

**Phase 2 Interim Remedial Action  
Final Design Report**

Saddle Rock Park  
Wenatchee, Washington

*for*  
**City of Wenatchee**

June 4, 2021



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Mercantile Building  
14 North Wenatchee Avenue  
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**File No. 4296-008-02**

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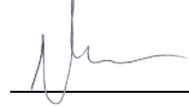
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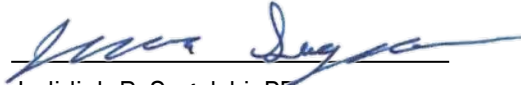
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## 1.0 INTRODUCTION

The City of Wenatchee (City) has retained GeoEngineers, Inc. (GeoEngineers) to complete the Phase 2 Interim Remedial Action (IRA) design report and bid package for the Saddle Rock Park (Site) located at 1130 Circle Street in Wenatchee, Washington (Drawing G1). The City project number is identified as PK200601. Phase 1 IRA design and construction oversight was conducted by GeoEngineers previously in 2019 for the City. This final Phase 2 IRA Design Report (Report) utilizes information from previous investigations, reports and the Phase 1 IRA activities to develop drawings and specifications to remove waste rock pile SR05 (Drawings TESC1 and GP1). Arsenic concentrations at SR05 are greater than the site-specific cleanup concentration of 95 milligrams per kilogram (mg/kg). In order to access and remove waste rock at SR05, an existing park trail (a former dirt road), referenced as the primary haul road (primary haul road) will be utilized and improved for Phase 2 construction use. It is expected that traditional design and construction means and methods will be employed for the Phase 2 work.

As part of the initial activities for the Phase 2 IRA, additional Site soil data was collected by GeoEngineers to identify bare soil areas within the Site with naturally occurring arsenic concentrations greater than the site-specific background concentration. The additional data collection was focused where human receptors are likely to encounter the high arsenic concentrations during recreational activities (along hiking trails). Activities related to identifying the high arsenic concentrations in Site bare soil and proposed measures to mitigate exposure to the high arsenic concentrations within the Site are described in a Technical Memorandum (TM), "Technical Memorandum: Phase 2 Saddle Rock Interim Remedial Action, Bare Soils Investigation Summary, August 2020," and the "Mitigation Measures Assessment Report, Saddle Rock Natural Area, Phase 2 IRA Construction Project, Wenatchee, Washington" (GeoEngineers 2020a and 2020b), respectively.

This Report provides the requirements for the City and the City's selected contractor (Contractor) for completing construction work and managing contaminated waste rock soil and that will be encountered during earthwork activities on the project. The combination of this Report, drawings and specifications shall be followed by the City-selected Contractor. If discrepancies between this Report, drawings and specification are discovered by the City-selected Contractor, those discrepancies shall be provided to the City and approved by the City before implementing any construction design or work alternatives. All interested bidding contractors will be required to attend a mandatory pre-bid Site-walk and meeting in Spring 2021. The exact date and time will be determined by the City.

Soil excavated for this project is subject to special handling and/or disposal requirements as discussed in this Report. The procedures outlined in this document are based on guidance provided by the Washington State Department of Ecology (Ecology) (Ecology 2012); the Model Toxics Control Act (MTCA) (Chapter 70.105D RCW); Washington Administrative Code (WAC) Chapter 173-340; and our experience on similar projects. We understand that the City's Contractor working on this project will be responsible for complying with the final design report and specifications, as well as all applicable local, state and federal regulations during all Phase 2 construction activities.

In addition, the Contractor personnel responsible for any earthwork activities shall be 40-hour hazardous waste operations and emergency response (HAZWOPER) trained and certified (in compliance with Occupational Safety and Health Administration [OSHA] standard 29 CFR Part 1910.120) and Chapter 296-843 WAC and meet the regulatory requirements identified in Section 4.4 below.

## 2.0 SITE DESCRIPTION AND BACKGROUND

The Saddle Rock Regional Park is a local landmark in the Wenatchee Valley and has been a popular destination for hikers, bicyclists and horseback riders for decades. In 2011, the City completed the purchase of the property with the assistance and support of the Chelan-Douglas Land Trust (CDLT), Washington State Recreation Conservation Office and local citizens. The City dedicated the property as the Saddle Rock Regional Park on July 16, 2011.

The 325-acre property was previously owned by the Washington Department of Natural Resources (DNR) for over 100 years. Based on DNR records, it received small mining lease payments from 1891 to 1989. In connection with due diligence environmental assessment by others, the findings indicated possible mining waste rock sites created during DNR ownership with total arsenic concentrations exceeding MTCA criteria. Decades of public use has also led to severe erosion problems, and habitat deterioration.

Ecology conducted an initial investigation of the Site in the Spring of 2011. Waste rock samples from six sites, along with soil samples from surrounding areas, were collected to compare the concentration of metals in waste rock to background concentrations. Analysis identified elevated total arsenic concentrations in the indigenous materials and two additional areas were identified for further testing. Laboratory analysis of the materials confirmed total arsenic concentrations exceeding the MTCA criteria.

In 2012, the City received an integrated planning grant from Ecology through which an remedial investigation (RI), cultural resources and feasibility study (FS) reports were prepared. The RI and FS reports (Hart Crowser 2013a and 2013b) identified and estimated 6,045 cubic yards of waste rock to be removed. Chemicals of concern (COCs) identified by Ecology and others included arsenic, mercury, selenium, silver and barium. Total arsenic was detected greater than the MTCA screening level of 14.4 mg/kg in each waste rock sample, whereas the other COCs were not always present at concentrations above their respective MTCA screening criteria.

In 2019, the Site waste rock piles were further evaluated at the request of Ecology and a site-specific cleanup level was established for remedial cleanup excavation (GeoEngineers 2019a). After the development of the site-specific cleanup level and an associated design report, four waste rock areas (SR01, SR02, SR03 and SR08) were removed during Phase 1 of the IRA. Phase 1 IRA construction activities began in September 2019 and concluded in November 2019 (GeoEngineers 2020c). Construction activities included excavating waste rock and soil with arsenic concentrations greater than the site-specific cleanup level of 95 mg/kg from the waste rock pile areas. In addition, soil samples were collected and analyzed for barium, iron, lead, manganese, mercury, selenium and silver to confirm that these other COCs were less than applicable MTCA cleanup criteria. After excavation, the disturbed areas were graded to match existing topography and disturbed areas were hydroseeded. A hand-held x-ray fluorescence (XRF) instrument was operated by GeoEngineers to collect in-place excavation limit soil concentrations and additional confirmation soil samples were collected for off-site laboratory analytical results to support the XRF sample readings. The XRF and soil analytical results were used to document removal of waste rock and soil and confirm the respective excavation limits had generally reached the arsenic site-specific cleanup concentration.

Approximately 7,889 cubic yards (cy) (approximately 11,802 tons) of waste rock and soil was excavated from the Site and transported for disposal to Waste Management's (WM) Greater Wenatchee permitted Subtitle D landfill.

This Report presents the final design for Phase 2 activities to address the remaining waste rock pile at SR05 and install mitigation measures to prevent human exposure to bare soils that have elevated arsenic concentrations.

### **3.0 PHASE 2 IRA AGREED ORDER SCOPE OF WORK**

An Agreed Order (AO) between the City and Ecology was revised after Phase 1 activities were completed and a revised scope of work (SOW) has been established in accordance with the following sections (Ecology 2018). The following are the tasks in the AO completed by the City and GeoEngineers:

- Task 1a – Further Delineation of Arsenic in Bare Soils with the Phase 2 Area
- Task 1b – Assessment and Identification of Appropriate Mitigation Measures for Contaminated Soil Influenced by Human Activities
- Task 2 – Phase 2 IRA Preliminary Design and Engineering Cost Estimate
- Task 3 – Preparation of Phase 2 IRA Design Report and Bid Package
- Task 4 – Phase 2 IRA Implementation (to be completed by City-selected Contractor under supervision by the City and GeoEngineers)
- Task 5 – Phase 2 IRA Completion Report

#### **3.1. Task 1a – Further Delineation of Arsenic in Bare Soils with the Phase 2 Area**

Under Task 1a, GeoEngineers assessed arsenic in bare soils influenced by human activities (not including SR05 waste rock) within the Phase 1 and Phase 2 areas, as requested and discussed in Ecology’s TM dated October 1, 2019 (Ecology 2019b) and in Ecology’s email correspondence (Ecology 2020). Geotechnical explorations were also conducted in select areas along the primary haul road alignment to collect subsurface soil data for engineering analysis.

GeoEngineers performed an XRF survey to define the extent of arsenic in bare soil throughout the Site above the established site-specific background concentration of 95 mg/kg. “Bare soils” were defined as areas with no vegetative cover, not including outcrops and scree slopes, where the lack of vegetative cover appears to be likely attributable to human activities. XRF arsenic concentration delineation was completed in general accordance with methods described in the amended Sampling and Analysis Plan (SAP) submitted to the City on February 20, 2019 (GeoEngineers 2019a). Surficial soil measurements of total arsenic were obtained since no excavation of soils in these areas is anticipated.

The results of the XRF arsenic characterization were submitted to the City and Ecology within a technical memorandum, which included tabulated and mapped arsenic results. The memorandum was used during Task 1b to assess options to mitigate potential exposure of the public to elevated concentrations of arsenic in soil.

#### **3.2. Task 1b – Assessment and Identification of Appropriate Mitigation Measures for Contaminated Soil Influenced by Human Activities**

GeoEngineers assessed potential mitigation measures to address bare soil areas in Phase 1 and 2 Site areas (impacted by human activities) with elevated arsenic concentrations as delineated under Task 1a.

Our assessment included protectiveness, performance, estimated cost, management of short-term risks, technical and administrative implementability and considerations of public concerns. The assessment also considered and discussed long-term operations and maintenance requirements.

Potential mitigation measures in this assessment included, but were not limited to:

- Public education and signs.
- Potential trail realignments and/or trail closures.
- Revegetation or covering of bare soils.
- Appropriate features for trail closures.
- Installation of benches at selected locations to encourage hikers to sit/rest in areas with lower arsenic concentrations in soil.
- Potential feature(s) at the trailhead to support removal of dirt and dust from shoes, boots and paws before hikers leave the site.

The assessment was submitted to the City and Ecology in a summary report discussing screening of potentially applicable mitigation measures, further development of applicable mitigation measures and recommendations regarding what mitigation measures should be implemented at the Site. The report was included as part of Task 2 as discussed below.

### **3.3. Task 2 – Phase 2 IRA Preliminary Design and Engineering Cost Estimate**

After the City and Ecology's approval of the selected mitigation measures in Task 1b, a draft Phase 2 IRA preliminary design report and engineering cost estimate were prepared for submittal to the City and Ecology. Elements of the preliminary design included primary haul road improvements, preliminary remedial design for the SR05 waste rock pile, and the preliminary design of mitigation measures for bare soil areas with elevated arsenic concentrations. The geotechnical data collected as part of Task 1a was evaluated also, to complete applicable engineering analysis for recommended primary haul road improvements, cut and fill slope inclinations, slope stability and roadway surfacing requirements.

The following mitigation measures were selected to be installed, after the completion of remedial excavation work at SR05:

- New signage to inform the public of the naturally occurring heavy metal hazards and to promote hiking only on the main trail system;
- Installation of park benches in select high arsenic concentration areas to discourage hikers from sitting on native soils;
- Capping the majority of the main trail (primary haul road) with gravel;
- Select side trail closings; and
- Implementation of long term operation and maintenance of mitigation measures.

We also prepared an engineering cost estimate for the implementation of the Phase 2 IRA. This cost estimate included the estimated costs for completion of all components of the Phase 2 IRA including:

- Assessment of alternative primary haul road alignments, to reduce the primary haul road grades;
- Existing primary haul road improvements;
- Remedial excavation and reclamation of SR05; and
- Implementation of the selected mitigation measures.

The purpose of the cost estimate was to document that sufficient funds have been allocated to complete the Phase 2 IRA prior to preparation of the bid package.

### **3.4. Task 3 – Preparation of Phase 2 IRA Design Report and Bid Package**

After the City and Ecology’s approval of the Task 2 Preliminary Design Report and Engineering Cost Estimate, a final Phase 2 IRA Design Report and Bid Package (this Report) has been prepared for submittal to Ecology. Final geotechnical design considerations for construction, from the above tasks, was also included in this Report.

Components of this Phase 2 Design Report include:

- A design narrative describing the purpose and objectives of the project;
- Description of the planned remedial actions and mitigation measures;
- Design of Phase 2 primary haul road improvements, including stormwater management features;
- Design of the SR05 remedial excavation;
- Estimated schedule for mobilization, road improvements, SR05 waste rock pile excavation, SR05 waste rock disposal, confirmation sampling, regrading and revegetation, and implementation of bare soil mitigation measures;
- Construction ready set of design drawings;
- Technical specifications and special provisions in Washington State Department of Transportation (WSDOT) format;
- Health and Safety Plan (HASP);
- Site Sampling and Analysis Plan (SAP) for Phase 1 and 2 IRA waste rock pile sampling activities; and
- Documentation of waste acceptance by the preferred landfill.

The implementation of the Phase 2 IRA will be the responsibility of the Contractor, under the supervision of the City and GeoEngineers, except for the implementation of the SAP, which will be the sole responsibility of GeoEngineers.

The design drawings are stamped by a State of Washington Professional Engineer (“List of Drawings” of this Report) and generally include the following:

- Coversheet and Notes;
- Topographic view of existing conditions in plan view;
- An erosion and sediment control (ESC) plan;

- Proposed primary haul road improvements and staging/loading area;
- Cross sections of the SR05 pile showing estimated excavation depths;
- Final grading plans after removal of the SR05 waste rock pile; and
- Details as needed.

The project specifications (presented with the City contract documents) are sufficient for construction and include measurement and payment sections, product information and execution. Specifications are stamped by a State of Washington Professional Engineer. The specifications generally include, but not limited to, the following:

- Upfront contracting information;
- Measurement and payment;
- Mobilization/Demobilization;
- Site clearing and grubbing;
- Waste rock and soil disposal;
- Earthwork;
- Temporary and Permanent Erosion and Sediment control; and
- Restoration Activities, including Bare Soil Mitigation Measures.

Phase 1 IRA construction activities included the identification and permanent closure of former mining adits at select former waste rock pile areas. While there is no adit currently identified at SR05, the Contractor shall be prepared to close an adit at SR05 if discovered.

The City is preparing SEPA application documentation. SEPA documentation has been submitted to appropriate regulatory agencies by the City, and will be provided for public review. A copy of the preliminary documentation is presented in Appendix A.

### **3.5. Task 4 – Phase 2 IRA Implementation**

After Ecology approval of the Design Report and Bid Package, the City will solicit bids and select a Contractor to implement the Phase 2 IRA. The City-selected Contractor will perform the construction work with an utmost focus on health and safety and in accordance with the final Phase 2 IRA design report and bid package. The City and the City’s Engineer will provide oversight of Phase 2 construction activities and sampling and analysis activities.

### **3.6. Task 5 – Phase 2 IRA Completion Report**

After completion of the Phase 2 IRA field activities, GeoEngineers will prepare the Phase 2 IRA Completion Report, for submittal to the City and Ecology.

The Phase 2 IRA completion report will include the following components:

- As-built map of the constructed primary haul road improvements and stormwater features.

- Disposal weight tickets and estimated volume changes (based on pre- and post-excavation survey results) for the SR05 waste rock area.
- As-built maps for the SR05 waste rock area delineating the waste rock area on topography before remedial action and applicable overlays for excavation, regrading and revegetation and added stormwater management features.
- Map of the SR05 waste rock area confirmation sampling locations and depths.
- Tabulations of confirmation results for Site COCs (both XRF and laboratory analytical results).
- Data quality review for the analytical confirmation results.
- Laboratory analytical reports including lab QA/QC samples and associated data quality review.
- Receipts for any purchased revegetation and bare soil mitigation measure materials for the SR05 area.
- Appropriate as-built information for the Contractor- and City-installed mitigation measures features to address bare soil areas.
- Operation and Maintenance Plan for the installed mitigation measures features to address bare soil areas.

GeoEngineers will prepare the report in draft form and submit to the City and Ecology for review/comment. GeoEngineers will incorporate the City's and Ecology's comments into the report and prepare a Draft Final report for submittal back to Ecology. The Draft Final Report will undergo public comment review before it is deemed final. Significant public comments could result in revision of the report.

The elements presented in this Phase 2 Design Report and Bid Package cover the final design and construction of Phase 2 work activities.

#### **4.0 PHASE 2 IRA CONSTRUCTION ACTIVITIES**

All work shall be conducted in a safe manner, so as to not endanger Contractor personnel, public or other key personnel on the Site. The work will consist of, but not be limited to, providing all labor, materials, earthwork and incidentals necessary to improve (as needed) the primary haul road to access SR05, excavate waste rock and soil from SR05 and transport the waste rock and soil for permitted off-site disposal. Related mobilization and demobilization, clearing and grubbing, erosion and stormwater control and SR05 post-excavation waste rock pile area restoration grading and select mitigation measures will also be performed by the Contractor. The installation of certain new mitigation measures, including signs/benches/select trail closures, will be performed by the City and/or CDLT representatives.

Logistical difficulties associated with the performance of this project include steep slopes throughout the project area, which will require special handling and appropriate construction equipment and vehicles that can operate safely on steep slopes. The steep slopes may cause mobilization difficulties, cause difficulties in moving around the Site due to soil conditions, contribute to further soil erosion and may complicate delivery of the required materials and equipment to complete the project.

Saddle Rock Park will be closed for public use during the entire Phase 2 IRA construction period because work activities will occur throughout most of the Site. Signs will be strategically posted by the Contractor to inform the public of the temporary park closure and general construction activities. Signs will be posted by



the Contractor per the attached Drawings. Flaggers will not be needed because the public will not be allowed in the construction area of Phase 2. If public hikers are encountered in the closed construction area, on-site project personnel will communicate that the area is closed due to construction and they need to leave the area as soon as possible. Allowable work hours for the Contractor to complete construction activities in a safe manner will be 7 am to 7 pm, Monday through Sunday, during daylight hours. Any work outside of daylight hours must be done with appropriate lighting, and only if approved of by the City. If the Contractor wishes to deviate from established working hours, the Contractor shall submit a written request to the Capital Projects Manager for consideration. The Contractor is not allowed to access or utilize the existing Saddle Rock Regional Park trailhead parking lot and vicinity. All Site access shall be routed through the existing one gated construction entrance at the dead end of Circle Street.

The Contractor shall utilize the primary haul road to complete the SR05 excavation and transportation of waste rock and soil off-site. The Contractor shall be aware there is an imbalance in the cut and fill soil quantities along the primary haul road. The Contractor shall be prepared to possibly manage higher fill volumes, in select areas along the primary haul road, as the Contractor improves the road for construction use. Fill volumes will be dependent on the amount of road widening the Contractor selects for the primary haul road improvements and should be 'wasted' in-place or as close as possible to cut excavation areas.

As shown in Drawings KM1 and PP1 through PP6, the existing primary haul road may be widened in places as needed so equipment can access SR05. The existing primary haul road will be used to the top of the Site ridgeline, and a temporary access road will be constructed from about Station 1762+86 on the primary haul road onward to access SR05, at the discretion of the Contractor. The final alignment from the primary haul road to SR05 will be approved by the City, but should be limited to previously disturbed areas. Excavation and grading activities for Phase 2 IRA work will primarily focus on improving the existing primary haul road as needed, constructing the temporary access road to SR05 from the primary haul road, excavation and disposal of waste rock and soil from SR05, resurfacing the primary haul road with compacted gravel and installing new stormwater control features for stormwater runoff along the primary haul road. The Contractor shall use care in moving and transporting waste rock and soil during excavation activities.

The Contractor shall use care to minimize disturbing existing/native vegetation and areas outside of those identified in the Plans where work is to occur. The planned temporary staging area (in the general vicinity of the former SR02 waste rock pile area) (Drawing TESC1) should be made only as large as necessary to fit equipment and materials necessary to complete the project. Temporary delineation of the working area (e.g. with high visibility fencing) may be warranted to help mitigate excessive damage in this area. If the temporary staging area is used to temporarily unload and reload waste rock and soil into highway-rated dump trucks, impacted areas within and near the temporary staging area will need to be excavated back to pre-existing topographic conditions, tested by GeoEngineers to document that all waste rock and soil has been removed and revegetated per the plans and specifications. Excavation and other disturbed areas (including the staging area developed by the Contractor) will be graded to match surrounding existing conditions after waste rock and soil is removed.

Final drawings depicting general construction information are attached ("List of Drawings" of this Report). Specifications have been prepared in WSDOT format, and provide the project requirements discussed this final Report. Any "field engineering or field adjustment" procedures, or drawing, specifications and/or design deviations proposed by the Contractor shall be discussed with and approved by the City prior to

implementation. All necessary project requirements are included in this final Report, drawings and specifications; therefore, a Construction Quality Assurance (CQA) Plan is not applicable for this project.

The Contractor that is awarded this project by the City shall prepare a work plan with the following project specific submittals, to be provided to the City for review, prior to mobilizing to the Site. The Contractor work plan shall include:

- Contractor-specific project HASP with appropriate training certificates of Site personnel working on the project, personal protective equipment (PPE) requirements and COVID-19 supplemental plan;
- Contractor project schedule;
- Temporary Erosion and Sediment Control (TESC) plan (including dust control management plan)/Spill Prevention Control and Countermeasure (SPCC) plan;
- Temporary park closure plan;
- Fire Prevention, Control and Counter Measures Plan;
- Primary and temporary access haul road plan; and
- SR05 waste rock excavation, transport and disposal plan.

The above costs to create the above work plan and submittals by the City-selected Contractor will be incidental to all other bid items on the project.

#### 4.1. Key Personnel

The GeoEngineers field team scheduled to perform periodic oversight work during Phase 2 construction activities include:

- |                     |  |
|---------------------|--|
| ■ Nick Rohrbach     | Senior Environmental Scientist / Project Manager |
| ■ JR Sugalski, PE   | Project Engineer / Field Inspector               |
| ■ Justin Orr        | Staff Geologist / Field Inspector                |
| ■ Dustin Wasley, PE | Principal-in-Charge                              |

All key personnel who will be performing invasive activities (i.e., sampling, construction oversight, construction and excavation and grading, etc.) during the Phase 2 IRA construction implementation will be trained in accordance with the HAZWOPER standards, as defined by the OSHA standard 29 CFR 1910.120 and Chapter 296-843 WAC. The GeoEngineers field team will be in direct communication with the City Capital Project Manager during construction oversight services. The Contractor shall direct questions/concerns/other information regarding the project to the City Capital Project Manager during the construction contract period.

Other personnel who will be on-site are listed below. The City's Capital Project Manager, for Parks, Recreation and Cultural Services, will be kept informed regarding project activities, plans, schedules, budget/invoicing and other issues through direct communications and meetings by the Contractor. Ecology's Project Manager will be kept informed of project progress and information by the City's Capital Project Manager.

- Charlotte Mitchell – City Capital Project Manager
- Frank Winslow – Ecology Project Manager
- CDLT representatives Authorized personnel

#### 4.2. Logistics

Due to the lack of facilities at the Site, a temporary project office building is not currently available for the Phase 2 IRA implementation. Temporary facilities may be brought onto the Site, by the Contractor, and will include a minimum of a Contractor/key personnel decontamination area and sanitary facilities (porta potties) in the staging area. If the Contractor elects to leave their construction equipment, supplies and materials, vehicles, or temporary facilities at the Site, it may be subject to theft and vandalism since the project is located in a non-secured open space. The Contractor shall secure and be responsible for all of their construction equipment, supplies and materials, vehicles or temporary facilities at their expense. Care will be taken by the Contractor to avoid any significant impacts to all nearby natural and existing vegetation and to reduce the potential for non-work-related exposure to potentially hazardous materials known to be present at the Site.

All food, equipment and other supplies will be packed in and out. All refuse will be stored in animal-proof containers, and routinely packed out of the Site and properly disposed at an approved solid waste facility. The temporary staging area will be cleaned up and left in good condition prior to departure each day of construction, and if needed, graded and revegetated in accordance with this Report. All-terrain vehicles (ATVs) may be used as part of the Phase 2 IRA activities, which may require that a small supply of fuel be kept available at the Site. Small quantities of diesel and gasoline fuel for trucks and equipment may also be stored on-site, with appropriate spill control measures. To control potential spill or release problems, the following fuel handling procedures will be employed by the Contractor:

- Only containers approved for gasoline/diesel will be used;
- A storage area, within the Contractor staging area, with secondary containment (with a spill/release volume 110 percent of the stored fuel volume) will be established at the Site;
- Care will be taken to avoid spills during refueling;
- Refueling will be done near the fuel storage area, to the greatest practical degree; and
- There will be no open flames or other sources of ignition allowed in the vicinity of the fuel storage area or during refueling operations.

The Phase 2 Contractor shall be prepared to prevent and control potential fires caused by the Contractor's construction activities on-site. The Site is located in a dry environment and is prone to wildfires due to the lack of moisture and the native vegetation present. Fire extinguishers shall be stationed within all Contractor vehicles and construction equipment. The use of a water tanker truck or trailer, also utilized for dust control, shall be mobilized on-site for potential fire mitigation. Appropriate mobile water tanks, hosing and spray nozzles shall be positioned (for the duration of all construction activities) near the SR05 excavation area and the staging area. A fire prevention and control plan will be required to be prepared by the Contractor, in accordance with local, state and federal regulations and this Report.

Additional general requirements for the implementation of the Phase 2 construction are discussed below.

### 4.3. Cultural and Historical Monitoring

A cultural resource and historical assessment was conducted for the City in 2013 (Reiss-Landreau Research [RLR] 2013). While there were no cultural artifacts discovered specifically within the Phase 1 and 2 waste rock pile areas, an “Inadvertent Discovery Procedure (IDP)” has been defined and will be utilized by the Contractor during Phase 2 construction activities. These procedures shall be followed by the Contractor at all times and when archeological significant material is discovered during excavation work. Inadvertent discoveries shall be limited to Native American related materials, including human bones or artifacts that may be present. In the event of the find of any suspect materials, Contractor shall immediately cease work in that area, and report such materials to the on-site Engineer and City, who in turn will contact a qualified cultural resources professional, as appropriate.

A copy of the IDP is provided in Appendix B of this Report. A qualified cultural resource company will be subcontracted by the City during the Phase 2 construction work, in the event a significant find is discovered. Ecology will also be added to the notified parties if the IDP is triggered during construction. The Contractor shall be prepared for potential project delays if a significant find is discovered and will make the Site accessible to all parties involved.

### 4.4. Worker Health and Safety Requirements

The following worker health and safety protocols shall be implemented by the Contractor during all excavation/soil disturbing activities:

- Personnel involved in excavation and/or handling of waste rock and soil during the Phase 2 IRA activities shall conduct their work in accordance with applicable health and safety regulations and the Contractor’s Site safety and health plan.
- Personnel working on the property shall comply with provisions of WAC 173 340-810 (MTCA Cleanup Regulation, Worker Safety and Health).
- Personnel involved with invasive construction activities (including waste rock and soil excavation and transport) shall be in compliance with HAZWOPER training in accordance with Chapter 296-843 WAC and OSHA standard 29 CFR Part 1910.120.
- For occasional workers, such as professional surveyors, a 24-hour HAZWOPER training course will be completed along with one supervised on-site fieldwork day.
- In response to the COVID-19 pandemic, the Contractor shall prepare a project specific COVID-19 health and safety plan (CHSP), in conjunction with the Contractor’s primary health and safety plan.

### 4.5. Mobilization

Mobilization by the Contractor will be performed in accordance with this Report, final drawings and specifications. The final initial mobilization date will be determined in the future by the City. Select equipment identified below, with the ability to safely navigate steep slopes, is recommended to be used when completing certain work elements. Equipment and vehicles operated by the Contractor shall be in accordance with the manufacturer’s suggested slope rating(s). The following general equipment is likely to be used during Phase 2 IRA activities, based on experience, technical, safety and cost considerations:

- Several four wheel drive pickup trucks/ATVs;

- Several highway-rated dump trucks;
- Kamatsu CD110R-1 mini tracked spin/dump machines or equivalent (recommended steep slope equipment);
- Wheeled loader;
- One Caterpillar D6 bulldozer or equivalent (recommended steep slope equipment);
- One Caterpillar 330 Excavator or equivalent (recommended steep slope equipment);
- One small backhoe excavator for haul road and staging area maintenance or difficult excavation areas (recommended steep slope equipment); and
- Water truck, water trailer and/or other mobile water tanks (to actively control fugitive emissions during construction work and on standby for potential fire control).

It will be the Contractor's responsibility to verify what kind of equipment can complete the project safely, including the recommended list described above. Equipment will be thoroughly pressure washed and cleaned to remove dirt/weeds/grease/oil prior to arrival on-site and prior to leaving the Site; the equipment will be made available for inspection by key personnel prior to mobilization to the Site. The Contractor shall remove all residual contaminated soil (in waste rock pile zones) via physical methods and containing those spoils for transport to the approved off-site landfill. Soil acquired on equipment elsewhere on the Site will be removed via physical methods and will be left on-site, also prior to leaving the Site. All equipment will be utilized, so as to not cause cross contamination or track contamination beyond the limits of SR05. All equipment shall be thoroughly decontaminated by the Contractor prior to demobilization.

As described in Section 4.2, the entire Site area is within a high wildfire danger environment. The Contractor will be required to create and submit a fire plan for Phase 2 IRA activities, which will cover (at a minimum) protocols and procedures for preventing fire creation and fire suppression if a fire was created during construction work. The Contractor will be responsible for implementing the plan, during mobilization and all construction activities, in accordance with local, state and federal regulations. Other fire prevention related tools, including fire extinguishers located on every Contractor vehicle and equipment, will be required.

#### **4.6. Stormwater Water Control / Erosion Control Measures**

Prior to waste rock and soil removal activities, temporary erosion and sediment control (TESC) devices must be installed by the Contractor to control the migration of stormwater and sediment. The Contractor shall install temporary erosion and sediment features, as shown on Drawing TESC1 and Drawing TESC2, to control and contain stormwater runoff from leaving the Site. A sediment trap near the site entrance was installed and water bars were also installed on the lower primary haul road as part of Phase 1 IRA activities (Drawing TESC1). These features shall be maintained during all Phase 2 construction activities. Sediment track out occurring from the Site construction entrance, shall be actively cleaned up by the Contractor (at least one time per day or more often if wet conditions exist) via mechanical or hand tool methods.

Before the excavation of SR05 commences, silt fence shall be installed along the downgradient portion of the excavation zone and along the temporary access road to SR05. To reduce erosion to the primary haul road after substantial construction work is complete, new additional water bars will be installed by the Contractor along the road alignment. Specified water bar spacing, in accordance with the *Eastern*

*Washington Stormwater Manual*, are provided on Drawing MD1. Erosion measures shall be 'field adjusted' by the Contractor and approved by the City, if the final drawings are incomplete or indicate an erosion measure that is not functional for the intended purpose.

The Contractor shall divert stormwater away from SR05 and primary haul road during the Phase 2 IRA. Stormwater will be controlled in such a manner that no stormwater discharges will occur off Site or into Circle Street drainage structures. Typical erosion and stormwater control details are shown in the final Drawings. The Contractor shall install erosion control measures surrounding the staging area in accordance with the final drawings.

A project Storm Water Pollution Prevention Plan (SWPPP) will be generated by the Contractor in accordance with City ordinance and the final design drawings and specifications, which include provision for managing stormwater at the Site. All erosion and sediment control design and implementation will be in accordance with Ecology's *Eastern Washington Stormwater Manual* and the drainage report provided in Appendix C. The project is considered to be exempt of construction stormwater permitting requirements based on the AO, which prevails on this project (Section VIII, Part N [Compliance with Applicable Laws]). Project stormwater also does not discharge to "Waters of the State" and will be generally contained or infiltrate on-site.

#### **4.7. Fugitive Dust Emission Control**

Fugitive dust emission control will be implemented by the Contractor during all construction activities at the Site. If water truck(s) cannot safely mobilize to SR05, alternative mobile water tanks (e.g., portable tanks or water tank trailer) shall be used by the Contractor along the primary haul road, the staging area and at SR05. The Contractor shall not discharge dust or any other air contaminants into the atmosphere in such quantity as will violate the regulations of any legally constituted authority. At the first sign of fugitive dust emissions, water (or other City-/GeoEngineers-approved method for dust control and mitigation) will be applied using appropriate spray nozzles until the soil is visually damp. Special consideration will be given not to over water the waste rock and soil. No ponding or runoff from the waste rock and soil will be allowed. Trucks leaving the Site will be covered during transport at all times. Construction procedures employed by the Contractor shall reduce the potential for cross contamination of known waste rock and soil. The approach is as follows:

- Any spilled waste rock and soil, or sediment tracked out on to Circle Street, will be removed immediately via hand tools or mechanically via construction equipment.
- Visible dust should be mitigated by the Contractor, using a water truck/water trailer/portable water tank and appropriate hoses/spray nozzles, to control off-site air migration.
- Mitigation and control of potential exposure to fugitive dust during dump truck offloading at the permitted disposal facility will be the sole responsibility of the transport Contractor. It will be the transport Contractor's responsibility for coordinating with the approved permitted off-site landfill on their fugitive dust control requirements.
- The Contractor shall be prepared to elevate personal protective equipment (PPE) requirements (in accordance with their project Health and Safety Plan [HASP]) to Level C if dust suppression activities are not actively controlled to control air emissions discharges and creating a potential exposure inhalation hazard for on-site personnel. No off-site fugitive dust migration will be allowed.



#### 4.8. Clearing and Grubbing

Clearing and grubbing, performed at the direction of the City and in accordance with the final drawings and specifications, will be kept to a minimum. Grubbed material and slash will be stockpiled on-site for shredding as mulch to be used during Site restoration or for erosion control on exposed slopes. Clearing and grubbing will be limited to the following locations:

- Areas requiring widening along the primary haul road: and
- SR05 and the associated temporary access road.

It is suspected that threatened plant species (*Lomatium nudicaule*, *Bromis tectorum*, *Balsamorhiza saggitata*, *Pseudoregneria spicata* and *Comandra umbellata*) are present at the Site in one location near SR05. The location is near or adjacent to the haul area and is within the project area and identified on Drawing TESC1. This area shall be protected by temporary construction fencing when mobile equipment is present in the area. Care should be taken to not disturb the vegetation during installation of the temporary fencing.

#### 4.9. Haul Roads

Access to complete the Phase 2 IRA construction activities will be via the primary haul road (Drawings KM1 and PP1 through PP6). The Contractor will establish a preferred temporary access road from the primary haul road (at the Site ridgeline to SR05), by constructing a safe temporary access road for construction equipment and vehicles. The alignment of the temporary access road will be approved by the City before use.

The primary haul road currently varies in width from about 6 to 10 feet wide. The Contractor will widen, grade and surface the primary haul road, as needed, in order to access SR05 with excavation equipment and haul truck/equipment(s) to remove the waste rock and soil from SR05. Portions of the existing primary haul road have severe ruts and erosion channels, that will require the Contractor to repair these areas during the preparation of the primary haul for transporting SR05 waste rock. The primary haul road may be improved with imported gravel along select areas, at the discretion of the Contractor, to accommodate removal of waste rock and soil from SR05. Select areas where the Contractor plans to import gravel, to improve haul road conditions, shall be reviewed and approved by the City prior to the Contractor implementing this task. The Contractor shall complete haul road improvements in accordance with the geotechnical requirements described in Appendix D. The selection of the equipment needed to remove waste rock and soil at SR05 will also be at the discretion of the Contractor.

After waste rock and soil is removed from SR05 and the SR05 area is approved by the City to be restored by the Contractor, stormwater culverts will be installed, the primary haul road surface will be graded, appropriately moisture conditioned and compacted to a firm and dense condition and water bars will be installed in accordance with the spacing on Drawing MD1. Sections of the primary haul road with slopes of less than 15 percent will be final surfaced with at least 4 inches of compacted crushed surfacing base coarse (CSBC) as specified in WSDOT specification 9-0.39(3) and 4-04.3. The steeper sections (greater than 15 percent slope) of the primary haul road (Station 1712+00 to 1736+00) will be treated with magnesium chloride and mixed with crushed surfacing top course (CSTC) gravel into the native soil. Extreme care shall be taken during magnesium chloride applications to ensure no runoff of these liquids and avoid detrimental impacts to existing vegetation. The chloride treatment will work to reduce dust generation and

erosion for steeper portions of the road. After placement of CSTC gravel and magnesium chloride, the road surface shall again be appropriately moisture conditioned and compacted to a firm and dense condition.

Water bars were determined to be an effective stormwater management practice to maintain full dispersion at the site and culverts under the road were added to maintain drainage at the site. A drainage report discussing appropriate stormwater controls for the primary haul road is included in Appendix C.

#### **4.10. Waste Rock and Soil Excavation and Disposal**

The following sections provide the procedures during the excavation and disposal of waste rock and soil excavated from SR05.

##### **4.10.1. Waste Rock and Soil Excavation**

Waste rock pile SR05 will be excavated to the approximate limits shown on the final drawings and specifications, and as directed by GeoEngineers. Waste rock pile SR04 will not be excavated and will be left as is. The approximate limits of excavation for SR05 are shown in Drawing GP1. The final excavation extent and depth will be based on field observations, field screening with an XRF operated by GeoEngineers field personnel and laboratory soil samples collected by GeoEngineers. The samples are planned to be submitted on a standard turn-around time (up to 14 days); however, the Contractor may select expedited laboratory results (within approximately 48 hours) at their expense. The target cleanup level for the limits of the SR05 excavation is 95 mg/kg and the estimated current total volume of SR05 waste rock and soil to be removed is 1,200 bank cubic yards (BCY), based on the waste rock evaluation conducted by GeoEngineers (GeoEngineers 2019c). Once field screening indicates the extents of the waste rock excavation are reached, confirmation soil samples will also be collected by GeoEngineers in general accordance with the SAP (GeoEngineers 2019a).

The Contractor will provide access to SR05 for key personnel and shall sequence excavation and other activities to accommodate sampling and analysis work by the City and City's Engineer.

In order to control the release of waste rock, soil and sediment at SR05, excavation and transport of the waste rock and soil will proceed in a careful manner working from the top of the slope downwards. Very steep slopes are present, immediately around the lateral limits of SR05. Haul dump trucks or haul equipment, utilized both on-site and off-site, will not be overfilled in order to minimize spillage of waste rock and soil or cause an unsafe/overweight driving situation. If waste rock and soil spillage occurs, the Contractor shall immediately cleanup via hand tools or equipment. Loading areas and the primary haul roads shall remain free of spilled waste rock and soil to avoid tracking of contaminants along the haul route(s).

As described above, the Contractor shall be prepared to close a former mining adit, if discovered during SR05 excavation activities. These activities will be considered a force account bid item under the City contract with the Contractor. It is anticipated these activities will be up to \$5,000.00 total to complete the work. Actual total costs spent, to complete these activities by the Contractor, will be paid by the City.

##### **4.10.2. Off-Site Disposal**

The following procedures shall be implemented by the Contractor when transporting and disposing of waste rock and soil from the Site to the approved permitted disposal facility:



- The Contractor will be responsible for the transportation of waste rock and soil off-site, to WM's Subtitle D landfill located in East Wenatchee, Washington.
- The City has established an account with WM, and a profile has been established for the waste rock and soil. All invoices for waste disposal at WM's landfill will be direct billed to the City.
- Labeling, packaging, transport, disposal and record keeping will occur in general accordance with requirements outlined in WAC 173-303.
- In accordance with WAC-173-350-300, loaded trucks or containers with Subtitle D materials will be covered before leaving the Site.
- The Contractor will coordinate with the disposal facility regarding acceptance of any waste rock and soil being disposed, Mitigation and control of potential exposure to fugitive dust during dump truck offloading at the permitted disposal facility will be the sole responsibility of the transport Contractor. It will be the transport Contractor's responsibility for coordinating with the landfill on their fugitive dust control requirements.

The City previously obtained approval for waste rock and soil disposal at the permitted disposal facility (Appendix E). A waste profile was established with WM's Subtitle D Greater Wenatchee landfill located in East Wenatchee, Washington during the Phase 1 IRA. The previous waste profile, created during Phase 1 IRA activities, will be utilized as the profile to dispose the waste rock and soil from the Phase 2 IRA project. A copy of disposal records will be provided by the Contractor and included in the draft Final Construction Report.

It is the Contractor's responsibility to coordinate the transportation of contaminated waste rock and soil and obtain and maintain all disposal records from the selected disposal facility for future reference. Disposal records will be provided to the City on a weekly basis.

#### **4.11. Material and Miscellaneous Debris Removal and Disposal**

Non-Native American and non-inadvertent discovery type material(s), man-made wood and metal material and miscellaneous nuisance debris (if encountered) within Phase 2 work area that pose a potential physical hazard or is considered to be garbage will be removed by the Contractor, after review and approval by the City. Material(s) will be transported and disposed at the landfill described in the above Section 4.10.2.

#### **4.12. Installation of Mitigation Measures**

As described in GeoEngineers' TM (GeoEngineers 2020a), three general Site areas were identified where native soil was greater than the site-specific background concentration of 95 mg/kg. Areas identified included two locations in the Phase 1 area. Two areas are located in the Phase 1 area. One locations is between SR03 and SR08 and the second location is northwest of SR01. The third area that exceeds the site-specific background concentration is within the Phase 2 area and is primarily limited to locations along the primary haul road that will be used to access SR05.

To mitigate potential human exposure to elevated arsenic concentrations across the Site, multiple institutional controls will be implemented by the City and/or CDLT, as described above. Signs to inform the public of the naturally occurring arsenic in the area will be installed. Other signs will also be installed to encourage hikers to stay on the main trail. In addition to the new signs, benches will be installed to encourage people to sit on the benches and not on bare soil in certain Site areas. The benches and signs

will be installed by the City and/or CDLT after the Contractor has completed Site restoration activities as described in Section 4.13.

To assist with mitigating exposure to elevated arsenic in the Phase 2 area, compacted gravel will be used to cover the primary haul road in both the Phase 1 and 2 IRA areas. Many of the elevated arsenic concentration locations identified by GeoEngineers in the Phase 2 area, occurred along and within the primary haul road alignment. After waste rock and soil is removed from SR05, the primary haul road will be final graded and permanent stormwater features (culverts and water bars) will be installed by the Contractor. From Station 1700+00 to 1712+00 and from 1736+00 to 1762+86, the Contractor will surface the primary haul road (after permanent stormwater control features are installed) with at least 4 inches of compacted CSBC. The steeper sections of the haul road (station 1712+00 to 1736+00) will be treated with magnesium chloride as described above in the attached specifications. The restored primary haul road will serve as a hiking trail and accommodate maintenance and emergency vehicle access after Phase 2 construction is complete and during future park use.

After Phase 2 IRA actions are completed by the Contractor, the CDLT and/or the City will reclaim and abandon select hiking trails that are detrimental to the surrounding natural area and not necessarily associated with the primary park trail system. Select trails will be closed via signage and fencing, leveled and revegetated. Identification of the exact trails to be abandoned and methods for abandonment will be determined by the City and the CDLT. Trails to be closed, altered or improved are preliminarily presented in the Phase 2 preliminary design report (GeoEngineers 2021), respectively. Final trail alterations will be confirmed between the City and the CDLT, to avoid areas with high arsenic concentrations based on the recent Bare Soils Evaluation completed by GeoEngineers. The CDLT and City intend to complete the Park-wide trail alterations in a phased approach, with timing between phases of trail work being dependent on the funding/manpower available to complete the work assigned in each phase. The City and the CDLT intend to complete community outreach in 2021 to gather community input on these trail plans and will incorporate (as applicable) in the final trail plans.

#### **4.13. Restoration**

Site restoration activities, after primary haul road improvements and the removal of waste rock and soil at SR05, will include:

- Final laboratory confirmation sampling by GeoEngineers (Section 4.13.1);
- Final grading by the Contractor at SR05 (Section 4.13.1);
- Reclamation/revegetation of SR05 and the temporary haul road and staging area by the Contractor (Section 4.13.2);
- Primary haul road finish grading and permanent stormwater infrastructure installation and maintenance (in Phase 1 and 2 areas) by the Contractor (Section 4.13.3); and
- Placement of gravel surfacing and magnesium chloride (in a select section) on the primary haul road by the Contractor (Section 4.9 and 4.13.3).

The following sections provide detailed information for each Site restoration activity.

#### **4.13.1. SR05 Confirmation Sampling and Final Grading**

Once SR05 is excavated to the approximate limits as shown in Drawing GP1, the area will be final graded to match surrounding topographic surface conditions. Prior to final acceptance by the City and Ecology, the former waste rock pile footprint of SR05 will be screened with an XRF and final confirmation soil samples will be collected and analyzed at an off-site laboratory (by GeoEngineers) to document that metals concentrations are generally below the site-specific cleanup concentration for arsenic (95 mg/kg).

Confirmation soil samples collected by GeoEngineers for off Site laboratory analysis will be submitted on a standard turnaround time (TAT) (about 14 days), unless the Contractor requests an expedited TAT (48 hours) at their additional expense. Once final acceptance of the removal work at SR05 has been provided by the City and Ecology to the Contractor, the SR05 excavation area will be final graded by the Contractor and the temporary access road can be restored.

Once earth work activities are complete, temporary silt fence shall be removed by the Contractor (after the approval by the City) and disposed at the permitted landfill discussed in Section 4.10.2. All other erosion and sediment features installed by the Contractor shall remain on-site. All primary haul road and/or temporary access road gravel imported and placed by the Contractor shall remain on-site.

#### **4.13.2. Reclamation/Revegetation of SR05, the Primary Haul Road/Temporary Access Road and the Temporary Staging Area**

Organic material recovered during clearing and grubbing, and was generated into mulch by the Contractor, shall be placed over the final graded SR05 area/along the disturbed edges of the primary haul road/temporary staging areas as much as feasible by the Contractor. Mulch should be placed over final graded areas before the application of hydroseed. The Contractor will also install the primary haul road water bars and gravel surfacing in accordance with the final design project plans and specifications.

The City-approved mulch/hydroseed mix identified in the attached specifications, will be applied to the following areas:

- Areas where waste rock and soil was excavated from SR05;
- The temporary access road for SR05;
- The Contractor staging area; and
- Cut and fill slopes along the primary haul road where the road was widened.

#### **4.13.3. Primary Haul Road Finish Grading and Permanent Stormwater Control Infrastructure Installation and Maintenance**

The Contractor shall install the three culverts identified on the Plans and final grade the primary haul road throughout the Site, as needed after all excavation work is completed. Final grading of the primary haul road shall repair existing rutting/erosion and rutting/erosion created from hauling waste rock and soil and equipment/vehicle usage across the Site. The Contractor will place the primary haul road final gravel surfacing and alternative steep slope soil stabilizing materials in accordance with the drawings and specifications. Extreme care shall be taken during magnesium chloride applications to ensure no runoff of these liquids and avoid detrimental impacts to existing vegetation.

Sediment accumulation within existing or newly installed stormwater infrastructure, installed as part of both Phase 1 and 2 construction activities, should be cleared of accumulated sediment prior to Contractor demobilization. These features include the primary haul road water bars and the sediment trap located near the Site entrance.

#### **4.14. Schedule**

Implementation of the Phase 2 IRA is expected to be accomplished in mid- to late-2021; however, various factors could result in project delays. The field season at the Site is typically between April and October, depending on rain events and snow levels. The timeframe of Phase 2 IRA construction activities has been planned to be conducted starting August 2021 and ending October 2021.

The proposed construction schedule is attached as Appendix F and assumes an initial mobilization of mid to late August 2021. This schedule is considered preliminary and may change depending on final design considerations, available funding and field conditions.

### **5.0 HEALTH AND SAFETY PLAN**

A site-specific HASP has been prepared by GeoEngineers (Appendix G-1). The HASP will serve as the primary document for key personnel, presented in Section 4.2 above, when entering and working on the Site. The Contractor will be responsible for preparing and implementing their own HASP, that meets the requirements presented in this Report and with the final report drawings and specifications. As described in Section 4.4, the Contractor shall also prepare a COVID-19 specific plan that is supplemental to their primary HASP.

Guidance for working around or near Chelan County Public Utility District (CCPUD) utilities is also provided in Appendix G-2. Overhead CCPUD utilities are present in the Phase 1 area. The Contractor shall be prepared to conduct all work in accordance with these guidelines.

All personnel working in the Phase 2 project area will have the authority to stop work if an unsafe work activity is occurring or is witnessed. The unsafe work activity will be immediately reported to the City and an appropriate remedy for the unsafe activity will be implemented prior to re-starting work activities on-site.

### **6.0 LIMITATIONS**

This Report has been prepared for use by the City of Wenatchee and City of Wenatchee's authorized agents and regulatory agencies. This Report is to be used as a guideline during construction activities associated with the Saddle Rock, Phase 2 Interim Remedial Action Project Site. This Report can be provided to third parties for informational purposes only. The information contained herein is not intended for use by others, and it is not applicable to other sites. No other (third) party may rely on the product of our services unless we agree in advance and in writing to such reliance. This is to provide our firm with reasonable protection against open-ended liability claims by third parties with whom there would otherwise be no contractual limits to their actions.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted environmental science practices in this area at the time this Report was prepared. No warranty or other conditions, express or implied, should be understood.

## 7.0 REFERENCES

- Ecology, 2012. Tacoma Smelter Plume Model Remedies Guidance: Sampling and Cleanup of Arsenic and Lead Contaminated Soils. Toxics Cleanup Program Publication No. 12-09-086-A.
- Ecology, 2018. Agreed Order, Gold Knob Prospect Site (FSID 22496), 1200 Circle Street, Wenatchee, Washington. October 25, 2018.
- Ecology, 2019a. Technical Memorandum, Gold Knob Prospect (aka Saddle Rock Park), Phase 2 Interim Remedial Action Approach. October 1, 2019.
- Ecology, 2020. Email Correspondence between Charlotte Mitchell and Frank Winslow, RE: Gold Knob/Saddle Rock – Phase 2 Draft Scope of Work. March 12, 2020.
- GeoEngineers, 2019a. Technical Memorandum for Saddle Rock Interim Remedial Action Field Sampling: April 2019. File No. 4296-008-00. June 26, 2019.
- GeoEngineers, 2019b. Sampling and Analysis Plan, Interim Remedial Action Design and Remedial Action, Saddle Rock Natural Area, Wenatchee, Washington. File No. 4296-008-00. February 20, 2019.
- GeoEngineers, 2020a. Technical Memorandum: Phase 2 Saddle Rock Interim Remedial Action, Bare Soils Investigation Summary, August 2020. File No. 4296-008-02. August 20, 2020.
- GeoEngineers, 2020b. Mitigation Measures Assessment Report, Saddle Rock Natural Area, Phase 2 IRA Construction Project, Wenatchee, Washington. File No. 4296-008-02. November 20, 2020.
- GeoEngineers, 2020c. Interim Remedial Action Report, Saddle Rock Natural Area, Phase 1 IRA Construction Project, Wenatchee, Washington. File No. 4296-008-01. March 11, 2020. GeoEngineers, 2021. Phase 2 Interim Remedial Action, Preliminary Design Report, Saddle Rock Park, Wenatchee, Washington. File No. 4296-008-02. January 4, 2021.
- Hart Crowser, 2013a. Remedial Investigation, Saddle Rock Park, Wenatchee, Washington. June 19, 2013.
- Hart Crowser, 2013b. Feasibility Study, Saddle Rock Park, Wenatchee, Washington. June 28, 2013.
- Reiss\_Landreau Research, 2013. An Archaeological Review and inventory of the Saddle Rock Park Development Project, Chelan County Washington. RLR Report 2012-263-28. January 2, 2013.



**APPENDIX A**  
**SEPA Documentation**

# SEPA ENVIRONMENTAL CHECKLIST

## ***Purpose of checklist:***

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

## ***Instructions for applicants:***

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

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

## ***Instructions for Lead Agencies:***

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

## ***Use of checklist for nonproject proposals:***

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

## **A. Background** [\[HELP\]](#)

1. Name of proposed project, if applicable: **Saddle Rock Interim Remedial Action (IRA) Project Phase 2**
2. Name of applicant: **City of Wenatchee**



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

**Charlotte Mitchell, PE**  
**Capital Projects Manager**  
**1350 McKittrick St**  
**Wenatchee WA 98807**  
**Phone:509-888-3662**

4. Date checklist prepared: **02/01/2021**

5. Agency requesting checklist: **City of Wenatchee**

6. Proposed timing or schedule (including phasing, if applicable): **Construction to begin mid August 2021 and be completed by the end of November 2021**

7. Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain. **No. This is the second and final phase related to arsenic mitigation on Saddle Rock.**

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

**Remedial Investigation Report (completed by Hart Crowser, 06/19/13)**

**Feasibility Study Report (completed by Hart Crowser, 06/28/13)**

**Phase One Environmental Site Evaluation and Cultural Resources Report (completed by Hart Crowser, 07/16/2014)**

**Technical Memorandum, Gold Knob Prospect (aka Saddle Rock Park), Establishing Site Cleanup Levels and Areas (completed by Department of Ecology, 06/14/18)**

**Interim Remedial Action Sampling and Analysis Plan (completed by GeoEngineers, Inc., 02/26/19)**

**Final Technical Memorandum for Saddle Rock IRA Data Gaps Field Sampling (completed by GeoEngineers, June 2019)**

**Final Phase 1 IRA Design Report (completed by GeoEngineers, July 2019)**

**Interim Remedial Action Report, Phase 1 Construction report (completed by GeoEngineers, Inc., June 2019)**

**Technical Memorandum: Phase 2 Saddle Rock Interim Remedial Action, Bare Soils Investigation Summary (completed by GeoEngineers, Inc., August 2020)**

**Phase 2 Interim Remedial Action Preliminary Design Report (completed by GeoEngineers, Inc., January 2021)**

**Final Phase 2 IRA Design Report (to be completed June 2021)**

**IRA Completion Reports (to be completed January 2022)**

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 known.**

10. List any government approvals or permits that will be needed for your proposal, if known.  
**Department of Ecology (Ecology) approval of Phase 2 Final IRA Design Report and City council approval to award construction contract.**

11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.) **The Washington Department of Natural Resources owned the Saddle Rock Natural Area Park, prior to City of Wenatchee (City) ownership, for over 100 years. There were multiple small mining claims and actions permitted on this site from 1891 to 1989. These mining activities produced waste rock material, in the form of piles outside of each mining adit.**

**Saddle Rock Natural Area is now a City-owned park consisting of 328 acres. The park features steep slopes, natural vegetation, wildlife habitat and hiking trails. The trailhead has a picnic shelter, restrooms and drinking fountain. This project will remediate heavy metals, including arsenic, in the final remaining waste rock pile as a result of historic mining activities. Phase one design and construction addressed the four lower waste rock piles. This project, Phase two design and construction will address the remaining remote waste rock piles.**

**The waste rock piles from these mining activities have been found to have elevated concentrations of heavy metals, primarily total arsenic. This project will remove one waste pile and dispose of the material offsite at a permitted landfill to ensure the heavy metals from the former mining activities is not a threat to public safety.**

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.

**Saddle Rock Natural Area is located at 1201 Circle Street, Wenatchee WA 98801. The project site is located inside the City's Urban Growth Boundary, but outside the City limits.**

**The primary access point to the site is from Circle Street. Circle Street connects to Miller Street. Neighbors of the site include: Appleatchee Riders, Saddle Rock Park (proper), and private property owned by a mining company. Maps are attached.**

**The property consists of two parcels equaling 328 acres, Assessor parcel numbers 222016430050 and 222016300000.**

**The legal description is: The East half of the Northeast quarter of the Southwest quarter of the Southeast Quarter of Section 16, Township 22 North Range 20 E.W.M., Chelan County, Washington, EXCEPT right of way to Circle Street.**

## B. Environmental Elements [\[HELP\]](#)

### 1. Earth [\[help\]](#)

- a. General description of the site: **The project site encompasses an area of 328 acres. It is located in the steep sage rangeland of the Wenatchee Foothills. The project site has been disturbed with many user defined trails and old roadbeds. There is an overhead power transmission line crossing the northeast corner of the property.**

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

- b. What is the steepest slope on the site (approximate percent slope)? **Approximately 60%**
- c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any agricultural land of long-term commercial significance and whether the proposal results in removing any of these soils. **The property contains soil units from the Bjork, Cashmere, and Cowiche series. The dominant soil type is the Bjork silt loam series, which is a mix of clay, silt, and sand. The southeast corner contains Cashmere sandy loam. The southwest corner contains Cowiche silt loam. ( Feasibility Study Report, 06/28/2013)**
- d. Are there surface indications or history of unstable soils in the immediate vicinity? If so, describe. **Yes. Portions of the site contain steep slopes with visible evidence of wind and water erosion. The nature and consistency of site soils make them prone to high erosion potential.**
- e. Describe the purpose, type, total area, and approximate quantities and total affected area of any filling, excavation, and grading proposed. Indicate source of fill. **The purpose of this project is to remove heavy metals impacted waste rock at a former mining claim location. The total area of the site is 328 acres, with approximately 105,000 square feet (2-3 acres) of total affected area. Currently, an estimated total of 1,200 bank cubic yards of soil will be excavated from a waste rock pile and disposed at a permitted landfill. The former waste rock pile will be graded to match existing conditions, after the waste rock is removed. There will be no fill brought on site.**
- f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe. **Yes. The steepness of slopes could result in erosion if a heavy rainstorm event or high wind event during construction, until natural vegetation cover is re-established.**
- g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)? **There will be a net change of 0 square feet (SF) of impervious surface. Currently approximately 0.15 acres of the 328 is impervious surface (at the site parking lot) for a total percentage of less than 1%.**
- h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any: **As part of the Final IRA Design Report, erosion and sediment protocols will be included in the plans and specifications for use during construction work. Typical temporary and permanent best management practices (BMPs) mitigation measures (i.e., silt fence, check dams) will be utilized where necessary. It will be the responsibility of the construction contractor to implement the erosion measures at the site.**

In addition, construction activities will be timed to occur in late summer/fall (August – November). In general, these months represent some of the driest months of the year in Wenatchee, with mean monthly rainfall totals of 0.35 inches in August, 0.36 inches in September, and 0.60 inches in October.

## 2. Air [\[help\]](#)

- a. What types of emissions to the air would result from the proposal during construction, operation, and maintenance when the project is completed? If any, generally describe and give approximate quantities if known. **Exhaust from construction equipment during construction and from vehicles visiting the site. Dust may also be generated on haul roads during removal and transport of waste rock to the landfill. In addition, there is the potential for heavy metal particles to become airborne during removal.**
- b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe. **No.**
- c. Proposed measures to reduce or control emissions or other impacts to air, if any: **This risk of air emissions will be mitigated by the construction contractor with watering work areas and tarping/covering dump truck loads and other construction BMPs. These activities will be outlined and included in the Final IRA Design Report.**

## 3. Water [\[help\]](#)

- a. Surface Water: [\[help\]](#)
  - 1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into. **No.**
  - 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.**
  - 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. **None.**
  - 4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known. **This project will involve installation of one of drainage culvert to divert surface water runoff from rain events around the existing trail and reduce erosion.**
  - 5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan. **The project site is situated within Flood Zone X, recorded on FEMA Map Panel No.**

**5300150625D, dated September 30, 2004. An area of minimal risk outside the 1-percent and 2-percent-annual-chance floodplains.**

6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge. **No.**

b. Ground Water: [\[help\]](#)

1) Will groundwater be withdrawn from a well for drinking water or other purposes? If so, give a general description of the well, proposed uses and approximate quantities withdrawn from the well. Will water be discharged to groundwater? Give general description, purpose, and approximate quantities if known. **No.**

2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, containing the following chemicals. . . ; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve. **None.**

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. **In areas with pervious surfaces within the Phase two construction areas, stormwater will flow on site as it does now into existing naturally created drainage features. During very large rainstorm events, stormwater likely infiltrates onsite and may discharge offsite in City-owned drainage ditches. Areas with impervious surfaces at the site trailhead parking lot, stormwater will be retained on site in retention ponds (outside of the construction work zone(s)).**

2) Could waste materials enter ground or surface waters? If so, generally describe. **No.**

3) Does the proposal alter or otherwise affect drainage patterns in the vicinity of the site? If so, describe. **This project will involve installation of one drainage to divert rain flow around the existing trail and reduce erosion. See attached site plan.**

d. Proposed measures to reduce or control surface, ground, and runoff water, and drainage pattern impacts, if any: **This project will install one drainage culvert to reduce erosion. In**

addition, the existing trails will have water bars and other erosion control features installed. Silt fencing will be placed downslope from construction areas to prevent surface water runoff during rain events.

#### 4. **Plants** [\[help\]](#)

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? **Surface vegetation in the areas of the waste rock clean up location as well as the access to that location from the existing trail, will be removed. The vegetation is comprised of native grasses, western serviceberry, and mountain-big sagebrush. Disturbed areas will be reseeded after the construction is complete. XX SF of vegetated surface will be disturbed. Most of this will be from widening the trail to 10' to accommodate construction equipment and the acces road to the waste rock clean up location.**

c. List threatened and endangered species known to be on or near the site. **None known.**

d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any: **This project will replant drought tolerant, native plants. The seed mix to be used has been compiled with the assistance of the Chelan Douglas Land Trust.**

e. List all noxious weeds and invasive species known to be on or near the site. **Some areas of the foothills are known to have invasive weeds such as diffuse knapweed, Russian knapweed, and whitetop. Noxious weeds are controlled annually by the Chelan Douglas Land Trust (CDLT).**

#### 5. **Animals** [\[help\]](#)

- a. List any birds and other animals which have been observed on or near the site or are known to be on or near the site. **As the project site is heavily visited by pedestrians with dogs and/or horses, local/native birds, mammals and herptiles are generally sparse. WDFW identified several species and communities with special status that are located in the Wenatchee Foothills, near the Saddle Rock Natural Area Park. These include Priority Habitats: Shrub Steppe and Mule Deer Winter Range; and Priority Species: Bald Eagle, Osprey, Golden Eagle, Dusky Grouse, Chukar, Vaux's Swift, Mule Deer, Elk and Western Gray Squirrel.**

Examples include:

birds: hawk, heron, eagle, songbirds, other:

mammals: deer, bear, elk, beaver, other:

fish: bass, salmon, trout, herring, shellfish, other \_\_\_\_\_

- b. List any threatened and endangered species known to be on or near the site. **None known.**
- c. Is the site part of a migration route? If so, explain. **Not known.**
- d. Proposed measures to preserve or enhance wildlife, if any: **Waste rock piles ate the site are generally devoid of vegetation due to elevated metals concentrations, low pH, and lack of nutrients to sustain plants. The proposed project will enhance terrestrial wildlife habitat by removing the last pile and transporting waste rock offsite to a permitted landfill. The reclaimed area will be planted with native species endemic to the shrub-steppe habitat of the Wenatchee Foothills.**

**During construction, avoidance measures will be implemented to prevent disturbance to native bunchgrass habitats surrounding the waste rock pile. Trees will also be retained, where possible at reclamation sites.**

- e. List any invasive animal species known to be on or near the site. **None known.**

## **6. Energy and Natural Resources** [\[help\]](#)

- a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc. **None.**
- b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe. **No.**
- c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any: **Not applicable.**



## 7. Environmental Health [\[help\]](#)

a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste, that could occur as a result of this proposal? If so, describe. **There is a risk of exposure to heavy metals (primarily arsenic) as this project involves removing the material and transporting it to a landfill. The construction contractor and its workers will be required to have Hazardous Waste Operations and Emergency Response (HAZWOPER) training. An IRA Health and Safety Plan will be created which will include safety procedures for the project, including prevention of contamination exposure to workers, locations of hospitals and emergency procedures, a site security plan to ensure no members of the public have access to the areas where work is being performed, safety plans specific to steep slope operations, and safety plans for hauling waste rock from the site to the Greater Wenatchee Regional Landfill.**

- 1) Describe any known or possible contamination at the site from present or past uses. **See Section A, part 11, above.**
- 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. **None.**
- 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. **None.**
- 4) Describe special emergency services that might be required. **None.**
- 5) Proposed measures to reduce or control environmental health hazards, if any: **Offsite migration of dust and spills of waste rock will not be permitted. It will be controlled with water spray suppression and tarping/covering dump truck loads.**

### b. Noise

- 1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)? **None.**
- 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. **Noise during construction during daylight hours for approximately 50 days.**
- 3) Proposed measures to reduce or control noise impacts, if any: **None.**



## 8. Land and Shoreline Use [\[help\]](#)

- a. What is the current use of the site and adjacent properties? Will the proposal affect current land uses on nearby or adjacent properties? If so, describe. **Recreation, open space and a private equestrian facility. This proposal is being complete to address the existing uses.**
- b. Has the project site been used as working farmlands or working forest lands? If so, describe. How much agricultural or forest land of long-term commercial significance will be converted to other uses as a result of the proposal, if any? If resource lands have not been designated, how many acres in farmland or forest land tax status will be converted to nonfarm or nonforest use? **No.**
- 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.**
- c. Describe any structures on the site. **There is a restroom building and a picnic shelter, near the construction zone(s).**
- d. Will any structures be demolished? If so, what? **No.**
- e. What is the current zoning classification of the site? **The project site lies within an area designated Residential Single Family District (RS) outside City limits, but within the City Urban Growth Boundary.**
- f. What is the current comprehensive plan designation of the site? **Open space and recreation.**
- g. If applicable, what is the current shoreline master program designation of the site? **Not applicable.**
- 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.**
- j. Approximately how many people would the completed project displace? **None.**

- k. Proposed measures to avoid or reduce displacement impacts, if any: **Not applicable.**
- l. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any: **None.**
- m. Proposed measures to reduce or control impacts to agricultural and forest lands of long-term commercial significance, if any: **None.**

**9. Housing** [\[help\]](#)

- 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** [\[help\]](#)

- a. What is the tallest height of any proposed structure(s), not including antennas; what is the principal exterior building material(s) proposed? **No permanent new structures are being proposed.**
- b. What views in the immediate vicinity would be altered or obstructed? **None.**
- b. Proposed measures to reduce or control aesthetic impacts, if any: **Native plants/trees and grading will be used to match project impacts into the existing landscape.**

**11. Light and Glare** [\[help\]](#)

- a. What type of light or glare will the proposal produce? What time of day would it mainly occur? **None.**
- 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** [\[help\]](#)

- a. What designated and informal recreational opportunities are in the immediate vicinity?  
**The project is located on, and adjacent to the Saddle Rock Natural Area, Dry Gulch and Appleatchee Riders property. These areas provide for a variety of recreation and outdoor education purposes ranging from snowshoeing, to walking, running, hiking, and equestrian uses.**
- b. Would the proposed project displace any existing recreational uses? If so, describe.  
**The site will be closed temporarily to recreational use during construction, but there will be no permanent displacement to any existing recreational uses.**
- c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:  
**This project is designed to improve recreation opportunities for the community and adjacent property owners.**

**13. Historic and cultural preservation** [\[help\]](#)

- a. Are there any buildings, structures, or sites, located on or near the site that are over 45 years old listed in or eligible for listing in national, state, or local preservation registers? If so, specifically describe. **No.**
- 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. **No.**
- 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 cultural resources inventory and phase one environmental review were recently completed. They were provided to the State of Washington Department of Archeology and Historic Preservation and forwarded to the Colville tribes by the State for review. An inadvertent Discovery Plan has been developed by Ecology for use during construction, which will be included in the Final IRA Design Report.**

- 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. **None.**

#### 14. *Transportation* [\[help\]](#)

- a. Identify public streets and highways serving the site or affected geographic area and describe proposed access to the existing street system. Show on site plans, if any. **Circle Street ends at the project site.**
- b. Is the site or affected geographic area currently served by public transit? If so, generally describe. If not, what is the approximate distance to the nearest transit stop? **No. The nearest stop is approximately one quarter mile away on Miller Street.**
- c. How many additional parking spaces would the completed project or non-project proposal have? How many would the project or proposal eliminate? **No change to existing parking.**
- d. Will the proposal require any new or improvements to existing roads, streets, pedestrian, bicycle or state transportation facilities, not including driveways? If so, generally describe (indicate whether public or private). **No.**
- e. Will the project or proposal use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe. **No.**
- f. How many vehicular trips per day would be generated by the completed project or proposal? If known, indicate when peak volumes would occur and what percentage of the volume would be trucks (such as commercial and nonpassenger vehicles). What data or transportation models were used to make these estimates? **No additional trips will be generated by the project.**
- g. Will the proposal interfere with, affect or be affected by the movement of agricultural and forest products on roads or streets in the area? If so, generally describe. **No.**
- h. Proposed measures to reduce or control transportation impacts, if any: **None.**

#### 15. *Public Services* [\[help\]](#)

- a. Would the project result in an increased need for public services (for example: fire protection, police protection, public transit, health care, schools, other)? If so, generally describe. **No.**
- b. Proposed measures to reduce or control direct impacts on public services, if any. **None.**

**16. Utilities** [\[help\]](#)

- 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 additional utilities are proposed.**

**C. Signature** [\[HELP\]](#)

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

Signature: \_\_\_\_\_

Name of signee Charlotte Mitchell

Position and Agency/Organization Capital Projects Manager/City of Wenatchee

Date Submitted: \_\_\_\_\_

**D. Supplemental sheet for nonproject actions** [\[HELP\]](#)

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

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

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

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

Proposed measures to avoid or reduce such increases are:

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

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

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

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

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

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

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

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

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

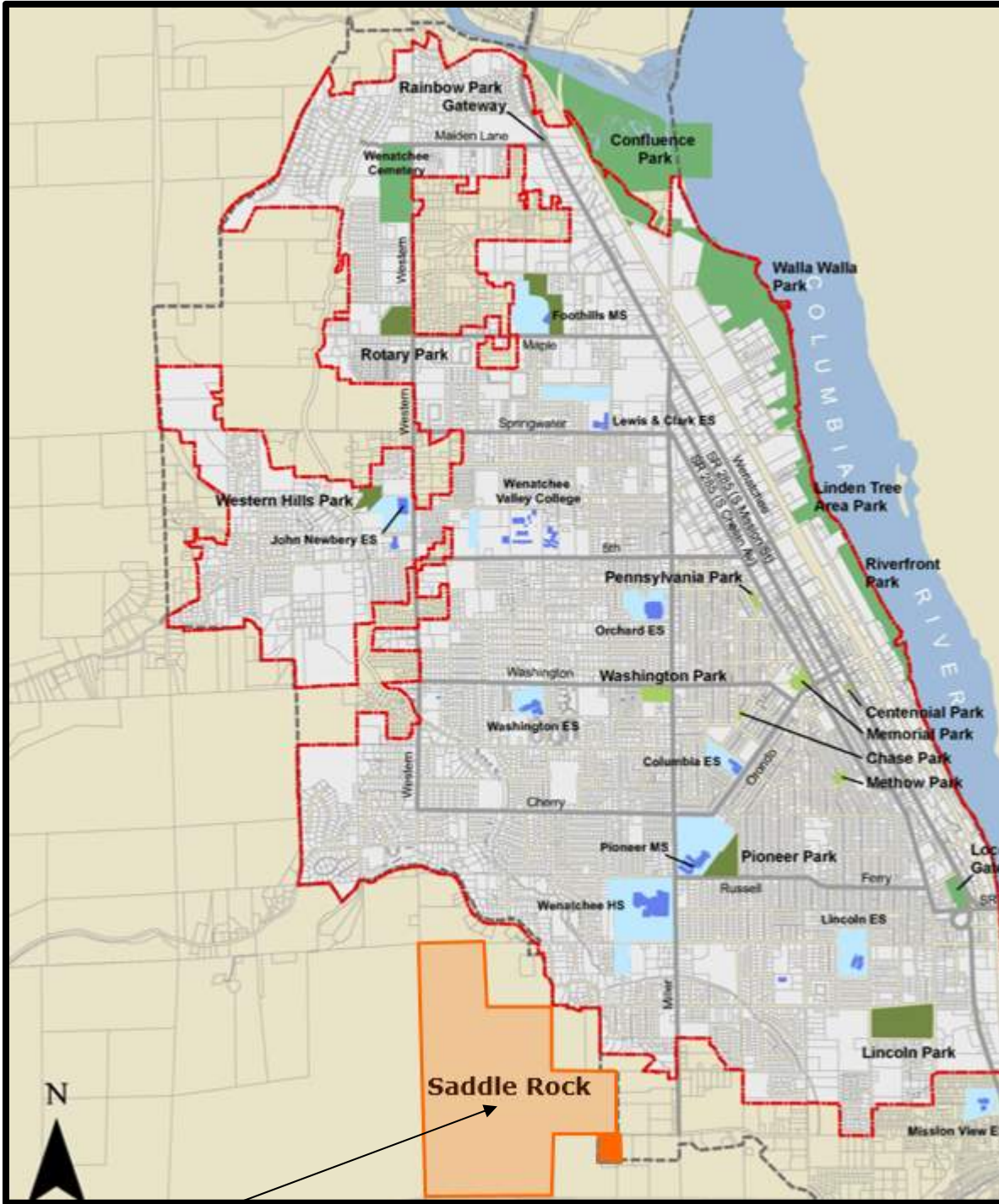
Proposed measures to reduce or respond to such demand(s) are:

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

DRAFT



# MAP AND IMAGES



Project Site

**APPENDIX B**  
**Inadvertent Discovery Plan**

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## *Project Recommendations*

During the course of inspection, RLR identified six historic mining sites, and one historic archaeological or historic property, and have uncovered evidence of a Native American traditional cultural property associated with the site. The archaeological properties have been recorded to the Washington State Department of Archaeology and Historic Preservation's Washington Information System for Architectural and Archaeological Records Data (WISAARD) database as archaeological sites. Prior to development of the project area, **Reiss-Landreau Research recommends that the stakeholders consider putting forth a district nomination for the sites associated with Saddle Rock, as their historic relationship is clear and notable. In addition, the eligibility of the sites under criterion A and B are clearly established.**

Inadvertent Discovery Procedure.

If any archaeological resources are discovered or suspected during the course of the project, activity in the immediate area shall stop until a professional archaeologist can assess the discovery.

If the inadvertent discovery is archaeological material:

1. The project proponent, Chelan County Department of Community Development and the Washington State Department of Archaeology and Historic Preservation (DAHP) will be contacted and work in that area will stop.
2. The archaeologist will contact the Project Proponent, The City of Wenatchee.
  - a. Upon notification of discovery of potential archaeological deposits, a professional archaeologist will evaluate the remains.
  - b. The DAHP will be given the opportunity to view the artifacts within 48 hours after the discovery or at the earliest possible time thereafter. The discovery will be kept confidential. After halting construction, securing the site, and notifying the contractor, the archaeologist will conduct a brief in-field evaluation. The purpose of the evaluation is to determine whether the discovered resources have potential to answer research questions.
  - c. Evaluation protocols are described in the following section.
  - d. If parties agree that the artifacts are not significant, RLR will ask the construction representatives to resume construction.

- e. If parties agree that the artifacts are significant, the Washington State DAHP will issue a stop work order until further notice for all construction work in the area defined as a significant site.

#### **Guidelines for the Discovery of Human Remains:**

1. All persons who know of the existence and location of human remains must, by law, **notify the county coroner and local law enforcement**. This must be done in the most expeditious manner possible. (RCW 27.44; 68.50; 68.60);
2. Any person engaging in ground disturbing activity that encounters skeletal human remains must **cease all activity which may cause further disturbance to the remains, make a reasonable effort to protect the area from further disturbance, report the presence and location of those remains to the coroner and local law enforcement** (RCW 27.44; 68.50; 68.60). The remains should not be touched, moved, or further disturbed;
3. The county coroner will assume jurisdiction over the human skeletal remains and make a determination of whether those remains are forensic or non-forensic. (RCW 27.44; 68.50; 68.60);
4. If the county coroner determines the remains are non-forensic, then the Department of Archaeology and Historic Preservation will take jurisdiction over the remains. (RCW 27.44; 68.50; 68.60);
5. The State Physical Anthropologist will make a determination of whether the remains are Indian or Non-Indian and report that finding to the affected parties. (RCW 27.44, 68.50; 68.60);
6. The DAHP will handle all consultation with the affected parties as to the future preservation, excavation, and disposition of the remains if there is no federal agency involved.

**APPENDIX C**  
**Drainage Report**

**Final Drainage Report**  
Phase 2 Interim Remedial Action Project  
June 2021

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## Final Drainage Report

Project: Phase 2 Interim Remedial Action Project  
City of Wenatchee  
Wenatchee, Washington

Date: June 2021

Civil Engineer: Perteet Inc.  
505 5th Avenue S, Suite 300  
Seattle, Washington 98104  
Phone #: 206.436.0515

Perteet Project Manager: Jennifer Saugen, PE  
Lead Drainage Design Engineer: Nichole Pellett, PE





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## INTRODUCTION

The purpose of this drainage report is to provide a description of the drainage approach being used on the Phase 2 Interim Remedial Action Project. The report summarizes the design criteria, applicable standards, and the water quality and flow control requirements for the project.

The project will extend northwest from the Saddle Rock Trailhead for approximately 6300 feet. A primitive road exists in the Phase 1 and 2 areas that is approximately 6 feet to 10 feet wide, from the park trailhead up to the park ridgetop. This existing primitive road will be minimally improved to allow the travel of appropriate construction vehicles and equipment during construction along the roadway. The road will be improved and widened to a consistent 10-foot width. Improvements also include installing water bars along the roadway to prevent erosion (see the Design Criteria Minimum Requirements section of this report). The improved road will be used to remove a waste rock pile as a result of historic mining activities at the site. A vicinity map is shown in Figure 1.

## EXISTING SITE CONDITIONS

The project site is currently undeveloped and consists of soil, rock, and gravel, with areas of erosion. Existing roadway grade varies from 0% to 33%. The project site is located within the Dry Gulch Preserve, located to the west of Wenatchee City limits. The project consists of improving the existing gravel road (average width of 6-foot) with a 10-foot wide gravel roadway. The ground cover consists primarily of dryland grasses and shrubs. A stormwater swale was installed as a part of the Phase 1 Interim Removal Action, located downhill of SR01 and SR02. The swale is still in use and is expected to remain after Phase 2 is complete. There is no existing stormwater infrastructure present in the vicinity of the primitive road within the project limits of Phase 2. Any stormwater runoff in the project area that is not infiltrated into the soil sheet flows south and east toward low points and ultimately will route beneath Dry Gulch Rd in a 42" culvert. This site consists of one Threshold Discharge Area (TDA). The TDA Key Map can be seen in Figures A-17 and A-18 in Appendix A. See also Figures A-1 through A-4 for the existing drainage condition figures and see the Downstream Analysis section of this report for more information. See Figure 1 for a Vicinity Map of the site.

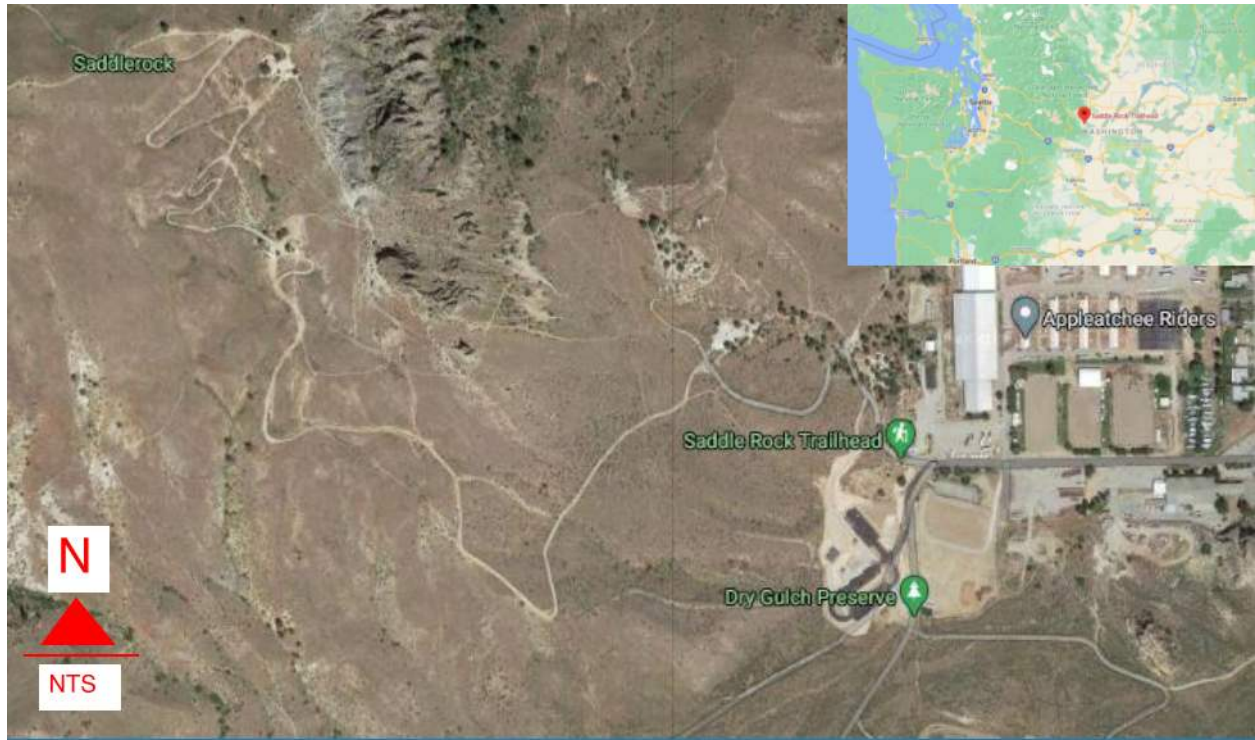


Figure 1. Vicinity Map

On-site soils consist of the following soils:

- BkF Bjork silt loam, 45 to 65 percent slopes
- BoF2 (Bjork-Rock outcrop complex, 25 to 65 percent slopes, eroded)
- CaB (Cashmere sandy loam, 3 to 8 percent slopes)
- CaC (Cashmere sandy loam, 8 to 15 percent slopes)
- CwB (Cowiche silt loam, 3 to 8 percent slopes)
- We (Cowiche silt loam, 25 to 45 percent slopes)
- Ro (Rock outcrop)

See Figure 2 for a view of the site soils, gathered from the National Resource Conservation Service website.

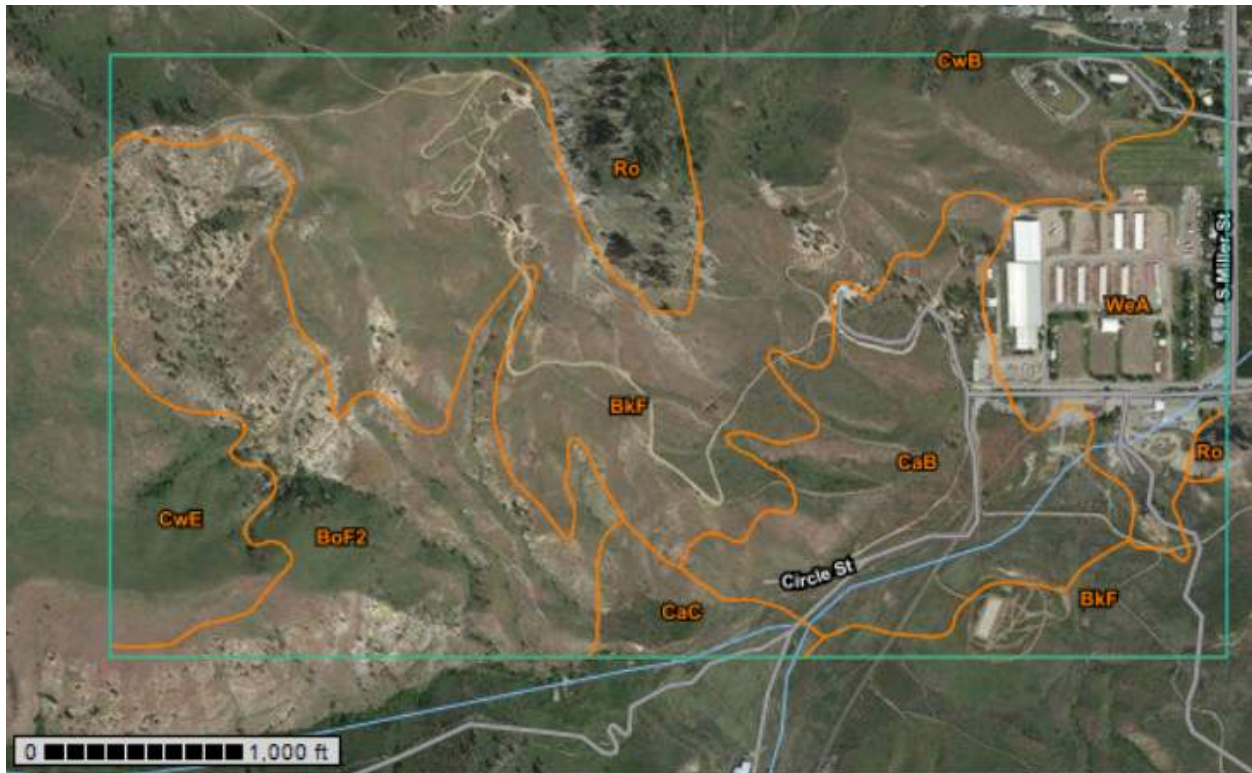


Figure 2. Site Soil Map

## DEVELOPED SITE CONDITIONS

The proposed project will improve approximately 6,400 lineal feet of an existing gravel roadway that is approximately 6 to 10-feet wide with a consistently 10-foot wide gravel roadway as required for construction equipment (see the Design Criteria Minimum Requirements section of this report). Three culverts as well as water bars will be added to cut down on erosion. See the Proposed Drainage Conditions Map in Appendix A (Figures A-9 through A-12).

## OFF-SITE ANALYSIS

Perteet visited the site on Monday, July 27, 2020. The weather was sunny and windy with a temperature around 80 degrees Fahrenheit. The purpose of the visit was to complete a site analysis. In addition, GIS and Google Earth Pro were used to complete the upstream and downstream analysis.

### Upstream Analysis

The project is located on a bluff in the Dry Gulch Preserve located to the west of Wenatchee, WA. The most northeast end of the roadway is located at the top of the bluff. Therefore, at the top of the roadway there is no upstream offsite runoff. The road then winds down the hill and upstream runoff sheet flows across the road as it winds down the bluff from the west and the north. Refer to Figure A-19 in appendix A of this report for the Upstream Analysis Map. The proposed condition proposes three culverts. Therefore, the upstream area draining to each culvert location was delineated and included in Figure A-19. From downstream to upstream, the basin areas are 392,513 SF, 278,104 SF and 411,687 SF.

### Downstream Analysis

Runoff sheet flows down the bluff generally towards the south and the east generally towards the trailhead location. It is ultimately captured in a 42" culvert that crosses under Dry Gulch Rd located to the south of the intersection with Circle St (see Figure A-20. Downstream Analysis in Appendix A). The project will add 3 culverts in order to cut down on erosion. The downstream flow paths from these culverts do not intersect within ¼ mile from discharging from the site. Therefore, the site has three distinct Threshold Discharge Areas (TDAs).

## DESIGN CRITERIA (MINIMUM REQUIREMENTS)

The City of Wenatchee has adopted the Department of Ecology Stormwater Management Manual for Eastern Washington and has approved the use of the 2019 draft manual. According to Chapter 2.6 of the manual, the project type is a "redevelopment" which is "the replacement or improvement of impervious surfaces, including buildings and other structures, and replacement or improvement of impervious parking and road surfaces, that is not part of a routine maintenance activity."

The project lies within Climate Region 2.

Table 1 provides a brief discussion of the applicability to this project of each core element in the Eastern Washington Stormwater Management Manual.

**Table 1. Summary of Core Elements Required.**

Core Element		Required or Exempt
1	Preparation of a Stormwater Site Plan	Yes – required for all Redevelopment projects
2	Construction Stormwater Pollution Prevention	Yes – required for all Redevelopment projects
3	Source Control of Pollution	Yes – required for all Redevelopment projects
4	Preservation of Natural Drainage Systems	Yes – required for all Redevelopment projects
5	Runoff Treatment	Exempt – The project adds more than 5000 SF of NPGIS (not PGIS) since it is not a high use site and does not discharge to a UIC well. It also satisfies the requirement for Full Dispersion. See the flow chart for determining applicable core elements for redevelopment projects (Figure 2.2), from the 2019 ecology manual, located in Appendix B, for further detail.
		Basic Treatment – Yes see above.
		Metals Treatment – No. This is a roadway with an Average Daily Traffic (ADT) that is less than 7,500 vehicles per day. It is a maintenance road that will rarely see traffic.
		Oil Control – Exempt, only required for high use sites.
		Phosphorus Treatment – Exempt, only required for sites that discharge to a water body that has phosphorus treatment requirements designated by the federal, state, or local government. The Columbia River is not listed as such a water body.
6	Flow Control	Exempt This project creates more than 10,000 square feet of new impervious surfaces and does not discharge directly to an exempt body of water. However, the following projects and discharges are exempt from flow control requirements to protect stream morphology. 1) Any project able to disperse, without discharge to surface waters, the total 25-year runoff volume for the proposed development condition on property that is under the functional 2019 Stormwater Management Manual for Eastern Washington, Chapter 2 – Page 97. See the guidelines for dispersion in Chapter 6.5 – Dispersion BMPs, particularly BMP F6.42: Full Dispersion. Details on that BMP have been included in Appendix C for convenience.
7	Operation and Maintenance	Required. Operation and maintenance guidelines are included as Appendix D of this report.
8	Local Requirements	Required for all New Development projects

Site design plans for the project will be created showing the proposed improvements and how to implement them. These plans include Site Preparation plans showing all temporary erosion and sediment control elements, and Roadway Plans showing all roadway and stormwater elements. The Roadway Plans bring the project into compliance with Core Element #1, and the Site Preparation Plans are a step toward compliance with Core Element #2. To become fully compliant with Core Element #2, the project will be required to have a Construction Stormwater Pollution Prevention Plan (CSWPPP). Source Control BMPs applicable to all sites are as follows:

- S101E: BMPs for Formation of a Pollution Prevention Team
- S102E: BMPs for Preventative Maintenance/Good Housekeeping
- S104E: BMPs for Spill Prevention and Cleanup
- S105E: BMPs for Employee Training
- S106E: BMPs for Inspections
- S107E: BMPs for Record Keeping
- S108E: BMPs for Correcting Illicit Connections to Storm Drains

Core Element #3, Source Control of Pollution will be met for this project through the planned flow control BMP. The planned flow control BMP for this site is BMP F6.42: Full Dispersion. This site is projected to be a maintenance roadway. No refueling or vehicle washing operations will take place on the site. Proper maintenance of the on-site stormwater facilities which consist of BMP 203E: Water Bars will be the only necessary Source Pollution Control BMP. See Appendix C to view these BMPs.

This project complies with Core Element #4, Preservation of Natural Drainage Systems, by continuing to allow runoff to discharge as it currently does across the bluff.

Per Core Element #8, the project is required to apply any local requirements as well. The City of Wenatchee's Stormwater Standards add no additional requirements to the project.

See Appendix D for the Operations and Maintenance Manual required for compliance with Core Element #7.

## WATER QUALITY TREATMENT (CE #5)

This project is exempt from water quality treatment based on chapter 2 page 91 of the 2019 Stormwater Management Manual for Eastern Washington, "Runoff treatment is required for all projects creating 5,000 SF or more of new pollution generating impervious surface (PGIS) and replaced surface unless the discharge satisfies the requirements for full dispersion. The land use calculations assumed conservatively that the total new non pollution generating impervious surface (NPGIS) added was a consistent widening of the roadway from 6-feet to 10-feet. This project creates 37,716 SF of new NPGIS surfaces and satisfies the requirements for full dispersion (see Table 2).

## FLOW CONTROL

The Phase 2 Interim Remedial Action Project is exempt from flow control because it meets local requirements for full dispersion. Table 2 provides a summary of surface types in the existing and proposed conditions. See also Figures A-5 through A-8 for the Existing Land Use areas and Figures A-13 through A-16 for the Proposed Land



Use areas in Appendix A of this report. A TDA Key Map has also been included in Figures A-17 and A-18. Flow control will be provided with BMP F6.42: Full Dispersion. See Appendix C for required compliance with Core Element #6.

**Table 2. TDA 1: Summary of Surface Types.**

Surface Type	Existing Condition (Square Feet)	Proposed Condition (Square Feet)
PGIS	0	0
NPGIS	15,839	15,839
Pervious Surface (Landscaped or Undeveloped)	21,882	11,322
Replaced NPGIS	0	0
New NPGIS	0	10,560
Total Impervious	21,882	26,399
Total Area	37,721	37,721

**Table 3. TDA 2: Summary of Surface Types.**

Surface Type	Existing Condition (Square Feet)	Proposed Condition (Square Feet)
PGIS	0	0
NPGIS	8,626	8,627
Pervious Surface (Landscaped or Undeveloped)	8,536	2,636
Replaced NPGIS	0	0
New NPGIS	0	5,751
Total Impervious	8,626	14,378
Total Area	17,162	37,721

**Table 4. TDA 3: Summary of Surface Types.**

Surface Type	Existing Condition (Square Feet)	Proposed Condition (Square Feet)
PGIS	0	0
NPGIS	13,251	13,251
Pervious Surface (Landscaped or Undeveloped)	18,720	9,887
Replaced NPGIS		0
New NPGIS		8,829
Total Impervious	13,251	22,080
Total Area	31,971	31,971

As mentioned previously, the site meets the requirements using Full Dispersion to treat the runoff.

## PROJECT CONVEYANCE

Stormwater will sheet flow from the upstream basins and into three-12” culverts. The Santa Barbara Urban Hydrograph method was used to calculate the runoff volume reaching the culverts. Then the culverts were checked that this flow could be conveyed. Per Figure 4.1 in the Manual, Wenatchee and the project location are located within Region 2, the Central Basin. Region 2 has storms like the SCS Type 1A storm. These calculations are located in Appendix C.

The site meets the requirements using of BMP 203E: Water Bars to treat the runoff. A water bar is a small ditch or ridge of material that is constructed diagonally across a road or right-of-way to divert stormwater runoff from the road surface. See Appendix C for required compliance with Core Element #5.

Water bars are the most feasible BMP for controlling flow rates for this site. A water bar is a small ditch or ridge of material that will be constructed diagonally across the roadway to divert stormwater runoff from the road surface. Water bars shall be placed as required based on roadway slopes. The proposed roadway slopes are to range from just 0% to nearly 30%. Per Table 7.17 of the ecology manual, water bars must be placed as follows:

**Table 5. Water Bar Spacing Guidelines.**

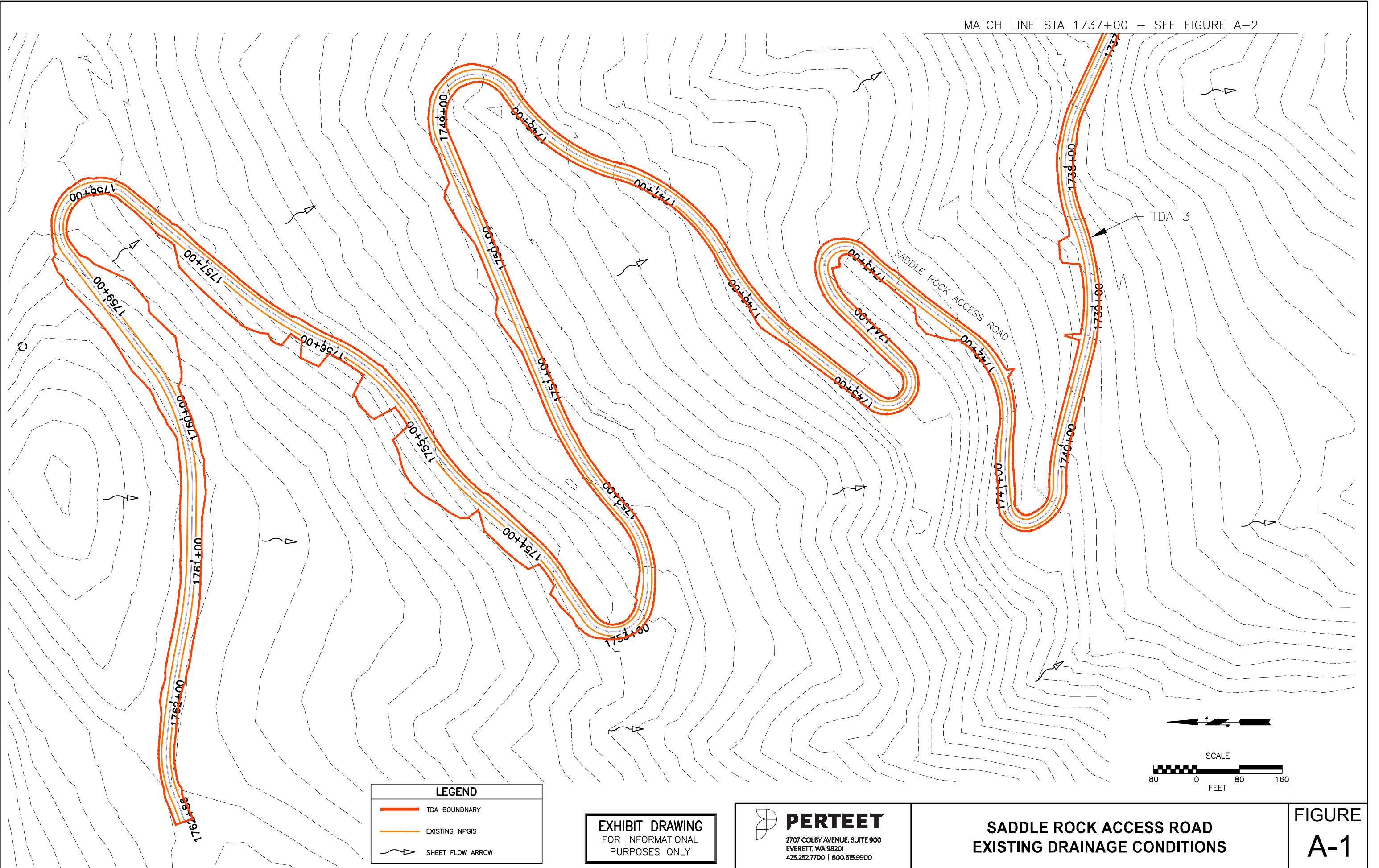
Slope Along Road (%)	Spacing (feet)
< 5	125
5-10	100
10-20	75
20-35	50

APPENDIX A  
Report Figures

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Feb 12, 2021 - 12:35pm nichole.pellet X:\Wenatchee, City of\Projects\20190234 - Saddle Rock Access Road\CADD\05 - Exhibits\Drainage Exhibits\FIGURE A1-A4 Existing Drainage.dwg Layout Name: Figure A-1

MATCH LINE STA 1737+00 - SEE FIGURE A-2



LEGEND	
	TDA BOUNDARY
	EXISTING NPGS
	SHEET FLOW ARROW

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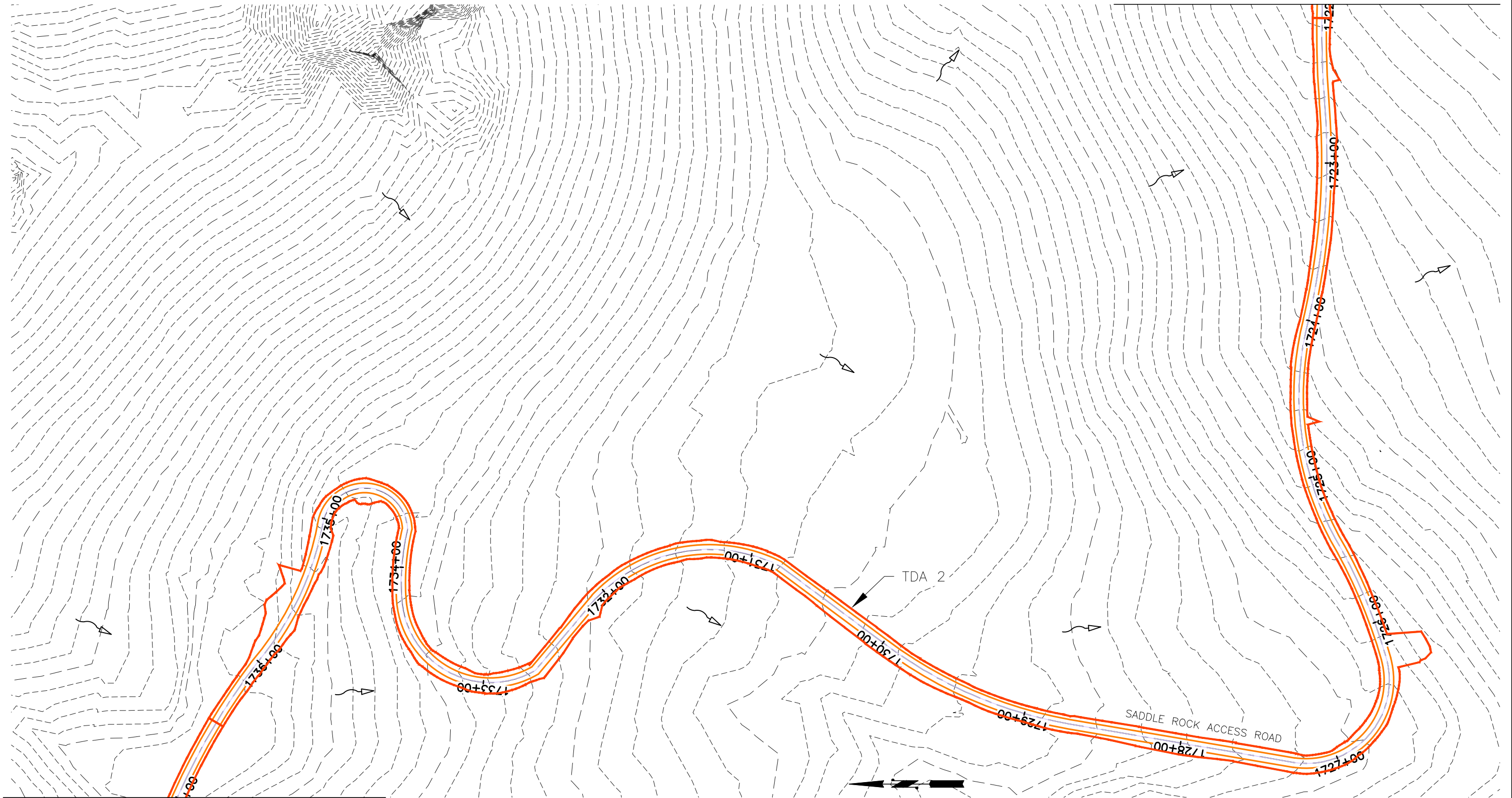
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**SADDLE ROCK ACCESS ROAD**  
**EXISTING DRAINAGE CONDITIONS**

**FIGURE**  
**A-1**

Feb 12, 2021 - 12:35pm nichole.pellet X:\Wenatchee, City of\Projects\20190234 - Saddle Rock Access Road\CADD\05 - Exhibits\Drainage Exhibits\FIGURE A1-A4 Existing Drainage.dwg Layout Name: Figure A-2

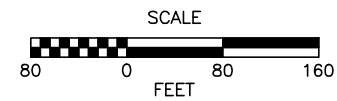
MATCH LINE STA 1722+00 - SEE FIGURE A-3



MATCH LINE STA 1737+00 - SEE FIGURE A-1

LEGEND	
	TDA BOUNDARY
	EXISTING NPGIS
	SHEET FLOW ARROW

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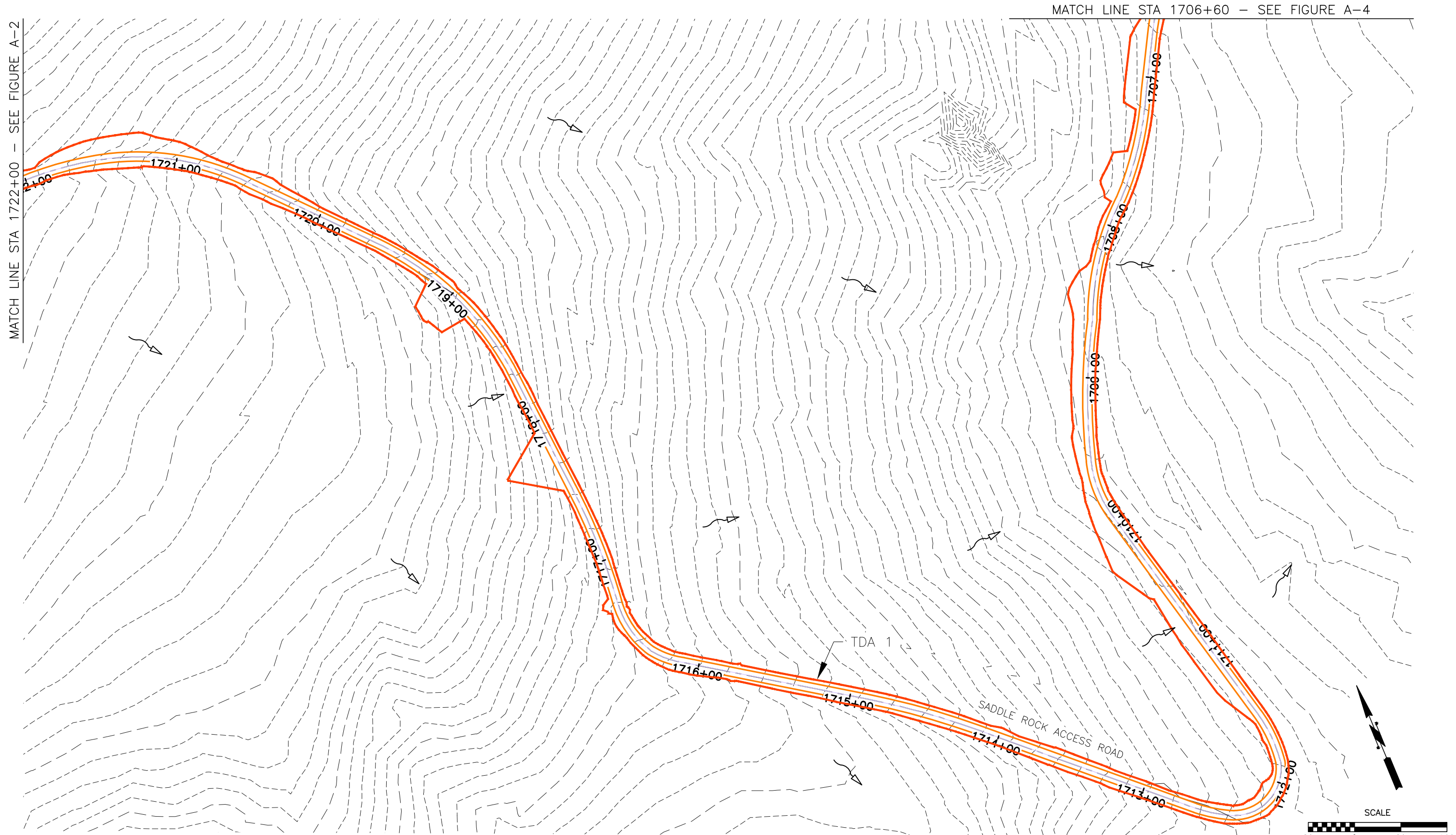
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**SADDLE ROCK ACCESS ROAD  
EXISTING DRAINAGE CONDITIONS**

**FIGURE  
A-2**



Feb 12, 2021 - 12:36pm nichole.pellet X:\Wenatchee, City of\Projects\20190224 - Saddle Rock Access Road\CADD\05 - Exhibits\Drainage Exhibits\FIGURE A1-A4 Existing Drainage.dwg Layout Name: Figure A-3



LEGEND	
	TDA BOUNDARY
	EXISTING NPGIS
	SHEET FLOW ARROW

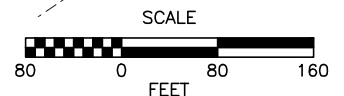
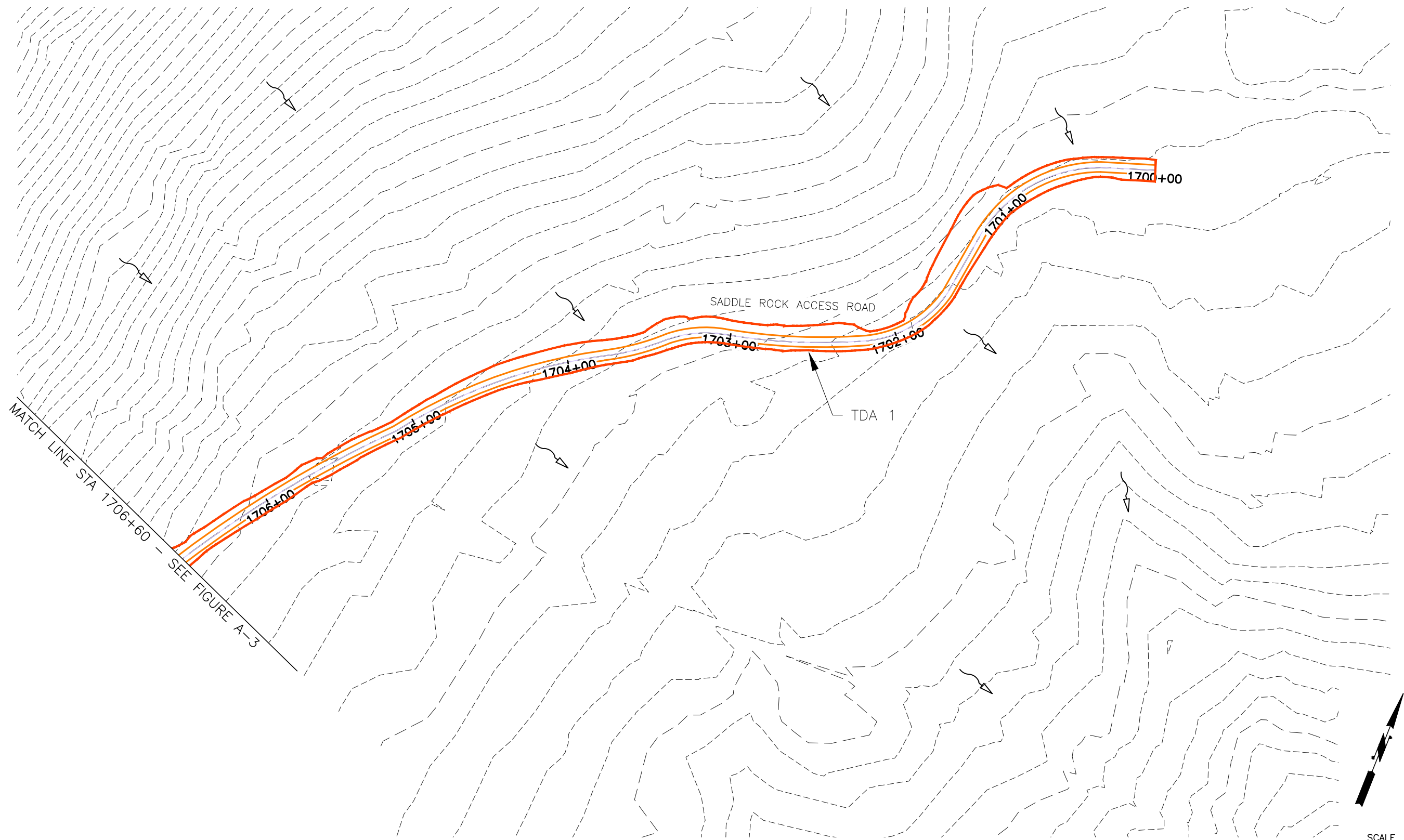
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**SADDLE ROCK ACCESS ROAD**  
**EXISTING DRAINAGE CONDITIONS**

**FIGURE**  
**A-3**

Feb 12, 2021 - 12:37pm nichole.pellet X:\Wenatchee, City of\Projects\20190234 - Saddle Rock Access Road\CADD\05 - Exhibits\Drainage Exhibits\FIGURE A1-A4 Existing Drainage.dwg Layout Name: Figure A-4



LEGEND	
	TDA BOUNDARY
	EXISTING NPGIS
	SHEET FLOW ARROW

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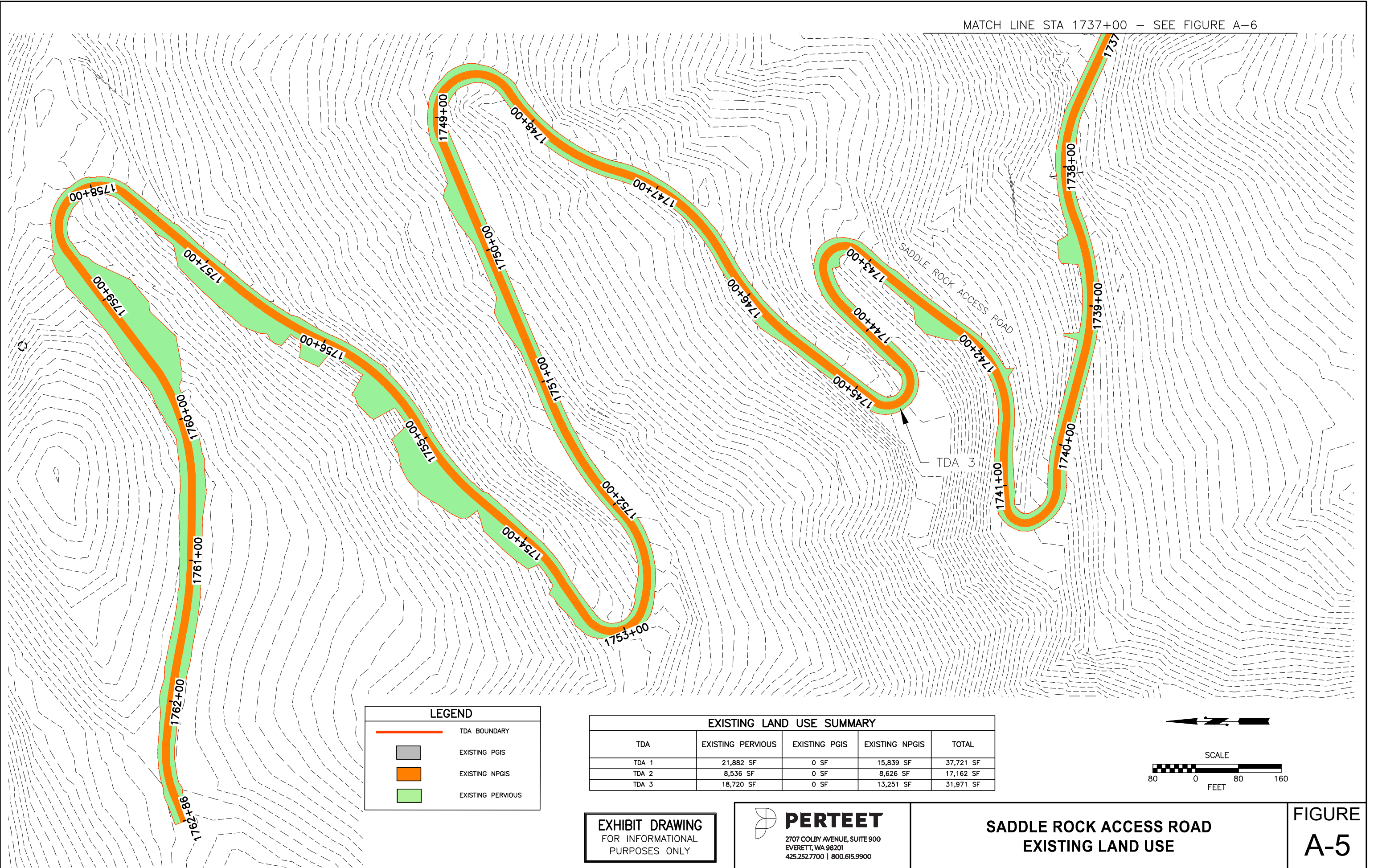
**SADDLE ROCK ACCESS ROAD  
EXISTING DRAINAGE CONDITIONS**

**FIGURE  
A-4**



Feb 12, 2021 - 12:51pm nichole.pellet X:\Wenatchee, City of\Projects\20190234 - Saddle Rock Access Road\CADD\05 - Exhibits\Drainage Exhibits\FIGURE A5-A8 Existing Land Use.dwg Layout Name: Figure A-5

MATCH LINE STA 1737+00 - SEE FIGURE A-6

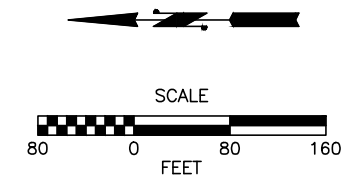


**LEGEND**

	TDA BOUNDARY
	EXISTING PGIS
	EXISTING NPGIS
	EXISTING PERVIOUS

**EXISTING LAND USE SUMMARY**

TDA	EXISTING PERVIOUS	EXISTING PGIS	EXISTING NPGIS	TOTAL
TDA 1	21,882 SF	0 SF	15,839 SF	37,721 SF
TDA 2	8,536 SF	0 SF	8,626 SF	17,162 SF
TDA 3	18,720 SF	0 SF	13,251 SF	31,971 SF



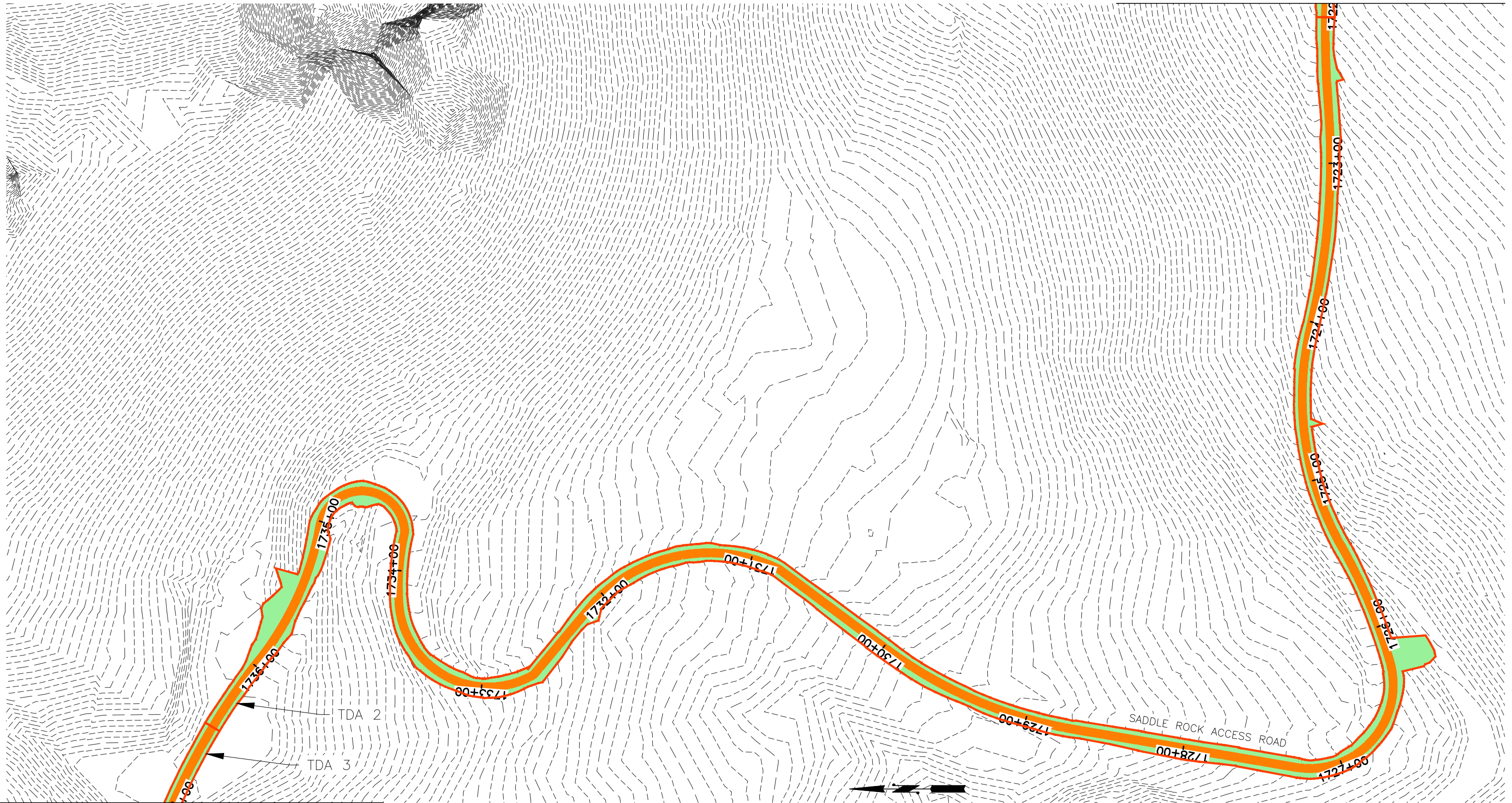
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**SADDLE ROCK ACCESS ROAD  
EXISTING LAND USE**

**FIGURE  
A-5**



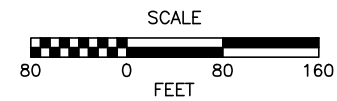


MATCH LINE STA 1737+00 - SEE FIGURE A-5

LEGEND	
	TDA BOUNDARY
	EXISTING PGIS
	EXISTING NPGIS
	EXISTING PERVIOUS

TDA	EXISTING PERVIOUS	EXISTING PGIS	EXISTING NPGIS	TOTAL
TDA 1	21,882 SF	0 SF	15,839 SF	37,721 SF
TDA 2	8,536 SF	0 SF	8,626 SF	17,162 SF
TDA 3	18,720 SF	0 SF	13,251 SF	31,971 SF

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**EXISTING LAND USE**

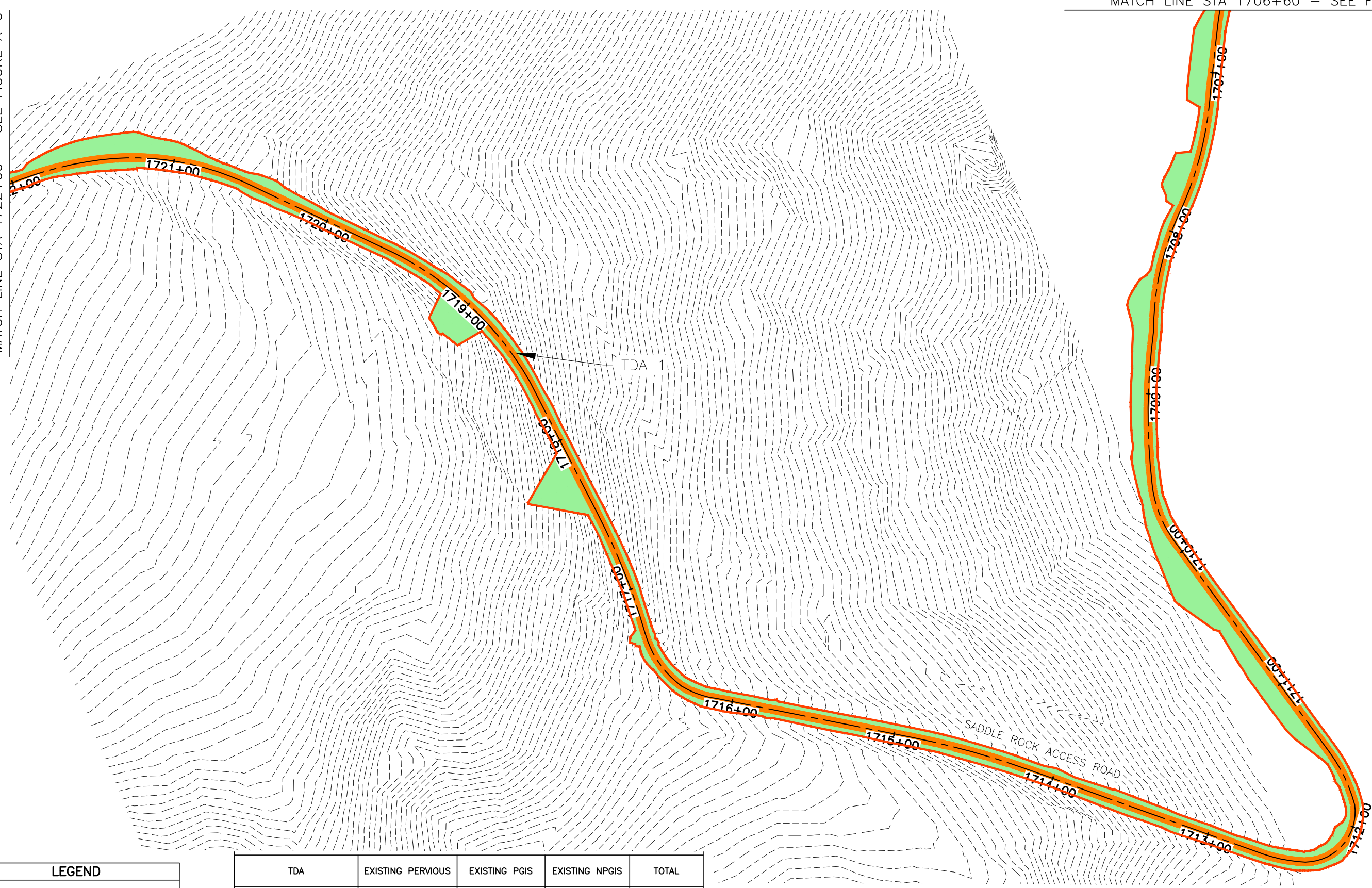
**FIGURE**  
**A-6**



Feb 12, 2021 - 3:49pm nichole.pallat X:\Wenatchee\_City\_of\Projects\20190234 - Saddle Rock Access Road\CADD\05 - Exhibits\Drainage Exhibits\FIGURE A5-A8 Existing Land Use.dwg Layout Name: Figure A-7

MATCH LINE STA 1722+00 - SEE FIGURE A-6

MATCH LINE STA 1706+60 - SEE FIGURE A-8



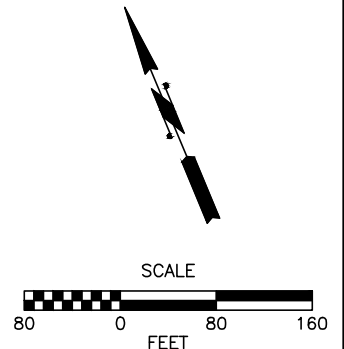
LEGEND	
	TDA BOUNDARY
	EXISTING PGIS
	EXISTING NPGIS
	EXISTING PERVIOUS

TDA	EXISTING PERVIOUS	EXISTING PGIS	EXISTING NPGIS	TOTAL
TDA 1	21,882 SF	0 SF	15,839 SF	37,721 SF
TDA 2	8,536 SF	0 SF	8,626 SF	17,162 SF
TDA 3	18,720 SF	0 SF	13,251 SF	31,971 SF

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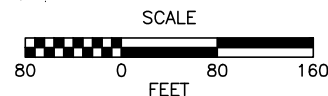
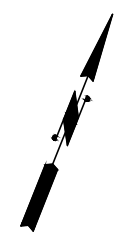
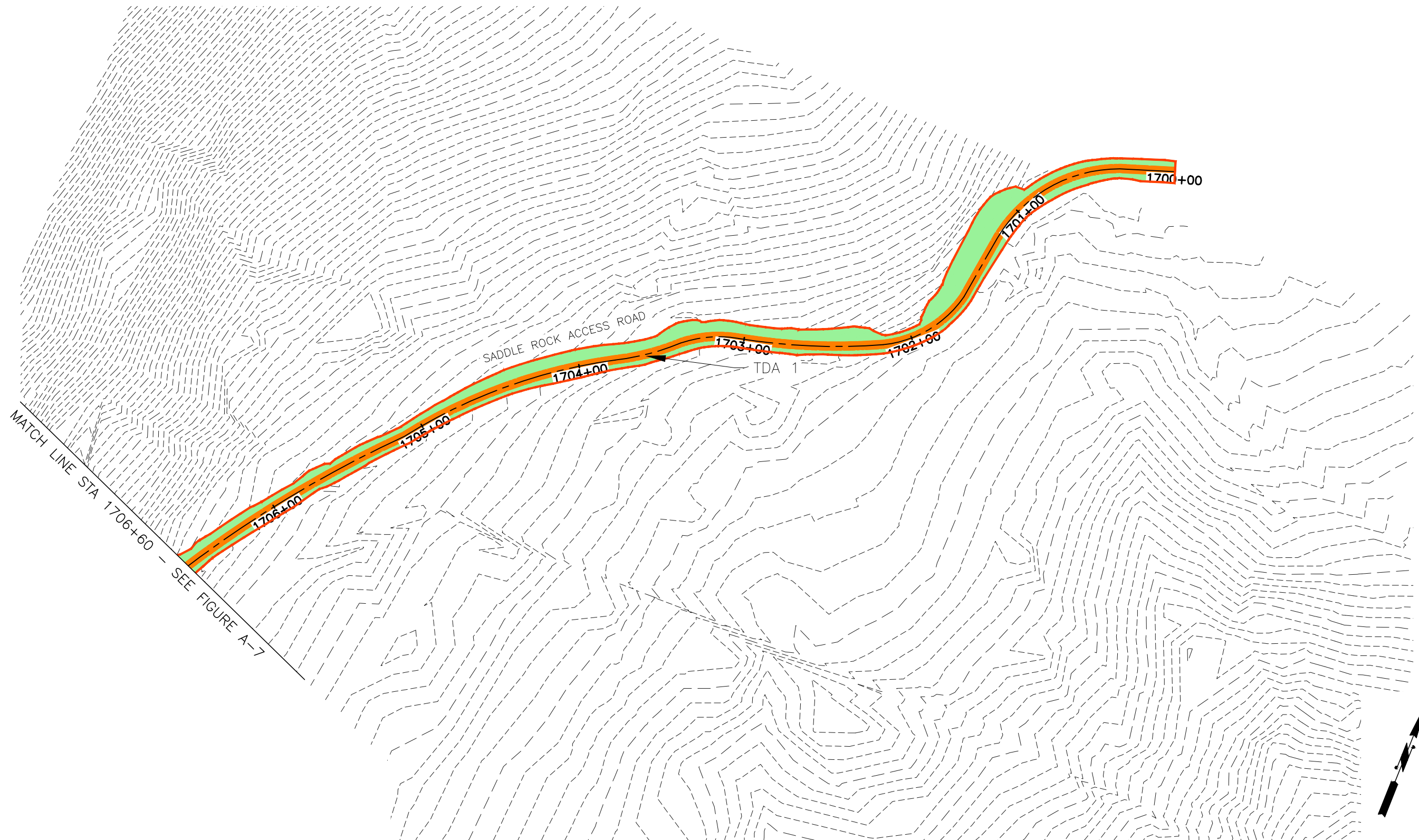
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**SADDLE ROCK ACCESS ROAD  
EXISTING LAND USE**



**FIGURE  
A-7**

Feb 12, 2021 - 3:51pm nichole.pallat X:\Wenatchee, City of\Projects\20190234 - Saddle Rock Access Road\CADD\05 - Exhibits\Drainage Exhibits\FIGURE A5-A8 Existing Land Use.dwg Layout Name: Figure A-8



LEGEND	
	TDA BOUNDARY
	EXISTING PGIS
	EXISTING NPGIS
	EXISTING PERVIOUS

TDA	EXISTING PERVIOUS	EXISTING PGIS	EXISTING NPGIS	TOTAL
TDA 1	21,882 SF	0 SF	15,839 SF	37,721 SF
TDA 2	8,536 SF	0 SF	8,626 SF	17,162 SF
TDA 3	18,720 SF	0 SF	13,251 SF	31,971 SF

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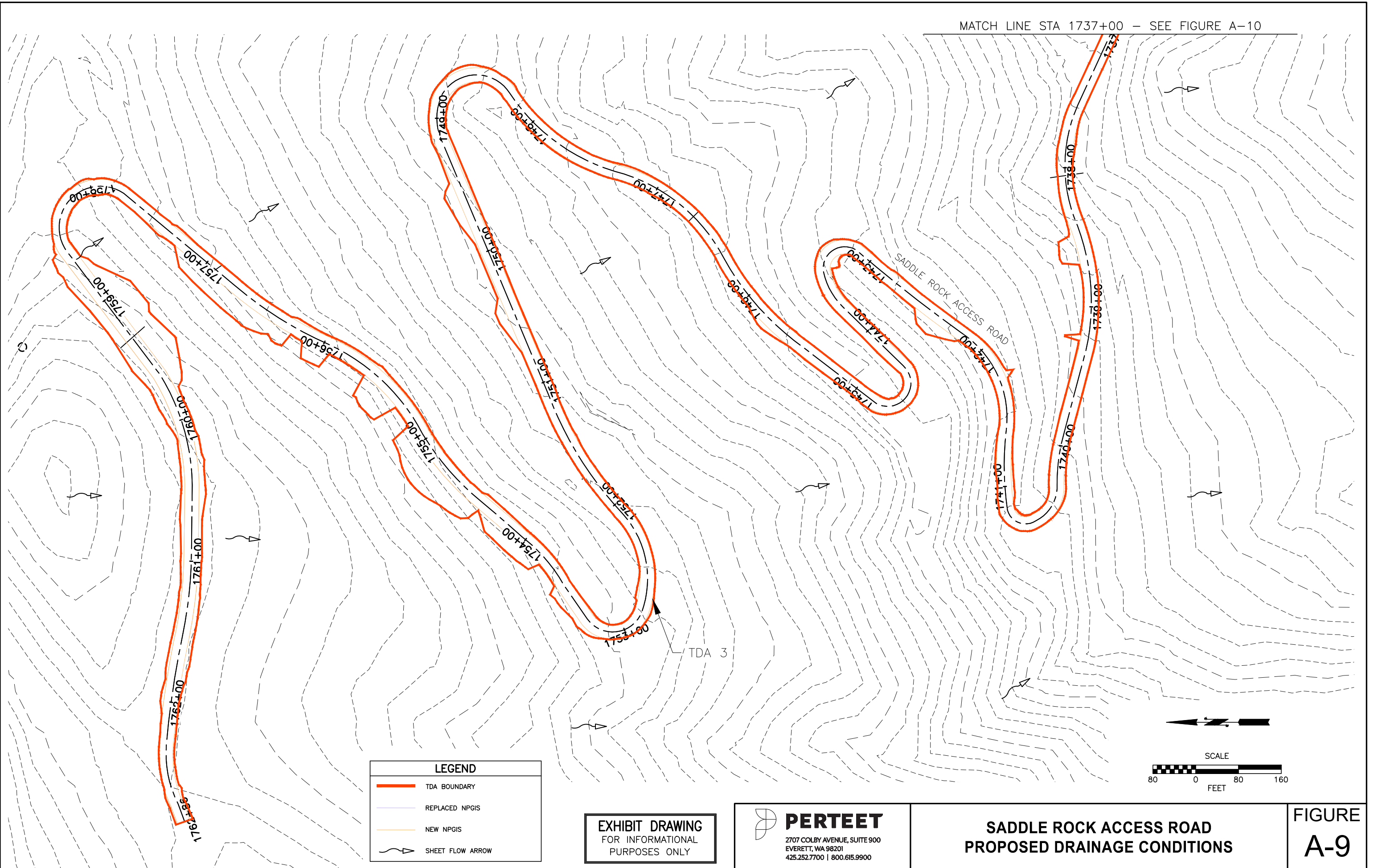
**SADDLE ROCK ACCESS ROAD  
EXISTING LAND USE**

**FIGURE  
A-8**



Feb 12, 2021 - 1:46pm nichole.pallat X:\Wenatchee\_City\_of\Projects\2019\20234 - Saddle Rock Access Road\CADD\05 - Exhibits\Drainage Exhibits\FIGURE A9-A12 Proposed Drainage.dwg Layout Name: Figure A-9

MATCH LINE STA 1737+00 - SEE FIGURE A-10



LEGEND	
	TDA BOUNDARY
	REPLACED NPGIS
	NEW NPGIS
	SHEET FLOW ARROW

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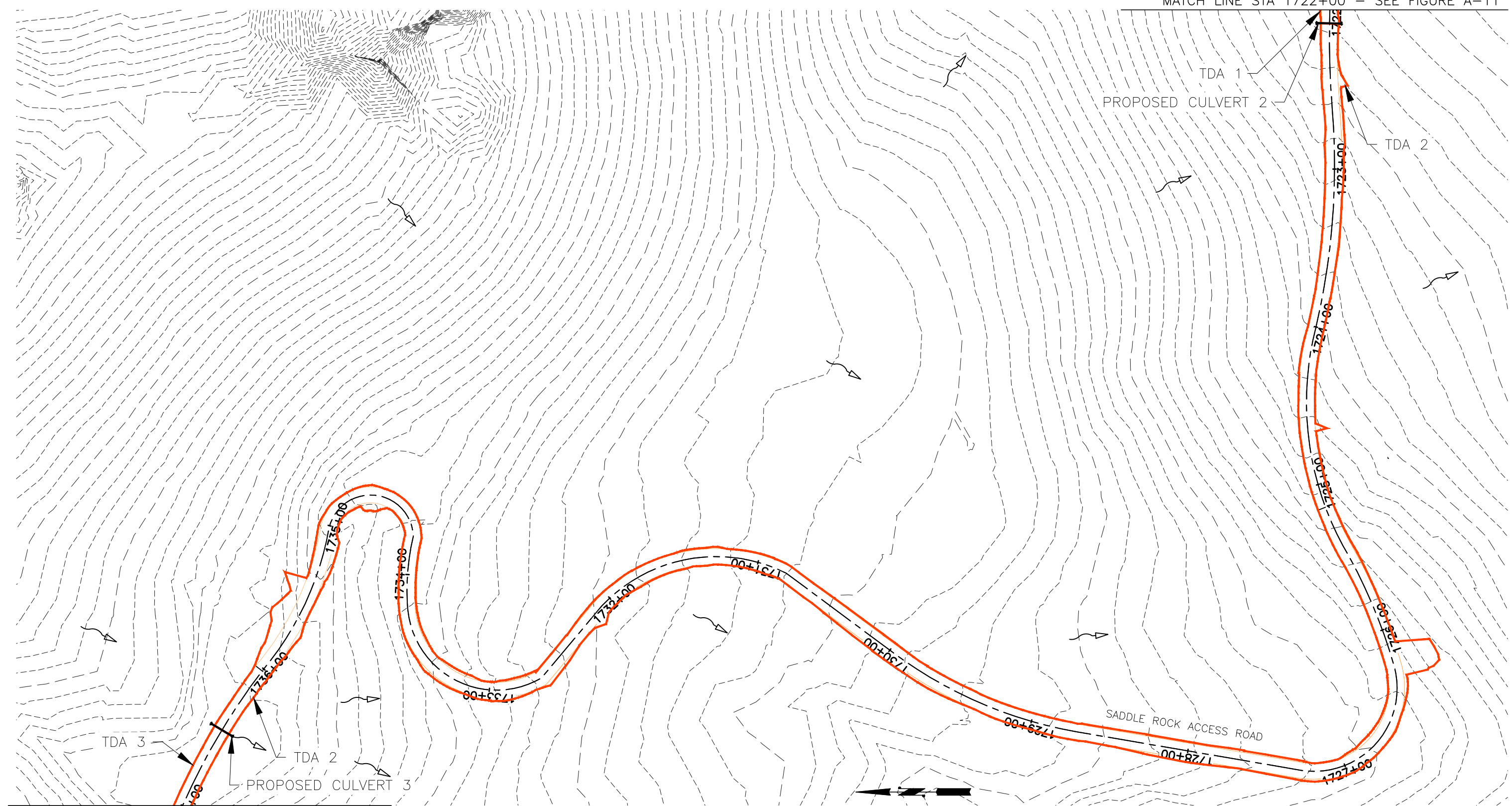
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**SADDLE ROCK ACCESS ROAD  
PROPOSED DRAINAGE CONDITIONS**

**FIGURE  
A-9**

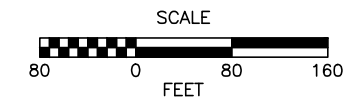
Feb 12, 2021 - 1:47pm nichole.pallat X:\Projects\20190234 - Saddle Rock Access Road\CADD\05 - Exhibits\Drainage Exhibits\FIGURE A9-A12 Proposed Drainage.dwg Layout Name: Figure A-10

MATCH LINE STA 1722+00 - SEE FIGURE A-11



MATCH LINE STA 1737+00 - SEE FIGURE A-9

LEGEND	
	TDA BOUNDARY
	REPLACED NPGIS
	NEW NPGIS
	SHEET FLOW ARROW



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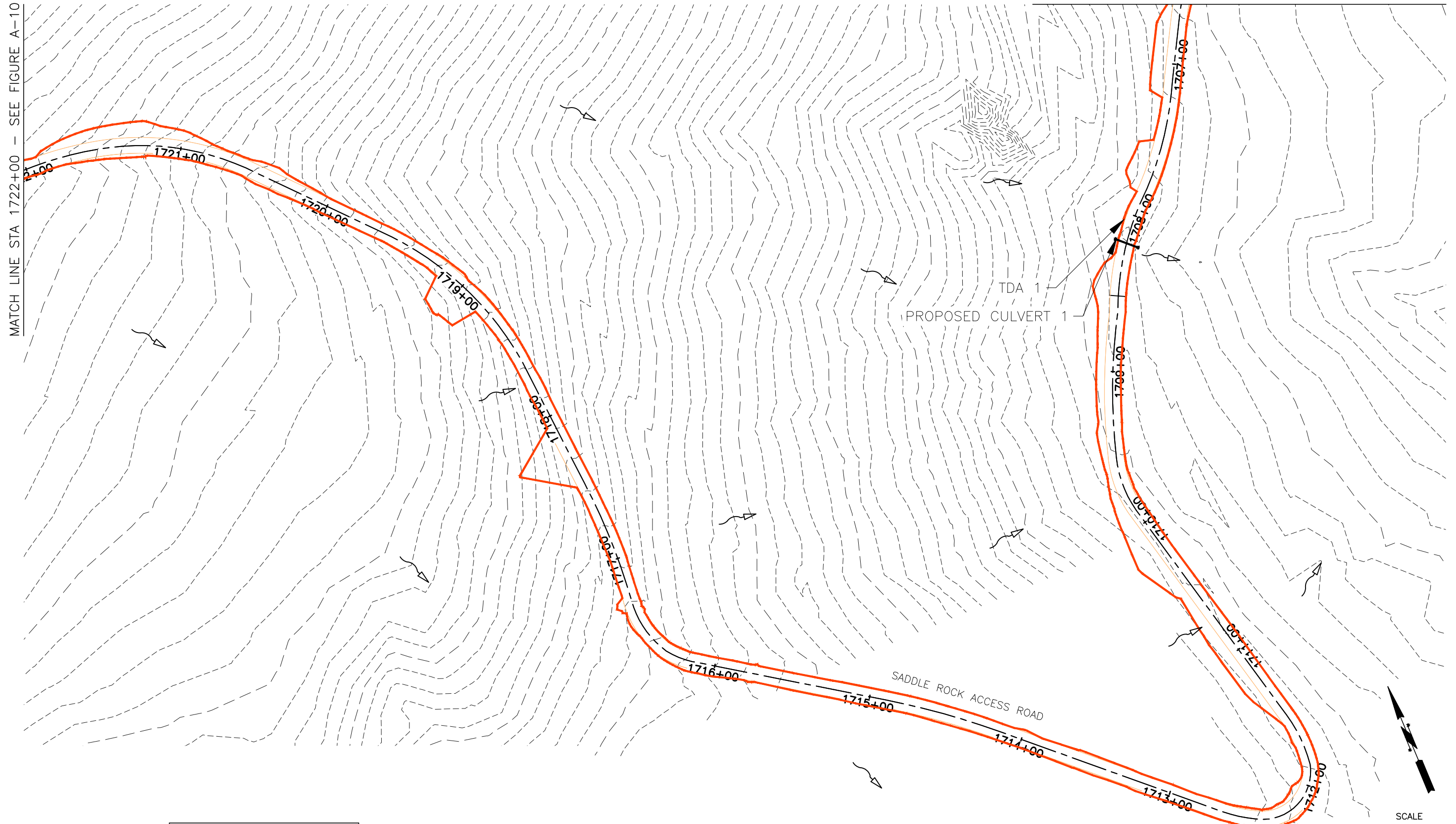
**SADDLE ROCK ACCESS ROAD  
PROPOSED DRAINAGE CONDITIONS**

**FIGURE  
A-10**

Feb 12, 2021 - 1:48pm nichole.pellat X:\Wenatchee\_City\Projects\2019\2023\4 - Saddle Rock Access Road\CADD\05 - Exhibits\Drainage Exhibits\FIGURE A9-A12 Proposed Drainage.dwg Layout Name: Figure A-11

MATCH LINE STA 1722+00 - SEE FIGURE A-10

MATCH LINE STA 1706+60 - SEE FIGURE A-12



LEGEND	
	TDA BOUNDARY
	REPLACED NPGIS
	NEW NPGIS
	SHEET FLOW ARROW

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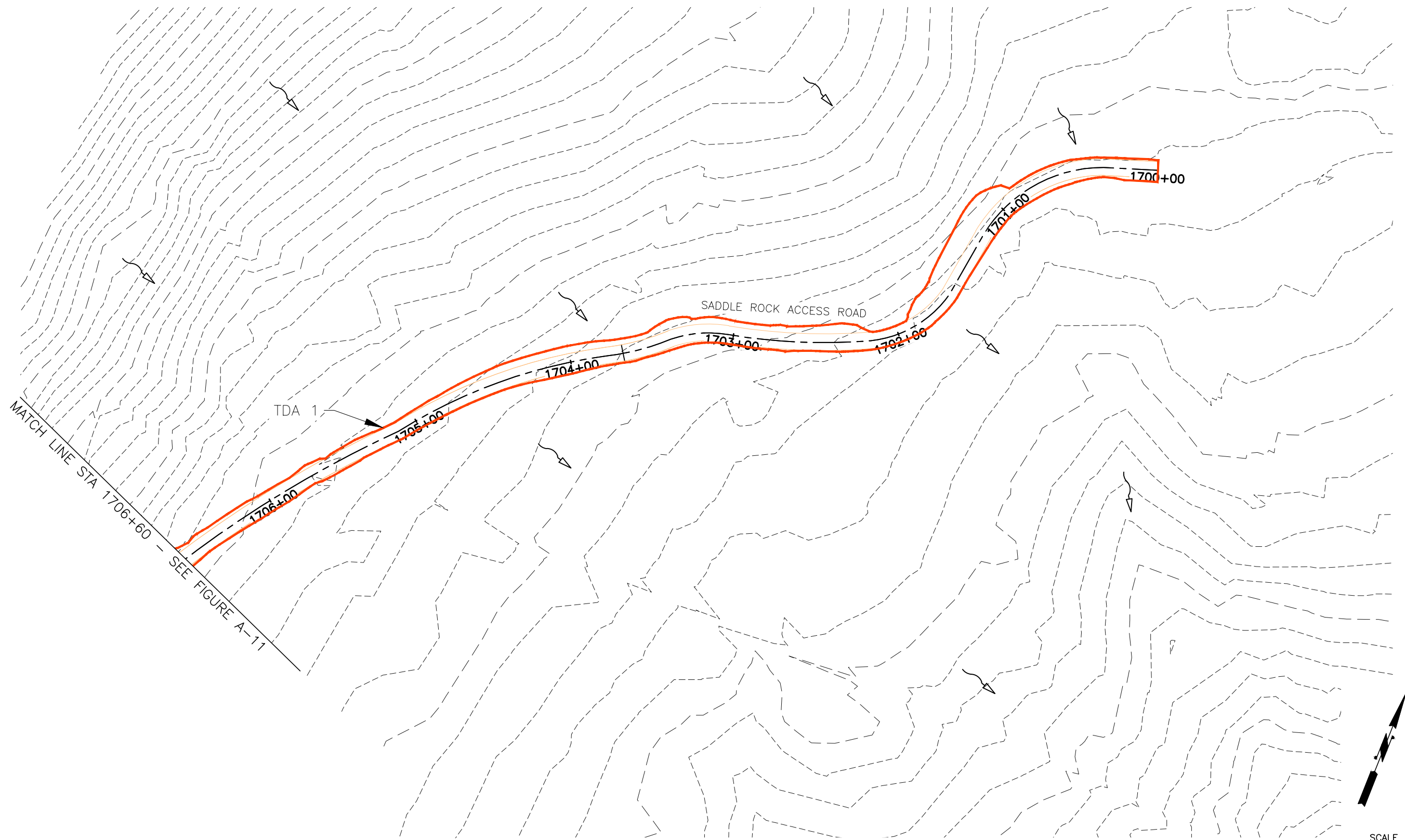
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**SADDLE ROCK ACCESS ROAD  
PROPOSED DRAINAGE CONDITIONS**

**FIGURE  
A-11**



Feb 12, 2021 - 1:48pm nichole.pellatt X:\Wenatchee\_City\_of\Projects\2019\0234 - Saddle Rock Access Road\CADD\05 - Exhibits\Drainage Exhibits\FIGURE A9-A12 Proposed Drainage.dwg Layout Name: Figure A-12



LEGEND	
	TDA BOUNDARY
	REPLACED NPGIS
	NEW NPGIS
	SHEET FLOW ARROW

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425.252.7700 | 800.615.9900

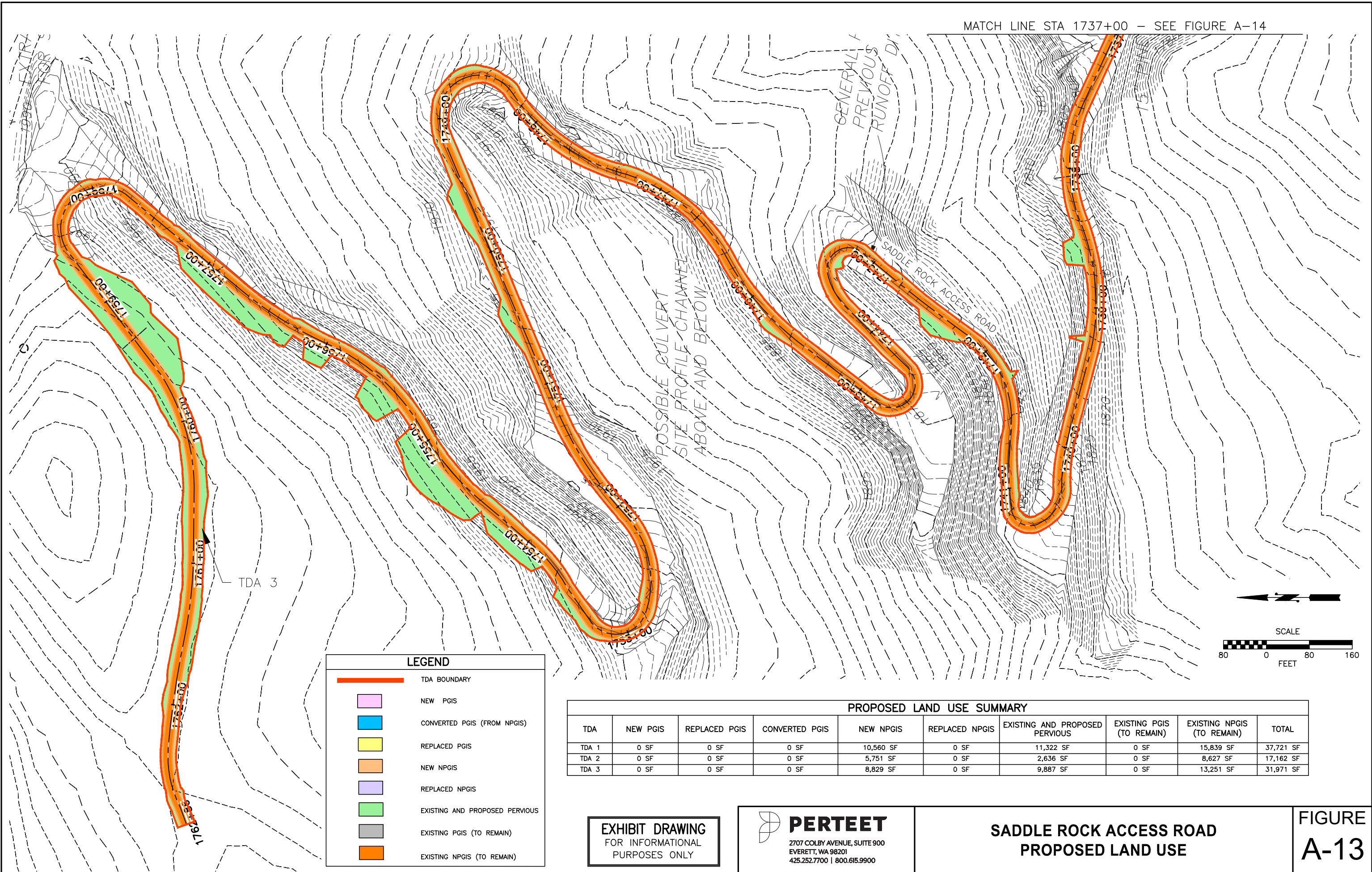
**SADDLE ROCK ACCESS ROAD  
PROPOSED DRAINAGE CONDITIONS**

**FIGURE  
A-12**



Feb 12, 2021 - 3:06pm nichole.pallat X:\Wenatchee\_City\_of\Projects\20190234 - Saddle Rock Access Road\CADD\05 - Exhibits\Drainage Exhibits\FIGURE A13-A16 Proposed Land Use.dwg Layout Name: Figure A-13

MATCH LINE STA 1737+00 - SEE FIGURE A-14



**LEGEND**

- TDA BOUNDARY
- NEW PGIS
- CONVERTED PGIS (FROM NPGIS)
- REPLACED PGIS
- NEW NPGIS
- REPLACED NPGIS
- EXISTING AND PROPOSED PERVIOUS
- EXISTING PGIS (TO REMAIN)
- EXISTING NPGIS (TO REMAIN)

**PROPOSED LAND USE SUMMARY**

TDA	NEW PGIS	REPLACED PGIS	CONVERTED PGIS	NEW NPGIS	REPLACED NPGIS	EXISTING AND PROPOSED PERVIOUS	EXISTING PGIS (TO REMAIN)	EXISTING NPGIS (TO REMAIN)	TOTAL
TDA 1	0 SF	0 SF	0 SF	10,560 SF	0 SF	11,322 SF	0 SF	15,839 SF	37,721 SF
TDA 2	0 SF	0 SF	0 SF	5,751 SF	0 SF	2,636 SF	0 SF	8,627 SF	17,162 SF
TDA 3	0 SF	0 SF	0 SF	8,829 SF	0 SF	9,887 SF	0 SF	13,251 SF	31,971 SF

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





**SADDLE ROCK ACCESS ROAD  
PROPOSED LAND USE**

**FIGURE  
A-13**

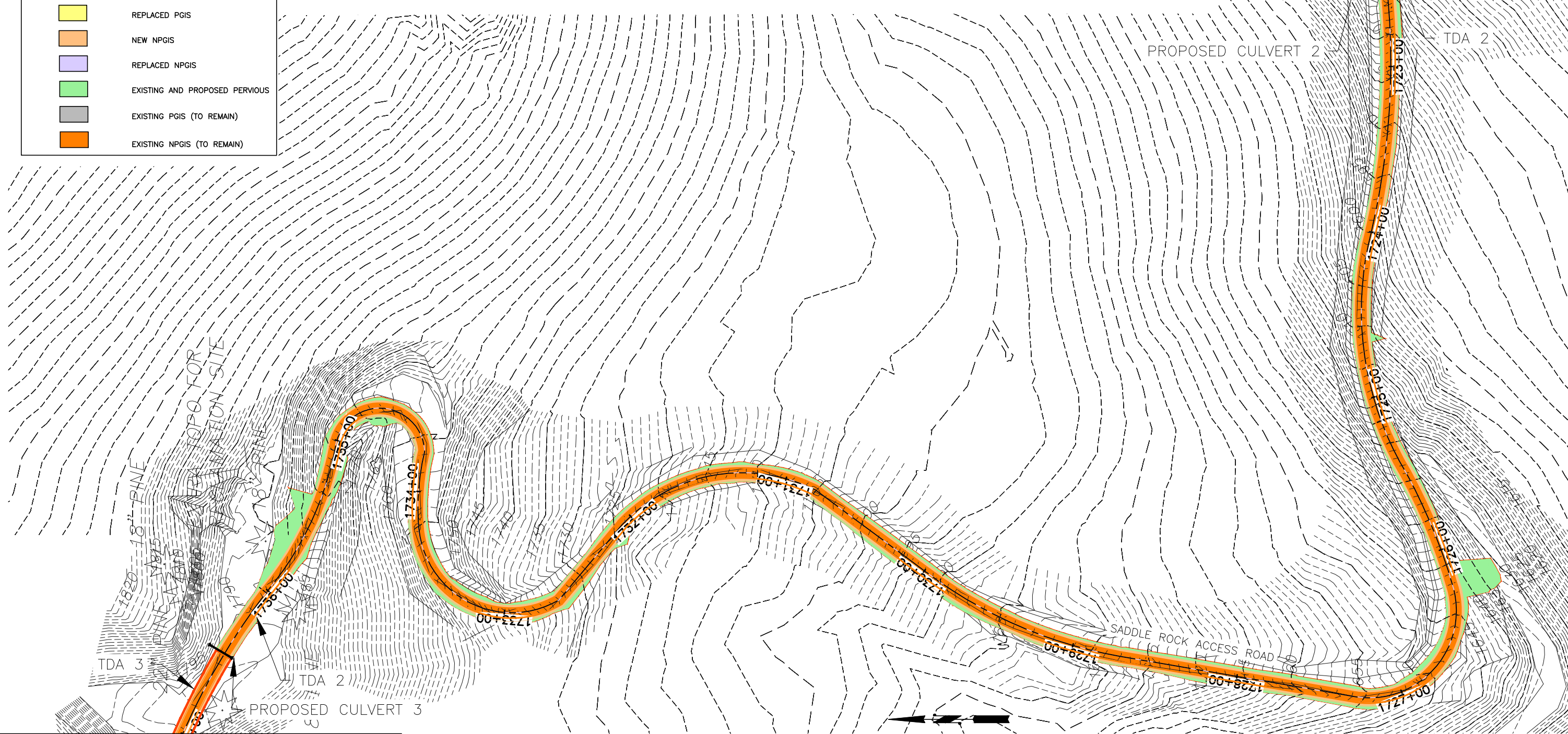


Feb 12, 2021 - 3:09pm nichole.pallat X:\Projects\20190234 - Saddle Rock Access Road\CADD\05 - Exhibits\Drainage Exhibits\FIGURE A13-A16 Proposed Land Use.dwg Layout Name: Figure A-14

MATCH LINE STA 1722+00 - SEE FIGURE A-15

LEGEND	
	TDA BOUNDARY
	NEW PGIS
	CONVERTED PGIS (FROM NPGIS)
	REPLACED PGIS
	NEW NPGIS
	REPLACED NPGIS
	EXISTING AND PROPOSED PERVIOUS
	EXISTING PGIS (TO REMAIN)
	EXISTING NPGIS (TO REMAIN)

PROPOSED LAND USE SUMMARY									
TDA	NEW PGIS	REPLACED PGIS	CONVERTED PGIS	NEW NPGIS	REPLACED NPGIS	EXISTING AND PROPOSED PERVIOUS	EXISTING PGIS (TO REMAIN)	EXISTING NPGIS (TO REMAIN)	TOTAL
TDA 1	0 SF	0 SF	0 SF	10,560 SF	0 SF	11,322 SF	0 SF	15,839 SF	37,721 SF
TDA 2	0 SF	0 SF	0 SF	5,751 SF	0 SF	2,636 SF	0 SF	8,627 SF	17,162 SF
TDA 3	0 SF	0 SF	0 SF	8,829 SF	0 SF	9,887 SF	0 SF	13,251 SF	31,971 SF



MATCH LINE STA 1737+00 - SEE FIGURE A-13

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**SADDLE ROCK ACCESS ROAD  
PROPOSED LAND USE**

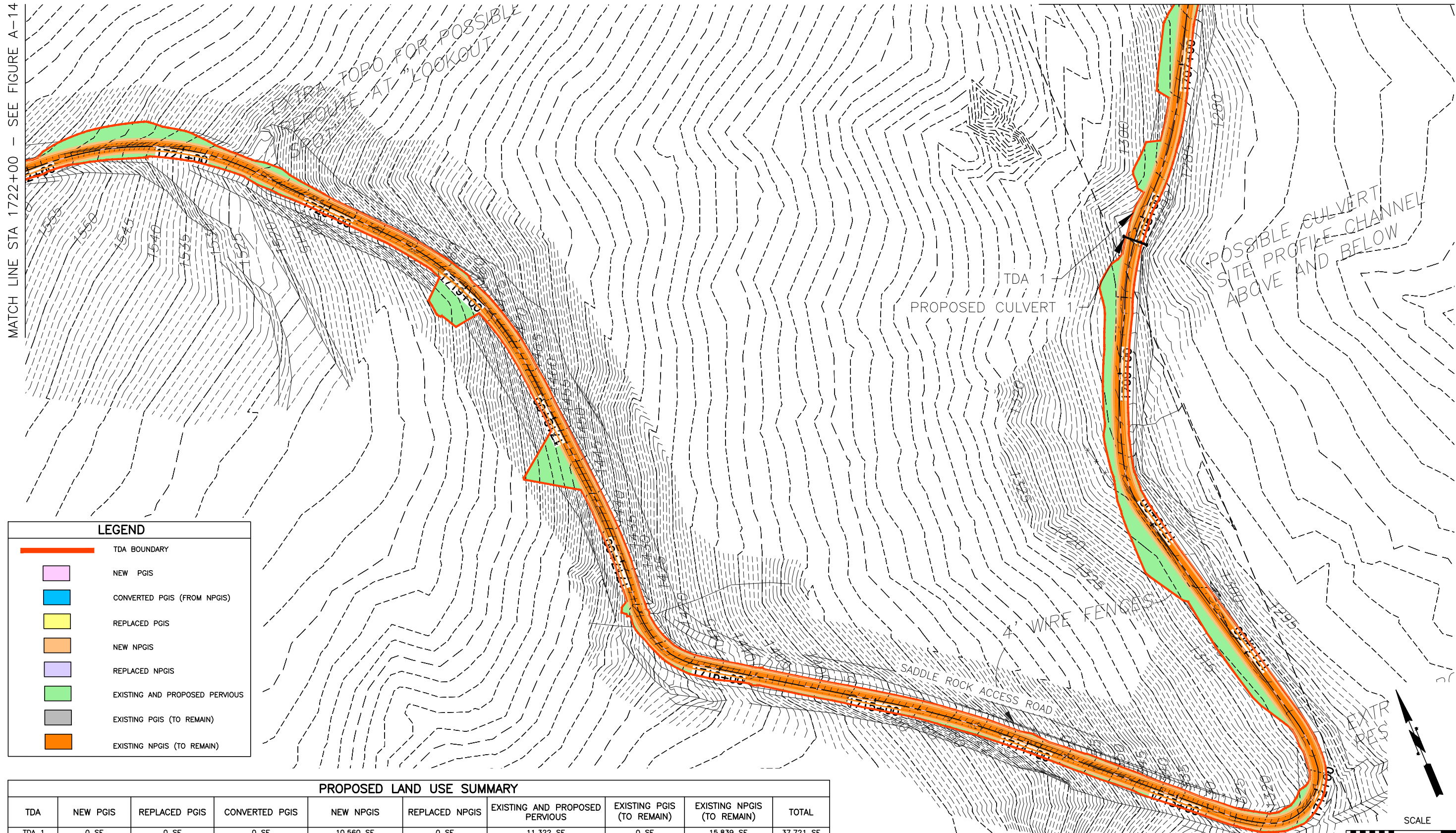
**FIGURE  
A-14**



Feb 12, 2021 - 3:12pm nichole.pallat X:\Wenatchee, City of\Projects\20190234 - Saddle Rock Access Road\CADD\05 - Exhibits\Drainage Exhibits\FIGURE A13-A16 Proposed Land Use.dwg Layout Name: Figure A-15

MATCH LINE STA 1706+60 - SEE FIGURE A-16

MATCH LINE STA 1722+00 - SEE FIGURE A-14

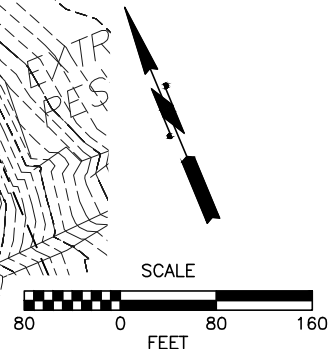


**LEGEND**

- TDA BOUNDARY
- NEW PGIS
- CONVERTED PGIS (FROM NPGIS)
- REPLACED PGIS
- NEW NPGIS
- REPLACED NPGIS
- EXISTING AND PROPOSED PERVIOUS
- EXISTING PGIS (TO REMAIN)
- EXISTING NPGIS (TO REMAIN)

**PROPOSED LAND USE SUMMARY**

TDA	NEW PGIS	REPLACED PGIS	CONVERTED PGIS	NEW NPGIS	REPLACED NPGIS	EXISTING AND PROPOSED PERVIOUS	EXISTING PGIS (TO REMAIN)	EXISTING NPGIS (TO REMAIN)	TOTAL
TDA 1	0 SF	0 SF	0 SF	10,560 SF	0 SF	11,322 SF	0 SF	15,839 SF	37,721 SF
TDA 2	0 SF	0 SF	0 SF	5,751 SF	0 SF	2,636 SF	0 SF	8,627 SF	17,162 SF
TDA 3	0 SF	0 SF	0 SF	8,829 SF	0 SF	9,887 SF	0 SF	13,251 SF	31,971 SF

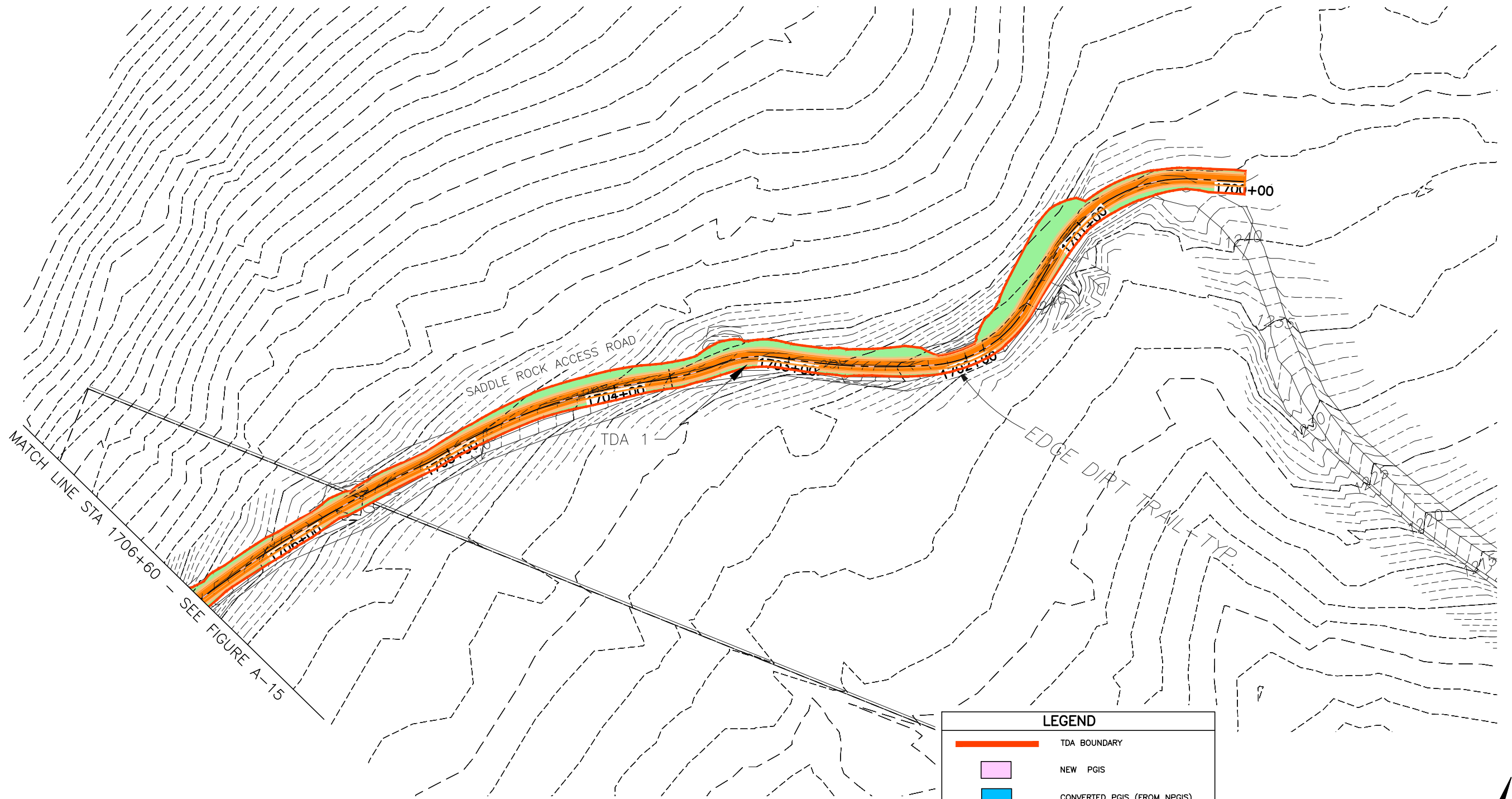


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







**SADDLE ROCK ACCESS ROAD  
PROPOSED LAND USE**


**FIGURE  
A-15**



PROPOSED LAND USE SUMMARY									
TDA	NEW PGIS	REPLACED PGIS	CONVERTED PGIS	NEW NPGIS	REPLACED NPGIS	EXISTING AND PROPOSED PERVIOUS	EXISTING PGIS (TO REMAIN)	EXISTING NPGIS (TO REMAIN)	TOTAL
TDA 1	0 SF	0 SF	0 SF	10,560 SF	0 SF	11,322 SF	0 SF	15,839 SF	37,721 SF
TDA 2	0 SF	0 SF	0 SF	5,751 SF	0 SF	2,636 SF	0 SF	8,627 SF	17,162 SF
TDA 3	0 SF	0 SF	0 SF	8,829 SF	0 SF	9,887 SF	0 SF	13,251 SF	31,971 SF

**LEGEND**

-  TDA BOUNDARY
-  NEW PGIS
-  CONVERTED PGIS (FROM NPGIS)
-  REPLACED PGIS
-  NEW NPGIS
-  REPLACED NPGIS
-  EXISTING AND PROPOSED PERVIOUS
-  EXISTING PGIS (TO REMAIN)
-  EXISTING NPGIS (TO REMAIN)



SCALE




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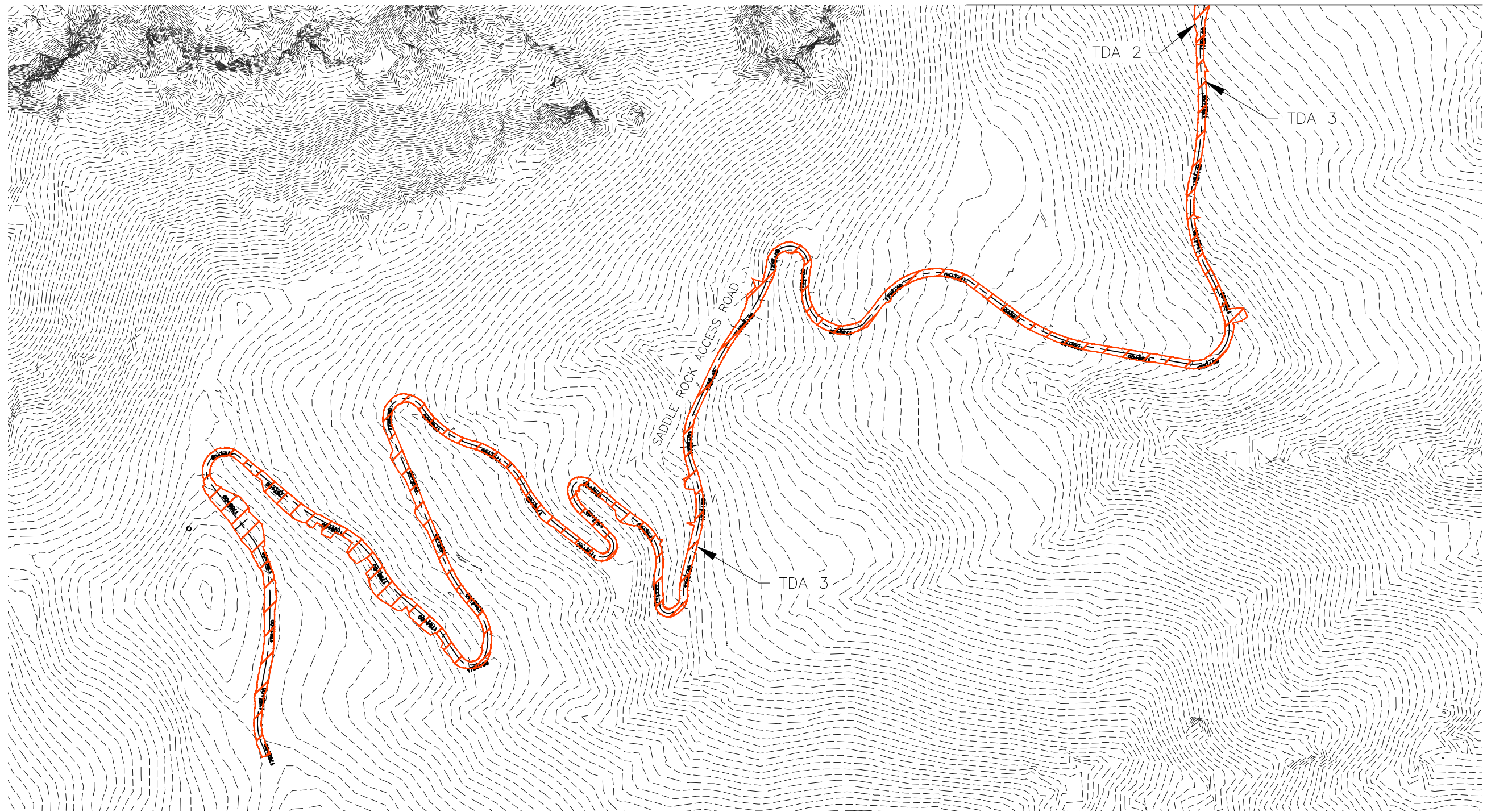
**SADDLE ROCK ACCESS ROAD  
PROPOSED LAND USE**

**FIGURE  
A-16**





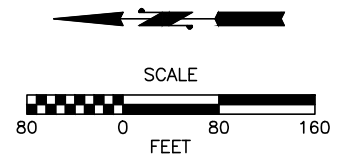
Feb 12, 2021 - 3:24pm nichole.pellatt X:\Wenatchee, City of\Projects\20190234 - Saddle Rock Access Road\CADD\05 - Exhibits\Drainage Exhibits\FIGURE A17-A18 TDA KEY MAP.dwg Layout Name: A-17

MATCH LINE STA 1720+50 - SEE FIGURE A-18



**LEGEND**

-  TDA BOUNDARY
-  TDA LIMITS

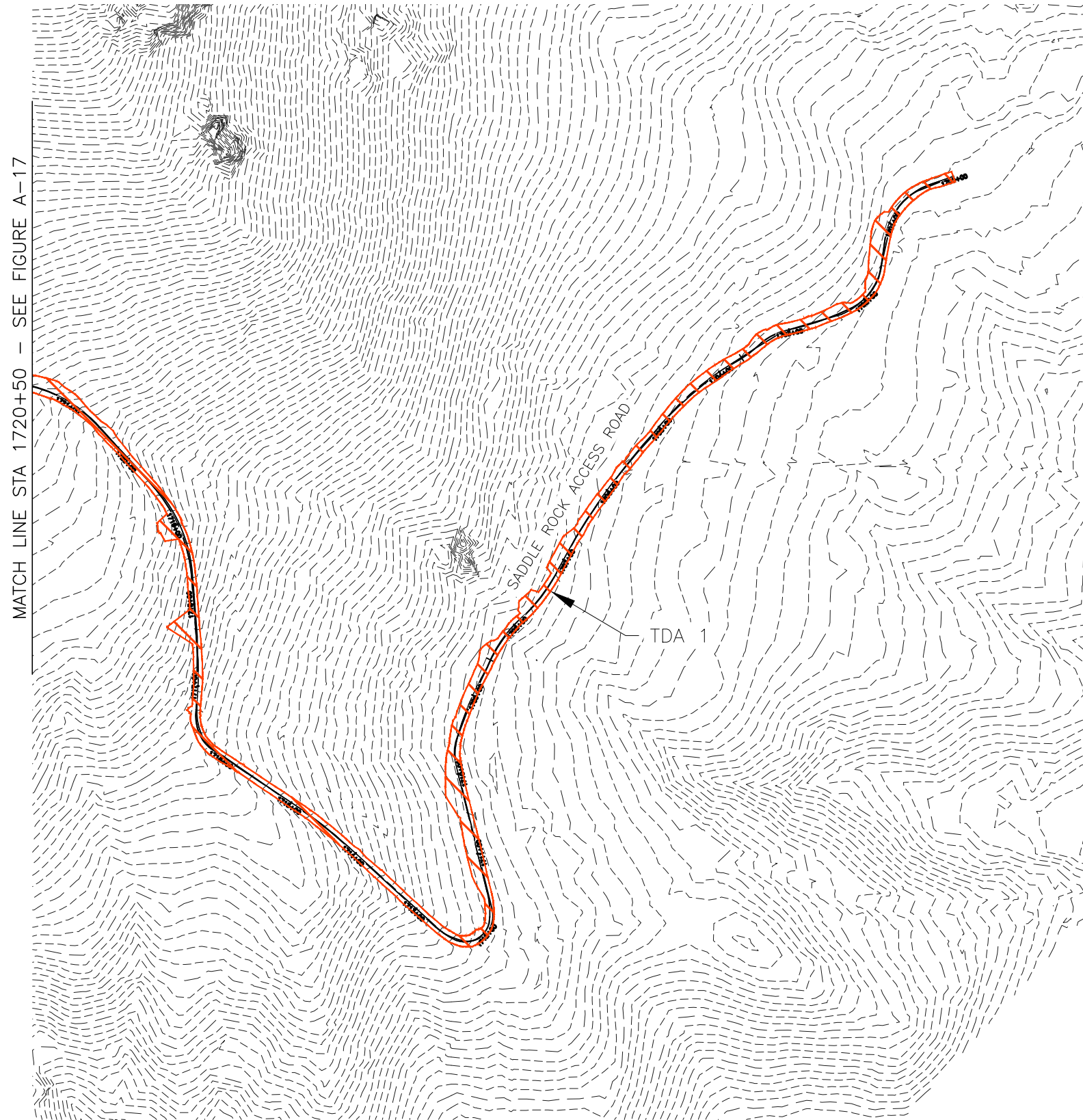


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**SADDLE ROCK ACCESS ROAD**  
**TDA KEY MAP**

**FIGURE**  
**A-17**



**LEGEND**

-  TDA BOUNDARY
-  TDA LIMITS

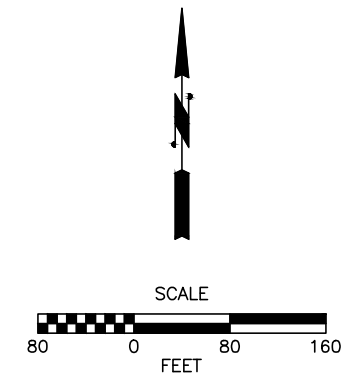


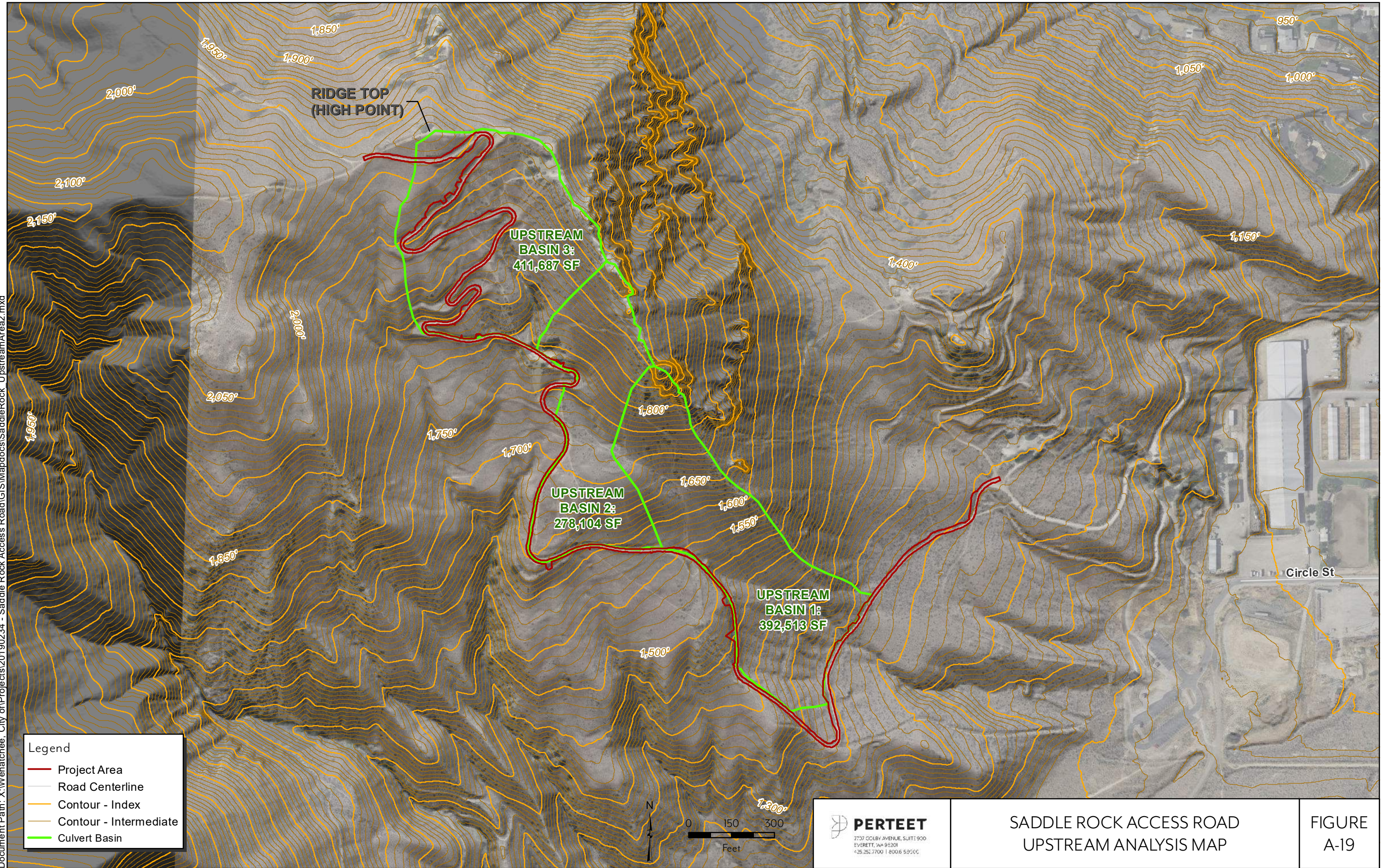
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**SADDLE ROCK ACCESS ROAD  
TDA KEY MAP**

**FIGURE  
A-18**





**Legend**

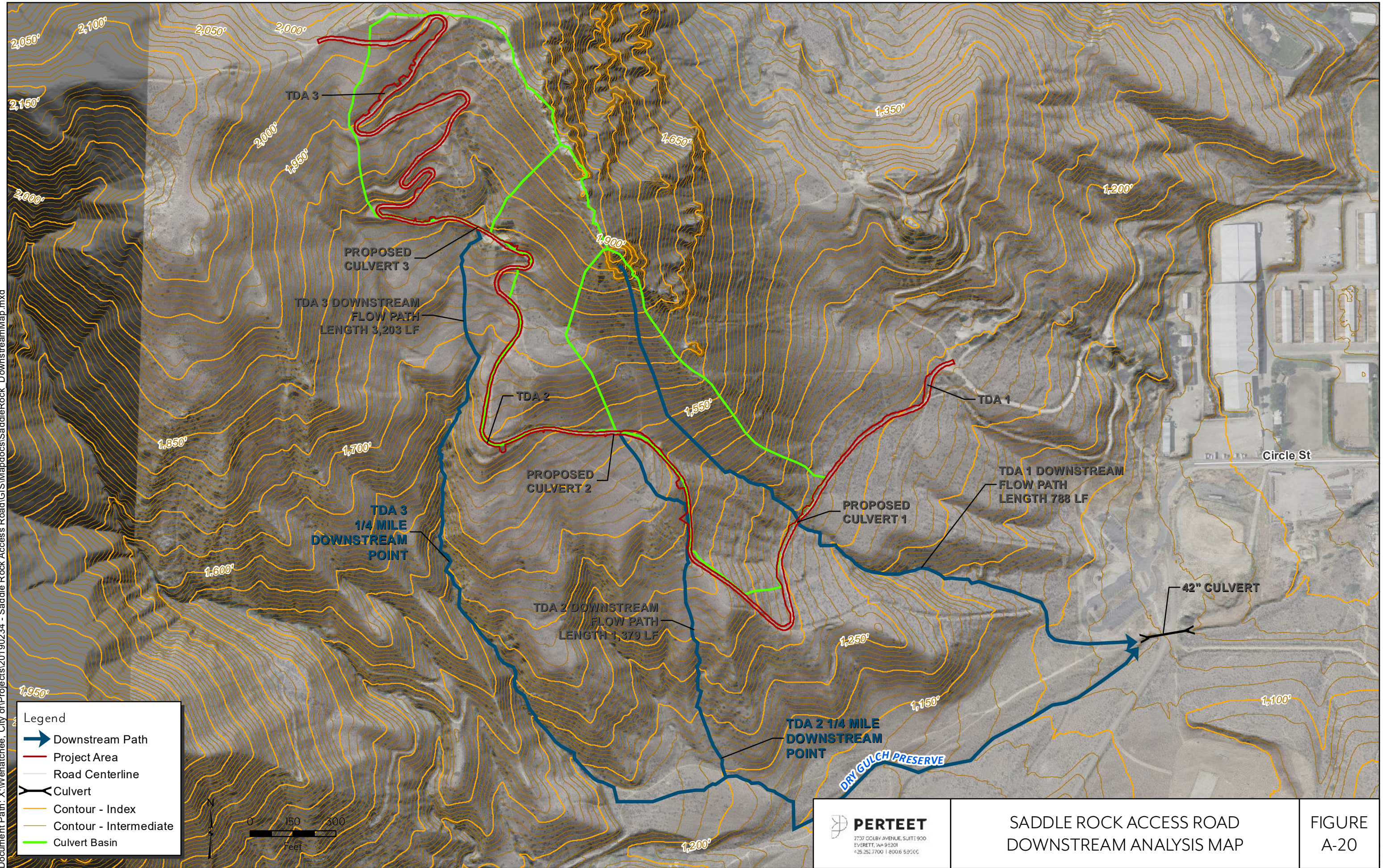
- Project Area
- Road Centerline
- Contour - Index
- Contour - Intermediate
- Culvert Basin

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SADDLE ROCK ACCESS ROAD  
 UPSTREAM ANALYSIS MAP

FIGURE  
 A-19





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**SADDLE ROCK ACCESS ROAD  
 DOWNSTREAM ANALYSIS MAP**

**FIGURE  
 A-20**

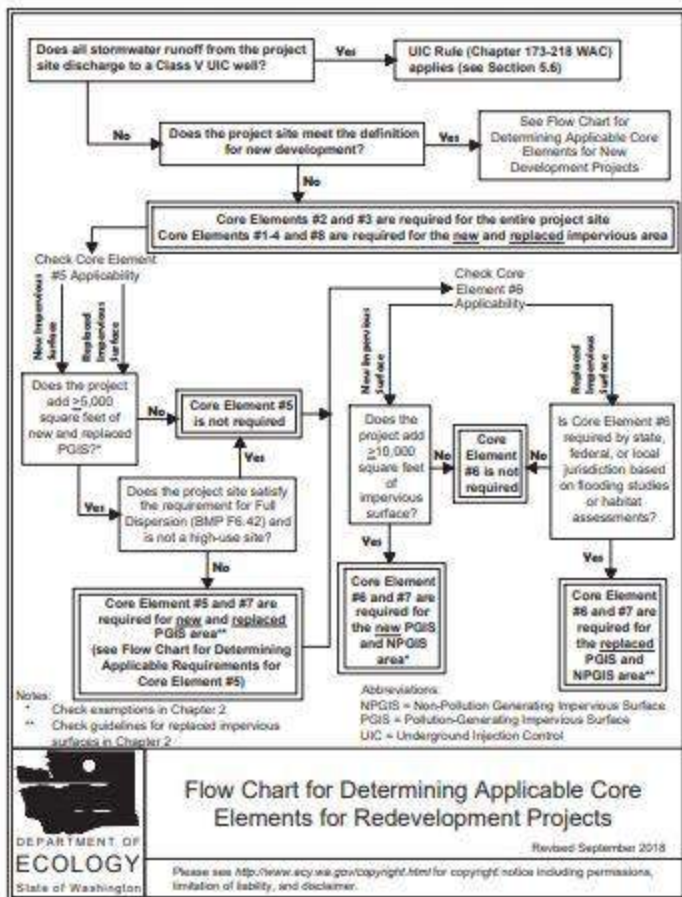


APPENDIX B

**Minimum Requirements Figure**

---

**Figure 2.2: Flow Chart for Determining Applicable Core Elements for Redevelopment Projects**



APPENDIX C  
Calculations

---

TDA 1 | Perv CN | Perv TC | Directly Connected CN | Directly Connected TC | Compute

Basin Id: TDA 1

New

Rainfall Type: TYPE1a.rac

 Time Series

Design Method: SBUH

Storm Dur: 24 hrs

Hyd Interval (min): 10

Unit Hyd: SCS Unit Hyd

Peak Factor: 484.00

Loss Method: SCS Curve Number

## Summary Data

Perv TC: 32.34 min.

Imperv TC: 0.00 min.

Total Area: 9.01 ac

Close

TDA 1 | Perv CN | Perv TC | Directly Connected CN | Directly Connected TC | Compute

Description

Area (ac)

CN

HSG

Update





Add

 Urban
  Developing Urban
  Cultivated Agriculture

Delete

 Other Agriculture
  Arid Rangeland

Move to DCIA

Description	Subarea	CN	
Desert shrub (Good)	9.01	79.00	

Abstraction Coeff: Total Area (ac) Avg CN: 

Close

TDA 1 | Perv CN | Perv TC | Directly Connected CN | Directly Connected TC | Compute

Flow Type:  Description:  Len (ft)  s (%)  Coeff

Select Coeff:   Slope Cal

Update

Add

Delete

Total TC (min):

Type	Description	Length	Slope	Coeff	TT
Sheet	Sheet flow	300.00	24.00	0.06	7.51
Shall...	shallow flow	540.00	22.50	0.06	3.55

Close

Select Design Event: 25 year

AMC for this Computation:  
 AMC 1  AMC 2  AMC 3

Project AMC: 2

Results

Peak Rate: 0.5748 cfs  
Time to Peak: 490.00 min / (8.17 hrs) from start.  
Hyd Vol: 17088.35 cf / 0.392295 acft

---

## Worksheet for TDA 1 - Culvert 1

---

### Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

### Input Data

Roughness Coefficient	0.013	
Channel Slope	0.03000	ft/ft
Diameter	1.00	ft
Discharge	0.57	ft <sup>3</sup> /s

### Results

Normal Depth	0.21	ft
Flow Area	0.12	ft <sup>2</sup>
Wetted Perimeter	0.94	ft
Hydraulic Radius	0.12	ft
Top Width	0.81	ft
Critical Depth	0.32	ft
Percent Full	20.6	%
Critical Slope	0.00562	ft/ft
Velocity	4.92	ft/s
Velocity Head	0.38	ft
Specific Energy	0.58	ft
Froude Number	2.28	
Maximum Discharge	6.64	ft <sup>3</sup> /s
Discharge Full	6.17	ft <sup>3</sup> /s
Slope Full	0.00026	ft/ft
Flow Type	SuperCritical	

### GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

### GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	20.62	%
Downstream Velocity	Infinity	ft/s



---

## Worksheet for TDA 1 - Culvert 1

---

### GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	0.21	ft
Critical Depth	0.32	ft
Channel Slope	0.03000	ft/ft
Critical Slope	0.00562	ft/ft

Basin Id: TDA 2

New

Rainfall Type: TYPE1a.rac

Time Series

Design Method: SBUH

Storm Dur: 24 hrs

Hyd Interval (min): 10

Unit Hyd: SCS Unit Hyd

Peak Factor: 484.00

Loss Method: SCS Curve Number

Summary Data

Perv TC: 6.58 min.  
Imperv TC: 5.00 min.  
Total Area: 6.38 ac

Close

Description:  Area (ac):  CN:  HSG:

Update

Add

Urban  Developing Urban  Cultivated Agriculture

Delete

Other Agriculture  Arid Rangeland

Move to DCIA

Description	Subarea	CN
Desert shrub (Good)	6.38	79.00

Abstraction Coeff:

Total Area (ac)

Avg CN:

Close

TDA 2 | Perv CN | Perv TC | Directly Connected CN | Directly Connected TC | Compute

Flow Type:  Description:  Len (ft)  s (%)  Coeff

Select Coeff:   Slope Cal

Total TC (min):

Type	Description	Length	Slope	Coeff	TT
Sheet	something	300.00	58.00	0.06	5.27
Shall...	shallow	235.00	31.20	0.06	1.31

Select Design Event: 25 year

Compute

AMC for this Computation:

- AMC 1  AMC 2  AMC 3

Project AMC: 2

Results

Peak Rate: 0.4487 cfs

Time to Peak: 480.00 min / (8.00 hrs) from start.

Hyd Vol: 12100.31 cf / 0.277785 acft

Close

## Worksheet for TDA 2 - Culvert 2

### Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

### Input Data

Roughness Coefficient	0.013	
Channel Slope	0.30000	ft/ft
Diameter	1.00	ft
Discharge	0.45	ft <sup>3</sup> /s

### Results

Normal Depth	0.10	ft
Flow Area	0.04	ft <sup>2</sup>
Wetted Perimeter	0.66	ft
Hydraulic Radius	0.07	ft
Top Width	0.61	ft
Critical Depth	0.28	ft
Percent Full	10.5	%
Critical Slope	0.00562	ft/ft
Velocity	10.26	ft/s
Velocity Head	1.63	ft
Specific Energy	1.74	ft
Froude Number	6.77	
Maximum Discharge	20.99	ft <sup>3</sup> /s
Discharge Full	19.51	ft <sup>3</sup> /s
Slope Full	0.00016	ft/ft
Flow Type	SuperCritical	

### GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

### GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	10.47	%
Downstream Velocity	Infinity	ft/s

---

## Worksheet for TDA 2 - Culvert 2

---

### GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	0.10	ft
Critical Depth	0.28	ft
Channel Slope	0.30000	ft/ft
Critical Slope	0.00562	ft/ft

TDA 3 | Perv CN | Perv TC | Directly Connected CN | Directly Connected TC | Compute

Basin Id: TDA 3

New

Rainfall Type: TYPE1a.rac

Time Series

Design Method: SBUH

Storm Dur: 24 hrs

Hyd Interval (min): 10

Unit Hyd: SCS Unit Hyd

Peak Factor: 484.00

Loss Method: SCS Curve Number

Summary Data

Perv TC: 32.34 min.

Imperv TC: 0.00 min.

Total Area: 9.45 ac

Close



Description

Area (ac)

CN

HSG

Update

Add

Urban    Developing Urban    Cultivated Agriculture

Delete

Other Agriculture    Arid Rangeland

Move to DCIA

Description	Subarea	CN
Desert shrub (Good)	9.45	79.00

Abstraction Coeff:

Total Area (ac)

Avg CN:

Close

TDA 3 | Perv CN | Perv TC | Directly Connected CN | Directly Connected TC | Compute

Flow Type:  Description:  Len (ft)  s (%)  Coeff

Select Coeff:   Slope Cal

Total TC (min):

Type	Description	Length	Slope	Coeff	TT	Type	Desc
Sheet	something	300.00	83.00	0.06	4.57		
Shall...	shallow	881.00	45.00	0.06	4.09		

TDA 3 | Perv CN | Perv TC | Directly Connected CN | Directly Connected TC | Compute

Select Design Event: 25 year ▼

Compute

AMC for this Computation:

 AMC 1  AMC 2  AMC 3

Project AMC: 2

## Results

Peak Rate: 0.6213 cfs

Time to Peak: 480.00 min / (8.00 hrs) from start.

Hyd Vol: 17922.87 cf / 0.411452 acft

Close

---

## Worksheet for TDA 3 - Culvert 3

---

### Project Description

Friction Method	Manning Formula
Solve For	Normal Depth

### Input Data

Roughness Coefficient	0.013	
Channel Slope	0.03000	ft/ft
Diameter	1.00	ft
Discharge	0.62	ft <sup>3</sup> /s

### Results

Normal Depth	0.21	ft
Flow Area	0.12	ft <sup>2</sup>
Wetted Perimeter	0.96	ft
Hydraulic Radius	0.13	ft
Top Width	0.82	ft
Critical Depth	0.33	ft
Percent Full	21.4	%
Critical Slope	0.00562	ft/ft
Velocity	5.04	ft/s
Velocity Head	0.39	ft
Specific Energy	0.61	ft
Froude Number	2.29	
Maximum Discharge	6.64	ft <sup>3</sup> /s
Discharge Full	6.17	ft <sup>3</sup> /s
Slope Full	0.00030	ft/ft
Flow Type	SuperCritical	

### GVF Input Data

Downstream Depth	0.00	ft
Length	0.00	ft
Number Of Steps	0	

### GVF Output Data

Upstream Depth	0.00	ft
Profile Description		
Profile Headloss	0.00	ft
Average End Depth Over Rise	0.00	%
Normal Depth Over Rise	21.43	%
Downstream Velocity	Infinity	ft/s

---

## Worksheet for TDA 3 - Culvert 3

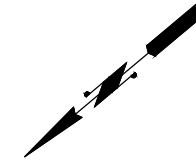
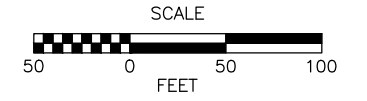
---

### GVF Output Data

Upstream Velocity	Infinity	ft/s
Normal Depth	0.21	ft
Critical Depth	0.33	ft
Channel Slope	0.03000	ft/ft
Critical Slope	0.00562	ft/ft

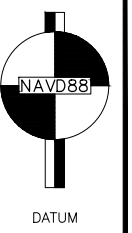
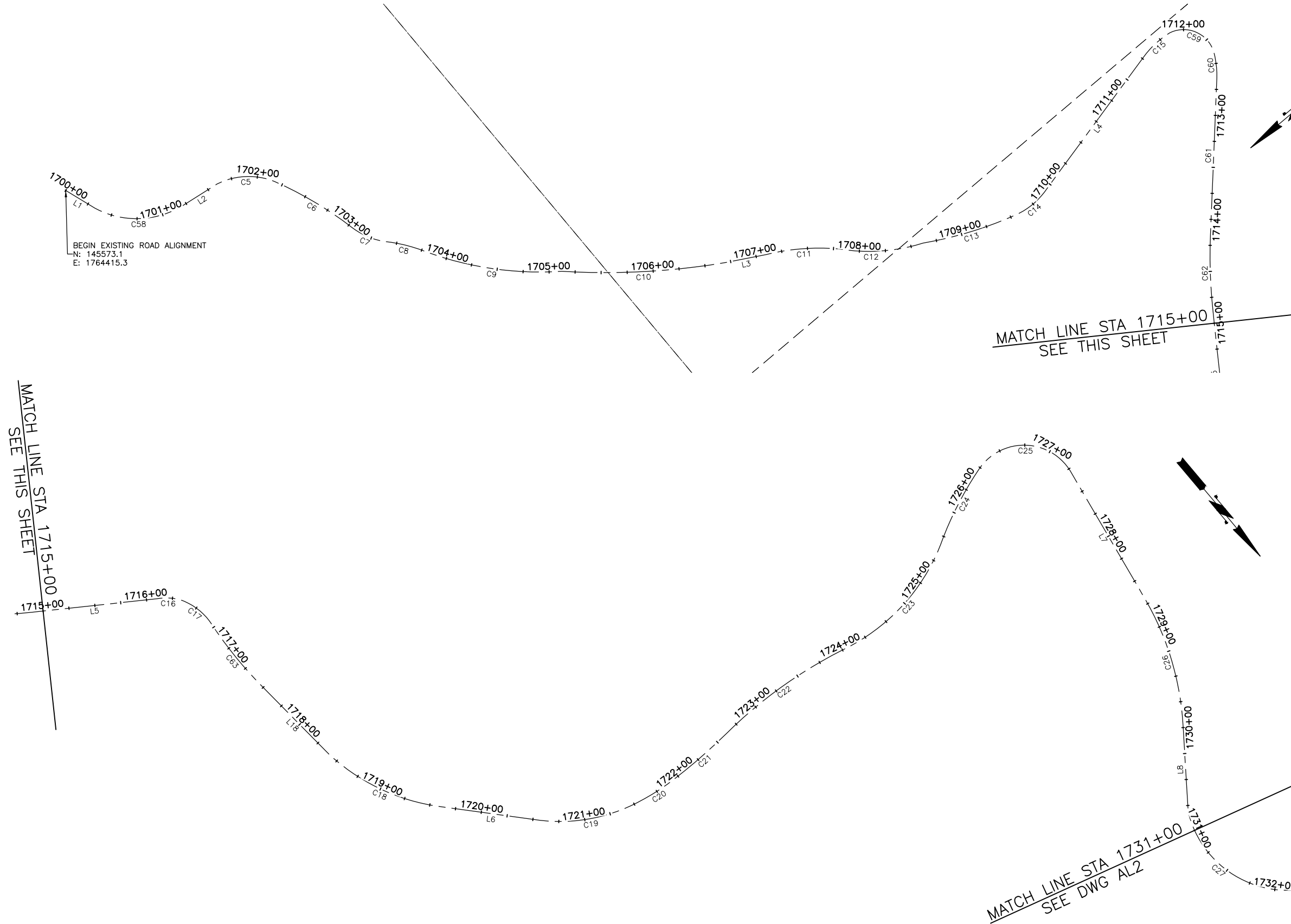
APPENDIX D  
Plans and Details

---



- SURVEY NOTES:**
1. DATA SOURCE: BASE SURVEY FROM DAWSON SURVEYING AND LIDAR TOPO DATA FROM CITY OF WENATCHEE DATED 01/08/19. GIS DATA FROM HART CROWSER DATED 01/15/19.
  2. HORIZONTAL DATUM: WASHINGTON STATE PLANE COORDINATE SYSTEM, NORTH ZONE (4601), US SURVEY FOOT.
  3. VERTICAL DATUM: NAVD88.

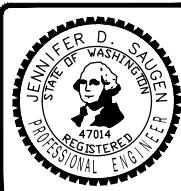
- GENERAL NOTES:**
1. ALIGNMENT DATA SHOWN APPROXIMATES THE EXISTING ACCESS ROAD. THE CONTRACTOR SHALL IMPROVE THE EXISTING ACCESS ROAD BY WIDENING, FLATTENING, AND REDUCING CURVATURE AS NEEDED TO ACCOMMODATE CONSTRUCTION EQUIPMENT.
  2. SEE DWG NO. AL3 FOR ALIGNMENT TABLES.
  3. CONTRACTOR SHALL DETERMINE THE ROAD ALIGNMENT FROM END OF EXISTING ROAD TO SR05. ROAD ALIGNMENT TO BE APPROVED BY ECOLOGY AND THE CITY.
  4. SEE PLAN AND PROFILE SHEETS FOR SR05 LOCATION.



Jun 01, 2021 - 11:29am mickley,callea X:\Wenatchee\_City of Projects\20190234 - Saddle Rock Access Road\CADD\02 - Plan Sheets\20190234-AL.dwg Layout Name: AL1

NO.	DATE	BY	REVISION

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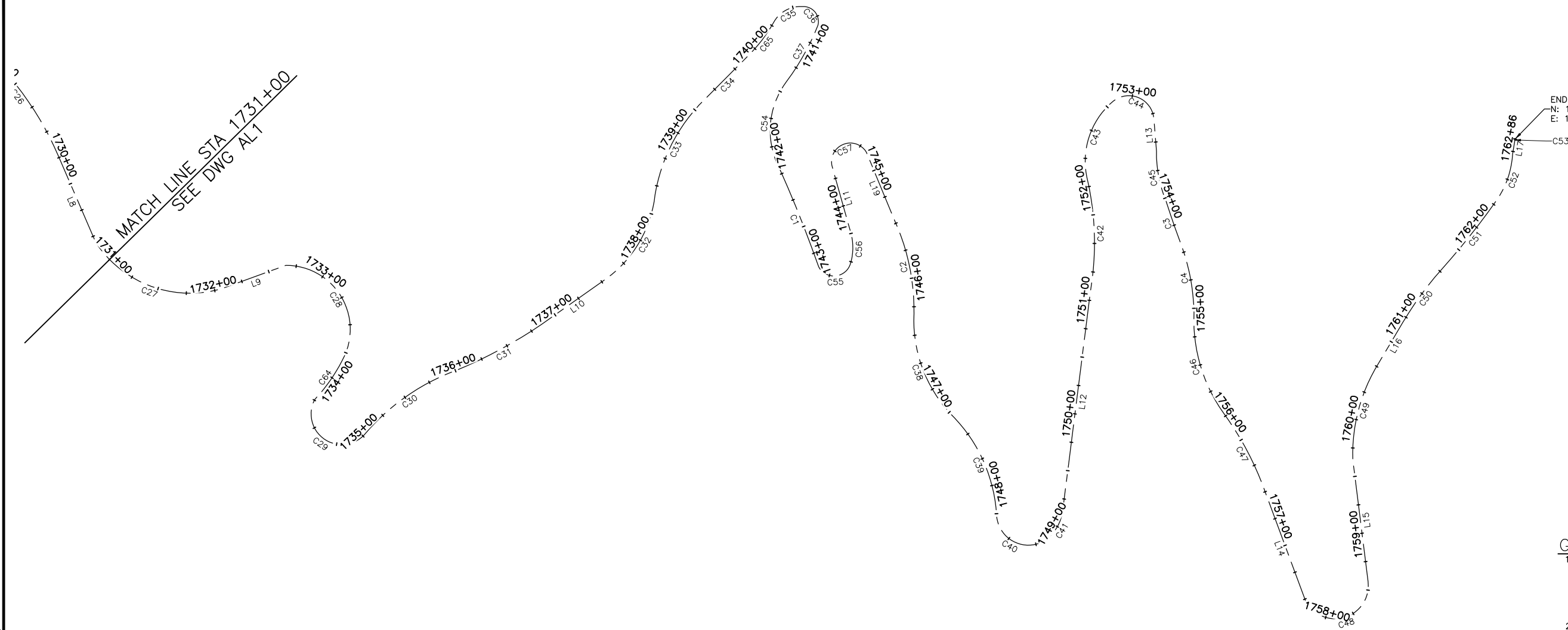
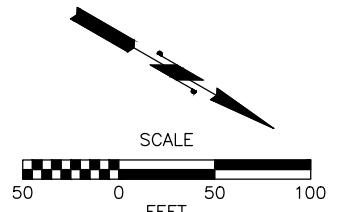
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INTERIM REMOVAL ACTION, PHASE 2  
 SADDLE ROCK PARK  
 WENATCHEE, WASHINGTON

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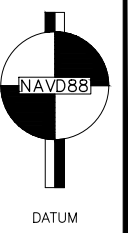
ALIGNMENT PLAN

DRAWN: MC	PROJ NO: 4296-008-02
DESIGN: CO	SHEET 5 OF 18
CHECKED: RC	DATE: 3.31.21
DRAWING NO	AL1



END EXISTING ROAD ALIGNMENT  
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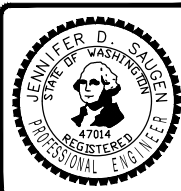
- GENERAL NOTES:**
- ALIGNMENT DATA SHOWN APPROXIMATES THE EXISTING ACCESS ROAD. THE CONTRACTOR SHALL IMPROVE THE EXISTING ACCESS ROAD BY WIDENING, FLATTENING, AND REDUCING CURVATURE AS NEEDED TO ACCOMMODATE CONSTRUCTION EQUIPMENT.
  - SEE DWG NO. AL3 FOR ALIGNMENT TABLES.
  - CONTRACTOR SHALL DETERMINE THE ROAD ALIGNMENT FROM END OF EXISTING ROAD TO SR05. ROAD ALIGNMENT TO BE APPROVED BY ECOLOGY AND THE CITY.
  - SEE PLAN AND PROFILE SHEETS FOR SR05 LOCATION.



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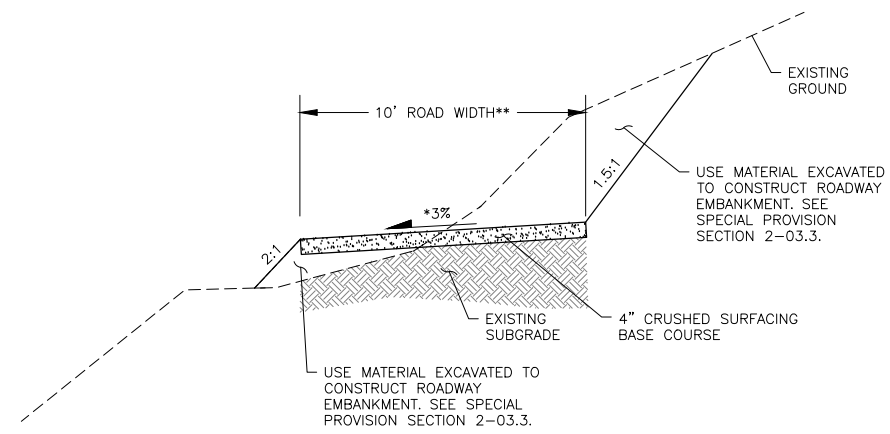
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ALIGNMENT PLAN

DRAWN: MC	PROJ NO: 4296-008-02
DESIGN: CO	SHEET 6 OF 18
CHECKED: RC	DATE: 3.31.21
DRAWING NO	AL2



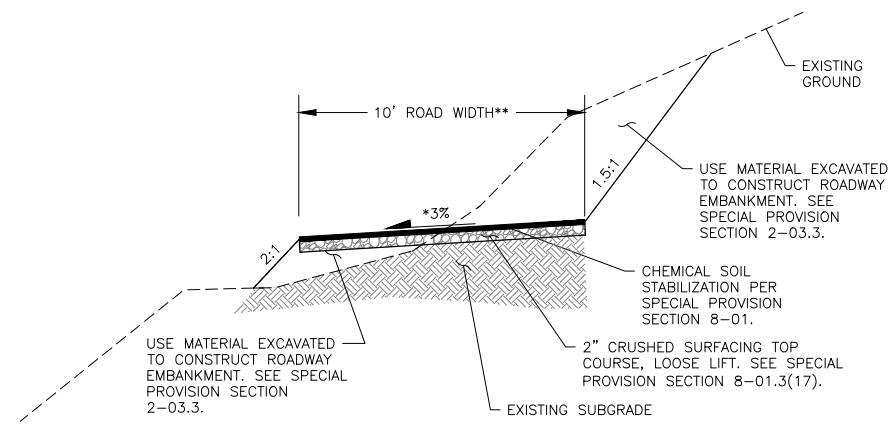




\*3% SLOPE ACCESS ROAD FROM UPHILL TO DOWNHILL SIDE.  
 \*\*10' ROAD WIDTH IS APPROXIMATE. CONTRACTOR TO DETERMINE ROAD WIDTH NEEDED TO ACCOMMODATE CONSTRUCTION VEHICLES AND EQUIPMENT.

TYPICAL IMPROVE EXISTING ACCESS ROAD SECTION A

STA 1700+00 TO STA 1712+00  
 STA 1736+00 TO STA 1762+86  
 N.T.S.



\*3% SLOPE ACCESS ROAD FROM UPHILL TO DOWNHILL SIDE.  
 \*\*10' ROAD WIDTH IS APPROXIMATE. CONTRACTOR TO DETERMINE ROAD WIDTH NEEDED TO ACCOMMODATE CONSTRUCTION VEHICLES AND EQUIPMENT.

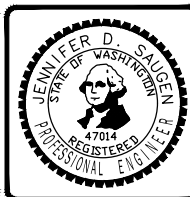
TYPICAL IMPROVE EXISTING ACCESS ROAD SECTION B

STA 1712+00 TO STA 1736+00  
 N.T.S.

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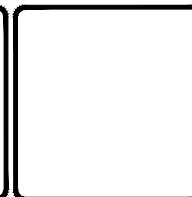
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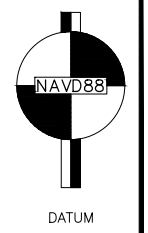
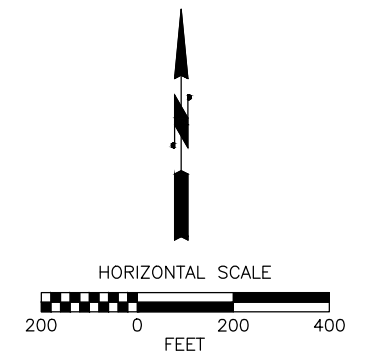
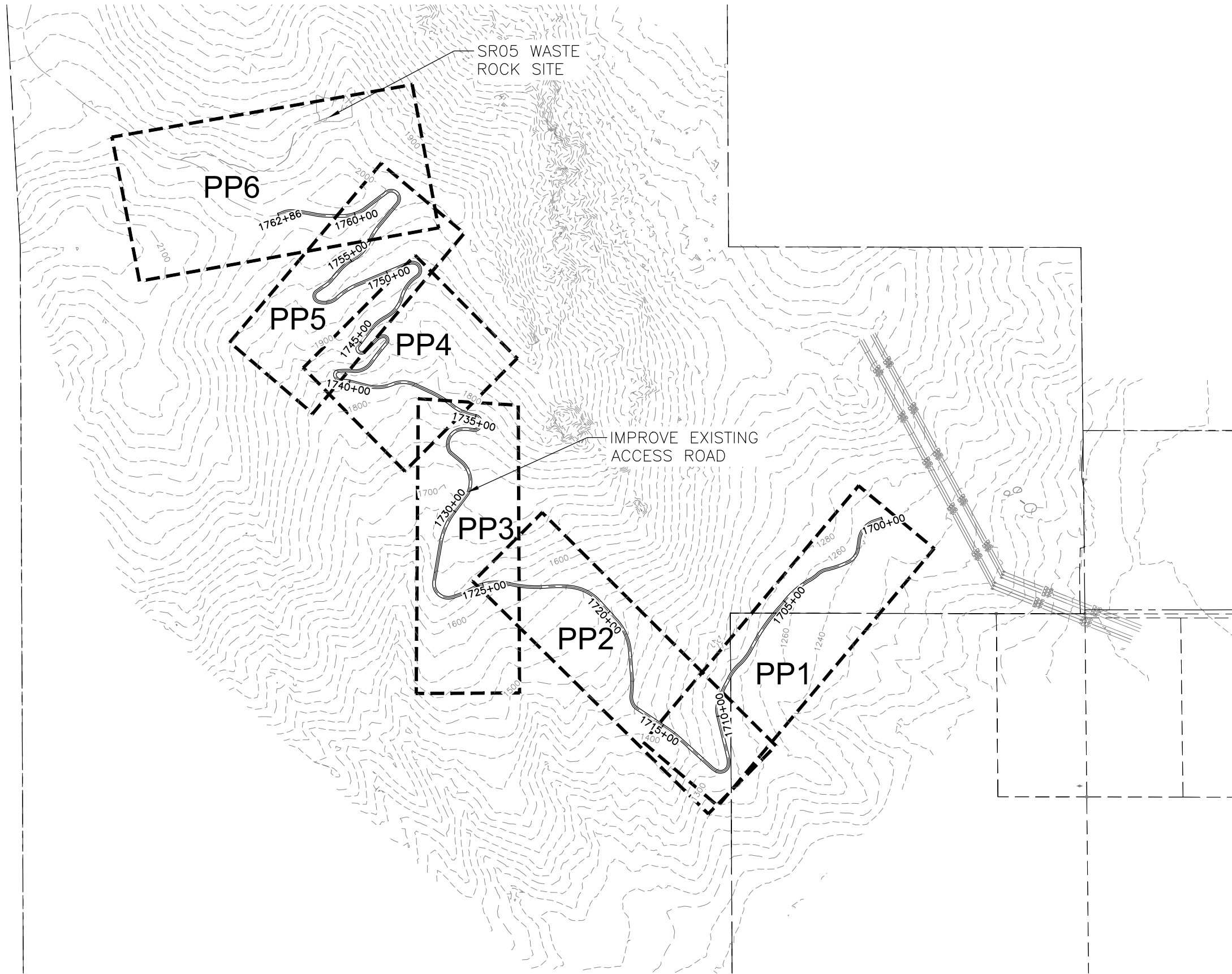
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 SADDLE ROCK PARK  
 WENATCHEE, WASHINGTON

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TYPICAL SECTIONS

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DESIGN: CO	SHEET 8 OF 18
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DRAWING NO	
TS1	

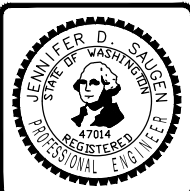
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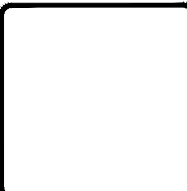
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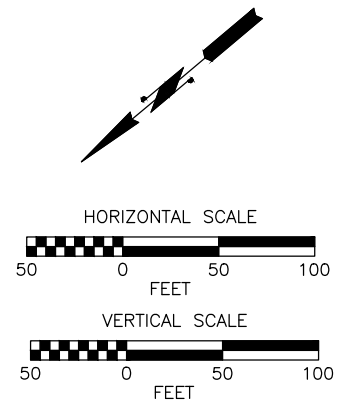
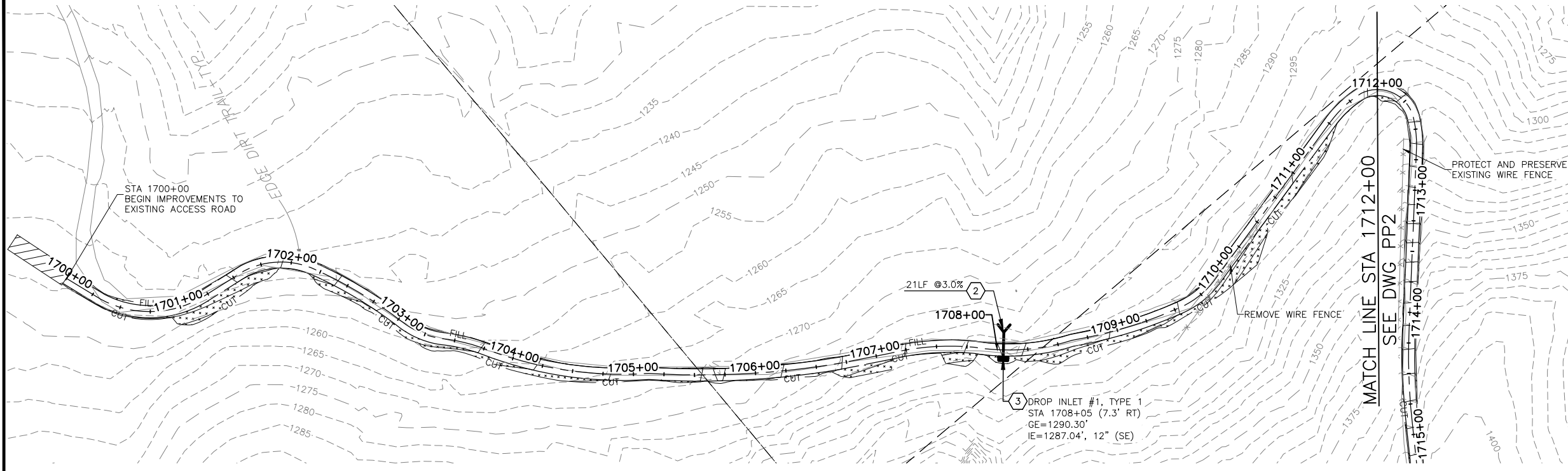
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INTERIM REMOVAL ACTION, PHASE 2  
 SADDLE ROCK PARK  
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**KEY MAP**

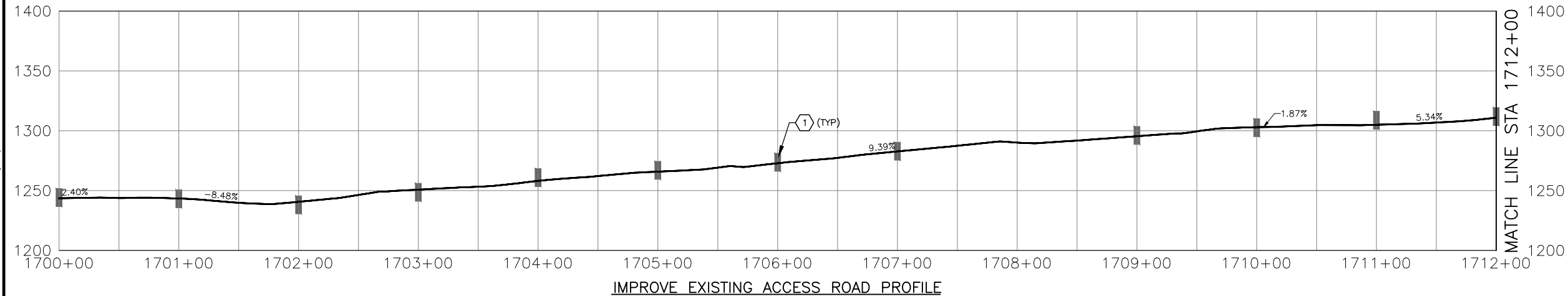
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DESIGN: CO	SHEET 9 OF 18
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DRAWING NO	<b>KM1</b>



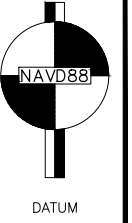
- CONSTRUCTION NOTES:**
- 1 INSTALL WATER BAR PER DETAIL 3 ON DWG. NO. MD1.
  - 2 INSTALL SCHEDULE A CULVERT PIPE 12 IN. DIAM. AT 3.0% WITH OUTLET PROTECTION PER DETAILS 1 AND 2 ON DWG. NO. MD1.
  - 3 INSTALL DROP INLET TYPE 1 PER WSDOT STD. PLAN B-45.20-01.

- LEGEND**
- CONSTRUCTION STAGING AREA
  - CLEARING AND GRUBBING/SEEDING, FERTILIZING AND MULCHING
  - DROP INLET TYPE 1
  - CULVERT PER DETAIL ON DWG. NO. MD1
  - WATER BAR PER DETAIL ON DWG. NO. MD1
  - CUT
  - FILL
  - EXISTING WIRE FENCE

- GENERAL NOTES:**
1. HORIZONTAL AND VERTICAL ALIGNMENT SHOW THE EXISTING ACCESS ROAD. IT IS PROVIDED AS A REFERENCE FOR THE CONTRACTOR TO USE FOR DETERMINING THE IMPROVEMENTS NEEDED TO MAKE IT SUITABLE FOR USE BY CONSTRUCTION VEHICLES AND EQUIPMENT. CONTRACTOR SHALL IMPROVE EXISTING ACCESS ROAD TO ALLOW HAULING OF WASTE ROCK FROM SR05 PER SPECIAL PROVISION SECTION 2-03.3.
  2. CONTRACTOR SHALL BE RESPONSIBLE FOR CHOOSING A ROUTE AND CONSTRUCTING A TEMPORARY ACCESS ROAD BETWEEN THE EXISTING ACCESS ROAD AND SR05. CONSTRUCTION SHALL BE PER SPECIAL PROVISION SECTION 2-03.3.
  3. SEED EXPOSED SOIL AREAS FOR ROADSIDE RESTORATION. CONTRACTOR TO PROVIDE INITIAL SEED APPLICATION AT CONCLUSION OF CONSTRUCTION ACTIVITIES AND A FINAL APPLICATION AT THE DIRECTION OF THE ENGINEER IF CONCLUSION OF ACTIVITIES OCCURS OUTSIDE OF THE WSDOT SPECIFIED SEED WINDOW IN SECTION 8-02.3(9)A OF THE STANDARD SPECIFICATIONS.



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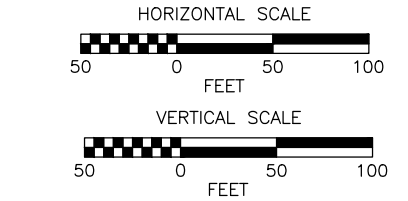
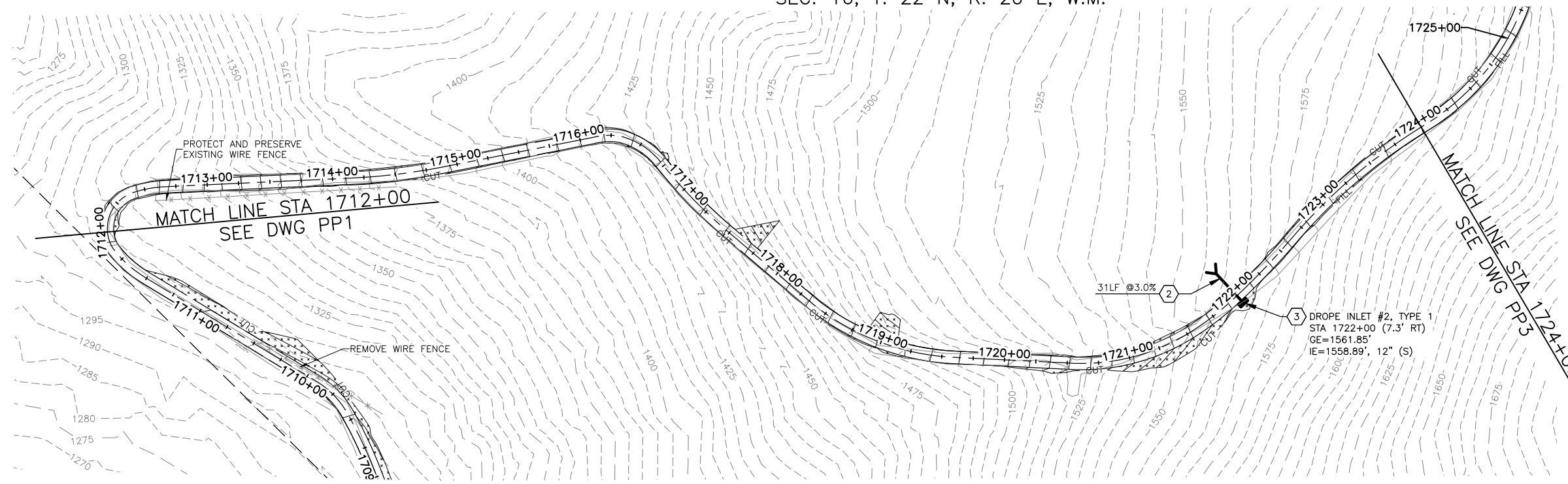
INTERIM REMOVAL ACTION, PHASE 2  
 SADDLE ROCK PARK  
 WENATCHEE, WASHINGTON

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PLAN AND PROFILE

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DESIGN: CO	SHEET 10 OF 18
CHECKED: RC	DATE: 3.31.21
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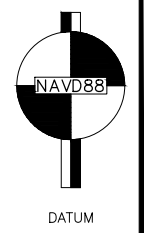
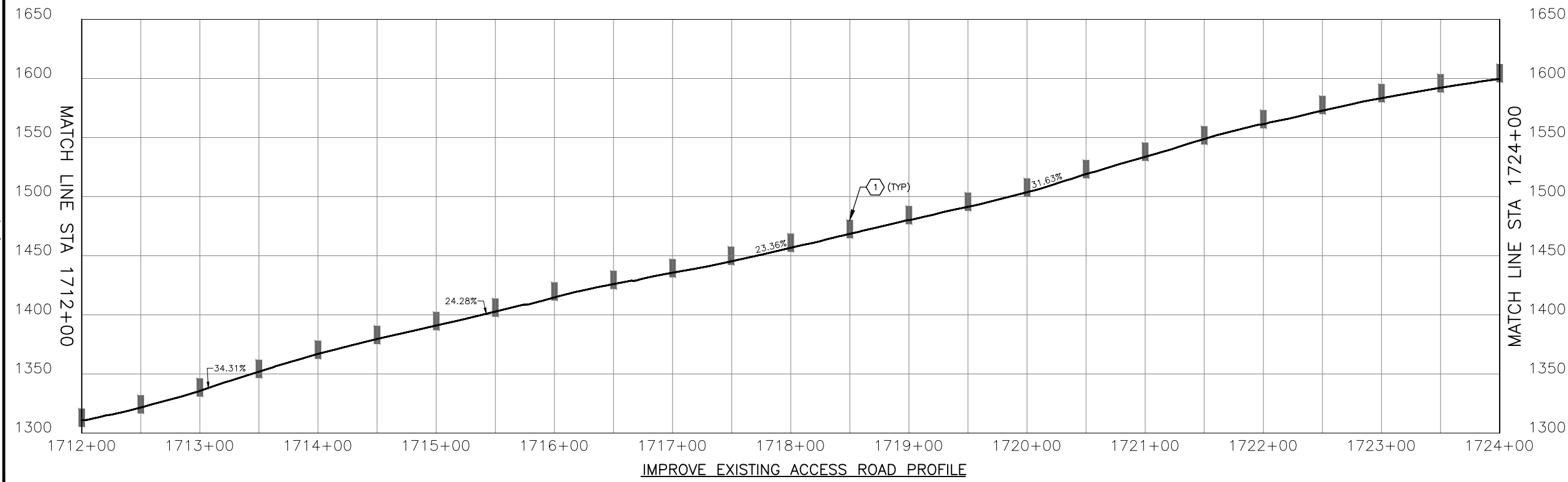




- CONSTRUCTION NOTES:**
- INSTALL WATER BAR PER DETAIL 3 ON DWG. NO. MD1.
  - INSTALL SCHEDULE A CULV. PIPE 12 IN. DIAM. AT 3.0% WITH OUTLET PROTECTION PER DETAILS 1 AND 2 ON DWG. NO. MD1.
  - INSTALL DROP INLET TYPE 1 PER WSDOT STD. PLAN B-45.20-01.

- LEGEND**
- CONSTRUCTION STAGING AREA
  - CLEARING AND GRUBBING/SEEDING, FERTILIZING AND MULCHING
  - DROP INLET TYPE 1
  - CULVERT PER DETAIL ON DWG. NO. MD1
  - WATER BAR PER DETAIL ON DWG. NO. MD1
  - CUT LINE
  - FILL LINE
  - EXISTING WIRE FENCE

- GENERAL NOTES:**
- HORIZONTAL AND VERTICAL ALIGNMENT SHOW THE EXISTING ACCESS ROAD. IT IS PROVIDED AS A REFERENCE FOR THE CONTRACTOR TO USE FOR DETERMINING THE IMPROVEMENTS NEEDED TO MAKE IT SUITABLE FOR USE BY CONSTRUCTION VEHICLES AND EQUIPMENT. CONTRACTOR SHALL IMPROVE EXISTING ACCESS ROAD TO ALLOW HAULING OF WASTE ROCK FROM SR05 PER SPECIAL PROVISION SECTION 2-03.3.
  - CONTRACTOR SHALL BE RESPONSIBLE FOR CHOOSING A ROUTE AND CONSTRUCTING A TEMPORARY ACCESS ROAD BETWEEN THE EXISTING ACCESS ROAD AND SR05. CONSTRUCTION SHALL BE PER SPECIAL PROVISION SECTION 2-03.3.
  - SEED EXPOSED SOIL AREAS FOR ROADSIDE RESTORATION. CONTRACTOR TO PROVIDE INITIAL SEED APPLICATION AT CONCLUSION OF CONSTRUCTION ACTIVITIES AND A FINAL APPLICATION AT THE DIRECTION OF THE ENGINEER IF CONCLUSION OF ACTIVITIES OCCURS OUTSIDE OF THE WSDOT SPECIFIED SEED WINDOW IN SECTION 8-02.3(9)A OF THE STANDARD SPECIFICATIONS.



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INTERIM REMOVAL ACTION, PHASE 2  
 SADDLE ROCK PARK  
 WENATCHEE, WASHINGTON

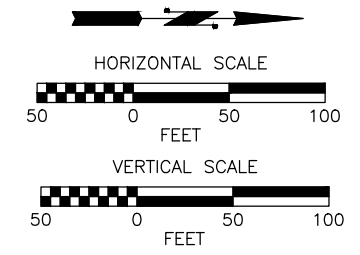
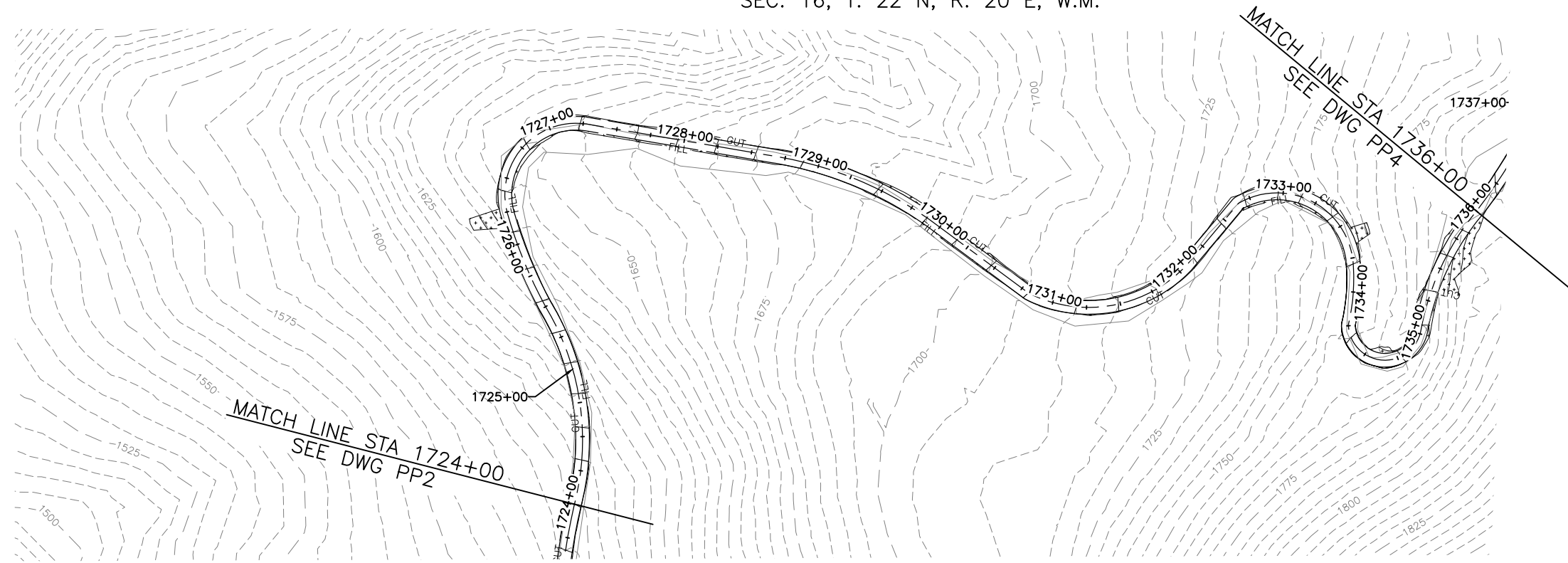
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PLAN AND PROFILE

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CHECKED: RC	DATE: 3.31.21
DRAWING NO	PP2

Jun 01, 2021 - 11:30am mibkey.callea X:\Wenatchee\_City of Projects\20190234 - Saddle Rock Access Road\CADD\02 - Plan Sheets\20190234-PP.dwg Layout Name: PP2

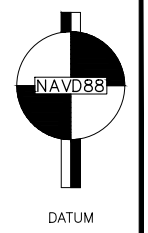
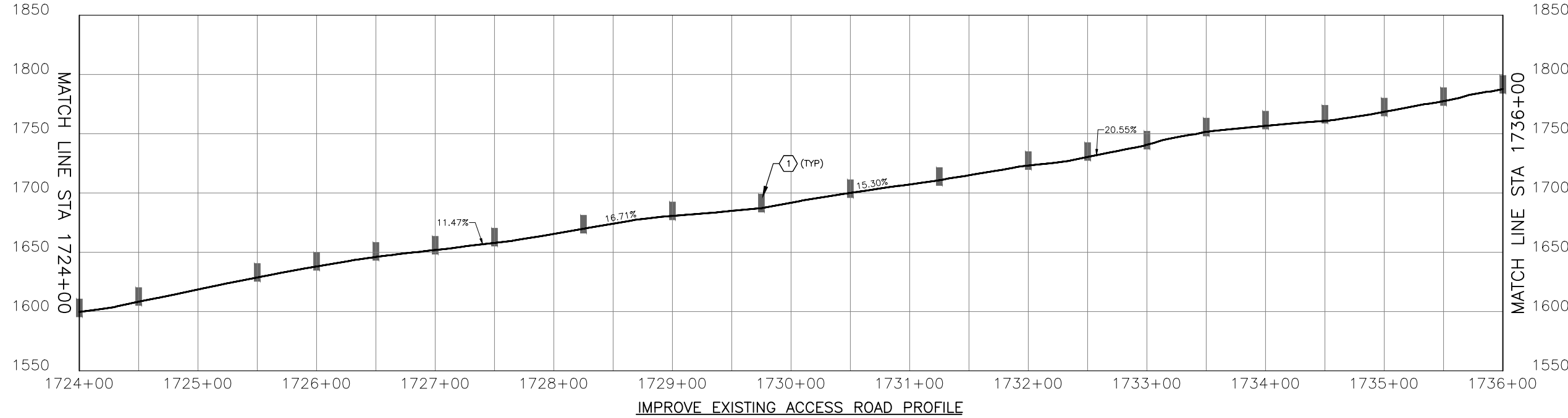
SEC. 16, T. 22 N, R. 20 E, W.M.



- CONSTRUCTION NOTES:**
1. INSTALL WATER BAR PER DETAIL 3 ON DWG. NO. MD1.
  2. INSTALL SCHEDULE A CULV. PIPE 12 IN. DIAM. AT 3.0% WITH OUTLET PROTECTION PER DETAILS 1 AND 2 ON DWG. NO. MD1.
  3. INSTALL DROP INLET TYPE 1 PER WSDOT STD. PLAN B-45.20-01.

- LEGEND**
- CONSTRUCTION STAGING AREA
  - CLEARING AND GRUBBING/SEEDING, FERTILIZING AND MULCHING
  - DROP INLET TYPE 1
  - CULVERT PER DETAIL ON DWG. NO. MD1
  - WATER BAR PER DETAIL ON DWG. NO. MD1
  - CUT
  - CUT LINE
  - FILL
  - FILL LINE
  - EXISTING WIRE FENCE

- GENERAL NOTES:**
1. HORIZONTAL AND VERTICAL ALIGNMENT SHOW THE EXISTING ACCESS ROAD. IT IS PROVIDED AS A REFERENCE FOR THE CONTRACTOR TO USE FOR DETERMINING THE IMPROVEMENTS NEEDED TO MAKE IT SUITABLE FOR USE BY CONSTRUCTION VEHICLES AND EQUIPMENT. CONTRACTOR SHALL IMPROVE EXISTING ACCESS ROAD TO ALLOW HAULING OF WASTE ROCK FROM SR05 PER SPECIAL PROVISION SECTION 2-03.3.
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  3. SEED EXPOSED SOIL AREAS FOR ROADSIDE RESTORATION. CONTRACTOR TO PROVIDE INITIAL SEED APPLICATION AT CONCLUSION OF CONSTRUCTION ACTIVITIES AND A FINAL APPLICATION AT THE DIRECTION OF THE ENGINEER IF CONCLUSION OF ACTIVITIES OCCURS OUTSIDE OF THE WSDOT SPECIFIED SEED WINDOW IN SECTION 8-02.3(9)A OF THE STANDARD SPECIFICATIONS.



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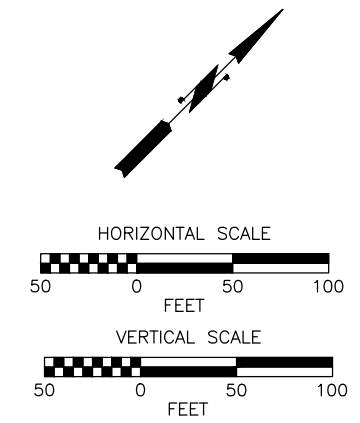
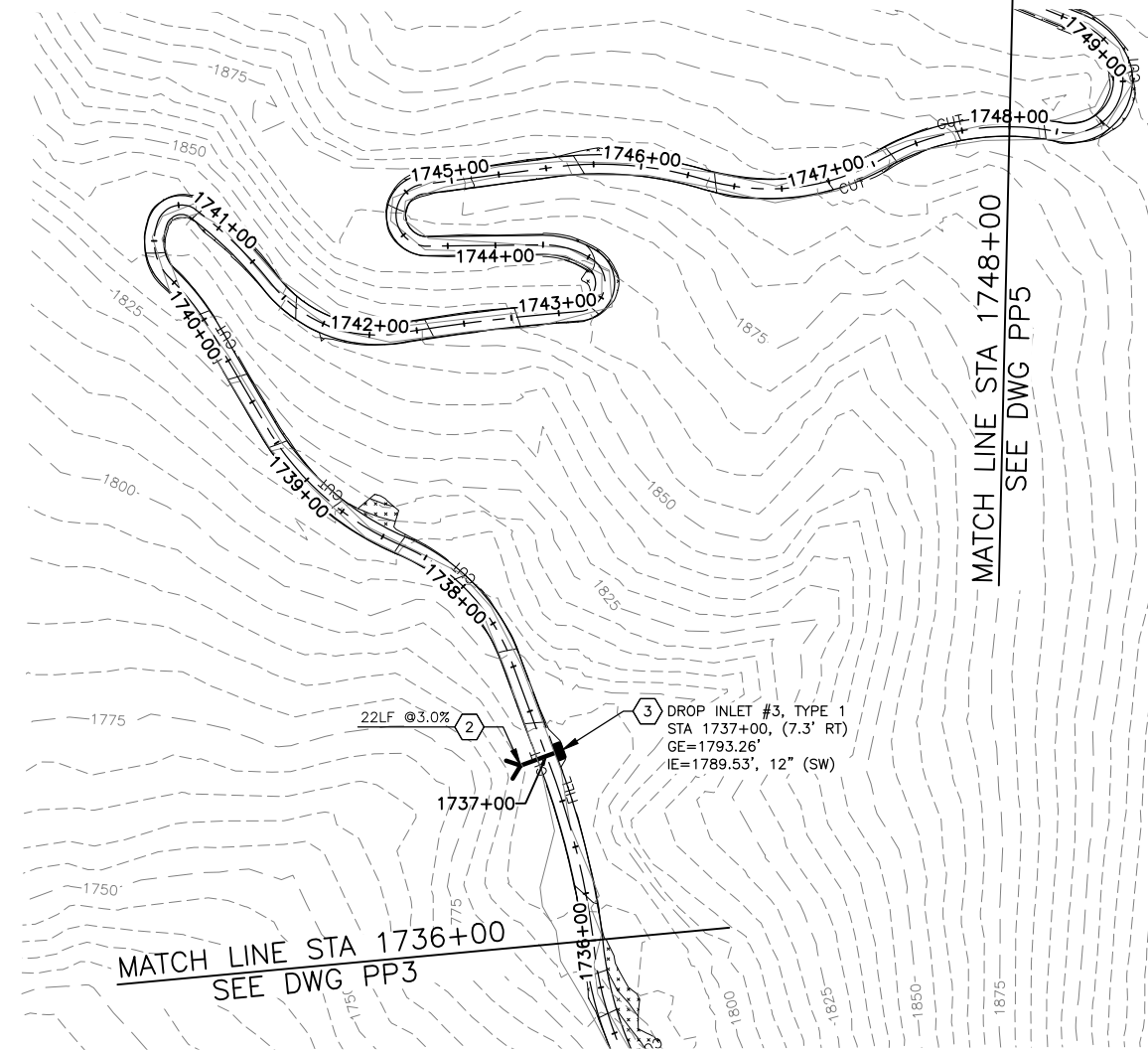
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 SADDLE ROCK PARK  
 WENATCHEE, WASHINGTON

**PLAN AND PROFILE**

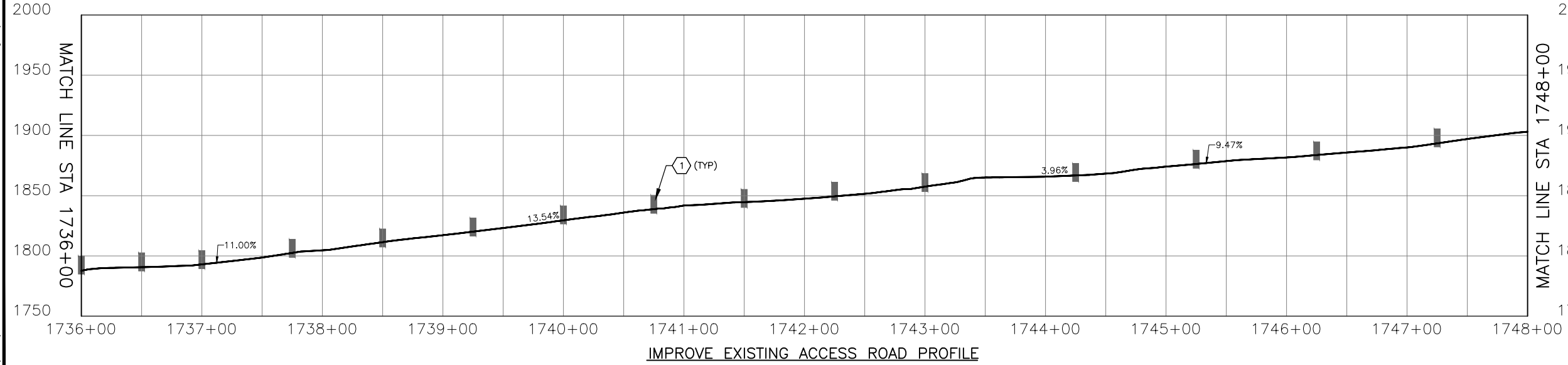
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DESIGN: CO	SHEET 12 OF 18
CHECKED: RC	DATE: 3.31.21
DRAWING NO	<b>PP3</b>



- CONSTRUCTION NOTES:**
- INSTALL WATER BAR PER DETAIL 3 ON DWG. NO. MD1.
  - INSTALL SCHEDULE A CULV. PIPE 12 IN. DIAM. AT 3.0% WITH OUTLET PROTECTION PER DETAILS 1 AND 2 ON DWG. NO. MD1.
  - INSTALL DROP INLET TYPE 1 PER WSDOT STD. PLAN B-45.20-01.

- LEGEND**
- CONSTRUCTION STAGING AREA
  - CLEARING AND GRUBBING/SEEDING, FERTILIZING AND MULCHING
  - DROP INLET TYPE 1
  - CULVERT PER DETAIL ON DWG. NO. MD1
  - WATER BAR PER DETAIL ON DWG. NO. MD1
  - CUT LINE
  - FILL LINE
  - EXISTING WIRE FENCE

- GENERAL NOTES:**
- HORIZONTAL AND VERTICAL ALIGNMENT SHOW THE EXISTING ACCESS ROAD. IT IS PROVIDED AS A REFERENCE FOR THE CONTRACTOR TO USE FOR DETERMINING THE IMPROVEMENTS NEEDED TO MAKE IT SUITABLE FOR USE BY CONSTRUCTION VEHICLES AND EQUIPMENT. CONTRACTOR SHALL IMPROVE EXISTING ACCESS ROAD TO ALLOW HAULING OF WASTE ROCK FROM SR05 PER SPECIAL PROVISION SECTION 2-03.3.
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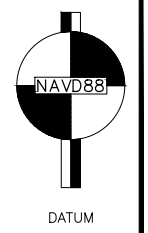


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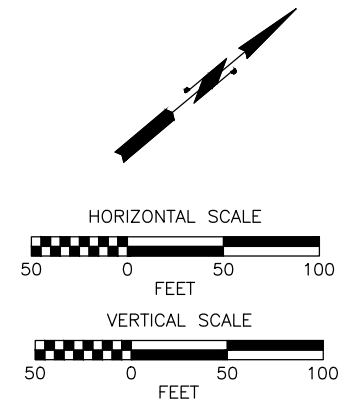
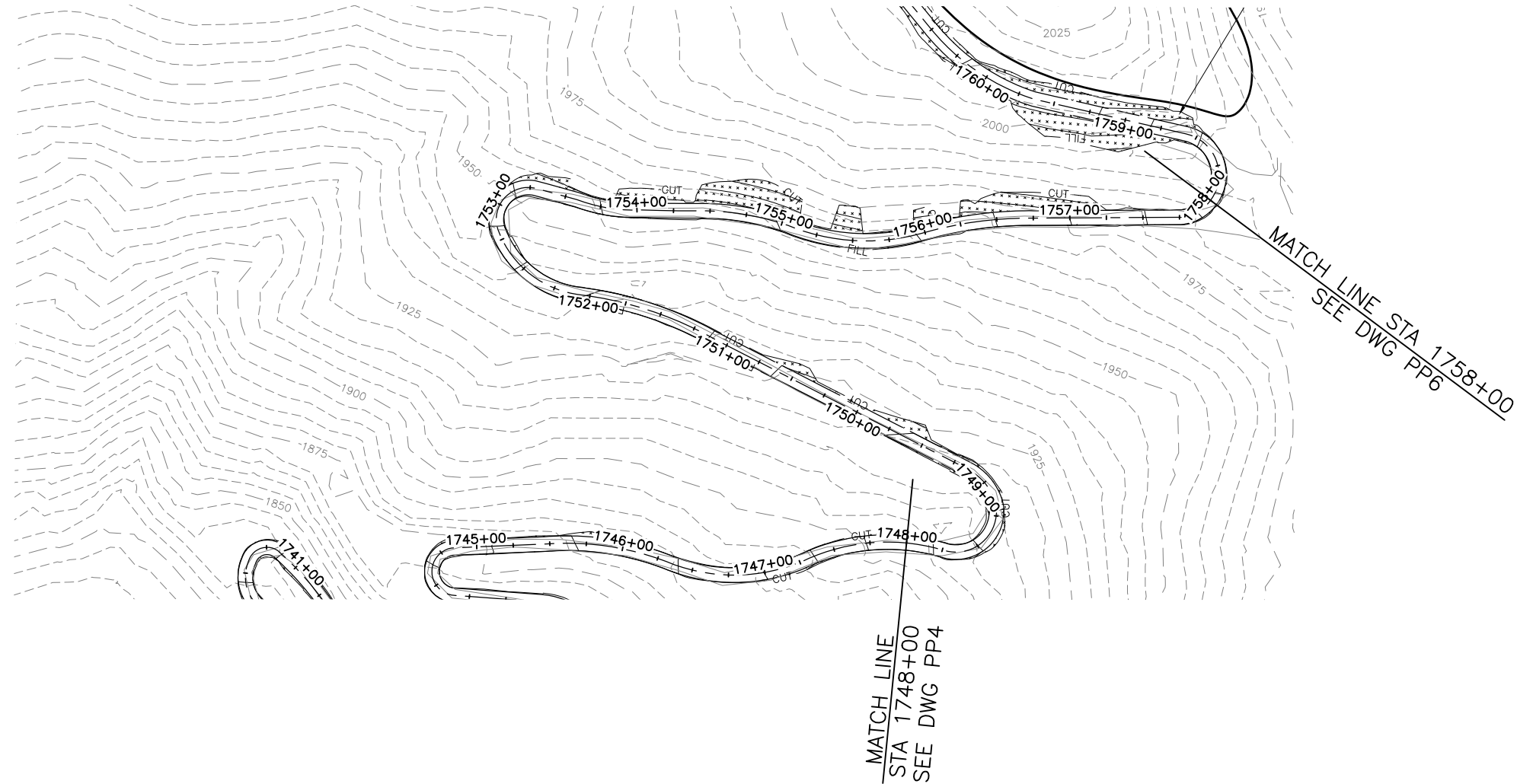
**PLAN AND PROFILE**

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**CONSTRUCTION NOTES:**

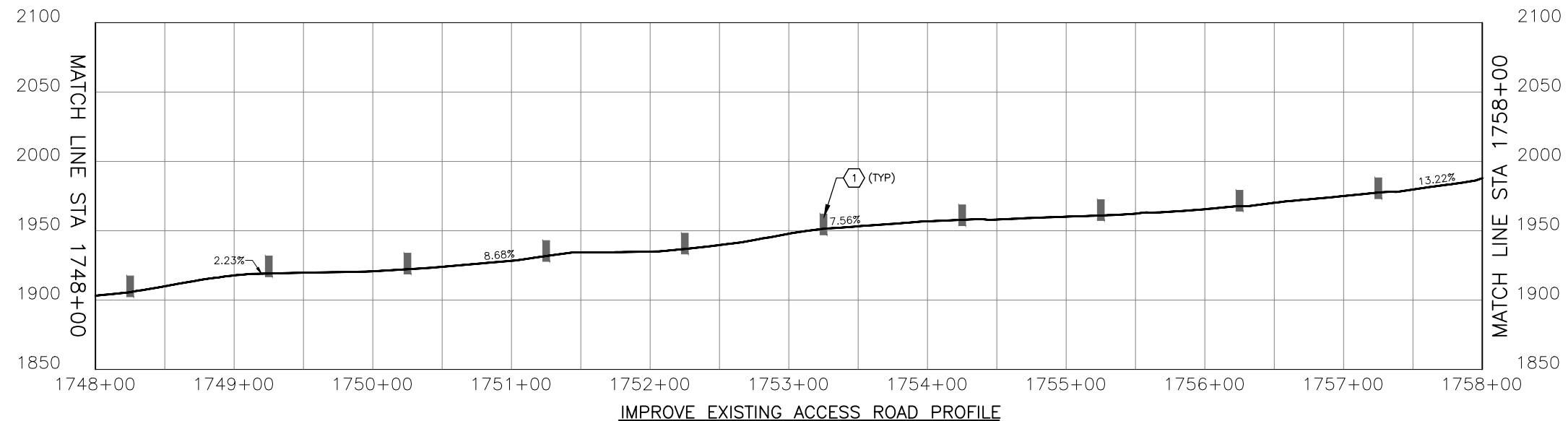
1. INSTALL WATER BAR PER DETAIL 3 ON DWG. NO. MD1.
2. INSTALL SCHEDULE A CULV. PIPE 12 IN. DIAM. AT 3.0% WITH OUTLET PROTECTION PER DETAILS 1 AND 2 ON DWG. NO. MD1.
3. INSTALL DROP INLET TYPE 1 PER WSDOT STD. PLAN B-45.20-01.

**LEGEND**

- CONSTRUCTION STAGING AREA
- CLEARING AND GRUBBING/SEEDING, FERTILIZING AND MULCHING
- DROP INLET TYPE 1
- CULVERT PER DETAIL ON DWG. NO. MD1
- WATER BAR PER DETAIL ON DWG. NO. MD1
- CUT LINE
- FILL LINE
- EXISTING WIRE FENCE

**GENERAL NOTES:**

1. HORIZONTAL AND VERTICAL ALIGNMENT SHOW THE EXISTING ACCESS ROAD. IT IS PROVIDED AS A REFERENCE FOR THE CONTRACTOR TO USE FOR DETERMINING THE IMPROVEMENTS NEEDED TO MAKE IT SUITABLE FOR USE BY CONSTRUCTION VEHICLES AND EQUIPMENT. CONTRACTOR SHALL IMPROVE EXISTING ACCESS ROAD TO ALLOW HAULING OF WASTE ROCK FROM SR05 PER SPECIAL PROVISION SECTION 2-03.3.
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**PERTEET**  
 2707 COLBY AVENUE, SUITE 900  
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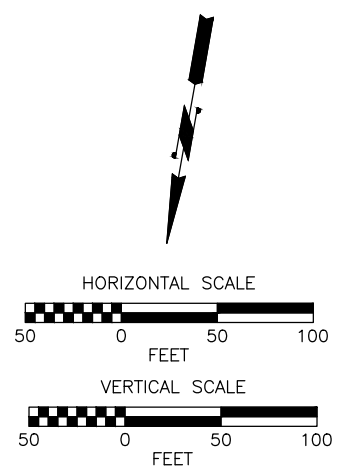
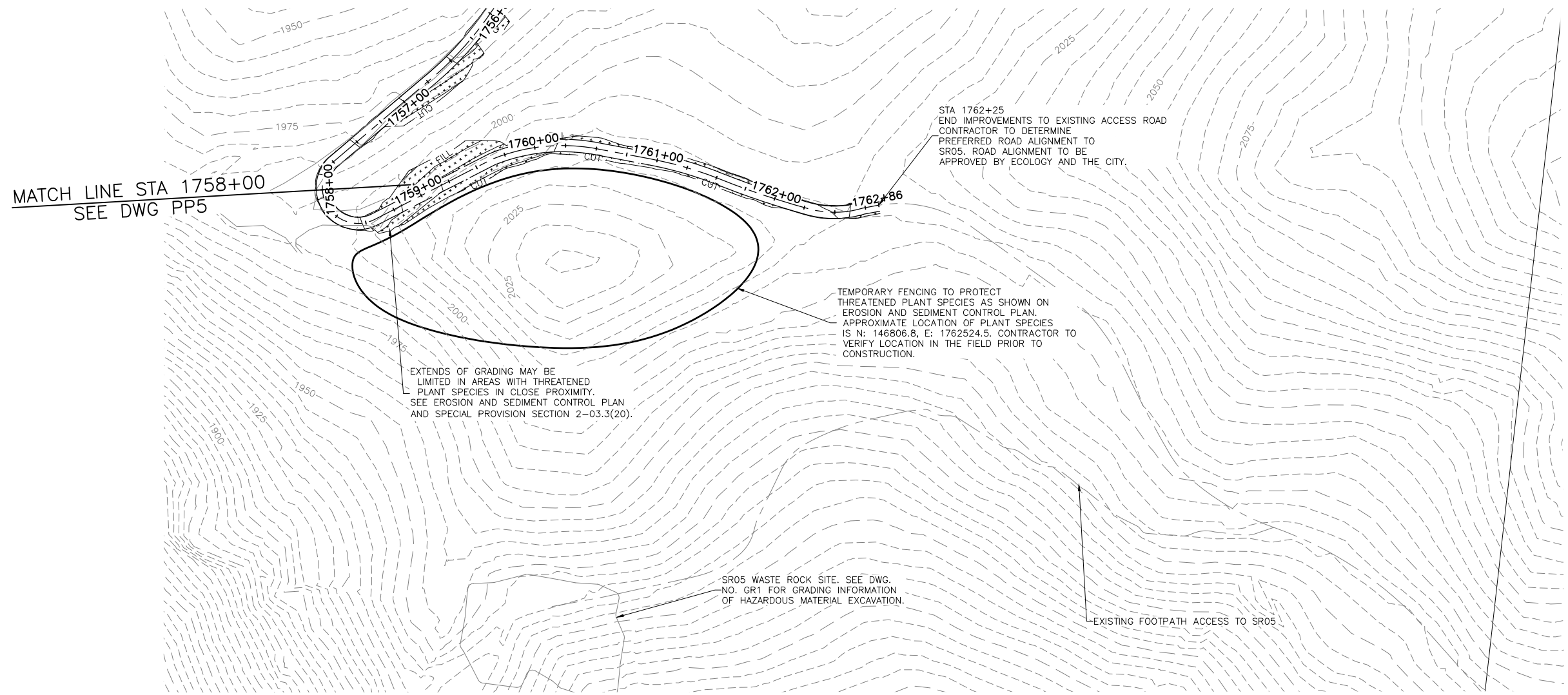
JENNIFER D. SAUGEN  
 STATE OF WASHINGTON  
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 PROFESSIONAL ENGINEER

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INTERIM REMOVAL ACTION, PHASE 2  
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 WENATCHEE, WASHINGTON

PLAN AND PROFILE

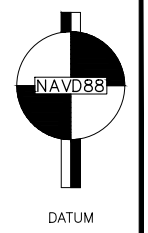
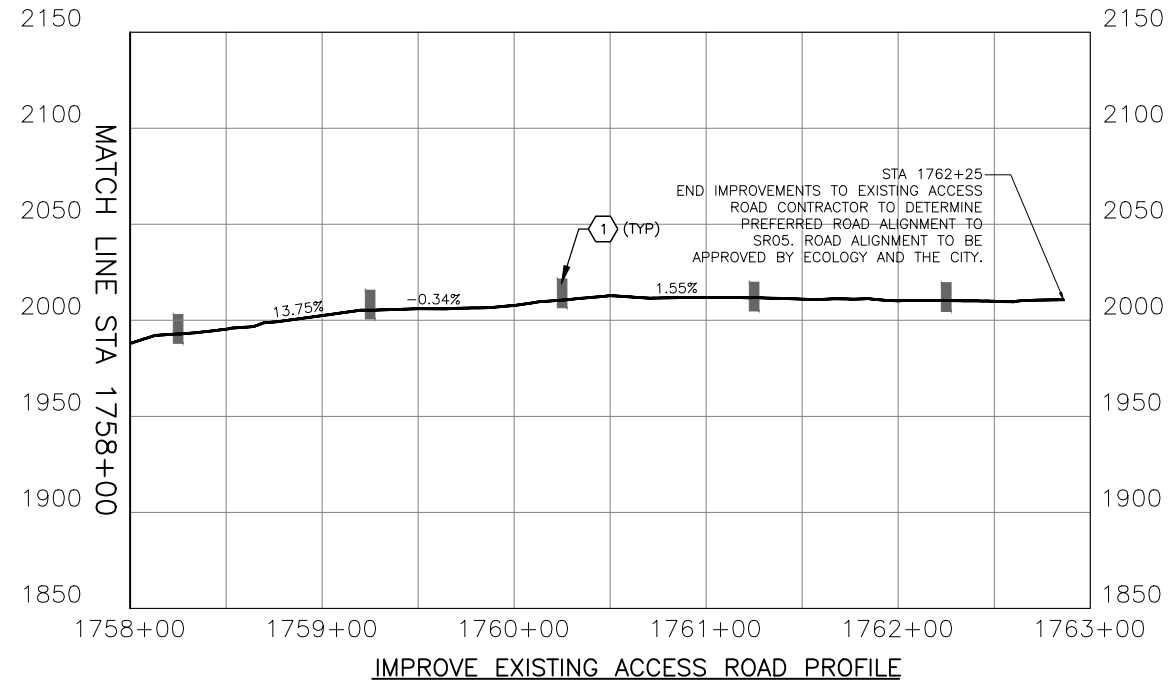
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 DESIGN: CO SHEET 14 OF 18  
 CHECKED: RC DATE: 3.31.21  
 DRAWING NO  
**PP5**



- CONSTRUCTION NOTES:**
1. INSTALL WATER BAR PER DETAIL 3 ON DWG. NO. MD1.
  2. INSTALL SCHEDULE A CULV. PIPE 12 IN. DIAM. AT 3.0% WITH OUTLET PROTECTION PER DETAILS 1 AND 2 ON DWG. NO. MD1.
  3. INSTALL DROP INLET TYPE 1 PER WSDOT STD. PLAN B-45.20-01.

- LEGEND**
- CONSTRUCTION STAGING AREA
  - CLEARING AND GRUBBING/SEEDING, FERTILIZING AND MULCHING
  - DROP INLET TYPE 1
  - CULVERT PER DETAIL ON DWG. NO. MD1
  - WATER BAR PER DETAIL ON DWG. NO. MD1
  - CUT LINE
  - FILL LINE
  - EXISTING WIRE FENCE

- GENERAL NOTES:**
1. HORIZONTAL AND VERTICAL ALIGNMENT SHOW THE EXISTING ACCESS ROAD. IT IS PROVIDED AS A REFERENCE FOR THE CONTRACTOR TO USE FOR DETERMINING THE IMPROVEMENTS NEEDED TO MAKE IT SUITABLE FOR USE BY CONSTRUCTION VEHICLES AND EQUIPMENT. CONTRACTOR SHALL IMPROVE EXISTING ACCESS ROAD TO ALLOW HAULING OF WASTE ROCK FROM SR05 PER SPECIAL PROVISION SECTION 2-03.3.
  2. CONTRACTOR SHALL BE RESPONSIBLE FOR CHOOSING A ROUTE AND CONSTRUCTING A TEMPORARY ACCESS ROAD BETWEEN THE EXISTING ACCESS ROAD AND SR05. CONSTRUCTION SHALL BE PER SPECIAL PROVISION SECTION 2-03.3.
  3. SEED EXPOSED SOIL AREAS FOR ROADSIDE RESTORATION. CONTRACTOR TO PROVIDE INITIAL SEED APPLICATION AT CONCLUSION OF CONSTRUCTION ACTIVITIES AND A FINAL APPLICATION AT THE DIRECTION OF THE ENGINEER IF CONCLUSION OF ACTIVITIES OCCURS OUTSIDE OF THE WSDOT SPECIFIED SEED WINDOW IN SECTION 8-02.3(9)A OF THE STANDARD SPECIFICATIONS.



Jun 01, 2021 11:31am mickley,callea X:\Wenatchee, City of\Projects\20190234 - Saddle Rock Access Road\CADD\02 - Plan Sheets\20190234-PP.dwg Layout Name: PP6

NO.	DATE	BY	REVISION

**PERTEET**  
 2707 COLBY AVENUE, SUITE 900  
 EVERETT, WA 98201  
 425.252.7700 | 800.615.9900



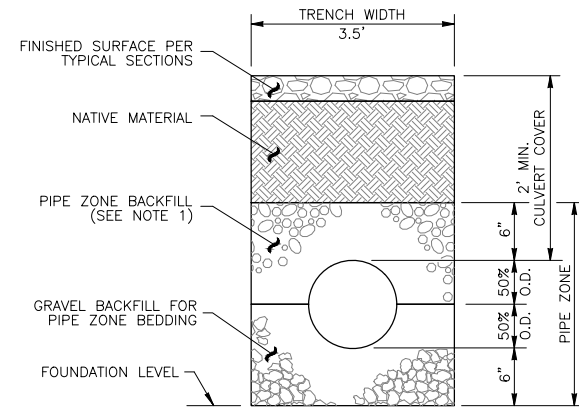
**GEOENGINEERS**  
 523 E SECOND AVE : SPOKANE, WA 99202 : WWW.GEOENGINEERS.COM

INTERIM REMOVAL ACTION, PHASE 2  
 SADDLE ROCK PARK  
 WENATCHEE, WASHINGTON

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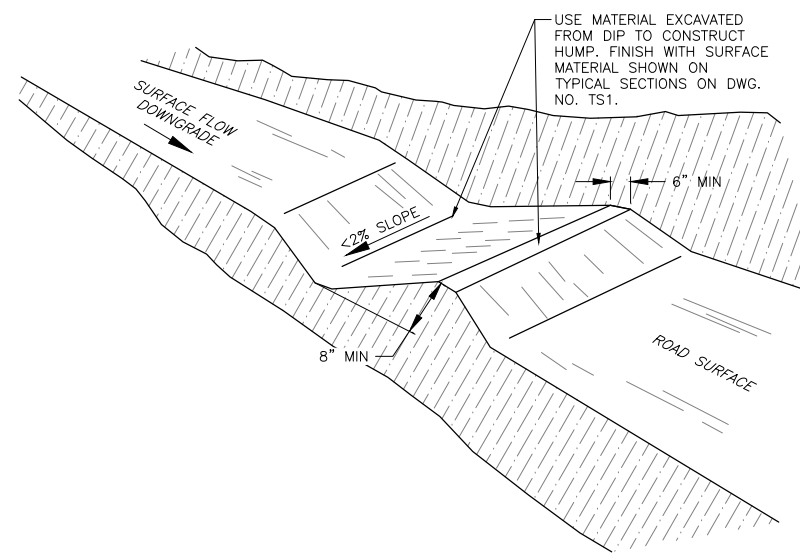
PLAN AND PROFILE

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DESIGN: CO	SHEET 15 OF 18
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DRAWING NO	PP6



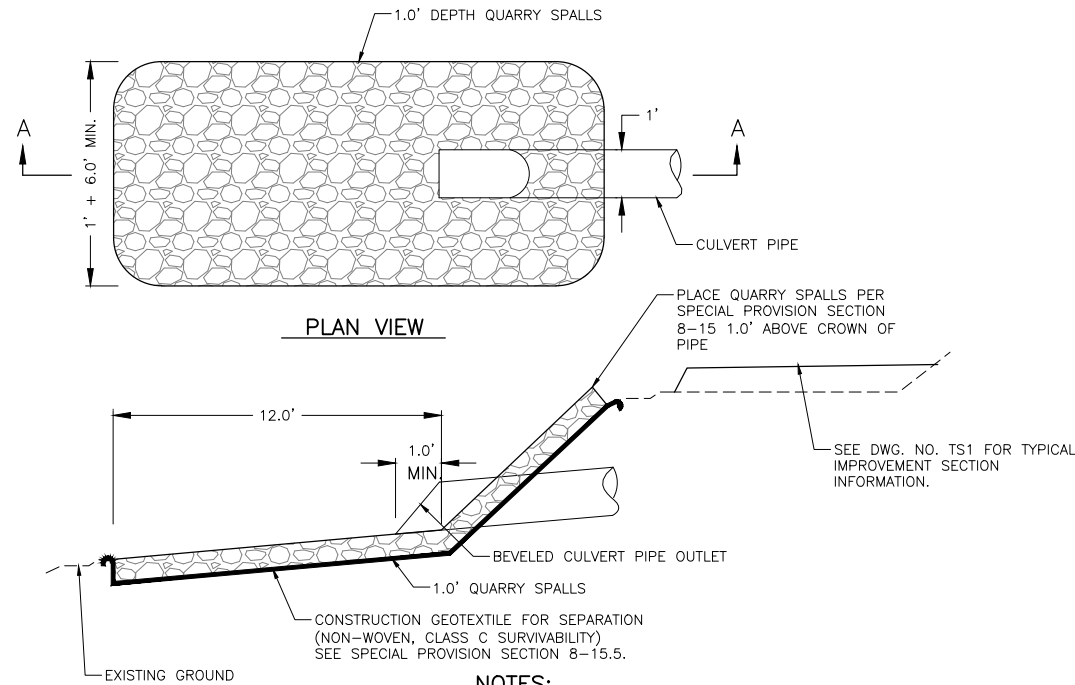
NOTES:  
1. IF THERMOPLASTIC PIPE IS USED, GRAVEL BACKFILL FOR PIPE ZONE BEDDING SHALL BE USED FOR THE ENTIRE PIPE ZONE.

**CULVERT DETAIL 1**  
DD1  
NTS



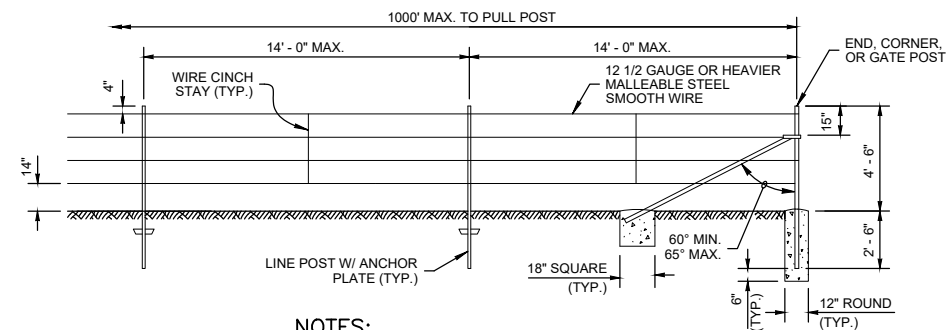
WATER BAR SPACING	
SLOPE ALONG ROAD (1%)	SPACING (FEET)
5	125
5-10	100
10-20	75
20-35	50

**WATER BAR DETAIL 3**  
DD1  
NTS



NOTES:  
CULVERT ENDS SHALL BE BEVELED TO MATCH THE EMBANKMENT OR DITCH SLOPE AND SHALL NOT BE BEVELED FLATTER THAN 4H:1V

**SECTION A-A**  
**OUTLET PROTECTION 2**  
DD1  
NTS



NOTES:  
1. SEE WSDOT STD. PLAN L-10.10-02 FOR POST SPECIFICATIONS, NOTES, AND FURTHER DETAIL INFORMATION.  
2. SEE RESTORATION PLAN, DWG. NO. RP1, FOR WIRE FENCE INSTALLATION LOCATIONS.

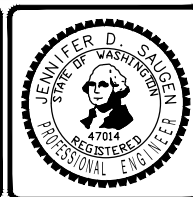
**WIRE FENCE TYPE 3 4**  
DD1  
NTS



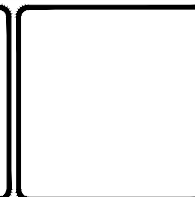
Jun 01, 2021 - 11:31am mickley,calles X:\Wenatchee, City of\Projects\20190234 - Plain Streets\20190234-DD.dwg Layout Name: MD1

NO.	DATE	BY	REVISION

**PERTEET**  
2707 COLBY AVENUE, SUITE 900  
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425.252.7700 | 800.615.9900



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INTERIM REMOVAL ACTION, PHASE 2  
SADDLE ROCK PARK  
WENATCHEE, WASHINGTON

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MISCELLANEOUS DETAILS

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DESIGN: CO	SHEET 16 OF 18
CHECKED: RC	DATE: 3.31.21
DRAWING NO	MD1

APPENDIX E

Department of Ecology BMPs

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## BMP C203E: Water Bars

### Purpose

A water bar is a small ditch or ridge of material that is constructed diagonally across a road or right-of-way to divert stormwater runoff from the road surface, wheel tracks, or a shallow road ditch. See [Figure 7.14: Water Bars](#).

### Conditions of Use

Clearing right-of-way and construction of access for power lines, pipelines, and other similar installations often require long narrow rights-of-way over sloping terrain. Disturbance and compaction promotes gully formation in these cleared strips by increasing the volume and velocity of runoff. Gully formation may be especially severe in tire tracks and ruts. To prevent gullying, runoff can often be diverted across the width of the right-of-way to undisturbed areas by using small predesigned diversions.

Give special consideration to each individual outlet area, as well as to the cumulative effect of added diversions. Use gravel to stabilize the diversion where significant vehicle traffic is anticipated.

### Design and Installation Specifications

- Height: 8 inches minimum, measured from the channel bottom to the ridgetop.
- Side slope of channel: 2H:1V maximum; 3H:1V or flatter when vehicles will cross.
- Top width of ridge: 6 inches minimum.
- Locate water bars to use natural drainage systems and to discharge into well-vegetated stable areas.
- See [Table 7.17: Water Bar Spacing Guidelines](#) for spacing guidelines for water bars.

**Table 7.17: Water Bar Spacing Guidelines**

Slope Along Road (%)	Spacing (feet)
< 5	125
5 to 10	100
10 to 20	75
20 to 35	50
> 35	Use rock-lined ditch

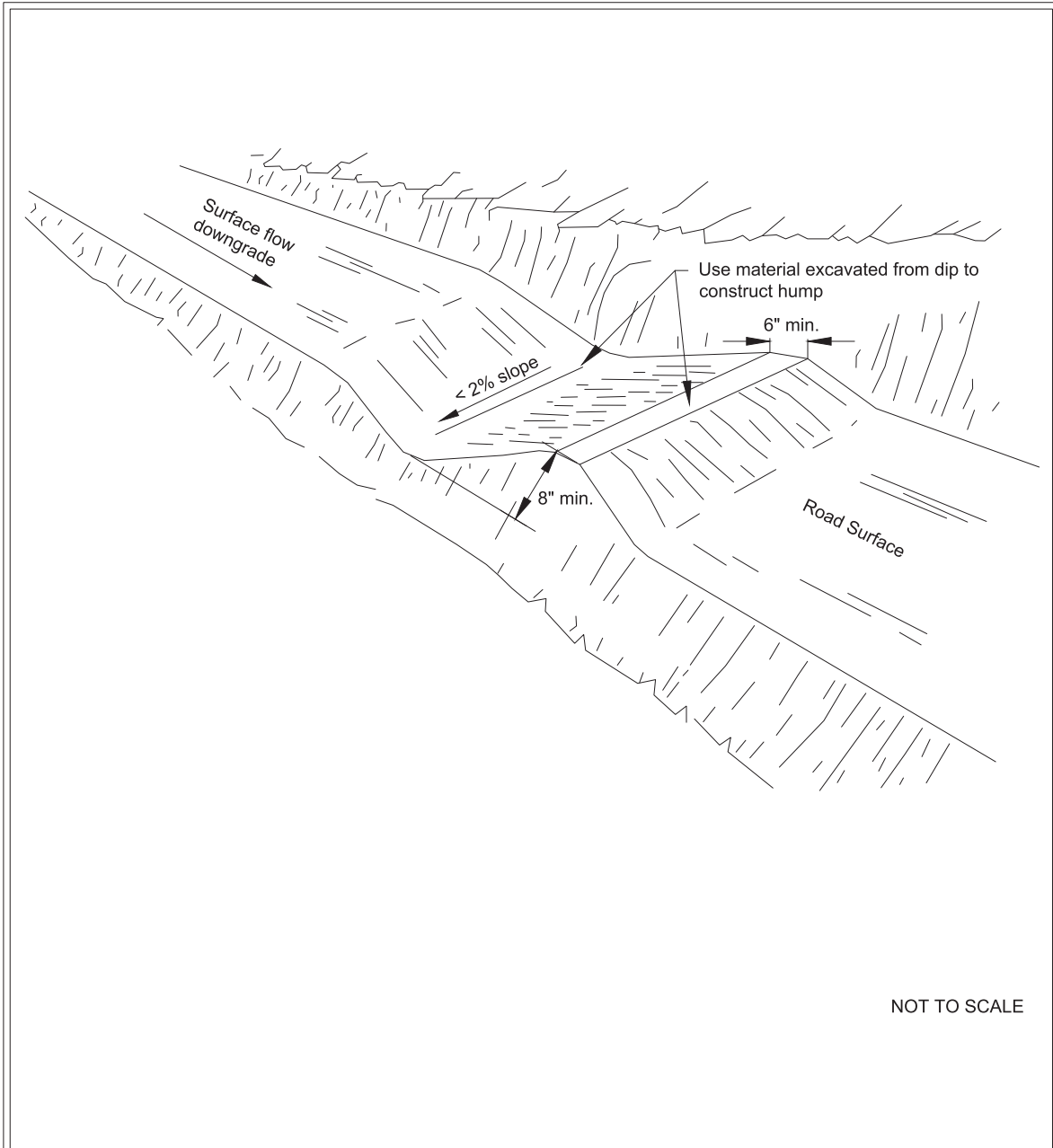
- Grade of water bar and angle: Select an angle that results in a ditch slope < 2%.
- Install the water bar as soon as the clearing and grading is completed. When utilities are being installed, reconstruct the water bar as construction is completed on each section.
- Compact the water bar ridge.

- Stabilize, seed, and mulch the portions that are not subjected to traffic. Place gravel in the areas crossed by vehicles.
- Note that [BMP C208E: Triangular Silt Dike \(TSD\)](#) can be used to create the ridge for the water bar.

### ***Maintenance Standards***

- Periodically inspect water bars for wear and after every heavy rainfall for wear and erosion damage.
- Immediately remove sediment from the flow area and repair the dike.
- Check outlet areas and make timely repairs as needed.
- When permanent road drainage is established and the area above the temporary water bar is permanently stabilized, remove the dike and fill the channel to blend with the natural ground, and appropriately stabilize the disturbed area.

**Figure 7.14: Water Bars**



NOT TO SCALE



## Water Bars

Revised June 2016

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## **BMP F6.42: Full Dispersion**

This BMP allows for “fully dispersing” runoff from impervious surfaces and cleared areas of commercial and residential development sites that protect a portion of the site (or for large sites, a portion of an area within a subbasin drainage on the site) in a natural, native vegetation cover condition. Natural vegetation is preserved and maintained in accordance with guidelines. Runoff from roofs, driveways, and roads within the development is dispersed within the site by using the areas of preserved vegetation.

**Note:** Full dispersion is not subject to Underground Injection Control (UIC) regulations. However, [Figure 6.32: Standard Dispersion Trench With Notched Grade Board](#) shows a standard dispersion trench that is subject to UIC regulations; see [5.6 Subsurface Infiltration \(Underground Injection Control Wells\)](#).

### ***Applications and Limitations***

This BMP is primarily intended for areas of new development. A sliding scale for the amount of preserved vegetated area is provided to allow application to other sites.

- Up to 10% of the site that is impervious surface can be rendered ineffective impervious area by dispersing runoff from it into the native vegetation area. Any additional impervious areas (this BMP recommends limiting additional impervious areas to < another 10% for rural areas) are considered effective impervious surfaces with the exception of roofs served by drywells.
- Types of development that retain a percentage of the site (or for large sites, a portion of an area within a subbasin drainage on the site) in a natural forested or other native vegetation cover condition may also use these BMPs to avoid triggering the flow control BMP requirement or to minimize its use at the site.

### ***General Criteria***

Impervious areas of residential developments can meet flow control requirements by distributing runoff into native vegetation areas that meet the limitations and design guidelines below if the ratio of impervious area to native vegetation area does not exceed 15%. Vegetation must be preserved and maintained according to the following requirements:

- The preserved area should be situated to minimize the clearing of existing native vegetation, to maximize the preservation of wetlands, and to buffer stream corridors.
- The preserved area should be placed in a separate tract or protected through recorded easements for individual lots.
- If feasible, the preserved area should be located downslope from the building sites, since flow control and water quality are enhanced by flow dispersion through undisturbed soils and native vegetation.
- The preserved area should be shown on all property maps and should be clearly marked during clearing and construction on the site.
- Vegetation and trees should not be removed from the natural growth retention area, except for the removal of dangerous and diseased trees.

## Design Procedure

The amount of vegetation that must be preserved and maintained for full dispersion is based on a “sliding scale” that varies between 20% and 65% depending on the percentage of the site with impervious surface that drains into the native vegetation area, as shown in [Table 6.10: Percentage of Site With Undisturbed Native Vegetation Versus Percentage of Site With Impervious Surface Draining to Areas of Preserved Native Vegetation](#).

**Table 6.10: Percentage of Site With Undisturbed Native Vegetation Versus Percentage of Site With Impervious Surface Draining to Areas of Preserved Native Vegetation**

Percentage of Site With Impervious Surface Draining to Native Vegetation Area	Percentage of Site With Undisturbed Native Vegetation
10.0	65
9.0	60
8.25	55
7.5	50
6.75	45
6.0	40
5.25	35
4.5	30
3.75	25
3.0	20

### Roof Downspouts

Roof surfaces that are connected to drywells are considered “fully dispersed” provided that they are designed according to local requirements. Otherwise, the roof runoff is assumed to run into the street, and that volume must be added to the volume dispersed in the roadway dispersion component of this BMP.

### Driveway Dispersion

Driveway surfaces are considered to be “fully dispersed” if the site meets the required ratio of impervious surfaces to preserved native vegetation above, and if they comply with the driveway dispersion BMPs ([BMP F6.40: Concentrated Flow Dispersion](#) and [BMP F6.41: Sheet Flow Dispersion](#)) and have flow paths through native vegetation > 100 feet. This also holds true for any driveway surfaces that comply with the roadway dispersion BMPs described below.

### Roadway Dispersion BMPs

Roadway surfaces are considered to be “fully dispersed” if the site meets the required ratio of impervious surfaces to preserved native vegetation above, and if they comply with the following dispersion requirements:

- Roadway runoff dispersion is allowed only on rural neighborhood collectors and local access streets. To the extent feasible, driveways should be dispersed to the same standards as roadways to ensure adequate water quality protection of downstream resources.
- The road section shall be designed to minimize collection and concentration of roadway runoff. Sheet flow over roadway fill slopes (i.e., where roadway subgrade is above adjacent right-of-way) should be used wherever possible to avoid concentration.
- When it is necessary to collect and concentrate runoff from the roadway and adjacent upstream areas (e.g., in a ditch on a cut slope), concentrated flows shall be incrementally discharged from the ditch via cross culverts or at the ends of cut sections. These incremental discharges of newly concentrated flows shall not exceed 0.5 cubic feet per second (cfs) at any one discharge point from a ditch for the 100-year storm. Where flows at a particular ditch discharge point were already concentrated under existing site conditions (e.g., in a natural channel that crosses the roadway alignment), the 0.5 cfs limit would be in addition to the existing concentrated peak flows.
- Ditch discharge points with up to 0.2 cfs discharge for the 100-year storm shall use rock pads or dispersion trenches to disperse flows. Ditch discharge points with between 0.2 and 0.5 cfs discharge for the 100-year storm shall use only dispersion trenches to disperse flows.
- Dispersion trenches shall be designed to accept surface flows (free discharge) from a pipe, culvert, or ditch end, shall be aligned perpendicular to the flow path, and shall be minimum 2 by 2 feet in section, 50 feet in length, filled with 0.75- to 1.5-inch washed rock, and provided with a level notched grade board (see [Figure 6.32: Standard Dispersion Trench With Notched Grade Board](#)). Manifolds may be used to split flows up to 2 cfs discharge for the 100-year storm between up to four trenches. Dispersion trenches shall have a minimum spacing of 50 feet.
- After being dispersed with rock pads or trenches, flows from ditch discharge points must traverse a minimum of 100 feet of undisturbed native vegetation before leaving the project site, or entering an existing on-site channel carrying existing concentrated flows across the road alignment.

**Note:** In order to provide the 100-foot flow path length to an existing channel, some roadway runoff may unavoidably enter the channel undispersed. Also note that water quality treatment may be waived for roadway runoff dispersed through 100 feet of undisturbed native vegetation.

- Flow paths from adjacent discharge points must not intersect within the 100-foot flow path lengths, and dispersed flow from a discharge point must not be intercepted by another discharge point. To enhance the flow control and water quality effects of dispersion, the flow path shall be  $\leq 15\%$  slope, and shall be located within designated open space.

**Note:** Runoff may be conveyed to an area meeting these flow path criteria.

- Ditch discharge points shall be located a minimum of 100 feet upgradient of steep slopes (i.e.,

slopes > 40%), wetlands, and streams.

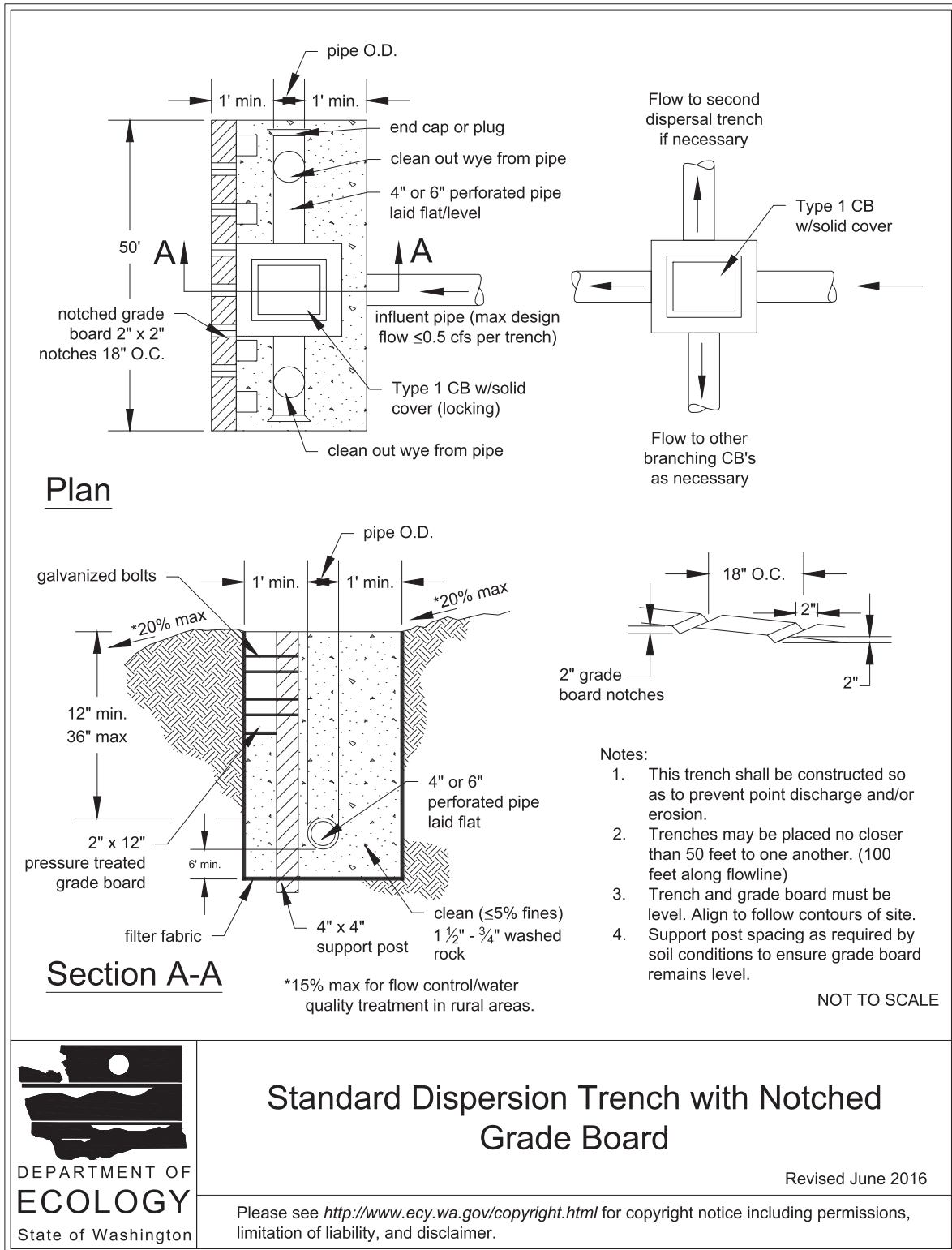
- Where the local jurisdiction determines there is a potential for significant adverse impacts downstream (e.g., erosive steep slopes or existing downstream drainage problems), dispersion of roadway runoff may not be allowed, or other measures may be required.

### **Cleared Area Dispersion BMPs**

The runoff from cleared areas that consist of bare soil, nonnative landscaping, lawn, and/or pasture is considered to be “fully dispersed” if it is dispersed through  $\geq 25$  feet of native vegetation in accordance with the following criteria:

- The contributing flow path of cleared area being dispersed must be  $\leq 150$  feet.
- Slopes within the 25-foot-minimum flow path through native vegetation should be  $\leq 8\%$ . If this criterion cannot be met due to site constraints, the 25-foot flow path length must be increased 1.5 feet for each 1% increase in slope above 8%.

**Figure 6.32: Standard Dispersion Trench With Notched Grade Board**



## **Construction Criteria**

See the construction criteria for [BMP F6.40: Concentrated Flow Dispersion](#).

## **Operation and Maintenance Criteria**

See the operation and maintenance criteria for [BMP F6.40: Concentrated Flow Dispersion](#).

## **BMP F6.43: Channelized Flow Dispersion**

This BMP redisperses influent channelized flows to natural or engineered dispersion areas.

### **General Criteria**

Channelized flow dispersion criteria for all soil types are summarized below.

#### **Flows to Be Dispersed**

Dispersion areas should be suited to handle stormwater runoff from tributary areas so that ideally there is no runoff leaving the dispersion area.

#### **Siting Criteria**

See the siting criteria for [BMP F6.40: Concentrated Flow Dispersion](#).

#### **Setback Requirements**

See the setback requirements for [BMP F6.40: Concentrated Flow Dispersion](#).

#### **Redispersion Design Criteria**

Flows collected in a pipe or ditch conveyance system require energy dissipation and dispersal at the end of the conveyance system before entering the dispersion area. See [Figure 6.32: Standard Dispersion Trench With Notched Grade Board](#) for a typical detail for flow dispersion trench. Guidance for the design of energy dissipaters can be found in *Hydraulic Design of Energy Dissipators for Culverts and Channels* ([FHWA, 2006](#)) and in the latest version of the WSDOT *Hydraulics Manual*.

Concentrated runoff from the flow contributing area and adjacent upstream areas (such as in a ditch or cut slope) must be incrementally discharged from the conveyance system (e.g., ditch, gutter, or storm drain) via cross culverts or at the ends of cut sections. These incremental discharges of newly concentrated flows must not exceed 0.5 cubic feet per second (cfs) at any single discharge point from the conveyance system for the 100-year design flow (see hydrologic modeling methods in [Chapter 4 - Hydrologic Analysis and Design](#)). Where flows at a particular discharge point are already concentrated under existing site conditions (for example, in a natural channel that crosses a roadway alignment), the 0.5 cfs limit would be in addition to the existing concentrated peak flows.

Discharge points with up to 0.2 cfs discharge for the 100-year design flow may use rock pads or dispersion trenches to disperse flows. Discharge points with between 0.2 and 0.5 cfs discharge for the 100-year design flow must use only dispersion trenches to disperse flows.

Design dispersion trenches to accept surface flows (free discharge) from a pipe, culvert, or ditch end; aligned perpendicular to the flow path; a minimum of 2 by 2 feet in section; 50 feet in length; filled with 0.75- to 1.5-inch-diameter washed rock; and provided with a level notched grade board (see [Figure 6.32: Standard Dispersion Trench With Notched Grade Board](#)). Use manifolds to split flows up to 2 cfs discharge for the 100-year peak flow between four trenches (maximum). Provide a minimum spacing of 50 feet for dispersion trenches.

After being dispersed with rock pads or trenches, flows from discharge points must traverse the required flow path length of the dispersion area before entering an existing on-site channel carrying existing concentrated flows away from the roadway alignment.

**Note:** To provide the required flow path length to an existing channel, some roadway runoff may unavoidably enter the channel undispersed.

Do not allow flow paths from adjacent discharge points to intersect within the required flow path lengths, and ensure dispersed flow from a discharge point is not intercepted by another discharge point.

Locate ditch discharge points a minimum of 100 feet upgradient of steep slopes (slopes > 40% within a vertical elevation change of  $\geq 10$  feet), wetlands, and streams.

Where the local jurisdiction determines that there is a potential for significant adverse impacts downstream (such as erosive steep slopes or existing downstream drainage problems), dispersion of roadway runoff may not be allowed, or other measures may be required.

### **Level Spreaders and Energy Dissipaters**

Where gravel level spreaders are not located between the flow contributing area and the dispersion area, side slopes leading to natural dispersion areas should be  $\leq 25\%$  (4H:1V). Side slopes that are 25% to 15% (7H:1V) should not be considered part of the dispersion area. Slopes > 25% are allowed if the existing side slopes are well vegetated and show no signs of erosion problems. See latest version of the WSDOT HRM.

Where gravel level spreaders are located between the flow contributing area and the dispersion area, consider flow contributing area side slopes  $\leq 33\%$  part of the natural dispersion area if existing side slopes are well vegetated and show no signs of erosion problems ([WSDOT, 2011](#)). See latest version of the WSDOT HRM.

For any existing slope that will lead to a natural dispersion area, if evidence of channelized flow (rills or gullies) is present, use a flow-spreading device before those flows are allowed to enter the dispersion area.

## ***Design Procedure***

### **Natural Channelized Flow Dispersion**

The following criterion is specific to channelized flow dispersion that discharged on slopes  $\leq 15\%$  to all Type A and some Type B soils, depending on saturated hydraulic conductivity rates.

- For saturated hydraulic conductivity rates ( $K_{sat}$ , as determined in [6.3.3 General Criteria for Infiltration BMPs](#)) of 4 inches per hour (in/hr) or greater, the dispersion area should be  $\geq 50\%$



APPENDIX F

**Operations and Maintenance**

---

## OPERATIONS AND MAINTENANCE

505 5<sup>th</sup> Ave S, Suite 300, Seattle, WA 98104 | P 206.436.0515

The tables below summarize conditions when maintenance should occur for each type of stormwater facility proposed on-site. At the very least, facilities should be visually inspected twice per year and after large rainfall events. Maintenance is recommended early in the spring after the last expected snowfall has melted.

**Table 1. Water Bars.**

Activity	Objective	Schedule	Notes
Periodically inspect water bars for wear and after every heavy rainfall. Immediately remove sediment from the flow area and repair the dike. Check outlet areas and make timely repairs as needed.	Repair damage due to erosion.	Twice annually (October and January).	N/A
When permanent road drainage is established and the area above the temporary water bar is permanently stabilized, remove the dike and fill the channel to blend with the natural ground, and appropriately stabilize the disturbed area.	Establish permanent feature.	After the site has been stabilized.	N/A

**Table 2. Full Dispersion.**

Activity	Objective	Schedule	Notes
Preserved area should be placed in a separate tract or protected through recorded easements for individual lots.	Maintain the treatment BMP.	N/A	Site is located in a nature preserve.

**APPENDIX D**  
**Geotechnical Evaluation**

**Phase I Environmental Site Assessment  
Geotechnical Engineering Evaluation**

WSDOT Site ID 605282  
3120 East Wellesley Avenue  
Spokane, Washington

*for*  
**Washington State Department of Transportation**

January 4, 2021



## **Geotechnical Engineering Evaluation**

Saddle Rock Interim Remedial Action Project  
Planned Haul Road  
Wenatchee, Washington

*for*

**City of Wenatchee**

January 4, 2021



523 East Second Avenue  
Spokane, Washington 99202  
509.363.3125

**Geotechnical Engineering Evaluation**  
**Saddle Rock Interim Remedial Action Project**  
**Planned Haul Road**  
**Wenatchee, Washington**

**File No. 4296-008-02**

**January 4, 2021**

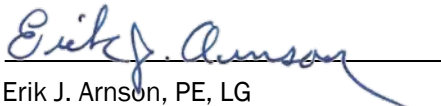
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### APPENDICES

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Appendix B. Report Limitations and Guidelines for Use



## 1.0 INTRODUCTION

GeoEngineers, Inc. (GeoEngineers) is pleased to present the results of our geotechnical engineering services for the Phase 2, Saddle Rock Interim Remedial Action (IRA) Project. The project Site is located on the Saddle Rock Mountain, southwest of Wenatchee, Washington at the location shown in the Vicinity Map, Figure 1. The Site is a park owned by the City of Wenatchee (City) and is frequented by the public for recreational use. The Site was documented to have several mining claims, where waste rock was generated during previous mining prospecting explorations. Since 2011, the Washington State Department of Ecology (Ecology) and others have performed multiple investigations of the remnant waste rock piles exposed at the ground surface near the former mine locations. These investigations indicated that the waste rock piles contained heavy metal contaminants of concern (COC), primarily arsenic. Since arsenic and other heavy metals are hazardous to public health, the preferred remedial action includes excavating the remaining waste rock pile (SR05) and transporting off-site for proper disposal at a permitted waste disposal facility.

To complete the excavation and removal process, heavy equipment will need to access the former SR05 mine location. An existing primitive road extends from the valley floor to the top of the Site ridgeline and is the most direct access to SR05. The approximate location of the existing road is shown in the Site Plan, Figure 2. However, the existing road is on average, approximately 6- to 10-feet wide and is severely eroded in isolated locations. As such, the existing road is not suitable for heavy equipment or vehicle traffic in its present condition. Our Phase 2 project subconsultant, Perteet, Inc., conducted a realignment and new construction assessment of an alternative haul road in order to reduce the road profile grade, but the concept was abandoned by the City in favor of improving the existing road (due to estimated construction costs and potential Site impacts related to large earthwork cuts and fills). Earthwork improvements, in the form of minor widening and surfacing (as needed), will be performed to upgrade the existing road for its intended use as a construction haul road. We understand conceptual plans call for widening the road to approximately 10 feet in width, adding erosion control structures, such as water bars, and potentially surfacing portions of the road with crushed rock. The profile grade of the proposed haul road will match existing grade, resulting in some very steep segments.

## 2.0 SCOPE OF SERVICES

Our geotechnical engineering scope of services was presented as part of our May 8, 2020, revised proposal titled “Saddle Rock Interim Remedial Action Project – Phase 2 Additional Sampling, Environmental Design and Reporting Services.” The purpose of our services was to provide geotechnical engineering recommendations for the design of specific geotechnical aspects of the proposed road improvements, based on subsurface investigation, laboratory testing and engineering analysis. The scope of geotechnical engineering services completed by GeoEngineers for the project is summarized below.

- Completing a literature review of available reports and studies for the Site and surrounding area.
- Completing a geologic site reconnaissance to evaluate site conditions and determine test pit excavation locations.
- Exploring subsurface soil conditions by completing eight test pit excavations at the Site, as a basis for developing our geotechnical recommendations.

- Geotechnical laboratory testing of soil samples collected from the test pits to evaluate pertinent physical and engineering characteristics of Site soil.
- Providing a draft geotechnical engineering report containing logs of test pits, laboratory test results and recommendations for: cut and fill slope inclinations; slope stability; and roadway surfacing.
- Providing a final geotechnical engineering report including mutually agreed upon edits.

### 3.0 SITE CONDITIONS

#### 3.1. Literature Review

##### 3.1.1. Geologic Setting

The Washington State Department of Natural Resources (DNR) Bulletin 75 titled “Geologic Of the Wenatchee and Monitor Quadrangles, Chelan and Douglas Counties, Washington” (Gresens 1983) maps the predominant surficial geology along the existing road alignment as (Ts) “Swauk(?) Formation of late Eocene age. Well-indurated light- to dark-gray felspathic sandstone interbedded with shale and conglomerate. Commonly contains thick calcite veins.” The one exception, according to the map, is where the road crosses a narrow zone of intrusive igneous rock between approximate Project Stations 1707+00 and 1708+00.

##### 3.1.2. Soil Survey Review

The United States Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) provides online soil data through the Web Soil Survey. The Web Soil Survey maps the upper 5 feet of the surficial soil at the site along of the existing road as (BkF) Bjork silt loam, 45 to 65 percent slopes, with two exceptions. From approximate Project Station 1703+00 to 1704+00, the existing road crosses an area soil mapped as (CaB) Cashmere sandy loam, 3 to 8 percent slopes. From approximate Project Station 1728+00 to 1732+00, the existing road crosses an area soil mapped as (BoF2) Bjork-Rock outcrop complex, 25 to 65 percent slopes, eroded. NRCS information for each soil type is provided below.

(BkF) Bjork silt loam, 45 to 65 percent slopes and (BoF2) Bjork-Rock outcrop complex, 25 to 65 percent slopes, eroded. The Bjork soil formed on hillslopes in a parent material of residuum from schist, gneiss or sandstone with loess in the upper part. The typical soil profile consists includes: 0 to 12 inches, silt loam; 12 to 26 inches, clay loam; and 26 to 36 inches, weathered bedrock. The drainage class of the soil is “well drained,” and the Hydrologic Soil Group is C.

(CaB) Cashmere sandy loam, 3 to 8 percent slopes. The Cashmere sandy loam formed on Alluvial fans and/or terraces in a parent material of glaciofluvial deposits. The typical soil profile consists includes: 0 to 9 inches, sandy loam; and 9 to 60 inches, sandy loam. The drainage class of the soil is “well drained,” and the Hydrologic Soil Group is A.

#### 3.2. Surface Conditions

The Site is located within the Dry Gulch Preserve on Saddle Rock mountain. The existing road is located on a southeast facing slope on the south flank of Saddle Rock mountain. The road begins near the intersection of Circle Street and Dry Gulch Road in Wenatchee and traverses the slope for approximately 6,400 lineal feet until it approaches the summit of Saddle Rock mountain. The road varies in width from about 6 to

10 feet and has gradients which vary from near level to about 32 percent. The road is “primitive” with an unpaved surface of bare soil and/or gravel that had been severely eroded in various locations by uncontrolled stormwater runoff. The surrounding slope is sparsely vegetated with native grass and sage brush.

### **3.3. Subsurface Exploration Program**

We explored subsurface soil conditions at the site on August 5, 2020, by excavating eight test pits (TP-1 through TP-8) to depths between about 5 and 11 feet below ground surface (bgs). The test pit locations were completed along the original proposed re-alignment before the decision was made to improve the existing road alignment. The test pits were excavated by Palm Construction, Inc., under subcontract to GeoEngineers, using a track-mounted Cat 305E2 excavator. The approximate locations of the test pits, relative to existing site features, are shown on Figure 2.

Representative disturbed samples of soil and rock collected from the test pits were returned to our laboratory for examination and testing. Detailed descriptions of our site exploration and laboratory testing programs, along with exploration logs and laboratory test results, are presented in Appendix A.

### **3.4. Subsurface Conditions**

Subsurface conditions encountered in our test pits were generally consistent with the Swauk Formation and the Bjork soil described in the previously referenced geologic and soil survey literature. In general, we encountered silty sand or silty sand overlying sandstone in our test pit explorations at the Site.

At the ground surface at the locations of test pits TP-1, TP-3 and TP-4, we encountered about 2 inches of topsoil, which we described sandy silt with organic matter (roots). At the remaining test pit locations, we encountered bare soil at the ground surface.

Below the topsoil or ground surface, we encountered loose to dense, cemented, silty fine or fine to medium sand with occasional gravel (Unified Soil Classification System [USCS] Soil Group Classification – SM). Cementation was observed to range from weak to strong. Test pits TP-1, TP-2, TP-4, TP-5 and TP-7 terminated in the silty sand at depths ranging from about 5 to 10½ feet bgs. The silty sand in test pit TP-3 transitioned to loose to medium dense, weakly cement, clayey fine to medium sand with occasional gravel (USCS Soil Group Classification – SC) at a depth of about 8 feet bgs. Test pit TP-3 terminated in the clayey sand at about 11 feet bgs. We characterize the silty and clayey sand as having moderate strength, low to moderate compressibility and permeability, and a very high susceptibility to changes in moisture content.

Below the silty sand in test pits TP-6 and TP-8, we encountered slightly weathered to decomposed, very soft to medium hard, sandstone with poor to fair rock quality and thinly- to medium-spaced bedding. Test pits TP-6 and TP-8 were terminated in the sandstone at depths of about 8 and 9 feet bgs, respectively. We characterize sandstone as having moderate to high strength, and low compressibility and permeability.

Laboratory percent fines (silt- and clay-sized soil particles passing the US No. 200 sieve) determinations on 11 representative soil samples indicate the fines content of the silty and clayey sand (SM, SC) samples tested ranged from about 20 to 49 percent with the moisture content ranging from about 6 to 11 percent.

### **3.5. Groundwater Conditions**

We did not encounter groundwater in our test pits within the depths explored. Based on our understanding of the project, we do not anticipate groundwater will impact construction during improvement of the existing road. However, the presence, elevation and extent of groundwater varies seasonally, generally being highest in the spring and early summer months, and from year to year, which might result in intermittent seeps or springs in isolated locations at the Site during the spring season or following significant precipitation.

## **4.0 CONCLUSIONS AND RECOMMENDATIONS**

### **4.1. General**

Based on the results of our Site exploration, laboratory testing and engineering analyses, we believe the Site soil conditions are generally suitable for the proposed road improvements, provided the recommendations in the following sections are followed. A summary of some of the geotechnical-related conditions and issues associated with design and construction of the proposed improvements at the Site include the following.

### **4.2. Site Preparation and Earthwork**

#### **4.2.1. Initial Preparation**

We anticipate initial Site preparations will include clearing of brush along the existing road, and stripping of surface vegetation and other organic matter, where present, in areas that will be widened. Root wads from bushes should be grubbed and removed. Stripping depths should be sufficient to remove vegetation and topsoil, where present, and localized zones of other soil with more than about 15 percent organic matter (by volume) that might be present in areas of the site that were not explored.

Excavations and voids resulting from clearing and grubbing should be backfilled with suitable on-site soils or imported structural fill, as defined in Section 4.3. Stripped and grubbed material should be removed and disposed or spread on site at a suitable location as directed by the City or their appointed representative. Actual stripping depths should be determined by the City or their appointed representative based on field observations at the time of construction.

#### **4.2.2. Grading and Excavations**

We understand improvements will be constructed at or near existing Site grade. As such, we anticipate grade changes likely will be in the range of plus or minus 1 foot or less but may require larger cut and fills where the road is widened. In our opinion, Site soil can be excavated using appropriately sized, conventional, excavating equipment and procedures capable of excavating in and around moderately cemented soil. Deeper excavations, such as for culverts, might require ripping of medium hard rock, if encountered.

If earthwork activities cause excessive soil disturbance after stripping or initial grading activities, removal of the disturbed soil and replacement with structural fill might be necessary. Given the sensitivity of the Site soil to moisture, we recommend earthwork construction activities occur during dry weather periods. Ground disturbance should be expected if site preparation work is conducted during periods of wet weather. All excavations to repair disturbed areas should be backfilled with suitable fill, as defined Section 4.3.

### **4.2.3. Subgrade Preparation**

After initial site preparation and grading activities are completed by the contractor, the soil exposed at road subgrade should be compacted to a firm and dense condition. Compaction methods may include wheel rolling, tracking with heavy equipment and/or compaction with static or vibratory rollers. Other compaction methods may be used if approved by the Engineer. If the exposed soil is not near optimum moisture content, scarification of the upper 12 inches of the soil and careful moisture-conditioning (drying or moistening) might be required to adjust the soil moisture content to within 3 percent of optimum moisture content prior to compaction.

We recommend that the Engineer evaluate the condition of the subgrade at the time of construction to determine if it is consistent with the soil encountered in our explorations at the site and if it has been prepared in accordance with the project plans and specifications. Haul road soil encountered at subgrade that cannot be compacted to the specified criteria or is otherwise unsuitable, as determined by the Engineer, should be removed to a depth of 2 feet below subgrade or firm bearing, whichever is less, and replaced with structural fill placed as recommended in Section 4.3. Removal of unsuitable soil should not be performed unless approved by the Engineer.

### **4.2.4. Excavation Slopes**

Widening of the existing road will require excavation (cut) slopes in some locations and potentially, for culvert installation. Excavations deeper than 4 feet should be shored or sloped at stable inclinations if workers are required to enter such excavations. Temporary slopes and shoring for utility excavations must conform to the provisions of Title 296 Washington Administrative Code (WAC), Part N, "Excavation, Trenching and Shoring."

In our opinion, site soil classifies as Type B or C for excavation purposes (Chapter 296-155-664 WAC), depending on the fines content and soil cementation. The maximum allowable temporary slope is 1H:1V (horizontal:vertical) for Type B soil, and 1.5H:1V for Type A soil, provided excavations are less than 20 feet deep located above a groundwater table or seepage zones. This guidance is based on our assumption that all surface loads are kept a minimum distance of at least one-half the depth of the cut away from the top of the slope. Flatter slopes will be necessary if surface loads are imposed above the cuts a distance equal to or less than one-half the depth of the cut. These recommendations are provided for planning purposes only. The Contractor performing the work is responsible for site safety and determining the appropriate temporary slope based on the WAC requirements.

Based on available topographic information, the steepest natural slope in the vicinity of the existing road is located above and east of the road near Project Station 1735+00. The slope is inclined up to about 1.5H:1V and does not exhibit visual evidence of deep-seated instability but does show evidence of surficial erosion. Based on these observations, in our opinion, the natural angle of repose of the Site soil on this slope is about 34 degrees or greater.

The angle of repose of a slope correlates to the angle of internal friction of the slope soil which is representative of the shear strength of the soil. Silty sand soil generally has an internal angle of friction in the range of 30 to 34 degrees but can be higher or lower. Given these observations, it is our opinion that cut and fill slopes of 1.5H:1V or shallower should be stable with respect to significant slope failure. In steep portions of the road alignment, maximum 1.5H:1V permanent cut and fill slopes may be used to widen the haul road. Surficial erosion should be anticipated on slopes inclined steeper than about 2H:1V, requiring



periodic maintenance. Where the topography is less steep, consideration should be given to flatten the slopes to 2H:1V, to reduce the potential for erosion and maintenance.

Surface drainage should be directed away from slope faces. Slopes should be seeded as soon as possible to encourage the development of a vegetative cover or otherwise protected. Raveling and erosion of the slope face could occur with time until a vegetation cover is established, or protection is placed. Raveling and erosion of slopes steeper than 2H:1V could occur even after vegetation is established, and ongoing maintenance should be anticipated.

### **4.3. Structural Fill**

#### **4.3.1. General**

Soil used to construct the roadway improvements is classified as structural fill for the purposes of this report. Structural fill material requirements vary, depending upon its use as described below. Structural fill, whether on-site soil or imported, should be free of debris, organic material, frozen soil and particles larger than 6 inches in maximum dimension. We anticipate the Phase 2 construction contractor may need to place structural fill in select areas along the existing road (to be utilized as the primary 'haul road'), but the majority of existing road soil conditions are anticipated to be suitable for vehicle and equipment traffic, once road improvements have been made.

#### **4.3.2. Use of On-site Soil**

The suitability of on-site soil for use as structural fill depends on soil gradation and/or moisture content at the time of compaction. As stated, the silty sand (SM) soil samples collected from our test pits at the Site had fines contents ranging from 20 to 49 percent by weight and, in our opinion, are highly moisture sensitive.

While the on-site soil may be used as structural fill, in our opinion, it likely will require careful moisture-conditioning, either wetting or drying, to achieve acceptable compaction levels. Such moisture-conditioning might require extra time on the contractor's part and likely will not be possible during wet weather conditions.

#### **4.3.3. Fill Placement and Compaction Criteria**

Structural fill should be placed in loose lifts not exceeding 12 inches in thickness (or a thickness compatible with the compaction equipment used, not to exceed 12 inches) and mechanically compacted to a firm and dense condition. Each lift should be conditioned to the proper moisture content for compaction prior to applying compaction efforts. Compaction can be completed by track walking equipment or other means specified in the contract documents.

We recommend the Engineer be on site during earthwork operations to observe site preparation and structural fill placement. Soil conditions should be evaluated as it is prepared by using method or performance specifications, such as visual evaluation, probing and proof-rolling of the structural fill and recompacted on-site soil, to check for compliance with final contract documents and recommendations in this report.

#### 4.4. Weather Considerations

As stated previously, the on-site silty sand soil is highly moisture sensitive. As the moisture content of the soil increases, the strength decreases. During wet weather, as the soil approaches saturation, it becomes soft and muddy. Performing earthwork in these conditions will lead to severe disturbance of near-surface soil. During dry weather, the on-site soil should be less susceptible to disturbance and provide better support for construction equipment and vehicles. In addition, drying of soil that is above its optimum moisture content is most effective during extended periods of warm, dry weather.

The wet weather season generally begins in November and continues through May in eastern Washington. If possible, this project should be constructed, during the dry season between June and October. However, periods of wet weather may occur during any time of year. If wet weather earthwork is unavoidable, we recommend that the following steps be taken if surficial soil conditions begin to deteriorate:

- Stop earthwork activities during and immediately after periods of heavy precipitation.
- Grade the ground surface in and around the work area so that areas of ponded water do not develop.
- Accumulated water should be removed from the work area in accordance with the project Stormwater Pollution Prevention Plan (SWPPP).
- Areas of uncompacted soil should be sealed by rolling with a smooth-drum roller before precipitation occurs.
- Construction traffic should be restricted to specific areas of the Site, preferably areas that are not susceptible to disturbance.
- Construction activities should be scheduled so that the length of time that soil is exposed to moisture is reduced to the extent practical.

#### 4.5. Road Surfacing

##### 4.5.1. Drainage

Long-term performance of the road surface is influenced significantly by how well it is drained. Uncontrolled stormwater runoff can erode the road surface leading to channels and other damage in the roadbed. Proper grading of the road surface can help reduce such damage by directing stormwater off the road. Such positive drainage can be accomplished by crowning the subgrade to drain to each side of the road and/or super-elevating the road to drain to one side or the other. In either case, we recommend a minimum 2 percent cross slope to promote drainage. In addition, we recommend water bars be installed across the road to intercept stormwater sheet flow on the road and direct it to the shoulder. Water bar spacing will depend on the road gradient with smaller water bar spacing required on steeper sections of the road.

##### 4.5.2. Gravel Surfacing

It might be necessary to place gravel surfacing in select areas of the existing road alignment while the road is being used as the 'haul road' to remove the SR05 waste rock material, especially if work is occurring during wet weather. We anticipate only selected areas of the existing road may require gravel surfacing; however, the contractor should determine the extent and thickness required to complete the project during project bidding. We understand the contractor will surface portions of the existing road (the 'haul road') with final gravel surfacing after substantial construction is completed.

We recommend gravel surfacing consist of Crushed Surfacing Base Course (CSBC) or Crushed Surfacing Top Course (CSTC) meeting criteria in *Section 9-03.9(3)* of the Washington State Department of Transportation (WSDOT) *2020 Standard Specifications for Road, Bridge and Municipal Construction (M41-10)*. Alternative material gradations may be used if approved by the Engineer.

Typical minimum gravel surfacing thickness for infrequently used roads accessed by passenger vehicles is 6 inches. The gravel section is usually increased if the road is frequently travelled and/or supports heavy loads, such as truck traffic. In such cases, gravel thicknesses of 12 to 18 inches are common. Laboratory testing of one representative sample from test pit TP-3, indicated a California Bearing Ratio (CBR) of about 4 for native soils compacted to 90 percent MDD. Typically, for moderate-volume gravel roads and for a CBR of 4, a minimum gravel surfacing thickness of 12 inches would be recommended. However, since this road will be a low-volume road after its use as a haul road, it is likely not warranted to place 12 inches of gravel surfacing after completion of this project.

Gravel sections thinner than 6 inches may be used with the understanding that the surfacing will require more frequent maintenance and that the rock surfacing will likely not provide adequate support if the subgrade soils are wet and could result in severe rutting. In the case of gravel surfacing, such maintenance usually consists of regrading the surface, replenishing the gravel to its original thickness and compacting it.

Gravel placed on road surfaces with gradient of about 15 percent or more often rapidly develops ruts and potholes, as it is displaced down the slope by the tires of vehicles attempting to climb such steep grades. The gravel may also be unstable for vehicles descending slopes steeper than about 15 percent. As such, these road sections require significantly more maintenance than sections with lower gradients.

Once the gravel surfacing has been displaced, it remains in a loose condition and can shift under vehicle tires, potentially reducing the traction and control of the vehicles. For sections of road with gradients of about 15 percent or steeper, we recommend gravel surfacing be omitted and the bare soil chemically treated, as described below. If gravel is placed on such steep gradients, we also suggest it be chemically treated to help bind the material and resist displacement.

#### **4.5.3. Chemical Treatment**

Chemicals, such as calcium chloride and magnesium chloride, sometimes referred to as “road salts,” are used for both deicing of roads, dust control and improving the ride on unpaved roads. These chemicals are mixed with water and usually applied with a water truck equipped with spray nozzles. For unpaved roads, these chemicals seep into the road surface and bind the soil particles together as they crystalize. These treatments need to be reapplied over time with the application frequency depending on traffic volume and weather. Wet weather and higher traffic volumes will break down the chemicals faster than infrequent traffic and dry weather conditions. Chemical treatment of unpaved road surfaces is often performed annually for higher volume gravel roads; however, the City may determine a suitable application interval, based on the road condition and frequency of use as part of their maintenance plan.

For estimating purposes, treatment typically requires about 0.5 gallons of water mixed with calcium chloride or magnesium chloride be applied per square yard of soil for dust control. However, up to 0.7 gallons per square yard might be required on steep gradients or where the road surface is rough. Also, prewetting of the road surface might be required before applying the mix under certain circumstances.

## 5.0 LIMITATIONS

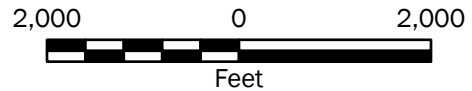
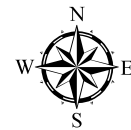
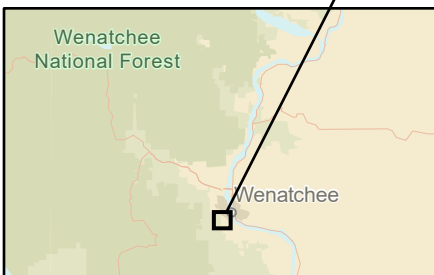
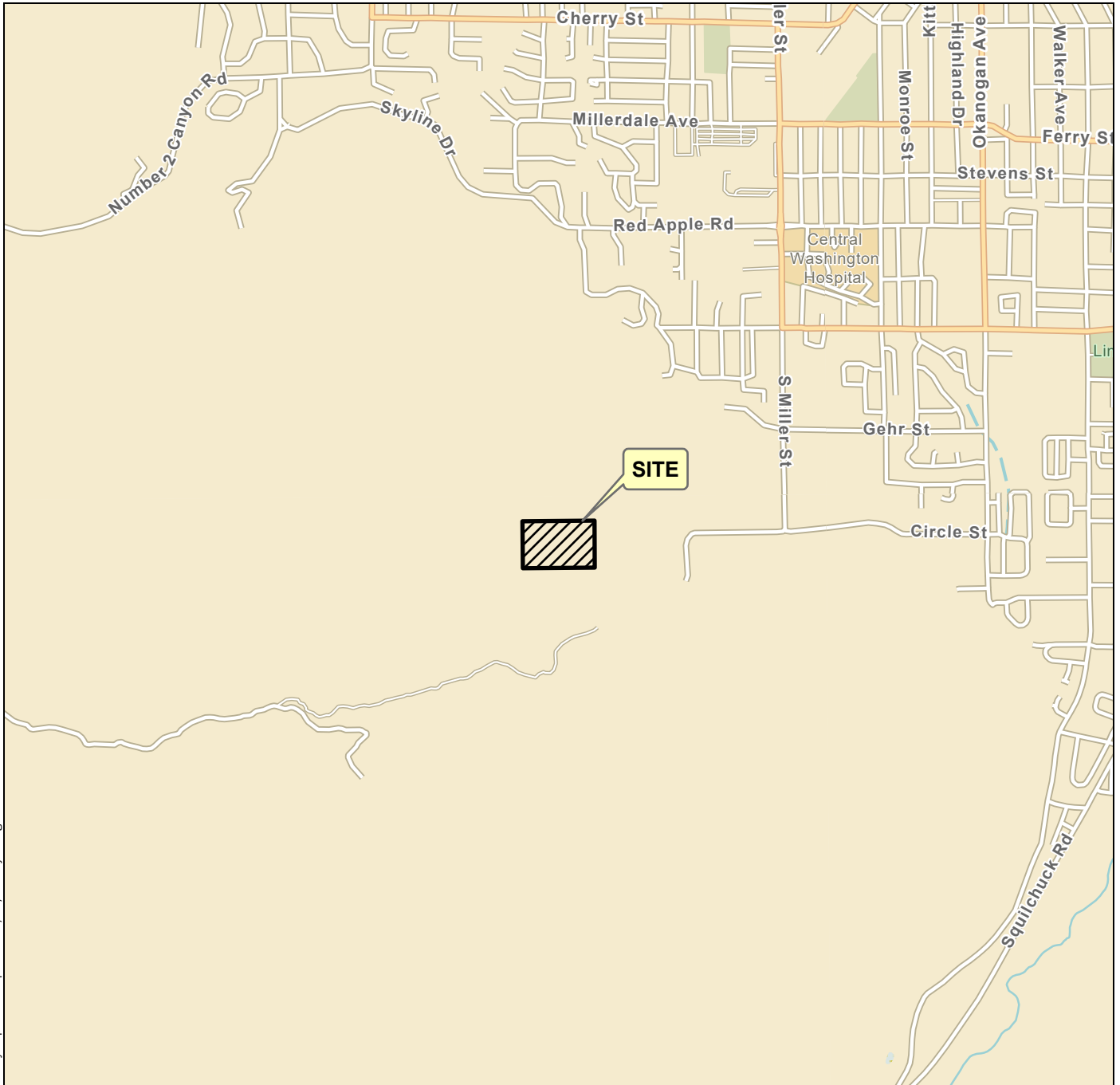
We have prepared this report for the City of Wenatchee for the proposed Saddle Rock Interim Remedial Action Project in Wenatchee, Washington. The City of Wenatchee may distribute copies of this report to its authorized agents and regulatory agencies, as may be required for the project.

Within the limitations of scope, schedule and budget, our services have been executed in accordance with generally accepted practices in the field of geotechnical engineering in this area at the time this report was prepared. The conclusions, recommendations and opinions presented in this report are based on our professional knowledge, judgment and experience. No warranty or other conditions, express or implied, should be understood.

Please refer to Appendix B titled “Report Limitations and Guidelines for Use” for additional information pertaining to use of this report.







**Vicinity Map**

**Saddle Rock Interim Remedial Action Project  
Wenatchee, Washington**



**Figure 1**

**Notes:**

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.




Data Source: ESRI

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet



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**Legend**

-  Approximate Test Pit Location
-  Phase 2 Construction Access Road
-  Phase 2 Construction Haul Road



**Notes:**

1. The locations of all features shown are approximate.
2. This drawing is for information purposes. It is intended to assist in showing features discussed in an attached document. GeoEngineers, Inc. cannot guarantee the accuracy and content of electronic files. The master file is stored by GeoEngineers, Inc. and will serve as the official record of this communication.

Data Source: ESRI

Projection: NAD 1983 StatePlane Washington North FIPS 4601 Feet

<b>Site Plan</b>	
Saddle Rock Interim Remedial Action Project Wenatchee, Washington	
	<b>Figure 2</b>



**APPENDIX A**  
**Field Explorations and Laboratory Testing**



## **APPENDIX A**

### **FIELD EXPLORATIONS AND LABORATORY TESTING**

#### **Field Explorations**

We explored subsurface soil conditions along portions of the existing road on August 5, 2020, by excavating eight test pits (TP-1 through TP-8) to depths between about 5 and 11 feet below ground surface (bgs). The test pits were excavated by Palm Construction, Inc., under subcontract to GeoEngineers, using a track-mounted Cat 305E2 excavator. The approximate locations of the test pits, relative to existing site features, are shown on Figure 2.

Representative grab and bulk samples of soil were collected from the test pits and placed in sealed plastic bags for transportation to our soil laboratory for further examination and testing. The explorations were continuously monitored by GeoEngineers' field staff who examined and classified the soil encountered and obtained the representative soil samples. Soil encountered in the explorations was classified in general accordance with ASTM International (ASTM) D 2488 (visual-manual procedure) and the classification chart listed in Key to Exploration Logs, Figure A-1. Logs of the explorations are presented in Logs of Test Pits, Figures A-2 through A-9. The logs are based on interpretation of the field and laboratory data and indicate the depth at which subsurface materials, or their characteristics change, although these changes might be gradual.

Locations of the explorations were selected by GeoEngineers, based on the proposed preliminary road realignment. The planned test pit locations were established in the field by our representative using GISPro Software on an iPad using available satellites with GPS and/or triangulation from cell towers. The exploration locations should be considered accurate to the degree implied by the method used.

#### **Laboratory Testing**

Representative soil samples were selected for laboratory tests to evaluate select geotechnical engineering characteristics of the site soil to confirm or revise our field classification. Soil samples obtained from the explorations were visually classified in the field and/or in our laboratory using the Unified Soil Classification System (USCS) and ASTM classification methods. ASTM test method D 2488 (Practice for Description and Identification of Soils) was used in the field to visually classify the soil samples, while ASTM D 2487 (Classification of Soils for Engineering Purposes) was used to classify the soil based on laboratory tests results. These classification procedures are described in Figure A-1 and incorporated in the exploration logs shown in Figures A-2 through A-9.

The test procedures were performed in general accordance with the applicable ASTM test procedures ("in general accordance" means certain local and common descriptive practices and methodologies have been followed). The laboratory soil testing program is summarized in Table A-1, Summary of Laboratory Testing.



**TABLE A-1. SUMMARY OF LABORATORY TESTING**

<b>Standard Test Method for:</b>	<b>Test Method Designation</b>	<b>Total Tests Performed</b>	<b>Results Location</b>
Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils	ASTM D 4318	2	Presented in Figure A-10 and in the applicable logs in the 'Remarks' column.
Determining the Amount of Material Finer than 75- $\mu$ m (No. 200) Sieve in Soils by Washing	ASTM D 1140	11	Presented in the applicable exploration logs in the 'Fines Content (%)' column.
Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort (56,000 ft-lbf/ft <sup>3</sup> (2,700 kN-m/m <sup>3</sup> ))	ASTM D 1557	1	Presented in Figure A-11.
Standard Test Method for California Bearing Ratio (CBR) of Laboratory-Compacted Soils	ASTM D 1883	1	Presented in Figure A-12.

## SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
COARSE GRAINED SOILS	GRAVEL AND GRAVELLY SOILS	CLEAN GRAVELS <small>(LITTLE OR NO FINES)</small>		<b>GW</b>	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES
		GRAVELS WITH FINES <small>(APPRECIABLE AMOUNT OF FINES)</small>		<b>GP</b>	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES
		GRAVELS WITH FINES <small>(APPRECIABLE AMOUNT OF FINES)</small>		<b>GM</b>	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
	SAND AND SANDY SOILS	CLEAN SANDS <small>(LITTLE OR NO FINES)</small>		<b>SW</b>	WELL-GRADED SANDS, GRAVELLY SANDS
		SANDS WITH FINES <small>(APPRECIABLE AMOUNT OF FINES)</small>		<b>SP</b>	POORLY-GRADED SANDS, GRAVELLY SAND
		SANDS WITH FINES <small>(APPRECIABLE AMOUNT OF FINES)</small>		<b>SM</b>	SILTY SANDS, SAND - SILT MIXTURES
FINE GRAINED SOILS	SILTS AND CLAYS	LIQUID LIMIT LESS THAN 50		<b>ML</b>	INORGANIC SILTS, ROCK FLOUR, CLAYEY SILTS WITH SLIGHT PLASTICITY
		LIQUID LIMIT LESS THAN 50		<b>CL</b>	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
		LIQUID LIMIT LESS THAN 50		<b>OL</b>	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS	LIQUID LIMIT GREATER THAN 50		<b>MH</b>	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS SILTY SOILS
		LIQUID LIMIT GREATER THAN 50		<b>CH</b>	INORGANIC CLAYS OF HIGH PLASTICITY
		LIQUID LIMIT GREATER THAN 50		<b>OH</b>	ORGANIC CLAYS AND SILTS OF MEDIUM TO HIGH PLASTICITY
HIGHLY ORGANIC SOILS			<b>PT</b>	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS	

NOTE: Multiple symbols are used to indicate borderline or dual soil classifications

### Sampler Symbol Descriptions

	2.4-inch I.D. split barrel
	Standard Penetration Test (SPT)
	Shelby tube
	Piston
	Direct-Push
	Bulk or grab
	Continuous Coring

Blowcount is recorded for driven samplers as the number of blows required to advance sampler 12 inches (or distance noted). See exploration log for hammer weight and drop.

"P" indicates sampler pushed using the weight of the drill rig.

"WOH" indicates sampler pushed using the weight of the hammer.

NOTE: The reader must refer to the discussion in the report text and the logs of explorations for a proper understanding of subsurface conditions. Descriptions on the logs apply only at the specific exploration locations and at the time the explorations were made; they are not warranted to be representative of subsurface conditions at other locations or times.

## ADDITIONAL MATERIAL SYMBOLS

SYMBOLS		TYPICAL DESCRIPTIONS
GRAPH	LETTER	
	<b>AC</b>	Asphalt Concrete
	<b>CC</b>	Cement Concrete
	<b>CR</b>	Crushed Rock/Quarry Spalls
	<b>SOD</b>	Sod/Forest Duff
	<b>TS</b>	Topsoil

### Groundwater Contact



Measured groundwater level in exploration, well, or piezometer



Measured free product in well or piezometer

### Graphic Log Contact

Distinct contact between soil strata

Approximate contact between soil strata

### Material Description Contact

Contact between geologic units

Contact between soil of the same geologic unit

### Laboratory / Field Tests

%F	Percent fines
%G	Percent gravel
AL	Atterberg limits
CA	Chemical analysis
CP	Laboratory compaction test
CS	Consolidation test
DD	Dry density
DS	Direct shear
HA	Hydrometer analysis
MC	Moisture content
MD	Moisture content and dry density
Mohs	Mohs hardness scale
OC	Organic content
PM	Permeability or hydraulic conductivity
PI	Plasticity index
PL	Point load test
PP	Pocket penetrometer
SA	Sieve analysis
TX	Triaxial compression
UC	Unconfined compression
VS	Vane shear

### Sheen Classification

NS	No Visible Sheen
SS	Slight Sheen
MS	Moderate Sheen
HS	Heavy Sheen

## Key to Exploration Logs



Figure A-1

Date Excavated	8/5/2020	Total Depth (ft)	10.5	Logged By	JDO	Excavator	Palm Construction, Inc.	Groundwater not observed
				Checked By	EJA	Equipment	CAT 305E2	Caving not observed
Surface Elevation (ft) Vertical Datum	1601 NAVD88		Easting (X) Northing (Y)	1763056 145306		Coordinate System Horizontal Datum	WA State Plane North NAD83 (feet)	

Elevation (feet)	Depth (feet)	SAMPLE		Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
		Testing Sample	Sample Name Testing						
1600	1		1		TS	Approximately 2 inches dark brown sandy silt with organic matter (roots) (topsoil)			
1599	2		2		SM	Grayish brown silty fine to medium sand (medium dense, dry to moist)	11	48	
1598	3								
1597	4		3						
1596	5				SM	Brown silty fine to medium sand with occasional gravel (dense, moist) (weakly cemented)			
1595	6		4				10	45	
1594	7								
1593	8		5						
1592	9								
1591	10		6						

Notes: See Figure A-1 for explanation of symbols.  
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 1/2 foot.  
Coordinates Data Source: Horizontal approximated based on Aerial Imagery. Vertical approximated based on Aerial Imagery.

### Log of Test Pit TP-1



Project: Saddle Rock Interim Remedial Action Project  
Project Location: Wenatchee, Washington  
Project Number: 4296-008-02

Figure A-2  
Sheet 1 of 1

Date: 11/20/20 Path: P:\4296008\GINT\429600802.GPJ DBLlibrary\Library\GEOENGINEERS\_DF\_STD\_US\_JUNE\_2017.GLB\GEB\_TESTPIT\_IP\_GEOTEC\_SF

Date Excavated	8/5/2020	Total Depth (ft)	9	Logged By	JDO	Excavator	Palm Construction, Inc.	Groundwater not observed
				Checked By	EJA	Equipment	CAT 305E2	Caving not observed
Surface Elevation (ft) Vertical Datum	1525 NAVD88		Easting (X) Northing (Y)	1763311 145081		Coordinate System Horizontal Datum	WA State Plane North NAD83 (feet)	

Elevation (feet)	Depth (feet)	SAMPLE		Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
		Testing Sample	Sample Name Testing						
1524	1		1		SM	Grayish brown silty fine to medium sand (medium dense, dry to moist)			
1523	2		2		SM	Brown silty fine to medium sand with occasional gravel (dense, moist)			
1522	3								
1521	4		3				10	49	
1520	5					Becomes weakly cemented			
1519	6		4						
1518	7								
1517	8		5						
1516	9								

Notes: See Figure A-1 for explanation of symbols.  
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 1/2 foot.  
Coordinates Data Source: Horizontal approximated based on Aerial Imagery. Vertical approximated based on Aerial Imagery.

### Log of Test Pit TP-2



Project: Saddle Rock Interim Remedial Action Project  
Project Location: Wenatchee, Washington  
Project Number: 4296-008-02

Figure A-3  
Sheet 1 of 1

Date: 11/20/20 Path: F:\4296008\GINT\429600802.GPJ DBLlibrary\Library\GEOENGINEERS\_DF\_STD\_US\_JUNE\_2017.GLB\GERB\_TESTPIT\_IP\_GEOTEC\_SF

Date Excavated	8/5/2020	Total Depth (ft)	11	Logged By	JDO	Excavator	Palm Construction, Inc.	Groundwater not observed
				Checked By	EJA	Equipment	CAT 305E2	See "Remarks" section for caving observed
Surface Elevation (ft) Vertical Datum	1481 NAVD88		Easting (X) Northing (Y)	1763219 144894		Coordinate System Horizontal Datum	WA State Plane North NAD83 (feet)	

Elevation (feet)	Depth (feet)	SAMPLE		Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
		Testing Sample	Sample Name Testing						
1480	1	1			TS SM	Approximately 2 inches dark brown sandy silt with organic matter (roots) (topsoil) Brown to reddish brown silty fine sand (loose to medium dense, moist)			
1479	2	2							
1478	3	3							
1477	4	4							
1476	5	5							
1475	6	6							
1474	7	7							
1473	8	8	% <sub>w</sub>		SC	Brown clayey fine to medium sand with occasional gravel (loose to medium dense, dry to moist) (weakly cemented)	7	49	Minor caving observed at 8 feet
1472	9	9							
1471	10	10	% <sub>F</sub> ; CBR; CP; AL				8	46	CBR = 5 AL (LL = 37; PI = 15) MDD = 125 pcf, OMC = 11%
1470	11	11							

Notes: See Figure A-1 for explanation of symbols.  
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 1/2 foot.  
Coordinates Data Source: Horizontal approximated based on Aerial Imagery. Vertical approximated based on Aerial Imagery.

### Log of Test Pit TP-3



Project: Saddle Rock Interim Remedial Action Project  
Project Location: Wenatchee, Washington  
Project Number: 4296-008-02

Figure A-4  
Sheet 1 of 1

Date: 11/20/20 Path: F:\4296008\GINT\429600802.GPJ DBLlibrary\Library\GEOENGINEERS\_DF\_STD\_US\_JUNE\_2017.GLB\GEB8\_TESTPIT\_1P\_GEOtec\_SF



Date Excavated	8/5/2020	Total Depth (ft)	10.5	Logged By	JDO	Excavator	Palm Construction, Inc.	Groundwater not observed
				Checked By	EJA	Equipment	CAT 305E2	Caving not observed
Surface Elevation (ft) Vertical Datum	1434 NAVD88		Easting (X) Northing (Y)	1763442 144807		Coordinate System Horizontal Datum	WA State Plane North NAD83 (feet)	

Elevation (feet)	Depth (feet)	SAMPLE		Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
		Testing Sample	Sample Name Testing						
1433	1	1			TS SM	Approximately 2 inches dark brown sandy silt with organic matter (roots) (topsoil) Grayish brown silty fine sand (loose to medium dense, dry to moist)			
1432	2								
1431	3	2			SM	Brown to reddish brown silty fine to medium sand with occasional gravel (loose to medium dense, moist) (weakly cemented)			
1430	4						6	20	
1429	5								
1428	6	4							
1427	7								
1426	8	5							
1425	9								
1424	10				SM	Grayish brown silty fine to medium sand with occasional gravel (dense, moist) (moderately cemented)	8	40	

Notes: See Figure A-1 for explanation of symbols.  
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 1/2 foot.  
Coordinates Data Source: Horizontal approximated based on Aerial Imagery. Vertical approximated based on Aerial Imagery.

### Log of Test Pit TP-4



Project: Saddle Rock Interim Remedial Action Project  
Project Location: Wenatchee, Washington  
Project Number: 4296-008-02

Figure A-5  
Sheet 1 of 1

Date: 11/20/20 Path: P:\4296008\GINT\429600802.GPJ\DBLibrary\Library\GEOENGINEERS\_DF\_STD\_US\_JUNE\_2017.GLB\GERB\_TESTPIT\_IP\_GEOtec\_3F

Date Excavated	8/5/2020	Total Depth (ft)	10	Logged By	JDO	Excavator	Palm Construction, Inc.	Groundwater not observed
				Checked By	EJA	Equipment	CAT 305E2	See "Remarks" section for caving observed
Surface Elevation (ft) Vertical Datum	1426 NAVD88		Easting (X) Northing (Y)	1763543 144920		Coordinate System Horizontal Datum	WA State Plane North NAD83 (feet)	

Elevation (feet)	Depth (feet)	SAMPLE		Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
		Testing Sample	Sample Name Testing						
1425	1		1		SM	Grayish brown silty fine sand (loose, dry to moist)			
						Becomes brown			
1424	2		2						
1423	3				SM	Brown to reddish brown silty fine to medium sand with occasional gravel (medium dense, moist) (weakly cemented)			
1422	4								
1421	5		3						Minor caving observed from 5 to 7 feet
1420	6								
1419	7		4			Becomes moderately cemented			
1418	8								
1417	9		5			Becomes strongly cemented			
1416	10								

Date: 11/20/20 Path: F:\4296008\GINT\429600802.GPJ DBLibrary\Library\GEOENGINEERS\_DF\_STD\_US\_JUNE\_2017.GLB\GER\_TESTPIT\_IP\_GEOVEC\_SF

Notes: See Figure A-1 for explanation of symbols.  
 The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 1/2 foot.  
 Coordinates Data Source: Horizontal approximated based on Aerial Imagery. Vertical approximated based on Aerial Imagery.

### Log of Test Pit TP-5



Project: Saddle Rock Interim Remedial Action Project  
 Project Location: Wenatchee, Washington  
 Project Number: 4296-008-02

Date Excavated	8/5/2020	Total Depth (ft)	8	Logged By	JDO	Excavator	Palm Construction, Inc.	Groundwater not observed
				Checked By	EJA	Equipment	CAT 305E2	See "Remarks" section for caving observed
Surface Elevation (ft) Vertical Datum	1407 NAVD88		Easting (X) Northing (Y)	1763615 145043		Coordinate System Horizontal Datum	WA State Plane North NAD83 (feet)	

Elevation (feet)	Depth (feet)	SAMPLE		Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
		Testing Sample	Sample Name Testing						
1406	1		1		SM	Brown silty fine sand with cobble-sized strongly cemented clasts (medium dense to dense, dry to moist)			
1405	2		2				8	37	AL (non-plastic)
1404	3								
1403	4		3		Sandstone	Brown sandstone, moderately weathered to predominantly decomposed, very soft to soft, poor rock quality, thinly to medium spaced bedding	5	24	Minor caving observed from 4 to 8 feet
1402	5								
1401	6								
1400	7		4						
1399	8								

Date: 11/20/20 Path: P:\4296008\GINT\429600802.GPJ DBLlibrary\Library\GEOENGINEERS\_DF\_STD\_US\_JUNE\_2017.GLB\GER8\_TESTPIT\_1P\_GEOTEC\_SF

Notes: See Figure A-1 for explanation of symbols.  
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 1/2 foot.  
Coordinates Data Source: Horizontal approximated based on Aerial Imagery. Vertical approximated based on Aerial Imagery.

### Log of Test Pit TP-6



Project: Saddle Rock Interim Remedial Action Project  
Project Location: Wenatchee, Washington  
Project Number: 4296-008-02

Figure A-7  
Sheet 1 of 1

Date Excavated	8/5/2020	Total Depth (ft)	5	Logged By	JDO	Excavator	Palm Construction, Inc.	Groundwater not observed
				Checked By	EJA	Equipment	CAT 305E2	Caving not observed
Surface Elevation (ft) Vertical Datum	1313 NAVD88		Easting (X) Northing (Y)	1763827 144979		Coordinate System Horizontal Datum	WA State Plane North NAD83 (feet)	

Elevation (feet)	Depth (feet)	SAMPLE		Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
		Testing Sample	Sample Name Testing						
1312	1		1		SM	Brown silty fine sand with cobble-sized strongly cemented clasts (medium dense to dense, dry to moist)			
1311	2								
1310	3		2				7	41	
1309	4		3		SM	Brown silty fine to medium sand (very dense, moist) (strongly cemented)			
1308	5								

Notes: See Figure A-1 for explanation of symbols.  
The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 1/2 foot.  
Coordinates Data Source: Horizontal approximated based on Aerial Imagery. Vertical approximated based on Aerial Imagery.

### Log of Test Pit TP-7



Project: Saddle Rock Interim Remedial Action Project  
Project Location: Wenatchee, Washington  
Project Number: 4296-008-02

Date: 11/20/20 Path: P:\4296008\GINT\429600802.GPJ DBLibrary\Library\GEOENGINEERS\_DF\_STD\_US\_JUNE\_2017.GLB\GER8\_TESTPIT\_IP\_GEOTEC\_SF

Date Excavated	8/5/2020	Total Depth (ft)	9	Logged By	JDO	Excavator	Palm Construction, Inc.	Groundwater not observed
				Checked By	EJA	Equipment	CAT 305E2	Caving not observed
Surface Elevation (ft) Vertical Datum	1302 NAVD88		Easting (X) Northing (Y)	1763941 145159		Coordinate System Horizontal Datum	WA State Plane North NAD83 (feet)	

Elevation (feet)	Depth (feet)	SAMPLE		Graphic Log	Group Classification	MATERIAL DESCRIPTION	Moisture Content (%)	Fines Content (%)	REMARKS
		Testing Sample	Sample Name Testing						
1301	1		1		SM	Brown silty fine sand (loose to medium dense, dry)			
1300	2		2		SM	Brown to reddish brown silty fine to medium sand with occasional gravel (medium dense to dense, moist) (strongly cemented) (weathered rock)	6	27	
1299	3								
1298	4								
1297	5								
1296	6		3						
1295	7								
1294	8		4		Sandstone	Reddish brown sandstone, slightly to moderately weathered, medium hard, fair rock quality, thinly spaced bedding			
1293	9								

Date: 11/20/20 Path: F:\4296008\GINT\429600802.GPJ\DBLibrary\GEOENGINEERS\_DF\_STD\_US\_JUNE\_2017.GLB\GERB\_TESTPIT\_IP\_GEOEC\_SF

Notes: See Figure A-1 for explanation of symbols.  
 The depths on the test pit logs are based on an average of measurements across the test pit and should be considered accurate to 1/2 foot.  
 Coordinates Data Source: Horizontal approximated based on Aerial Imagery. Vertical approximated based on Aerial Imagery.

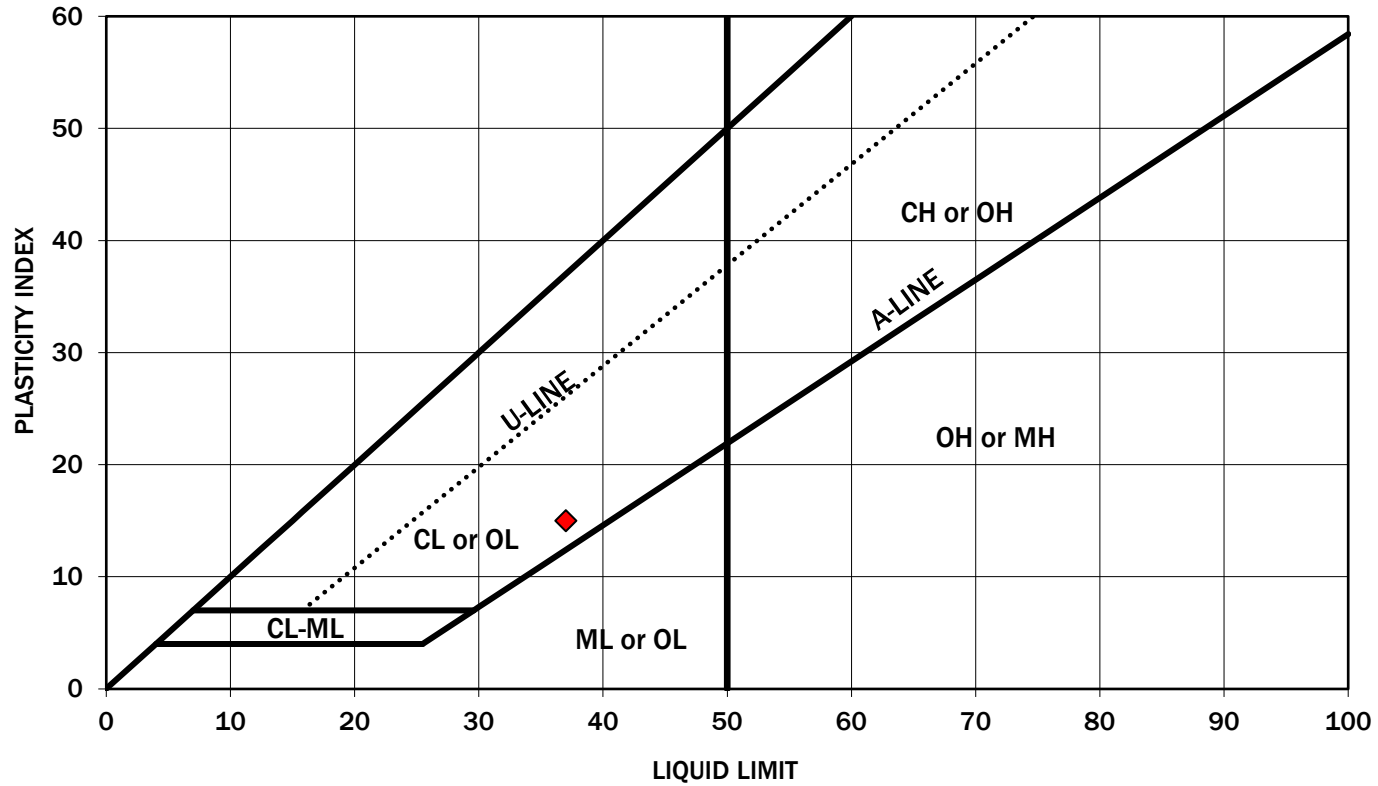
### Log of Test Pit TP-8



Project: Saddle Rock Interim Remedial Action Project  
 Project Location: Wenatchee, Washington  
 Project Number: 4296-008-02



PLASTICITY CHART



Symbol	Boring Number	Depth (feet)	Moisture Content (%)	Liquid Limit (%)	Plasticity Index (%)	Soil Description
◆	TP-3	10 - 11	8	37	15	Clayey sand (SC)

Atterberg Limits Test Results

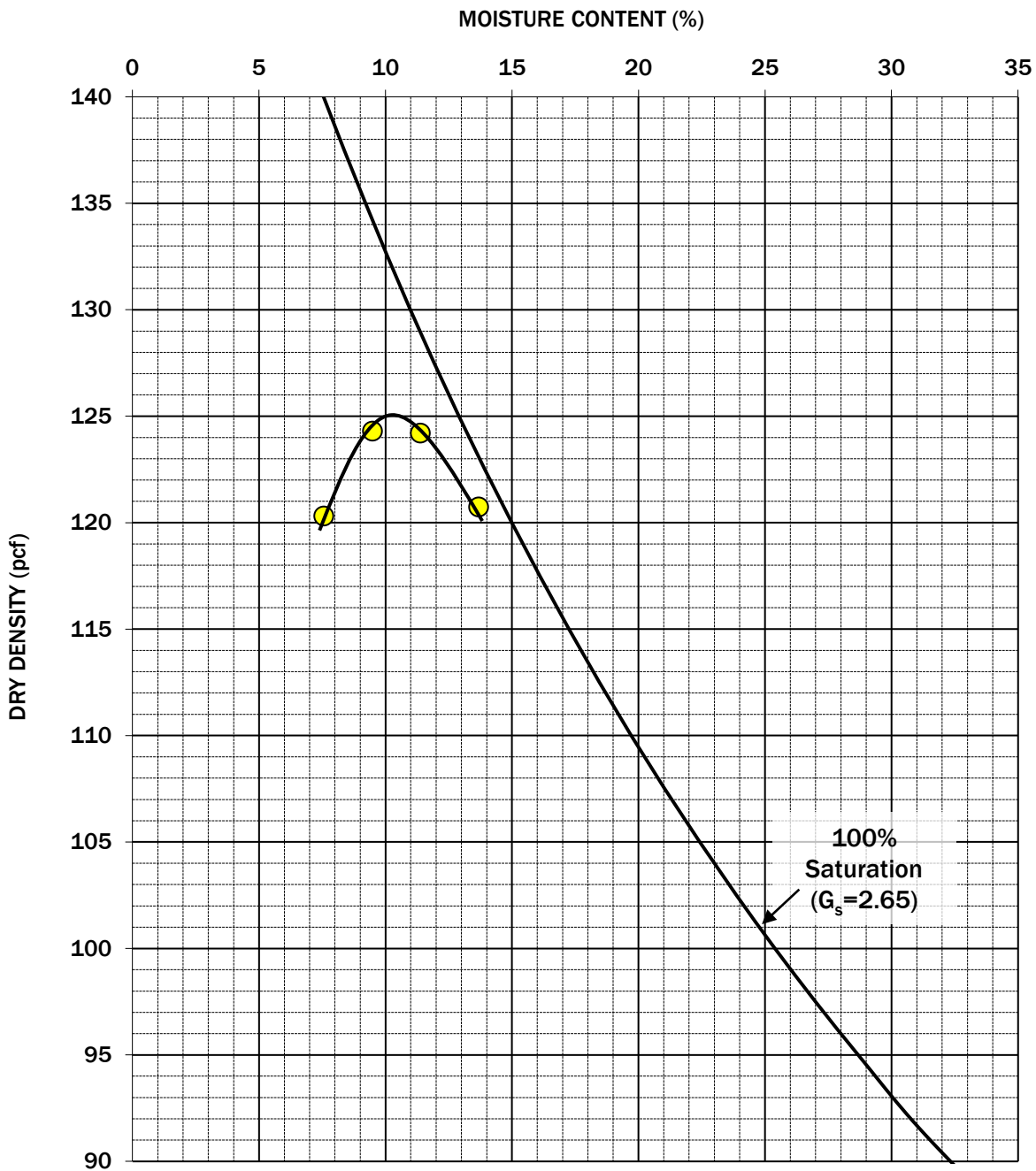
Saddle Rock Interim Remedial Action Report  
Wenatchee, Washington



Figure A-10

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The liquid limit and plasticity index were obtained in general accordance with ASTM D 4318.



Symbol	Boring Number	Depth (feet)	Soil Description	Optimum Moisture (%)	Maximum Dry Density (pcf)
▲ Corrected ● Uncorrected	TP-3	10 - 11	Clayey fine to medium sand with occasional gravel (SC)	n/a 11	n/a 125

Note: This report may not be reproduced, except in full, without written approval of GeoEngineers, Inc. Test results are applicable only to the specific sample on which they were performed, and should not be interpreted as representative of any other samples obtained at other times, depths or locations, or generated by separate operations or processes.

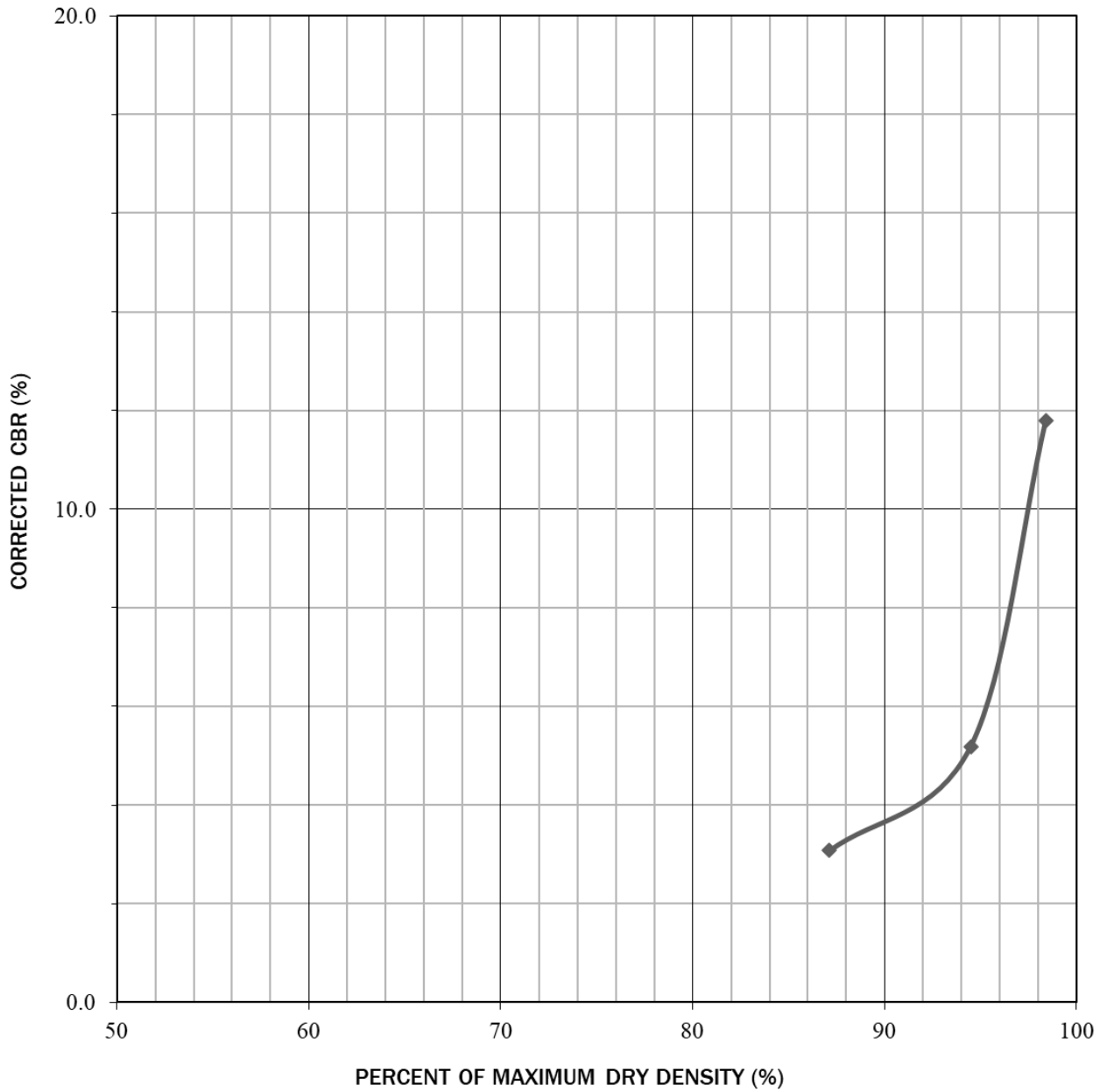
The Proctor results were obtained in general accordance with ASTM D 1557.

### Compaction Test Results

Saddle Rock Interim Remedial Action Report  
Wenatchee, Washington



Figure A-11



Exploration Number	Depth (feet)	Compaction Test Method	Soil Description	Optimum Moisture (%)	Maximum Dry Density (pcf)
TP-3	10 - 11	D1557, B	Clayey fine to medium sand with occasional gravel (SC)	11	125

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The California Bearing Ratio was obtained in general accordance with ASTM D 1883.

### California Bearing Ratio Test Results

Saddle Rock Interim Remedial Action Report  
Wenatchee, Washington



Figure A-12

**APPENDIX B**  
**Report Limitations and Guidelines for Use**

## **APPENDIX B REPORT LIMITATIONS AND GUIDELINES FOR USE<sup>1</sup>**

This appendix provides information to help you manage your risks with respect to the use of this report.

### **Read These Provisions Closely**

It is important to recognize that the geoscience practices (geotechnical engineering, geology and environmental science) rely on professional judgment and opinion to a greater extent than other engineering and natural science disciplines, where more precise and/or readily observable data may exist. To help clients better understand how this difference pertains to our services, GeoEngineers includes the following explanatory “limitations” provisions in its reports. Please confer with GeoEngineers if you need to know more how these “Report Limitations and Guidelines for Use” apply to your project or site.

### **Geotechnical Services are Performed for Specific Purposes, Persons and Projects**

This report has been prepared for the City of Wenatchee and for the Project specifically identified in the report. The information contained herein is not applicable to other sites or projects.

GeoEngineers structures its services to meet the specific needs of its clients. No party other than the party to whom this report is addressed may rely on the product of our services unless we agree to such reliance in advance and in writing. Within the limitations of the agreed scope of services for the Project, and its schedule and budget, our services have been executed in accordance with our Agreement with the City of Wenatchee dated August 29, 2019, and generally accepted geotechnical practices in this area at the time this report was prepared. We do not authorize, and will not be responsible for, the use of this report for any purposes or projects other than those identified in the report.

### **A Geotechnical Engineering or Geologic Report is based on a Unique Set of Project-Specific Factors**

This report has been prepared for the proposed Saddle Rock Interim Remedial Action Project in Wenatchee, Washington. GeoEngineers considered a number of unique, project-specific factors when establishing the scope of services for this project and report. Unless GeoEngineers specifically indicates otherwise, it is important not to rely on this report if it was:

- not prepared for you,
- not prepared for your project,
- not prepared for the specific site explored, or
- completed before important project changes were made.

For example, changes that can affect the applicability of this report include those that affect:

- the function of the proposed structure;

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<sup>1</sup> Developed based on material provided by ASFE, Professional Firms Practicing in the Geosciences; [www.asfe.org](http://www.asfe.org).



- elevation, configuration, location, orientation or weight of the proposed structure;
- composition of the design team; or
- project ownership.

If changes occur after the date of this report, GeoEngineers cannot be responsible for any consequences of such changes in relation to this report unless we have been given the opportunity to review our interpretations and recommendations. Based on that review, we can provide written modifications or confirmation, as appropriate.

### **Environmental Concerns are Not Covered**

Unless environmental services were specifically included in our scope of services, this report does not provide any environmental findings, conclusions, or recommendations, including but not limited to, the likelihood of encountering underground storage tanks or regulated contaminants.

### **Subsurface Conditions Can Change**

This geotechnical or geologic report is based on conditions that existed at the time the study was performed. The findings and conclusions of this report may be affected by the passage of time, by man-made events such as construction on or adjacent to the site, new information or technology that becomes available subsequent to the report date, or by natural events such as floods, earthquakes, slope instability or groundwater fluctuations. If more than a few months have passed since issuance of our report or work product, or if any of the described events may have occurred, please contact GeoEngineers before applying this report for its intended purpose so that we may evaluate whether changed conditions affect the continued reliability or applicability of our conclusions and recommendations.

### **Geotechnical and Geologic Findings are Professional Opinions**

Our interpretations of subsurface conditions are based on field observations from widely spaced sampling locations at the site. Site exploration identifies the specific subsurface conditions only at those points where subsurface tests are conducted or samples are taken. GeoEngineers reviewed field and laboratory data and then applied its professional judgment to render an informed opinion about subsurface conditions at other locations. Actual subsurface conditions may differ, sometimes significantly, from the opinions presented in this report. Our report, conclusions and interpretations are not a warranty of the actual subsurface conditions.

### **Geotechnical Engineering Report Recommendations are Not Final**

We have developed the following recommendations based on data gathered from subsurface investigation(s). These investigations sample just a small percentage of a site to create a snapshot of the subsurface conditions elsewhere on the site. Such sampling on its own cannot provide a complete and accurate view of subsurface conditions for the entire site. Therefore, the recommendations included in this report are preliminary and should not be considered final. GeoEngineers' recommendations can be finalized only by observing actual subsurface conditions revealed during construction. GeoEngineers cannot assume responsibility or liability for the recommendations in this report if we do not perform construction observation.

We recommend that you allow sufficient monitoring, testing and consultation during construction by GeoEngineers to confirm that the conditions encountered are consistent with those indicated by the explorations, to provide recommendations for design changes if the conditions revealed during the work differ from those anticipated, and to evaluate whether earthwork activities are completed in accordance with our recommendations. Retaining GeoEngineers for construction observation for this project is the most effective means of managing the risks associated with unanticipated conditions. If another party performs field observation and confirms our expectations, the other party must take full responsibility for both the observations and recommendations. Please note, however, that another party would lack our project-specific knowledge and resources.

### **A Geotechnical Engineering or Geologic Report Could Be Subject to Misinterpretation**

Misinterpretation of this report by members of the design team or by contractors can result in costly problems. GeoEngineers can help reduce the risks of misinterpretation by conferring with appropriate members of the design team after submitting the report, reviewing pertinent elements of the design team's plans and specifications, participating in pre-bid and preconstruction conferences, and providing construction observation.

### **Do Not Redraw the Exploration Logs**

Geotechnical engineers and geologists prepare final boring and testing logs based upon their interpretation of field logs and laboratory data. The logs included in a geotechnical engineering or geologic report should never be redrawn for inclusion in architectural or other design drawings. Photographic or electronic reproduction is acceptable but separating logs from the report can create a risk of misinterpretation.

### **Give Contractors a Complete Report and Guidance**

To help reduce the risk of problems associated with unanticipated subsurface conditions, GeoEngineers recommends giving contractors the complete geotechnical engineering or geologic report, including these "Report Limitations and Guidelines for Use." When providing the report, you should preface it with a clearly written letter of transmittal that:

- advises contractors that the report was not prepared for purposes of bid development and that its accuracy is limited; and
- encourages contractors to conduct additional study to obtain the specific types of information they need or prefer.

### **Contractors are Responsible for Site Safety on Their Own Construction Projects**

Our geotechnical recommendations are not intended to direct the contractor's procedures, methods, schedule or management of the work site. The contractor is solely responsible for job site safety and for managing construction operations to minimize risks to on-site personnel and adjacent properties.

### **Biological Pollutants**

GeoEngineers' Scope of Work specifically excludes the investigation, detection, prevention or assessment of the presence of Biological Pollutants. Accordingly, this report does not include any interpretations, recommendations, findings or conclusions regarding the detecting, assessing, preventing or abating of Biological Pollutants, and no conclusions or inferences should be drawn regarding Biological Pollutants as

they may relate to this project. The term “Biological Pollutants” includes, but is not limited to, molds, fungi, spores, bacteria and viruses, and/or any of their byproducts.

A Client that desires these specialized services is advised to obtain them from a consultant who offers services in this specialized field.

### **Information Provided by Others**

GeoEngineers has relied upon certain data or information provided or compiled by others in the performance of our services. Although we use sources that we reasonably believe to be trustworthy, GeoEngineers cannot warrant or guarantee the accuracy or completeness of information provided or compiled by others.



**APPENDIX E**  
**Landfill Disposal Acceptance and Profile**





Requested Facility: Greater Wenatchee Regional Landfill Profile Number: 114473WA
Multiple Generator Locations (Attach Locations) Request Certificate of Disposal Renewal? Original Profile Number:

A. GENERATOR INFORMATION (MATERIAL ORIGIN)

- 1. Generator Name: City of Wenatchee-Saddle Rock Park
2. Site Address: 1130 Circle St (City, State, ZIP) Wenatchee WA 98801
3. County: Chelan
4. Contact Name: Charlotte Mitchell
5. Email: cmitchell@wenatcheewa.gov
6. Phone: (509) 888-3662 7. Fax: (509) 888-3201
8. Generator EPA ID: N/A
9. State ID: N/A

C. MATERIAL INFORMATION

- 1. Common Name: LF02-Metals Impacted Soil
Describe Process Generating Material: See Attached
Former mining activities produced waste rock soil at the Saddle Rock Park (1130 Circle St, Wenatchee, WA 98801). Waste rock soil needs removal from park area. Construction project to remove waste rock soil will be conducted in two phases.
2. Material Composition and Contaminants: See Attached
Table with 2 columns: Contaminant, Percentage. Row 1: Soil and Metals, 100%. Total comp. must be equal to or greater than 100% >=100%
3. State Waste Codes: N/A
4. Color: Brown
5. Physical State at 70°F: Solid
6. Free Liquid Range Percentage: N/A
7. pH: N/A
8. Strong Odor: No
9. Flash Point: <140°F 140°-199°F >=200°

E. ANALYTICAL AND OTHER REPRESENTATIVE INFORMATION

- 1. Analytical attached Yes
Please identify applicable samples and/or lab reports:
Lab report 1904-160B (PDF), SaddleRock\_TechMemo\_RevisedTable6 (PDF)
2. Other information attached (such as MSDS)? Yes

G. GENERATOR CERTIFICATION (PLEASE READ AND CERTIFY BY SIGNATURE)

By signing this EZ Profile™ form, I hereby certify that all information submitted in this and all attached documents contain true and accurate descriptions of this material, and that all relevant information necessary for proper material characterization and to identify known and suspected hazards has been provided.

If I am an agent signing on behalf of the Generator, I have confirmed with the Generator that information contained in this Profile is accurate and complete.

Name (Print): Charlotte Mitchell Date: 06/27/2019
Title: Capital Project Manager
Company: City of Wenatchee

B. BILLING INFORMATION

SAME AS GENERATOR

- 1. Billing Name: City of Wenatchee
2. Billing Address: 1350 McKittrick Street (City, State, ZIP) Wenatchee WA 98801
3. Contact Name: Charlotte Mitchell
4. Email: cmitchell@wenatcheewa.gov
5. Phone: (509) 888-3662 6. Fax: (509) 888-3201
7. WM Hauled? Yes No
8. P.O. Number:
9. Payment Method: Credit Account Cash Credit Card

D. REGULATORY INFORMATION

- 1. EPA Hazardous Waste? Yes\* No
Code:
2. State Hazardous Waste? Yes No
Code:
3. Is this material non-hazardous due to Treatment, Delisting, or an Exclusion? Yes\* No
4. Contains Underlying Hazardous Constituents? Yes\* No
5. From an industry regulated under Benzene NESHAP? Yes\* No
6. Facility remediation subject to 40 CFR 63 GGGGG? Yes\* No
7. CERCLA or State-mandated clean-up? Yes\* No
8. NRC or State-regulated radioactive or NORM waste? Yes\* No
\*If Yes, see Addendum (page 2) for additional questions and space.
9. Contains PCBs? -> If Yes, answer a, b and c. Yes No
a. Regulated by 40 CFR 761? Yes No
b. Remediation under 40 CFR 761.61 (a)? Yes No
c. Were PCB imported into the US? Yes No
10. Regulated and/or Untreated Medical/Infectious Waste? Yes No
11. Contains Asbestos? Yes No
-> If Yes: Non-Friable Non-Friable - Regulated Friable

F. SHIPPING AND DOT INFORMATION

- 1. One-Time Event Repeat Event/Ongoing Business
2. Estimated Quantity/Unit of Measure: 9,000
Tons Yards Drums Gallons Other:
3. Container Type and Size: Dump Truck(s)
4. USDOT Proper Shipping Name: N/A

Certification Signature

Handwritten signature: Charlotte Mitchell



**Only complete this Addendum if prompted by responses on EZ Profile™ (page 1) or to provide additional information. Sections and question numbers correspond to EZ Profile™.**

Profile Number: 114473WA

**C. MATERIAL INFORMATION**

Describe Process Generating Material (Continued from page 1): If more space is needed, please attach additional pages.

with Phase 1 planned to be completed in 2019. Phase 2 is planned for 2020.

Material Composition and Contaminants (Continued from page 1): If more space is needed, please attach additional pages.

5.	
6.	
7.	
8.	
9.	
Total composition must be equal to or greater than 100%	≥100%

**D. REGULATORY INFORMATION**

**Only questions with a "Yes" response in Section D on the EZ Profile™ form (page 1) need to be answered here.**

1. EPA Hazardous Waste

a. Please list all USEPA listed and characteristic waste code numbers:

- b. Is the material subject to the Alternative Debris standards (40 CFR 268.45)?  Yes  No
- c. Is the material subject to the Alternative Soil standards (40 CFR 268.49)? → If Yes, complete question 4.  Yes  No
- d. Is the material exempt from Subpart CC Controls (40 CFR 264.1083)?  Yes  No  
 → If Yes, please check **one** of the following:
  - Waste meets LDR or treatment exemptions for organics (40 CFR 264.1082(c)(2) or (c)(4))
  - Waste contains VOCs that average <500 ppmw (CFR 264.1082(c)(1)) – will require annual update.

2. State Hazardous Waste → Please list all state waste codes: \_\_\_\_\_

3. For material that is Treated, Delisted, or Excluded → Please indicate the category, below:  
 Delisted Hazardous Waste       Excluded Waste under 40 CFR 261.4 → Specify Exclusion: \_\_\_\_\_  
 Treated Hazardous Waste Debris       Treated Characteristic Hazardous Waste → If checked, complete question 4.

4. Underlying Hazardous Constituents → Please list all Underlying Hazardous Constituents:

5. Industries regulated under Benzene NESHAP include petroleum refineries, chemical manufacturing plants, coke by-product recovery plants, and TSDFs.

- a. Are you a TSDF? → If yes, please complete Benzene NESHAP questionnaire. If not, continue.  Yes  No
- b. Does this material contain benzene?  Yes  No  
 1. If yes, what is the flow weighted average concentration? \_\_\_\_\_ ppmw
- c. What is your facility's current total annual benzene quantity in Megagrams?  <1 Mg    1–9.99 Mg    ≥10 Mg
- d. Is this waste soil from a remediation?  Yes  No  
 1. If yes, what is the benzene concentration in remediation waste? \_\_\_\_\_ ppmw
- e. Does the waste contain >10% water/moisture?  Yes  No
- f. Has material been treated to remove 99% of the benzene or to achieve <10 ppmw?  Yes  No
- g. Is material exempt from controls in accordance with 40 CFR 61.342?  Yes  No  
 → If yes, specify exemption: \_\_\_\_\_
- h. Based on your knowledge of your waste and the BWON regulations, do you believe that this waste stream is subject to treatment and control requirements at an off-site TSDF?  Yes  No

6. 40 CFR 63 GGGGG → Does the material contain <500 ppmw VOHAPs at the point of determination?  Yes  No

7. CERCLA or State-Mandated clean up → Please submit the Record of Decision or other documentation with process information to assist others in the evaluation for proper disposal. A "Determination of Acceptability" may be needed for CERCLA wastes not going to a CERCLA approved facility.

8. NRC or state regulated radioactive or NORM Waste → Please identify Isotopes and pCi/g: \_\_\_\_\_



# Non-Hazardous WAM Approval

Requested Management Facility: Greater Wenatchee Regional Landfill

Profile Number: 114473WA Waste Acceptance Expiration Date: 06/30/2022

Common Name: LF02-Metals Impacted Soil WM Regulatory Volume Limit: \_\_\_\_\_  NA

### APPROVAL DETAILS

Approval Decision:  Approved  Not Approved

Profile Renewal:  Yes  No

Management Method: Alternate Daily Cover (ADC)

Generator Name: City of Wenatchee-Saddle Rock Park

Profile Expiration Date: 06/30/2022

Periodic Testing Due Date: \_\_\_\_\_  NA

Other Due Date: \_\_\_\_\_  NA (Specify) \_\_\_\_\_

Management Facility Precautions, Special Handling Procedures or Limitation on approval:

#### Generator Conditions

- Shall not contain free liquids.
- Shipment must be scheduled into the disposal facility at least 24 hours in advance. Contact information will be provided by your TSR.
- Waste manifest or applicable shipping document must accompany load.
- The waste profile number must appear on the shipping papers.

Donald Lavrinc [10/23/2019]:

Amended to increase tonnage from 9000 tons to 17000 tons.

WM Authorization Name: Donald Lavrinc Title: Waste Approval Manager

WM Authorization Signature: *Donald Lavrinc* Date: 06/30/2019

Agency Authorization (if Required): \_\_\_\_\_ Date: \_\_\_\_\_

**APPENDIX F**  
**Proposed Construction Schedule**



**APPENDIX G-1**  
**Health and Safety Plan**



**APPENDIX G-1  
HEALTH AND SAFETY PLAN  
INTRODUCTION**

This Health and Safety Plan (HASP) has been prepared for the Interim Remedial Action (IRA) Phase 2 Construction Implementation at the Saddle Rock Natural Area (Site) located in Wenatchee, Washington. This HASP is to be used in conjunction with the GeoEngineers Safety Program Manual. Together, the written safety programs and this HASP constitute the Site safety plan for the Phase 2 Saddle Rock IRA Construction project. This plan is to be used by GeoEngineers personnel on this Site and must be available during oversight for construction excavation and grading, and confirmation x-ray fluorescence (XRF) and soil sampling. If the work entails potential exposures to other substances or unusual situations, this plan will be revised to include additional health and safety information to meet the Site conditions. All plans are to be used in conjunction with current standards and policies outlined in the GeoEngineers Health and Safety Program Manual and are subject to review by the GeoEngineers Health and Safety Program Manager.

*Liability Clause: If requested by subcontractors, this Site HASP may be provided for informational purposes only. In this case, Form 1 (Appendix B-1) shall be signed by the subcontractor. Please be advised that this site-specific HASP is intended for use by GeoEngineers employees only. Nothing herein shall be construed as granting rights to GeoEngineers' subcontractors or any other contractors working on this site to use or legally rely on this HASP. GeoEngineers specifically disclaims any responsibility for the health and safety of any person not employed by the company.*

**WORK PLAN**

The City of Wenatchee (City) is implementing Phase 2 IRA Construction to address waste rock associated with historical mining activities at the Site. The City's preferred alternative involves the excavation, transportation and disposal of waste materials at a permitted, lined and monitored landfill and restoring the Site to native conditions. The general project information is presented below:

**GENERAL PROJECT INFORMATION**

<b>Project Name:</b>	Phase 2 Interim Remedial Action Construction Saddle Rock Natural Area
<b>Project Number:</b>	4296-008-02
<b>Type of Project:</b>	Construction Oversight and Environmental Sampling
<b>Start/Completion:</b>	July to November 2021
<b>Subcontractors:</b>	Professional Land Surveyor (PLS) (48 Degrees North), Onsite Laboratory

**Site Description**

The Saddle Rock Natural Area is a 325-acre parcel located immediately west of Wenatchee, Washington. It is a local landmark in the Wenatchee Valley and has been a popular destination for hikers, bicyclists and

horseback riders for decades. The street address is 1200 Circle Street in Wenatchee, Washington. Portions of the project area are situated on relatively steep slopes in upland shrub-steppe habitat.

### Site History

Historically, three mines operated within the Saddle Rock Park property boundary (Sunrise Mine, Squaw Saddle Mine, and Gold Knob Mine). Mining claims were originally located at the Site between 1908 and 1910. Waste rock generated at the Site likely originated from lode claims, which were leased from Washington State Department of Natural Resources (DNR). However, later prospecting and development in the 1950s and 1960s may have displaced some of the waste materials and resulted in the current trail system at the park. In 2011, the City completed the purchase of the property with the assistance and support of the Chelan-Douglas Land Trust, Washington State Recreation Conservation Office and local citizens. The City dedicated the property as the Saddle Rock Regional Park on July 16, 2011.

Detailed information regarding background information, including Site location, physical description, use history, summary of previous environmental investigations and identification of preliminary hazardous substances are presented in the 2019 Sampling and Analysis Plan (GeoEngineers).

### Field Activities

All work shall be conducted in a safe manner, so as to not endanger City-selected Contractor personnel or other key personnel on the Site. The work will consist of, but not be limited to, providing construction oversight services during excavation and transport of the waste rock pile from the Phase 2 work area (SR05) and conducting confirmation XRF and soil sampling. Related mobilization and demobilization, clearing and grubbing, erosion and stormwater control, haul road improvements, and post-excavation waste rock pile area restoration grading will also be performed by the Contractor and may be observed by GeoEngineers' employees, as needed.

Primary construction activities include excavation of the delineated SR05 waste rock pile at the Site and transportation of the waste rock to an off-site permitted landfill. Final excavation extents will be determined through a combination of in-field and laboratory chemical analysis. After waste rock remove, the excavation area will be regraded to match the existing area and minimize erosion utilizing soil in the immediate vicinity of the former waste rock pile to reshape the local area. The disturbed ground surface will then be revegetated.

The following activities are anticipated for GeoEngineers field personnel during the implementation of the work plan:

Anticipated Field Activities (Check All That Apply)	
<input checked="" type="checkbox"/> Safety Meeting Record Form 2	<input type="checkbox"/> Vapor Measurements
<input checked="" type="checkbox"/> Job Hazard analyses (JHA) Form 3	<input type="checkbox"/> Product Sample collection
<input type="checkbox"/> Site Reconnaissance	<input type="checkbox"/> Soil Stockpile Testing
<input type="checkbox"/> Exploratory Borings	<input checked="" type="checkbox"/> Remedial Excavation
<input checked="" type="checkbox"/> Construction Monitoring	<input type="checkbox"/> Recovery of Free Product
<input checked="" type="checkbox"/> Surveying	<input type="checkbox"/> Monitoring Well Installation
<input type="checkbox"/> Test Pit Exploration	<input type="checkbox"/> Monitoring Well Development

### Anticipated Field Activities (Check All That Apply)

<input checked="" type="checkbox"/> Soil Sample Collection	<input type="checkbox"/> Underground Storage Tank (UST) Removal Monitoring
<input type="checkbox"/> Groundwater Sampling	<input type="checkbox"/> Other: <a href="#">Click here to enter text.</a>
<input type="checkbox"/> Groundwater Depth and Free Product Measurement	<input type="checkbox"/> Other: <a href="#">Click here to enter text.</a>

### List of Field Personnel and Training

Anticipated field personnel include are summarized in the following table. Field personnel will have appropriate training (HAZWOPER, first aid, respirator fit test, HAZWOPER supervisor training) and up to date certifications.

#### FIELD PERSONNEL AND TRAINING

Name of Employee on Site	Level of HAZWOPER Training (24-/40-hr)	Date of 8-Hr Refresher Training	First Aid/ CPR
Nick Rohrbach	40-hour	January 2021	July 2020
JR Sugalski, PE	40-hour	May 2020 (to be refreshed prior to field work)	March 2019 (to be refreshed prior to field work)
Justin Orr	40-hour	January 2021	November 2020

### Chain of Command Functional Responsibility

Key individuals and project roles are summarized in the following table. A description of the responsibilities, lines of authority and communication for the key individuals are summarized below.

Chain of Command	Title	Name	Telephone Numbers
1	Current Owner	City of Wenatchee – Charlotte Mitchell, PE	(o) 509.888.3662
2	Project Manager	Nick Rohrbach	(c) 509.899.9389
3	Principal-In-Charge	Dustin Wasley, PE	(o) 509.209.2842
4	Health and Safety Program Manager	Mary Lou Sullivan	(o) 253.722.2425
5	Site Safety Officer (SSO)	Justin Orr	(c) 406.890.1310
4	Field Personnel	Justin Orr	(c) 406.890.1310
6	Subcontractor(s)	Erik B. Gahringer, PLS (48 Degrees Surveying)	(o) 509.436.1640

- **Health and Safety Program Manager (HSM)** – GeoEngineers’ HSM is responsible for implementing and promoting employee participation in the program. The HSM issues directives, advisories and information regarding health and safety to the technical staff. Additionally, the HSM has the authority to audit on-site compliance with HASPs, suspend work or modify work practices for safety reasons, and dismiss from the Site any GeoEngineers or subcontractor employees whose conduct on the Site endangers the health and safety of themselves or others.

- **Project Manager (PM)** – PM is assigned to manage the activities of various projects and is responsible to the principal-in-charge of the project. The PM is responsible for assessing the hazards present at a job site and incorporating the appropriate safety measures for field staff protection into the field briefing and/or Site Safety Plan. He or she is also responsible for assuring that appropriate HASPs complying with the corporate manual are developed. The PM will provide a summary of chemical analysis to personnel completing the HASP. PMs shall also see that their project budgets consider health and safety costs. The PM shall keep the HSM informed of the project's health- and safety-related matters as necessary. The PM shall designate the project Site Safety Officer (SSO) and help the SSO implement the specifications of the HASP. The PM is responsible for communicating information in site safety plans and checklists to appropriate field personnel. Additionally, the PM and SSO shall hold a site safety briefing before any field activities begin. The PM is responsible for transmitting health and safety information to the SSO when appropriate.
- **Site Safety Officer/HAZWOPER** – The SSO will have the on-site responsibility and authority to modify and stop work or remove personnel from the Site if working conditions change that may affect on-site and off-site health and safety. The SSO will be the main contact for any on-site emergency situation. The SSO is First Aid and cardiopulmonary resuscitation (CPR) qualified and has current Hazardous Waste Operations and Emergency Response (HAZWOPER) training. The SSO is responsible for implementing and enforcing the project safety program and safe work practices during Site activities. The SSO shall conduct daily safety meetings, perform air monitoring as required, conduct Site safety inspections as required, coordinate emergency medical care, and ensure personnel are wearing the appropriate personal protective equipment (PPE). The SSO shall have advanced fieldwork experience and shall be familiar with health and safety requirements specific to the project. The SSO has the authority to suspend Site activities if unsafe conditions are reported or observed.

Duties of the SSO include the following:

- Implementing the HASP in the field and monitoring compliance with its guidelines by staff.
- Being sure that all GeoEngineers field personnel have met the training and medical examination requirements. Advising other contractor employees of these requirements.
- Maintaining adequate and functioning safety supplies and equipment at the Site.
- Setting up work zones, markers, signs and security systems, if necessary.
- Performing or supervising air quality measurements. Communicating information on these measurements to GeoEngineers field staff and subcontractor personnel.
- Communicating health and safety requirements and Site hazards to field personnel, subcontractors and contractor employees, and Site visitors.
- Directing personnel to wear PPE and guiding compliance with all health and safety practices in the field.
- Consulting with the PM regarding new or unanticipated Site conditions, including emergency response activities. If monitoring detects concentrations of potentially hazardous substances at or above the established exposure limits, notify/consult with the PM. Consult with the PM and the HSM regarding new or unanticipated Site conditions, including emergency response activities. If field monitoring indicates concentrations of potentially hazardous substances at or above the established exposure limits, the HSM must be notified and corrective action taken.
- Documenting all Site accidents, illnesses and unsafe activities or conditions, and reporting them to the PM and the HSM.
- Directing decontamination operations of equipment and personnel.

- **Field Employees** – All employees working on Site that have the potential of coming in contact with hazardous substances or physical hazards are responsible for participating in the health and safety program and complying with the Site-specific health and safety plans. These employees are required to:
  - Participate and be familiar with the health and safety program as described in this manual.
  - Notify the SSO that when there is need to stop work to address an unsafe situation.
  - Comply with the HASP and acknowledge understanding of the plan.
  - Report to the SSO, PM or HSM any unsafe conditions and all facts pertaining to incidents or accidents that could result in physical injury or exposure to hazardous materials.
  - Participate in health and safety training, including initial 40-hour Occupational Safety and Health Administration (OSHA) course, annual 8-hour HAZWOPER refresher, and First Aid/CPR training.
  - Participate in the medical surveillance program if applicable.
  - Schedule and take a respirator fit test annually.
  - Any field employee working on Site may stop work if the employee believes the work is unsafe.
- **Contractors Under GeoEngineers Supervision** – Contractors working on the Site under the City's Phase 2 Saddle Rock IRA contract shall have their own health and safety program that is in line with this Site-specific health and safety plan.

## EMERGENCY INFORMATION

<b>Hospital Name</b>	<b>Central Washington Hospital &amp; Clinics</b>
<b>Hospital Address</b>	<b>1201 S. Miller Street Wenatchee, WA 98801</b>
<b>Phone Number (Hospital ER)</b>	<b>(509) 662-1511</b>
<b>Driving Distance</b>	<b>1.4 Miles</b>
<b>Driving Directions</b>	<ol style="list-style-type: none"> <li><b>1. Head southeast toward Saddle Rock Trailhead</b></li> <li><b>2. Continue onto Circle St</b></li> <li><b>3. Turn left onto S Miller St</b></li> <li><b>4. Turn right onto Red Apple Rd</b></li> <li><b>5. Turn right onto Rosewood Ave</b></li> <li><b>6. Continue straight</b></li> <li><b>7. Turn left</b></li> </ol>
<b>Driving Map</b>	

## Standard Emergency Procedures

### ■ Get help

- Send another worker to phone 9-1-1 (if necessary)
- As soon as feasible, notify GeoEngineers' Project Manager



- **Reduce risk to injured person**
  - Turn off equipment
  - Move person from injury location (if in life-threatening situation only)
  - Keep person warm
  - Perform CPR (if necessary)
- **Transport injured person to medical treatment facility (if necessary)**
  - By ambulance (if necessary) or GeoEngineers vehicle
  - Stay with person at medical facility
  - Keep GeoEngineers Project Manager apprised of situation and notify Human Resources Manager of situation

## HAZARD ANALYSIS

A hazard analysis has been completed as part of this HASP. The hazard analysis was performed considering known and potential hazards at the Site and surrounding areas, as well as the planned work activities. The results of the hazard analysis are presented in this section. The hazard assessment will be evaluated each day before beginning work. Updates will be made as necessary and documented in the Job Hazard Analyses (JHA) Form 3 (Appendix A) or the daily field log.

The following are known applicable hazards.

### Physical Hazards

Anticipated physical hazards that may be encountered at the Site are summarized in the following table.

Anticipated Physical Hazards (Check All That Apply)
<input type="checkbox"/> Drill rigs and Concrete Coring
<input checked="" type="checkbox"/> Backhoe/Excavators/Dump Trucks
<input checked="" type="checkbox"/> All-terrain vehicle (ATV) or Utility-terrain vehicle (UTV)
<input type="checkbox"/> Crane
<input checked="" type="checkbox"/> Front End Loader
<input checked="" type="checkbox"/> Excavations/trenching (1:1 slopes for Type B soil)
<input type="checkbox"/> Shored/braced excavation if greater than 4 feet of depth
<input checked="" type="checkbox"/> Overhead hazards/power lines
<input checked="" type="checkbox"/> Tripping/puncture hazards (debris on-site, steep slopes or pits)
<input type="checkbox"/> Unusual traffic hazard – Street traffic in the right of way
<input checked="" type="checkbox"/> Heat/Cold, Humidity
<input type="checkbox"/> Utilities/ utility locate
<input type="checkbox"/> Noise
<input type="checkbox"/> Over Water Work

### Safe Work Practices and Mitigation Procedures

- High-visibility vests will be worn by on-site personnel to ensure they can be seen by coworkers, subcontractors and the public.
- Personnel will avoid tripping hazards, steep slopes, pits and other hazardous encumbrances, where possible. If it becomes necessary to work within 6 feet of the edge of a pit, slope or other potentially hazardous area, appropriate fall protection measures will be implemented by the SSO in accordance with OSHA/DOSH regulations and the GeoEngineers Health and Safety Program.
- Steep slopes are present throughout the Site, which present logistical and mobilization difficulties. When working in steep terrain, personnel will take extra caution to avoid slips and falls. Work in steep terrain may require additional time, which will be addressed at the SR05 waste rock pile prior to conducting sampling activities.
- Personnel will not enter any adits, shafts, winzes, or other historical mining-related features during fieldwork. Care will be taken while traversing the Site to avoid stopes or other fall hazards.
- Work may require use of utility terrain vehicles UTVs or ATVs to access Site features during sampling. A pre-ride examination will be performed on the UTV or ATV prior to use each day, which will include inspection of headlights, break lights, steering, throttle, brakes, and controls. The UTV or ATV will be operated at low speeds and in accordance with manufacturers specifications, across the Site to reduce risk of rollover or encounters with unanticipated trenches, adits, or stopes.
- Cold stress control measures will be implemented according to the GeoEngineers Health and Safety Program to prevent frost nip (superficial freezing of the skin), frost bite (deep tissue freezing), or hypothermia (lowering of the core body temperature). Heated break areas and warm beverages shall be available during periods of cold weather.
- Heat stress control measures required for this Site will be implemented according to GeoEngineers Health and Safety Program with water provided on Site.
- Heavy duty equipment/machinery/vehicles will be present throughout Site, which will require GeoEngineers employees to pay extra attention to surroundings. Ensure no one walks behind equipment while in motion and only approach after visual eye contact has been made with operator.

### Heat Stress Prevention

Keep workers hydrated in a hot outdoor environment requires more water be provided than at other times of the year. When employee exposure is at or above an applicable temperature listed in the Heat Stress table below, Project Managers will ensure that:

- A sufficient quantity of drinking water is readily accessible to employees at all times,
- All employees have the opportunity to drink at least 1 quart of drinking water per hour,
- A cooler with ice will be available for storage of drinks and food, and
- A sun shade will be provided for GeoEngineers employees and key personnel to take breaks and/or monitor construction activities.

## HEAT STRESS

Type of Clothing	Outdoor Temperature Action Levels
Nonbreathing clothes including vapor barrier clothing or PPE such as chemical resistant suits	52°
Double-layer woven clothes including coveralls, jackets and sweatshirts	77°
All other clothing	89°

### Cold Stress Prevention

Working in cold environments presents many hazards to Site personnel and can result in frost nip (superficial freezing of the skin), frost bite (deep tissue freezing), or hypothermia (lowering of the core body temperature).

The combination of wind and cold temperatures increases the degree of cold stress experienced by Site personnel. Site personnel shall be trained on the signs and symptoms of cold-related illnesses, how the human body adapts to cold environments, and how to prevent the onset of cold-related illnesses. Heated break areas and warm beverages shall be provided during periods of cold weather.

### Fire/Wildfire

Regional or local wildfires may present hazards to Site personnel via smoke in the air and can result in watery eyes, headaches, shortness of breath, lung irritation, or persistent coughing.

Ensure GeoEngineers employees monitor changing wind patterns and utilize a N95 rated half face respirator, as needed. Work may be temporarily halted until air quality conditions improve according to state health regulators.

### Biological Hazards

Anticipated biological hazards that may be encountered at the Site are summarized in the following table.

Anticipated Biological Hazards (Check All That Apply)	
<input checked="" type="checkbox"/> Poison Ivy or other vegetation	<a href="#">Click here to enter text.</a>
<input checked="" type="checkbox"/> Insects or snakes	<a href="#">Click here to enter text.</a>
<input type="checkbox"/> Hypodermic needles or other infectious hazards	<a href="#">Click here to enter text.</a>
<input checked="" type="checkbox"/> Wildlife	<a href="#">Click here to enter text.</a>

### Safe Work Practices and Mitigation Procedures

Biological hazards can come in the form of wildlife such as rodents, wild animals, insects and spiders. Each of the hazards can present concerns. Exposure can be minimized by following the measures below:

- **Rodents and Wildlife** –Live animals can inflict wounds and can spread diseases such as Bubonic Plague and Rabies.
  - Avoid contact with wild or stray animals. If bitten or scratched, get medical attention immediately.

- Avoid contact with rats or rat-infested buildings. If you can't avoid contact, wear protective gloves and wash your hands regularly.
  - Avoid contact with animal and bird droppings. Particles can become airborne and, if inhaled, cause sickness.
  - Report dead animals to the proper authorities so they can be disposed of properly.
  - Report cougar sightings to the Washington Department of Fish and Wildlife (WDFW).
- **Insects, Yellow Jackets and Spiders** - Hazardous insects and spiders include:
- Mosquitoes: Rain and flooding may lead to increased numbers of mosquitoes, which can carry diseases such as West Nile virus or dengue fever.
  - Yellow Jacket and Wasp stings: If you receive multiple stings seek help immediately. Watch for signs of allergic reaction to stings, which typically happen within the first few hours.
  - Spiders: The black widow and hobo spider are poisonous spiders that hide behind objects and in rubble piles. Their bites can be severe, causing pain, nausea, fever, and breathing difficulty.
  - Ticks: often inhabit long grass and the ends of low-hanging branches. They may be abundant and active in spring when adults who have over-wintered start moving around looking for a host to feed.
- **Protective Measures** – Exposure can be minimized by following the measures:
- Wear long pants, long sleeves, and socks. Tuck pants into boots or socks to provide an insect barrier.
  - Be alert when working around abandoned buildings or debris.
  - Wear work gloves and stay on the lookout for spiders and ticks.
  - Seek medical attention if bitten by a poisonous spider or deer tick or if you experience severe symptoms.
  - Avoid scented soaps and perfumes.
  - Don't leave food, drinks, and garbage out uncovered.
  - If a black bear is visible, alter your route to move away from the bear's area. If it approaches, do not run. Remain calm, continue facing the bear and slowly back away. If the bear continues to approach, attempt to scare the bear away by shouting and acting aggressively. If a black bear attacks, fight back using fists, sticks, rocks, and EPA registered bear pepper spray (if available).
  - Never approach a cougar. Although most cougars will avoid a confrontation, all cougars are unpredictable. Always give a cougar an avenue of escape. Stay calm and talk to the cougar in a confident voice. Do not run - back away from the cougar slowly and always keep eye contact. Sudden movement may trigger an attack. Make yourself appear as large as possible with arms extended. Do not crouch or attempt to hide. If possible, pick up sticks or branches and wave them around. If a cougar attacks, fight back. Use rocks, sticks, fists, etc. to defend yourself.

## Ergonomic Hazards

Anticipated ergonomic hazards that may be encountered at the Site are summarized in the following table.

Anticipated Ergonomic Hazards (Check All That Apply)	
<input checked="" type="checkbox"/> Repetitive Movement	Click here to enter text.
<input checked="" type="checkbox"/> Lifting Heavy Objects	Click here to enter text.
<input type="checkbox"/> Confined Space	Click here to enter text.
<input type="checkbox"/> Vibration	Click here to enter text.
<input checked="" type="checkbox"/> Awkward Posture	Click here to enter text.
<input type="checkbox"/> Noise	Click here to enter text.
<input checked="" type="checkbox"/> Hand Tools	Click here to enter text.
<input type="checkbox"/> Other: Click here to enter text.	Click here to enter text.

### Safe Work Practices and Mitigation Procedures

- **Engineering Controls** – Implement physical change to the workplace, which eliminates/reduces the hazard on the job/task, including:
  - Use a device to lift and reposition heavy objects to limit force exertion.
  - Reduce the weight of a load to limit force exertion.
  - Reposition a work table to eliminate a long/excessive reach and enable working in neutral postures.
  - Redesign tools to enable neutral postures.
- **Administrative Controls** – Establish efficient processes or procedures, including:
  - Require that heavy loads are only lifted by two people to limit force exertion.
  - Establish systems so workers are rotated away from tasks to minimize the duration of continual exertion, repetitive motions, and awkward postures. Design a job rotation system in which employees rotate between jobs that use different muscle groups.
  - Staff "floaters" to provide periodic breaks between scheduled breaks.
- **Personal Protective Equipment** – Use protection to reduce exposure to ergonomics-related risk factors, including:
  - Use padding to reduce direct contact with hard, sharp, or vibrating surfaces.
  - Wear good fitting thermal gloves to help with cold conditions while maintaining the ability to grasp items easily.

### Chemical Hazards

Anticipated chemical hazards that may be encountered at the Site are summarized in the following table. Fact sheets summarizing the hazardous substance and their health effects are presented in Appendix B.

**SUMMARY OF ANTICIPATED CHEMICAL HAZARDS, EXPOSURE ROUTES AND EXPOSURE LIMITS**

<b>Compound/Description</b>	<b>Exposure Limits/IDLH</b>	<b>Exposure Routes</b>	<b>Symptoms/Health Effects</b>
Arsenic	PEL 0.05 mg/m <sup>3</sup> IDLH 5.0 mg/m <sup>3</sup>	Inhalation, skin absorption, skin and eye contact, ingestion	Ulceration of nasal septum; dermatitis; GI disturbances; peripheral neuropathy; respiratory irritation; hyperpigmentation of skin
Barium	PEL 0.5 mg/m <sup>3</sup> IDLH 50 mg/m <sup>3</sup>	Inhalation, skin absorption, skin and eye contact, ingestion	Changes in heart rhythm or paralysis in humans. Small doses result in vomiting, abdominal cramps, diarrhea, difficulties in breathing, increased or decreased blood pressure, numbness around the face, and muscle weakness
Iron	PEL 1 mg/m <sup>3</sup> IDLH 2,500 mg/m <sup>3</sup>	Inhalation, skin absorption, skin and eye contact, ingestion	Chronic exposure to iron oxide fumes or dusts may result in development of a benign pneumoconiosis. Inhalation of excessive concentrations of iron oxide may enhance the risk of lung cancer development in workers exposed to pulmonary carcinogens.
Lead	PEL 0.05 mg/m <sup>3</sup> IDLH 100 mg/m <sup>3</sup>	Inhalation, skin absorption, skin and eye contact, ingestion	Lassitude; insomnia; facial pallor; abnormalities; weight loss, malnutrition, constipation, abdominal pain; colic; anemia; gingival lead line; tremors; paralysis of the wrist and ankles; encephalopathy; kidney disease; irritated eyes; hypertension
Manganese	PEL 500 mg/m <sup>3</sup> IDLH 5 mg/m <sup>3</sup>	Inhalation, skin absorption, skin and eye contact, ingestion	Health effects include behavioral changes and other nervous system effects, which include movements that may become slow and clumsy. This combination of symptoms when sufficiently severe is referred to as "manganism."
Mercury	PEL 0.05 mg/m <sup>3</sup> IDLH 10 mg/m <sup>3</sup>	Inhalation, skin absorption, skin and eye contact, ingestion	Irritated eyes, skin; cough, chest pain, dyspnea, bronchitis, pneumonia; tremors, insomnia, irritability, indecision, headache, lassitude; stomatitis, salivation; GI disturbances, abnormalities, low weight; proteinuria
Selenium	PEL 0.2 mg/m <sup>3</sup> IDLH 1 mg/m <sup>3</sup>	Inhalation, skin absorption, skin and eye contact, ingestion	Dizziness, fatigue, and irritation of mucous membranes have been reported in people exposed to selenium in workplace air at concentrations higher than legal levels
Silver	PEL 0.01 mg/m <sup>3</sup> IDLH 10 mg/m <sup>3</sup>	Inhalation, skin absorption, skin and eye contact, ingestion	Exposure to dust containing high levels of silver compounds (silver nitrate or silver oxide) may cause breathing problems, lung and throat irritation and stomach pain.

Notes:

If a State has established a PEL more restrictive than the OSHA limits, then the applicable State limit becomes the legal limit.

IDLH = immediately dangerous to life or health; mg/m<sup>3</sup> = milligrams per cubic meter; PEL = permissible exposure limit



## Safe Work Practices and Mitigation Procedures

- **Engineering Controls** - Implement physical change to the workplace, which eliminates/reduces the hazard on the job/task, including:
  - Change process to minimize contact with hazardous chemicals.
  - Isolate or enclose the process.
  - Use of wet methods to reduce generation of dusts or other particulates.
  - General dilution ventilation.
- **Administrative Controls** - Establish efficient processes or procedures, including:
  - Rotate job assignments.
  - Adjust work schedules so that workers are not overexposed to a hazardous chemical.
- **Personal Protective Equipment** - Use protection to reduce exposure to ergonomics-related risk factors, including:
  - Wear gloves.
  - Wear eye protection.
  - Wear protective clothing.
  - Wear respiratory protection for dusts or other particulates (if present).

## X-Ray Fluorescence Safety

The rental handheld XRF unit emits x-rays to analyze concentrations of metals in the Site soil. X-rays are emitted from the lens via a focused beam. The x-rays emitted from an XRF can penetrate many substrates, and therefore, caution will be used when handling and operating the device. The following procedures will be followed while operating the XRF, in accordance with the rental company and manufacturer's requirements:

- When using the XRF device, exposure will be minimized by only operating the XRF when it is pointed to the ground.
- The operator will always be aware of the instrument's radioactive source and the direction of X-rays beams.
- The operator will never point the XRF at anyone. Moreover, the XRF will not be pointed at another person, whether it is energized or de-energized.
- The XRF will never be used to analyze material that is being held in the operator's or other person's hand.
- Never point the XRF instrument into the air and perform a test.
- Always be certain that the beam is not pointed at anyone and assume that the beam may pass through testing material and any table the testing material upon which it is placed.

## Hazard Reporting and Documentation

Additional hazards that are specific to your site should be identified here or on the JHA (Form 3; Appendix A). Daily field logs should include evaluation of:

- *Physical Hazards* (excavations and shoring, equipment, traffic, tripping, heat stress, cold stress and others)
- *Biological Hazards* (snakes, spiders, ticks, wasps, animals, poison ivy, pollen, and others present)
- *Ergonomic Hazards* (lifting heavy loads, tight work spaces, etc.)
- *Chemical Hazards* (odors, spills, free product, airborne particulates and others present)

## AIR MONITORING PLAN

An air monitoring plan has been prepared as part of development of this HASP. The air monitoring plan is based on the results of the chemical exposure assessment and the known and potential inhalation hazards on Site. The air monitoring plan addresses steps necessary to limit worker exposure. Non-occupational exposures are not addressed in this plan.

The Phase 2 Contractor will be responsible for implementing construction work in a manner that does not emit or generate fugitive dust for the Site, especially from the SR05 waste rock pile or along the haul road where arsenic concentration are greater than 95 mg/kg. Fugitive dust is not allowed as part of this project. However, if sustained winds are present which produce wind born dust particles and GeoEngineers personnel are working in identified contaminated areas (i.e., SR05 waste rock area), then appropriate respiratory protection (half face respirator with HEPA filter or P100 equivalent) will be added while work is conducted in those areas.

### Air Monitoring Instrumentation (Check All That Apply)

- Multi-Gas Detector (may include oxygen, carbon monoxide, hydrogen sulfide, lower explosive limit)
- Dust Monitor
- Other, Please specify: Visual Monitoring

### Monitoring Frequency (Check All That Apply)

- Continuous while handling samples and construction observation
- 15 minutes
- 30 minutes
- Hourly

## SITE CONTROL PLAN

Work zones are generally the SR05 waste rock pile, the haul road, the Site staging area and the immediate vicinities around them. The existing trail/road within the Phase 2 work area will also be improved and utilized by the Contractor. An equipment and materials staging area will be located near the former waste rock pile SR-02. The Phase 2 Contractor will be responsible for setting up the Phase 2 work zones, to close the area to the public and safely complete work.

GeoEngineers employees should work upwind of the SR05 area if possible. To the extent practicable, use the buddy system with other key personnel or Contractor personnel. All personnel from GeoEngineers and the City selected Contractor should be made aware of safety features during each morning's safety tailgate meeting (location of fire extinguishers, cell phone numbers, etc.). For medical assistance, see "Emergency Information" above.

### **Traffic or Vehicle Access Control Plans**

Fieldwork will be completed within a park, in an off-road setting. Portions of the Saddle Rock Park will close for public use during the Phase 2 construction. Other areas of the park will remain open during fieldwork, and caution will be maintained if hikers are present near the boundaries of construction activities. Closed areas will include the areas required to complete construction in the park. Signs will be posted by the City-selected Contractor to inform the public of the general hazards (both chemical and physical) associated with the SR05 waste rock pile and construction activities.

Allowable work hours for the City-selected Contractor to complete construction activities in a safe manner will be 7 am to 7 pm, Monday through Sunday. If the Contractor wishes to deviate from established working hours, the Contractor shall submit a written request to the City Capital Projects Manager for consideration. The Contractor is not allowed to access or utilize the Saddle Rock Regional Park trailhead parking lot and vicinity. All Site access shall be routed through the one gated entrance at the dead end of Circle Street.

### **Site Work Zones**

Hot zone/exclusion, contamination and decontamination zones will be located within the SR05 waste rock pile area and as needed, at the staging area.

A contamination reduction zone will be established just outside the exclusion zone for the decontamination of sampling equipment, personal sanitation and work boots. Care will be taken to prevent the spread of contamination. Equipment and personnel decontamination are discussed in the following sections, and the following types of equipment will be available to perform these activities:

- Scrub brushes;
- Spray rinse applicator;
- Plastic garbage bags; and
- Container of Alconox/water solution and Alconox powder.

### **Buddy System**

Personnel on Site will use the buddy system (pairs) with other key personnel or Contractor personnel, particularly whenever communication is restricted.

### **Site Communication Plan**

Positive communications (within sight and hearing distance or via radio) should be maintained between personnel on Site, with other personnel remaining in proximity to assist each other in case of emergencies. The team should prearrange hand signals or other emergency signals for communication when voice communication becomes impaired (including cases of lack of radios or radio breakdown) and an agreed upon location for an emergency assembly area.

In instances where communication cannot be maintained, you should consider suspending work until it can be restored. If this is not an option, the following are some examples for communication:

- Hand gripping throat: Out of air, can't breathe.
- Gripping partner's wrist or placing both hands around waist: Leave area immediately, no debate.
- Hands on top of head: Need assistance.
- Thumbs up: Okay, I'm all right; or, I understand.
- Thumbs down: No, negative.

### **Emergency Action**

Emergency Action Plan for the Site is summarized below.

- If any member of the field personnel experiences any adverse exposure or other symptoms while on-site, the entire field personnel should immediately halt work and act according to the instructions provided by the Site Safety and Health Supervisor.
- Wind indicators visible to all on-site personnel should be provided by the Site Safety and Health Supervisor to indicate possible routes for upwind escape. Alternatively, the Site Safety and Health Supervisor may ask on-site personnel to observe the wind direction periodically during Site activities.
- The discovery of any condition that would suggest the existence of a situation more hazardous than anticipated should result in the evacuation of the field team, contact of the PM, and reevaluation of the hazard and the level of protection required.
- If an accident occurs, the Site Safety and Health Supervisor and the injured person are to complete, within 24 hours, an Accident Report for submittal to the PM, the Health and Safety Program Manager and Human Resources. The PM should ensure that follow-up action is taken to correct the situation that caused the accident or exposure.

For medical assistance, see the "Emergency Information" section above.

### **Decontamination Procedures**

A contamination reduction zone will be established by the Contractor for personnel at the SR05 waste pile area and the staging area, for use before leaving these areas (i.e., breaking for lunches/bathroom, leaving for another portion of the Site, etc.) The zone should consist of garbage bags into which used PPE should be disposed. Personnel will wash hands at the Site before eating and utilize a boot wash station leaving the Site.

Decontamination, at a minimum, should include removing and disposing of PPE when exiting the exclusion zone; and washing your hands. Decontamination may also consist of removing outer protective gloves and washing soiled boots and gloves using bucket and brush provided on site in the contamination reduction zone. If needed, inner gloves will then be removed, and respirator, hands and face will be washed in either a portable wash station or a bathroom facility at the Site. Employees will perform decontamination procedures and wash before eating, drinking or leaving the Site.

### **Waste Disposal or Storage**

Used PPE is to be placed in a plastic bag for disposal by the Contractor.

### **Sampling, Managing and Handling Drums and Containers**

Drums and containers will not be used to store waste materials on-site.

### **Personal Sanitation**

Washrooms are present at the Saddle Rock Trailhead. The Contractor will also mobilize portable sanitation facilities onsite for use by all project personnel, both at the staging area and the SR05 waste rock pile area.

### **Lighting**

Field work will be generally conducted during daylight hours and during approved City business hours; temporary artificial lighting is not anticipated to be necessary.

### **Fire/Wildfire**

The potential for fire and/or wildfire conditions exist at the Site. The City-selected Contractor will be responsible for creating and implementing a fire prevention and mitigation plan, in accordance with the Phase 2 design report, drawings and specifications. GeoEngineers employees will continuously monitor the work area(s) for potential fire-risk when operations have the potential to generate sparks. Employees should always be alert for unexpected events, such as ignition of grass or sudden release of materials under pressure, and be prepared to act in these emergencies. Care will be taken to not park in tall grass or leave any vehicle sitting idle to reduce the potential for a fire.

Field vehicles, including the ATVs or UTVs, will be equipped with a fire extinguisher (ABC-rated). Employees must be trained in the proper use of fire suppression equipment. However, local fire professionals (Chelan County Fire Department) should handle large fires that cannot be controlled with a fire extinguisher. The Chelan County Fire Department should be notified in these instances.

The Contractor will provide water truck, water trailer, portable water tanks and/or water spray equipment to actively control fugitive emissions during construction work and on standby for potential fire or wildfire control.

### **Heavy Duty Equipment/Vehicles**

The Contractor will be responsible for operating all equipment and ensuring safety.

General rules associated with heavy-duty equipment/machinery operations on Site are as follows:

- While vehicles in motion, all non-essential personnel shall remain at a distance and should only approach after visual eye contact has been made with operator.
- All operators and crew members will be familiar with the construction operations and will have received practical training.
- As project conditions dictate (i.e., the presence of puncture or crushing risks to the feet), protective shanks and/or metatarsal guards conforming to ASTM F2412-05/ ASTM F2413-05 must be worn.

- No loose-fitting clothing, jewelry, or free long hair is permitted near the moving equipment or machinery parts.
- Before leaving the controls, the operator will place the safety controls 'on' or shut down the engine.
- A first aid kit and fire extinguisher will be available at all times, within each Contractor vehicle and equipment.
- The work area shall be kept free of obstructions and undue accumulations of water or debris.

## PERSONAL PROTECTIVE EQUIPMENT

After the initial and/or daily hazard assessment has been completed the appropriate PPE will be selected to ensure worker safety. Task-specific levels of PPE shall be reviewed with field personnel during the pre-work briefing conducted before the start of Site operations each day.

Site activities include handling and sampling solid surface and subsurface material (material may potentially contain elevated concentrations of arsenic or other heavy metals). Site hazards include potential exposure to contaminated media, and physical hazards such as trips/falls.

Visual air monitoring will be conducted to determine the level of respiratory protection.

- Half-face combination organic vapor/high efficiency particulate air (HEPA) or P100 cartridge respirators will be available on Site to be used as necessary by GeoEngineers personnel. Respirators will be donned if Site conditions cannot control fugitive dust generated. The Contractor will provide respiratory protection to its field personnel. HEPA and P100 cartridges are used for protection against dust, metals, and potentially regional or nearby wildfires (not within the project Site).
- Level D PPE, unless a higher level of protection is required, will be worn at all times on the Site. Potentially exposed personnel will wash gloves, hands, face and other pertinent items to prevent hand-to-mouth contact. This will be done prior to hand-to-mouth activities including eating. Smoking will not be allowed at the Site.
- Personnel and equipment decontamination will be used to decrease potential ingestion and inhalation hazards and risks.

### Applicable Personal Protection Gear (Check All That Apply)

- Hardhat (if overhead hazards, or client requests)
- Steel-toed boots
- Safety glasses (if dust, particles, or other hazards are present or client requests)
- Reflective vest (if working near traffic or equipment)
- Hearing protection
- Rubber boots



### Gloves (Check All That Apply)

#### Gloves (Specify):

- Nitrile
- Latex
- Liners
- Leather
- Other (specify) [Click here to enter text.](#)

### Protective Clothing (Check All That Apply)

- Tyvek (if dry conditions are encountered, Tyvek is sufficient) (modified Level D or Level C)
- Saranex (personnel shall use Saranex if liquids are handled or splash may be an issue) (modified Level D or Level C)
- Cotton (Level D)
- Rain gear (as needed) (Level D)
- Layered warm clothing (as needed) (Level D)

### Inhalation Hazard Protection (Check All That Apply)

- Level D (no respirator)
- Level C (respirators with organic vapor/HEPA P100 filters, or similar, as needed)
- Level B (Self Contained Breathing Apparatus— STOP, Consult the HSM)

## Personal Protective Clothing Inspections

PPE clothing ensembles designated for use during Site activities shall be selected to provide protection against known or anticipated hazards. However, no protective garment, glove or boot is entirely chemical-resistant, nor does any PPE provide protection against all types of hazards. To obtain optimum performance from PPE, Site personnel shall be trained in the proper use and inspection of PPE. This training shall include the following:

- Inspect PPE clothing before and during use for imperfect seams, non-uniform coatings, tears, poorly functioning closures or other defects. If the integrity of the PPE clothing is compromised in any manner, proceed to the contamination reduction zone and replace the PPE clothing.
- Inspect PPE clothing during use for visible signs of chemical permeation such as swelling, discoloration, stiffness, brittleness, cracks, tears or other signs of punctures. If the integrity of the PPE clothing is compromised in any manner, proceed to the contamination reduction zone and replace the PPE clothing.
- Disposable PPE should not be reused unless it has been properly decontaminated.

## **Respirator Selection, Use and Maintenance**

If respirators are required, Site personnel shall be trained before use on the proper use, maintenance and limitations of respirators. Additionally, they must be medically qualified to wear respiratory protection in accordance with 29 CFR 1910.134. Site personnel who will use a tight-fitting respirator must have passed a qualitative or quantitative fit test conducted in accordance with an OSHA-accepted fit test protocol. Fit testing must be repeated annually or whenever a new type of respirator is used. Respirators will be stored in a protective container.

## **Respirator Cartridges**

No action levels identified in the Chemical Hazards Table (above), are expected to be exceeded via the inhalation exposure route. However, Site personnel should don respiratory protection appropriate for the heavy metals, if windy weather occurs, air borne dust is produced from the SR05 waste rock pile, or regional wildfire smoke is present. A half-face or full-face air purifying respirator with a National Institute for Occupational Safety and Health (NIOSH)-approved HEPA P100 combination cartridge (Level C), will be appropriate for these chemicals of concern. Monitoring frequency should be continuous while using Level C respiratory protection. The SSO closely monitor personnel using respiratory protection, including observing for signs of fatigue or respiratory distress, the potential for cartridge breakthrough or increased resistance to inhalation. The frequency and duration of breaks should be increased for personnel working in respiratory protection.

If Site personnel are required to wear air-purifying respirators, the appropriate cartridges shall be selected to protect personnel from known or anticipated Site contaminants. The respirator/cartridge combination shall be approved and NIOSH-certified. A cartridge change-out schedule shall be developed based on the Site contaminants, anticipated contaminant concentrations and data supplied by the cartridge manufacturer related to the absorption capacity of the cartridge for specific contaminants. Site personnel shall be made aware of the cartridge change-out schedule prior to the initiation of Site activities. Site personnel shall also be instructed to change respirator cartridges if they detect increased resistance during inhalation or detect vapor breakthrough by smell, taste or feel, although breakthrough is not an acceptable method of determining the change-out schedule.

## **Respirator Inspection and Cleaning**

The Site Safety Officer shall periodically (weekly) inspect GeoEngineers respirators at the project Site. Site personnel shall inspect GeoEngineers respirators prior to each use in accordance with the manufacturer's instructions. In addition, Site personnel wearing a tight-fitting respirator shall perform a positive and negative pressure user seal check each time the respirator is donned, to ensure proper fit and function. User seal checks shall be performed in accordance with the GeoEngineers respiratory protection program or the respirator manufacturer's instructions.

## **PERSONNEL MEDICAL SURVEILLANCE**

Most GeoEngineers employees are not in a medical surveillance program because they do not fall into the category of "Employees Covered" in OSHA 1910.120(f)(2), which states that a medical surveillance program is required for the following employees:

1. All employees who are or may be exposed to hazardous substances or health hazards at or above the permissible exposure limits or, if there is no permissible exposure limit, above the published exposure levels for these substances, without regard to the use of respirators, for 30 days or more a year.
2. All employees who wear a respirator for 30 days or more a year or as required by state and federal regulations.
3. All employees who are injured, become ill or develop signs or symptoms due to possible overexposure involving hazardous substances or health hazards from an emergency response or hazardous waste operation.
4. Members of HAZMAT teams.

## **DOCUMENTATION TO BE COMPLETED FOR HAZWOPER PROJECTS**

The following forms are required for Hazardous Waste Operations and Emergency Response (HAZWOPER) projects and this Site:

- Field Log
- Health and safety pre-entry briefing acknowledgment (Form 1)
- Safety Meeting Record (Form 2)
- Job Hazard Analyses (Form 3)
- Accident/Exposure Report Form (Form 4)
- Conditional forms available at GeoEngineers office: Accident Report

The Field Log is to contain the following information:

- Updates on hazard assessments, field decisions, conversations with subcontractors, client or other parties, etc.;
- Air monitoring/calibration results, including: personnel, locations monitored, activity at the time of monitoring, etc.;
- Actions taken;
- Action level for upgrading PPE and rationale; and
- Meteorological conditions (temperature, fire, wind direction, wind speed, humidity, rain, snow, etc.).

**FORM 1**  
**HEALTH AND SAFETY PRE-ENTRY BRIEFING AND ACKNOWLEDGEMENT OF THE SITE HEALTH AND SAFETY PLAN FOR GEOENGINEERS' EMPLOYEES, SUBCONTRACTORS AND VISITORS**  
**SADDLE ROCK INTERIM REMEDIAL ACTION DESIGN PROJECT**  
**FILE NO. 4296-008-02**

Inform employees, contractors and subcontractors or their representatives about:

- The nature, level and degree of exposure to hazardous substances they're likely to encounter;
- All site-related emergency response procedures; and
- Any identified potential fire, explosion, health, safety or other hazards.

Conduct briefings for employees, contractors and subcontractors, or their representatives as follows:

- A pre-entry briefing before any site activity is started.
- Additional briefings, as needed, to make sure that the Site-specific HASP is followed.
- Make sure all employees working on the Site are informed of any risks identified and trained on how to protect themselves and other workers against the Site hazards and risks.
- Update all information to reflect current site activities and hazards.
- All personnel participating in this project must receive initial health and safety orientation. Thereafter, brief tailgate safety meetings will be held as deemed necessary by the Site Safety Officer.
- The orientation and the tailgate safety meetings shall include a discussion of emergency response, site communications and site hazards.

(All of GeoEngineers' Site workers shall complete this form, which should remain attached to the HASP and be filed with other project documentation). Please be advised that this site-specific HASP is intended for use by GeoEngineers employees only. Nothing herein shall be construed as granting rights to GeoEngineers' subcontractors or any other contractors working on this site to use or legally rely on this HASP. GeoEngineers specifically disclaims any responsibility for the health and safety of any person not employed by the company.

I hereby verify that a copy of the current HASP has been provided by GeoEngineers, Inc., for my review and personal use. I have read the document completely and acknowledge an understanding of the safety procedures and protocol for my responsibilities on site. I agree to comply with all required, specified safety regulations and procedures.

**Print Name**

**Signature**

**Date**

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**FORM 3**  
**JOB HAZARD ANALYSES (JHA) FORM**  
**PHASE 2 - SADDLE ROCK INTERIM REMEDIAL ACTION PROJECT**  
**FILE NO. 04296-008-02**

This form can be used for analyses of daily hazards where there are multiple tasks and ongoing projects and for record keeping purposes. Make copies as needed.

<b>Project:</b> Waste Rock Excavation and Sampling <b>File No:</b> 4296-008-02		<b>Date:</b> 7/14/2021	<b>Site Location:</b> 1200 Circle Street Wenatchee, Washington	
<b>Development Team:</b>	<b>Position/Title:</b>	<b>Reviewed by:</b>	<b>Position/Title:</b>	
Justin Orr	Field Personnel	Nick Rohrbach	PM	
Name	Position	Name	Position	
<b>Minimum Required Protective Equipment:</b> (see critical actions for task-specific requirements)				
<b>PPE</b>	<b>Equipment</b>	<b>Tools</b>	<b>Actions</b>	
<input checked="" type="checkbox"/> Hard Hat <input checked="" type="checkbox"/> High Visibility Vest <input type="checkbox"/> Safety Shoes/Waders <input checked="" type="checkbox"/> Gloves <input checked="" type="checkbox"/> Safety Glasses	<input type="checkbox"/> Safety Beacons <input type="checkbox"/> Safety Cones <input checked="" type="checkbox"/> First Aid Kit <input checked="" type="checkbox"/> Fire Extinguisher <input checked="" type="checkbox"/> Eye Wash/ Drinking Water	<input checked="" type="checkbox"/> Cell/Satellite Phone <input type="checkbox"/> Digital Camera <input checked="" type="checkbox"/> iPad <input type="checkbox"/> <input type="checkbox"/>	<input checked="" type="checkbox"/> Stay Visible <input checked="" type="checkbox"/> Equipment Inspection <input checked="" type="checkbox"/> Work in Pairs <input type="checkbox"/> Safety Control/Traffic Plan <input type="checkbox"/>	
<b>Job Steps</b>	<b>Potential Hazards</b>	<b>Critical Actions to Mitigate Hazards</b>		
Pre-Field Work	<ul style="list-style-type: none"> <li>■ Vehicle Inspection</li> <li>■ Unfamiliar Locations</li> <li>■ Site Parking</li> </ul>	<ul style="list-style-type: none"> <li>■ Inspect the vehicle before departure:               <ul style="list-style-type: none"> <li>▪ Check for tire cuts, fluid leaks, flat tires, body damage, windshield cracks, and other damage.</li> <li>▪ Check lights, wipers, fluid levels, and seat belts.</li> </ul> </li> <li>■ Study the area maps, photos and use GPS and compass skills.</li> <li>■ Identify the safest spot to park field vehicles.</li> </ul>		
Traveling to Work Site (Paved Roads)	<ul style="list-style-type: none"> <li>■ Unfamiliar Roads</li> <li>■ Mechanical Failure</li> <li>■ Flat Tire</li> <li>■ Vehicle Fire</li> <li>■ Vehicle Collision</li> <li>■ Other Hazards</li> </ul>	<ul style="list-style-type: none"> <li>■ Use only vehicles appropriate for the work needs and the driving conditions expected.</li> <li>■ Ensure the vehicle has a complete and current first aid kit and fire extinguisher.</li> <li>■ Place heavy objects behind a secure safety cage if they must be carried in a passenger compartment.</li> <li>■ Use parking brake, and don't leave vehicle unattended while it is running.</li> <li>■ Ensure vehicle has fuel to get to and from your destinations.</li> <li>■ Inform your Project Manager of your destination and estimated time of return.</li> <li>■ Carry extra food, water, and clothing.</li> <li>■ Drive defensively.</li> </ul>		



Job Steps	Potential Hazards	Critical Actions to Mitigate Hazards
Arrival to Work Site	<ul style="list-style-type: none"> <li>■ Job site hazards and steps to prevent injury.</li> <li>■ Appropriate personnel protective equipment not worn.</li> <li>■ Traffic Hazards</li> <li>■ Other Hazards</li> </ul>	<ul style="list-style-type: none"> <li>■ Conduct a tailgate safety meeting discussing the jobs, the hazards and actions that will be taken to prevent injury. All subcontractors including the traffic control personnel will be part of the tailgate meeting.</li> <li>■ Discuss “Stop Work Authority” as it applies to each site member.</li> <li>■ Discuss appropriate PPE including high visibility clothing such as reflective vest.</li> <li>■ Notify project manager of work activities and location.</li> </ul> <p>Ensure that the general or earthwork contractor has set up an exclusion zone surrounding work area that includes demarcation of the active personnel work zone.</p>
Site/Work Conditions	<ul style="list-style-type: none"> <li>■ Falls</li> <li>■ Foot Injuries</li> <li>■ Stress and Impact Injuries</li> <li>■ Wildfires</li> <li>■ Lightning</li> <li>■ Personal Safety</li> <li>■ Unusual traffic hazards</li> <li>■ Biological Hazards</li> <li>■ Communication</li> <li>■ Heavy-duty equipment/vehicles</li> <li>■ Earthwork</li> </ul>	<ul style="list-style-type: none"> <li>■ Identify and use safe travel routes. Do not exceed physical abilities or equipment design.</li> <li>■ Ensure that appropriate fire suppression equipment and systems are available and in good condition.</li> <li>■ Take extra precautions when encountering steep, loose, wet conditions.</li> <li>■ Use pack equipment properly. Carry weight on hips, not back.</li> <li>■ Warm up and stretch the appropriate muscle groups before and after hitting the trail.</li> <li>■ Test and use secure footing. Move cautiously and deliberately. Never run.</li> <li>■ Wear safety-toed boots with good, non-skid soles that are tall enough to support ankles.</li> <li>■ Know basic first aid. Completion of a basic first aid course is required.</li> <li>■ Use footwear appropriate to the terrain and load being carried.</li> <li>■ Know how to fall. Roll, protect the head and neck, and do not extend arms to break the fall.</li> <li>■ Use a flashlight after dark.</li> <li>■ Travel after dark only in an emergency.</li> <li>■ Discuss applicable hazard mitigation measures - Insects, Vegetation, Wildlife.</li> <li>■ Verify cell phone is working.</li> <li>■ Maintain communication with Project Manager or ‘buddy’ throughout job task.</li> <li>■ Verify location and contact numbers for emergency medical assistance or 911.</li> <li>■ Bring plenty of water, stay hydrated.</li> <li>■ Refer to GeoEngineers Personal Safety Program.</li> <li>■ Use care when walking behind vehicles; only approach after visual eye contact has been made with operator.</li> <li>■ If driving a vehicle back up slowly and use a spotter for difficult locations or poor lighting, or while trailering.</li> <li>■ Do not use cell phones or GPS while driving; ask your colleagues to assist you, or safely pull over to use if you are alone.</li> </ul>

Job Steps	Potential Hazards	Critical Actions to Mitigate Hazards
Communication	Additional Hazards, i.e., No communication in case of emergency	<ul style="list-style-type: none"> <li>■ Verify cell phone is working.</li> <li>■ Maintain communication with Project Manager throughout job task.</li> <li>■ Verify location and contact numbers for emergency medical assistance or 911.</li> </ul>
	Additional Hazards, i.e., Emergency	<ul style="list-style-type: none"> <li>■ <b>Dial 911</b></li> <li>■ Hospital Route (Attached Fall Protection Plan)</li> </ul>
<b>Required Control Measures:</b> (check the box when complete)		
<input type="checkbox"/> Perform a pre-work vehicle inspection (First Aid kit, fire extinguisher).		
<input type="checkbox"/> Drive defensively looking out for the other guy.		
<input type="checkbox"/> Conduct a pre-work safety meeting.		
<input type="checkbox"/> Use a Safety Watch to monitor equipment Minimum Approach Distance (MAD) and to keep personnel clear if needed.		
<input type="checkbox"/> Wear Personal Protective Equipment (PPE).		
<input type="checkbox"/> Ensure training is current (First Aid, defensive driving, etc.).		
<input type="checkbox"/> Conduct Task Safety Assessments throughout the job.		
<b>Additional Comments:</b>		

**Daily Hazard Assessment Record of Safety Meetings**

Signature	Date	Signature	Date
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____

**FORM 4**  
**ACCIDENT/EXPOSURE REPORT FORM**  
**SADDLE ROCK INTERIM REMEDIAL ACTION DESIGN PROJECT**  
**FILE NO. 4296-008-02**

To (Supervisor): \_\_\_\_\_ From (Employee): \_\_\_\_\_

Telephone  
(with area code): \_\_\_\_\_

Name of injured or ill employee: \_\_\_\_\_

Date of accident: \_\_\_\_\_ Time of accident: \_\_\_\_\_ Exact location of accident: \_\_\_\_\_

Narrative description of: **accident/exposure** (circle one):  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Medical attention given on site:  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Nature of illness or injury and part of body involved: \_\_\_\_\_ Lost Time? Yes  No

**Probably Disability (check one):**

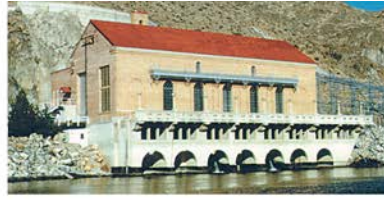
Fatal	Lost work day with days away from work	Lost work day with days of restricted activity	No lost work day	First Aid only
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Corrective action taken by reporting unit and corrective action that remains to be taken (by whom and when):  
\_\_\_\_\_  
\_\_\_\_\_

Employee  
Signature: \_\_\_\_\_ Date: \_\_\_\_\_

Name of Supervisor: \_\_\_\_\_

**APPENDIX G-2**  
**Chelan County PUD Guidelines for**  
**Use of Transmission Line Right-of-Way**



## PUBLIC UTILITY DISTRICT NO. 1 of CHELAN COUNTY

P.O. Box 1231, Wenatchee, WA 98807-1231 • 327 N. Wenatchee Ave., Wenatchee, WA 98801

(509) 663-8121 • Toll free 1-888-663-8121 • [www.chelanpud.org](http://www.chelanpud.org)

### Guidelines for Use of Transmission Line Right-of-Way

#### Purpose:

Work with property-owners and/or customers on easements, activities and construction in the vicinity of the District's transmission lines.

#### Background:

Much of the District's transmission system is on private property. In order for the District to own, operate and maintain its transmission system, the PUD works with property owners to obtain mutually agreeable easements. Easements are specific and unique to the individual property for which they are granted. The easement describes the allowable activities for both the District and the property owner. The District works with a property owner to ensure they have maximum use of their land while at the same time preserving the District's ability to operate and maintain its transmission lines safely.

#### Safety and you!

Safety is one of our core values. We care about your safety as well as the safety of your property. We are guided by the safety requirements of the Washington State Administrative Code (WAC) and the National Electric Safety Code. If you have projects or activities planned near the PUD's transmission lines, they must be allowed under the safety codes. There are many laws or codes which may apply however at a minimum we recommend that you review WAC 296-24-960 and WAC 296-307. If you have any questions about a proposed project, call us at (509) 661-8400 and we can talk before you get started.



The following are a few things that should be considered when in the vicinity of the PUD's electric transmission system.

- **Calculating distances:** Talk to us when you are trying to calculate distances near a transmission line. Don't try to measure or assume a distance. These lines are typically 115 or 230 Kilovolts (kV). Visual inspections of the lines and locations can be deceiving and/or incorrect. Power line locations can and do change significantly as the conductor heats and cools or is displaced by winds.
- **Grading near a transmission line:** Contact the PUD if you are considering doing any grading around the transmission line. In some instances, even minor grading can infringe on the required code clearances that are there for your safety. Additionally if you are grading within 50' of any pole or 20' of any guy anchor the stability of the structure could be affected.
- **Buildings & structures:** If you are placing a building or any other man-made structure near a transmission line we need to make sure that they are located in a safe area and that access to the transmission structures are preserved. We will provide you with written approval for your proposed project once we are sure that it meets the applicable codes and regulations.

- **Swimming pools:** Swimming pools and power lines don't mix. Diving boards and other toys are often up in the air and many times long metal rods are used for cleaning the pool. It is too easy to forget that there is a power line overhead.
- **Trees & plants:** Check with the PUD before planting trees or other vegetation near the transmission lines. It's important to keep in mind the long term growth potential of any vegetation. Our policy is that they should not exceed 12 feet in height at maturity. Even at this height there are limitations to where "non-qualified electrical workers" can work. For instance, WAC 296-24-960 (3)(a) requires that no work be performed, nor part of any tool be allowed, closer than 10.7' to a 115 kV line and 12.8' to a 230kV transmission line.
- **Equipment:** If you are going to be operating equipment or cranes around the transmission line there are specific codes which apply. The following table is taken from the WAC and is not meant to cover every situation but is provided for general use. You need to be aware of all required clearances for working in proximity of the lines. These are the absolute minimums for your safety. Stay as far away from the lines as possible! Remember we can help determine distances if you have any doubt.

Normal Voltage	Minimum Required Clearance (feet)
0 to 50,000 V	10
115,00 V	15
230,000 V	20

**Things important to the District:**

In order to provide reliable and safe delivery of power, the following examples illustrate important safety concerns we have. This list is not all inclusive, but gives you some guidelines for frequently encountered items.

- **Fences:** Fences near power lines can be problematic for both the property owner and District crews. Metal fences in particular conduct electricity and can develop dangerous voltages if they are not properly installed. Fences cannot be attached to our poles. Fences also are a problem for us when we have to do maintenance and they can be a safety hazard for our crews. At least **10 feet of space** between our poles and a fence is necessary to give our crews room to work and provide a safe working environment. Gates may also be required for District access.
- **Controlled burns:** No burning is allowed in the vicinity of the lines. Many of the structures are wood and the conductors are made out of soft metals. Excessive heat can damage the infrastructure.
- **Blasting:** The PUD needs to know if there is going to be any blasting near a transmission line. We need to be sure that our facilities are not damaged.
- **Protection barriers:** If there is significant traffic around our transmission structures we may want some form of physical barrier or protection. This may be as simple as a few ecology blocks or something more significant depending upon the situation.
- **Dust:** Activities that produce an excessive amount of dust are a concern to the District. Dust can accumulate on the insulators and cause an electrical flashover.



**For more information about the transmission lines, safety and how we may assist you with your project, please contact your Chelan PUD Transmission Department at (509) 661-8400.**





