SEPA[1] 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.

[1] https://ecology.wa.gov/Regulations-Permits/SEPA/Environmental-review/SEPA-guidance/Checklist-guidance

A. Background

Find help answering background questions[2]

1. **Name of proposed project, if applicable:**

   Manzanita Substation

2. **Name of applicant:**

   Mason County Public Utility District #1

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

   Kristin Masteller

   (360) 877-5249

   21971 N. Highway 101

   Shelton, WA 98584

4. **Date checklist prepared:**

   December 8, 2023

5. **Agency requesting checklist:**

   Mason County Community Development

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

   Site grading and substation construction estimated for March 2024. Estimated completion November 2024.

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

   None.

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

   No critical areas, such as wetlands, streams, surface waters, or critical slopes are located on or in the immediate vicinity of the site. A construction SWPPP is being prepared for the proposed construction.

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.**

    Land Modification permit and Commercial Plan Review through Mason County, and a Stormwater Construction Permit from Washington State Department of Ecology.

[2] https://ecology.wa.gov/Regulations-Permits/SEPA/Environmental-review/SEPA-guidance/SEPA-checklist-guidance/SEPA-Checklist-Section-A-Background

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.)

Mason County PUD No. 1 plans to build a new 115 kV substation on a portion of their property (approximately 2.3 acres) located at the corner of Manzanita Rd and E McReavy Rd. The substation will connect to the existing infrastructure. Substation construction will include widening the access driveway off E McReavy Rd, constructing a concrete pad foundation for the transformer equipment, and installation of perimeter fencing. During construction, a stormwater pond will be installed next to the substation to provide runoff water storage. The property was cleared of existing vegetation during previous project development.

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.

Parcel #: 32105-31-00000

Address: 1681 E McReavy Rd, Union, WA 98592

Legal Description: NW SW ELY of R/W

Twp/Range/Section and/or GPS location: E1/2, SW1/4 of Section 5, Township 22N, Range 3W

B.Environmental Elements

1. Earth

Find help answering earth questions[3]

a. General description of the site:

Circle or highlight one: Flat, rolling, hilly, steep slopes, mountainous, other:

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

[3] https://ecology.wa.gov/regulations-permits/sepa/environmental-review/sepa-guidance/sepa-checklist-guidance/sepa-checklist-section-b-environmental-elements/environmental-elements-earth

Following construction, the steepest slope on site will be a 50% slope within the stormwater pond. The steepest slope separate from the stormwater pond is approximately 0-3.5% on the western side of the property. The surrounding topography gently slopes downward toward the north, east, and west, with about 10 feet of vertical relief from high to low points.

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.

A geological assessment was performed on the site June 7, 2022. The findings identified glacial soil depositing in the area. The soil is identified as a compact mixture of sand, silt, clay, gravel, and boulders.

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

There are no indications or any known history of unstable soils.

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

Construction of the substation, stormwater pond, and access road will result in 2.3 acres of total disturbance, which includes 2,450 cubic yards of excavation, 2,985 cubic yards of fill, and 450 cubic yards of imported gravel. Fill includes 1,300 cubic yards of well-graded base material and 100 cubic yards of reused excavated material for the substation, 1,185 cubic yards of gravel borrow/local pit source fill for the stormwater pond and 400 cubic yards of base material for the access road. Sources of imported fill material will be determined when a contractor is awarded the project.

e. Could erosion occur because of clearing, construction, or use? If so, generally describe.

Appropriate erosion and sedimentation control plans and BMPs will be implemented to decrease the risk of any erosion.

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

After completion of the substation and stormwater pond, potentially 4% of the site may be impervious (foundations, pond) and nearly 54% will be gravel surface rock.

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

During all phases of construction, appropriate stormwater best management practices, including erosion and sediment controls, will be implemented as outlined in a SWPPP to be prepared for the project. The SWPPP will be prepared in accordance with the Washington Department of Ecology Construction Stormwater General Permit. Silt fence or an alternative sediment control practice will be installed downgradient of all project

disturbance areas until construction is complete and final stabilization established. The implementation of erosion controls, such as temporary stabilization of exposed areas during construction and final stabilization following construction, will be performed as required by the Construction Stormwater General Permit. The site has been previously disturbed and has been provided seeding and mulching for temporary stabilization and straw wattles for sediment control. This current condition will be maintained until construction commences.

2. Air

Find help answering air questions[4]

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.

During construction, emissions common with the use of construction equipment are expected. These emissions include vehicle exhaust and fugitive dust.

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

No known off-site sources of emission or odor.

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

Construction machinery and equipment will be equipped with standard equipment to reduce air impacts. All equipment and machinery with all phases of work to be in good, working order and meet all applicable state and federal emissions criteria. Work will be performed to minimize potential dust disturbance. Appropriate BMPs will be implemented and followed during clearing and phased construction.

3. Water

Find help answering water questions[5]

a. Surface:

Find help answering surface water questions[6]

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.

[4] https://ecology.wa.gov/Regulations-Permits/SEPA/Environmental-review/SEPA-guidance/SEPA-checklist-guidance/SEPA-Checklist-Section-B-Environmental-elements/Environmental-elements-Air
[5] https://ecology.wa.gov/Regulations-Permits/SEPA/Environmental-review/SEPA-guidance/SEPA-checklist-guidance/SEPA-Checklist-Section-B-Environmental-elements/Environmental-elements-3-Water
[6] https://ecology.wa.gov/Regulations-Permits/SEPA/Environmental-review/SEPA-guidance/SEPA-checklist-guidance/SEPA-Checklist-Section-B-Environmental-elements/Environmental-elements-3-Water/Environmental-elements-Surface-water

The nearest stream is unnamed according to MC GIS and is located approximately 1,300 ft. away, in the NE direction, from the site property boundary. The site is located within the Hood Canal Watershed (HUC 8 17110018) according to the Department of Ecology Water Quality Atlas. The Hood Canal receives drainage from the unnamed stream and is located 4,500 ft. northeast of the site property boundary. On-site topography currently conveys surface flow in a general northwestern direction, away from the stream.

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.**

   No surface water features have been identified within 200 feet of the project site.

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 and dredge material to be placed or removed in or from surface waters or wetlands.

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

   Not applicable, 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.**

   The proposal is outside of the 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.**

   Discharges of waste materials to surface waters will not occur as part of this project or following construction. Discharges will consist of stormwater only during and after construction. Following construction, stormwater will flow to the northwest following discharge from the site.

b. Ground:

Find help answering ground water questions[7]

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 a general description, purpose, and approximate quantities if known.**

   No groundwater to be withdrawn with this proposal. Site served by public water.

[7] https://ecology.wa.gov/Regulations-Permits/SEPA/Environmental-review/SEPA-guidance/SEPA-checklist-guidance/SEPA-Checklist-Section-B-Environmental-elements/Environmental-elements-3-Water/Environmental-elements-Groundwater

2. **Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (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 discharge or presence associated with this proposal.

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.**

   Potential runoff would include only stormwater. A stormwater pond will be constructed adjacent to the substation as part of this project to manage the post-construction stormwater runoff from the substation. The site is located within the Hood Canal Watershed (HUC 8 17110018) according to the Department of Ecology Water Quality Atlas. The Hood Canal is located approximately 4,500 ft. northeast and eventually reach an unnamed tributary drainage that flows into the Hood Canal.

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

   The discharge of waste materials to ground or surface waters is not anticipated as part of this project. Any waste materials generated during construction of the substation or pond will be containerized, sheltered from stormwater runoff and wind, and disposed of in accordance with applicable rules and regulations.

3. **Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe.**

   Changes to drainage patterns will occur on-site, but alteration of drainage patterns in the vicinity of the site is not anticipated. The site has been previously cleared of timber and reseeded. The construction of the substation will include a stormwater pond to manage the post-construction stormwater runoff from the substation.

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

The complete site includes stormwater facilities to manage surface runoff. Open areas will be re-vegetated to be compatible with substation.

4. Plants

Find help answering plants questions

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

☐ **deciduous tree: alder, maple, aspen, other**

☒ **evergreen tree: fir, cedar, pine, other**

☐ **shrubs**

☒ **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?

Existing grass and ground cover will be removed during grading, totaling 2.3 acres.

c. List threatened and endangered species known to be on or near the site.

No threatened and endangered species known to be on or near the site.

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any.

Existing vegetation will be preserved to the fullest extent possible. Southern site boundary will be re-vegetated to provide a buffer between project site and existing homes. Areas outside not covered with surface rock will be re-seeded with grass.

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

No known at this time.

5. Animals

Find help answering animal questions[8]

a. List any birds and other animals that 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:** None

b. List any threatened and endangered species known to be on or near the site.

No threatened or endangered species are known to be on or near the sites.

c. Is the site part of a migration route? If so, explain.

No indication of the site being a migration route.

[8] https://ecology.wa.gov/Regulations-Permits/SEPA/Environmental-review/SEPA-guidance/SEPA-checklist-guidance/SEPA-Checklist-Section-B-Environmental-elements/Environmental-elements-5-Animals

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

The site is a disturbed lot developed as a residential property. The proposed facilities will be unmanned, limiting human-wildlife interaction. Portions of the site are planned to be re-vegetated to provide a buffer between project site and existing homes. However, much of the site will need to stay cleared for substation equipment and utility activities/storage.

e. List any invasive animal species known to be on or near the site.

None yet known.

6. Energy and natural resources

Find help answering energy and natural resource questions[9]

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.

Construction equipment will use diesel fuel for construction operations. The operation of the substation will consume energy in the form of electricity.

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

No, height of substation structures will not exceed 70 feet.

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.

No energy conservation features are proposed. However, MCPUD1 incorporates conservation of energy usage through its long range plan.

7. Environmental health

Health Find help with answering environmental health questions[10]

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

1. Describe any known or possible contamination at the site from present or past uses.

No known sources of possible contamination.

[9] https://ecology.wa.gov/Regulations-Permits/SEPA/Environmental-review/SEPA-guidance/SEPA-checklist-guidance/SEPA-Checklist-Section-B-Environmental-elements/Environmental-elements-6-Energy-natural-resou
[10] https://ecology.wa.gov/Regulations-Permits/SEPA/Environmental-review/SEPA-guidance/SEPA-checklist-guidance/SEPA-Checklist-Section-B-Environmental-elements/Environmental-elements-7-Environmental-health

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.**

   No known at this time. Underground utilities will be located prior to any earthwork or digging.

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.**

   After construction of the substation, operating equipment containing oil will be present. An oil contamination system will likely be designed and constructed in accordance with 40 CFR 112. The type of oil being used includes mineral oil which will be contained within the power transformer.

4. **Describe special emergency services that might be required.**

   In the event of an accident during construction, fire and medical responders may be required.

5. **Proposed measures to reduce or control environmental health hazards, if any.**

   Scheduled safety meetings prior to the start of any work.

b. Noise

1. **What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?**

   No existing noise in the area may affect the proposed project at any of the proposed phases.

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)?**

   Construction equipment noise (trucks, cranes, boring rigs) will be present for the duration of construction. At full build out, maximum noise levels at the site will come from the power transformer and is anticipated to be up to 74 decibels at approximately 10 feet from transformer at times of peak load.

3. **Proposed measures to reduce or control noise impacts, if any:**

   Construction work will be scheduled during day hours, 7 am – 8 pm, to avoid potential disturbance.

8. Land and shoreline use

Find help answering land and shoreline use questions[11]

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 land use of the site is residential. The proposed activities are a permitted use within this zone (County Code 17.04.222) and will not affect nearby or adjacent properties.

b. Has the project site been used as working farmlands or working forest lands? If so, describe.

No, parcel is zoned Rural Residential with a single-family home built in 1978.

How much agricultural or forest land of long-term commercial significance will be converted to other uses because of the proposal, if any?

None.

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?

None. No portion of the proposed project are located on resource lands.

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?**

   No, surrounding land is residential.

c. Describe any structures on the site.

The site contains one residential home of standard wood frame construction. The house is 2,000 square feet in size. Also, the site contains a transmission line supported on wood power poles and cross-arms operated by MCPUD1.

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

No.

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

Rural Residential 5 (RR5)

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

Rural area

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

Not applicable

[11] https://ecology.wa.gov/Regulations-Permits/SEPA/Environmental-review/SEPA-guidance/SEPA-checklist-guidance/SEPA-Checklist-Section-B-Environmental-elements/Environmental-elements-8-Land-shoreline-use

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?

None, facilities are un-manned.

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

None.

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.

Project planning, design, and construction to be completed in conformance with federal, state, and local requirements.

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

None nearby.

9. Housing

Find help answering housing questions[12]

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

None.

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

None.

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

None.

10. Aesthetics

Find help answering aesthetics questions[13]

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

Structures are anticipated to not exceed 70 feet in height.

[12] https://ecology.wa.gov/Regulations-Permits/SEPA/Environmental-review/SEPA-guidance/SEPA-checklist-guidance/SEPA-Checklist-Section-B-Environmental-elements/Environmental-elements-9-Housing
[13] https://ecology.wa.gov/Regulations-Permits/SEPA/Environmental-review/SEPA-guidance/SEPA-checklist-guidance/SEPA-Checklist-Section-B-Environmental-elements/Environmental-elements-10-Aesthetics

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

No views of the Hood Canal will be altered or obstructed with this proposal.

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

Maintain a vegetated buffer between property boundaries.

11. Light and glare

Find help answering light and glare questions[14]

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

There will be 8-12 floodlights shining into the substation after construction is complete. The lights will be on when someone is present at the substation.

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

No.

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

None.

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

None.

12. Recreation

Find help answering recreation questions

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

Golf at the Alderbrook Resort.

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

No.

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

No proposed measures. Proposed project, at all phases, will have no negative impact on recreation opportunities. Substation will allow for county growth and recreation expansion.

[14] https://ecology.wa.gov/Regulations-Permits/SEPA/Environmental-review/SEPA-guidance/SEPA-checklist-guidance/SEPA-Checklist-Section-B-Environmental-elements/Environmental-elements-11-Light-glare

13. Historic and cultural preservation

Find help answering historic and cultural preservation questions[15]

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.

No known cultural resources, including archaeological sites, historical/architectural resources, or isolated finds, were identified in or near the proposed Project area. The closest known cultural resource site is located 0.88 miles to the northwest. No National Register of Historic Places (NRHP)-listed properties, National Historic Landmarks, National Historic Trails, or Traditional Cultural Properties were identified in, or in the vicinity of, the proposed Project area. The General Land Office review did not identify any historic resources in or near the proposed Project area. The building (house) located on-site was built in 1978 (45 years old).

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.

There are no known landmarks, features, or other evidence of Indian or historic-period use or occupation in or near the proposed Project area. No professional studies have been completed.

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.

A literature and records search for previously completed cultural resources inventories and previously recorded cultural resources sites located in or near the Project area was conducted on October 23, 2023, by a POWER Engineers, Inc. archaeologist, through the Department of Archaeology and Historic Preservation (DAHP)'s Washington Information System for Architectural and Archaeological Records Data (WISAARD). WISAARD's predictive model was also reviewed. In addition, several maps (including the Mason County Historic Preservation Map and General Land Office plat maps) and databases were consulted, including publicly available online databases for the NRHP, the National Historic Landmarks, and the National Historic Trails.

A cultural resources investigation, which included pedestrian survey and the excavation of 22 shovel test pits (STPs), was completed for the proposed Project area on September 9, 2022, by Applied Archaeological Research Inc. (AAR) (cultural resources report on file at the Mason County PUD No. 1). No cultural resources sites or isolated occurrences were encountered during the field investigation completed for the proposed Project.

[15] https://ecology.wa.gov/Regulations-Permits/SEPA/Environmental-review/SEPA-guidance/SEPA-checklist-guidance/SEPA-Checklist-Section-B-Environmental-elements/Environmental-elements-13-Historic-cultural-p

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.

Based on the predictive model developed by the DAHP, the proposed Project area encompasses locations that range from moderate risk (surveys recommended) to high risk (surveys highly advised) for the presence archaeological deposits. The DAHP predictive model does not, however, account for localized conditions, such as prior ground disturbance. Review of aerial photographs indicates that the proposed Project area has been subject to prior disturbance, reducing but not precluding the likelihood of encountering intact archaeological deposits. No artifacts were found within the 22 STPs excavated for the proposed Project.

An unanticipated discovery plan will be in place to establish protocol if cultural deposits are encountered during construction.

14. Transportation

Find help with answering transportation questions[16]

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.

The site is bordered by E. Manzanita Drive to the north of the City of Tacoma green space and E. McReavy Road to the west.

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?

The area is not served directly by public transit. Nearest route is Bus Route 2 running along Highway 106 with the nearest bus station approximately 1.88 miles north in Union, WA on Highway 106.

c. 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 impacts to roads with any phase of this proposal.

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

No use of water, rail, or air. Equipment, machinery, and supplies will be transported via trucks.

e. 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?

[16] https://ecology.wa.gov/Regulations-Permits/SEPA/Environmental-review/SEPA-guidance/SEPA-checklist-guidance/SEPA-Checklist-Section-B-Environmental-elements/Environmental-elements-14-Transportation

No phase of the proposal will impact traffic. During construction, there will be vehicle trips to the site for personnel and equipment. Post construction, the site will be unmanned but there will be periodic trips for maintenance.

f. **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.**

No interference with traffic, site will be unmanned.

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

N/A.

15. Public services

Find help answering public service questions[17]

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.**

Potential for fire protection in the event of an accident or police protection in the event of trespassing or vandalism.

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

Planning and design considered safety and security. Isolating the substation with vegetated buffer will visually, fully or partially, remove the completed site from public view. Security measures will be installed to deter trespassing or vandalism.

16. Utilities

Find help answering utilities questions[18]

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

b. **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.**

No utilities required for this site proposal, no new utility construction activities are required.

C.Signature

Find help about who should sign[19]

[17] https://ecology.wa.gov/regulations-permits/sepa/environmental-review/sepa-guidance/sepa-checklist-guidance/sepa-checklist-section-b-environmental-elements/environmental-elements-15-public-services
[18] https://ecology.wa.gov/regulations-permits/sepa/environmental-review/sepa-guidance/sepa-checklist-guidance/sepa-checklist-section-b-environmental-elements/environmental-elements-16-utilities
[19] https://ecology.wa.gov/Regulations-Permits/SEPA/Environmental-review/SEPA-guidance/SEPA-checklist-guidance/SEPA-Checklist-Section-C-Signature

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.

X 

Type name of signee: Kristin Masteller

Position and agency/organization: General Manager, Mason County PUD No. 1

Date submitted:**12/08/2023**

D.Supplemental sheet for nonproject actions

Find help for the nonproject actions worksheet[20]

Do not use this section for project actions.

[20] https://ecology.wa.gov/regulations-permits/sepa/environmental-review/sepa-guidance/sepa-checklist-guidance/sepa-checklist-section-d-non-project-actions

CULTURAL RESOURCES REPORT COVER SHEET

DAHP Project Number: **2022-08-05283** (Please contact the lead agency for the project number. If associated to SEPA, please contact SEPA@dahp.wa.gov to obtain the project number before creating a new project.)

Author: Emily C. Taber and Bill R. Roulette

Title of Report: Results of a Cultural Resources Study for the Manzanita Substation Project, Mason County, Washington
Applied Archaeological Research, Inc. Report No. 2622

Date of Report: September 9, 2022

County(ies): Mason Section: 5 Township: 19N Range: 3W

Quad: 1990 Union, WA Acres: ca. 5.8

PDF of report submitted (REQUIRED) ☒ Yes

Historic Property Inventory Forms to be Approved Online? ☐Yes ☒No

Archaeological Site(s)/Isolate(s) Found or Amended? ☐Yes ☒No

TCP(s) found? ☐ Yes ☒ No

Replace a draft? ☐ Yes ☒ No

Satisfy a DAHP Archaeological Excavation Permit requirement? ☐ Yes # ☒ No

Were Human Remains Found? ☐ Yes DAHP Case # ☒ No

DAHP Archaeological Site #:

_____
_____
_____
_____
_____

- Submission of PDFs is required.
- Please be sure that any PDF submitted to DAHP has its cover sheet, figures, graphics, appendices, attachments, correspondence, etc., compiled into one single PDF file.
- Please check that the PDF displays correctly when opened.

RESULTS OF A CULTURAL RESOURCES STUDY FOR THE MANZANITA SUBSTATION PROJECT, MASON COUNTY, WASHINGTON

By

Emily C. Taber, M.S., RPA,
and
Bill R. Roulette, M.A., RPA

Prepared for

Mason County Public Utility District No. 1

September 9, 2022

APPLIED ARCHAEOLOGICAL RESEARCH, INC. REPORT NO. 2622

APPLIED
ARCHAEOLOGICAL
RESEARCH, INC.
Cultural Resource Management and Historic Preservation

4001 NE Halsey Street, Suite 3
Portland, OR 97232
Phone (503) 281-9451

INTRODUCTION

Mason County Public Utility District (PUD) No. 1 plans to construct the Manzanita substation south of the community of Union. The PUD is self-sponsoring the design phase of the project. It will seek capitol or federal funds for future phases of the project. Depending upon the funding source, future phases will need to comply with either Governor's Executive Order (EO) 21-02 or Section 106 of the National Historic Preservation Act of 1966, as amended, and its implementing regulations, 36 CFR 800. In either case, the funding agency has the responsibility to ensure that the project has no adverse effect on historic properties. To assist the funding agency with its compliance with this Mason County PUD No.1, retained Applied Archaeological Research, Inc. (AAR) to conduct a cultural resource study of the area of potential effects (APE) related to the project. AAR personnel for the project included Emily C. Taber, M.S., RPA, who conducted a record and literature search and conducted the field investigations assisted by Jake Lovell, B.S., and Bill R. Roulette, M.A., RPA, who served as the Principal Investigator. Both Ms. Taber and Mr. Roulette contributed to the report.

Conventions

Measurements used in this report to express common distances, elevations, and areas are in United States customary units. Measurements related to archaeological techniques are in metric units. Numbers in the thousands used to express ages and distances feature commas to denote thousands. Calendar dates and dates used to express years before present (B.P.) do not use commas to denote the thousands place but do use commas to denote ages of 10,000 B.P. and greater. Modern, common names without taxonomic equivalents are used when listing plants and animals.

Description of the APE and the Proposed Project

The APE is in the southwest quarter of Section 5, in Township 21 North, Range 3 West, Willamette Meridian (Figure 1). It is composed of parcel 321053100000. It is 5.8 acres in size. It is in the shape of an irregular trapezoid and maximally 1,005 feet (ft) long measured east-to-west and 275 ft wide measured north-to-south (Figure 2).

The APE is east of Annas Bay, part of Hood Canal, and south of the community of Union. The Skokomish Indian Reservation is about 1.2 miles to the west and the southern shore of Hood Canal is 1.5 miles to the north. The Pierce County Line is 13.45 miles to the east. Its northwestern corner abuts the T-junction of East Manzanita Drive and East McReavy Road, which borders its western side. It is in a low-lying area at an elevation of about 540 to 550 ft above mean sea level. The ground surface generally slopes to the north towards Hood Canal.

Its western part contains a house and outbuilding that will be removed. The home is accessed via a paved driveway that extends eastward from East McReavy Road. An electrical transmission line extends through its northern edge. The western part of the APE contains a mix of grassy lawn areas with landscape plantings that are around the house and outbuilding (Figure 3) and forest (Figure 4). Its northern edge, under the transmission line right-of-way (Figure 5), and eastern part are largely clear of vegetation and contained grasses and Scotch broom (Figure 6). The eastern part contains numerous burn piles, some of which have been flattened, and in general has a disturbed appearance (Figure 6).

Mason County PUD proposes to construct a substation in the APE. The substation would include a warehouse, a booster station, a stormwater retention facility, two reservoirs, a grounding well, and a regulator bank. The substation would be accessed via graveled roads and would be surrounded by a security fence with a gate.

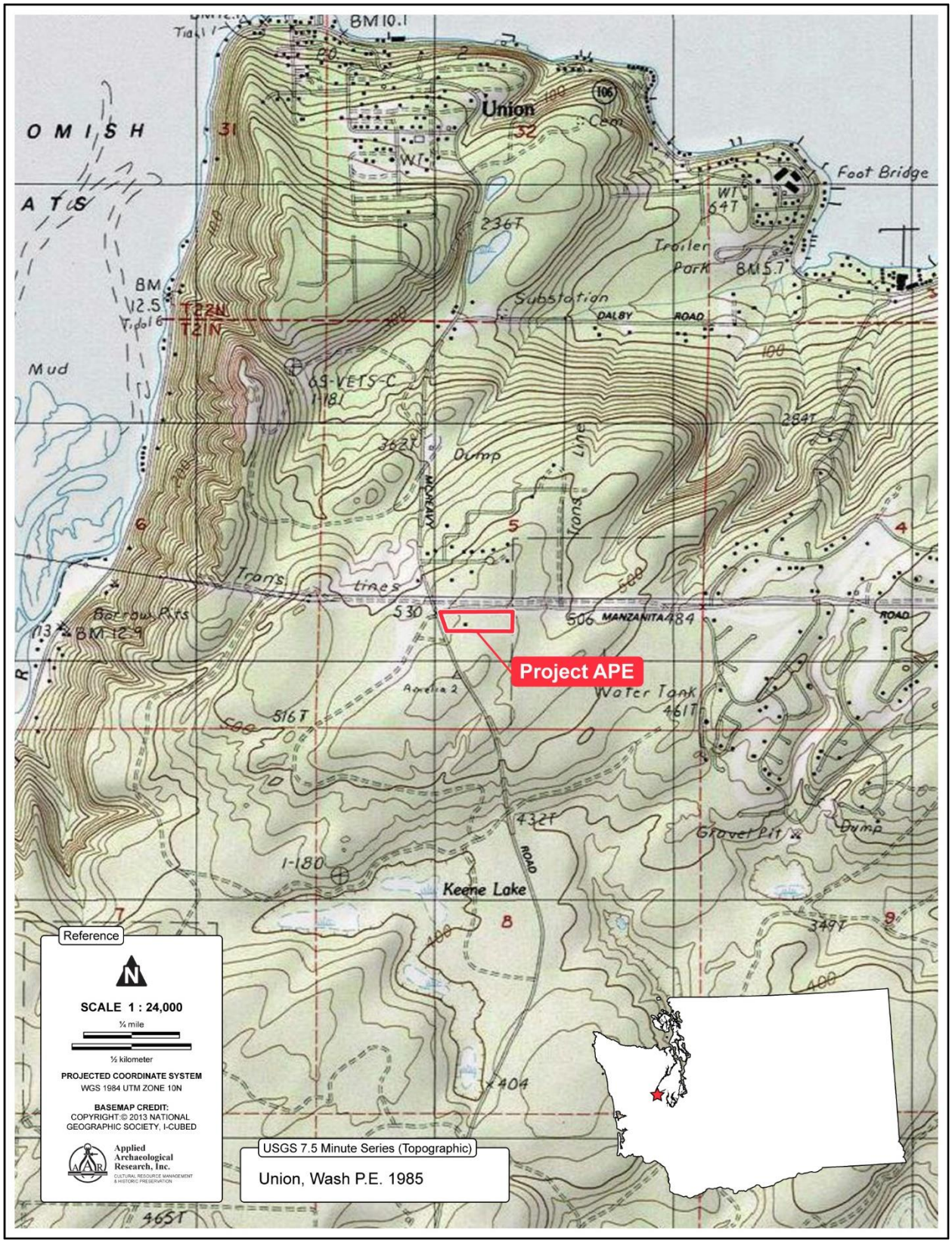

Figure 1. Topographic map showing the project APE location.

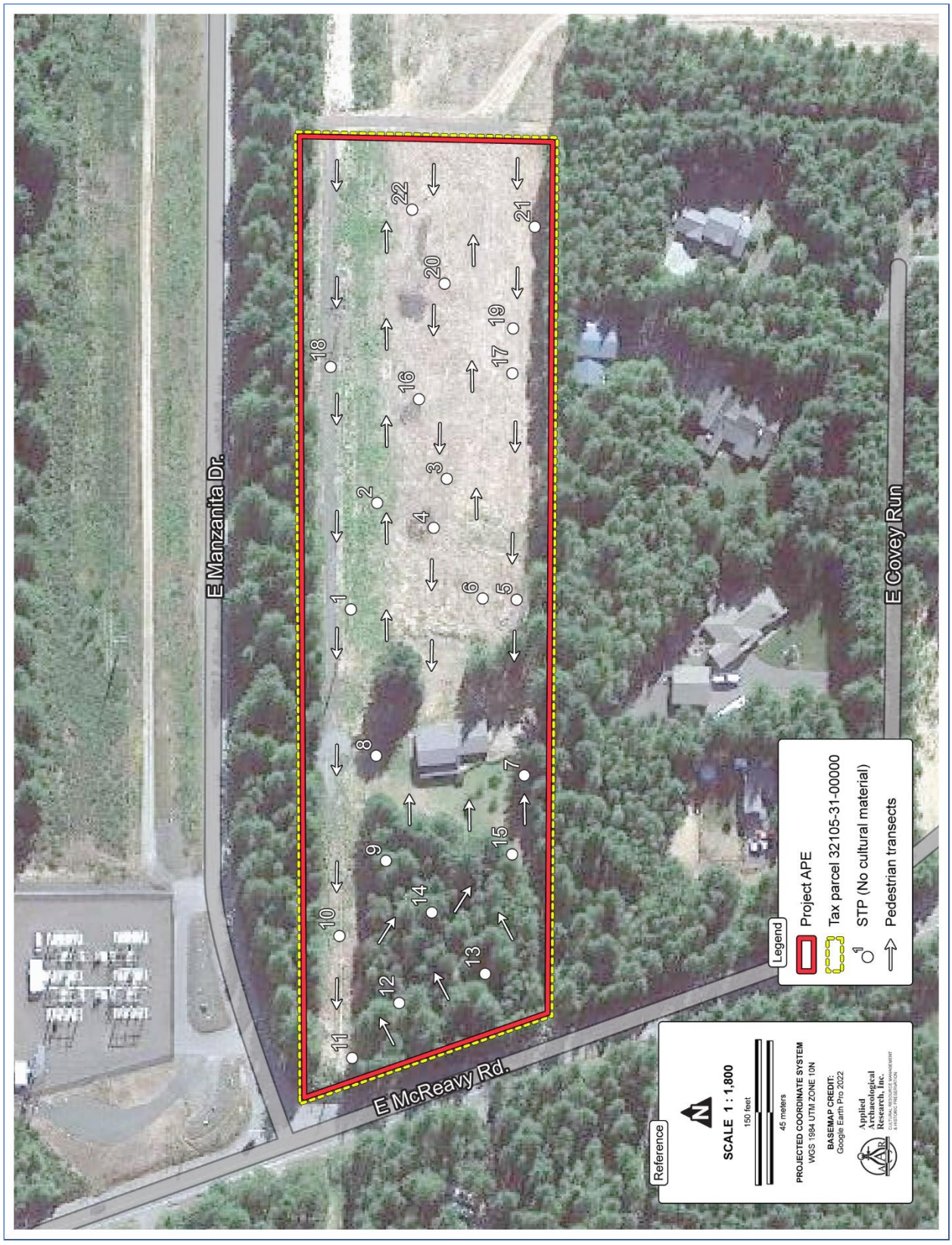

Figure 2. Aerial photomap showing the project APE, shovel test probes, and pedestrian transects.

Figure 3. View looking southeast showing the mown lawn and ornamental fruit trees. Note house and open-air shed in background.

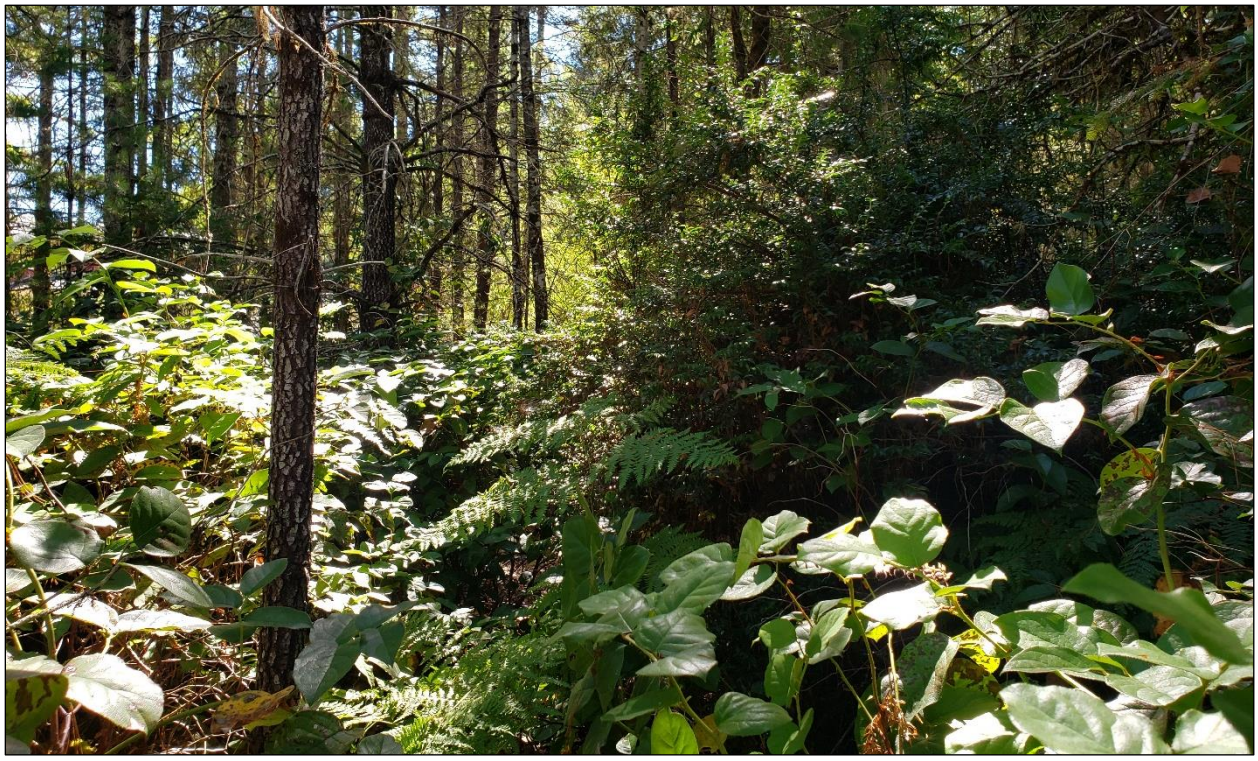

Figure 4. View of forest part of the APE looking southwest.

Figure 5. Part of the APE in a transmission line right-of-way. View is east.

Figure 6. Overview of the eastern part of the APE looking west. Note burn piles in background and flattened burn pile in foreground.

ENVIRONMENTAL OVERVIEW

Environmental Overview

The APE is at the southern fringe of the Olympic Mountains on the Olympic Peninsula, a landmass in western Washington State bordered on the west by the Pacific Ocean, on the north by the Strait of Juan de Fuca, and on the east by Hood Canal. The Olympic Mountains begin a short distance to the northwest of the APE and are the dominate geologic feature on the peninsula. The mountains are composed of two volcanic belts enclosing a large, rugged interior area (Easterbrook and Rahm 1970:74; Franklin and Dyrness 1973:9). The mountains were uplifted concurrent with the uplift of the Cascade Range to the east during the Plio-Pleistocene. The highest peak, Mt. Olympus, is nearly 8,000 ft tall, while the associated ridges rise to between ca. 4,500 to 6,000 ft. In the APE vicinity, the mountains descend to the edge of Hood Canal.

The project APE is in the Puget Trough province, an elongated topographic and structural depression that runs from Canada south to the Willamette Valley that in part is a drowned glacial fjord carved out by lobes of the Cordilleran icecap that occupied the area during the Pleistocene (Easterbrook and Rahm 1970:48; Franklin and Dyrness 1973:17). By 13,000 B.P. glacial ice had retreated north of the Olympic Peninsula leaving behind vast amounts of till, sand, and gravel, which underlie the region's modern landsurface (Easterbrook and Rahm 1970:55). Hood Canal is a fjord formed during that time when the retreating Cordilleran ice sheet gouged it and other channels in Puget Sound. The terminal moraine of the most recent glacial advance, the Vashon Stade, is located a short distance south of Olympia. From the moraine northward, the land slopes gently towards Puget Sound, and contains lakes and poorly drained depressions underlain by glacial drift (Franklin and Dyrness 1973:17).

The APE and surrounding area is in the Puget Trough sub-area of the *Tsuga heterophylla* (western hemlock) Zone (Franklin and Dyrness 1973:43–44). Vegetation in the sub-area reflects less rainfall compared to other parts of the zone and the widespread occurrence of soils that formed in glacial drift and outwash (Franklin and Dyrness 1973:88). In general, the zone is dominated by forests of western hemlock, western redcedar, and Douglas-fir with red alder, black cottonwood, big-leaf maple, and Oregon ash in riparian areas. Understory includes salal, salmonberry, oceanspray, sword fern, and fringecup.

Prairies, often associated with stands of Oregon oak, are also present, particularly in the southern part of the region. Prairies near and adjacent to the project area include Goose Prairie to the north and Buck Prairie on the east. Creation and maintenance of the prairies within the Puget Trough are likely due to the gravelly, excessively drained soils derived from glacial till and low summer precipitation, with repeated burning from natural causes, native peoples, and perhaps early settlers (Franklin and Dyrness 1973:89). After Euroamerican colonization, and due to livestock grazing and fire suppression, most prairies have been gradually reduced by the invasion of Douglas-fir and Oregon oak.

The soil mapped in the project area is Alderwood gravelly sandy loam, 8 to 15 percent slope. Alderwood series soils consist of well-drained upland soils that developed in mixed gravelly glacial till dominated by igneous rock. Its typic pedon includes a surface layer of organic matter which may be as much as 8 inches thick, underlain by brown gravelly sandy loam to a depth of about 14 inches. Below that lies several layers of pale brown gravelly sandy loam which become very pale brown with depth. These extend to about 2 ft below surface (Ness and Fowler 1960:9).

The Hood Canal shorelines support numerous species of fish, wildlife, birds, and marine life. Avian habitat supports waterfowl and other birds such as bald eagles, osprey, gulls, great blue herons, shorebirds, and others. Upland forest birds can be found in the marine riparian zones along the water's

edge. Marine mammals such as harbor seals, otters, orcas, and an occasional grey whale or humpback whale occur in its waters. Other marine species include Dungeness crab, geoduck clam, several species of oyster and other native clam, octopus, squid, sea star, and shrimp. Fish documented in Hood Canal include salmonids such as coho, steelhead, summer chum and fall Chinook, as well as forage fish, bass, cod, English sole, and red snapper (Mason County Department of Community Development 2012).

Native fauna in the Puget Trough province likely include deer and elk, especially on the eastern side of the Olympic Peninsula, as well as bear, wolf, beaver, marmot, otter, mink, fisher, rabbit, squirrel, skunk, and raccoon (Schalk and Yesner 1988). Given the narrow shoreline and steeply rising mountains on the west shore of Hood Canal, little forage would have been available for elk, and herds would have been small and migratory (Schalk and Yesner 1988).

RESULTS OF BACKGROUND RESEARCH

Regional Archaeology and Cultural Chronology

The project APE and surrounding area lie within the Northwest Coast culture area of North America, which extends from the Copper River delta on the Gulf of Alaska to the Winchuk River near the border of Oregon and California. Inland, the Northwest Coast culture area ranges from the Chugach and Saint Elias mountain ranges of Alaska through the Coast Range of British Columbia and includes the area between the coast and the Cascade Range in Washington and Oregon (Suttles 1990:1). Cultural characteristics common among the prehistoric and ethnographic peoples of this region include an emphasis on person wealth and status, an economy based on intensive harvesting and preserving of natural resources (particularly of salmon), multifamily households, and complex exchange systems (Matson and Coupland 1995:36). Northwest Coast peoples also possessed a distinctive woodworking technology that was manifest in wooden plank houses, ocean going canoes, and numerous items of everyday domestic use as well as items of spiritual and ceremonial use. The artwork of this culture area is very distinctive, and includes carvings, paintings, and textiles in wood, fiber, horn, shell, and antler among other media.

The Olympic Peninsula may have been colonized by humans shortly after the retreat of glacial ice as suggested by the discovery of the partial remains of a mastodon at the Manis site (45CA218), located near Sequim in Clallam County. A rib bone from the creature contained what appears to be a bone projectile point. Other than the possible point, there is no direct evidence that early peoples killed the mastodon, which may have expired of natural causes and was subsequently scavenged (Morgan 1998).

Other evidence for the presence of humans in the region during the late Pleistocene (before ca. 11,700 B.P.) consists of a Clovis point, a large, fluted spear point that is unique to the period ca. 12,700 and 13,000 B.P. The points are found throughout North America and represent one of the earliest archaeological cultures on the continent. In the Pacific Northwest, most Clovis points are isolated surface finds. In northwest Washington, such points been found near Olympia, on Whidbey Island, on the Kitsap Peninsula, and on the campus of Pierce College (Croes et al. 2008:200; Kelly et al. 2010).

A second archaeological culture present in the Northwest in the late Pleistocene is represented by large, broad-bladed projectile points that come in a variety of forms, but which often have slight shoulders, and straight-to-contracting, edge-ground stems. The points are collectively referred to western stemmed points (WSP). Unlike fluted points in the region, which are most often found as isolates, WSPs are often found in sites which include other tools such as bifacial knives, end scrapers, gravers, bola stones, and heavy chopping and scraping tools, and lithic debris from making the tools. Sites with WSP tradition components have been found in numerous locations in Western Washington including on San

Juan Island (Kenady et al. 2002), and east of Seattle in Redmond (Kopperl et al. 2016). The latter is the most intensively WSP tradition component in the region. The site contains *in situ* cultural material found in a thin layer between underlying glacial outwash sediments and overlying peat deposit. Bracketing dates on the layer are ca. 12,500 and 10,000 B.P. (Kopperl et al. 2016). The layer contained bifaces, projectile points, scrapers, retouched flakes, pointed tools and denticulates and expedient tools classified as drills, edge-modified cobbles, and used flakes. The projectile points include examples of a regional variant of what may be Windust points, the most common WST projectile point style of the Columbia Plateau, and two unfluted lanceolate concave based projectile points that Taylor and Beck (2016:205–217) identify as part of the WST component.

Archaeological sites dating to after the period of initial use and colonization are organized into the Archaic period that is followed by the Early, Middle, and Late pacific periods (Ames and Maschner 1999).

The Archaic period (8000 B.P.-6400 B.P.) is well documented throughout the Northwest although not in all areas. Perhaps the archetypal site of the Archaic Period is the Glenrose Cannery site on the Fraser River in British Columbia, just south of Vancouver. R. G. Matson excavated the site and classified its component that dated to between ca. 9000-6300 B.P. as Old Cordilleran. Artifacts associated with this component include leaf-shaped lanceolate bifaces, cobble and cobble-flake tools, and antler wedges (Ames and Maschner 1999:72). Microblades and contracting stemmed points are introduced into the artifact inventory at the end of the phase (Carlson 1990:66–67).

Sites on the Olympic Peninsula dating to this period are attributed to the Olcott phase. Sites representing this phase share numerous traits including locations on upland, non-marine terraces, or higher secondary stream terraces; a lack of domestic or architectural features such as hearths; little organic material such as bone or shell; few groundstone items; numerous scrapers and choppers; Cascade-style points; and use of coarse-grained lithic raw materials such as basalt and argillite for toolstone (Morgan et al. 1998:3.4). The content and structure of the sites, and their locations on the landscape, suggest a land use pattern associated with a highly mobile hunting and foraging lifeway.

The Early Pacific period (ca. 6400 B.P. - 3500 B.P.) begins around the time sea-levels were within 6.5 to 10 ft of their present levels following deglaciation (Ames and Maschner 1999:88). Following stabilization of worldwide ocean levels littoral, estuarine, and delta habitats began to develop. Prehistoric peoples came to intensively exploit these environments. Toward the end of the period, indigenous people developed quasi-permanent settlements or hamlets that were mainly occupied during the winter. Subsistence economies developed that depended upon harvesting a select few resources in bulk and processing and storing them for later consumption (Ames and Maschner 1999:89–91). In terms of land use, one of the most important developments beginning during this time was the reorganization of regional settlement patterns. Instead of social groups moving together from place to place as part of a subsistence round, increasingly over this period important procurement tasks were conducted by task groups that departed from and returned to settlements.

Technological changes during this period include the disappearance of microblades from the toolkit along the northern coast, the introduction of several types of bone and antler tools, and of groundstone. The development of a bone and antler tool complex is a particular hallmark of this period. Harpoon heads, both bi- and unilateral are among the most common tool types included in the complex. Grinding stone as a manufacturing technique focused initially on slate and such tools as lance points and adzes are made of this material. Grinding as a manufacturing technique was also used on marine shell. The advent of adzes and other ground tools suggests a burgeoning woodworking industry.

During the Middle Pacific period (ca. 3500 B.P. – 1800/1500 B.P.) the basic economic and technological traits that characterize the ethnographic pattern observed at historical contact became established (Matson and Coupland 1995; Morgan et al. 1998:3.7). Site locations and types suggest a continuation of the land use systems introduced in the preceding period, which can be characterized as logistically organized. Artifacts diagnostic of the period include broad-necked projectile points, stemmed drills, flaked cylindrical bipoints, flaked crescents, perforated ground stone pendants, peripherally flaked cobbles, and atlatl weights.

The Late Pacific period (ca. 1800/1500 B.P. - 250 B.P.) represents the ethnographic culture type and is characterized by cultural continuity. Hallmarks of the period include permanent plank houses located in winter villages, a salmon-based economy, extensive use of storage techniques, and ascribed social status (Ames and Maschner 1999). Regional differences appear in artifact types and art, which may relate to both functional needs as well as to cultural/ethnic differences among the groups of the Northwest Coast area. Populations during this time may have peaked by ca. 1000 B.P. before declining.

Previous Archaeological Investigations in the APE and Vicinity

Background research focused on the area within a one-mile-radius of the project APE. It included a review of archaeological records on file at the Washington State Department of Archaeology and Preservation (DAHP) obtained using its Washington Information System for Architectural and Archaeological Records Data WISAARD) web portal, which indicates that the project area has not previously been surveyed and does not contain documented cultural resources. No records were found using WISAARD related to archaeological surveys conducted within one mile of the APE. The nearest survey for which a report is available was conducted in 2008 and examine lands 1.1 miles southwest of the APE. It was a formal study conducted in advance of a fish passage improvement project. No archaeological sites were recorded during the study (Wilson 2008).

The recorded archaeological site nearest the APE, 45MS53, is 0.9-mile northwest on the eastern shore of Annas Bay. WISAARD contains a documentation form for the site but no associated report. When it was originally recorded in 1972, it was described as containing three human burials and an adze (Munsell 1972). The burials were removed at that time due to risk of damage from highway construction activities. In a 1993 site visit it was further observed to include a shell midden of several clam species and a small quantity of lithic debris. It was heavily disturbed (Wessen 1993).

Other nearby precontact archaeological sites are located a minimum of 1.2 miles away from the APE and consist of shell middens on coastal waterways (Kiers 2011; Valentino 2013). The nearest upland archaeological sites that are in an environmental and geologic setting like that of the APE are 45MS128 and 45MS126, which are located between 3.47 and 3.77 miles to the west, respectively. They consist of sparse lithic scatters which were observed in disturbed contexts between the surface and about 10 centimeters (cm) below the surface (cmbs) (Wessen 1986a, 1986b).

Ethnographic Overview

The project APE and all of Hood Canal was the traditional home of Twana speakers, a Coast Salish language spoken around Hood Canal up in the drainages of its tributaries. It is specifically within the traditional territories of the Skokomish, one of the Southern Coast Salish groups (Suttles and Lane 1990:485). Some ethnohistoric information on Coast Salish peoples was collected by fur traders and missionaries in the early to nineteenth century and more substantial information was collected by ethnologist George Gibbs in the 1850s and missionary Myron Eells in the 1870s. Ethnographic work continued in the twentieth century on various aspects of cultural, society, and technology (Suttles and Lane 1990:502). Not all the information is applicable to the Hood Canal people. Even the earliest

mentions of groups living on the Salish Sea comes from a time when the societies of the native groups had been significantly changed because of catastrophic population losses from exotic disease as well as by partial assimilation into Euroamerican culture. Thus, to a significant extent, the information collected describes lifeways that were memory rather than ongoing.

Twana speaking peoples were divided into dialect groups that occupied one or more villages in a drainage or section of coastline. The dialects were mutually intelligible, and the dialect groups were tied through bonds of marriage, by trade, joint feasting, and ceremonial activities, and use of common territory (Suttles and Lane 1990:485). The ties connected all Twana people and extended beyond Hood Canal. Villages consisted of one or more plank houses occupied by multiple families. The Skokomish River valley was the most densely occupied area in Twana territory, with seven winter villages recorded upriver (Schalk 1988:61). Ethnographically reported villages were situated at the head of Dabob Bay, at the mouth of the Hamma Hamma River, at Lilliwaup, at Duckabush, and at Brinnon (Swanton 1952:447). Others were probably situated at the mouths of other rivers and along Hood Canal and one, associated with the Vance Creek Band, was inland from the canal (Schalk 1988:63). Among the Twana, winter village membership was permanent although during the summer months, when families dispersed to fish, hunt, and gather plant resources, the composition of the group was more fluid (Suttles and Lane 1990:493).

Subsistence among Twana speaking peoples was focused on fish, especially salmon, along with sea and land mammals, shellfish, and a wide variety of plant foods. Herring and smelt, flounders, lingcod, and rockfish were all taken with traps, weirs, and nets. Twana hunters were specialized as sea hunters, land hunters, or fowlers. Sea hunters took seals and porpoises, as well as sea lions on the rare occasions when they appeared in Hood Canal. Seals were clubbed, trapped, or harpooned, and porpoises were taken with harpoons, although these were of secondary importance (Schalk and Yesner 1988). Beached whales were used but live ones were not hunted on the open ocean and rarely ventured into Hood Canal. Land hunters focused primarily on elk and blacktail deer, while fowlers caught ducks in large nets raised between poles or would go out in canoes at night and catch them with smaller nets attached to a shaft, or with a multiprong spear. For the Twana, along the western portion of the Hood Canal, the most important shellfish were littleneck clams, butter clams, horse clams, cockles, geoduck, bay mussels, and native oyster (Schalk and Yesner 1988). Surface dwelling species were gathered, while burrowing species were dug up with a digging stick. Plant resources included camas, bracken, salmonberry, thimbleberry, blackberry, serviceberry, salal, huckleberry, and elderberry. These resources were often collected from prairies that native groups kept open by repeated burning (Suttles and Lane 1990:485).

Crafts production was divided among men and women, with men responsible for woodworking. Specialized tools such as stone mauls, elk antler wedges or yew wedges, and adzes were used to create cedar plank houses and canoes, as well as bent-corner boxes and enclosed water containers, dishes, and spoons, although these items were not decorated as elaborately as those made by northern Northwest Coast groups (Suttles and Lane 1990:489). Women used cedar bark to fashion cordage, mats, buckets, and blankets. Twine was made from nettles, cattails, and Indian hemp traded in from east of the Cascades. Mats were sewed or woven from cattail and tule and were used in houses, as sleeping mats, and in canoes. Baskets were decorated and could be made waterproof and used for stone boiling. Both men and women worked animal skins.

The Twana and other Southern Coast Salish first encountered Euroamericans in 1792, when George Vancouver sailed up Hood Canal and Puget Sound. At that early date, the explorers noted signs that smallpox had been among the Native groups (Suttles and Lane 1990:499). The pre-contact, or pre-disease, Twana population likely exceeded 1,000 individuals. The Hood Canal region was swept by epidemics of smallpox between ca. 1800 to 1840. By 1841, just 500 people were counted, the rest having

perished in epidemics. The Twana population continued to decline to a low of 264 people by 1875 (Simmons 1982:5–35).

Euroamerican colonization of Twana territory was underway by the mid-1850s, leading to conflicts between settlers and Indians. In 1855 the Treaty of Point-No-Point, one of the Treaties of Puget Sound, was signed between the Twana, Chemakums, and Clallams, and Territorial Governor Isaac Stevens. The treaty provided for a reservation of 3,840 acres but failed to identify a location. Terms of the Point-No-Point Treaty also included Skokomish tribal members ceding all title and rights of their land to the US Government in exchange for reservation lands and around fifty thousand dollars. They retained the right to use their traditional lands for fishing, hunting, and gathering (Ruby and Brown 1992). Eventually a location at the mouth of the Skokomish River was approved, and in 1874 its acreage increased to 4,986.97 by executive order. The treaty was ratified in 1859 (Suttles and Lane 1990:500). The forced relocation of Twana peoples from their native homes resulted in the collapse of the community villages as political structures. This led in part to the participation of inland southern Puget Sound Indians in the Indian War of 1855-1856 (Suttles and Lane 1990:500). Following the war, the South Coast Salish economy shifted to selling furs and other resources, and to laboring in logging mills and hop fields owned by Euroamericans. Many of the Indians refused to relocate to the reservation and instead stayed in their traditional homes to work in logging camps and mills. Currently the tribe is organized under the Indian Reorganization Act and on May 3, 1938, the Secretary of the Interior approved the tribal constitution and bylaws (Suttles and Lane 1990:500)

Historical Overview

Historically, the timber industry was the most lucrative economic activity in the region. Sawmills were established beginning in 1853 and included the Skookum, Sherwood, Shelton Valley, and Willey Mills. In 1854, the Washington Territorial Legislature carved Swawamish County out of Thurston County. Though originally named for the local Swawamish People, in 1864 the County's name was changed to Mason to honor Charles H. Mason, the recently deceased secretary of state (Shelton-Mason County Journal 2007). The timber industry led to railroad construction within the new county. The first railroad was constructed under the direction of the Union River Logging Company in 1883, followed shortly by the Puget Sound and Grays Harbor Railroad and Transportation Company in 1887, which came to be known as the Blakely line, and the Peninsular Railway and Navigation Company in 1891 (Cheever 1949; Spector 1990:1). At that time logging railroads were the only feasible way to access the densely wooded interior of the Olympic Peninsula. Railroads enabled the timber industry to expand from small frontier logging to the mass harvesting of timber as one of Mason County's primary means of production. The county also produced and continues to produce dairy products, beef, and oysters for the surrounding region (Deegan 1971).

Cartographic Research

As part of AAR's background research, maps of Section 5, in Township 21 North, Range 3 West, Willamette Median, dating to between 1858 and the 1980s were examined to determine whether unrecorded structures or features are located within the project APE, and to trace the development of the general area over time. The earliest map analyzed was prepared by the General Land Office (GLO) and dates to 1858, predating logging in the area. The project area is shown as vacant land and no improvements such as roads are depicted (GLO 1853).

Maps produced by the United States Geological Survey (USGS) in 1943 and 1952 show no developments in the APE (USGS 1943, 1952). A USGS map published in shows a structure in the APE in the approximate location as the extant residence (USGS 1990). Aerial photographs taken in the twentieth century clearly depict the house as early as 1980 (NETROnline 2022).

FIELD METHODS AND RESULTS

Field Methods

Fieldwork was conducted on August 29 and 30, 2022. It included a pedestrian survey using a series of east-to-west transects spaced about 15 meters apart in its cleared parts (Figure 2). In its western part, which was in places densely vegetated, meandering transects were employed to survey its accessible parts (Figure 4). Following the pedestrian survey, 22 STPs were excavated across the undeveloped part of the APE in an approximate grid to provide uniform coverage of it. The location of some STP were adjusted to avoid berms, burn piles, developments, and inaccessible parts of the APE.

The STPs were 40 cm in diameter and were excavated in 10-cm or thinner levels to depths of at least 50 cmbs, where possible. Sediment removed from the STPs was screened through one-eighth inch-mesh hardware cloth. Afterward the STPs were completely backfilled, and their locations were recorded using a handheld Garmin InReach Mini global positioning system (GPS) device. GPS data were then exported to a graphics program for final editing and formatting.

Results

No artifacts were found during the surface survey. Surface visibility across the APE varied from 100 percent in its eastern part to zero percent in its wooded western part. In most parts surface vegetation was thin or absent and gravels were exposed. The area around the house, which included a mown lawn and ornamental fruit trees, had between zero and 50 percent soil visibility. Its eastern part included scattered burn piles, some of which had been mechanically flattened (Figure 6). Track marks from heavy machinery were visible across its eastern part.

No artifacts were found within the STPs. Table 1 summarizes information on soil profiles exposed in them. Profiles mostly conformed with the typic pedon description for Alderwood series soils, but STPs excavated in open areas lacked the surface layer of duff and organics common for the series. Also, the soils in STPs had higher silt and clay fractions and a lower sand content that is typical for the series.

A common profile observed in the STPs included a thick surface layer of brown very gravelly silty clay loam. The layer was more than 50 cm thick in some probes. Where a second layer was encountered, it consisted of yellowish brown to dark yellowish brown silty clay loam that extended to the base of excavations. STPs 4 and 20 were placed near the edge of burn piles and STPs 9 and 10 were placed in the right-of-way for the transmission line that passes through the northern edge of the APE. In those STPs soils were disturbed with woody debris mixed into them to 40 cmbs.

STPs 11 through 15 were placed in forested parts of the APE. Profiles exposed in them included a surface layer about 10 cm thick of heavy organics and pine needle duff mixed with scant amounts of brown silt loam. The remainder of the soil profile was similar but included abundant fine to medium roots. STPs 2, 3, 4, 5, 6, 7, 15, 16, 17, and 18 were terminated above 50 cmbs due to impassable large rocks or roots. STPs 2 and 8 included modern trash or non-diagnostic items in their upper 10 cm. All STPs included abundant sub-rounded to angular pebbles, cobbles, and rocks, and abundant sub-rounded boulders, which were poorly mixed (Figure 7).

Table 1. Summary Data for STPs.

STP	UTM Coordinates (Zone 10T)	Depth (cmbs)	Sediments (Dry)	Results
1	493072 5242384	0-50	Brown (10YR 4/3) very gravelly silty clay loam with poorly sorted pebbles, cobbles, and large rocks throughout.	No artifacts
2	493105 5242376	0-40	Brown (10YR 4/3) very gravelly silty clay loam with poorly sorted pebbles, cobbles, and large rocks throughout. Non-diagnostic brown and colorless glass fragments in upper 10 cm. Stopped by rocks at 40 cmbs.	No artifacts
3	493113 5242354	0-45	Brown (10YR 4/3) very gravelly silty clay loam with poorly sorted pebbles, cobbles, and large rocks throughout. Stopped by rocks at 45 cmbs.	No artifacts
4	493097 5242358	0-30	Brown (10YR 4/3) very gravelly silty clay loam with poorly sorted pebbles, cobbles, and large rocks throughout. Bisque, burnt wood chunks, charcoal, and woody debris throughout. Stopped by rocks at 30 cmbs.	No artifacts
5	493075 5242332	0-35	Brown (10YR 4/3) very gravelly silty clay loam with poorly sorted pebbles, cobbles, and large rocks throughout. Stopped by rocks at 35 cmbs.	No artifacts
6	493075 5242343	0-15	Brown (10YR 4/3) very gravelly silty clay loam with poorly sorted pebbles, cobbles, and large rocks throughout.	No artifacts
		15-35	Yellowish brown (10YR 5/4) very gravelly silty clay loam with poorly sorted pebbles, cobbles, and large rocks throughout. Stopped by rocks at 35 cmbs.	
7	493020 5242330	0-40	Brown (10YR 4/3) very gravelly silty clay loam with poorly sorted pebbles, cobbles, and large rocks throughout. Stopped by rocks at 40 cmbs.	No artifacts
8	493026 5242376	0-15	Brown (10YR 4/3) very gravelly silty clay loam with poorly sorted pebbles, cobbles, and large rocks throughout. Modern trash found from 0 to 10 cmbs.	No artifacts
		15-50	Yellowish brown (10YR 5/4) very gravelly silty clay loam with poorly sorted pebbles, cobbles, and large rocks throughout.	
9	492993 5242373	0-50	Brown (10YR 4/3) very gravelly silty clay loam with poorly sorted pebbles, cobbles, and large rocks throughout.	No artifacts
10	492969 5242388	0-50	Brown (10YR 4/3) very gravelly silty clay loam with poorly sorted pebbles, cobbles, and large rocks throughout. Woody debris in upper 40 cm.	No artifacts
11	492931 5242384	0-10	Pine needle duff and heavy organics with traces of brown (10YR 4/3) silty clay loam.	No artifacts
		10-50	Brown (10YR 4/3) very gravelly silty clay loam with poorly sorted pebbles, cobbles, large rocks, and fine to medium roots throughout.	
12	492948 5242369	0-10	Pine needle duff and heavy organics with scant amounts of brown (10YR 4/3) silty clay loam.	No artifacts
		10-45	Brown (10YR 4/3) very gravelly silty clay loam with poorly sorted pebbles, cobbles, large rocks, and fine to medium roots throughout.	
		45-50	Yellowish brown (10YR 5/6) very gravelly silty clay loam with poorly sorted pebbles, cobbles, large rocks, and fine to medium roots throughout.	
13	492957 5242342	0-10	Pine needle duff and heavy organics with scant amounts of brown (10YR 4/3) silty clay loam.	No artifacts
		10-50	Yellowish brown (10YR 5/6) very gravelly silty clay loam with poorly sorted pebbles, cobbles, large rocks, and fine to medium roots throughout.	

Table 1. Summary Data for STPs, continued.

STP	UTM Coordinates (Zone 10N)	Depth (cmbs)	Sediments (Dry)	Results
14	492976 5242359	0-10	Pine needle duff and heavy organics with trace amounts of brown (10YR 4/3) silty clay loam.	No artifacts
		10-50	Yellowish brown (10YR 5/6) very gravelly silty clay loam with poorly sorted pebbles, cobbles, large rocks, and fine to medium roots throughout.	
15	492995 5242334	0-5	Pine needle duff and heavy organics with trace amounts of brown (10YR 4/3) silty clay loam.	No artifacts
		5-30	Yellowish brown (10YR 5/6) very gravelly silty clay loam with poorly sorted pebbles, cobbles, large rocks, and fine to medium roots throughout. Stopped by roots at 30 cmbs.	
16	493138 5242363	0-30	Brown (10YR 4/3) very gravelly silty clay loam with poorly sorted pebbles, cobbles, and large rocks throughout.	No artifacts
		30-35	Yellowish brown (10YR 5/4) very gravelly silty clay loam with poorly sorted pebbles, cobbles, and large rocks throughout. Stopped by rocks at 35 cmbs.	
17	493146 5242334	0-35	Brown (10YR 4/3) very gravelly silty clay loam with poorly sorted pebbles, cobbles, and large rocks throughout.	No artifacts
		35-45	Yellowish brown (10YR 5/4) very gravelly silty clay loam with poorly sorted pebbles, cobbles, and large rocks throughout. Stopped by rocks at 35 cmbs.	
18	493148 5242391	0-25	Brown (10YR 4/3) very gravelly silty clay loam with poorly sorted pebbles, cobbles, and large rocks throughout. Stopped by rocks at 25 cmbs.	No artifacts
19	493160 5242333	0-60	Brown (10YR 4/3) very gravelly silty clay loam with poorly sorted pebbles, cobbles, and large rocks throughout. At 60 cmbs, soils transitioned to dark yellowish brown (10YR 3/4) gravelly silty clay loam.	No artifacts
20	493174 5242355	0-50	Brown (10YR 4/3) very gravelly silty clay loam with poorly sorted pebbles, cobbles, and large rocks throughout. At 50 cmbs, soils transitioned to dark yellowish brown (10YR 3/4) gravelly silty clay loam.	No artifacts
21	493192 5242327	0-55	Brown (10YR 4/3) very gravelly silty clay loam with poorly sorted pebbles, cobbles, and large rocks throughout. At 55 cmbs, soils transitioned to dark yellowish brown (10YR 3/4) gravelly silty clay loam.	No artifacts
22	493197 5242365	0-50	Brown (10YR 4/3) very gravelly silty clay loam with poorly sorted pebbles, cobbles, and large rocks throughout.	No artifacts

SUMMARY AND RECOMMENDATIONS

Background research showed that the project APE does not contain recorded cultural resources. Historical maps that show the APE depict it as undeveloped. Previous cultural resource surveys in the APE vicinity did not result in the identification of archaeological sites. The nearest recorded archaeological sites are from the precontact period and are located on Hood Canal well removed from the APE. The nearest recorded sites in environmental settings analogous to the APE are precontact lithic scatters where artifacts were limited to the surface and the upper 10 cm of the soil profile.

Based on the results of the fieldwork, which included an intensive pedestrian survey and the excavation of 22 STPs, the APE does not contain archaeological resources. It is AAR's opinion that its field methods were adequate to have identified archaeological resources had they been present. No such resources were found.

Figure 7. Typical soil profile shown in STP 6 at termination due to intrusive rocks.

Based on the available evidence, AAR recommends a finding of no effect to historic properties for the undertaking. No additional archaeological investigations of the APE are recommended.

Although considered unlikely, there is always the possibility for an inadvertent discovery during project implementation. If during excavations prehistoric or historical artifacts or cultural features are encountered, all construction activities must stop in the vicinity of the finds. Mason County PUD No. 1, as the *de facto* lead agency, is to promptly notify the Washington DAHP and ensure compliance with relevant state and federal laws and regulations that protect cultural resources.

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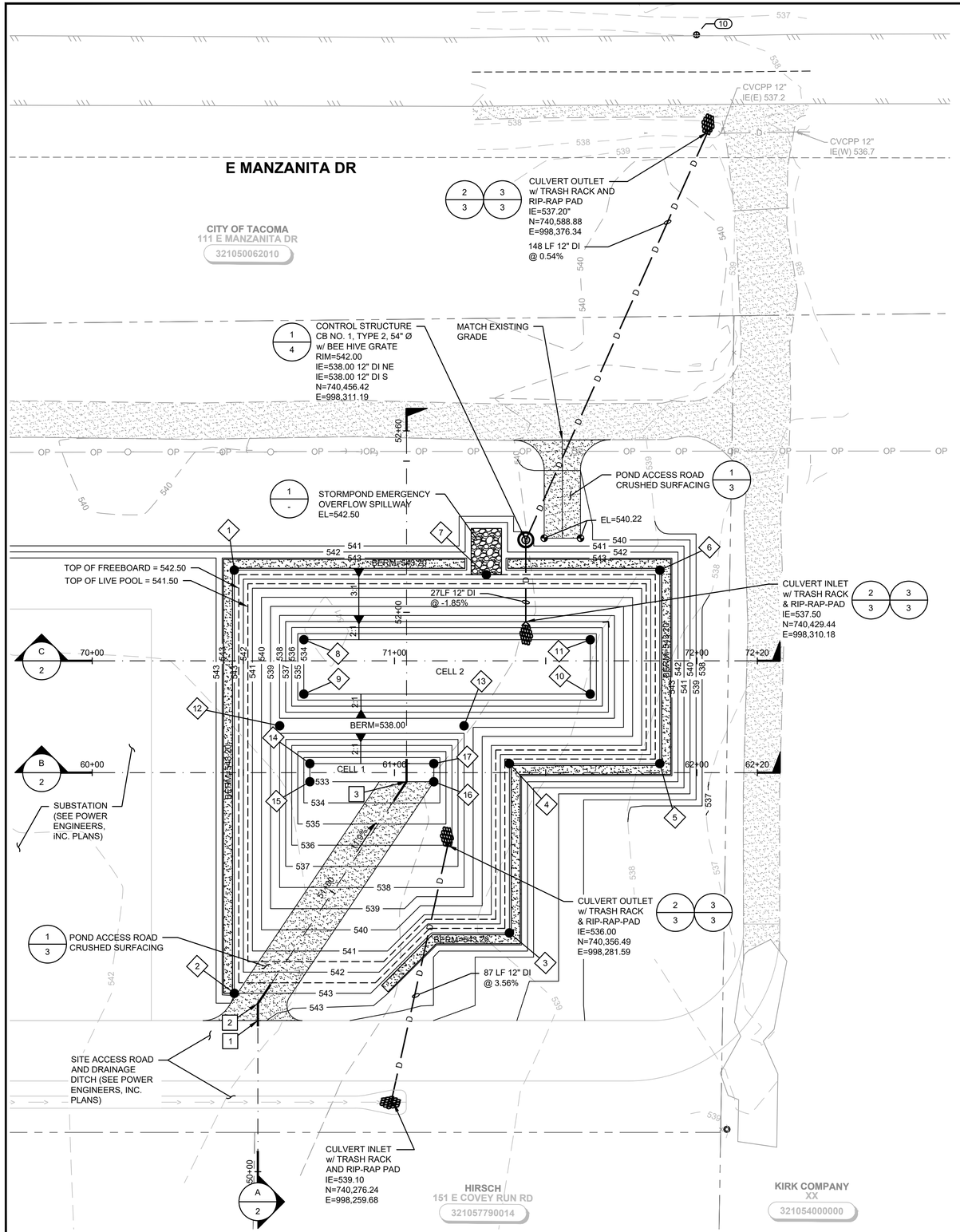


MANZANITA PROPOSED EAST STORMWATER POND GRADING AND PIPING PLAN

SCALE: 1"=20'

STORMWATER POND INFORMATION

FACILITY TYPE	
BOTTOM ELEVATION (CELL 1)	533.00
BOTTOM ELEVATION (CELL 2)	534.00
SEDIMENT STORAGE ELEVATION (CELL 1)	534.00
REQUIRED DEAD STORAGE AREA (WATER QUALITY)	3,865 SF
DESIGN DEAD STORAGE AREA (WATER QUALITY)	6,865 SF
WATER QUALITY SURFACE ELEVATION	538.00
BERM ELEVATION	538.00
EMERGENCY OVERFLOW WATER SURFACE ELEVATION	542.00
REQUIRED LIVE STORAGE AREA (DETENTION)	11,850 SF
DESIGN LIVE STORAGE AREA (DETENTION)	12,565 SF
TOP OF LIVE STORAGE SURFACE	541.50

STORMWATER POND ACCESS ROAD INFORMATION

POINT #	ITEM	NORTHING & EASTING	
1	BEGIN ACCESS RD	N=740,300.88 E=998,216.65	543.10
2	ANGLE POINT	N=740,306.50 E=998,216.86	543.32
3	BOTTOM CELL 1	N=740,377.97 E=998,268.76	533.00

STORMWATER POND GRADING INFORMATION

POINT #	ITEM	NORTHING AND EASTING
1	POND TOP	N=740,450.08 E=998,214.46
2	POND TOP	N=740,310.18 E=998,209.20
3	POND TOP	N=740,326.72 E=998,300.89
4	POND TOP	N=740,382.69 E=998,302.99
5	POND TOP	N=740,380.82 E=998,352.71
6	POND TOP	N=740,444.74 E=998,355.11
7	POND OVERFLOW	N=740,445.42 E=998,297.71
8	CELL 2 BOTTOM	N=740,426.22 E=998,236.58
9	CELL 2 BOTTOM	N=740,408.23 E=998,235.90
10	CELL 2 BOTTOM	N=740,404.67 E=998,330.58
11	CELL 2 BOTTOM	N=740,422.63 E=998,331.26
12	POND BERM	N=740,398.04 E=998,227.51
13	POND BERM	N=740,395.75 E=998,288.47
14	CELL 1 BOTTOM	N=740,385.18 E=998,237.04
15	CELL 1 BOTTOM	N=740,379.19 E=998,236.81
16	CELL 1 BOTTOM	N=740,377.63 E=998,277.78
17	CELL 1 BOTTOM	N=740,383.64 E=998,278.01

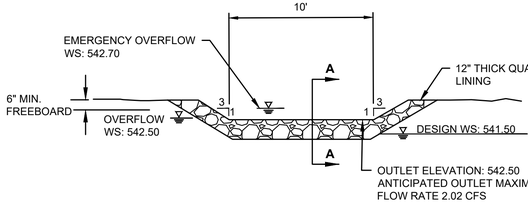
GENERAL NOTES:

1. SEE DETAIL 4 ON SHEET 3 FOR TYPICAL PIPE TRENCH SECTION.
2. PIPE BETWEEN POINT OF INDICATED ELEVATION SHALL BE SET AT A SINGLE UNIFORM GRADE.
3. SEE DETAIL 5 ON SHEET 3 FOR STORM POND PLANTING RESTORATION.

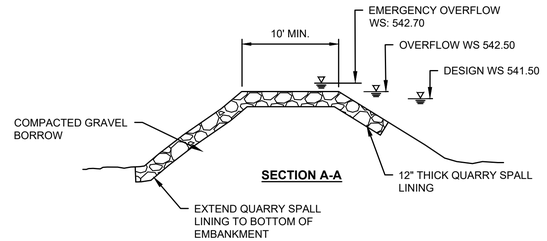
20' 10' 0 20' 40'
SCALE: 1"=20'

STORMWATER NOTES:

1. EROSION CONTROL MEASURE SHALL BE INSTALL PRIOR TO CONSTRUCTION ACTIVITIES.
2. THE CONTRACTOR'S CESCL SHALL BE RESPONSIBLE FOR PREPARING A STORMWATER POLLUTION PREVENTION PLAN (SWPPP).
3. THE SWPPP SHALL BE SUBMITTED TO THE OWNER FOR APPROVAL AT THE PRECONSTRUCTION CONFERENCE. NO WORK SHALL BEGIN UNTIL THE CONTRACTOR'S SWPPP, AS APPROVED BY THE OWNER, IS IMPLEMENTED.
4. THE SWPPP SHALL BE PREPARED IN ACCORDANCE WITH CHAPTER 4, VOLUME II CHAPTER 7 - BMPS FROM THE CURRENT EDITION OF THE WASHINGTON STATE DEPARTMENT OF ECOLOGY'S STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON.
5. THE SWPPP SHALL ADDRESS, AT LEAST, THE FOLLOWING ITEMS:
   - IDENTIFICATION OF CONSTRUCTION HAUL ROUTES AND LOCATION OF BMPS (E.G., STABILIZED CONSTRUCTION ENTRANCE, SILT FENCES, STORM DRAIN INLET PROTECTION).
   - WASTE DISPOSAL METHODS AND LOCATIONS.
   - DETAILED CONSTRUCTION SEQUENCE AND SCHEDULE, INCLUDING IDENTIFYING DATES SCHEDULED FOR BMP INSTALLATION, REMOVAL, CLEARING, GRADING, SEEDING, AND LANDSCAPING.
   - DETAILS FOR ANY TEMPORARY FLOW DIVERSIONS, DEWATERING SYSTEMS, AND BMPS (IN ACCORDANCE WITH THE CURRENT EDITION OF THE WASHINGTON STATE DEPARTMENT OF ECOLOGY'S STORMWATER MANAGEMENT MANUAL FOR WESTERN WASHINGTON) PROPOSED BY THE CONTRACTOR.
   - CALCULATIONS FOR TEMPORARY SEDIMENTATION PONDS, IF USED
   - A LIST OF PRODUCTS TO BE USED, INCLUDING MATERIAL SAFETY DATA SHEETS.
   - IDENTIFICATION OF STOCKPILE AND STAGING AREAS, AND BMPS TO BE IMPLEMENTED AT THESE LOCATIONS.



EMERGENCY OVERFLOW SPILLWAY



SECTION A-A

NOTES:

1. GRAVEL BORROW SHALL BE FREE FROM ORGANIC MATTER OR OTHER DELETERIOUS MATERIALS AND IN CONFORMANCE WITH SECTION 9-03.14(1) OF THE WSDOT STANDARD SPECIFICATIONS.
2. QUARRY SPALLS SHALL CONFORM TO SECTION 9-13 OF THE WSDOT STANDARD SPECIFICATIONS. MATERIALS USED FOR QUARRY SPALLS SHALL MEET THE REQUIREMENT OF SECTION 9-13.1(5) IF THE WSDOT STANDARD SPECIFICATIONS, EXCEP THAT THE SIZE OF MATERIAL SHALL E REVISED AS FOLLOWS: 100 PERCENT PASSING A 4-INCH SIEVE SIZE AND 40 PERCENT PASSING A 2-INCH SIEVE SIZE.

1 / - STORMWATER OVERFLOW DETAIL

SCALE: NTO TO SCALE

Gray & Osborne, Inc.
CONSULTING ENGINEERS
1130 RAINIER AVENUE SOUTH, SUITE 300
SEATTLE, WASHINGTON 98144
(206) 284-0860

MICHAEL B. JOHNSON
STATE OF WASHINGTON
36498
REGISTERED PROFESSIONAL ENGINEER
10/3/23

MASON COUNTY PUD 1

MANZINITA SUBSTATION

1681 E McREAVY RD
UNION, WA

No.	DATE	REVISION

ISSUED FOR:	BID SET
ISSUE DATE:	OCTOBER 2023
APPROVED BY:	MBJ
CHECKED BY:	SLG
DRAWN BY:	JPW
DESIGNER:	SLG
G & O JOB NO.:	22260
FILE:	POND_GRADE.DWG

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

CIVIL

MANZANITA PROPOSED EAST POND GRADING AND PIPING PLAN

DRAWING: 1 OF: 4

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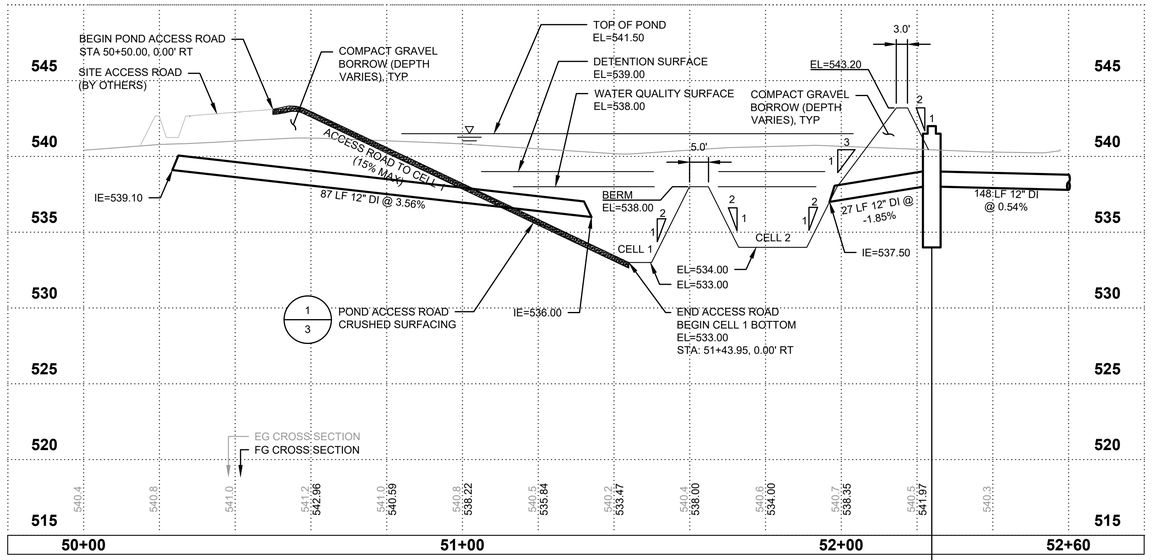
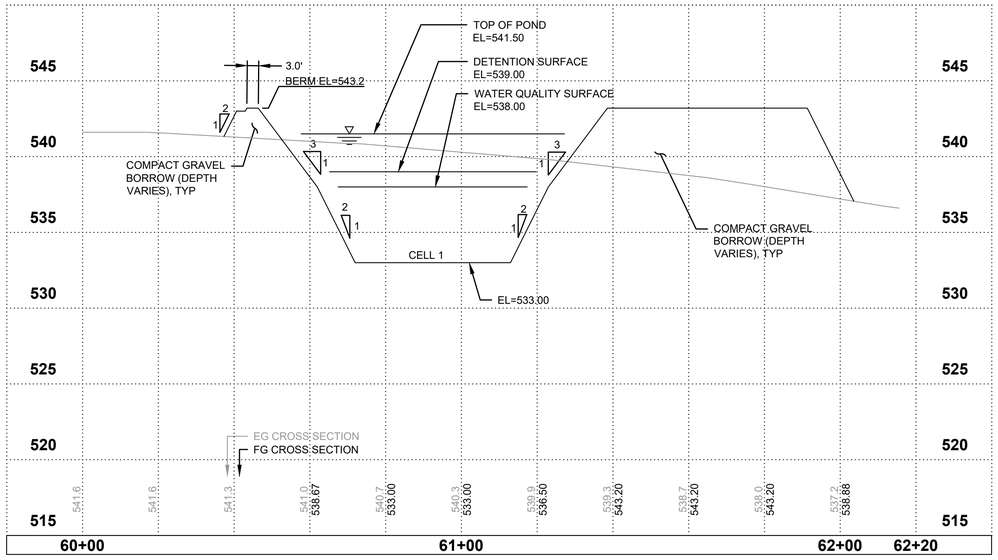
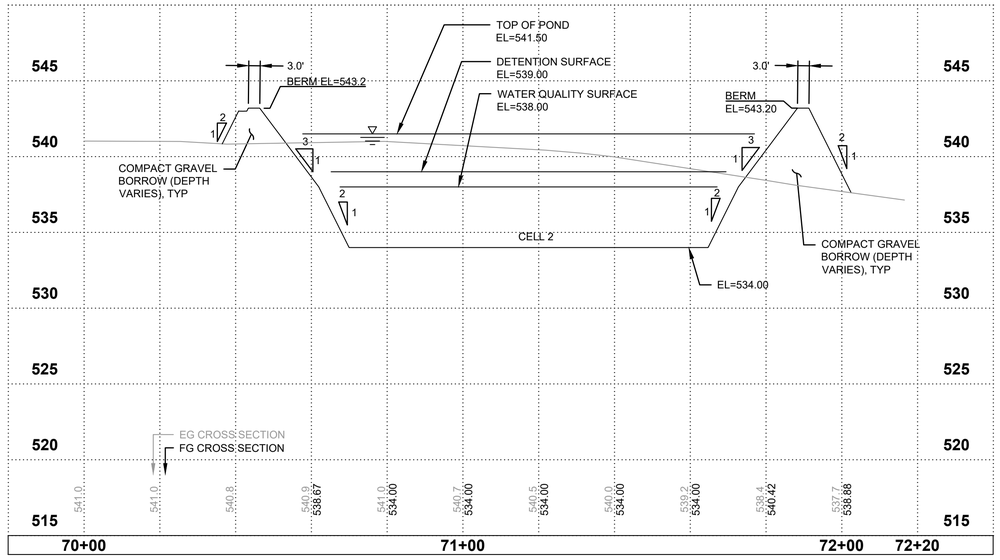


A / C2-4 **POND ACCESS ROAD**
SCALE H: 1"=20'-0"
V: 1"=5'-0"



B / 1 **POND SECTION**
SCALE H: 1"=20'-0"
V: 1"=5'-0"



C / 1 **POND SECTION**
SCALE H: 1"=20'-0"
V: 1"=5'-0"

Gray & Osborne, Inc.
CONSULTING ENGINEERS
1130 RAINIER AVENUE SOUTH, SUITE 300
SEATTLE, WASHINGTON 98144
(206) 284-0860

MICHAEL B. JOHNSON
STATE OF WASHINGTON
36498
REGISTERED PROFESSIONAL ENGINEER
10/3/23

MASON COUNTY PUD 1

MANZINITA SUBSTATION

1681 E McREAVY RD
UNION, WA

No.	DATE	REVISION

ISSUED FOR:	BID SET
ISSUE DATE:	OCTOBER 2023
APPROVED BY:	MBJ
CHECKED BY:	SLG
DRAWN BY:	JPW
DESIGNER:	SLG
G & O JOB NO.:	22260
FILE:	POND_GRADE.DWG

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

CIVIL

MANZANITA PROPOSED EAST POND ACCESS RD AND CROSS SECTIONS

DRAWING: **2** OF: **4**

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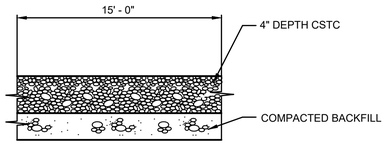


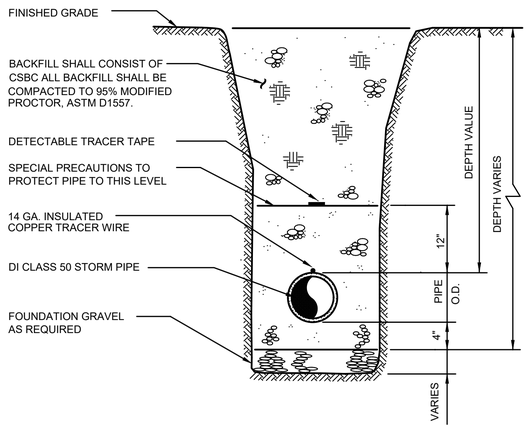
NOTE:

1. CRUSHED SURFACING TOP COURSE SHALL CONFORM TO SECTION 9-03.9(3) OF THE WSDOT STANDARD SPECIFICATIONS.

1 TYP

ACCESS ROAD CRUSHED SURFACING

NOT TO SCALE



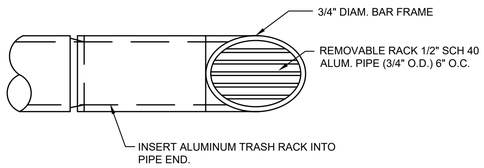
NOTES:

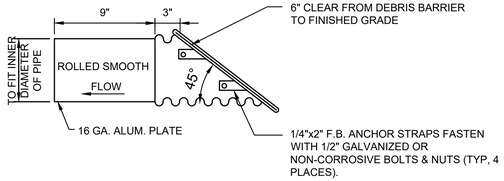
1. STORM PIPE INSTALLATION SHALL CONFORM TO 7-08 OF THE WSDOT STANDARD SPECIFICATIONS.
2. CRUSHED SURFACING BASE COURSE SHALL CONFORM TO SECTION 9-03.9(3) OF THE WSDOT STANDARD SPECIFICATIONS.
3. FOUNDATION GRAVEL SHALL BE CLASS A GRAVEL BACKFILL FOR FOUNDATIONS IN CONFORMANCE WITH SECTION 9-03.12(1)A OF THE WSDOT STANDARD SPECIFICATIONS.

4 TYP

TYPICAL TRENCH SECTION

NOT TO SCALE





ALUMINUM TRASH RACK

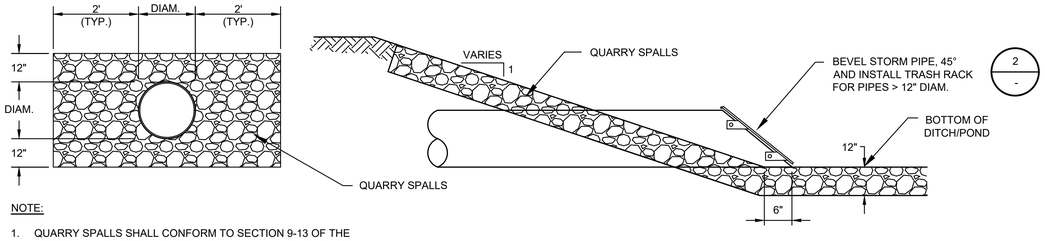
NOTES:

1. ALL STEEL PARTS MUST BE GALVANIZED & ASPHALT COATED (TREATMENT 1 OR BETTER).
2. CONTRACTOR TO VERIFY DIMENSIONS.

2 TYP

TRASH RACK DEBRIS BARRIER

NOT TO SCALE



2 -

NOTE:

1. QUARRY SPALLS SHALL CONFORM TO SECTION 9-13 OF THE WSDOT STANDARD SPECIFICATIONS. MATERIALS USED FOR QUARRY SPALLS SHALL MEET THE REQUIREMENT OF SECTION 9-13.1(5) IF THE WSDOT STANDARD SPECIFICATIONS, EXCEP THAT THE SIZE OF MATERIAL SHALL E REVISED AS FOLLOWS: 100 PERCENT PASSING A 4-INCH SIEVE SIZE AND 40 PERCENT PASSING A 2-INCH SIEVE SIZE.

3 TYP

STORM PIPE INLET/OUTLET PROTECTION DETAIL

NOT TO SCALE

Bioswale Seed Mix				
A seed mix for bioswales and other intermittently wet areas.				
Tall or meadow fes-	*Festuca arundin-*	75-80	98	90

NOTE:

1. SEED EXPOSED EARTH ON THE POND BOTTOM AND INTERIOR SIDE SLOPES WITH AN APPROPRIATE BIOSWALE SEE MIXTURE. PLANT ALL REMAINING AREAS OF THE TRACT WITH GRASS OR LANDSCAPE AND MULCH WITH A 3-INCH COVER OF HOG FUEL OR SHREDDED WOOD MULCH. SHREDDED WOOD MULCH IS MADE FROM SHREDDED TREE TRIMMINGS, USUALLY FROM TREES CLEARED ON SITE. THE MULCH SHOULD BE FREE OF GARBAGE AND WEEDS AND SHOULD NOT CONTAIN EXCESSIVE RESIN, TANNIN OR OTHER MATERIAL DETRIMENTAL TO PLANT GROWTH DO NOT USE CONSTRUCTION MATERIALS, WOOD DEBRIS OR WOOD TREATED WITH PRESERVATIVES FOR PRODUCING SHREDDED WOOD MULCH.

5 TYP

STORM POND PLANTING RESTORATION

NOT TO SCALE

Gray & Osborne, Inc.
CONSULTING ENGINEERS
1130 RAINIER AVENUE SOUTH, SUITE 300
SEATTLE, WASHINGTON 98144
(206) 284-0860

MICHAEL B. JOHNSON — STATE OF WASHINGTON — 36498 — REGISTERED PROFESSIONAL ENGINEER

10/3/23

MASON COUNTY PUD

MASON COUNTY PUD 1

MANZINITA SUBSTATION

1681 E McREAVY RD
UNION, WA

No.	DATE	REVISION

ISSUED FOR:	BID SET
ISSUE DATE:	OCTOBER 2023
APPROVED BY:	MBJ
CHECKED BY:	SLG
DRAWN BY:	JPW
DESIGNER:	SLG
G & O JOB NO.:	22260
FILE:	DETAILS.DWG

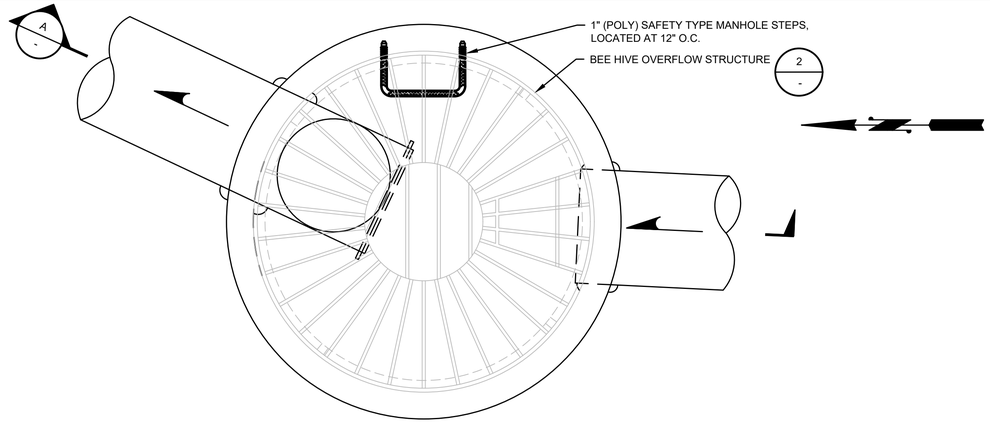
0 1" 2"
TWO INCHES AT FULL SCALE. IF NOT, SCALE ACCORDINGLY

CIVIL

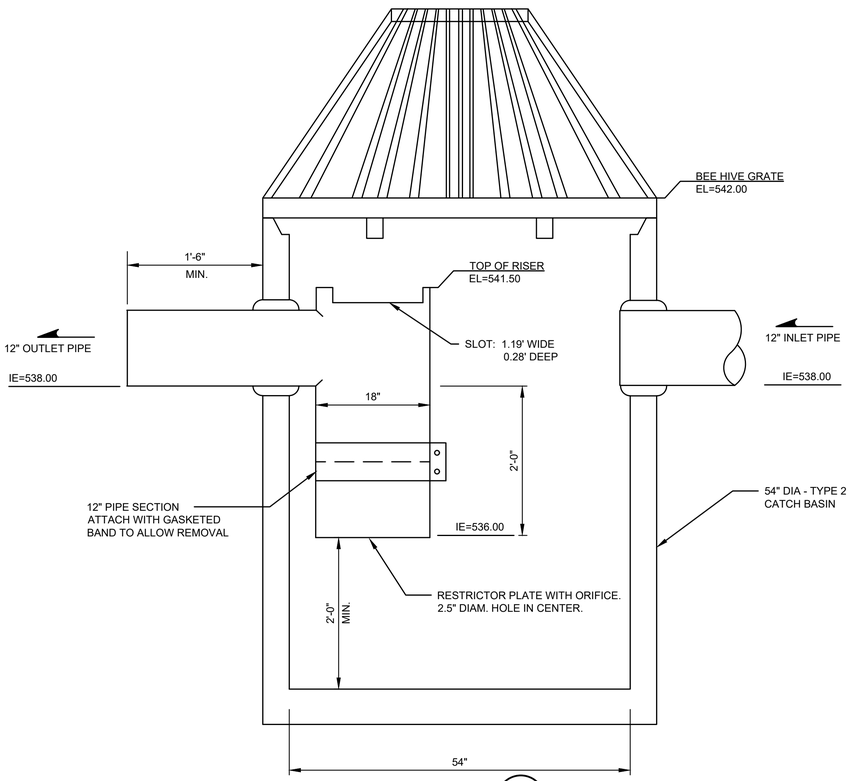
STORMWATER DETAILS

DRAWING: **3** OF: **4**

M:\Mason County PUD 1\22260.00 Manzanita Reservoir and Booster\02 Design\Planset_EAST POND\Civil\DETAILS.dwg, 10/3/2023 4:09 PM, SHARI GAER



PLAN VIEW



SECTION
NOT TO SCALE
A
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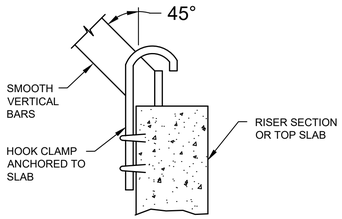
NOTES:

1. THE RESTRICTOR/SEPARATOR SHALL BE FABRICATED FROM .60" ALUMINUM OR .064" ALUMINIZED STEEL OR .064" GALVANIZED STEEL PIPE IN ACCORDANCE WITH AASHTO M 36, M196 AND M274. GALVANIZED STEEL SHALL HAVE ASPHALT TREATMENT 1.
2. OUTLET SHALL BE CONNECTED TO STORM DRAIN PIPE WITH A COUPLING BAND.
3. FRAME AND LADDER OR STEPS SHALL BE OFFSET SO THAT (1) THE RISER PIPE IS VISIBLE FROM TOP AND (2) CLIMB-DOWN SPACE IS CLEAR OF THE RISER.
4. METAL PARTS: CORROSION RESISTANT ALUMINUM. IF STEEL SUBSTITUTED FOR ALUMINUM, GALVANIZED PARTS NEED TO HAVE ASPHALT TREATMENT 1.

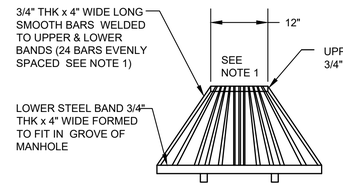
1
1
FLOW CONTROL STRUCTURE - CB NO. 1
NOT TO SCALE



1
-
DETAIL HOOK CLAMP
NOT TO SCALE

NOTES:

1. ADJUST DIMENSIONS TO MAINTAIN 45° ANGLE ON VERTICAL BARS AND 3" O.C. MAX. SPACING OF BARS AROUND LOWER STEEL BAND. WHEN VERTICAL BAR SPACING EXCEEDS 3" O.C., AND CONCENTRIC HORIZONTAL RINGS, SPACED 3" O.C. TO THE STRUCTURE.
2. METAL PARTS: CORROSION RESISTANT, STEEL PARTS GALVANIZED.
3. PROVIDE MAINT. ACCESS BY WELDING (4) CROSS BARS TO (4) VERTICAL BARS AS SHOWN. HINGE UPPER ENDS W/ FLANGES/ BOLTS & PROVIDE LOCKING MECHANISM (W/PADLOCK) ON LOWER END. LOCATE LADDER STEPS DIRECTLY BELOW.



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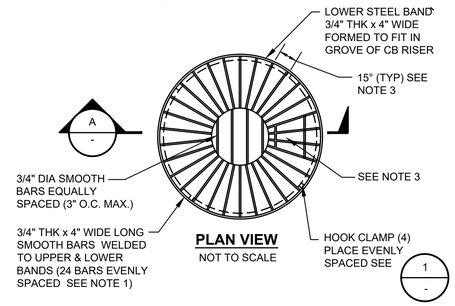
SECTION
NOT TO SCALE



PLAN VIEW
NOT TO SCALE

2
-
BEE HIVE OVERFLOW STRUCTURE DETAIL
NOT TO SCALE

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MASON COUNTY PUD

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STORMWATER DETAILS

DRAWING: **4** OF: **4**

M:\Mason County PUD 1\22260.00 Manzanita Reservoir and Booster\02 Design\Planset_EAST POND\Civil\DETAILS.dwg, 10/3/2023 4:09 PM, SHARI GAER