Aspect CONSULTING

SUPPLEMENTAL REMEDIAL INVESTIGATION WORK PLAN

Satsop Grocery 840 Monte-Elma Road
Satsop, Washington
VCP Identification No. SW1225

Prepared for: Mr. Bruce Dorfler

Project No. 080206 • February 25, 2013

Aspect Consulting, LLC

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1 Introduction

Aspect Consulting, LLC (Aspect) has prepared this Supplemental Remedial Investigation Work Plan (Work Plan) on behalf of Mr. Bruce Dorfler for the Satsop Grocery property at 840 Monte-Elma Road in Satsop, Washington (herein referred to as the Site) (Figure 1). The purpose of the Work Plan is to present a scope of work to address the comments received from the Washington State Department of Ecology (Ecology) regarding the Site. The Work Plan has been prepared in accordance with the Model Toxics Control Act Cleanup Regulation (MTCA) as established in Chapter 173-340 of the Washington Administrative Code (WAC 173-340). The Site is enrolled in the Ecology Voluntary Cleanup Program (VCP) and has been assigned VCP Identification No. SW1225.

The results of previous investigations conducted at the Site are presented in the *Remedial Investigation and Focused Feasibility Study, Satsop Grocery*, dated August 12, 2011, prepared by Aspect (RI/FFS Report). The RI/FFS Report documents concentrations of constituents of concern (COCs) detected in soil and groundwater at the Site that exceed MTCA Method A cleanup levels. COCs for the Site include total petroleum hydrocarbons as gasoline (TPH-gasoline) and the volatile organic compounds (VOCs) benzene, toluene, ethyl-benzene, and total xylenes (BTEX). Aspect designed a cleanup action to remediate COCs in soil and groundwater as documented in the *Engineering Design and Specifications Report*, dated July 12, 2012 (EDS Report). The EDS Report provides specific details for the cleanup action, which will consist of combined air sparge and soil vapor extraction (AS/SVE). However, as described in the Opinion Letter dated October 16, 2012, Ecology requests that additional work be completed prior to implementation of the cleanup action.

The proposed scope of work for supplemental remedial investigation to address Ecology concerns consists of the following work elements:

- Soil Delineation – To further evaluate the western extent of concentrations of COCs in soil beneath the grocery store building;
- Groundwater Delineation – To further evaluate the western extent of COCs in groundwater proximate to the western property boundary;
- Geophysical Investigation – To determine whether the historical underground storage tanks (USTs) reportedly located proximate on the north side of the grocery store building were removed or closed in-place; and
- Soil Vapor Pathway Evaluation – To assess the potential for exposure to COCs via the vapor intrusion (VI) pathway.

The specific activities associated with each of the work elements described above are presented in the following sections.

2 Soil Delineation

This section presents a scope of work to further evaluate the western extent of COCs in soil beneath the grocery store building. Two angled borings will be advanced beneath the grocery building using hollow-stem auger drilling techniques. The first boring will be advanced from the north side of the building and the second from the east side. Proposed locations for the borings are depicted on Figure 2.

Prior to drilling, Aspect will coordinate both public and private utility locates to identify conductible subsurface utilities. Logistic requirements for advancement of the boring located on the north side of the building will require closure of at least one lane of Monte-Elma Road. Therefore, Aspect will coordinate a Street-Use permit through Greys Harbor County and will implement appropriate traffic control measures as necessary. Drilling activities will be conducted by Cascade Drilling, LP, of Woodinville, Washington.

Both borings will be advanced at an approximate angle of 45 degrees from vertical and will reach a final depth of approximately 25 feet below ground surface (bgs). Soil samples will be collected at 5-foot intervals (based on angle) during drilling using stainless steel split-spoon samplers. A minimum of two soil samples per boring will be collected and submitted for laboratory analysis. One soil sample will be collected at the water table and a vadose zone sample will be collected from a depth dependent on the results of field-screening using a photoionization detector (PID). Additional soil samples may be submitted for laboratory analysis based on field-screening, if warranted. Saturated soil from below the water table will not be sampled. Reconnaissance groundwater samples will also be collected from each boring. All drilling and sampling equipment will be decontaminated between uses, as appropriate.

Soil and groundwater samples will be collected and handled in accordance with the following procedures:

- All samples will be transferred immediately into laboratory-supplied sample containers, taking care to minimize disturbance. Care will be taken not to handle the seal or lid of the container when placing the sample into the containers.
- Information will be logged by an Aspect field representative during drilling and will include at a minimum: sample depth, Unified Soil Classification System descriptions; sample recovery; soil moisture and occurrence of groundwater; physical indications of petroleum contamination such as odors or staining; and field-screening results using a PID.
- Each sample container will be labeled with the date, time sampled, well identification and number, project name, project number, and preservative(s), if any.
- Information will be logged on a Chain-of-Custody form, and the sample will be placed in a chilled cooler at approximately 4 degrees Celsius for transport to the laboratory.

- Chain-of-custody protocols will be maintained during sample transport and submittal to the laboratory.

Soil and groundwater samples will be submitted for laboratory analysis of TPH-gasoline by Northwest Method NWTPH-Gx; BTEX by U.S. Environmental Protection Agency (EPA) method 8260 or 8021; and total lead by EPA methods. All samples will be submitted to ALS of Everett, Washington, on a standard 5- to 10-day turnaround.

All waste soil and water generated during drilling will be placed in labeled containers at the Site pending receipt of waste profiling results. All disposable sampling, and health and safety supplies, and equipment will be disposed of in an appropriate waste dumpster at the Site. Each boring location will be plotted on a scaled site map using a measuring tape or other measuring device to determine the boring location. Each boring will be backfilled with bentonite. Cold-patch asphalt or concrete will be used as a surface completion to maintain the integrity of the asphalt or concrete cap.

3 Groundwater Delineation

This section presents a scope of work to further evaluate the western extent of COCs in groundwater proximate to the western property boundary. In addition to the reconnaissance groundwater samples collected from beneath the grocery store building described in the preceding section, one permanent groundwater monitoring well will be installed proximate to the southwest corner of the building using hollow-stem auger drilling techniques. The new well will be identified as MW-13. A proposed location for MW-13 is depicted on Figure 2. The purpose of this well is to provide a down-gradient compliance monitoring point for the cleanup action.

Prior to drilling, Aspect will coordinate both public and private utility locates to identify conductible subsurface utilities. Drilling activities will be conducted by Cascade Drilling, LP, of Woodinville, Washington.

The well boring will be advanced to a depth of approximately 25 feet bgs. Soil samples will be collected at 5-foot intervals during drilling using stainless steel split-spoon samplers. A minimum of two soil samples will be collected and submitted for laboratory analysis. One soil sample will be collected at the water table and a vadose zone soil sample will be collected from a depth dependent on the results of field-screening using a PID. Additional soil samples may be submitted for laboratory analysis based on field-screening, if warranted.

The boring will be completed as a groundwater monitoring well in accordance with WAC 173-160. The well will be constructed with 2-inch-diameter, threaded Schedule 40 PVC, and will be screened from approximately 10 to 25 feet bgs. A concrete surface seal will be set at grade and the well will be finished with a flush-mount traffic-rated monument. Following installation, the well will be developed by the driller to remove fine-grained material from inside the well casing and filter pack to the extent practical, and to improve hydraulic communication between the well screen and the surrounding water-bearing formation. Following installation and development, Aspect will survey the top-of-casing

elevation of the well relative to the existing groundwater monitoring well network at the Site. Aspect will also conduct a groundwater monitoring event that will include depth-to-water measurements and collection of groundwater samples from wells MW-1 through MW-13.

Groundwater samples will be submitted for laboratory analysis of the following:

- TPH-gasoline by Northwest Method NWTPH-Gx; and
- BTEX by EPA method 8260 or 8021.

In addition, the groundwater sample from monitoring well MW-13 will be submitted for laboratory analysis of:

- Total lead by EPA methods;
- Methyl tertiary-butyl ether (MTBE) and 1,2-dichloroethane (EDC) by EPA Method 8260; and
- 1,2 Dibromoethane (EDB) by EPA Method 8011.

All groundwater samples will be submitted to ALS of Everett, Washington, on a standard 5- to 10-day turnaround.

4 Geophysical UST Investigation

This section presents a scope of work to determine whether the historical USTs reportedly located proximate to the north side of the grocery store building were removed or closed in-place. Aspect will subcontract a limited geophysical survey consisting of ground penetrating radar (GPR) and electromagnetic detection (EM). The survey will be confined to the approximate area depicted on Figure 2.

The GPR survey will be conducted along transects and utilizes high frequency radio waves which are emitted from an antenna and travel through the subsurface directly below the antenna. If anomalies are encountered, the radio waves are reflected back and recorded at the surface. The data are then processed to provide two-dimensional images displaying any anomalies (such as USTs) that may be encountered. The EM survey induces a flow of electrical current into the soil that, in turn, induces an electromagnetic field that is measured at the surface. The presence of metallic objects and voids affects this field and manifests as anomalies in the processed data.

The results of the geophysical survey will be processed and interpreted by the subcontractor. The subcontractor will provide a report of survey results to Aspect indicating whether evidence of USTs was detected.

5 Vapor Intrusion Assessment

This section presents a scope of work to assess the potential for exposure to COCs via the VI pathway. Based on discussions with Ecology and the current operating status of the Site as a retail gasoline-station, sub-slab soil vapor sampling was selected to assess the potential for exposure via the VI pathway. Sub-slab soil vapor samples will be collected from three locations within the grocery store building. Proposed sampling locations are depicted on Figure 2. The sampling locations are spaced to provide coverage in the most likely impacted area and are located away from external walls and doors where possible.

The samples will be collected in accordance with the Tier I Assessment as described in the draft *Guidance for Evaluating Soil Vapor intrusion in Washington State: Investigation and Remedial Action*. Semi-permanent soil vapor sampling ports will be installed at each of the three locations using the following procedure:

- Prior to beginning, the sampling locations will be cleared for utilities.
- A ½-inch borehole will be drilled through the concrete floor to a depth of approximately 12-inches below the floor surface.
- The ½-inch borehole will be over-drilled to a depth of approximately 3 inches with a 1-inch borehole.
- A sampling port will be constructed and inserted into the borehole.
- The annular space between the sampling port and the borehole will be sealed with 1 inch of sealant topped with 2 inches of concrete, flush with the floor surface, to minimize short-circuiting.
- The finished sampling port will be protected with a steel flush-mount removable cap.

All sample port installation activities and locations will be documented on appropriate field forms and field notebooks. Following installation of the sample ports, sub-slab soil vapor samples will be collected from each sample location in accordance with the following procedures:

- Samples will be collected in laboratory-supplied, 6-liter, evacuated SUMMA canisters.
- Prior to sample collection, the vapor port and sampling train will be purged using a peristaltic pump, taking care that the entire sampling train volume has been purged to ensure the sample is representative of subsurface conditions. Purged soil vapor will be collected in Tedlar® bags and released outdoors.
- Laboratory-supplied flow controllers will be used to collect 8-hour time-integrated samples at a sample rate of less than 0.02 liters per minute. This low flow rate ensures that the sampling-induced pressure difference across the floor slab will be minimal.
- Soil vapor sampling will be conducted during non operating hours to minimize ventilation within the building.

- All field activities, environmental and building conditions, and sample documentation will be recorded on the appropriate field forms and field notebook.
- Information, including initial and final canister pressure, will be logged on a Chain-of-Custody form, and SUMMA canisters will be packed in their original shipping containers and shipped overnight to the laboratory for analysis.
- Chain-of-custody protocols will be maintained during sample transport and submittal to the laboratory.
- All disposable sampling, health and safety supplies, and equipment will be disposed of in an appropriate waste dumpster at the Site.

The sub-slab soil vapor samples will be submitted for laboratory analysis of VOCs by EPA Method TO-15. The samples will be submitted to an Ecology-certified analytical laboratory for analysis on a standard 5- to 10-day turnaround.

6 Reporting

Aspect will prepare a brief letter report to document the activities and results of the supplemental remedial investigation. The letter report will present the results of the soil and groundwater delineation activities, the geophysical investigation, and the soil vapor pathway evaluation. The letter report will include:

- A description of the supplemental remedial investigation activities;
- A summary of the supplemental remedial investigation results;
- Summary data tables and figures; and
- Aspect's conclusions regarding whether the results of the investigation will impact the cleanup action described in the EDS Report.

7 References

Aspect Consulting, LLC, 2012, Remedial Investigation and Focused Feasibility Study, Satsop Grocery, Prepared for Bruce Dorfler, August 12, 2011.

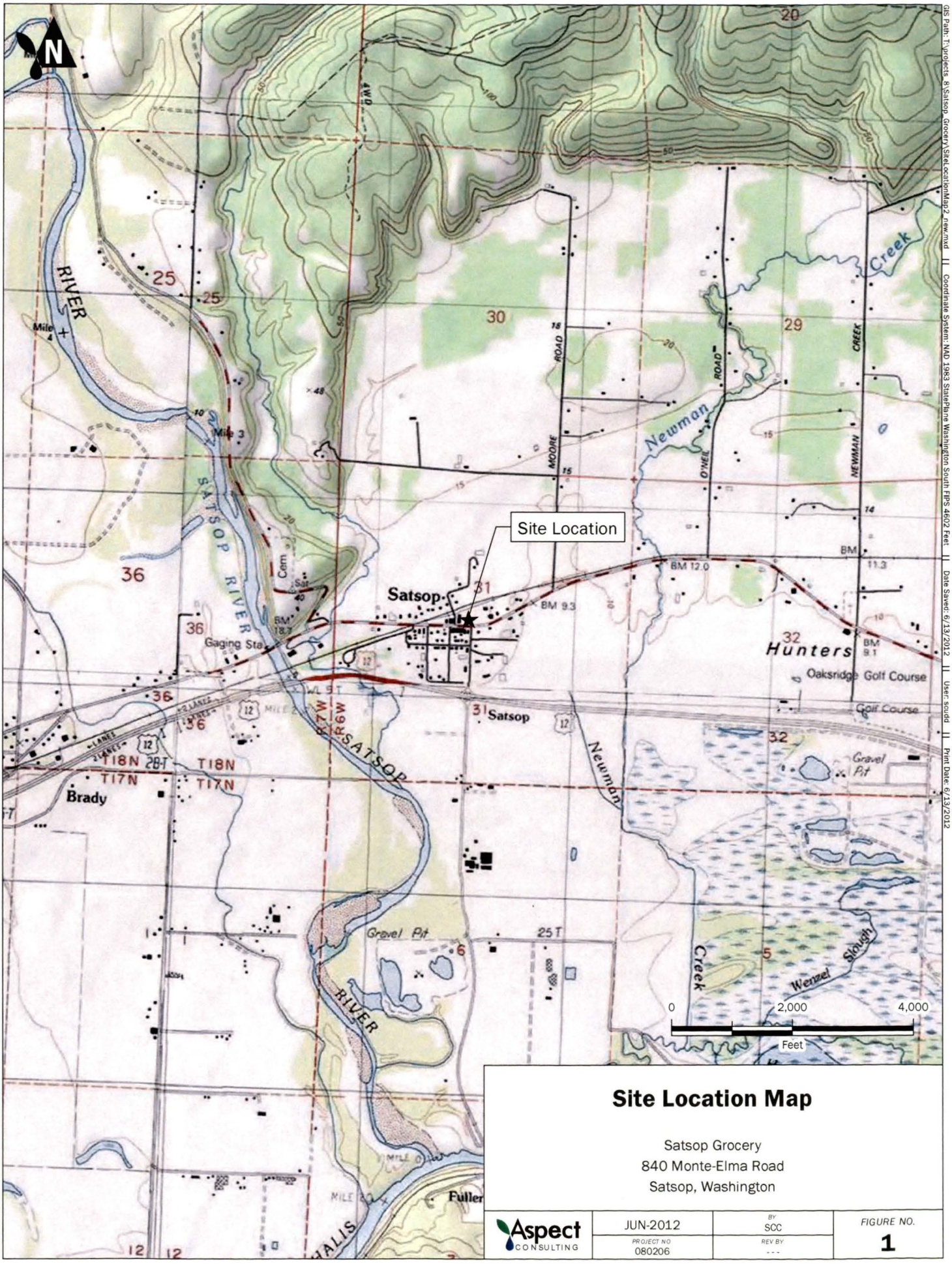
Aspect Consulting, LLC, 2012, Engineering Design and Specifications Report, Satsop Grocery, Prepared for Bruce Dorfler, July 12, 2012.

Washington State Department of Ecology (Ecology), 2009, Guidance for Evaluating Soil Vapor Intrusion in Washington State: Investigation and Remedial Action, Washington State Department of Ecology, Toxics cleanup Program, Review DRAFT, October 2009.

8 Limitations

Work for this project was performed for Mr. Bruce Dorfler (Client), and this Work Plan was prepared in accordance with generally accepted professional practices for the nature and conditions of work completed in the same or similar localities, at the time the work was performed. This Work Plan does not represent a legal opinion. No other warranty, expressed or implied, is made.

All documents prepared by Aspect for the Client apply only to the services described in the Agreement(s) with the Client. Any use or reuse by any party other than the Client is at the sole risk of that party, and without liability to Aspect. Aspect's original files/reports shall govern in the event of any dispute regarding the content of electronic documents furnished to others.



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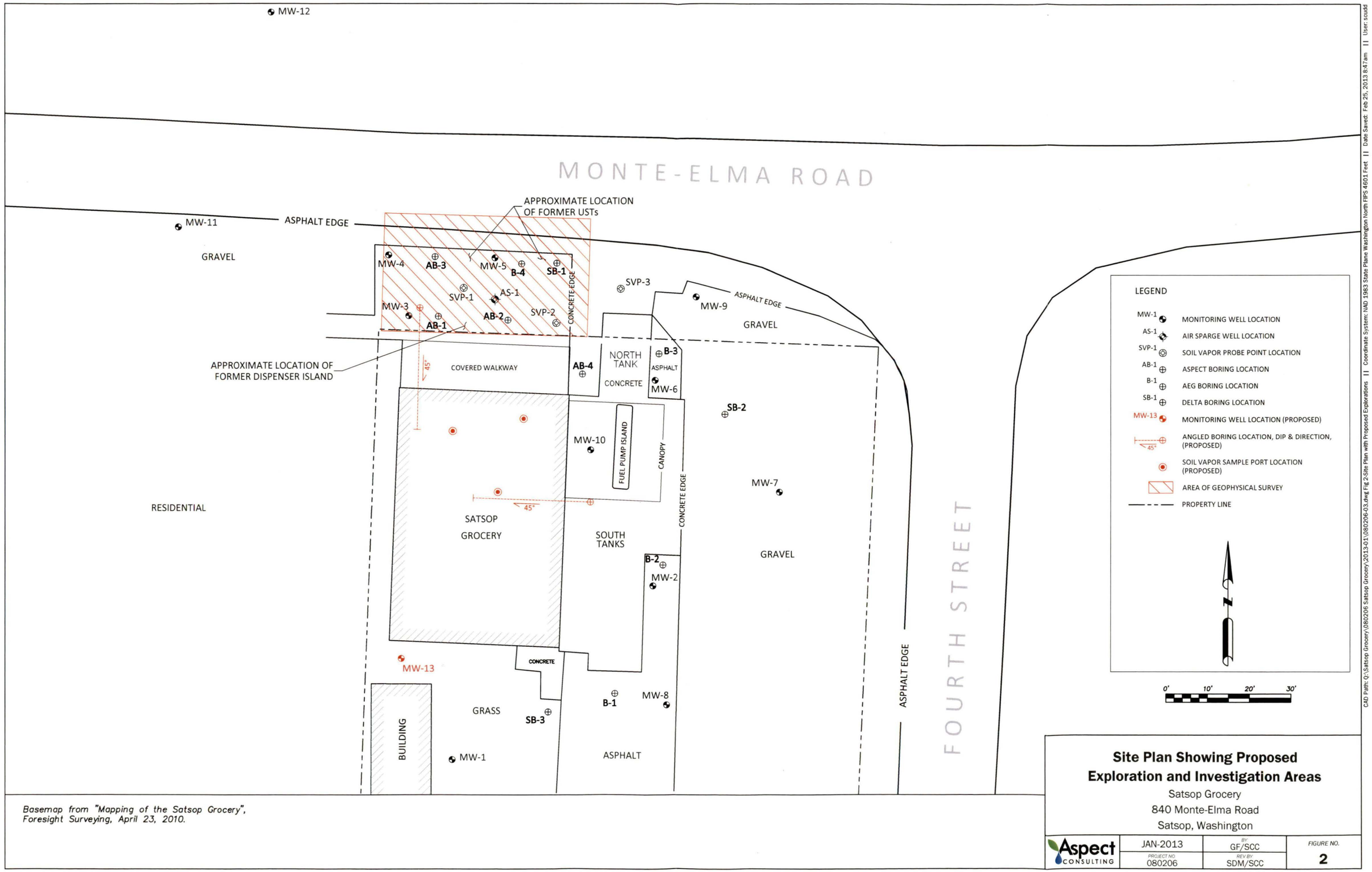
Site Location Map

Satsop Grocery
840 Monte-Elma Road
Satsop, Washington

Aspect CONSULTING	JUN-2012	BY SCC	FIGURE NO. 1
	PROJECT NO 080206	REV BY ---	



Basemap from "Mapping of the Satsop Grocery", Foresight Surveying, April 23, 2010.

Site Plan Showing Proposed Exploration and Investigation Areas

Satsop Grocery
840 Monte-Elma Road
Satsop, Washington

Aspect CONSULTING	JAN-2013	BY: GF/SCC	FIGURE NO. 2
	PROJECT NO. 080206	REV BY: SDM/SCC	