Appendix B

GROUNDWATER COMPLIANCE MONITORING PLAN

TRUCK CITY SITE PROPERTY
MOUNT VERNON, WASHINGTON

Prepared for
SKAGIT COUNTY
MOUNT VERNON, WASHINGTON
October 6, 2014
Project No. 0714.02.02

Prepared by
Maul Foster & Alongi, Inc.
WA 98225

GROUNDWATER COMPLIANCE MONITORING PLAN

TRUCK CITY SITE PROPERTY

The material and data in this plan were prepared under the supervision and direction of the undersigned.

MAUL FOSTER & ALONGI, INC.

_____

Yen-Vy Van, LHG
Senior Hydrogeologist

_____

Justin L. Clary, PE
Principal Engineer

_____

Jim Darling
Vice President, Principal Planner

CONTENTS

TABLES AND ILLUSTRATIONS

FOLLOWING PLAN:

TABLES

FIGURES

ACRONYMS AND ABBREVIATIONS

AEG	Associated Environmental Group, LLC
AGI	Applied Geotechnology, Inc.
bgs	below ground surface
BTEX	benzene, toluene, ethylbenzene, and total xylenes
COI	chemical of interest
the County	Skagit County, Washington
CUL	cleanup level
Ecology	Washington State Department of Ecology
ESA	environmental site assessment
IHS	indicator hazardous substance
MFA	Maul Foster & Alongi, Inc.
MTC	Materials Testing & Consulting, Inc.
MTCA	Model Toxics Control Act
NWTPH	Northwest Total Petroleum Hydrocarbons
POC	point of compliance
the Property	Truck City Site property
REL	remediation level
RI/FS	remedial investigation and feasibility study
TPH	total petroleum hydrocarbons
Truck City parcel	Skagit County parcel P29546
USEPA	U.S. Environmental Protection Agency
UST	underground storage tank
VOC	volatile organic compound
WAC	Washington Administrative Code

1 INTRODUCTION

This Compliance Monitoring Plan (CMP) presents the Washington State Department of Ecology's (Ecology) proposed ground water CMP for the Truck City site ("Site") (Facility Site ID: 2673, Cleanup Site ID: 5176). The Site is located at 3216 Old Highway 99 South, Mount Vernon in Skagit County, Washington (Figure 1). The Site, in combination with other adjacent parcels, is proposed for construction of the Skagit County jail. The proposed jail property (Property) comprises the following five parcels: Skagit County parcels P29546 (Truck City parcel) and four adjoining undeveloped parcels to the south, P119262, P119263, P119265, and P119267 (Figure 2). The parcels are owned by various parties, and Skagit County (the "County") has executed purchase and sale agreement(s) for the parcels. The Truck City parcel comprises the entire Site based on data available at this time. As part of that effort, the County is pursuing a Prospective Purchaser Consent Decree with the Washington State Department of Ecology (Ecology).

This plan has been prepared to meet the groundwater monitoring requirements specified in the cleanup action plan for the Site and was developed in accordance with the compliance monitoring requirements put forth in the Washington State Model Toxics Control Act (MTCA) (Washington Administrative Code [WAC] 173-340-410). The approach put forth in this plan is consistent with the Washington State Department of Ecology (Ecology)-approved draft Public Review Remedial Investigation and Feasibility Study (RI/FS) (MFA, 2014).

1.1 Purpose of Groundwater Compliance Monitoring Plan

The final remedy for the site, as described in the cleanup action plan (Ecology, 2014a), includes removal of contaminated soils, bioremediation, and natural attenuation.

The goals of this compliance monitoring plan are to:

- Identify existing and proposed replacement monitoring wells (to be installed after completion of petroleum-contaminated-soil excavation) for inclusion in the compliance monitoring network and provide criteria for siting and installing future monitoring wells.
- Describe cleanup levels (CULs) for use in existing and future monitoring wells.
- Provide guidelines and criteria for assessing compliance with CULs during the protection, performance, and confirmational stages of groundwater monitoring, including monitoring frequency.
- Identify contingent actions to be implemented in response to noncompliance with CULs and the criteria for triggering these actions.
- Provide criteria for decommissioning monitoring wells.

- Provide criteria for modifying the monitoring frequency, as a contingent action, in response to a change in the stage of monitoring, or in response to achievement of cleanup criteria.

Ecology has determined that the highest beneficial use of groundwater is protection of surface water. Groundwater CULs based on protection of surface water and the point of compliance (POC) at the site boundary were established in the Ecology-approved draft public review RI/FS (MFA, 2014).

Groundwater data collected at the site from 1989 to 2014 showed that selected indicator hazardous substance (IHS) concentrations, including gasoline- and diesel-range total petroleum hydrocarbons (TPH) and benzene, exceed MTCA Method A CULs within the site boundary (MFA, 2014). These findings support the use of sentinel wells at the site boundary for monitoring CUL compliance at the POC.

2 BACKGROUND

2.1 Site Description

The Site is located in section 32, township 34 north, range 4 east, of the Willamette Meridian. The Property comprises five rectangular parcels: the Truck City parcel, an 8.01-acre tax parcel; two 1.0-acre tax parcels (parcel numbers P119262 and P119263); a 1.75-acre tax parcel (parcel number P119265); and a 1.88-acre tax parcel (parcel number P119267) (refer to Figure 2). The Property's surface topography is generally flat. Access to the Site/Property is from Old Highway 99 South, adjacent to the west property boundary.

Fifteen former underground storage tank (UST) locations were identified at the Truck City Site. Historical UST nests include the northern UST and southern UST nests, which had housed four USTs and three USTs, respectively (Figure 2). These USTs were decommissioned and removed in 1993, during an interim remedial action conducted by Ecology (Ecology, 1993). The USTs had a capacity of 5,000 gallons each. The current and only operational UST nest at the Site is the eastern UST nest, which houses three 5,000-gallon gasoline USTs and one 15,000-gallon diesel UST. This UST system was upgraded in 1998. Two 500-gallon USTs, located between the diesel pump islands and the gasoline pump islands, and a former septic tank, used as a waste oil tank, were also decommissioned and removed during the interim removal action. Additionally, a UST, of unknown size (and presumably a former heating oil tank), may be located beneath the retail store footprint. This UST reportedly was decommissioned in place. Figure 3 presents the Site's features and previous environmental investigation features.

The Property is currently zoned "Public." The City of Mt. Vernon has designated the proposed county jail as an Essential Public Facility. The Truck City parcel contains six buildings associated with the commercial operations of the gas station, truck stop and truck wash, restaurant, and retail store. Five of the buildings—the contractor's staging shop, office space, truck wash building, retail

store, and restaurant/café—were constructed in 1978. The building currently used for storage was constructed in 1957.

The gas station pump islands, fueling facilities, and truck scale (weigh station) are located in the western area of the Truck City parcel. The diesel pump islands and the Truck City parcel's current operational USTs are located in the central area of the parcel, adjacent south of the truck wash building. Long-term truck parking is designated in the east area of the parcel. Figure 4 presents the Property's current site features and recent investigation locations.

2.2 Site History

Archival records indicate that the vicinity once was, generally, rural farmland with local residences. The Property was developed by 1953 and operated as a truck stop and restaurant until the truck stop burned in 1976. The parcel was redeveloped to its current configuration in 1978, and operations have not significantly changed since then. Several subsurface investigations were conducted at the Property between 1989 and 2014. Ecology completed an interim soil remedial cleanup action in 1993.

2.3 Previous Investigations

Site investigations have been conducted on the Property since 1989 to assess potential petroleum-hydrocarbon impacts related to the operation of the retail gasoline station. Applied Geotechnology, Inc. (AGI) conducted a hydrocarbon assessment of the Property in 1989. AGI advanced eight borings, to approximately 15 to 20 feet below ground surface (bgs), adjacent to the northern, southern, and eastern UST nests; gasoline and diesel pump islands; and truck wash area. Six of the borings were completed as 2-inch-diameter monitoring wells. AGI concluded that soil and groundwater gasoline and diesel petroleum hydrocarbon contamination was present around the northern and southern UST nests, and the potential exists for off-site migration of these chemicals of interest (COIs). Detected concentrations of gasoline- and diesel-range TPH and associated petroleum fuel volatile organic compounds (VOCs), specifically benzene, toluene, and total xylenes, are above Ecology's current MTCA Method A CULs. Groundwater flow direction at the Property was assessed to be west to southwesterly (AGI, 1989).

Ecology conducted an interim action cleanup in 1993. Seven USTs, 5,000 gallons in capacity each and located in the northern and southern UST nests, were decommissioned and removed, along with associated product lines. Two additional 500-gallon-capacity USTs, as well as a septic tank full of waste oil, were encountered during the contaminated-soil-excavation activities and were also removed. Ecology reported that, because the septic system had been used for waste oil disposal and was connected to the parcel's storm drain system, the septic tank may be one of the contaminant sources at this parcel (Ecology, 1993). The interim action removed 6,244 cubic yards of contaminated soil and 89,991 gallons of contaminated water. The impacted soil was placed on an on-site treatment pad in the northeastern area of the Property for aeration and biodegradation. Final confirmation samples from the stockpiled soil showed detections of gasoline-range TPH below CULs, with residual diesel-range TPH concentrations above CULs. The USTs were reported to be in good condition, with no holes. However, impacted soil was apparent in the excavation pit

(sidewalls and base of the excavation). A petroleum sheen was also observed in groundwater that had seeped into the pit. Ecology also reported the presence of free product in the form of fuel seeps from the excavation sidewalls (Ecology, 1993). The monitoring wells installed in the excavation area by AGI were destroyed during excavation activities. Ecology concluded that groundwater contamination at the Property may be an ongoing issue.

Associated Environmental Group, LLC (AEG) conducted a site characterization of the Property in 2005. Eleven borings were advanced via a direct-push-probe drilling rig to depths ranging from approximately 5 to 8 feet bgs. The borings were placed in the perimeters north, east, and south of the pump islands and UST nests. Shallow soil and groundwater samples were collected at all borings. Analytical results for all samples indicated no detectable presence of petroleum hydrocarbons (AEG, 2005).

In 2005, an unknown volume of diesel was spilled at the Property when a truck driver filling a rig allowed an unattended fueling nozzle to fall out of the tank during fueling activities. The spill spread to a ditch (known as Maddox Creek), which is located adjacent to and east of the Property and flows south parallel to Old Highway 99 South to Hickox Road (approximately 0.68 mile south of the Property). This spill went unreported until the Ecology Spills Team traced the source back to the Truck City parcel (Ecology, Environmental Report Tracking System No. 546209, 2005). Sheen was observed in Maddox Creek. Ecology retained NRC Environmental Services to clean up the spill. Absorbent booms and pads were placed in Maddox Creek. Subsequently, Materials Testing & Consulting, Inc. (MTC) conducted sediment sampling in Maddox Creek, in the vicinity of the Property, to assess whether residual contamination remains in the creek. Based on current data the sediments in Maddox Creek no longer appear to be impacted by releases at the Site.

MTC conducted an initial Phase II environmental site assessment (ESA) in February 2014 and a supplemental ESA in March 2014. Eleven borings were advanced, via a direct-push-probe drilling rig, to a maximum depth of 15 feet bgs. The borings were located in and outside of the former excavation remediation area. Soil samples were collected from all borings for laboratory analyses. One groundwater sample was collected from a boring placed south of the former UST nests in the western area of the Truck City parcel. MTC assessed the condition of several remaining monitoring wells at the Property and concluded that most wells were inaccessible or unusable (MTC, 2014a). A secondary groundwater sample was collected from an existing well located north of the truck scale. Three surficial soil samples were also collected at adjoining parcels to the south. MTC concluded that the remediated area contained localized, residual soil contaminated with petroleum at concentrations below MTCA Method A CULs. However, impacted soil, at concentrations above MTCA CULs for gasoline- and diesel-range TPH, was documented adjacent to the truck scale (MTC, 2014b). Laboratory analytical results for the two groundwater samples indicated no detectable TPH in the gasoline and diesel ranges or associated VOCs, specifically benzene, toluene, ethylbenzene, and total xylenes (BTEX).

2.4 Point of Compliance

For groundwater, the POC is the point or points where the groundwater CULs must be attained for a site to be in compliance with the cleanup standards. Groundwater CULs shall be attained in all

groundwaters from the POC to the outer boundary of the hazardous-substance plume. A conditional POC for groundwater is not proposed for the Property at this time.

POCs at the site will include all existing monitoring wells. Sentinel wells will include wells TC-1, TC-2, TC-4, and TC-6. The remaining wells, TC-3 and TC-5, are located at the former source areas. Site CULs, based on protection of surface water, apply at the POC. Compliance monitoring will be conducted at all monitoring wells, TC-1 through TC-6, to evaluate compliance with CULs at the former source areas and downgradient of these areas, near the southern and western perimeter of the Truck City parcel.

Sentinel wells will be used to evaluate whether groundwater at the downgradient POC is in compliance with CULs. IHS concentrations in groundwater at or below action levels will not exceed CULs at the POC. RELs are discussed in Section 4 of this plan. Sentinel wells are designated to allow monitoring between the former source areas and the property boundary of the Truck City parcel.

The fuel spill in 2005 was remediated, and sediment sampling in Maddox Creek at locales downgradient of the Site indicated cleanup activities were completed in accordance with MTCA. Based on current data the sediments in Maddox Creek no longer appear to be impacted by releases at the Site.

3 CONCEPTUAL SITE MODEL

The following is a summary of the investigation findings and the resultant conceptual site model as presented in the draft public review RI/FS (MFA, 2014).

3.1 Geology and Hydrogeology

The Property and vicinity have been mapped as recent alluvium and artificial fill. Alluvium deposits encountered at the Property, at locations of investigation, consist of floodplain sequences ranging from fluvial silty sand and well sorted sand, to silt with intervening clay. Fill, comprising sandy gravel to gravelly silty sand, was generally present to approximately 3 to 5 feet bgs at the Truck City parcel, except in the former UST nests, where soil remedial cleanup action by Ecology in 1993 overexcavated this area to approximately 9.5 feet bgs. A cross section transect of the Property and a corresponding geologic cross section are presented in Figures 5 and 6, respectively.

The matrix of the unconfined shallow aquifer appears to be silty sand. Depth to groundwater, encountered during subsurface exploration activities, was variable throughout the Property, ranging approximately from 3.5 to 9.5 feet bgs. The static water level at completed monitoring wells TC-1 through TC-6, at the Truck City parcel, ranged approximately from 5.80 to 6.45 feet bgs during the groundwater monitoring and sampling event conducted on July 18, 2014. The direction of groundwater migration at the Property during the July 2014 groundwater event, based on

professionally surveyed elevations at monitoring wells TC-1 through TC-6, is generally to the south-southeast, with tangent to the west (refer to Figure 7).

AGI reported a west-to-southwesterly groundwater flow direction at the Property during their investigation in October 1989, based on water levels measured from installed monitoring wells. Seasonal groundwater flow direction fluctuations are expected at the Property and vicinity because of the shallow depth to groundwater in the floodplain area. The local and regional discharge points in the area appear to be to the west-southwest, toward Britt Slough and the Skagit River. At their closest points, Britt Slough and the Skagit River are located approximately 0.5 mile and 1.5 mile, respectively, west of the Property. Maddox Creek, located adjacent east of the Property, flows south, parallel to Old Highway 99 South; intersects at Hickox Road; and flows west from this intersection.

3.2 Source and Nature and Extent of Residual Contamination

Based on historical and MFA's recent subsurface investigations, the source of soil and groundwater contamination is the historical operation of a gasoline station at the Truck City parcel.

IHSs identified for site soil include gasoline-range TPH and ethylbenzene (Table 1). IHSs identified for site groundwater are:

- Gasoline-range TPH
- Diesel-range TPH
- Benzene

The selected remedy for the site addresses these IHSs. There is residual soil contamination on the Truck City parcel adjacent south of the former northern UST nest, in the vicinity of boring TCBH-3 and adjacent east of the truck scale (Figure 8). Site data indicate IHS concentrations exceeding CULs in groundwater adjacent to the former southern and northern UST nests (borings TCBH-1 and TCBH-3, respectively) and the former septic waste oil tank (well TC-5) (MFA, 2014).

Figure 9 and Table 2 show IHSs that were detected in groundwater at concentrations above their respective CULs, based on MFA's remedial investigation conducted in July 2014.

3.2.1.1 Groundwater Contamination

CUL exceedances were detected only in well TC-5 and at borings TCBH-1 and TCBH-3. These locales of investigation represent former source areas at the Truck City parcel. Total arsenic was detected above its CUL only at TC-2; however, in our professional opinion, this detection was due to the high level of turbidity in this groundwater sample, as concentrations of dissolved arsenic from TC-2 were below the CUL (Table 2).

In general, IHS concentrations in shallow groundwater at the Property show decreasing trends of TPH and benzene, based on a comparison and evaluation of historical analytical results from investigations conducted from 1989 through 2014. IHS impacts appear to be localized to the former source areas in the western area of the Truck City parcel.

3.3 Risk Evaluation

The Property is currently zoned "Public." Properties immediately adjacent to the site are largely composed of similar, large-lot commercial and light-industrial uses. The Truck City parcel currently contains two buildings. The northern building is used as the convenience store for the gasoline station. The southern building is a café. The remaining parcels of the Property are undeveloped. The footprint of the proposed county jail encompasses the central area of the Truck City parcel and adjoining southern parcels of the Property. The northwestern portion of the proposed jail will overlie a localized area of soil remediation for removal of historical residual contamination. Figure 10 presents an overlay of the proposed jail with respect to current residual-impacted areas at the Property.

Therefore, it is possible that persons will occupy this area of the Property at some time in the foreseeable future. Any future development will need to be protective of persons at the Property.

The following are potentially complete human health exposure pathways.

Commercial/construction/workers—there are currently no building structures at the localized impacted area at the Property. Therefore, there are no current commercial workers potentially exposed to COIs in soil. However, construction activities likely will be performed as part of site redevelopment. Construction workers could contact IHSs in soil at 0 to 15 feet bgs through incidental ingestion, dermal contact, and inhalation of impacted soil particulates. There is currently no potable water use at or near the Property and there are no known plans to develop this resource. In the future, potable water to the Property may be provided by the Skagit County Public Utility District No. 1, including water for any future development.

The impacted groundwater is shallow and localized. Future construction workers may be exposed to the impacted shallow groundwater through ingestion, dermal contact, and inhalation of chemicals volatilizing from groundwater, and appropriate protection of construction workers will be required.

Remedial action will be required to protect persons from potential exposure to volatile chemicals from the subsurface. Soil gas has the potential to migrate, and, without remedial action, persons in nearby future buildings could potentially be exposed to IHSs.

Note: this is an assessment of current potential exposure scenarios if the Property is not remediated before buildings are constructed. The intent of future cleanup actions and the subsequent recommended cleanup alternative is to remediate the soil and groundwater so that these scenarios are addressed and concerns are negated once buildings are constructed.

Following cleanup, the site will be used as an essential public facility and is anticipated to operate as the county jail.

There is no exposure by ecological receptors at the site. The site is covered by buildings, pavement, or other physical barriers that prevent plants or wildlife from being exposed.

3.4 Post-Remedial Action Conditions

The focus of the compliance groundwater monitoring discussed in this plan is to confirm that the site remedy is protective of groundwater. The primary objectives of the monitoring program are to provide early warning, via sentinel wells, of a potential change in groundwater conditions that could indicate that contaminants could potentially migrate off site (see Section 5 for further details). The surface water exposure pathway has been eliminated by the completed remedial actions associated with Maddox Creek. Monitoring will continue in accordance with this plan to ensure that groundwater protection continues.

4 CLEANUP LEVELS

The compliance monitoring program put forth in this plan relies on sentinel wells (TC-1, TC-2, TC-4, and TC-6) to provide early warning of a possible exceedance of groundwater CULs at the POC. CULs are based on MTCA Method A groundwater CULs (Table 3).

5 MONITORING PROGRAM

This section provides the monitoring program objectives and details, including selection of the monitoring network, stages of monitoring, and the sampling and analysis program.

5.1 Monitoring Objectives

The primary objectives of the groundwater-related remedial actions at the Truck City parcel are to reduce source area concentrations in groundwater, protect groundwater from further contamination, and prevent contaminant migration off site. The groundwater monitoring program will:

- Provide confirmation of the ongoing effectiveness of the site remedy.
- Ensure that CULs are met at the POC.
- Provide early warning, via sentinel wells, of a potential increase in source area groundwater concentrations.
- Prevent exceedances of CULs at the POC through implementation of contingency measures, if needed.

5.2 Monitoring Well Network

The compliance monitoring program relies on the use of sentinel wells (i.e., wells located near the groundwater source area, upgradient of the POC). The compliance monitoring network includes

existing wells TC-1 through TC-6 (Figure 11). Sentinel well locations are based on the following criteria:

- They are downgradient of the source area.
- They are situated to allow monitoring for compliance with CULs at the POC and to provide ongoing evaluation of the efficacy of the completed remedial action.

Well logs for TC-1 through TC-6 are provided in the appendix.

The following table summarizes the intended use for each well included in the compliance monitoring network.

Table 4 Compliance Monitoring Network

Monitoring Well	Well Type	Purpose
TC-1	Sentinel well	Assess compliance with CULs
TC-2	Sentinel well	Assess compliance with CULs
TC-3	Source area well	Evaluate remedy effectiveness and contaminant trends
TC-4	Sentinel well	Assess compliance with CULs
TC-5	Source area well	Evaluate remedy effectiveness and contaminant trends
TC-6	Sentinel well	Assess compliance with CULs

Sentinel wells will be monitored for compliance with CULs (see Section 4). The source area wells will be monitored to evaluate concentration trends in the source area and will also be monitored for compliance purposes (i.e., achievement of CULs or action levels).

5.2.1 Monitoring Well Installation

It is assumed that monitoring wells TC-4 and TC-5 will be removed as part of the soil excavation cleanup activities, i.e., excavation and removal of localized residual contamination. Replacement wells will be installed in either the same locations or in their vicinity to continue assessment of these locations on the Truck City parcel. The replacement monitoring wells will be installed in accordance with Washington State well construction standards (WAC 173-160). Soil descriptions and dispositions will be logged during well installations. Site characterization is complete and soil samples will not be collected for chemical analysis. Ecology will be notified within 30 days of the installation of replacement compliance network wells.

5.2.2 Monitoring Well Decommissioning

Inactive monitoring wells, which may include wells that are not included in the compliance monitoring network or compliance network wells that are deemed no longer needed for compliance monitoring (as discussed in the next section), may be decommissioned after consultation and with Ecology's approval. Ecology will be notified at least 30 days prior to well-decommissioning

activities. All active wells, and inactive wells that have not yet been decommissioned, will be maintained in order to meet the functional well standards put forth in the Washington State Minimum Standards for Construction and Maintenance of Wells (WAC 173-160). Monitoring well decommissioning will be completed by a licensed well driller in accordance with WAC 173-160.

5.3 Stages of Monitoring

Compliance monitoring at the site will be conducted in three stages in accordance with WAC 173-340-410. This section includes detailed information on each stage of monitoring, including:

- Monitoring frequency
- Data evaluation and compliance requirements and procedures
- Criteria for terminating the compliance monitoring program

The protection and performance monitoring stages will include all compliance network wells, which consist of source area wells and sentinel wells (see Section 5.2 and Figure 5); the confirmational monitoring stage will include only sentinel wells.

If an action level is exceeded in a sentinel well at any time during the monitoring program, then the contingency measures outlined in Section 6 of this plan will go into effect and will be conducted concurrently with other monitoring activities.

Source area wells will be monitored to assess IHS concentration trends in the source area for purposes of better understanding concentration and hydraulic gradients, but will not be used for determining compliance with cleanup requirements.

5.3.1 Protection Monitoring

Protection monitoring is conducted to confirm that human health and the environment are adequately protected during the construction, operation, and maintenance period of a remedial action.

Protection monitoring will be conducted on a quarterly basis for the first four to six quarters of the monitoring program and will involve the entire network of wells (TC-1 through TC-6).

Quarterly monitoring may begin, at the discretion of the property owner and operator, six to nine months after completion of remedial action. Monitoring of the other compliance network wells will continue on the approved schedule.

5.3.2 Performance Monitoring

Performance monitoring is conducted to confirm that the interim action or cleanup action has attained CULs established for the Truck City parcel. Protection monitoring and performance monitoring may be combined and will proceed to the confirmational monitoring stage.

Performance monitoring requirements include attaining four consecutive quarters of either detections below RELs or non-detects at the source area wells.

5.3.3 Confirmational Monitoring

Confirmational monitoring is conducted to confirm the long-term effectiveness of an interim action or cleanup action once CULs have been attained. The confirmational monitoring phase will begin after the performance monitoring requirements have been met (as discussed in the previous section). The monitoring program will be terminated once the confirmational monitoring requirements discussed below have been met.

During the confirmational monitoring stage, only sentinel wells will be monitored. The source area wells will no longer be monitored and may be decommissioned, as discussed in the previous section.

The sentinel wells will be monitored on a quarterly basis until the following requirements have been met:

- IHS concentrations in the sentinel wells have been below action levels for four consecutive quarters, beginning with the first confirmational monitoring event.
- Following four consecutive quarters of concentrations below action levels in sentinel wells during the confirmational monitoring stage, the owner or operator, after consultation with Ecology, may discontinue compliance monitoring and abandon the sentinel wells. Ecology will be provided with a notice of intent to abandon the sentinel wells 30 days prior to abandonment.

The objective of the monitoring program, as stated in Section 5.1, is to prevent groundwater contaminant migration off site by ensuring that the CULs are met at the POC. Meeting the requirements listed for each of the three stages of the monitoring program will provide confirmation that this primary objective has been met, as follows:

- CULs have been achieved in the source area.
- Action levels have not been exceeded in the sentinel wells, and confirmational monitoring indicates that they are not likely to exceed action levels in the future, indicating that the threat of off-site migration has been eliminated.

Therefore, once the confirmational monitoring requirements listed above have been met, the monitoring program may be terminated and the sentinel wells may be decommissioned.

5.4 Sampling and Analysis

Groundwater monitoring will include measuring water levels and water quality parameters (e.g., dissolved oxygen, pH, temperature, and specific conductance) and the collection and analysis of groundwater samples.

Groundwater samples collected in association with routine compliance monitoring activities (i.e., not as part of the contingency measures discussed in Section 6 of this plan) will be analyzed for IHSs, using the following analytical methods or other, comparable, analytical methods deemed to be suitable alternatives and approved for use by Ecology:

- Gasoline-range TPH by Northwest Total Petroleum Hydrocarbon (NWTPH)-Gx with U.S. Environmental Protection Agency (USEPA) 5035 sample preparation
- Diesel-range TPH by NWTPH-Dx Method
- VOCs associated with petroleum fuel, specifically BTEX, by USEPA 8021B with USEPA 5035 sample preparation

The analytical methods used will be verified to ensure that the method reporting limits do not exceed CULs. Additionally, selected groundwater samples will be analyzed for geochemical parameters (including nitrate, manganese, ferrous iron, sulfate, and methane) to continue assessment of the presence of electron acceptors during the biodegradation process and to evaluate the biodegradation of TPH and selected VOCs. Analytical methods for these geochemical parameters include:

- Nitrate by USEPA 353.2
- Manganese by USEPA 6020A
- Ferrous iron by USEPA ApplEnvMic7-87-1536
- Sulfate by ASTM D516-02
- Methane by RSK 175

6 CONTINGENCY MEASURES

Sentinel wells will be monitored during all three stages of the compliance monitoring program (as discussed in the previous section). If an IHS concentration in a sentinel well exceeds the associated CUL nine months after completion of remedial action at the Truck City parcel, then contingency measures will be implemented. Contingency measures are specific followup actions that will be implemented in response to defined triggers, as discussed in the sections below.

Contingencies are organized into four tiers.

6.1 Tier 1

Tier 1 is triggered when, after completion of the remedial action, a CUL is exceeded during two consecutive monitoring events in one (or more) sentinel well(s).

Quarterly monitoring will continue at all sentinel wells until IHS concentrations remain below CULs for four consecutive quarters. Allowing for up to eight quarters of quarterly monitoring will provide

sufficient data to evaluate concentration trends and seasonal variations for two consecutive seasons. If IHS concentrations are below CULs for four consecutive quarters before two years of monitoring are complete, monitoring activities may cease after consultation with and Ecology's approval. The Tier 1 contingency action will be considered complete, and Tier 2 contingency measures will not be triggered. However, if IHS concentrations are not below CULs for two consecutive quarters, Tier 2 contingency measures may be triggered.

A longer period of quarterly monitoring may be conducted before proceeding to Tier 2 if:

- IHS concentrations are showing stable or declining trends; and
- No detected IHS concentration is greater than two times an action level.

Ecology will be notified if quarterly monitoring is extended beyond two years. If IHS concentrations are not below action levels for four consecutive quarters at any time during the two-year period, and a Tier 2 contingency has already been implemented for that well(s) and IHS(s), then Tier 3 contingency measures will be triggered.

6.2 Tier 2

Tier 2 contingency measures follow a Tier 1 response and are triggered when IHS concentrations in a sentinel well are not below action CULs for two consecutive quarters at any time during a two-year quarterly monitoring period (or longer if the conditions listed in the previous section are met and Ecology has been notified).

If a Tier 2 contingency is triggered, then supplemental in situ bioremediation will be implemented. Injection of additional bioremediation products by direct-push drilling into the subsurface in the vicinity of monitoring wells with detections above CULs will provide a supplemental source of oxygen to enable the indigenous microorganisms (bacteria) to continue to break down COIs.

If higher action levels are not supported by the Tier 2 modeling work, then Tier 3 contingency measures will be triggered.

6.3 Tier 3

Tier 3 follows a Tier 2 response and is triggered when:

a) Higher action levels are not supported by the Tier 2 work, or

b) IHS concentrations in a sentinel well are not below CULs for four consecutive quarters at any time during a two-year quarterly monitoring period.

Tier 3 involves installation of up to two additional sentinel well(s) in the immediate vicinity, either downgradient or crossgradient, of the existing sentinel well (or wells) with the CUL exceedances. Monitoring in the affected sentinel well(s) will continue on a quarterly basis while the Tier 3 sentinel well locations are selected and the new well(s) are installed and developed. New sentinel wells will be installed in accordance with Ecology regulations.

The purpose of installing a new sentinel well(s) in the vicinity of the original, affected sentinel well is to determine whether the CUL exceedances observed in the original well are localized or representative of widespread groundwater contamination and/or IHS migration at concentrations that exceed CULs.

Following installation and development, the new sentinel wells will be monitored on a quarterly basis and concentrations compared to CULs. If CULs are exceeded in the new wells during any of the next four quarters, Tier 4 contingency measures, as discussed below, will be triggered. If no CULs are exceeded, the original sentinel well will be decommissioned, the new sentinel wells will be incorporated into the compliance monitoring network, and monitoring will proceed according to the current stage of monitoring.

6.4 Tier 4

Tier 4 follows a Tier 3 response and is triggered when CULs are exceeded in new sentinel well(s) installed as a Tier 3 response. Tier 4 involves additional subsurface investigation and/or source characterization, which may indicate a need for additional remedial action(s) in order to ensure that CULs are met at the POC.

Tier 4 contingency measures, if needed, will be determined on a case-by-case basis in consultation with Ecology. However, Tier 4 activities will focus characterization efforts on the upgradient source areas, as identified in the RI/FS (MFA, 2014). Tier 4 will include producing a work plan with proposed additional subsurface characterization and/or source characterization activities and a schedule for completion for review and approval by Ecology.

7 NOTIFICATION AND REPORTING

Ecology will be notified of the following activities:

- Revisions to the compliance monitoring network, including decommissioning or replacement of compliance network wells.
- Reverting to a previous stage of the monitoring program (e.g., from performance monitoring to protection monitoring).
- Proceeding to the confirmational monitoring stage and termination of the monitoring program.
- Tier 1 contingency measures have been triggered or contingency measures have been elevated to the next tier.
- Extending the Tier 1 contingency monitoring beyond two years without initiating Tier 2 contingency measures.

- Implementation of certain contingency measures, including installation of additional sentinel wells, and developing and conducting additional subsurface investigation and/or source area characterization activities.

Groundwater monitoring reports will be prepared on a quarterly basis, at a minimum, unless Ecology has preapproved a longer reporting timeframe. The reports will provide a description of sampling activities, analytical data, field measurements of groundwater quality parameters and groundwater levels, a discussion of analytical data trends, and data validation reports. The data validation reports will provide a review of all raw data to verify that the laboratory has supplied the required quality assurance and quality control deliverables. The data will be validated against USEPA, Washington State, and laboratory-specific criteria for completeness and usability.

8 SCHEDULE

The proposed compliance monitoring activities, as outlined in this plan, will begin within six months following execution of the Prospective Purchaser Consent Decree and Ecology approval of this plan.

LIMITATIONS

The services undertaken in completing this plan were performed consistent with generally accepted professional consulting principles and practices. No other warranty, express or implied, is made. These services were performed consistent with our agreement with our client. This plan is solely for the use and information of our client unless otherwise noted. Any reliance on this plan by a third party is at such party's sole risk.

Opinions and recommendations contained in this plan apply to conditions existing when services were performed and are intended only for the client, purposes, locations, time frames, and project parameters indicated. We are not responsible for the impacts of any changes in environmental standards, practices, or regulations subsequent to performance of services. We do not warrant the accuracy of information supplied by others, or the use of segregated portions of this plan.

REFERENCES

AEG. 2005. Phase II—Site characterization report, Truck City Truck Stop, 3228 Old Highway 99, Mount Ecology. 1993.

AGI. 1989. Hydrocarbon contamination assessment, Truck City Truck Stop, 1731 Old Highway 99 South, Mount Vernon, Washington. Applied Geotechnology, Inc. November 13.

Ecology. 1993. Interim action cleanup report, Truck City Truck Stop, 1731 Old Highway 99 South, Mount Vernon, Washington. Washington State Department of Ecology. January 8.

Ecology. 2014a. Draft cleanup action plan, Truck City site, Mount Vernon, Washington. Washington State Department of Ecology, Toxics Cleanup Program, Northwest Regional Office. Bellevue, Washington. October.

Ecology, 2014b. Correspondence with Site Manager.

MFA. 2014. Draft public review remedial investigation/feasibility study, Truck City site, Mount Vernon, Washington. Prepared for Skagit County. Maul Foster & Alongi, Inc., Bellingham, Washington. October 2.

MTC. 2014a. Phase II environmental site assessment, Truck City site, 3228 Old Highway 99 South, Mount Vernon, WA 98273. Materials Testing & Consulting, Inc. February 17.

MTC. 2014b. Phase II environmental site assessment, Truck City site, 3228 Old Highway 99 South, Mount Vernon, WA 98273. Materials Testing & Consulting, Inc. March 17.

TABLES

FIGURES

APPENDIX
WELL LOGS