PanGEO INCORPORATED
Geotechnical & Earthquake Engineering Consultants

April 25, 2019
PanGEO Project No. 06-117.300

Mr. Dominic Miller, P.E.
Gray & Osborne, Inc.
2102 Carriage Street SW, Building "I"
Olympia, WA 98502

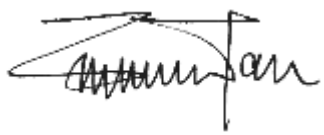
Subject: **GEOTECHNICAL REPORT – DRAFT**
Proposed Public Works Facility
DuPont, Washington
Gray & Osborne IPN #19233 Task 01

Dear Mr. Miller,

As requested, PanGEO has completed a geotechnical study for the proposed Public Works Facility in DuPont, Washington. The results of our study are summarized in the attached draft report. We will finalize this report after we receive your review comments. In summary, the site is underlain by medium dense to dense sand and gravel that is considered adequate for supporting new buildings on conventional spread footings. Furthermore, we anticipate that infiltration of stormwater will be feasible from the geotechnical engineering perspective.

We appreciate the opportunity to assist you with this project. Please call if you have any questions.

Sincerely,



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1.0 INTRODUCTION

PanGEO completed a geotechnical engineering study to assist the project team with the design efforts for the proposed Public Works Facility in DuPont, Washington. Our work was performed in accordance with our proposal dated January 8, 2019, which was subsequently authorized on March 8, 2019. The purpose of our geotechnical study was to evaluate subsurface conditions at the site and to provide geotechnical engineering recommendations pertinent to the proposed development. Our services included a site reconnaissance, observing excavation of six test pits, reviewing our previous work at the site, and developing the conclusions and recommendations presented in this report.

2.0 SITE AND PROJECT DESCRIPTION

The overall project consists of two sites adjacent to Civic Drive in Dupont, Washington. The approximate location of the overall project site is shown on the attached Figure 1, Vicinity Map. The North Site is a relatively level undeveloped area located west of the existing City of DuPont Public Safety Building (1700 to 1780 Civic Drive) and north of Civic Drive. The South Site is a relatively level undeveloped area located on the south side of Civic Drive and immediately east of an existing stormwater pond. The approximate locations of the North and South sites in relation to existing development is shown in Plate 1 on the following page. Based on information provided by Gray and Osborne, we understand the following developments are planned:

North Site – Construct an at-grade shop/garage structure, a 2-story office building, and a fueling station approximately as shown on Figure 2. We anticipate the relatively light-weight structures will have concrete slab-on-grade floors and excavations for foundation construction will be less than 4 feet deep.

South Site - Construct an at-grade decant facility, vehicle wash structure, and a brine station approximately as shown on Figure 2. Topography at the site is level and we anticipate the finished floor elevation of the structures will be constructed at or near the existing site grade. A relatively shallow below-grade concrete trench will run along the north side of the decant facility to allow water to drain from collected waste material.

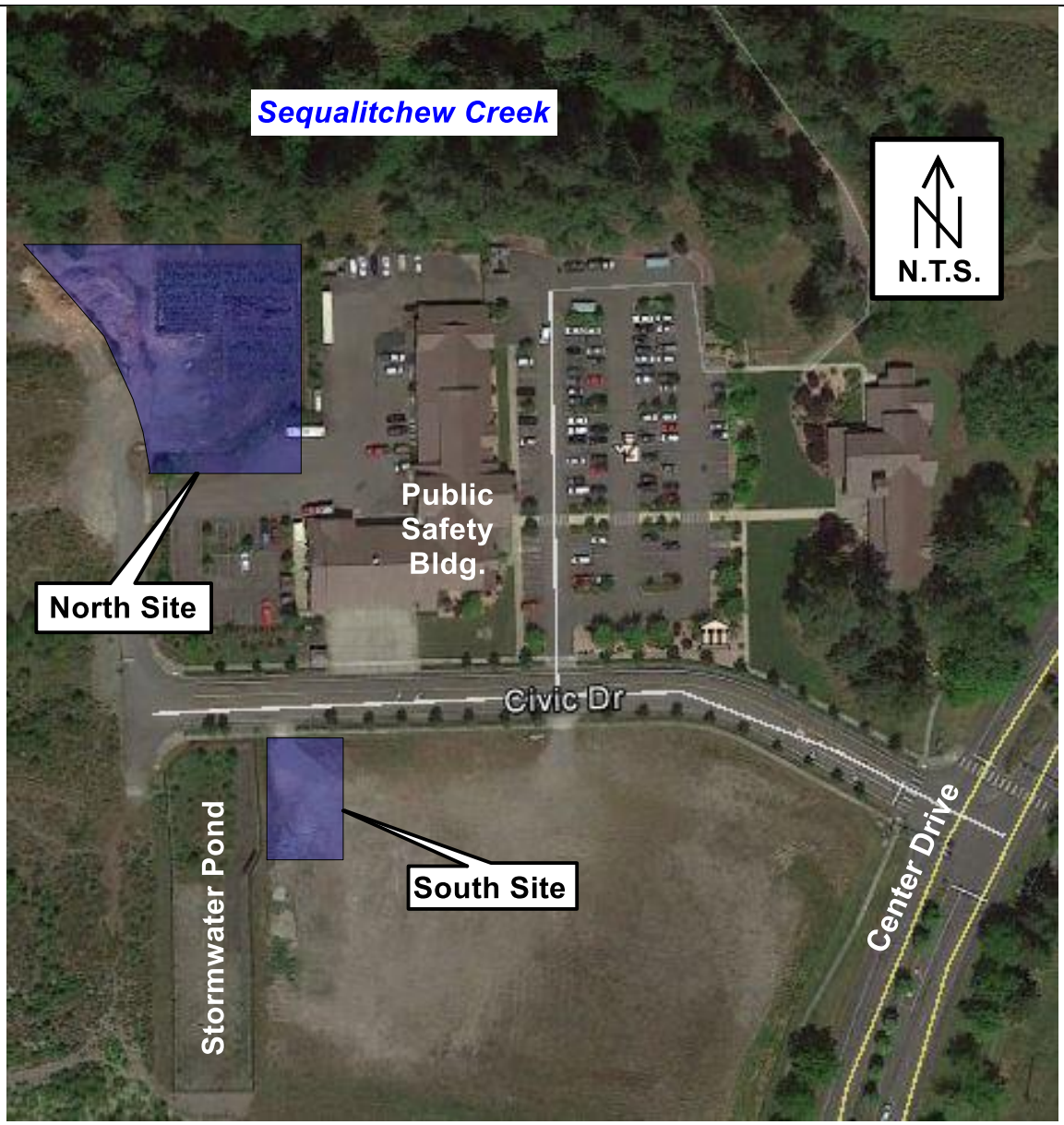

Plate 1 – Approximate location of North and South sites (imagery obtained from Google Earth).

Critical Areas **–** The North Site is located near the crest of an offsite steep slope that descends north to Sequalitchew Creek. Based on our field observations, the overall slope height is about 30 feet and the slope gradient is 40 percent or greater, which classifies the slope as a Landslide Hazard Area per the City of DuPont's Municipal Code, Chapter 25.105.050.

The conclusions and recommendations in this report are based on our understanding of the proposed development, which is in turn based on the project information provided. If the above

project description is incorrect, or the project information changes, we should be consulted to review the recommendations contained in this study and make modifications, if needed. In any case, PanGEO should be retained to provide a review of the final design to confirm that our geotechnical recommendations have been correctly interpreted and adequately implemented in the construction documents.

3.0 SUBSURFACE EXPLORATIONS AND LABORATORY TESTING

3.1 CURRENT TEST PITS

Six test pits (GTP-101 to GTP-106) were excavated at the approximate locations shown on Figure 2. The test pits were excavated on April 1, 2019, with a Komatsu PC45MR rubber-tracked mini-excavator owned and operated by JA Bowman Trucking, of Eatonville, Washington. The test pits were excavated to depths ranging from 4 to 8½ feet below the existing ground surface.

A geologist from PanGEO was present throughout the field exploration to observe the test pits, assist in sampling, and to prepare descriptive logs of the explorations in general accordance to the system outlined in Figure A-1, Terms and Symbols for Boring and Test Pit Logs. The logs provide descriptions of the materials encountered, depths to soil contacts, and depths of seepage or caving, if present, observed in the test pit sidewalls. The relative density and consistency of the underlying soil was estimated based on probing the walls of the excavation and the difficulty of completing the excavation. Summary test pit logs are presented in Appendix A.

3.2 PREVIOUS TEST PITS

In addition to the current test pits, we reviewed our logs of previous test pits excavated near the site in 2006. The approximate location of the previous test pits are shown on Figure 2 and the test pit logs are provided in Appendix B. The subsurface conditions encountered at our current test pits were quite similar to the conditions encountered at our previous test pits near the site.

3.3 LABORATORY TESTING

Grain size distribution tests were performed on six selected representative samples obtained from the current test pits. The tests were performed in general accordance with the procedure outlined

in ASTM D 6913. Particles larger than about 1½ inch in diameter were not included in the tests. The test results are displayed on the test pit logs in Appendix A, where appropriate, and the grain size distribution test results are included in Appendix C.

4.0 SUBSURFACE CONDITIONS

4.1 SITE GEOLOGY

According to the geologic map of the *Nisqually 7.5-minute Quadrangle* (Walsh *et al*, 2003), the project site and its vicinity are underlain by unconsolidated fill deposits (Map Unit Qf) and Vashon recessional outwash gravel (Qgog). Fill is mapped in the northwest portion of the North Site and is described as clay, silt, sand, gravel, organic matter, shells, rip-rap, and debris. The remainder of the project is mapped as Vashon recessional outwash gravel which is described as recessional and proglacial, stratified, pebble to boulder gravel, locally containing silt and clay. This unit is locally known as Steilacoom Gravel.

4.2 SOIL CONDITIONS

The soils observed in our test pits were classified and described in the field using the system outlined in Figure A-1 and summary test pit logs are included in Appendix A. The results from our test pits generally confirmed the mapped geology. The subsurface conditions encountered at the North Site and the South Site follow:

North Site **–** Test pits GTP-101 through GTP-104 were excavated at the North Site. Existing fill ranging from 2 feet to greater than 4 feet thick was encountered at the North Site test pits. The existing fill typically consisted of dense poorly graded gravel with silt and sand or medium dense silty sand with gravel. Existing fill was encountered to the maximum exploration depth of 4 feet below grade at GTP-101. Underlying the existing fill at GTP-101 through GTP-103, dense to very dense well to poorly graded gravel with silt and sand that we interpret to be consistent with the mapped Vashon recessional outwash gravel was encountered. The recessional outwash gravel contained occasional cobbles and, in general, a decrease in fines with depth was noted.

South Site- Test pits GTP-105 and GPT-106 were excavated at the South Site. At both GTP-105 and GTP-106, existing fill consisting of medium dense silty sand with gravel

and dense poorly graded gravel with silt and sand was encountered to 5 feet below grade. Underlying the existing fill, a soft to stiff layer of buried topsoil that ranged from 6 inches thick at GT-105 to about 1½ feet thick at GT-106 was encountered. Underlying the buried topsoil layer, dense to very dense well to poorly graded gravel with silt and sand consistent with the mapped recessional outwash gravel was encountered to the maximum exploration depth of 8 feet at both GT-105 and GT-106.

4.3 GROUNDWATER

Groundwater/seepage was not encountered in the test pits at the time of excavation. Based on observations of soil samples, the site topography, and our experience with nearby projects, we do not anticipate the presence of static groundwater within about 15 to 20 feet of the existing ground surface.

5.0 CRITICAL AREAS CONSIDERATIONS

During our field exploration, we conducted a site reconnaissance of the offsite steep slope located north of the North Site to observe potential signs of past slope movement and instability near the crest of the steep slope adjacent to Sequalitchew creek. Based on our field observations, the subject slope is about 30 feet in height and has an average inclination of about 1½H:1V (Horizontal:Vertical) to 2H:1V. The slope is vegetated with medium diameter evergreen and trees with an understory of sword fern and miscellaneous brush (see Plate 2, right).

Plate 2 – Offsite steep slope descending to Sequalitchew Creek, facing west).

During our reconnaissance, we did not observe unusual terrace-like features, slump blocks, jackstrawed trees, tension cracks or hummocky topography, which are frequently indicative of

ground expressions associated with landsliding and slope instability. However, the surficial soils mantling the slope are loose and may be prone to shallow sloughing or erosion in the future.

Based on our subsurface exploration and our site reconnaissance, it is our opinion that the steep slope north of the North Site is globally stable in its current configuration. Since the proposed area of construction will not involve a significant amount of earthwork, the proposed structures will be relatively lightweight, and the structures will be setback at least 40 feet from the top of the steep slope, it is our opinion that the proposed development will not increase the potential for slope instability, provided the recommendations contained in this report are incorporated into the project design and construction.

6.0 GEOTECHNICAL RECOMMENDATIONS

6.1 SEISMIC DESIGN PARAMETERS

The seismic design may be accomplished using the ASCE 7-10 and the 2015 edition of the International Building Code (IBC). Both specify a design earthquake having a 2% probability of occurrence in 50 years (return interval of 2,475 years). The following parameters, which are consistent with the 2008 USGS seismic hazard maps, are recommended for the seismic design of the building:

Table 1. Summary of Seismic Design Parameters per 2015 IBC

Site Class	Spectral Acceleration at 0.2 sec. (g)	Spectral Acceleration at 1.0 sec. (g)	Site Coefficients		Design Spectral Response Parameters	
	S_S	S_1	F_a	F_v	S_{DS}	S_{D1}
D	1.303	0.519	1.0	1.5	0.869	0.519

6.2 LIQUEFACTION ASSESSMENT

Soil liquefaction is a condition where saturated cohesionless soils undergo a substantial loss of strength due to the build-up of excess pore water pressures resulting from cyclic stress applications induced by earthquakes. Soils most susceptible to liquefaction are loose, uniformly graded sands and loose silts with little cohesion. The dense and coarse nature of the on-site soils and lack of shallow static groundwater table effectively precludes the development of liquefaction. Therefore, special design associated with soil liquefaction is not needed for this project.

6.3 FOUNDATIONS

We understand the proposed 2-story office building, single story garage, fueling station, decant facility, vehicle wash, and brine station will be constructed at or near the existing site grade. We anticipate medium dense to dense existing fill and recessional outwash deposits will be encountered in footing excavations for these structures. Support for these structures may be provided by conventional spread footings or a structural slab with thickened edges, provided the foundation subgrade is compacted in-place to a firm and unyielding condition. We recommend the following geotechnical design values be used for designing the foundations:

Allowable Bearing Pressure – Assuming that the footings will bear on medium dense to dense sand and gravel, we recommend that an allowable soil bearing pressure of 2,500 psf be used to size the footings. The recommended bearing pressure may be increased by one-third for transient loading, such as wind or seismic forces.

If a structural slab will be used, a modulus of subgrade reaction of 200 pci may be utilized for design of a structural slab.

Footing Embedment – For frost heave considerations, exterior footings should be placed at a minimum depth of 18 inches below the final exterior grade. Interior spread foundations should be placed at a minimum depth of 12 inches below the top of slab.

Estimated Settlement - Footings designed and constructed in accordance with the above recommended values should experience total settlement of less than one inch and differential settlement less than about ½-inch. The concrete foundations should be designed with

adequate stiffness to accommodate the differential settlement without cracking. Most of the anticipated settlement should occur during construction as dead loads are applied.

Lateral Resistance - Lateral loads on the structures may be resisted by passive earth pressure developed against the embedded near-vertical faces of the foundation system and by frictional resistance developed between the bottom of the foundation and the supporting subgrade soils. For footings bearing on native sand and gravel or on granular structural fill, a frictional coefficient of 0.5 may be used to evaluate sliding resistance developed between the concrete and the subgrade soil. Passive soil resistance may be calculated using an equivalent fluid weight of 350 pcf, assuming the footings are backfilled with structural fill. The above values include a factor of safety of 1.5. Unless covered by pavements or slabs, the passive resistance in the upper 12 inches of soil should be neglected.

Footing Drains – Because the native foundation soils (recessional outwash) are considered free draining, it is our opinion that perimeter footing drains may be omitted for the proposed buildings.

Footing Excavations - All footing excavations should be trimmed as neat as possible. Prior to placing forms or rebar, the exposed footing subgrades should be compacted to a dense, unyielding condition. If the buried topsoil layer is encountered in footing excavations or if the footing subgrade is still loose or yielding after re-compaction, it should be overexcavated down to competent soil and replaced with granular structural fill or lean mix concrete. The overexcavation width should extend at least one-half the overexcavation depth beyond the edge of the footing.

6.4 BELOW GRADE WALLS

Below grade walls should be properly designed to resist the pressure exerted by the soils behind the walls and surcharge loads. Proper drainage provisions should also be provided behind the walls to intercept and remove groundwater from behind the wall. Our geotechnical recommendations for the design and construction of below grade walls are presented below.

Lateral Earth Pressures - The below grade portions of the walls that are designed to yield should be designed for a static lateral earth pressure based upon an equivalent fluid weight of 35 pounds per cubic foot (pcf). If the top of retaining walls will be restrained from lateral

movement, the walls should be designed for a static earth pressure based upon an equivalent fluid weight of 55 pcf. A uniform pressure of 7H psf should be added to reflect the increase loading for seismic conditions, where H corresponds to the buried depth of the wall. The recommended lateral pressures assume that the backfill behind the wall consists of a free draining and properly compacted fill with adequate drainage provisions.

Surcharge Pressures - Any surcharge loads located within a 1H:1V projection from the base of the walls should be included in the design calculation. The horizontal pressure on the below-grade wall from a surcharge load may be estimated as 35% of the vertical surcharge load.

Wall Drainage – Provided walls will be backfilled with free draining granular soils, it is our opinion that wall drainage provisions are not needed for this site. However, if the interior of the wall will house moisture-sensitive equipment or finishes that are moisture sensitive, measures for water-proofing should be applied.

Lateral Resistance – Lateral forces from wind or seismic loading and unbalanced lateral earth pressures may be resisted by passive earth pressures acting against the embedded portions of the foundation and the friction at the bottom of foundation elements. For design purposes, an allowable passive pressure of 350 pounds per cubic foot (pcf) and an allowable friction coefficient 0.5 may be used. These values include a factor of safety of at least 1.5, assuming that the structural fill adjacent to the sides of the foundation has been properly compacted. A one-third increase of these values is appropriate for transient loads.

Wall Backfill – All wall backfill should consist of free draining granular soils. The on-site soils, in general, may be used for wall backfill. If imported wall backfill is needed, we recommend using Gravel Borrow per Section 9-03.14(1) of the 2018 WSDOT *Standard Specifications*. Wall backfill should be moisture conditioned to within about 3 percent of optimum moisture content, placed in loose, horizontal lifts less than 8 inches in thickness, and systematically compacted to a dense and relatively unyielding condition and to at least 95 percent of the maximum dry density, as determined using test method ASTM D 1557 (Modified Proctor). Small hand operated compaction equipment should be used within 5 feet of walls to prevent overstressing the walls.

6.5 FLOOR SLABS

It is our opinion that concrete slab-on-grade construction is appropriate for the proposed structures. If topsoil is encountered at the slab subgrade elevation, it should be overexcavated and replaced with properly compacted on-site sand and gravel. The subgrade should be compacted to a dense and unyielding condition before the fill placement.

Because the site soils may be quite gravelly, a leveling course may be needed to form a level surface for the concrete pour. The leveling course should consist of at least 2 to 4 inches of Crushed Surfacing Top Course (WSDOT, 2018).

In areas where interior space is sensitive to moisture, a 10-mil polyethylene vapor barrier may also be placed below the slab.

6.6 PAVEMENT

New asphalt pavement will be constructed as part of the proposed development. Assuming the pavement will generally be used by light passenger cars and trucks, with only occasional heavy truck use, as a minimum, we recommend that the new pavement section consist of 4 inches of hot mix asphalt (HMA, WSDOT 9-03.8) overlying a 6-inch thick layer of crushed surfacing base course (CSBC, WSDOT 9-03.9(3)), overlying properly compacted existing on-site sand and gravel. In the parking areas where truck traffic will be limited, a lighter pavement section consisting of 2½ inches HMA over 4 inches CSBC may be used.

Both the soils and the crushed rock base should be compacted to a minimum of 95% of the materials maximum dry density as determined by ASTM D 1557 (Modified Proctor). The subgrade should be proofrolled with a fully loaded dump truck to assist in identifying soft or unstable areas. Any loose, yielding areas identified during the compaction or proofroll processes should be overexcavated and replaced with structural fill compacted to a minimum of 95 percent of its maximum dry density.

It should be noted that actual pavement performance will depend on a number of factors, including the actual traffic loading conditions. The recommended pavement section will need to be revised if the traffic level will be more or less than our assumed value.

6.7 EARTHWORK CONSIDERATIONS

6.7.1 Site Preparation

Site preparation includes striping and clearing of surface vegetation and deleterious materials in the footprints of proposed structures and pavement areas, and excavating to the design subgrade. All stripped materials should be properly disposed off-site or be "wasted" on site in non-structural landscaping areas. Based on the conditions encountered at our test pit locations, we anticipate the stripping depth would be 6 inches or less.

Following the site striping, excavation, and over-excavation (if warranted), the exposed subgrade should be compacted to a dense and unyielding condition as confirmed by PanGEO. Soil in loose or soft areas should be over-excavated and replaced with compacted structural fill.

6.7.2 Temporary Excavation Slopes

All temporary excavations should be performed in accordance with Part N of WAC (Washington Administrative Code) 296-155. The contractor is responsible for maintaining safe excavation slopes and/or shoring. Excavations more than 4 feet deep should be properly shored or sloped. For planning purposes, it is our opinion that temporary excavations may be sloped as steep as 1H:1V, but should be re-evaluated in the field during construction based on actual observed soil conditions. We anticipate the excavations to largely encounter medium dense to dense sandy and gravel with variable amounts of cobbles. Although boulders were not observed in our test pits, the presence of boulders cannot be ruled out.

6.7.3 Material Reuse

It is our opinion that the on-site recessional outwash sand and gravel soils may be considered for use as structural fill or trench backfill provided the soil can be compacted to the project requirements for structural fill. The contractor should be aware that the near surface soils at the site are moisture sensitive, and will become disturbed and soft when exposed to inclement weather conditions and/or construction traffic.

6.7.4 Structural Fill and Compaction

Structural fill is defined as compacted fill placed under buildings, roadways, slabs, pavements, or other load-bearing areas. For retaining wall and foundation backfill, cobbles larger than 4 inches in size should be screened and excluded. Imported structural fill, if needed, should consist of well-graded granular soils such as Gravel Borrow (WSDOT 9-03.14(1)), or approved equivalent.

Structural fill should be moisture conditioned to within about 3 percent of optimum moisture content, placed in loose, horizontal lifts less than 8 inches in thickness, and systematically compacted to a dense and relatively unyielding condition and to at least 95 percent of the maximum dry density, as determined using test method ASTM D1557 (Modified Proctor).

The procedure to achieve proper density of a compacted fill depends on the size and type of compacting equipment, the number of passes, thickness of the layer being compacted, and certain soil properties. When size of the excavation restricts the use of heavy equipment, smaller equipment can be used, but the soil must be placed in thin enough layers to achieve the required compaction.

Generally, loosely compacted soils result from poor workmanship or soils placed at improper moisture content. Soils with a high percentage of silt or clay are particularly susceptible to becoming too wet, and coarse-grained materials easily become too dry for proper compaction. Silty or clayey soils with a moisture content too high for adequate compaction should be dried as necessary, or moisture conditioned by mixing with drier materials. Sprinkling is sometimes required to wet a coarse-grained soil to near optimum moisture content before compaction.

6.8 UTILITIES

6.8.1 Trench Excavation

Trench excavations may be accomplished using conventional excavation equipment. All excavations in excess of 4 feet in depth should be sloped in accordance with Washington Administrative Code (WAC) 296-155, or be shored. It is contractor's responsibility to maintain safe working conditions, including temporary excavation stability.

6.8.2 Pipe Support and Bedding

Based on our field explorations, we anticipate medium dense to dense sand and gravel deposits suitable to support utility pipes will be encountered in utility trench excavations. Utility installation should be conducted in accordance with the 2018 WSDOT Standard Specifications or other applicable specifications for placement and compaction of pipe bedding and backfill. In general, pipe bedding should be placed in loose lifts not exceeding 6 inches in thickness, and compacted to a firm and unyielding condition. Bedding materials and thicknesses provided should be suitable for the utility system and materials installed, and in accordance with any applicable manufacturers' recommendations. Pipe bedding materials should be placed on relatively undisturbed native soil. Soft soils, if present, should be removed from the bottom of the trench and replaced with pipe bedding material.

6.8.3 Trench Backfill

The onsite soils may be utilized for trench backfill provided they can be compacted to the project specifications. Boulders and cobbles larger than about 6 inches should be removed from onsite material used as trench backfill. Imported trench backfill, if needed, should meet the requirements for Gravel Borrow as specified in Section 9-03.14(1) of the 2018 WSDOT *Standard Specifications,* or an approved equivalent. The trench backfill should be placed in 8- to 12-inch, loose lifts and compacted using mechanical equipment to at least 90 percent maximum dry density, per ASTM D1557 (Modified Proctor). In paved areas, the upper 2 feet of the backfill should be compacted to at least 95 percent maximum dry density, per ASTM D1557. Heavy compaction equipment should not be permitted to operate directly over utilities until a minimum of 2 feet of backfill has been placed.

6.9 INFILTRATION EVALUATION

Based on the presence of relatively clean recessional outwash sand and gravel encountered at shallow depths in our test pits, it is our opinion that storm water infiltration should be feasible at both the North and South sites.

The infiltration rates of the site soils were assessed by using the grain size analysis method described in Section 6.9.1. Recommended long-term (design) infiltration rates for the and additional discussions are provided in Section 6.9.2.

6.9.1 Design Infiltration Rate Based on Grain Size Analysis

Design infiltration rates of soils not consolidated by glacial advance such as alluvium or recessional outwash may be assessed based on grain size distributions, as outlined in the *Stormwater Management Manual for Western Washington* (SMMWW, WSDOE, 2014). The method estimates the initial saturated hydraulic conductivity (K_{sat}) using the following relationship:

$$\log_{10}(K_{sat}) = -1.57 + 1.9D_{10} + 0.015D_{60} - 0.013D_{90} - 2.08f_{fines}$$

Three partial correction factors are then applied to the K_{sat} value to estimate the long-term (design) infiltration rate as discussed in the following section.

6.9.1 ***Recommended Design Infiltration Rates and Discussion***

The correction factor for site variability (CF_v) is selected based on the number of locations tested and the consistency of the underlying soil conditions and ranges from 0.33 to 1.0 (no correction factor). Based on the varying fines content of the recessional outwash, the potential for recessional outwash soils to vary over relatively short distances, and based on our experience and engineering judgment, we recommend a correction factor of 0.5 for site variability.

The test method correction factor (CF_t) is intended to account for the uncertainty of the test method and the scale of test versus the size of the facility. The SMMWW applies a correction factor of $CF_t = 0.4$ when using the grain size method to estimate the long-term infiltration rate.

An influent control correction factor (CF_m) of 0.9 is intended to account for a reduction in infiltration capacity due to clogging from siltation and the build-up of biological material.

Based on the discussions above, a total correction factor of 0.18 (i.e., $CF_v \times CF_t \times CF_m = 0.5 \times 0.4 \times 0.9 = 0.18$) was applied to the K_{sat} value to get the estimated long-term infiltration rates presented in Table 2 (following page).

Table 2 – Estimated Long-Term Infiltration Rates

Sample Location, Depth	Correction Factor (CF_v x CF_t x CF_m)*	Long-Term Infiltration Rate (inches/hour)
GTP-101, 4’	0.18	5.9
GTP-102, 8’	0.18	4.6
GTP-103, 7’	0.18	94.5**
GTP-104, 7’	0.18	43.5**
GTP-105, 8’	0.18	2.6
GTP-106, 8’	0.18	38.5**

*CF_v = 0.5, CF_t = 0.4, CF_m = 0.9

**We recommend a maximum infiltration rate be limited to 10 inches/hour for design.

Groundwater Separation: For infiltration facilities, the DOE SMMWW requires a minimum 5-foot separation between the bottom of the infiltration facility and the seasonal high groundwater level. Based on observations of soil samples, the site topography, and our experience with nearby projects, we do not anticipate the presence of static groundwater within about 15 to 20 feet of the existing ground surface. Therefore, it is our opinion that the proposed infiltration facility will meet the DOE groundwater separation requirement.

6.10 WET SEASON CONSTRUCTION

General recommendations relative to earthwork performed in wet weather or in wet conditions are presented below. Because the sandy and gravelly soils at the site are relatively free draining, these materials may be used as all-weather fill. The following procedures are best management practices recommended for use in wet weather construction:

- Earthwork should be performed in small areas to minimize subgrade exposure to wet weather. Excavation or the removal of unsuitable soil should be followed promptly by the placement and compaction of clean structural fill. The size and type of construction equipment used may have to be limited to prevent soil disturbance.

- During wet weather, the allowable fines content of the structural fill should be reduced to no more than 5 percent by weight based on the portion passing ¾-inch sieve. The fines should be non-plastic.
- The ground surface within the construction area should be graded to promote run-off of surface water and to prevent the ponding of water.
- Bales of straw and/or geotextile silt fences should be strategically located to control erosion and the movement of soil.
- Excavation slopes and soils stockpiled on site should also be covered with plastic sheets.

6.11 SURFACE DRAINAGE AND EROSION CONSIDERATIONS

Adequate drainage provisions are imperative and we recommend both short and long term drainage measures be incorporated into the project design and construction. Surface runoff can be controlled during construction by careful grading practices. Typically, this includes the construction of shallow, upgrade perimeter ditches or low earthen berms to collect runoff and prevent water from entering the excavation. All collected water should be directed under control to a positive and permanent discharge system.

Permanent control of surface water should be incorporated in the final grading design. Adequate surface gradients and drainage systems should be incorporated into the design such that surface runoff is directed away from structures. Potential problems associated with erosion may also be reduced by establishing vegetation within disturbed areas immediately following grading operations.

Under no circumstances should water be allowed to pond immediately adjacent to paved areas or foundations. All pavement drainage should be directed into conduits which carry runoff away from the pavement into storm drain systems or other appropriate outlets.

7.0 ADDITIONAL SERVICES

To confirm that our recommendations are properly incorporated into the design and construction of the proposed project, PanGEO should be retained to conduct a review of the final project plans and specifications, and to monitor the construction of geotechnical elements. Modifications to

our recommendations presented in this report may be necessary, based on the actual conditions encountered during construction.

8.0 LIMITATIONS

We have prepared this report for use by Gray & Osborne, Inc. and the City of DuPont. Recommendations contained in this report are based on a site reconnaissance, a subsurface exploration program, review of pertinent subsurface information, and our understanding of the project. The study was performed using a mutually agreed-upon scope of work.

Variations in soil conditions may exist between the locations of the explorations and the actual conditions underlying the site. The nature and extent of soil variations may not be evident until construction occurs. If any soil conditions are encountered at the site that are different from those described in this report, we should be notified immediately to review the applicability of our recommendations. Additionally, we should also be notified to review the applicability of our recommendations if there are any changes in the project scope.

The scope of our work does not include services related to construction safety precautions. Our recommendations are not intended to direct the contractors' methods, techniques, sequences or procedures, except as specifically described in our report for consideration in design. Additionally, the scope of our work specifically excludes the assessment of environmental characteristics, particularly those involving hazardous substances.

This report has been prepared for planning and design purposes for specific application to the proposed project in accordance with the generally accepted standards of local practice at the time this report was written. No warranty, express or implied, is made.

This report may be used only by the client and for the purposes stated, within a reasonable time from its issuance. Land use, site conditions (both off and on-site), or other factors including advances in our understanding of applied science, may change over time and could materially affect our findings. Therefore, this report should not be relied upon after 24 months from its issuance. PanGEO should be notified if the project is delayed by more than 24 months from the date of this report so that we may review the applicability of our conclusions considering the time lapse.

It is the client's responsibility to see that all parties to this project, including the designer, contractor, subcontractors, etc., are made aware of this report in its entirety. The use of information contained in this report for bidding purposes should be done at the contractor's option and risk. Any party other than the client who wishes to use this report shall notify PanGEO of such intended use and for permission to copy this report. Based on the intended use of the report, PanGEO may require that additional work be performed and that an updated report be reissued. Noncompliance with any of these requirements will release PanGEO from any liability resulting from the use this report.

We appreciate the opportunity to be of service.

Sincerely,

(Draft)

Spenser P. Scott
Staff Geologist

(Draft)

Steven T. Swenson, L.G.
Project Geologist

(Draft)

Siew L. Tan, P.E.
Principal Geotechnical Engineer

9.0 REFERENCES

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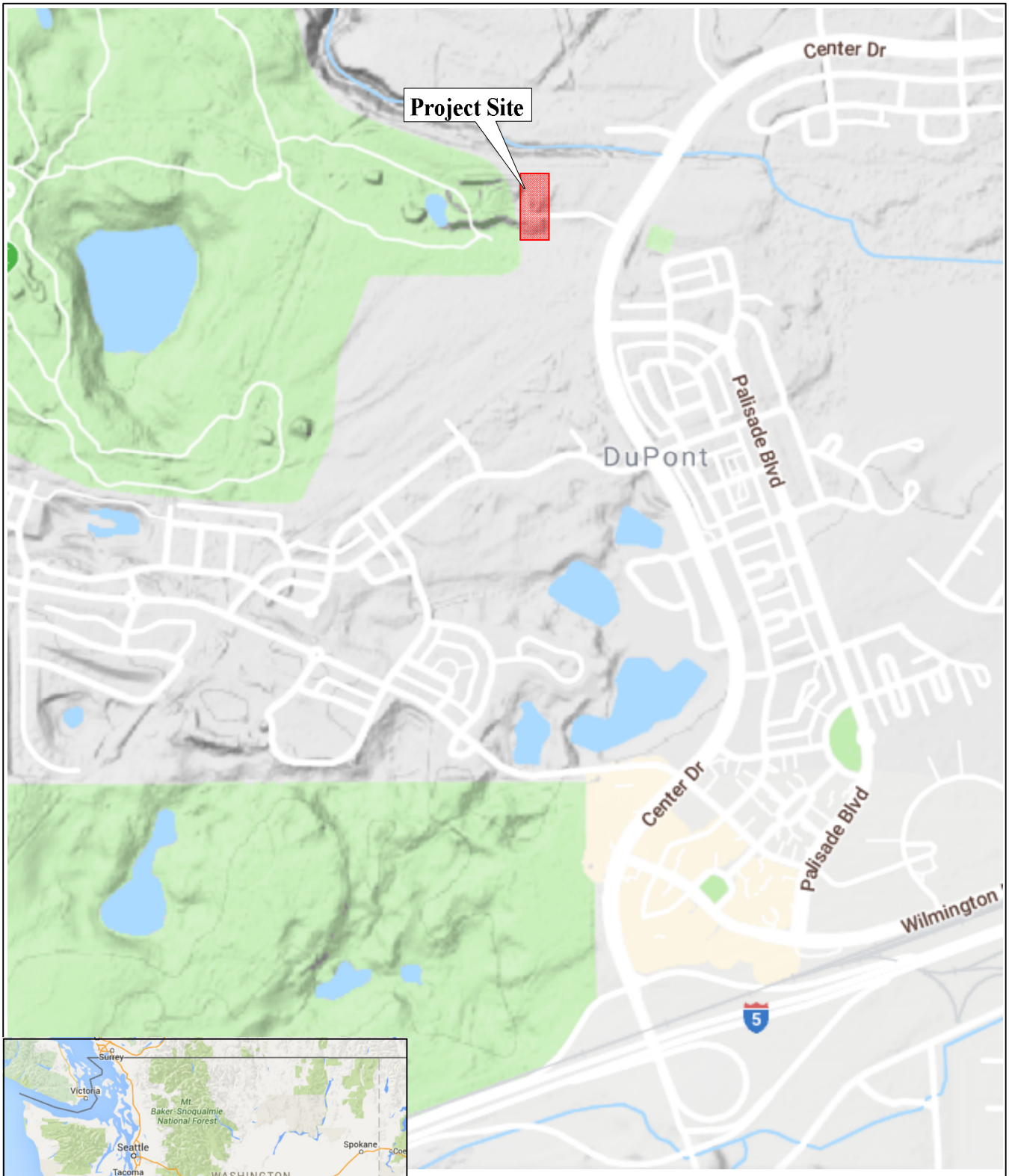

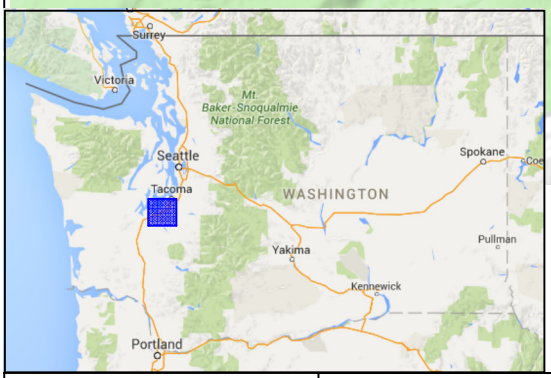

Base Map: Google Maps

NORTH

Approx. Scale: Not to Scale

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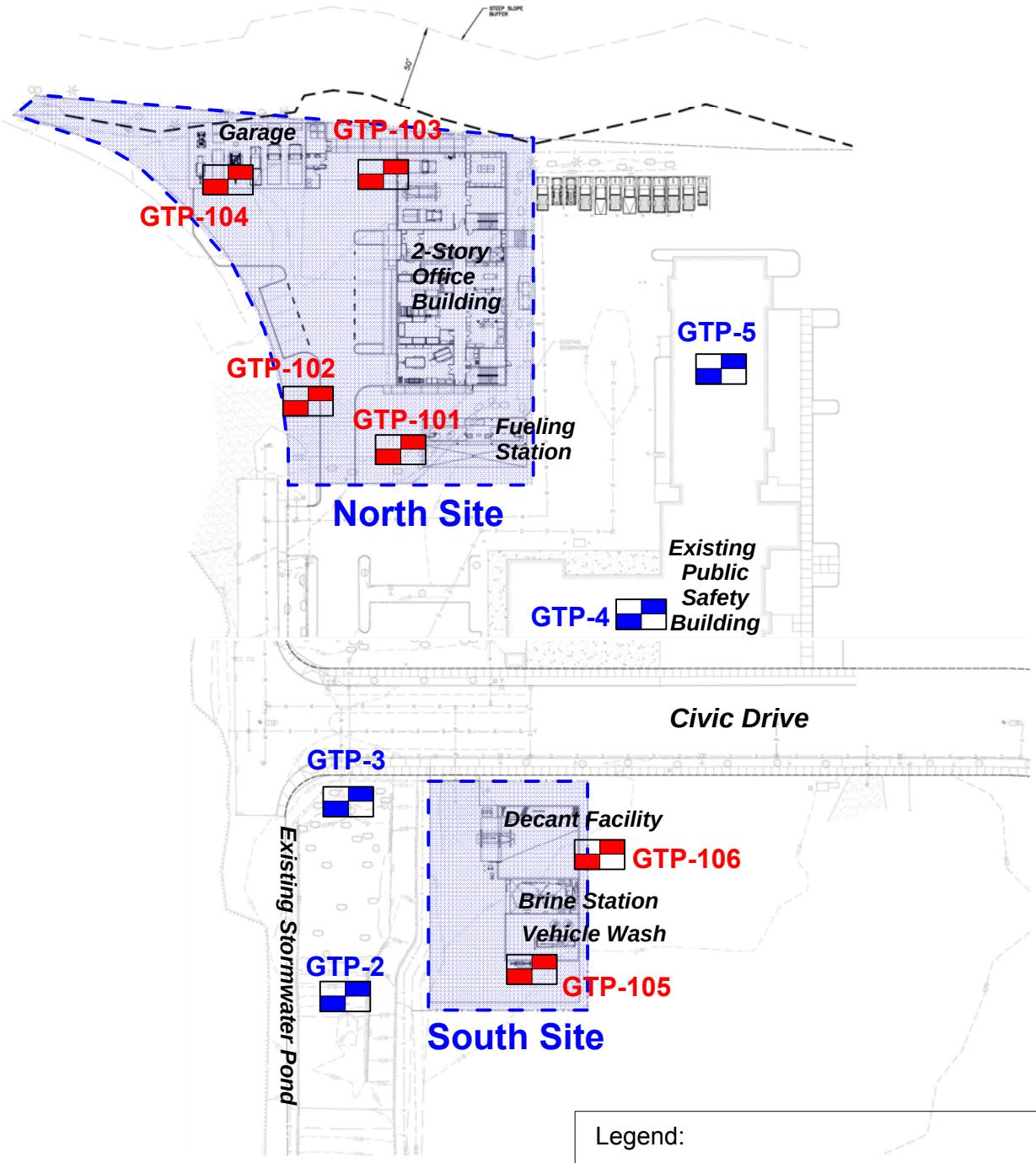
Proposed Public Works Facility
1780 Civic Drive
DuPont, Washington

VICINITY MAP

Project No. **06-117.300**

Figure No. **1**

06-117.300 Fig 1 - Vicinity Map.grf 4/16/19 (15:59) SPS



Legend:

- Proposed Development Areas
- Approximate Test Pit Locations *PanGEO, Inc., April 2019*
- Previous Test Pit Locations *PanGEO, Inc., August 2006*

Approx. Scale
1" = 100'

Base map modified from a Proposed Site Plan by Gray & Osborne, Inc. dated March 2019.

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Proposed Public Works Facility
1780 Civic Drive
DuPont, Washington

SITE AND EXPLORATION PLAN

Project No. **06-117.300**

Figure No. **2**

06-117.300 Fig 2 Site Plan.grf 4/24/19 (16:51) STS

APPENDIX A

SUMMARY TEST PIT LOGS

RELATIVE DENSITY / CONSISTENCY

SAND / GRAVEL			SILT / CLAY		
Density	SPT N-values	Approx. Relative Density (%)	Consistency	SPT N-values	Approx. Undrained Shear Strength (psf)
Very Loose	<4	<15	Very Soft	<2	<250
Loose	4 to 10	15 - 35	Soft	2 to 4	250 - 500
Med. Dense	10 to 30	35 - 65	Med. Stiff	4 to 8	500 - 1000
Dense	30 to 50	65 - 85	Stiff	8 to 15	1000 - 2000
Very Dense	>50	85 - 100	Very Stiff	15 to 30	2000 - 4000
			Hard	>30	>4000

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS		GROUP DESCRIPTIONS	
Gravel 50% or more of the coarse fraction retained on the #4 sieve. Use dual symbols (eg. GP-GM) for 5% to 12% fines.	GRAVEL (<5% fines)	GW	Well-graded GRAVEL
		GP	Poorly-graded GRAVEL
	GRAVEL (>12% fines)	GM	Silty GRAVEL
		GC	Clayey GRAVEL
Sand 50% or more of the coarse fraction passing the #4 sieve. Use dual symbols (eg. SP-SM) for 5% to 12% fines.	SAND (<5% fines)	SW	Well-graded SAND
		SP	Poorly-graded SAND
	SAND (>12% fines)	SM	Silty SAND
		SC	Clayey SAND
Silt and Clay 50%or more passing #200 sieve	Liquid Limit < 50	ML	SILT
		CL	Lean CLAY
		OL	Organic SILT or CLAY
	Liquid Limit > 50	MH	Elastic SILT
		CH	Fat CLAY
		OH	Organic SILT or CLAY
Highly Organic Soils		PT	PEAT

Notes: 1. Soil exploration logs contain material descriptions based on visual observation and field tests using a system modified from the Uniform Soil Classification System (USCS). Where necessary laboratory tests have been conducted (as noted in the "Other Tests" column), unit descriptions may include a classification. Please refer to the discussions in the report text for a more complete description of the subsurface conditions.

2. The graphic symbols given above are not inclusive of all symbols that may appear on the borehole logs. Other symbols may be used where field observations indicated mixed soil constituents or dual constituent materials.

DESCRIPTIONS OF SOIL STRUCTURES

Layered: Units of material distinguished by color and/or composition from material units above and below

Laminated: Layers of soil typically 0.05 to 1mm thick, max. 1 cm

Lens: Layer of soil that pinches out laterally

Interlayered: Alternating layers of differing soil material

Pocket: Erratic, discontinuous deposit of limited extent

Homogeneous: Soil with uniform color and composition throughout

Fissured: Breaks along defined planes

Slickensided: Fracture planes that are polished or glossy

Blocky: Angular soil lumps that resist breakdown

Disrupted: Soil that is broken and mixed

Scattered: Less than one per foot

Numerous: More than one per foot

BCN: Angle between bedding plane and a plane normal to core axis

COMPONENT DEFINITIONS

COMPONENT	SIZE / SIEVE RANGE	COMPONENT	SIZE / SIEVE RANGE
Boulder:	> 12 inches	Sand	
Cobbles:	3 to 12 inches	Coarse Sand:	#4 to #10 sieve (4.5 to 2.0 mm)
Gravel		Medium Sand:	#10 to #40 sieve (2.0 to 0.42 mm)
Coarse Gravel:	3 to 3/4 inches	Fine Sand:	#40 to #200 sieve (0.42 to 0.074 mm)
Fine Gravel:	3/4 inches to #4 sieve	Silt	0.074 to 0.002 mm
		Clay	<0.002 mm

TEST SYMBOLS

for In Situ and Laboratory Tests listed in "Other Tests" column.

ATT	Atterberg Limit Test
Comp	Compaction Tests
Con	Consolidation
DD	Dry Density
DS	Direct Shear
%F	Fines Content
GS	Grain Size
Perm	Permeability
PP	Pocket Penetrometer
R	R-value
SG	Specific Gravity
TV	Torvane
TXC	Triaxial Compression
UCC	Unconfined Compression

SYMBOLS

Sample/In Situ test types and intervals

- 2-inch OD Split Spoon, SPT (140-lb. hammer, 30" drop)
- 3.25-inch OD Spilt Spoon (300-lb hammer, 30" drop)
- Non-standard penetration test (see boring log for details)
- Thin wall (Shelby) tube
- Grab
- Rock core
- Vane Shear

MONITORING WELL

- Groundwater Level at time of drilling (ATD)
- Static Groundwater Level
- Cement / Concrete Seal
- Bentonite grout / seal
- Silica sand backfill
- Slotted tip
- Slough
- Bottom of Boring

MOISTURE CONTENT

Dry	Dusty, dry to the touch
Moist	Damp but no visible water
Wet	Visible free water

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Terms and Symbols for Boring and Test Pit Logs

Figure A-1

Test Pit No. GTP-101

Approximate ground surface elevation: 222 feet

Coordinates (WGS84): 47.106028, -122.648404

Depth (ft)	USCS	Material Description
0 – ½	SM	Grass and sod over medium dense, moist, dark brown, silty SAND; trace cobble and gravel; rootlets, trash debris **[Topsoil]**
½ – 4	GW-GM	Dense to very dense, moist, dark brown, well graded GRAVEL with silt and sand; trace cobble; occasional grey sandy pocket; sand increases with depth **[Qf – Fill]** **-Sample at 4':** 8.4% fines

Photos GTP-101: Test Pit GTP-101 to approximately 4 feet in depth (below); Sample from bottom of exploration at 4 feet (left)

GTP-101 was terminated approximately 4 feet below ground surface. No groundwater was observed at the time of excavation.

Test Pit No. GTP-102

Approximate ground surface elevation: 223 feet

Coordinates (WGS84): 47.106060, -122.648626

Depth (ft)	**USCS**	**Material Description**
0 – ½	SM	Grass and sod over medium dense, moist, dark brown, silty SAND with gravel; rootlets, trace wood debris **[Topsoil]**
½ – 4	GP-GM	Dense, moist, dark brown, poorly graded GRAVEL with silt and sand; trace cobble, trace wood debris **[Qf – Fill]**
4 – 8½	GP	Medium dense, moist, light brown, poorly graded GRAVEL with sand; trace cobble; iron-oxide staining; becomes slightly cemented at about 8 feet **[Qgog – Vashon Recessional Outwash Gravel]** **-Sample at 8':** 2.9% fines

Photos GTP-102: Test Pit GTP-102 to approximately 8½ feet in depth (below); Sample from bottom of exploration at 8½ feet (left)

GTP-102 was terminated approximately 8½ feet below ground surface. No groundwater was observed at the time of excavation.

Test Pit No. GTP-103

Approximate ground surface elevation: 224 feet

Coordinates (WGS84): 47.106450, -122.648425

Depth (ft)	USCS	Material Description
0 – ½	SM	Grass and sod over medium dense, moist, dark brown, silty SAND with gravel; rootlets **[Topsoil]**
½ – 2	GP-GM	Dense, moist, dark brown, poorly graded GRAVEL with silt and sand; trace cobble, trace rootlets **[Qf – Fill]**
2 – 7	GP	Dense to very dense, moist, light brown to red-brown, poorly graded GRAVEL with sand; trace cobble, iron-oxide staining **[Qgog – Vashon Recessional Outwash Gravel]** **-Sample at 7':** 2.7% fines

Photos GTP-103: Test Pit GTP-103 to approximately 7 feet in depth (below); Sample from bottom of exploration at 7 feet (left)

GTP-103 was terminated approximately 7 feet below ground surface. No groundwater was observed at the time of excavation.

Test Pit No. GTP-104

Approximate ground surface elevation: 224 feet

Coordinates (WGS84): 47.106430, -122.648900

Depth (ft)	USCS	Material Description
0 – 1	SM	Compost and mulch over medium dense, moist, dark brown to dark grey, silty SAND with gravel; trace cobble **[Qf – Fill]**
1 – 3	GP-GM	Dense, moist, brown to red-brown, poorly graded GRAVEL with silt and sand; trace cobble **[Qgog – Vashon Recessional Outwash Gravel]**
3 – 7	GP	Dense to very dense, moist to wet, gray, poorly graded GRAVEL with sand; trace cobble **[Qgog – Vashon Recessional Outwash Gravel]** **-Sample at 7':** 1.8% fines

Photos GTP-104: Test Pit GTP-104 to approximately 7 feet in depth (below); Sample from bottom of exploration at 7 feet (left)

GTP-104 was terminated approximately 7 feet below ground surface. No groundwater was observed at the time of excavation.

Test Pit No. GTP-105

Approximate ground surface elevation: 218 feet

Coordinates (WGS84): 47.104975, -122.648059

Depth (ft)	**USCS**	**Material Description**
0 – 1	SM	1¼ -inch gravel and sparse vegetation over medium dense, moist, grey, silty SAND with gravel; trace cobble **[Qf – Fill]**
1 – 5	GP-GM	Dense, moist, grey-brown, slightly silty GRAVEL with sand; trace cobble **[Qf – Fill]**
5 – 5½	TPSL	Soft to stiff, moist, black, very silty organic SILT with sand and gravel; burnt wood fragments **[Previous Topsoil Layer]**
5½ - 8	GW-GM	Dense to very dense, moist, brown, well graded GRAVEL with silt and sand; trace cobble **[Qgog – Vashon Recessional Outwash Gravel]** **-Sample at 8':** 11.9% fines

Photos GTP-105: Test Pit GTP-105 to approximately 8 feet in depth (below); Sample from bottom of exploration at 8 feet (left)

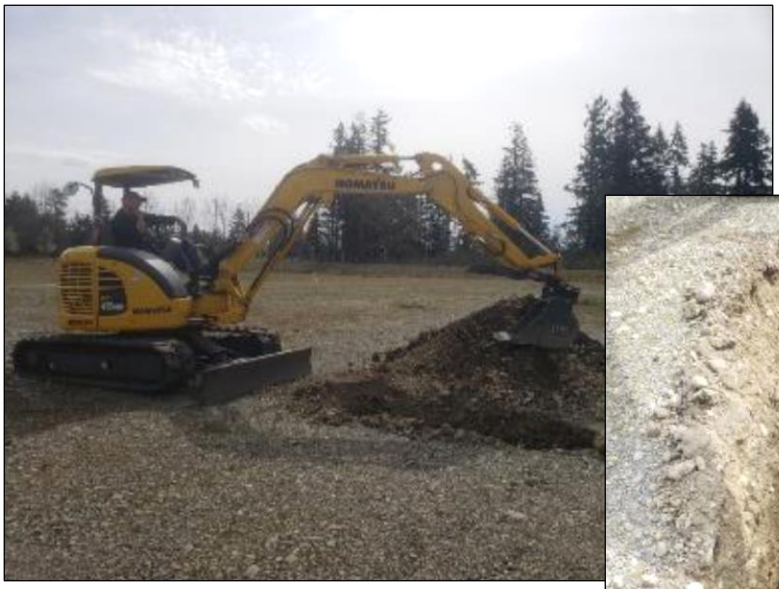
GTP-105 was terminated approximately 8 feet below ground surface. No groundwater was observed at the time of excavation.

Test Pit No. GTP-106

Approximate ground surface elevation: 216 feet

Coordinates (WGS84): 47.105082, -122.648051

Depth (ft)	USCS	Material Description
0 – 1	SM	1¼ -inch gravel and sparse vegetation over medium dense, moist, grey, silty SAND with gravel; trace cobble **[Qf – Fill]**
1 – 5	GP-GM	Dense, moist, grey-brown, slightly silty GRAVEL with sand; trace silt, trace wood debris **[Qf – Fill]**
5 – 6 ½	TPSL	Soft to stiff, moist, black, very silty organic SILT with sand and gravel; burnt wood fragments **[Previous Topsoil Layer]**
6½ - 8	GP	Dense to very dense, moist, brown, poorly graded GRAVEL with sand; trace cobble **[Qgog – Vashon Recessional Outwash Gravel]** **-Sample at 8':** 3.6% fines



Photos GTP-106: Test Pit GTP-106 to approximately 8 feet in depth (below); Operator digging test pit (left)

GTP-106 was terminated approximately 8 feet below ground surface. No groundwater was observed at the time of excavation.

Date of Test Pit Observation: April 1, 2019

Test Pit Logged by: S. Scott

APPENDIX B

LOGS OF PREVIOUS TEST PITS

Test Pit GTP-2

Approximate ground surface elevation: 214 feet
Ground Surface Conditions: Gravel and Cobbles with scattered weeds

Depth (ft)	Material Description
0 – 3	Medium dense, damp, brown to dark brown, silty sandy GRAVEL with abundant cobbles, some roots in the upper 12 inches (**Vashon Drift**).
3 – 6½	Medium dense to dense, damp to moist, gray-brown, sandy GRAVEL with some cobbles and trace silt (**Vashon Drift**).
6½ – 10½	Medium dense to dense, very moist, gray, fine GRAVEL with some sand and cobbles, trace silt (**Vashon Drift**).
	Test Pit terminated approximately 10½ feet below ground surface. No groundwater/seepage observed in the test pit. No weathering indicating seasonal groundwater within test pit depth was observed.

Test Pit GTP-3

Approximate ground surface elevation: 210 feet
Ground Surface Conditions: Dry silt with scattered thin vegetation cover

Depth (ft)	Material Description
0 – 2½	Medium dense, dry to damp, brown, sandy SILT, some wood chips and trace gravel (**Fill/Disturbed Soil**).
2½ – 6	Medium dense, damp to moist, gray, slightly slity sandy GRAVEL with some cobbles (**Vashon Drift**).
6 – 9½	Medium dense to dense, very moist, gray, sandy GRAVEL with trace silt (**Vashon Drift**).
	Test Pit terminated approximately 9½ feet below ground surface. No groundwater/seepage observed in the test pit.

Test Pit GTP-4

Approximate ground surface elevation: 214 feet
Ground Surface Conditions: Gravel and Cobbles with spare weeds

Depth (ft)	Material Description
0 – 2½	Loose to medium dense, moist, dark brown to black, silty sandy GRAVEL with some cobbles, tree chucks, and organics (**Fill**).
2½ – 6	Medium dense, moist, gray-brown, sandy GRAVEL with some cobbles and little silt (**Vashon Drift**).
	Test Pit terminated approximately 6 feet below ground surface. No groundwater/seepage observed in the test pit.

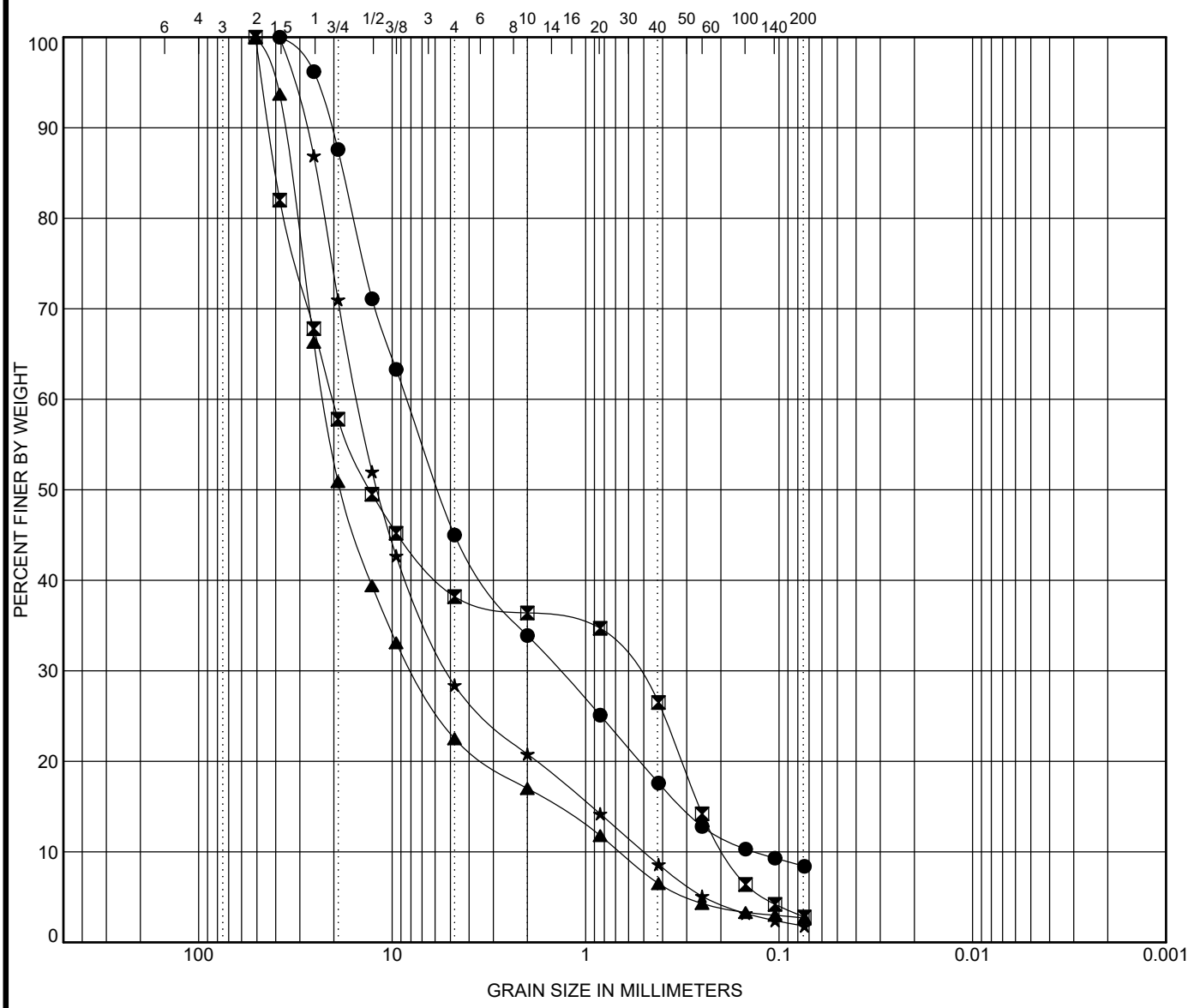
Test Pit GTP-5

Approximate ground surface elevation: 223 feet
Ground Surface Conditions: Gravel with scattered weeds

Depth (ft)	Material Description
0 – 1½	Medium dense, damp, brown, silty sandy GRAVEL with abundant cobbles, some roots, and organics (**Fill**).
1½ – 6½	Medium dense, damp to moist, gray, sandy GRAVEL with some cobbles and trace silt (**Vashon Drift**).
	Test Pit terminated approximately 6½ feet below ground surface. No groundwater/seepage observed in the test pit.

APPENDIX C

LABORATORY TEST RESULTS



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

	Specimen Identification		Classification	LL	PL	PI	Cc	Cu
●	GTP-101	@ 4.0 ft.	WELL-GRADED GRAVEL with SILT and SAND(GW-GM)	NP	NP	NP	1.65	62.68
⊠	GTP-102	@ 8.0 ft.	POORLY GRADED GRAVEL with SAND(GP)	NP	NP	NP	0.08	107.27
▲	GTP-103	@ 7.0 ft.	POORLY GRADED GRAVEL with SAND(GP)	NP	NP	NP	4.03	33.99
★	GTP-104	@ 7.0 ft.	POORLY GRADED GRAVEL with SAND(GP)	NP	NP	NP	3.52	30.15

	Specimen Identification		D100	D90	D60	D10	%Gravel	%Sand	%Silt	%Clay
●	GTP-101	4.0	38.1	20.642	8.409	0.134	55.0	36.5	8.4	
⊠	GTP-102	8.0	50.8	43.297	20.295	0.189	61.8	35.3	2.9	
▲	GTP-103	7.0	50.8	36.07	22.58	0.664	77.5	19.8	2.7	
★	GTP-104	7.0	38.1	27.958	15.064	0.5	71.6	26.6	1.8	

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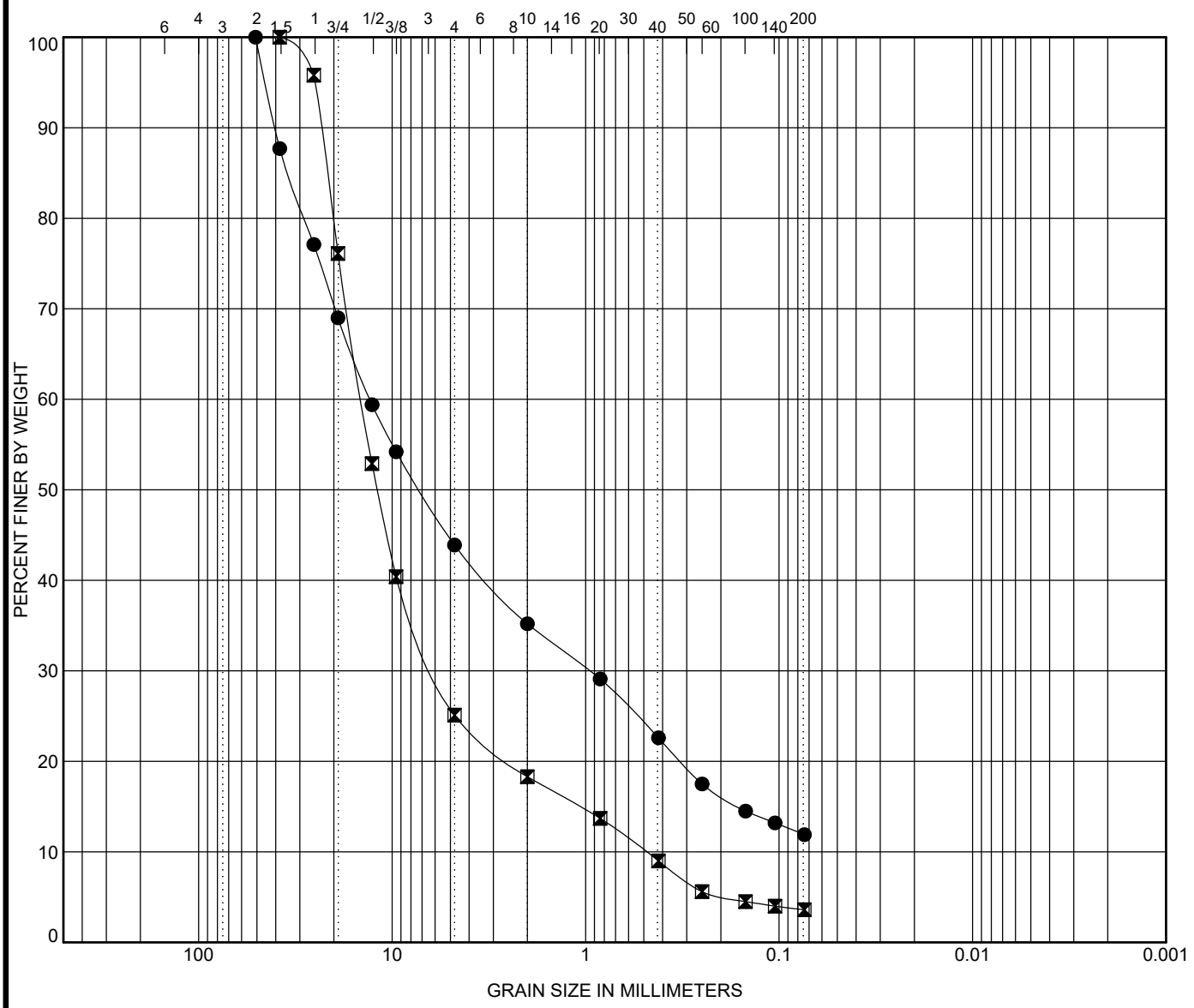
GRAIN SIZE DISTRIBUTION

Project: Proposed Public Works Facility
Job Number: 06-117.300
Location: 1780 Civic Drive, DuPont, WA

Figure C-1



COBBLES	GRAVEL		SAND			SILT OR CLAY
	coarse	fine	coarse	medium	fine	

Specimen Identification		Classification	LL	PL	PI	Cc	Cu
● GTP-105	@ 8.0 ft.	WELL-GRADED GRAVEL with SILT and SAND(GW-GM)	NP	NP	NP	1.58	293.54
⊠ GTP-106	@ 8.0 ft.	POORLY GRADED GRAVEL with SAND(GP)	NP	NP	NP	5.05	29.53

Specimen Identification		D100	D90	D60	D10	%Gravel	%Sand	%Silt	%Clay
● GTP-105	8.0	50.8	40.206	13.026		56.1	31.9	11.9	
⊠ GTP-106	8.0	38.1	23.337	14.378	0.487	74.9	21.5	3.6	

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GRAIN SIZE DISTRIBUTION

Project: Proposed Public Works Facility
Job Number: 06-117.300
Location: 1780 Civic Drive, DuPont, WA

Figure C-2

Urban Environmental Partners llc
Diligent, responsive, and practical consulting!

UEP llc Project No. 19-67

PanGEO, Inc.
Mr. Siew Tan
3414 NE 55th Street Seattle, WA 98105-2310

August 1, 2019

Subject: Soil Sampling Report for Dupont Public Works Facility
1780 Civic Drive DuPont, WA

Dear Mr. Tan:

This report summarizes the Urban Environmental Partners llc (UEP) results from sampling and testing of surface soil at the proposed Public Works Facility in DuPont, Washington (Figure 1). DuPont requested that shallow soil samples be collected in areas where footings and other foundation structures may require excavation for the construction of the planned Public Works Facility. Soil sampling for this project was completed in both the North Site and the South Site areas of the property as shown on Figure 2, in areas representative of the planned excavation.

This report summarizes the soil sample collection methods, and analytical results for the project samples. Locations for soil sample collection are shown on Figure 2. Sample analytical results are summarized in Table 1.

Soil Sample Collection Methods

As stated above, sampling was completed within in a grid pattern in the area within the North and South Sites. In accordance with guidance in Ecology publication 12-09-087, *Quick Guidance for Arsenic and Lead Soil Sampling and Cleanup*, Revised May 2015 (provided as Appendix A), we selected 16 total locations for sampling surface soil based on a total area of approximately 1.0 acre for the 2 Sites. For the North Site area, a total of 13 soil samples were collected. For the South Site area, a total of 3 soil samples were collected. Sample locations and numbers are shown on Figure 2.

The soil samples were collected on July 17, 2019, by UEP using a shovel, spade, and trowel. The samples were taken from a depth of 0” to 5” below grade. UEP collected a 4-ounce (oz.) soil sample at each of the 16 sample locations (Numbered 1 through 16).

Soil material at each sample location was homogenized in a stainless-steel bowl and placed in a numbered 4-oz. glass sampling jar. Jars were placed on ice in a cooler, under chain-of-custody documentation. Soils encountered were dry, light-brown silty, gravelly, sands. The cooler with samples was submitted on July 17, 2019 to Friedman and Bruya Laboratories (Seattle, WA) for analysis of the metals lead (Pb) and arsenic (As) by EPA Method 6020B.

Quality Assurance/Quality Control

Quality Assurance/Quality Control activities included generally accepted procedures for sample collection, storage, tracking, documentation, and analysis. All samples were labeled with a sample number, date, time, and sampler name. Appropriate chain-of-custody documentation was completed, and is attached as Appendix B with the lab certificates of analysis.

Analytical Results

The analytical results for lead and arsenic in the 16 soil samples are discussed below. The results are compared to acceptable cleanup levels (CULs) for unrestricted land use (residential) criteria established under the Model Toxics Control Act (MTCA) codified as WAC 173-340, and presented in Table 740-1 of the MTCA regulation.

For this report, UEP has compared the soil sample results to the unrestricted land use standards to be conservative in our interpretation and recommendations. The soil sample results are summarized in Table 1. Table 1 also includes other representative data presenting "background soil levels" for Pb and As for the Puget sound Region obtained from "*Natural Background Soil Metals Concentrations in Washington State*" for purposes of additional comparison and discussion.

Soil Sample Results

Lead Results

Concentrations of lead (Pb) in the soil samples ranged from 3.56 mg/kg to 19.5 mg/kg if detected; with the MTCA Method A Cleanup Level (CUL) for Pb being 20 mg/kg, all 16 soil samples were below the CUL. In addition, all of the 16 samples were below the "Natural Background Concentration" for Pb in Puget Sound, which is 24.0 mg/kg. And again, all 16 samples were below the Pb CUL under MTCA.

Arsenic Results

Concentrations of arsenic (As) in soil samples ranged from 2.3 mg/kg to 16.6 mg/kg if detected, with the residential MTCA Method A CUL for As being 250 mg/kg. Interestingly, 12 of 16 samples were slightly above the "Natural Background Concentration" for As in Puget

Sound, 7 mg/kg, which is representative for the area. Nevertheless, all samples were below the As CUL under MTCA. Laboratory reports and associated chain-of-custody documents are presented in Appendix B.

Interpretation and Recommendations

It is our opinion that the number of samples collected, the sample collection method, and the lab analysis used provides reliable metals data for lead and arsenic that are representative of conditions of soil that will be excavated in the 2 areas for construction of the public works facility.

The data results for lead and arsenic for all 16 soil samples in the 2 site areas are below applicable cleanup levels for remediation at residential (unrestricted land use) properties under the MTCA regulations (WAC 173-340).

All the samples are within Puget Sound background levels for lead. About 75% of samples show some slight elevations of arsenic above natural background concentrations for Puget Sound, which is a condition endemic to the region. Again, all the soil samples are well below applicable cleanup levels for residential properties for both metals.

Based on the data results presented in Table 1, it is our opinion that there are no real limitations on the export or re-use of excavated soil from either of the tested areas during construction for foundation work at the sites. The metals data table and this report can be provided to anyone who is contracted to take the excavated dirt to show them the conditions of the soil, at the time that our sampling work was completed.

As a precaution against potential liability from any misunderstanding and miscommunication, we recommend that none of the excavated dirt should be re-used or placed as fill on a residential property. The presence of even slight arsenic metal concentrations above Puget Sound natural background values could be potentially misconstrued, by a home owner who gardens in their back yard, or by a person who has a different risk avoidance view point than a typical home owner. At a minimum, it is our recommendation that any property owner who receives exported dirt from the site should be given the data table and the lab results from this report to make their own interpretation for an informed use of the material.

Limitations of the Report

Our services for this project were focused on the assessment of lead and arsenic metals content in soils in the identified 2 property areas, and were therefore non-comprehensive, and are not intended to identify all environmental problems potentially applicable to every situation. Please be aware that our scope of work was limited to those items specifically described above. Other activities or conditions that are not specifically described are excluded and are therefore not part of our services.

Land use, site conditions (both on-site and off-site), and other factors may change over time. Since on-going site activities and future regulations are beyond our control and could change at any time after the completion of this report, our observations, findings, and opinions can be considered valid for a limited time duration, and may be changed by changes in the site conditions since the time of our site reconnaissance and sample collection.

UEP llc assumes no responsibility or liability whatsoever for any claim, loss of property value, damage, or injury or other 3rd Party claims or assertions which result from perceived or possible but unknown, pre-existing materials being encountered or present on the project site, or from the discovery of such materials.

This report is prepared for the sole use of PanGeo and your Client. The scope of services performed during this assessment may not be appropriate for the needs of other 3rd Party users. Re-use of this document or the findings, conclusions, or recommendations presented herein, are at the sole risk of said user(s) and 3rd Parties. Any 3rd Party other than PanGeo and your Client who would like to use this report shall notify UEP llc of such intended use, and gain reliance from us for use of the document. Based on the communicated intended use of the report, UEP llc may require that additional work be performed, or that an updated report be issued. Non-compliance with any of these 3rd Party use requirements will release UEP llc from any liability resulting from the use of this report by any unauthorized party.

No warranty, either express or implied, is made.

Closing

We appreciate this opportunity to provide our services to PanGEO and your Client. Please contact us at your convenience with any issues regarding our work or the presentation of the findings in this report. We are happy to answer questions, provide additional information, and to be of additional service to PanGeo and your Client.

Best Regards,

John R Funderburk, MSPH

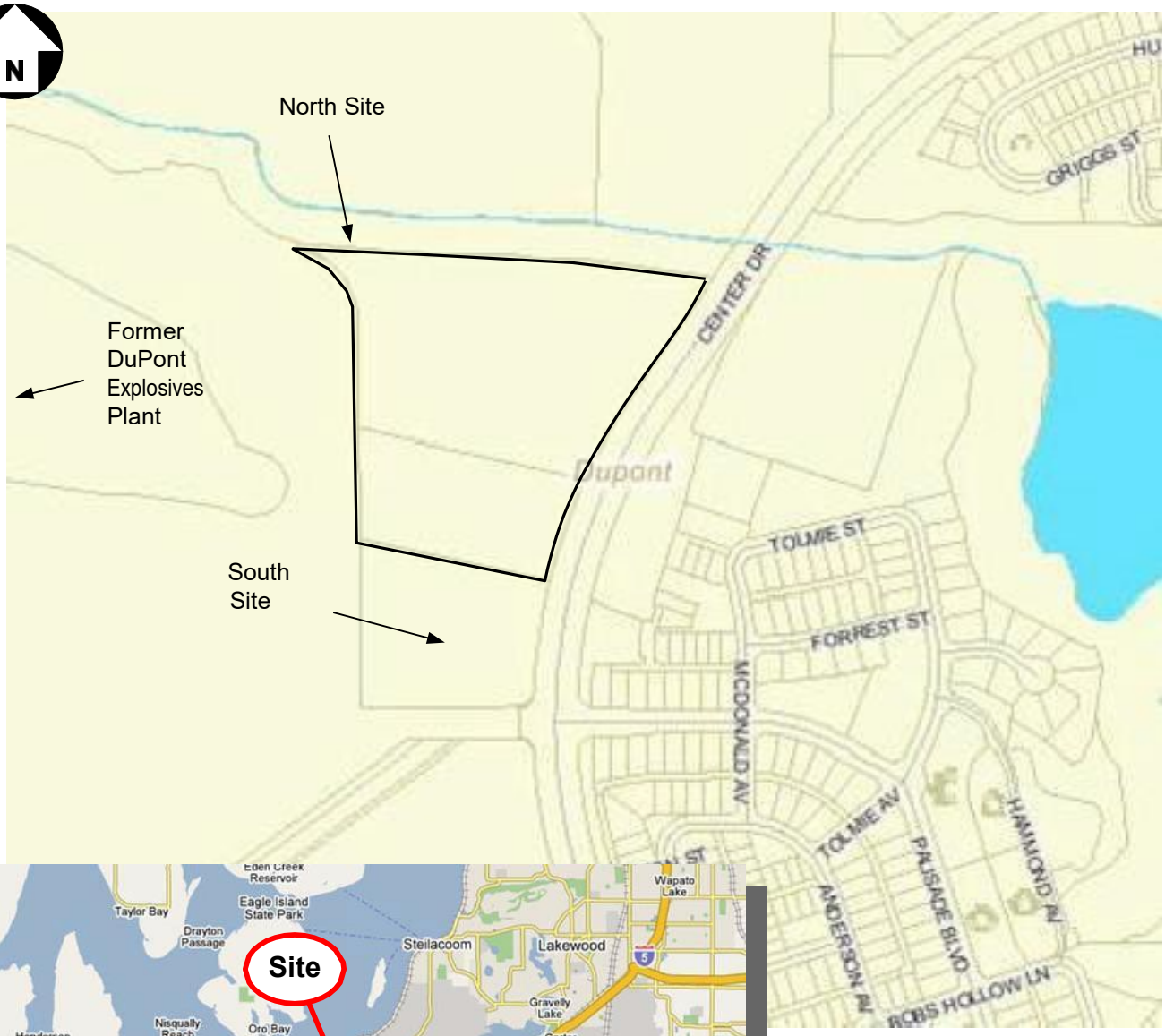
John R. Funderburk, MSPH
Principal, Managing Partner
Urban Environmental Partners llc

FIGURES

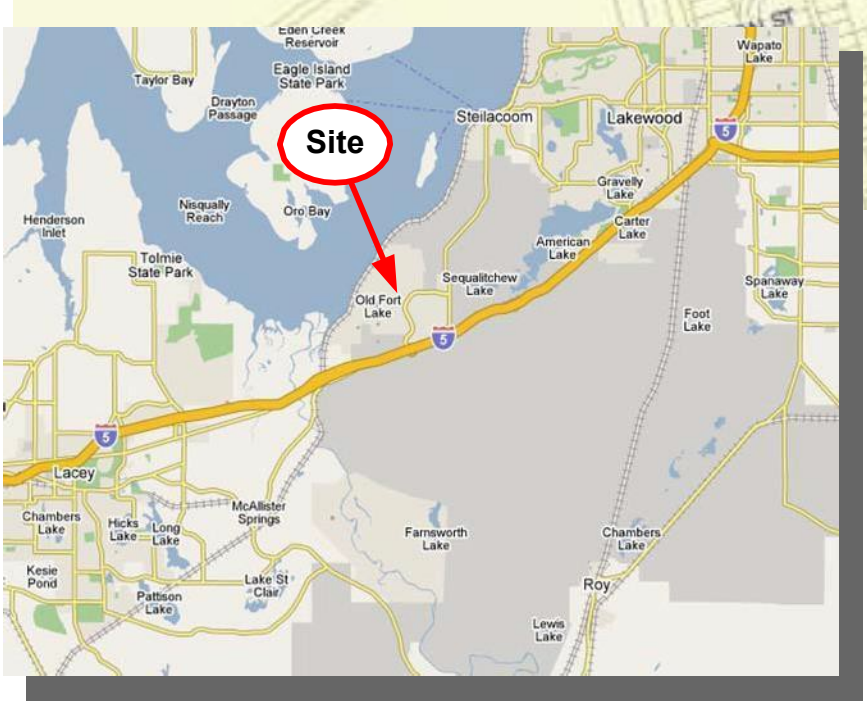
Figure 1:	Site Location Map
Figure 2:	Locations of Soil Sample Collection for Arsenic and Lead

TABLES

APPENDICES



Basemap: Pierce County GIS



Google Maps 2019

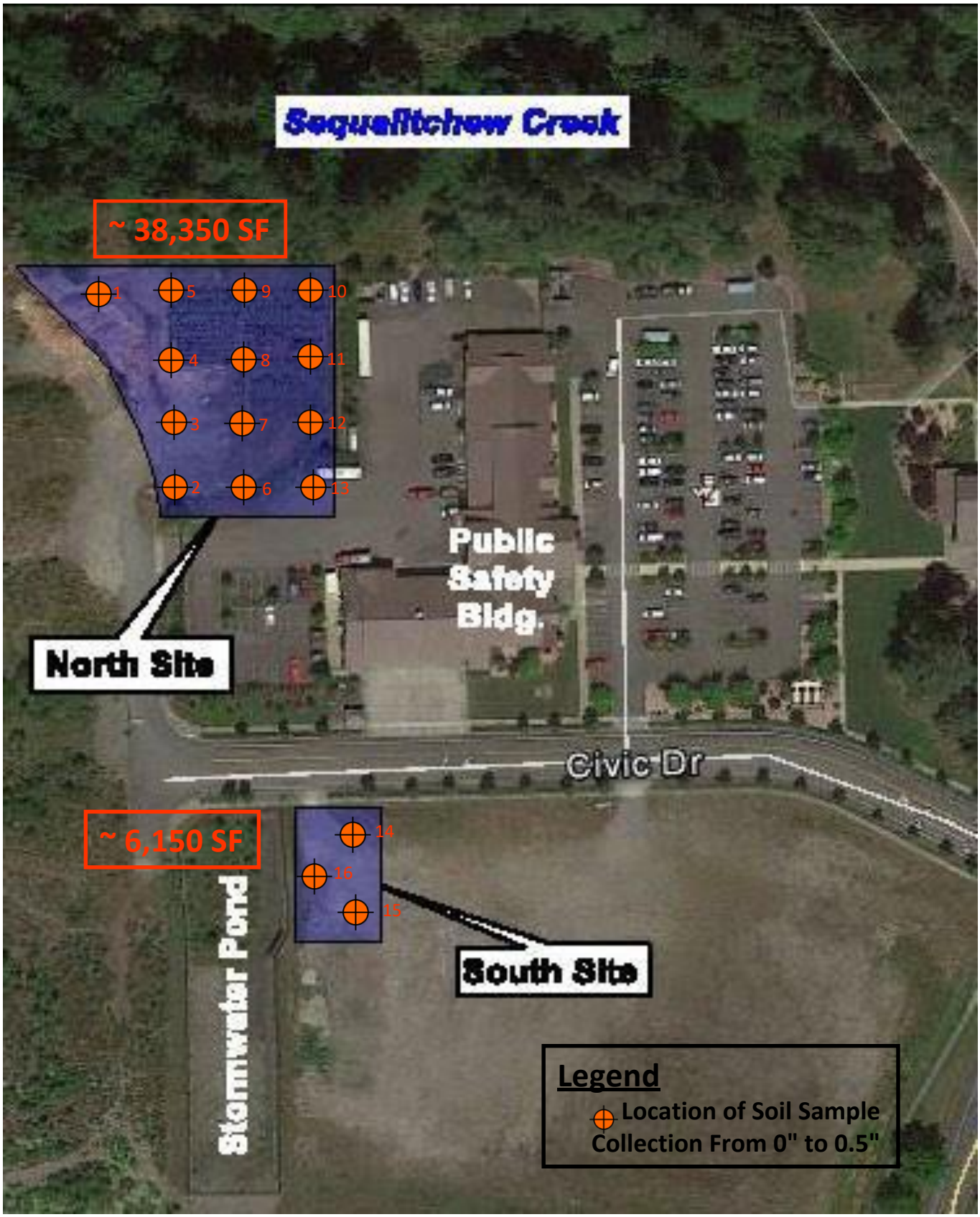
Project File: 19-67.vsd

Urban Environmental Partners llc
Diligent, responsive, and practical consulting!

Site Location Maps

Dupont Public Works
Facility Center Drive
DuPont, Washington

Figure
1



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PanGeo
DuPont Public Works Facility
DuPont, Washington
Gray and Osborne, Inc

Figure 2 Locations of Soil Sample Collection for Arsenic (As) and Lead (Pb)

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Table 1
Soil Analytical Results for Lead (Pb), Arsenic (As)
North & South Sites - Civic Drive in Dupont, WA

Location ID	Sample ID	Sampled By	Date Sampled	Depth (in/bgs)	Analytical Results - milligrams per kilogram (mg/kg)				
					Pb[1]	As[1]	Below CUL	Below Natural Background Levels[3] Pb	Below Natural Background Levels[3] As
1	1	MG/UEP	7/11/2019	0" - 5"	17.6	13.5	✓	✓	
2	2	MG/UEP	7/11/2019	0" - 5"	18.4	16.6	✓	✓	
3	3	MG/UEP	7/11/2019	0" - 5"	14.1	11.4	✓	✓	
4	4	MG/UEP	7/11/2019	0" - 5"	8.79	5.79	✓	✓	✓
5	5	MG/UEP	7/11/2019	0" - 5"	19.5	11.6	✓	✓	
6	6	MG/UEP	7/11/2019	0" - 5"	16.8	12.2	✓	✓	
7	7	MG/UEP	7/11/2019	0" - 5"	12.6	9.52	✓	✓	
8	8	MG/UEP	7/11/2019	0" - 5"	12.3	11.1	✓	✓	
9	9	MG/UEP	7/11/2019	0" - 5"	13.8	10.5	✓	✓	
10	10	MG/UEP	7/11/2019	0" - 5"	15.4	12.6	✓	✓	
11	11	MG/UEP	7/11/2019	0" - 5"	16.3	13.7	✓	✓	
12	12	MG/UEP	7/11/2019	0" - 5"	14.3	11	✓	✓	
13	13	MG/UEP	7/11/2019	0" - 5"	12	9.38	✓	✓	
14	14	MG/UEP	7/11/2019	0" - 5"	3.56	3.18	✓	✓	✓
15	15	MG/UEP	7/11/2019	0" - 5"	4.6	2.93	✓	✓	✓
16	16	MG/UEP	7/11/2019	0" - 5"	11	4.23	✓	✓	✓
MTCA[2] Cleanup Level for Soil					**250**	**20**			
Natural Background Soil Metals Publication #95-115[3]					**24**	**7**			

NOTES:
Red denotes concentration exceeds MTCA cleanup level for soil.
(1)Analyzed by Method EPA Method 6020B
(2)MTCA Cleanup Regulation, Chapter 173-340 of WAC, Table 740-1
(3) Natural Backgound Soil Metals Concentrations in Washington State-Publiction #94-115
Method A Cleanup Levels for Soil, revised November 2013.
MTCA = Washington Model Toxics Control Act

-- = not analyzed/not applicable
bgs = below grade surface
ND = not detected at a concentration exceeding the laboratory reporting limit
Pb = Lead
As = Arsenic

UEP = Urban Environmental Partners
WAC = Washington Administrative Code
EPA = U.S. Environmental Protection Agency

APPENDIX A

Quick Guidance for Arsenic and Lead Soil Sampling and Cleanup

Soils on your property may be contaminated with arsenic and lead from the former Asarco smelter in Tacoma. The **Tacoma Smelter Plume Model Remedies Guidance** (guidance) explains how to sample and clean up soils. This fact sheet gives an overview of the guidance and when to use it.

What are Model Remedies?

These Model Remedies are cleanup methods that the Washington Department of Ecology (Ecology) approved for Tacoma Smelter Plume contamination only. They may not be used if there are other types of contamination on the property. Ecology has tested these methods and found them to be effective.

Who should use this guidance?

Property owners or developers planning on grading their property should follow the guidance.

First, check where your project is within the Tacoma Smelter Plume. See page 4 for a map or visit https://fortress.wa.gov/ecy/smeltersearch/. The map shows estimated arsenic levels in parts per million (ppm).

Actual levels can vary greatly from property to property. Soil sampling is the only way to know if your property is contaminated. Ecology recommends you sample your soil for arsenic and lead if your property is in an area where the arsenic is estimated to be over 20 ppm.

You should also consider...

- **Development history:** Undeveloped land tends to have higher levels of arsenic and lead than developed land.
- **Future use:** There is greater risk to human health if the area will be used by children or people often in contact with soil.
- **Cleanup approval:** If a local permit office, buyer, or lender requires Ecology's written approval of your cleanup, enter the Voluntary Cleanup Program (VCP). The VCP is now free for projects with only Tacoma Smelter Plume contamination. To learn more, contact Eva Barber (upper right).

About the Tacoma Smelter Plume

Asarco's former copper smelter in north Tacoma emitted arsenic, lead, and other heavy metals. These pollutants were carried by the wind and settled on surface soils, creating the Tacoma Smelter Plume (page 4).

More Information

Technical Assistance Coordinator:
Eva Barber
Toxics Cleanup Program
P.O. Box 47775
Olympia, WA 98504-7775
Phone: (360) 407–7094
E-mail: Eva.Barber@ecy.wa.gov

Tacoma Smelter Plume website
http://www.ecy.wa.gov/toxics/tacoma-smelter.html

Model Remedies Guidance
https://fortress.wa.gov/ecy/gsp/DocViewer.ashx?did=5364

Cleanup database
https://fortress.wa.gov/ecy/areispublic/

To request ADA accommodation, including materials in a format for the visually impaired, call Ecology at 360-407-6300. Persons with impaired hearing may call Washington Relay Service at 711. Persons with speech disability may call TTY at 877-833-6341.

Facility Site ID #: 89267963

Soil Sampling Basics

You don't need to hire a professional to sample soil. Soil sampling does not require special tools or expertise. The Model Remedies Guidance explains the sampling process in more detail.

- **Equipment:** trowel or small shovel; mixing bowl; glass jars or plastic zip bags to hold the samples; wash bucket, soap, scrub brush, and rinse water.
- **Lab analysis:** Ecology has a list of state-accredited labs at http://www.ecy.wa.gov/apps/eap/acclabs/labquery.asp. Use EPA methods 6010, 6020, or 6200 (arsenic and lead), or 7060 (arsenic), or 7421 (lead).
- **Lab cost:** $30-60 per sample for arsenic and lead.

Planning to Sample

Number of samples: Use the table below to find how many samples to take. First, look at the **future use** of the land. Take more samples for home sites, play areas, or commercial buildings than for open spaces. Check the map to see if you are sampling an area where arsenic is estimated to be over 100 parts per million (ppm).

Sample depths: You must sample more than just the 0-6 inch layer of soil. At every fourth location, take a sample from 6-12 inches. In some cases, the guidance advises taking deeper samples.

Forest duff: This is the layer of decomposing leaves and needles on the soil surface. It can contain high levels of arsenic and lead. Be sure to sample forest duff before disposal, composting, or reuse.

Minimum number of sample locations per area sampled

Sampling area	Residential, parks, commercial Samples needed		Forest and open land Samples needed	
Acres	Estimated arsenic >100 ppm	Estimated arsenic 20-100 ppm	Estimated arsenic >100 ppm	Estimated arsenic 20-100 ppm
0.25*	10	8	8	8
1	20	16	16	12
5	40	32	30	24
10	60	48	40	32
20	80	64	50	40
100	120	90	70	60
>100	120 + 1 per 5 acres	90 + 1 per 5 acres	70 + 1 per 10 acres	60 + 1 per 10 acres

0.25 acres ~ 11,000 square feet

What do the sampling results mean?

Soils are over state cleanup levels if:

- Average arsenic >20 ppm or
- Single sample of arsenic >40 ppm

- OR -

- Average lead >250 ppm or
- Single sample of lead >500 ppm

See the guidance for next steps.

Average refers to the arithmetic average.

Choosing a Remedy

The guidance describes four cleanup options:

- **Excavation and removal** permanently removes arsenic and lead and is effective at any level of contamination.
- **Mixing or tilling** can only be used as a model remedy if your soils have less than 40 ppm arsenic.
- **Capping in place.** You can cap soil in place with soil or pavement.
- **Consolidation and capping.** You can also dig up soil and move it into one spot for capping.

The depth and type of cap depend on the arsenic levels. Caps also need regular inspection and maintenance.

Note: Ecology does not recommend caps for residential properties.

What else is in the guidance?

The guidance also explains more about how to:

- Sample soils for arsenic and lead.
- Plan for cleanup.
- Sample soil stockpiles for landfill disposal or reuse on the property.
- Check imported fill or topsoil.
- Sample to show that your soil is remediated.

Use the guidance worksheets to:

- Keep a record of your work.
- Help estimate cleanup costs.

Direct link: https://fortress.wa.gov/ecy/publications/publications/1209086other.pdf

Health Information

Arsenic: Scientists have linked long-term exposure to arsenic to many health problems. They include heart disease, diabetes, and cancer of the bladder, lung, skin, kidney, liver, and prostate.

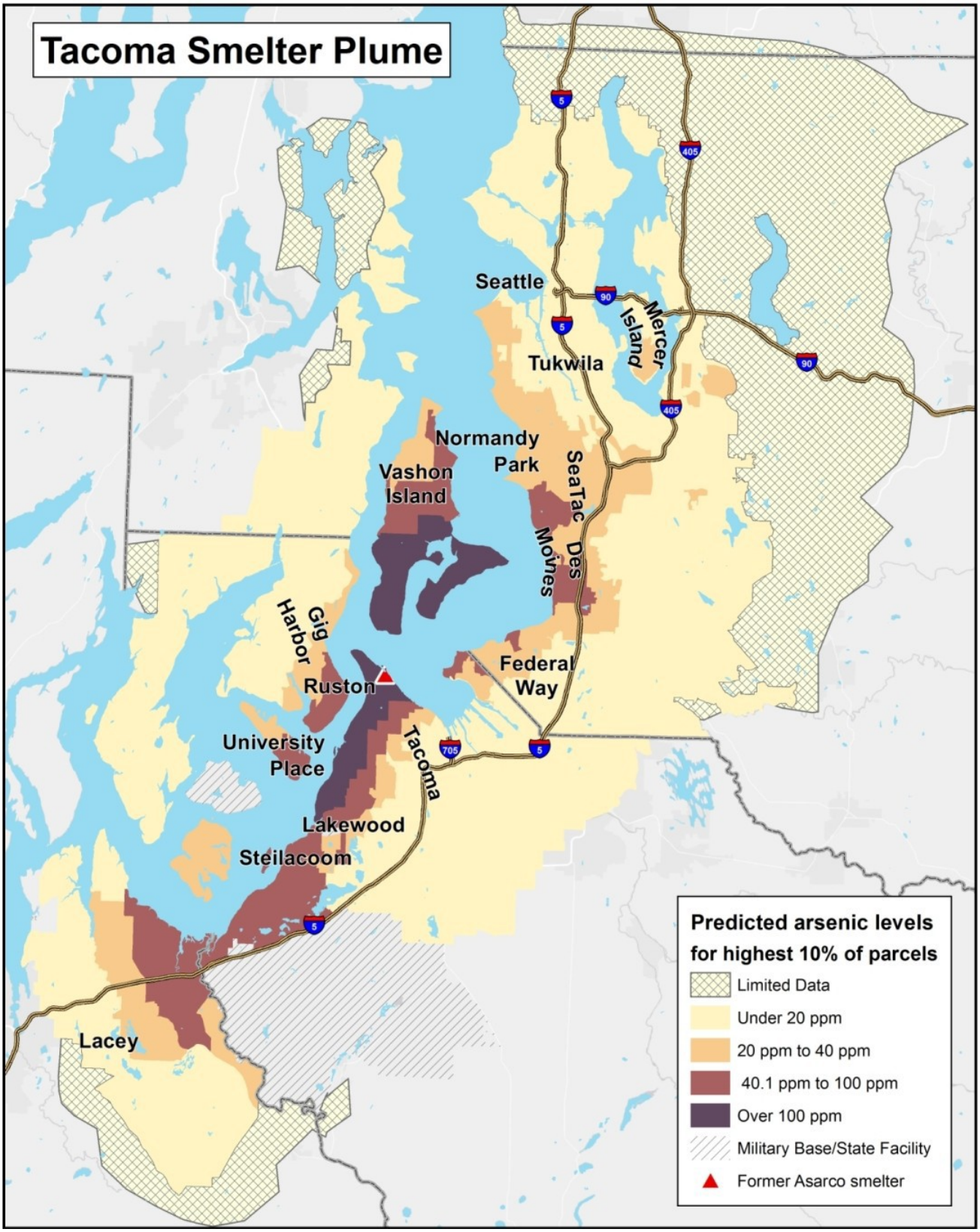
Lead: In children, lead can cause behavior problems like hyperactivity, developmental delays, and reduced growth. In adults, lead can increase blood pressure, affect memory, and add to other health problems.

Protect Yourself With Healthy Actions

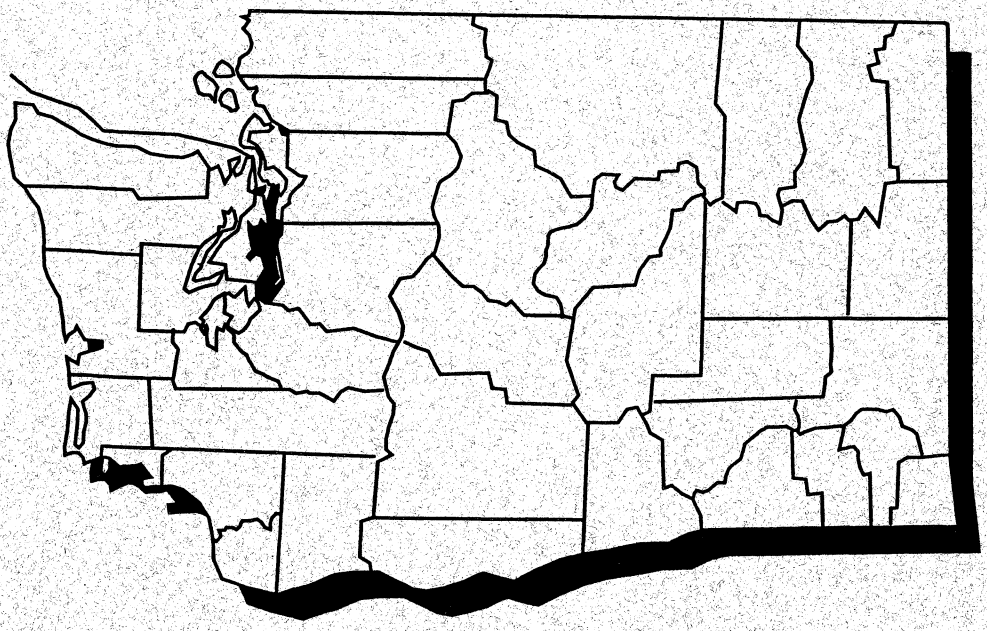
When working or playing outside, wear gloves and wash your hands to lower exposure to soil.

Wear a mask to avoid breathing in dust and water down dry areas.

Wash work clothes separately from other laundry and avoid bringing soil into the home.



With 90% certainty, at least 1 in 10 parcels will have arsenic in soil at or above levels shown. Predictions are based on distance and direction from the former Asarco smelter, and on sampling data from forested and other soils undisturbed by development. Actual arsenic levels may vary greatly from parcel to parcel. Arsenic levels are shown in parts per million (ppm). This map is also available at: https://fortress.wa.gov/ecy/smeltersearch/.



Natural Background Soil Metals Concentrations in Washington State

Toxics Cleanup Program
Department of Ecology

WASHINGTON STATE
DEPARTMENT OF
ECOLOGY

October, 1994
Publication #94-115

printed on recycled paper

Executive Summary

This report contains information on the natural background concentrations of metals in surficial soil throughout Washington State. The objective of this study was to define a range of values that represent the natural concentration of metals in surficial soils throughout Washington. The results of this study represent the culmination of a seven-year effort by Ecology (Toxics Cleanup Program) and its co-sponsor, the USGS Water Resources Division (Tacoma Office).

Upon the completion of a small pilot project (Big Soos Creek Drainage Basin, King County, 1987), Washington was divided into 24 distinct regions based on differences in geology, soils, and climate (see **Figure 1**). Twelve of these 24 regions were then selected for a statewide assessment of Washington. These 12 regions were selected because they represent the major urban, industrial, and highly developed core areas in Washington, which is where most cleanup sites are located. Soil samples were then collected from the predominant soil series in each of the 12 regions, with a total of 490 soil samples collected from 166 locations throughout Washington. An effort was made to collect samples from undisturbed or undeveloped areas. Samples were collected from the "A," "B," and "C" soil horizons at each sampling location (ground surface to a depth of 3 ft.). Each sample was analyzed for total metals content.

The results of this study found that the soil metals concentrations in Western Washington were on average slightly higher than Eastern Washington. The population, climate, and vegetation of Western Washington are thought to be the primary reasons for this variation. The variation in west-to-east data are more pronounced when the 90th percentile values are compared (see **Table 1** below). The one exception was arsenic, whose east-side 90th percentile value was 13% higher than the west. Statewide and regional 90th percentile values are presented in **Table 1** below.

Table 1: Statewide & Regional 90th Percentile Values[1]

	Al	As[2]	Be	Cd	Cr	Cu	Fe	Pb	Mn	Hg	Ni	Zn
State Wide	37,200	7	2	1	42	36	42,100	17	1,100	0.07	38	86
Puget Sound	32,600	7	0.6	1	48	36	58,700	24	1,200	0.07	48	85
Clark County	52,300	6	2	1	27	34	36,100	17	1,500	0.04	21	96
Yakima Basin	33,400	5	2	1	38	27	51,500	11	1,100	0.05	46	79
Spokane Basin	21,400	9	0.8	1	18	22	25,000	15	700	0.02	16	66

[1] **All Values = mg/kg and represent total-recoverable analysis.**
[2] **Graphite furnace atomic absorption (GFAA) analysis.**

APPENDIX B

FRIEDMAN & BRUYA, INC.

ENVIRONMENTAL CHEMISTS

James E. Bruya, Ph.D.
Yelena Aravkina, M.S.
Michael Erdahl, B.S.
Arina Podnozova, B.S.
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www.friedmanandbruya.com

July 26, 2019

John Funderburk, Project Manager
Urban Environmental Partners
2324 1st Ave, Suite 203
Seattle, WA 98121

Dear Mr Funderburk:

Included are the results from the testing of material submitted on July 16, 2019 from the Soil Test, F&BI 907259 project. There are 20 pages included in this report. Any samples that may remain are currently scheduled for disposal in 30 days, or as directed by the Chain of Custody document. If you would like us to return your samples or arrange for long term storage at our offices, please contact us as soon as possible.

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

Sincerely,

FRIEDMAN & BRUYA, INC.

Michael Erdahl
Project Manager

Enclosures
UEP0726R.DOC

CASE NARRATIVE

This case narrative encompasses samples received on July 16, 2019 by Friedman & Bruya, Inc. from the Urban Environmental Partners Soil Test, F&BI 907259 project. Samples were logged in under the laboratory ID's listed below.

Laboratory ID	Urban Environmental Partners
907259 -01	1
907259 -02	2
907259 -03	3
907259 -04	4
907259 -05	5
907259 -06	6
907259 -07	7
907259 -08	8
907259 -09	9
907259 -10	10
907259 -11	11
907259 -12	12
907259 -13	13
907259 -14	14
907259 -15	15
907259 -16	16

All quality control requirements were acceptable.

Analysis For Total Metals By EPA Method 6020B

Client ID:	1	Client:	Urban Environmental Partners
Date Received:	07/16/19	Project:	Soil Test, F&BI 907259
Date Extracted:	07/19/19	Lab ID:	907259-01
Date Analyzed:	07/22/19	Data File:	907259-01.107
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	13.5
Lead	17.6

Analysis For Total Metals By EPA Method 6020B

Client ID:	2	Client:	Urban Environmental Partners
Date Received:	07/16/19	Project:	Soil Test, F&BI 907259
Date Extracted:	07/19/19	Lab ID:	907259-02
Date Analyzed:	07/22/19	Data File:	907259-02.108
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	16.6
Lead	18.4

Analysis For Total Metals By EPA Method 6020B

Client ID:	3	Client:	Urban Environmental Partners
Date Received:	07/16/19	Project:	Soil Test, F&BI 907259
Date Extracted:	07/19/19	Lab ID:	907259-03
Date Analyzed:	07/22/19	Data File:	907259-03.109
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	11.4
Lead	14.1

Analysis For Total Metals By EPA Method 6020B

Client ID:	4	Client:	Urban Environmental Partners
Date Received:	07/16/19	Project:	Soil Test, F&BI 907259
Date Extracted:	07/19/19	Lab ID:	907259-04
Date Analyzed:	07/22/19	Data File:	907259-04.110
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	5.79
Lead	8.79

Analysis For Total Metals By EPA Method 6020B

Client ID:	5	Client:	Urban Environmental Partners
Date Received:	07/16/19	Project:	Soil Test, F&BI 907259
Date Extracted:	07/19/19	Lab ID:	907259-05
Date Analyzed:	07/23/19	Data File:	907259-05.158
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	11.6
Lead	19.5

Analysis For Total Metals By EPA Method 6020B

Client ID:	6	Client:	Urban Environmental Partners
Date Received:	07/16/19	Project:	Soil Test, F&BI 907259
Date Extracted:	07/19/19	Lab ID:	907259-06
Date Analyzed:	07/23/19	Data File:	907259-06.159
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	12.2
Lead	16.8

Analysis For Total Metals By EPA Method 6020B

Client ID:	7	Client:	Urban Environmental Partners
Date Received:	07/16/19	Project:	Soil Test, F&BI 907259
Date Extracted:	07/19/19	Lab ID:	907259-07
Date Analyzed:	07/23/19	Data File:	907259-07.160
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	9.52
Lead	12.6

Analysis For Total Metals By EPA Method 6020B

Client ID:	8	Client:	Urban Environmental Partners
Date Received:	07/16/19	Project:	Soil Test, F&BI 907259
Date Extracted:	07/19/19	Lab ID:	907259-08
Date Analyzed:	07/23/19	Data File:	907259-08.161
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	11.1
Lead	12.3

Analysis For Total Metals By EPA Method 6020B

Client ID:	9	Client:	Urban Environmental Partners
Date Received:	07/16/19	Project:	Soil Test, F&BI 907259
Date Extracted:	07/19/19	Lab ID:	907259-09
Date Analyzed:	07/23/19	Data File:	907259-09.162
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	10.5
Lead	13.8

Analysis For Total Metals By EPA Method 6020B

Client ID:	10	Client:	Urban Environmental Partners
Date Received:	07/16/19	Project:	Soil Test, F&BI 907259
Date Extracted:	07/19/19	Lab ID:	907259-10
Date Analyzed:	07/23/19	Data File:	907259-10.163
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	12.6
Lead	15.4

Analysis For Total Metals By EPA Method 6020B

Client ID:	11	Client:	Urban Environmental Partners
Date Received:	07/16/19	Project:	Soil Test, F&BI 907259
Date Extracted:	07/19/19	Lab ID:	907259-11
Date Analyzed:	07/23/19	Data File:	907259-11.164
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	13.7
Lead	16.3

Analysis For Total Metals By EPA Method 6020B

Client ID:	12	Client:	Urban Environmental Partners
Date Received:	07/16/19	Project:	Soil Test, F&BI 907259
Date Extracted:	07/19/19	Lab ID:	907259-12
Date Analyzed:	07/23/19	Data File:	907259-12.165
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	11.0
Lead	14.3

Analysis For Total Metals By EPA Method 6020B

Client ID:	13	Client:	Urban Environmental Partners
Date Received:	07/16/19	Project:	Soil Test, F&BI 907259
Date Extracted:	07/19/19	Lab ID:	907259-13
Date Analyzed:	07/23/19	Data File:	907259-13.166
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	9.38
Lead	12.0

Analysis For Total Metals By EPA Method 6020B

Client ID:	14	Client:	Urban Environmental Partners
Date Received:	07/16/19	Project:	Soil Test, F&BI 907259
Date Extracted:	07/19/19	Lab ID:	907259-14
Date Analyzed:	07/23/19	Data File:	907259-14.169
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	3.18
Lead	3.56

Analysis For Total Metals By EPA Method 6020B

Client ID:	15	Client:	Urban Environmental Partners
Date Received:	07/16/19	Project:	Soil Test, F&BI 907259
Date Extracted:	07/19/19	Lab ID:	907259-15
Date Analyzed:	07/23/19	Data File:	907259-15.170
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	2.93
Lead	4.60

Analysis For Total Metals By EPA Method 6020B

Client ID:	16	Client:	Urban Environmental Partners
Date Received:	07/16/19	Project:	Soil Test, F&BI 907259
Date Extracted:	07/19/19	Lab ID:	907259-16
Date Analyzed:	07/23/19	Data File:	907259-16.171
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	4.23
Lead	11.0

Analysis For Total Metals By EPA Method 6020B

Client ID:	Method Blank	Client:	Urban Environmental Partners
Date Received:	Not Applicable	Project:	Soil Test, F&BI 907259
Date Extracted:	07/19/19	Lab ID:	I9-438 mb
Date Analyzed:	07/19/19	Data File:	I9-438 mb.091
Matrix:	Soil	Instrument:	ICPMS2
Units:	mg/kg (ppm) Dry Weight	Operator:	SP

Analyte:	Concentration mg/kg (ppm)
Arsenic	<1
Lead	<1

Date of Report: 07/26/19
Date Received: 07/16/19
Project: Soil Test, F&BI 907259

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

Laboratory Code: 907324-30 (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	2.07 ca	91	88	75-125	3
Lead	mg/kg (ppm)	50	2.66 ca	105	100	75-125	5

Laboratory Code: Laboratory Control Sample

Analyte	Reporting Units	Spike Level	Percent Recovery LCS	Acceptance Criteria
Arsenic	mg/kg (ppm)	10	98	80-120
Lead	mg/kg (ppm)	50	108	80-120

Data Qualifiers & Definitions

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

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

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

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

cf - The sample was centrifuged prior to analysis.

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

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

f - The sample was laboratory filtered prior to analysis.

fb - The analyte was detected in the method blank.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

John Underburs 907259 **SAMPLE CHAIN OF CUSTODY** ME 07-8/16-19 (NP) 1 Page # 1 of 2 BI2

Report To johnf@uepconsulting.com

Company Urban Environmental Partners, llc

Address 2324 1st Ave ste 203

City, State, ZIP Seattle Wa 98121

Phone (206) 229-6804 Email

SAMPLERS (*signature*)	
PROJECT NAME	PO #
REMARKS	INVOICE TO

TURNAROUND TIME
- ☐ Standard Turnaround
- ☐ RUSH
- Rush charges authorized by:

SAMPLE DISPOSAL
- ☐ Dispose after 30 days
- ☐ Archive Samples
- ☐ Other

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	ANALYSES REQUESTED: TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM	Lead	Arsenic			Notes
1	01	7/16/19	8:30	soil	1								X	X			X-std TAT per JF 7/18/19 ME
2	02		8:40		1								X	X			
3	03		8:50		1								X	X			
4	04		9:00		1								X	X			
5	05		9:10		1								X	X			
6	06		9:30		1								X	X			
7	07		9:45		1								X	X			
8	08		9:55		1								X	X			
9	09		10:05		1								X	X			
10	10		10:20		1								X	X			

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Matthew W. Grunwald	Matthew W. Grunwald	UEP LLC	7/16/19	1:10pm
Received by:	Annette N. Eves	FeBI	7/16/19	13:10
Relinquished by:				
Received by:		Samples received at 2 °C		

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

907259

SAMPLE CHAIN OF CUSTODY ME 07-216-19

Page # 2 of 2

Report To johnf@uepconsulting.com

Company Urban Environmental Partners LLC

Address 2324 1st Ave Ste 203

City, State, ZIP Seattle Wa 98121

Phone (206) 229-6804 Email

SAMPLERS (*signature*)

PROJECT NAME | PO #

REMARKS | INVOICE TO

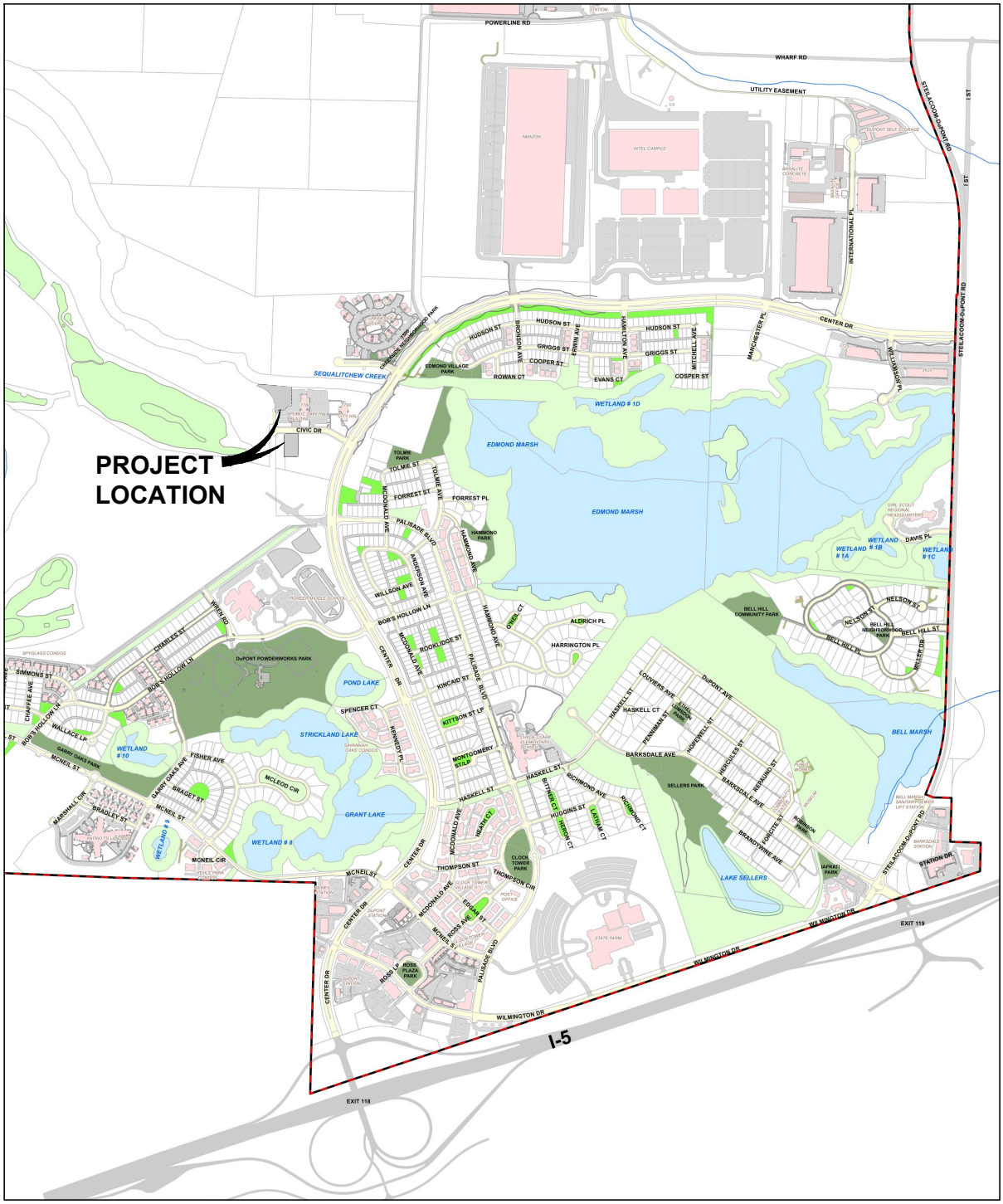
TURNAROUND TIME
☐ Standard Turnaround
☐ RUSH
Rush charges authorized by:

SAMPLE DISPOSAL
☐ Dispose after 30 days
☐ Archive Samples
☐ Other

Sample ID	Lab ID	Date Sampled	Time Sampled	Sample Type	# of Jars	TPH-HCID	TPH-Diesel	TPH-Gasoline	BTEX by 8021B	VOCs by 8260C	SVOCs by 8270D	PAHs 8270D SIM	Lead	Arsenic			Notes
11	11	7/16/19	10:35	Soil	1								x	y			
12	12	↓	10:40	↓	1								x	y			
13	13	↓	10:50	↓	1								x	X			
14	14	↓	11:00	↓	1								x	y			
15	15	↓	11:10	↓	1								x	y			
16	16	↓	11:30	↓	1								x	y			

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

SIGNATURE	PRINT NAME	COMPANY	DATE	TIME
Relinquished by: Matthew W. Grunwald	Matthew Grunwald	UEP LLC	7/16/19	1:10pm
Received by: [signature]	Annette Nieves	FeBI	7/16/19	13:10
Relinquished by:				
Received by:		Samples received at 24 °C		



VICINITY MAP
NOT TO SCALE

CITY OF DUPONT

PUBLIC WORKS FACILITY

VICINITY MAP

Gray & Osborne, Inc.
CONSULTING ENGINEERS

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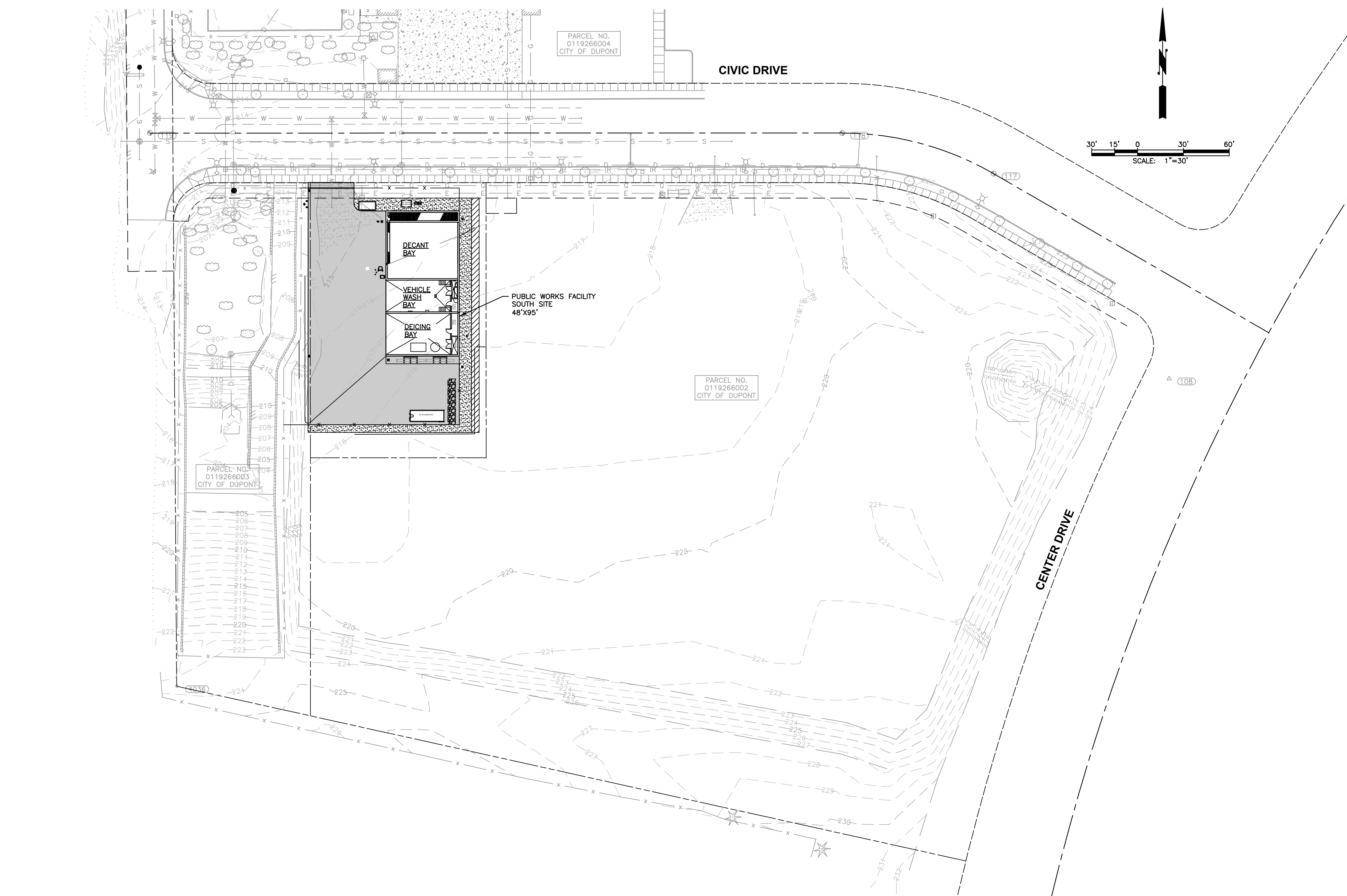

PROPOSED SITE PLAN
SCALE: 1"=30'-0"

0 1" 2"
TWO INCHES AT FULL SCALE. IF NOT, SCALE ACCORDINGLY

Gray & Osborne, Inc.
CONSULTING ENGINEERS
2102 CARRIAGE DRIVE SW, BLDG. I
OLYMPIA, WA 98502 • (360) 292-7418

DATE: AUG 2019
DRAWN: CDG
CHECKED: SLG
APPROVED: DJM

PRELIMINARY NOT FOR CONSTRUCTION

No.	REVISION	DATE	APPD

DOMINIC J. MILLER STATE OF WASHINGTON 35679 REGISTERED PROFESSIONAL ENGINEER

CITY OF DUPONT
PIERCE COUNTY WASHINGTON
PUBLIC WORKS FACILITY
PROPOSED SITE PLAN

SHEET: G2-1
OF: 3
JOB NO.: 19233.00
DWG:G2_GRADING_SITE

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EX CB, TYPE 2
RIM EL=213.60
IE=207.35 12" CPEP N
IE=205.90 12" CPEP E
IE=205.70 12" DI S

EX CB, TYPE 1
RIM EL=214.22
IE=2[illegible]

EX CB, TYPE 2
RIM EL=214.76
IE=211.11 12" CPEP N
IE=208.36 12" CPEP E
IE=208.31 12" CPEP W

X / GD-X — 30' CANTILEVER SLIDE GRATE

CONNECT TO EXISTING FENCE
N=653,465.34
E=1,105,500.58

N=653,465.34
E=1,105,604.87

CIVIC DRIVE

EX CB, TYPE 1
RIM EL=208.18
IE=205.53 12" CPEP WSW
IE=205.48 12" CPEP ESE
IE=205.38 12" CPEP N

OIL/ WATER SEPARATOR

DECANT BAY

VEHICLE WASH BAY

DEICING BAY

ELECT. ROOM

5' MODERATE LANDSCAPING BUFFER — X / X

SITE HMA — 1 / GD-1

FENCE — 4 / GD-1

EX CB, TYPE 2
RIM EL=207.73
IE=204.78 18" CPEP S

IE=204.11
18" CPEP N

40 YD DUMPSTER

CONNECT TO EXISTING FENCE
N=653,310.40
E=1,105,489.96

N=653,310.40
E=1,105,604.87

SITE GRAVEL SURFACING — 3 / GD-1

216

218

10' 5' 0 10' 20'
SCALE: 1"=10'

LANDSCAPING PLAN
SCALE: 1"=10'-0"

NOTES:

1. NUMERICAL CALL-OUTS REFER TO FINISHED GRADE ELEVATIONS UNLESS OTHERWISE NOTED.
2. SLOPE FINISHED GROUND AWAY FROM ALL STRUCTURES; SLOPE TO DRAIN AT 2% MIN SLOPE.
3. EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO CONSTRUCTION ACTIVITIES. SEE SHEET GD-8.
4. ALL DISTURBED AREAS NOT SHOWN WITH HMA OR GRAVEL RESTORATION SHALL BE HYDROSEEDED.

0 1" 2"
TWO INCHES AT FULL SCALE.
IF NOT, SCALE ACCORDINGLY

L:\DUPONT\19233 Public Works Facility\01 Design\Planset\General\G2_LANDSCAPE.dwg, 8/14/2019 8:32 AM, SHARI GAER

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No.	REVISION	DATE	APPD

DOMINIC J. MILLER — STATE OF WASHINGTON — 21612 — REGISTERED PROFESSIONAL ENGINEER

CITY OF DUPONT
PIERCE COUNTY WASHINGTON

PUBLIC WORKS FACILITY

LANDSCAPING PLAN

SHEET: L2-1
OF: 1

JOB NO.: 19233.00
DWG:G2_LANDSCAPE

EX CB, TYPE 2
RIM EL=213.60
IE=207.35 12" CPEP N
IE=205.90 12" CPEP E
IE=205.70 12" DI S

EX CB, TYPE 1
RIM EL=214.22
IE=207.87 12" CPEP E
IE=209.27 12" CPEP W

EX CB, TYPE 2
RIM EL=214.76
IE=211.11 12" CPEP N
IE=208.36 12" CPEP E
IE=208.31 12" CPEP W

N=653,468.91
E=1,105,505.90

N=653,468.96
E=1,105,535.90

N=653,465.34
E=1,105,604.87

N=653,458.79
E=1,105,612.87

EL=214.93

EL=215.02

OIL/WATER SEPARATOR (3 / GD-2)

DOUBLE CHECK VALVE ASSEMBLY VAULT (1 / GD-5)

SAMPLE PORT (4 / GD-2)

CIVIC DRIVE

TYPE I, CATCH BASIN
RIM EL=213.00

TYPE I, CATCH BASIN
RIM EL=215.30

EL=215.71

(2 / GD-4) FIRE HYDRANT ASSEMBLY

EL=215.80

OIL/ WATER SEPARATOR

EL=216.00

EL=215.80

EL=215.64

5' R

N=620,973.22
E=1,053,527.86

SURFACE CLEAOUT (2 / CD-7)

DECANT BAY

WATER SERVICE (3 / GD-4)

VEHICLE WASH BAY

ELECT. ROOM

EQUIP. ROOM

ELECT. ROOM

DEICING BAY

ELECT. ROOM

EDMS ROOM

EL=215.35

SITE HMA (1 / GD-1)

EX CB, TYPE 1
RIM EL=208.18
IE=205.53 12" CPEP WSW
IE=205.48 12" CPEP ESE
IE=205.38 12" CPEP N

EX CB, TYPE 2
RIM EL=207.73
IE=204.78 18" CPEP S

IE=204.11
18" ICPEP N

SEWER CLEANOUT (5 / GD-2)

N=653,355.34
E=1,105,604.87

EL=216.00

EL=217.00

EL=216.84

TYPE I, CATCH BASIN
RIM EL=215.00

EL=215.00

(1 / GD-5) NON-FREEZE YARD HYDRANT

PIPE RACK

DOWNSPOUTS INFILTRATION TRENCH 5'x30'x4' DEEP (1 / GD-7)

EL=216.50

40 YD DUMPSTER

N=653,310.40
E=1,105,505.87

EL=216.00

EL=216.50

EL=217.00

N=653,310.40
E=1,105,604.87

SITE GRAVEL SURFACING (3 / GD-1)

10' 5' 0 10' 20'
SCALE: 1"=10'

PROPOSED GRADING PLAN
SCALE: 1"=10'-0"

NOTES:

1. NUMERICAL CALL-OUTS REFER TO FINISHED GRADE ELEVATIONS UNLESS OTHERWISE NOTED.
2. SLOPE FINISHED GROUND AWAY FROM ALL STRUCTURES; SLOPE TO DRAIN AT 2% MIN SLOPE.
3. EROSION CONTROL MEASURES SHALL BE INSTALLED PRIOR TO CONSTRUCTION ACTIVITIES. SEE SHEET GD-8.
4. ALL DISTURBED AREAS NOT SHOWN WITH HMA OR GRAVEL RESTORATION SHALL BE HYDROSEEDED.

0 1" 2"
TWO INCHES AT FULL SCALE.
IF NOT, SCALE ACCORDINGLY

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OLYMPIA, WA 98502 • (360) 292-7418

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No.	REVISION	DATE	APPD

DOMINIC C. MILLER
STATE OF WASHINGTON
REGISTERED
PROFESSIONAL ENGINEER

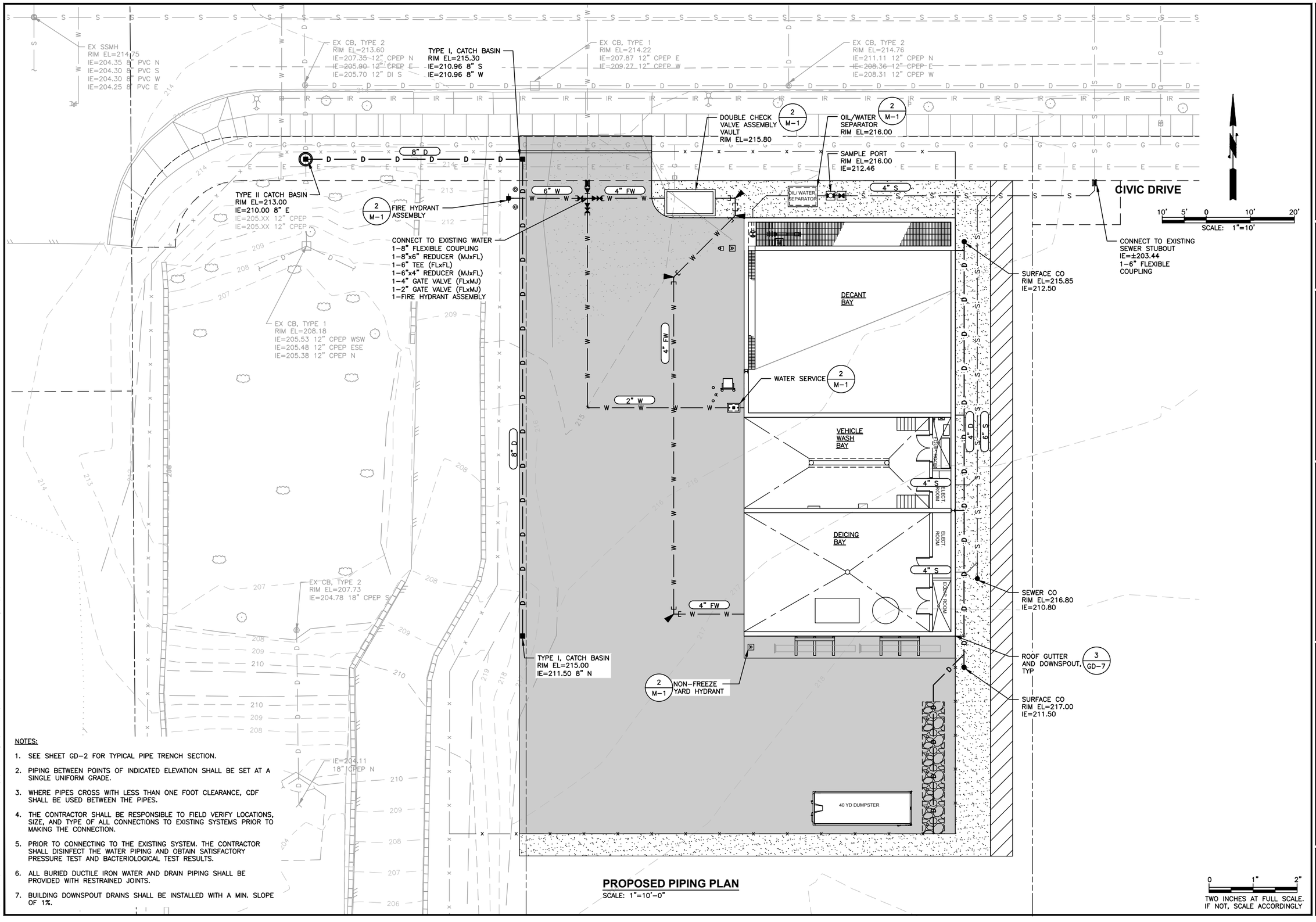
CITY OF DUPONT
WASHINGTON
PIERCE COUNTY

PUBLIC WORKS FACILITY

PROPOSED GRADING PLAN

SHEET: G2-3
OF: 3

JOB NO.: 19233.00
DWG:G2_GRADING_SITE



NOTES:

1. SEE SHEET GD–2 FOR TYPICAL PIPE TRENCH SECTION.
2. PIPING BETWEEN POINTS OF INDICATED ELEVATION SHALL BE SET AT A SINGLE UNIFORM GRADE.
3. WHERE PIPES CROSS WITH LESS THAN ONE FOOT CLEARANCE, CDF SHALL BE USED BETWEEN THE PIPES.
4. THE CONTRACTOR SHALL BE RESPONSIBLE TO FIELD VERIFY LOCATIONS, SIZE, AND TYPE OF ALL CONNECTIONS TO EXISTING SYSTEMS PRIOR TO MAKING THE CONNECTION.
5. PRIOR TO CONNECTING TO THE EXISTING SYSTEM. THE CONTRACTOR SHALL DISINFECT THE WATER PIPING AND OBTAIN SATISFACTORY PRESSURE TEST AND BACTERIOLOGICAL TEST RESULTS.
6. ALL BURIED DUCTILE IRON WATER AND DRAIN PIPING SHALL BE PROVIDED WITH RESTRAINED JOINTS.
7. BUILDING DOWNSPOUT DRAINS SHALL BE INSTALLED WITH A MIN. SLOPE OF 1%.

PROPOSED PIPING PLAN

SCALE: 1"=10'–0"

TWO INCHES AT FULL SCALE.
IF NOT, SCALE ACCORDINGLY

Gray & Osborne, Inc.
CONSULTING ENGINEERS
2102 CARRIAGE DRIVE SW, BLDG. I
OLYMPIA, WA 98502 • (360) 292-7418

DATE: AUG 2019	DRAWN: CDG	CHECKED: SLG	APPROVED: DJM

PRELIMINARY
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CONSTRUCTION

No.	REVISION	DATE	APPD

DOMINIC J. MILLER — STATE OF WASHINGTON — 19955 — REGISTERED PROFESSIONAL ENGINEER

CITY OF DUPONT
PIERCE COUNTY WASHINGTON

PUBLIC WORKS FACILITY

PROPOSED PIPING PLAN

SHEET: G2-2
OF: 3

JOB NO.: 19233.00
DWG:G2_PIPING_SITE

L:\DUPONT\19233 Public Works Facility\01 Design\Planset\General\G2_PIPING_SITE.dwg, 8/14/2019 8:38 AM, SHARI GAER

Gray & Osborne, Inc.
CONSULTING ENGINEERS

MEMORANDUM

TO:	CITY OF DUPONT
FROM:	DOMINIC MILLER, P.E. KERRI SIDEBOTTOM, P.E.
DATE:	AUGUST 12, 2019
SUBJECT:	DUPONT PUBLIC WORKS FACILITY STORMWATER ANALYSIS CITY OF DUPONT, PIERCE COUNTY, WASHINGTON G&O #19233

BACKGROUND

The City of DuPont is proposing to construct a new Public Works building and associated decant facility near City Hall at the west end of Civic Drive. The development will include a Public Works building and storage shed to the north of Civic Drive and a decant facility, vehicle wash, and brine station south of the road. Both sites will also include parking areas, sidewalks, and driveways.

The existing City Hall and Public Safety buildings and Civic Drive were completed in 2009. Stormwater facilities were installed to address all runoff from the buildings, associated parking areas and driveways, sidewalks, and landscaping areas, as well as Civic Drive. The Civic Drive pond, installed at the west end of Civic Drive and south of the road, was designed to provide treatment and infiltration for runoff from all pollution-generating impervious surfaces within the planned developments. At the time of design, the planned development also included substantial commercial construction to the south of Civic Drive, which has not been constructed at this point in time. A draft stormwater plan was completed for the site in 2006 by Gray & Osborne.

EXISTING FACILITIES

Record drawings for the existing stormwater infrastructure were prepared by Gray & Osborne in March 2009. The existing City Hall building and Public Safety building were each constructed with underground infiltration trenches to address non-polluted runoff from the roofs of each building. The infiltration trenches were sized to fully infiltrate runoff from each roof. These infiltration trenches appear to be functional. Because they are not hydraulically associated with the larger pond, and no changes are proposed to the trenches or their tributary areas, these trenches were not included in this analysis.

2102 Carriage Drive SW, Building I Olympia, Washington 98502 (360) 292-7481 Fax (360) 292-7517

The large Civic Drive Pond was designed with a biofiltration area at the north end to provide runoff treatment and a deep infiltration basin at the south end. The pond was sized to fully infiltrate runoff from the driveways, sidewalks, and parking areas around City Hall, the Public Safety Building, and a proposed area for fire training parking north of Civic Drive, as well as the parking area and sidewalks for the proposed commercial/office development south of Civic Drive. The record drawings indicate that the infiltration portion of the pond was constructed with straight sides on the east and west, a 5:1 slope at the south end, and a 3:1 slope on the north end, with 6.5 feet of storage depth. The biofiltration area was constructed at a slope of 0.5%, a flow path of approximately 85 feet, and a 23-foot wide level spreader at the inlet (north end). The filtration area has 2 feet of amended soil and is heavily vegetated. Runoff from the areas mentioned previously is collected and then flows downslope to the south where it enters a manhole structure. From there, it flows to the infiltration pond. The infiltration pond has 3.5 feet of storage depth before water will back up into the manhole and pond within the swale area. The biofiltration area therefore can provide additional storage for high flow events.

The facilities appear to be functional at this time, and no drainage complaints associated with the pond or the infiltration trenches have been noted.

PROPOSED DEVELOPMENT

The proposed development includes the addition of several buildings and substantial parking areas to currently undeveloped land on both sides of Civic Drive.
Table 1 includes the existing and proposed site areas.

TABLE 1

Site Areas

Land Cover	Existing Areas		Proposed New Areas			
	North Basin	South Basin	North Basin		South Basin	
PGIS (parking, driveway, road)[1]	2.520	0.000	0.407		0.201	
Sidewalk[1]	0.340	0.108	0.047		0.000	
Cleared, Lawn/Landscape[2]	3.740	4.766	0.182		0.074	
Roof[3]	0.725	0	Total roof[3]	0.298	Total roof[3]	0.105
			Public Works Building roof	0.184	Decant roof	0.050
			Storage roof	0.066	Brine roof	0.023
			Fueling roof	0.048	Wash roof	0.031
Pond	0	0.367	0		0	
Total	7.325	5.241	0.935		0.379	
			North Basin Total		8.260	
			South Basin Total		5.620	

1. Runoff is or will be conveyed to infiltration/treatment pond
2. Runoff is assumed to flow eventually to pond and is modeled as such
3. Runoff from all roofs except for the fueling station is or will be conveyed to separate, underground, gravel infiltration trenches. Fueling station roof will be piped to pond.

Runoff from all of the new PGIS, sidewalk, and landscaped areas, as well as the fueling station roof will be conveyed to the existing stormwater treatment and infiltration pond south of Civic Drive. Runoff from the public works building, storage shed, decant facility, brine station, and vehicle wash roofs will be collected and conveyed to infiltration trenches, as treatment is not required for these surfaces. All of the new areas indicated in Table 1 are modeled as forested for the predeveloped condition in the model (0.935 ac for the North Basin and 0.379 acres for the South Basin). The existing areas are excluded from the predeveloped modeling analysis as all runoff from these areas is currently infiltrated.

FLOW CONTROL

The existing pond was modeled using WWHM2012, with pond dimensions from the record drawings. The model inputs and outputs are included as an attachment to this memo. The tributary basin to the pond was modeled as the existing driveways, parking, sidewalks, and landscaping areas associated with the Public Safety building, City Hall, and Civic Drive. The proposed parking, sidewalk, and landscaping areas for the Public Works Facility project were added to the tributary area as well. The model excluded future commercial/office development just east of the existing pond as it is intended that this area will provide its own flow control facility. The modeling indicates that the pond has sufficient capacity for the tributary flow, including the new parking areas, driveways, and sidewalks.

RUNOFF TREATMENT

The existing treatment facility consists of a gradually sloped biofiltration swale upstream of the infiltration pond. The biofiltration swale was sized to treat runoff from all of the projected pollution-generating impervious surfaces within the north and south development areas. As noted, this included a large commercial/office area with associated parking, which has not been constructed. Our current analysis does not include this area in the calculations as it is intended that the future commercial/office area located east of the existing pond will provide its own water quality facility. The swale size was checked using the Manual's swale sizing procedure. The water quality flow for the tributary area was determined using the online water quality flow rate as calculated by WWHM for the existing PGIS and the proposed PGIS from the Public Works Facility project. The swale sizing is provided below in accordance with BMP T9.10 in Volume V of the Manual:

Step 1: Determine bottom width

Step D-4 from Manual (Vol V, page 9-7): $b = \frac{Q_{wq} n_{wq}}{1.49 y^{1.67} s^{0.5}}$ [b must be ≥2']

Q_{wq} = 0.6011 cfs
n_{wq} =0.24 (from Manual, Vol V, Table 9.4.1)
y =4" → 0.33' [must be 4" or less]
s =0.5%

$$b = \frac{0.6011 * 0.24}{1.49 * 0.33^{1.67} * 0.005^{0.5}} = 8.6'$$

Swale bottom width is set to 23 feet to reflect the size of the existing level spreader.

Step 2: Determine depth of flow based on bottom width (*b*) calculated in Step 1

Step D-4 from Manual (Vol V, page 9-7): $y = \left(\frac{Q_{wq} n_{wq}}{1.49 s^{0.5} b}\right)^{0.6}$ [y must be ≤4" (0.333')]

Q_{wq} = 0.6011 cfs
n_{wq} =0.24 (from KCSWDM)
s = 0.5%
b = 23' [must be ≥2']

$$y = \left(\frac{0.6011 * 0.24}{1.49 * 0.005^{0.5} * 23}\right)^{0.6} = 0.18'$$

Step 3: Determine area of flow based on bottom width (*b*) and depth (y) calculated in Steps 1 and 2

Step D-5 from Manual (Vol V, page 9-9): $A = by + Zy^2$

b = 23'
y = 0.18'
Z = 0 [swale effectively has no side slope, as the flow area is nearly 50 feet wide]

$$A = 23 * 0.18 + 3 * 0.18^2 = 4.23 \text{ sqft}$$

Step 4: Determine WQ flow velocity

Step D-6 from Manual (Vol V, page 9-9): $V_{wq} = \frac{Q_{wq}}{A_{wq}}$ [V_{wq} must be ≤0.5 fps]

Q_{wq} = 0.6011 cfs
A_{wq} = 4.23 sqft

$$V_{wq} = \frac{0.6011}{4.23} = 0.14 \text{ fps}$$

0.14 fps < 0.5 fps → WQ flow rate capacity is OK

Step 5: Determine swale bottom length

Step D-7 from Manual (Vol V, page 9-9): $L = 540V_{wq}$ [L must be ≥100']

V_{wq} = 0.14 fps

$$L = 540 * 0.14 = 77'$$

Swale length is approximately 85 feet, which exceeds the calculated 77-foot length.

Step 6: Check 100-year flow rate capacity

Check 100-year flow rate capacity: $V_{100} = \frac{Q_{100}}{A_{100}}$ [V_{100} must be ≤3 fps]

Q_{100} = 3.645 cfs
$A_{100} = by + Zy^2 = 4.26$
n_{100} =0.04 (from Manual, Vol V, page 9-12)
Z =0 [swale effectively has no side slope, as the flow area is nearly 50 feet wide]
b = 23'

$$V_{100} = \frac{3.645}{4.26} = 0.86 \text{ fps}$$

0.86 fps < 3 fps → 100-year flow rate capacity is OK

NEW FACILITIES

The new buildings from the Public Works Facility Project will require flow control for the roof runoff. Underground infiltration trenches are proposed for most of the new buildings. Runoff from the Public Works Building and the covered storage north of Civic Drive can be piped using roof drains to a common infiltration trench. The long-term infiltration rate in this area was found to be greater than 10 inches per hour (see test pit GTP-103), but a long-term rate of 10 inches per hour is used for design.

The decant facility, brine station, and vehicle wash will also include piped roof drainage to an infiltration trench. It is recommended that the infiltration trench be located to the east of the buildings where a long-term infiltration rate of over 10 inches per hour was determined (see test pit GTP-106). The infiltration rate south of the building was considerably lower.

Table 2 includes the design parameters for the proposed infiltration trenches.

TABLE 2

Proposed Infiltration Trenches

Location	Buildings	Long-term infiltration rate (in/hr)[1]	Trench Width (ft)	Trench Length (ft)	Trench Depth (ft)	Storage (ac-ft)[2]
North Basin	Public Works Facility, covered storage	10	5	71	4	0.013
South Basin	Decant facility, brine station, vehicle wash	10	5	30	4	0.005

1. See geotechnical report prepared by PanGEO Inc.
2. Assuming void space of 40 percent within trench gravel.

CONCLUSION

The existing Civic Drive treatment and infiltration pond appears to be adequately sized to handle runoff from all pavement, parking, sidewalks, and landscaping from the existing City Hall and Public Safety developments, as well as the proposed Public Works facility development. The biofiltration swale within the northern half of the pond is adequately sized to treat all polluted runoff from the basin. It is recommended that roof runoff from the Public Works building, storage shed, decant facility, brine station, and vehicle wash buildings be fully infiltrated in dedicated underground infiltration trenches. It should also be noted that this report did not address future development in the South Basin to the east of the existing pond. Any future development in this region is anticipated to provide its own flow control and water quality facilities.

DM/sp

FIGURE 1
PROJECT VICINITY

Disclaimer: Map features are approximate and have not been surveyed. Additional features not yet mapped may be present. Pierce County assumes no liability for variations ascertained by formal survey. 6/27/2019

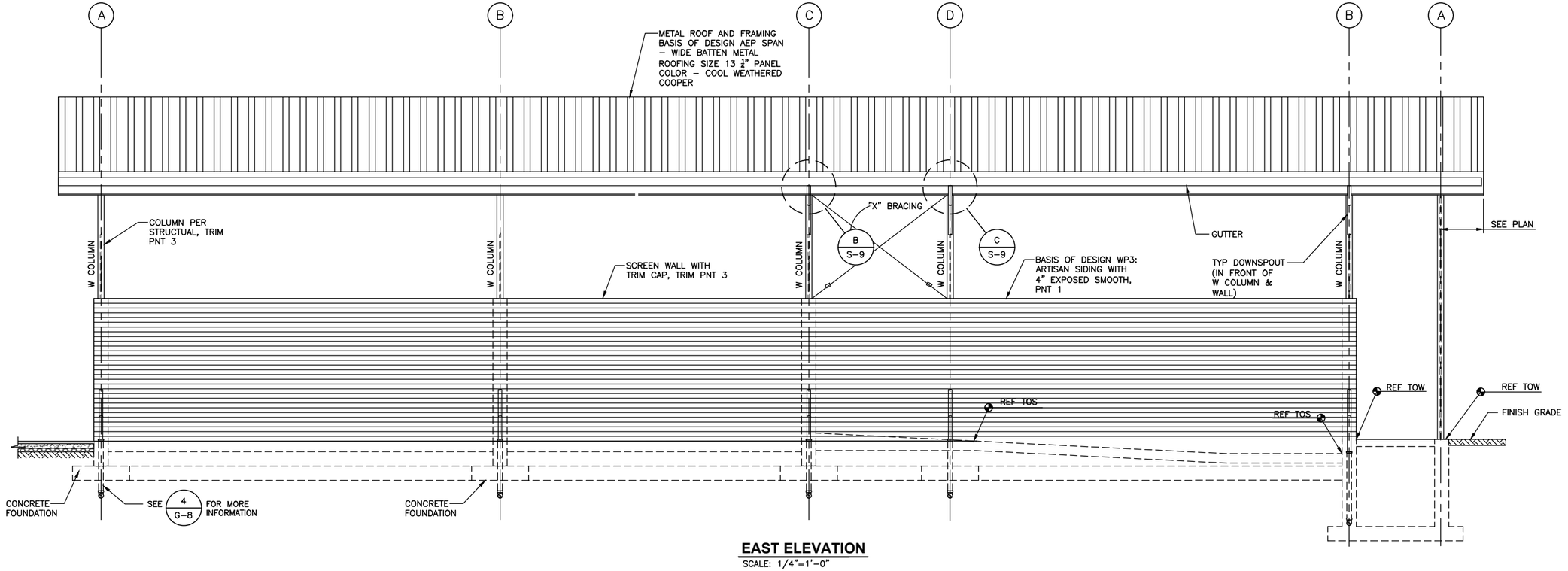
CITY OF DuPONT

PUBLIC WORKS FACILITY

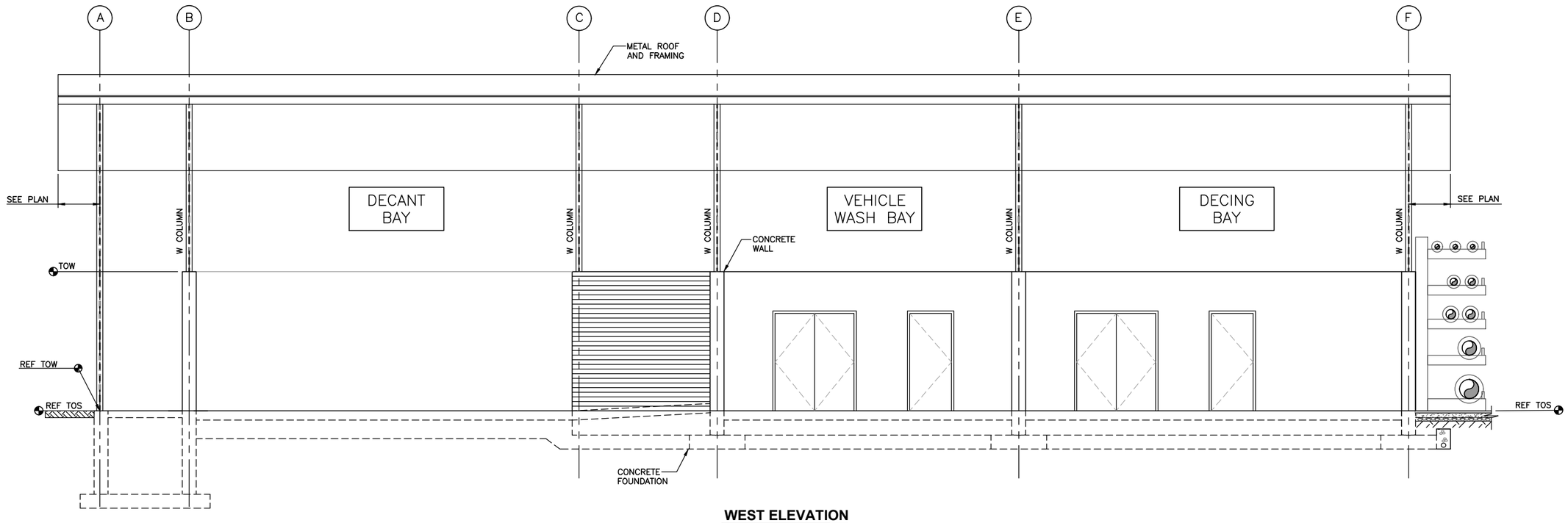
MATERIALS BOARD & COLOR BOARD

Gray & Osborne, Inc.
CONSULTING ENGINEERS

TOWNE HART



EAST ELEVATION
SCALE: 1/4"=1'-0"



WEST ELEVATION
SCALE: 1/4"=1'-0"

0 1" 2"
TWO INCHES AT FULL SCALE.
IF NOT, SCALE ACCORDINGLY

L:\DUPONT\19233 Public Works Facility\01 Design\Planset\Structural\S4_DCF_VW.dwg, 8/12/2019 3:32 PM, SHARI CAER

Gray & Osborne, Inc.
CONSULTING ENGINEERS
2102 CARRIAGE DRIVE SW, BLDG. 1
OLYMPIA, WA 98502 • (360) 292-7418

DATE: AUG 2019	DRAWN:	CHECKED: PTG	APPROVED: MJB

PRELIMINARY
NOT FOR
CONSTRUCTION

No.	REVISION	DATE	APPD

MYRON J. BASDEN
STATE OF WASHINGTON
PROFESSIONAL ENGINEER

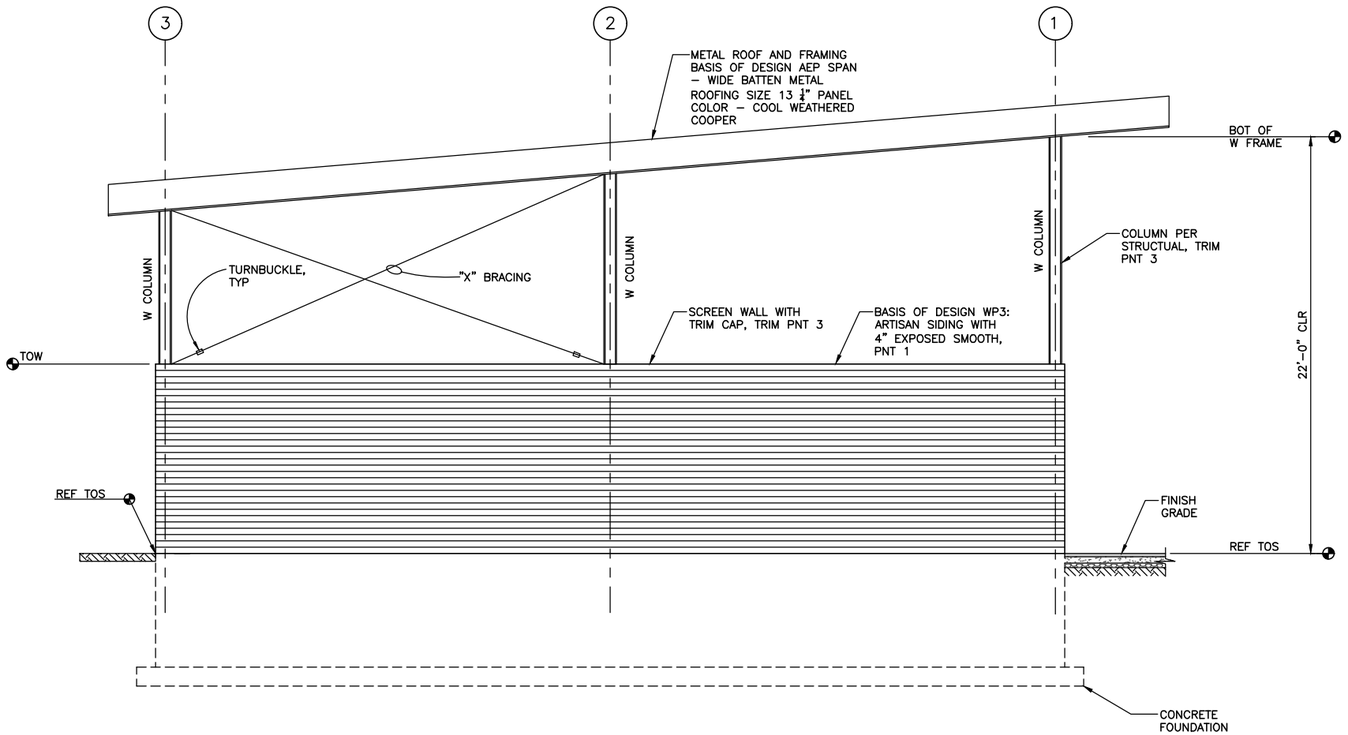
CITY OF DUPONT
PIERCE COUNTY WASHINGTON

PUBLIC WORKS FACILITY

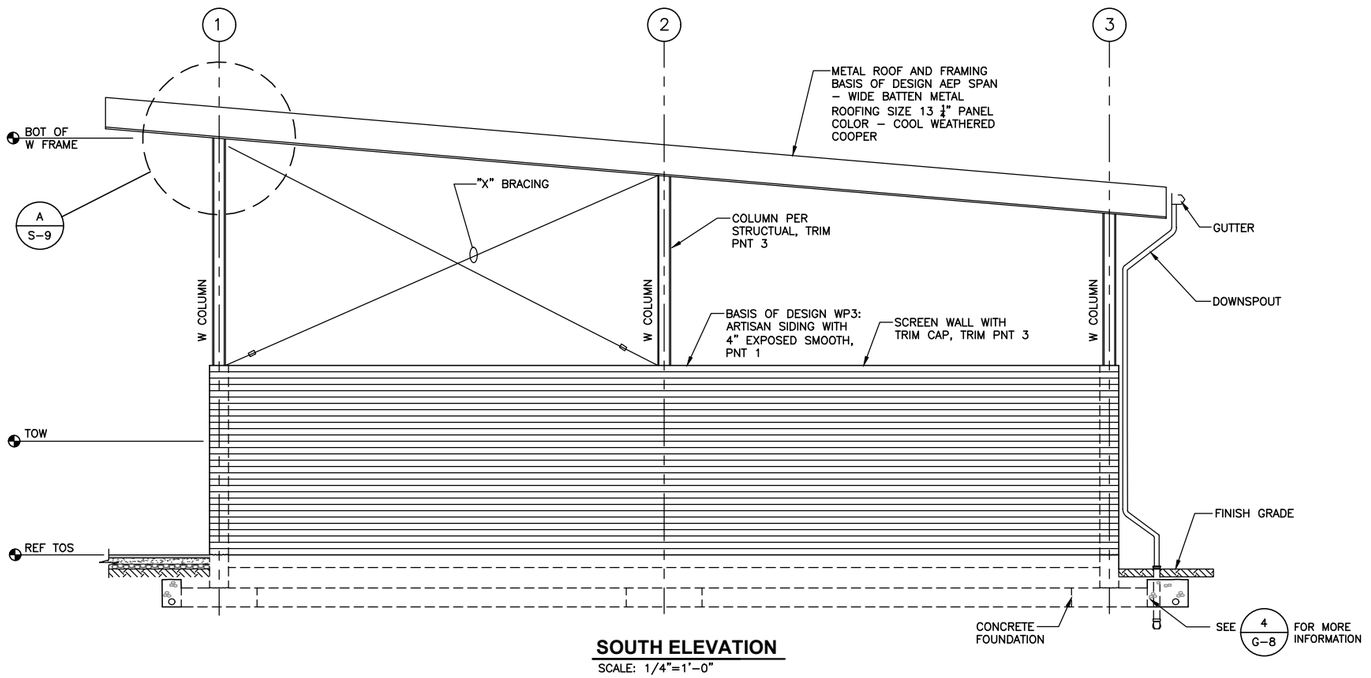
DECANT/VEHICLE WASH/ DEICING FACILITY
BUILDING ELEVATIONS

SHEET: S4-6
OF: 9

JOB NO.: 19233.00
DWG:S4_DCF_VW



NORTH ELEVATION
SCALE: 1/4"=1'-0"



SOUTH ELEVATION
SCALE: 1/4"=1'-0"

0 1" 2"
TWO INCHES AT FULL SCALE.
IF NOT, SCALE ACCORDINGLY

Gray & Osborne, Inc.
CONSULTING ENGINEERS
2102 CARRIAGE DRIVE SW, BLDG. I
OLYMPIA, WA 98502 • (360) 292-7418

DATE: AUG 2019 | DRAWN: | CHECKED: PTG | APPROVED: MJB

PRELIMINARY
NOT FOR
CONSTRUCTION

No.	REVISION	DATE	APPD

MYRON J. BASDEN — STATE OF WASHINGTON — REGISTERED PROFESSIONAL ENGINEER

CITY OF DUPONT
PIERCE COUNTY, WASHINGTON

PUBLIC WORKS FACILITY

DECANT/VEHICLE WASH/ DEICING FACILITY
BUILDING ELEVATIONS

SHEET: S4-7
OF: 9

JOB NO.: 19233.00
DWG:S4_DCF_VW

First American

First American Title Insurance Company

7502 Lakewood Drive West, Ste A
Lakewood, WA 98499

May 10, 2019

Rick Bond
Gray & Osborne
1130 Rainier Avenue South Suite 300
Seattle, WA 98144

Phone: (206)284-0860
Fax: (206)283-3206

Title Officer:	Lisa Polosky
Phone:	(253)382-2811
Fax No.:	(253)382-2883
E-Mail:	lpolosky@firstam.com
Order Number:	3236808

Owner:	City of Dupont
Property:	1700 to 1780 Civic Drive Dupont, Washington 98327

Attached please find the following item(s):

Guarantee

Thank You for your confidence and support. We at First American Title Insurance Company maintain the fundamental principle:

Customer First!

First American

Guarantee

Subdivision Guarantee

ISSUED BY
First American Title Insurance Company

GUARANTEE NUMBER
5003353-3236808

SUBJECT TO THE EXCLUSIONS FROM COVERAGE, THE LIMITS OF LIABILITY AND THE CONDITIONS AND STIPULATIONS OF THIS GUARANTEE,

FIRST AMERICAN TITLE INSURANCE COMPANY
a Nebraska corporation, herein called the Company

GUARANTEES

Gray & Osborne

the Assured named in Schedule A against actual monetary loss or damage not exceeding the liability stated in Schedule A, which the Assured shall sustain by reason of any incorrectness in the assurances set forth in Schedule A.

First American Title Insurance Company

Dennis J. Gilmore
President

Jeffrey S. Robinson
Secretary

This jacket was created electronically and constitutes an original document

SCHEDULE OF EXCLUSIONS FROM COVERAGE OF THIS GUARANTEE

1. Except to the extent that specific assurances are provided in Schedule A of this Guarantee, the Company assumes no liability for loss or damage by reason of the following:
   (a) Defects, liens, encumbrances, adverse claims or other matters against the title, whether or not shown by the public records.
   (b) (1) Taxes or assessments of any taxing authority that levies taxes or assessments on real property; or, (2) Proceedings by a public agency which may result in taxes or assessments, or notices of such proceedings, whether or not the matters excluded under (1) or (2) are shown by the records of the taxing authority or by the public records.
   (c) (1) Unpatented mining claims; (2) reservations or exceptions in patents or in Acts authorizing the issuance thereof; (3) water rights, claims or title to water, whether or not the matters excluded under (1), (2) or (3) are shown by the public records.
2. Notwithstanding any specific assurances which are provided in Schedule A of this Guarantee, the Company assumes no liability for loss or damage by reason of the following:
   (a) Defects, liens, encumbrances, adverse claims or other matters affecting the title to any property beyond the lines of the land expressly described in the description set forth in Schedule (A), (C) or in Part 2 of this Guarantee, or title to streets, roads, avenues, lanes, ways or waterways to which such land abuts, or the right to maintain therein vaults, tunnels, ramps or any structure or improvements; or any rights or easements therein, unless such property, rights or easements are expressly and specifically set forth in said description.
   (b) Defects, liens, encumbrances, adverse claims or other matters, whether or not shown by the public records; (1) which are created, suffered, assumed or agreed to by one or more of the Assureds; (2) which result in no loss to the Assured; or (3) which do not result in the invalidity or potential invalidity of any judicial or non-judicial proceeding which is within the scope and purpose of the assurances provided.
   (c) The identity of any party shown or referred to in Schedule A.
   (d) The validity, legal effect or priority of any matter shown or referred to in this Guarantee.

GUARANTEE CONDITIONS AND STIPULATIONS

1. Definition of Terms.
The following terms when used in the Guarantee mean:
   (a) the "Assured": the party or parties named as the Assured in this Guarantee, or on a supplemental writing executed by the Company.
   (b) "land": the land described or referred to in Schedule (A)(C) or in Part 2, and improvements affixed thereto which by law constitute real property. The term "land" does not include any property beyond the lines of the area described or referred to in Schedule (A)(C) or in Part 2, nor any right, title, interest, estate or easement in abutting streets, roads, avenues, alleys, lanes, ways or waterways.
   (c) "mortgage": mortgage, deed of trust, trust deed, or other security instrument.
   (d) "public records": records established under state statutes at Date of Guarantee for the purpose of imparting constructive notice of matters relating to real property to purchasers for value and without knowledge.
   (e) "date": the effective date.

2. Notice of Claim to be Given by Assured Claimant.
An Assured shall notify the Company promptly in writing in case knowledge shall come to an Assured hereunder of any claim of title or interest which is adverse to the title to the estate or interest, as stated herein, and which might cause loss or damage for which the Company may be liable by virtue of this Guarantee. If prompt notice shall not be given to the Company, then all liability of the Company shall terminate with regard to the matter or matters for which prompt notice is required; provided, however, that failure to notify the Company shall in no case prejudice the rights of any Assured unless the Company shall be prejudiced by the failure and then only to the extent of the prejudice.

3. No Duty to Defend or Prosecute.
The Company shall have no duty to defend or prosecute any action or proceeding to which the Assured is a party, notwithstanding the nature of any allegation in such action or proceeding.

4. Company's Option to Defend or Prosecute Actions; Duty of Assured Claimant to Cooperate.
Even though the Company has no duty to defend or prosecute as set forth in Paragraph 3 above:
   (a) The Company shall have the right, at its sole option and cost, to institute and prosecute any action or proceeding, interpose a defense, as limited in (b), or to do any other act which in its opinion may be necessary or desirable to establish the title to the estate or interest as stated herein, or to establish the lien rights of the Assured, or to prevent or reduce loss or damage to the Assured. The Company may take any appropriate action under the terms of this Guarantee, whether or not it shall be liable hereunder, and shall not thereby concede liability or waive any provision of this Guarantee. If the Company shall exercise its rights under this paragraph, it shall do so diligently.
   (b) If the Company elects to exercise its options as stated in Paragraph 4(a) the Company shall have the right to select counsel of its choice (subject to the right of such Assured to object for reasonable cause) to represent the Assured and shall not be liable for and will not pay the fees of any other counsel, nor will the Company pay any fees, costs or expenses incurred by an Assured in the defense of those causes of action which allege matters not covered by this Guarantee.
   (c) Whenever the Company shall have brought an action or interposed a defense as permitted by the provisions of this Guarantee, the Company may pursue any litigation to final determination by a court of competent jurisdiction and expressly reserves the right, in its sole discretion, to appeal from an adverse judgment or order.
   (d) In all cases where this Guarantee permits the Company to prosecute or provide for the defense of any action or proceeding, an Assured shall secure to the Company the right to so prosecute or provide for the defense of any action or proceeding, and all appeals therein, and permit the Company to use, at its option, the name of such Assured for this purpose. Whenever requested by the Company, an Assured, at the Company's expense, shall give the Company all

reasonable aid in any action or proceeding, securing evidence, obtaining witnesses, prosecuting or defending the action or lawful act which in the opinion of the Company may be necessary or desirable to establish the title to the estate or interest as stated herein, or to establish the lien rights of the Assured. If the Company is prejudiced by the failure of the Assured to furnish the required cooperation, the Company's obligations to the Assured under the Guarantee shall terminate.

5. Proof of Loss or Damage.

In addition to and after the notices required under Section 2 of these Conditions and Stipulations have been provided to the Company, a proof of loss or damage signed and sworn to by the Assured shall be furnished to the Company within ninety (90) days after the Assured shall ascertain the facts giving rise to the loss or damage. The proof of loss or damage shall describe the matters covered by this Guarantee which constitute the basis of loss or damage and shall state, to the extent possible, the basis of calculating the amount of the loss or damage. If the Company is prejudiced by the failure of the Assured to provide the required proof of loss or damage, the Company's obligation to such assured under the Guarantee shall terminate. In addition, the Assured may reasonably be required to submit to examination under oath by any authorized representative of the Company and shall produce for examination, inspection and copying, at such reasonable times and places as may be designated by any authorized representative of the Company, all records, books, ledgers, checks, correspondence and memoranda, whether bearing a date before or after Date of Guarantee, which reasonably pertain to the loss or damage. Further, if requested by any authorized representative of the Company, the Assured shall grant its permission, in writing, for any authorized representative of the Company to examine, inspect and copy all records, books, ledgers, checks, correspondence and memoranda in the custody or control of a third party, which reasonably pertain to the loss or damage. All information designated as confidential by the Assured provided to the Company pursuant to this Section shall not be disclosed to others unless, in the reasonable judgment of the Company, it is necessary in the administration of the claim. Failure of the Assured to submit for examination under oath, produce other reasonably requested information or grant permission to secure reasonably necessary information from third parties as required in the above paragraph, unless prohibited by law or governmental regulation, shall terminate any liability of the Company under this Guarantee to the Assured for that claim.

6. Options to Pay or Otherwise Settle Claims: Termination of Liability.

In case of a claim under this Guarantee, the Company shall have the following additional options:

(a) To Pay or Tender Payment of the Amount of Liability or to Purchase the Indebtedness.

The Company shall have the option to pay or settle or compromise for or in the name of the Assured any claim which could result in loss to the Assured within the coverage of this Guarantee, or to pay the full amount of this Guarantee or, if this Guarantee is issued for the benefit of a holder of a mortgage or a lienholder, the Company shall have the option to purchase the indebtedness secured by said mortgage or said lien for the amount owing thereon, together with any costs, reasonable attorneys' fees and expenses incurred by the Assured claimant which were authorized by the Company up to the time of purchase.

Such purchase, payment or tender of payment of the full amount of the Guarantee shall terminate all liability of the Company hereunder. In the event after notice of claim has been given to the Company by the Assured the Company offers to purchase said indebtedness, the owner of such indebtedness shall transfer and assign said indebtedness, together with any collateral security, to the Company upon payment of the purchase price.

Upon the exercise by the Company of the option provided for in Paragraph (a) the Company's obligation to the Assured under this Guarantee for the claimed loss or damage, other than to make the payment required in that paragraph, shall terminate, including any obligation to continue the defense or prosecution of any litigation for which the Company has exercised its options under Paragraph 4, and the Guarantee shall be surrendered to the Company for cancellation.

(b) To Pay or Otherwise Settle With Parties Other Than the Assured or With the Assured Claimant.

To pay or otherwise settle with other parties for or in the name of an Assured claimant any claim assured against under this Guarantee, together with any costs, attorneys' fees and expenses incurred by the Assured claimant which were authorized by the Company up to the time of payment and which the Company is obligated to pay.

Upon the exercise by the Company of the option provided for in Paragraph (b) the Company's obligation to the Assured under this Guarantee for the claimed loss or damage, other than to make the payment required in that paragraph, shall terminate, including any obligation to continue the defense or prosection of any litigation for which the Company has exercised its options under Paragraph 4.

7. Determination and Extent of Liability.

This Guarantee is a contract of Indemnity against actual monetary loss or damage sustained or incurred by the Assured claimant who has suffered loss or damage by reason of reliance upon the assurances set forth in this Guarantee and only to the extent herein described, and subject to the Exclusions From Coverage of This Guarantee.

The liability of the Company under this Guarantee to the Assured shall not exceed the least of:

(a) the amount of liability stated in Schedule A or in Part 2;

(b) the amount of the unpaid principal indebtedness secured by the mortgage of an Assured mortgagee, as limited or provided under Section 6 of these Conditions and Stipulations or as reduced under Section 9 of these Conditions and Stipulations, at the time the loss or damage assured against by this Guarantee occurs, together with interest thereon; or

(c) the difference between the value of the estate or interest covered hereby as stated herein and the value of the estate or interest subject to any defect, lien or encumbrance assured against by this Guarantee.

8. Limitation of Liability.

(a) If the Company establishes the title, or removes the alleged defect, lien or encumbrance, or cures any other matter assured against by this Guarantee in a reasonably diligent manner by

any method, including litigation and the completion of any appeals therefrom, it shall have fully performed its obligations with respect to that matter and shall not be liable for any loss or damage caused thereby.

(b) In the event of any litigation by the Company or with the Company's consent, the Company shall have no liability for loss or damage until there has been a final determination by a court of competent jurisdiction, and disposition of all appeals therefrom, adverse to the title, as stated herein.

(c) The Company shall not be liable for loss or damage to any Assured for liability voluntarily assumed by the Assured in settling any claim or suit without the prior written consent of the Company.

9. Reduction of Liability or Termination of Liability.

All payments under this Guarantee, except payments made for costs, attorneys' fees and expenses pursuant to Paragraph 4 shall reduce the amount of liability pro tanto.

10. Payment of Loss.

(a) No payment shall be made without producing this Guarantee for endorsement of the payment unless the Guarantee has been lost or destroyed, in which case proof of loss or destruction shall be furnished to the satisfaction of the Company.

(b) When liability and the extent of loss or damage has been definitely fixed in accordance with these Conditions and Stipulations, the loss or damage shall be payable within thirty (30) days thereafter.

11. Subrogation Upon Payment or Settlement.

Whenever the Company shall have settled and paid a claim under this Guarantee, all right of subrogation shall vest in the Company unaffected by any act of the Assured claimant.

The Company shall be subrogated to and be entitled to all rights and remedies which the Assured would have had against any person or property in respect to the claim had this Guarantee not been issued. If requested by the Company, the Assured shall transfer to the Company all rights and remedies against any person or property necessary in order to perfect this right of subrogation. The Assured shall permit the Company to sue, compromise or settle in the name of the Assured and to use the name of the Assured in any transaction or litigation involving these rights or remedies.

If a payment on account of a claim does not fully cover the loss of the Assured the Company shall be subrogated to all rights and remedies of the Assured after the Assured shall have recovered its principal, interest, and costs of collection.

12. Arbitration.

Unless prohibited by applicable law, either the Company or the Assured may demand arbitration pursuant to the Title Insurance Arbitration Rules of the American Land Title Association. Arbitrable matters may include, but are not limited to, any controversy or claim between the Company and the Assured arising out of or relating to this Guarantee, any service of the Company in connection with its issuance or the breach of a Guarantee provision or other obligation. All arbitrable matters when the Amount of Liability is $2,000,000 or less shall be arbitrated at the option of either the Company or the Assured. All arbitrable matters when the amount of liability is in excess of $2,000,000 shall be arbitrated only when agreed to by both the Company and the Assured. The Rules in effect at Date of Guarantee shall be binding upon the parties. The award may include attorneys' fees only if the laws of the state in which the land is located permits a court to award attorneys' fees to a prevailing party. Judgment upon the award rendered by the Arbitrator(s) may be entered in any court having jurisdiction thereof.

The law of the situs of the land shall apply to an arbitration under the Title Insurance Arbitration Rules.

A copy of the Rules may be obtained from the Company upon request.

13. Liability Limited to This Guarantee; Guarantee Entire Contract.

(a) This Guarantee together with all endorsements, if any, attached hereto by the Company is the entire Guarantee and contract between the Assured and the Company. In interpreting any provision of this Guarantee, this Guarantee shall be construed as a whole.

(b) Any claim of loss or damage, whether or not based on negligence, or any action asserting such claim, shall be restricted to this Guarantee.

(c) No amendment of or endorsement to this Guarantee can be made except by a writing endorsed hereon or attached hereto signed by either the President, a Vice President, the Secretary, an Assistant Secretary, or validating officer or authorized signatory of the Company.

14. Notices, Where Sent.

All notices required to be given the Company and any statement in writing required to be furnished the Company shall include the number of this Guarantee and shall be addressed to the Company at **First American Title Insurance Company, Attn: Claims National Intake Center, 1 First American Way, Santa Ana, California 92707 Claims.NIC@firstam.com Phone: 888-632-1642 Fax: 877-804-7606**

First American Title

First American

Schedule A

Subdivision Guarantee

ISSUED BY
First American Title Insurance Company

GUARANTEE NUMBER
3236808

Order No.: 3236808 Liability: $2,000.00 Fee: $350.00
Tax: $34.65

Name of Assured: Gray & Osborne

Date of Guarantee: April 25, 2019

The assurances referred to on the face page hereof are:

1. Title is vested in:

   City of Dupont, a municipal corporation

2. That, according to the public records relative to the land described in Schedule C attached hereto (including those records maintained and indexed by name), there are no other documents affecting title to said land or any portion thereof, other than those shown under Record Matters in Schedule B.

3. The following matters are excluded from the coverage of this Guarantee

   A. Unpatented Mining Claims, reservations or exceptions in patents or in acts authorizing the issuance thereof.

   B. Water rights, claims or title to water.

   C. Tax Deeds to the State of Washington.

   D. Documents pertaining to mineral estates.

4. No guarantee is given nor liability assumed with respect to the validity, legal effect or priority of any matter shown herein.

5. This Guarantee is restricted to the use of the Assured for the purpose of providing title evidence as may be required when subdividing land pursuant to the provisions of Chapter 58.17, R.C.W., and the local regulations and ordinances adopted pursuant to said statute. It is not to be used as a basis for closing any transaction affecting title to said property.

6. Any sketch attached hereto is done so as a courtesy only and is not part of any title commitment, guarantee or policy. It is furnished solely for the purpose of assisting in locating the premises and First American expressly disclaims any liability which may result from reliance made upon it.

RECORD MATTERS

1. General taxes for the year 2019, which have been paid.

   Tax Account No.: 0119266004 (Lot 1)

   Amount: $ 10.82
   Assessed Land Value: $ 2,555,000.00
   Assessed Improvement Value: $ 0.00

   The taxes for the current year reflect an exemption for Municipal Corp and Misc Taxing Districts. Any curtailment of the exemption may result in an additional amount being due for the current year and for any re-assessment of land and improvement values.

2. General taxes for the year 2019, which have been paid.

   Tax Account No.: 0119266002 (Lot 2)

   Amount: $ 9.61
   Assessed Land Value: $ 260,300.00
   Assessed Improvement Value: $ 0.00

   The taxes for the current year reflect an exemption for Municipal Corp and Misc Taxing Districts. Any curtailment of the exemption may result in an additional amount being due for the current year and for any re-assessment of land and improvement values.

3. Taxes which may be assessed and extended on any subsequent roll for the tax year 2019, with respect to new improvements and the first occupancy which may be included on the regular assessment roll and which are an accruing lien not yet due or payable.

4. Easement, including terms and provisions contained therein:
   Recording Information: 755683
   In Favor of: Puget Sound Power & Light Company
   For: electrical transmission and/or distribution line

   Modification and/or amendment by instrument:
   Recording Information: 1362684

5. Easement, including terms and provisions contained therein:
   Recording Information: 1362683
   In Favor of: Puget Sound Power & Light Company
   For: electrical transmission and/or distribution line

6. Easement, including terms and provisions contained therein:
   Recording Information: 2015421
   In Favor of: Puget Sound Power & Light Company
   For: electrical transmission and/or distribution line

7. Reservations and exceptions, including the terms and conditions thereof:
   Reserving: minerals
   Reserved By: Weyerhaeuser Company
   Recorded: February 2, 1990
   Recording Information: 9002020329

   We note no examination has been made regarding the transfer or taxation of the reserved rights.

   Modification and/or amendment by instrument:
   Recording Information: 9405130746

8. Easement, including terms and provisions contained therein:
   Recording Information: 9004190543
   In Favor of: Puget Sound Power & Light Company
   For: utilities

9. Covenants, conditions, restrictions and/or easements; but deleting any covenant, condition or restriction indicating a preference, limitation or discrimination based on race, color, religion, sex, handicap, family status, or national origin to the extent such covenants, conditions or restrictions violate Title 42, Section 3604(c), of the United States Codes:
   Recording Information: 9208240297, including all amendments thereto

   Assignment of Declarant Rights recorded under Recording No. 200201080843.

10. Provisions of the Articles of Incorporation and By-Laws of the **Northwest Landing Commercial Owners Association**, and any tax, fee, assessments or charges as may be levied by said association.

11. Easement, including terms and provisions contained therein:
   Recording Information: 9511200886
   In Favor of: Puget Sound Power & Light Company
   For: underground electric system
   Affects: Easterly portion said premises

12. Easement, including terms and provisions contained therein:
   Recording Information: 9205210946
   In Favor of: City of Dupont
   For: Landscape easement
   Affects: Easterly portion said premises

13. Easement, including terms and provisions contained therein:
   Recording Information: 9601090362
   In Favor of: owners
   For: Landscaping, pedestrian access and utility

14. Covenants, conditions, restrictions and/or easements; but deleting any covenant, condition or restriction indicating a preference, limitation or discrimination based on race, color, religion, sex, handicap, family status, or national origin to the extent such covenants, conditions or restrictions violate Title 42, Section 3604(c), of the United States Codes:
Recording Information: 9712230865

15. Covenants, conditions, restrictions and/or easements; but deleting any covenant, condition or restriction indicating a preference, limitation or discrimination based on race, color, religion, sex, handicap, family status, or national origin to the extent such covenants, conditions or restrictions violate Title 42, Section 3604(c), of the United States Codes:
Recording Information: 9910290750

16. The terms and provisions contained in the document entitled "Notice Regarding historic District Designation and Declaration of Covenant"
Recorded: February 12, 2001
Recording No.: 200101120143

Modification and/or amendment by instrument:
Recording Information: 200606120310

17. The terms and provisions contained in the document entitled "Declaration of Covenant Regarding Fire Station"
Recorded: February 16, 2006
Recording No.: 200602160943

18. The terms and provisions contained in the document entitled "Declaration of Restrictive Covenant - Commercial"
Recorded: July 25, 2006
Recording No.: 200607251021

19. The terms and provisions contained in the document entitled "Declaration of Restrictive Covenant - Commercial"
Recorded: July 25, 2006
Recording No.: 200607251022

20. Terms, covenants, conditions and/or provisions as contained in an easement serving said premises, as contained in instrument:
Recording Information: 200708100582
For: Temporary construction easement and permanent access and utility easement

21. Any and all offers of dedication, conditions, restrictions, easements, boundary discrepancies or encroachments, notes and/or provisions shown or disclosed by Short Plat recorded August 15, 2007, under recording number 200708155002.

Affidavit of Minor Correction of Survey recorded under Recording No. 200712180504.

22. Easement, including terms and provisions contained therein:
Recording Information: 200708270208
In Favor of: Pierce County
For: Sanitary sewer
Affects: Northeasterly portion Lot 2

23. The terms and provisions contained in the document entitled "Declaration of Restrictive Covenant Commercial - Lot A"
Recorded: October 26, 2007
Recording No.: 200710260184

24. The terms and provisions contained in the document entitled "Declaration of Restrictive Covenant Commercial - Lot B"
Recorded: October 26, 2007
Recording No.: 200710260185

25. Easement, including terms and provisions contained therein:
Recording Information: 200804111004
In Favor of: Puget Sound Energy, Inc.
For: gas and electricity

26. Unrecorded leaseholds, if any, rights of vendors and security agreement on personal property and rights of tenants, and secured parties to remove trade fixtures at the expiration of the term.

Informational Notes, if any

First American

Schedule C

Subdivision Guarantee

ISSUED BY
First American Title Insurance Company

GUARANTEE NUMBER
3236808

The land in the County of Pierce, State of Washington, described as follows:

Lots 1 and 2, Pierce County Short Plat No. 200708155002, according to Short Plat recorded August 15, 2007, records of Pierce County, Washington.

Situate in the County of Pierce, State of Washington.

APPLICATION
A8
Revised 2/1/2019

Sewer Development Review Application For
Site Specific Sewer Information Letter

Pierce County

Complete and submit this form and any supplemental information or documents to: https://pals.piercecountywa.gov/palsonline/#/dashboard. All documents must be uploaded in PDF format.

- You must also submit a Site Plan with this request. See Bulletin B17 for examples. A blank grid is included on the last page of this form.

If you have any questions, contact our office at (253) 798-2737.

A. Property Information

1. Parcel No(s): 0119266002
2. Site Address(es): XXXX Civic Drive, DuPont WA 98327
   Street | Suite/Tenant Space | City | Zip

B. Applicant Information (☐ Check here if same as Property Owner Information listed above)

1. Applicant Name: City of DuPont Gus Lim

   Mailing Address: 1700 Civic Drive, DuPont WA 98327
   Street | Suite/Tenant Space | City | Zip

   Office or Cell Phone: (253) 912-5380 Alternate Number:

   Email Address: glim@dupontwa.gov

C. Existing Uses (List all the existing uses on all the parcels listed above)

Existing Uses	Number of Existing Dwelling Units or Tenant Spaces	Number of Existing Buildings	Number of Existing Buildings to Remain	Number of Existing Buildings to be Demolished
Single-family Residences				
Duplexes				
Accessory Dwelling Units				
Apartment Units				
Condos				
Commercial				

List all existing commercial businesses and tenants:

D. Proposed Uses (☐ Check here if there are no proposed changes or expansions of use)

Proposed Uses	Number of Proposed Dwelling Units or Tenant Spaces	Number of Proposed Buildings
Single-family Residences		
Duplexes		
Accessory Dwelling Units		
Apartment Units		
Condos		
Commercial		1

List all existing commercial businesses and tenants:

E. Water Use Data (Required for commercial uses only)

1. New Connections (Existing or Proposed Development):

   What is the estimated sewer discharge or water use* in gallons per day (gpd) or hundred cubic feet per month (ccf/mo) from all the existing and proposed buildings on the property to be connected?

   100 gpd _____ ccf/mo

2. Proposed Development on Previously Connected Property:

   Will the proposed development or change in business require an increase in water use on the property?

   ☐ Yes
   ☐ No

If yes, then please submit documented Water Use Data* for the existing and proposed uses so the Sewer Division can determine what additional connection charges must be paid, if any.

*Please read Bulletin #B5 Documented Water Use Data, to see what type of water use data is required to be submitted.

F. Site Specific Sewer Information Letter Application Fee

- ☐ Existing Single Family Residences or Duplexes (to remain) $60.00
- ☐ Existing Apartments, Condos, or Mobile Home Parks (to remain) $120.00
- ☐ Existing Commercial Buildings (to remain) $120.00
- ☐ Proposed Residential or Commercial Development $180.00

Future Use

Water use on the South Site will be due to the Vehicle Wash bay, semi-regular wash-down of the facility, and seasonal minor use of the deicing bay to make salt brine (dispersed on city streets as storm runoff).

Vehicle Wash = 20 GPD Average

Facility Wash-down, Salt Brine, misc. = 80 GPD Average

The South Site will also contain a Decant bay. This will not create water use due to the water being collected from catch basins around the city. However, this will create discharge to sewer after processing through an oil-water separator. The discharge amount is based on the previous year's catch basin vactoring data.

Decant Discharge = 240 GPD Average

Current Use

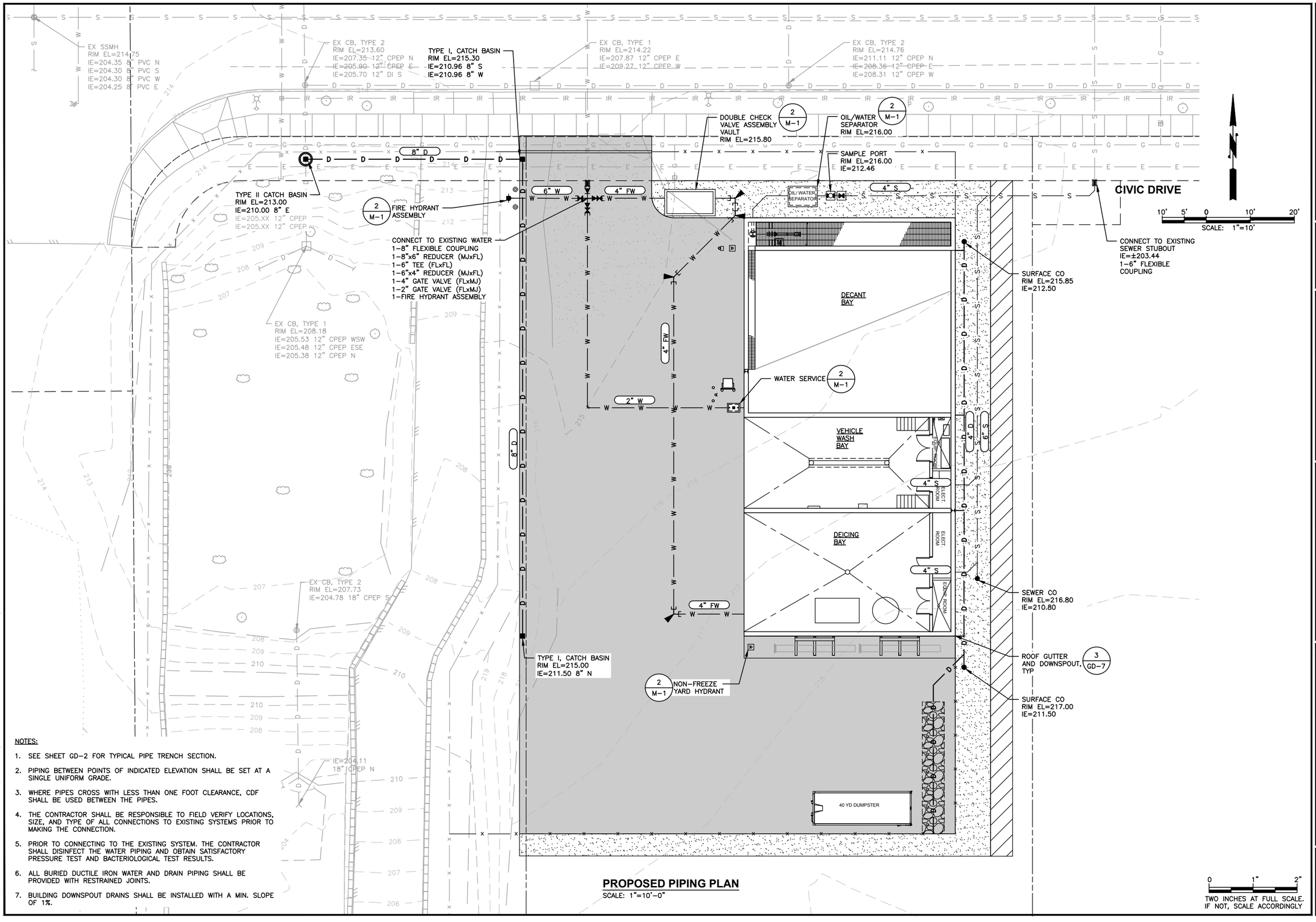
No current use on parcel.

Total future use for all activities on Parcel 0119266002:

100 *GPD Average*

Total future discharge for all activities on Parcel 0119266002:

340 *GPD Average*



NOTES:

1. SEE SHEET GD–2 FOR TYPICAL PIPE TRENCH SECTION.
2. PIPING BETWEEN POINTS OF INDICATED ELEVATION SHALL BE SET AT A SINGLE UNIFORM GRADE.
3. WHERE PIPES CROSS WITH LESS THAN ONE FOOT CLEARANCE, CDF SHALL BE USED BETWEEN THE PIPES.
4. THE CONTRACTOR SHALL BE RESPONSIBLE TO FIELD VERIFY LOCATIONS, SIZE, AND TYPE OF ALL CONNECTIONS TO EXISTING SYSTEMS PRIOR TO MAKING THE CONNECTION.
5. PRIOR TO CONNECTING TO THE EXISTING SYSTEM. THE CONTRACTOR SHALL DISINFECT THE WATER PIPING AND OBTAIN SATISFACTORY PRESSURE TEST AND BACTERIOLOGICAL TEST RESULTS.
6. ALL BURIED DUCTILE IRON WATER AND DRAIN PIPING SHALL BE PROVIDED WITH RESTRAINED JOINTS.
7. BUILDING DOWNSPOUT DRAINS SHALL BE INSTALLED WITH A MIN. SLOPE OF 1%.

PROPOSED PIPING PLAN

SCALE: 1"=10'–0"

TWO INCHES AT FULL SCALE.
IF NOT, SCALE ACCORDINGLY

Gray & Osborne, Inc.
CONSULTING ENGINEERS
2102 CARRIAGE DRIVE SW, BLDG. I
OLYMPIA, WA 98502 • (360) 292-7418

DATE: AUG 2019	DRAWN: CDG	CHECKED: SLG	APPROVED: DJM

PRELIMINARY
NOT FOR
CONSTRUCTION

No.	REVISION	DATE	APPD

DOMINIC J. MILLER — STATE OF WASHINGTON — 19955 — REGISTERED PROFESSIONAL ENGINEER

CITY OF DUPONT
PIERCE COUNTY WASHINGTON

PUBLIC WORKS FACILITY

PROPOSED PIPING PLAN

SHEET: G2-2
OF: 3

JOB NO.: 19233.00
DWG:G2_PIPING_SITE

L:\DUPONT\19233 Public Works Facility\01 Design\Planset\General\G2_PIPING_SITE.dwg, 8/14/2019 8:38 AM, SHARI GAER

CITY OF DuPONT
1700 Civic Drive • DuPont, WA 98327
Phone: (253) 912-5381 • Fax: (253) 964-1455
www.dupontwa.gov

Water Availability Form

Part A
To Be Completed By Applicant

Project Address XXX Center Drive, DuPont, WA 98327 Application Number _____

Subdivision/Project Name DuPont Public Works Facility - South Site Parcel 0119266002

Proposed Water Usage 100 gal/day average ☉ Commercial ☐ Residential # of Units _____

Customer Type (circle one) Rural Residential Residential Multi-family (Commercial) Industrial

I, the undersigned, or my appointed representative have requested the following purveyor to certify willingness and ability to provide the indicated service. I have read and understand the information provided by the water purveyor on this Certificate, and acknowledge that the proposed project may require improvements to the water system which would incur my financial obligation. Prior to final approval for water service, operational responsibility, and financial obligation may be required.

Printed Name Dom Miller, P.E. Signature _____

Address 2102 Carriage Drive SW, Bldg I City Olympia State WA Zip 98502

Part B
To Be Completed by Water Purveyor

Water system to provide service: City of DuPont State ID#: 20500P

The proposed development is / is not within our approved service area (circle one).

This water utility will / will not be providing service (circle one).

Approved number of connections _____ Existing Source Capacity _____

Number of current/existing users _____ Existing Storage _____

Water service will be provided by:

☐ Direct connection to approved, existing water main

☐ Extension of existing water main(s)

☐ New water system in accordance with WAC 246-290

_____ _____ _____
Water Purveyor Signature Printed Name Date

*****NOTE: Completion of page 2 and water purveyor signature are required*****

CITY OF DuPONT
1700 Civic Drive • DuPont, WA 98327
Phone: (253) 912-5381 • Fax: (253) 964-1455
www.dupontwa.gov

FLOW AND PRESSURE FOR FIRE SUPPRESSION DESIGN

Project Name: DuPont Public Works Facility - South Site

Project Location: XXX Center Drive, DuPont, WA 98327

Developer's Engineer: Dom Miller, P.E.

Telephone: 360-292-7481

Date: _____

Minimum Fire Flow per Ordinance No 10-905: _____

Required Fire Flow per I.F.C. 2012: _____

2011 Water System Model (see notes 2, 3 and 4 below):

Street Intersection: _____

Node Number: _____

Static Pressure: _____

Fire Flow: _____

Residual Pressure: _____

Fire Suppression System Design Criteria (see note 5 below):

Street Intersection: _____

Static Pressure: _____

Fire Flow: _____

Residual Pressure: _____

Notes:

1. Actual fire flow will be based on building construction type and building square footage with credits for fire sprinklers.
2. The 2011 Water System Model results are based on the build out condition using the land use indicated in the 2011 Water System Comprehensive Plan.
3. Available fire suppression storage is based on the criteria presented in the 2011 Water System Comprehensive Plan, which is defined as 4,000 gpm for 4 hours, or 960,000 gallons.
4. Pipe velocities are limited to 10 feet/second in pipes used for fire flow runs.
5. The model results have been adjusted per City policy. The policy reduces the model results as follows:
   - Static pressure is reduced by 10 psi
   - Available fire flow is reduced by 10% at a minimum allowable pressure of 20 psi

Cc: Public Works Department, Building Department, Fire Department

SEPA ENVIRONMENTAL CHECKLIST

Purpose of checklist:

Governmental agencies use this checklist to help determine whether the environmental impacts of your proposal are significant. This information is also helpful to determine if available avoidance, minimization or compensatory mitigation measures will address the probable significant impacts or if an environmental impact statement will be prepared to further analyze the proposal.

Instructions for applicants:

This environmental checklist asks you to describe some basic information about your proposal. Please answer each question accurately and carefully, to the best of your knowledge. You may need to consult with an agency specialist or private consultant for some questions. You may use "not applicable" or "does not apply" only when you can explain why it does not apply and not when the answer is unknown. You may also attach or incorporate by reference additional studies reports. Complete and accurate answers to these questions often avoid delays with the SEPA process as well as later in the decision-making process.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

Instructions for Lead Agencies:

Please adjust the format of this template as needed. Additional information may be necessary to evaluate the existing environment, all interrelated aspects of the proposal and an analysis of adverse impacts. The checklist is considered the first but not necessarily the only source of information needed to make an adequate threshold determination. Once a threshold determination is made, the lead agency is responsible for the completeness and accuracy of the checklist and other supporting documents.

Use of checklist for nonproject proposals:

For nonproject proposals (such as ordinances, regulations, plans and programs), complete the applicable parts of sections A and B plus the SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (part D). Please completely answer all questions that apply and note that the words "project," "applicant," and "property or site" should be read as "proposal," "proponent," and "affected geographic area," respectively. The lead agency may exclude (for non-projects) questions in Part B - Environmental Elements –that do not contribute meaningfully to the analysis of the proposal.

A. Background [HELP]

1. Name of proposed project, if applicable:

Public Works Facilities (North and South)

2. Name of applicant:

City of DuPont
1780 Civic Drive
DuPont, WA 98327

3. Address and phone number of applicant and contact person:

Gum Lim
City of DuPont
Public Works Director
1700 Civic Drive
DuPont, WA 98327
(253) 912-5381

4. Date checklist prepared:

August 2019

5. Agency requesting checklist:

City of DuPont

6. Proposed timing or schedule (including phasing, if applicable):

Construction is anticipated to start in the fall of 2020 and will end in the Winter of 2021.

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.

There are no additional plans for expansion upon completion of the Public Works Facilities.

8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

Cultural Resource Study, Traffic Impact Analysis, Noise Study, Geotech Engineering Report, Tree Retention Plan, Soil Samples Report on Lead and Arsenic, Consent Degree between Washington State Department of Ecology and Weyerhauser Company and DuPont Company. A stormwater site plan and a construction Stormwater Polution Prevention Plan will be prepared for the project.

9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.

None.

10. List any government approvals or permits that will be needed for your proposal, if known.

Pierce County Industrial Wastewater Discharge Permit, Pierce County Significant Industrial User Pretreatment Review, Pierce County Commercial Sewer Service Application, NPDES Stormwater Construction Permit, City of DuPont Land Use Application, and the City of DuPont Building Permit.

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)

The Public Works Department Facility-North Site is a proposed 16,000 square foot Public Works Department office building, 2,920 square foot vehicle storage building, and 900 square foot covered gas and diesel fueling station. The proposal includes 30 additional parking stalls, additional paving, and landscaping. The site can be accessed from two existing driveways off Civic Drive.

The Public Works Department Facility-South Site is a proposed 4,560 square foot building that will include a decant facility, vehicle wash station, and brine station for deicing for the City of DuPont Public Works Department. The site plan indicates one access drive off of Civic Drive, a 40 yard dumpster, and no parking spaces.

12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.

The Public Works Facility-North Site project is located at the City of DuPont's Public Safety Building and the City of DuPont's City Hall property. The site address is 1700 to 1780 Civic Drive, DuPont, WA. (0119266004), Section 26 Township 109 Range 01.The Public Works Facility-South Site project is located to the south of said property (0119266002), Section 26 Township 19 Range 01.

B. Environmental Elements [HELP]

1. *Earth* [help]

a. General description of the site:

(circle one): **Flat**, rolling, hilly, steep slopes, mountainous, other _____

b. What is the steepest slope on the site (approximate percent slope)?

The site is predominantly flat. The North Site is located near the crest of an offsite steep slope that descends north to Sequalitchew Creek. The overall slope height is about 30 feet and the slope gradient is 40 percent or greater, which classifies the slope as a Landslide Hazard Area per DMC 25.105.070(2). No work is proposed within 50 feet of a slope exceeding 40 percent.

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils.

The geotechnical report by PanGeo dated April 25, 2019, states: the site and its vicinity are underlain by unconsolidated fill deposits and Vashon recessional outwash gravel. Fill is mapped in the northwest portion of the North Site and is described as clay, silt, sand, gravel, organic matter, shells, rip-rap and debris. The remainder of the project is mapped as Vashon recessional outwash gravel which is described as recessional and proglacial, stratified, pebble to bourlder gravel, locally containing silt and clay. This unit is locally known as Steilacoom Gravel.

d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe.

Yes, the North Site is located near the crest of an offsite steep slope that descends north to Sequalitchew Creek.

e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill.

The proposed project would require earthwork activities, including filling and excavation for foundations, footings, utilities, walls, and pavement. The North site slopes to the southeast, the proposed site grades will require movement of on-site soils to re-contour the site for proposed improvements. The cut and fill would likely be balanced for the site improvements. The south site is relatively flat, the proposed site grades will remain roughly consistent with the existing topographic conditions. The existing soils maybe used for structural fill so very little if any will be need to be imported. 6-12 inches of foundation gravel will be imported for all structures for approximately 600 cubic yards.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

Yes, erosion could occur as a result of construction activities, however, a temporary erosion and sedimentation control plan will be designed and implemented according to the City of DuPont Standards.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

North Site will be about 15% covered with impervious surfaces after project construction. The South Site will be about 60% covered with impervious surfaces after project construction.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

The project will meet or exceed the engineering design standards for erosion control and shall apply Best Management Practices throughout the construction of the project such as silt fencing..

2. Air [help]

a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known.

Air emissions will occur from construction equipment during construction of the facility. Vehicles emissions will occur during operation of each facility. Quantaties are unknown.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

According to the Olympic Regional Clean Air Agency (ORCAA) there are no off site emission sources near the project site.

c. Proposed measures to reduce or control emissions or other impacts to air, if any:

The project should fully implement applicable US Environmental Protection Agency, Washington State Department of Ecology and Puget Sound Clean Air Agency standards and requirements governing air quality with construction and operation of the buildings.

3. Water [help]

a. Surface Water: [help]

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

Yes, Sequalitchew Creek is located to the north of the site and flows to the west to discharge to the Puget Sound.

2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

Yes, work will be conducted within 200 feet of Sequalitchew Creek.

3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

No fill of drege material will be placed in or removed from suface waters.

4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

No surface water withdrawals or diversions are proposed.

5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

This site is not located within a 100-year flood plain.

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

No waste materials will be discharged to surface water under this proposal.

b. Ground Water: [help]

1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known.

No groundwater will be withdrawn or water discharged to groundwater under this proposal.

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals. . . ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.
No waste material will be discharged to the ground. All sanitary sewer effluent will be collected and conveyed via tightline pipe to the existing sanitary sewer system.

c. Water runoff (including stormwater):

1) Describe the source of runoff (including storm water) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.
For the Public Works Facility-South Site, the source of runoff will be rainfall from the building roof top and pavement areas. Stormwater from pavement areas will be collected and conveyed through catch basins and storm pipe for water quality treatment prior to entering the existing stormwater pond to the west. Rainfall from building roof top will be collected and conveyed through storm pipe to a proposed onsite infiltration trench.
For the Public Works Facility-North Site, the source of runoff will be rainfall from the building roof tops and pavement areas. Stormwater from pavement areas and roof tops will be collected and conveyed through catch basisns and storm pipe for water quality treatment prior to entering the existing stomrwater pond to the south.

2) Could waste materials enter ground or surface waters? If so, generally describe.

No waste materials would enter groundwater under this proposal. All sanitary sewer effluent will be collected and conveyed to the existing sanitary sewer system.

3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe.
No.

d. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any:

A storm drainage system will be designed and constructed per City of DuPont Standards to control runoff from the proposed project.

4. Plants [help]

a. Check the types of vegetation found on the site:

_X___deciduous tree: alder, maple, aspen, other
_X__evergreen tree: fir, cedar, pine, other
____shrubs
_X__grass
____pasture
____crop or grain
____ Orchards, vineyards or other permanent crops.
____ wet soil plants: cattail, buttercup, bullrush, skunk cabbage, other
____water plants: water lily, eelgrass, milfoil, other
____other types of vegetation

b. What kind and amount of vegetation will be removed or altered?

Grass and weeds from previous grading, roughly about 10,000 square feet.

c. List threatened and endangered species known to be on or near the site.
None are known to exist to our knowledge.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:
Proposed landscaping will be examined for compliance with DuPont Municipal Code (DMC) 25.70 regarding commercial design, DMC 25.90 regarding landscaping and DMC 25.95 regarding off-street parking with review of the land use application. Tree retention will be examined for compliancne with DMC 25.120 regarding tree retention with review of the land use application.

e. List all noxious weeds and invasive species known to be on or near the site.

None are known to exist on or near the site to our knowledge.

5. Animals [help]

a. List any birds and other animals which have been observed on or near the site or are known to be on or near the site.

Examples include:

birds: hawk, heron, eagle, **songbirds**, other:
mammals: **deer,** bear, elk, beaver, other:
fish: bass, **salmon**, trout, herring, shellfish, other _____

b. List any threatened and endangered species known to be on or near the site.
Washington State Department of Fish and Wildlife Habitats and Species Maps indicate the following endangered animal species located within the proposed site: Big Brown Bat, Yuma Myotis, and the Little Brown Bat.

c. Is the site part of a migration route? If so, explain.
Yes, the site is part of the Pacific Flyway for Migratory Birds.

d. Proposed measures to preserve or enhance wildlife, if any:

Landscaping plan will be designed and implemented per City of DuPont Standards to preserve and enhance wildlife.

e. List any invasive animal species known to be on or near the site.
None are known to exist on or near the site to our knowledge.

6. Energy and Natural Resources [help]

a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.
Electricity and natural gas are available to the site. Electricity will be used for building and site lighting. Natural gas will be used for building heat. Wood, oil and solar will not be used.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.
No.

c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:
The project will comply with all state energy code requirements. No other specific measures are proposed.

7. Environmental Health [help]

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe.

1) Describe any known or possible contamination at the site from present or past uses.
The presence of arsenic and lead are likely from possible air-fall contamination which may have resulted from two sources:
A) The past ore smelting operations in Tacoma as outlined in the Area Wide Soil Task Force Report (AWSTFR) published June 2003 by the Washington State Department of Ecology.The AWSTFR has defined concentrations of total arsenic less than 200mg/kg to be within the low to moderate range for commercial properties such as the subject site. The subject site falls within a potential impact zone on a map of Washington State depticting the potentially affected areas.
B) The the past activities of the DuPont Works operations located northwest of the subject site. Lead contamination has been detected site-wide. Arsenic contamination is generally detectied within 25 feet of the former NGRR track beds but can occur in other discrete areas.

A Soil Sampling Report was prepared by Urban Environmental Partners LLC dated August 1, 2019. Lead and Arsenic results were below the Clean Up Level.

2) Describe existing hazardous chemicals/conditions that might affect project development and design. This includes underground hazardous liquid and gas transmission pipelines located within the project area and in the vicinity.
Other than a minor potential for arsenic from the Asarco plume, none are known to exist on or near the site.

3) Describe any toxic or hazardous chemicals that might be stored, used, or produced during the project's development or construction, or at any time during the operating life of the project.
During construction, chemicals associated with construction equipment would be on the site. Upon project completion, it is not anticipated that hazardous materials would be present.
During the operating life of the project the Public Works Facility-North Site will have petroleum oils, pesticides and fertilizer. The Public Works Facility-South Site will have a brine machine and salt associated with the system.

4) Describe special emergency services that might be required.
Other than normal fire, medical and police services already available in the area, no special services are anticipated.

5) Proposed measures to reduce or control environmental health hazards, if any:
No specific measures are proposed.

b. Noise

1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?
Noise from Center Drive to the east and from surrounding businesses would exist but would not be anticipated to affect the proposed development.

2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.
On a short term basis, noise from construction equipment would be present from approximately 7 am to 6 pm, Monday through Friday. On a long term basis, the majority of the maintenance employees work Monday through Friday from 7:30 am to 4:00 pm, with three employees working Monday through Thursday from 7 am to 5:30 pm. During adverse weather and the need for the brine machine, noise from vehicular traffic to and from the site would be present with possible operating hours of 24 hours/7 days a week.

3) Proposed measures to reduce or control noise impacts, if any:
During the construction phase of the project, construction equipment will be maintained and meet noise ordinance. The use of on-site and perimeter landscaping will help to reduce and control noise created by the proposed development.

8. Land and Shoreline Use [help]

a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe.

The current use of the north property is the City of DuPont Public Safety Building and City Hall. The property to the south is undeveloped. The property to the east is residential. The property to the west is a golf course.

b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use?

To our knowledge, the site has not been used as working forma lands or forest lands and no lands of commercial significance will be converted to other uses.

1) Will the proposal affect or be affected by surrounding working farm or forest land normal business operations, such as oversize equipment access, the application of pesticides, tilling, and harvesting? If so, how:

There are no working farm or forest lands near the site.

c. Describe any structures on the site.

There is the City of DuPont Public Safety Building which houses the Police and Fire Departments. The City of DuPont is also located on the site.

d. Will any structures be demolished? If so, what?

No structures will be demolished.

e. What is the current zoning classification of the site?

Mixed Use District (MXD).

f. What is the current comprehensive plan designation of the site?

It is designated by the Comprehensive Plan as being within the Civic Center.

g. If applicable, what is the current shoreline master program designation of the site?

N/A.

h. Has any part of the site been classified as a critical area by the city or county? If so, specify.

No.

i. Approximately how many people would reside or work in the completed project?

Twenty three fulltime permanent employees could ultimately be employed at the site plus three to four seasonal employees.

j. Approximately how many people would the completed project displace?

No people will be displaced due to the project.

k. Proposed measures to avoid or reduce displacement impacts, if any:

N/A.

L. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

Permitted use in the Mixed Use Zoning Disctrict are stated in DMC 25.35.020 and will be followed as such.

m. Proposed measures to reduce or control impacts to agricultural and forest lands of long-term commercial significance, if any:

N/A.

9. Housing [help]

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low-income housing.

N/A.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

N/A

c. Proposed measures to reduce or control housing impacts, if any:

N/A

10. Aesthetics [help]

a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed?

The tallest height of any building structure will be no taller than 50 feet per DMC 25.35.050(4).

b. What views in the immediate vicinity would be altered or obstructed?

Views from the south and north of the site would be alter but it is not anticipated that any views would be obstructed.

b. Proposed measures to reduce or control aesthetic impacts, if any:

The project will be designed to meet current City of DuPont design standards. The use of architectural detailing on the buildings and the use of on-site and perimeter landscaping will reduce and control aesthetic impacts of the development.

11. Light and Glare [help]

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

Glare from building window glass could be present during daylight hours and light and glare from building and parking lot lighting and vehicular traffic to and from the site could be present in early morning and evening hours.

b. Could light or glare from the finished project be a safety hazard or interfere with views?

It is not anticipated that light or glare created by the proposed project would create safety hazards or interfere with views.

c. What existing off-site sources of light or glare may affect your proposal?

Lot and building lights from the east would be present but not anticipated to affect the proposed development.

d. Proposed measures to reduce or control light and glare impacts, if any:

Building glass will be non-glare and lighting will be directed appropriately. The use of perimeter landscaping and the retention of trees where possible will help to contain any light or glare created to within the site.

12. Recreation [help]

a. What designated and informal recreational opportunities are in the immediate vicinity?

The Home Course Golf Course is located adjacent to the site to the west and the Sequalitchew Creek Trail is located to the north.

b. Would the proposed project displace any existing recreational uses? If so, describe.

The project will not displace any recreational uses.

c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:

No specific measures are proposed.

13. Historic and cultural preservation [help]

a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers ? If so, specifically describe.

The Cultural Report describes the identification of one recorded historic archaeological site determined not eligible for listing on historic registers overlapping the southern portion of the project, and two locations where archaeological material was collected during previous archaeological monitoring in the immediate vicinity of the northern portion of the project. No site numbers were assigned to these latter two locations. Field investigations, inclusive of archaeological sites within the project location. No further cultural resources investigations are recommended.

b. Are there any landmarks, features, or other evidence of Indian or historic use or occupation? This may include human burials or old cemeteries. Are there any material evidence, artifacts, or areas of cultural importance on or near the site? Please list any professional studies conducted at the site to identify such resources.

Nearly 20 sites are recorded within approximately .25 mile of the project location. These include both historic and precontact archaeological sites. A Cultural Resources Assessment was performed by Cultural Resource consultants dated May 1, 2019.

c. Describe the methods used to assess the potential impacts to cultural and historic resources on or near the project site. Examples include consultation with tribes and the department of archeology and historic preservation, archaeological surveys, historic maps, GIS data, etc.

Pursuant to a 1989 Memorandum of Agreement between Weyerhaeuser Real Estate Company, City of DuPont and the Washington State Historic Preservation Office, an archaeological consultant shall oversee all clearing and grading activity and provide a closing report to the City.

d. Proposed measures to avoid, minimize, or compensate for loss, changes to, and disturbance to resources. Please include plans for the above and any permits that may be required.

14. Transportation [help]

a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any.

Access to the sites will be via Civic Drive from Center Drive.

b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop?

No. The nearest transit stop is located at DuPont Station.

c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate?

The Public Works Facility-North Site proposes 30 parking spaces. The Public Works Facility-South Site proposes no parking spaces. The proposal would not eliminate any parking spaces.

d. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private).

No.

e. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

No.

f. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates?

A Trip Generation Summary was performed by Geralyn Reinart, P.E. dated July 2019. Approximately 109 total daily trips are expected to be generated on a typical weekday with 22 trips during the AM peak hour and 16 trips during the PM peak hour. Please refer to the Traffic Impact Analysis for additional information.

g. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe.

There are no working farms or forest lands near the site.

h. Proposed measures to reduce or control transportation impacts, if any:

None are planned at this time.

15. Public Services [help]

a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe.

Yes, the proposed development will increase the need for public services. Emergency services to businesses and offices will be provided by DuPont Fire and Police departments. The development should not increase the need for health care and school services.

b. Proposed measures to reduce or control direct impacts on public services, if any.

Payment of City of DuPont fire impact fees, stormwater system development charges, and construction of new fire hydrants are measures that will reduce and control impacts to public services.

16. Utilities [help]

a. Circle utilities currently available at the site:
electricity, natural gas, water, refuse service, telephone, sanitary sewer, septic system, other _____

c. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

Electricity	**Puget Sound Engergy**
Natural Gas	**Puget Sound Energy**
Water	**City of DuPont**
Sanitary Sewer	**Pierce County Public Works and Utilities**
Telephone	**CenturyLink**
Cable	**Comcast**
Refuse Service	**LeMay, Inc**

C. Signature [HELP]

The above answers are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: _____

Name of signee _____

Position and Agency/Organization _____

Date Submitted: _____

D. Supplemental sheet for nonproject actions [HELP]

(**IT IS NOT NECESSARY** to use this sheet for project actions)

Because these questions are very general, it may be helpful to read them in conjunction with the list of the elements of the environment.

When answering these questions, be aware of the extent the proposal, or the types of activities likely to result from the proposal, would affect the item at a greater intensity or at a faster rate than if the proposal were not implemented. Respond briefly and in general terms.

1. How would the proposal be likely to increase discharge to water; emissions to air; production, storage, or release of toxic or hazardous substances; or production of noise?

Proposed measures to avoid or reduce such increases are:

2. How would the proposal be likely to affect plants, animals, fish, or marine life?

Proposed measures to protect or conserve plants, animals, fish, or marine life are:

3. How would the proposal be likely to deplete energy or natural resources?

Proposed measures to protect or conserve energy and natural resources are:

4. How would the proposal be likely to use or affect environmentally sensitive areas or areas designated (or eligible or under study) for governmental protection; such as parks, wilderness, wild and scenic rivers, threatened or endangered species habitat, historic or cultural sites, wetlands, floodplains, or prime farmlands?

Proposed measures to protect such resources or to avoid or reduce impacts are:

5. How would the proposal be likely to affect land and shoreline use, including whether it would allow or encourage land or shoreline uses incompatible with existing plans?

Proposed measures to avoid or reduce shoreline and land use impacts are:

6. How would the proposal be likely to increase demands on transportation or public services and utilities?

Proposed measures to reduce or respond to such demand(s) are:

7. Identify, if possible, whether the proposal may conflict with local, state, or federal laws or requirements for the protection of the environment.

City of DuPont
Planning Division
Land Use Application

1700 Civic Drive
DuPont, WA 98327
www.dupontwa.gov

Phone: (253) 912-5393
Fax: (253) 964-1455

City File Number: _____

All information listed in this application, or by applicable ordinance, must be submitted in order for a land use application to be determined complete. Only a complete land use application will be processed for conformance with adopted policies and requirements.

General Information:

Project name: DuPont Public Works Facility - South Site

Applicant name: City of DuPont

Address: XXX Civic Drive, DuPont, WA 98327

Phone number: 253-912-5211 Fax number: 253-964-3554

Applicant's representative: Dom Miller, P.E. - Gray & Osborne Engineering

Address: 2102 Carriage Drive SW, Bldg I, Olympia, WA

Phone number: 360-292-7481 Fax number: 360-292-7517

Description of proposal. Be specific.

The project is for the City of DuPont Public Works Facility, which will be located just south of the existing Public Safety Building. The proposed facility will include a decant facility, vehicle wash, and a brine station for deicing.

Site Information:

Assessor's Parcel Number(s): #0119266002

Area of site in square feet: 194,278 SF

Area of streets and alleys: Civic Drive

Area of storm drainage improvements and conveyance lines: 160 linear feet

Area of open space and neighborhood green tracts: 0 SF

Area of critical areas and buffers: N/A

Area of building floors: 4,560 SF

Area of impervious surfaces: 16,715 SF

Area of landscaping: 5' Moderate Landscape Buffer

Building height: 1-story 25 feet

Number of dwelling units: N/A

Number of employees: 0

Number of disabled, compact and standard parking stalls: 0

Description and area of all proposed tracts: N/A

Required Plans, Information and Fee:

(Quantity and minimum scale of each item or drawing is indicated in parenthesis. Plans shall be no larger than 24 by 36 inch sheet size)

1. [x] Vicinity Map (include as part of site plan).
2. [x] Site Plan drawn at 1 inch = 20 feet extending 100 feet beyond the property lines (eight copies).
3. [x] Landscape Plans identifying: location, size and species of all landmark, historic and specimen trees; trees to be retained, specific tree protection measures drawn at 1 inch = 20 feet (seven copies).
4. [x] Grading Plan with estimated dimensions and quantities of work involved drawn at 1 inch = 20 feet horizontal with 2' contour intervals (seven copies).
5. [x] Storm Drainage and Utility Plan drawn at 1 inch = 20 feet (seven copies).
6. [x] Preliminary Stormwater Management Report and calculations (three copies).
7. [ ] Roadway cross sections, (seven copies of single line drawing with dimensions).
8. [ ] One each 8 by 11 inch reduction of all drawings.
9. [ ] Average daily trips generated by the proposal based on the International Transportation Engineers Trip Generation Manual (two copies).
10. [x] Building Elevations drawn at ¼ inch = 1 foot or larger. Identify building materials and colors (eight copies).
11. [x] Title report of subject lot that is less than 30 days old to identify all encumbrances (two copies).
12. [ ] Draft of proposed covenants, conditions and restrictions related to the maintenance of open space or commonly owned improvements, if applicable (two copies).
13. [x] Letter of Sewer Availability from Pierce County (two copies).
14. [x] Letter of Water Availability from City of DuPont (two copies).
15. [ ] One site drawing showing the refuse enclosure(s) that is approved via signature and date by LeMay, Inc. Contact person is Charlie Maxwell, Public Relations Director, 253-537-8687.
16. [x] Completed Environmental Checklist (two copies).
17. [x] Completed Land Use Application (one copy).
18. [ ] Completed Agent Affidavit (one copy).
19. [ ] Filing fee(s).

Note:

Fill out and return this application with all material listed in the Required Plans, Information and Fee section. Submittal of all required plans, information and fees constitutes a complete application. You will be contacted by the City within 28 days of formal application submittal regarding whether the application is complete. Site work may not start until all necessary permits have been obtained. Paper or electronic drawings of the proposal may be requested for presentation purposes.

(Applicant Signature) 8/14/19 (Date)

Dom Miller, P.E.
(Print name)

Gray & Osborne, Inc.
CONSULTING ENGINEERS

August 14, 2019

Mr. Jeffery S. Wilson
Department of Community Development
City of DuPont
1700 Civic Drive
DuPont, Washington 98327

SUBJECT: LAND USE APPLICATION, PUBLIC WORKS FACILITY – SOUTH SITE
CITY OF DUPONT, PIERCE COUNTY, WASHINGTON
G&O #19233

Dear Mr. Wilson:

Please find enclosed the following materials submitted for the Land Use Application for the City of DuPont's Public Works Facility – South Site Tax Parcel No. 0119266002:

1. **Vicinity Map (include as part of site plan).**

   See Attached Vicinity Map Figure.

2. **Site Plan drawn at 1 inch = 20 feet extending 100 feet beyond the property lines (eight copies).**

   See attached drawing G2-1.

3. **Landscape Plans identifying: location, size and species of all landmark, historic and specimen trees; trees to be retained, specific tree protection measures drawn at 1 inch = 20 feet (seven copies).**

   Attached is landscaping plan L2-1. There are no existing trees on the south site.

4. **Grading Plan with estimated dimensions and quantities of work involved drawn at 1 inch = 20 feet horizontal with 2' contour intervals (seven copies).**

   See attached drawing G2-3.

2102 Carriage Drive SW, Building I Olympia, Washington 98502 (360) 292-7481 Fax (360) 292-7517

5. **Storm Drainage and Utility Plan (seven copies).**

   See attached drawing G2-2.

6. **Preliminary Stormwater Management Report and calculations (three copies).**

   See attached Stormwater Design Analysis Memo, August 12, 2019.

7. **Roadway cross sections, (seven copies of single line drawing with dimensions).**

   N/A

8. **One each 8 by 11 inch reduction of all drawings.**

   Not provided at this time.

9. **Average daily trips generated by the proposal based on the International Transportation Engineers Trip Generation Manual (two copies).**

   N/A

10. **Building Elevations drawn at ¼ inch = 1 foot or larger. Identify building materials and colors (eight copies).**

    See attached drawings S4-6 and S4-7.

11. **Title report of subject lot that is less than 30 days old to identify all encumbrances (two copies).**

    See attached Title Report dated May 10, 2019.

12. **Draft of proposed covenants, conditions and restrictions related to the maintenance of open space or commonly owned improvements, if applicable (two copies).**

    N/A

13. **Letter of Sewer Availability from Pierce County (two copies).**

    A Letter of Sewer Availability will be requested from Pierce County.

14. **Letter of Water Availability from City of DuPont (two copies).**

    See attached.

15. **One site drawing showing the refuse enclosure(s) that is approved via signature and date by LeMay, Inc., Contact person is Charlie Maxwell, Public Relations Director, (253) 537-8687.**

    No refuse enclosure will be provided for this site.

16. **Completed Environmental Checklist (two copies).**

    See attached.

17. **Completed Land Use Application (one copy).**

    See attached.

18. **Completed Agent Affidavit (one copy).**

    N/A

19. **Filing fee(s).**

    Filing fee will be provided at a later date by the Public Works Department.

Also provided is copy of the following materials:

Geotechnical Report

Geotechnical Report Proposed Public Works Facility, PanGEO, Inc., April 25, 2019.

Lead and Arsenic Report

Soil Sampling Report for DuPont Public Works Facility, Urban Environmental Partners, LLC, August 1, 2019.

Please contact the undersigned if you have any questions on this submittal review.

Sincerely,

GRAY & OSBORNE, INC.

Dominic J. Miller, P.E.

DJM/sp
Encl.