172nd / 190th Corridor Plan

Technical Memorandum #5.6: Wetlands and Water Resources Baseline Conditions Clackamas County, Oregon

Prepared for:

CLACKAMAS COUNTY

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MB&G Project No. 0010557

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1.0 INTRODUCTION

The purpose of this technical memorandum is to document biological resources within the 172nd/190th Corridor Plan Project Study Area (PSA) identified during field surveys for three proposed roadway improvement alternatives associated with the project. This information will be used by the project team to guide the development of future roadway improvements in the PSA by minimizing and/or avoiding adverse impacts to natural resources to the extent possible.

1.1 PROJECT PURPOSE

The purpose of this project is to effectively address the 172nd-190th corridor congestion and safety problems, serve future north-south traffic, serve expected population growth in Damascus, Happy Valley, the Pleasant Valley Plan Area and Gresham, and to serve the growing demand for regional travel.

1.2 PROJECT DESCRIPTION

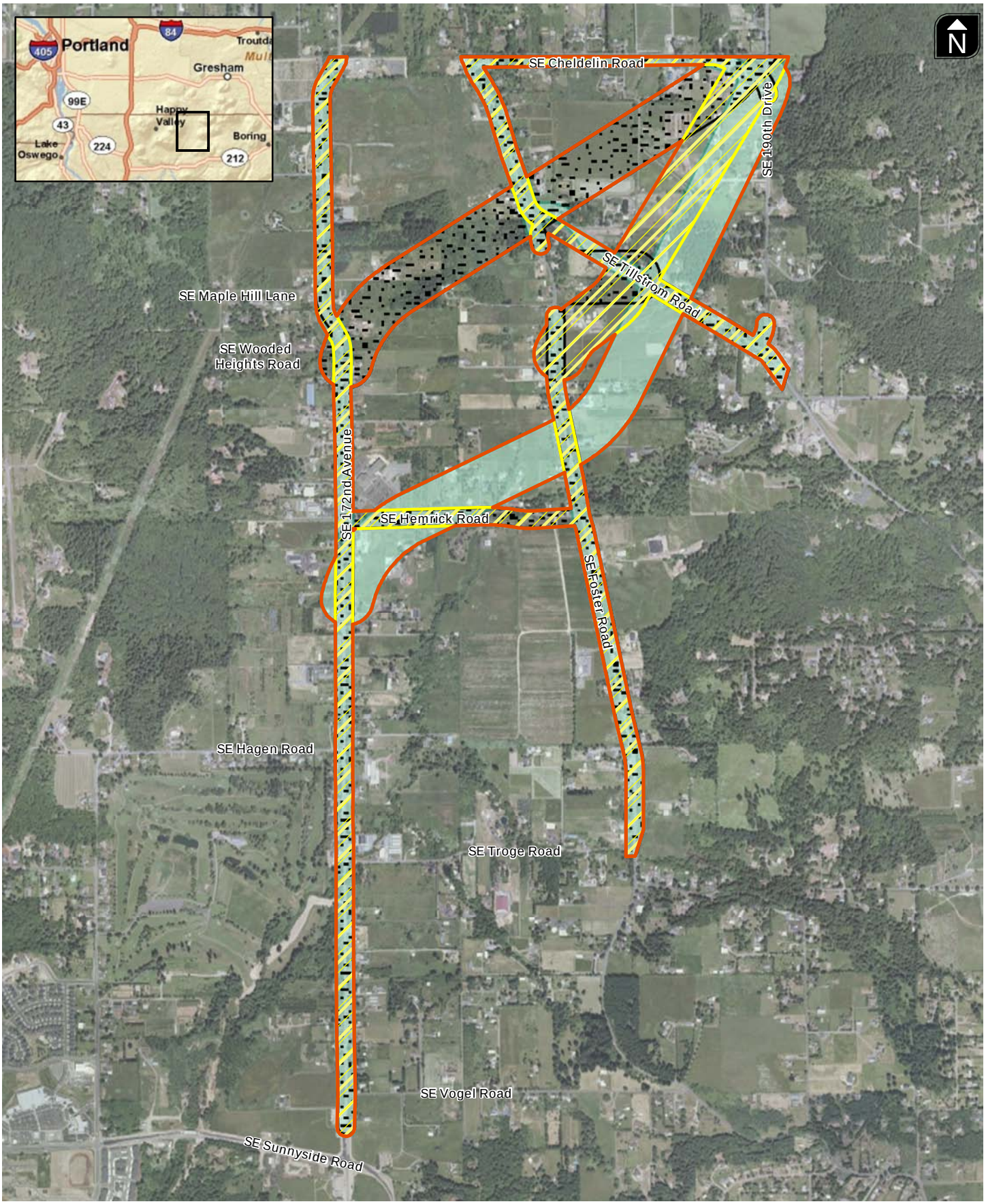
The proposed project includes developing and evaluating roadway improvement alternatives for the SE 172nd Avenue corridor from SE Sunnyside Road to the Multnomah County line as well as developing and evaluating design alternatives for a potential new major arterial between SE 172nd and SE 190th Drive near the county line.

The area around the 172nd/190th Corridor Plan PSA was recently added to the Portland Metropolitan Urban Growth Boundary (part in 1998 and the remainder in 2002) and is planned for urban development at an average density of at least 10 units per net buildable acre for the residential areas. There are also planned commercial and employment areas within the City of Damascus. Some of this development has already begun to occur. Existing conditions along SE 172nd Avenue and SE 190th Drive lack the needed continuity and capacity to serve future traffic demand created by anticipated urban growth. There are limited locations where this type of connection/facility can occur due to topographic constraints and existing urban buildout. In addition, planning efforts reveal that there are no other physically viable, cost-effective north-south routes in this portion of Clackamas County.

1.3 PROJECT STUDY AREA – ROADWAY ALTERNATIVES

The original PSA for the project discussed in Technical Report 5.1 included all land within the 18 potential alternatives that were originally considered for the project. A revised PSA (hereafter referred to as PSA) has been developed to identify three potential roadway alignments that may be improved during implementation of the proposed 172nd/190th Corridor Plan project. This PSA has been refined based on the results of the design team's roadway infrastructure improvement alternatives screening process (Figure 5.6-1).

Alternative AT-02 travels north from SE Sunnyside Road along SE 172nd Avenue, turning northeast at SE Wooded Heights Road and intersects with SE 190th Drive at the Multnomah County line.



Project Study Area (PSA) - 334.3 acres
Alternative AT-06*
Alternative AT-02*
Alternative AS-10a*

1 inch = 1,500 feet

0 375 750 1,500 Feet

Source: Aerial photo, NAIP 2009. Project Study Area from OTAK. Inset map from ESRI.

*Alternatives shown have been clipped to Project Study Area.

Figure 5.6-1
Project Location & Vicinity Map
172nd/190th Corridor Plan
Clackamas County, Oregon

Alternative AT-06 extends north from SE Sunnyside Road along SE 172nd Avenue, turning northeast just south of SE Hemrick Road, crossing SE Foster Road and SE Tillstrom Road before turning north at the intersection with SE 190th Drive just south of the Multnomah County line.

Alternative AS-10a extends north from SE Sunnyside Road along SE 172nd Avenue to the Multnomah County line. Another section travels northeast from SE Foster Road approximately 1,700 feet north of SE Hemrick Road, crossing SE Tillstrom Road and connecting to SE 190th Drive at SE Cheldelin Road.

The PSA is a single composite of potential impact areas for all three alternatives. It extends north from SE Sunnyside Road along SE 172nd Avenue to the Multnomah County line and along SE Cheldelin Road between SE Foster Road and SE 190th Drive. The PSA also extends to the east along SE Hemrick Road to SE Foster Road. The PSA encompasses portions of SE Foster Road, SE Tillstrom Road, and SE 190th Drive (Figure 5.6-1). The PSA includes a 200-foot buffer from the centerline of existing roadways and a 600-foot buffer from the approximated centerline of proposed new roadways.

1.4 Landscape Setting and Land Use

The PSA is located near the western foothills of the Cascade Range in Oregon at the northern end of the Willamette Valley Physiographic province. The PSA is located at the eastern edge of the Portland metropolitan area within the urban growth boundaries of Damascus, Gresham and Happy Valley and within unincorporated Clackamas County.

The majority of the PSA has been disturbed and includes zoned residential, rural, and agricultural areas. The PSA is mostly comprised of single family homes and small farms consisting of agriculture and/or livestock uses. Most of the farms are smaller than 20 acres in size. Alfalfa and hay fields dominate the agricultural uses; cattle, horses, sheep, and chickens are the predominant livestock within the PSA. In addition, several ornamental plant nurseries are also located within the PSA. The most developed areas within the PSA are located along SE 172nd Avenue and include Pleasant Valley Greenhouses, Scouters Mountain Elementary School and Abundant Life Church.

Multiple arterial roads including SE 172nd Avenue and SE Foster Road, and many tertiary roadways are located within the PSA. No roads wider than two lanes are located within the PSA. There are currently no passing lanes or turn lanes, and all roads lack sidewalks or bicycle lanes.

Some forested areas remain within the PSA; however, these areas are relatively small and isolated. The largest contiguous forest within the PSA is located within the 600 foot buffer of Alternative AT-02 between SE 172nd Avenue and SE Foster Road. This forested area is a second-growth, mixed conifer-deciduous forest.

Rock Creek and a number of its tributaries flow through the PSA. The southern and central portions of the PSA are located within the Clackamas River – Rock Creek Watershed (170900110607 6th field hydrologic unit code [HUC]) and the northern portion of the PSA is located within the Upper Johnson Creek Watershed (170900120101 6th field HUC), both of which eventually drain to the Willamette River. Rock Creek, the main waterway within the PSA, is a perennial, second order tributary of the Clackamas River. Rock Creek has a watershed of approximately 12 square miles. Rock Creek's headwaters are located on the northeast slope of a small butte near SE Borges Road, east of the PSA, at approximately 700 feet above mean sea

level (msl). Rock Creek discharges into the Clackamas River just south of Highway 212, approximately 1.5 miles southwest of the PSA (USGS 1984).

2.0 METHODS

The following sections of this report summarize the wetland and water resources identified during an office-based review of available information and subsequent field reconnaissance by Mason, Bruce, and Girard, Inc. (MB&G) biologists.

Potential jurisdictional wetlands and waters were reviewed during the office-based review using the following resources:

- Aerial photographs (NAIP 2009);
- U.S. Geological Survey topographic maps (USGS 1984);
- USFWS National Wetlands Inventory (NWI) mapping (USFWS 2010)
- LWI mapping records for Happy Valley and Damascus (Vigil Agrimis 2009)
- Damascus Natural Features Inventory, including LWI mapping records (Winterbrook Planning 2007, 2009);
- Damascus Storm Treatment Report;
- Oregon Wetland Assessment Protocol (ORWAP) mapping (OSU 2010);
- Oregon Department of Forestry (ODF) stream mapping (ODF 2003);
- The Soil Survey of Clackamas County, Oregon (Gerig 1985, NRCS 2006).

Previous wetland delineation reports addressing areas within the PSA were requested from the Oregon Department of State Lands (DSL) and were reviewed including: WD1996-0242, WD1999-0021, WD2007-0642, WD2008-0256, WD2009-0077, WD2009-0387 (Downing 2010). LWI mapping was determined to be the most accurate source of existing wetland and waters data as it was field-verified and digital LWI data was available. Therefore, LWI data were utilized as reference for the field reconnaissance.

The 100-year floodplain and Federal Emergency Management Act (FEMA) floodway was also reviewed within the PSA using Floodplain Insurance Rate Maps (FEMA 2008). In addition, water quality-limited waterways were reviewed within the PSA (DEQ 2006).

MB&G biologists conducted field reconnaissance on April 18th and 20th-22nd, 2011 to collect available wetland and waters information in the PSA and further inform the alignment selection process for the three proposed alternatives. The main goals of the field reconnaissance for the purposes of this report were to assess the presence, location, and quality of wetlands and waters, and observe general land use conditions affecting natural resources. Particular attention was paid to deviations to LWI data and all possible jurisdictional ditches, which were not mapped in the LWI data. The presence and location of wetlands and waters were determined based on presence of hydrophytic vegetation and above-ground, visible hydrology indicators. Only those features with the possibility of being jurisdictional were mapped during the field reconnaissance.

Multiple areas within the PSA were inaccessible to MB&G due to lack of Right-of-Entry from private landowners. Alternative AT-02 had approximately 42%, Alternative AT-06 had 46%, and Alternative AS-10a had 44% Right-of-Entry from landowners. These percentages do not include field reconnaissance conducted from public road Rights-of-Way. In addition, MB&G biologists used accessible adjacent properties whenever possible to identify potential biological resources on the inaccessible lands; therefore, the actual area that MB&G surveyed during the field

reconnaissance is greater than the land encompassed by properties that had granted Right-of-Entry. For lands within the PSA that were not accessible, could not be reviewed from public Right-of-Way, or were not adjacent to an accessible parcel, MB&G relied on existing environmental data that was included in Technical Memorandum 5.1.

The location of observed wetlands and waters were recorded with a resource-grade Trimble GeoXT GPS unit for accessible properties and digitized using aerial maps for inaccessible properties during the field reconnaissance.

After the field reconnaissance, MB&G analyzed collected data using ESRI ArcPad geographic information systems (GIS) software to determine the spatial extent of potential impacts for each alternative. The three proposed alternatives were reviewed for their ability to comply with state and federal permitting processes as part of a "fatal flaw" analysis. A "fatal flaw" is defined for the purposes of this report as any action that would not likely be permitted by the state, federal, and local agencies or departments, based on the MB&G biologists' best professional judgment.

3.0 WETLANDS AND WATER RESOURCES RESULTS

The following sections detail the results of the office-based review and field reconnaissance for wetlands and waters observed within the PSA.

3.1 WETLANDS

Forty-nine wetlands for an approximate total of 36 acres were identified within the PSA during the field reconnaissance discussed in Section 2.0. The wetland types (Cowardin 1979) and acreages identified within the PSA are presented in Table 5.6-1 and Figures 5.6-2a and 5.6-2b.

Table 5.6-1. Wetland Types and Acreages Identified within the PSA for the 172nd/190th Corridor Plan

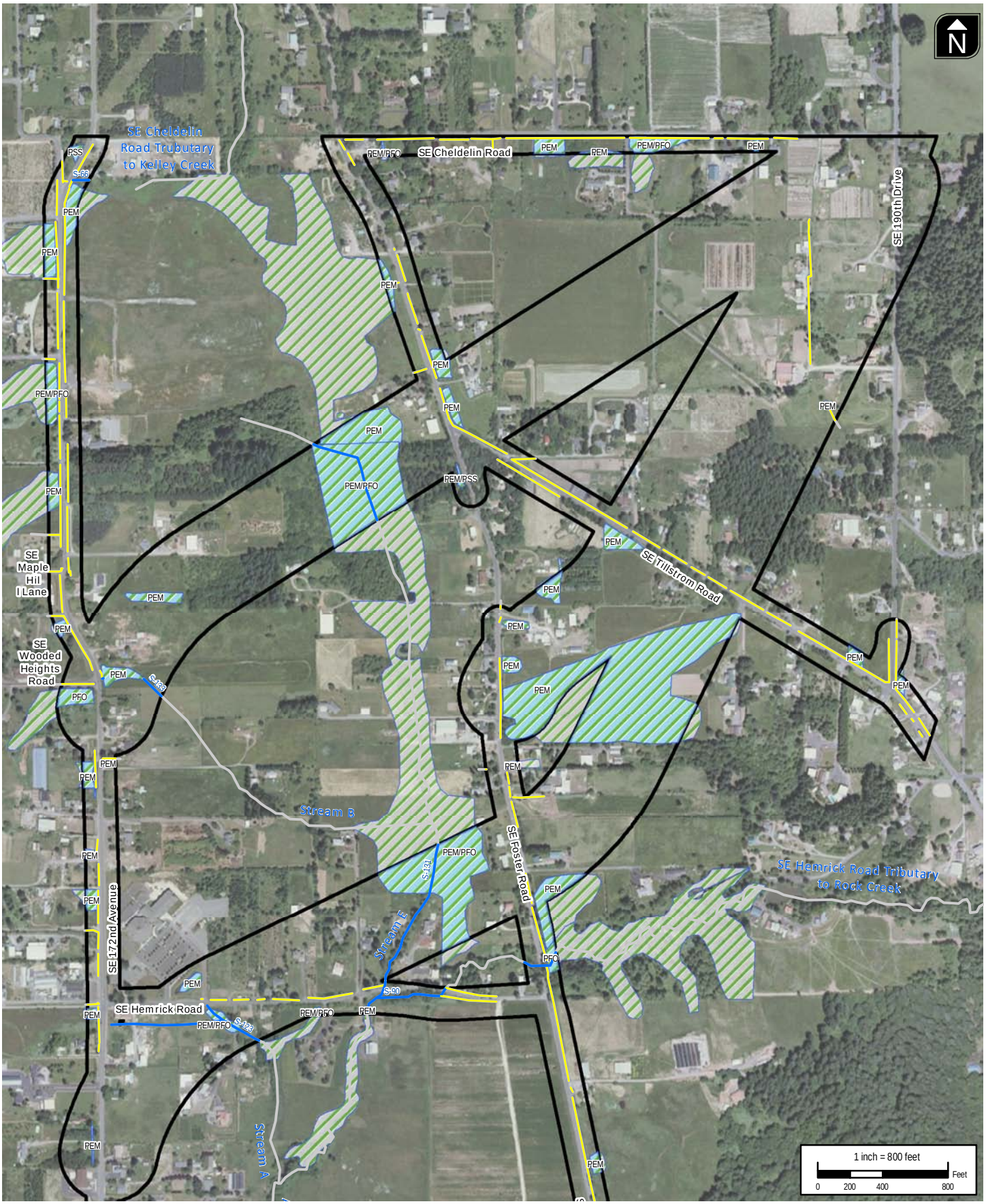
Wetland Type	Number of Wetlands	Acreage of Wetlands
Palustrine Emergent/ Scrub-Shrub (PEM/PSS)	2	0.17
Palustrine Forested (PFO)[1]	8	12.93
Palustrine Emergent (PEM)	39	22.92
Total	**49**	**36.02**

[1]Includes PEM/PFO wetlands

The following is a description of each Cowardin (1979) wetland classification and includes the dominant vegetation present within each wetland type in the PSA. These descriptions do not list a complete inventory of plant species within each wetland type but are presented to convey the general vegetation communities identified during the field reconnaissance.

Palustrine Emergent/ Scrub-Shrub (PEM/PSS) wetlands are characterized by woody species less than 30 feet in height (Winterbrook Planning 2007). Dominant vegetation within this wetland type in the PSA includes redosier dogwood (*Cornus sericea*), Douglas spirea (*Spirea douglasii*), and reed canarygrass (*Phalaris arundinacea*). Two PEM/PSS wetlands are located within the PSA.

Palustrine Forested (PFO) wetlands are characterized by wetlands or portions of wetlands that are dominated by woody species over 30 feet in height with over 50% canopy cover (Winterbrook Planning 2007). Dominant vegetation observed for PFO wetlands within the PSA include black cottonwood (*Populus balsamifera* ssp. *trichocarpa*), creeping buttercup



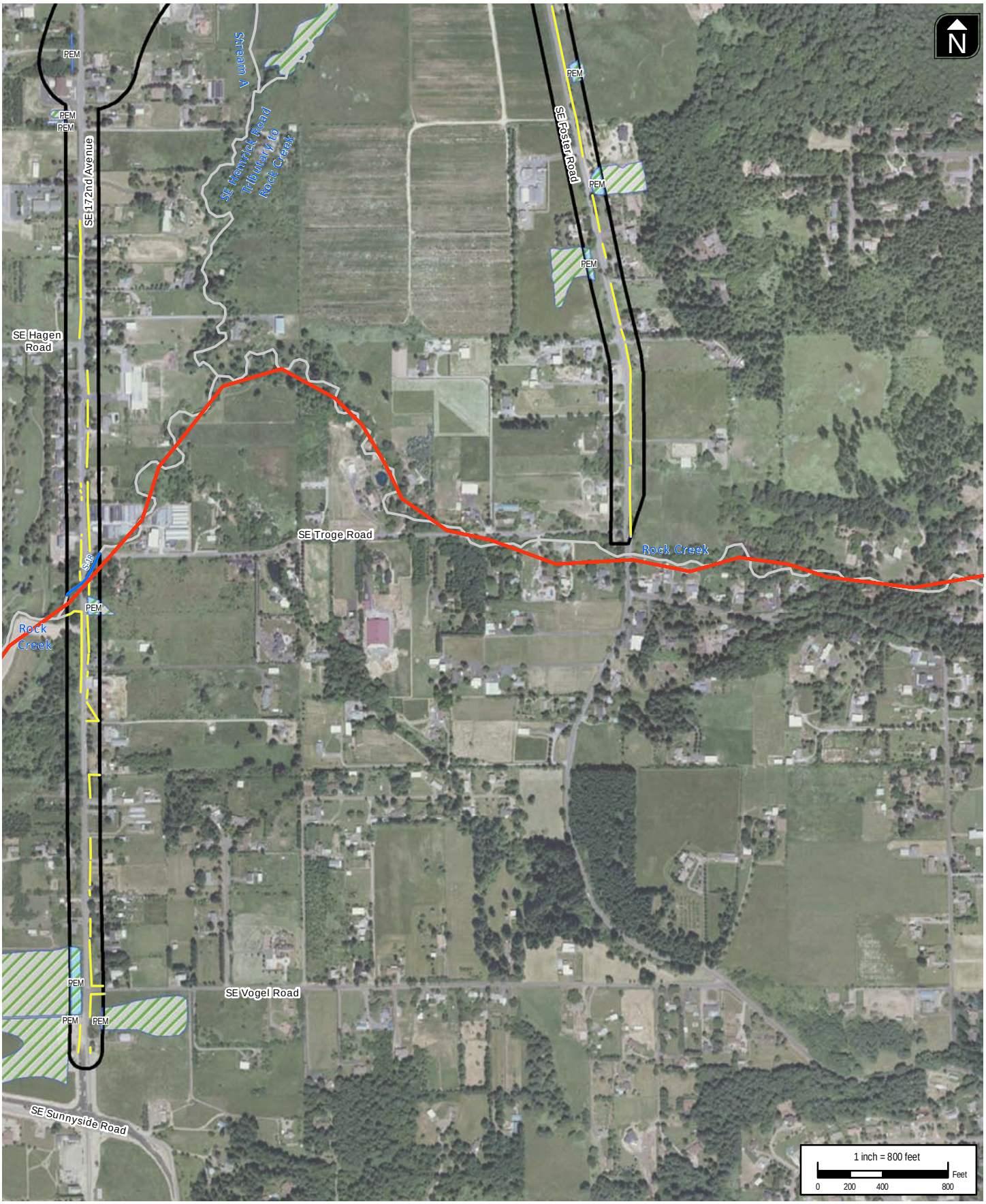
Project Study Area (PSA) - 334.3 acres
Wetlands within PSA*
Wetlands outside PSA
Streams outside PSA
Ditches
Stream within PSA*
303d Listed Streams

*Wetlands & Streams within the PSA field verified by MB&G Biologists. Wetlands & Streams outside of the PSA from Happy Valley LWI (2007).

Source: Aerial photo, NAIP 2009. PSA from OTAK. Inset map from ESRI. Wetlands and Waters by MB&G. 303d listed streams from ODEQ.

Figure 5.6-2a (Northern PSA) Wetlands & Waters

172nd/190th Corridor Plan
Clackamas County, Oregon



Project Study Area (PSA) - 334.3 acres
Wetlands within PSA*
Wetlands outside PSA
Streams outside PSA
Ditches
Stream within PSA*
303d Listed Streams

*Wetlands & Streams within the PSA field verified by MB&G Biologists. Wetlands & Streams outside of the PSA from Happy Valley LWI (2007).

Source: Aerial photo, NAIP 2009. PSA from OTAK. Inset map from ESRI. Wetlands and Waters by MB&G. 303d listed streams from ODEQ.

Figure 5.6-2b (Southern PSA) Wetlands & Waters

172nd/190th Corridor Plan
Clackamas County, Oregon

(*Ranunculus repens*), elderberry (*Sambucus* sp.), Himalayan blackberry (*Rubus armeniacus*), Oregon ash (*Fraxinus latifolia*), red alder (*Alnus rubra*), reed canarygrass, sword fern (*Polystichum munitum*), western redcedar (*Thuja plicata*), yellow-flag iris (*Iris pseudacorus*), and youth on age (*Tolmiea menziesii*). Eight PFO wetlands are located within the PSA. LWI data

Palustrine Emergent (PEM) wetlands are characterized by poorly-drained flats or depressions, marshes and shallow ponds that are dominated by grasses and other herbaceous plants (Winterbrook Planning 2007). Dominant vegetation observed for PEM wetlands within the PSA includes colonial bentgrass (*Agrostis tenuis*), common rush (*Juncus effusus*), creeping buttercup, curly dock (*Rumex crispus*), meadow foxtail (*Alopecurus pratensis*), reed canarygrass, and water knotweed (*Polygonum amphibium*). Thirty-nine PEM wetlands are located within the PSA and are the most common wetland type within the PSA.

3.2 WATERS

A total of six streams and 131 ditches were identified throughout the PSA during the field reconnaissance discussed in Section 2.0. The waters types (creeks, streams and ditches) and acreages identified within the PSA are presented in Table 5.6-1 and Figure 5.6-2.

Table 5.6-2. Waters Types and Acreages Identified within the PSA of the 172nd/190th Corridor Plan

Waters Type	Acreage of Waters
Rock Creek	0.139
SE Hemrick Road Tributary to Rock Creek	0.085
SE Cheldelin Road Tributary to Kelley Creek	0.007
Stream A	0.127
Stream B	0.019
Stream E	0.288
Total for Creeks, Tributaries and Streams	**0.665**
Ditches	1.421
Total for All Waters within the PSA	**2.086**

Rock Creek (identified as S-18 on Figure 5.6-2b) and two main tributaries were field-verified within the PSA. These tributaries include the SE Hemrick Road Tributary to Rock Creek (identified as S-90 on Figure 5.6-2a), and the SE Cheldelin Road Tributary to Kelley Creek (identified as S-66 on Figure 5.6-2a). In addition, three smaller streams within the PSA feed into the SE Hemrick Road Tributary to Rock Creek (identified as Stream A, Stream B and Stream E on Figure 5.6-2a). Streams C, D, and F originally identified in Technical Memorandum #5.1: Preliminary Natural Resources Report are not within the PSA or were not observed during the field reconnaissance.

One hundred thirty-one ditches totaling approximately 1.42 acres were identified and mapped within the PSA during the field reconnaissance. The majority of these ditches occur along existing roadways. Common vegetation associated with these ditches includes colonial bentgrass, common rush, creeping buttercup, curly dock, meadow foxtail, reed canarygrass, and water knotweed.

3.3 WATER QUALITY

Water quality is documented as being degraded within Rock Creek with the poorest conditions located at the headwaters, approximately 3 creek miles east of the PSA (ABR 2006). This is mainly due to relatively flat terrain near the headwaters which has allowed for substantial agricultural and residential development within close proximity of the creek and its tributaries.

Water quality parameters and standards have been established by the Oregon Department of Environmental Quality (DEQ) to protect the beneficial uses of Oregon's waterways. Water quality-limited parameters of streams and beneficial uses of watersheds within and downstream of the PSA are presented in the following sections.

Clackamas River – Rock Creek Watershed

Development and agricultural activities within the PSA have affected the water quality within Rock Creek and the Clackamas River downstream of the PSA. DEQ has listed both the Clackamas River and Rock Creek as 303(d)-listed water quality-limited waterbodies because they do not meet water quality standards for *E. coli* bacteria and temperature (DEQ 2006) (Table 5.6-3, Figure 5.6-2b).

Table 5.6-3. 303(d) Water Quality Parameters for Rock Creek and the Clackamas River

Parameter	Waterbody	River Mile	Season	List Date
E. coli	Rock Creek; Clackamas River	0-6.1	Summer; Fall/Winter/Spring	2004; 2004
Temperature	Rock Creek	0-6.1	Summer	1998

Upper Johnson Creek Watershed

The mainstem of Johnson Creek is located north of the PSA; however, development activities within the PSA could impact water quality in this creek as the northern portion of the PSA occurs within the creek's southern watershed.

DEQ has listed Johnson Creek as a 303(d)-listed water quality limited waterbody because it does not meet water quality standards for multiple parameters (Table 5.6-4). Mitchell Creek and Kelley Creek, tributaries of Johnson Creek located north of the PSA, are not water quality-limited (DEQ 2006).

Table 5.6-4. 303(d) Water Quality Parameters for Johnson Creek

Parameter	Waterbody	River Mile	Season	List Date
DDT	Johnson Creek	0-23.7	Year Round	2004
Dieldrin	Johnson Creek	0-23.7	Year Round	2004
E. coli	Johnson Creek	0-23.7	Summer	2004
Fecal coliform	Johnson Creek	0-23.7	Year Round	1998
PCB	Johnson Creek	0-23.7	Year Round	2004
Polynuclar Aromatic Hydrocarbons	Johnson Creek	0-23.7	Year Round	2002
Temperature	Johnson Creek	0-7.1	Summer	1998

Beneficial Uses

DEQ lists multiple beneficial uses within the Willamette River Tributaries, including the Clackamas River, Johnson Creek, and Rock Creek (DEQ 2005) (Table 5.6-5).

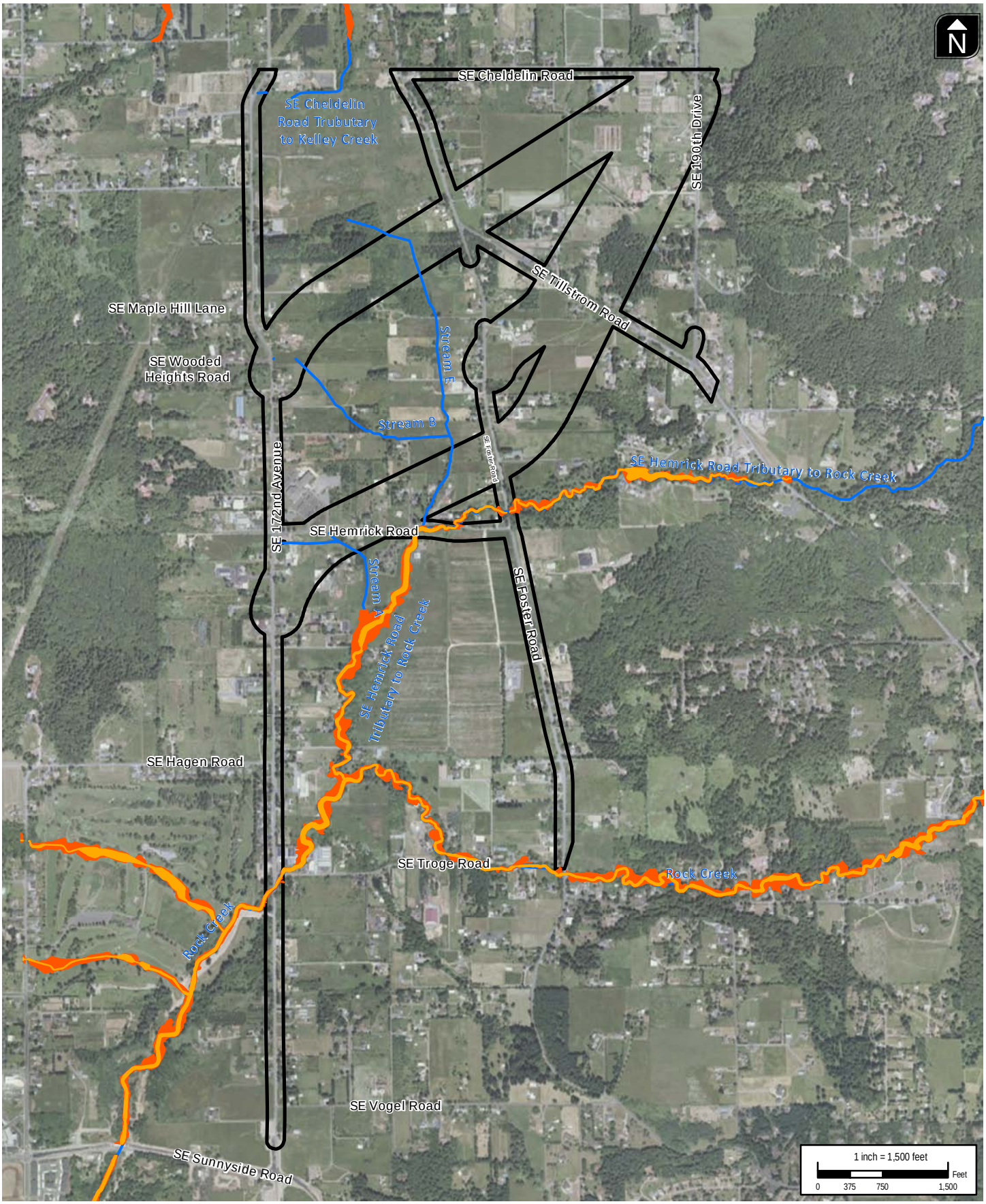
Table 5.6-5. Designated Beneficial Uses of Waterbodies Located within and Downstream of the PSA

Designated DEQ Beneficial Use	Willamette River Streams and Tributaries
Public Domestic Water Supply[1]	Yes
Private Domestic Water Supply[1]	Yes
Industrial Water Supply	Yes
Industrial Water Supply	Yes
Irrigation	Yes
Livestock Watering	Yes
Fish and Aquatic Life[2]	Yes
Wildlife and Hunting	Yes
Fishing	Yes
Boating	Yes
Water Contact Recreation	Yes
Aesthetic Quality	Yes
Hydro Power	Yes
Commercial Navigation and Transportation	No

[1] With adequate pretreatment and natural quality that meets drinking water standards.

3.4 FLOODPLAINS AND FLOODWAYS

FEMA defines the 100-year flood as "a flood that has a 1% chance of being equaled or exceeded in any given year" and defines a floodway as "the channel of a stream plus any adjacent floodplain areas that must be kept free of encroachment so that the 1% annual chance flood can be carried without substantial increases in flood heights," (FEMA 2008). There are 100-year floodplains and floodways mapped within the PSA: along Rock Creek and the SE Hemrick Road Tributary to Rock Creek (Figure 5.6-3).



Project Study Area (PSA) - 334.3 acres
Streams
FEMA 100-Year Flood Zone
FEMA Floodway

Source: Aerial photo, NAIP 2009. PSA from OTAK. Flood Zone and Floodway from FEMA. Streams derived from Damascus LWI and field verified/edited by MB&G.

Figure 5.6-3
Floodways & Floodplains
172nd/190th Corridor Plan
Clackamas County, Oregon

4.0 WETLAND AND WATERS RESOURCES POTENTIAL IMPACTS

The following sections of this report summarize the potential impacts to water resources for each transportation alternative identified during an office-based review and subsequent field reconnaissance by MB&G. Results from the GIS analysis for all alternatives for wetland/waters and floodway potential impacts are included in Table 5.6-6 below.

Table 5.6-6 Summary of Wetland and Waters Resources Potential Impacts within each Alternative for the SE 172nd/190th Corridor[1]

Wetland and Water Resources	AT-02	AT-06	AS-10a
Number of Wetlands	47	**46**	**46**
Palustrine Emergent/ Scrub-Shrub (PEM-PSS)	**2**	**2**	**2**
Palustrine Forested (PFO)	**8**	**8**	**8**
Palustrine Emergent (PEM)	37	**35**	37
Acres of Wetlands	17.82	24.11	**12.41**
Palustrine Emergent/ Scrub-Shrub (PEM-PSS)	**0.17**	**0.17**	**0.17**
Palustrine Forested (PFO)	7.82	6.81	**1.71**
Palustrine Emergent (PEM)	**9.82**	17.13	10.53
Acres of Streams	0.40	0.46	**0.28**
Number of Ditches	**129**	130	131
Acres of Ditches	**1.36**	1.37	1.41
Floodplain (acres)	0.46	**0.31**	0.46
Floodway (acres)	0.66	**0.23**	0.66

[1]Bold areas indicate lowest potential impact.

4.1 ALTERNATIVE AT-02

4.1.1 Wetland Resources

Within Alternative AT-02, there are 17.82 total acres of wetlands. Overall, Alternative AT-02 would have the second largest potential impact to wetlands. It would potentially impact the most PFO wetland acres; however it would impact the least PEM wetland acres of the three alternatives.

4.1.2 Water Resources

Alternative AT-02 would potentially impact approximately 0.40 acres of stream including Rock Creek and five of its tributaries: the SE Hemrick Road Tributary to Rock Creek (Figure 5.6-2a), and the SE Cheldelin Road Tributary to Kelley Creek (5.6-2a), and three smaller streams (Streams A, B and E) that feed into the SE Hemrick Road Tributary to Rock Creek (Figure 5.6-2a). Alternative AT-02 has the second highest impact potential to streams and stream buffers. One hundred twenty-nine ditches for a total of 1.36 acres are present within Alternative AT-02, which is similar to the other two alignments.

4.1.3 Floodplains and Floodways

Alternative AT-02 contains 0.46 acre of FEMA-designated floodplain and 0.66 acre of FEMA-designated floodway, similar to Alternative AS-10a. Both of these alternatives would have higher potential floodplain and floodway impacts than Alternative AT-06.

4.2 ALTERNATIVE AT-06

4.2.1 Wetland Resources

Within Alternative AT-06, there are 24.11 acres of wetlands. Overall, Alternative AT-06 and Alternative As-10a would impact the fewest number of wetlands; however, AT-06 would potentially impact the highest amount of wetland acres. Of the three alternatives, AT-06 would potentially have the largest impact on PEM wetlands.

4.2.2 Water Resources

Alternative AT-06 would potentially impact approximately 0.46 acre of stream including Rock Creek and five of its tributaries: the SE Hemrick Road Tributary to Rock Creek Rock Creek (Figure 5.6-2a), and the SE Cheldelin Road Tributary to Kelley Creek (5.6-2a), and three smaller streams (Streams A, B and E) that feed into the SE Hemrick Road Tributary to Rock Creek (Figure 5.6-2a). Alternative AT-06 has the highest impact potential to streams and stream buffers. One hundred thirty ditches for a total of 1.37 acres are present within Alternative AT-06. Overall, this alternative would potentially impact the second greatest number of ditches and the second most acres of ditches.

4.2.3 Floodplains and Floodways

Alternative AT-06 contains 0.31 acre of FEMA-designated floodplain and 0.23 acre of FEMA-designated floodway. This alternative would have the least potential impact to mapped floodplains and floodways.

4.3 ALTERNATIVE AS-10A

4.3.1 Wetland Resources

Within Alternative AS-10a, there are 12.41 acres of wetlands. Of the three alternatives, AS-10a would potentially have the least impact on wetland acres. It would potentially impact the fewest acres of PFO wetlands.

4.3.2 Water Resources

Alternative AS-10a would potentially impact approximately 0.28 acre of stream including Rock Creek and five of its tributaries: the SE Hemrick Road Tributary to Rock Creek Rock Creek (Figure 5.6-2a), and the SE Cheldelin Road Tributary to Kelley Creek (5.6-2a), and three smaller streams (Streams A, B and E) that feed into the SE Hemrick Road Tributary to Rock Creek (Figure 5.6-2a). Alternative AS-10a has the lowest impact potential to streams and stream buffers. One hundred thirty-one ditches for a total of 1.41 acres are present within Alternative AS-10a. Overall, this alternative would potentially impact the greatest number of ditches and the most acres of ditches.

4.3.3 Floodplains and Floodways

Alternative AS-10a contains 0.46 acre of FEMA-designated floodplain and 0.66 acre of FEMA-designated floodway, similar to Alternative AT-02. Both of these alternatives would have higher potential floodway impacts than Alternative AT-06.

4.4 WATER QUALITY

Water quality-limited streams and rivers are located within and downstream of the PSA. All three alternatives cross Rock Creek which DEQ has listed as a 303(d)-listed water quality limited waterbody (DEQ 2006). Alternative AS-10a also crosses the SE Cheldelin Road tributary to Kelley Creek, which eventually drains to Johnson Creek, DEQ-listed as a 303(d) water quality limited waterbody (DEQ 2006). The limiting parameters should be taken into account during the stormwater design process for the project to mitigate the adverse impacts the road network improvements may have on downstream water quality.

4.5 FLOODPLAINS AND FLOODWAYS

Alternative AT-06 contains the least amount of FEMA-designated floodplain and floodway within the PSA. Alternatives AT-02 and AS-10a have an equal potential to impact FEMA-designated floodplains and floodways.

4.6 AGENCY COORDINATION AND POTENTIAL PERMITTING REQUIREMENTS

A complete wetland/waters boundary delineation following the U.S. Army Corps of Engineers (ACOE)-approved methodology and appropriate supplement for all areas with potential impacts for the preferred Build Alternative will be required as the final chosen alternative transitions from the design to construction phase. Review of a wetland/water delineation report and a jurisdictional determination will be required from the DSL and ACOE.

Impacts to wetlands and waters are likely to result from implementation of the proposed project; therefore, the following laws and regulations will apply to the project: Section 404 of the federal Clean Water Act, administered by the ACOE; the Oregon Removal/Fill Law, administered by the DSL; and Metro's Title 13, which protects stream and wetland buffers, administered by local agencies through the land use review process. If proposed wetland/waters impacts are less than 0.10 acre and do not involve impacts to wetlands, the ACOE will not require pre-construction notification (i.e., Joint Permit Application). Similarly, if proposed wetland/waters impacts are less than 50 cubic yards, the DSL will not require a permit for the proposed action. If proposed impacts are less than 0.5 acre, then the proposed project may qualify for the ACOE Nationwide Permit (NWP) #14, Linear Transportation Projects and the DSL General Permit (GP) for Certain Transportation-Related Structures assuming these permits options are in place with similar terms and conditions when the project is implemented. If the project requires greater than 0.5 acre of impacts, an Individual Permit (IP) will be required from the ACOE and DSL.

Impacts to wetlands/waters of the U.S. and State will require compensatory mitigation by both the ACOE and DSL. The PSA is located within the Foster Creek Wetland Mitigation Bank service area and credits are currently available at this bank for $175,000 per acre. If bank credits are unavailable during the permitting process, alternative forms of mitigation will need to be considered, including payment-in-lieu (for DSL-jurisdictional impacts only); fee-in-lieu (if fee-in-lieu sites have been approved for release of credits by the DSL and ACOE in the project area); or on- or off-site wetland creation, enhancement, or restoration. If on- or off-site mitigation is

proposed, the DSL and ACOE will require preparation and implementation of a compensatory wetland mitigation plan.

DEQ's 401 Water Quality Certification (WQC) process will be triggered if an ACOE permit is required for wetland/waters impacts. If a 401 WQC is required, a Stormwater Management Plan should be prepared and will need to be approved by DEQ.

Project construction activities are anticipated to disturb more than one acre of land. As a result, the National Pollutant Discharges Elimination System (NPDES) permit program, administered under Section 402 of the Clean Water Act, will require an NPDES 1200-C or 1200-CA permit to be secured for the project. Clackamas County currently holds a 1200-CA permit; therefore a permit would only need to be applied for if an entity other than the County constructs the project or if the County's permit expires.

This permit requires that the holder prepare an Erosion and Sediment Control Plan (ESCP) which utilizes approved Best Management Practices (BMPs) to prevent erosion and control sediment runoff from the construction site. In addition, the permit requires the applicant to inspect and maintain erosion controls to ensure they are working properly.

5.0 CONCLUSIONS

5.1 KEY FINDINGS

Forty-nine likely-jurisdictional wetlands are mapped within the PSA based on field reconnaissance. A total of six streams mapped within the PSA based on LWI and ODF data were also verified in the field. In addition, there are 131 roadside drainage ditches located throughout the PSA that may be considered jurisdictional by DSL, ACOE, or both agencies. Wetlands, streams and ditches that are deemed jurisdictional by the DSL and ACOE should be avoided to the maximum extent possible during project implementation. Based on the data compiled during the records review and the field reconnaissance, Alternative AS-10a would have the least amount of impact on wetlands and waters. All alternatives would have similar impacts to ditches.

Water quality-limited streams and rivers are located within and downstream of the PSA and include Rock Creek, Johnson Creek, and the Clackamas River. All three alternatives contain areas mapped within the FEMA-designated floodplain and floodway; however, Alternative AT-06 contains the fewest acres of designated floodplain and floodway.

5.2 NEXT STEPS

Jurisdictional wetlands and waters should be avoided to the maximum extent possible during the final phase of the alternatives analysis.

A complete wetland/waters delineation and report should be prepared for areas within the single, selected alternative.

If the project exceeds the ACOE and DSL permit thresholds, a JPA must be prepared to document wetland and waters impacts.

The water quality-limited parameters of 303(d)-listed streams within and downstream of the PSA should be taken into account during the stormwater design process during implementation of the project to mitigate the adverse impacts the road network improvements may have on downstream water quality.

Fill within FEMA-mapped floodplain and floodway areas should be avoided in order to allow movement of floodwater and maintain existing flood elevations.

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