



## Periodic Review

Lilyblad (Pacific Functional Fluids)

2244 Port of Tacoma Rd

Tacoma, WA 98421

Facility Site ID#: 1239

Cleanup Site ID#: 4329

Headquarters, Industrial Section

September 2022

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## 1.0 INTRODUCTION

This document is a review by the Washington State Department of Ecology (Ecology) of post-cleanup Site conditions and monitoring data to assure human health and the environment are being protected at the Lilyblad Site (Site). Cleanup at this Site was implemented under the Model Toxics Control Act (MTCA) regulations, Chapter 173-340 Washington Administrative Code (WAC).

Cleanup activities at this Site are being conducted by Ecology. The cleanup actions resulted from concentrations of volatile organic compounds, semi-volatile organic compounds, and petroleum hydrocarbons remaining at the Site that exceed MTCA cleanup levels. The MTCA cleanup levels for soil are established under WAC 173-340-740. The MTCA cleanup levels for groundwater are established under WAC 173-340-720.

WAC 173-340-420(2) requires Ecology to conduct a periodic review of a Site every five years under certain specific conditions. The conditions that apply to this site are:

1. Whenever the department conducts a cleanup action; and
2. Where, in the department's judgment, modifications to assumptions using Site-specific information would significantly increase the concentration of hazardous substances remaining at the Site after cleanup.

When evaluating whether human health and the environment are being protected, the factors Ecology shall consider include [WAC 173-340-420(4)]:

- (a) The effectiveness of ongoing or completed cleanup actions, including the effectiveness of engineered controls and institutional controls in limiting exposure to hazardous substances remaining at the Site,
- (b) New scientific information for individual hazardous substances or mixtures present at the Site,
- (c) New applicable state and federal laws for hazardous substances present at the Site,
- (d) Current and projected Site use,
- (e) Availability and practicability of higher preference technologies; and
- (f) The availability of improved analytical techniques to evaluate compliance with cleanup levels.

Ecology shall publish a notice of all periodic reviews in the Site Register and provide an opportunity for public comment.

## 2.0 SUMMARY OF SITE CONDITIONS

### 2.1 Site History

The first commercial use of the facility was in the 1960's, Lilyblad Petroleum Inc. (Lilyblad) began operation at the facility in 1972 as a distributor of gasoline, diesel, solvents, and packaged petroleum products. Throughout the history of the facility, Lilyblad became involved in various recycling operations, including recycling of spent solvent and waste fuels. The recycling operations ended in March 1988.

Ecology named Lilyblad and its partner Sol Pro as the potentially liable persons (PLPs) and entered into an Agreed Order in 1995. Under the Agreed Order and subsequent amendments, Lilyblad conducted the remedial investigation (RI), interim actions, and pilot testing at the site. In 2006, Lilyblad as a company was dissolved (Sol Pro was also no longer in business). Ecology prepared a feasibility study and issued a cleanup action plan (CAP) in 2007. In 2009, Ecology entered a settlement with Lilyblad and took over the site cleanup. Ecology implemented the CAP starting in 2009.

In 2003, Pacific Functional Fluids, LLC (PFF) purchased Lilyblad's assets, which included accounts receivable and inventory, equipment, and the water treatment system. PFF currently operates the facility to store, blend, repackage and distribute chemical and petroleum products. PFF does not receive, recycle, or treat dangerous waste.

As Lilyblad was dissolved, M&G Holdings LLC currently owns the property.

### 2.2 Site Investigations

Past activities by Lilyblad (spent solvent and waste fuels recycling) resulted in the releases of hazardous substances to the soil and groundwater. Releases and potential releases of hazardous substance have been documented at the site since 1984. Numerous site investigation and sampling events have been conducted from 1999 to 2021. The results are summarized in the following reports:

- *Supplemental Remedial Investigation Report, Lilyblad Petroleum Inc.* (CH2M Hill, October 2004)
- *Interim Soil and Groundwater Sampling Event: MPE Treatment Area, PW Eagle Property, Lilyblad Pilot Test Areas* (Terra Vac, January 2006)
- *Site Remedy Report Review Report and Proposed Updated Focused Feasibility Study* (Geosyntec, April 2022)

## 2.3 Cleanup Levels

Cleanup levels (CULs) for the site are summarized below for soil and groundwater. These levels were originally evaluated in the 2004 Supplemental Remedial Investigation and formalized in the 2007 Cleanup Action Plan. Except for the TPH CULs, which are based on method A, the contaminants of concern (COCs) CULs were developed based on surface water criteria, which are typically more stringent than the method A or B levels that are protective of human health. Soil CULs were developed based on the groundwater CULs using estimated three phase partitioning in accordance with WAC 173-340-747.

| Chemical Group | Contaminant of Concern      | Soil CUL (µg/kg) | Groundwater CUL (µg/L) |
|----------------|-----------------------------|------------------|------------------------|
| VOC            | 1,1,1-trichloroethane       | 1,144            | 227                    |
| VOC            | 1,1,2-trichloroethane       | 54.1             | 16                     |
| VOC            | 1,1-dichloroethane          | 164,000          | 52,000                 |
| VOC            | 1,1-dichloroethene          | 7.9              | 1.93                   |
| VOC            | 1,2,4-trimethylbenzene      | 10,350,000       | 26,000                 |
| VOC            | 1,2-dichloroethane          | 100.6            | 37                     |
| VOC            | 1,4-dichlorobenzene         | 64.6             | 4.86                   |
| VOC            | Benzene                     | 75               | 22.7                   |
| VOC            | bis(2-ethylhexyl)phthalate  | 4,400            | 2.2                    |
| VOC            | cis-1,2-dichlorobenzene     | 14,880           | 5200                   |
| VOC            | Ethylbenzene                | 41,130           | 6910                   |
| VOC            | m,p-xylene                  | 58,400           | 26,000                 |
| VOC            | Methylene chloride          | 1,332            | 590                    |
| VOC            | Tetrachloroethene           | 24.5             | 3.3                    |
| VOC            | Toluene                     | 71,340           | 15,000                 |
| VOC            | Trichloroethene             | 121.7            | 30                     |
| VOC            | Vinyl chloride              | 7.91             | 2.4                    |
| SVOC           | Naphthalene                 | 115,900          | 4,940                  |
| SVOC           | Pentachlorophenol           | 37.97            | 3                      |
| SVOC           | 2-methylnaphthalene         | -                | 22.5                   |
| TPH            | Diesel range hydrocarbons   | 2,000,000        | 1000                   |
| TPH            | Gasoline range hydrocarbons | 100,000          | 1000                   |
| MOIL           | Motor oil                   | 2,000,000        | 1000                   |

## **2.4 Remedial Actions**

In 2009, Ecology's contractor implemented the CAP, including construction and operation of a dual vapor extraction (DPE) system. This system consists of a series of extraction wells and an onsite water treatment system. The system operated intermittently until 2019, when Ecology shut down the system to re-evaluate the site conditions.

Following the shutdown, Ecology identified a number of limitations of the DPE system. This includes the difficulty of installing additional extraction wells at active areas of the site, where contamination is suspected to remain. There are also uncertainties associated with the required funding for the continuous operations of the DPE and in permitting of the groundwater extraction volume needed to increase contaminant removal rates (see *2022 Site Remedy Report and Proposed Updated Focused Feasibility Study* for further details).

## **2.5 Environmental Covenant**

There is currently no environmental covenant for this property.

Because the site has an active facility (Pacific Functional Fluids), there are areas of suspected contamination that are not currently accessible for active remediation. As such, an environmental covenant is being considered in addition to active remediation, to protect human health and the environment. The environmental covenant will place restrictions on land and groundwater usage. A site monitoring plan and periodic review will be used to evaluate the effectiveness of the environmental covenant.

## **3.0 PERIODIC REVIEW**

### **3.1 Effectiveness of completed cleanup actions**

Based upon recent sampling results, some contaminants remain on site at levels above the groundwater and soil CULs, notably for TPHs (gasoline, motor oil, and diesel range), vinyl chloride, and 1,4-dichlorobenzene. The plumes appear to be mostly stable. The site is still paved to eliminate exposure to contaminated soils by ingestion and contact.

### **3.2 New scientific information for individual hazardous substances for mixtures present at the Site**

There is no new scientific information for the contaminants related to the Site.

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### **3.3 New applicable state and federal laws for hazardous substances present at the Site**

The cleanup at the Site was governed by Chapter 173-340 WAC (1996 ed.).

As mentioned above, except for the TPH CULs (which were based on method A), the COCs CULs were developed in 2004 based on surface water criteria, which are typically more stringent than the method A or B levels that are protective of human health. Since the CULs were developed, there have been changes to surface water criteria, method A and B screening levels, and the development of groundwater screening levels for the protection of human health via vapor intrusion to indoor air. As discussed below, current MTCA screening levels were reviewed as part of this report, and the 2004 CULs have been found to continue to remain protective of human health and the environment, given the current site conditions.

#### **3.3.1 Groundwater Cleanup Level Review**

In groundwater, monitoring data for the site has indicated a generally stable or decreasing plume that is limited in extent to the site and immediate vicinity and approximately 0.25 miles from the nearest surface water body, the Blair Waterway (see Appendix, Site and Vicinity Layout). Current MTCA groundwater screening levels were reviewed in relation to the 2004 CULs and site characteristics.

VOCs that remain at the site that could potentially pose a vapor intrusion risk are generally detected at a distance away from enclosed buildings and/or there are closer groundwater samples that are below the MTCA default vapor intrusion screening levels for the commercial worker scenario (see Appendix Figures 3f, 3h, and 3i for VOCs data). In addition, default vapor intrusion screening levels are generally similar or in the same range as the current CULs. Based on plume stability, locations of detections over screening levels, and the similarity of the vapor intrusion screening levels to the 2004 CULs, the 2004 CULs for the site are considered to be protective of human health via the vapor intrusion pathway.

The 2004 CULs were also reviewed in comparison to current surface water criteria. In some cases, the current surface water criteria are lower than the site CULs. However, given the plume stability and distance from Blair Waterway, the 2004 CULs are still considered protective for human health and the environment for the current site conditions.

MTCA method A and method B screening levels were not evaluated because they are based on drinking water criteria, which are not applicable to the site (Pacific Groundwater Group, 1998).

#### **3.3.2 Soil Screening Level Review**

In soil, TPH detections above screening levels are typically within the saturated zone or capillary fringe within the TPH groundwater plume (see Appendix, Figures 3b, 3c, and 3e). In addition, 1,4-dichlorobenzene, tetrachloroethene, and pentachlorophenol have been detected over soil CULs, established under assumption of a pathway for contaminants from soil to groundwater, then migration to surface water. However, wells near these locations have not shown exceedances of groundwater CULs developed to protect surface water in the Blair Waterway



(see Appendix, Figures 3a, 3d and 3g). This suggests that impacts to groundwater that could pose a threat to surface water are generally not occurring under the current site conditions.

In addition, the current method C screening levels are the same or higher than the 2004 CULs established for the site, indicating that the direct contact pathways remains protective. Therefore Ecology concludes that adjustment of the current soil CULs is not warranted.”

### **3.4 Current and projected Site use**

The Site is currently used for industrial purposes. There have been no changes in current or projected future Site or resource uses.

### **3.5 Availability and practicability of higher preference technologies**

The remedy implemented was DPE, which operated intermittently for about 10 years. Based on the evaluation in the *2022 Site Remedy Report Review Report and Proposed Updated Focused Feasibility Study*, this remedy will result in contamination remaining onsite above groundwater and soil CULs for an indeterminate time period. Other technologies were evaluated in the *2022 Site Remedy Report Review Report and Proposed Updated Focused Feasibility Study* to reduce the restoration timeframe. The report identified biosparge as the preferred alternative for future cleanup. Availability of improved analytical techniques to evaluate compliance with cleanup levels.

The analytical methods used at the time of the remedial action were capable of detection below selected Site cleanup levels. The presence of improved analytical techniques would not affect decisions or recommendations made for the Site.

### **3.6 CONCLUSIONS**

Soils and groundwater CULs have not been met at the standard point of compliance for the Site (see attached *2022 Site Remedy Review Report and Proposed Updated Focused Feasibility Study* for sampling results and data).

Review of the data and operations showed that the current DPE system has limitations, including:

- Inability to install and operate additional extraction wells at active areas of the site, where contamination is suspected to remain
- Uncertainty in permitting the discharge volume needed to increase groundwater extraction rate at the DPE wells
- Uncertainty in continuous operations needed to optimize contaminants removal

Based on this periodic review, an environmental covenant is considered to protect human health and the environment. A re-evaluation of the site remedy was completed in the *2022 Site Remedy Report Review Report and Proposed Updated Focused Feasibility Study* to evaluate if

there are more effective technologies other than DPE to better reduce the contaminants and shorten the restoration timeframe. Biosparge was selected as the preferred remedial alternative to replace DPE as the active remediation.

### **3.7 Next Review**

The next review for the Site will be scheduled five years from the date of this periodic review. If a different cleanup remedy and institutional controls are implemented, the next periodic review will be scheduled five years from the completion of those activities.

## REFERENCES

CH2M Hill, 2004. Supplemental Remedial Investigation Report – Lilyblad Petroleum. October.

Ecology, 1995. Agreed Order No. DE 95HS-2292 for Facility ID WAD027543032. Washington State Department of Ecology. 30 October.

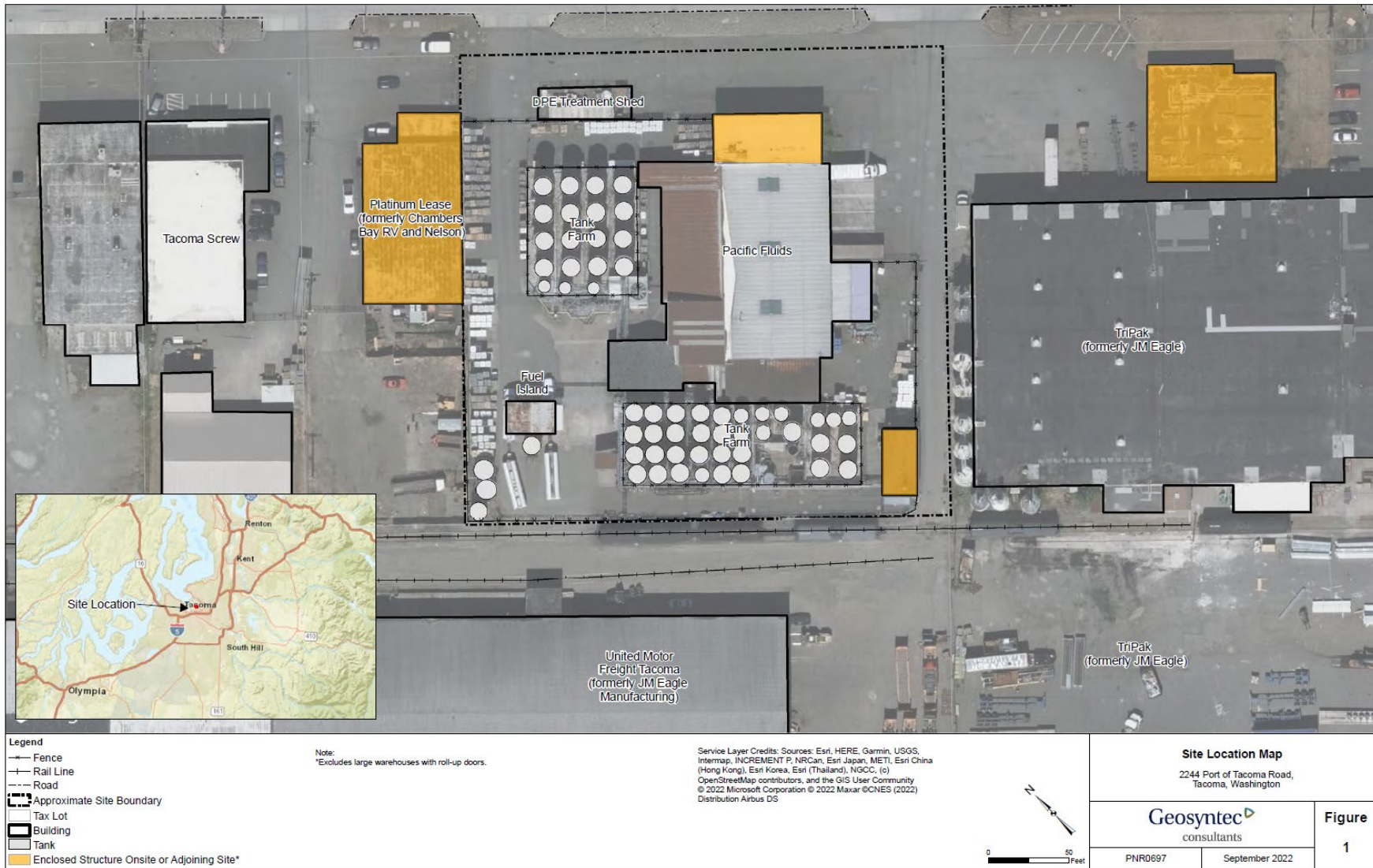
Geosyntec, 2022. Site Remedy Report Review Report and Proposed Updated Focused Feasibility Study. Lilyblad Cleanup Site. April.

Pacific Groundwater Group, 1998. Letter to Department of Ecology SWRO: Applicability of Human Drinking Water Cleanup Levels at the Lilyblad Cleanup Site. 28 October.

Terra Vac, 2006. Interim Soil and Groundwater Sampling Event: MPE Treatment Area, PW Eagle Property, Lilyblad Pilot Test Areas. January.

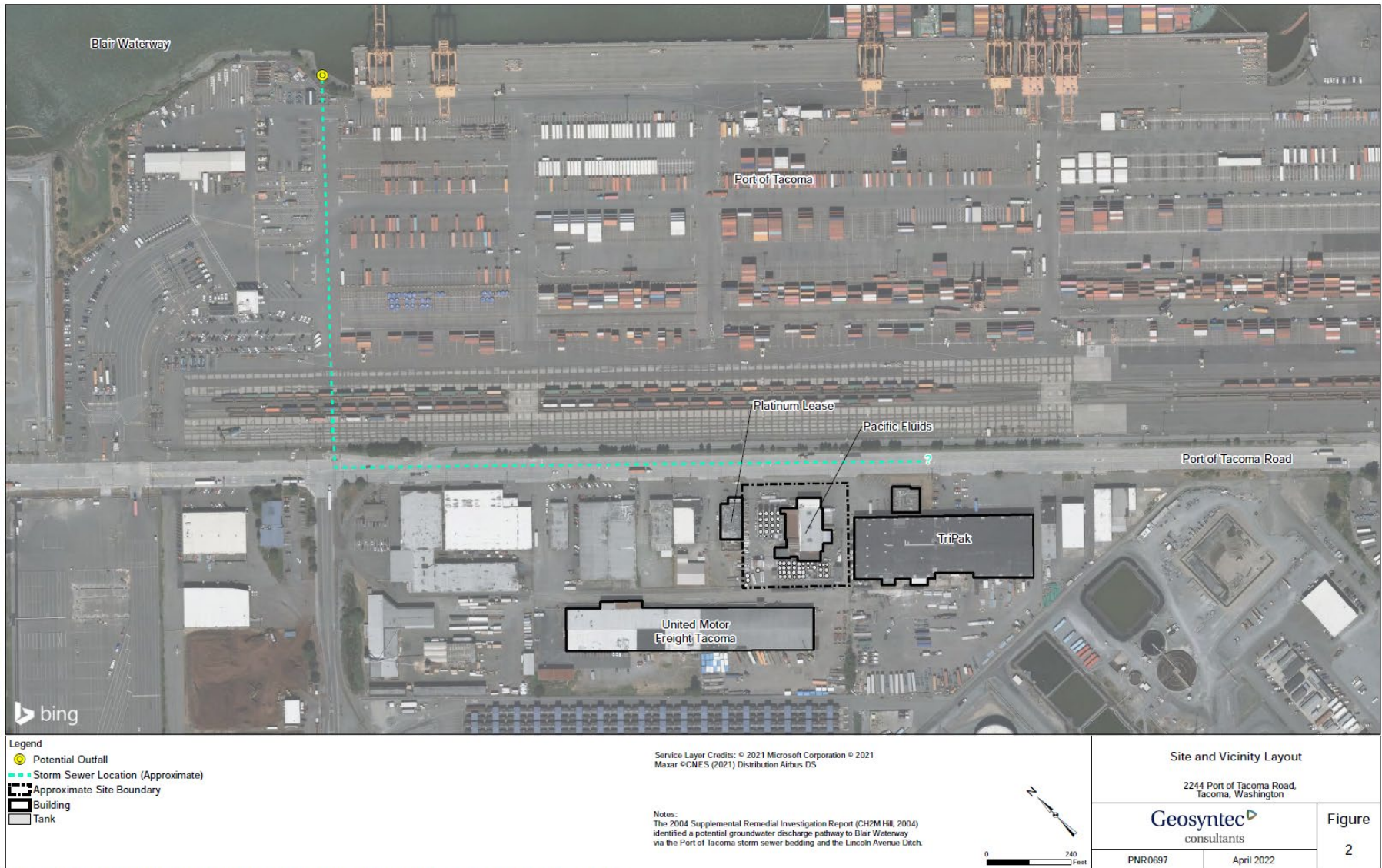
## **4.0 APPENDIX**

### **4.1 Site Location Map**



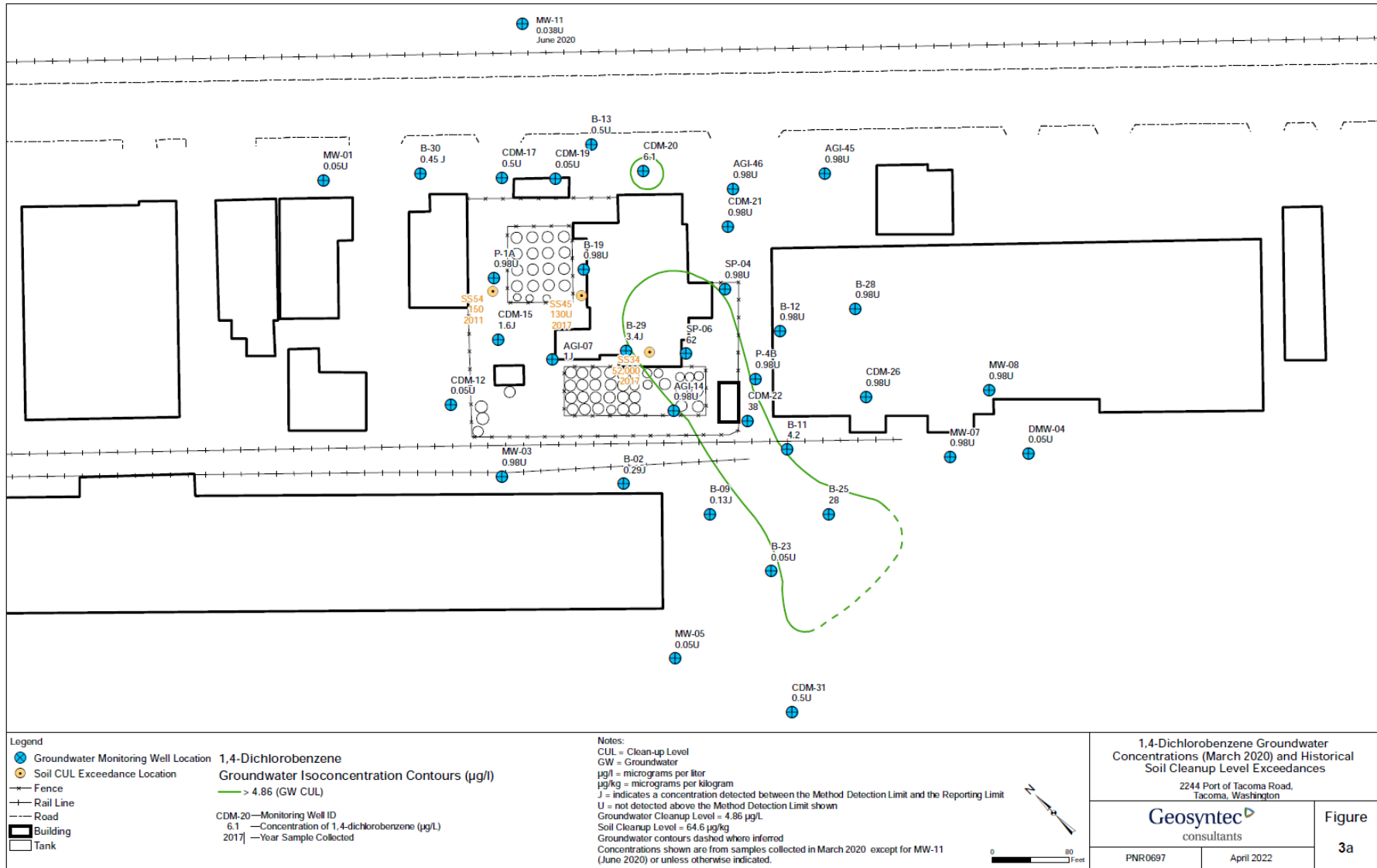


## 4.2 Site and Vicinity Layout

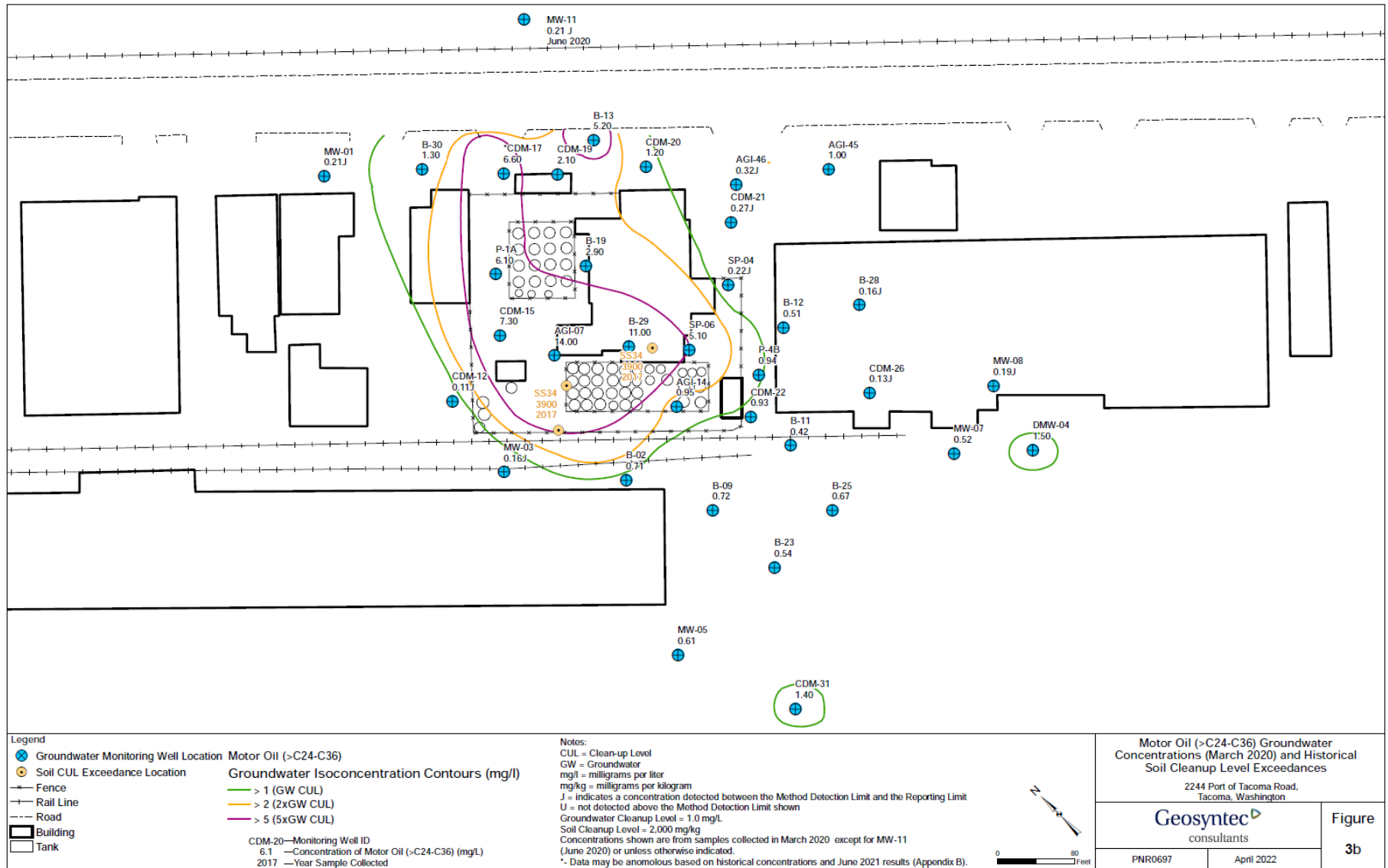


F:\Projects\Lilyblad\PNR0697\_LILYBLAD CLEANUP OMM\900 GIS and CAD\920 GIS\MXD\Site Review Report\Figure 2 Site Layout Map.mxd 10/13/2021 12:20:42 PM

### 4.3 Concentration Maps

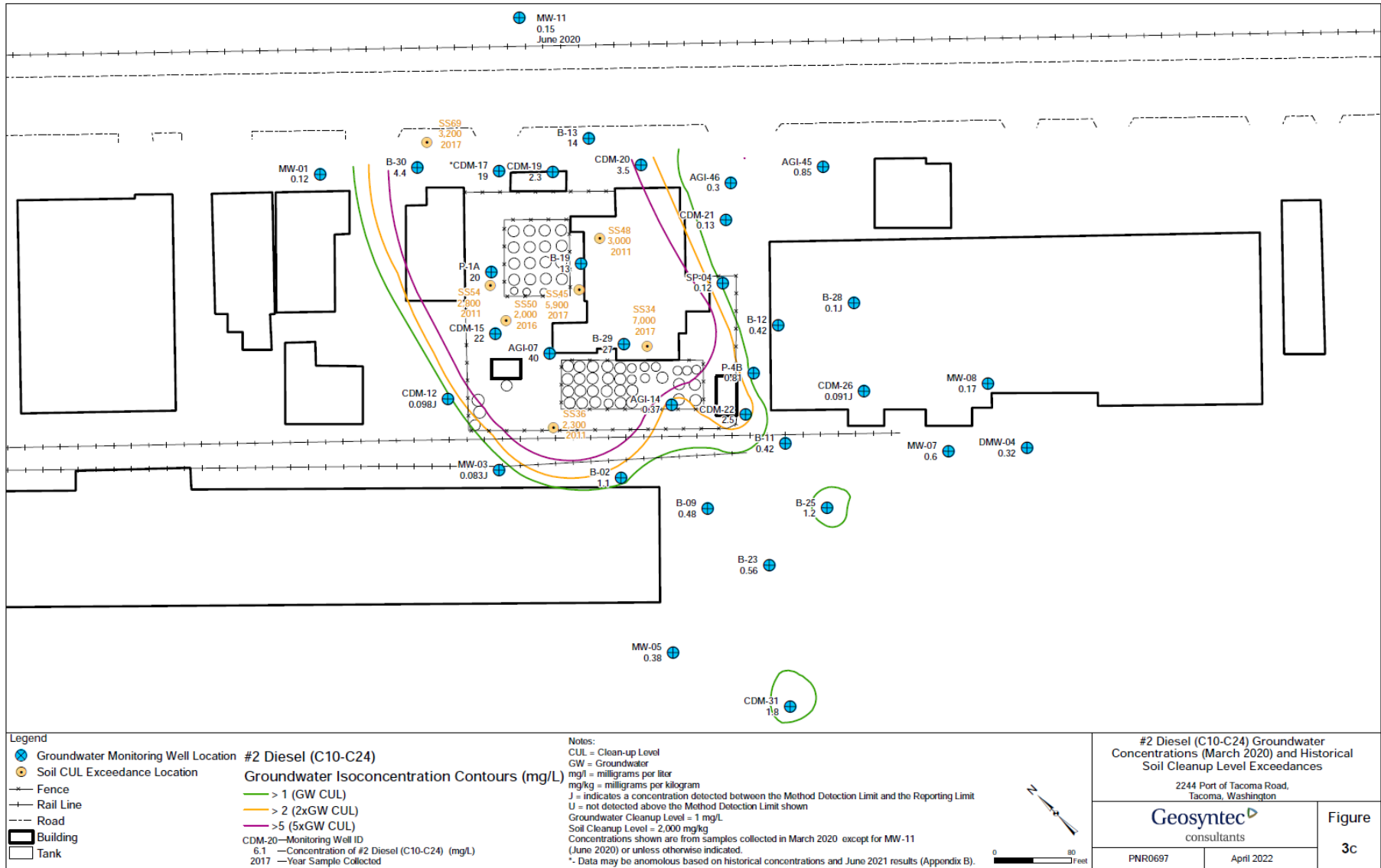


P:\Projects\Lilyblad\PNR0697\_LILYBLAD CLEANUP OMM\900 GIS and CAD\920 GIS\MXD\Site Review Report\Figure 6a Interpolated 1,4-Dichlorobenzene Concentrations2.mxd 10/13/2021 12:35:46 PM

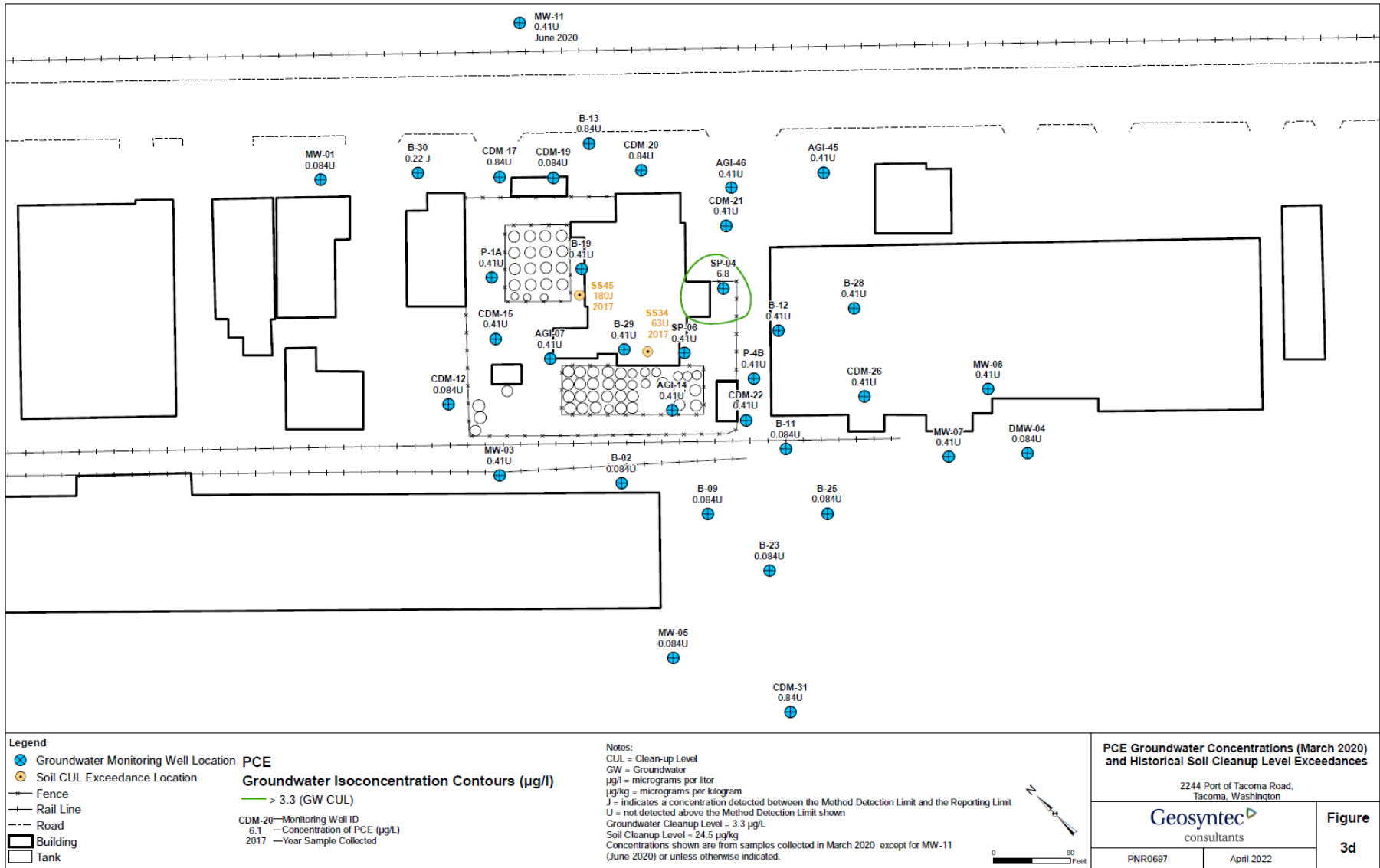


P:\Projects\Lilyblad\PNR0697\_LILYBLAD CLEANUP OMM\900 GIS and CAD\920 GIS\MXD\Site Review Report\Figure 5b Interpolated Motor Oil Concentrations.mxd 2/18/2022 10:45:56 AM

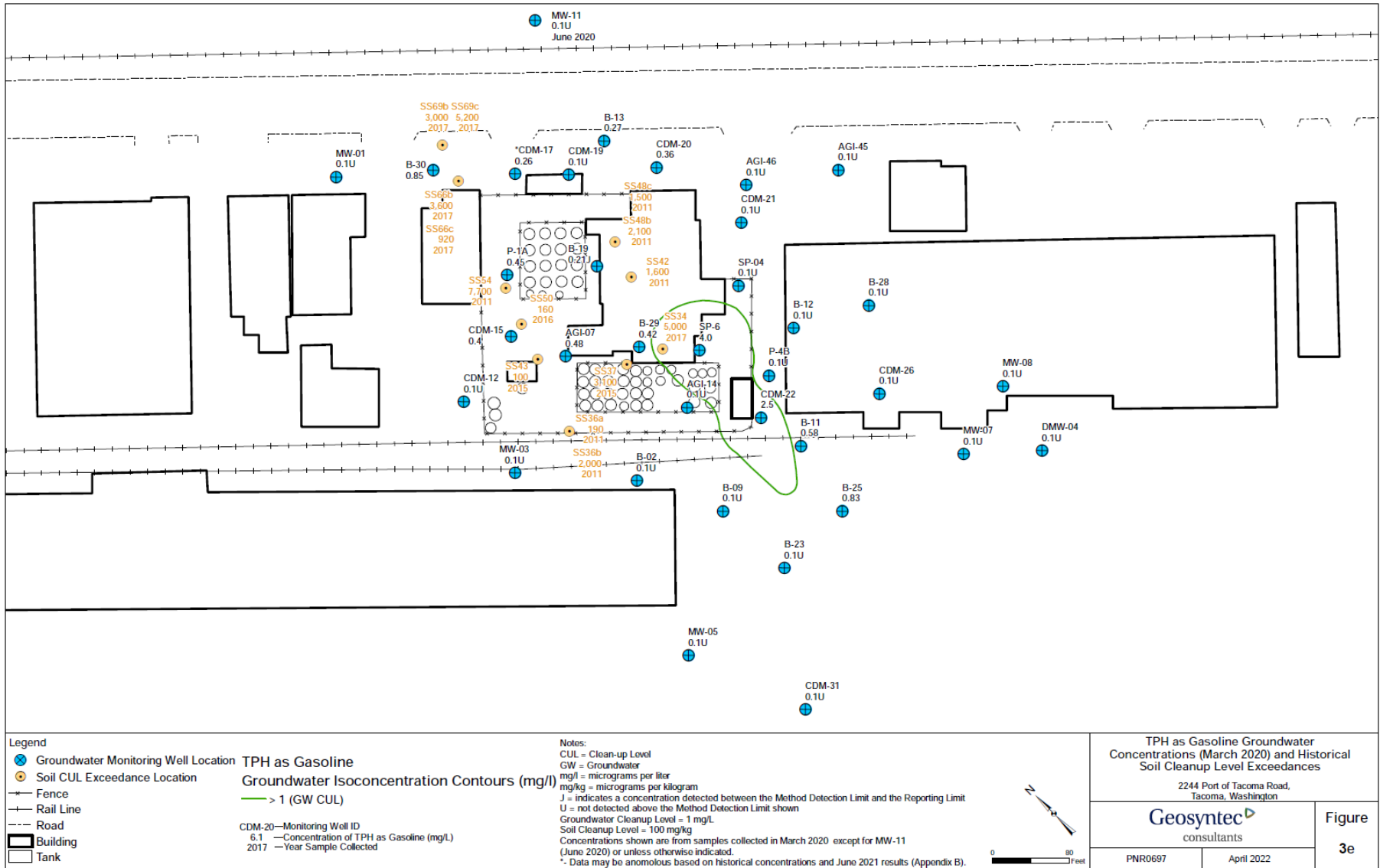




P:\Projects\Lilyblad\PNR0697\_LILYBLAD CLEANUP OMM\900 GIS and CAD\920 GIS\MXD\Site Review Report\Figure 3c Interpolated Diesel Concentration\2.mxd 2/17/2022 12:09:28 PM



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P:\Projects\Lilyblad\PNR0697\_LILYBLAD CLEANUP OMM\900 GIS and CAD\920 GIS\MXDs\Site Review Report\Figure 5e Interpolated TPH as Gasoline Concentrations2.mxd 2/18/2022 9:09:19 AM

