Appendix E

Water Resources Report

Draft

Water Resources Report

Lolo Pass Road Access Alternatives Study

Clackamas County, Oregon

Task Order No. DTFH7015F19002
IDIQ Contract No. DTFH 70-10-D-00019
Project No. OR CLACK 37005(1)

Prepared for

Federal Highway Administration
Western Federal Lands Highway Division
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INTRODUCTION

At the request of the Western Federal Lands Highways Division, David Evans and Associates, Inc. (DEA) performed an investigation of water resources for the Lolo Pass Road Access Alternatives Study in Clackamas County, Oregon. This preliminary investigation is based primarily on publicly available information, and does not include wetland delineation or high water mark.

The 424-acre study area is designed to encompass all alternatives under consideration. It includes potential realignment alternatives for Lolo Pass Road beginning with the existing Zigzag River bridge and extending north to approximately the Snowcap Way – Lolo Pass Road intersection (T2S, R7E, Sections 26, 27 and 34) (Figures 1 and 2). However, the Sandy River itself is not addressed in this report.

The study area (424-acres) is located in Clackamas County east of East Lolo Pass Road. It lies partially within the Mt. Hood National forest. It is densely forested nearly throughout with several scattered private residences.

1. METHODS

1.1 PRELIMINARY RESOURCE REVIEW

Reference materials were reviewed to provide information regarding the potential water resources in the study area, which could be affected by the proposed project (excluding the Sandy River). The materials reviewed included:

- Rhododendron, Brightwood, Salmon, and Hickman Butte Oregon National Wetland Inventory Quadrangles, US Fish and Wildlife Service, 1997.
- Rhododendron, Brightwood, Salmon, and Hickman Butte Oregon 7.5 minute Quadrangle, U.S. Geological Survey 1997.
- Natural Resources Conservation Service (NRCS). 2011. Soil Survey Geographic (SSURGO) database for Clackamas County Area, Oregon.

The topographical maps (Appendix A, Figure 2) were examined to determine water features and topography of the site and adjacent properties that might influence on-site conditions. The National Wetland Inventory (NWI) map (Figure 4) was examined to determine whether wetlands or waterways are mapped on site. The soil survey map (Figure 3) was reviewed to determine if any hydric soils are mapped on site. Digital soil data was unavailable for those portions of the study area within the Mt. Hood National Forest.

2. WETLANDS AND WATERS

Most of the wetlands shown on the NWI coincide with or adjoin the Sandy River channel, and are likely to be included as part of the Sandy River for jurisdictional purposes (Figure 2, Sheet 2). The three exceptions are a large forested wetland to the east of East Autumn Lane, and two small excavated wetlands in the northeast section of the study area. The small wetlands are classified as palustrine unconsolidated bottom, semi permanently flooded, excavated wetlands (PUBFx) and the large one is a palustrine forested, seasonally flooded wetland under the Cowardin classification system (Cowardin et al. 1979). A field reconnaissance of the large NWI wetland verified its presence and mapped its approximate actual extent (Figure 6). This wetland is connected to a small wetland area along the east side of Lolo Pass Road (Figure 6).

The Clackamas Soil Survey shows seven general soil types within the study area (Figure 3, Sheet 2). None of them are listed as hydric (formed under wet conditions) by the Natural Resource Conservation Service (NRCS 2014). Therefore, soil mapping does not indicate that unmapped areas may contain wetlands.

The study area includes portions of two mapped streams: Zigzag River and the Sandy River, which is not addressed in this report. Clear Creek is a tributary to the Sandy River that parallels the Sandy River and is separated from it by Lolo Pass Road. Clear Creek does not enter the designated study area. Two other small seasonal drainages were found adjoining the large on-site wetland and are addressed here as part of that wetland. One discharges into the wetland from the north, and another drains it to the south in a small channel paralleling East Autumn Lane (Figure 6). This water ultimately discharges to a wetland roadside ditch along the east side of Lolo Pass Road, where it appears to infiltrate.

Based on existing information, federally listed and endangered fish under jurisdiction of National Marine Fisheries Service (NMFS) are present in the study area. The Zigzag River is designated as Critical Habitat for steelhead trout and Chinook salmon. The listed threatened fish which occur in the Zigzag River are Lower Columbia River (LCR) winter steelhead, LCR summer steelhead, LCR Coho salmon, and LCR spring Chinook salmon. No listed endangered fish are known to occur in this portion of the Zigzag River. It is likely that native resident cutthroat trout, sculpin, and other non-listed fish are present in these streams as well.

3. WATER QUALITY

3.1 WATER QUALITY LISTING FOR ZIGZAG RIVER

The Department of Environmental Quality's (DEQ) 2012 Integrated Report lists pollutants and water quality factors for waterbodies at specific river miles (DEQ 2012). Table 1 summarizes the pollutant limits for the Zigzag River. The study area crosses the Zigzag River at the East Lolo Pass Road Bridge. The crossing occurs at river mile 0.20.

Table 1: Zigzag River Pollutants

Basin Name Subbasin 4th Field HUC Record ID	Water Body LLID Segment Miles Beach Name Beach ID	Pollutant	Seasonal	Criteria	Beneficial Uses
Lower Columbia Lower Columbia-Sandy 17080001 15575	Zigzag River 1.21945E+12 0 to 13.7 13.7	Alkalinity	Year Round	Table 20 Toxic Substances	Aquatic life
Lower Columbia Lower Columbia-Sandy 17080001	Zigzag River 1.21945E+12 0 to 13.7 13.7	Ammonia	Year Round	Table 20 Toxic Substances	Aquatic life
Lower Columbia Lower Columbia-Sandy 17080001 15577	Zigzag River 1.21945E+12 0 to 13.7 13.7	Chloride	Year Round	Table 20 Toxic Substances	Aquatic life
Lower Columbia Lower Columbia-Sandy 17080001 20910	Zigzag River 1.21945E+12 0 to 6.9 6.9	Dissolved Oxygen	August 15 - June 15	Spawning: Not less than 11.0 mg/L or 95% of saturation	Salmon and steelhead spawning

Basin Name Subbasin 4th Field HUC Record ID	Water Body LLID Segment Miles Beach Name Beach ID	Pollutant	Seasonal	Criteria	Beneficial Uses
Lower Columbia Lower Columbia-Sandy 17080001 4552	Zigzag River 1.21945E+12 0 to 13.7 13.7	Habitat Modification	Undefined	The creation of tastes or odors or toxic or other conditions that are deleterious to fish or other aquatic life or affect the potability of drinking water or the palatability of fish or shellfish may not be allowed.	Salmonid fish rearing; Salmonid fish spawning; Resident fish and aquatic life
Lower Columbia Lower Columbia-Sandy 17080001 15578	Zigzag River 1.21945E+12 0 to 13.7 13.7	pH	Summer	pH 6.5 to 8.5	Resident fish and aquatic life; Water contact recreation
Lower Columbia Lower Columbia-Sandy 17080001 21363	Zigzag River 1.21945E+12 0 to 13.7 13.7	Phosphate Phosphorus	Summer	Total phosphates as phosphorus (P): Benchmark 50 ug/L in streams to control excessive aquatic growths	Aquatic life
Lower Columbia Lower Columbia-Sandy 17080001 4580	Zigzag River 1.21945E+12 0 to 13.7 13.7	Sedimentation	Undefined	The formation of appreciable bottom or sludge deposits or the formation of any organic or inorganic deposits deleterious to fish or other aquatic life or injurious to public health, recreation, or industry may not be allowed.	Resident fish and aquatic life; Salmonid fish rearing; Salmonid fish spawning
Lower Columbia Lower Columbia-Sandy 17080001 13386	Zigzag River 1.21945E+12 0 to 6.9 6.9	Temperature	August 15 - June 15	Salmon and steelhead spawning: 13.0 degrees Celsius 7-day-average maximum	Salmon and steelhead spawning
Lower Columbia Lower Columbia-Sandy 17080001 12806	Zigzag River 1.21945E+12 0 to 13.7 13.7	Temperature	Year Round (Non-spawning)	Core cold water habitat: 16.0 degrees Celsius 7-day-average maximum	Core cold water habitat

Source: ***http://www.deq.state.or.us/wq/assessment/rpt2012/search.asp***

4. WATER WELLS

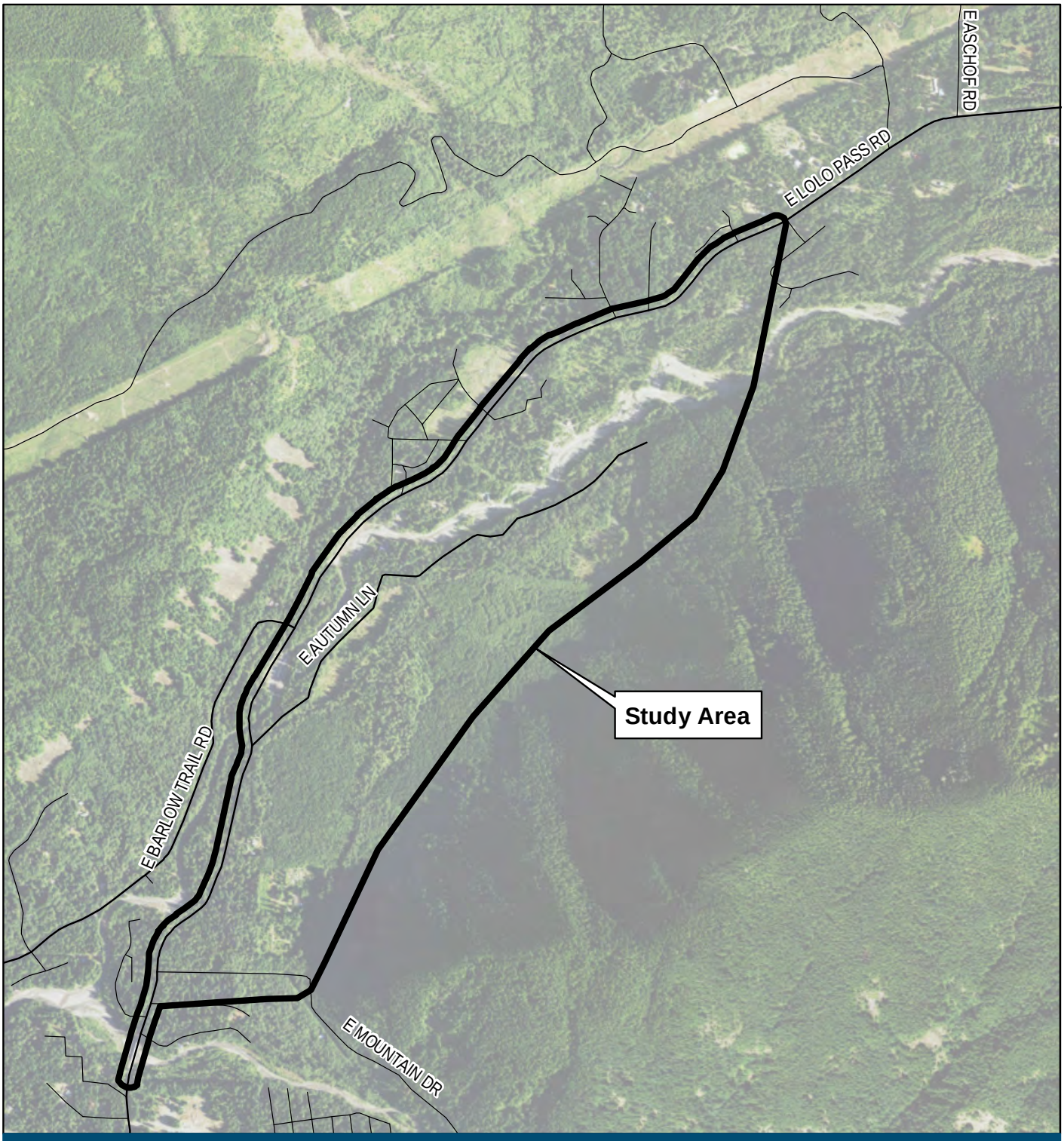
Information on water wells within the project area was obtained from the Oregon Water Resources Department Well Log Query system and is presented in Appendix B (OWRD 2015). There are 117 well logs recorded for the area, including well drilling, alteration, or abandonment.

5. RESULTS AND CONCLUSIONS

Apart from the Sandy River and wetlands within its ordinary high water mark, one Water of the State and U.S. was identified within the study area. Three wetlands are mapped within the study area by the NWI. The largest mapped wetland has been inspected, and its general maximum extent was mapped including associated small drainages. It was found to be connected to a small roadside wetland area along Lolo Pass Road as well. A wetland delineation would be necessary to map and verify specific jurisdictional limits of wetlands and waters on site. Temporary and permanent impacts to existing waters and wetlands are subject to Section 404 of the Clean Water Act and Oregon's Removal/Fill law, and will require permits from both Oregon Department of State Lands and the U.S. Army Corps of Engineers.

6. APPENDICES

APPENDIX A: Figures



Lolo Pass Road Access Alternatives

ESRI, ArcGIS Online, World Imagery. NAIP. 2014.

Sandy River Corridor Study Area

Figure 1
Aerial Photograph

N

0 1,500 3,000 Feet

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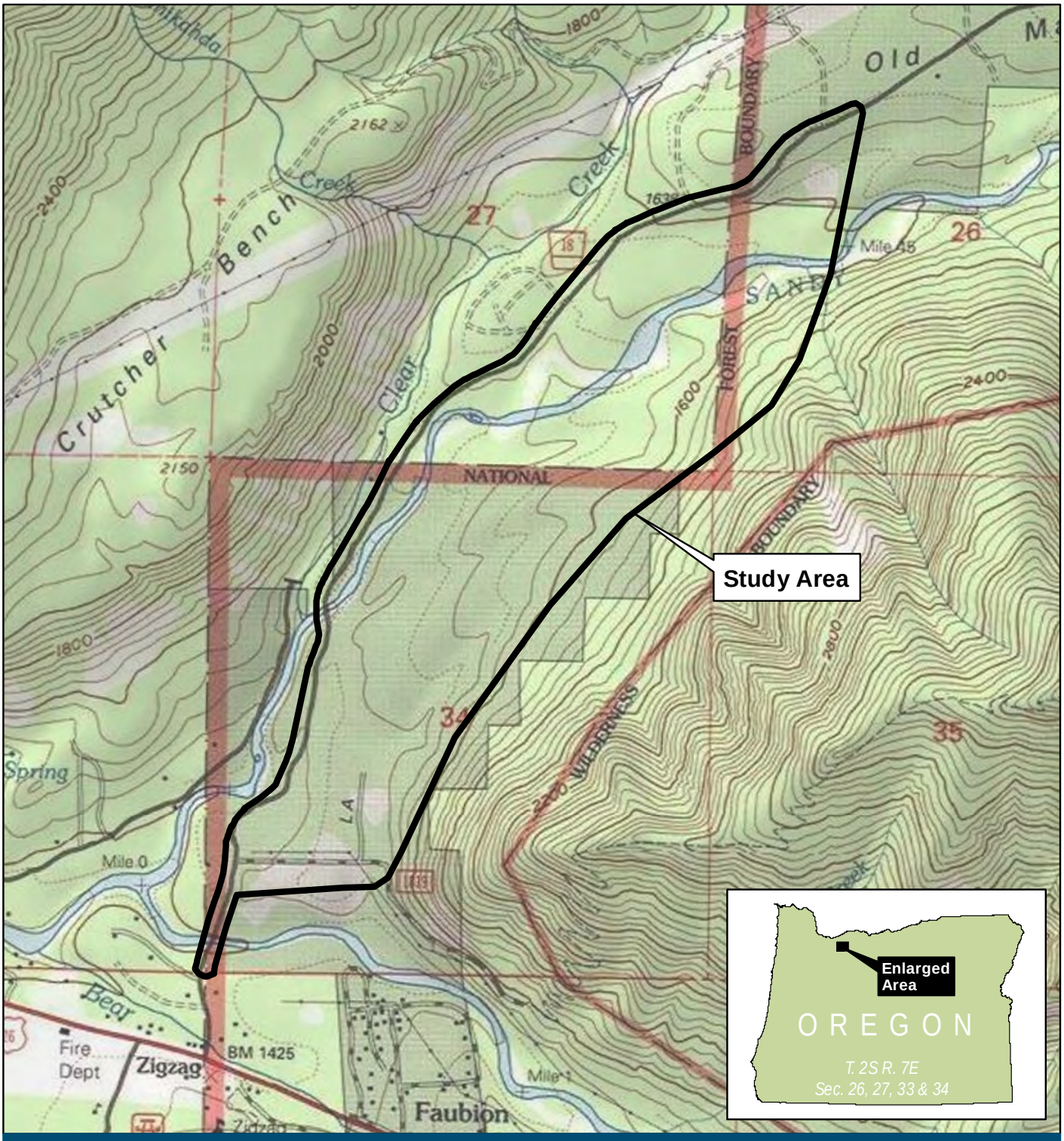

Lolo Pass Road Access Alternatives

ESRI, ArcGIS Online, USA Topographic Maps: Rhododendron, Oregon. 1997

Sandy River Corridor Study Area

Figure 2
Topographical Map

N

0 1,500 3,000 Feet

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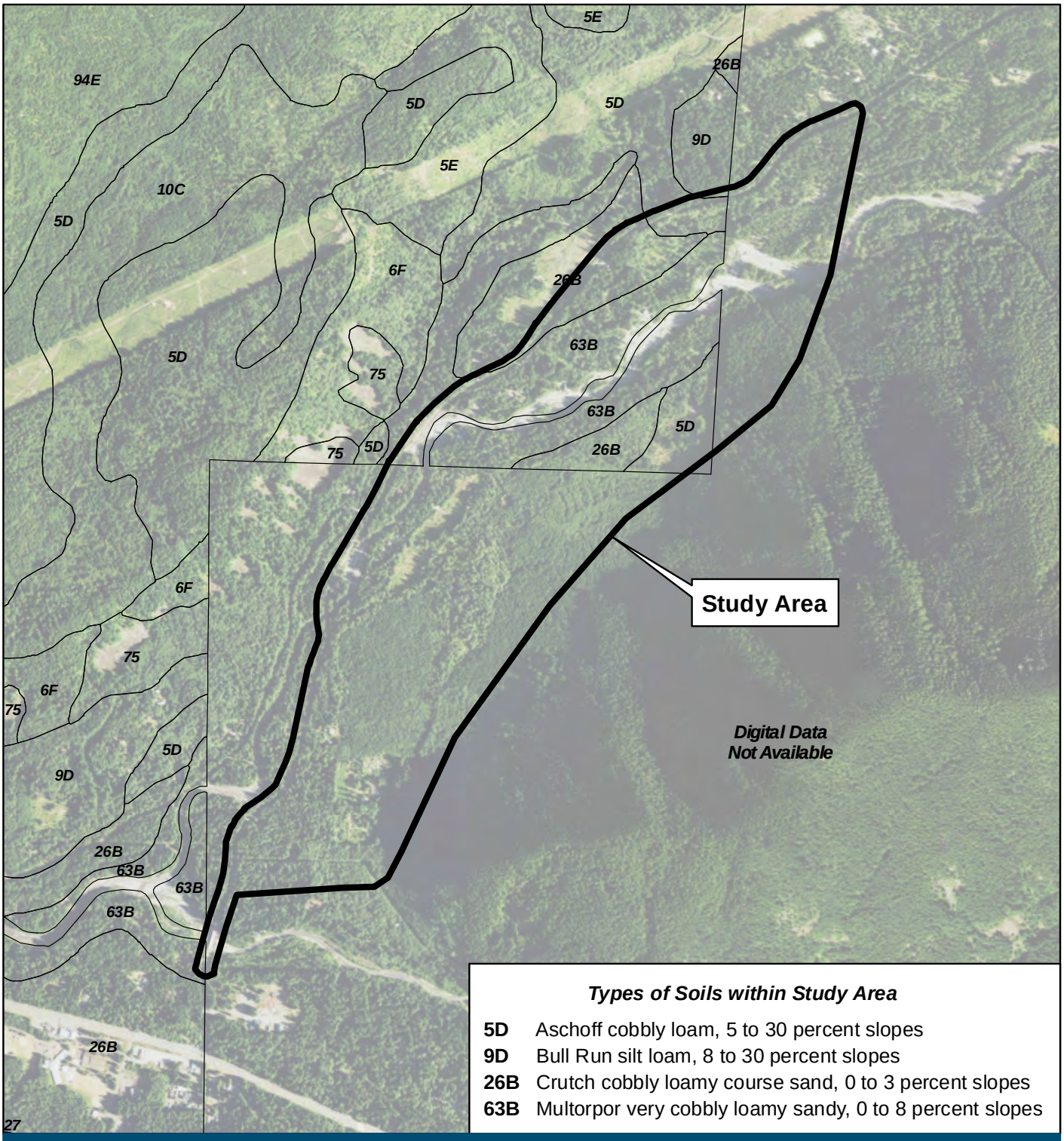


Types of Soils within Study Area

5D	Aschoff cobbly loam, 5 to 30 percent slopes
9D	Bull Run silt loam, 8 to 30 percent slopes
26B	Crutch cobbly loamy course sand, 0 to 3 percent slopes
63B	Multorpor very cobbly loamy sandy, 0 to 8 percent slopes

Lolo Pass Road Access Alternatives

ESRI, ArcGIS Online, World Imagery. Microsoft. July 11, 2010.

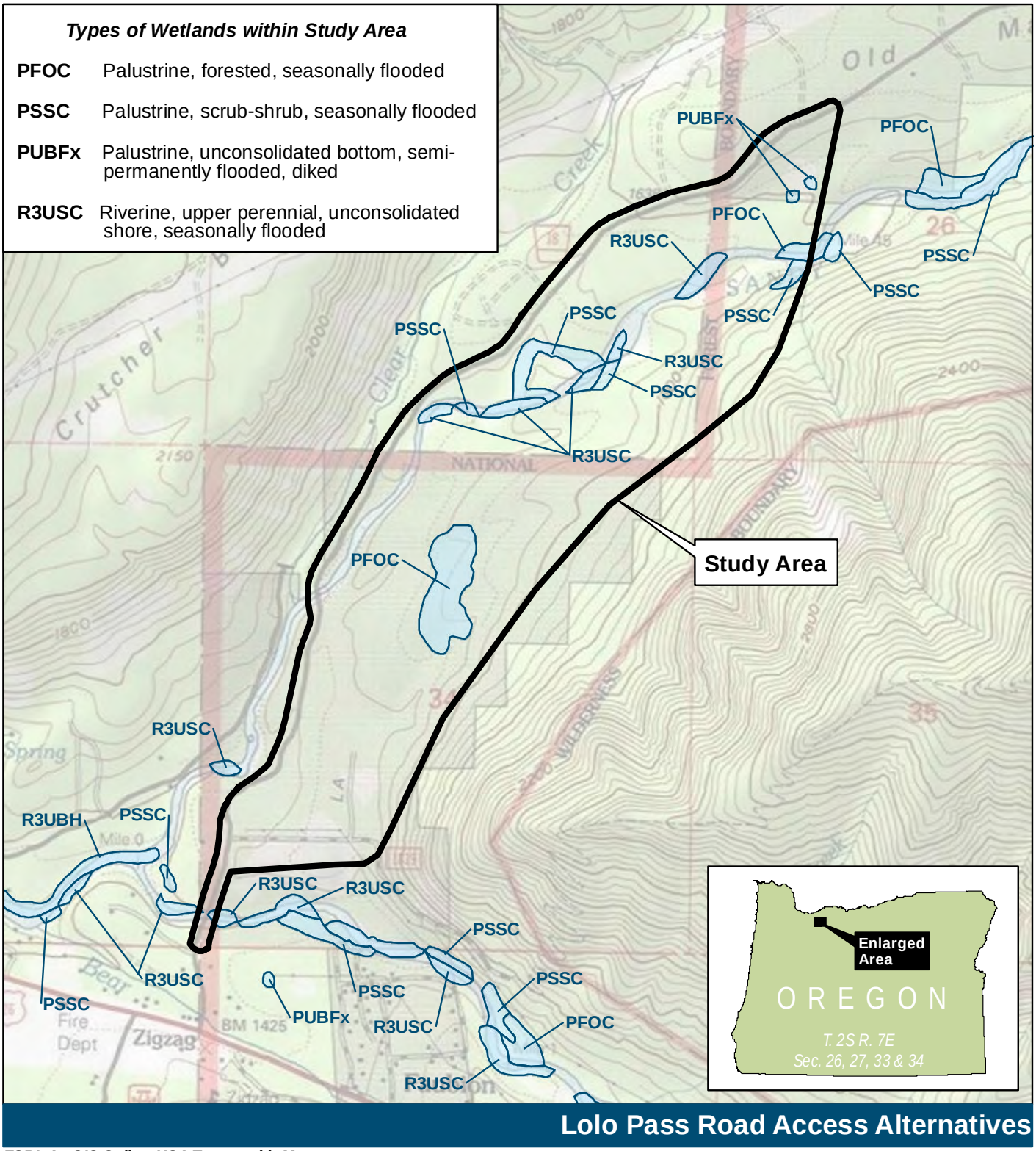
Natural Resources Conservation Service (NRCS). 2011. Soil Survey Geographic (SSURGO) database for Clackamas County Area, Oregon.

Sandy River Corridor Study Area

Figure 3
Soil Survey

N

0 1,500 3,000 Feet



Lolo Pass Road Access Alternatives

ESRI, ArcGIS Online, USA Topographic Maps: Rhododendron, Oregon. 1997

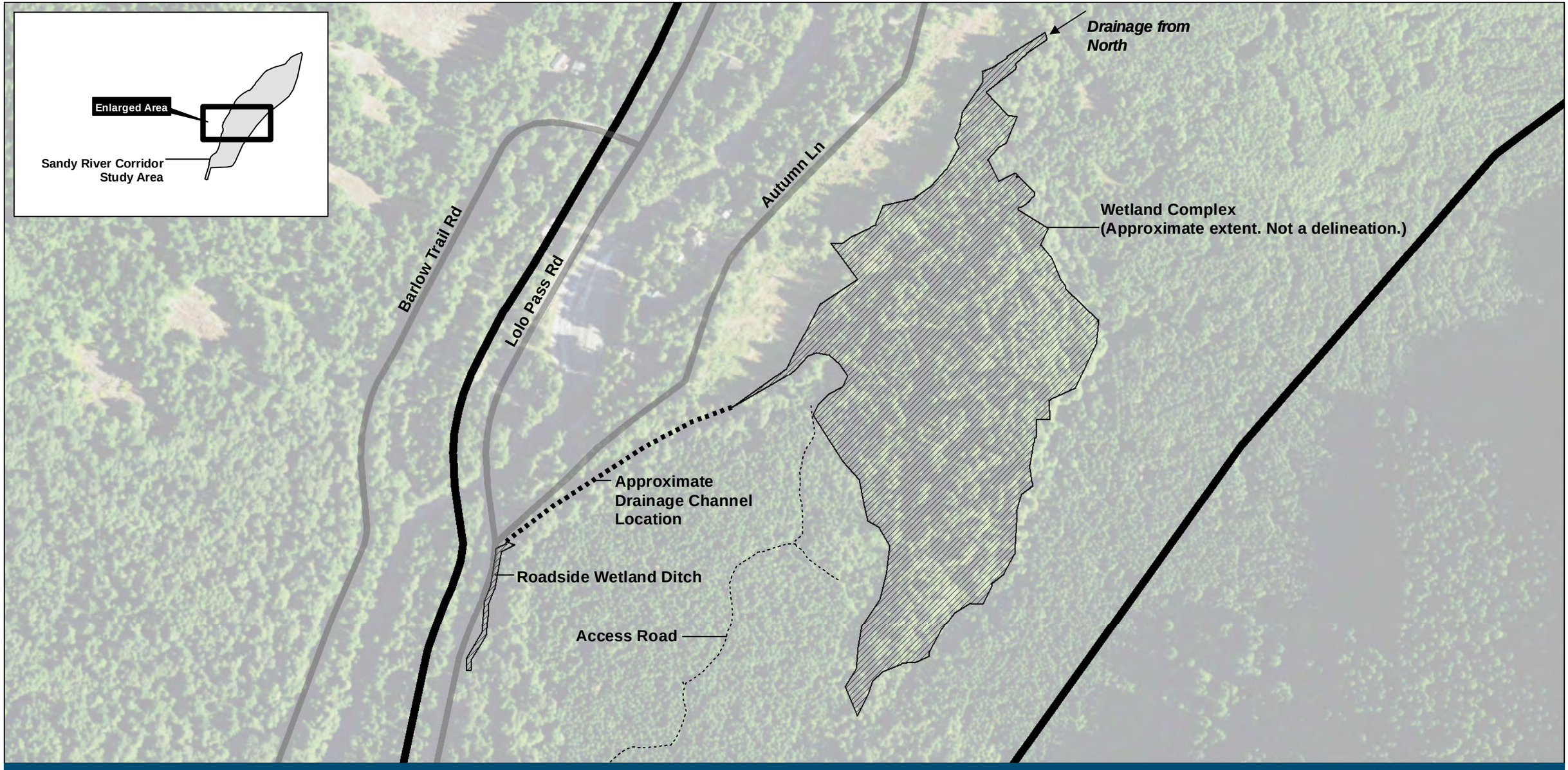
US Fish and Wildlife Service. 2010. National Wetlands Inventory (1977 to present). Branch of Habitat Assessment.

Sandy River Corridor Study Area

Figure 4
National Wetlands Inventory

N

0 1,500 3,000 Feet



Lolo Pass Road Access Alternatives

Legend

- Access Road
- Drainage Channel
- Wetland Complex (Approximate extent. Not a delineation.)

Sandy River Corridor Study Area

Figure 5
On-Site Wetland Complex

Data Sources:
ESRI, ArcGIS Online, World Imagery. Microsoft. July 11, 2010.
On-site inspection and GPS mapping.

N

0 300 600 Feet

Document Path: P:\FHAX0000218\0600\INFO\GIS\Maps\Water Resources Report\Fig_05_Wetlands.mxd
Date: 9/22/2015 Time: 2:59:46 PM User Name: mmf

APPENDIX B: Well Logs

Well #	Well Tag	Last Name	First Name	Depth First Water	Depty Drilled	Completed Depth	Post Static Water Level	Start Date	Completion Date	Quarter Section	Tax Lot	Well Location
20332		GATES	ED	25	60	60	13	6/9/1995	6/9/1995	2S7E26	707	20395 LOW LOW PASS RD
70635	114599	WELCH	BRYAN			58.5	16	7/17/2014	7/17/2014	2S7E26NW	400	20480 E ASCHOFF RD
7553		HOFFMEISTER	JAMES G	53	427	427	150	10/19/1978	10/26/1978	2S7E26NW	300	
50538	1592	CALLAWAY	MICK	20	140	140	17	4/22/1996	4/24/1996	2S7E26NW	700	28061 EAST GROVE WAY
51902	7284	LEWIS	WAYNE	26	77	77	16			2S7E26NW	711	21241 E LOLO PASS RD
50978	4014	ALGECIRAS	JORGE	24	57	57	22	9/10/1996	9/10/1996	2S7E26SW	714	21275 E LOLO PASS RD, RHODODENDRON
63094	84119				30	30	6	12/6/2006	12/6/2006	2S7E26SW	701	21283 E LOLO PASS RD
63095	84118				26	26	14	12/7/2006	12/7/2006	2S7E26SW	701	21283 E LOLO PASS RD
62988	82878				30	30	19	10/26/2006	10/26/2006	2S7E26SW	701	21283 E LOLO PASS RD, WELCHES, OR
19902	117446	WHEELER	KIM	21	57	57	20.5	11/10/1994	11/10/1994	2S7E26NW	713	21287 E LOLO PASS RD, RHODODENDRON
19919		JOHNSON	DOUG	30	140	140	25	10/21/1994	10/22/1994	2S7E27	1500	21909 E AUTUMN LANE
60506	60216	BAKER	ROBERT	12	79	78	7	9/23/2004	9/27/2004	2S7E27SE	1700	22063 S AUTUMN LANE, RHODODENDRON
14449		SIMON	WILLIAM	116	125	125	57	10/9/1991	10/10/1991	2S7E27SE	4502	22110 E AUTUMN LANE, RHOHODENDRON
60585	68318	ELDREDGE	DAVID	60	80	80	7	10/11/2004	10/13/2004	2S7E27SE	1800	22137 E AUTUMN LANE, RHODODENDRON
53410	25281			53	59	59	5.5	6/12/1998	6/12/1998	2S7E27SW	1900	22173 AUTUM LANE, ZIG ZAG
18785		UPDEGRAFT	DENNIS	20	120	120	6	8/26/1993	8/27/1993	2S7E27	2100	22200 E LOLO PASS RD
54471	28223	WALTERS	RICHARD	40	60	60	8	3/25/1999	3/26/1999	2S7E27SE	2100	22257 E AUTUMN LANE
19904		SHAW	KEITH	18			7	11/11/1909	11/11/1994	2S7E27SE	1500	22335 E LOLO PASS RD, ZIG ZAG
19915		LIGATICH	MATT	12	38	38	7	11/14/1994	11/14/1994	2S7E27SE	900	22449 LOLO PASS RD, ZIG ZAG
51209	6247	LIGATICH	MATTHEW	38	78	78	6	11/12/1996	11/13/1996	2S7E27SE	900	22449 LOLO PASS RD, ZIG ZAG
14448		SKINNER	JAMES	47	79	79	4	10/14/1991	10/15/1991	2S7E27SW	4000	22485 E AUTUMN LN
56060	39130	POOLE	DAN	55	93	93	10.8	8/5/2000	8/8/2000	2S7E34NE	3100	22600 E LOLO PASS RD, RHODODENDRON
53130	18712	WEINTZ	DON	14	59	56	5	2/27/1998	3/9/1998	2S7E34NE	3800	22745 E LOLO PASS RD, RHODODENDRON
53445	25282	WILSON	CHRIS	35	60	50	7.5	6/15/1998	6/16/1998	2S7E34NW	2000	23000 LOLO PASS RD, RHODODENDRON
17602		GILMER	TIMOTHY	19	60	60	7	12/17/1991	12/18/1991	2S7E34NW	600	23400 E LOLO PASS RD, RHODODENDRON
58764	60638	MATTSON	CAL	6	68	68	4	1/21/2003	1/25/2003	2S7E34SW	601	23491 LOLO PASS RD
50167		BREWSTER	DANA	6	59	59	7	11/22/1995	11/27/1995	2S7E34NW	100	23560 LOLO PASS RD, RHODODENDRON
53446	25283	BEVILACQUA	BOB	15	79	79	15	6/22/1998	6/23/1998	2S7E34NW	2301	23720 E LOLO PASS RD, WELCHES
51849		SHAVER	BRAD	3		0		6/6/1997	6/6/1997	2S7E34NW	2100	23740 E LOLO PASS RD, RHODODENDRON
51928	12862	SHAVER	BRAD	17	60	56	7	6/16/1997	6/17/1997	2S7E34NW	2100	23740 E LOLO PASS RD, RHODODENDRON
56265	42836	PELHAM	MARC	16	79	79	11.5	10/19/2000	10/24/2000	2S7E34NW	2300	23802 E LOLO PASS RD, RHODODENDRON
19044		WHALLON	JIM	32	38	38	8.5	1/24/1994	1/24/1994	2S7E27SW	2200	21980 LOLO PASS RD, RHODODENDRON
57492	48630	MCMILLAN	JUDY	10	78	78	3	11/14/2001	11/16/2001	2S7E34NW	2600	70302 E BARLOW TRAIL RD, RHODODENDRON
53456	25296	WHYTE	TONY	17	284	284	7.5	6/23/1998	6/27/1998	2S7E34NW	1301	70305 E BARLOW TRAIL RD, RHODODENDRON
55879		COULTURE	ROBERT			0	20	7/12/2000	7/13/2000	2S7E34SW	2700	70304 E TERRACE DR, RHODODENDRON
50557		ROUSKA	JOHN	6	80	80	4	4/6/1996	4/7/1996	2S7E34	900	70377 E BARLOW TR RD

Well #	Well Tag	Last Name	First Name	Depth First Water	Depty Drilled	Completed Depth	Post Static Water Level	Start Date	Completion Date	Quarter Section	Tax Lot	Well Location
17906		SANDERS	PAUL	58	200	200	34	5/29/1992	5/30/1992	2S7E34NE	3700	70751 E BARLOW TRAIL
55761	39471	SANDERS	STEVE		200	98	31	6/20/2000	6/20/2000	2S7E34NW	3700	70751 E BARLOW TRAIL RD
53754	25292	SIMMONS	BUD	27	60	59	12	8/26/1998	8/27/1998	2S7E34NE	3801	70796 BARLOW TRAIL RD, RHODODENDRON
62095	75442	MCCAFFERTY	DENNIS	17	120	120	17	1/27/2006	1/30/2006	2S7E27SW	2501	71240 E MICHIGAN AVE, RHODODENDRON
56533	45669	MCPHERSON	RON	17	86	86	5	2/8/2001	2/12/2001	2S7E27SW	3700	22461 E AUTUMN LANE, RHODODENDRON
18266		SCHUMOCK	JIM	12	56	56	0.5	11/21/1992	11/25/1992	2S7E27SW	3900	E AUTUMN LANE, WELCHES
63830	88353	PELZ	CARL		7	0		8/5/2007	8/5/2007	2S7E34SW	801	E MOUNTAIN DR
63831	88352	PELZ	CARL		7	0		8/5/2007	8/5/2007	2S7E34SW	801	E MOUNTAIN DR
63832	88351	PELZ	CARL		7	0		8/5/2007	8/5/2007	2S7E34SW	801	E MOUNTAIN DR
63833	78414	PELZ	CARL		7	0		8/5/2007	8/5/2007	2S7E34SW	801	E MOUNTAIN DR
62680	88353	PELZ	CARL		7	7		8/12/2006	8/12/2006	2S7E34SW	801	END OF E MOUNTAIN DR
62682	88351	PELZ	CARL		7	7		8/12/2006	8/12/2006	2S7E34SW	801	END OF E MOUNTAIN DR
62681	88352	PELZ	CARL		7	7		8/12/2006	8/12/2006	2S7E34SW	801	END OF MOUNTAIN DR
63098	88701	PELZ	CARL	6	7	7	6	11/30/2006	11/30/2006	2S7E34SW	801	LOLO PASS RD; JUST S OF BRIDGE ACROSS ZIG ZAG RIVER
63101	88702	PELZ	CARL		7	7		11/30/2006	11/30/2006	2S7E34SW	801	LOLO PASS RD; JUST S OF ZIG ZAG RIVER BRIDGE
63103	88703	PELZ	CARL	6.5	7	7	6.5	11/30/2006	11/30/2006	2S7E34SW	801	LOLO PASS RD; JUST S OF ZIG ZAG RIVER BRIDGE
63105	88704	PELZ	CARL		7	7		11/30/2006	11/30/2006	2S7E34SW	801	LOLO PASS RD; JUST S OF ZIG ZAG RIVER BRIDGE
63835	88701	PELZ	CARL	7	0			7/22/2007	7/22/2007	2S7E34SW	801	LOLO PASS RD; S OF BRIDGE ACROSS ZIGZAG RIVER
63836	88702	PELZ	CARL	7	0			7/22/2007	7/22/2007	2S7E34SW	801	LOLO PASS RD; S OF BRIDGE ACROSS ZIGZAG RIVER
63837	88703	PELZ	CARL	7	0			7/22/2007	7/22/2007	2S7E34SW	801	LOLO PASS RD; S OF ZIGZAG RIVER BRIDGE
63838	88704	PELZ	CARL	7	0			7/22/2007	7/22/2007	2S7E34SW	801	LOLO PASS RD; S OF ZIGZAG RIVER BRIDGE
62996	78414	PELZ	CARL	7	7			11/12/2006	11/12/2006	2S7E34SW	801	NEAR 70598 E MOUNTAIN DR
63834	88354	PELZ	CARL	7	0			8/5/2007	8/5/2007	2S7E34SW	3300	E TERRACE DR
62683	88354	PELZ	CARL	7	7			8/12/2006	8/12/2006	2S7E34SW	3300	END OF E TERRACE DR

APPENDIX C: Literature Citations

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Rhododendron, Brightwood, Salmon, and Hickman Butte Oregon 7.5 minute Quadrangle, U.S. Geological Survey 1997

U.S. Army Corps of Engineers (USACE). 2010. Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region, ed. J. S. Wakeley, R. W. Lichvar, and C.V. Noble. ERDC/EL TR-08-13. Vicksburg, MS: U.S. Army Engineer Research and Development Center.