November 25, 2013

Karen Tatman, PE  
Quincy Engineering, Inc.  
200 Hawthorne Ave. SE, Suite E-530  
Salem, Oregon  97301-4996  

RE: FINAL EXPLORATION AND TESTING WORK PLAN  
US 101 AT OR 6 – TILLAMOOK  
TILLAMOOK, OREGON  

INTRODUCTION

The Oregon Department of Transportation (ODOT), along with their engineering consultant Quincy Engineering, Inc. (Quincy), is planning to improve the traffic performance and safety of US 101 and OR 6 in downtown Tillamook and across Hoquarton Slough. The location of the project site is shown on the Vicinity Map, Figure 1. The project includes replacement of the bridge over Hoquarton Slough as well as new embankments, retaining walls, traffic signals, and pavement. As a subconsultant to Quincy, Shannon & Wilson, Inc., is providing geotechnical engineering services to support engineering design of the proposed structures.

The purpose of this draft Exploration and Testing Work Plan (ETWP) is to describe the geotechnical field explorations and laboratory testing that will be performed by Shannon & Wilson under our current scope of services. Key sections of this work plan include a description of tasks to be completed as part of the geotechnical field explorations, drilling and sampling procedures, borehole installations and abandonment procedures, handling of investigation-derived waste (IDW), traffic control plans, a health and safety plan, and a proposed work schedule.

FIELD EXPLORATIONS

The geotechnical field exploration program for the proposed structures includes a field reconnaissance; 10 mud-rotary borings (B-1 through B-10) for the proposed bridge, retaining walls, embankment, and traffic signal poles; two Cone Penetration Tests (CPTs) for seismic hazard evaluations; Falling Weight Deflectometer (FWD) testing (approximately 50 test
locations); six shallow borings and six pavement cores; and 10 Dynamic Cone Penetration (DCP) tests. Nine of the 10 DCP tests will be performed in the borings. The proposed exploration locations are shown on the Site and Exploration Plan, Figure 2. Details of our field exploration procedures are explained below.

**Permitting**

We understand that permits are required for working in ODOT right-of-way (ROW) and Tillamook County ROW. In addition, right-of-entry permits will be needed from private property owners. Shannon & Wilson will obtain ODOT and Tillamook County ROW permits. We understand that Quincy will provide private property right-of-access. There is no drilling within the active channel and no resource agency permits are required. Once ODOT is advised of the specific drilling dates, ODOT will be responsible for any notifications of tribes.

**Field Reconnaissance and Underground Utility Check**

A Shannon & Wilson Engineer and Engineering Geologist will visit the site to perform a geologic reconnaissance that will focus on potential geologic hazards to the proposed structures and observations of existing structure and pavement conditions indicative of foundation performance. While on site, they will mark the locations of the proposed borings and CPTs. We will notify the One-Call Utility Notification Center to locate and mark buried utilities at least two business days prior to the start of drilling. Utility markings will be observed prior to beginning the borings and CPTs. Any adjustments of boring and CPT locations due to utility conflicts will be performed at that time.

**Traffic Control**

Borings B-2, B-4, B-5, B-8, and B-10 through B-16 will require traffic control. Traffic flow control will be subcontracted to D&H Flagging or BSD Enterprises, who will provide site traffic control in accordance with ODOT requirements. D & H Flagging has provided traffic control plans, which are included in Appendix A. We anticipate that some single lane closures and parking lane closures will be required.

All traffic control devices will be set up and in place before any personnel or equipment enters the work area. Likewise, traffic control will be removed after all other personnel and equipment has left the right-of-way at the end of the work period. Surface restoration will be performed at the end of each work period.
Boring B-5 will be drilled during daytime hours. All other borings requiring traffic control will be drilled at night, between 7:00 pm and 6:00 am, Sunday night through Thursday night. No work on these borings will be done on Friday night, Saturday night, or on holidays.

**Falling Weight Deflectometer Testing**

FWD tests will be employed to evaluate the existing pavement section condition at locations mentioned previously in this work plan. A total of five FWD test lines will be performed along westbound (WB) OR 6, and southbound (SB) and northbound (NB) of US 101. One FWD test line will be performed in the right lane of First Ave. (WB OR 6), from Madrona to Main; two FWD test lines will be performed in the outside wheel path of both lanes of Main Ave. (SB US 101), from First to Fourth Streets; and two FWD test lines will be in the outside wheel path of both lanes of Pacific Ave. (NB US 101) from First to Fourth Streets. The tests will be performed at approximately 75-foot intervals. The test areas are shown in Figure 2, Site and Exploration Plan. The tests will be performed by Pavement Consultants, Inc., of Seattle, Washington.

Traffic control for the FWD testing will involve a single lane closure and rolling traffic control in accordance with the 2006 Oregon Temporary Traffic Control Handbook.

**Drilling**

The field exploration program includes 10 mud-rotary borings for structure and embankment design, and six each of pavement core and shallow borings for pavement design. All equipment that enters the subsurface will be cleaned by pressure washing between each boring. Anticipated boring designations, purposes, depths, and other information are shown in Table 1. The proposed locations of all borings are shown on the Site and Exploration Plan, Figure 2.

<table>
<thead>
<tr>
<th>Boring Designation</th>
<th>Purpose</th>
<th>Anticipated Depth (feet)</th>
<th>Drilling Method</th>
<th>Anticipated Traffic Control</th>
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</thead>
<tbody>
<tr>
<td>B-1</td>
<td>wall</td>
<td>40 to 80</td>
<td>mud rotary</td>
<td>none</td>
</tr>
<tr>
<td>B-2</td>
<td>wall</td>
<td>40 to 80</td>
<td>mud rotary</td>
<td>single lane closure</td>
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<tr>
<td>B-3</td>
<td>bridge</td>
<td>80 to 120</td>
<td>mud rotary</td>
<td>none</td>
</tr>
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<td>B-4</td>
<td>bridge</td>
<td>80 to 120</td>
<td>mud rotary</td>
<td>bus stop closure</td>
</tr>
<tr>
<td>B-5</td>
<td>wall</td>
<td>40 to 80</td>
<td>mud rotary</td>
<td>parking closure</td>
</tr>
<tr>
<td>B-6</td>
<td>wall</td>
<td>40 to 80</td>
<td>mud rotary</td>
<td>cones</td>
</tr>
<tr>
<td>B-7</td>
<td>embankment</td>
<td>30 to 60</td>
<td>mud rotary</td>
<td>cones</td>
</tr>
</tbody>
</table>
Mud Rotary Drilling

The mud-rotary borings, designated B-1 through B-10, will be drilled using a truck-mounted drill rig provided and operated by Hardcore Drilling of Dundee, Oregon. Mud-rotary borings are typically advanced using a tri-cone bit, through which a bentonite drilling mud is pumped. The drill mud serves to cool the bit, keep the hole open, and flush the cuttings to the surface. Returning drill mud is typically passed through a screen and into a tub over the hole. The screen collects the cuttings, and the tub collects the mud for recirculation back into the hole. If a borehole cannot be kept open using mud alone, casing may be set to facilitate advancement of the hole. The material obtained from the cleaning procedures between each boring will be collected into steel 55-gallon drums.

Pavement Boring, Coring, and Dynamic Cone Penetrometer Testing

The continuous flight solid-stem auger borings, designated B-11 through B-16, will be drilled using a trailer-mounted drill rig provided and operated by Dan Fischer Excavating, Inc., of Forest Grove, Oregon. Prior to drilling, the existing pavement will be cored using a 5-inch-diameter pavement core barrel. Once the pavement subgrade is reached, a DCP test will be performed to provide an estimate of roadway subgrade strength. Solid stem-auger drilling techniques will be used to continue the borings to a depth of 10 feet below the ground surface. The material obtained from the cleaning procedures between each boring will be collected into steel 55-gallon drums.
Sampling

Disturbed soil samples will be collected in the mud-rotary and pavement core borings at 2.5- to 5-foot depth intervals. The disturbed samples will be collected using a 2-inch outside diameter split-barrel sampler in conjunction with in situ Standard Penetration Testing (SPT), in accordance with ASTM D1586. If appropriate soils are encountered during drilling, undisturbed soil samples may also be collected using a 3-inch outside diameter thin-walled Shelby tube sampler. This sampler will be either piston driven or hydraulically pushed into the undisturbed soil at the bottom the boring in general accordance with ASTM D1587. Additional samples may be obtained at selected depths, depending on the subsurface conditions encountered. Each soil sample will be sealed and labeled in a plastic jar or plastic bag. Shelby tubes will be capped and sealed with waterproof tape. All samples will be returned to our laboratory for additional examination and testing.

A Shannon & Wilson geologist will be on site during the drilling operations to locate the drilling sites, observe drilling, collect samples, perform DCP testing, and prepare descriptive geologic logs of the materials encountered during drilling. Soil descriptions and identifications on the boring logs will be in general accordance with ASTM D 2488. The boring logs will present an interpretation of the soil/rock materials encountered in each borehole, the depths of material changes, sample collection points, and groundwater levels.

Cone Penetration Testing (CPT)

The exploration program includes two CPTs, designated CP-1 and CP-2. During a CPT, a specialized cone assembly at the end of a steel probe is hydraulically pushed down through the subsurface. The cone assembly generally contains load cells and associated strain gauges, which monitor the deformation of the load cells. One set of load cells deforms with increasing resistance to cone tip penetration. Another set of load cells deforms with increasing frictional resistance encountered on a sleeve on the outside of the assembly. The cone assembly also contains a piezometer which measures pore pressure. Pore pressure is useful in estimating soil behavior type because penetration has varying effects on pore pressure, depending on the type of material being penetrated. Data from the strain gauges and from the piezometer is transmitted from the cone assembly back through extension rods to the CPT recording device via a cable. Industry software programs then convert the raw data signals from the instruments into tip resistance, skin friction, and pore pressure. Software programs further apply correlations to the
processed data to estimate the soil type and equivalent SPT N-value. Some cone assemblies also contain geophones, which can be used to measure seismic wave velocities.

In CP-1 and CP-2, we will measure seismic wave velocities at depth intervals of approximately 6 or 10 feet. Both CPTs will be advanced to refusal. The CPTs will be performed by Subsurface Technologies, Inc., of North Plains, Oregon. The CPT process will not be observed by Shannon & Wilson. No physical samples will be collected in the CPTs.

**Streambed Sediment Sample**

The streambed sediment sample will be collected from the existing bridge. A 5-gallon bucket tied to a rope will be dropped in the water, where the bucket can sink to the streambed to collect sediment. One 5-gallon bucket sample will be collected. An anchor may be tied to the bucket to help it more readily sink to the streambed.

**Hole Abandonment**

Boreholes will be backfilled with bentonite chips or a bentonite-cement grout, in accordance with Oregon Water Resource Department regulations. Any pavement sections penetrated by boreholes will be restored using matching sections of pea gravel and an ODOT-approved asphalt cold patch. No wells or instrumentation of any kind will be permanently installed in the boreholes. CPT holes do not require backfill.

**Best Management Practices**

All Shannon & Wilson drilling subcontractors will abide by industry Best Management Practices. Plastic will be placed under all drill rigs at locations susceptible to fluid leakage. Spill kits will be present and readily available on every drill rig. When drilling near rivers or other bodies of water, silt fencing or straw bales will be used as a safeguard against drill fluids entering the water. All drill fluids and cuttings will be drummed and removed from drill sites. Moist areas will be protected from vehicle and foot traffic using landing mats.

**Investigation-Derived Waste Handling and Disposal**

Investigation-derived wastes (IDW) generated during the field exploration program will include soil cuttings, drilling mud, purged groundwater, and decontamination wash water. All IDW shall be placed in 55-gallon drums, sealed, and labeled. Drum labels shall include the project name, borehole identification, depth interval from which the waste was generated, and the date.
collected. All IDW-containing drums shall be removed from rights-of-way and private properties after the borings are completed. The IDW-containing drums will be temporarily stored in a location pre-approved by ODOT. Temporary storage of the drums should not exceed 90 days.

Upon completion of the field exploration program, composite samples of the drum contents will be submitted to an analytical laboratory for testing. The composite samples will be developed based on the known and observed characteristics of the explorations and may include the combining of borings from sites of similar histories and characteristics. At a minimum, drum contents will be tested for the presence of the eight heavy metals regulated as hazardous waste (RCRA-8), polychlorinated biphenyls (PCBs), volatile organic compounds (VOCs), semi-volatile organic compounds, and petroleum products.

Following receipt of the laboratory analyses, Shannon & Wilson will arrange for hauling and disposal of the IDW, in a manner consistent with laboratory findings, at a licensed disposal facility. Shannon & Wilson will provide copies of all disposal receipts and/or permits documenting proper disposal of the IDW to ODOT.

Safety

Site safety is critical for this field exploration program. A daily site safety meeting will be held in a safe area off the road prior to the start of work each day. Shannon & Wilson has developed a site-specific Health and Safety Plan for the proposed field explorations. The details of the Health and Safety Plan are presented in Appendix B.

LABORATORY TESTING

The laboratory testing program includes index testing as summarized in Table 2. Current applicable ASTM International standards will be followed as shown in the table. The number of tests completed may vary from what is shown in the table based on the materials encountered. In general, index property measurements will be performed in Shannon & Wilson’s in-house laboratory or by Northwest Testing, Inc., of Wilsonville, Oregon. Testing to determine corrosivity potential will be subcontracted to Specialty Analytical of Clackamas, Oregon.
TABLE 2: PROPOSED LABORATORY TESTING

<table>
<thead>
<tr>
<th>Test</th>
<th>ASTM</th>
<th>Quantity</th>
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<tbody>
<tr>
<td>Moisture Content</td>
<td>D2216</td>
<td>60</td>
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<tr>
<td>Atterberg Limits</td>
<td>D4318</td>
<td>7</td>
</tr>
<tr>
<td>Gradation</td>
<td>D422</td>
<td>5</td>
</tr>
<tr>
<td>Percent Passing No. 200 Sieve</td>
<td>D1140</td>
<td>10</td>
</tr>
<tr>
<td>Organic Content</td>
<td>D2974</td>
<td>2</td>
</tr>
<tr>
<td>Consolidation</td>
<td>D2435</td>
<td>3</td>
</tr>
<tr>
<td>Soil Unconfined Compressive Strength</td>
<td>D2166</td>
<td>2</td>
</tr>
<tr>
<td>Sulfate, Sulfide, Chloride, pH, redox, Resistivity</td>
<td>See below</td>
<td>2</td>
</tr>
</tbody>
</table>

Sulfate and Chloride – EPA 300.0; Sulfide – ASTM 4500; pH – EPA 9045B; Resistivity – ASTM 9050M/EPA 120.1; Oxidation reduction potential (redox) – ASTM 2580B - modified.

SCHEDULE

Field explorations are scheduled to begin the night of December 1, 2013. We anticipate that the field explorations will require approximately seven to 10 days to complete. All borings located on private properties and outside of the roadway (B-1, B-3, B-5, B-6, B-7, and B-9) will be drilled during normal business hours (7 am to 6 pm). The two CPTs will also be performed during normal business hours. All borings located within the roadway or requiring significant traffic control (B-2, B-4, B-8, and B-10 through B-16) will be drilled during the night (7:00 pm to 6:00 am, Sunday through Thursday). The FWD testing will also be performed during the night time. Laboratory testing will be completed approximately one week after drilling is complete.

SHANNON & WILSON, INC.

Adrian A.J. Holmes, CEG
Senior Engineering Geologist

AAJH/TTN/RPP:ann
Attachments:

- Figure 1, Vicinity Map
- Figure 2, Site and Exploration Plan
- Appendix A, Traffic Control Plans
- Appendix B, Shannon & Wilson Health and Safety Plan
US101 at OR6 (Tillamook) Key No. 14313
North of Front Street and Port of Tillamook Bay Railroad
Tillamook, Oregon

VICINITY MAP

November 2013 24-1-03811-003

SHANNON & WILSON, INC.
Geotechnical and Environmental Consultants FIG. 1
LEGEND

PROPOSED EXPLORATIONS

- Boring
- CPT
- Pavement Boring: Core, DCP, 10' Deep
- DCP in Geotechnical Boring: 8” to 36” bgs
- DCP: 0” to 36” bgs

Existing Boring

FWD Test
(75’ spacing outside wheel path, adjacent lanes offset tests by 37.5’, test on each Pavement boring location)
APPENDIX A

Traffic Control Plans
**NOTES**

- Maintain current lane width at all times.
- Cone spacing: 28` max.
- Adjust to field conditions.
- All traffic control shall adhere to current MUTCD guidelines.

**LEGEND**

- 48" x 48" Signs w/ Flags
- 28" Cones

---

**Contractor:** Shannon & Wilson  
**Contact Person:** Eric Paslack  
**Phone:** (503) 216-4750  
**Email:** ecp@shanwil.com  
**Job Location:** Hwy 101 & Hwy 6  
**Tillamook**  
**Type of Work:** Borings  
**Duration:** Pending  
**Time:** Pending  
**Date:** Pending  

**November 19, 2013**  
**D&H PLAN #4293-1**
**NOTES**

- Maintain current lane width at all times.
- Cone spacing: 20` max.
- Remove Parking as necessary per city/job specs.
- Adjust to field conditions.
- All traffic control shall adhere to current MUTCD guidelines.

---

**PLAN NOT TO SCALE**

---

**LEGAL**

- 48" x 48" Signs w/ Flags
- 28" Cones

---

**D&H Flagging Inc.**

1621 SE Pardee St
Portland, OR 97202

- Off: (503) 212-2488
- Fax: (503) 234-4572
- Cell: (503) 783-6133
- jeff@d-hflagging.com

**Contractor:** Shannon & Wilson

- Contact Person: Eric Paslack
- Phone: (503) 210-4750
- Email: ecp@shanwil.com
- Job Location: Hwy 101 & Hwy 6
- Tillamook
- Type of Work: Borings
- Duration: Pending
- Time: Pending
- Date: Pending

November 20, 2013  
D&H PLAN #4293-2
**Parking Closure - 3rd St (Netarts Hwy 131)**

- **NOTES**
  - Maintain current lane width at all times.
  - Cone spacing = 20" max.
  - Remove Parking as necessary per city/job specs.
  - Adjust to field conditions.
  - All traffic control shall adhere to current MUTCD guidelines.

<table>
<thead>
<tr>
<th>48&quot; x 48&quot; Signs w/ Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>28&quot; Cones</td>
</tr>
</tbody>
</table>

**Legend**

- **ROAD WORK AREA**
- **Parking Lane**
- **100` 1 parking spot**
- **WZ**
- **2nd St**
- **3rd St (Netarts Hwy 131)**
- **Main Ave (Hwy 101)**

---

**Right Lane Closure - Pacific Ave (Hwy 101)**

- **NOTES**
  - Maintain current lane width at all times.
  - Cone spacing = 20" max.
  - Remove Parking as necessary per city/job specs.
  - Adjust to field conditions.
  - All traffic control shall adhere to current MUTCD guidelines.

<table>
<thead>
<tr>
<th>48&quot; x 48&quot; Signs w/ Flags</th>
</tr>
</thead>
<tbody>
<tr>
<td>28&quot; Cones</td>
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**Legend**

- **ROAD WORK AREA**
- **Parking Lane**
- **100` 1 parking spot**
- **WZ**
- **2nd St**
- **3rd St (Netarts Hwy 131)**
- **Main Ave (Hwy 101)**

---

**D&H Flagging Inc.**

- "Women-owned Business"
- **Jeff Davis**
  - 1621 SE Pardee St
  - Portland, OR 97202
  - Off: (503) 232-2488
  - FAX: (503) 234-4572
  - Cell: (503) 793-6133
  - jeff@d-hflagging.com

**Contractor:** Shannon & Wilson

- **Contact Person:** Eric Paslack
- **Phone:** (503) 210-4750
- **Email:** ecp@shanwil.com
- **Job Location:** Hwy 101 & Hwy 6
- **Tillamook**

**Type of Work:** Borings

**Duration:** Pending

**Time:** Pending

**Date:** Pending

---

**November 20, 2013**

**D&H PLAN #4293-3**
Right Lane Closure - Pacific Ave (Hwy 101)

* Maintain current lane width at all times.
* Cone spacing= 20' max.
* Remove Parking as necessary per city/job specs.
* Adjust to field conditions.
* All traffic control shall adhere to current MUTCD guidelines.

**NOTES**

**LEGEND**

- 48" x 48" Signs w/ Flags
- 28" Cones

**PLAN NOT TO SCALE**

**Contractor:** Shannon & Wilson
**Contact Person:** Eric Paslack
**Phone:** (503) 210-4750
**Email:** ecp@shanwil.com
**Job Location:** Hwy 101 & Hwy 6
**Tillamook**
**Type of Work:** Borings
**Duration:** Pending
**Time:** Pending
**Date:** Pending

**November 20, 2013**

**D&H PLAN #4293-5**

D&H Flagging Inc.
"Women-owned business"

Jeff Davis
1621 SE Pardee St
Portland, OR 97202
Off: (503) 232-2488
Fax: (503) 234-4572
Cell: (503) 793-6133
jeff@d-hflagging.com
(Page 6 of 7)

Center Lane Closure - Pacific Ave (Hwy 101)

--- NOTES ---

* Maintain current lane width at all times.
* Cone spacing= 20` max.
* Adjust to field conditions.
* All traffic control shall adhere to current MUTCD guidelines.

--- PLAN ---

N 48" x 48" Signs w/ Flags
B 28" Cones
 sequential Arrow

--- LEGEND ---

--- CONTRACTOR ---

Shannon & Wilson
Contact Person: Eric Paslack
Phone: (503) 210-4750
Email: ecp@shanwil.com
Job Location: Hwy 101 & Hwy 6
Tillamook
Type of Work: Borings
Duration: Pending
Time: Pending
Date: Pending

November 20, 2013                   D&H PLAN #4293-6

--- D&B ---

Flagging Inc.
"Women-owned business"
Jeff Davis
1621 SE Pardee St
Portland, OR 97202
Off: (503) 232-2488
Fax: (503) 234-4572
Cell: (503) 793-6133
jeff@d-hflagging.com
**NOTES**

- Maintain current lane width at all times.
- Cone spacing = 20' max.
- Adjust to field conditions.
- All traffic control shall adhere to current MUTCD guidelines.
APPENDIX B
HEALTH AND SAFETY PLAN
FIELD EXPLORATIONS

This plan is specific to Shannon and Wilson, Inc., employees only. Shannon and Wilson, Inc., will not assume responsibility for others onsite. This plan must be kept accessible by all Shannon & Wilson personnel while working on site.

A. GENERAL INFORMATION

Project: US 101 at OR 6 - Tillamook
Shannon and Wilson Project No.: 24-1-03811-003
Location: Tillamook, Oregon
Plan prepared by: Adrian A.J. Holmes Date: September 25, 2013

Scope of Work: Drilling geotechnical borings with collection of subsurface soil samples and CPTs.

Site personnel have read this plan and are familiar with its provisions.

<table>
<thead>
<tr>
<th>Name</th>
<th>Signature</th>
<th>Date</th>
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</thead>
<tbody>
<tr>
<td>Site Safety Officer</td>
<td>Cody Sorensen</td>
<td></td>
</tr>
<tr>
<td>Project Manager</td>
<td>Park Piao</td>
<td></td>
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<tr>
<td>Project Engineer</td>
<td>Derrick Hayes</td>
<td></td>
</tr>
<tr>
<td>Exploration Task Manager</td>
<td>Adrian Holmes</td>
<td></td>
</tr>
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</table>

Emergency Information: (CALL 911 IMMEDIATELY)

<table>
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<tr>
<th>Resources</th>
<th>Phone No.</th>
<th>Location, if applicable</th>
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<td>911</td>
<td></td>
</tr>
<tr>
<td>Hospital/Emergency Room*</td>
<td>503-842-4444</td>
<td>Tillamook County General Hospital* 1000 Third Street Tillamook, OR 97141</td>
</tr>
<tr>
<td>Oregon State Police</td>
<td>503-375-3555</td>
<td>Salem Dispatch Center</td>
</tr>
<tr>
<td>Fire Department</td>
<td>503-842-7587</td>
<td>Tillamook Fire District</td>
</tr>
<tr>
<td>National Response Center</td>
<td>800-424-8802</td>
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<tr>
<td>Oregon Dept. of Water Resources</td>
<td>503-986-0900</td>
<td></td>
</tr>
<tr>
<td>Oregon Emergency Response</td>
<td>800-452-0311</td>
<td></td>
</tr>
<tr>
<td>Oregon Fish and Wildlife</td>
<td>503-947-6000</td>
<td></td>
</tr>
</tbody>
</table>

* Tillamook County General Hospital location shown on attached map.
Key Project Personnel

Matt VanBergen (Drillers)  503-476-6111  Hardcore Drilling (cell phone)

Additional Resources

One Call Utility Notification  1-800-332-2344

Other Onsite Contractors:
BSD Enterprises  503-812-6802  Office Phone
D&H Flagging  503-232-2488  Office Phone

B. HAZARDS ASSESSMENT

1) Slip, trip, and fall
   Identify any hazards in the daily safety meeting and either remove the hazard or be sure it is clearly marked.

2) Moving drilling equipment
   Non-drilling personnel should stay away from drilling equipment, and the drillers should identify the swing area of any moving equipment.

3) Loud noise (traffic and equipment)
   Wear hearing protection.

4) Wet surfaces
   Wear boots with good traction and place sand on slick surfaces.

5) Falling objects
   Wear steel-toe boots and a hard hat.

6) Flying debris
   Wear safety glasses.

7) Temperature extremes and sun
   Wear layers for adjustment to temperatures and tinted glasses.

Hazardous Materials/Waste Type(s): Liquid X (Gasoline) Solid ___ Semi-Solids
Soils ___ Gas ___
Characteristic(s): Corrosive ___ Volatile ___ Ignitable X Toxic ___
Reactive ___ Radioactive ___ Unknown ___

Other Hazard Information: Oxygen depletion (y/n) N (%)  
Buried Utilities (y/n) Y - Locates to be requested from One-Call Notification Center and
then field verified.

C. SITE STATUS

Status of site: on active roadway and areas adjacent to active roadway

D. LEVEL OF PERSONNEL PROTECTION RECOMMENDED

Based on evaluation of potential hazards, the following levels of personal protection have been designated for the applicable work area.

**Level D:** Safety vests, hard hats, steel-toe boots, gloves, hearing protection, and safety glasses.

**IF SITE CONDITIONS CHANGE AND VISUAL, OLFATORY, OR MECHANICAL DETECTION INDICATES THE POSSIBLE PRESENCE OF CONTAMINATION (AND ASSOCIATED HAZARDS) THEN THIS LEVEL OF PERSONNEL PROTECTION MUST BE REVIEWED WITH THE PROJECT MANAGER.**

E. PROJECT ORGANIZATION AND COORDINATION

The following personnel are designated to carry out the stated job functions onsite.

- **Project Manager:** Derrick Hayes 503-210-4764
- **Onsite Safety/Security Officer:** Cody Sorensen 503-210-4784
- **Field Team Leader:** Cody Sorensen 503-210-4784

F. DECONTAMINATION / DISPOSAL PROCEDURES

For general operations, drill cuttings/fluids will be contained on site and disposed of in an area provided by Tillamook County. If olfactory or visual screening indicates contaminated media have been encountered, work will stop immediately and ODOT will be contacted through Shannon & Wilson and Quincy Engineering. The ODOT will provide instructions on how to proceed. Disposable suits, gloves, etc. will be put in plastic bags.

G. SITE SAFETY AND HEALTH PLAN

The designated Site Safety Officer is directly responsible to the Field Team Leader for safety recommendations onsite. A safety meeting will be held each morning before beginning work to review the safety plan and discuss any safety concerns. The safety meetings will be held in the site emergency assembly area, which will be a safe area designated at the beginning of the job by the Site Safety Officer.
First-aid kit  Shannon & Wilson field vehicle
Emergency eye wash  Shannon & Wilson field vehicle
Emergency air horn  Shannon & Wilson field vehicle
Fire extinguisher  Shannon & Wilson field vehicle

H. ENVIRONMENTAL MONITORING

Environmental monitoring is not anticipated.

I. EMERGENCY PROCEDURES (should be modified as required for incident)

The following standard emergency procedures will be used by onsite personnel. The Site Safety Officer shall be notified of any onsite emergencies and be responsible to see that the appropriate procedures are followed.

Personnel Injury in the Work Area. Upon notification of injury in the Work Area, the designated emergency air horn shall be sounded. Site personnel shall immediately stop work and assemble in the emergency assemble area. The Site Safety Officer should evaluate the nature of the injury, and if medical treatment is needed will immediately contact 911. Once emergency personnel have been contacted emergency first-aid will be applied. No persons shall re-enter the Work Area until the cause of the injury or symptoms is determined.

If the cause of the injury or loss of the injured person does not affect the performance of site personnel, operations may continue, with appropriate onsite first-aid and necessary follow-up as stated above. Otherwise activities onsite will stop until the added risk is removed or minimized.

Fire/Explosion. Upon notification of a fire or explosion onsite, the designated emergency air horn shall be sounded and site personnel shall assemble at the emergency assemble area. The fire department shall be alerted and all personnel will move to a safe location upwind.

Personal Protective Equipment Failure. If a site worker experiences a failure of protective equipment that affects the protection factor, that person shall immediately leave the Work Area. Re-entry shall not be permitted until the equipment has been repaired or replaced.

Other Equipment Failure. If other equipment onsite, fails to operate properly, the Project Team leader and Site Safety officer shall be notified and then determine the effect of this failure on continuing operations onsite. If the failure affects the safety of personnel or prevents completion of the Work Plan tasks, all personnel shall leave the Work Area until the situation is evaluated and appropriate actions taken.

In all situations, when an onsite emergency results in evacuation of the Work Area, personnel shall not re-enter until:
1. The conditions resulting in the emergency have been corrected.
2. The hazards have been reassessed.
3. The Site Safety Plan has been reviewed.
4. Site personnel have been briefed on any changes in the Site Safety Plan.

HEALTH AND SAFETY PLAN

My signature (below) signifies that I have read the attached Health and Safety Plan. My signature also signifies that I understand and accept all items listed therein.

_____________________________________________________

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