# Horseshoe Lake Flood Reduction (Project 1114873)

## Targeted Drainage Review

August 4, 2015

**Reviewed By:**

Wes Kameda, P.E., Engineer II
DNRP/WLRD/SWS - Capital Services Unit

**Prepared By:**

Claire Jonson, P.E., Engineer III
DNRP/WLRD/SWS - Capital Services Unit


8-4-2015

**King County**

**Department of Natural Resources and Parks**
Water and Land Resources Division
Capital Services Unit
201 South Jackson Street, Suite 600
Seattle, Washington 98104-3855

# TABLE OF CONTENTS

# SECTION I: PROJECT OVERVIEW

## FIGURE 1. TECHNICAL INFORMATION REPORT (TIR) WORKSHEET

KING COUNTY, WASHINGTON, SURFACE WATER DESIGN MANUAL

### TECHNICAL INFORMATION REPORT (TIR) WORKSHEET

**Part 1 PROJECT OWNER AND PROJECT ENGINEER**

Project Owner: King County WLRD
Phone: 206-477-4722
Address: 201 S Jacksont St, Suite 600 Seattle, WA 98104
Project Engineer: Wes Kameda
Company:
Phone:

**Part 2 PROJECT LOCATION AND DESCRIPTION**

Project Name: Horseshoe Lake Flood Reduction
DDES Permit #:
Location Township: 21N
Range: 6E
Section: 16
Site Address: Parcel 346340TRCT

**Part 3 TYPE OF PERMIT APPLICATION**

- ☐ Landuse Services Subdivison / Short Subd. / UPD
- ☐ Building Services M/F / Commerical / SFR
- ☒ Clearing and Grading
- ☐ Right-of-Way Use
- ☐ Other

**Part 4 OTHER REVIEWS AND PERMITS**

- ☐ DFW HPA
- ☐ COE 404
- ☐ DOE Dam Safety
- ☐ FEMA Floodplain
- ☐ COE Wetlands
- ☒ Other City of Black Diamond
- ☐ Shoreline Management
- ☐ Structural Rockery/Vault/____
- ☐ ESA Section 7

**Part 5 PLAN AND REPORT INFORMATION**

| Technical Information Report | | Site Improvement Plan (Engr. Plans) | |
|---|---|---|---|
| Type of Drainage Review (circle): | Full / (Targeted) / Large Site | Type (circle one): | (Full) / Modified / Small Site |
| Date (include revision dates): | | Date (include revision dates): | |
| Date of Final: | | Date of Final: | |

**Part 6 ADJUSTMENT APPROVALS**

Type (circle one): Standard / (Complex) / Preapplication / Experimental / Blanket

Description: (include conditions in TIR Section 2)
Section 1.2.1 Core Requirement # 1: Discharge at the Natural Location

Date of Approval:

# TECHNICAL INFORMATION REPORT (TIR) WORKSHEET

## Part 7 MONITORING REQUIREMENTS

Monitoring Required: Yes / No

Start Date: _____

Completion Date: _____

Describe: _____

## Part 8 SITE COMMUNITY AND DRAINAGE BASIN

Community Plan : Not Applicable (NA)

Special District Overlays: NA

Drainage Basin: Middle Green River

Stormwater Requirements: NA

## Part 9 ONSITE AND ADJACENT SENSITIVE AREAS

- ☐ River/Stream
- ☒ Lake
- ☒ Wetlands
- ☒ Closed Depression
- ☐ Floodplain
- ☐ Other

- ☐ Steep Slope
- ☐ Erosion Hazard
- ☐ Landslide Hazard
- ☐ Coal Mine Hazard
- ☐ Seismic Hazard
- ☐ Habitat Protection
- ☐

## Part 10 SOILS

| Soil Type | Slopes | Erosion Potential |
|---|---|---|
| EvC: EVERETT GRAVELLY SANDY LOAM | 0-15% | Low with ESC measures. |
| | | |
| | | |

- ☐ High Groundwater Table (within 5 feet)
- ☐ Other
- ☐ Sole Source Aquifer
- ☐ Seeps/Springs

☐ Additional Sheets Attached

# TECHNICAL INFORMATION REPORT (TIR) WORKSHEET

| Part 11 DRAINAGE DESIGN LIMITATIONS | |
|---|---|
| REFERENCE | LIMITATION / SITE CONSTRAINT |
| ☐ Core 2 – Offsite Analysis | |
| ☐ Sensitive/Critical Areas | |
| ☐ SEPA | |
| ☐ Other | |
| ☐ | |
| ☐ Additional Sheets Attached | |

| Part 12 TIR SUMMARY SHEET (provide one TIR Summary Sheet per Threshold Discharge Area) | |
|---|---|
| **Threshold Discharge Area:** (name or description) | |
| **Core Requirements (all 8 apply)** | 0. Horseshoe Lk is |
| Discharge at Natural Location | Number of Natural Discharge Locations: closed depression |
| Offsite Analysis | Level: 1 / 2 / 3 dated: |
| Flow Control (incl. facility summary sheet) | Level: 1 / 2 / 3 or Exemption Number 1<br>Small Site BMPs |
| Conveyance System | Spill containment located at: |
| Erosion and Sediment Control | ESC Site Supervisor:<br>Contact Phone:<br>After Hours Phone: |
| Maintenance and Operation | Responsibility: Private / Public<br>If Private, Maintenance Log Required: Yes / No |
| Financial Guarantees and Liability | Provided: Yes / No |
| Water Quality (include facility summary sheet) | Type: Basic / Sens. Lake / Enhanced Basicm / Bog<br>or Exemption No. 1<br>Landscape Management Plan: Yes / No |
| **Special Requirements (as applicable)** | |
| Area Specific Drainage Requirements | Type: CDA / SDO / MDP / BP / LMP / Shared Fac. / None<br>Name: |
| Floodplain/Floodway Delineation | Type: Major / Minor / Exemption / None<br>100-year Base Flood Elevation (or range):<br>Datum: |
| Flood Protection Facilities | Describe: |
| Source Control (comm./industrial landuse) | Describe landuse:<br>Describe any structural controls: |

# TECHNICAL INFORMATION REPORT (TIR) WORKSHEET

| Oil Control | High-use Site: Yes / (No)<br>Treatment BMP: _____<br>Maintenance Agreement: Yes / No<br>with whom? _____ |
|---|---|
| **Other Drainage Structures** | |
| Describe: | |

**Part 13 EROSION AND SEDIMENT CONTROL REQUIREMENTS**

| MINIMUM ESC REQUIREMENTS DURING CONSTRUCTION | MINIMUM ESC REQUIREMENTS AFTER CONSTRUCTION |
|---|---|
| ☐ Clearing Limits | ☐ Stabilize Exposed Surfaces |
| ☐ Cover Measures | ☐ Remove and Restore Temporary ESC Facilities |
| ☐ Perimeter Protection | ☐ Clean and Remove All Silt and Debris, Ensure Operation of Permanent Facilities |
| ☐ Traffic Area Stabilization | ☐ Flag Limits of SAO and open space preservation areas |
| ☐ Sediment Retention | ☐ Other _____ |
| ☐ Surface Water Collection | |
| ☐ Dewatering Control | |
| ☐ Dust Control | |
| ☐ Flow Control | |

**Part 14 STORMWATER FACILITY DESCRIPTIONS (Note: Include Facility Summary and Sketch)**

| Flow Control | Type/Description | Water Quality | Type/Description |
|---|---|---|---|
| ☐ Detention | _____ | ☐ Biofiltration | _____ |
| ☐ Infiltration | _____ | ☐ Wetpool | _____ |
| ☐ Regional Facility | _____ | ☐ Media Filtration | _____ |
| ☐ Shared Facility | _____ | ☐ Oil Control | _____ |
| ☐ Flow Control BMPs | _____ | ☐ Spill Control | _____ |
| ☒ Other | Pump Facility | ☐ Flow Control BMPs | _____ |
| | | ☐ Other | _____ |

# TECHNICAL INFORMATION REPORT (TIR) WORKSHEET

| Part 15 EASEMENTS/TRACTS | | Part 16 STRUCTURAL ANALYSIS |
|---|---|---|
| ☒ Drainage Easement | | ☐ Cast in Place Vault |
| ☐ Covenant | | ☐ Retaining Wall |
| ☐ Native Growth Protection Covenant | | ☐ Rockery > 4' High |
| ☐ Tract | | ☐ Structural on Steep Slope |
| ☐ Other | | ☐ Other |

**Part 17 SIGNATURE OF PROFESSIONAL ENGINEER**

I, or a civil engineer under my supervision, have visited the site. Actual site conditions as observed were incorporated into this worksheet and the attached Technical Information Report. To the best of my knowledge the information provided here is accurate.

Clarissa Jonson 8/4/2015

*Signed/Date*

## PROJECT DESCRIPTION

Horseshoe Lake is hydraulically connected to groundwater and it does not have a surface water outlet. When the nearby water table elevation rises, the water level of the lake also rises, increasing the threat of flooding. There are fifteen single family residences along the waterfront. The rising water level of Horseshoe Lake threatens both homes and infrastructure. King County has performed emergency pumping six times (1991, 1996, 1997, 2007, 2011, and 2014). Emergency pumping of Horseshoe Lake is required to maintain roadway access, protect property and protect the environment by preventing flooding of septic systems.

This project proposes to construct a 4,400 foot long pipeline with 12-inch diameter polyethylene pipe. The pipe will run from just outside of the wetland buffer along Horseshoe Lake and discharge to the Regional Stormwater Facility at The Reserve at Woodlands on Parcel 212106-9059. The project also proposes to establish a gravel surfaced, permanent pump location and access driveway from SE Auburn - Black Diamond Road.

The proposed pipe will enable emergency flood protection at Horseshoe Lake and infiltration testing by BD Village Partners, L.P. at the Regional Stormwater Facility. A rental pump will be connected to the pipeline as needed during flooding emergencies and during infiltration testing of the Regional Stormwater Facility. Water will be drawn from Horseshoe Lake via a temporary floating suction line which will be deployed only during pumping operations.

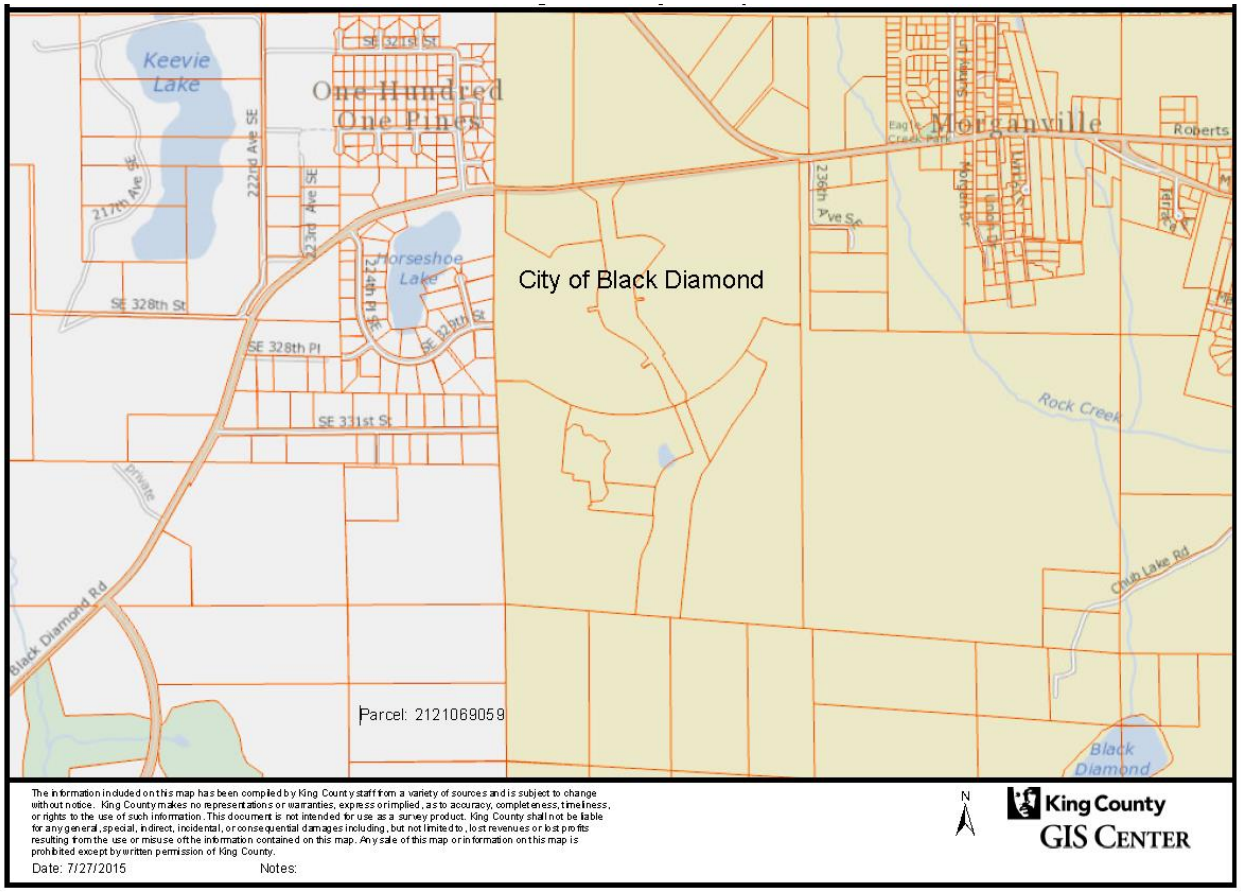
King County Department of Permitting and Environmental Review has issued a Determination of Non Significance (DNS) under File No. GRDE13-0135 for the infiltration test facility located east of 218$^{th}$ Ave SE and south of SE Auburn-Black Diamond Road and Horseshoe Lake, Parcel 212106-9059. See Figure 1 for the TIR Worksheet.

The Green to Cedar Rivers Regional Trail is an 11 mile trail between the Cedar River Trail in Maple Valley and Flaming Geyser State Park that will travel through the two Yarrow Bay Developments known as “The Villages” in Black Diamond and “The Reserve at Woodlands” in unincorporated King County. The 36 foot wide trail corridor will be developed within a 100 foot north-south easement along the western edge of the Villages Development and then travel south through the Reserve along the eastern edge, adjacent to the proposed regional storm water facility, before heading west along the southern edge of the proposed Reserve Development to exit within the right-of-way along SE 218th Avenue SE. The trail easement through the two developments is defined in section 7 of the Development Agreement between King County and BD Village Partners, LP, May 14, 2014.

## PROJECT LOCATION

Horseshoe Lake is located in parcel 346340TRCT, in the N.E. ¼ of Section 16, Township 21 N., Range 6E, W.M., which is located just west of the City of Black Diamond border. Excess stormwater will be pumped from Horseshoe Lake to The Reserve at Woodlands. See Figure 2 for a location map of the pumping from Horseshoe Lake to the Reserve at Woodlands on Parcel 212106-9059.

## FIGURE 2 – VICINITY MAP




## PRE-DEVELOPED CONDITIONS

The project site is on the northeast shore of Horseshoe Lake and contained by parcel 346340TRCT. The site is completely vegetated and owned by the Horseshoe Lake Homeowner Association. There is an existing driveway from SE Auburn-Black Diamond Road. See Figure 3 of the 1996 aerial photo of the area.

## FIGURE 3 – 1996 AERIAL PHOTO OF ACCESS DRIVEWAY FROM SE AUBURN-BLACK DIAMOND ROAD


The pipe route to the Reserve at Woodlands, Parcel 212106-9059 is vegetated and contained within a Road and Utility Easement and within the City of Black Diamond.

Parcel 346340TRCT is within an area considered by the 2009 King County Surface Water Design Manual as a Basic Water Quality Treatment Area and as a Conservation Flow Control Area.

See Appendix A for the November 12, 2013 Technical Memorandum from James Johnson, LG, Golder Associates to Karen Walters, Muckleshoot Tribe regarding the Reserve at Woodlands Hydrogeologic Information for the project. See Appendix B for the November 13, 2013 Technical Memorandum from James Johnson, LG, Golder Associates to Karen Walter, Muckleshoot Indian Tribe regarding the Reserve at Woodlands Infiltration Testing and Monitoring Strategy.

## DEVELOPED CONDITIONS

The pump site will be located at the northeast portion of Horseshoe Lake parcel 346340TRCT. The pump will be rented on an as needed basis, whenever the lake level rises to a level that threatens homes along the lake. The permanent infrastructure that is proposed to be permitted by this project consists of the following:

- Expansion of the existing gravel driveway to serve as a permanent pump location. This work was done during the 2014 flood emergency. No additional expansion of the as-built condition is proposed. See Figure 4 for the proposed impervious area.

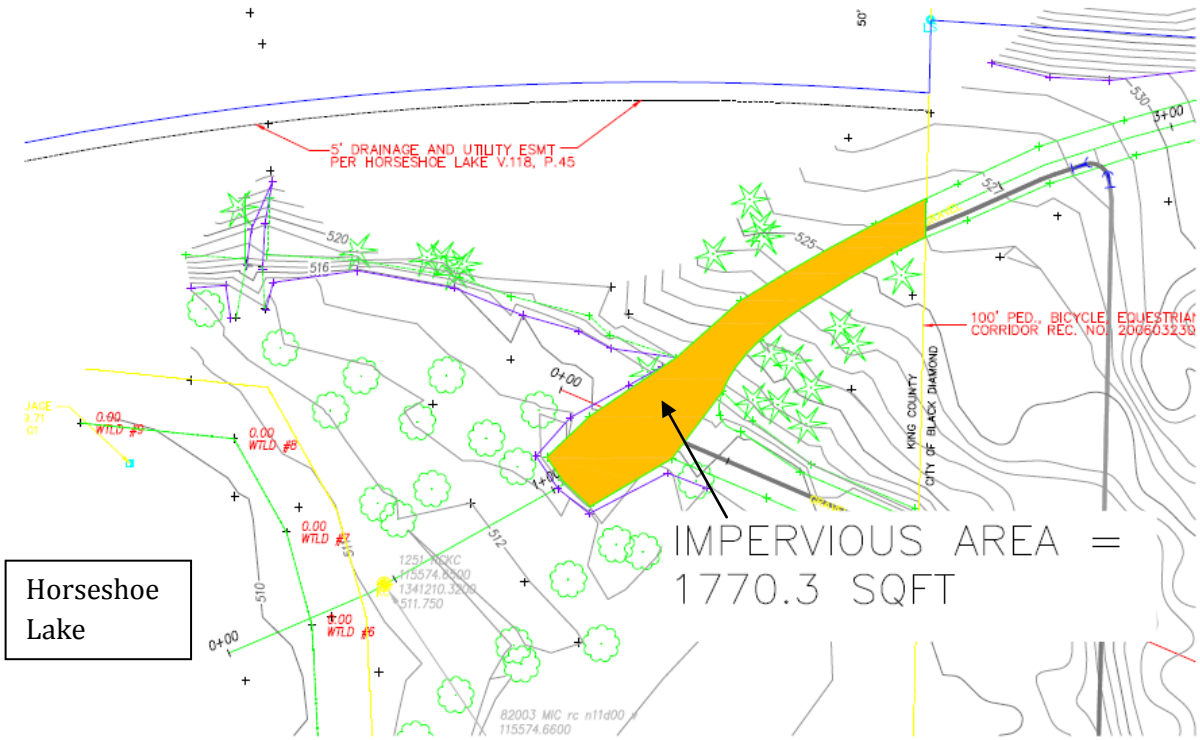
- Re-establish the existing graveled access driveway from SE Auburn-Black Diamond Road to the pump site by removing overgrown weeds and applying gravel to portions of the driveway surface if necessary. This access had been constructed during previous flooding emergencies. No additional expansion of the as-built condition is proposed. See Figure 3 for the access area per 1996 photos.

- Install a buried 12-inch diameter HDPE pipe from the pump site to the location in the City of Black Diamond

The pipe in the City of Black Diamond will flow to the Regional Stormwater Facility Reserve at Woodlands, Parcel 212106-9059. This pipe will be located either overland or below ground and will be permitted and installed by others.

The King County portion of this project will create less than 2,000 square feet of new impervious surface and less than 7,000 square feet of new pervious surface. See Figure 4 for the impervious area.

## FIGURE 4 – IMPERVIOUS AREA



King County is obligated to provide flood protection to vulnerable homes on Horseshoe Lake. This is a long-term commitment. Reestablishing access and setting up the area for periodic emergency pumping adds uncertainty and the potential for an unintended expansion and environmental impacts adjacent to Horseshoe Lake. King County DNRP is proposing to permanently establish and restrict future activity to this single access route for the flood protection work.

While the pipe on the Horseshoe Lake tract is designed to be compatible with the proposed future pipeline within the City of Black Diamond, its function is not dependent on the approval and construction of the future Black Diamond pipeline or Regional Stormwater Facility. The pipe in the Horseshoe Lake tract will be functional upon completion. In the past the water from Horseshoe Lake has been conveyed via temporary piping to Rock Creek, the Woodland HOA Infiltration Pond and most recently to a gravel pit.

# Section II: Conditions and Requirements Summary

This section will address the requirements set forth by King County's 2009 Surface Water Management Design Manual (SWDM) Core and Special Requirements listed in Chapter 1 for Targeted Drainage Review. The project is a retrofit project that results in less than 2,000 square feet of added impervious surface and is proposing to construct or modify a drainage pipe that is 12 inches or larger. Therefore, SWDM Section 1.1.2.2, Targeted drainage review project category #2 applies to this project. Only Core Requirement #s 1, 2, 4, 6, and 7 and Special Requirement #5 apply.

## CORE REQUIREMENTS

*CORE REQUIREMENT #1 DISCHARGE AT THE NATURAL LOCATION (1.2.1):* Horseshoe Lake is hydraulically connected to groundwater and it does not have a surface water outlet. The project will pump excess stormwater from Horseshoe Lake to The Reserve at Woodlands Regional Stormwater Facility on an intermittent basis during flood emergencies. A surface water drainage adjustment will be initiated to review this portion of the project.

*CORE REQUIREMENT #2 OFFSITE ANALYSIS (1.2.2):* Analysis is addressed in the Offsite Analysis Section III.

*CORE REQUIREMENT #3 FLOW CONTROL (1.2.3):* Not applicable. This flood reduction pumping project is qualified for Basic Exemption #1 because it will create less than 2,000 square feet of new impervious surface and less than 35,000 square feet of new pervious surface.

*CORE REQUIREMENT #4 CONVEYANCE SYSTEM (1.2.4)***:** Design and analysis is addressed in Section V.

*CORE REQUIREMENT #5 EROSION AND SEDIMENTATION CONTROL PLAN (1.2.5)***:** The project will implement temporary erosion sediment controls related to the construction of the pipeline and the specific conditions on the site as shown on the project plan set.

*CORE REQUIREMENT #6 MAINTENANCE AND OPERATIONS (1.2.6)***:** King County will assume maintenance of the pump facilities and conveyance systems.

*CORE REQUIREMENT #7 FINANCIAL GUARANTEES AND LIABILITY (1.2.7):* Not applicable because King County is responsible for construction of the flood reduction pumping project.

*CORE REQUIREMENT #8WATER QUALITY (1.2.8):* Not applicable. The project is qualified for Surface Area Exemption #1 because the project is creating less than 5,000 square feet of new pollution generating impervious surface and less than 35,000 square feet of new pollution generating pervious surface that is not fully dispersed.

## SPECIAL REQUIREMENTS

*SPECIAL REQUIREMENT #5 OIL CONTROL (1.3.5):* Not applicable because this project is not proposing to develop or redevelop a high use site.

## CRITICAL AREAS ORDINANCE REQUIREMENTS

1. **Wetlands:** Horseshoe Lake is a mapped wetland.
2. **Streams and Flood Hazard Areas:** The project is not located within or adjacent to a mapped Stream and Flood Hazard area.
3. **Erosion Hazard Areas:** The project is not located within or adjacent to an erosion hazard area.
4. **Landslide Hazard Areas:** The project is not located within or adjacent to a landslide area.
5. **Seismic Hazard Areas:** The project is not located within or adjacent to a seismic area.
6. **Coal Mine Hazard Areas:** The project is not located within or adjacent to a coal mine area.

All applicable core and special requirements from the 2009 KCSWDM have been complied with. Exemptions and exceptions regarding flow control and water quality treatment for the site are discussed in the "Flow Control and Water Quality Facility Analysis and Design" Section IV.

# Section III: Offsite Analysis

This section identifies the tributary basin areas downstream of the project site and evaluates the downstream drainage system problems. The intent of this section is to demonstrate that the proposed project will not create new drainage problems.

## Basin Downstream Information

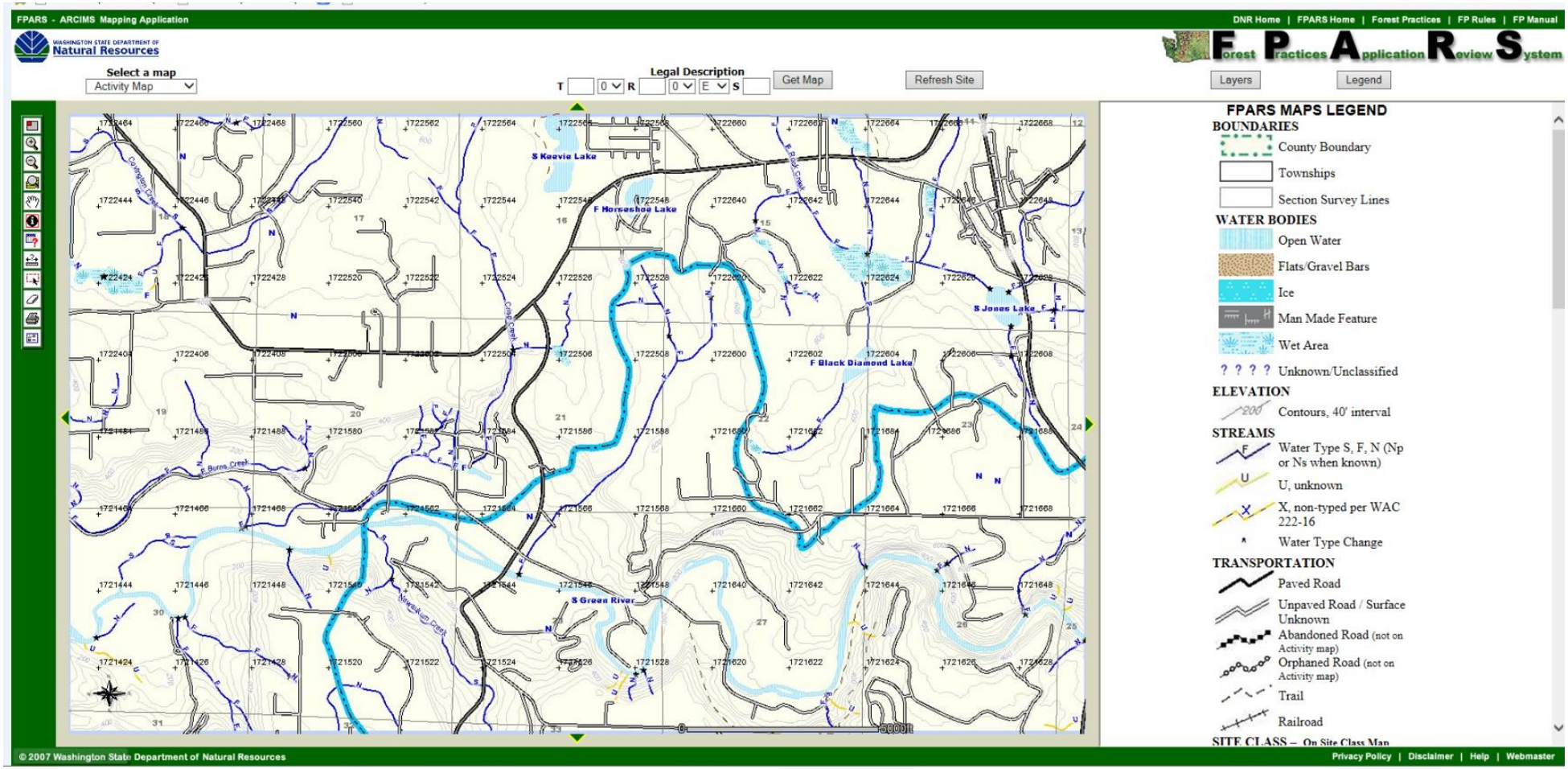
The project will pump excess stormwater from Horseshoe Lake to The Reserve at Woodlands Regional Stormwater Facility. See Appendix A for the November 12, 2013 Technical Memorandum from James Johnson, LG, Golder Associates to Karen Walters, Muckleshoot Tribe regarding the Reserve at Woodlands Hydrogeologic Information for the project. See Appendix B for the November 13, 2013 Technical Memorandum from James Johnson, LG, Golder Associates to Karen Walter, Muckleshoot Indian Tribe regarding the Reserve at Woodlands Infiltration Testing and Monitoring Strategy.

## Resource Review

The following documents and resources were reviewed and researched for existing and/or potential drainage problems. The findings of each are listed as follows:

1. FEMA maps indicated that the project is not within a Federal Emergency Management Agency (FEMA)-designated floodplain.
2. The project drains to Middle Green River. See the Washington State Department of Natural Resources mapping of the project area in Figure 5.
3. Analysis of King County Drainage Service Section complaints revealed significant flooding problems with Horseshoe Lake. See Figure 6 for the list of drainage complaint

FIGURE 5: WASHINGTON STATE DNR MAP



## FIGURE 6: DRAINAGE COMPLAINTS

| Complaint No | Problem | Type | Recd Date | Close Date | Address | PIN | Comments |
|---|---|---|---|---|---|---|---|
| 1996-0655 | LK LEVEL | C | 2/21/1996 | 3/8/1996 | 32626 224TH PL SE | 3463400290 | HORSESHOE LAKE FLOODING |
| 2001-0150 | DES | C | 3/14/2001 | 8/7/2001 | 32626 224TH PL SE | 3463400290 | EROSION OF CHANNEL AT LAKE BOTTOM. WOULD LIKE COUNTY ASSISTANCE OR TA TO ASSIST. |
| 2001-0150 | DES | R | 3/24/2001 | 8/7/2001 | 32626 224TH PL SE | 3463400290 | EROSION OF CHANNEL AT LAKE BOTTOM. WOULD LIKE COUNTY ASSISTANCE OR TA TO ASSIST. |
| 2007-0126 | INQ | X | 2/16/2007 | 2/26/2007 | 32626 224TH PL SE | 3463400290 | RELATED TO HORSESHOE LAKE. MS. RUSH WANTS THE LAKE TO BE INCORPORATED INTO THE DEVELOPMENT PLANS FOR SECTION 15. |
| 2014-0237 | RFD | C | 3/1/2014 | 4/3/2014 | 32626 224th Pl SE | 3463400290 | Flooding/emergency pumping at Horseshoe Lake. SWS-CapServ to address. |
| 1995-0475 | DRNG/CB | C | 5/24/1995 | 7/28/1995 | 32809 227TH PL SE | 3463400190 | REQUEST FOR TRASH RACKS ON PIPE INLET |
| 1991-1211 | FLOODING | C | 12/24/1991 | 12/27/1991 | 32730 224TH PL SE | 3463400260 | HORSESHOE LAKE RISING |
| 2011-0119 | RFD | C | 2/17/2011 | 5/31/2012 | 32720 224TH PL SE | 3463400260 | Horseshoe Lake flooding. Referred to SWS CSU Horseshoe Lake pumping project. |
| 2014-0252 | RFD | R | 4/14/2014 | 7/31/2014 | 22710 SE 329TH ST | 3463400160 | EMAIL ABOUT CLEAR CUTTING EAST OF HORSESHOE LAKE. |
| 1992-0266 | INFO/FLD | SR | 3/30/1992 | 11/14/1992 | HORSHOE LAKE | 3463400090 | HORSESHOE LAKE NOT NDA |
| 1992-0266 | INFO/FLD | X | 3/30/1992 | 4/13/1992 | HORSHOE LAKE | 3463400090 | HORSESHOE LAKE |
| 1996-0560 | FLDG | C | 2/23/1996 | 3/21/1996 | 22421 SE 329TH ST | 3463400090 | STORM EVENT HISTORIC DRNG PATTERN |
| 1996-1033 | DRNG | R | 4/29/1996 | 5/24/1996 | 22421 SE 329TH ST | 3463400090 | TA REQUEST-HW 2 DEAL W/FLO FRM NGHBR |
| 2003-0224 | WQB | WQC | 3/10/2003 | 3/24/2003 | 22431 SE 331ST ST | 2025500065 | ALLEGED POLLUTANT DISCHARGE AS PART OF ROADWAY SURFACING. INVESTIGATION DID NOT CONFIRM CONDITION |
| 2008-0035 | WQD | WQC | 1/22/2008 | 1/23/2008 | | 2121069001 | 2 55-gal drums of oil left outside ROW. Plum Creek Land Co will remove and dispose. |
| 2012-0525 | WQAI | WQA | 7/20/2012 | 10/25/2012 | 20827 AUBURN BLA | 2021069004 | |

# Section IV: Flow Control and Water Quality Facility Analysis and Design

## Basin Description-Existing and Developed Site Hydrology

There is one project threshold drainage basin within the Middle Green River drainage basin. Existing and Developed drainage basin is the same. All surface water in the project area drains to Horseshoe Lake.

## Flow Control

Not applicable. This flood reduction pumping project is qualified for Basic Exemption #1 because it will create less than 2,000 square feet of new impervious surface and less than 35,000 square feet of new pervious surface.

## Water Quality

Not Applicable. The project is qualified for Surface Area Exemption #1 because the project is creating less than 5,000 square feet of new pollution generating impervious surface and less than 35,000 square feet of new pollution generating pervious surface that is not fully dispersed.

## SECTION V: CONVEYANCE SYSTEM ANALYSIS AND DESIGN

The proposed conveyance system from Horseshoe Lake to the Reserve at Woodlands is shown in Figure 8 map of the infiltration testing pipeline. The Regional Stormwater Facility shall be designed to accommodate a pumped volume of water from Horseshoe Lake equivalent to a flow of six cubic feet per second over a two-week period assuming wet season ground water conditions. Head losses for the entire pipe run to the Reserve at Woodlands are calculated in Appendix C. A possible rental pump given the capacity and head requirement is shown in Appendix D.

# Section VI: Special Reports and Studies

Critical areas within, adjacent to, or affected by a project require a special study unless there is a substantial showing that the project will not affect the area contrary to the goals of Sensitive Areas Ordinance 9614 [8(5)] and the Environmentally Critical Areas Code (KCC 21A.24). See Figure 7 for a Critical Areas Ordinance (CAO) map of the project area.

Horseshoe Lake is a mapped wetland. The project will pump excess stormwater from Horseshoe Lake to The Reserve at Woodlands Regional Stormwater Facility. A separate wetland study of the wetland adjacent to Horseshoe Lake, by King County will be submitted as part of the DPER clearing and grading permit application. See Appendix A for the November 12, 2013 Technical Memorandum from James Johnson, LG, Golder Associates to Karen Walters, Muckleshoot Tribe regarding the Reserve at Woodlands Hydrogeologic Information for the project. See Appendix B for the November 13, 2013 Technical Memorandum from James Johnson, LG, Golder Associates to Karen Walter, Muckleshoot Indian Tribe regarding the Reserve at Woodlands Infiltration Testing and Monitoring Strategy.

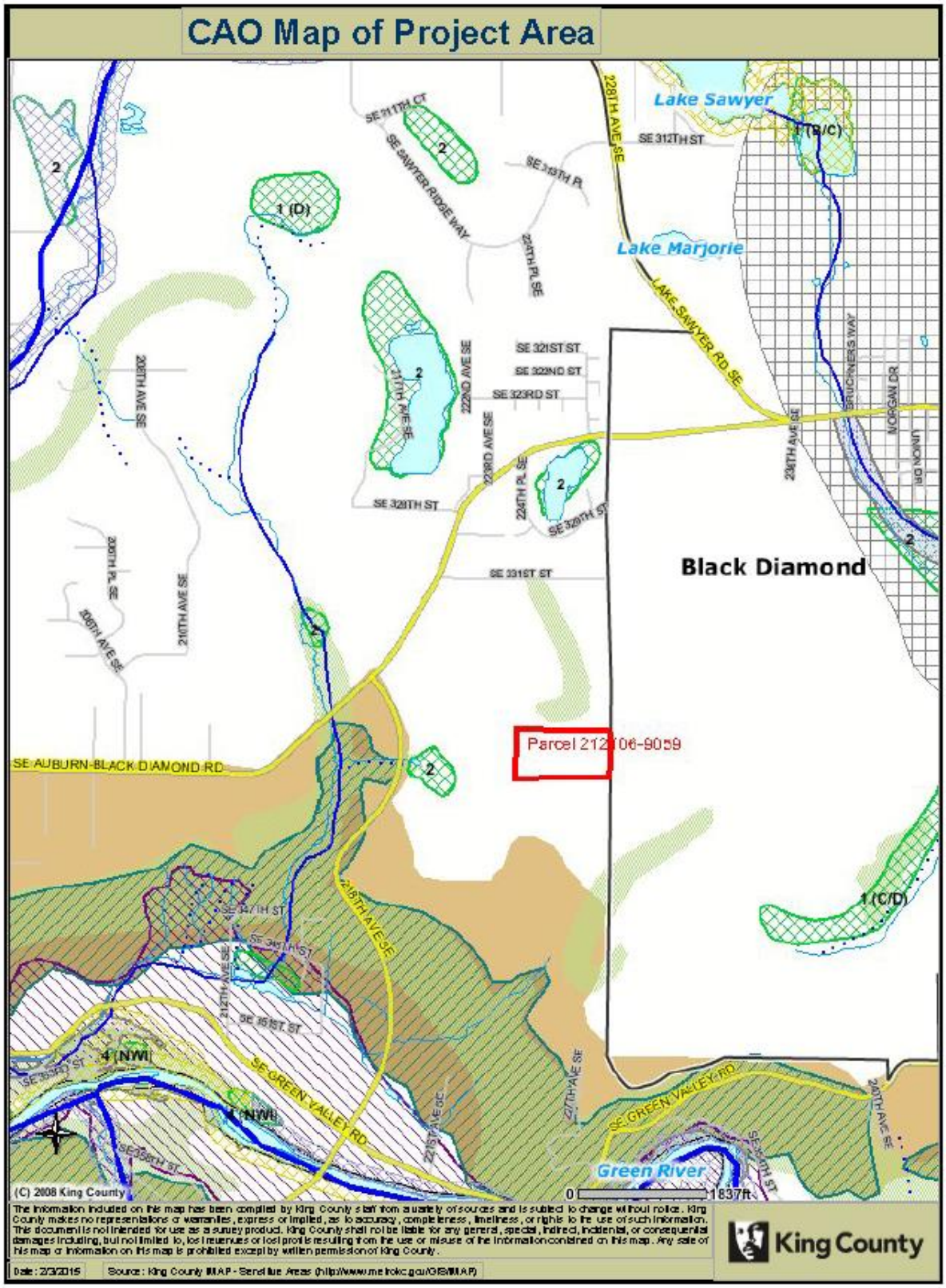
# Section VII: Other Permits

This will require the following permit.

1. **Clearing and Grading Permit** from the King County Department of Permitting and Environmental Review is required for work that includes clearing and removal of vegetation, excavation, grading, and earthwork construction within King County.
2. **Right of Way Special Use Permit** from the King County Department of Transportation is required for working in the right of way within King County.

3. **Clearing and Grading Permit** from the City of Black Diamond and Environmental Review is required for work that includes clearing and removal of vegetation, excavation, grading, and earthwork construction within the City of Black Diamond.
4. **Right of Way Special Use Permit** from the City of Black Diamond is required for working in the right of way within the City of Black Diamond.

FIGURE 7: CAO MAP OF PROJECT AREA



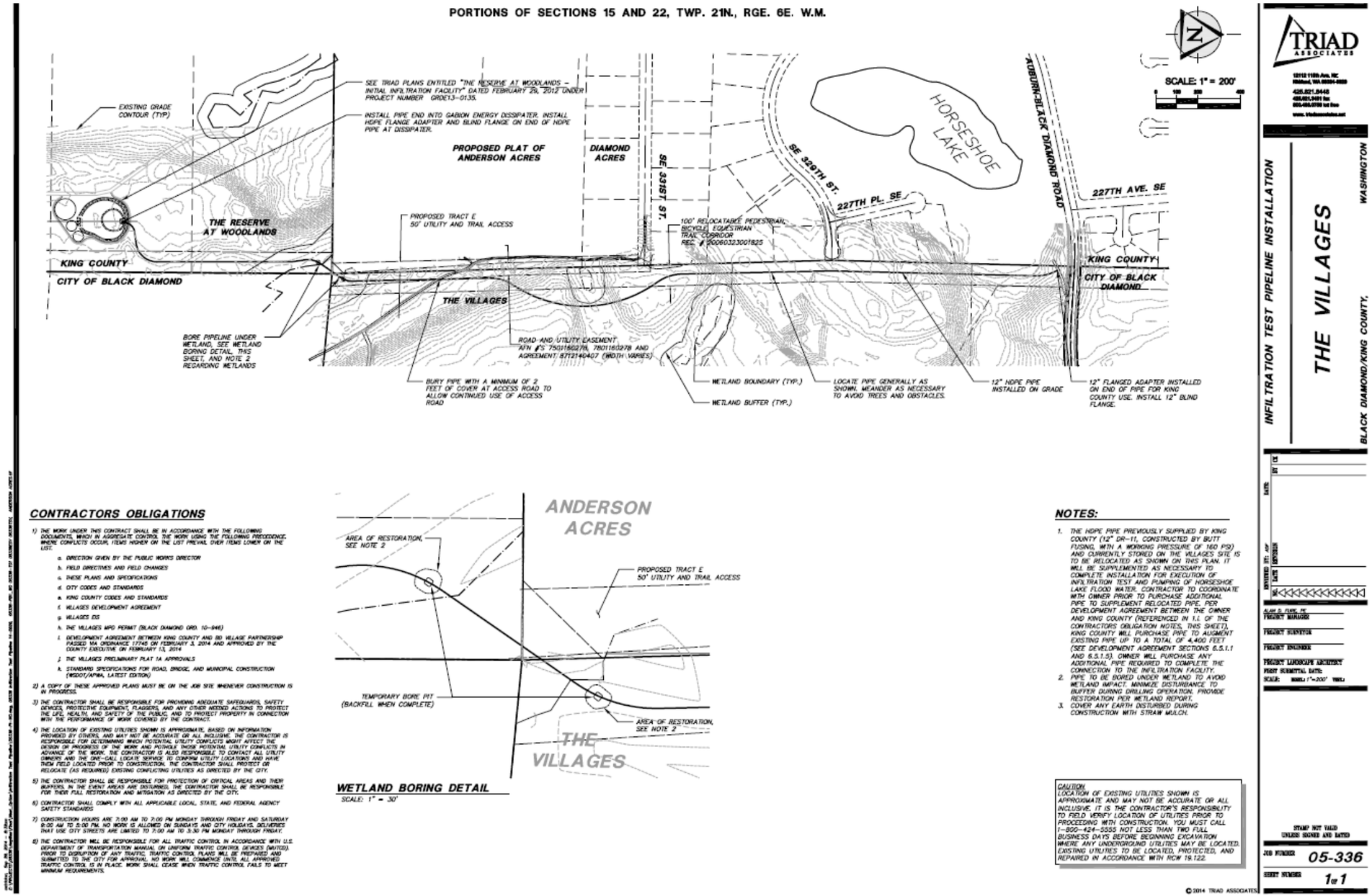
# CAO Map of Project Area




Date: 2/3/2015 Source: King County iMAP - Sensitive Areas (http://www.metrokc.gov/GIS/iMAP)

King County

FIGURE 8: MAP OF INFILTRATION TEST PIPELINE




## CONTRACTORS OBLIGATIONS

1) THE WORK UNDER THIS CONTRACT SHALL BE IN ACCORDANCE WITH THE FOLLOWING DOCUMENTS, WHICH IN AGGREGATE, CONTROL THE WORK USING THE FOLLOWING PRECEDENCE. WHERE CONFLICTS OCCUR, ITEMS HIGHER ON THE LIST PREVAIL OVER ITEMS LOWER ON THE LIST.
   a. DIRECTION GIVEN BY THE PUBLIC WORKS DIRECTOR
   b. FIELD DIRECTIVES AND FIELD CHANGES
   c. THESE PLANS AND SPECIFICATIONS
   d. CITY CODES AND STANDARDS
   e. KING COUNTY CODES AND STANDARDS
   f. VILLAGES DEVELOPMENT AGREEMENT
   g. VILLAGES CC&R
   h. THE VILLAGES NPDES PERMIT (BLACK DIAMOND ORD. 10-946)
   i. DEVELOPMENT AGREEMENT BETWEEN KING COUNTY AND BD VILLAGE PARTNERSHIP PASSED VIA ORDINANCE 17740 ON FEBRUARY 3, 2014 AND APPROVED BY THE COUNTY EXECUTIVE ON FEBRUARY 13, 2014
   j. THE VILLAGES PRELIMINARY PLAT 1A APPROVALS
   k. STANDARD SPECIFICATIONS FOR ROAD, BRIDGE, AND MUNICIPAL CONSTRUCTION (WSDOT/APWA, LATEST EDITION)
2) A COPY OF THESE APPROVED PLANS MUST BE ON THE JOB SITE WHENEVER CONSTRUCTION IS IN PROGRESS.
3) THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ADEQUATE SAFEGUARDS, SAFETY DEVICES, PROTECTIVE EQUIPMENT, FLAGGERS, AND ANY OTHER NEEDED ACTIONS TO PROTECT THE LIFE, HEALTH, AND SAFETY OF THE PUBLIC, AND TO PROTECT PROPERTY IN CONNECTION WITH THE PERFORMANCE OF WORK COVERED BY THE CONTRACT.
4) THE LOCATION OF EXISTING UTILITIES SHOWN IS APPROXIMATE, BASED ON INFORMATION PROVIDED BY OTHERS, AND MAY NOT BE ACCURATE OR ALL INCLUSIVE. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING WHICH POTENTIAL UTILITY CONFLICTS MIGHT AFFECT THE DESIGN OR PROGRESS OF THE WORK AND POTHOLE THOSE POTENTIAL UTILITY CONFLICTS IN ADVANCE OF THE WORK. THE CONTRACTOR IS ALSO RESPONSIBLE TO CONTACT ALL UTILITY OWNERS AND THE ONE-CALL LOCATE SERVICE TO CONFIRM UTILITY LOCATIONS AND HAVE THEM FIELD LOCATED PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL PROTECT OR RELOCATE (AS REQUIRED) EXISTING CONFLICTING UTILITIES AS DIRECTED BY THE CITY.
5) THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTION OF CRITICAL AREAS AND THEIR BUFFERS. IN THE EVENT AREAS ARE DISTURBED, THE CONTRACTOR SHALL BE RESPONSIBLE FOR THEIR FULL RESTORATION AND MITIGATION AS DIRECTED BY THE CITY.
6) CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL AGENCY SAFETY STANDARDS
7) CONSTRUCTION HOURS ARE 7:00 AM TO 7:00 PM MONDAY THROUGH FRIDAY AND SATURDAY 9:00 AM TO 5:00 PM. NO WORK IS ALLOWED ON SUNDAYS AND CITY HOLIDAYS. DELIVERIES THAT USE CITY STREETS ARE LIMITED TO 7:00 AM TO 3:30 PM MONDAY THROUGH FRIDAY.
8) THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL TRAFFIC CONTROL IN ACCORDANCE WITH U.S. DEPARTMENT OF TRANSPORTATION MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD). PRIOR TO DISRUPTION OF ANY TRAFFIC, TRAFFIC CONTROL PLANS WILL BE PREPARED AND SUBMITTED TO THE CITY FOR APPROVAL. NO WORK WILL COMMENCE UNTIL ALL APPROVED TRAFFIC CONTROL IS IN PLACE. WORK SHALL CEASE WHEN TRAFFIC CONTROL FAILS TO MEET MINIMUM REQUIREMENTS.




## WETLAND BORING DETAIL

SCALE: 1" = 30'

## NOTES:

1. THE HDPE PIPE PREVIOUSLY SUPPLIED BY KING COUNTY (12" DR-11, CONSTRUCTED BY BUTT FUSING, WITH A WORKING PRESSURE OF 160 PSI) AND CURRENTLY STORED ON THE VILLAGES SITE IS TO BE RELOCATED AS SHOWN ON THIS PLAN. IT WILL BE SUPPLEMENTED AS NECESSARY TO COMPLETE INSTALLATION FOR EXECUTION OF INFILTRATION TEST AND FILLING OF HORSESHOE LAKE FLOOD WATER. CONTRACTOR TO COORDINATE WITH OWNER PRIOR TO PURCHASE ADDITIONAL PIPE TO SUPPLEMENT RELOCATED PIPE. PER DEVELOPMENT AGREEMENT BETWEEN THE OWNER AND KING COUNTY (REFERENCED IN 1.i. OF THE CONTRACTORS' OBLIGATION NOTES, THIS SHEET), KING COUNTY WILL PURCHASE PIPE TO AUGMENT EXISTING PIPE UP TO A TOTAL OF 4,400 FEET (SEE DEVELOPMENT AGREEMENT SECTIONS 6.5.1.1 AND 6.5.1.5). OWNER WILL PURCHASE ANY ADDITIONAL PIPE REQUIRED TO COMPLETE THE CONNECTION TO THE INFILTRATION FACILITY.
2. PIPE TO BE BORED UNDER WETLAND TO AVOID WETLAND IMPACT. MINIMIZE DISTURBANCE TO BUFFER DURING DRILLING OPERATION. PROVIDE RESTORATION PER WETLAND REPORT.
3. COVER ANY EARTH DISTURBED DURING CONSTRUCTION WITH STRAW MULCH.

CAUTION:
LOCATION OF EXISTING UTILITIES SHOWN IS APPROXIMATE AND MAY NOT BE ACCURATE OR ALL INCLUSIVE. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY LOCATION OF UTILITIES PRIOR TO PROCEEDING WITH CONSTRUCTION. YOU MUST CALL 1-800-424-5555 NOT LESS THAN TWO FULL BUSINESS DAYS BEFORE BEGINNING EXCAVATION WHERE ANY UNDERGROUND UTILITIES MAY BE LOCATED. EXISTING UTILITIES TO BE LOCATED, PROTECTED, AND REPAIRED IN ACCORDANCE WITH RCW 19.122.



TRIAD ASSOCIATES

INFILTRATION TEST PIPELINE INSTALLATION

THE VILLAGES

BLACK DIAMOND/KING COUNTY, WASHINGTON

ALAN D. FLAKE, PE
PROJECT MANAGER
PROJECT SURVEYOR
PROJECT ENGINEER
PROJECT LANDSCAPE ARCHITECT
FIRST SUBMITTAL DATE:
SCALE: HORIZ. 1"=200' VERT.

STAMP NOT VALID UNLESS SIGNED AND DATED

JOB NUMBER 05-336

SHEET NUMBER 1 of 1

# Section VIII: Construction Stormwater Pollution Prevention Plan Analysis and Design

## Erosion and Sediment Control Analysis and Design (Part A)

The intent of the Erosion and Sedimentation Control (ESC) Plan is to minimize, to the maximum extent possible, the transport of sediment from the project site downstream to Evans Creek or any adjacent properties. The project proposes to implement all appropriate and necessary measures to minimize the extent and duration of erosion and sediment transport. ESC measures will be inspected and monitored to ensure continued performance of their intended function. Facilities and measures shall be maintained and repaired as needed.

Erosion and sediment control measures were chosen to fit the proposed condition and topography of the site. The area of the project site is a paved subdivision road.

ESC measures within the project site were chosen to emphasize erosion control rather than treatment of sediment.

### *Erosion and Sediment Control Standard Measures*

The following measures were selected to fit the site conditions. Selection was based on meeting the criteria set forth in the 2009 King County *Surface Water Design Manual,* Appendix D (Erosion and Sediment Control Standards). During construction, ESC plans will be revised as necessary to address changing site conditions so as to maintain the minimal extent and duration of erosion and sediment transport.

1. **Clearing Limits:** Prior to any land-disturbing activities, including clearing or grading, all clearing limits, critical areas and their buffers, and trees that are to be preserved within the construction area will be clearly marked with the use of plastic, metal, or stake wire fencing. The project also proposes to phase land-disturbing activities and work progressively from section to section, rather than clearing and grubbing the entire length of the project.
2. **Cover Measures:** Temporary and permanent cover measures will be used to protect disturbed areas that are to remain unworked for more than 7 days during the dry season and 12 hours during the wet season. The use of mulch and plastic will be extensive in that they are temporary protective devices where the intent is to minimize the extent and duration of such areas exposed. Cleared areas will be revegetated as soon as practical after grading.
3. **Perimeter Protection:** The project will install silt fencing and other types of perimeter protection measures around the site so as to minimize, to the maximum extent possible, the transport of sediment from the project site downstream to Crisp Creek or any adjacent properties.

4. **Traffic Area Stabilization:** The unsurfaced entrances and roads shall be stabilized by construction of a stabilized construction entrance.
5. **Sediment Retention:** Within the project site, the chosen methods focus on collecting and conveying sediment-laden runoff to treatment facilities. The project also proposes to use filter fabric protection on storm drain inlets in support of the treatment facilities.
6. **Surface Water Controls:** At the perimeter of the site, drainage areas will be treated with perimeter protection measures.
7. **Wet Season Requirements:** Temporary and permanent cover measures will be used to protect disturbed areas that are to remain un-worked for more than 12 hours during the wet season. The wet season is from October 1 to April 30.
8. **Critical Areas Restrictions:** Critical areas and their buffers, and trees that are to be preserved within the construction area will be delineated and clearly marked with the use of plastic, metal, or stake wire fencing.
9. **Dust Control:** Water is to be used when a traffic hazard may be created or when wind-transported sediment is likely to be deposited in the Middle Green River. Care will be taken to ensure that runoff will not be generated.

## STORMWATER POLLUTION PREVENTION AND SPILL PLAN DESIGN (PART B)

The intent of the Stormwater Pollution Prevention and Spill (SWPPS) Plan is to identify, to the maximum extent possible, activities that could contribute pollutants to surface and storm water, Evans Creek and any adjacent properties during construction. The project proposes to implement all appropriate and necessary measures to minimize the potential of pollutants to surface and stormwater. SWPPS Plan measures will be monitored to ensure continued performance of their intended function. Activities measured shall be maintained and revised as needed to address changing site conditions.

### *STORMWATER POLLUTION PREVENTION AND SPILL ACTIVITY MEASURES*

The following activities are typically associated with construction and are addressed to the maximum extent possible herein. The bid-winning contractor will be required to develop a more in-depth SWPPS that is specific to his/her construction method or procedures and equipment. During construction, SWPPS plans will be revised as necessary to address changing site conditions so as to maintain the minimal contribution of pollutants.

1. **Storage and Handling of Liquids:** The Contractor will identify liquids he/she and his subcontractors will or intend to handle or store on the site.
2. **Storage and Stockpiling of Construction Materials and Wastes:** The Contractor will identify construction materials stockpiled and wastes that may be generated on-site. This

will include the type of cover measure used to keep rainwater from contacting the materials and wastes.

3. **Fueling**: The Contractor will specify method of onsite fueling and provide a descriptive of containment methods for fuel spills.
4. **Maintenance, Repairs, and Storage of Vehicles and Equipment:** It is not anticipated that the Contractor will have maintenance and repair area. In any event of equipment failure that raises the potential of pollutant contamination, methods for containment will be employed.
5. **Concrete Saw Cutting, Slurry, and Washwater Disposal:** No truck washouts will be located in critical delineated and marked areas.
6. **Handling of pH Elevated Water:** The Contractor will provide details for treating and neutralizing water.
7. **Application of Chemicals, including Pesticides and Fertilizers:** The Contractor will provide a list of chemicals that will be used or stored on the site.

# SECTION IX: BOND, QUANTITIES, FACILITY SUMMARIES, AND DECLARATION OF COVENANT

Facilities are being constructed and maintained by King County; therefore, no bonds or financial guarantees will be required.

# SECTION X: OPERATIONS AND MAINTENANCE MANUAL

## STANDARD MAINTENANCE

The proposed pump and conveyance system will be maintained by King County according to the pump manufacturer's operations and maintenance manual.