MCPA | ND | 50.0 | | | | | | | | | |
| Picloram | ND | 160 | | | | | | | | | |
| Bentazon | ND | 10.0 | | | | | | | | | |
| Chloramben | ND | 10.0 | | | | | | | | | |
| Acifluorfen | ND | 50.0 | | | | | | | | | |
| 3,5-Dichlorobenzoic acid | ND | 15.0 | | | | | | | | | |
| 4-Nitrophenol | ND | 20.0 | | | | | | | | | |
| Dacthal (DCPA) | ND | 15.0 | | | | | | | | | |
| Surr: 2,4-Dichlorophenylacetic acid | 1,160 | | 1,000 | | 116 | 5 | 150 | | | | |

Sample ID: **LCS-44570** SampType: **LCS** Units: **µg/Kg** Prep Date: **7/18/2024** RunNo: **93138**
Client ID: **LCSS** Batch ID: **44570** Analysis Date: **7/19/2024** SeqNo: **1944231**

| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dicamba | 237 | 20.0 | 200.0 | 0 | 119 | 6.87 | 123 | | | | |
| 2,4-D | 269 | 20.0 | 200.0 | 0 | 135 | 13.2 | 123 | | | | S |
| 2,4-DP | 235 | 15.0 | 200.0 | 0 | 118 | 17.2 | 120 | | | | |
| 2,4,5-TP (Silvex) | 247 | 15.0 | 200.0 | 0 | 123 | 22.3 | 124 | | | | |
| 2,4,5-T | 213 | 15.0 | 200.0 | 0 | 107 | 17.5 | 122 | | | | |
| Dinoseb | 123 | 50.0 | 200.0 | 0 | 61.7 | 13 | 115 | | | | |
| Dalapon | 1,340 | 50.0 | 1,000 | 0 | 134 | 5.02 | 155 | | | | |
| 2,4-DB | 222 | 15.0 | 200.0 | 0 | 111 | 40.9 | 123 | | | | |

**Work Order:** 2407281
**CLIENT:** Friedman & Bruya
**Project:** 407227

# QC SUMMARY REPORT

## Herbicides by EPA 8151A (GC/MS)

Sample ID: **LCS-44570** SampType: **LCS** Units: **µg/Kg** Prep Date: **7/18/2024** RunNo: **93138**
Client ID: **LCSS** Batch ID: **44570** Analysis Date: **7/19/2024** SeqNo: **1944231**

| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MCPP | 1,050 | 30.0 | 1,000 | 0 | 105 | 19.2 | 142 | | | | |
| MCPA | 1,050 | 50.0 | 1,000 | 0 | 105 | 6.41 | 143 | | | | |
| Picloram | 260 | 160 | 200.0 | 0 | 130 | 5.42 | 148 | | | | |
| Bentazon | 216 | 10.0 | 200.0 | 0 | 108 | 21.5 | 133 | | | | |
| Chloramben | 130 | 10.0 | 200.0 | 0 | 65.2 | 8.88 | 94.8 | | | | |
| Acifluorfen | 120 | 50.0 | 200.0 | 0 | 60.1 | 5.24 | 110 | | | | |
| 3,5-Dichlorobenzoic acid | 226 | 15.0 | 200.0 | 0 | 113 | 12.3 | 132 | | | | |
| 4-Nitrophenol | 191 | 20.0 | 200.0 | 0 | 95.4 | 13 | 148 | | | | |
| Dacthal (DCPA) | 219 | 15.0 | 200.0 | 0 | 110 | 12.7 | 122 | | | | |
| Surr: 2,4-Dichlorophenylacetic acid | 1,250 | | 1,000 | | 125 | 14.7 | 155 | | | | |

**NOTES:**
S - Outlying spike recovery observed (high bias). Samples are non-detect; result meets QC requirements.

Sample ID: **2407281-001AMS** SampType: **MS** Units: **µg/Kg-dry** Prep Date: **7/18/2024** RunNo: **93138**
Client ID: **SP01-Gransor** Batch ID: **44570** Analysis Date: **7/19/2024** SeqNo: **1944234**

| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dicamba | 267 | 24.6 | 245.7 | 0 | 108 | 6.87 | 123 | | | | |
| 2,4-D | 313 | 24.6 | 245.7 | 0 | 127 | 13.2 | 123 | | | | S |
| 2,4-DP | 294 | 18.4 | 245.7 | 0 | 120 | 17.2 | 120 | | | | |
| 2,4,5-TP (Silvex) | 322 | 18.4 | 245.7 | 0 | 131 | 22.3 | 124 | | | | S |
| 2,4,5-T | 259 | 18.4 | 245.7 | 0 | 105 | 17.5 | 122 | | | | |
| Dinoseb | 251 | 61.4 | 245.7 | 0 | 102 | 13 | 115 | | | | |
| Dalapon | 1,070 | 61.4 | 1,229 | 0 | 87.3 | 5.02 | 155 | | | | |
| 2,4-DB | 314 | 18.4 | 245.7 | 0 | 128 | 40.9 | 123 | | | | S |
| MCPP | 1,340 | 36.9 | 1,229 | 0 | 109 | 19.2 | 142 | | | | |
| MCPA | 1,300 | 61.4 | 1,229 | 0 | 105 | 6.41 | 143 | | | | |
| Picloram | 196 | 197 | 245.7 | 0 | 79.7 | 5.42 | 148 | | | | |
| Bentazon | 287 | 12.3 | 245.7 | 0 | 117 | 21.5 | 133 | | | | |
| Chloramben | 127 | 12.3 | 245.7 | 0 | 51.5 | 8.88 | 94.8 | | | | |
| Acifluorfen | 215 | 61.4 | 245.7 | 0 | 87.5 | 5.24 | 110 | | | | |
| 3,5-Dichlorobenzoic acid | 276 | 18.4 | 245.7 | 0 | 112 | 12.3 | 132 | | | | |

**Work Order:** 2407281
**CLIENT:** Friedman & Bruya
**Project:** 407227

# QC SUMMARY REPORT

## Herbicides by EPA 8151A (GC/MS)

Sample ID: **2407281-001AMS** SampType: **MS** Units: **µg/Kg-dry** Prep Date: **7/18/2024** RunNo: **93138**
Client ID: **SP01-Gransor** Batch ID: **44570** Analysis Date: **7/19/2024** SeqNo: **1944234**

| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4-Nitrophenol | 303 | 24.6 | 245.7 | 0 | 123 | 13 | 148 | | | | |
| Dacthal (DCPA) | 93.9 | 18.4 | 245.7 | 0 | 38.2 | 12.7 | 122 | | | | |
| Surr: 2,4-Dichlorophenylacetic acid | 1,580 | | 1,229 | | 129 | 14.7 | 155 | | | | |

**NOTES:**
S - Outlying spike recovery observed. A duplicate analysis was performed and recovered within range.

Sample ID: **2407281-001AMSD** SampType: **MSD** Units: **µg/Kg-dry** Prep Date: **7/18/2024** RunNo: **93138**
Client ID: **SP01-Gransor** Batch ID: **44570** Analysis Date: **7/19/2024** SeqNo: **1944235**

| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dicamba | 211 | 24.6 | 246.2 | 0 | 85.9 | 6.87 | 123 | 266.6 | 23.1 | 30 | |
| 2,4-D | 247 | 24.6 | 246.2 | 0 | 101 | 13.2 | 123 | 312.8 | 23.3 | 30 | |
| 2,4-DP | 232 | 18.5 | 246.2 | 0 | 94.3 | 17.2 | 120 | 293.7 | 23.4 | 30 | |
| 2,4,5-TP (Silvex) | 254 | 18.5 | 246.2 | 0 | 103 | 22.3 | 124 | 321.9 | 23.7 | 30 | |
| 2,4,5-T | 206 | 18.5 | 246.2 | 0 | 83.6 | 17.5 | 122 | 258.6 | 22.7 | 30 | |
| Dinoseb | 191 | 61.5 | 246.2 | 0 | 77.4 | 13 | 115 | 250.6 | 27.2 | 30 | |
| Dalapon | 760 | 61.5 | 1,231 | 0 | 61.8 | 5.02 | 155 | 1,072 | 34.0 | 30 | R |
| 2,4-DB | 273 | 18.5 | 246.2 | 0 | 111 | 40.9 | 123 | 314.3 | 14.1 | 30 | |
| MCPP | 1,070 | 36.9 | 1,231 | 0 | 86.9 | 19.2 | 142 | 1,336 | 22.2 | 30 | |
| MCPA | 1,040 | 61.5 | 1,231 | 0 | 84.5 | 6.41 | 143 | 1,296 | 21.9 | 30 | |
| Picloram | 144 | 197 | 246.2 | 0 | 58.4 | 5.42 | 148 | 0 | | 30 | |
| Bentazon | 240 | 12.3 | 246.2 | 0 | 97.7 | 21.5 | 133 | 286.9 | 17.6 | 30 | |
| Chloramben | 112 | 12.3 | 246.2 | 0 | 45.5 | 8.88 | 94.8 | 126.6 | 12.2 | 30 | |
| Acifluorfen | 161 | 61.5 | 246.2 | 0 | 65.5 | 5.24 | 110 | 215.0 | 28.6 | 30 | |
| 3,5-Dichlorobenzoic acid | 214 | 18.5 | 246.2 | 0 | 87.0 | 12.3 | 132 | 276.1 | 25.2 | 30 | |
| 4-Nitrophenol | 250 | 24.6 | 246.2 | 0 | 102 | 13 | 148 | 303.0 | 19.1 | 30 | |
| Dacthal (DCPA) | 60.4 | 18.5 | 246.2 | 0 | 24.5 | 12.7 | 122 | 93.95 | 43.5 | 30 | R |
| Surr: 2,4-Dichlorophenylacetic acid | 1,210 | | 1,231 | | 98.6 | 14.7 | 155 | | 0 | | |

**NOTES:**
R - High RPD observed, spike recovery is within range.

# Sample Log-In Check List

| | | | |
|---|---|---|---|
| Client Name: | FB | Work Order Number: | 2407281 |
| Logged by: | Morgan Wilson | Date Received: | 7/17/2024 3:58:00 PM |

## Chain of Custody

| | | | | |
|---|---|---|---|---|
| 1. | Is Chain of Custody complete? | Yes ☑ | No ☐ | Not Present ☐ |
| 2. | How was the sample delivered? | Courier | | |

## Log In

| | | | | |
|---|---|---|---|---|
| 3. | Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact) | Yes ☐ | No ☐ | Not Present ☑ |
| 4. | Was an attempt made to cool the samples? | Yes ☑ | No ☐ | NA ☐ |
| 5. | Were all items received at a temperature of >2°C to 6°C * | Yes ☑ | No ☐ | NA ☐ |
| 6. | Sample(s) in proper container(s)? | Yes ☑ | No ☐ | |
| 7. | Sufficient sample volume for indicated test(s)? | Yes ☑ | No ☐ | |
| 8. | Are samples properly preserved? | Yes ☑ | No ☐ | |
| 9. | Was preservative added to bottles? | Yes ☐ | No ☑ | NA ☐ |
| 10. | Is there headspace in the VOA vials? | Yes ☐ | No ☐ | NA ☑ |
| 11. | Did all samples containers arrive in good condition(unbroken)? | Yes ☑ | No ☐ | |
| 12. | Does paperwork match bottle labels? | Yes ☑ | No ☐ | |
| 13. | Are matrices correctly identified on Chain of Custody? | Yes ☑ | No ☐ | |
| 14. | Is it clear what analyses were requested? | Yes ☑ | No ☐ | |
| 15. | Were all hold times (except field parameters, pH e.g.) able to be met? | Yes ☑ | No ☐ | |

## Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

| | | | |
|---|---|---|---|
| Person Notified: | | Date: | |
| By Whom: | | Via: | ☐ eMail ☐ Phone ☐ Fax ☐ In Person |
| Regarding: | | | |
| Client Instructions: | | | |

17. Additional remarks:

Item Information

| Item # | Temp ºC |
|---|---|
| Sample | 5.0 |

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

# SUBCONTRACT SAMPLE CHAIN OF CUSTODY

2407281


Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 5500 4th Ave S

City, State, ZIP Seattle, WA 98108

Phone # (206) 285-8282 merdahl@friedmanandbruya.com


SUBCONTRACTER: Alliance Technical Group

| PROJECT NAME/NO. | PO # |
|---|---|
| 407227 | E-302 |

REMARKS: EIM



TURNAROUND TIME
Standard TAT
☒ RUSH 24 HOUR TAT
Rush charges authorized by:

SAMPLE DISPOSAL
Dispose after 30 days
Return samples
Will call with instructions



| Sample ID | Lab ID | Date Sampled | Time Sampled | Matrix | # of jars | ANALYSES REQUESTED: 8151 herbicides | | | | | | | | | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SP01-Gransor | | 7/16/2024 | 1200 | soil | 1 | x | | | | | | | | | | |
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*Friedman & Bruya, Inc.*
*3012 16th Avenue West*
*Seattle, WA 98119-2029*
*Ph. (206) 285-8282*
*Fax (206) 283-5044*


| | SIGNATURE | PRINT NAME | COMPANY | DATE | TIME |
|---|---|---|---|---|---|
| Relinquished by: | | Michael Erdahl | Friedman & Bruya | 7/17/24 | 1131 |
| Received by: | | Briana Ballard | ATG | 7/17 | 3:58 PM |
| Relinquished by: | | | | | |
| Received by: | | | | | |

**Summary: DATA VALID? ☒YES**

# Analytical Laboratory Data Validation Check Sheet

Project Name: Sester Farms  Project Number: 1972-24001-03

Date of Review: 07/23/24  Lab. Name: Alliance  Lab Batch ID #: 407227

Chain of Custody

| | | | |
|---|---|---|---|
| 1.) Are all requested analyses reported? | ☒yes | ☐no | |
| 2.) Were the requested methods used? | ☒yes | ☐no | |
| 3.) Trip blank submitted? | ☐yes | ☒no | |
| 4.) Field blank submitted? | ☐yes | ☒no | |

Timing

| | | | |
|---|---|---|---|
| 5.) Samples extracted within holding times? | ☒yes | ☐no | |
| If not, are all discrepancies footnoted? | ☐yes | ☐no | ☒NA |
| 6.) Analysis performed within holding times? | ☒yes | ☐no | |
| If not, are all discrepancies footnoted? | ☐yes | ☐no | ☒NA |

Quality Assurance/Quality Control

| | | | |
|---|---|---|---|
| 7.) Are the required reporting limits reported? (MRLs vs MDLs/PQLs) | ☒yes | ☐no | |
| 8.) Are all reported values above either MRL or MDL? | ☒yes | ☐no | |
| 9.) Are all values between the MDL & PQL tagged as trace? | ☐yes | ☐no | ☒NA |
| 10a.) Are reporting limits raised for other reason besides high analyte conc.? | ☐yes | ☒no | |
| 10b.) If so, are they footnoted? | ☐yes | ☐no | ☒NA |
| 11.) Lab method blank completed? | ☐yes | ☒no | |
| 12.) Lab, Field, or Trip Blank(s) report detections? | ☐yes | ☒no | |

If yes, indicate blank type, chemical(s) and concentration(s): _____

| | | | |
|---|---|---|---|
| 13.) For inorganics and metals, is there one method blank for each analyte? | ☒yes | ☐no | ☐NA |
| If not, are all discrepancies footnoted? | ☐yes | ☐no | |
| 14.) For VOCs, is there one method blank for each day of analysis? | ☐yes | ☐no | ☒NA |
| If not, are all discrepancies footnoted? | ☐yes | ☐no | |
| 15.) For SVOC's, is there one method blank for each extraction batch? | ☒yes | ☐no | ☐NA |
| If not, are all discrepancies footnoted? | ☐yes | ☐no | |

Accuracy

| | | | |
|---|---|---|---|
| 16.) Is there a surrogate spike recovery for all VOC & SVOC samples? | ☒yes | ☐no | ☐NA |
| Do all surrogate spike recoveries meet accepted criteria? | ☒yes | ☐no | |
| If not, are all discrepancies footnoted? | ☐yes | ☐no | ☒NA |
| 17.) Is there a spike recovery for all Laboratory Control Samples? | ☒yes | ☐no | ☐NA |
| Do all LCS/LCSD spike recoveries meet accepted criteria? | ☐yes | ☒no | |
| If not, are all discrepancies footnoted? | ☒yes | ☐no | ☐NA |

For analyte 2,4-D, Spike recovery is outside accepted recovery limits. (S)

| | | | |
|---|---|---|---|
| 18.) Are all LCS/LCSD RPDs within acceptable limits? | ☐yes | ☐no | ☐NA |
| If not, are all discrepancies footnoted? | ☐yes | ☐no | ☐NA |

For several analytes, High relative percent difference was observed. (R)

Precision

| | | | |
|---|---|---|---|
| 19.) Are all matrix spike/matrix spike duplicate recoveries within acceptable limits? | ☐yes | ☒no | ☐NA |
| If not, are all discrepancies footnoted? | ☐yes | ☐no | ☐NA |

For several analytes, Spike recovery is outside accepted recovery limits. (S)

| | | | |
|---|---|---|---|
| 20.) Are all matrix spike/matrix spike duplicate RPDs within acceptable limits? | ☐yes | ☐no | ☒NA |

If not, are all discrepancies footnoted? ☐yes ☐no ☒NA

21.) Do all RPD calculations for Field Duplicates meet accepted criteria? ☐yes ☐no ☒NA

**Initial** Review By: NB **Final** Review By: PT

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.

5500 4th Ave South
Seattle, WA 98108-2419
(206) 285-8282
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www.friedmanandbruya.com

September 11, 2024

Lynn Green, Project Manager
Evren Northwest, Inc.
PO Box 14488
Portland, OR 97293

Dear Mr Green:

Included is the amended report from the testing of material submitted on July 20, 2024 from the 1972-24001-02, F&BI 407291 project. Per your request, the mercury, endrin, and aldrin reporting limits have been lowered.

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

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Neil Woller, Paul Trone, Evan Bruggeman
ENW0726R.DOC

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

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July 26, 2024

Lynn Green, Project Manager
Evren Northwest, Inc.
PO Box 14488
Portland, OR 97293

Dear Mr Green:

Included are the results from the testing of material submitted on July 20, 2024 from the 1972-24001-02, F&BI 407291 project. There are 19 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 have any questions.

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
c: Neil Woller, Paul Trone, Evan Bruggeman
ENW0726R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on July 20, 2024 by Friedman & Bruya, Inc. from the Evren Northwest 1972-24001-02, F&BI 407291 project. Samples were logged in under the laboratory ID's listed below.

| Laboratory ID | Evren Northwest |
|---|---|
| 407291 -01 | DU01-240719-0.5 |
| 407291 -02 | DU01-240719-0.5-Rep01 |
| 407291 -03 | DU01-240719-0.5-Rep02 |
| 407291 -04 | DU01-240719-1.5 |
| 407291 -05 | DU01-240719-2.5 |

The samples marked for herbicide analysis were sent to Alliance Technical Group. The report is enclosed.

A 6020B internal standard associated with copper did not meet the acceptance criteria. The samples were diluted and reanalyzed with acceptable results. Both data sets were reported.

The 6020B calibration standard exceeded the acceptance criteria for several metals in the method blank. The metals were not detected, therefore this did not represent an out of control condition, and the results are not considered estimates.

Copper in the 6020B matrix spike and matrix spike duplicate did not meet the acceptance criteria. The laboratory control sample passed the acceptance criteria, therefore the results were due to matrix effect.

The 8081B matrix spike and matrix spike duplicate did not meet the relative percent difference for toxaphene. The analyte was not detected therefore the data were acceptable.

All other quality control requirements were acceptable.

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | DU01-240719-0.5 | Client: | Evren Northwest |
| Date Received: | 07/20/24 | Project: | 1972-24001-02, F&BI 407291 |
| Date Extracted: | 07/22/24 | Lab ID: | 407291-01 |
| Date Analyzed: | 07/22/24 | Data File: | 407291-01.119 |
| Matrix: | Soil | Instrument: | ICPMS3 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | 2.0 |
| Barium | 180 |
| Cadmium | <1 |
| Copper | 6.2 J |
| Lead | 17 |
| Mercury | <0.2 j |
| Selenium | <1 |
| Silver | <1 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | DU01-240719-0.5 | Client: | Evren Northwest |
| Date Received: | 07/20/24 | Project: | 1972-24001-02, F&BI 407291 |
| Date Extracted: | 07/22/24 | Lab ID: | 407291-01 x10 |
| Date Analyzed: | 07/23/24 | Data File: | 407291-01 x10.083 |
| Matrix: | Soil | Instrument: | ICPMS3 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Chromium | 29 |
| Copper | <50 |
| Nickel | <10 |
| Zinc | <50 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | DU01-240719-0.5-Rep01 | Client: | Evren Northwest |
| Date Received: | 07/20/24 | Project: | 1972-24001-02, F&BI 407291 |
| Date Extracted: | 07/22/24 | Lab ID: | 407291-02 |
| Date Analyzed: | 07/22/24 | Data File: | 407291-02.120 |
| Matrix: | Soil | Instrument: | ICPMS3 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | 2.0 |
| Barium | 180 |
| Cadmium | <1 |
| Copper | 6.3 J |
| Lead | 16 |
| Mercury | <0.2 j |
| Selenium | <1 |
| Silver | <1 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | DU01-240719-0.5-Rep01 | Client: | Evren Northwest |
| Date Received: | 07/20/24 | Project: | 1972-24001-02, F&BI 407291 |
| Date Extracted: | 07/22/24 | Lab ID: | 407291-02 x5 |
| Date Analyzed: | 07/22/24 | Data File: | 407291-02 x5.124 |
| Matrix: | Soil | Instrument: | ICPMS3 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Chromium | 21 |
| Copper | <25 |
| Nickel | 7.1 |
| Zinc | 33 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | DU01-240719-0.5-Rep02 | Client: | Evren Northwest |
| Date Received: | 07/20/24 | Project: | 1972-24001-02, F&BI 407291 |
| Date Extracted: | 07/22/24 | Lab ID: | 407291-03 |
| Date Analyzed: | 07/22/24 | Data File: | 407291-03.121 |
| Matrix: | Soil | Instrument: | ICPMS3 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | 2.0 |
| Barium | 180 |
| Cadmium | <1 |
| Copper | 6.7 J |
| Lead | 16 |
| Mercury | <0.2 j |
| Selenium | <1 |
| Silver | <1 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | DU01-240719-0.5-Rep02 | Client: | Evren Northwest |
| Date Received: | 07/20/24 | Project: | 1972-24001-02, F&BI 407291 |
| Date Extracted: | 07/22/24 | Lab ID: | 407291-03 x10 |
| Date Analyzed: | 07/23/24 | Data File: | 407291-03 x10.084 |
| Matrix: | Soil | Instrument: | ICPMS3 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Chromium | 25 |
| Copper | <50 |
| Nickel | <10 |
| Zinc | <50 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | DU01-240719-1.5 | Client: | Evren Northwest |
| Date Received: | 07/20/24 | Project: | 1972-24001-02, F&BI 407291 |
| Date Extracted: | 07/22/24 | Lab ID: | 407291-04 |
| Date Analyzed: | 07/22/24 | Data File: | 407291-04.122 |
| Matrix: | Soil | Instrument: | ICPMS3 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | 2.0 |
| Barium | 69 |
| Cadmium | <1 |
| Copper | 6.1 J |
| Lead | 11 |
| Mercury | <0.2 j |
| Selenium | <1 |
| Silver | <1 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | DU01-240719-1.5 | Client: | Evren Northwest |
| Date Received: | 07/20/24 | Project: | 1972-24001-02, F&BI 407291 |
| Date Extracted: | 07/22/24 | Lab ID: | 407291-04 x5 |
| Date Analyzed: | 07/22/24 | Data File: | 407291-04 x5.126 |
| Matrix: | Soil | Instrument: | ICPMS3 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Chromium | 23 |
| Copper | <25 |
| Nickel | 5.9 |
| Zinc | <25 |

## Analysis For Total Metals By EPA Method 6020B

| | | | |
|---|---|---|---|
| Client ID: | Method Blank | Client: | Evren Northwest |
| Date Received: | Not Applicable | Project: | 1972-24001-02, F&BI 407291 |
| Date Extracted: | 07/22/24 | Lab ID: | I4-588 mb |
| Date Analyzed: | 07/22/24 | Data File: | I4-588 mb.056 |
| Matrix: | Soil | Instrument: | ICPMS3 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | SP |

| Analyte: | Concentration mg/kg (ppm) |
|---|---|
| Arsenic | <1 |
| Barium | <1 |
| Cadmium | <1 k |
| Chromium | <1 |
| Copper | <5 |
| Lead | <1 |
| Mercury | <0.2 j k |
| Nickel | <1 |
| Selenium | <1 |
| Silver | <1 k |
| Zinc | <5 |

## Analysis For Organochlorine Pesticides By EPA Method 8081B

| | | | |
|---|---|---|---|
| Client Sample ID: | DU01-240719-0.5 | Client: | Evren Northwest |
| Date Received: | 07/20/24 | Project: | 1972-24001-02, F&BI 407291 |
| Date Extracted: | 07/23/24 | Lab ID: | 407291-01 1/30 |
| Date Analyzed: | 07/23/24 | Data File: | 072310.D |
| Matrix: | Soil | Instrument: | GC12 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | VM |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Tetrachlorometaxylene | 54 | 20 | 134 |
| Decachlorobiphenyl | 59 | 20 | 139 |

| Compounds: | Concentration mg/kg (ppm) |
|---|---|
| alpha-BHC | <0.01 |
| gamma-BHC (Lindane) | <0.01 |
| beta-BHC | <0.01 |
| delta-BHC | <0.01 |
| Heptachlor | <0.01 |
| Aldrin | <0.0021 |
| Heptachlor Epoxide | <0.01 |
| trans-Chlordane | <0.01 |
| cis-Chlordane | <0.01 |
| 4,4'-DDE | <0.01 |
| Endosulfan I | <0.01 |
| Dieldrin | <0.01 |
| Endrin | <0.0015 |
| 4,4'-DDD | <0.01 |
| Endosulfan II | <0.01 |
| 4,4'-DDT | <0.01 |
| Endrin Aldehyde | <0.01 |
| Methoxychlor | <0.01 |
| Endosulfan Sulfate | <0.01 |
| Endrin Ketone | <0.01 |
| Toxaphene | <1 |

## Analysis For Organochlorine Pesticides By EPA Method 8081B

| | | | |
|---|---|---|---|
| Client Sample ID: | DU01-240719-0.5-Rep01 | Client: | Evren Northwest |
| Date Received: | 07/20/24 | Project: | 1972-24001-02, F&BI 407291 |
| Date Extracted: | 07/23/24 | Lab ID: | 407291-02 1/30 |
| Date Analyzed: | 07/23/24 | Data File: | 072308.D |
| Matrix: | Soil | Instrument: | GC9 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | VM |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Tetrachlorometaxylene | 65 | 20 | 157 |
| Decachlorobiphenyl | 62 | 28 | 158 |

| Compounds: | Concentration mg/kg (ppm) |
|---|---|
| alpha-BHC | <0.01 |
| gamma-BHC (Lindane) | <0.01 |
| beta-BHC | <0.01 |
| delta-BHC | <0.01 |
| Heptachlor | <0.01 |
| Aldrin | <0.0021 |
| Heptachlor Epoxide | <0.01 |
| trans-Chlordane | <0.01 |
| cis-Chlordane | <0.01 |
| 4,4'-DDE | <0.01 |
| Endosulfan I | <0.01 |
| Dieldrin | <0.01 |
| Endrin | <0.0015 |
| 4,4'-DDD | <0.01 |
| Endosulfan II | <0.01 |
| 4,4'-DDT | <0.01 |
| Endrin Aldehyde | <0.01 |
| Methoxychlor | <0.01 |
| Endosulfan Sulfate | <0.01 |
| Endrin Ketone | <0.01 |
| Toxaphene | <1 |

## Analysis For Organochlorine Pesticides By EPA Method 8081B

| | | | |
|---|---|---|---|
| Client Sample ID: | DU01-240719-0.5-Rep02 | Client: | Evren Northwest |
| Date Received: | 07/20/24 | Project: | 1972-24001-02, F&BI 407291 |
| Date Extracted: | 07/23/24 | Lab ID: | 407291-03 1/30 |
| Date Analyzed: | 07/23/24 | Data File: | 072309.D |
| Matrix: | Soil | Instrument: | GC9 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | VM |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Tetrachlorometaxylene | 70 | 20 | 157 |
| Decachlorobiphenyl | 67 | 28 | 158 |

| Compounds: | Concentration mg/kg (ppm) |
|---|---|
| alpha-BHC | <0.01 |
| gamma-BHC (Lindane) | <0.01 |
| beta-BHC | <0.01 |
| delta-BHC | <0.01 |
| Heptachlor | <0.01 |
| Aldrin | <0.0021 |
| Heptachlor Epoxide | <0.01 |
| trans-Chlordane | <0.01 |
| cis-Chlordane | <0.01 |
| 4,4'-DDE | <0.01 |
| Endosulfan I | <0.01 |
| Dieldrin | <0.01 |
| Endrin | <0.0015 |
| 4,4'-DDD | <0.01 |
| Endosulfan II | <0.01 |
| 4,4'-DDT | <0.01 |
| Endrin Aldehyde | <0.01 |
| Methoxychlor | <0.01 |
| Endosulfan Sulfate | <0.01 |
| Endrin Ketone | <0.01 |
| Toxaphene | <1 |

## Analysis For Organochlorine Pesticides By EPA Method 8081B

| | | | |
|---|---|---|---|
| Client Sample ID: | DU01-240719-1.5 | Client: | Evren Northwest |
| Date Received: | 07/20/24 | Project: | 1972-24001-02, F&BI 407291 |
| Date Extracted: | 07/23/24 | Lab ID: | 407291-04 1/30 |
| Date Analyzed: | 07/23/24 | Data File: | 072310.D |
| Matrix: | Soil | Instrument: | GC9 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | VM |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Tetrachlorometaxylene | 72 | 20 | 157 |
| Decachlorobiphenyl | 70 | 28 | 158 |

| Compounds: | Concentration mg/kg (ppm) |
|---|---|
| alpha-BHC | <0.01 |
| gamma-BHC (Lindane) | <0.01 |
| beta-BHC | <0.01 |
| delta-BHC | <0.01 |
| Heptachlor | <0.01 |
| Aldrin | <0.0021 |
| Heptachlor Epoxide | <0.01 |
| trans-Chlordane | <0.01 |
| cis-Chlordane | <0.01 |
| 4,4'-DDE | <0.01 |
| Endosulfan I | <0.01 |
| Dieldrin | <0.01 |
| Endrin | <0.0015 |
| 4,4'-DDD | <0.01 |
| Endosulfan II | <0.01 |
| 4,4'-DDT | <0.01 |
| Endrin Aldehyde | <0.01 |
| Methoxychlor | <0.01 |
| Endosulfan Sulfate | <0.01 |
| Endrin Ketone | <0.01 |
| Toxaphene | <1 |

## Analysis For Organochlorine Pesticides By EPA Method 8081B

| | | | |
|---|---|---|---|
| Client Sample ID: | Method Blank | Client: | Evren Northwest |
| Date Received: | Not Applicable | Project: | 1972-24001-02, F&BI 407291 |
| Date Extracted: | 07/23/24 | Lab ID: | 04-1697 mb 1/30 |
| Date Analyzed: | 07/23/24 | Data File: | 072307.D |
| Matrix: | Soil | Instrument: | GC12 |
| Units: | mg/kg (ppm) Dry Weight | Operator: | VM |

| Surrogates: | % Recovery: | Lower Limit: | Upper Limit: |
|---|---|---|---|
| Tetrachlorometaxylene | 87 | 20 | 134 |
| Decachlorobiphenyl | 102 | 20 | 139 |

| Compounds: | Concentration mg/kg (ppm) |
|---|---|
| alpha-BHC | <0.01 |
| gamma-BHC (Lindane) | <0.01 |
| beta-BHC | <0.01 |
| delta-BHC | <0.01 |
| Heptachlor | <0.01 |
| Aldrin | <0.0021 |
| Heptachlor Epoxide | <0.01 |
| trans-Chlordane | <0.01 |
| cis-Chlordane | <0.01 |
| 4,4'-DDE | <0.01 |
| Endosulfan I | <0.01 |
| Dieldrin | <0.01 |
| Endrin | <0.0015 |
| 4,4'-DDD | <0.01 |
| Endosulfan II | <0.01 |
| 4,4'-DDT | <0.01 |
| Endrin Aldehyde | <0.01 |
| Methoxychlor | <0.01 |
| Endosulfan Sulfate | <0.01 |
| Endrin Ketone | <0.01 |
| Toxaphene | <1 |

Date of Report: 07/26/24
Date Received: 07/20/24
Project: 1972-24001-02, F&BI 407291

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR TOTAL METALS USING EPA METHOD 6020B

Laboratory Code: 309239-04 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result (Wet wt) | Percent Recovery MS | Percent Recovery MSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|---|
| Arsenic | mg/kg (ppm) | 10 | 2.42 | 100 b | 103 b | 75-125 | 3 b |
| Barium | mg/kg (ppm) | 50 | 10.2 | 95 b | 97 b | 75-125 | 2 b |
| Cadmium | mg/kg (ppm) | 10 | <1 | 99 | 104 | 75-125 | 5 |
| Chromium | mg/kg (ppm) | 50 | 7.04 | 77 | 78 | 75-125 | 1 |
| Copper | mg/kg (ppm) | 50 | 9.53 | 73 vo | 74 vo | 75-125 | 1 |
| Lead | mg/kg (ppm) | 50 | 1.99 | 92 | 94 | 75-125 | 2 |
| Mercury | mg/kg (ppm | 5 | <1 | 93 | 96 | 75-125 | 3 |
| Nickel | mg/kg (ppm) | 25 | 5.19 | 75 b | 75 b | 75-125 | 0 b |
| Selenium | mg/kg (ppm) | 5 | <1 | 88 | 94 | 75-125 | 7 |
| Silver | mg/kg (ppm) | 10 | <1 | 98 | 103 | 75-125 | 5 |
| Zinc | mg/kg (ppm) | 50 | 16.4 | 74 b | 75 b | 75-125 | 1 b |

Laboratory Code: Laboratory Control Sample

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|---|---|---|---|---|
| Arsenic | mg/kg (ppm) | 10 | 94 | 80-120 |
| Barium | mg/kg (ppm) | 50 | 96 | 80-120 |
| Cadmium | mg/kg (ppm) | 10 | 96 | 80-120 |
| Chromium | mg/kg (ppm) | 50 | 101 | 80-120 |
| Copper | mg/kg (ppm) | 50 | 96 | 80-120 |
| Lead | mg/kg (ppm) | 50 | 94 | 80-120 |
| Mercury | mg/kg (ppm) | 5 | 95 | 80-120 |
| Nickel | mg/kg (ppm) | 25 | 99 | 80-120 |
| Selenium | mg/kg (ppm) | 5 | 94 | 80-120 |
| Silver | mg/kg (ppm) | 10 | 99 | 80-120 |
| Zinc | mg/kg (ppm) | 50 | 98 | 80-120 |

Date of Report: 07/26/24
Date Received: 07/20/24
Project: 1972-24001-02, F&BI 407291

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR ORGANOCHLORINE PESTICIDES BY EPA METHOD 8081B

Laboratory Code: 407291-01 1/30 (Matrix Spike)

| Analyte | Reporting Units | Spike Level | Sample Result | Percent Recovery MS | Percent Recovery MSD | Acceptance Criteria | RPD (Limit 20) |
|---|---|---|---|---|---|---|---|
| alpha-BHC | mg/kg (ppm) | 0.1 | <0.01 | 61 | 68 | 17-122 | 11 |
| gamma-BHC (Lindane) | mg/kg (ppm) | 0.1 | <0.01 | 59 | 65 | 18-128 | 10 |
| beta-BHC | mg/kg (ppm) | 0.1 | <0.01 | 59 | 64 | 17-130 | 8 |
| delta-BHC | mg/kg (ppm) | 0.1 | <0.01 | 57 | 62 | 20-124 | 8 |
| Heptachlor | mg/kg (ppm) | 0.1 | <0.01 | 67 | 70 | 15-133 | 4 |
| Aldrin | mg/kg (ppm) | 0.1 | <0.01 | 57 | 64 | 50-150 | 12 |
| Heptachlor Epoxide | mg/kg (ppm) | 0.1 | <0.01 | 59 | 66 | 19-132 | 11 |
| trans-Chlordane | mg/kg (ppm) | 0.1 | <0.01 | 57 | 63 | 15-157 | 10 |
| cis-Chlordane | mg/kg (ppm) | 0.1 | <0.01 | 56 | 62 | 17-133 | 10 |
| 4,4'-DDE | mg/kg (ppm) | 0.1 | <0.01 | 57 | 63 | 17-139 | 10 |
| Endosulfan I | mg/kg (ppm) | 0.1 | <0.01 | 58 | 64 | 19-130 | 10 |
| Dieldrin | mg/kg (ppm) | 0.1 | <0.01 | 59 | 65 | 17-140 | 10 |
| Endrin | mg/kg (ppm) | 0.1 | <0.01 | 67 | 72 | 20-143 | 7 |
| 4,4'-DDD | mg/kg (ppm) | 0.1 | <0.01 | 69 | 78 | 20-143 | 12 |
| Endosulfan II | mg/kg (ppm) | 0.1 | <0.01 | 57 | 64 | 21-133 | 12 |
| 4,4'-DDT | mg/kg (ppm) | 0.1 | <0.01 | 45 | 41 | 10-385 | 9 |
| Endrin Aldehyde | mg/kg (ppm) | 0.1 | <0.01 | 56 | 62 | 12-123 | 10 |
| Methoxychlor | mg/kg (ppm) | 0.1 | <0.01 | 49 | 47 | 10-226 | 4 |
| Endosulfan Sulfate | mg/kg (ppm) | 0.1 | <0.01 | 55 | 58 | 17-134 | 5 |
| Endrin Ketone | mg/kg (ppm) | 0.1 | <0.01 | 58 | 61 | 10-153 | 5 |
| Toxaphene | mg/kg (ppm) | 4 | <0.1 | 31 | 40 | 12-123 | 25 vo |

Date of Report: 07/26/24
Date Received: 07/20/24
Project: 1972-24001-02, F&BI 407291

## QUALITY ASSURANCE RESULTS FOR THE ANALYSIS OF SOIL SAMPLES FOR ORGANOCHLORINE PESTICIDES BY EPA METHOD 8081B

Laboratory Code: Laboratory Control Sample 1/30

| Analyte | Reporting Units | Spike Level | Percent Recovery LCS | Acceptance Criteria |
|---|---|---|---|---|
| alpha-BHC | mg/kg (ppm) | 0.1 | 88 | 53-132 |
| gamma-BHC (Lindane) | mg/kg (ppm) | 0.1 | 85 | 70-130 |
| beta-BHC | mg/kg (ppm) | 0.1 | 88 | 61-129 |
| delta-BHC | mg/kg (ppm) | 0.1 | 84 | 56-136 |
| Heptachlor | mg/kg (ppm) | 0.1 | 99 | 56-125 |
| Aldrin | mg/kg (ppm) | 0.1 | 84 | 50-131 |
| Heptachlor Epoxide | mg/kg (ppm) | 0.1 | 89 | 54-131 |
| trans-Chlordane | mg/kg (ppm) | 0.1 | 86 | 58-133 |
| cis-Chlordane | mg/kg (ppm) | 0.1 | 86 | 59-128 |
| 4,4'-DDE | mg/kg (ppm) | 0.1 | 87 | 64-134 |
| Endosulfan I | mg/kg (ppm) | 0.1 | 88 | 57-128 |
| Dieldrin | mg/kg (ppm) | 0.1 | 85 | 52-132 |
| Endrin | mg/kg (ppm) | 0.1 | 95 | 53-128 |
| 4,4'-DDD | mg/kg (ppm) | 0.1 | 88 | 55-132 |
| Endosulfan II | mg/kg (ppm) | 0.1 | 84 | 58-126 |
| 4,4'-DDT | mg/kg (ppm) | 0.1 | 97 | 60-123 |
| Endrin Aldehyde | mg/kg (ppm) | 0.1 | 79 | 48-111 |
| Methoxychlor | mg/kg (ppm) | 0.1 | 98 | 61-124 |
| Endosulfan Sulfate | mg/kg (ppm) | 0.1 | 88 | 60-129 |
| Endrin Ketone | mg/kg (ppm) | 0.1 | 89 | 50-129 |
| Toxaphene | mg/kg (ppm) | 4 | 87 | 37-185 |

# 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, biased low; or, the calibration results for the analyte were outside of acceptance criteria, biased high, with a detection for the analyte in the sample. 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 standard reporting limit. 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.

k – The calibration results for the analyte were outside of acceptance criteria, biased high, and the analyte was not detected in the sample.

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.

407291

# SAMPLE CHAIN OF CUSTODY

07/20/24

Page # 1 of 1 F1/TSM

Report To Lynn Green
Company Evren Northwest
Address PO Box 14488
City, State, ZIP Portland OR 97293
Phone 503 452-5561 Email lynng@evren-nw.com

SAMPLERS (*signature*)

PROJECT NAME: 1972-24001-02
PO #:

REMARKS: metals = As, Ba, Cd, Cr, Pb, Hg, Cr, Se, Ag, Ni, Cu, Zn
Project specific RLs? - Yes / No
INVOICE TO

TURNAROUND TIME
~~Standard turnaround~~
RUSH 24hr TAT per PT
Rush charges authorized by: ML

SAMPLE DISPOSAL
☐ Archive samples
☐ Other
Default: Dispose after 30 days

| Sample ID | Lab ID | Date Sampled | Time Sampled | Sample Type | # of Jars | ANALYSES REQUESTED: NWTPH-Dx | NWTPH-Gx | BTEX EPA 8021 | NWTPH-HCID | VOCs EPA 8260 | PAHs EPA 8270 | PCBs EPA 8082 | OCPs 8081 | Chlor Herb 8151 | * Metals | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DU01-240719-0.5 | -01 | 7/19/24 | 1317 | Soil | 1 | | | | | | | | X | X | X | | |
| DU01-240719-0.5-Rep01 | -02 | | 1318 | | 1 | | | | | | | | X | X | X | | |
| DU01-240719-0.5-Rep02 | -03 | | 1319 | | 1 | | | | | | | | X | X | X | | |
| DU01-240719-1.5 | -04 | | 1320 | | 1 | | | | | | | | X | X | X | | |
| DU01-240719-2.5 | -05 | ↓ | 1321 | ↓ | 1 | | | | | | | | | | | | Hold |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | | |

| SIGNATURE | PRINT NAME | COMPANY | DATE | TIME |
|---|---|---|---|---|
| Relinquished by: | Dan Sagle | ENW | 7/19/24 | 18:00 |
| Received by: | James Bruya | F&B | 7/20 | 1600 |
| Relinquished by: | | | | |
| Received by: | | Samples received at 6 °C | | |

*Friedman & Bruya, Inc.*
*5500 4th Ave S.*
*Seattle WA 98108*
*(206) 285-8282*
*office@friedmanandbruya.com*

# SAMPLE CONDITION UPON RECEIPT CHECKLIST

PROJECT # 407291 CLIENT Evrea INITIALS/ DATE: 7/22 SB

**If custody seals are present on cooler, are they intact?** ☒ NA ☐ YES ☐ NO

**Cooler/Sample temperature** 6 °C
Thermometer ID: Fluke 96312917

**Were samples received on ice/cold packs?** ☒ YES ☐ NO

**How did samples arrive?**
☐ Over the Counter ☐ Picked up by F&BI ☒ FedEx/UPS/GSO

**Is there a Chain-of-Custody* (COC)?** ☒ YES ☐ NO Initials/ Date: NP 7/22
*or other representative documents, letters, and/or shipping memos

**Number of days samples have been sitting prior to receipt at laboratory** 1 days
Rec 7/20

**Are the samples clearly identified?** (explain "no" answer below) ☒ YES ☐ NO

**Were all sample containers received intact (i.e. not broken, leaking etc.)?** (explain "no" answer below) ☒ YES ☐ NO

**Were appropriate sample containers used?** ☒ YES ☐ NO ☐ Unknown

**If custody seals are present on samples, are they intact?** ☒ NA ☐ YES ☐ NO

**Are samples requiring no headspace, headspace free?** ☒ NA ☐ YES ☐ NO

**Is the following information provided on the COC, and does it match the sample label?**
(explain "no" answer below)

| | | | |
|---|---|---|---|
| Sample ID's | ☒ Yes | ☐ No | ☐ Not on COC/label |
| Date Sampled | ☒ Yes | ☐ No | ☐ Not on COC/label |
| Time Sampled | ☒ Yes | ☐ No | ☐ Not on COC/label |
| # of Containers | ☒ Yes | ☐ No | |
| Relinquished | ☒ Yes | ☐ No | |
| Requested analysis | ☒ Yes | ☐ On Hold | |

**Other comments** (use a separate page if needed)

**Air Samples: Were any additional canisters/tubes received?** ☒ NA ☐ YES ☐ NO

**Number of unused TO15 canisters** _____ **Number of unused TO17 tubes** _____

GLS.

800-322-5555
www.gls-us.com

**Ship From**
EVREN NW
DAN SAJKO
40 SE 24TH AVE
PORTLAND, OR 97214

**Tracking #: 560254992**

**SDS**

**Ship To**
**FRIEDMAN AND BRUYA-PRIVATE RESIDENCE**
**JIM BRUYA**
**12427 14TH AVE SW**
**SEATTLE, WA 98146**

**SEATTLE**

**S06436D**

95517225

**COD:** $0.00
**Weight:** 0 lb(s)
**Reference:**

**Delivery Instructions:**

**Signature Type:** NOT REQUIRED

**KNT WA980-5D1**

Print Date: 10/6/2023 2:57 PM

GLS.

800-322-5555
www.gls-us.com

Tracking #: 560254993

SDS

**Ship From**
EVREN NW
DAN SAJKO
40 SE 24TH AVE
PORTLAND, OR 97214

**Ship To**
FRIEDMAN AND BRUYA-PRIVATE RESIDENCE
JIM BRUYA
12427 14TH AVE SW
SEATTLE, WA 98146

SEATTLE

S06436D

95517226

KNT WA980-5D1

**COD:** $0.00
**Weight:** 0 lb(s)
**Reference:**

**Delivery Instructions:**

**Signature Type:** NOT REQUIRED

CSL-06

S06436D CPS

SEATTLE

98146

12771220

KNT WA980 – 5D1

Scan Region:64 7/20/2024 11:26 AM Wgt :6.0 lb

3600 Fremont Ave N
Seattle, WA 98103
T: (206) 352-3790
F: (206) 352-7178
info@fremontanalytical.com

**Friedman & Bruya**
Michael Erdahl
5500 4th Ave S
Seattle, WA 98108

**RE: 407291,**
**Work Order Number: 2407351**

July 24, 2024

**Attention Michael Erdahl:**

Fremont Analytical, Inc, an Alliance Technical Group company, received 4 sample(s) on 7/22/2024 for the analyses presented in the following report.

***Herbicides by EPA 8151A***
***Sample Moisture (Percent Moisture)***

All analyses were performed according to our accredited Quality Assurance program. Please contact the laboratory if you should have any questions about the results.

Please note, while the appearance of our logo and branding will update, our commitment to accuracy, speed, and customer service remain values celebrated and shared by Alliance Technical Group. Thank you for the opportunity to serve you.

Sincerely,

Brianna Barnes
Project Manager

**CC:**
Evan Bruggeman
Lynn Green
Paul Trone

*DoD-ELAP Accreditation #79636 by PJLA, ISO/IEC 17025:2017 and QSM 5.4 for Environmental Testing*
*ORELAP Certification: WA 100009 (NELAP Recognized) for Environmental Testing*
*Washington State Department of Ecology Accredited for Environmental Testing, Lab ID C910*

Original

**Date:** *07/24/2024*

**CLIENT:** Friedman & Bruya
**Project:** 407291
**Work Order:** 2407351

# Work Order Sample Summary

| Lab Sample ID | Client Sample ID | Date/Time Collected | Date/Time Received |
|---|---|---|---|
| 2407351-001 | DU01-240719-0.5 | 07/19/2024 1:17 PM | 07/22/2024 11:28 AM |
| 2407351-002 | DU01-240719-0.5-Rep01 | 07/19/2024 1:18 PM | 07/22/2024 11:28 AM |
| 2407351-003 | DU01-240719-0.5-Rep02 | 07/19/2024 1:19 PM | 07/22/2024 11:28 AM |
| 2407351-004 | DU01-240719-1.5 | 07/19/2024 1:20 PM | 07/22/2024 11:28 AM |

Note: If no "Time Collected" is supplied, a default of 12:00AM is assigned

Original

# Case Narrative

WO#: **2407351**

Date: **7/24/2024**

**CLIENT:** Friedman & Bruya
**Project:** 407291

I. SAMPLE RECEIPT:
Samples receipt information is recorded on the attached Sample Receipt Checklist.

II. GENERAL REPORTING COMMENTS:
Results are reported on a wet weight basis unless dry-weight correction is denoted in the units field on the analytical report ("mg/kg-dry" or "ug/kg-dry").

Matrix Spike (MS) and MS Duplicate (MSD) samples are tested from an analytical batch of "like" matrix to check for possible matrix effect. The MS and MSD will provide site specific matrix data only for those samples which are spiked by the laboratory. The sample chosen for spike purposes may or may not have been a sample submitted in this sample delivery group. The validity of the analytical procedures for which data is reported in this analytical report is determined by the Laboratory Control Sample (LCS) and the Method Blank (MB). The LCS and the MB are processed with the samples and the MS/MSD to ensure method criteria are achieved throughout the entire analytical process.

III. ANALYSES AND EXCEPTIONS:
Exceptions associated with this report will be footnoted in the analytical results page(s) or the quality control summary page(s) and/or noted below.

Qualifiers:

* - Flagged value is not within established control limits
B - Analyte detected in the associated Method Blank
D - Dilution was required
E - Value above quantitation range
H - Holding times for preparation or analysis exceeded
I - Analyte with an internal standard that does not meet established acceptance criteria
J - Analyte detected below Reporting Limit
N - Tentatively Identified Compound (TIC)
Q - Analyte with an initial or continuing calibration that does not meet established acceptance criteria
S - Spike recovery outside accepted recovery limits
ND - Not detected at the Reporting Limit
R - High relative percent difference observed

Acronyms:

%Rec - Percent Recovery
CCB - Continued Calibration Blank
CCV - Continued Calibration Verification
DF - Dilution Factor
DUP - Sample Duplicate
HEM - Hexane Extractable Material
ICV - Initial Calibration Verification
LCS/LCSD - Laboratory Control Sample / Laboratory Control Sample Duplicate
MCL - Maximum Contaminant Level
MB or MBLANK - Method Blank
MDL - Method Detection Limit
MS/MSD - Matrix Spike / Matrix Spike Duplicate
PDS - Post Digestion Spike
Ref Val - Reference Value
REP - Sample Replicate
RL - Reporting Limit
RPD - Relative Percent Difference
SD - Serial Dilution
SGT - Silica Gel Treatment
SPK - Spike
Surr - Surrogate

# Analytical Report

Work Order: **2407351**
Date Reported: **7/24/2024**

**CLIENT:** Friedman & Bruya
**Project:** 407291

**Lab ID:** 2407351-001 **Collection Date:** 7/19/2024 1:17:00 PM
**Client Sample ID:** **DU01-240719-0.5** **Matrix:** Soil

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **Herbicides by EPA 8151A** | | | | Batch ID: 44603 | | Analyst: SH |
| Dicamba | ND | 23.2 | | µg/Kg-dry | 1 | 7/23/2024 6:10:47 PM |
| 2,4-D | ND | 23.2 | | µg/Kg-dry | 1 | 7/23/2024 6:10:47 PM |
| 2,4-DP | ND | 23.2 | | µg/Kg-dry | 1 | 7/23/2024 6:10:47 PM |
| 2,4,5-TP (Silvex) | ND | 23.2 | | µg/Kg-dry | 1 | 7/23/2024 6:10:47 PM |
| 2,4,5-T | ND | 23.2 | | µg/Kg-dry | 1 | 7/23/2024 6:10:47 PM |
| Dinoseb | ND | 23.2 | | µg/Kg-dry | 1 | 7/23/2024 6:10:47 PM |
| Dalapon | ND | 23.2 | | µg/Kg-dry | 1 | 7/23/2024 6:10:47 PM |
| 2,4-DB | ND | 23.2 | | µg/Kg-dry | 1 | 7/23/2024 6:10:47 PM |
| MCPP | ND | 232 | | µg/Kg-dry | 1 | 7/23/2024 6:10:47 PM |
| MCPA | ND | 291 | | µg/Kg-dry | 1 | 7/23/2024 6:10:47 PM |
| Picloram | ND | 23.2 | | µg/Kg-dry | 1 | 7/23/2024 6:10:47 PM |
| Bentazon | ND | 23.2 | | µg/Kg-dry | 1 | 7/23/2024 6:10:47 PM |
| Chloramben | ND | 23.2 | | µg/Kg-dry | 1 | 7/23/2024 6:10:47 PM |
| Acifluorfen | ND | 23.2 | | µg/Kg-dry | 1 | 7/23/2024 6:10:47 PM |
| 3,5-Dichlorobenzoic acid | ND | 23.2 | | µg/Kg-dry | 1 | 7/23/2024 6:10:47 PM |
| 4-Nitrophenol | ND | 23.2 | | µg/Kg-dry | 1 | 7/23/2024 6:10:47 PM |
| Dacthal (DCPA) | ND | 23.2 | | µg/Kg-dry | 1 | 7/23/2024 6:10:47 PM |
| Surr: 2,4-Dichlorophenylacetic acid | 113 | 11.7 - 155 | | %Rec | 1 | 7/23/2024 6:10:47 PM |
| **Sample Moisture (Percent Moisture)** | | | | Batch ID: R93185 | | Analyst: DI |
| Percent Moisture | 14.0 | 0.500 | | wt% | 1 | 7/23/2024 9:15:11 AM |

# Analytical Report

Work Order: **2407351**
Date Reported: **7/24/2024**

**CLIENT:** Friedman & Bruya
**Project:** 407291

**Lab ID:** 2407351-002 **Collection Date:** 7/19/2024 1:18:00 PM
**Client Sample ID:** **DU01-240719-0.5-Rep01** **Matrix:** Soil

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **Herbicides by EPA 8151A** | | | | Batch ID: 44603 | | Analyst: SH |
| Dicamba | ND | 23.3 | | µg/Kg-dry | 1 | 7/23/2024 6:27:21 PM |
| 2,4-D | ND | 23.3 | | µg/Kg-dry | 1 | 7/23/2024 6:27:21 PM |
| 2,4-DP | ND | 23.3 | | µg/Kg-dry | 1 | 7/23/2024 6:27:21 PM |
| 2,4,5-TP (Silvex) | ND | 23.3 | | µg/Kg-dry | 1 | 7/23/2024 6:27:21 PM |
| 2,4,5-T | ND | 23.3 | | µg/Kg-dry | 1 | 7/23/2024 6:27:21 PM |
| Dinoseb | ND | 23.3 | | µg/Kg-dry | 1 | 7/23/2024 6:27:21 PM |
| Dalapon | ND | 23.3 | | µg/Kg-dry | 1 | 7/23/2024 6:27:21 PM |
| 2,4-DB | ND | 23.3 | | µg/Kg-dry | 1 | 7/23/2024 6:27:21 PM |
| MCPP | ND | 233 | | µg/Kg-dry | 1 | 7/23/2024 6:27:21 PM |
| MCPA | ND | 292 | | µg/Kg-dry | 1 | 7/23/2024 6:27:21 PM |
| Picloram | ND | 23.3 | | µg/Kg-dry | 1 | 7/23/2024 6:27:21 PM |
| Bentazon | ND | 23.3 | | µg/Kg-dry | 1 | 7/23/2024 6:27:21 PM |
| Chloramben | ND | 23.3 | | µg/Kg-dry | 1 | 7/23/2024 6:27:21 PM |
| Acifluorfen | ND | 23.3 | | µg/Kg-dry | 1 | 7/23/2024 6:27:21 PM |
| 3,5-Dichlorobenzoic acid | ND | 23.3 | | µg/Kg-dry | 1 | 7/23/2024 6:27:21 PM |
| 4-Nitrophenol | ND | 23.3 | | µg/Kg-dry | 1 | 7/23/2024 6:27:21 PM |
| Dacthal (DCPA) | ND | 23.3 | | µg/Kg-dry | 1 | 7/23/2024 6:27:21 PM |
| Surr: 2,4-Dichlorophenylacetic acid | 112 | 11.7 - 155 | | %Rec | 1 | 7/23/2024 6:27:21 PM |
| **Sample Moisture (Percent Moisture)** | | | | Batch ID: R93185 | | Analyst: DI |
| Percent Moisture | 14.2 | 0.500 | | wt% | 1 | 7/23/2024 9:15:11 AM |

# Analytical Report

Work Order: **2407351**
Date Reported: **7/24/2024**

**CLIENT:** Friedman & Bruya
**Project:** 407291

**Lab ID:** 2407351-003 **Collection Date:** 7/19/2024 1:19:00 PM
**Client Sample ID:** **DU01-240719-0.5-Rep02** **Matrix:** Soil

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **Herbicides by EPA 8151A** | | | | Batch ID: 44603 | | Analyst: SH |
| Dicamba | ND | 23.2 | | µg/Kg-dry | 1 | 7/23/2024 6:44:00 PM |
| 2,4-D | ND | 23.2 | | µg/Kg-dry | 1 | 7/23/2024 6:44:00 PM |
| 2,4-DP | ND | 23.2 | | µg/Kg-dry | 1 | 7/23/2024 6:44:00 PM |
| 2,4,5-TP (Silvex) | ND | 23.2 | | µg/Kg-dry | 1 | 7/23/2024 6:44:00 PM |
| 2,4,5-T | ND | 23.2 | | µg/Kg-dry | 1 | 7/23/2024 6:44:00 PM |
| Dinoseb | ND | 23.2 | | µg/Kg-dry | 1 | 7/23/2024 6:44:00 PM |
| Dalapon | ND | 23.2 | | µg/Kg-dry | 1 | 7/23/2024 6:44:00 PM |
| 2,4-DB | ND | 23.2 | | µg/Kg-dry | 1 | 7/23/2024 6:44:00 PM |
| MCPP | ND | 232 | | µg/Kg-dry | 1 | 7/23/2024 6:44:00 PM |
| MCPA | ND | 290 | | µg/Kg-dry | 1 | 7/23/2024 6:44:00 PM |
| Picloram | ND | 23.2 | | µg/Kg-dry | 1 | 7/23/2024 6:44:00 PM |
| Bentazon | ND | 23.2 | | µg/Kg-dry | 1 | 7/23/2024 6:44:00 PM |
| Chloramben | ND | 23.2 | | µg/Kg-dry | 1 | 7/23/2024 6:44:00 PM |
| Acifluorfen | ND | 23.2 | | µg/Kg-dry | 1 | 7/23/2024 6:44:00 PM |
| 3,5-Dichlorobenzoic acid | ND | 23.2 | | µg/Kg-dry | 1 | 7/23/2024 6:44:00 PM |
| 4-Nitrophenol | ND | 23.2 | | µg/Kg-dry | 1 | 7/23/2024 6:44:00 PM |
| Dacthal (DCPA) | ND | 23.2 | | µg/Kg-dry | 1 | 7/23/2024 6:44:00 PM |
| Surr: 2,4-Dichlorophenylacetic acid | 110 | 11.7 - 155 | | %Rec | 1 | 7/23/2024 6:44:00 PM |
| **Sample Moisture (Percent Moisture)** | | | | Batch ID: R93185 | | Analyst: DI |
| Percent Moisture | 13.8 | 0.500 | | wt% | 1 | 7/23/2024 9:15:11 AM |

**CLIENT:** Friedman & Bruya
**Project:** 407291

**Lab ID:** 2407351-004 **Collection Date:** 7/19/2024 1:20:00 PM
**Client Sample ID:** **DU01-240719-1.5** **Matrix:** Soil

| Analyses | Result | RL | Qual | Units | DF | Date Analyzed |
|---|---|---|---|---|---|---|
| **Herbicides by EPA 8151A** | | | | Batch ID: 44603 | | Analyst: SH |
| Dicamba | ND | 23.1 | | µg/Kg-dry | 1 | 7/23/2024 7:00:34 PM |
| 2,4-D | ND | 23.1 | | µg/Kg-dry | 1 | 7/23/2024 7:00:34 PM |
| 2,4-DP | ND | 23.1 | | µg/Kg-dry | 1 | 7/23/2024 7:00:34 PM |
| 2,4,5-TP (Silvex) | ND | 23.1 | | µg/Kg-dry | 1 | 7/23/2024 7:00:34 PM |
| 2,4,5-T | ND | 23.1 | | µg/Kg-dry | 1 | 7/23/2024 7:00:34 PM |
| Dinoseb | ND | 23.1 | | µg/Kg-dry | 1 | 7/23/2024 7:00:34 PM |
| Dalapon | ND | 23.1 | | µg/Kg-dry | 1 | 7/23/2024 7:00:34 PM |
| 2,4-DB | ND | 23.1 | | µg/Kg-dry | 1 | 7/23/2024 7:00:34 PM |
| MCPP | ND | 231 | | µg/Kg-dry | 1 | 7/23/2024 7:00:34 PM |
| MCPA | ND | 289 | | µg/Kg-dry | 1 | 7/23/2024 7:00:34 PM |
| Picloram | ND | 23.1 | | µg/Kg-dry | 1 | 7/23/2024 7:00:34 PM |
| Bentazon | ND | 23.1 | | µg/Kg-dry | 1 | 7/23/2024 7:00:34 PM |
| Chloramben | ND | 23.1 | | µg/Kg-dry | 1 | 7/23/2024 7:00:34 PM |
| Acifluorfen | ND | 23.1 | | µg/Kg-dry | 1 | 7/23/2024 7:00:34 PM |
| 3,5-Dichlorobenzoic acid | ND | 23.1 | | µg/Kg-dry | 1 | 7/23/2024 7:00:34 PM |
| 4-Nitrophenol | ND | 23.1 | | µg/Kg-dry | 1 | 7/23/2024 7:00:34 PM |
| Dacthal (DCPA) | ND | 23.1 | | µg/Kg-dry | 1 | 7/23/2024 7:00:34 PM |
| Surr: 2,4-Dichlorophenylacetic acid | 121 | 11.7 - 155 | | %Rec | 1 | 7/23/2024 7:00:34 PM |
| **Sample Moisture (Percent Moisture)** | | | | Batch ID: R93185 | | Analyst: DI |
| Percent Moisture | 13.6 | 0.500 | | wt% | 1 | 7/23/2024 9:15:11 AM |

**Work Order:** 2407351
**CLIENT:** Friedman & Bruya
**Project:** 407291

# QC SUMMARY REPORT

## Herbicides by EPA 8151A

Sample ID: **MB-44603** SampType: **MBLK** Units: **µg/Kg** Prep Date: **7/22/2024** RunNo: **93209**
Client ID: **MBLKS** Batch ID: **44603** Analysis Date: **7/23/2024** SeqNo: **1945611**

| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dicamba | ND | 20.0 | | | | | | | | | |
| 2,4-D | ND | 20.0 | | | | | | | | | |
| 2,4-DP | ND | 20.0 | | | | | | | | | |
| 2,4,5-TP (Silvex) | ND | 20.0 | | | | | | | | | |
| 2,4,5-T | ND | 20.0 | | | | | | | | | |
| Dinoseb | ND | 20.0 | | | | | | | | | |
| Dalapon | ND | 20.0 | | | | | | | | | |
| 2,4-DB | ND | 20.0 | | | | | | | | | |
| MCPP | ND | 200 | | | | | | | | | |
| MCPA | ND | 250 | | | | | | | | | |
| Picloram | ND | 20.0 | | | | | | | | | |
| Bentazon | ND | 20.0 | | | | | | | | | |
| Chloramben | ND | 20.0 | | | | | | | | | |
| Acifluorfen | ND | 20.0 | | | | | | | | | |
| 3,5-Dichlorobenzoic acid | ND | 20.0 | | | | | | | | | |
| 4-Nitrophenol | ND | 20.0 | | | | | | | | | |
| Dacthal (DCPA) | ND | 20.0 | | | | | | | | | |
| Surr: 2,4-Dichlorophenylacetic acid | 1,050 | | 1,000 | | 105 | 5 | 150 | | | | |

Sample ID: **LCS-44603** SampType: **LCS** Units: **µg/Kg** Prep Date: **7/22/2024** RunNo: **93209**
Client ID: **LCSS** Batch ID: **44603** Analysis Date: **7/23/2024** SeqNo: **1945612**

| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dicamba | 177 | 20.0 | 200.0 | 0 | 88.4 | 6.87 | 123 | | | | |
| 2,4-D | 211 | 20.0 | 200.0 | 0 | 105 | 13.2 | 123 | | | | |
| 2,4-DP | 209 | 20.0 | 200.0 | 0 | 104 | 17.2 | 120 | | | | |
| 2,4,5-TP (Silvex) | 198 | 20.0 | 200.0 | 0 | 99.1 | 22.3 | 124 | | | | |
| 2,4,5-T | 178 | 20.0 | 200.0 | 0 | 89.2 | 17.5 | 122 | | | | |
| Dinoseb | 205 | 20.0 | 200.0 | 0 | 102 | 13 | 115 | | | | |
| Dalapon | 1,370 | 20.0 | 1,000 | 0 | 137 | 5.02 | 155 | | | | |
| 2,4-DB | 197 | 20.0 | 200.0 | 0 | 98.7 | 40.9 | 123 | | | | |

**Work Order:** 2407351
**CLIENT:** Friedman & Bruya
**Project:** 407291

# QC SUMMARY REPORT

## Herbicides by EPA 8151A

Sample ID: **LCS-44603** SampType: **LCS** Units: **µg/Kg** Prep Date: **7/22/2024** RunNo: **93209**
Client ID: **LCSS** Batch ID: **44603** Analysis Date: **7/23/2024** SeqNo: **1945612**

| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| MCPP | 2,050 | 200 | 1,000 | 0 | 205 | 19.2 | 142 | | | | S |
| MCPA | 799 | 250 | 1,000 | 0 | 79.9 | 6.41 | 143 | | | | |
| Picloram | 206 | 20.0 | 200.0 | 0 | 103 | 5.42 | 148 | | | | |
| Bentazon | 206 | 20.0 | 200.0 | 0 | 103 | 21.5 | 133 | | | | |
| Chloramben | 242 | 20.0 | 200.0 | 0 | 121 | 8.88 | 94.8 | | | | S |
| Acifluorfen | 192 | 20.0 | 200.0 | 0 | 96.0 | 5.24 | 110 | | | | |
| 3,5-Dichlorobenzoic acid | 197 | 20.0 | 200.0 | 0 | 98.6 | 12.3 | 132 | | | | |
| 4-Nitrophenol | 185 | 20.0 | 200.0 | 0 | 92.7 | 13 | 148 | | | | |
| Dacthal (DCPA) | 216 | 20.0 | 200.0 | 0 | 108 | 12.7 | 122 | | | | |
| Surr: 2,4-Dichlorophenylacetic acid | 1,830 | | 2,000 | | 91.7 | 11.7 | 155 | | | | |

**NOTES:**
S - Outlying spike recovery observed (high bias). Samples are non-detect; result meets QC requirements.

Sample ID: **2407334-001AMS** SampType: **MS** Units: **µg/Kg-dry** Prep Date: **7/22/2024** RunNo: **93209**
Client ID: **BATCH** Batch ID: **44603** Analysis Date: **7/23/2024** SeqNo: **1945618**

| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dicamba | 170 | 20.4 | 203.8 | 0 | 83.6 | 6.87 | 123 | | | | |
| 2,4-D | 191 | 20.4 | 203.8 | 0 | 94.0 | 13.2 | 123 | | | | |
| 2,4-DP | 193 | 20.4 | 203.8 | 0 | 94.6 | 17.2 | 120 | | | | |
| 2,4,5-TP (Silvex) | 180 | 20.4 | 203.8 | 0 | 88.4 | 22.3 | 124 | | | | |
| 2,4,5-T | 167 | 20.4 | 203.8 | 0 | 81.9 | 17.5 | 122 | | | | |
| Dinoseb | 382 | 20.4 | 203.8 | 0 | 188 | 13 | 115 | | | | S |
| Dalapon | 1,680 | 20.4 | 1,019 | 0 | 165 | 5.02 | 155 | | | | S |
| 2,4-DB | 179 | 20.4 | 203.8 | 0 | 87.8 | 40.9 | 123 | | | | |
| MCPP | 2,450 | 204 | 1,019 | 0 | 241 | 19.2 | 142 | | | | S |
| MCPA | 684 | 255 | 1,019 | 0 | 67.1 | 6.41 | 143 | | | | |
| Picloram | 155 | 20.4 | 203.8 | 0 | 76.3 | 5.42 | 148 | | | | |
| Bentazon | 155 | 20.4 | 203.8 | 0 | 76.3 | 21.5 | 133 | | | | |
| Chloramben | 209 | 20.4 | 203.8 | 0 | 102 | 8.88 | 94.8 | | | | S |
| Acifluorfen | 386 | 20.4 | 203.8 | 0 | 189 | 5.24 | 110 | | | | S |
| 3,5-Dichlorobenzoic acid | 196 | 20.4 | 203.8 | 0 | 96.1 | 12.3 | 132 | | | | |

**Work Order:** 2407351
**CLIENT:** Friedman & Bruya
**Project:** 407291

# QC SUMMARY REPORT

## Herbicides by EPA 8151A

Sample ID: **2407334-001AMS** SampType: **MS** Units: **µg/Kg-dry** Prep Date: **7/22/2024** RunNo: **93209**
Client ID: **BATCH** Batch ID: **44603** Analysis Date: **7/23/2024** SeqNo: **1945618**

| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 4-Nitrophenol | 10.6 | 10.2 | 203.8 | 0 | 5.18 | 13 | 148 | | | | S |
| Dacthal (DCPA) | 145 | 20.4 | 203.8 | 0 | 71.0 | 12.7 | 122 | | | | |
| Surr: 2,4-Dichlorophenylacetic acid | 1,450 | | 1,019 | | 142 | 11.7 | 155 | | | | |

**NOTES:**
S - Outlying spike recovery observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

Sample ID: **2407334-001AMSD** SampType: **MSD** Units: **µg/Kg-dry** Prep Date: **7/22/2024** RunNo: **93209**
Client ID: **BATCH** Batch ID: **44603** Analysis Date: **7/23/2024** SeqNo: **1945619**

| Analyte | Result | RL | SPK value | SPK Ref Val | %REC | LowLimit | HighLimit | RPD Ref Val | %RPD | RPDLimit | Qual |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Dicamba | 184 | 20.3 | 203.2 | 0 | 90.3 | 6.87 | 123 | 170.5 | 7.44 | 30 | |
| 2,4-D | 209 | 20.3 | 203.2 | 0 | 103 | 13.2 | 123 | 191.5 | 8.67 | 30 | |
| 2,4-DP | 204 | 20.3 | 203.2 | 0 | 100 | 17.2 | 120 | 192.8 | 5.71 | 30 | |
| 2,4,5-TP (Silvex) | 195 | 20.3 | 203.2 | 0 | 96.1 | 22.3 | 124 | 180.2 | 8.08 | 30 | |
| 2,4,5-T | 183 | 20.3 | 203.2 | 0 | 90.1 | 17.5 | 122 | 166.9 | 9.23 | 30 | |
| Dinoseb | 397 | 20.3 | 203.2 | 0 | 195 | 13 | 115 | 382.2 | 3.70 | 30 | S |
| Dalapon | 1,950 | 20.3 | 1,016 | 0 | 192 | 5.02 | 155 | 1,684 | 14.5 | 30 | S |
| 2,4-DB | 194 | 20.3 | 203.2 | 0 | 95.6 | 40.9 | 123 | 178.8 | 8.28 | 30 | |
| MCPP | 2,240 | 203 | 1,016 | 0 | 221 | 19.2 | 142 | 2,454 | 9.07 | 30 | S |
| MCPA | 730 | 254 | 1,016 | 0 | 71.9 | 6.41 | 143 | 683.9 | 6.55 | 30 | |
| Picloram | 181 | 20.3 | 203.2 | 0 | 89.2 | 5.42 | 148 | 155.5 | 15.4 | 30 | |
| Bentazon | 181 | 20.3 | 203.2 | 0 | 89.2 | 21.5 | 133 | 155.5 | 15.4 | 30 | |
| Chloramben | 225 | 20.3 | 203.2 | 0 | 111 | 8.88 | 94.8 | 208.8 | 7.62 | 30 | S |
| Acifluorfen | 413 | 20.3 | 203.2 | 0 | 203 | 5.24 | 110 | 385.6 | 6.97 | 30 | S |
| 3,5-Dichlorobenzoic acid | 211 | 20.3 | 203.2 | 0 | 104 | 12.3 | 132 | 195.8 | 7.51 | 30 | |
| 4-Nitrophenol | 11.0 | 10.2 | 203.2 | 0 | 5.40 | 13 | 148 | 10.57 | 3.79 | 30 | S |
| Dacthal (DCPA) | 186 | 20.3 | 203.2 | 0 | 91.7 | 12.7 | 122 | 144.6 | 25.2 | 30 | |
| Surr: 2,4-Dichlorophenylacetic acid | 1,440 | | 1,016 | | 142 | 11.7 | 155 | | 0 | | |

**NOTES:**
S - Outlying spike recovery observed. A duplicate analysis was performed with similar results indicating a possible matrix effect.

# Sample Log-In Check List

| | | | |
|---|---|---|---|
| Client Name: | FB | Work Order Number: | 2407351 |
| Logged by: | Morgan Wilson | Date Received: | 7/22/2024 11:28:00 AM |

## Chain of Custody

| | | | | |
|---|---|---|---|---|
| 1. | Is Chain of Custody complete? | Yes ☑ | No ☐ | Not Present ☐ |
| 2. | How was the sample delivered? | Client | | |

## Log In

| | | | | |
|---|---|---|---|---|
| 3. | Custody Seals present on shipping container/cooler? (Refer to comments for Custody Seals not intact) | Yes ☐ | No ☐ | Not Present ☑ |
| 4. | Was an attempt made to cool the samples? | Yes ☑ | No ☐ | NA ☐ |
| 5. | Were all items received at a temperature of >2°C to 6°C * | Yes ☑ | No ☐ | NA ☐ |
| 6. | Sample(s) in proper container(s)? | Yes ☑ | No ☐ | |
| 7. | Sufficient sample volume for indicated test(s)? | Yes ☑ | No ☐ | |
| 8. | Are samples properly preserved? | Yes ☑ | No ☐ | |
| 9. | Was preservative added to bottles? | Yes ☐ | No ☑ | NA ☐ |
| 10. | Is there headspace in the VOA vials? | Yes ☐ | No ☐ | NA ☑ |
| 11. | Did all samples containers arrive in good condition(unbroken)? | Yes ☑ | No ☐ | |
| 12. | Does paperwork match bottle labels? | Yes ☑ | No ☐ | |
| 13. | Are matrices correctly identified on Chain of Custody? | Yes ☑ | No ☐ | |
| 14. | Is it clear what analyses were requested? | Yes ☑ | No ☐ | |
| 15. | Were all hold times (except field parameters, pH e.g.) able to be met? | Yes ☑ | No ☐ | |

## Special Handling (if applicable)

16. Was client notified of all discrepancies with this order? Yes ☐ No ☐ NA ☑

| | | | |
|---|---|---|---|
| Person Notified: | | Date: | |
| By Whom: | | Via: | ☐ eMail ☐ Phone ☐ Fax ☐ In Person |
| Regarding: | | | |
| Client Instructions: | | | |

17. Additional remarks:

Item Information

| Item # | Temp ºC |
|---|---|
| Sample | 5.6 |

* Note: DoD/ELAP and TNI require items to be received at 4°C +/- 2°C

# SUBCONTRACT SAMPLE CHAIN OF CUSTODY



Send Report To Michael Erdahl

Company Friedman and Bruya, Inc.

Address 5500 4th Ave S

City, State, ZIP Seattle, WA 98108

Phone # (206) 285-8282 merdahl@friedmanandbruya.com

SUBCONTRACTER
Alliance Technical Group

| PROJECT NAME/NO. | PO # |
|---|---|
| 407291 | E-313 |

REMARKS

2407351

TURNAROUND TIME
☒ Standard TAT
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
Dispose after 30 days
Return samples
Will call with instructions



| Sample ID | Lab ID | Date Sampled | Time Sampled | Matrix | # of jars | ANALYSES REQUESTED: 8151 Herbicides | | | | | | | | | | Notes |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| DU01-240719-0.5 | | 7/19/2024 | 1317 | soil | 3 | x | | | | | | | | | | |
| DU01-240719-0.5-Rep01 | | 7/19/2024 | 1318 | soil | 3 | x | | | | | | | | | | |
| DU01-240719-0.5-Rep02 | | 7/19/2024 | 1319 | soil | 3 | x | | | | | | | | | | |
| DU01-240719-1.5 | | 7/19/2024 | 1320 | soil | 3 | x | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |
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| | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | | | | | |

*Friedman & Bruya, Inc.*
*3012 16th Avenue West*
*Seattle, WA 98119-2029*
*Ph. (206) 285-8282*
*Fax (206) 283-5044*

| | SIGNATURE | PRINT NAME | COMPANY | DATE | TIME |
|---|---|---|---|---|---|
| Relinquished by: | | Michael Erdahl | Friedman & Bruya | 7/22/24 | 1020 |
| Received by: | | Gittein-Gipson | ATG | 7/22/24 | 11:28 |
| Relinquished by: | | | | | |
| Received by: | | | | | |

**Summary: DATA VALID? ☒YES**

# Analytical Laboratory Data Validation Check Sheet

Project Name: Sester Farms  Project Number: 1972-24001-02

Date of Review: Sept. 11, 2024  Lab. Name: F&BI  Lab Batch ID #: 407291 - amended

Chain of Custody

| | | | |
|---|---|---|---|
| 1.) Are all requested analyses reported? | ☒yes | ☐no | |
| 2.) Were the requested methods used? | ☒yes | ☐no | |
| 3.) Trip blank submitted? | ☐yes | ☒no | |
| 4.) Field blank submitted? | ☐yes | ☒no | |

Timing

| | | | |
|---|---|---|---|
| 5.) Samples extracted within holding times? | ☒yes | ☐no | |
| If not, are all discrepancies footnoted? | ☐yes | ☐no | ☒NA |
| 6.) Analysis performed within holding times? | ☒yes | ☐no | |
| If not, are all discrepancies footnoted? | ☐yes | ☐no | ☒NA |

Quality Assurance/Quality Control

| | | | |
|---|---|---|---|
| 7.) Are the required reporting limits reported? (MRLs vs MDLs/PQLs) | ☒yes | ☐no | |
| 8.) Are all reported values above either MRL or MDL? | ☒yes | ☐no | |
| 9.) Are all values between the MDL & PQL tagged as trace? | ☐yes | ☐no | ☒NA |
| 10a.) Are reporting limits raised for other reason besides high analyte conc.? | ☐yes | ☒no | |
| 10b.) If so, are they footnoted? | ☐yes | ☐no | ☒NA |
| 11.) Lab method blank completed? | ☒yes | ☐no | |
| 12.) Lab, Field, or Trip Blank(s) report detections? | ☐yes | ☒no | |

If yes, indicate blank type, chemical(s) and concentration(s): _____

| | | | |
|---|---|---|---|
| 13.) For inorganics and metals, is there one method blank for each analyte? | ☒yes | ☐no | ☐NA |
| If not, are all discrepancies footnoted? | ☐yes | ☐no | |
| 14.) For VOCs, is there one method blank for each day of analysis? | ☐yes | ☐no | ☒NA |
| If not, are all discrepancies footnoted? | ☐yes | ☐no | |
| 15.) For SVOC's, is there one method blank for each extraction batch? | ☒yes | ☐no | ☐NA |
| If not, are all discrepancies footnoted? | ☐yes | ☐no | |

Accuracy

| | | | |
|---|---|---|---|
| 16.) Is there a surrogate spike recovery for all VOC & SVOC samples? | ☐yes | ☐no | ☒NA |
| Do all surrogate spike recoveries meet accepted criteria? | ☐yes | ☐no | |
| If not, are all discrepancies footnoted? | ☐yes | ☐no | ☒NA |
| 17.) Is there a spike recovery for all Laboratory Control Samples? | ☒yes | ☐no | ☐NA |
| Do all LCS/LCSD spike recoveries meet accepted criteria? | ☒yes | ☐no | |
| If not, are all discrepancies footnoted? | ☐yes | ☐no | ☒NA |
| 18.) Are all LCS/LCSD RPDs within acceptable limits? | ☐yes | ☐no | ☒NA |
| If not, are all discrepancies footnoted? | ☐yes | ☐no | ☒NA |

Precision

| | | | |
|---|---|---|---|
| 19.) Are all matrix spike/matrix spike duplicate recoveries within acceptable limits? | ☐yes | ☒no | ☐NA |
| If not, are all discrepancies footnoted? | ☒yes | ☐no | ☐NA |

Several analytes were spiked at a level that was less than five times that present in the sample. Matrix spike recoveries may not be meaningful. (b)

The value reported fell outside the control limits established for Toxaphene. (vo)

| | | | |
|---|---|---|---|
| 20.) Are all matrix spike/matrix spike duplicate RPDs within acceptable limits? | ☒yes | ☐no | ☐NA |
| If not, are all discrepancies footnoted? | ☐yes | ☐no | ☒NA |

(b)

21.) Do all RPD calculations for Field Duplicates meet accepted criteria? ☐yes ☐no ☒NA

Comments:

The samples marked for herbicide analysis were sent to Alliance Technical Group. The report is enclosed.

A 6020B internal standard associated with copper did not meet the acceptance criteria. The samples were diluted and reanalyzed with acceptable results. Both data sets were reported.

The 6020B calibration standard exceeded the acceptance criteria for several metals in the method blank. The metals were not detected; therefore, this did not represent an out of control condition, and the results are not considered estimates.

Copper in the 6020B matrix spike and matrix spike duplicate did not meet the acceptance criteria. The laboratory control sample passed the acceptance criteria; therefore, the results were due to matrix effect.

The 8081B matrix spike and matrix spike duplicate did not meet the relative percent difference for toxaphene. The analyte was not detected therefore the data were acceptable.

All other quality control requirements were acceptable.

**Initial** Review By: NB **Final** Review By: PT

**Summary: DATA VALID? ☒YES**

# Analytical Laboratory Data Validation Check Sheet

Project Name: Sester Farms  Project Number: 1972-24001-02

Date of Review: Sept. 11, 2024  Lab. Name: Alliance  Lab Batch ID #: 407291 - amended

Chain of Custody

| | | | |
|---|---|---|---|
| 1.) Are all requested analyses reported? | ☒yes | ☐no | |
| 2.) Were the requested methods used? | ☒yes | ☐no | |
| 3.) Trip blank submitted? | ☐yes | ☒no | |
| 4.) Field blank submitted? | ☐yes | ☒no | |

Timing

| | | | |
|---|---|---|---|
| 5.) Samples extracted within holding times? | ☒yes | ☐no | |
| If not, are all discrepancies footnoted? | ☐yes | ☐no | ☒NA |
| 6.) Analysis performed within holding times? | ☒yes | ☐no | |
| If not, are all discrepancies footnoted? | ☐yes | ☐no | ☒NA |

Quality Assurance/Quality Control

| | | | |
|---|---|---|---|
| 7.) Are the required reporting limits reported? (MRLs vs MDLs/PQLs) | ☒yes | ☐no | |
| 8.) Are all reported values above either MRL or MDL? | ☒yes | ☐no | |
| 9.) Are all values between the MDL & PQL tagged as trace? | ☐yes | ☐no | ☒NA |
| 10a.) Are reporting limits raised for other reason besides high analyte conc.? | ☐yes | ☒no | |
| 10b.) If so, are they footnoted? | ☐yes | ☐no | ☒NA |
| 11.) Lab method blank completed? | ☒yes | ☐no | |
| 12.) Lab, Field, or Trip Blank(s) report detections? | ☐yes | ☒no | |

If yes, indicate blank type, chemical(s) and concentration(s): _____

| | | | |
|---|---|---|---|
| 13.) For inorganics and metals, is there one method blank for each analyte? | ☒yes | ☐no | ☐NA |
| If not, are all discrepancies footnoted? | ☐yes | ☐no | |
| 14.) For VOCs, is there one method blank for each day of analysis? | ☐yes | ☐no | ☒NA |
| If not, are all discrepancies footnoted? | ☐yes | ☐no | |
| 15.) For SVOC's, is there one method blank for each extraction batch? | ☒yes | ☐no | ☐NA |
| If not, are all discrepancies footnoted? | ☐yes | ☐no | |

Accuracy

| | | | |
|---|---|---|---|
| 16.) Is there a surrogate spike recovery for all VOC & SVOC samples? | ☒yes | ☐no | ☐NA |
| Do all surrogate spike recoveries meet accepted criteria? | ☐yes | ☒no | |
| If not, are all discrepancies footnoted? (S) | ☒yes | ☐no | ☐NA |
| 17.) Is there a spike recovery for all Laboratory Control Samples? | ☒yes | ☐no | ☐NA |
| Do all LCS/LCSD spike recoveries meet accepted criteria? | ☐yes | ☒no | |
| If not, are all discrepancies footnoted? | ☒yes | ☐no | ☒NA |

Spike recovery outside accepted recovery limits for several analytes. (S)

| | | | |
|---|---|---|---|
| 18.) Are all LCS/LCSD RPDs within acceptable limits? | ☐yes | ☐no | ☒NA |
| If not, are all discrepancies footnoted? | ☐yes | ☐no | ☒NA |

Precision

| | | | |
|---|---|---|---|
| 19.) Are all matrix spike/matrix spike duplicate recoveries within acceptable limits? | ☐yes | ☒no | ☐NA |
| If not, are all discrepancies footnoted? | ☒yes | ☐no | ☐NA |

Spike recovery outside accepted recovery limits for several analytes. (S)

| | | | |
|---|---|---|---|
| 20.) Are all matrix spike/matrix spike duplicate RPDs within acceptable limits? | ☒yes | ☐no | ☐NA |
| If not, are all discrepancies footnoted? | ☐yes | ☐no | ☒NA |
| 21.) Do all RPD calculations for Field Duplicates meet accepted criteria? | ☐yes | ☐no | ☒NA |

S = Outlying spike recovery observed (high bias). Samples are non-detect; result meets QC requirements.

**Initial** Review By: NB  **Final** Review By: PT

*Appendix C*

# Screening Level Ecological Risk Assessment

# SCREENING LEVEL
# ECOLOGICAL RISK ASSESSMENT REPORT

Gramor Property
Map and Tax Lot T2SR3E S03 TL03302
Damascus, Clackamas County, Oregon
Parcel No.: 00603617
Approx Lat ~45.418659N; Long -122.418580E

Prepared for:

**T & K Sester Family, LLC**
24200 SE Highway 212
Damascus, Oregon

Prepared by:

SOUND ECOLOGICAL ENDEAVORS, LLC.
19325 32nd Avenue NW, Stanwood, WA
98292

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# 1.0 INTRODUCTION AND SITE DESCRIPTION

T&K Sester Family, LLC (Client) contracted Sound Ecological Endeavors (SEE) and EVREN Northwest, Inc. (ENW) to conduct a screening level ecological risk assessment (SLERA) for the 28.67 acre subject Gramor site located on the north side of Highway 212 between SE 222nd Drive to the west and SE 242nd Avenue to the east in Damascus, Clackamas County, Oregon (subject property; Figures 1 and 2; T2S,R3ES3-WM). The small city of Boring, Oregon, is located approximately 2 miles to the east. This SLERA was conducted pursuant to an approved Tier 2 case-specific Beneficial Use Determination (BUD) for blending virgin topsoil at the subject site with low-level pesticide impacted soils received from Portland Water Bureau's Bull Run Filtration Facility and Finished Water Pipeline in Gresham, Oregon. Client proposes to grow rotational grass seed and nursery stock crops in the amended topsoil at the subject site. Primary aspects of the SLERA were to conduct of a Problem Formulation promoting an adequate Conceptual Ecological Exposure Model (CEEM) and a preliminary Exposure Assessment as guide for appropriate ecological risk-based screening, in an initial highly protective determination of potential for unacceptable risk posed by previously documented constituents of interest (COIs) in Bull Run Filtration Facility and Finished Water Pipeline soils. Per a site visit on August 13, 2024, a scoping checklist was completed as provided in Appendix A, identifying complete exposure pathways to terrestrial soil-dwelling ecological receptors (soil invertebrates, birds, mammals, and reptiles) and their predators. as may be present at the subject property. Scoping screening is intended to identify sites that are obviously devoid of ecologically important and/or indicator species or habitats, where exposure pathways are obviously incomplete and thus for which no further ecological assessment is necessary. Initial risk-based screening is intended to eliminate concerns or identify exposures requiring additional examination.

The risk assessment process follows U.S. Environmental Protection Agency (EPA) and Oregon Department of Environmental Quality (ODEQ]) guidance.[1,2] Potential risks were evaluated by comparing measured site-specific concentrations for COIs and/or their laboratory method detection/reporting limits to risk-based screening concentrations, for selected exposure pathways and media. Section 1 provides site description and understanding, Section 2 describes the data used for the risk analysis. The ecological risk-based screening and results are presented in Sections 3 and 4, respectively. Conclusions and recommendations based on risk assessments results are presented in Section 5. Detailed risk-based screening tables B1, B2, and B3 are provided in Appendix B.

## 1.1 SITE DESCRIPTION

The 28.67-acre subject property is identified as Clackamas County parcel 00603617 and is currently being prepared to cultivate rotational crops of grass seed and nursery stock by Client. Surrounding properties are residential, agricultural, and commercial in use. The property spans a topographic divide between the Noyer Creek Watershed to the northeast/east and the Richardson Creek Watershed to the southwest.

**Historical Use.** The subject site was occupied by forestland until 2005 when forestland was cleared, stumps removed, and the stump-holes filled/levelled. Since then, the site has primarily remained a vacant/fallow field, was fully tilled in 2008, was mowed and may have been at least partially planted in the early 2010s; however, the site has been fallow from 2015 to 2020 when it was completely mowed, and has been fallow since.

1 EPA. 2000 (July 10). Ecological Soil Screening Level Guidance. Draft. Office of Emergency and Remedial Response.
2 ODEQ. 2020 (December). Guidance for Ecological Risk Assessment. Waste Management and Cleanup Division, Oregon Department of Environmental Quality.

**Geologic Setting and Soils.** The site is located in the Portland Basin, a low-lying area between the Oregon Cascade Range to the east and the Portland Hills and Tualatin Mountains to the west. The Columbia and Willamette Rivers are the principal rivers within the basin.

The site is located near the northeastern margin of the basin between Johnson Creek to the north and Clackamas River to the south, named the "central domain" by Madin (1994),[3] which is dominated by conical to elongate hills known as the Boring Hills. Doubly plunging folds, fault-bounded folds, or fault blocks comprise the structure of the Boring Hills. While Boring Lava flows or vents are almost exclusively associated with the folded and faulted hills, most of the Boring Hills consist largely of sedimentary rock. Boring Lava occurs along the flanks of the hills. Thus, it appears that Boring Lava erupted from vents along the faults.

The site is in an area mapped as Pleistocene to Pliocene Springwater Formation (QTs), which is described as fluvial conglomerate, volcaniclastic sandstone, siltstone, and debris flows derived from the Cascade Range to the east. The conglomerate is massively and profoundly weathered red, brown, gray-green and orange and moderately indurated. Clasts are well-rounded pebble to boulder-sized basalt, andesite and dacite rock, with rare exotic Columbia River provenance metamorphic and plutonic rock compositions. Feldspathic, volcanic lithic, and vitric sediments comprise the conglomerate's silt and sand matrix. Angular to rounded basalt, andesite and dacite lava, scoria, and pumice in a clay, ash and sand matrix comprise debris flow materials. Quartzofeldspathic silt, ash and clay materials comprise siltstones and mudstones. The base of the Springwater Formation is conformable with conglomerates and volcaniclastic sandstones of the Pliocene to Miocene Troutdale Formation.

According to the U.S. Department of Agriculture (USDA) Natural Resources Conservation Service (NRCS) Web Soil Survey (WSS), 83% of the site area is mapped as Bornstedt silt loam (8B), while the remaining 17% of area is mapped as Delena silt loam (30C).

Bornstedt silt loam occurs on 0-6% slopes, is moderately well drained, has a Ksat of 0.06 to 0.20 inch per hour (in/hr.), and has the following profile: H1: 0- to 8-in silt loam, H2: 8- to 33-in silty clay loam, and H3: 33- to 71-in silty clay. Estimated depth to ground water is 24- to 36-in, and depth to a restrictive feature is greater than 80-in. Bornstedt soils are not listed hydric.

Delena silt loam occurs on 3-12% slopes, is poorly drained, has a Ksat of 0.0 to 0.06 in/hr., and has the following profile: H1: 0- to 12-in silt loam, H2: 12- to 25-in silty clay loam, and H3: 25- to 60-in silty clay loam. Estimated depth to ground water is 0- to 18-in, and depth to the fragipan is 20- to 30-in. Delena Silt Loams are listed hydric.

**Topography.** The subject property is located within the US Geological Survey Damascus, OR 7.5-minute quadrangle, at an approximate elevation of between 585 and 620 feet above mean sea level (see Figure 1). The subject property slopes gently to the north to northeast. The slope is relatively consistent at about 4 percent from north to south with a slight bench and gentle slope to the south beginning within approximately 100 meters north of Highway 212.

**Hydrology.** Hydrology encompasses multiple distinct above and below ground conditions of water, some protected, some regulated, and some not.

The nearest surface water feature is an ephemeral drainage that cuts diagonally northeast to southwest across the northwest property corner. The nearest perennial surface water body is Noyer Creek, located approximately 1,500 feet to the east of the subject property and generally flowing to the south towards its confluence with Deep Creek, approximately 1.6 mi south of the subject site. From this confluence, Deep Creek meanders 0.90 miles southwestward to where it discharges into the westward-flowing Clackamas River. An unnamed potentially ephemeral

3 Madin, I.P., 1994, *Geology of the Damascus Quadrangle, Clackamas and Multnomah Counties, Oregon*: Oregon Department of Geology and Mineral Industries Geologic Maps Series GMS-60, 1:24,000.

tributary of Noyer Creek is approximately 700 feet southeast of the subject property flowing east. Noyer Creek flows southward.

Richardson Creek, a perennial surface water body, is approximately 0.5 miles west and southwest of the subject property. The northwest ephemeral drainage located on the subject site is sloped toward Richardson Creek and when flow is present in the drainage during some rain events, the water would flow toward Richardson Creek. However, given this drainage is ephemeral and there is no channel within the drainage on the subject property, it is not a Regulatory Stream/Watercourse.

Records of nearby wells located on the Oregon Water Resources Department's online Well Report Query suggest depth to regional ground water in the vicinity of the subject site to be greater than 100 feet below ground surface (bgs). No water wells were registered to the subject property during a search of the State of Oregon Water Resources Department (OWRD) online database. For the purposes of this report, it is assumed that shallow subsurface interflow resulting from infiltration, being gravitational in nature and still infiltrating (Klaus & Jackson, 2018), generally mimics topography surface water flow (i.e., from topographic highs to lows). However, as noted earlier multiple factors can affect the direction of ground-water flow in unsaturated subsurface layers including, but not limited to, sediment/rock type, subsurface utility lines, buried river valleys, and stream beds, folds, fractures, and faults. The direction of shallow subsurface water flow in the subject area is generally expected to be to the northeast, based on the local and regional topography. Subsurface flows near Highway 212 may flow from the subject property to the south.

Given the ephemeral drainage crossing the site, the following paragraphs distinguish between precipitation-based / gravitational water that is unprotected, unregulated, or otherwise regulated conditions (UUORCs) versus Relatively Permanent waters or water bodies protected by the Clean Water Act (CWA)[4] and associated state and local agencies.

Precipitation falling upon the ground begins infiltrating which is analogous to underground precipitation. As the infiltration rate is overwhelmed by precipitation rate at the surface or at a less permeable subsurface layer, surface runoff (i.e., Nonpoint Source Stormwater [NpSS]) or Interflow (analogous to underground storm water flow) are formed, respectively. Both NpSS and Interflow remain predominantly gravitationally driven, and continue to infiltrate (Klaus & Jackson, 2018). Of some importance to the formation of Wetlands as being Waters, such solely precipitation-based, gravitational "water" is continually oxygenated, eliminating the formation of anoxic hydric soils with anaerobic digestion of organic carbon as the energy source for microbial/bacterial metabolism. Further, such precipitation-based water is impermanent, fleeting and/or ephemeral in nature further eliminating the formation of anaerobic Regulatory Wetland conditions as RPWs) in any jurisdiction. Precipitation and its underground analogue, infiltration, are not protected nor regulated.

NpSS is the primarily applied otherwise regulated (Nonwaters) condition, tied to beneficial use determinations. This regulation of Nonwaters cannot be statutorily applied as protections that promote a taking of private property, because beneficial uses require a balancing of actions which reduce the potential for downgradient harm, if any, to persons, property, and the environment. Given the agricultural nature of the subject property, the avoidance of more than natural/normal runoff to the extent reasonable/feasible with Best Management Practices (BMPs), Best Available Technology (BAT) and/or All Known and Reasonable Technology (AKART), shall be adequate to

4 *The Clean Water Acts' (CWA's) use of "waters" encompasses "only those relatively permanent, standing or continuously flowing bodies of water 'forming geographic[al] features' that are described in ordinary parlance as 'streams, oceans, rivers, and lakes.'" 547 U. S., at 739 (quoting Webster's New International Dictionary 2882 (2d ed. 1954) (Webster's Second); original alterations omitted)*" (Sackett v. USEPA, 2013)

address the NpSS, and its underground analogue Interflow, impacts to downgradient persons, property and the environment, particularly Waters. As presented in the CWA, such regulatory actions of unprotected water include the management of irrigation water and irrigation return water.

Consistent with the CWA's definition of "Waters",[4] protected Relatively Permanent Waters are not solely precipitation-based, not predominantly moved vertically by gravitational forces, not rapidly dissipating, and thus not ephemeral. Be they Surface or Ground or Underground Waters, and anoxic/hydric Wetlands such "protected" Waters/ defined Water Bodies all require a level of seasonal presence, or "base flow" [5] extending beyond the rainy season's replenishment and aeration. A condition which is not actually present for adequate duration, cannot be permanently protected as a Defined Water Body, including not as a protected Wetland which also must be Waters to be protected as a Water or A Surface Water (of the State, e.g., ORS 468B.005(10). Similarly defined Waters that are "adjacent" to such already defined Regulatory Water Bodies, become similarly federally jurisdictional only when continuously connected by Relatively Permanent (surface or underground) Waters. Just as for surface waters, Underground Waters (and Groundwaters) also must be Relatively Permanent to be protected as such. The term "Waters", requiring formal "Protections", has been defined for any jurisdiction as at a minimum, exhibiting Relative Permanency. [6]

Relatively Permanent Waters to be protected may further be distinguished from precipitation-based, gravitational Nonwaters due to "standing up" against gravity, and predominantly flowing horizontally rather than driven vertically downward by gravity. This is particularly evident in lakes, ponds, and ground water, which according to Darcy's Law, have a pressure surface (or Water Table) and increasing pressure with depth, which pressure is what creates a unit or Water "Body", with cohesive predominantly horizontal flow (excluding thermal turnover). This is especially pertinent in regulatory Groundwaters (as distinguished from Underground Waters) which when near the soil surface also may become Wetlands, and most often must overcome soil matrix pressures to act as a cohesive underground water body. A Groundwater unit requires essentially 100% saturation to create water pressure where the upper surface equals atmospheric pressure, which conditions cannot develop with a predominance of gravitational infiltration or most subsurface interflow. Such saturation of a soil matrix also is critical for regulatory/defined wetland conditions which also are a regulatory ground water condition expressed at or very near the soil surface. Water pressure dominance over gravitational infiltration is necessary for the development of anaerobic and electrochemically reducing conditions, forming hydric soils to which the predominant vegetation must be typically adapted.

Thus, the drainage crossing the northwest corner of the site represents Nonwaters/NpSS condition and does not form protected "Waters." Such impermanent or ephemeral water, including NpSS/runoff is not defined Waters nor defined Water Bodies, but may be UUORCs. In being UUORCs, such above ground or underground water may be controlled and/or manipulated to not present downgradient harms to persons, property, or the environment. Given the application of best agricultural practices at the subject property, this avoidance of more than natural/normal runoff to the extent reasonable/feasible shall be adequate to address the NpSS and Interflow impacts to downgradient persons, property and the environment, particularly Waters.

5 Base flow forms when precipitation and resulting ephemeral water or storm water collects and is stored, such as with snowpack, glacier ice, standing ponds and lakes, Ground Waters, and/or any other Waters, all of which shall have stability or pressure which "stands" up against gravity.

6 If Relatively Permanent Waters must be present seasonally and not be continually renewed by precipitation, then the seasonal nature must extend at least three months beyond the "rainy season", which along the western portions of Oregon and Washington generally is three months after mid to late April, thus being mid to late July.

## 1.2 SITE LAND AND WATER USE

The subject property is currently zoned RRFF5-Rural Residential Farm Forest 5-acre. Both residential and Farm/light industrial/commercial uses are allowed. This farm property is being prepared by T & K Sester Family, LLC to cultivate rotational crops of grass seed and nursery stock consistent with T & K Sester Family, LLC's other agricultural properties. ODC Development LLC (seller) and T & K Sester Family, LLC (buyer) have provided a letter of project approval agreeing to receive potentially farming impacted soils from the source farm property at the subject farm property. Additionally, receipt of this topsoil is compatible with County land use in this area, as evidenced by an approved Land Use Compatibility Statement. All topsoil received from the source property will be placed within the two Soil Placement Areas identified in Figure 3, neither of which extend into the ephemeral drainage crossing the northwest corner of the subject property. This soil placement is not predicted to notably alter hydrology of the ephemeral drainage.

Shallow ground water is not a source of drinking water at the site. There is no known shallow aquifer to be tapped as a drinking water source. No Surface Waters are utilized.

# 2.0 PROBLEM FORMULATION

The scope of the ERA is defined through problem formulation. This step describes physical and chemical characteristics of the site and the important ecological habitats, plants, invertebrates, fish, and wildlife that are present or likely to be present in order to identify the ecological COIs and ecological receptors of concern, and to develop a CEEM. The CEEM depicts the expected fate and transport of COIs at the site, the potential exposure media, and likely exposure pathways for ecological receptor groups of concern. The problem formulation concludes with identification of the ecological endpoints that delineate the focus (i.e., objectives) of the remainder of the SLERA.

## 2.1 ECOLOGICAL STRESSORS

Ecological receptors may be affected through exposure to chemicals (i.e., toxicity), physical stresses (i.e., destruction of habitat), and biological stresses (i.e., viruses and bacteria). While biological stressors may affect ecological receptors, they are most frequently associated with waste food or human waste and in areas where wildlife congregate in large numbers. These conditions do not exist at the site, and thus, biological stressors are unlikely to be a significant factor at the site and are not considered further.

Past physical disturbances include the 2005 clearing for farming uses. The importing of soil from the Bull Run Filtration Facility and Finished Water Pipeline also is a physical disturbance currently being permitted as a Beneficial Use of the soil. The site has been mowed, tilled and possibly planted since 2005. These allowed physical disturbances conditions lawfully limit ecological receptors to those very accustomed to human presence and disturbance. Physical stressors of normal agricultural practices are not regulated within hazardous waste assessment programs.

The site's primary COIs are organochlorine pesticides (OCPs), chlorinated herbicides (CHs), and naturally occurring inorganic (i.e., metals) constituents (See Table B1; Appendix B). The process for retaining COIs is described in Section 2 above and a list of COIs retained for the ERA is presented in Table B1.

## 2.2 ECOLOGICAL SETTING

The regional and site-specific ecology are described in this section to provide an understanding of the climate, plants, invertebrates, fish, and wildlife that may inhabit the region surrounding the site, and those potentially found on-site.

Other than threatened and endangered species that must be considered on an individual level, a particular species must be potentially present on or utilize the site in numbers adequate to allow an exposure level that may result in effects to the species' population. Such significant exposure to site-related contaminants of ecological interest will only occur for those species known to or likely to use the site on a regular basis and in significant numbers.

### Regional Ecology

The climate of the region is typical of the Pacific Northwest interior. It is characterized by a long, cool, rainy season from October to May, and a short, warm, dry season from June to September. The transition between these two seasons is gradual. The climate is influenced primarily by prevailing westerly winds that carry moisture from the Pacific Ocean and provide the coast with abundant rainfall. A persistent offshore high-pressure system blocks most maritime frontal systems from entering the area during the summer months. During the winter, however, this high moves southward to the coast of California and consequently has minimal effect on the movement of Pacific frontal systems.

The Cascade Mountain Range to the east blocks most continental weather, including winter storms that are common west of the Continental Divide. However, occasional influxes of cold air from the north penetrate the Willamette Valley through the Columbia Gorge. Temperatures in the area seldom exceed 90°F or fall below 0°F. Rainfall averages approximately 40 inches annually and occurs primarily between October and March.

Historically, the region was dominated by evergreen forests with a limited understory. Riparian areas along streams and rivers and naturally disturbed areas (e.g., landslides) were mixed with deciduous/evergreen forests with dense understory and herbaceous layers. Other than disturbed and or riparian/moist soil habitats, the mature undisturbed coniferous habitats supported a stable but relatively limited assemblage of plant, invertebrate, reptile, amphibian, bird, and mammal species. Anthropogenic disturbance over time have increased overall species diversity, but also have limited some species, especially those particularly dependent on specific mature habitats such as coniferous forests.

Currently, the region contains remnant or second growth patches of evergreen forest outside of urban and suburban limits, and small "hobby" farms and agricultural fields and pastures dominate the landscape. While these ecosystems may support an array of plants, invertebrates, birds and mammals, and many of these may be abundant, the species composition is generally different than that present within mature native or natural successional habitats. Representative regional fauna may include:

- Numerous invertebrate species.
- A few frog, salamander, and snake species.
- Song and perching birds, woodpeckers, grouse, waterfowl, piscivorous birds such as herons or kingfishers, scavengers such as crows and vultures, and raptors such as owls, hawks, and eagles.
- Small mammals such as voles and deer mice, medium bodied mammals such as raccoons, skunks, and opossum, and large mammals such as deer, cougars, or black bear. Wolves have been reintroduced into the state and it is possible they are present in the region.

However, other than those species particularly suited or accustomed to agricultural, suburban, or urban ecosystems, some populations of native wildlife are limited and isolated by the fragmentation of suitable historical mature habitat. This fragmentation is alleviated to some extent nearing the Cascade foothills to the east, where the agro-ecosystems give way to primarily second or third growth coniferous forests.

The Gramor subject property is located on the edge of the urban portion of the small town of Damascus. Surrounding properties include forested, agricultural, small farm, and rural residential.

### Site Ecology

Site features are illustrated in Figure 2. The 28+ acre site was completely cleared and leveled in 2005 and has been intermittently mowed and tilled since. The property currently is early successional grasses (predominantly vernal grass which may have been planted), flowering weedy species, and shrubs including a large predominance of Himalayan Blackberries. A few young conifers, black cottonwood, and pussy willow trees are scattered across the property.

A non-channelized swale exists along or near the property northern boundary. This swale collects ephemeral NpSS, which, at some depth flows southwest onto and across the adjacent property, eventually reaching Richardson Creek over half a mile downgradient. Very little to no runoff reaches Noyer Creek. A small portion of site runoff is collected in the Highway 212 roadside Point

Source Stormwater Conveyance (ditch). Typical moist soil vegetation exists in the lower portion of the swale at the subject property northwest portion.

Given the presence of the successional upland habitat within the area of new soil dispersion, the ecological receptor groups currently most likely exposed to future COIs include:

- Terrestrial plants;
- Terrestrial invertebrates;
- Terrestrial birds (primarily songbirds such as robin, junco, finch, and crow);
- Terrestrial small mammals (primarily voles, shrews, and possibly raccoons, skunk and opossum);
- Limited avian predators hawks, owls, bald eagle
- Limited mammalian predators coyote.

### Sensitive Environments

Sensitive environments include areas of particular environmental value where a hazardous substance could pose a greater threat than in other non-sensitive areas. Such sensitive areas may include critical habitat for federally or state threatened endangered or threatened (i.e., protected) species, parks, monuments, marine sanctuaries, recreation areas, wildlife refuges, wildlife management areas, wilderness areas, wetlands, wild and scenic rivers, and other significant so designated open space.

There are no particularly sensitive environments on the subject property soil receiving areas. Neither the northwestern ephemerally wet swale nor its hydrology will be impacted by the proposed soil augmentation.

### Rare, Threatened, and Endangered Species

A rare, threatened, and endangered (RTE) species search was conducted through observation of the Oregon Biodiversity Information Center online species mapping, for a two-mile radius surrounding the site. No protected species were shown on this mapping. No RTE species were observed, nor are known or expected to regularly inhabit the site. As the property lawfully becomes more active farmland, fewer species will use the property.

## 2.3 CONCEPTUAL ECOLOGICAL EXPOSURE MODEL

The CEEM depicts the sources of contamination, contaminant release and transport mechanisms, impacted exposure media, and exposure routes for ecological receptor types at the site. Based on previous investigations and current understanding of site conditions, the potentially contaminated exposure media and pathways for ecological receptors are outlined in Figure 4 and include:

- Surface soil (zero to three feet bgs).

Given these exposure media and their location, terrestrial species are the only potential ecological receptor groups that may be exposed to COIs, also as depicted in Figure 4.

### Assessment Endpoints and Measures

Assessment endpoints are qualitative or quantitative expressions of the environmental values to be protected and, therefore, assessed in the ERA. As such, assessment endpoints link the ERA and risk management processes by highlighting ecological aspects that are of concern to risk managers. Assessment measures are characteristics of the site, selected ecological receptors,

or ecosystems that are measured through monitoring or sampling activities, and then related qualitatively or quantitatively to the selected assessment endpoint(s).

### Assessment Endpoints

Within a screening level ERA such as this, assessment endpoints are generalized to reflect the risk-based screening process and protective ecological risk-based screening concentrations (ERBSCs). The primary assessment endpoints for this ERA include:

- Protection of the reproduction and survival of non-protected plants, invertebrates, birds, and mammals exposed to COIs in site surface soil.

### Assessment Measures

Assessment measures are used to evaluate the response of the indicator communities/species when exposed to a stressor. Generally, they are measurable ecological characteristics and define what samples and/or data will be collected to address the assessment endpoints. For this SLERA, the assessment measures are comprised of the following:

- Measured concentrations of COIs in Bull Run Filtration Facility and Finished Water Pipeline removed soil, added to measured concentrations of COIs in Gramor site virgin receiving topsoil.
- Readily available ERBSCs available from ODEQ guidance (DEQ, 2020) and other applicable readily available guidance and/or published literature.

## 3.0 RISK ASSESSMENT DATA AND SCREENING

The following analytical data set were utilized (Appendix B; Table B1):

- **Bull Run Filtration Facility**. Six (6) incremental sampling methodology (ISM) samples (DU-1A, DU-1B, DU-1C, DU-2A, DU-2B, and DU-2C) collected in November 2023 from surface (0-1.5-ft) and near surface (1.5-5-ft) soils at this former farm source site.
- **Finished Water Pipeline**. Eight (8) ISM samples (FWS-DU-1, FWS-DU-2, FWC-DU-1, FWC-DU-2, FWN-DU-1A, FWN-DU-1B, FWN-DU-1C, and FWN-DU-2) collected in November 2023 from surface (0-1.5-ft) and near surface (1.5-5-ft) soils within the finished water pipeline alignment at this former farm source site.
- **Subject (Gramor) Site**. One (1) grab sample (SP01-Gramor) and four (4) ISM samples (DU01-0.5, DU01-0.5-Rep01, DU01-0.5-Rep02, and DU01-1.5) collected in July 2024 from virgin surface (0-1.5-ft) soil from the receiving future farm receiving site.

These 19 soil samples were collected to adequately characterize agricultural contaminants across the two source soil removal areas and receipt soil area for prediction of site-specific subject property COI concentrations and the associated potential ecological risks that may be posed by the blended soils. As shown in Table B1, soil samples were analyzed for OCPs, CHs, and select metals. Standard laboratory quality control procedures were used by the laboratory. These analytical data are considered good quality and useable for the risk assessment.

The preferred Exposure Point Concentrations (EPCs) were the calculated concentration resulting from a blended average of 3 parts source soil to 1.5 part receiving soil mixture of detected and non-detected (evaluated at one-half method reporting limit [MRL]) analyte concentrations, as an initial risk-based screening that assumes all wildlife are exposed all the time to these EPCs in soil. Per ODEQ guidance, analytes undetected at both sites with normal or lower than normal/target MRLs, were eliminated from further consideration. For metals (inorganics), if all detected concentrations were below background, and/or were not detected at target MRLs, the constituent was eliminated from further consideration.

ERBSCs selected for the initial screening were the lowest available from the ODEQ Ecological Risk-Based Screening Concentrations Table, for terrestrial receptors, including T&E and Top Consumer/Predator receptor types. The initial screenings are shown on Tables B2 and B3 in Appendix B for the Pipeline and Bull Run soils, respectively. The only COI concentration detected above background and above the ERBSC was dieldrin. The initial EPC exceeded the lowest possible ERBSC by a factor of 1.5 for Finished Water Pipeline blended soils, and 2.7 for Bull Run Filtration Facility blended soils.

## 4.0 ECOLOGICAL RISK CHARACTERIZATION

Given the highly protective (zero risk) ecological risk-based screening resulted in only dieldrin posing a slight potential for ecological risk, ecological receptor exposure to dieldrin was more thoroughly examined with inclusion of more realistic EPC, ERBSCs, and exposure factors adjusted to more likely exposures and regulatorily acceptable risk. First, given there were no RTE species predicted at the subject property, the lowest possible ERBSC was replaced by the lowest ODEQ default non-RTE surface soil ERBSC of 0.009 mg/kg representing 100 percent exposure at the subject property by small ground-feeding insectivorous mammal populations such as shrews. Simple comparison of EPCs to the new ERBSC, reduced the originally predicted dieldrin ERBSC exceedance (or Hazard Quotient [HQ]) from 1.5 to 0.8 for Finished Water Pipeline blended soils and from 2.7 to 1.4 for Bull Run Filtration Facility blended soils. These simplest, still highly protective results show there is no risk predicted for the Finished Water Pipeline soils but a slight potential risk for blended Bull Run Filtration Facility soils.

First, consideration of toxicity predicted by the ODEQ ERBSCs is established based on a "no-effect" or "zero-risk" threshold for individual mammals, often based on a most sensitive species and from a most sensitive laboratory testing result and often including "safety factors" resulting in lower and lower thresholds of toxicity than predicted by studied results. Countless research studies have shown that most species, in the wild, as a whole, are less susceptible and/or less exposed to most toxins compared to laboratory dosing conditions. Thus, risks predicted using default ODEQ ERBSCs are purposefully established for most chemicals with statistical Type II Error for the protective inclusion of excess false positive results, which is the prediction of toxicity when it does not exist. Given the most accurate ERBSC presents a risk/HQ of only 1.4, and the reduction of any applied safety factor of 5 to a safety factor of 3 would reduce this HQ to less than 1, it is highly likely this level of predicted toxicity is not to be realized in nature at the population level, being representation of a false positive prediction.

Second, further consideration was given to actual versus default insectivorous small mammal exposure to dieldrin in Bull Run Filtration Facility blended soil. The default ODEQ ERBSCs assume 100% exposure of all individuals of a particular species or genus as representative of an entire wildlife "population" as those individuals inhabiting the subject property only. Further, the initial acceptable risk is cautiously established as zero (HQ of 1 using a No-Observed-Effect-Concentration/Dose), without consideration of background/additional risk and under the assumption that adjacent wildlife populations are similarly impacted or not, also without consideration of the balancing of risks associated with lawful Beneficial Uses of the land.

Third, burrowing omnivorous or herbivorous small mammal and other similarly foraging species will be less exposed to dieldrin because insects (as food) are known to concentrate dieldrin at higher levels than plants. Also, larger mammals, including top predators such as owls, hawks, foxes, and coyotes are less susceptible to dieldrin and have larger home ranges so will be less exposed to soil at the subject property. These reductions in direct toxicity and exposure eliminate concern for predicted risks to species other than insectivorous small burrowing mammals.

While shrews and other insectivorous burrowing mammals (e.g. moles) may currently be present at the subject Gramor property, the intended beneficial use of the land is actively managed/tilled farmland. This allowed use will exclude many, if not most burrowing small mammals, thus reducing exposure and number of individual small mammals, and reducing the risk of toxic effects. The allowed physical effects of farming notably reduce the potential toxic effects of dieldrin imported to the property. Since the land is managed farmland, the number and exposure of insectivorous as well as all other wildlife will be much lower than the defined "local population" considered present for ERBSC calculation.

Absent the use of dieldrin on the subject property in the future, the farming activity will promote natural and microbial/bacteriological break down of the dieldrin over time, thus reducing the potential for future risks should the farmland be returned to more natural invertebrate and wildlife exposure conditions. Thus, moving the legally-existing dieldrin containing soils from the Bull Run Facility, and leaving cleaner soils at the Bull Run Facility, results in both a short term and long-term reduction in the potential for toxic impacts due to dieldrin currently in the Bull Run Soils. The Gramor subject property becomes long term containment, exposure reduction, and treatment for the dieldrin bound in Bull Run soils.

Given the Bull Run soils were legal farmland prior to removal and will contain lower mixed concentrations of the COIs at a new farmland location, then with application of Best Farming Practices to avoid runoff/NpSS, within a Beneficial Use Determination process, there should be some consideration of the improved conditions within an extremely helpful public benefit of the Bull Run Filtration facility. Further, dieldrin was used legally at the Bull Run Facility property, according to label instructions on active farmland. While now exceeding a relatively recently developed ERBSC, the calculated concentration of dieldrin on the receiving Gramor Property cannot be considered unlawful if being used for the same agricultural purposes which no longer add any dieldrin to the soils.

Overall, the multiplied additive address of multiple toxicity and exposure concerns within ODEQ default ERBSCs and associated risk-based screening process exaggerates potential for risk, but the project plainly presents a reduction of the potential for widespread exposure at multiple sites, combined with an overall reduction in dieldrin concentrations at the more limited Gramor property area of exposure, combined with plainly lawfully allowed land uses, such that the very minimal ecological risks predicted for the Bull Run Filtration soils are unlikely to be realized and even so, would represent a reduced risk compared to current conditions, within a highly beneficial and overall more protective use of Finished Pipeline and Bull Run soils.

## 5.0 CONCLUSIONS AND RECOMMENDATIONS

Deposition of farm soils from the Bull Run Filtration Facility and associated Finished Water Pipeline were predicted to result in a very slight potential for risks (Hazard Quotients of 0.8 to 1.4) to an insectivorous mammal population living within receiving soils of the subject Gramor Property.

These predicted insectivorous mammal risks are unlikely to be realized as long as the blended virgin site soil and Bull Run Filtration Facility/Finished Water Pipeline soils are actively managed/farmed, reducing the potential for shrews or similar mammals such as omnivorous moles to present at the subject property and be unacceptably exposed to dieldrin.

Given the transfer of soil from the Bull Run Filtration Facility/Finished Water Pipeline to the subject site results in lower concentrations of dieldrin on actively farmed soils, the blending of such soils offers a long-term natural process of dieldrin bioremediation, reduces the potential for unacceptable exposures and/or harm to the environment, and represents a highly suitable Beneficial Use of the removed soils.

## LIMITATIONS

This report may be made available to future property owners and to regulatory agencies. This report is not intended for use by others and the information contained herein is not applicable to other sites.

Our interpretation of subsurface conditions is based on field observations and chemical analytical data. Areas with contamination may exist in portions of the site that were not explored or analyzed.

Within the limitations of scope, schedule, and budget, our services have been executed in accordance with generally accepted practices and laws, rules, and regulations at the time that the report was prepared. No other conditions, express or implied, should be understood.


Rone Brewer
Ecologist/Ecological Risk Assessor, SEE

Paul M. Trone
Principal Geologist, ENW

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# FIGURES

| DRAWING NUMBER | 1972-24001(V01) |
|---|---|
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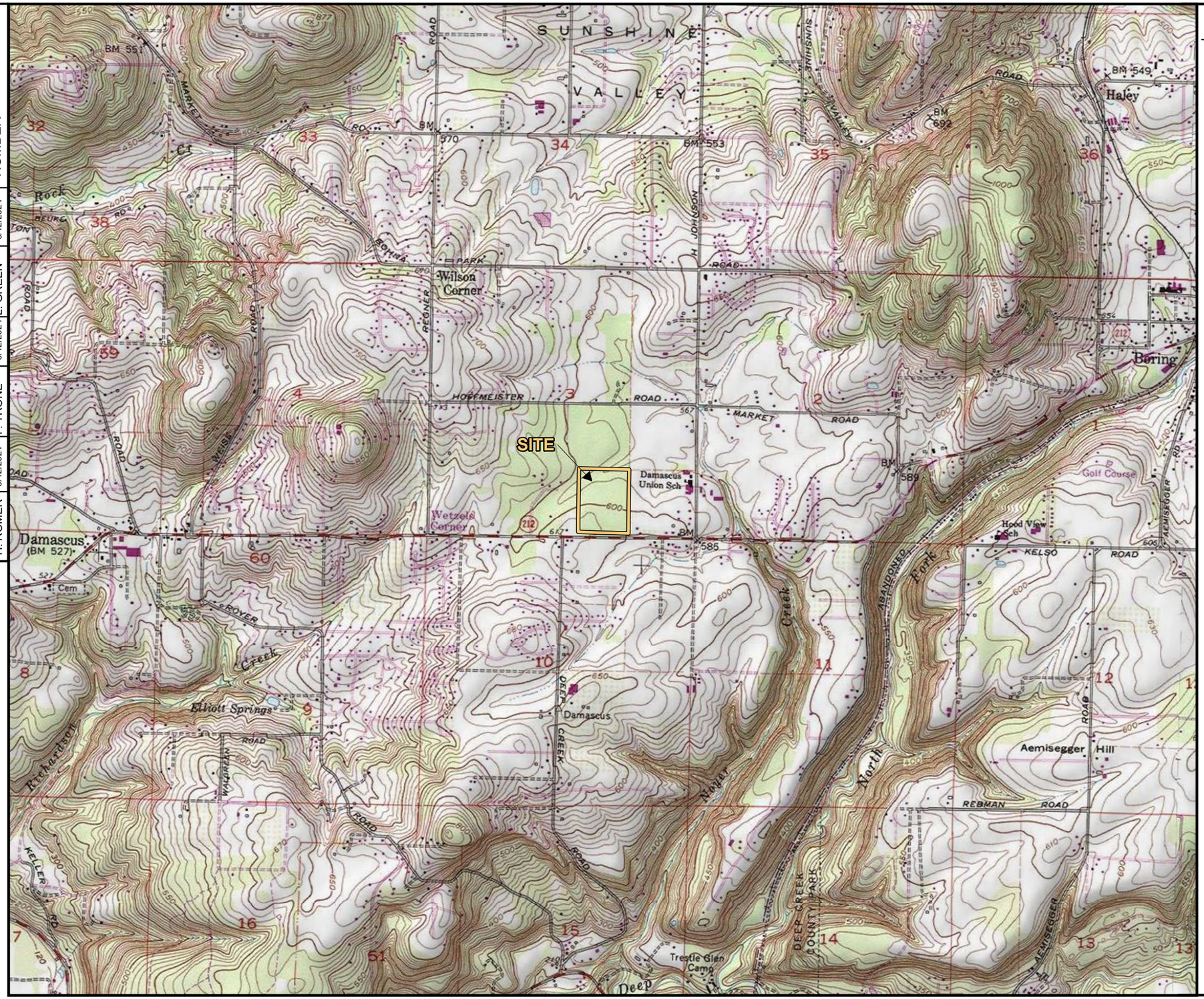
| CHECKED BY | P. TRONE 6/12/2024 |
| DRAWN BY | H. ROMER 6/12/2024 |




**LEGEND:**

SUBJECT PROPERTY BOUNDARY

**NOTES:**

1. BASE MAP DEVELOPED BY THE USGS (DAMASCUS, 1:24000, 2013)

0 950 1,900 3,800

Feet

(APPROXIMATE 1" = 1900 FEET WHEN PRINTED 11x17)

N

EVREN NORTHWEST INC.
environmental natural resource consultants

**FIGURE 1**

**SITE VICINITY MAP**

**RECEIVING FARM PROPERTY**
**CLACKAMAS COUNTY PARCEL**
**00603617 HIGHWAY 212, DAMASCUS**
**OREGON**

| DRAWN BY | CHECKED BY | APPROVED BY | DRAWING NUMBER |
|---|---|---|---|
| H. ROMER 6/12/2024 | P. TRONE 6/12/2024 | L. GREEN 6/12/2024 | 1972-24001(V01) |


**LEGEND:**

- SUBJECT PROPERTY BOUNDARY
- EPHEMERAL DRAINAGE

**NOTES:**

1. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH MAP DATED 2023 AND ENW FIELD NOTES.

2. ALL BUILDING, STREET, AND FEATURE LOCATIONS ARE APPROXIMATE.

3. SYMBOLS REPRESENT LOCATION AND DO NOT ALWAYS REPRESENT EXACT SHAPE, SIZE, OR ORIENTATION.

0 80 160 320

Feet

(APPROXIMATE 1" = 160 FEET WHEN PRINTED 11x17)

N

EVREN NORTHWEST INC.
environmental / natural resource consultants

**FIGURE 2**

**SITE PLAN**

**RECEIVING FARM PROPERTY**
**CLACKAMAS COUNTY PARCEL**
**00603617 HIGHWAY 212, DAMASCUS**
**OREGON**

| DRAWN BY | CHECKED BY | APPROVED BY | DRAWING NUMBER |
|---|---|---|---|
| H. ROMER 6/25/2024 | P. TRONE 6/25/2024 | L. GREEN 6/25/2024 | 1972-24001(V01) |


**LEGEND:**

- SUBJECT PROPERTY BOUNDARY
- GRAVEL FARM ROAD
- SOIL PLACEMENT / AMENDMENT AREA
- 100 FOOT RIPARIAN BUFFER
- WATERWAY

**NOTES:**

1. BASE MAP DEVELOPED FROM AN AERIAL PHOTOGRAPH MAP DATED 2023 AND ENW FIELD NOTES.

2. ALL BUILDING, STREET, AND FEATURE LOCATIONS ARE APPROXIMATE.

3. SYMBOLS REPRESENT LOCATION AND DO NOT ALWAYS REPRESENT EXACT SHAPE, SIZE, OR ORIENTATION.

0 70 140 280

Feet

(APPROXIMATE 1" = 140 FEET WHEN PRINTED 11x17)

N

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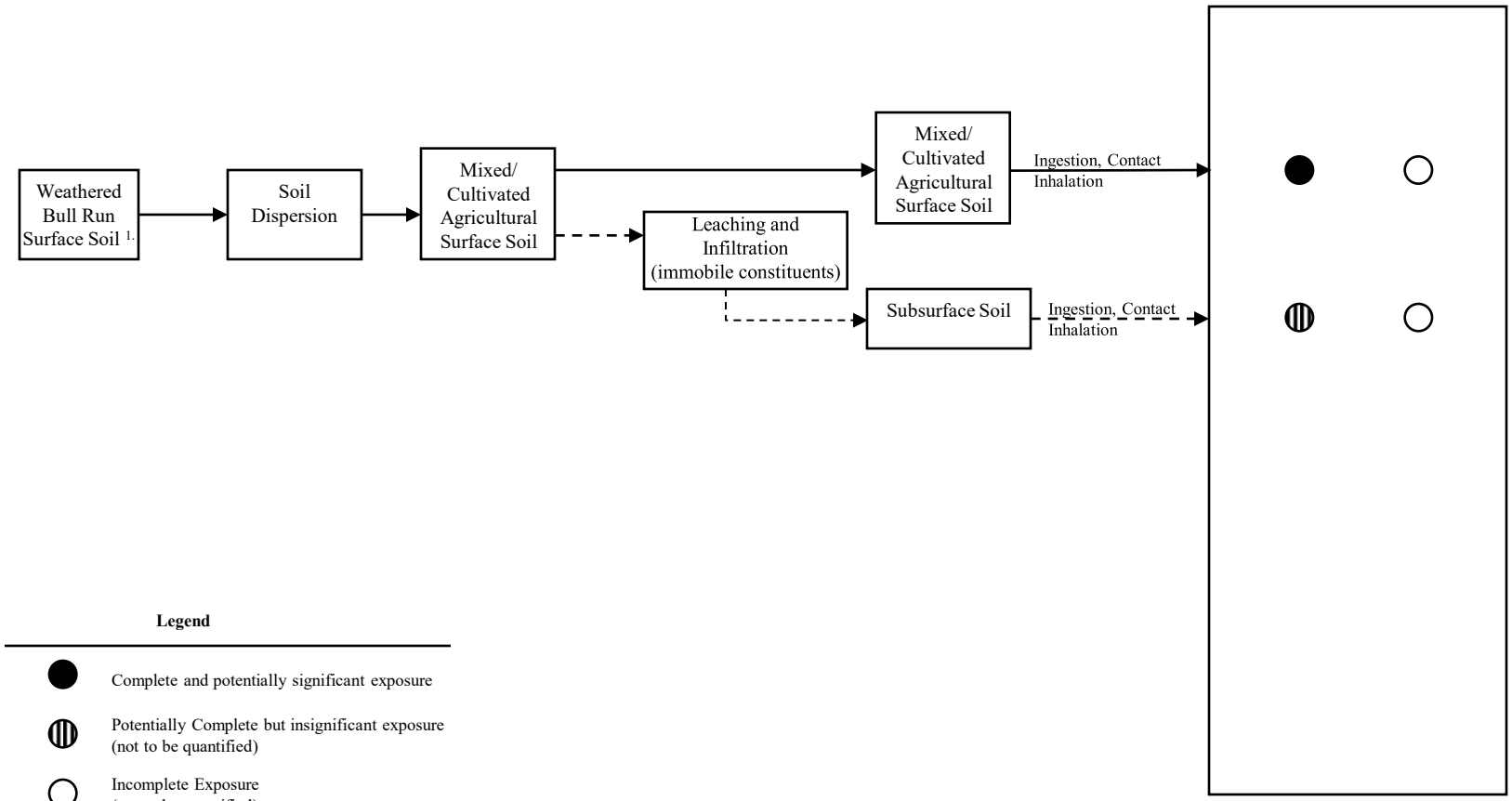
**FIGURE 3**

**TOPSOIL PLACEMENT PLAN**

**RECEIVING FARM PROPERTY CLACKAMAS COUNTY PARCEL 00603617 HIGHWAY 212, DAMASCUS OREGON**




**Legend**

- Complete and potentially significant exposure
- Potentially Complete but insignificant exposure (not to be quantified)
- Incomplete Exposure (not to be quantified)
- Incomplete or Insignificant Pathway
- Complete and/or Significant Pathway

Note 1: Soil removed from Bull Run Infiltration Facility to be dispersed upon the Gramor Subject Property augmenting the existing field.

**Figure 4**

**Conceptual Ecological Exposure Model (CEEM)**

**Gramor Property**
**Damascus, Clackamas County, Oregon**

# Appendix A

# Basic Site Information Checklist

# &

# Ecological Scoping Checklist

| General Site Information |
|---|
| **ECSI File No. or LUST File No.:** None |
| **Site Name:** Gramor Property |
| **Site Location (address, city, and/or county):**<br>~235XX Highway 212, Damascus, Clackamas County, OR 97089 |
| **Latitude/Longitude or other location documentation for site:** ~45.418659N; -122.418580E |
| **Current and Historical Site Use (gas station, dry cleaner, jet hangar, etc.) [1]:**<br>Forested, Cleared in 2005, tilled 2008, occasionally mowed (last in 2020), fallow/very early successional. |
| **Zoning:** RRFF5-Rural Residential Farm Forest 5-acre;<br>Urban Growth Boundary: METRO UGB |
| **Site[2] Features:**<br>Shrub and sparse young tree cover. Swale. |
| **Chemicals of Interest[3]:** DDT, DDE, Dieldrin, Arsenic, Beryllium, Cadmium, Chromium III, Copper, Lead, Mercury, Nickel Silver |

[1] Include contaminant management, treatment, storage or disposal and areas where a release may have occurred. Historical sources should be identified using sources of information which help in identifying current or past uses or occupants of a site including aerial photographs, fire insurance maps, property tax files, recorded land title records, United States Geological Survey (USGS) 7.5 minute topographic maps, local street directories, building department records, zoning or land use records. Any previous site assessments, environmental assessments or studies should be summarized

[2] Facility or Site (OAR 340-122-0115(26)) means any building, structure, installation, equipment, pipe or pipeline including any pipe into a sewer or publicly owned treatment works, well, pit, pond, lagoon, impoundment, ditch, landfill, storage container, above ground tank, underground storage tank, motor vehicle, rolling stock, aircraft, or any site or area where a hazardous substance has been deposited, stored, disposed of, or placed, or otherwise come to be located and where a release has occurred or where there is a threat of a release, but does not include any consumer product in consumer use or any vessel.

[3] A COI list should include chemicals that are detected or are suspected to be present based on historical and current operations. For Stage 1, the site-specific history of hazardous substance uses and releases is usually the source of potential chemical information. Identify hazardous substances that have the potential to bioaccumulate in Section C2 of Attachment 1.

## Site Conditions – Provide Approximate Areas (acreage or square feet)

These habitats may occur in a range of natural and protected areas, including parks and green space found within urban areas. More information and habitat classification can be found at: https://oregonexplorer.info/content/classification-wildlife-habitats

| 20 Acre Parcel Site | Adjacent | |
|---|---|---|
| X | X | **Terrestrial Open Habitat / Grasslands**: Dominated by short to medium-tall grasses, low to medium shrubs, or bare soil. |
| | X | **Forest or Woodland Habitats:** Woodlands (maple, alder, aspen), conifer forest (Douglas fir, hemlock, cedar, spruce), mixed-woodland, juniper, pine (ponderosa, lodgepole). |
| ? | ? | **Wetland[4]:** May be either tidal or non-tidal wetlands with emergent herbaceous plants. |
| | | **Riparian Zone:** Patches or linear strips of land adjacent to waterbodies (rivers, streams, waterbodies), or on nearby floodplains and terraces. May be impacted by periodic riverine flooding or perennial flowing water**.** May or may not also contain wetlands. |
| | | **Aquatic Open Water:** Ponds, lakes, reservoirs, rivers, creeks, streams, bays estuaries, and nearshore marine and intertidal. |
| | | **Impermeable Surface:** Pavement, structures. |

## Documentation

- Aerial Site Vicinity Map(s) identifying zoning and Site features. Include topographic map.
- Summarize known or potential contaminated soil, groundwater, migration pathways.
- Figure illustrating source/release areas, sample locations, estimated areas of contamination, and surface features such as pavement, stormwater catch basins/drainage system including outfalls, dry wells or stormwater swales.
- Aerial Map showing habitat types described above both within and adjacent to the Site by at least 1/4 mile from Site boundary. Definitions and tools[5] for identifying wetlands include:

[4] Covered Under Oregon Statewide Wetlands Inventory (ORS 196.674) https://www.oregon.gov/dsl/WW/Pages/SWI.aspx

[5] Information shown on the Local Wetland Inventory maps is for planning purposes only, as wetland information is subject to change. There may be unmapped wetland and waters subject to regulation and all wetlands and waters boundary mapping is approximate. In all cases, actual field conditions determine the presence, absence and boundaries of wetlands and waters.

| | |
|---|---|
| https://www.oregon.gov/dsl/WW/Pages/Inventories.aspx<br>http://tools.oregonexplorer.info/oe_map_viewer_2_0/viewer.html?Viewer=orwap<br>National Wetlands Inventory: https://www.fws.gov/wetlands/Data/Mapper.html | |
| Checklist Completed By: Rone Brewer, President/Principle Ecologist, Sound Ecological Endeavors, LLC | Date: 09/06/2024 |

## Ecological Scoping Checklist

| | |
|---|---|
| Site Name | Gramor Property |
| Date of Site Visit | |
| Site Location | ~235XX Highway 212, Damascus, Clackamas Co., OR |
| Site Visit Conducted by | Rone Brewer |

Part ❶

| **CONTAMINANTS OF INTEREST IN LOCALITY OF FACILITY† Types, Classes, Or Specific Hazardous Substances ‡ Known Or Suspected** | **Upland** | **Aquatic** |
|---|---|---|
| Organochlorine Pesticides | X | |
| Metals | X | |
| | | |
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‡ As defined by OAR 340-122-115(30) † As defined by OAR 340-122-115(34)

Part ❷

| **OBSERVED IMPACTS OBSERVED IN THE LOCALITY OF THE FACILITY** | **Finding** |
|---|---|
| Onsite vegetation (**N**one, **L**imited, **E**xtensive) | Ex |
| Vegetation in the locality of the site (**N**one, **L**imited, **E**xtensive) | Li/Ex |
| Onsite wildlife such as macroinvertebrates, reptiles, amphibians, birds, mammals, other (**N**one, **L**imited, **E**xtensive) | Li |
| Wildlife such as macroinvertebrates, reptiles, amphibians, birds, mammals, other in the locality of the site (**N**one, **L**imited, **E**xtensive) | Li |
| Other readily observable impacts (**N**one, **D**iscuss below) | Di |
| Discussion: | |
| Subject property cleared of trees and stumps/leveled in 2005, mowed occasionally since. | |
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**ATTACHMENT 1**
**Ecological Scoping Checklist (cont'd)**

| SPECIFIC EVALUATION OF ECOLOGICAL RECEPTORS / HABITAT | Finding |
|---|---|
| ***Terrestrial - Wooded*** | |
| Percentage of site that is wooded | 5, sparse |
| Dominant vegetation type (**E**vergreen, **D**eciduous, **M**ixed) | **D** |
| Prominent tree size at breast height, i.e., four feet (<6", 6" to 12", >12") | <6"to12" |
| Evidence / observation of wildlife (**M**acroinvertebrates, **R**eptiles, **A**mphibians, **B**irds, **M**ammals, **O**ther) | Bi |
| ***Terrestrial - Scrub/Shrub/Grasses*** | |
| Percentage of site that is scrub/shrub | 95 |
| Dominant vegetation type (**Sc**rub, **Sh**rub, **G**rasses, **O**ther) | **Sc, Sh, Gr** |
| Prominent height of vegetation (<2', 2' to 5', >5') | <2'to5' |
| Density of vegetation (**D**ense, **P**atchy, **S**parse) | **D** |
| Evidence / observation of wildlife (**M**acroinvertebrates, **R**eptiles, **A**mphibians, **B**irds, **M**ammals, **O**ther) | Macro, Bi, Mam |
| ***Terrestrial – Ruderal*** | |
| Percentage of site that is ruderal | 0 |
| Dominant vegetation type (**L**andscaped, **A**griculture, **B**are ground) | **-** |
| Prominent height of vegetation (0', >0' to <2', 2' to 5', >5') | - |
| Density of vegetation (**D**ense, **P**atchy, **S**parse) | **-** |
| Evidence / observation of wildlife (**M**acroinvertebrates, **R**eptiles, **A**mphibians, **B**irds, **M**ammals, **O**ther) | - |
| ***Aquatic - Non-flowing (lentic)*** | |
| Percentage of site that is covered by lakes or ponds | 0 |
| Type of water bodies (**L**akes, **P**onds, **V**ernal pools, **I**mpoundments, **Lag**oon, **R**eservoir, **C**anal) | - |
| Size (acres), average depth (feet), trophic status of water bodies | - |
| Source water (**R**iver, **St**ream, **G**roundwater, **I**ndustrial discharge, **Su**rface water runoff) | - |
| Water discharge point (**N**one, **R**iver, **St**ream, **G**roundwater, **W**etlands impoundment) | - |
| Nature of bottom (**M**uddy, **R**ocky, **S**and, **C**oncrete, **O**ther) | **-** |
| Vegetation present (**S**ubmerged, **E**mergent, **F**loating) | **-** |
| Obvious wetlands present (**Y**es / **N**o) | - |
| Evidence / observation of wildlife (**M**acroinvertebrates, **R**eptiles, **A**mphibians, **B**irds, **M**ammals, **O**ther) | - |
| ***Aquatic - Flowing (lotic)*** | |
| Percentage of site that is covered by rivers, streams (brooks, creeks), intermittent streams, dry wash, arroyo, ditches, or channel waterway | 0 |
| Type of water bodies (**R**ivers, **S**treams, **I**ntermittent Streams, **D**ry wash, **A**rroyo, **D**itches, **C**hannel waterway) | - |
| Size (acres), average depth (feet), approximate flow rate (cfs) of water bodies | **-** |
| Bank environment (cover: **V**egetated, **B**are / slope: **S**teep, **G**radual / height (in feet)) | - |

| SPECIFIC EVALUATION OF ECOLOGICAL RECEPTORS / HABITAT | Finding |
|---|---|
| Source water (**R**iver, **St**ream, **G**roundwater, **I**ndustrial discharge, **Su**rface water runoff) | Runoff/NPS Storm |
| Tidal influence (**Y**es / **N**o) | N |
| Water discharge point (**N**one, **R**iver, **St**ream, **G**roundwater, **W**etlands impoundment) | Swale |
| Nature of bottom (**M**uddy, **R**ocky, **S**and, **C**oncrete, **O**ther) | Dirt/Mud |
| Vegetation present (**S**ubmerged, **E**mergent, **F**loating) | Terr/Em |
| Obvious wetlands present (**Y**es / **N**o) | N |
| Evidence / observation of wildlife (**M**acroinvertebrates, **R**eptiles, **A**mphibians, **B**irds, **M**ammals, **O**ther) | Bi, Mam |
| ***Aquatic – Wetlands*** | |
| Obvious or designated wetlands present (**Y**es / **N**o) | No |
| Wetlands suspected as site is/has (**A**djacent to water body, in **F**loodplain, **S**tanding water, **D**ark wet soils, **M**ud cracks, **D**ebris line, **W**ater marks) | Swale |
| Vegetation present (**S**ubmerged, **E**mergent, **S**crub/shrub, **W**ooded) | Terr/EM |
| Size (acres) and depth (feet) of suspected wetlands | <1 Acre Swale/Bottom |
| Source water (**R**iver, **St**ream, **G**roundwater, **I**ndustrial discharge, **Su**rface water runoff) | Runoff |
| Water discharge point (**N**one, **R**iver, **St**ream, **G**roundwater, **I**mpoundment) | Swale/St? |
| Tidal influence (**Y**es / **N**o) | N |
| Evidence / observation of wildlife (**M**acroinvertebrates, **R**eptiles, **A**mphibians, **B**irds, **M**ammals, **O**ther) | Bi, Mam |

📷: Photographic documentation of these features is highly recommended.

Part ❹

| HABITATS AND SPECIES OBSERVED OR DOCUMENTED IN LOF |
|---|
| |
| Small mammals/voles/moles, racoon, coyote, deer, likely porcupine, skunk and similar |
| Passerine Birds, jay, robin, sparrow sp., raptors-hawks/owls |
| Likely grasshoppers, flies, etc. |
| Likely garter snakes |
| Limited possibility of amphibian overland passage during early spring/wet season along northern property swale? |
| Limited possibility of squirrels along eastern property tree line |
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**ATTACHMENT 2**
**Evaluation of Receptor-Pathway Interactions**

| EVALUATION OF RECEPTOR-PATHWAY INTERACTIONS | Y | N | U |
|---|---|---|---|
| **Are hazardous substances present or potentially present in surface waters? This includes tidal or seasonally inundated areas and wetlands.**<br>**AND**<br>**Could hazardous substances reach these receptors via surface water?** | | N | |
| When answering the above questions, consider the following:<br>• Known or suspected presence of hazardous substances in surface waters.<br>• Ability of hazardous substances to migrate to surface waters. Consider migration pathways such as erosion of soils adjacent to aquatic environments (e.g., banks or riparian areas), subsurface preferential pathways (e.g., pipes), outfalls, groundwater discharges, and surface migration (e.g., ditches).<br>• Terrestrial organisms may be dermally exposed to water-borne contaminants as a result of wading or swimming in contaminated waters. Aquatic receptors may be exposed through osmotic exchange, respiration or ventilation of surface waters.<br>• Contaminants may be taken-up by terrestrial plants whose roots are in contact with surface waters.<br>• Terrestrial receptors may ingest water-borne contaminants if contaminated surface waters are used as a drinking water source. | | | |
| **Are hazardous substances present or potentially present in groundwater?**<br>**AND**<br>**Could hazardous substances reach these receptors via groundwater?** | | N | |
| When answering the above questions, consider the following:<br>• Known or suspected presence of hazardous substances in groundwater.<br>• Ability of hazardous substances to migrate to groundwater.<br>• Potential for hazardous substances to migrate via groundwater and discharge into habitats and/or surface waters.<br>• Contaminants may be taken-up by terrestrial and rooted aquatic plants whose roots are in contact with groundwater present within the root zone (~1m depth).<br>• Terrestrial wildlife receptors generally will not contact groundwater unless it is discharged to the surface. | | | |

**"Y" = yes; "N" = No, "U" = Unknown (counts as a "Y")**

**ATTACHMENT 2**
**Evaluation of Receptor-Pathway Interactions (cont'd)**

| EVALUATION OF RECEPTOR-PATHWAY INTERACTIONS | Y | N | U |
|---|---|---|---|
| **Are hazardous substances present or potentially present in sediments? This includes tidal or seasonally inundated areas and wetlands.**<br>**AND**<br>**Could hazardous substances reach receptors via contact with sediments?** | | N | |
| When answering the above questions, consider the following:<br>• Known or suspected presence of hazardous substances in sediment.<br>• Ability of hazardous substances to leach or erode from surface soils and be carried into sediment via surface runoff.<br>• Potential for contaminated groundwater to upwell through, and deposit contaminants in, sediments.<br>• If sediments are present in an area that is only periodically inundated with water, both aquatic and terrestrial species may exposed. Aquatic receptors may be directly exposed to sediments or may be exposed through osmotic exchange, respiration or ventilation of sediment pore waters.<br>• Terrestrial species may be exposed to sediment in an area that is only periodically inundated with water.<br>• If sediments are present in an area that is only periodically inundated with water, terrestrial species may have direct access to sediments for the purposes of incidental ingestion. Aquatic receptors may regularly or incidentally ingest sediment while foraging. | | | |
| **Are hazardous substances present or potentially present in prey or food items of ecologically important receptors?**<br>**AND**<br>**Could hazardous substances reach these receptors via consumption of food items?** | Y<br><br>Y | | |
| When answering the above questions, consider the following:<br>• Higher trophic level terrestrial and aquatic consumers and predators may be exposed through consumption of contaminated food sources.<br>• In general, organic contaminants with log $K_{ow}$ > 3.5 may accumulate in terrestrial mammals and those with a log $K_{ow}$ > 5 may accumulate in aquatic vertebrates. | | | |

**"Y" = yes; "N" = No, "U" = Unknown (counts as a "Y")**

**ATTACHMENT 2**
**Evaluation of Receptor-Pathway Interactions (cont'd)**

| EVALUATION OF RECEPTOR-PATHWAY INTERACTIONS | Y | N | U |
|---|---|---|---|
| **Are hazardous substances present or potentially present in surficial soils?**<br>**AND**<br>**Could hazardous substances reach these receptors via incidental ingestion of or dermal contact with surficial soils?** | Y<br><br>Y | | |
| When answering the above questions, consider the following:<br>• Known or suspected presence of hazardous substances in surficial (~1m depth) soils.<br>• Ability of hazardous substances to migrate to surficial soils.<br>• Significant exposure via dermal contact would generally be limited to organic contaminants which are lipophilic and can cross epidermal barriers.<br>• Exposure of terrestrial plants to contaminants present in particulates deposited on leaf and stem surfaces by rain striking contaminated soils (i.e., rain splash).<br>• Contaminants in bulk soil may partition into soil solution, making them available to roots.<br>• Incidental ingestion of contaminated soil could occur while animals grub for food resident in the soil, feed on plant matter covered with contaminated soil or while grooming themselves clean of soil. | | | |
| **Are hazardous substances present or potentially present in soils?**<br>**AND**<br>**Could hazardous substances reach these receptors via vapors or fugitive dust carried in surface air or confined in burrows?** | Y<br><br>Y | | |
| When answering the above questions, consider the following:<br>• Volatility of the hazardous substance (volatile chemicals generally have Henry's Law constant > $10^{-5}$ atm-$m^3$/mol and molecular weight < 200 g/mol).<br>• Exposure via inhalation is most important to organisms that burrow in contaminated soils, given the limited amounts of air present to dilute vapors and an absence of air movement to disperse gases.<br>• Exposure via inhalation of fugitive dust is particularly applicable to ground-dwelling species that could be exposed to dust disturbed by their foraging or burrowing activities or by wind movement.<br>• Foliar uptake of organic vapors would be limited to those contaminants with relatively high vapor pressures.<br>• Exposure of terrestrial plants to contaminants present in particulates deposited on leaf and stem surfaces. | | | |

**"Y" = yes; "N" = No, "U" = Unknown (counts as a "Y")**

# Appendix B
# Ecological Risk-Based Screening Tables

**Table B1: Analytical Results for Bull Run Filtration Facility and Gramor Receiving Area Soils**

| Location ID | | DU-1 | DU-1 | DU-1 | DU-2 | DU-2 | DU-2 | FWS-DU-1 | FWS-DU-2 | FWC-DU-1 | FWC-DU-2 | FWN-DU-1 | FWN-DU-1 | FWN-DU-1 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | | DU-1A | DU-1B | DU-1C | DU-2A | DU-2B | DU-2C | FWS-DU-1 | FWS-DU-2 | FWC-DU-1 | FWC-DU-2 | FWN-DU-1A | FWN-DU-1B | FWN-DU-1C |
| Date Sampled | | 11/6/2023 | 11/6/2023 | 11/6/2023 | 11/6/2023 | 11/6/2023 | 11/6/2023 | 11/16/2023 | 11/16/2023 | 11/20/2023 | 11/20/2023 | 11/21/2023 | 11/21/2023 | 11/21/2023 |
| Depth Sampled (feet) | | 0-1.5 | 0-1.5 | 0-1.5 | 1.5-5.0 | 1.5-5.0 | 1.5-5.0 | 0-1.5 | 1.5-5 | 0-1.5 | 1.5-5 | 0-1.5 | 0-1.5 | 0-1.5 |
| Sampled By | | PBS | PBS | PBS | PBS | PBS | PBS | PBS | PBS | PBS | PBS | PBS | PBS | PBS |
| Location | | Bull Run Filtration Facility | | | | | | Finished Water South | | Finished Water Center | | Finished Water North | | Finished W |
| Constituent of Interest | Note | mg/Kg (ppm) | mg/Kg (ppm) | mg/Kg (ppm) | mg/Kg (ppm) | mg/Kg (ppm) | mg/Kg (ppm) | mg/Kg (ppm) | mg/Kg (ppm) | mg/Kg (ppm) | mg/Kg (ppm) | mg/Kg (ppm) | mg/Kg (ppm) | mg/Kg (ppm) |
| Pesticides | | | | | | | | | | | | | | |
| Aldrin | c, v | <0.00204 (ND) | <0.00204 (ND) | <0.00203 (ND) | <0.00204 (ND) | <0.00204 (ND) | <0.00204 (ND) | <0.00201 (ND) | <0.00199 (ND) | <0.00197 (ND) | <0.00197 (ND) | <0.00196 (ND) | <0.00199 (ND) | <0.00195 (ND) |
| Chlordane | c, v | <0.00204 (ND) | <0.00204 (ND) | <0.00203 (ND) | <0.00204 (ND) | <0.00204 (ND) | <0.00204 (ND) | <0.00201 (ND) | <0.00199 (ND) | <0.00197 (ND) | <0.00197 (ND) | <0.00196 (ND) | <0.00199 (ND) | <0.00195 (ND) |
| DDD (4,4'-Dichlorodiphenyldichloroethane) | c, nv | 0.00240 | 0.00204 | 0.00212 | <0.00204 (ND) | <0.00204 (ND) | <0.00204 (ND) | <0.00201 (ND) | <0.00199 (ND) | 0.00421 | <0.00197 (ND) | <0.00196 (ND) | <0.00199 (ND) | <0.00195 (ND) |
| DDE (4,4'-Dichlorodiphenyldichloroethene) | c, v | 0.0586 | 0.0382 | 0.0357 | 0.00357 | 0.00387 | 0.00476 | 0.0112 | <0.00199 (ND) | 0.0731 | 0.00995 | 0.0232 | 0.0216 | 0.0223 |
| DDT (4,4'-Dichlorodiphenyltrichloroethane) | c, nv | 0.053 | 0.0339 | 0.0337 | 0.00473 | 0.00474 | 0.00546 | <0.00201 (ND) | <0.00199 (ND) | 0.076 | 0.00781 | 0.0216 | 0.0177 | 0.0198 |
| 2,4-Dichlorophenoxyacetic acid (2,4-D) | nc, nv | <0.1 (ND) | <0.1 (ND) | <0.1 (ND) | <0.1 (ND) | <0.1 (ND) | <0.1 (ND) | <0.13 (ND) | <0.1 (ND) | <0.1 (ND) | <0.1 (ND) | <0.1 (ND) | <0.1 (ND) | <0.1 (ND) |
| Dieldrin | c, nv | 0.0366 | 0.0266 | 0.0239 | 0.00228 | 0.00320 | 0.00337 | <0.00201 (ND) | <0.00199 (ND) | 0.0185 | <0.00197 (ND) | 0.0115 | 0.0078 | 0.0207 |
| Endosulfan (alpha-beta) | nc, v | <0.00204 (ND) | <0.00204 (ND) | <0.00203 (ND) | <0.00204 (ND) | <0.00204 (ND) | <0.00204 (ND) | <0.00201 (ND) | <0.00199 (ND) | <0.00197 (ND) | <0.00197 (ND) | <0.00196 (ND) | <0.00196 (ND) | <0.00195 (ND) |
| Endrin | nc, nv | <0.00204 (ND) | <0.00204 (ND) | <0.00203 (ND) | <0.00204 (ND) | <0.00204 (ND) | <0.00204 (ND) | <0.00201 (ND) | <0.00199 (ND) | <0.00197 (ND) | <0.00197 (ND) | <0.00206 (ND) | <0.00239 (ND) | <0.00195 (ND) |
| Heptachlor | c, v | <0.00204 (ND) | <0.00204 (ND) | <0.00203 (ND) | <0.00204 (ND) | <0.00204 (ND) | <0.00204 (ND) | <0.00201 (ND) | <0.00199 (ND) | <0.00197 (ND) | <0.00197 (ND) | <0.00196 (ND) | <0.00199 (ND) | <0.00195 (ND) |
| Heptachlor Epoxide | c, v | <0.00204 (ND) | <0.00204 (ND) | <0.00203 (ND) | <0.00204 (ND) | <0.00204 (ND) | <0.00204 (ND) | <0.00201 (ND) | <0.00199 (ND) | <0.00197 (ND) | <0.00197 (ND) | <0.00196 (ND) | <0.00199 (ND) | <0.00195 (ND) |
| gamma-Hexachlorocyclohexane (Lindane) | c, nv | <0.00204 (ND) | <0.00204 (ND) | <0.00203 (ND) | <0.00204 (ND) | <0.00204 (ND) | <0.00204 (ND) | <0.00201 (ND) | <0.00199 (ND) | <0.00197 (ND) | <0.00197 (ND) | <0.00196 (ND) | <0.00199 (ND) | <0.00195 (ND) |
| Toxaphene | c, nv | <0.0612 (ND) | <0.0611 (ND) | <0.0608 (ND) | <0.0612 (ND) | <0.0611 (ND) | <0.0611 (ND) | <0.0603 (ND) | <0.0598 (ND) | <0.0590 (ND) | <0.0592 (ND) | <0.0588 (ND) | <0.0598 (ND) | <0.0586 (ND) |
| Metals | | | | | | | | | | | | | | |
| Arsenic | c, nv | 5.18 | 5.09 | 5.02 | 4.98 | 4.88 | 4.95 | 4.40 | 4.85 | 4.18 | 3.67 | 3.40 | 3.66 | 2.94 |
| Barium | nc, nv | 226 | 220 | 221 | 160 | 156 | 164 | 171 | 170 | 182 | 157 | 142 | 146 | 142 |
| Beryllium | c, nv | 0.882 | 0.880 | 0.865 | 0.994 | 0.996 | 1.03 | 0.784 | 0.846 | 0.705 | 0.816 | 0.732 | 0.719 | 0.679 |
| Cadmium | nc, nv | <0.208 (ND) | <0.216 (ND) | <0.221 (ND) | <0.218 (ND) | <0.212 (ND) | <0.217 (ND) | <0.205 (ND) | <0.208 (ND) | <0.197 (ND) | <0.210 (ND) | <0.202 (ND) | <0.215 (ND) | <0.204 (ND) |
| Chromium (III) | nc, nv | 42.0 | 43.1 | 42.8 | 42.8 | 42.4 | 46.5 | 30.7 | 36.5 | 23.1 | 27.1 | 25.9 | 24.7 | 23.4 |
| Copper | nc, nv | 30.5 | 31.6 | 30.2 | 28.5 | 28.5 | 32.0 | 26.4 | 23.0 | 19.4 | 14.3 | 15.4 | 18.0 | 22.0 |
| Lead | NA, nv | 12.4 | 12.8 | 11.7 | 11.9 | 11.9 | 12.1 | 28.3 | 12 | 10 | 10.1 | 15.0 | 20.8 | 20.3 |
| Mercury | nc, nv | <0.0832 (ND) | <0.0864 (ND) | <0.0886 (ND) | <0.087 (ND) | <0.0848 (ND) | <0.0869 (ND) | <0.0819 (ND) | <0.0833 (ND) | 0.0800 | <0.0839 (ND) | 0.1580 | <0.086 (ND) | <0.0816 (ND) |
| Nickel | c, nv | 26.5 | 26.9 | 26.8 | 25.0 | 25.9 | 32.5 | 17.6 | 18.2 | 11.5 | 11.4 | 11.4 | 13.1 | 11.5 |
| Silver | nc, nv | <0.208 (ND) | <0.216 (ND) | <0.221 (ND) | <0.218 (ND) | <0.212 (ND) | <0.217 (ND) | <0.205 (ND) | <0.208 (ND) | <0.197 (ND) | <0.210 (ND) | <0.202 (ND) | <0.215 (ND) | <0.204 (ND) |

Notes:
mg/Kg = milligram per kilogram or parts per million (ppm).
<# (ND) = not detected at or above the laboratory method reporting limit shown.
NE = not established.
— = not analyzed or not applicable.
c = carcinogenic
nc = noncarcinogenic
v = volatile
nv = nonvolatile

**Table B1: Analytical Results for Bull Run Filtration Facility ar**

| Location ID | | FWN-DU-2 | SP01 | DU01 | DU01 | DU01 | DU01 | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample ID | | FWN-DU-2 | SP01-Gramor | DU01-240719-0.5 | DU01-240719-Rep01 | DU01-240719-Rep02 | DU01-240719-1.5 | | | | | | | |
| Date Sampled | | 11/21/2023 | 7/17/2024 | 7/19/2024 | 7/19/2024 | 7/19/2024 | 7/19/2024 | | | | | | | |
| Depth Sampled (feet) | | 1.5-5 | -- | 0.5 | 0.5 | 0.5 | 1.5 | | | | | | | |
| Sampled By | | PBS | ENW | ENW | ENW | ENW | ENW | | | | | | | |
| Location | | /ater North | Center of the subject Gramor 29-acre property | Subject Gramor 29-acre property | Subject Gramor 29-acre property | Subject Gramor 29-acre property | Subject Gramor 29-acre property | Average Concentration (Gramor Soil) DU01-0.5-1.5' | Maximum Soil Concentration (Finished Water Line Soil) 0-1.5' | Average Concentration (Finished Water Line Soil) 0-1.5' | Blended Soil Concentration Calculated on the Average Soil Concentration of Finished Water Line and Gramor (1.5:3) | Maximum Soil Concentration (Bull Run Infiltration Facility Soil) 0-1.5' | Average Concentration (Bull Run Infiltration Facility Soil) 0-1.5' | Blended Soil Concentration Calculated on the Average Soil Concentration of Bull Run Filtration Facility and Gramor (1.5:3) |
| Constituent of Interest | Note | mg/Kg (ppm) | mg/Kg (ppm) | mg/Kg (ppm) | mg/Kg (ppm) | mg/Kg (ppm) | mg/Kg (ppm) | mg/Kg (ppm) | mg/Kg (ppm) | mg/Kg (ppm) | mg/Kg (ppm) | mg/Kg (ppm) | mg/Kg (ppm) | mg/Kg (ppm) |
| Pesticides | | | | | | | | | | | | | | |
| Aldrin | c, v | <0.00201 (ND) | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | <0.00201 (ND) | <0.000991 (ND) | 0.0023 | <0.00204 (ND) | <0.001019 (ND) | 0.0023 |
| Chlordane | c, v | <0.00201 (ND) | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | <0.00201 (ND) | <0.000991 (ND) | 0.0023 | <0.00204 (ND) | <0.001019 (ND) | 0.0023 |
| DDD (4,4'-Dichlorodiphenyldichloroethane) | c, nv | <0.00201 (ND) | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | 0.00421 | 0.00139 | 0.0026 | 0.0024 | 0.00160 | 0.0027 |
| DDE (4,4'-Dichlorodiphenyldichloroethene) | c, v | <0.00201 (ND) | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | 0.0731 | 0.02042 | 0.0153 | 0.0586 | 0.02412 | 0.0177 |
| DDT (4,4'-Dichlorodiphenyltrichloroethane) | c, nv | <0.00201 (ND) | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | 0.0760 | 0.01824 | 0.0138 | 0.0530 | 0.02259 | 0.0167 |
| 2,4-Dichlorophenoxyacetic acid (2,4-D) | nc, nv | <0.1 (ND) | <0.0246 (ND) | <0.0232 (ND) | <0.0233 (ND) | <0.0232 (ND) | <0.0231 (ND) | <0.02348 (ND) | <0.13 (ND) | <0.051875 (ND) | 0.0385 | <0.1 (ND) | <0.05 (ND) | 0.0372 |
| Dieldrin | c, nv | <0.00201 (ND) | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | 0.0207 | 0.00781 | 0.0069 | 0.0366 | 0.0160 | 0.0123 |
| Endosulfan (alpha-beta) | nc, v | <0.00201 (ND) | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | <0.00201 (ND) | <0.000989 (ND) | 0.0023 | <0.00204 (ND) | <0.001019 (ND) | 0.0023 |
| Endrin | nc, nv | <0.00201 (ND) | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | <0.00239 (ND) | <0.001022 (ND) | 0.0023 | <0.00204 (ND) | <0.001019 (ND) | 0.0023 |
| Heptachlor | c, v | <0.00201 (ND) | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | <0.00201 (ND) | <0.000991 (ND) | 0.0023 | <0.00204 (ND) | <0.001019 (ND) | 0.0023 |
| Heptachlor Epoxide | c, v | <0.00201 (ND) | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | <0.00201 (ND) | <0.000991 (ND) | 0.0023 | <0.00204 (ND) | <0.001019 (ND) | 0.0023 |
| gamma-Hexachlorocyclohexane (Lindane) | c, nv | <0.00201 (ND) | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | <0.01 (ND) | <0.00201 (ND) | <0.000991 (ND) | 0.0023 | <0.00204 (ND) | <0.001019 (ND) | 0.0023 |
| Toxaphene | c, nv | <0.0603 (ND) | <1 (ND) | <1 (ND) | <1 (ND) | <1 (ND) | <1 (ND) | <1 (ND) | <0.0603 (ND) | <0.029738 (ND) | 0.1865 | <0.0612 (ND) | <0.030542 (ND) | 0.1870 |
| Metals | | | | | | | | | | | | | | |
| Arsenic | c, nv | 3.72 | 3.0 | 2.0 | 2.0 | 2.0 | 2.0 | 2.2 | 4.85 | 3.85 | 3.30 | 5.18 | 5.02 | 4.08 |
| Barium | nc, nv | 116 | 200 | 180 | 180 | 180 | 69 | 162 | 182 | 153 | 156 | 226 | 191 | 181 |
| Beryllium | c, nv | 0.671 | <1 (ND) | --- | --- | --- | --- | <0.5 (ND) | 0.846 | 0.74 | 0.58 | 1.03 | 0.94 | 0.71 |
| Cadmium | nc, nv | <0.211 (ND) | <1 (ND) | <1 (ND) | <1 (ND) | <1 (ND) | <1 (ND) | <0.5 (ND) | <0.215 (ND) | <0.103 (ND) | 0.152 | <0.221 (ND) | <0.108 (ND) | 0.155 |
| Chromium (III) | nc, nv | 29.8 | 17 | 29 | 21 | 25 | 23 | 23.0 | 36.5 | 27.7 | 26.1 | 46.5 | 43.3 | 36.5 |
| Copper | nc, nv | 13.3 | 8.6 | 6.2 J | 6.3 J | 6.7 J | 6.1 J | 6.8 J | 26.4 | 19.0 | 14.9 | 32.0 | 30.2 | 22.4 |
| Lead | NA, nv | 8.66 | 15 | 17 | 16 | 16 | 11 | 15 | 28.3 | 15.6 | 15.4 | 12.8 | 12.1 | 13.1 |
| Mercury | nc, nv | <0.0844 (ND) | <1 (ND) | <0.2 (ND) j | <0.2 (ND) j | <0.2 (ND) j | <0.2 (ND) j | <0.18 (ND) | 0.158 | 0.0611 | 0.0707 | <0.0886 (ND) | 0.043075 | 0.0587 |
| Nickel | c, nv | 10.4 | <5 (ND) | <10 (ND) | 7.1 | <10 (ND) | 5.9 | 5.1 | 18.2 | 13.1 | 10.5 | 32.5 | 27.3 | 19.9 |
| Silver | nc, nv | <0.211 (ND) | <1 (ND) | <1 (ND) | <1 (ND) | <1 (ND) | <1 (ND) | <1 (ND) | <0.215 (ND) | <0.103 (ND) | 0.152 | <0.221 (ND) | <0.108 (ND) | 0.155 |

Notes:
mg/Kg = milligram per kilogram or parts per million (ppm).
<# (ND) = not detected at or above the laboratory method reporting limit shown.
NE = not established.
— = not analyzed or not applicable.
c = carcinogenic
nc = noncarcinogenic
v = volatile
nv = nonvolatile

**Table B2 Gramor Initial Ecological Risk-Based Screening for Blended Average Finished Water Line Soil**

| Chemical Of Interest | Number of Analyses | Number of Detections | Frequency of Detection | Minimum Detected Concentration (mg/kg) | Maximum Detected Concentration (mg/kg) | Exposure Point Concentration* (mg/kg) | Minimum Sample Reporting Limit (mg/kg) | Maximum Sample Reporting Limit (mg/kg) | Minimum Soil Ecological Risk-Based Screening Concentration (mg/kg) | Background/ Reference Concentration (mg/kg) | Exceeds 5% Frequency of Detection? | Reporting Limit Too High For Ecological Receptors? | Maximum Concentration Exceeds Background? | Ecological Chemical of Interest? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Metals** | | | | | | | | | | | | | | |
| Arsenic, total | 1 | 1 | 100% | 3.30E+00 | 3.30E+00 | 3.30E+00 | Not Applicable | Not Applicable | 6.80E+00 | 8.80E+00 | Yes | No | No | No |
| Barium | 1 | 1 | 100% | 1.56E+02 | 1.56E+02 | 1.56E+02 | Not Applicable | Not Applicable | 1.10E+02 | 7.90E+02 | Yes | No | No | No |
| Beryllium | 1 | 1 | 100% | 5.80E-01 | 5.80E-01 | 5.80E-01 | Not Applicable | Not Applicable | 2.50E+00 | 2.00E+00 | Yes | No | No | No |
| Cadmium | 1 | 0 | 0% | Not Detected | Not Detected | 1.52E-01 | 1.52E-01 | 1.52E-01 | 2.70E-01 | 6.30E-01 | No | No | No | No |
| Chromium III | 1 | 1 | 100% | 2.61E+01 | 2.61E+01 | 2.61E+01 | Not Applicable | Not Applicable | 4.00E-01 | 7.60E+01 | Yes | No | No | No |
| Copper | 1 | 1 | 100% | 1.49E+01 | 1.49E+01 | 1.49E+01 | Not Applicable | Not Applicable | 1.40E+01 | 3.40E+01 | Yes | No | No | No |
| Lead | 1 | 1 | 100% | 1.54E+01 | 1.54E+01 | 1.54E+01 | Not Applicable | Not Applicable | 1.10E+01 | 7.90E+01 | Yes | No | No | No |
| Mercury | 1 | 1 | 100% | 7.07E-02 | 7.07E-02 | 7.07E-02 | Not Applicable | Not Applicable | 1.30E-02 | 2.30E-01 | Yes | No | No | No |
| Nickel | 1 | 1 | 100% | 1.05E+01 | 1.05E+01 | 1.05E+01 | Not Applicable | Not Applicable | 1.00E+01 | 4.70E+01 | Yes | No | No | No |
| Silver | 1 | 0 | 0% | Not Detected | Not Detected | 1.52E-01 | 1.52E-01 | 1.52E-01 | 2.60E+00 | 8.20E-01 | No | No | No | No |
| **Pesticides/Polychlorinated Biphenyls (PCBs)/Dioxins** | | | | | | | | | | | | | | |
| 2,4-Dichlorophenoxyacetic acid | 1 | 0 | 0% | Not Detected | Not Detected | 3.85E-02 | 3.85E-02 | 3.85E-02 | 2.00E+01 | Not Applicable | No | No | No | No |
| Aldrin | 1 | 0 | 0% | Not Detected | Not Detected | 2.30E-03 | 2.30E-03 | 2.30E-03 | 8.50E-05 | Not Applicable | No | No | No | No |
| Chlordane | 1 | 0 | 0% | Not Detected | Not Detected | 2.30E-03 | 2.30E-03 | 2.30E-03 | 2.70E-01 | Not Applicable | No | No | No | No |
| DDD | 1 | 1 | 100% | 2.60E-03 | 2.60E-03 | 2.60E-03 | Not Applicable | Not Applicable | 2.00E-02 | Not Applicable | Yes | No | No | No |
| DDE | 1 | 1 | 100% | 1.53E-02 | 1.53E-02 | 1.53E-02 | Not Applicable | Not Applicable | 2.00E-02 | Not Applicable | Yes | No | No | No |
| DDT | 1 | 1 | 100% | 1.38E-02 | 1.38E-02 | 1.38E-02 | Not Applicable | Not Applicable | 2.00E-02 | Not Applicable | Yes | No | No | No |
| Dieldrin | 1 | 1 | 100% | 6.90E-03 | 6.90E-03 | 6.90E-03 | Not Applicable | Not Applicable | 4.50E-03 | Not Applicable | Yes | No | **Yes** | **Yes** |
| Endosulfan | 1 | 0 | 0% | Not Detected | Not Detected | 2.30E-03 | 2.30E-03 | 2.30E-03 | 6.40E-01 | Not Applicable | No | No | No | No |
| Endrin | 1 | 0 | 0% | Not Detected | Not Detected | 2.30E-03 | 2.30E-03 | 2.30E-03 | 1.40E-03 | Not Applicable | No | No | No | No |
| Heptachlor | 1 | 0 | 0% | Not Detected | Not Detected | 2.30E-03 | 2.30E-03 | 2.30E-03 | 2.70E-01 | Not Applicable | No | No | No | No |
| Heptachlor epoxide | 1 | 0 | 0% | Not Detected | Not Detected | 2.30E-03 | 2.30E-03 | 2.30E-03 | 2.70E-01 | Not Applicable | No | No | No | No |
| Heptachlor epoxide | 1 | 0 | 0% | Not Detected | Not Detected | 2.30E-03 | 2.30E-03 | 2.30E-03 | 2.70E-01 | Not Applicable | No | No | No | No |
| Toxaphene | 1 | 0 | 0% | Not Detected | Not Detected | 1.87E-01 | 1.87E-01 | 1.87E-01 | 5.90E+00 | Not Applicable | No | No | No | No |

**Notes:**
kg = kilograms
mg = milligrams

**Table B3 Gramor Initial Ecological Risk-Based Screening for Blended Average Bull Run Infiltration Soil**

| Chemical Of Interest | Number of Analyses | Number of Detections | Frequency of Detection | Minimum Detected Concentration (mg/kg) | Maximum Detected Concentration (mg/kg) | Exposure Point Concentration* (mg/kg) | Minimum Sample Reporting Limit (mg/kg) | Maximum Sample Reporting Limit (mg/kg) | Minimum Soil Ecological Risk-Based Screening Concentration (mg/kg) | Background/ Reference Concentration (mg/kg) | Exceeds 5% Frequency of Detection? | Reporting Limit Too High For Ecological Receptors? | Maximum Concentration Exceeds Background/ Screening Concentration? | Ecological Chemical of Interest? |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Metals** | | | | | | | | | | | | | | |
| Arsenic, total | 1 | 1 | 100% | 4.08E+00 | 4.08E+00 | 4.08E+00 | Not Applicable | Not Applicable | 6.80E+00 | 8.80E+00 | Yes | No | No | No |
| Barium | 1 | 1 | 100% | 1.81E+02 | 1.81E+02 | 1.81E+02 | Not Applicable | Not Applicable | 1.10E+02 | 7.90E+02 | Yes | No | No | No |
| Beryllium | 1 | 1 | 100% | 7.10E-01 | 7.10E-01 | 7.10E-01 | Not Applicable | Not Applicable | 2.50E+00 | 2.00E+00 | Yes | No | No | No |
| Cadmium | 1 | 0 | 0% | Not Detected | Not Detected | 1.55E-01 | 1.55E-01 | 1.55E-01 | 2.70E-01 | 6.30E-01 | No | No | No | No |
| Chromium III | 1 | 1 | 100% | 3.65E+01 | 3.65E+01 | 3.65E+01 | Not Applicable | Not Applicable | 4.00E-01 | 7.60E+01 | Yes | No | No | No |
| Copper | 1 | 1 | 100% | 2.24E+01 | 2.24E+01 | 2.24E+01 | Not Applicable | Not Applicable | 1.40E+01 | 3.40E+01 | Yes | No | No | No |
| Lead | 1 | 1 | 100% | 1.31E+01 | 1.31E+01 | 1.31E+01 | Not Applicable | Not Applicable | 1.10E+01 | 7.90E+01 | Yes | No | No | No |
| Mercury | 1 | 1 | 100% | 5.87E-02 | 5.87E-02 | 5.87E-02 | Not Applicable | Not Applicable | 1.30E-02 | 2.30E-01 | Yes | No | No | No |
| Nickel | 1 | 1 | 100% | 1.99E+01 | 1.99E+01 | 1.99E+01 | Not Applicable | Not Applicable | 1.00E+01 | 4.70E+01 | Yes | No | No | No |
| Silver | 1 | 0 | 0% | Not Detected | Not Detected | 1.55E-01 | 1.55E-01 | 1.55E-01 | 2.60E+00 | 8.20E-01 | No | No | No | No |
| **Pesticides/Polychlorinated Biphenyls (PCBs)/Dioxins** | | | | | | | | | | | | | | |
| 2,4-Dichlorophenoxyacetic acid | 1 | 0 | 0% | Not Detected | Not Detected | 3.72E-02 | 3.72E-02 | 3.72E-02 | 2.00E+01 | Not Applicable | No | No | No | No |
| Aldrin | 1 | 0 | 0% | Not Detected | Not Detected | 2.30E-03 | 2.30E-03 | 2.30E-03 | 8.50E-05 | Not Applicable | No | No | No | No |
| Chlordane | 1 | 0 | 0% | Not Detected | Not Detected | 2.30E-03 | 2.30E-03 | 2.30E-03 | 2.70E-01 | Not Applicable | No | No | No | No |
| DDD | 1 | 1 | 100% | 2.70E-03 | 2.70E-03 | 2.70E-03 | Not Applicable | Not Applicable | 2.00E-02 | Not Applicable | Yes | No | No | No |
| DDE | 1 | 1 | 100% | 1.77E-02 | 1.77E-02 | 1.77E-02 | Not Applicable | Not Applicable | 2.00E-02 | Not Applicable | Yes | No | No | No |
| DDT | 1 | 1 | 100% | 1.67E-02 | 1.67E-02 | 1.67E-02 | Not Applicable | Not Applicable | 2.00E-02 | Not Applicable | Yes | No | No | No |
| Dieldrin | 1 | 1 | 100% | 1.23E-02 | 1.23E-02 | 1.23E-02 | Not Applicable | Not Applicable | 4.50E-03 | Not Applicable | Yes | No | **Yes** | **Yes** |
| Endosulfan | 1 | 0 | 0% | Not Detected | Not Detected | 2.30E-03 | 2.30E-03 | 2.30E-03 | 6.40E-01 | Not Applicable | No | No | No | No |
| Endrin | 1 | 0 | 0% | Not Detected | Not Detected | 2.30E-03 | 2.30E-03 | 2.30E-03 | 1.40E-03 | Not Applicable | No | No | No | No |
| Heptachlor | 1 | 0 | 0% | Not Detected | Not Detected | 2.30E-03 | 2.30E-03 | 2.30E-03 | 2.70E-01 | Not Applicable | No | No | No | No |
| Heptachlor epoxide | 1 | 0 | 0% | Not Detected | Not Detected | 2.30E-03 | 2.30E-03 | 2.30E-03 | 2.70E-01 | Not Applicable | No | No | No | No |
| gamma-Hexachlorocyclohexane (Lindane) | 1 | 0 | 0% | Not Detected | Not Detected | 2.30E-03 | 2.30E-03 | 2.30E-03 | 1.00E+01 | Not Applicable | No | No | No | No |
| Toxaphene | 1 | 0 | 0% | Not Detected | Not Detected | 1.87E-01 | 1.87E-01 | 1.87E-01 | 5.90E+00 | Not Applicable | No | No | No | No |

**Notes:**
kg = kilograms
mg = milligrams