

Impact Study A

**Natural Resource Assessment dated February 2017;
Memorandum “The Ridge at South Cooper Mountain Residential
Development Oregon Freshwater Wetland Assessment Method (OFWAM)
Analysis for Wetland G” dated January 10, 2017;
Response to request for additional materials dated March 28, 2017;
Memorandum “Wetland G Local Significance Determination”
dated May 3, 2017 by
Anchor QEA LLC**



Memorandum

May 3, 2017

To: Scott Whyte, City of Beaverton
From: Greg Summers, PWS, and Matt Kuziinsky, PWS
cc: Dan Grimberg, West Hills Land Development
Mike Peebles, Otak, Inc.

**Re: The Ridge at South Cooper Mountain Residential Development Project:
Wetland G Local Significance Determination**

Introduction

The purpose of this memorandum is to provide a summary of the local significance determination that was performed by Anchor QEA, LLC, for Wetland G, a 0.76-acre mixed palustrine emergent (PEM)/palustrine forested (PFO) wetland located on the development site for The Ridge at South Cooper Mountain residential planned unit development (PUD) in the City of Beaverton, Washington County, Oregon. Wetland G was delineated on the proposed development site by Anchor QEA (Anchor QEA 2017)¹ and corresponds with the location of Probable Wetland I (PW-I), which was identified on the site in the 2016 *South Cooper Mountain Annexation Area – Local Wetland Inventory* (LWI) prepared by David Evans and Associates, Inc. (DEA). At the time the LWI was completed, PW-I was not assessed using the Oregon Freshwater Wetland Assessment Method (OFWAM), and a local significance determination was not prepared because PW-I was estimated to be less than 0.5 acre in size, which is the minimum size a wetland needs to be in order to be evaluated for local significance². An OFWAM assessment and local significance determination were later completed for Wetland G by Anchor QEA when it was determined that Wetland G is larger than 0.5 acre.

This memorandum is intended to clarify and supplement the January 10, 2017, memorandum prepared for the project applicant (Dan Grimberg at West Hills Development) that presented the results of the OFWAM functions and conditions assessment and local significance determination for Wetland G. A copy of the January 10 memorandum was provided to the City of Beaverton in an April 5, 2017, land use application completeness submittal prepared by Otak, Inc.

¹ Anchor QEA's wetland delineation for The Ridge at South Cooper Mountain was verified by the Oregon Department of State Lands (DSL) on April 4, 2017 (WD No. 2017-0049).

² Per Oregon Administrative Rules (OAR) 141-086-0210(11), aside from representing probable wetlands as points on the Local Wetland Inventory (LWI) map and labeling them "PW," no further characterization or assessment is required for such areas.

Determination of Local Significance

Locally Significant Wetlands (LSWs) are defined in Oregon Administrative Rule (OAR) 141-086-0330(5) as "those wetland sites that provide functions or exhibit characteristics that are pertinent to community planning decisions made at a local scale, for example within a UGB." Wetlands are determined to be LSWs by local governments in accordance with the criteria and procedures provided in OARs 141-086-0340 and 141-086-0350.

The following sections outline the specific local significance determination steps that Anchor QEA conducted for Wetland G.

Oregon Freshwater Wetland Assessment Method Assessment

Per OAR 141-086-0340, the determination of whether a wetland is locally significant typically occurs during the preparation of an LWI and requires the completion of a function and quality assessment of inventoried wetlands using OFWAM. As previously stated, an OFWAM assessment was not completed for PW-I during the LWI for the South Cooper Mountain Annexation Area because PW-I was identified as being less than 0.5 acre in size. After a wetland delineation revealed that the wetland in the location of PW-I (i.e., Wetland G) was larger than 0.5 acre, Anchor QEA completed an OFWAM assessment to support a local significance determination.

Of the nine functions assessed by OFWAM, only five are used in the local significance determination: wildlife habitat, fish habitat, water quality, hydrologic control, and education functions. The recreation, aesthetic quality, sensitivity to impact, and enhancement potential function ratings are not used in the evaluation of whether a wetland meets LSW criteria. Function ratings required for an LSW determination based on the wildlife habitat, fish habitat, water quality, and hydrologic control functions are set forth in the Mandatory LSW Criteria in OAR 141-086-0350(2); ratings required for an LSW determination based on the education function are included in the Optional LSW Criteria in OAR 141-086-0350(3).

Each of the five functions used in the local significance determination are briefly described in the following subsections, along with the associated function condition ratings that Wetland G received for each of these functions.

Wildlife Habitat

The wildlife habitat function assesses the ability of the wetland to provide habitat for a variety of wildlife species and is primarily focused on vegetation structure and diversity. The ability of the wetland to provide wildlife habitat is rated based on a series of nine questions on the number of wetland vegetation classes present, dominant vegetation cover type, degree of interspersed between classes, extent of unvegetated open water, presence of surface connections to other waterbodies and/or wetlands, water quality conditions upstream or adjacent to the wetland, type of

surrounding land use, and percentage of bordering upland wildlife habitat. Wetlands that provide a high degree of wildlife habitat are those that exhibit the following characteristics:

- Contain all three major wetland vegetation classes (i.e., forested, scrub-shrub, and emergent)
- Are dominated by woody vegetation
- Exhibit a high degree of interspersed among vegetation classes
- Have more than 3 acres of unvegetated open water
- Contain a direct, perennial surface connection between the wetland and another body of water
- Lack water quality-limited areas in the upstream watershed
- Have surrounding land uses that are dominated by forested areas or open space areas
- Have upland wildlife habitat or a vegetated buffer dominated by woody vegetation along more than 40% of the wetland edge

For each of the questions in the OFWAM assessment, there is a series of three response ranges labeled "a," "b," and "c." The range provided in the "a" response corresponds with the highest functioning condition; the range provided in the "b" response corresponds with a moderate functioning condition; and the range provided in the "c" response corresponds with the lowest functioning condition.

Once each question is answered, the assessor tallies the "a," "b," and "c" responses. If at least four questions received an "a" response and no more than one question received a "c" response, then the wetland receives a wildlife habitat function rating of *Diverse*. If all questions received "c" responses, then the wetland receives a wildlife habitat function rating of *Lost or Not Present*. For any other combination of responses, the wetland receives a wildlife habitat function rating of *Provides Habitat for Some Wildlife Species*.

Wetland G Rating for Wildlife Habitat: *Provides Habitat for Some Wildlife Species*

Wildlife habitat in Wetland G is limited by the presence of only two Cowardin wetland classes (PFO and PEM), the low interspersed of these classes, the lack of a surface water connection to other waterbodies, the dominance of agricultural land use in the vicinity, and the limited amount of adjacent upland wildlife habitat. These limitations prevented Wetland G from receiving a *Diverse* rating for this function, which is required for the wetland to be considered locally significant for wildlife habitat.

Fish Habitat

The fish habitat function assesses the contribution of wetlands connected to streams, rivers, lakes, and ponds to the provision of fish habitat within the connected waterbody (Roth et al. 1996). It includes two parts based on the type of connected waterbody. Part A evaluates the wetland habitat connected to rivers and streams, and Part B evaluates the wetland habitat connected to ponds and

lakes. There are six questions under each part that address such conditions as degree of water shading, physical characteristics of the connected waterbody (e.g., degree of modification, depth), percentage of instream structures (e.g., woody debris, floating vegetation, large rocks), water quality condition, surrounding land use, and present fish species. Wetlands that provide a high degree of fish habitat are those that exhibit the following characteristics:

- Have a high percentage of stream shading (streams/streams) or contain both shallow and deep water areas (ponds/lakes)
- Are associated with natural stream channels
- Contain more than 25% of in-stream or in-wetland structures
- Lack water quality-limited stream reaches in the upstream watershed
- Have surrounding land uses that are dominated by forested areas or open space areas
- Contain salmon, trout, or other sensitive fish species

As with the wildlife habitat function assessment, three ranges of responses are provided for each fish habitat function question. If at least four questions received "a" responses and no more than one question received "c" responses, then the wetland receives a fish habitat function rating of *Intact*. If all questions received "c" responses, then the wetland receives a wildlife habitat function rating of *Lost or Not Present*. For any other combination of responses, the wetland receives a wildlife habitat function rating of *Impacted or Degraded*. If there is no surface connection between the wetland and one of these waterbodies, then the fish habitat function is determined to be *Not Present*.

Wetland G Rating for Fish Habitat: *Not Present*

Fish habitat is not present in Wetland G; it does not contain a stream, pond, or lake and has no direct surface water connection to other waterbodies. These conditions prevented Wetland G from receiving an *Intact* rating for this function, which is required for the wetland to be considered locally significant for fish habitat.

Water Quality

The water quality function assesses the ability of a wetland to remove pollutants from water that passes through it by trapping suspended sediments and reducing the concentration of nutrients (i.e., nitrogen and phosphorus) present in runoff (Roth et al. 1996). In OFWAM, this function is assessed based on responses to six questions about the wetland's primary source of water, presence of ponding/flooding in the wetland, degree of wetland vegetation cover, wetland size, dominant surrounding land use, and water quality condition of upstream or adjacent stream reaches. Wetlands that provide a high degree of water quality function are those that exhibit the following characteristics:

- Are primarily fed by surface flow or direct precipitation (i.e., not groundwater seepage)
- Exhibit areas of ponding or flooding during the growing season

- Have a high (greater than 60%) degree of wetland vegetation cover
- Are more than 5 acres in size
- Have surrounding land uses that are dominated by developed areas and/or agriculture
- Have water quality-limited (i.e., Section 303(d) listed) waterbodies upstream or adjacent to the wetland

For the water quality function, ratings assigned by OFWAM include *Intact*, *Impacted or Degraded*, or *Lost or Not Present* based on the specific responses to the assessment questions.

Wetland G Rating for Water Quality: *Impacted/Degraded*

Wetland G's ability to perform water quality functions is limited because it is primarily fed by groundwater and does not receive surface flow from streams or ditches, is not inundated by flooding, and is less than 5 acres in size. In addition, there are no 303(d)-listed stream reaches upstream from the wetland. As such, Wetland G did not receive the higher rating of *Intact* for this function, which is required for the wetland to be considered locally significant for the water quality function.

Hydrologic Control

The hydrologic control function assesses the wetland's ability to store stormwater during periods of high runoff and stream flooding and slowly release it downstream, reducing peak flows and flooding extent (Roth et al. 1996). In OFWAM, this function is assessed based on responses to seven questions that focus on the wetlands location within a 100-year flood plain or closed basin, whether or not there is evidence of flooding or ponding in the wetland, wetland size, presence of any restrictions to water flow through the wetland, dominant vegetation, dominant surrounding land use, and dominant land use in the upstream watershed. Wetlands that provide a high degree of water quality function are those that exhibit the following characteristics:

- Are located within a 100-year floodplain or within an enclosed basin
- Exhibit areas of ponding or flooding during the growing season
- Are more than 5 acres in size
- Have an outlet that restricts/slows water flow out of the wetland
- Are dominated by woody vegetation
- Have surrounding land uses that are dominated by developed areas and/or agriculture
- Have urban or urbanizing land uses in the watershed downstream from the wetland

For the hydrologic control function, ratings assigned by OFWAM include *Intact*, *Impacted or Degraded*, or *Lost or Not Present* based on the specific responses to the assessment questions.

Wetland G Rating for Hydrologic Control: *Impacted/Degraded*

Wetland G's ability to perform hydrologic control functions is limited because it is not located within floodplain, is not inundated by flooding, is less than 5 acres in size, does not have a restricted outlet, and is surrounded by agricultural land uses. As such, Wetland G did not receive the higher rating of *Intact* for this function, which is required for the wetland to be considered locally significant for the hydrologic control function.

Education

The education function assesses the wetland's ability to provide opportunities for education based on responses to a series of six questions that focus on public accessibility, the presence of potential hazards to the public, the presences of high-quality fish or wildlife habitat, the presence of existing or easily created public access facilities or viewing locations, and the ability of individuals with limited mobility to visit and/or view the site. Wetlands that provide a high degree of education function are those that exhibit the following characteristics:

- Are located on publicly owned lands
- Lack visible hazards to public use
- Exhibit high-quality fish and wildlife habitat
- Have existing physical facilities for public access/viewing or have areas where such facilities can be easily created
- Have a public access point within 250 feet of the wetland edge
- Have public access to a viewing point that is accessible to individuals with limited mobility

For the education function, ratings assigned by OFWAM include *Has Educational Use*, *Has the Potential for Educational Use*, or *Not Appropriate for Educational Use* based on the specific responses to the assessment questions.

Wetland G Rating for Education: *Not Appropriate for Educational Use*

Wetland G was determined to be inappropriate for educational use because it is a privately owned site that is not accessible to the public.

Compliance with Mandatory Locally Significant Wetland Criteria

For a wetland to be considered locally significant, it must meet one or more of the Mandatory LSW Criteria set forth in OAR 141-086-350(2). These criteria are listed in Table 1, along with a determination of whether Wetland G would meet each criterion.

As indicated in Table 1, Wetland G did not meet any of the Mandatory LSW Criteria. Wetland G did not receive a *Diverse* rating for wildlife habitat, nor did it receive *Intact* ratings for the fish habitat, water quality, or hydrologic control functions during the OFWAM assessment. Although Wetland G's water quality function was rated *Impacted/Degraded*, it is greater than 0.25 mile away from the

nearest DEQ 303(d)-listed waterbody (Tualatin River). Furthermore, Wetland G does not contain any rare plant species or support any species listed by the federal government as threatened or endangered or listed by the state as sensitive, threatened, or endangered.

Table 1
Determination of Local Wetland Significance for Wetland G – Mandatory Criteria

| Mandatory Locally Significant Wetland Criteria per OAR 141-086-0350(2) (One or More Must Be Met) | Determination |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>(a) The wetland performs any of the following functions at the levels indicated below using OFWAM:</p> <ul style="list-style-type: none"> (A) "Diverse" wildlife habitat (B) "Intact" fish habitat (C) "Intact" water quality function (D) "Intact" hydrologic control function | <p>No – Wetland G received the following OFWAM assessment ratings:</p> <ul style="list-style-type: none"> (A) Wildlife Habitat: <i>Provides for Some Species</i> (B) Fish Habitat: <i>None Present</i> (C) Water Quality Function: <i>Impacted/Degraded</i> (D) Hydrologic Control Function: <i>Impacted/Degraded</i> |
| <p>(b) The wetland or a portion of the wetland occurs within a horizontal distance less than one-fourth mile from a waterbody listed by the Department of Environmental Quality as a water quality-limited waterbody (303 (d) list), and the wetland's water quality function is described as "intact" or "impacted or degraded" using OFWAM. The 303(d) list specifies which parameters (e.g., temperature, pH) do not meet state water quality standards for each waterbody. A local government may determine that a wetland is not significant under this subsection upon documentation that the wetland does not provide water quality improvements for the specified parameter(s).</p> | <p>No – Although Wetland G's water quality function was rated <i>Impacted/Degraded</i> using OFWAM, it is more than 1.4 miles away from the nearest DEQ 303(d)-listed waterbody (Tualatin River).</p> |
| <p>(c) The wetland contains one or more rare plant communities, as defined in this rule.</p> | <p>No – Wetland G does not contain any rare plant communities as defined by Appendix G of the OFWAM Manual (Roth et al. 1996); all plants present are common to the area.</p> |
| <p>(d) The wetland is inhabited by any species listed by the federal government as threatened or endangered or listed by the state as sensitive, threatened or endangered, unless the appropriate state or federal agency indicates that the wetland is not important for the maintenance of the species.</p> | <p>No – Wetland G is not known to support any federal- or state-listed sensitive, threatened, or endangered species.</p> |

Note:
OFWAM: Oregon Freshwater Wetland Assessment Method

Compliance with Optional Locally Significant Wetland Criteria

In addition to the mandatory criteria, a wetland can also be considered locally significant at the discretion of the local government if it meets one or more of the Optional LSW Criteria set forth in

OAR 141-086-350(3). These criteria are listed in Table 2, along with a determination of whether Wetland G would meet each criterion.

Table 2
Determination of Local Wetland Significance for Wetland G – Optional Criteria

| Optional Locally Significant Wetland Criteria per OAR 141-086-0350(3) (One or More Must Be Met) | Determination |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>(a) The wetland represents a locally unique native plant community; wetland is or contains the only representative of a particular native wetland plant community in the Urban Growth Boundary/Urban Unincorporated Community, which is only applicable if the entire Urban Growth Boundary/Urban Unincorporated Community is inventoried. To be identified as a Locally Significant Wetland, such a wetland must also have been assessed to perform at least one of the following functions at the levels indicated below using OFWAM:</p> <ul style="list-style-type: none"> (A) Its wildlife habitat descriptor is either "provides diverse habitat" or "provides habitat for some wildlife species" (B) Its fish habitat descriptor is either "intact" or "impacted or degraded" (C) Its water quality function descriptor is either "intact" or "impacted or degraded" (D) Its hydrologic control function descriptor is either "intact" or "impacted or degraded" | <p>No – Wetland G does not represent a locally unique native plant community. The plant community present is common for the region and found throughout the Portland metropolitan area’s Urban Growth Boundary.</p> |
| <p>(b) The wetland is publicly owned and determined to "have educational uses" using OFWAM, and such use by a school or organization is documented for that site.</p> | <p>No – Wetland G is privately owned and was not determined to have educational uses using OFWAM.</p> |

Note:
OFWAM: Oregon Freshwater Wetland Assessment Method

As shown in Table 2, Wetland G also did not meet any of the Optional LSW Criteria because it does not represent a locally unique native plant community and does not provide any potential educational uses.

Conclusion

Anchor QEA determined that Wetland G does not meet the state’s mandatory or optional criteria for a Locally Significant Wetland. The OFWAM ratings returned for the wildlife habitat, fish habitat, water quality, hydrologic control, and education functions are not high enough to satisfy either the Mandatory or Optional LSW Criteria set forth in OAR 141-086-350. This is largely due to the isolated nature of Wetland G, which limits its ability to perform many of these functions at higher levels. In addition, Wetland G does not support any rare or unique plant communities or listed species or provide any educational opportunities.

References

- Anchor QEA, LLC, 2017. *Wetland Delineation Report: The Ridge at South Cooper Mountain (Bellairs and Lolich Properties)*. Prepared for West Hills Land Development. January 2017.
- DEA (David Evans and Associates, Inc.), 2016. *South Cooper Mountain Annexation Area: Local Wetland Inventory*. Prepared for City of Beaverton. February 2016.
- Roth et al. (Roth, E.M., R.D. Olsen, P.I. Snow, and R.R. Sumner), 1996. *Oregon Freshwater Wetland Assessment Methodology*, edited by S.G. McCannell, Wetlands Program, Oregon Division of State Lands. April 1996.



NATURAL RESOURCE ASSESSMENT
WEST HILLS LAND DEVELOPMENT: THE RIDGE AT SOUTH COOPER
MOUNTAIN (BELLAIRS AND LOLICH PROPERTIES)

Prepared for

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February 2017

CLEAN WATER SERVICES
NATURAL RESOURCE ASSESSMENT
WEST HILLS LAND DEVELOPMENT:
THE RIDGE AT SOUTH COOPER MOUNTAIN
(BELLAIRS AND LOLICH PROPERTIES)

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February 2017

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LIST OF ACRONYMS AND ABBREVIATIONS

| | |
|-------------------|------------------------------------------------------------------------------------------|
| CWS | Clean Water Services |
| DSL | Oregon Department of State Lands |
| HGM | hydrogeomorphic |
| HUC | hydrologic unit code |
| LWI | local wetland inventory |
| NGVD | National Geodetic Vertical Datum |
| NRA | natural resource assessment |
| Oregon HGM system | Oregon HGM Classification System |
| PEM | palustrine emergent |
| PFO | palustrine forested |
| PSS | palustrine scrub-shrub |
| PUD | planned unit development |
| R&O 07-20 | <i>Design and Construction Standards for Sanitary Sewer and Surface Water Management</i> |
| SPL | Service Provider Letter |
| UGB | Urban Growth Boundary |
| USACE | U.S. Army Corps of Engineers, Portland District |

1 INTRODUCTION

Anchor QEA, LLC, was retained by West Hills Land Development to perform a Clean Water Services (CWS) natural resource assessment (NRA) for the proposed residential development site known as The Ridge at South Cooper Mountain in the City of Beaverton, Washington County, Oregon (Figures 1 and 2). Specific location information for the project site follows. The study area for the NRA includes the project site plus a 200-foot-wide corridor around its perimeter.

| | |
|----------------------------------------|-------------------------------------------------------------------------------------------------------------------|
| City/County/State: | Beaverton, Washington County, Oregon |
| General Location: | North of SW Scholls Ferry Road, south of SW Horse Tale Lane, east of SW Strobel Road, and west of SW 175th Avenue |
| Tax Lots: | 2S1060000500 (Bellairs property) 2S1060000600 (Lolich property) |
| Latitude/Longitude¹: | 45.4282910° N/-122.8651180° W (Bellairs property) 45.4270980° N/-122.8662120° W (Lolich property) |
| PLSS: | NW 1/4 of Section 6, Township 2 South, Range 1 West |
| Street Address: | 18185 SW Scholls Ferry Road (Bellairs property) 18407 SW Scholls Ferry Road (Lolich property) |
| Approximate Area: | 15.95 acres (Bellairs property) 12.0 acres (Lolich property) |
| Zoning: | Agriculture and Forest District – AF-20 (both properties) ² |
| Waterways: | Unnamed tributary to Tualatin River |

¹ Latitude and longitude shown are for the approximate centroid of the property.

² The zoning listed is interim Washington County zoning and will be modified in the future by the City of Beaverton to Residential (R) zoning with multiple density categories including R-1, R-2, R-4, R-5, and R-7.

This NRA is prepared in accordance with the requirements of Chapter 3 of CWS's June 2007 *Design and Construction Standards for Sanitary Sewer and Surface Water Management* (Clean Water Services 2007), which is hereafter referred to as R&O 07-20. As required by Section 3.02.2(c) of R&O 07-20, this report provides a Standard Site Assessment, which includes the following information per Section 3.13.3 of R&O 07-20:

- Sensitive Areas Certification form
- Description of the proposed project, existing project site, and surrounding land use including supporting information from community development plans and other documents that influenced the project design (Appendix A)
- Determination, mapping, and description of all water quality sensitive areas (sensitive areas) both on the project site (Appendix B) and within 200 feet (Appendix C) of the project site
- Determination, mapping, and description of the vegetated corridor width and condition around each of the identified sensitive areas, including a slope analysis for areas where adjacent slopes exceed 25% (Appendix D)
- Vegetated corridor sample plot data sheets (Appendix E)
- Photographs of the study area and vegetated corridors (Appendix F)
- Determination of potential project encroachments into sensitive areas and associated vegetated corridors both on and within 200 feet of the project site
- Project figure set with the following maps:
 - Site location map (Figure 1)
 - Tax lot map (Figure 2)
 - South Cooper Mountain Community map (Figure 3)
 - Current aerial photograph (Figure 4)
 - Existing conditions maps (Figures 5 and 6a through 6f)
 - Proposed development maps (Figures 7 and 8a through 8f)

In accordance with Section 3.07.4 of R&O 07-20, and as required for submission of a Tier 2 Alternatives Analysis, the following additional information is provided:

- A description of why the encroachment is needed, including a discussion of rejected alternatives (Appendix G) that would result in less encroachment

- A Functional Assessment Report (Appendix H), as described in Section 3.14.7 of R&O 07-20, using methodology outlined in Oregon Department of State Lands' (DSL's) hydrogeomorphic (HGM) approach of assessment for wetland and riparian functions

In addition, the proposed project grading plans are provided in Appendix I.

This report documents the investigation, best professional judgment, and conclusions of Anchor QEA. It should be used for planning purposes only until verified in writing by CWS through the issuance of a Service Provider Letter (SPL).

2 PROJECT DESCRIPTION

The Ridge at South Cooper Mountain is a residential planned unit development (PUD) within the South Cooper Mountain Community Planning area (Figure 3). The proposed PUD would include 81 lots for detached single-family homes and 29 lots for attached single-family homes (townhomes), for a total of 110 lots (Figures 7 and 8a through 8f). The PUD would also include a parcel for future multi-family residential development of approximately 128 units. Development of the proposed PUD would require construction of both single- and multi-family residential building lots, residential streets, utilities, landscaping, a multi-use community trail, active and passive open space areas, and water quality facilities.

Regional transportation system improvements that are required by the South Cooper Mountain Community Plan to support the project include widening SW Scholls Ferry Road, converting SW Strobel Road to a north-south neighborhood route, and constructing a new east-west collector road (Road 8B) across the central portion of the project (Appendix A). With these improvements, access to the PUD would be provided from multiple locations along SW Strobel Road on the west side of the project site and via future Road 8B on the east side of the project site.

3 LANDSCAPE SETTING AND LAND USE

The study area is situated in the Prairie Terraces subregion of the Willamette Valley ecoregion (Thorson et al. 2003). This subregion is characterized by level to undulating topography drained by low-gradient, meandering streams and rivers; poorly drained soils derived from fluvial geologic deposits from the Missoula floods; and a mild climate with cool, wet winters, warm, dry summers, and a mean annual precipitation of 40 to 50 inches (Watershed Professionals Network 1999). Hydrologically, the study area is located in the Rock Creek-Tualatin River subwatershed (hydrologic unit code [HUC] 170900100503) of the Tualatin River subbasin of the Willamette River basin (OSU 2016a).

3.1 Study Area Description

3.1.1 Study Area Location

The study area is located in the South Cooper Mountain Community Plan Area, a 544-acre area in the southwestern portion of the City of Beaverton that is generally bounded by Horse Tale Lane to the north, SW Scholls Ferry Road to the south, SW Loon Drive to the east, and SW Tile Flat Road to the west (Figure 3). The South Cooper Mountain Community Plan Area was added to the Urban Growth Boundary (UGB) in 2011 and annexed into the City of Beaverton in 2013 (City of Beaverton 2014). The study area is located in the south-central portion of the plan area and lies adjacent to SW Scholls Ferry Road to the south and SW Strobel Road, a private road, to the west and northwest (Figures 1, 2, and 3). As previously stated, the study area includes Washington County tax lots 2S1060000500 (Bellairs property) and 2S1060000600 (Lolich property), totaling 27.95 acres, plus a 200-foot-wide corridor around its perimeter.

3.1.2 Study Area Conditions

The current conditions of the study area are depicted in the 2016 aerial photograph provided in Figure 4. As indicated in the figure, the Bellairs property includes a mix of land uses including a forested area and fallow agricultural field in the northern portion, a wooded-stream corridor and single-family residence in the central portion, and a Douglas fir (*Pseudotsuga menziesii*) woodlot in the southern portion. The Lolich property is primarily composed of agricultural fields in the northern and western portions and associated agricultural buildings, including a commercial farm stand and parking lot, in the

southeastern portion. A wooded stream corridor is also present in the south-central portion of the Lolich property and connects to the wooded stream corridor on the Bellairs property via a section of stream channel that is surrounded by herbaceous and scrub-shrub vegetation.

Existing structures within the study area include a house and small shed on the Bellairs property and a farm stand, house, small shed, garage, maintenance building, well house, and greenhouses on the Lolich property. Access to the study area is currently provided by three driveways off SW Scholls Ferry Road, including a paved private residential driveway on the Bellairs property, a gravel private residential driveway on the Lolich property, and the gravel entrance driveway to the Lolich farm stand, which leads to a large gravel parking area. Various unpaved farm roads are also present throughout the Lolich property.

Topography on the study area is relatively flat and slopes gradually downward toward the south and southwest. Elevations generally range from approximately 290 feet National Geodetic Vertical Datum (NGVD) in the northeastern corner to approximately 250 feet NGVD near the south-central portion of the site (Figure 5). Surrounding topography is similar, with the exception of the area north-northeast of the study area, which slopes steeply upward to a small knoll.

3.1.3 Land Use

The study area currently supports a single-family home on the Bellairs property and a farm stand and small-scale agricultural operation on the Lolich property. The 2016 aerial photograph included as Figure 4 provides a good depiction of the current land use of the study area and surrounding landscape. Land use immediately surrounding the study area consists of various types of agricultural uses (e.g., row crops, orchards, horse farms) and rural residential property. Further to the east, agricultural land is undergoing conversion to residential development (e.g., River Terrace East, River Terrace Northwest, South Cooper Mountain Heights) and institutional uses (e.g., South Cooper Mountain High School).

4 NATURAL RESOURCE ASSESSMENT

This NRA is prepared in compliance with Chapter 3 of the R&O 07-20. Vegetated corridor conditions and corridor widths were determined in accordance with Chapter 3 guidance.

Corridor conditions were determined by assessing and rating different plant communities as good, marginal, or degraded using CWS standards (Section 3.14.2 of the R&O 07-20).

4.1 Delineation of Water Quality Sensitive Areas

During wetland delineation fieldwork performed in August, September, and December 2016, Anchor QEA wetland staff identified water quality sensitive areas on the project site. The results of this study were compiled in a January 2017 report titled *Wetland Delineation Report – West Hills Land Development: The Ridge at South Cooper Mountain (Bellairs and Lolich Properties)* (Anchor QEA 2017), which was submitted to DSL on January 27, 2017 for verification and assigned wetland delineation number #WD 2017-0049. The wetland delineation map from this study is included in Appendix B.

Seven water quality sensitive areas (Wetlands A through G and two other waters [Unnamed Tributary and Southwest Drainage]) were delineated on the project site (Figures 5 and 6a through 6f). Each of these areas is briefly described in the following sections. Table 1 summarizes the areas and classifications for each water quality sensitive area.

Table 1
Water Quality Sensitive Areas Identified on the Project Site

| Wetlands | Description | Classification | | On-site Area | |
|-----------|--------------------------------------|-----------------------|------------|--------------|-------|
| | | Cowardin ¹ | Oregon HGM | Square Feet | Acres |
| Wetland A | Forested/herbaceous riparian wetland | PFO/PEM | Slope | 1,527 | 0.035 |
| Wetland B | Forested/herbaceous riparian wetland | PFO/PEM | Slope | 3,265 | 0.075 |
| Wetland C | Forested/herbaceous riparian wetland | PFO/PEM | Slope | 745 | 0.017 |
| Wetland D | Forested/herbaceous riparian wetland | PFO/PEM | Slope | 1,119 | 0.026 |
| Wetland E | Scrub-shrub/herbaceous wetland | PSS/PEM | Slope | 7,370 | 0.169 |
| Wetland F | Forested/scrub-shrub wetland | PFO/PSS | Slope | 87,736 | 2.014 |

| Wetlands | Description | Classification | | On-site Area | |
|------------------------------------------------------------|-----------------------------------------|-----------------------|------------|----------------|--------------|
| | | Cowardin ¹ | Oregon HGM | Square Feet | Acres |
| Wetland G | Forested/scrub-shrub/herbaceous wetland | PFO/PSS/PEM | Slope | 32,915 | 0.756 |
| Unnamed Tributary | Perennial stream | R3SBC | N/A | 7,808 | 0.179 |
| Southwest Drainage | Intermittent stream | R4SBC | N/A | 991 | 0.023 |
| Total area of wetlands and non-wetland other waters | | | | 143,476 | 3.294 |

Notes:

1. Cowardin system wetland codes:

PEM = palustrine emergent

PFO = palustrine forested

PSS = palustrine scrub-shrub

R3SBC = riverine, upper perennial, stream bed, seasonally flooded

R4SBC = riverine, intermittent, stream bed, seasonally flooded

HGM = hydrogeomorphic

N/A = not applicable

4.2 Wetlands

4.2.1 Wetlands A through D

Wetlands A through D are located adjacent to the southern portion of the Unnamed Tributary in the former floodplain of this stream (Figures 6b and 6c). These wetlands were classified as a palustrine forested (PFO)/palustrine emergent (PEM) wetlands under the U.S. Fish and Wildlife Service *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin system; Cowardin et al. 1979) and as a slope/flats wetland under the Oregon HGM Classification System (Oregon HGM system; Adamus 2001).

Dominant vegetation in Wetlands A through D generally includes Oregon ash (*Fraxinus latifolia*) and western red cedar (*Thuja plicata*) in the overstory; Himalayan blackberry (*Rubus armeniacus*) and English ivy (*Hedera helix*) in the shrub layer; and reed canarygrass (*Phalaris arundinacea*), bittersweet nightshade (*Solanum dulcamara*), and common horsetail (*Equisetum arvense*) in the herbaceous layer. A small patch of small-fruited bulrush (*Scirpus microcarpus*) was also observed in Wetland A, near the channel of the Unnamed Tributary. The primary hydrological sources sustaining

Wetlands A through D appear to be overland flow, high seasonal water table, and direct precipitation. Although these wetlands may have also historically received overbank flows from the Unnamed Tributary during storm events, the construction of the off-site impounded pond upstream of the study area likely limits the amount of flow moving through this stream system to such an extent that overbank flooding no longer occurs. The water regime of Wetlands A through D was determined to be seasonally saturated.

Based upon the wetland delineation data that were collected in the field and on a review of R&O 07-20 standards, Wetlands A through D are classified as CWS water quality sensitive areas.

4.2.2 Wetland E

Wetland E is located in and around the central section of the Unnamed Tributary on the Lolich property (Figure 6b). It includes the channel of the drainage that is completely overgrown with reed canarygrass. Wetland E also extends up the adjacent slopes, which are dominated by a mix of herbaceous and scrub-shrub vegetation. Wetland E was classified as a palustrine scrub-shrub (PSS)/PEM wetland under the Cowardin system and as a slope wetland under the Oregon HGM system. Wetland E is connected to Wetlands A through D on its downstream end through a culverted road crossing that includes a single 30-inch corrugated plastic culvert and to Wetland F on the upstream end by a culverted road crossing that includes twin 24-inch concrete culverts.

Dominant vegetation in Wetland E includes reed canarygrass, which is found both in the stream channel and on the side slopes. Other species present include saplings of Oregon ash and black cottonwood (*Populus balsamifera* ssp. *Trichocarpa*), Himalayan blackberry, common snowberry (*Symphoricarpos albus*), red osier dogwood (*Cornus alba*), bittersweet nightshade, soft rush (*Juncus effusus*), willowherb (*Epilobium* sp.), and Canada thistle (*Cirsium arvense*). The primary hydrological sources sustaining Wetland E appear to be instream flow, overland runoff, high seasonal water table, and direct precipitation. The water regime of Wetland E was determined to be seasonally saturated, with the channel bottom being seasonally flooded/seasonally saturated.

Based upon the wetland delineation data that were collected in the field and on a review of R&O 07-20 standards, Wetland E is classified as a CWS water quality sensitive area.

4.2.3 Wetland F

Wetland F occurs in the northeastern portion of the study area and is primarily located on the Bellairs property, with a small portion extending onto the Lolich property (Figures 6c and 6d). Wetland F is adjacent to the section of the Unnamed Tributary that is upstream from Wetland E and is connected to that wetland via a culverted road crossing that consists of twin 24-inch concrete culverts. Wetland F continues off site to the east/northeast. Wetland F includes both forested areas and a scrub-shrub and herbaceous fringe. It was classified as a PFO/PSS/PEM wetland under the Cowardin system and as a slope/flats wetland under the Oregon HGM system.

Dominant overstory vegetation in the forested areas of Wetland F includes Oregon ash, with some scattered Oregon white oak (*Quercus garryana*), red alder (*Alnus rubra*), and black cottonwood present. Understory scrub-shrub vegetation in forested areas includes saplings of Oregon ash, common hawthorn (*Crataegus monogyna*), Himalayan blackberry, trailing blackberry (*Rubus ursinus*), red osier dogwood, Scouler's willow (*Salix scouleriana*), and common snowberry. Common understory herbaceous vegetation includes reed canarygrass, taperfruit shortscale sedge (*Carex leptopoda*), avens (*Geum* sp.), and sword fern (*Polystichum munitum*). Dominant vegetation in the PSS/PEM portions of this wetland includes vine maple (*Acer circinatum*), Nootka rose (*Rosa nutkana*), Pacific ninebark (*Physocarpus capitatus*), reed canarygrass, velvetgrass (*Holcus lanatus*), fringed willowherb (*Epilobium ciliatum*), colonial bentgrass (*Agrostis capillaris*), tall fescue (*Schedonorus arundinacea*), and Canada thistle. The primary hydrological sources sustaining Wetland F appear to be instream flow, overland runoff, high seasonal water table, and direct precipitation. The water regime of Wetland F was determined to be seasonally saturated, with the channel bottom being seasonally flooded/seasonally saturated.

Based upon the wetland delineation data that were collected in the field and on a review of R&O 07-20 standards, Wetland F is classified as CWS water quality sensitive areas.

4.2.4 Wetland G

Wetland G is located on the Bellairs property in the northern portion of the study area (Figure 6e). It is a mixed forested/herbaceous wetland that occurs along the interface where a forested area transitions into a fallow agricultural field. Wetland G was classified as a PFO/PEM wetland under the Cowardin system and as a slope/flats wetland under the Oregon HGM system. Wetland G is not connected to any other waterbodies.

The forested portion of Wetland G is dominated by Oregon ash, with some young Oregon white oak also present. Understory vegetation includes Oregon ash saplings, Pacific ninebark, common snowberry, Himalayan blackberry, trailing blackberry, red osier dogwood, and common hawthorn. Clustered rose (*Rosa pisocarpa*), twinberry (*Lonicera involucrata*), and Cascara false buckthorn (*Fragula purshiana*) are also present. The herbaceous portion of Wetland G is dominated by common velvetgrass, colonial bentgrass, and perennial ryegrass (*Lolium perenne*). California oatgrass (*Danthonia californica*), sweet vernal grass (*Anthoxanthum odoratum*), and tall fescue are also common, as are scattered Oregon white oak saplings and Himalayan blackberry. The primary hydrological sources sustaining Wetland G appear to be overland flow, high seasonal water table, and direct precipitation. The water regime of Wetland G was determined to be seasonally saturated.

Based upon the wetland delineation data that were collected in the field and on a review of R&O 07-20 standards, Wetland G is classified as CWS water quality sensitive areas.

4.3 Non-Wetland Other Waters

Two non-wetland other waters, the Unnamed Tributary and Southwest Drainage, were identified within the study area during the wetland delineation (Figures 7a through 7c). Each of these features is further described in the following sections.

4.3.1 Unnamed Tributary

The Unnamed Tributary consists of a relatively narrow (less than 4 feet wide) perennial stream channel that flows from northeast to southwest across the site and receives surface water from the majority of the study area (Figures 6b through 6d). The stream originates at the base of an earthen embankment of a constructed pond that is located off site to the

northeast on tax lot 2S1060000404 (Figures 4 and 5). Within the study area, the majority of the stream channel is contained within the boundaries of Wetlands A through F. It exits the study area through a 36-inch concrete culvert under SW Scholls Ferry Road and continues southward through a forested riparian corridor and eventually drains into the Tualatin River.

The stream channel substrate consists predominantly of fine silts with some sand, gravel, and cobble. The northern and southern sections of the channel in the study area are covered by overhanging woody vegetation with little instream vegetation present, whereas in the central portion of the channel, very little woody vegetation overhangs the stream, and it is instead dominated by dense herbaceous vegetation, specifically reed canarygrass, both adjacent to and within the channel.

Based upon the wetland delineation data that were collected in the field and on a review of R&O 07-20 standards, the Unnamed Tributary is classified as a CWS water quality sensitive area.

4.3.2 Southwest Drainage

The Southwest Drainage consists of a short, excavated drainage ditch approximately 6 feet wide and 4 to 5 feet deep on average located along SW Scholls Ferry Road (Figure 6a). This ditch receives intermittent flow from an off-site impounded pond located on the adjacent property to the west (tax lot 2S2010000100) that receives water from an unnamed stream (Figures 4 and 5). Flow is conveyed under SW Strobel Road via a 48-inch corrugated metal culvert and into the drainage ditch, which is located partially on the study area and partially within the right-of-way of SW Scholls Ferry Road. The ditch extends toward the east along the edge of SW Scholls Ferry Road for approximately 152 feet before entering a 36-inch concrete culvert that conveys the flow toward the south under the roadway. That culvert discharges to another open drainage that eventually connects to the Unnamed Tributary approximately 50 feet to the south of SW Scholls Ferry Road.

Based upon the wetland delineation data that were collected in the field and on a review of R&O 07-20 standards, the Southwest Drainage is classified as a CWS water quality sensitive area.

4.4 Determination of Water Quality Sensitive Areas Off-Site but within 200 Feet of the Project Site

Off-site water quality sensitive areas within 200 feet to the east of the project site were determined using SWCA Environmental Consultants' September 2016 wetland delineation report for the Edmonds Trust Property/Blackbird Farms (SWCA Environmental Consultants 2016). This delineation was reviewed and approved by the DSL on December 12, 2016 (WD #2016-0367; Appendix C). Delineated water quality sensitive areas on that property that occur within 200 feet of the project site include the following:

- **Edmonds Pond** – The Edmonds Pond consist of a 1.60-acre impounded pond located within a perennial drainage (Figure 6d). The pond is impounded by an earthen embankment and includes a water control structure that discharges to an outflow channel on the southwestern side of the berm. This outflow channel drains into the Unnamed Tributary on the project site. The southwestern section of the pond extends into the study area. The Edmonds Pond is classified as a palustrine, unconsolidated bottom, permanently flooded, diked/impounded wetland under the Cowardin system and a Riverine Flow-through wetland under the Oregon HGM system.
- **Edmonds Wetland A** – Edmonds Wetland A is a 4.35-acre wetland that occurs along the northern and eastern sides of the Edmonds Pond (Figure 6d). A small section of this wetland extends into the study area. This wetland does not directly connect to any wetlands on the project site. Edmonds Wetland A is classified as a PFO wetland under the Cowardin system and a slope wetland under the Oregon HGM system.
- **Edmonds Wetlands C and D** – Edmonds Wetlands C and D are located to the southwest of the pond berm, on either side of the pond outflow channel (Figure 6d). These wetlands are 0.61 and 0.15 acre in size, respectively, and lie entirely within the off-site portion of the study area. Both wetlands are connected to on-site Wetland F. Wetland C and D are both classified as PEM wetlands under the Cowardin system and slope wetlands under the Oregon HGM system.
- **Edmonds Wetland E** – Edmonds Wetland E is a 0.002-acre isolated wetland that is located along the northern fence line of the Edmonds property (Figure 6d). It extends off the Edmonds property to the northwest into a slight depression in an adjacent

horse pasture. Wetland E is classified as PEM wetland under the Cowardin system and a slope wetland under the Oregon HGM system.

Approved wetland delineation were not available for the adjacent properties to the north, west, and south of the project site. Due to access restrictions on these sites, potential off-site water quality sensitive areas within 200 feet of the project site in those areas were assessed based on field observations from the project site (where possible), aerial imagery, the City of Beaverton South Cooper Mountain Annexation Area local wetland inventory (LWI) (David Evans and Associates, Inc. 2016), and other available sources. Water quality sensitive areas identified on those properties were not formerly delineated or surveyed in the field by Anchor QEA.

Although the LWI shows a portion of Wetland W-A extending onto the property to the north of the project site (Appendix C), observations made in the field and data collected by Anchor QEA scientists in the northeastern corner of the project site did not indicate the presence of wetlands in that area. Furthermore, SWCA Environmental Consultants did not find any wetlands on the Edmonds property in this location during their September 2016 delineation. As such, no water quality sensitive areas were identified within 200 feet north of the project site.

Three potential water quality sensitive areas were identified within 200 feet to west of the project site on the LWI (Figures 5, 6a through 6d and 6f):

- **LWI Wetland W-G** – Wetland W-G extends into the study area from the west and is identified on the LWI as a palustrine, emergent, persistent, saturated/semi-permanent/seasonal, farmed, partially drained/ditched (PEM1Yfd) wetland under the Cowardin classification system and as a slope wetland under the Oregon HGM system (Figures 5 and 6f). The area of Wetland W-G was estimated to be 21.29 acres.
- **LWI OW-2** – OW-2 is an impounded pond that occurs on the adjacent property to the west of the study area (Figures 5 and 6a). It is classified as a palustrine, unconsolidated bottom, mud, permanently flooded (PUB3H) wetland under the Cowardin classification system and as a depressional wetland under the Oregon HGM system. LWI Stream TR-1a flows into LWI OW-2 from the west. The channel of the

mapped LWI Stream TR-1a is shown as extending toward the northwest corner of the SW Strobel Road and SW Scholls Ferry Road intersection. Field visits to the site confirmed that this section of the LWI Stream TR-1a does not exist and instead, flow from LWI OW-2 exits the pond through an outlet channel located northeast of the pond. Flow is then conveyed through a culvert under SW Strobel Road that connects to the Southwest Drainage on the project site.

The following two potential water quality sensitive areas were identified within 200 feet to the south of the project site using the U.S. Geological Survey's 7.5-Minute Series (Topographic) Quadrangle for Beaverton, Oregon (USGS 2014) (Figures 5, 6a, and 6b):

- **Off-Site Stream 1** – Off-Site Stream 1 is a perennial stream that receives flow from the Unnamed Tributary from a culvert under SW Scholls Ferry Road. It is a perennial stream that flows to the Tualatin River.
- **Off-Site Stream 2** – Off-Site Stream 2 is a perennial stream that receives flow from the Southwest Drainage from a culvert under SW Scholls Ferry Road. It flows into Off-Site Stream 1, which flows to the Tualatin River.

4.5 Vegetated Corridor Width Determination

Table 2 summarizes the vegetated corridor widths applicable to each on-site and off-site sensitive area identified in Section 4.1 based on the vegetated corridor width requirements shown in Table 3-1 from Chapter 3 of R&O 07-20. As indicated, most sensitive areas on and within 200 feet of the project site are required to have 50-foot-wide vegetated corridors. One area adjacent to Wetland B required a slightly wider vegetated corridor in certain areas due to the presence of a short, steep slope. The vegetated corridor width in that location was determined using the methodology included in Section 3.14.4 of R&O 07-20 (Appendix D). In addition to that area, the vegetated corridor along Wetland F near the existing home on the Bellairs property has an area of reduced width due to a 15-foot setback associated with the house. Portions of the vegetated corridors associated with Wetland A, Wetland B, the Unnamed Tributary, and the Southwest Drainage are also truncated by existing roads.

Table 2
Vegetated Corridor Width Determinations

| Water Quality Sensitive Area | Location | Adjacent Slopes | Greater Than 0.5 Acre | Isolated | Connected to Water Quality Sensitive Areas Off Site | Vegetated Corridor Width (feet) |
|-----------------------------------------------|----------|-----------------|-----------------------|----------|-----------------------------------------------------|---------------------------------|
| On-site Water Quality Sensitive Areas | | | | | | |
| Wetland A | On site | Variable | No | No | Yes | 50 to 77 |
| Wetland B | On site | <25% | No | No | Yes | 50 |
| Wetland C | On site | <25% | No | No | Yes | 50 |
| Wetland D | On site | <25% | No | No | Yes | 50 |
| Wetland E | On site | <25% | No | No | Yes | 50 |
| Wetland F | On site | <25% | Yes | No | Yes | 21 to 50 |
| Wetland G | On site | <25% | Yes | Yes | No | 50 |
| Unnamed Tributary | On site | <25% | No | No | Yes | 50 |
| Southwest Drainage | On site | <25% | No | No | Yes | 50 |
| Off-site Water Quality Sensitive Areas | | | | | | |
| Edmonds Pond | Off site | <25% | Yes | No | Yes | 50 |
| Edmonds Wetland C | Off site | <25% | No | No | Yes | 50 |
| Edmonds Wetland D | Off site | <25% | Yes | No | Yes | 50 |
| Edmonds Wetland E | Off site | <25% | No | Yes | No | 25 |
| LWI W-G | Off-site | <25% | Yes | No | Yes | 50 |
| LWI OW-2 | Off site | <25% | Yes | No | Yes | 50 |
| Off-Site Stream 1 | Off site | <25% | No | No | Yes | 50 |
| Off-Site Stream 2 | Off site | <25% | No | No | Yes | 50 |

Notes:

1. LWI Wetland W-A is shown as extending onto the project site; however, data collected by Anchor QEA scientists was not sufficient to support wetland conditions.
LWI = local wetland inventory

Based on sensitive area type and adjacent slopes, the vegetated corridor width for all the off-site water quality sensitive areas, with the exception of Edmonds Wetland E, was determined to be 50 feet (Table 2). Because it is less than 0.5 acre in size and isolated, Edmonds Wetland E was assigned a 25-foot-wide vegetated corridor. Due to the location of these off-site features and the presence of existing roads between many of them and the project site, none of these vegetated corridors extend onto the project site (Figures 5 and 6a through 6f).

4.6 Vegetated Corridor Condition

To determine on-site vegetated corridor condition, at least one sample plot was established in each vegetated corridor type to characterize the vegetative condition. The vegetated corridor data forms for these plots are included in Appendix E. These data are summarized according to the R&O 07-20 criteria for rating vegetated corridor condition in Table 3. A brief description of these corridors and their condition ratings follows. Site photographs are included in Appendix F.

**Table 3
Existing On-site Vegetated Corridor Area by Condition**

| Vegetated Corridor Condition | Location | Area | |
|----------------------------------------------|-------------------------------------------------------------------------------------------|----------------|--------------|
| | | Square Feet | Acres |
| Degraded | Adjacent to Wetlands A, B, C, D, E, F, and G, Unnamed Tributary and Southwestern Drainage | 137,653 | 3.160 |
| Marginal | Adjacent to Wetland E and Unnamed Tributary | 6,715 | 0.154 |
| Good | Adjacent to Wetlands A, B, C, D, and G, Unnamed Tributary | 60,554 | 1.390 |
| Total On-site Vegetated Corridor Area | | 204,922 | 4.704 |

As shown in Figures 5 and 6a through 6f, the vegetated corridors identified on the project site are predominantly in degraded condition with some marginal and good vegetated corridor condition also present.

The prevalence of degraded vegetated corridor condition is primarily due to the lack of mature overstory trees and native plant cover in many of these areas. Most of the vegetated corridors have been disturbed by both past and ongoing agricultural activities and rural development (e.g., buildings, landscaping). Typical vegetation in active agricultural areas includes colonial bentgrass perennial ryegrass, sweet vernal grass, tall fescue, field brome (*Bromus arvensis*), common velvetgrass, English plantain (*Plantago lanceolata*), common centaury (*Centaureum erythraea*), bull thistle (*Cirsium vulgare*), Queen Anne's lace (*Daucus carota*), hairy cat's ear (*Hypochaeris radicata*), Canadian thistle, and common teasel (*Dipsacus*

fullonum). Himalayan blackberry and trailing blackberry are also present, along with trace amounts of black cottonwood and Oregon white oak (*Quercus garryana*) saplings.

Typical vegetation in non-agricultural degraded areas includes colonial bentgrass, common velvetgrass, tall fescue, and other various weedy grasses and forbs along with Himalayan blackberry and trailing blackberry. Minor amounts of black cottonwood trees and saplings, Oregon ash saplings, black hawthorn (*Crataegus douglasii*), and common snowberry are also present.

The degraded vegetated corridor along the Southwest Drainage is dominated by common hawthorn and Himalayan blackberry, with lesser amounts of black cottonwood, Oregon ash, Saskatoon (*Amelanchier alnifolia*), bigleaf maple (*Acer macrophyllum*), beaked hazel (*Corylus cornuta*), common snowberry, and rose species (*Rosa* spp.). The herbaceous layer is sparse and includes scattered western sword fern, taper fruit short-scale sedge, Herb Robert (*Geranium robertianum*), Fringe cup (*Tellima grandiflora*), fringed willowherb, and common horsetail.

5 PROPOSED PROJECT IMPACTS

Proposed project impacts on water quality sensitive areas and their associated vegetated corridors were avoided to the extent practicable during the design of the proposed development. However, due to the location of these resources on the project site, the configuration of existing roadways adjacent to the site, the location of the UGB along the south side of SW Scholls Ferry Road, and the development requirements of the South Cooper Mountain Community Plan, total avoidance of these areas is not possible. As such, the proposed project would require both temporary and permanent impacts to water quality sensitive areas and their vegetated corridors. For proposed impacts on water quality sensitive areas, the applicant intends to obtain both a Section 404 Permit from the U.S. Army Corps of Engineers, Portland District (USACE) under the Clean Water Act, and a Removal-Fill Permit from the DSL under the Oregon Removal-Fill Law. For proposed impacts to vegetated corridors, the applicant is seeking authorization from CWS through the issuance of an SPL.

Proposed project impacts on water quality sensitive areas include 2,151 square feet (0.049 acre) of temporary impacts and 38,964 square feet (0.894 acre) of permanent impacts (Figures 7, 8a through 8c, and 8e). Proposed temporary impacts on water quality sensitive areas are primarily related to construction access for road widening, road crossing construction, and utility installation work. These impacts would occur in Wetlands A, B, E, F, and the Unnamed Tributary (Figures 8a through 8c). All water quality sensitive areas disturbed by these temporary activities would be restored in place by grading to re-establish pre-construction contours and re-planting with native vegetation. Proposed permanent impacts on water quality sensitive areas are associated with the widening of SW Scholls Ferry Road, conversion of SW Strobel Road to a neighborhood route, construction of the Road 8B road crossing, and construction of residential lots and roadways. Permanent water quality sensitive area impacts would occur in Wetlands A, B, E, F, and G, the Unnamed Tributary, and the Southwest Drainage (Figures 8a through 8c and 8e). Permanent impacts on water quality sensitive areas will be mitigated off-site through the purchase of wetland mitigation credits from an approved wetland mitigation bank.

Proposed project impacts on vegetated corridors include a total of 9,177 square feet (0.211 acre) of temporary encroachment and 91,945 square feet (2.111 acre) of permanent encroachment (Table 4; Figures 5 and 6a through 6f). Proposed temporary vegetated corridor impacts would affect approximately 2,383 square feet (0.055 acre) of good condition vegetated corridor and 6,794 square feet (0.156 acre) of degraded condition vegetated corridor. Temporary vegetated corridor impacts are primarily related to construction access for road widening, road crossing construction, and utility installation work and would affect vegetated corridors associated with Wetlands A, B, C, E, F, and the Unnamed Tributary (Figures 8b and 8c). All areas of temporary vegetated corridor impact would be restored in place by grading to re-establish pre-construction contours and re-planting with native vegetation. Proposed permanent vegetated corridor impacts would affect approximately 38,015 square feet (0.872 acre) of good condition vegetated corridor, 1,409 square feet (0.032 acre) of marginal condition vegetated corridor, and 52,521 square feet (1.207 acre) of degraded condition vegetated corridor. Permanent vegetated corridor impacts are associated with the widening of SW Scholls Ferry Road, conversion of SW Strobel Road to a neighborhood route, and the construction of the Road 8B road crossing, residential streets and building lots, sanitary sewer line crossing and access road, water quality facility, and

community trail. These impacts would affect vegetated corridors associated with Wetlands A, B, C, D, E, F, and G, the Unnamed Tributary, and the Southwest Drainage (Figures 8a through 8c and 8e). Permanent impacts on vegetated corridors will be mitigated using on-site vegetated corridor replacement.

A summary of the vegetated corridor impacts by each water quality sensitive area and impact type is contained in Table 4. Proposed impacts are shown in Figures 8a through 8c and 8e, and enhancements for encroachments and impacts are discussed in Section 7. The nature of these impacts is further explained in the following sections.

**Table 4
Proposed Vegetated Corridor Encroachment**

| Water Quality Sensitive Area | Temporary Encroachment into Associated Vegetated Corridor | | Permanent Encroachment into Associated Vegetated Corridor | | Total Encroachment into Vegetated Corridor | |
|------------------------------|-----------------------------------------------------------|--------------|-----------------------------------------------------------|--------------|--------------------------------------------|--------------|
| | Square Feet | Acres | Square Feet | Acres | Square Feet | Acres |
| Wetland A | 825 | 0.019 | 6,270 | 0.144 | 7,095 | 0.163 |
| Wetland B | 1,618 | 0.037 | 3,374 | 0.077 | 4,992 | 0.114 |
| Wetland C | 1,440 | 0.033 | 1,654 | 0.038 | 3,094 | 0.071 |
| Wetland D | 547 | 0.013 | 0 | 0.000 | 547 | 0.013 |
| Wetland E | 2,415 | 0.055 | 7,489 | 0.172 | 9,905 | 0.227 |
| Wetland F | 1,199 | 0.028 | 4,988 | 0.115 | 6,187 | 0.143 |
| Wetland G | 0 | 0.000 | 57,980 | 1.331 | 57,980 | 1.331 |
| Unnamed Tributary | 1,133 | 0.026 | 863 | 0.020 | 1,996 | 0.046 |
| Southwest Drainage | 0 | 0.000 | 9,327 | 0.214 | 9,327 | 0.214 |
| Total | 9,177 | 0.211 | 91,945 | 2.111 | 101,123 | 2.322 |

5.1 Impact Descriptions

The following sections briefly describe the proposed development activities that would require temporary and permanent impacts on water quality sensitive areas and vegetated corridor. Impacts associated with these activities are shown in Figures 8a through 8c and 8e.

5.1.1 SW Scholls Ferry Road Widening

As part of the proposed PUD, the applicant is required to widen SW Scholls Ferry Road to meet the arterial street standards specified in the transportation framework portion of the South Cooper Mountain Community Plan (Appendix A). This work would involve converting the existing two-lane road to five lanes (two lanes in each direction plus a center turn lane) by expanding the existing right-of-way from 60 to 108 feet and the existing paved surface from 32 to 70 feet. A 7-foot-wide bike lane, 7.5-foot-wide planter strip, and 14-foot-wide multi-use path would also be constructed in the right-of-way.

Due to the presence of the UGB along the southern edge of SW Scholls Ferry Road, all expansion work would need to occur on the north side of existing roadway. To accommodate the expanded roadway and its associated right-of-way in that location, unavoidable temporary and permanent impacts to Wetland A, Wetland B, Unnamed Tributary, Southwest Drainage, and their associated vegetated corridors would be required. Portions of Wetlands A and B would be filled to accommodate the expanded roadbed and to extend the existing 36-inch concrete culvert that conveys flow from the Unnamed Tributary under the roadway. In addition, because the Southwest Drainage falls entirely within the footprint of the new roadway, that feature would need to be piped and filled to maintain conveyance between the off-site impounded pond (LWI OW-2) and off-site stream channel to the south (Off-Site Stream 2).

Proposed water quality sensitive area and vegetated corridor impacts that would be caused by these activities include the following:

- 1,128 square feet (0.026 acre) of temporary impacts on water quality sensitive areas
- 1,827 square feet (0.042 acre) of permanent impacts on water quality sensitive areas
- 2,443 square feet (0.056 acre) of temporary encroachment into vegetated corridors
- 16,304 square feet (0.374 acre) of permanent encroachment into vegetated corridors

Because these activities would encroach into more than 30% of the depth of the vegetated corridors around Wetlands A and B and would completely eliminate the vegetated corridor around the Southwest Drainage, this work would be considered a Tier 2 encroachment under Section 3.07.4 of R&O 07-20.

5.1.2 SW Strobel Road Improvement

In addition to the improvement of SW Scholls Ferry Road, the applicant would also be required to upgrade SW Strobel Road to a neighborhood route, as specified in the transportation framework portion of the South Cooper Mountain Community Plan (Appendix A). These upgrades would involve converting the existing single-lane private gravel road within a 30-foot-wide right-of-way to a 31-foot-wide three-lane (two travel lanes and a turn lane) paved residential street within a 60 to 67-foot-wide right-of-way. Only the eastern three quarters of the road would be built under the proposed development project, with the remaining portion constructed during development of the property to the west.

Expansion of SW Strobel Road would require permanent encroachment into the vegetated corridors of Wetland G and the Southwest Drainage in order to accommodate the cut and fill work required to support the new roadbed. Proposed water quality sensitive area and vegetated corridor impacts that would be caused by this activity include the following:

- 33,245 square feet (0.764 acre) of permanent impacts on water quality sensitive areas
- 67,307 square feet (1.545 acre) of permanent encroachment into vegetated corridors

Because this work would encroach into more than 30% of the depth of the vegetated corridors around Wetland G, this work would be considered a Tier 2 encroachment under Section 3.07.4 of R&O 07-20.

5.1.3 East-West Collector Street Construction

As specified in the transportation section of the South Cooper Mountain Community Plan (Appendix A), the applicant is required to construct an east-west collector street that would extend across the project site from SW Strobel Road to the eastern property boundary where it would continue off-site to the east and eventually turn toward the south to reconnect with

SW Scholls Ferry Road. This road, currently named Road 8B, would consist of a 46-foot-wide three-lane road within an 80-foot-wide right-of-way that would also contain bike lanes, planter strips, a sidewalk, and a multi-use path.

Under the proposed alignment, Road 8B would cross the Unnamed Tributary and its associated wetlands and would require the construction of a culverted road crossing (Figures 7 and 8c). The proposed road crossing would consist of a 21-foot-wide, 90-foot-long bottomless corrugated metal arch culvert system that would rest on parallel concrete footings. Installation of this crossing would require the following temporary and permanent impacts to Wetland E, Wetland F, and the Unnamed Tributary and their associated vegetated corridors:

- 1,023 square feet (0.023 acre) of temporary impacts on water quality sensitive areas
- 4,222 square feet (0.096 acre) of permanent impacts on water quality sensitive areas
- 2,612 square feet (0.060 acre) of temporary encroachment into vegetated corridors
- 10,346 square feet (0.238 acre) of permanent encroachment into vegetated corridors

Construction of Road 8B would meet the requirements of an allowed use under Section 3.05.7 of R&O 07-20. However, because this activity would encroach into more than 30% of the depth of the vegetated corridor, this work would be considered a Tier 2 encroachment under Section 3.07.4 of R&O 07-20.

5.1.4 Residential Lots and Roadways

In order to accommodate the residential road system and 15 single-family building lots, the applicant is proposing to completely fill Wetland G and eliminate its associated vegetated corridor (Figures 7 and 8e). This work would result in the following impacts on water quality sensitive areas and vegetated corridors:

- 32,915 square feet (0.865 acre) of permanent impacts on water quality sensitive areas
- 30,202 square feet (0.693 acre) of permanent encroachment into good condition vegetated corridors
- 27,778 square feet (0.638 acre) of permanent encroachment into degraded condition vegetated corridors

In addition to these impacts, both temporary and permanent encroachment into the vegetated corridor around Wetland C and the Unnamed Tributary would be required to accommodate five single-family building lots near the center of the project site. This work would result in the following impacts on water quality sensitive areas and vegetated corridors.

- 822 square feet (0.019 acre) of temporary encroachment into good condition vegetated corridors
- 1,647 square feet (0.038 acre) of temporary encroachment into degraded condition vegetated corridors
- 790 square feet (0.018 acre) of permanent encroachment into good condition vegetated corridors
- 1,184 square feet (0.027 acre) of permanent encroachment into degraded condition vegetated corridors

Because these activities would completely eliminate the vegetated corridor around Wetland G and affect greater than 40% of the vegetated corridor length around Wetland C, this work would be considered a Tier 2 encroachment under Section 3.07.4 of R&O 07-20.

5.1.5 Sanitary Sewer Line Crossing

The proposed sanitary sewer line crossing is located in the east-central portion of the Lolich property and would involve the installation of a 24-inch-diameter sewer line through an existing road crossing over the Unnamed Tributary. This line would serve as the main trunk line for the northern portion of the proposed development and would connect to an existing sanitary sewer main located along SW Scholls Ferry Road. Construction would involve trenching through the existing culverted road crossing to install the sewer line, removing the existing twin corrugated plastic culverts, and installing a replacement pipe culvert and 15-foot-wide access road to provide maintenance access to a future manhole that would be installed on the north side of the channel. Proposed vegetated corridor impacts associated with this activity include the following:

- 1,653 square feet (0.038 acre) of temporary encroachment into vegetated corridors

Installation of the sewer line would be considered an allowed use under Section 3.05.5 of R&O 07-20. Construction of the access road would also be an allowed use under Section 3.05.7 of R&O 07-20; however, because the proposed road would impact greater than 30% of the vegetated corridor depth, this work would be considered a Tier 2 encroachment under Section 3.07.4 of R&O 07-20.

5.1.6 Water Quality Facility

For the proposed development, the City of Beaverton is requiring the applicant to comply with USACE's Standard Local Operating Procedures for Endangered Species (SLOPES V) requirements for the Maintenance or Improvement of Stormwater, Transportation, or Utility Actions. These criteria require the use of stormwater facilities that limit stormwater discharge from the project site to pre-development discharge rates. To accomplish this, stormwater detention is required. To function properly, stormwater detention facilities must be located in areas that can accommodate their relatively large size while also being situated in topographically low areas to allow gravity-driven stormwater conveyance.

The proposed water quality facility for the single-family portion of the development would be located in the southwest portion of the project site, just north of SW Scholls Ferry Road (Figures 7, 8a, and 8b). In order to accommodate the required stormwater detention capacity for the development, this facility would require permanent encroachment into the vegetated corridors associated with Wetland A, Wetland C, and the Unnamed Tributary.

Encroachments would primarily be associated with grading to construct the eastern berm of the detention basin. Proposed impacts to vegetated corridors include the following:

- 3,211 square feet (0.074 acre) of permanent encroachment into vegetated corridors

Because construction of the water quality facility would encroach into more than 30% of the depth of the vegetated corridors around Wetland A and the Unnamed Tributary, this work would be considered a Tier 2 encroachment under Section 3.07.4 of R&O 07-20.

5.1.7 Community Trail

The multi-use community trail specified in the South Cooper Mountain Community Plan would extend between SW Scholls Ferry Road and proposed Road 8B along the east side of

the Unnamed Tributary. The intent of this trail is to provide walkability and connectivity for bicyclists and pedestrians within the South Cooper Mountain Community Plan Area and to promote connections from South Cooper Mountain to the area's regional trails and green spaces. The finished trail would consist of a 10-foot-wide asphalt path with 1-foot-wide gravel shoulders on either side, for a total trail corridor width of 12 feet. Construction of the community trail would result in the following impacts:

- 2,130 square feet (0.049 acre) of permanent encroachment into vegetated corridors

Construction of the community trail would be considered an allowed use under Section 3.05.8 of R&O 07-20. However, because this activity would encroach into more than 40% of the length of the vegetated corridor around Wetlands E, this work would be considered a Tier 2 encroachment under Section 3.07.4 of R&O 07-20.

6 ALTERNATIVES ANALYSIS

This section addresses the submittal requirements under Section 3.07.4 of R&O 07-20 specific to a Tier 2 Alternatives Analysis. As required by Section 3.07.4(b)(2) of R&O 07-20, alternative development designs are provided in Appendix G and functional assessments for the wetlands and other waters whose vegetated corridors would be impacted by the proposed project are included in Appendix H.

3.07.4. b.1. Description of why the encroachment is needed including rejected alternatives that would result in less encroachment.

Temporary and permanent encroachments into on-site water quality sensitive areas and their associated vegetated corridors are needed to facilitate construction of required improvements to the existing transportation system, new residential roadways, residential building lots, a sanitary sewer connection and associated access road, a water quality facility, and a multi-use community trail.

The proposed improvements to SW Scholls Ferry Road and SW Strobel Road are being required by the City of Beaverton as part of the transportation network specified in the South Cooper Mountain Community Plan. These improvements are needed to handle expected increases in traffic associated with the ongoing development of the South Cooper

Mountain Community Plan Area. Because the UGB boundary runs along the southern edge of SW Scholls Ferry Road in this location, all road modifications must occur to the north. As such, impacts to wetlands and vegetated corridors that are adjacent to the north side of the existing road are unavoidable. For SW Strobel Road, the South Cooper Mountain Community Plan calls for this road to be upgraded along its current alignment. The steep topography and private property ownership along the northern edge of the existing road alignment restricts road width expansion in that direction, requiring most of the improvement work to be completed on the project site where encroachment into the vegetated corridor around Wetland G is unavoidable due to the existing slope.

Construction of Road 8B is required by the South Cooper Mountain Community Plan to provide east-west access across the project site and multiple points of entrance into the proposed development. Because the Unnamed Tributary and its associated wetland corridor extends from north to south across the entire length of the project site, a road crossing of these resources by Road 8A is unavoidable.

The number of residential building lots proposed for the development are needed to meet the minimum density requirements of the various zoning overlays on the project site, including specific minimum lot and unit numbers for the single-family and multi-family portions of the project. Residential roadways are required to provide access to the proposed lots in accordance with applicable design standards. Although there is typically more flexibility for impact avoidance with these features, the project must still meet the minimum density requirements and be economically viable for the developer. Proposed lot impacts on the vegetated corridor of Wetland C were determined to be unavoidable as some encroachment is required to accommodate the residential road network and maximize the number of single-family lots in that relatively narrow portion of the project site.

The sanitary sewer connection is required to provide gravity-driven sanitary sewer service for the northern portion of the proposed development. Due to site topography and the location of the Unnamed Tributary and its associated wetlands between the development area and existing sewer main along SW Scholls Ferry Road, the sewer line must cross these sensitive areas and their vegetated corridors. The access road is being required by the City of Beaverton to provide maintenance access to the future manhole that will be located on the

northwest side of the stream channel; access from the other side of the channel is not possible due to the presence of future residential lots.

Impacts associated with the proposed water quality facility were also determined to be unavoidable. In order for the stormwater detention to function correctly, it needs to be located in the lowest portion of the project site to enable gravity-conveyance of stormwater. Proposed impacts to the vegetated corridors of Wetland A, Wetland C, and the Unnamed Tributary were also determined to be necessary to accommodate the stormwater detention capacity required for the development.

The multi-use community trail is required by the South Cooper Mountain Community Plan to provide walkability and connectivity for bicyclists and pedestrians within the South Cooper Mountain Community Plan Area and to promote connections from South Cooper Mountain to the area's regional trails and green spaces. In order to maximize the single-family portion of the development on the west side to the Unnamed Tributary, the trail was proposed for the east side of the stream corridor on the multi-family portion of the development. Due to space restriction on that parcel and the need to meet the required development density and parking requirements, a portion of the trail needed to be located within the outer edge of the vegetated corridor around Wetland E.

Alternative Designs

Because many of the water quality sensitive area and vegetated corridor impacts from the proposed transportation and utility infrastructure improvements were determined to be unavoidable, the alternative designs (Appendix G) prepared for the project focused on reducing residential lot and roadway impacts to Wetland G and minimizing encroachments into its associated vegetated corridor. However, permanent encroachment into the Wetland G vegetated corridor would still need to occur for the required SW Strobel Road improvements—i.e., total avoidance of the Wetland G vegetated corridor is not possible. It should also be noted that direct and indirect impacts affecting hydrology for Wetland G cannot be avoided due to SW Strobel Road improvements required excavation and interception of ground water.

Alternative 1A – Total Avoidance of Wetland G, Option 1

Alternative 1A examined the possibility of completely avoiding Wetland G by reducing the number of building lots and re-configuring the development's residential road system. Wetland G vegetated corridor encroachments would be limited to those required for the SW Strobel Road improvements plus some minor impacts for a residential street that would extend to the northeastern corner of the project site. Alternative 1A would allow the construction of 88 single-family lots and 128 multi-family units. Although this alternative would meet the 127-unit minimum required for the multi-family component, it would fall short of the 95-lot minimum required for single-family lots. In addition, it would result in 22 fewer single-family lots than the proposed development design, which represents a potential economic loss of \$8,800,000 for the developer depending on housing type (attached vs. detached). As such, Alternative 1A was rejected because it would not meet the minimum density standards of the City's zoning ordinance and would result in a significant economic loss for the developer.

Alternative 1B – Partial Avoidance of Wetland G

Under Alternative 1B, the Alternative 1A layout was modified by adding an additional east-west residential road in order to accommodate more single-family lots. The majority of Wetland G would be avoided with the exception of the southern portions, which would be impacted by the additional road. As with Alternative 1A, permanent encroachment into the Wetland G vegetated corridor would still need to occur for the required SW Strobel Road improvements and for the residential street that would extend to the northeastern corner of the project site. Alternative 1B would allow the construction of 93 single-family lots and 128 multi-family units. Although this alternative would meet the 127-unit minimum required for the multi-family component, it would still fall short of the 95-lot minimum required for single-family lots. In addition, it would result in 17 fewer single-family lots than the proposed development design, which represents a potential economic loss of \$6,800,000 for the developer depending on housing type. As such, Alternative 1B was rejected because it would not meet the minimum density standards of the City's zoning ordinance and would result in a significant economic loss for the developer.

Alternative 2 – Total Avoidance of Wetland G, Option 2

Alternative 2 examined a different option for avoiding all impacts to Wetland G by further modifying the development's road network. Under this alternative, a short north-south connector road would be added to the R-4 zone off Road 8B, allowing for the inclusion of two additional single-family lots in this zone over those provided by Alternative 1A. In addition, another connector road would be extended between SW Strobel Road and the cul-de-sac in the northern portion of the property to accommodate three additional single-family lots. Overall, this would allow the construction of 90 single-family lots and 128 multi-family units, which would meet the 127-unit minimum required for the multi-family component but not the 95-lot minimum required for single-family lots. After further analysis, it was also determined that the block pattern created by the proposed street layout would not meet the intersection spacing standards for a collector road (Road 8B) and that the road extension to SW Strobel Road was unbuildable due to steep slopes. The latter of these limitations would remove an additional 2 to 3 lots from the layout, pushing it even further below the minimum density requirement for single-family lots. In addition to these logistical problems, Alternative 2 would also result in 18 to 20 fewer single-family lots than the proposed development design, which represents a potential economic loss of \$7,200,000 to \$8,000,000 for the developer. Given all these limitations, Alternative 2 was rejected because it would not meet the minimum density standards of the City's zoning ordinance, would not meet the transportation design standards for the South Cooper Mountain Community Plan, and would result in a significant economic loss for the developer.

Alternative 3 – Partial Avoidance of Wetland G, Option 2

Alternative 3 presents an additional design that partially avoids impacts on Wetland G while adding enough single-family lots to just meet the minimum density standards. Under this alternative, the residential street that extends to the northeastern corner of the project site was shifted to the east to reduce impacts on Wetland G. This required moving the lots on the southeastern side of this road closer to the vegetated corridor of Wetland F, significantly reducing one of the only on-site areas available for vegetated corridor mitigation. Like Alternative 2, Alternative 3 also proposed a road extension to SW Strobel Road in the northern portion of the property to accommodate some the additional single-family lots needed to meet the minimum density standards. Although Alternative 3 could potentially meet minimum density requirements on paper, construction of the residential road extension

to SW Strobel Road was determined to be infeasible due to the steepness of the slope. As such, 2 to 3 of these lots were considered unbuildable, reducing the total number of single-family lots available under this alternative to 92 or 93, which is less than the 95 required to meet minimum density standards. Although the lot layout in this location could be potentially re-configured to use a cul-de-sac layouts like Alternatives 1A and 1B, the design would both increase the amount of on-site vegetated corridor impact that would need to be mitigated and eliminate much of the on-site areas where vegetated corridor mitigation could occur. Furthermore, assuming that this design could be further modified to meet minimum density requirements, Alternative 3 would still result in 15 fewer single-family lots than the proposed development design, which represents a potential economic loss of \$6,000,000 for the developer. Although it could potentially be modified to meet minimum density requirements, Alternative 3 was ultimately rejected because eliminated much of the area needed for on-site vegetated corridor impact mitigation and because it would result in a significant economic loss for the developer.

3.07.4. c.1. The proposed encroachment area is mitigated in accordance with Section 3.08.

Prior to the construction of the proposed development, the applicant would obtain both a CWA Section 404 Permit and an Oregon Removal-Fill Permit for all proposed project impacts on water quality sensitive areas. Compensatory mitigation for these sensitive area impacts would be achieved through the purchase of bank credits from an approved wetland mitigation bank. Compensatory mitigation for vegetated corridor impacts associated with Wetland G and the Southwest drainage would also be satisfied by this mitigation credit purchase because these resources would be eliminated in total. Compensatory mitigation for the other proposed vegetated corridor impacts would be mitigated on-site via the expansion of the existing vegetated corridor around Wetland F (see Section 7.0)

3.07.4. c.2. The replacement mitigation protects the functions and values of the Vegetated Corridor and Sensitive Area.

Replacement mitigation for permanent project impacts on Wetland G, Southwest Drainage, and their associated vegetated corridors would be achieved through the purchase of bank credits from an approved wetland mitigation bank that provides higher wetland functions than the functions provided by these resources. No mitigation for associated vegetated corridor impacts is required because the sensitive resource would be completely removed.

The proposed on-site mitigation for other vegetated corridor impacts would expand the overall vegetated corridor around the remaining sensitive areas, providing additional protection of the water quality in the Unnamed Tributary and its downstream receiving water (Tualatin River).

3.07.4. c.3. Enhancement of the replacement area, if not already in Good condition, and either the remaining Vegetated Corridor on the site or the first 50 feet of width closest to the resource, whichever is less, to a Good corridor condition.

Approximately 103,799 square feet (2.383 acres) of existing vegetated corridor would remain on the project site following development. Of this, 20,157 square feet (0.463 acre) is currently in good condition and will not require further enhancement. The remaining 83,642 square feet (1.920 acres) of marginal and degraded vegetated corridor will be enhanced to good condition through the removal of invasive species and the planting of native trees and shrubs (see Section 8.0).

3.07.4. c.4. A District Stormwater Connection Permit is likely to be issued based on proposed plans.

The stormwater treatment system proposed for the proposed development project has been designed to comply with the design criteria specified for stormwater facilities in the National Marine Fisheries Service biological opinion of the USACE's SLOPES V program, which is more stringent than current CWS requirements. As such, the applicant reasonably expects to obtain a District Stormwater Connection Permit based on the proposed project plans.

3.07.4. c.5. Location of the development and site planning minimizes incursion into the Vegetated Corridor.

The following design considerations are proposed to minimize the incursion of project elements into vegetated corridors:

- **SW Scholls Ferry Road Improvements** – Minimization options for this activity were fairly limited due to the improvements required by the South Cooper Mountain Community Plan and the restriction of work to the north side of the road. The choice to extend the existing 36-inch-diameter concrete culvert instead of replacing it would minimize impacts to the Unnamed Tributary and associated wetlands by simplifying the construction process and minimizing disturbance to the stream channel as much

as is practicable. Replacing the existing crossing with a box culvert or similar crossing would require a much larger work area, as well as the installation of a temporary diversion structure to route traffic around the work area, both of which could result in increased impacts to the stream, wetlands, and their associated vegetated corridors.

- **SW Strobel Road Improvements** – Vegetated corridor impacts from the SW Strobel Road improvement work has been minimized by pushing some of the proposed improvements onto the privately owned property to the north.
- **Road 8B Construction** – The proposed alignment of Road 8B has been designed to cross the Unnamed Tributary at an existing road crossing at a fairly narrow section of the stream/wetland corridor, thus minimizing impacts to both sensitive areas and their associated vegetated corridors. The proposed crossing would also replace an existing twin culvert structure with a single bottomless arch culvert, reduce the amount of instream fill required and increasing the area of exposed substrate in the streambed.
- **Residential Lots** – Vegetated corridor encroachment by residential lots has been minimized by using retaining walls along the back sides of those lots that border the vegetated corridor of Wetland C.
- **Sanitary Sewer Line Installation** – The proposed sanitary sewer line connection has been located within an existing road crossing to minimize impacts on both sensitive areas and vegetated corridors. It would also include replacing the existing substandard dual culvert crossing with an improved conveyance structure.
- **Community Trail** – Vegetated corridor impacts from the community trail have been minimized by keeping the majority of the trail outside of the vegetated corridor. For areas where vegetated encroachment is unavoidable, impacts have been minimized by locating the trail in the outermost 40% of the vegetated corridor.

3.07.4. c.6. No practicable alternative to the location of the development exists that will not disturb the Sensitive Area or Vegetated Corridor.

The proposed improvements to SW Scholls Ferry Road and SW Strobel Road are being required by the City of Beaverton as part of the transportation network specified in the South Cooper Mountain Community Plan. Because the UGB boundary runs along the southern edge of SW Scholls Ferry Road in this location, all road modifications must occur to the north. As such, impacts to wetlands and vegetated corridors that are adjacent to the

north side of the existing road are unavoidable. For SW Strobel Road, the South Cooper Mountain Community Plan call for this road to upgraded along its current alignment. The steep topography and private property ownership along the northern edge of the existing road alignment restricts road width expansion in that direction, requiring most of the improvement work to be completed on the project site where encroachment into the vegetated corridor around Wetland G is unavoidable due to the existing slope.

Construction of Road 8B is required by the South Cooper Mountain Community Plan to provide east-west access across the project site and multiple points of entrance into the proposed development. Because the Unnamed Tributary and its associated wetland corridor extends from north to south across the entire length of the project site, a road crossing of these resources by Road 8A is unavoidable; there is no way to cross the stream and wetland corridor without impacting sensitive areas and their associated vegetated corridors.

Proposed project impacts to water quality sensitive areas and vegetated corridors from residential lots and roadways are needed in order to meet the minimum density requirements of the site's zoning overlays, comply with the applicable development standards for residential development, and to ensure an economically viable project for the developer. Due to site constraints related to topography, the location of existing roads, and the presence of a stream/wetland corridor that extends across the site, there are no practicable alternatives to the proposed impacts that would allow these goals to be achieved.

The sanitary sewer connection is required to provide gravity-driven sanitary sewer service for the northern portion of the proposed development. Due to site topography and the location of the Unnamed Tributary and its associated wetlands between the development area and existing sewer main along SW Scholls Ferry Road, the sewer line and its associated access road must cross these sensitive areas and their vegetated corridors.

Impacts associated with the proposed water quality facility were also determined to be unavoidable. In order for the stormwater detention to function correctly, it needs to be located in the lowest portion of the project site to enable gravity-conveyance of stormwater. Proposed impacts to the vegetated corridors of Wetland A, Wetland C, and the Unnamed

Tributary were also determined to be necessary to accommodate the stormwater detention capacity required for the development.

The multi-use community trail is required by the South Cooper Mountain Community Plan. In order to maximize the single-family portion of the development on the west side to the Unnamed Tributary, the trail was proposed for the east side of the stream corridor on the multi-family portion of the development. Due to space restriction on that parcel and the need to meet the required development density and parking requirements, a portion of the trail needed to be located within the outer edge of the vegetated corridor.

3.07.4. c.7. The proposed encroachment provides public benefits.

Public benefits to water quality from the proposed project include adding 5,926 square feet (0.136 acres) of new vegetated corridor to existing vegetated corridors by enhancing degraded areas to good condition. This new vegetated corridor would be in addition to the 24,639 square feet (0.566 acre) of required compensatory vegetated corridor mitigation and would support improved public benefits to water quality by further expanding the overall vegetated corridors around the site's streams and wetlands, creating a wider and more effective protective zone for water quality sensitive areas in the Tualatin River watershed. The SLOPES V-compliant water quality facilities provide an increased water quality benefit by lessening the amount of sediment released and by storing larger quantities of water, lessening the potential for downstream erosion.

7 PROPOSED ON-SITE MITIGATION OF VEGETATED BUFFERS

As noted in Sections 5 and 6 of this report, the proposed development would require unavoidable temporary and permanent impacts to vegetated corridors along multiple water quality sensitive areas. Mitigation for temporary vegetated corridor impacts would occur in-place through the restoration of the affected areas to good condition. Replacement mitigation for permanent vegetated corridor impacts would occur adjacent to the existing vegetated corridor around Wetland F and would involve expanding the width of this corridor and bringing the added areas up to good condition as defined in Section 3.03.3 of R&O 07-20 (Figures 8b and 8d).

Using Table 3-2 from Chapter 3 of the R&O 07 20, permanent encroachments into vegetated corridors would be mitigated on site by providing replacement vegetated corridor at a 1:1 replacement ratio for the following proposed project impacts:

- 7,813 square feet (0.179 acre) of good condition vegetated corridor
- 1,411 square feet (0.032 acre) of marginal condition vegetated corridor
- 15,415 square feet (0.355 acre) of degraded condition vegetated corridor

Total on-site mitigation would be 24,639 square feet (0.566 acre) and would include the addition of degraded condition area to the existing vegetated corridor (Table 5). The degraded areas would be enhanced to good condition per Section 3.08.2(d) of R&O 07-20.

**Table 5
Mitigation Area Calculations for Permanent Impacts¹**

| Vegetated Corridor Mitigation Location | Current CWS Rating | Mitigation Strategy | Mitigation Area | |
|--------------------------------------------|--------------------|---------------------|-----------------|--------------|
| | | | Acres | Square Feet |
| On Site | Degraded | Enhancement | 24,639 | 0.566 |
| Total Vegetated Corridor Mitigation | | | 24,639 | 0.566 |

Notes:

1. Mitigation impacts are for permanent loss as a result of corridor impacts, and calculations do not include temporary impacts, which would be restored in place.

CWS = Clean Water Services

8 VEGETATED CORRIDOR ENHANCEMENT

Existing marginal and degraded vegetated corridors will be enhanced during the development of the project site as The Ridge at South Cooper Mountain residential subdivision. Enhancement will occur through planting to provide a vegetated corridor with sufficient planting diversity and density to place it on a trajectory to a good rating under CWS R&O 07-20 criteria. On-site vegetated corridors that are rated as marginal or degraded would be planted at full CWS planting densities of 0.01 tree per square foot and 0.05 shrub per square foot; marginal areas would be infill planted at a discounted planting rate of 0.005 tree per square foot and 0.025 shrub per square foot. Enhancement planting areas are summarized in Table 6 and planting details (e.g., site preparation, planting plan, planting guidelines, maintenance) are addressed in the following sections.

Table 6
Enhancement Planting Area Calculations

| Description | Planting Requirement | Area | |
|------------------------------------------------------------------------------|----------------------|--------------|----------------|
| | | Acres | Square Feet |
| Existing Marginal Condition Vegetated Corridors | Enhancement | 0.122 | 5,304 |
| Existing Degraded Condition Vegetated Corridors | Enhancement | 1.798 | 78,338 |
| Temporary Vegetated Corridor Impact Areas | Enhancement | 0.211 | 9,177 |
| On-site Mitigation Areas in Degraded Condition | Enhancement | 0.566 | 24,639 |
| Additional On-site Mitigation Areas in Degraded Condition for Public Benefit | Enhancement | 0.136 | 5,926 |
| Total | | 2.833 | 123,384 |

8.1.1 Project Site Preparation

Invasive and non-native species would be mowed, and follow-up herbicide would be applied as needed to eradicate any surviving invasive plants. Herbicide spraying would occur only under windless conditions by licensed applicators, and shields would be used to protect adjacent woody plants from overspray or drift.

Site preparation for the planting of native species would include initial mowing and scalping to reduce vegetative competition and improve planting effectiveness and herbicide application. Any bare ground exposed during site preparation would be seeded at a composition similar to the seed mix provided in Table 7 or standard seed mix composition to promote reestablishment of the herbaceous layer and minimize the potential for erosion. The seeding, along with natural volunteers, would provide additional species diversity and density and provide competition to help exclude recolonization by invasive species.

Table 7
Species Proposed for Seeding in the Prepared Vegetated Corridors

| Common Name | Scientific Name | Seed Mix (%) | Type of Planted Material |
|-------------------|----------------------------|--------------|--------------------------|
| Blue wild rye | <i>Elymus glaucus</i> | 30 | Seed |
| Red native fescue | <i>Festuca rubra</i> | 40 | Seed |
| California brome | <i>Bromus carinatus</i> | 15 | Seed |
| Large leaf lupine | <i>Lupinus polyphyllus</i> | 15 | Seed |

8.1.2 Proposed Enhancement Planting Plan

This planting plan is developed in accordance with CWS R&O 07-20. Plantings are designed to increase vegetation density and diversity and improve the vegetated corridors as the plantings grow and mature, placing the degraded vegetated corridor on a trajectory to a good rating in accordance with CWS criteria.

The planting plan serves as a guide to mimic natural conditions, and the mix of species to be planted is tailored to the moisture and light conditions of the project site. Final species selection would depend on plant availability at the time of installation. A breakdown of the proposed planting effort by cover type and associated plant totals for the vegetated corridor is presented in Table 8. The planting total for all enhancement areas is calculated to be 1,207 trees and 6,037 shrubs.

Table 8
Proposed Planting Treatments for Vegetated Corridor
Enhancement for the Thompson Woods Residential Development

| Scientific Name | Common Name | On Center Spacing (feet) | Plant Numbers |
|-----------------------------------------------------------------------------------------------------------|-----------------------|--------------------------|---------------|
| Trees (based on Clean Water Services standards of 0.01 to 0.05 trees/square foot)^{1,2} | | | |
| <i>Alnus rubra</i> | Red alder | 7 | 302 |
| <i>Acer macrophyllum</i> | Big leaf maple | 7 | 241 |
| <i>Pseudotsuga menziesii</i> | Douglas Fir | 7 | 302 |
| <i>Prunus emarginata</i> | Bitter Cherry | 7 | 60 |
| <i>Rhamnus purshiana</i> | Cascara | 7 | 61 |
| <i>Thuja plicata</i> | Western red cedar | 7 | 241 |
| Tree subtotal | | | 1,207 |
| Shrubs (based on Clean Water Services Standards of 0.025 to 0.05 shrubs/square foot)^{1,2} | | | |
| <i>Amelanchier alnifolia</i> | Serviceberry | 4 | 906 |
| <i>Holodiscus discolor</i> | Oceanspray | 4 | 604 |
| <i>Mahonia nervosa</i> | Cascade Oregon-Grape | 4 | 543 |
| <i>Sambucus racemosa</i> | Red Elderberry | 4 | 906 |
| <i>Lonicera involucrata</i> | Twinberry | 4 | 60 |
| <i>Oemleria cerasiformis</i> | Indian plum | 4 | 906 |
| <i>Symphoricarpos albus</i> | Snowberry | 4 | 906 |
| <i>Ribes sanguineum</i> | Red flowering currant | 4 | 604 |

| Scientific Name | Common Name | On Center Spacing (feet) | Plant Numbers |
|-----------------------|----------------|--------------------------|---------------|
| <i>Rosa nutkana</i> | Nootka Rose | 4 | 300 |
| <i>Rosa pisocarpa</i> | Clustered Rose | 4 | 302 |
| Shrub subtotal | | | 6,037 |
| Total Plants | | | 7,244 |

Notes:

1. Degraded condition corridors planted at 0.01 tree per square foot and 0.05 shrubs per square foot.
 2. Marginal condition corridors planted at 0.05 tree per square foot and 0.025 shrubs per square foot.
- Plants (especially shrubs) should be clumped to mimic natural conditions.
Final species quantities are dependent upon availability.

8.1.3 Planting Guidelines

General guidelines for plant material and their installation are as follows:

- Qualified staff would supervise the planting process. Modifications to the planting plan may occur based on field conditions and the availability of plant material.
- Woody planting would occur in the fall or winter after plant dormancy has commenced (December 1 to March 31).
- Plantings would be bare-root, live stake, and containerized (1-gallon) native plant seedlings, as appropriate, from regional genetic stock. Plastic nursery identification tags would be attached to the stem of each woody planting.
- Tree and shrub seedlings would be a minimum height of 18 inches. Seedlings are typically 1 to 3 years old.
- Local nursery stock would be used to ensure that material has acclimated to local conditions (reducing planting stress) and is genetically compatible with the local area.
- Final plant lists would be contingent upon plant availability. If selected species are unavailable from local nurseries, other genus or species with similar hydrological requirements may be substituted.
- Plantings would be distributed in a random pattern to mimic natural conditions. Grouping or clustering of individual species is appropriate, particularly for shrub species.
- Proposed locations of woody trees and shrubs would be field staked and identified with an approved coding system or by placement of the actual plant material.

- Plant stock would be handled in a manner that would not break, scrape, or twist any portion of the plant. Protect plants at all times from conditions that can damage the plant (e.g., sun, wind, or freezing conditions).
- Plant pits for trees and shrubs would be excavated as follows: Container stock with a width of two times the ball diameter and depth equal to the ball depth, and bare root stock with a width of two times the widest diameter of the roots and depth equal to the root system.
- Plants are to be placed plumb in the pit, backfilled with native soil to the original plant soil line, and tamped solidly around the ball and roots. All plants would be watered immediately after planting if soil is not saturated to the surface.
- Woody plantings would only be staked if the plant cannot stand alone in a moderate wind. Remove stakes as soon as their support becomes unnecessary.
- Woody plantings would be fertilized with a slow release (8 months), high nitrogen granular fertilizer (21-3-7), with application rates as specified by the manufacturer. Fertilizer would be applied at the base of the plant after the plant pit is backfilled, prior to the application of mulch.
- Woody plantings would be mulched with a minimum of 3 inches of organic matter (e.g., weed-free straw, compost, or bark mulch) to 18 inches in diameter to discourage weed growth, minimize soil erosion, and retain moisture. The mulch must not make contact with the plant stem.
- Appropriate materials or treatments to deter wildlife depredation and damage would be considered for woody plants.
- A temporary irrigation system would be installed to water plantings during the late spring/summer/early fall dry season to increase plant survival.

8.1.4 Project Site Maintenance

A 2-year maintenance program would be initiated to help ensure enhancement goals are achieved. Maintenance of the planting areas would take place in the summer months following initial planting and would be most aggressive in the first year of native plant establishment. Invasive, non-native vegetation would be controlled by combining methods, including cutting, pulling, and herbicide application, to control their reestablishment. Herbicide spraying would occur only under windless conditions, and shields would be used

to protect adjacent woody plants from overspray and drift. Aggressive vegetation management would be pursued for the 2-year maintenance period, while native plantings become established. Plants would be replaced if R&O 07-20 success standards for survival (80% of the planting specifications) were not met during the maintenance period. The plant survival rate for the vegetated corridor mitigation and enhancement planting areas would be approximately 966 trees (80% of 1,207 trees planted) and 4,830 shrubs (80% of 6,037 shrubs planted). Bare ground would be reseeded as needed.

9 SUMMARY

Anchor QEA was retained by West Hills Land Development to prepare a CWS NRA for the proposed residential development site known as The Ridge at South Cooper Mountain in the City of Beaverton, Washington County, Oregon. Nine water quality sensitive areas (seven wetlands and two waterways) were identified on site, totaling 143,476 square feet (3.294 acres). Wetland G (32,915 square feet [0.756 acre]) and the Southwest Drainage (330 square feet [0.008 acre]) are proposed for fill and off-site mitigation through the DSL wetland mitigation bank program, which resulted in its removal from the vegetated corridor calculation assessment. For the remaining water quality sensitive areas, based on vegetated corridor widths determined to be 50 feet (CWS R&O 07-20 Table 3-1), there are a total of 137,615 square feet (3.159 acres) of vegetated corridors on site.

The areas of proposed temporary and permanent impacts to vegetated corridors as a result of development were determined to be 33,815 square feet (0.777 acre). Permanent impacts will occur on 24,639 square feet (0.566 acre), and on-site mitigation areas were identified for vegetated corridors creation to offset those losses, totaling 24,639 square feet (0.566 acre). A net positive gain of 5,926 square feet (0.136 acre) of mitigation through creation of new vegetated corridor exceeds the respective replacement ratios for mitigation of permanent impacts (1:1 ratio for vegetated corridor). Temporary impact areas (9,177 square feet/0.211 acres) will be planted and restored at their location of occurrence. Additionally, 83,642 square feet (1.920 acres) of existing, unimpacted on-site vegetated corridor rated as degraded and marginal will be planted so that the areas are on a trajectory to good rating according to CWS requirements.

The total area of on-site good quality vegetated corridor proposed for creation is 123,384 square feet (2.833 acre) and includes the remaining degraded and marginal vegetated corridors (83,642 square feet/1.920 acre) and the degraded condition on-site mitigation areas (30,565 square feet/0.702 acre). In total, 1,207 trees and 6,037 shrubs would be planted in these vegetated corridor areas and would include the additional trees and shrubs for public benefits to water quality and wildlife habitat. The plant survival rate for these plantings would be approximately 966 trees (80% of 1,207 trees planted) and 4,830 shrubs (80% of 6,037 shrubs planted). With this submittal, West Hills Land Development is requesting the issuance of a SPL by CWS.

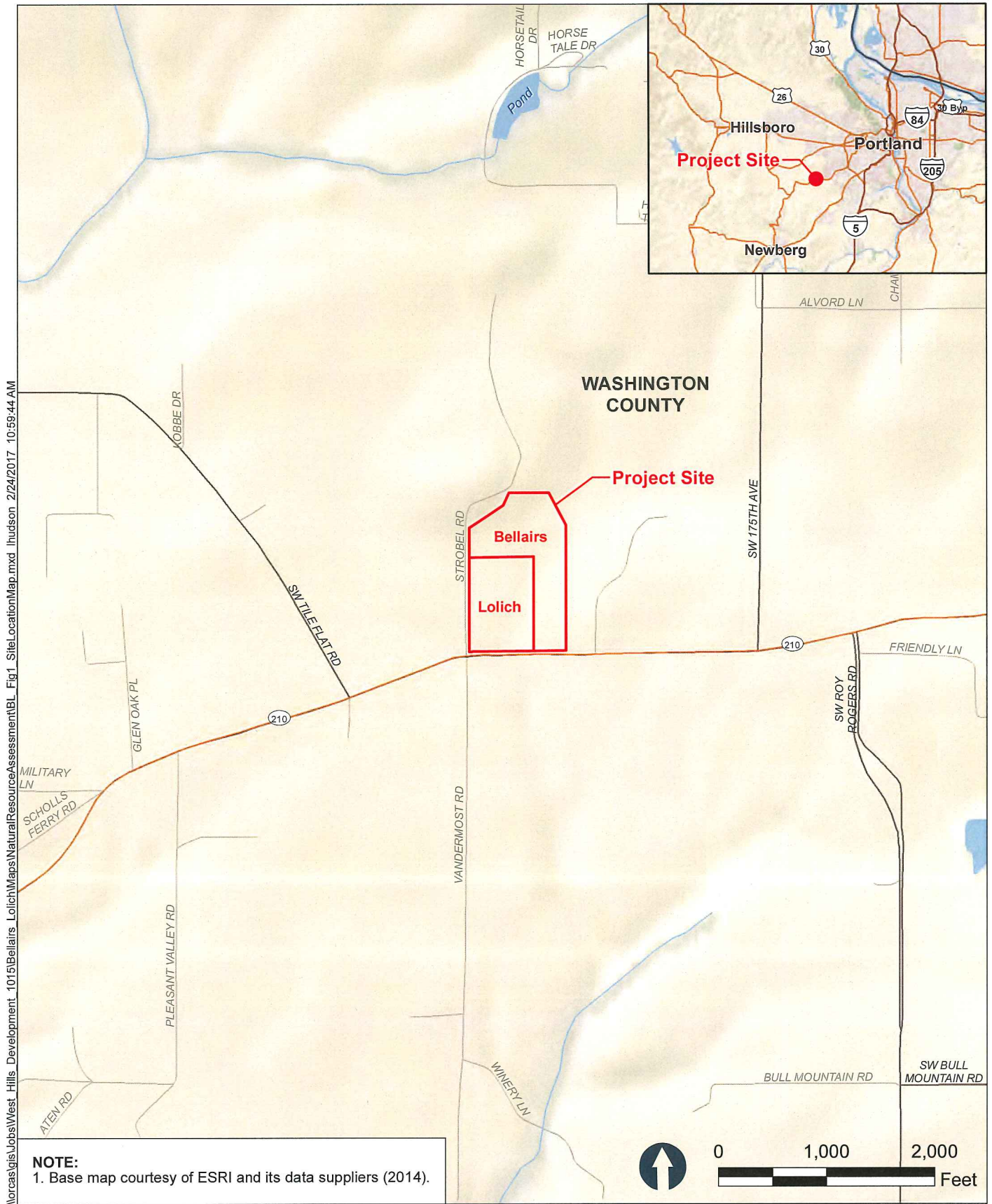
10 REFERENCES

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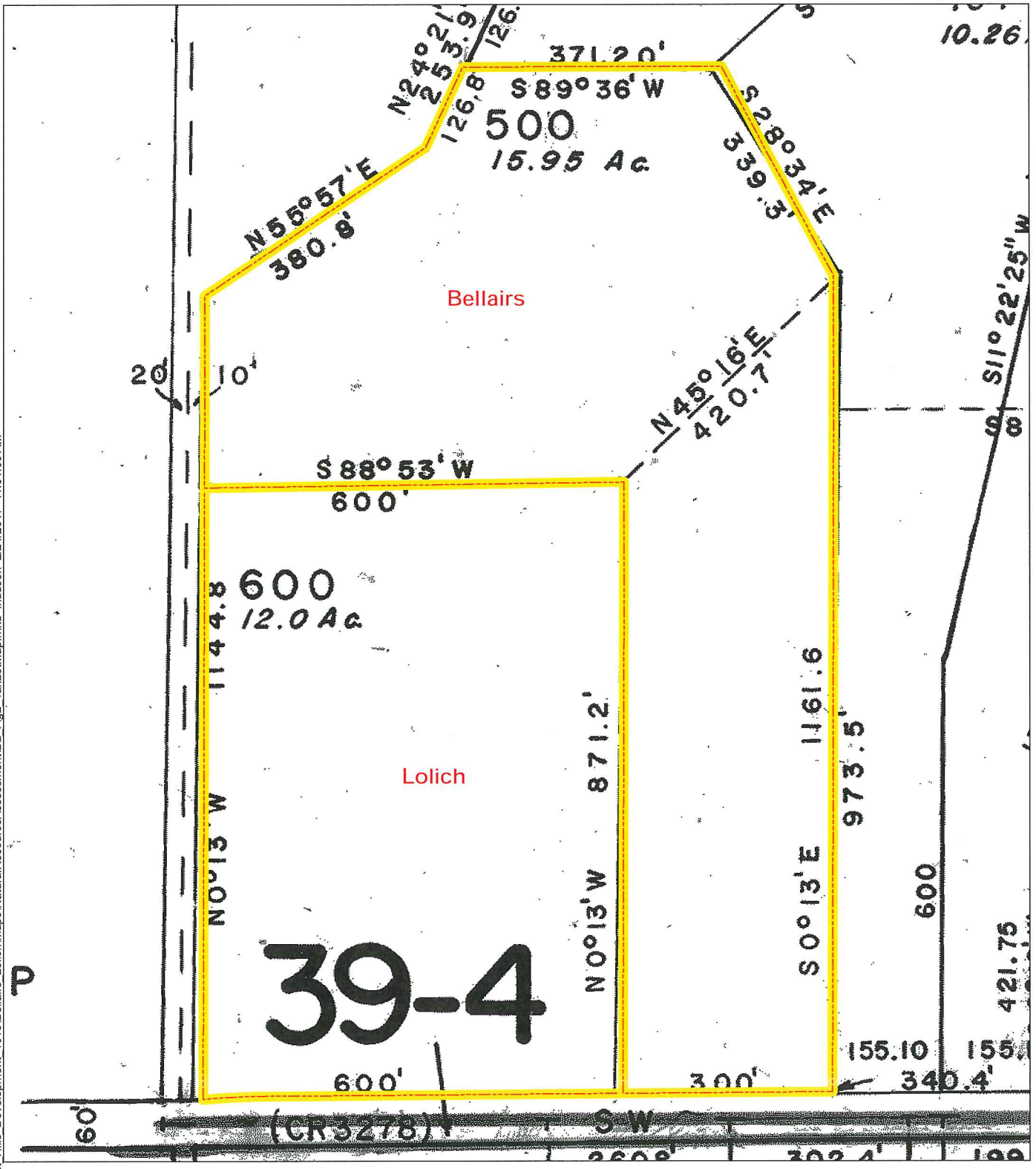
FIGURES



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Figure 1
 Site Location Map
 Natural Resource Assessment (Bellairs and Lolich Properties)
 West Hills Land Development: The Ridge at South Cooper Mountain

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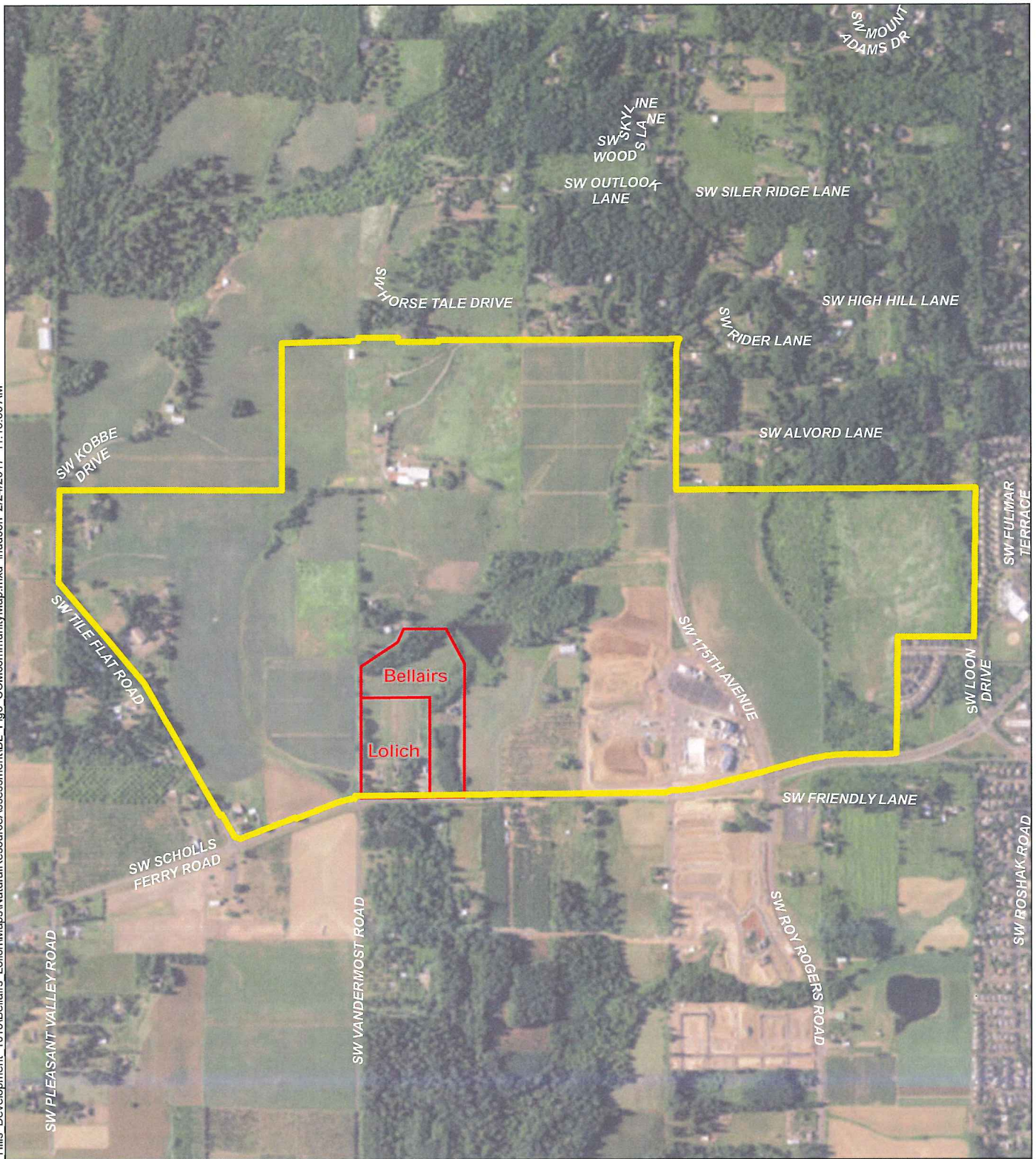
Project Site Boundary

NOTE:
1. Tax lot map acquired from Washington County.



Figure 2
Tax Lot Map
Natural Resource Assessment (Bellairs and Lolich Properties)
West Hills Land Development: The Ridge at South Cooper Mountain

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Project Site Boundary
 South Cooper Mountain Community Boundary

NOTE:
1. Aerial imagery acquired from Google Earth (2016).



0 600 1,200

 Feet


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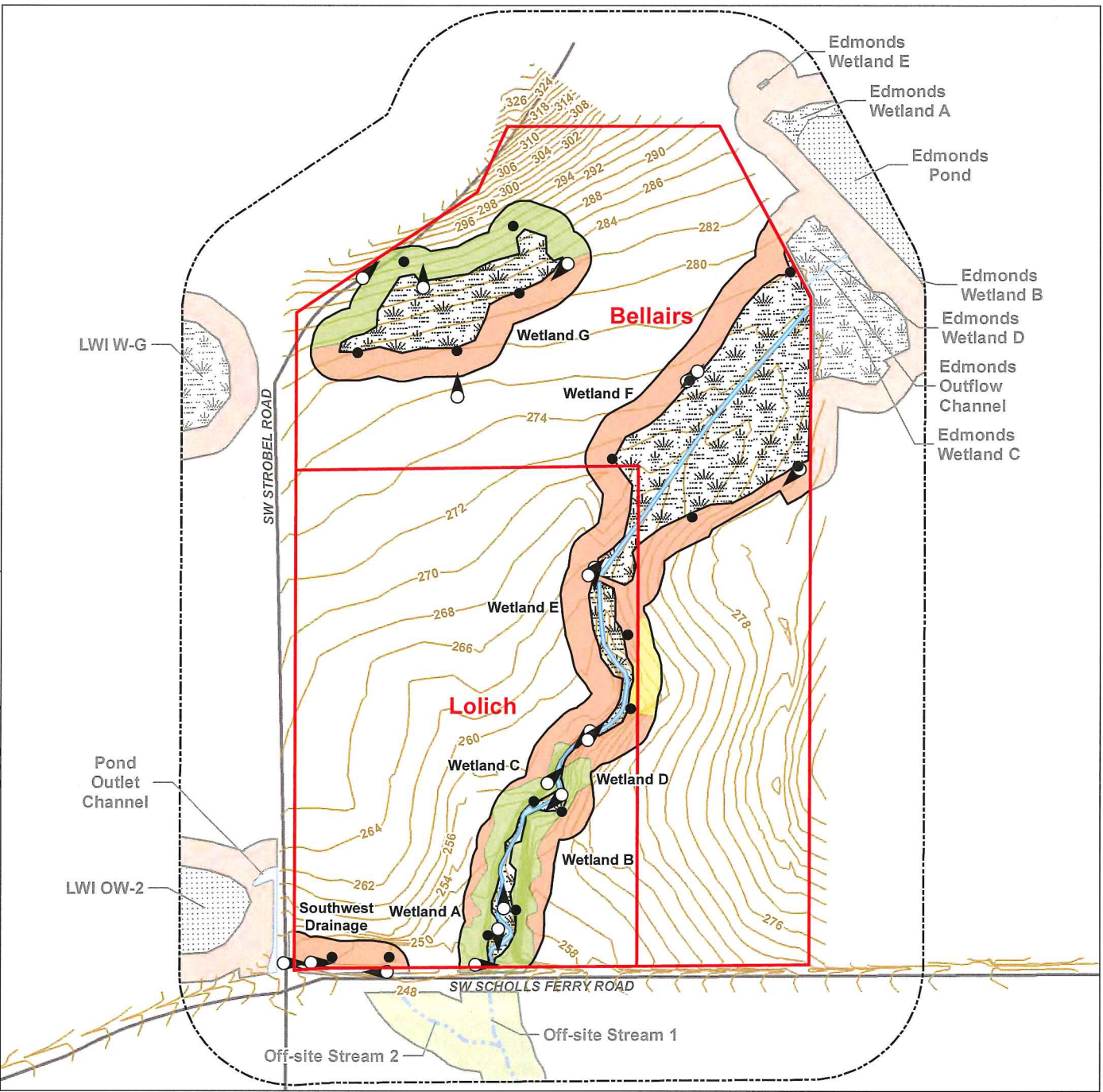
 Project Site Boundary  Study Area Boundary

NOTE:
1. Aerial imagery acquired from Google Earth (2016).



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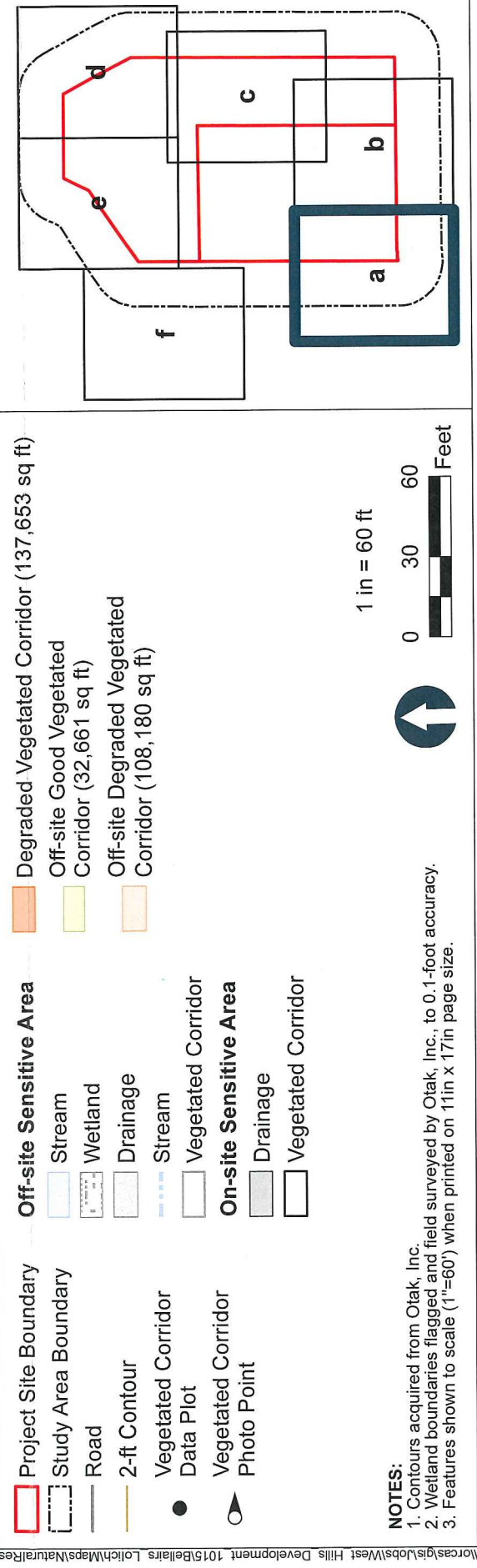
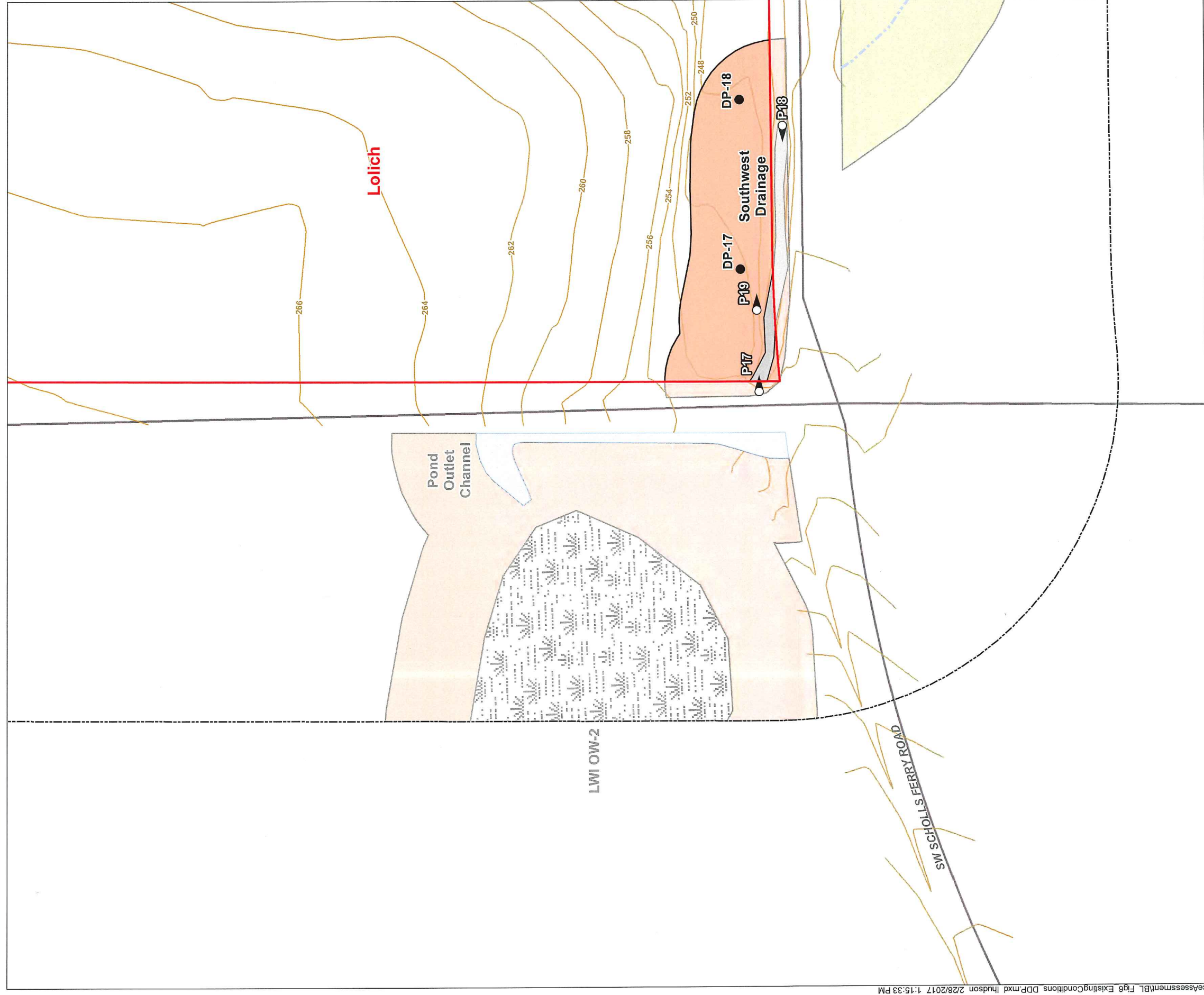


| | | | |
|-----------------------------------|-------------------------------|--------------------------------|--------------------------------------|
| Project Site Boundary | VC Photo Point | Off-site Sensitive Area | Good VC (60,554 sq ft) |
| Study Area Boundary | On-site Sensitive Area | Stream | Marginal VC (6,715 sq ft) |
| Road | Stream | Drainage | Degraded VC (137,653 sq ft) |
| 2-ft Contour | Drainage | Wetland | Off-site Good VC (32,661 sq ft) |
| Vegetated Corridor (VC) Data Plot | Delineated Wetland | Pond | Off-site Degraded VC (108,180 sq ft) |
| | VC | VC | |

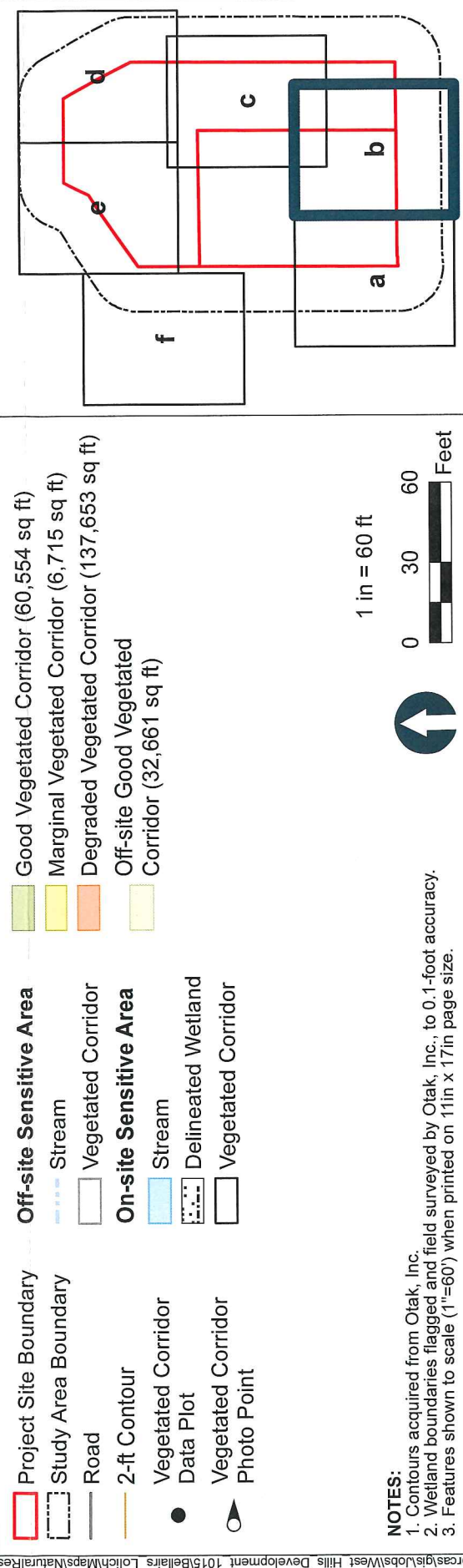
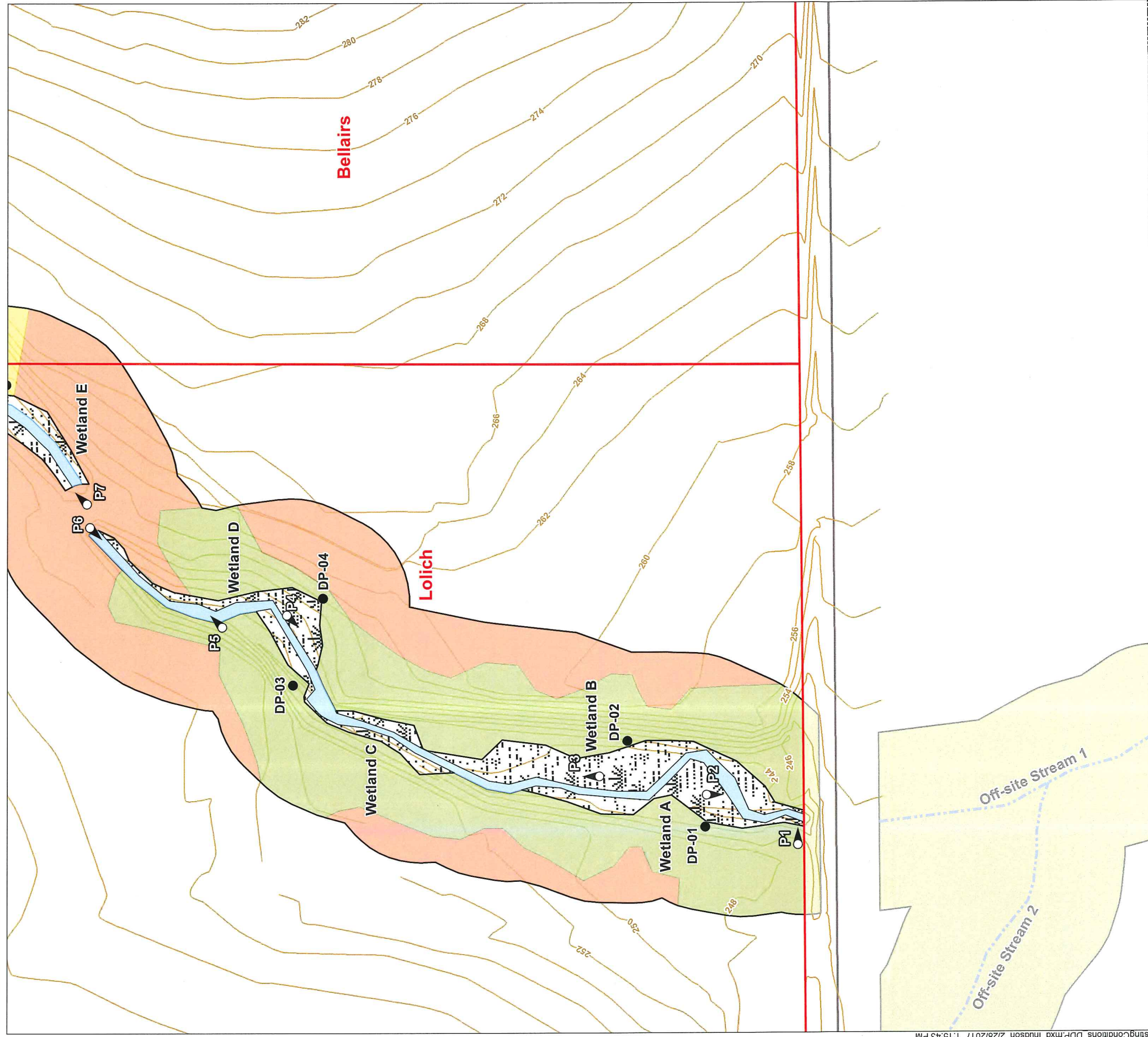
NOTES:
 1. Wetland boundaries flagged and field surveyed by Otak, Inc., to 0.1-foot accuracy.
 2. Contours acquired from Otak, Inc.



Figure 5
 Existing Conditions Overview Map
 Natural Resource Assessment (Bellairs and Lolich Properties)
 West Hills Land Development: The Ridge at South Cooper Mountain



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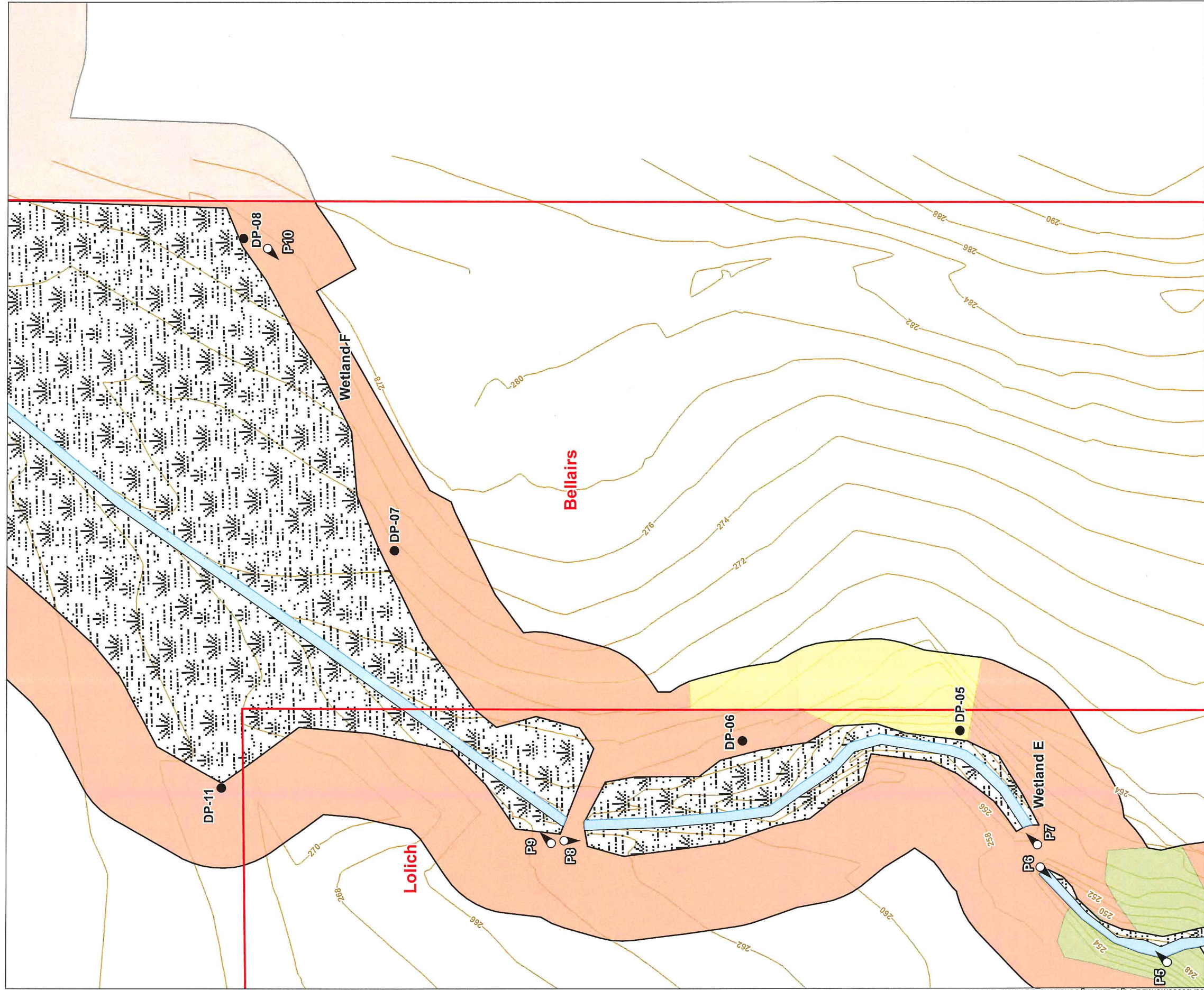


NOTES:

- Contours acquired from Otak, Inc.
- Wetland boundaries flagged and field surveyed by Otak, Inc., to 0.1-foot accuracy.
- Features shown to scale (1"=60') when printed on 11in x 17in page size.



Figure 6b
Existing Conditions Map
Natural Resource Assessment (Bellairs and Lolich Properties)
West Hills Land Development: The Ridge at South Cooper Mountain



| | | | |
|--|------------------------------|--|-------------------------------------------------------------|
| | Project Site Boundary | | Good Vegetated Corridor (60,554 sq ft) |
| | Study Area Boundary | | Marginal Vegetated Corridor (6,715 sq ft) |
| | 2-ft Contour | | Degraded Vegetated Corridor (137,653 sq ft) |
| | Vegetated Corridor | | Off-site Degraded Vegetated Corridor (108,180 sq ft) |
| | Data Plot | | Stream |
| | Vegetated Corridor | | Delineated Wetland |
| | Photo Point | | Vegetated Corridor |

NOTES:
 1. Contours acquired from Otak, Inc.
 2. Wetland boundaries flagged and field surveyed by Otak, Inc., to 0.1-foot accuracy.
 3. Features shown to scale (1"=60') when printed on 11in x 17in page size.

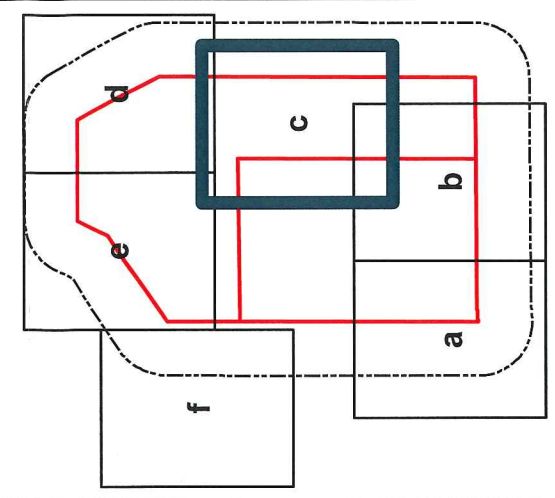
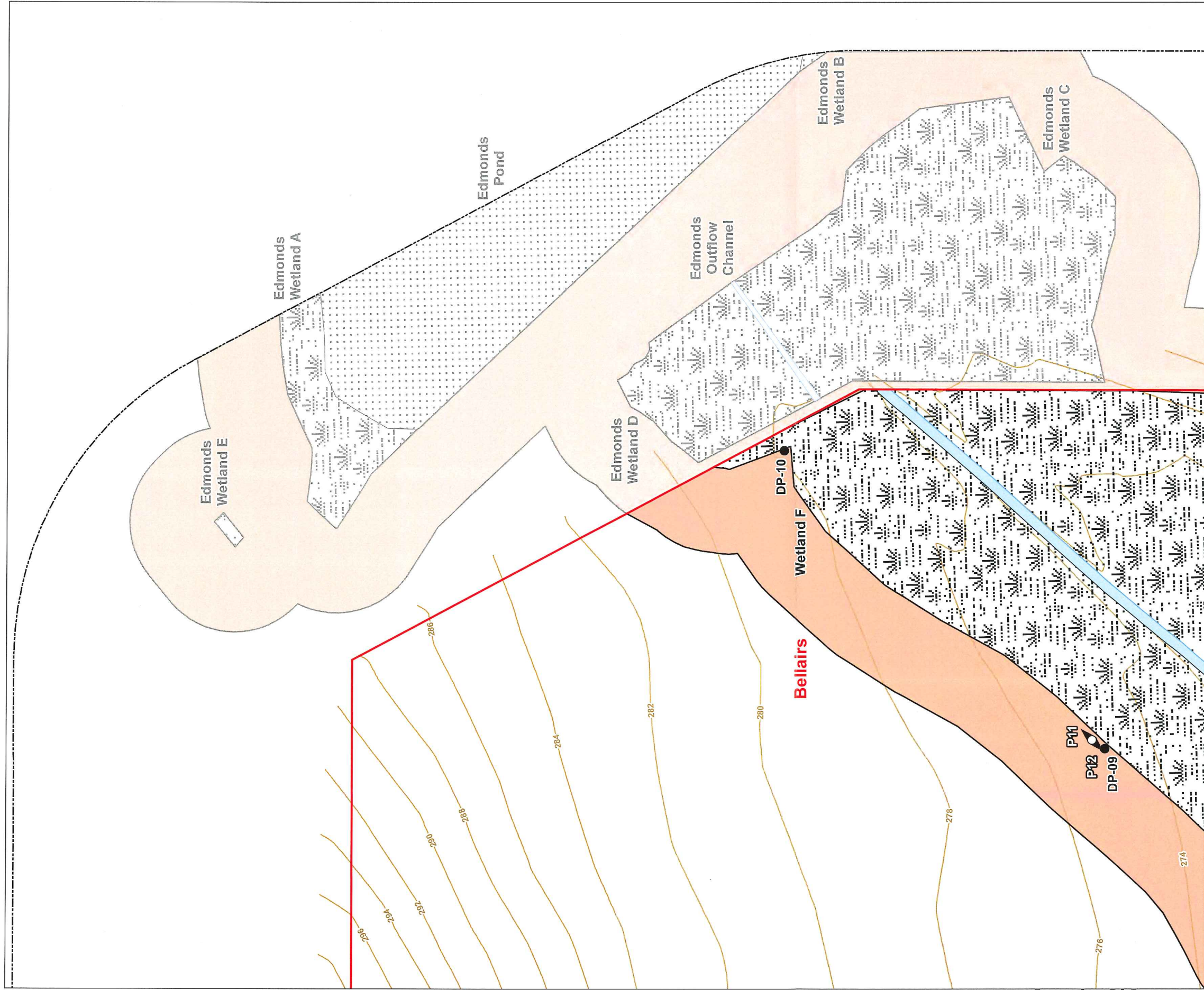


Figure 6c
 Existing Conditions Map
 Natural Resource Assessment (Bellairs and Lolich Properties)
 West Hills Land Development: The Ridge at South Cooper Mountain



| | | |
|-----------------------|-------------------------|------------------------------------------------------|
| Project Site Boundary | Off-site Sensitive Area | Degraded Vegetated Corridor (137,653 sq ft) |
| Study Area Boundary | Stream | Off-site Degraded Vegetated Corridor (108,180 sq ft) |
| 2-ft Contour | Wetland | |
| Vegetated Corridor | Pond | |
| Data Plot | Vegetated Corridor | |
| Vegetated Corridor | On-site Sensitive Area | |
| Photo Point | Stream | |
| | Delineated Wetland | |
| | Vegetated Corridor | |

1 in = 60 ft

0 30 60 Feet

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NOTES:
 1. Contours acquired from Otak, Inc.
 2. Wetland boundaries flagged and field surveyed by Otak, Inc., to 0.1-foot accuracy.
 3. Features shown to scale (1"=60') when printed on 11in x 17in page size.

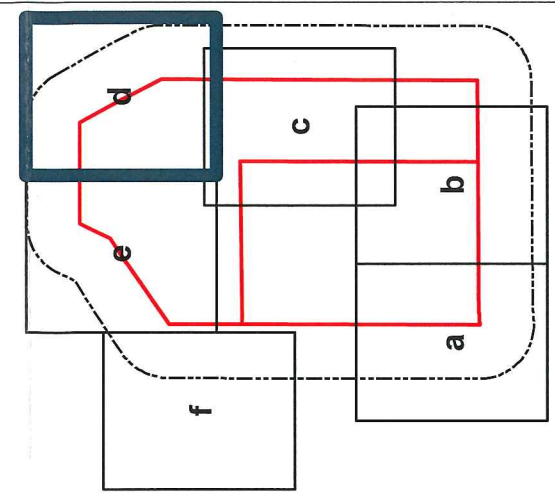
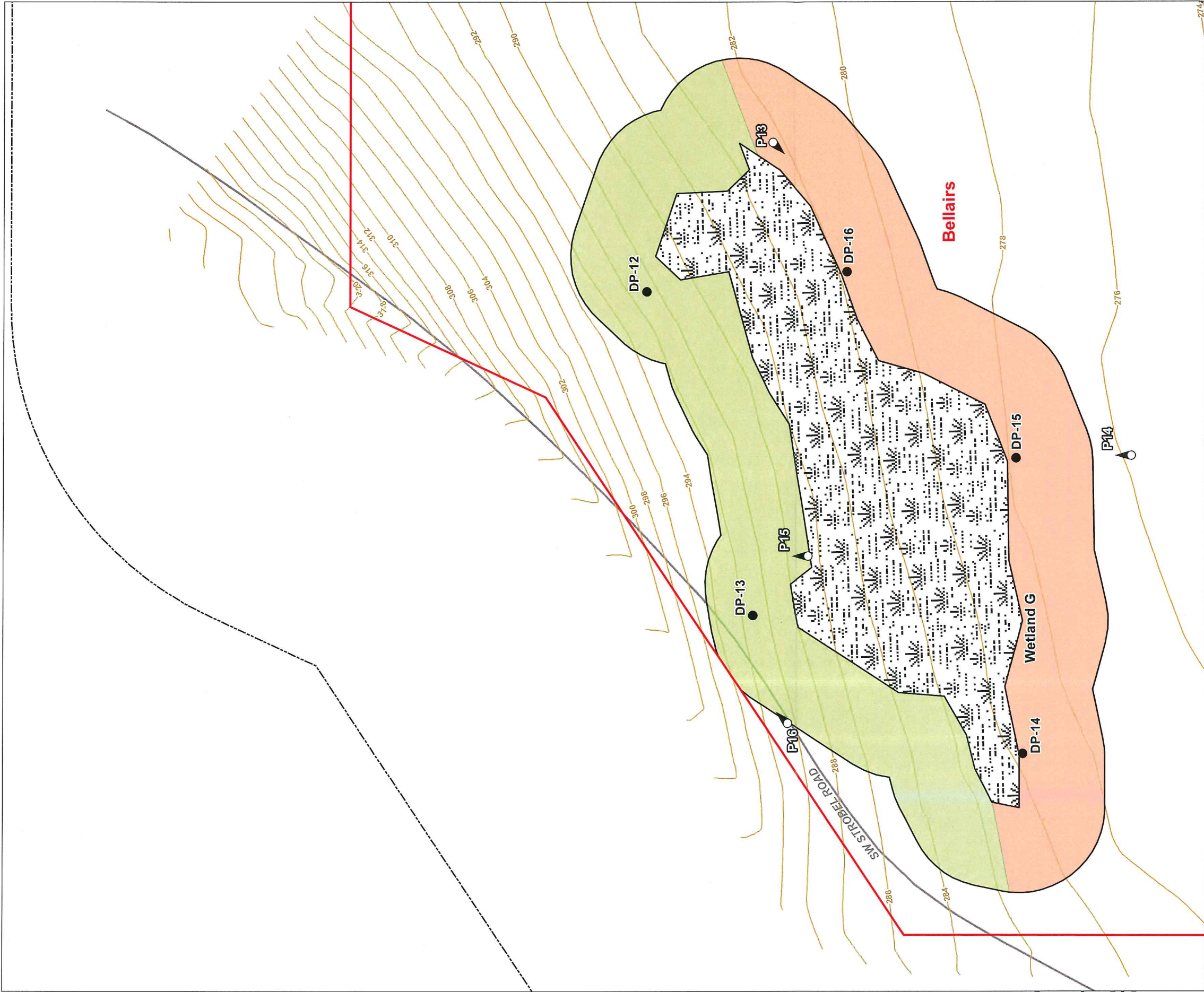


Figure 6d
 Existing Conditions Map
 Natural Resource Assessment (Bellairs and Lolich Properties)
 West Hills Land Development: The Ridge at South Cooper Mountain

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- Project Site Boundary
- Study Area Boundary
- Road
- 2-ft Contour
- Good Vegetated Corridor (60,554 sq ft)
- Degraded Vegetated Corridor (137,653 sq ft)
- Delineated Wetland
- Vegetated Corridor

- Vegetated Corridor
- Data Plot
- Vegetated Corridor
- Photo Point

NOTES:
 1. Contours acquired from Otak, Inc.
 2. Wetland boundaries flagged and field surveyed by Otak, Inc., to 0.1-foot accuracy.
 3. Features shown to scale (1"=60') when printed on 11in x 17in page size.

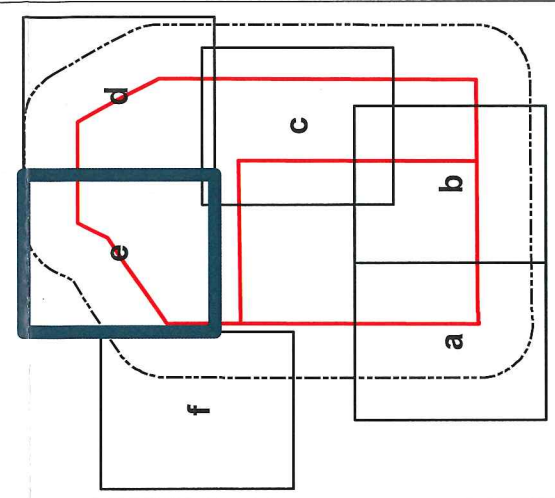
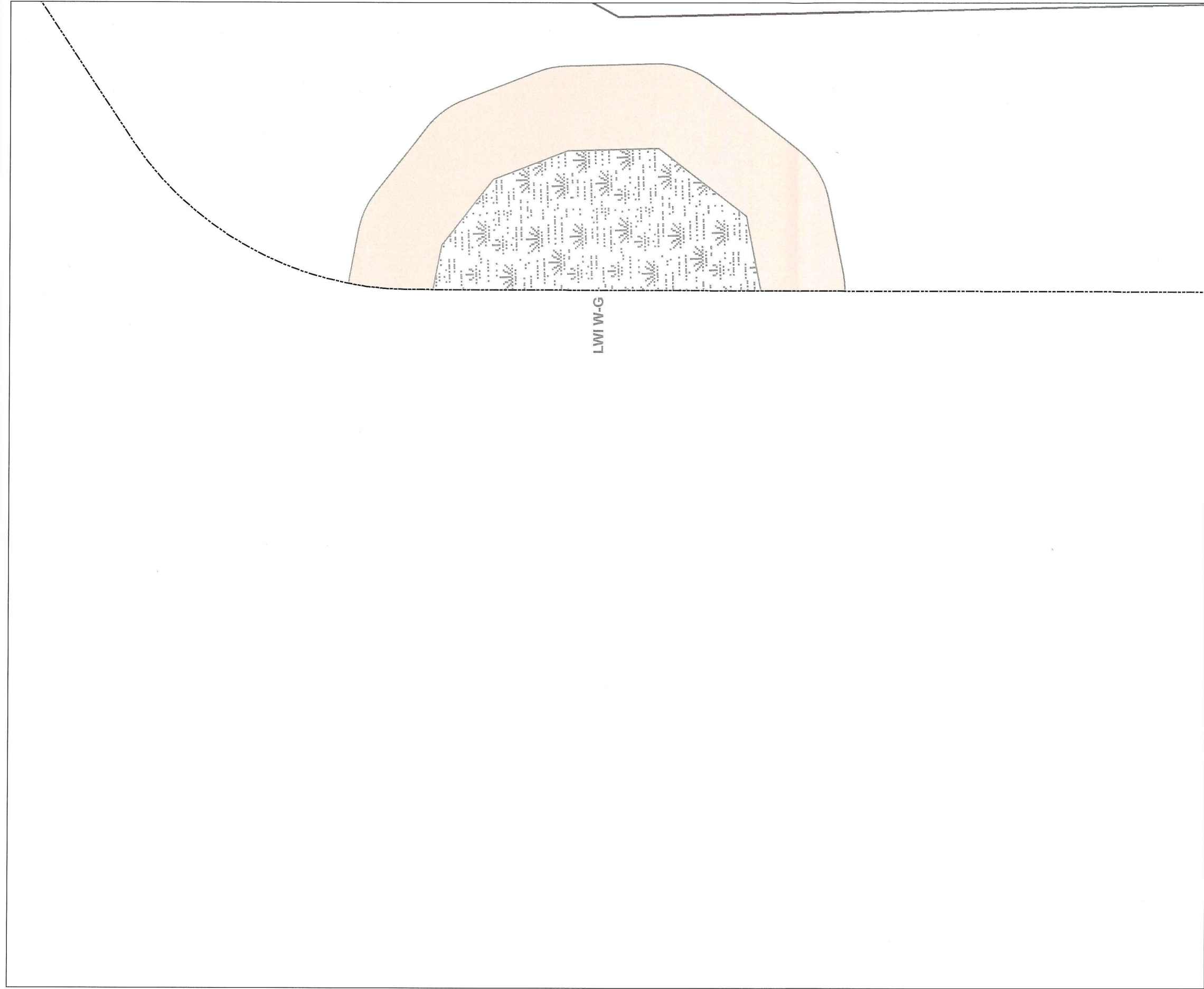
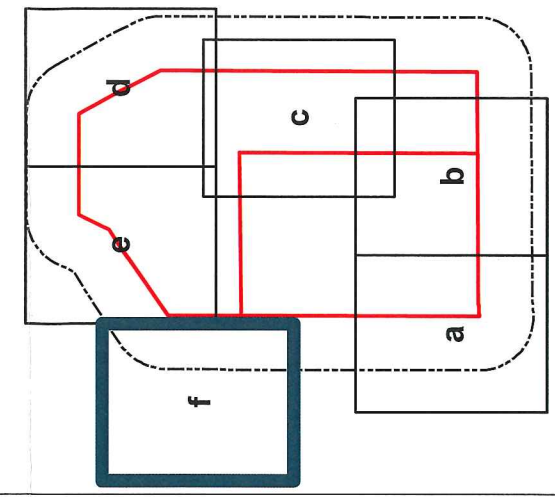
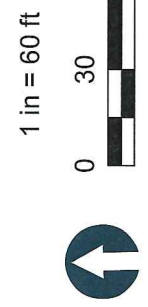


Figure 6e
 Existing Conditions Map
 Natural Resource Assessment (Bellairs and Lolich Properties)
 West Hills Land Development: The Ridge at South Cooper Mountain



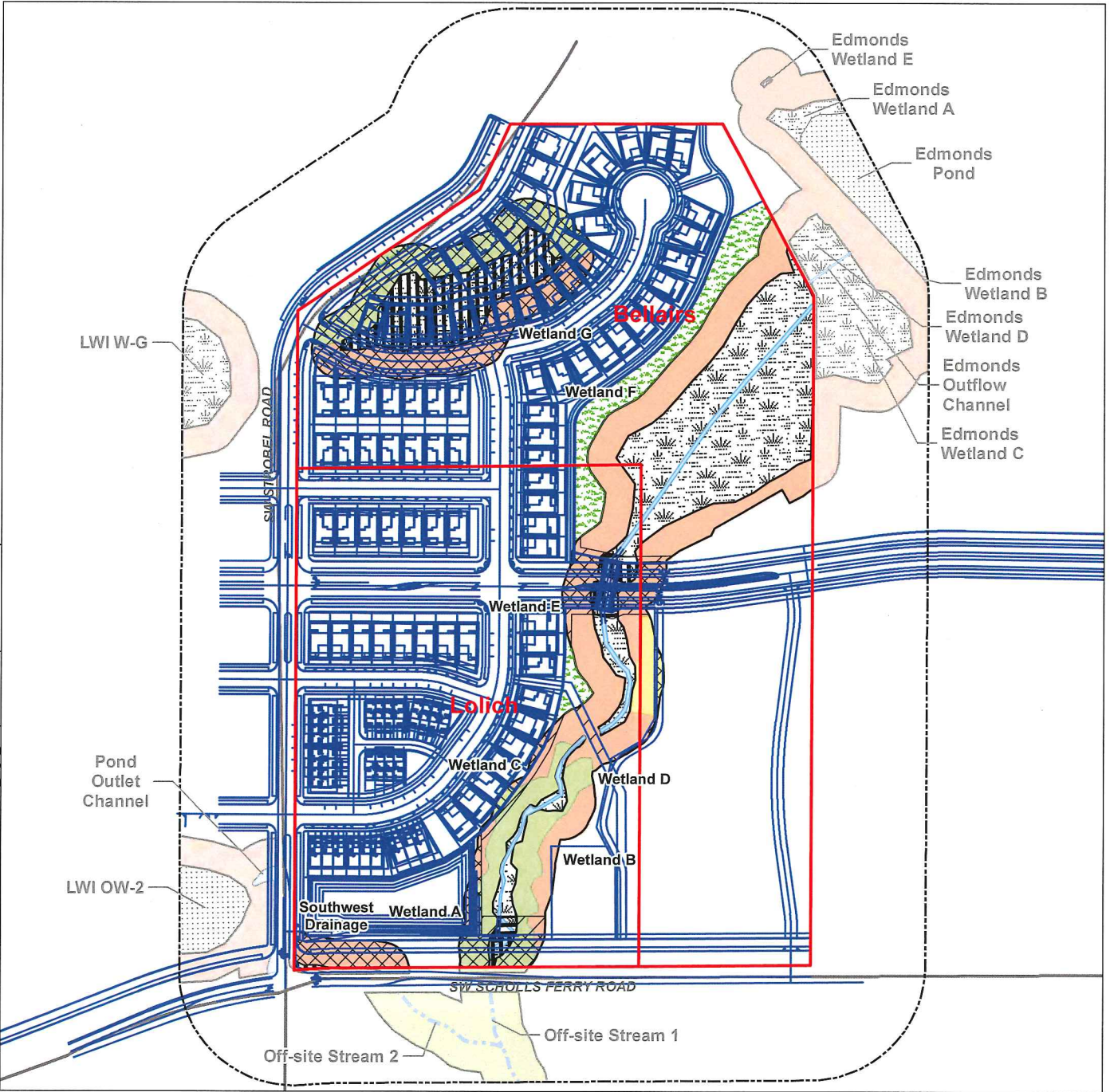
- Study Area Boundary
- Road
- Off-site Sensitive Area**
 - Wetland
 - Vegetated Corridor
- Off-site Degraded Vegetated Corridor (108,180 sq ft)**

NOTES:
 1. Contours acquired from Otak, Inc.
 2. Wetland boundaries flagged and field surveyed by Otak, Inc., to 0.1-foot accuracy.
 3. Features shown to scale (1"=60') when printed on 11in x 17in page size.



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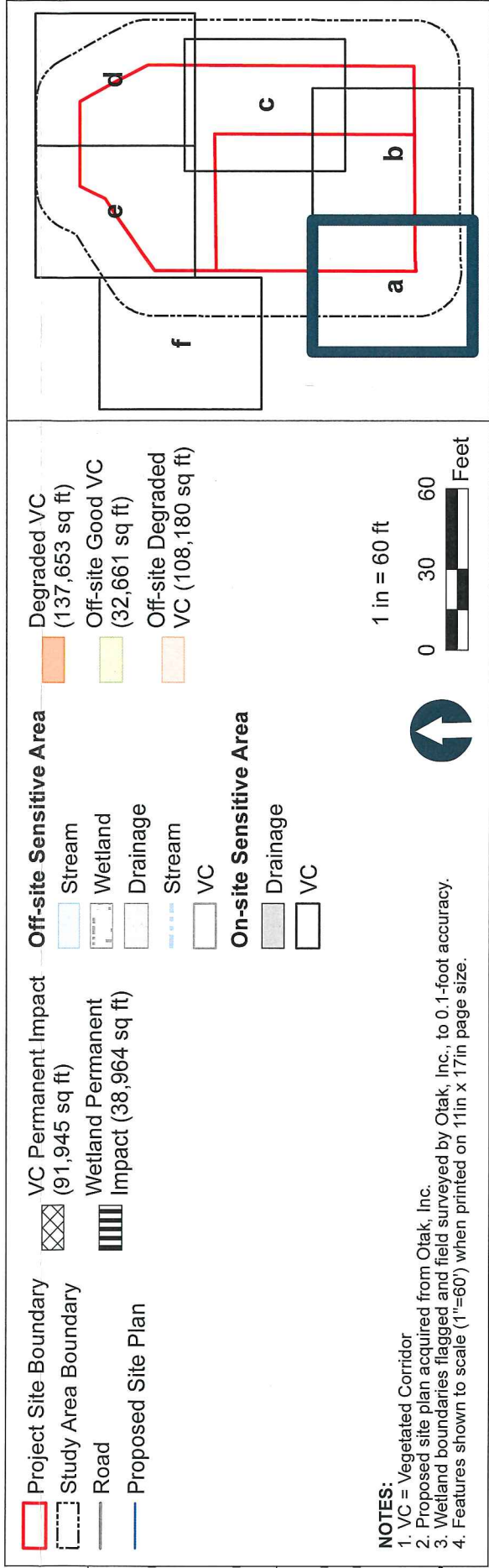
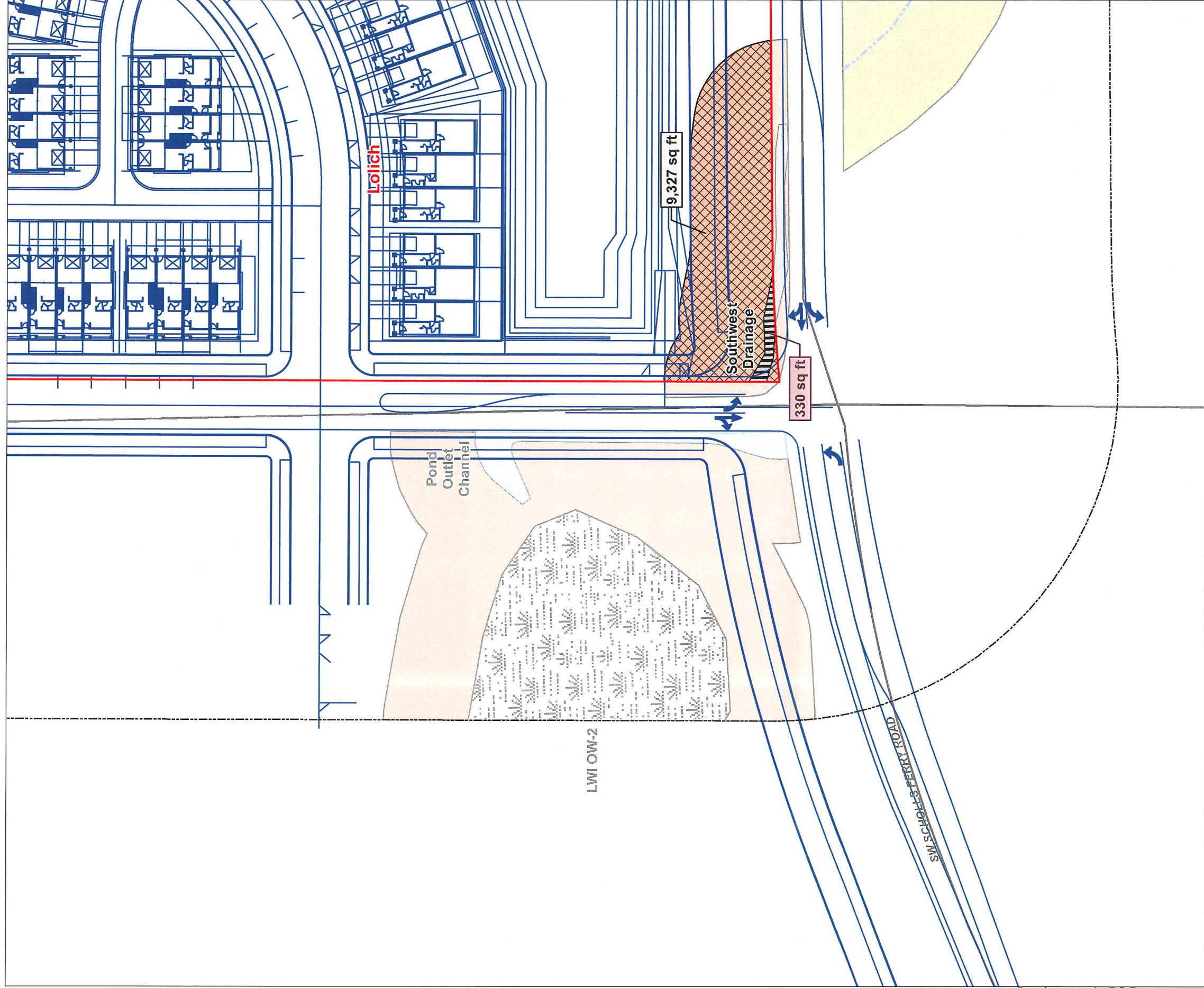


| | | | | |
|------------------------------------|-----------------------------------------|---------------------------------|--------------------------------|-------------------------------|
| Project Site Boundary | VC Permanent Impact (91,945 sq ft) | Good VC (60,554 sq ft) | Off-site Sensitive Area | On-site Sensitive Area |
| Study Area Boundary | VC Temporary Impact (9,177 sq ft) | Marginal VC (6,715 sq ft) | Stream | Stream |
| Road | Wetland Permanent Impact (38,964 sq ft) | Degraded VC (137,653 sq ft) | Drainage | Drainage |
| Proposed Site Plan | Wetland Temporary Impact (2,151 sq ft) | Off-site Good VC (32,661 sq ft) | Wetland | Delineated Wetland |
| Proposed Mitigation (30,565 sq ft) | Off-site Degraded VC (108,180 sq ft) | VC | Pond | VC |

NOTES:
 1. Wetland boundaries flagged and field surveyed by Otak, Inc., to 0.1-foot accuracy.
 2. Proposed site plan acquired from Otak, Inc.
 3. VC = Vegetated Corridor



Figure 7
 Proposed Development Overview Map
 Natural Resource Assessment (Bellairs and Lolich Properties)
 West Hills Land Development: The Ridge at South Cooper Mountain



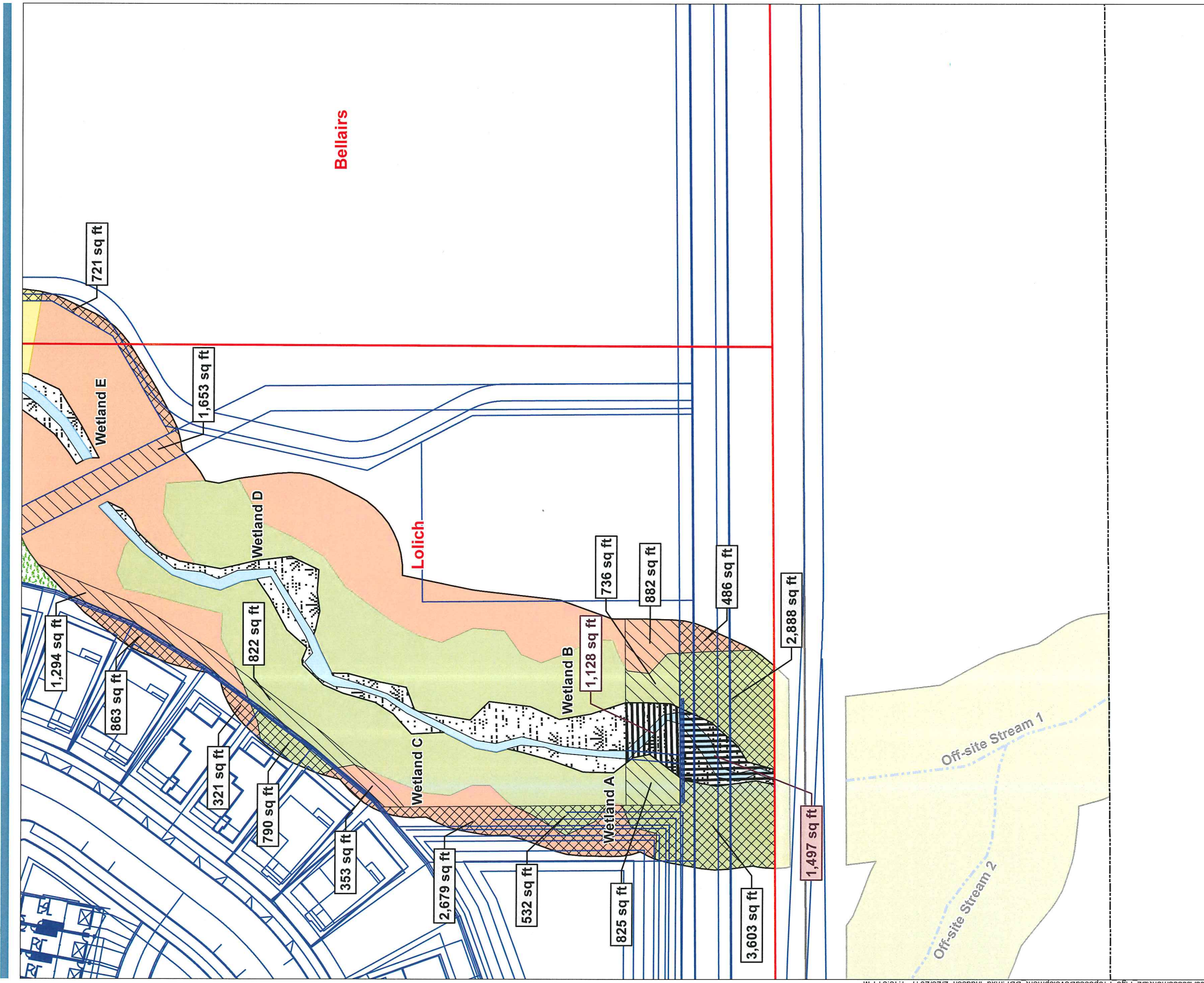
NOTES:

1. VC = Vegetated Corridor
2. Proposed site plan acquired from Otak, Inc.
3. Wetland boundaries flagged and field surveyed by Otak, Inc., to 0.1-foot accuracy.
4. Features shown to scale (1"=60') when printed on 11in x 17in page size.



Figure 8a
Proposed Development Map
Natural Resource Assessment (Bellairs and Lolich Properties)
West Hills Land Development: The Ridge at South Cooper Mountain

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Legend:

- Proposed Mitigation:**
 - Proposed Mitigation (30,565 sq ft)
 - VC Permanent Impact (91,945 sq ft)
 - VC Temporary Impact (9,177 sq ft)
 - Wetland Permanent Impact (38,964 sq ft)
 - Wetland Temporary Impact (2,151 sq ft)
- Off-site Sensitive Area:**
 - Stream
 - VC
- On-site Sensitive Area:**
 - Stream
 - Delineated Wetland
 - VC
- Vegetated Corridor (VC) Categories:**
 - Good VC (60,554 sq ft)
 - Marginal VC (6,715 sq ft)
 - Degraded VC (137,653 sq ft)
 - Off-site Good VC (32,661 sq ft)

Scale: 1 in = 60 ft

Scale Bar: 0, 30, 60 Feet

North Arrow: ↑

NOTES:

- VC = Vegetated Corridor
- Proposed site plan acquired from Otak, Inc.
- Wetland boundaries flagged and field surveyed by Otak, Inc., to 0.1-foot accuracy.
- Features shown to scale (1"=60') when printed on 11in x 17in page size.



Figure 8b
Proposed Development Map
Natural Resource Assessment (Bellairs and Lolich Properties)
West Hills Land Development: The Ridge at South Cooper Mountain

\\cortsys\jobs\West Hills Development\1015Bellairs_Lolich\Maps\NaturalResourceAssessment\BL_Fig8_ProposedDevelopment_DDF.mxd Hudson 2/28/2017 1:13:51 PM

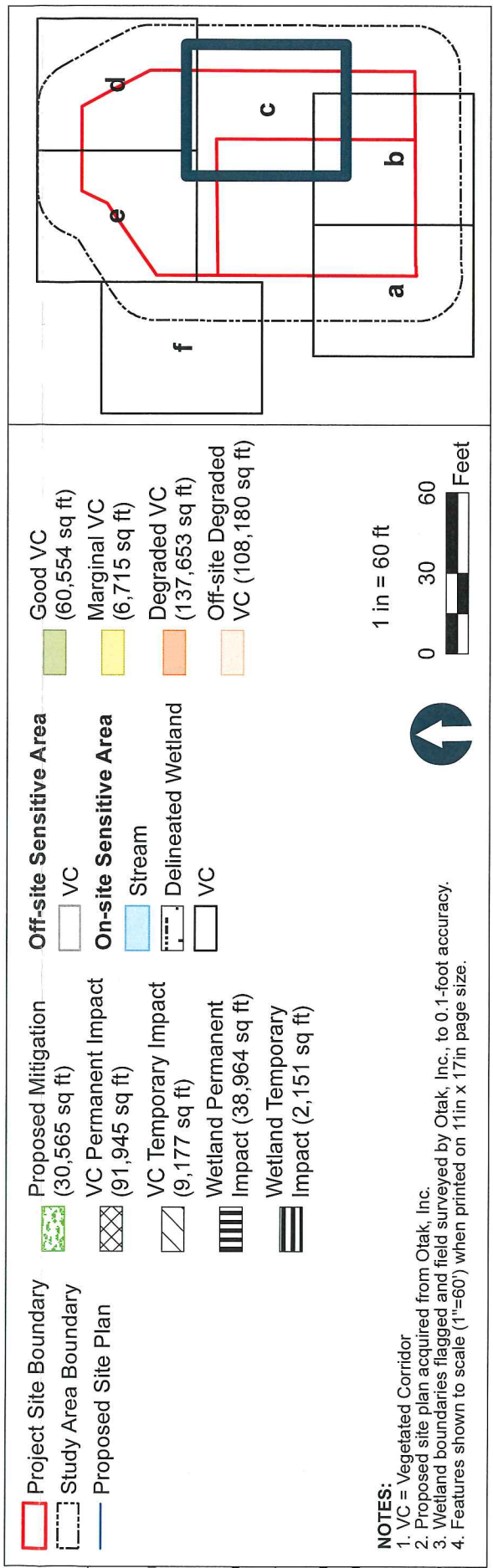
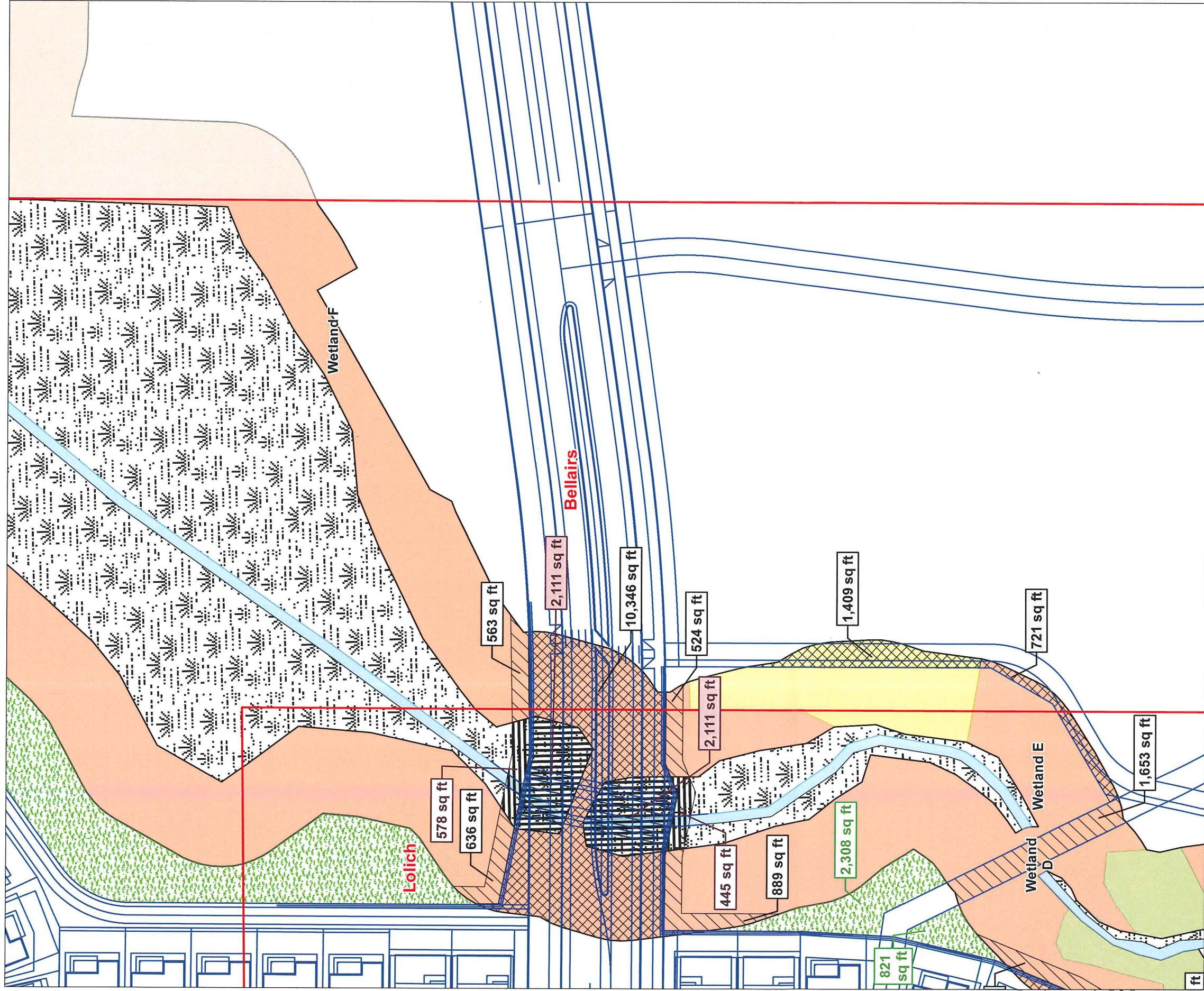
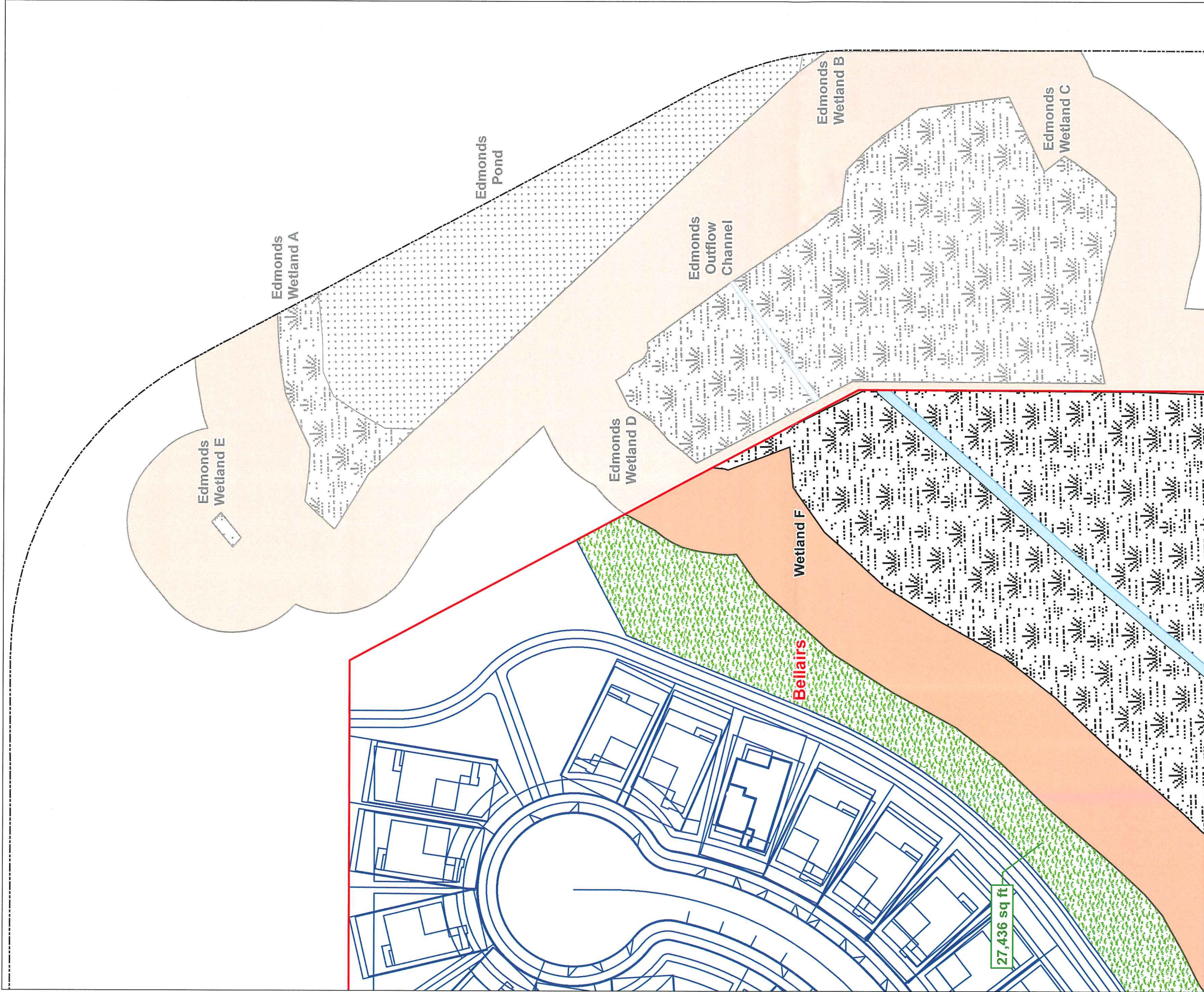


Figure 8c
 Proposed Development Map
 Natural Resource Assessment (Bellairs and Lolich Properties)
 West Hills Land Development: The Ridge at South Cooper Mountain



| | | | |
|-----------------------|------------------------------------|--------------------------------|--------------------------------------|
| Project Site Boundary | Proposed Mitigation (30,565 sq ft) | Off-site Sensitive Area | Degraded VC (137,653 sq ft) |
| Study Area Boundary | Stream | Stream | Off-site Degraded VC (108,180 sq ft) |
| Proposed Site Plan | Wetland | Pond | |
| | VC | VC | |
| | On-site Sensitive Area | Stream | |
| | Delineated Wetland | Delineated Wetland | |
| | VC | VC | |

1 in = 60 ft

0 30 60 Feet

NOTES:
 1. VC = Vegetated Corridor
 2. Proposed site plan acquired from Otak, Inc.
 3. Wetland boundaries flagged and field surveyed by Otak, Inc., to 0.1-foot accuracy.
 4. Features shown to scale (1"=60') when printed on 11in x 17in page size.

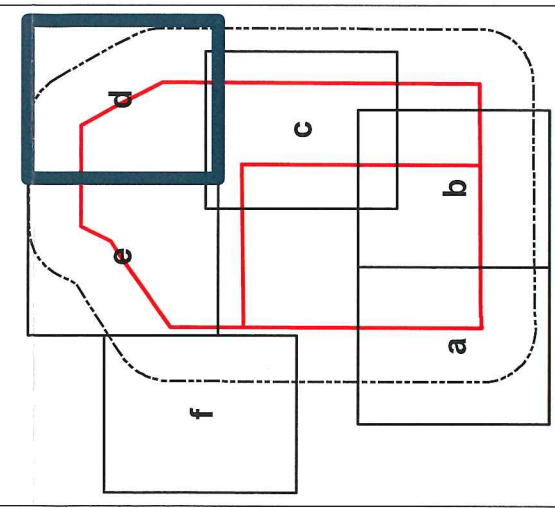
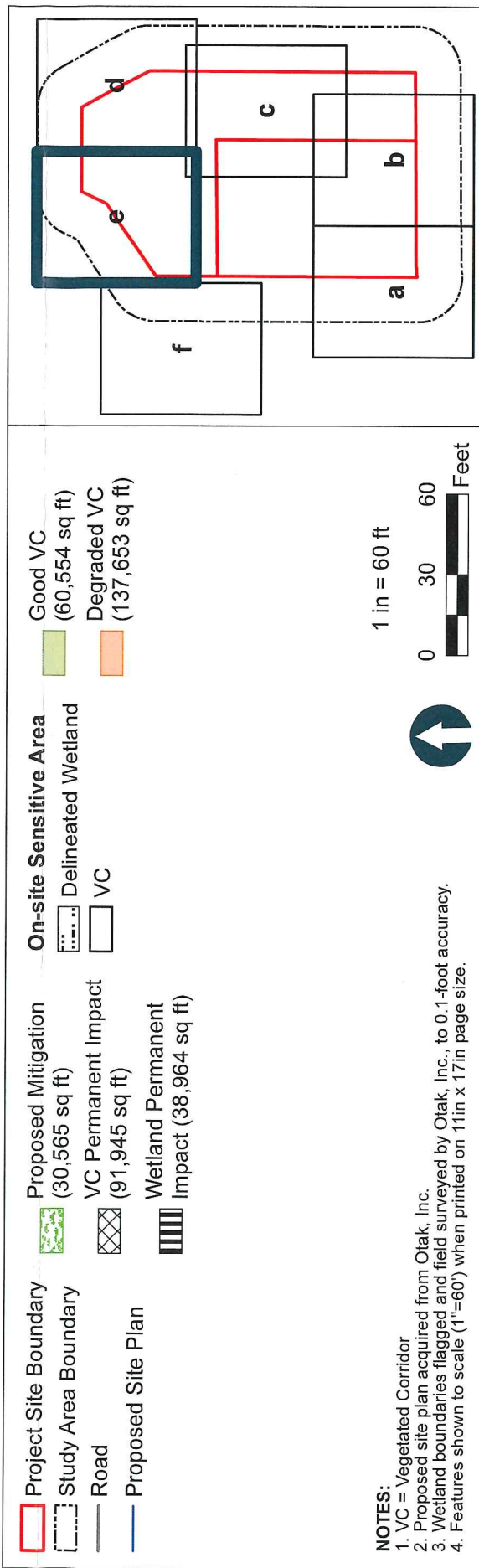
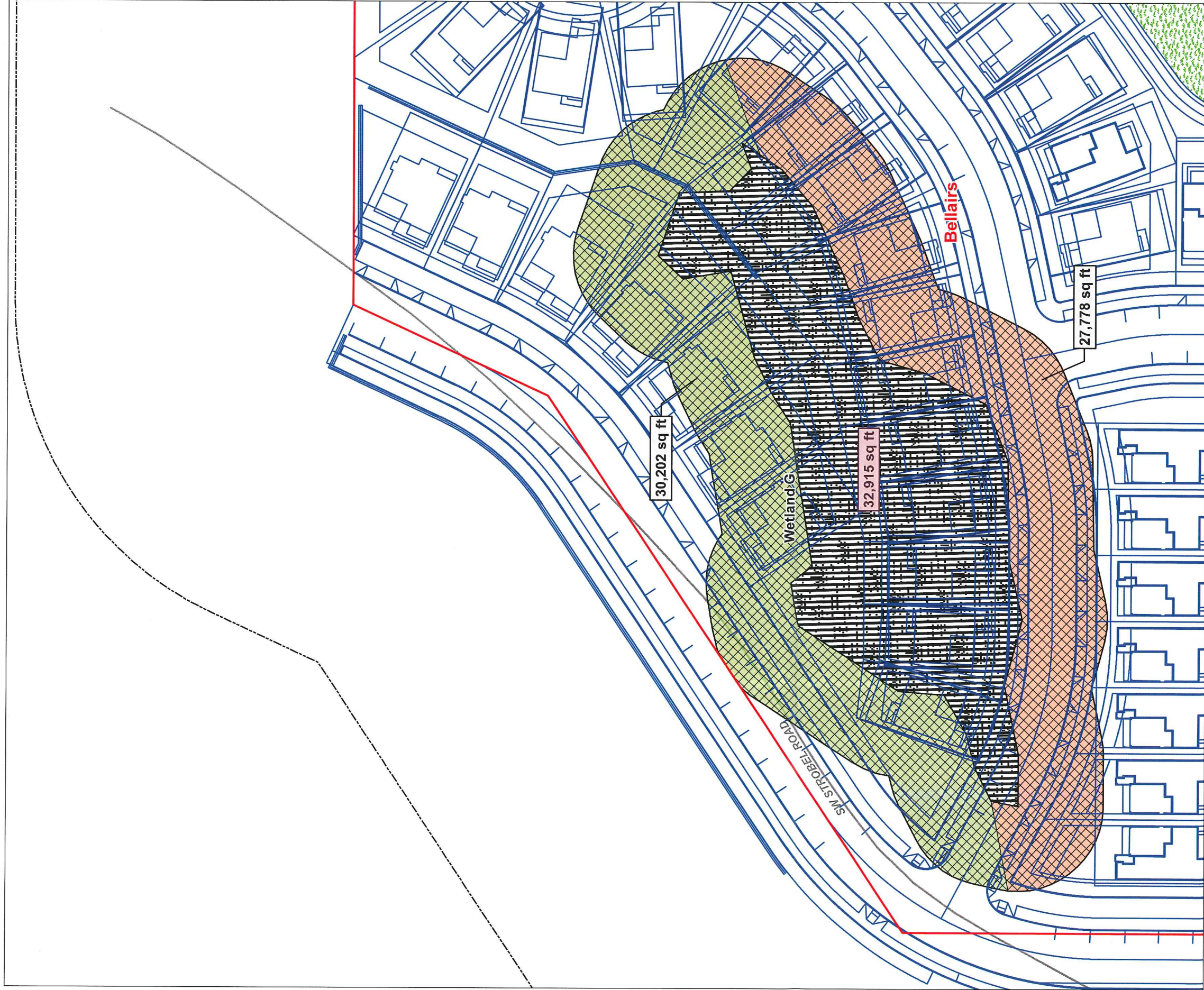


Figure 8d
 Proposed Development Map
 Natural Resource Assessment (Bellairs and Lolich Properties)
 West Hills Land Development: The Ridge at South Cooper Mountain

North Carolina State University, Raleigh, NC. 2017. 11/14/2017 1:14:03 PM



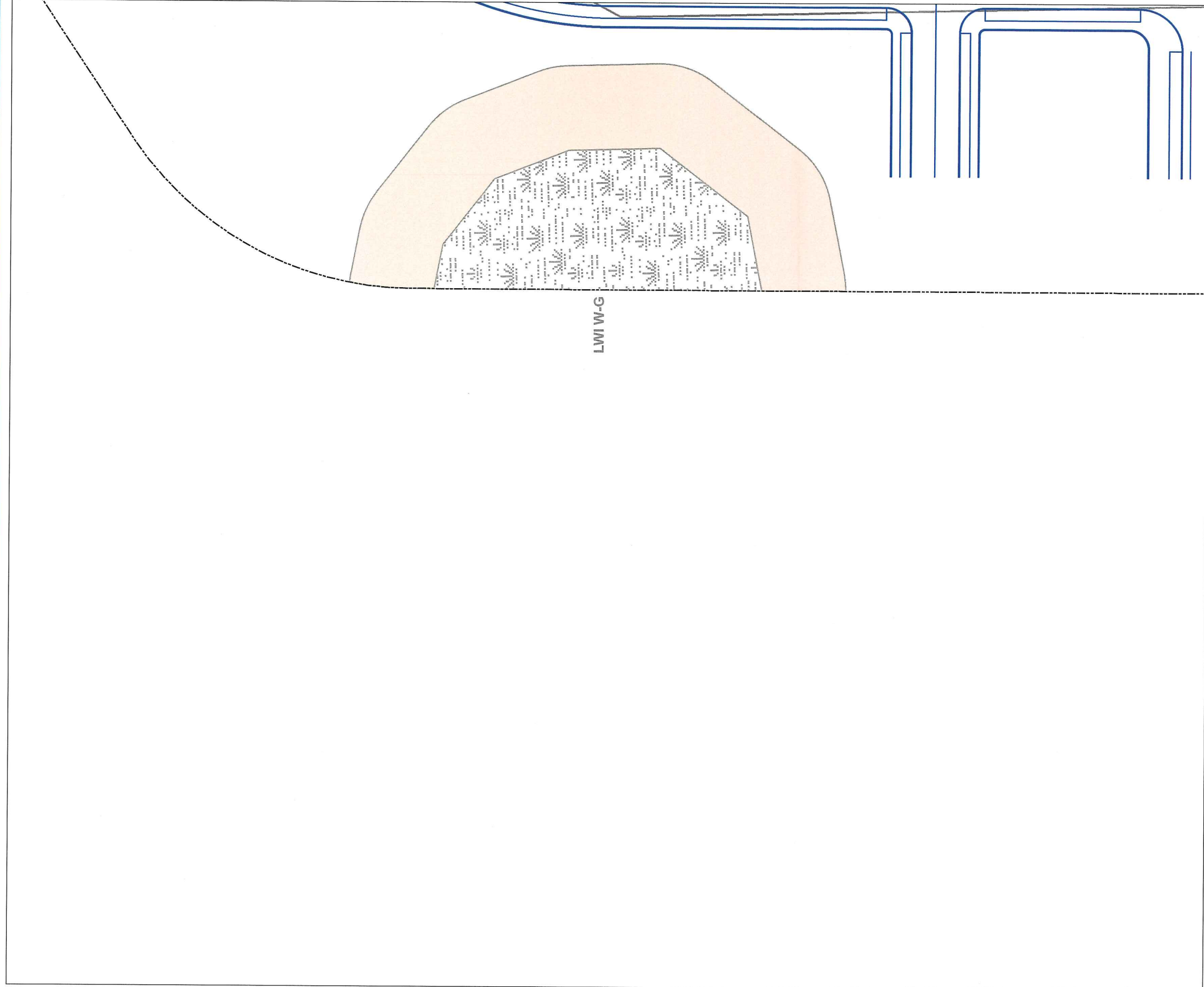
NOTES:

- VC = Vegetated Corridor
- Proposed site plan acquired from Otak, Inc.
- Wetland boundaries flagged and field surveyed by Otak, Inc., to 0.1-foot accuracy.
- Features shown to scale (1"=60') when printed on 11in x 17in page size.



Figure 8e
Proposed Development Map
Natural Resource Assessment (Bellairs and Lolich Properties)
West Hills Land Development: The Ridge at South Cooper Mountain

\\ncorsg\slabs\West Hills Development\1015Bellairs_Lolich\Maps\NaturalResourceAssessment\BTL_Fig8_ProposedDevelopment_DDP.mxd Hudson 2/28/2017 1:14:10 PM

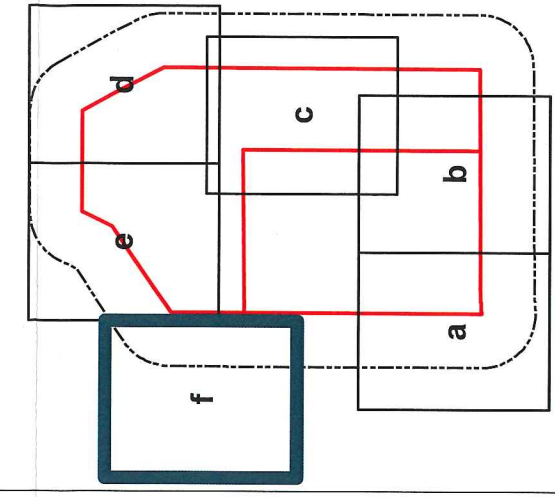


 Study Area Boundary
 Off-site Degraded VC (108, 180 sq ft)

Road
 Wetland

Proposed Site Plan
 VC

- NOTES:**
1. VC = Vegetated Corridor
 2. Proposed site plan acquired from Otak, Inc.
 3. Wetland boundaries flagged and field surveyed by Otak, Inc., to 0.1-foot accuracy.
 4. Features shown to scale (1"=60') when printed on 11in x 17in page size.



APPENDIX A
EXCERPTS FROM THE SOUTH COOPER
MOUNTAIN COMMUNITY DEVELOPMENT
PLAN

- b. *Buildings should be oriented to the street along key routes. The City should consider tailored building orientation standards so that the storefront character is continuous along the most active edges of the blocks.*
- c. *Mixed use buildings, 2 stories and taller, are encouraged.*
- d. *Future transit should be anticipated and accommodated.*
- e. *Public gathering spaces should be accommodated through a plaza, festival street, or parking area that can be converted to Saturday-market type use during community events.*

Transportation

Streets

Context

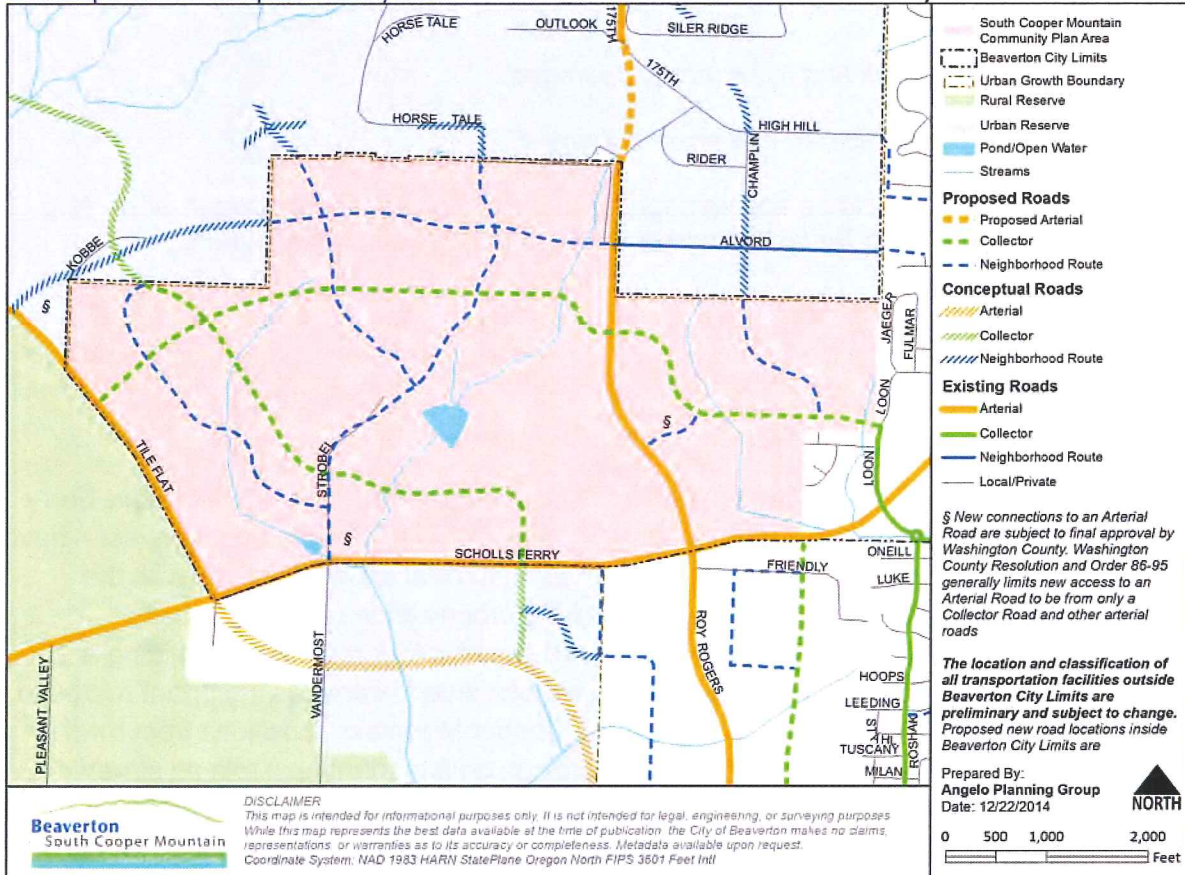
The existing major roadways that flank and run through the Community Plan area – SW Scholls Ferry Road on the south, SW 175th Avenue through the plan area, and SW Tile Flat Road on the west – have evolved over time. Historically they were farm-to-market roads and rural access routes. With the success of employment centers to the north and south, and the urbanization of the suburban communities in the Metro area, they have become even more important for regional commuting and local trips between the nearby communities. These roads will continue to serve as important routes to and through the plan area, as the land use context of south Cooper Mountain transitions from rural to urban. As urban development occurs, these arterials will provide an important new role as streets directly adjacent to urban neighborhoods, schools, and a Main Street. Accordingly, the policies in this section are intended to guide a balanced approach that provides for mobility and pedestrian safety, walking, biking, future transit, and access to urban uses.

SW Scholls Ferry Road, SW 175th Avenue and SW Tile Flat Road are under the jurisdiction of Washington County and are subject to County road standards. The policies of this plan pertaining to those streets are intended to guide selection of appropriate design treatments within the range of options allowed by the County in consultation and close coordination with the City of Beaverton and City of Tigard. A continued partnership approach will help the successful implementation of the planned transportation facilities, and adjacent land uses, in the area over time.

There are few alternatives today to the existing major roads, which all experience congestion during peak commute times. There is a need to supplement the arterial network with a connected network of collectors, neighborhood routes, and local streets to provide continuous routes that are parallel to the arterials and can offer access to and through new neighborhoods as they develop.

With several busy arterial roads bounding and splitting the Community Plan area, and important planned pedestrian destinations adjacent to them (including the future high school site and the planned Main Street area), thoughtfully designed and located pedestrian crossings will be critical to ensuring safe pedestrian access throughout the plan area. Pedestrian and bicycle connections to the planned high school and to River Terrace are particularly important for providing safe routes to school and walking and biking access that connects South Cooper Mountain and River Terrace.

Figure 10: Community Plan Street Framework



Street Policies

1. The streets planned for the Community Plan area are illustrated in Figure 10. The Beaverton Transportation System Plan and Washington County Transportation System Plans will be updated consistent with Figure 10 and will be the controlling documents for transportation planning. Should conflicts arise between the maps in Chapter 6 of the City's Comprehensive Plan and the maps in this document, those in Chapter 6 shall prevail.
2. The City of Beaverton will work with the Beaverton School District, the City of Tigard, Washington County, Tualatin Valley Fire and Rescue, Tualatin Hills Park and Recreation District, and other service providers to establish appropriate access and circulation serving the community.
3. SW Scholls Ferry Road, SW 175th Avenue, and SW Tile Flat Road are under Washington County jurisdiction. The City of Beaverton will coordinate with Washington County through transportation facility design and land use regulations and review to recognize and balance the urban mobility needs with the multi-modal urban community functions of these key roadways. The city will advocate for the objectives for each street provided below during planning and design for improvement projects affecting those streets within the Community Plan area.
 - a. SW 175th Avenue within the Community Plan area shall be improved through a coordinated approach between the City, County and adjacent land owners. The City shall proactively initiate this coordination. SW 175th Avenue should be designed to provide for mobility needs and provide an attractive and welcoming entrance to the area. Safe, protected pedestrian crossing opportunities shall be provided near important pedestrian destinations, such as the future high

school site, when a need is demonstrated and such crossings are appropriately and safely designed and located.

- b. SW Scholls Ferry Road adjacent to the Community Plan area should be designed to provide for efficient movement of vehicles, including freight, but should also provide for safe bicycle and pedestrian facilities, especially in the vicinity of the Main Street. The City of Beaverton will work with City of Tigard and Washington County to explore coordinated access, and a pedestrian crossing, in the vicinity of the high school and Main Street.*
- c. SW Tile Flat Road adjacent to the Community Plan area should retain a rural design, particularly on the west side adjacent to land designated as Rural Reserve. All expansions requiring additional right-of-way should be to the east (urban) side. Safe bicycle and pedestrian movements shall be accommodated by a shared-use pathway adjacent to the road on the east side, with trees and other landscaping to provide a visual buffer to adjacent rural lands.*
- 4. The new east-west Collector street is intended to provide a parallel route to SW Scholls Ferry Road that connects through the full width of the Community Plan area. This street shall be designed to provide a safe and comfortable connection for pedestrians and bicyclists as well as cars and to create a clear, direct and convenient route that connects the eastern, northern and western neighborhoods.*
- 5. The new north-south Collector road from SW Scholls Ferry Road through the Community Plan area is intended to provide connectivity through the Community Plan area.*
- 6. North of SW Scholls Ferry Road, this new collector shall serve as the Main Street area of South Cooper Mountain. The Main Street section of this Collector road shall be designated as a Major Pedestrian Route. Pedestrian-oriented features appropriate to a Main Street and features that encourage cars to travel more slowly through the Main Street area should be emphasized in design of the road.*
- 7. The alignment of the North-South Collector shall account for, and not preclude, future extension to the west to SW Grabhorn Road and south to serve Urban Reserve 6C.*
- 8. Within the Community Plan area, new neighborhoods shall be served and linked by a connected network of streets. Neighborhood Route connections shall provide connectivity between neighborhoods. The preferred network is illustrated in Figure 10. The City may permit flexibility to adapt to site specific conditions and ownerships provided the conceptual network in Figure 10, or equivalent, is provided.*
- 9. The City shall coordinate with Washington County to evaluate the need for, and feasibility of, any proposed Neighborhood Route connections to Arterial roads.*
- 10. In refining specific alignments for new roads identified on the Community Plan Street Framework map through the development review or project design process, impacts to natural resources shall be minimized to the extent possible while retaining key connections.*
- 11. Low Impact Development and "green street" techniques to manage stormwater runoff shall be utilized whenever feasible in the design of new streets and urban upgrades within the SCM Community Plan area, subject to the approval of the City Engineer.*
- 12. Conceptual Road: New roads shown located outside the current Urban Growth Boundary (UGB). Conceptual Roads demonstrate how roads within city limits may be extended or connected*

in the long-term future. Alignments and functional classifications of Conceptual Roads are preliminary, tentative, and may ultimately be under the jurisdiction of another body.

Bicycle and Pedestrian Framework

Context

Provision of a diverse and connected bicycle and pedestrian network consistent with regional active transportation goals is one of the great opportunities for the Community Plan area. The bicycle and pedestrian network will provide for local travel on bike and on foot, and support the overarching goal to create Beaverton's next great community. The network also serves to connect to destinations outside of the Community Plan area, such as Cooper Mountain Nature Park, the future Cooper Mountain Regional Trail, and River Terrace's trail system.

While the ultimate trail widths and designs will be determined at time of design and development, the following trail typology is recommended for planning purposes, based on THPRD's 2006 Trails Plan:

- **Community Multi-Use Trails:** These trails link important land uses and areas of interest with one another and connect users to the regional trail system. They are assumed to be paved paths that accommodate pedestrians (including those with disabilities) and bicyclists, recognizing that topographic constraints may be challenging. Within the planning area, it is assumed that multi-use trails that parallel roadways will be separated by a landscaped area. Trail width should be 8 to 10 feet paved width one- to two-foot gravel shoulders.
- **Pedestrian-Only Nature Trails:** These are assumed to be soft-surface trails that are for pedestrians only (though they should be accessible to those with disabilities whenever feasible). They provide connections through and along natural areas, including links to the Cooper Mountain Nature Park trail system. Widths may range from 3 to 8 feet.

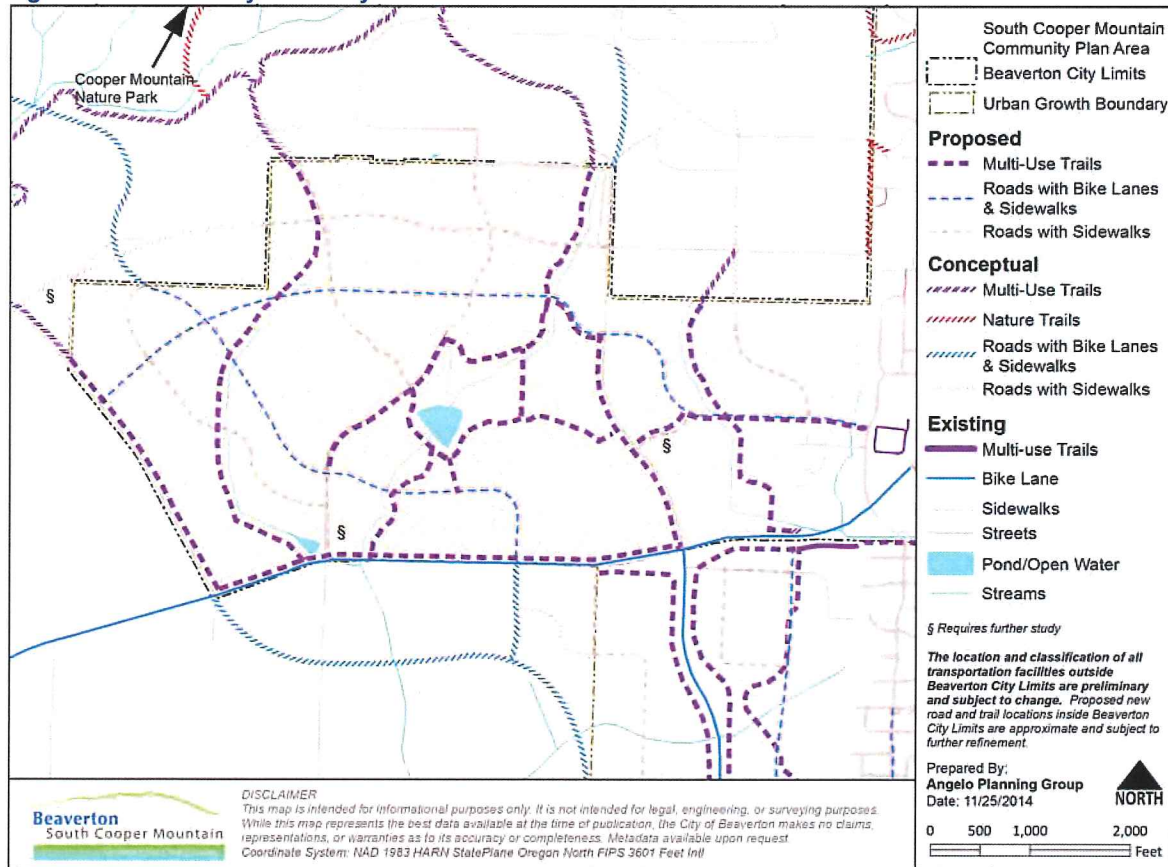
A conceptual bicycle and pedestrian framework plan is included in Figure 11, illustrating the plan to achieve the policy objectives listed below.

Bicycle and Pedestrian Framework Policies

1. *Bicycle and Pedestrian Crossings:* *While the location and design of specific crossing points will be determined through further site-specific engineering evaluation, safe, protected pedestrian crossing opportunities should be provided near important pedestrian destinations, such as the future high school site, when a need is demonstrated and such crossings can be appropriately and safely designed and located, as determined by an engineering-level safety analysis.*
2. *Trails:* *Trails within the Community Plan area shall be provided as shown on Figure 11; however, the City may permit flexibility to adapt to site specific conditions and ownerships provided the conceptual network in Figure 11, or equivalent, is provided. The following principles shall provide guidance in the refinement of trail alignments within the Community Plan area:*
 - a. *Stream Corridor Trails:* *Trails along stream corridors shall be built at the outer edge(s) of the vegetated corridors wherever possible, consistent with CWS standards. Such trails shall be designed to provide a recreational amenity and safe, pleasant pedestrian and/or bicycle connections between neighborhoods, as well as offering visual access to the resource area. Additional native vegetation shall be provided to either side of such trails wherever possible in order to enhance their value as wildlife corridors as well as transportation corridors.*

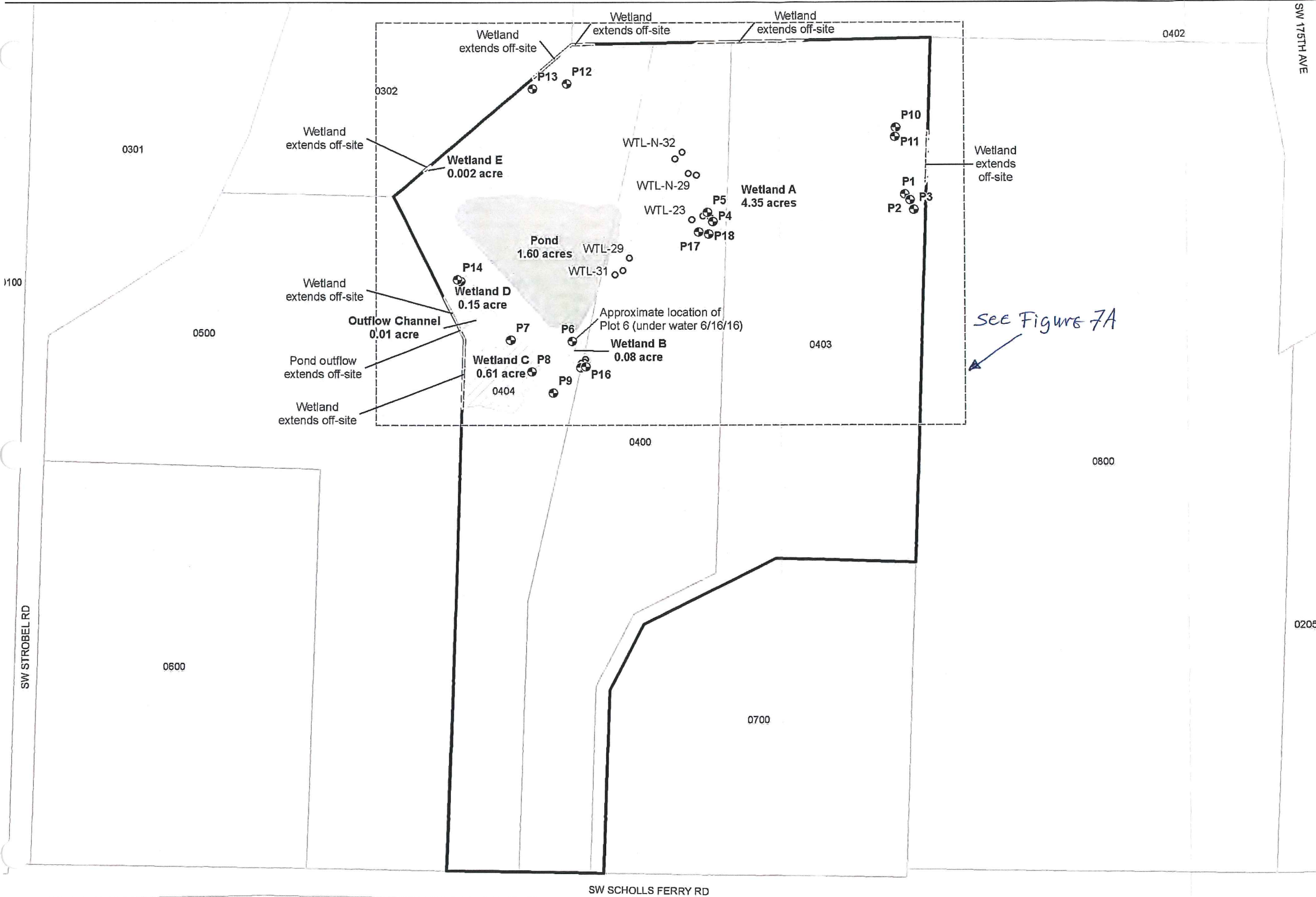
- b. Trails through Resource Areas: The site specific design and location of providing trail connections across wetland resource areas within the Community Plan area shall be addressed on a case-by-case basis. There is a need to provide safe and convenient pedestrian and/or bicycle across the central natural resource area located north of the high school and Main Street. There is also a need to provide access to the River Terrace Trail south of SW Scholls Ferry Road. These, and other trails through resource areas, shall be designed to minimize impacts to the natural resources. Maintenance and enhancement of wildlife corridors and connections between resource areas should be considered when designing and locating trails.
 - c. School to School Trail: A multi-use path shall link from SW Loon Drive at Scholls Heights Elementary school to SW 175th Avenue at the planned high school site as shown in Figure 11 in order to provide safe routes to both schools and to connect neighborhoods to the east to the planned high school.
 - d. Western Edge Trail: The community multi-use trail along the east side of SW Tile Flat Road within the Community Plan area shall be designed with trees and other landscaping to provide a visual buffer to adjacent rural lands. This trail shall be designed so that it can be extended further north, paralleling SW Grabhorn Road as far as Cooper Mountain Nature Park, when that portion of the Urban Reserve Area is brought into the UGB and developed.
3. Conceptual Trail: New pedestrian and or bicycle facilities shown located outside the current Urban Growth Boundary (UGB). Conceptual Trail demonstrate how pedestrian and bicycle facilities within city limits may be extended or connected in the long-term future. Alignments and functional classifications of Conceptual Trail are preliminary, tentative, and may ultimately be under the jurisdiction of another body.

Figure 11: Community Plan Bicycle & Pedestrian Framework



APPENDIX B
THE RIDGE AT SOUTH COOPER MOUNTAIN
(BELLAIRS AND LOLICH PROPERTIES)
WETLAND DELINEATION MAP

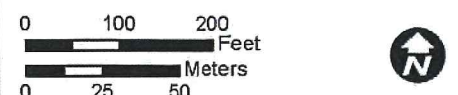
APPENDIX C
DATA SOURCES USED FOR OFF-SITE
VEGETATED CORRIDOR DETERMINATION



- Legend**
- Study Area
 - Sample Plot
 - Original Flag Location
 - Wetland
 - Open Water
 - Tax Lot
 - Delineation Detail Map Area

See Figure 7A

DSL WD # 2016-0367
 Approval Issued 12/12/2016
 Approval Expires 12/12/2021



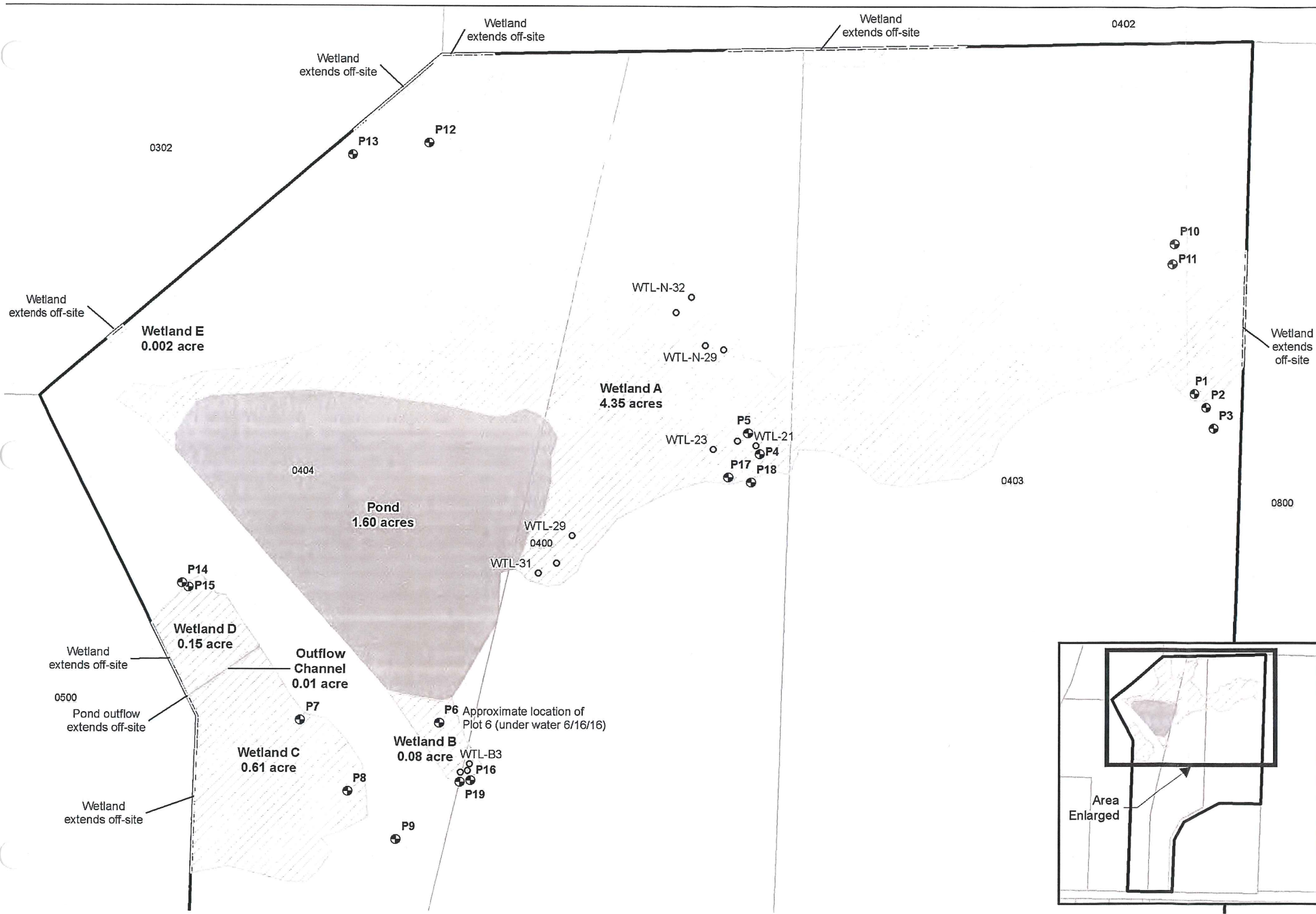
Source: Wetland boundaries and sample plot locations were mapped to sub-meter accuracy by SWCA using a Trimble GeoExplorer XT GPS unit on June 16, 2016.

Scott and Nancy Edmonds
 Blackbird Farms
 Wetland and Other Waters
 Delineation
 Beaverton, Washington County, Oregon

SWCA
 ENVIRONMENTAL CONSULTANTS
 1220 SW Morrison, Suite 700
 Portland, OR 97205-2235
 www.swca.com
 503 224 0333

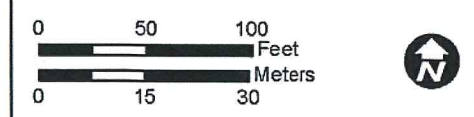
Project: 34707 December 08, 2016

Figure 7



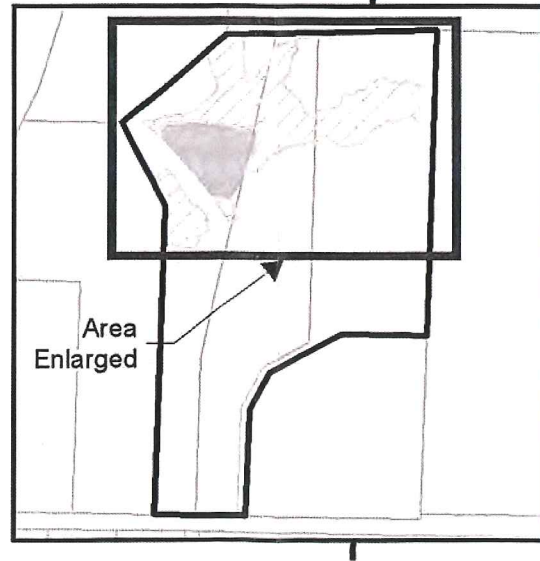
- Legend**
- Study Area
 - Sample Plot
 - Original Flag Location
 - Wetland
 - Open Water
 - Tax Lot

DSL WD # 2016-0367
 Approval Issued 12/12/2016
 Approval Expires 12/12/2021



Source: Wetland boundaries and sample plot locations were mapped to sub-meter accuracy by SWCA using a Trimble GeoExplorer XT GPS unit on June 16, 2016.

Scott and Nancy Edmonds
 Blackbird Farms
 Wetland and Other Waters
 Delineation
 Beaverton, Washington County, Oregon



SWCA
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 1220 SW Morrison, Suite 700
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Project: 34707 December 08, 2016
















Figure 7A

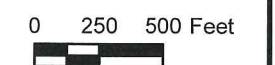
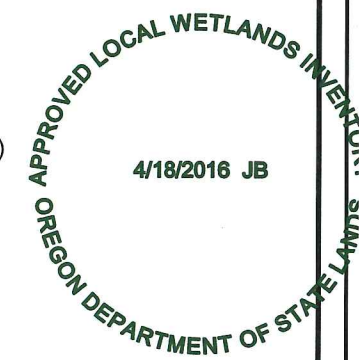
**Figure 5, Sheet 1 of 10
Local Wetland Inventory Map**

**City of Beaverton
South Cooper Mountain
Annexation Area**

LOCAL WETLAND INVENTORY

Legend

- | | | | |
|-------------------------------------------------------------------------------------|----------------|-------------------------------------------------------------------------------------|--------------------------------|
|  | Sheet Extent |  | Section |
|  | LWI Study Area |  | Beaverton City Limits |
|  | Arterial |  | Washington County Tax Lot |
|  | Street |  | CWS Small Streamsheds Boundary |
|  | LWI Stream | | |
|  | NHD Stream | | |
- Wetlands*
- | | |
|---------------------------------------------------------------------------------------|-----------------------|
|  | Emergent (PEM) |
|  | Forested (PFO) |
|  | Pond/Open Water (PUB) |
|  | Scrub/Shrub (PSS) |
|  | Detention Pond |



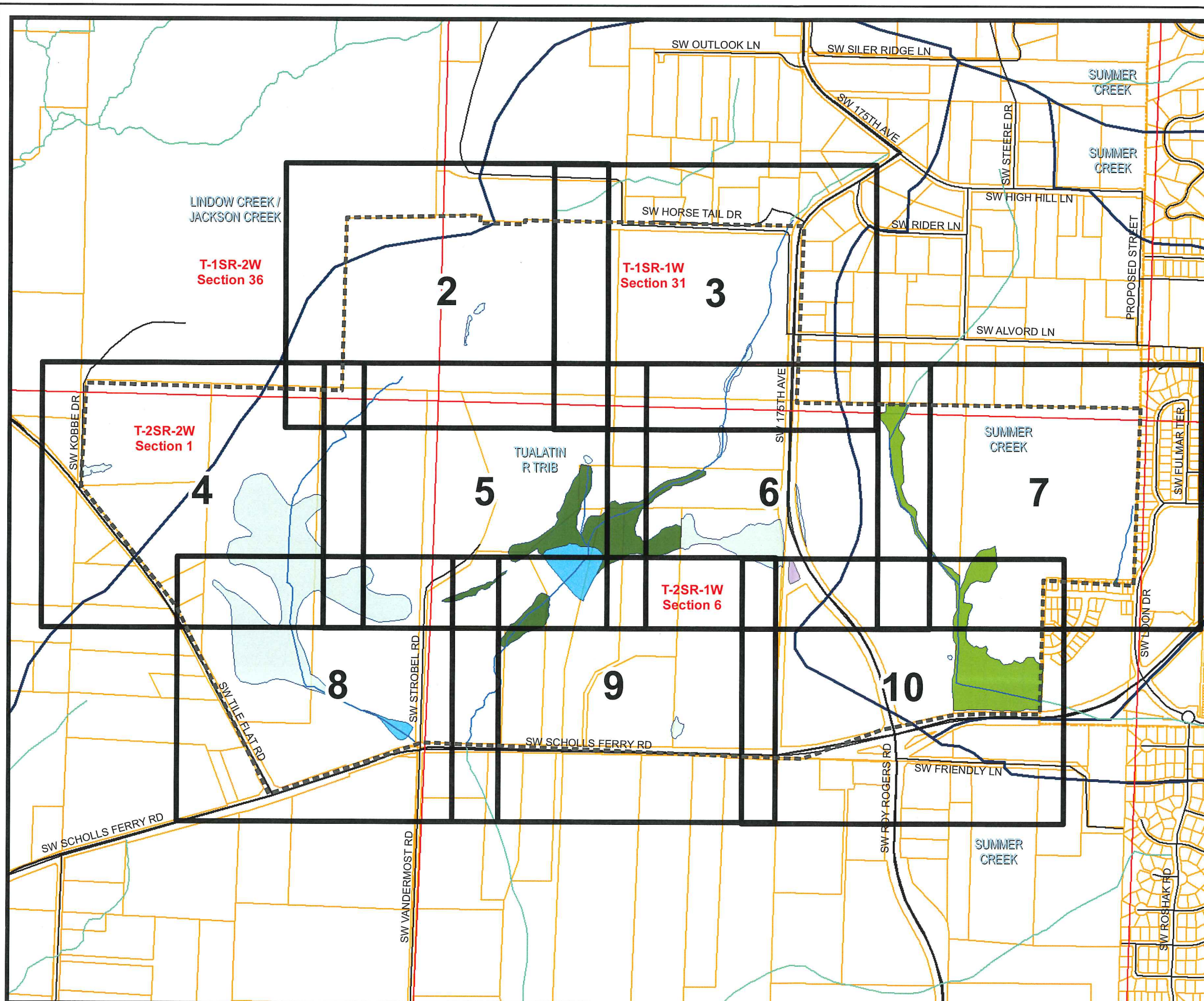
Data Sources:
 LWI Study Area: Metro RLIS, 2012. Modified by DEA.
 Tax Lots, PLSS, City Limits, Arterials, Streets: Metro RLIS, 2012
 Wetlands, Streamsheds: Anchor QEA, DKS Engineering, PHS, DEA, 2015; City of Beaverton, Metro RLIS, 2012. Modified by DEA.
 Streams: Metro RLIS, 2012; Modified by DEA. USGS NHD, 2015.

Disclaimer: Information shown on this map is for planning purposes, represents the conditions that exist at the map date, and is subject to change. The location and extent of wetlands and other waters is approximate. There may be unmapped wetlands and other waters present that are subject to regulation. A current Oregon Department of State Lands-approved wetland delineation is required for state removal-fill permits. You are advised to contact the Department of State Lands and the U.S. Army Corps of Engineers with any regulatory questions.



Information Current as of:
August 2015

Printed on and Corrections as of:
August 31, 2015



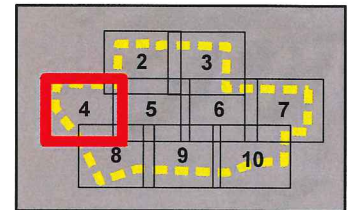
**Figure 5, Sheet 4
Local Wetland Inventory Map**

**City of Beaverton
South Cooper Mountain
Annexation Area**

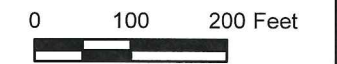
LOCAL WETLAND INVENTORY

Legend

- LWI Study Area
- Washington County Tax Lot
- Section
- Street
- CWS Small Streamsheds Boundary
- Data Plot
- Stream
- Wetlands*
Emergent (PEM)



* W = Wetlands
PW = Probable Wetlands



Data Sources:
 LWI Study Area: Metro RLIS, 2012. Modified by DEA.
 PLSS, City Limits, Streets: Metro RLIS, 2012
 Wetlands, Streamsheds: AKS Engineering, Anchor QEA, DEA, PHS 2015. Also City of Beaverton, Metro RLIS, 2012. Modified by DEA.
 Data Plots: DEA, 2015.
 Streams: Metro RLIS, 2012 and USGS NHD, 2015. Modified by DEA.

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Information Current as of:
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August 31, 2015

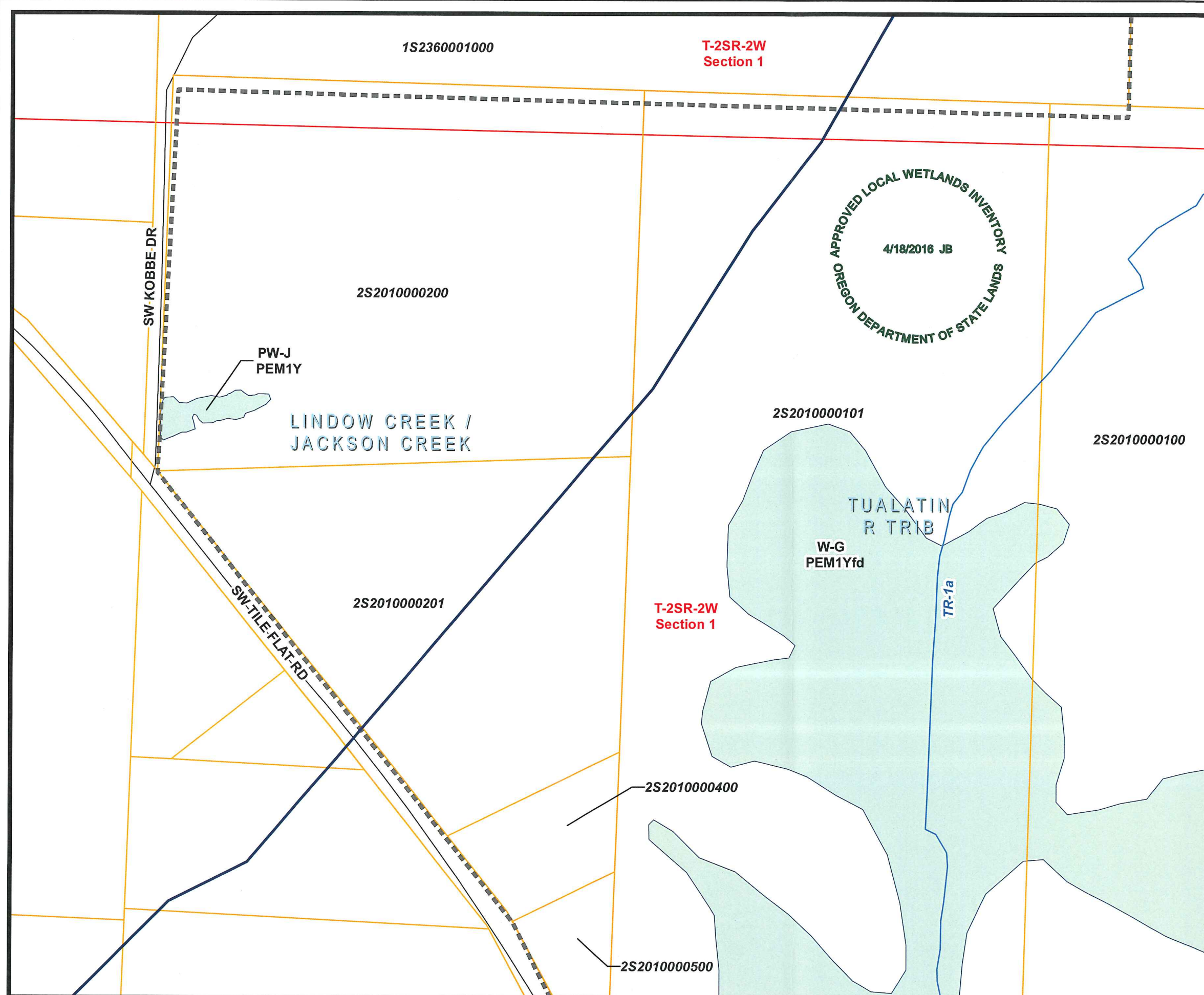


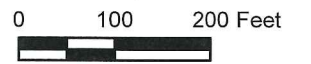
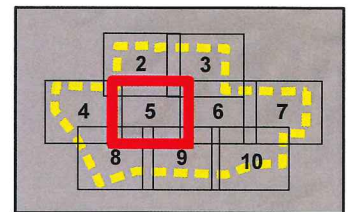
Figure 5, Sheet 5 Local Wetland Inventory Map

City of Beaverton South Cooper Mountain Annexation Area

LOCAL WETLAND INVENTORY

Legend

- LWI Study Area
 - Washington County Tax Lot
 - Section
 - Street
 - CWS Small Streamsheds Boundary
 - Data Plot
 - LWI Stream
 - Emergent (PEM)
 - Forested (PFO)
 - Pond/Open Water (PUB)
- * W = Wetlands
PW = Probable Wetlands



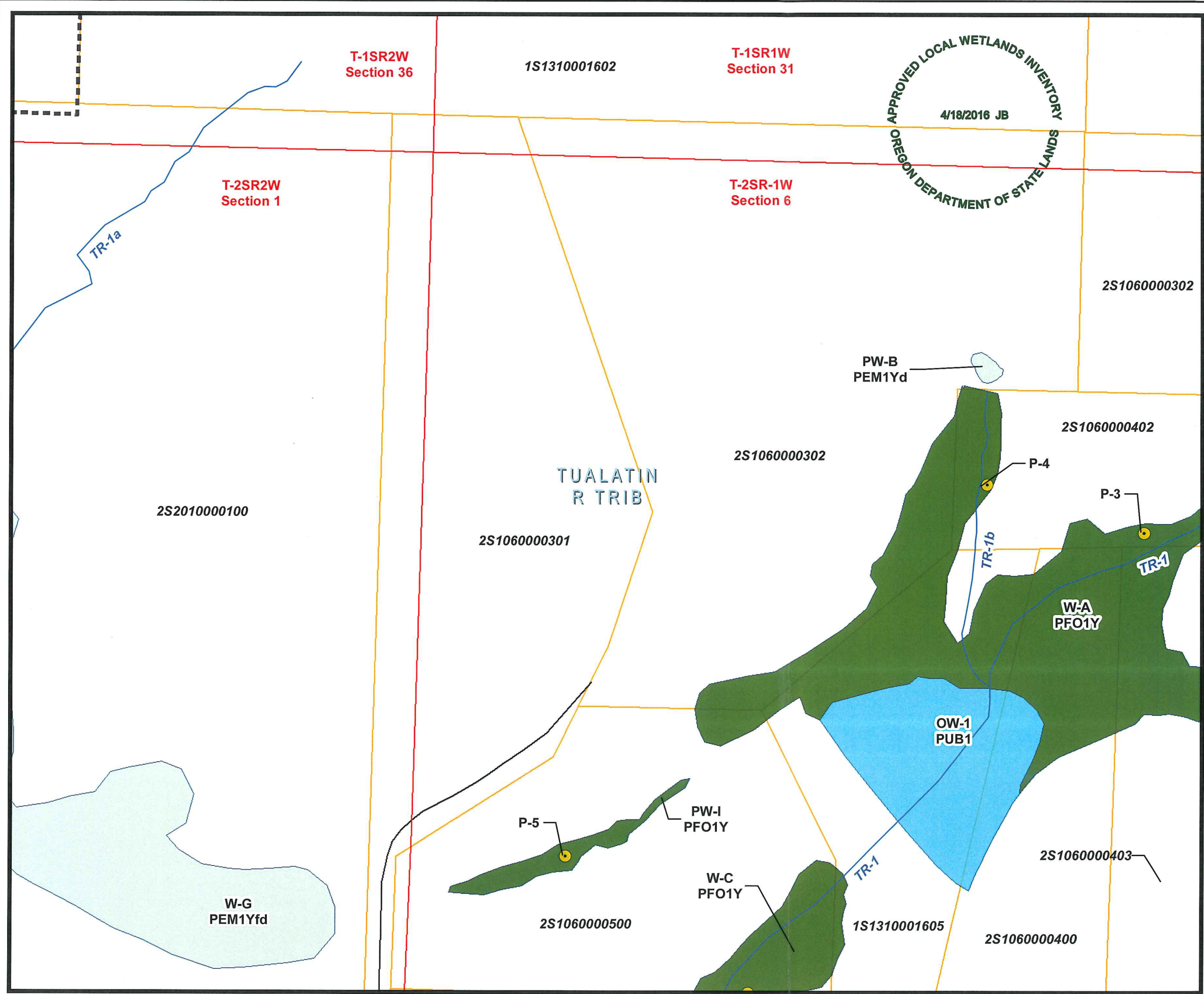
Data Sources:
 LWI Study Area: Metro RLIS, 2012. Modified by DEA.
 PLSS, City Limits, Streets: Metro RLIS, 2012
 Wetlands, Streamsheds: AKS Engineering, Anchor QEA, DEA, PHS 2015. Also City of Beaverton, Metro RLIS, 2012. Modified by DEA.
 Data Plots: DEA, 2015.
 Streams: Metro RLIS, 2012 and USGS NHD, 2015. Modified by DEA.

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Information Current as of:
August 2015

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August 31, 2015



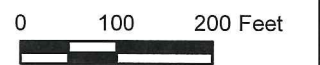
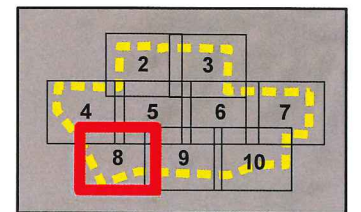
**Figure 5, Sheet 8
Local Wetland Inventory Map**

**City of Beaverton
South Cooper Mountain
Annexation Area**

LOCAL WETLAND INVENTORY

Legend

- LWI Study Area
 - Washington County Tax Lot
 - Section
 - Street
 - CWS Small Streamsheds Boundary
 - Data Plot
 - LWI Stream
 - NHD Stream
 - Emergent (PEM)
 - Forested (PFO)
 - Pond/Open Water (PUB)
- * W = Wetlands
PW = Probable Wetlands

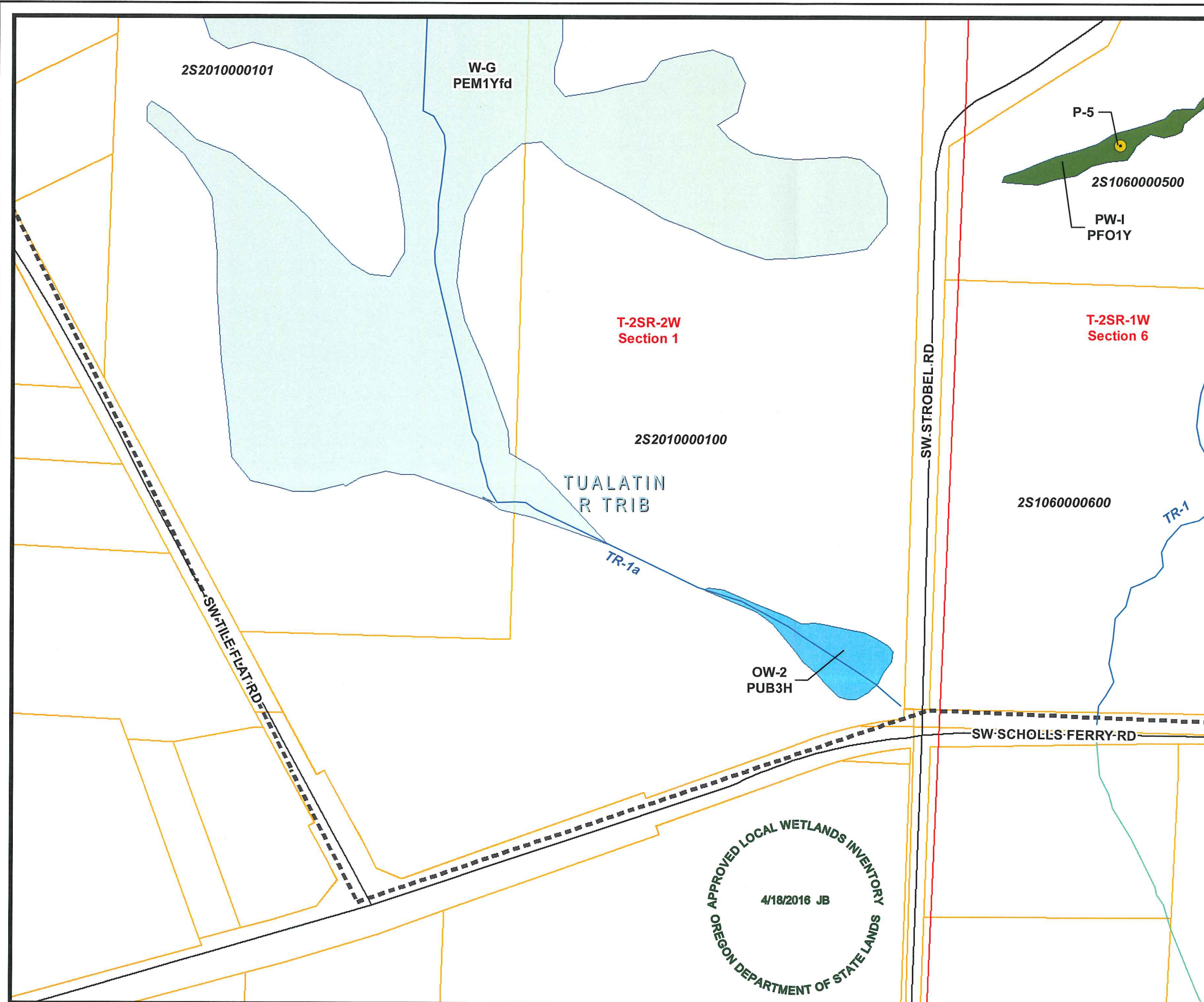


Data Sources:
 LWI Study Area: Metro RLIS, 2012. Modified by DEA.
 PLSS, City Limits, Streets: Metro RLIS, 2012
 Wetlands, Streamsheds: AKS Engineering, Anchor QEA, DEA, PHS 2015. Also City of Beaverton, Metro RLIS, 2012. Modified by DEA.
 Data Plots: DEA, 2015.
 Streams: Metro RLIS, 2012 and USGS NHD, 2015. Modified by DEA.

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August 2015
 Printed on and Corrections as of:
August 31, 2015














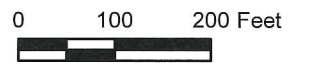
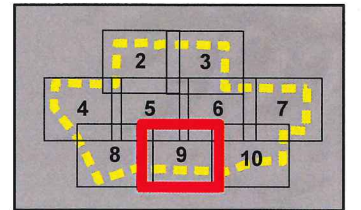
**Figure 5, Sheet 9
Local Wetland Inventory Map**

**City of Beaverton
South Cooper Mountain
Annexation Area**

LOCAL WETLAND INVENTORY

Legend

-  LWI Study Area
 -  Washington County Tax Lot
 -  Section
 -  Street
 -  CWS Small Streamsheds Boundary
 -  Data Plot
 -  LWI Stream
 -  NHD Stream
 - Wetlands***
 -  Emergent (PEM)
 -  Forested (PFO)
 -  Pond/Open Water (PUB)
- * W = Wetlands
PW = Probable Wetlands

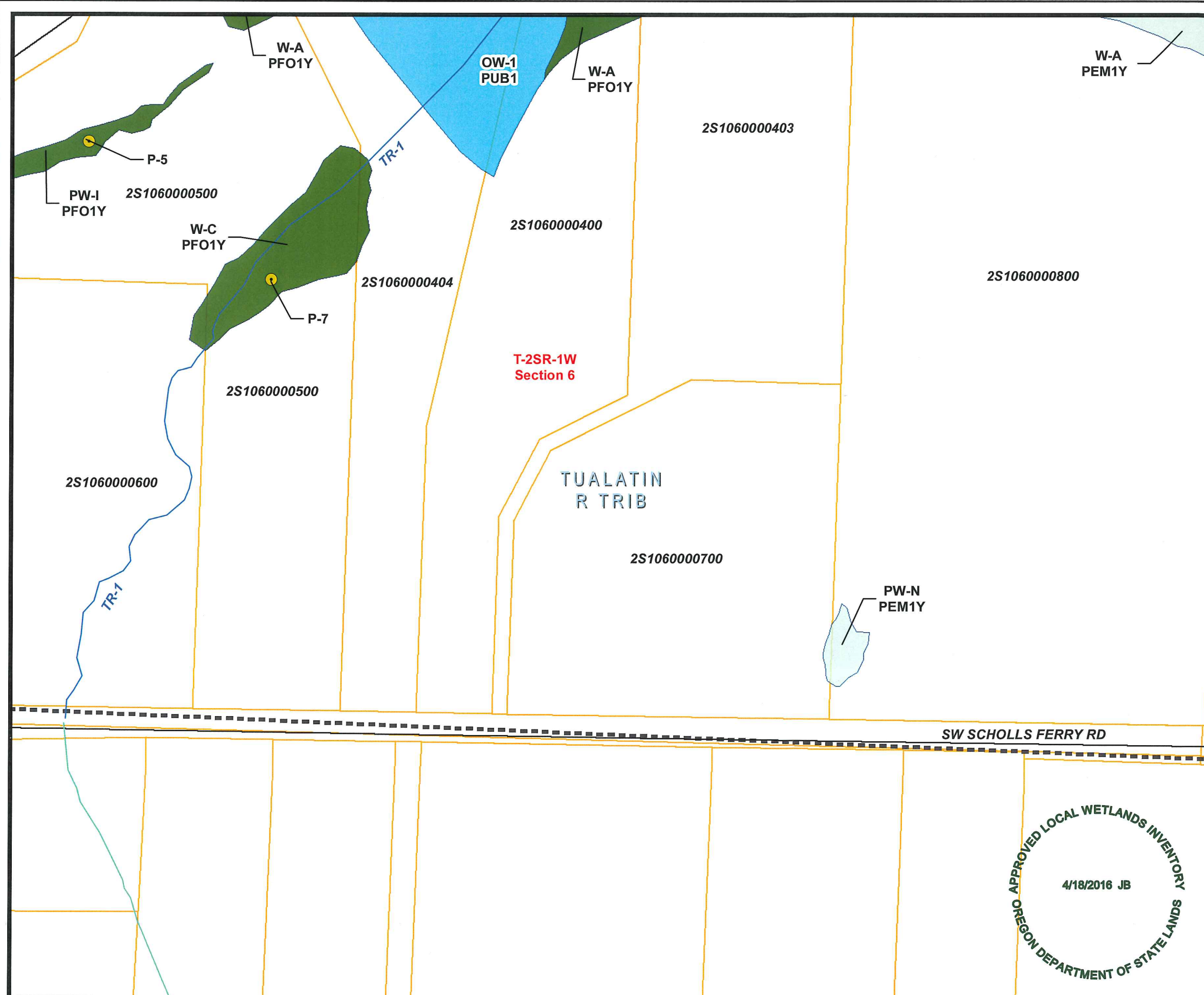


Data Sources:
 LWI Study Area: Metro RLIS, 2012. Modified by DEA.
 PLSS, City Limits, Streets: Metro RLIS, 2012
 Wetlands, Streamsheds: AKS Engineering, Anchor QEA, DEA, PHS 2015. Also City of Beaverton, Metro RLIS, 2012. Modified by DEA.
 Data Plots: DEA, 2015.
 Streams: Metro RLIS, 2012 and USGS NHD, 2015. Modified by DEA.

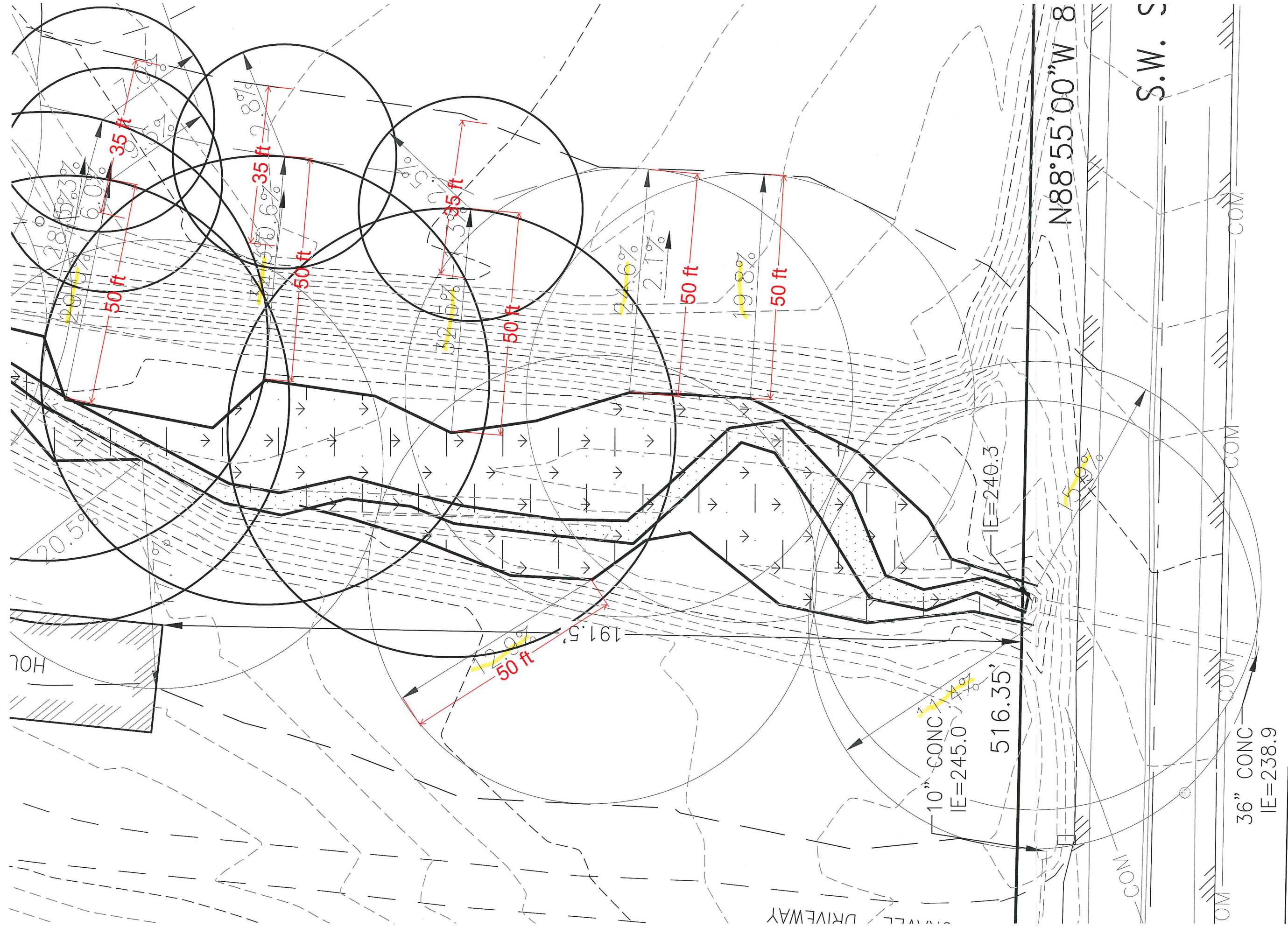
Disclaimer: Information shown on this map is for planning purposes, represents the conditions that exist at the map date, and is subject to change. The location and extent of wetlands and other waters is approximate. There may be unmapped wetlands and other waters present that are subject to regulation. A current Oregon Department of State Lands-approved wetland delineation is required for state removal-fill permits. You are advised to contact the Department of State Lands and the U.S. Army Corps of Engineers with any regulatory questions.



Information Current as of:
August 2015
 Printed on and Corrections as of:
August 31, 2015



APPENDIX D
VEGETATED CORRIDOR SLOPE ANALYSIS



APPENDIX E
VEGETATED CORRIDOR DATA SHEETS

VEGETATED CORRIDOR COMMUNITY TYPE DATA SHEET



6650 SW Redwood Lane, Suite 333
Portland, OR 97224
Office: (503) 670-1108 Fax: (503) 670-1128

PROJECT NAME: The Ridge at SCM (Bellairs and Lolich Properties) **DATE:** 8/24/2016

APPLICANT/OWNER: West Hills Land Development **SAMPLING POINT:** DP-01

INVESTIGATOR(S): Matt Kuziinsky and Julie Fox

| <u>Tree Stratum</u> | Plot Size: <u>r = 30ft</u> | Absolute Cover (%) | Native? (Y/N) | |
|-------------------------------------|----------------------------|--------------------|---------------|--------------------------------------------------------|
| 1. <u><i>Crataegus monogyna</i></u> | | 60 | N | Vegetated Corridor Condition Good |
| 2. <u><i>Thuja plicata</i></u> | | 40 | Y | |
| 3. _____ | | | | |
| 4. _____ | | | | |
| 5. _____ | | | | |
| 6. _____ | | | | |
| 7. _____ | | | | |
| 8. _____ | | | | |
| 9. _____ | | | | |
| 10. _____ | | | | |
| Total Tree Cover = | | 100 | | |

| <u>Native Combined Cover</u> | |
|------------------------------|--------------------|
| | Absolute Cover (%) |
| Tree = | 40 |
| Shrub = | 5 |
| Herb = | 40 |
| Total Cover = | 85 |

| <u>Sapling/Shrub Stratum</u> | Plot Size: <u>r = 30ft</u> | Absolute Cover (%) | Native? (Y/N) | Invasive? (Y/N) | |
|----------------------------------|----------------------------|--------------------|---------------|-----------------|--------------------------------------------------------------------------------|
| 1. <u><i>Ilex aquifolium</i></u> | | 15 | N | N | Tree Canopy Cover Absolute Cover (%) Total Cover = 100 |
| 2. <u><i>Thuja plicata</i></u> | | 5 | Y | N | |
| 3. _____ | | | | | |
| 4. _____ | | | | | |
| 5. _____ | | | | | |
| 6. _____ | | | | | |
| 7. _____ | | | | | |
| 8. _____ | | | | | |
| 9. _____ | | | | | |
| 10. _____ | | | | | |
| Total Shrub Cover = | | 20 | | | |

| <u>Percent Invasives</u> | |
|--------------------------|--------------------|
| | Absolute Cover (%) |
| Tree = | n/a |
| Shrub = | _____ |
| Herb = | 5 |
| Total Cover = | 5 |

| <u>Herb Stratum</u> | Plot Size: <u>r = 10ft</u> | Absolute Cover (%) | Native? (Y/N) | Invasive? (Y/N) | |
|------------------------------------|----------------------------|--------------------|---------------|-----------------|--------------------------------------|
| 1. <u><i>Equisetum arvense</i></u> | | 40 | Y | N | Corridor Condition Parameters |
| 2. <u><i>Solanum dulcamara</i></u> | | 5 | N | Y | |
| 3. _____ | | | | | |
| 4. _____ | | | | | |
| 5. _____ | | | | | |
| 6. _____ | | | | | |
| 7. _____ | | | | | |
| 8. _____ | | | | | |
| 9. _____ | | | | | |
| 10. _____ | | | | | |
| Total Herb Cover = | | 45 | | | |

| | |
|----------|------------------------------------------------------------|
| Good | >80% Native Combined Cover and >50% Tree Canopy Exists |
| Marginal | 50-80% Native Combined Cover and 26-50% Tree Canopy Exists |
| Degraded | <50% Native Combined Cover and <25% Tree Canopy Exists |

Comments:

Vegetated corridor surrounding Wetland A

VEGETATED CORRIDOR COMMUNITY TYPE DATA SHEET



6650 SW Redwood Lane, Suite 333
Portland, OR 97224
Office: (503) 670-1108 Fax: (503) 670-1128

PROJECT NAME: The Ridge at SCM (Bellairs and Lolich Properties) **DATE:** 8/25/2016

APPLICANT/OWNER: West Hills Land Development **SAMPLING POINT:** DP-02

INVESTIGATOR(S): Matt Kuziinsky and Julie Fox

| Tree Stratum | Plot Size: <u>r = 30ft</u> | Absolute Cover (%) | Native? (Y/N) | |
|----------------------------|----------------------------|--------------------|---------------|--------------------------------------------------------|
| 1. <u>Quercus garryana</u> | | 30 | Y | Vegetated Corridor Condition Good |
| 2. <u>Thuja plicata</u> | | 25 | Y | |
| 3. _____ | | | | |
| 4. _____ | | | | |
| 5. _____ | | | | |
| 6. _____ | | | | |
| 7. _____ | | | | |
| 8. _____ | | | | |
| 9. _____ | | | | |
| 10. _____ | | | | |
| Total Tree Cover = | | 55 | | |

| Native Combined Cover | |
|-----------------------|--------------------|
| | Absolute Cover (%) |
| Tree = | 55 |
| Shrub = | _____ |
| Herb = | 30 |
| Total Cover = | 85 |

| Sapling/Shrub Stratum | Plot Size: <u>r = 30ft</u> | Absolute Cover (%) | Native? (Y/N) | Invasive? (Y/N) | |
|----------------------------|----------------------------|--------------------|---------------|-----------------|-------------------------------------------------------------------------------|
| 1. <u>Rubus armeniacus</u> | | 25 | N | Y | Tree Canopy Cover Absolute Cover (%) Total Cover = 55 |
| 2. _____ | | | | | |
| 3. _____ | | | | | |
| 4. _____ | | | | | |
| 5. _____ | | | | | |
| 6. _____ | | | | | |
| 7. _____ | | | | | |
| 8. _____ | | | | | |
| 9. _____ | | | | | |
| 10. _____ | | | | | |
| Total Shrub Cover = | | 25 | | | |

| Percent Invasives | |
|-------------------|--------------------|
| | Absolute Cover (%) |
| Tree = | n/a |
| Shrub = | 25 |
| Herb = | 50 |
| Total Cover = | 75 |

| Herb Stratum | Plot Size: <u>r = 10ft</u> | Absolute Cover (%) | Native? (Y/N) | Invasive? (Y/N) | |
|-----------------------------|----------------------------|--------------------|---------------|-----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. <u>Solanum dulcamara</u> | | 50 | N | Y | Corridor Condition Parameters Good >80% Native Combined Cover and >50% Tree Canopy Exists Marginal 50-80% Native Combined Cover and 26-50% Tree Canopy Exists Degraded <50% Native Combined Cover and <25% Tree Canopy Exists |
| 2. <u>Equisetum arvense</u> | | 30 | Y | N | |
| 3. _____ | | | | | |
| 4. _____ | | | | | |
| 5. _____ | | | | | |
| 6. _____ | | | | | |
| 7. _____ | | | | | |
| 8. _____ | | | | | |
| 9. _____ | | | | | |
| 10. _____ | | | | | |
| Total Herb Cover = | | 80 | | | |

Comments:
Vegetated corridor surrounding Wetland B

VEGETATED CORRIDOR COMMUNITY TYPE DATA SHEET



6650 SW Redwood Lane, Suite 333
Portland, OR 97224
Office: (503) 670-1108 Fax: (503) 670-1128

| | | | |
|-------------------------|---------------------------------------------------|------------------------|-----------|
| PROJECT NAME: | The Ridge at SCM (Bellairs and Lolich Properties) | DATE: | 8/29/2016 |
| APPLICANT/OWNER: | West Hills Land Development | SAMPLING POINT: | DP-03 |
| INVESTIGATOR(S): | Matt Kuziinsky and Julie Fox | | |

| Tree Stratum | Plot Size: <u>r = 30ft</u> | Absolute Cover (%) | Native? (Y/N) |
|------------------------------|----------------------------|-----------------------|------------------|
| 1. <u>Salix spp.</u> | | 50 | Y |
| 2. <u>Fraxinus latifolia</u> | | 30 | Y |
| 3. _____ | | | |
| 4. _____ | | | |
| 5. _____ | | | |
| 6. _____ | | | |
| 7. _____ | | | |
| 8. _____ | | | |
| 9. _____ | | | |
| 10. _____ | | | |
| Total Tree Cover = | | 80 | |

Vegetated Corridor Condition

Good

Native Combined Cover

| | |
|--------------------|------------|
| Absolute Cover (%) | |
| Tree = | 80 |
| Shrub = | 15 |
| Herb = | 25 |
| Total Cover = | 120 |

| Sapling/Shrub Stratum | Plot Size: <u>r = 30ft</u> | Absolute Cover (%) | Native? (Y/N) | Invasive? (Y/N) |
|-------------------------------|----------------------------|-----------------------|------------------|--------------------|
| 1. <u>Cercis occidentalis</u> | | 20 | N | N |
| 2. <u>Corylus cornuta</u> | | 5 | Y | N |
| 3. <u>Rubus armeniacus</u> | | 20 | N | Y |
| 4. <u>Rubus ursinus</u> | | 10 | Y | N |
| 5. _____ | | | | |
| 6. _____ | | | | |
| 7. _____ | | | | |
| 8. _____ | | | | |
| 9. _____ | | | | |
| 10. _____ | | | | |
| Total Shrub Cover = | | 55 | | |

Tree Canopy Cover

| | |
|--------------------|-----------|
| Absolute Cover (%) | |
| Total Cover = | 80 |

Percent Invasives

| | |
|--------------------|-----------|
| Absolute Cover (%) | |
| Tree = | n/a |
| Shrub = | 20 |
| Herb = | |
| Total Cover = | 20 |

| Herb Stratum | Plot Size: <u>r = 10ft</u> | Absolute Cover (%) | Native? (Y/N) | Invasive? (Y/N) |
|------------------------------|----------------------------|-----------------------|------------------|--------------------|
| 1. <u>Epilobium ciliatum</u> | | 15 | Y | N |
| 2. <u>Equisetum arvense</u> | | 10 | Y | N |
| 3. <u>Jacobaea vulgaris</u> | | 2 | N | N |
| 4. <u>unidentified forb</u> | | 3 | -- | -- |
| 5. _____ | | | | |
| 6. _____ | | | | |
| 7. _____ | | | | |
| 8. _____ | | | | |
| 9. _____ | | | | |
| 10. _____ | | | | |
| Total Herb Cover = | | 30 | | |

Corridor Condition Parameters

| | |
|----------|------------------------------------------------------------|
| Good | >80% Native Combined Cover and >50% Tree Canopy Exists |
| Marginal | 50-80% Native Combined Cover and 26-50% Tree Canopy Exists |
| Degraded | <50% Native Combined Cover and <25% Tree Canopy Exists |

Comments:
Vegetated corridor surrounding Wetland C

VEGETATED CORRIDOR COMMUNITY TYPE DATA SHEET



6650 SW Redwood Lane, Suite 333
Portland, OR 97224
Office: (503) 670-1108 Fax: (503) 670-1128

PROJECT NAME: The Ridge at SCM (Bellairs and Lolich Properties) **DATE:** 8/29/2016

APPLICANT/OWNER: West Hills Land Development **SAMPLING POINT:** DP-04

INVESTIGATOR(S): Matt Kuziinsky and Julie Fox

| Tree Stratum | Plot Size: <u>r = 30ft</u> | Absolute Cover (%) | Native? (Y/N) | | Vegetated Corridor Condition |
|--------------------------------|----------------------------|--------------------|---------------|--|-------------------------------------|
| 1. <u><i>Thuja plicata</i></u> | | 75 | Y | | Good |
| 2. _____ | | | | | |
| 3. _____ | | | | | |
| 4. _____ | | | | | |
| 5. _____ | | | | | |
| 6. _____ | | | | | |
| 7. _____ | | | | | |
| 8. _____ | | | | | |
| 9. _____ | | | | | |
| 10. _____ | | | | | |
| Total Tree Cover = | | 75 | | | |

| Native Combined Cover | |
|-----------------------|--------------------|
| | Absolute Cover (%) |
| Tree = | 75 |
| Shrub = | _____ |
| Herb = | 75 |
| Total Cover = | 150 |

| Sapling/Shrub Stratum | Plot Size: <u>r = 30ft</u> | Absolute Cover (%) | Native? (Y/N) | Invasive? (Y/N) | |
|-----------------------------------|----------------------------|--------------------|---------------|-----------------|---------------------------------------------------------------------------|
| 1. <u><i>Rubus armeniacus</i></u> | | 10 | N | Y | Tree Canopy Cover Absolute Cover (%) Total Cover = 75 |
| 2. _____ | | | | | |
| 3. _____ | | | | | |
| 4. _____ | | | | | |
| 5. _____ | | | | | |
| 6. _____ | | | | | |
| 7. _____ | | | | | |
| 8. _____ | | | | | |
| 9. _____ | | | | | |
| 10. _____ | | | | | |
| Total Shrub Cover = | | 10 | | | |

| Percent Invasives | |
|-------------------|--------------------|
| | Absolute Cover (%) |
| Tree = | n/a |
| Shrub = | 10 |
| Herb = | _____ |
| Total Cover = | 10 |

| Herb Stratum | Plot Size: <u>r = 10ft</u> | Absolute Cover (%) | Native? (Y/N) | Invasive? (Y/N) | |
|------------------------------------|----------------------------|--------------------|---------------|-----------------|--------------------------------------|
| 1. <u><i>Equisetum arvense</i></u> | | 75 | Y | N | Corridor Condition Parameters |
| 2. _____ | | | | | |
| 3. _____ | | | | | |
| 4. _____ | | | | | |
| 5. _____ | | | | | |
| 6. _____ | | | | | |
| 7. _____ | | | | | |
| 8. _____ | | | | | |
| 9. _____ | | | | | |
| 10. _____ | | | | | |
| Total Herb Cover = | | 75 | | | |

| | |
|----------|------------------------------------------------------------|
| Good | >80% Native Combined Cover and >50% Tree Canopy Exists |
| Marginal | 50-80% Native Combined Cover and 26-50% Tree Canopy Exists |
| Degraded | <50% Native Combined Cover and <25% Tree Canopy Exists |

Comments:
Vegetated corridor surrounding Wetland D

VEGETATED CORRIDOR COMMUNITY TYPE DATA SHEET



6650 SW Redwood Lane, Suite 333
Portland, OR 97224
Office: (503) 670-1108 Fax: (503) 670-1128

PROJECT NAME: The Ridge at SCM (Bellairs and Lolich Properties) **DATE:** 8/29/2016

APPLICANT/OWNER: West Hills Land Development **SAMPLING POINT:** DP-05

INVESTIGATOR(S): Matt Kuziinsky and Julie Fox

| Tree Stratum | Plot Size: r = 30ft | Absolute Cover (%) | Native? (Y/N) |
|------------------------------------------------|---------------------|-----------------------|------------------|
| 1. <i>Populus balsamifera ssp. Trichocarpa</i> | | 40 | Y |
| 2. _____ | | | |
| 3. _____ | | | |
| 4. _____ | | | |
| 5. _____ | | | |
| 6. _____ | | | |
| 7. _____ | | | |
| 8. _____ | | | |
| 9. _____ | | | |
| 10. _____ | | | |
| Total Tree Cover = | | 40 | |

Vegetated Corridor Condition

Marginal

Native Combined Cover

| | |
|----------------------|--------------------|
| | Absolute Cover (%) |
| Tree = | 40 |
| Shrub = | _____ |
| Herb = | 30 |
| Total Cover = | 70 |

| Sapling/Shrub Stratum | Plot Size: r = 30ft | Absolute Cover (%) | Native? (Y/N) | Invasive? (Y/N) |
|----------------------------|---------------------|-----------------------|------------------|--------------------|
| 1. <i>Rubus armeniacus</i> | | 25 | N | Y |
| 2. _____ | | | | |
| 3. _____ | | | | |
| 4. _____ | | | | |
| 5. _____ | | | | |
| 6. _____ | | | | |
| 7. _____ | | | | |
| 8. _____ | | | | |
| 9. _____ | | | | |
| 10. _____ | | | | |
| Total Shrub Cover = | | 25 | | |

Tree Canopy Cover

| | |
|----------------------|--------------------|
| | Absolute Cover (%) |
| Total Cover = | 40 |

Percent Invasives

| | |
|----------------------|--------------------|
| | Absolute Cover (%) |
| Tree = | n/a |
| Shrub = | 25 |
| Herb = | 5 |
| Total Cover = | 30 |

| Herb Stratum | Plot Size: r = 10ft | Absolute Cover (%) | Native? (Y/N) | Invasive? (Y/N) |
|------------------------------|---------------------|-----------------------|------------------|--------------------|
| 1. <i>Epilobium ciliatum</i> | | 30 | Y | N |
| 2. <i>Rumex crispus</i> | | 5 | N | Y |
| 3. _____ | | | | |
| 4. _____ | | | | |
| 5. _____ | | | | |
| 6. _____ | | | | |
| 7. _____ | | | | |
| 8. _____ | | | | |
| 9. _____ | | | | |
| 10. _____ | | | | |
| Total Herb Cover = | | 35 | | |

Corridor Condition Parameters

| | |
|----------|------------------------------------------------------------|
| Good | >80% Native Combined Cover and >50% Tree Canopy Exists |
| Marginal | 50-80% Native Combined Cover and 26-50% Tree Canopy Exists |
| Degraded | <50% Native Combined Cover and <25% Tree Canopy Exists |

Comments:
Vegetated corridor surrounding Wetland E

VEGETATED CORRIDOR COMMUNITY TYPE DATA SHEET



6650 SW Redwood Lane, Suite 333
Portland, OR 97224
Office: (503) 670-1108 Fax: (503) 670-1128

PROJECT NAME: The Ridge at SCM (Bellairs and Lolich Properties) **DATE:** 8/29/2016

APPLICANT/OWNER: West Hills Land Development **SAMPLING POINT:** DP-06

INVESTIGATOR(S): Matt Kuziinsky and Julie Fox

| Tree Stratum | Plot Size: r = 30ft | Absolute Cover (%) | Native? (Y/N) | | Vegetated Corridor Condition |
|------------------------------------------------|---------------------|--------------------|---------------|--|-------------------------------------|
| 1. <i>Populus balsamifera ssp. Trichocarpa</i> | | 15 | Y | | Degraded |
| 2. _____ | | | | | |
| 3. _____ | | | | | |
| 4. _____ | | | | | |
| 5. _____ | | | | | |
| 6. _____ | | | | | |
| 7. _____ | | | | | |
| 8. _____ | | | | | |
| 9. _____ | | | | | |
| 10. _____ | | | | | |
| Total Tree Cover = | | 15 | | | |

| Native Combined Cover | |
|-----------------------|--------------------|
| | Absolute Cover (%) |
| Tree = | 15 |
| Shrub = | 50 |
| Herb = | 16 |
| Total Cover = | 81 |

| Sapling/Shrub Stratum | Plot Size: r = 30ft | Absolute Cover (%) | Native? (Y/N) | Invasive? (Y/N) | |
|------------------------------------------------|---------------------|--------------------|---------------|-----------------|--|
| 1. <i>Populus balsamifera ssp. Trichocarpa</i> | | 40 | Y | N | |
| 2. <i>Rubus armeniacus</i> | | 30 | N | Y | |
| 3. <i>Symphoricarpos albus</i> | | 10 | Y | N | |
| 4. _____ | | | | | |
| 5. _____ | | | | | |
| 6. _____ | | | | | |
| 7. _____ | | | | | |
| 8. _____ | | | | | |
| 9. _____ | | | | | |
| 10. _____ | | | | | |
| Total Shrub Cover = | | 80 | | | |

| Tree Canopy Cover | |
|-------------------|--------------------|
| | Absolute Cover (%) |
| Total Cover = | 15 |

| Percent Invasives | |
|-------------------|--------------------|
| | Absolute Cover (%) |
| Tree = | n/a |
| Shrub = | 30 |
| Herb = | 5 |
| Total Cover = | 35 |

| Herb Stratum | Plot Size: r = 10ft | Absolute Cover (%) | Native? (Y/N) | Invasive? (Y/N) | |
|--------------------------------|---------------------|--------------------|---------------|-----------------|--|
| 1. <i>Rumex crispus</i> | | 10 | N | N | |
| 2. <i>Juncus effusus</i> | | 15 | Y | N | |
| 3. <i>Centaurium erythraea</i> | | 10 | N | N | |
| 4. <i>Agrostis capillaris</i> | | 10 | N | N | |
| 5. <i>Jacobaea vulgaris</i> | | 5 | N | N | |
| 6. <i>Cirsium arvense</i> | | 5 | N | Y | |
| 7. <i>Epilobium ciliatum</i> | | 1 | Y | N | |
| 8. _____ | | | | | |
| 9. _____ | | | | | |
| 10. _____ | | | | | |
| Total Herb Cover = | | 56 | | | |

| Corridor Condition Parameters | |
|-------------------------------|------------------------------------------------------------|
| Good | >80% Native Combined Cover and >50% Tree Canopy Exists |
| Marginal | 50-80% Native Combined Cover and 26-50% Tree Canopy Exists |
| Degraded | <50% Native Combined Cover and <25% Tree Canopy Exists |

Comments:
Vegetated corridor surrounding Wetland E

VEGETATED CORRIDOR COMMUNITY TYPE DATA SHEET



6650 SW Redwood Lane, Suite 333
Portland, OR 97224
Office: (503) 670-1108 Fax: (503) 670-1128

PROJECT NAME: The Ridge at SCM (Bellairs and Lolic Properties) **DATE:** 9/6/2016
APPLICANT/OWNER: West Hills Land Development **SAMPLING POINT:** DP-07
INVESTIGATOR(S): Matt Kuziinsky and Julie Fox

| Tree Stratum | Plot Size: <u>r = 30ft</u> | Absolute Cover (%) | Native? (Y/N) |
|--------------------|----------------------------|--------------------|---------------|
| 1. None | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| Total Tree Cover = | | 0 | |

Vegetated Corridor Condition

Degraded

Native Combined Cover

Absolute Cover (%)

Tree = _____

Shrub = 10

Herb = 5

Total Cover = 15

| Sapling/Shrub Stratum | Plot Size: <u>r = 30ft</u> | Absolute Cover (%) | Native? (Y/N) | Invasive? (Y/N) |
|------------------------------|----------------------------|--------------------|---------------|-----------------|
| 1. <i>Fraxinus latifolia</i> | | 5 | Y | N |
| 2. <i>Rubus ursinus</i> | | 5 | Y | N |
| 3. | | | | |
| 4. | | | | |
| 5. | | | | |
| 6. | | | | |
| 7. | | | | |
| 8. | | | | |
| 9. | | | | |
| 10. | | | | |
| Total Shrub Cover = | | 10 | | |

Tree Canopy Cover

Absolute Cover (%)

Total Cover = 0

Percent Invasives

Absolute Cover (%)

Tree = n/a

Shrub = _____

Herb = 10

Total Cover = 10

| Herb Stratum | Plot Size: <u>r = 10ft</u> | Absolute Cover (%) | Native? (Y/N) | Invasive? (Y/N) |
|------------------------------------|----------------------------|--------------------|---------------|-----------------|
| 1. <i>Holcus lanatus</i> | | 60 | N | N |
| 2. <i>Agrostis capillaris</i> | | 20 | N | N |
| 3. <i>Schedonorus arundinaceus</i> | | 5 | N | N |
| 4. <i>Plantago lanceolata</i> | | 5 | N | N |
| 5. <i>Cirsium vulgare</i> | | 10 | N | Y |
| 6. <i>Pteridium aquilinum</i> | | 5 | Y | N |
| 7. | | | | |
| 8. | | | | |
| 9. | | | | |
| 10. | | | | |
| Total Herb Cover = | | 105 | | |

| <u>Corridor Condition Parameters</u> | |
|---------------------------------------------|------------------------------------------------------------|
| Good | >80% Native Combined Cover and >50% Tree Canopy Exists |
| Marginal | 50-80% Native Combined Cover and 26-50% Tree Canopy Exists |
| Degraded | <50% Native Combined Cover and <25% Tree Canopy Exists |

Comments:
Vegetated corridor surrounding Wetland F

VEGETATED CORRIDOR COMMUNITY TYPE DATA SHEET



6650 SW Redwood Lane, Suite 333
Portland, OR 97224
Office: (503) 670-1108 Fax: (503) 670-1128

PROJECT NAME: The Ridge at SCM (Bellairs and Lolich Properties) **DATE:** 9/6/2016

APPLICANT/OWNER: West Hills Land Development **SAMPLING POINT:** DP-08

INVESTIGATOR(S): Matt Kuziinsky and Julie Fox

| Tree Stratum | Plot Size: <u>r = 30ft</u> | Absolute Cover (%) | Native? (Y/N) |
|--------------------|----------------------------|--------------------|---------------|
| 1. None | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| Total Tree Cover = | | <u>0</u> | |

Vegetated Corridor Condition

Degraded

| Sapling/Shrub Stratum | Plot Size: <u>r = 30ft</u> | Absolute Cover (%) | Native? (Y/N) | Invasive? (Y/N) |
|-------------------------------|----------------------------|--------------------|---------------|-----------------|
| 1. <i>Crataegus douglasii</i> | | 2 | Y | N |
| 2. <i>Rubus armeniacus</i> | | 10 | N | Y |
| 3. | | | | |
| 4. | | | | |
| 5. | | | | |
| 6. | | | | |
| 7. | | | | |
| 8. | | | | |
| 9. | | | | |
| 10. | | | | |
| Total Shrub Cover = | | <u>12</u> | | |

Native Combined Cover

Absolute Cover (%)

Tree = _____

Shrub = 2

Herb = _____

Total Cover = 2

Tree Canopy Cover

Absolute Cover (%)

Total Cover = 0

| Herb Stratum | Plot Size: <u>r = 10ft</u> | Absolute Cover (%) | Native? (Y/N) | Invasive? (Y/N) |
|------------------------------------|----------------------------|--------------------|---------------|-----------------|
| 1. <i>Holcus lanatus</i> | | 5 | N | N |
| 2. <i>Agrostis capillaris</i> | | 80 | N | N |
| 3. <i>Schedonorus arundinaceus</i> | | 20 | N | N |
| 4. <i>Plantago lanceolata</i> | | 1 | N | N |
| 5. <i>Dactylis glomerata</i> | | 5 | N | N |
| 6. <i>Lotus corniculatus</i> | | 1 | N | N |
| 7. | | | | |
| 8. | | | | |
| 9. | | | | |
| 10. | | | | |
| Total Herb Cover = | | <u>112</u> | | |

Percent Invasives

Absolute Cover (%)

Tree = n/a

Shrub = 10

Herb = _____

Total Cover = 10

| <u>Corridor Condition Parameters</u> | |
|---------------------------------------------|------------------------------------------------------------|
| Good | >80% Native Combined Cover and >50% Tree Canopy Exists |
| Marginal | 50-80% Native Combined Cover and 26-50% Tree Canopy Exists |
| Degraded | <50% Native Combined Cover and <25% Tree Canopy Exists |

Comments:
Vegetated corridor surrounding Wetland F

VEGETATED CORRIDOR COMMUNITY TYPE DATA SHEET



6650 SW Redwood Lane, Suite 333
Portland, OR 97224
Office: (503) 670-1108 Fax: (503) 670-1128

| | | |
|-------------------------|--------------------------------------------------|------------------------------|
| PROJECT NAME: | The Ridge at SCM (Bellairs and Lolic Properties) | DATE: 9/6/2016 |
| APPLICANT/OWNER: | West Hills Land Development | SAMPLING POINT: DP-09 |
| INVESTIGATOR(S): | Matt Kuziinsky and Julie Fox | |

| <u>Tree Stratum</u> | Plot Size: <u>r = 30ft</u> | Absolute Cover (%) | Native? (Y/N) |
|---------------------|----------------------------|--------------------|---------------|
| 1. <u>None</u> | | | |
| 2. _____ | | | |
| 3. _____ | | | |
| 4. _____ | | | |
| 5. _____ | | | |
| 6. _____ | | | |
| 7. _____ | | | |
| 8. _____ | | | |
| 9. _____ | | | |
| 10. _____ | | | |
| Total Tree Cover = | | <u>0</u> | |

Vegetated Corridor Condition

Degraded

Native Combined Cover

| | |
|--------------------|----------|
| Absolute Cover (%) | |
| Tree = | _____ |
| Shrub = | _____ |
| Herb = | <u>5</u> |
| Total Cover = | <u>5</u> |

| <u>Sapling/Shrub Stratum</u> | Plot Size: <u>r = 30ft</u> | Absolute Cover (%) | Native? (Y/N) | Invasive? (Y/N) |
|------------------------------|----------------------------|--------------------|---------------|-----------------|
| 1. <u>Rubus armeniacus</u> | | <u>20</u> | <u>N</u> | <u>Y</u> |
| 2. _____ | | | | |
| 3. _____ | | | | |
| 4. _____ | | | | |
| 5. _____ | | | | |
| 6. _____ | | | | |
| 7. _____ | | | | |
| 8. _____ | | | | |
| 9. _____ | | | | |
| 10. _____ | | | | |
| Total Shrub Cover = | | <u>20</u> | | |

Tree Canopy Cover

| | |
|--------------------|----------|
| Absolute Cover (%) | |
| Total Cover = | <u>0</u> |

Percent Invasives

| | |
|--------------------|------------|
| Absolute Cover (%) | |
| Tree = | <u>n/a</u> |
| Shrub = | <u>20</u> |
| Herb = | _____ |
| Total Cover = | <u>20</u> |

| <u>Herb Stratum</u> | Plot Size: <u>r = 10ft</u> | Absolute Cover (%) | Native? (Y/N) | Invasive? (Y/N) |
|------------------------------------|----------------------------|--------------------|---------------|-----------------|
| 1. <u>Agrostis capillaris</u> | | <u>80</u> | <u>N</u> | <u>N</u> |
| 2. <u>Hypochaeris radicata</u> | | <u>20</u> | <u>N</u> | <u>N</u> |
| 3. <u>Juncus tenuis</u> | | <u>5</u> | <u>Y</u> | <u>N</u> |
| 4. <u>Plantago lanceolata</u> | | <u>1</u> | <u>N</u> | <u>N</u> |
| 5. <u>Schedonorus arundinaceus</u> | | <u>5</u> | <u>N</u> | <u>N</u> |
| 6. _____ | | | | |
| 7. _____ | | | | |
| 8. _____ | | | | |
| 9. _____ | | | | |
| 10. _____ | | | | |
| Total Herb Cover = | | <u>111</u> | | |

Corridor Condition Parameters

| | |
|----------|------------------------------------------------------------|
| Good | >80% Native Combined Cover and >50% Tree Canopy Exists |
| Marginal | 50-80% Native Combined Cover and 26-50% Tree Canopy Exists |
| Degraded | <50% Native Combined Cover and <25% Tree Canopy Exists |

Comments:
Vegetated corridor surrounding Wetland F

VEGETATED CORRIDOR COMMUNITY TYPE DATA SHEET



6650 SW Redwood Lane, Suite 333
Portland, OR 97224
Office: (503) 670-1108 Fax: (503) 670-1128

PROJECT NAME: The Ridge at SCM (Bellairs and Lolic Properties) **DATE:** 9/6/2016

APPLICANT/OWNER: West Hills Land Development **SAMPLING POINT:** DP-10

INVESTIGATOR(S): Matt Kuziinsky and Julie Fox

| Tree Stratum | Plot Size: <u>r = 30ft</u> | Absolute Cover (%) | Native? (Y/N) |
|--------------------|----------------------------|-----------------------|------------------|
| 1. None | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| Total Tree Cover = | | <u>0</u> | |

Vegetated Corridor Condition

Degraded

| Sapling/Shrub Stratum | Plot Size: <u>r = 30ft</u> | Absolute Cover (%) | Native? (Y/N) | Invasive? (Y/N) |
|----------------------------|----------------------------|-----------------------|------------------|--------------------|
| 1. <i>Rubus armeniacus</i> | | 10 | N | Y |
| 2. <i>Rubus ursinus</i> | | 5 | Y | N |
| 3. | | | | |
| 4. | | | | |
| 5. | | | | |
| 6. | | | | |
| 7. | | | | |
| 8. | | | | |
| 9. | | | | |
| 10. | | | | |
| Total Shrub Cover = | | <u>15</u> | | |

Native Combined Cover

Absolute Cover (%)

Tree = _____

Shrub = 5

Herb = _____

Total Cover = 5

Tree Canopy Cover

Absolute Cover (%)

Total Cover = 0

| Herb Stratum | Plot Size: <u>r = 10ft</u> | Absolute Cover (%) | Native? (Y/N) | Invasive? (Y/N) |
|------------------------------------|----------------------------|-----------------------|------------------|--------------------|
| 1. <i>Schedonorus arundinaceus</i> | | 50 | N | N |
| 2. <i>Agrostis capillaris</i> | | 20 | N | N |
| 3. <i>Holcus lanatus</i> | | 10 | N | N |
| 4. | | | | |
| 5. | | | | |
| 6. | | | | |
| 7. | | | | |
| 8. | | | | |
| 9. | | | | |
| 10. | | | | |
| Total Herb Cover = | | <u>80</u> | | |

Percent Invasives

Absolute Cover (%)

Tree = n/a

Shrub = 10

Herb = _____

Total Cover = 10

| <u>Corridor Condition Parameters</u> | |
|---------------------------------------------|------------------------------------------------------------|
| Good | >80% Native Combined Cover and >50% Tree Canopy Exists |
| Marginal | 50-80% Native Combined Cover and 26-50% Tree Canopy Exists |
| Degraded | <50% Native Combined Cover and <25% Tree Canopy Exists |

Comments:
Vegetated corridor surrounding Wetland F

VEGETATED CORRIDOR COMMUNITY TYPE DATA SHEET



6650 SW Redwood Lane, Suite 333
Portland, OR 97224
Office: (503) 670-1108 Fax: (503) 670-1128

| | | |
|-------------------------|--------------------------------------------------|------------------------------|
| PROJECT NAME: | The Ridge at SCM (Bellairs and Lolic Properties) | DATE: 9/6/2016 |
| APPLICANT/OWNER: | West Hills Land Development | SAMPLING POINT: DP-11 |
| INVESTIGATOR(S): | Matt Kuziinsky and Julie Fox | |

| <u>Tree Stratum</u> | Plot Size: <u>r = 30ft</u> | Absolute Cover (%) | Native? (Y/N) |
|---------------------|----------------------------|--------------------|---------------|
| 1. None | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| Total Tree Cover = | | <u>0</u> | |

Vegetated Corridor Condition

Degraded

Native Combined Cover

| | |
|--------------------|-----------------------------|
| Absolute Cover (%) | |
| Tree = | <u> </u> |
| Shrub = | <u> </u> |
| Herb = | <u> </u> |
| Total Cover = | 0 |

Tree Canopy Cover

| | |
|--------------------|----------|
| Absolute Cover (%) | |
| Total Cover = | 0 |

| <u>Sapling/Shrub Stratum</u> | Plot Size: <u>r = 30ft</u> | Absolute Cover (%) | Native? (Y/N) | Invasive? (Y/N) |
|------------------------------|----------------------------|--------------------|---------------|-----------------|
| 1. None | | | | |
| 2. | | | | |
| 3. | | | | |
| 4. | | | | |
| 5. | | | | |
| 6. | | | | |
| 7. | | | | |
| 8. | | | | |
| 9. | | | | |
| 10. | | | | |
| Total Shrub Cover = | | <u>0</u> | | |

Percent Invasives

| | |
|--------------------|-----------------------------|
| Absolute Cover (%) | |
| Tree = | <u>n/a</u> |
| Shrub = | <u> </u> |
| Herb = | <u>10</u> |
| Total Cover = | 10 |

| <u>Herb Stratum</u> | Plot Size: <u>r = 10ft</u> | Absolute Cover (%) | Native? (Y/N) | Invasive? (Y/N) |
|-------------------------------|----------------------------|--------------------|---------------|-----------------|
| 1. <i>Plantago lanceolata</i> | | 20 | N | N |
| 2. <i>Agrostis capillaris</i> | | 40 | N | N |
| 3. <i>Daucus carota</i> | | 15 | N | N |
| 4. <i>Cirsium arvense</i> | | 5 | N | Y |
| 5. <i>Dipsacus fullonum</i> | | 5 | N | Y |
| 6. <i>Lolium perenne</i> | | 25 | N | N |
| 7. | | | | |
| 8. | | | | |
| 9. | | | | |
| 10. | | | | |
| Total Herb Cover = | | <u>110</u> | | |

Corridor Condition Parameters

| | |
|----------|------------------------------------------------------------|
| Good | >80% Native Combined Cover and >50% Tree Canopy Exists |
| Marginal | 50-80% Native Combined Cover and 26-50% Tree Canopy Exists |
| Degraded | <50% Native Combined Cover and <25% Tree Canopy Exists |

Comments:
Vegetated corridor surrounding Wetland F

VEGETATED CORRIDOR COMMUNITY TYPE DATA SHEET



6650 SW Redwood Lane, Suite 333
Portland, OR 97224
Office: (503) 670-1108 Fax: (503) 670-1128

PROJECT NAME: The Ridge at SCM (Bellairs and Lolic Properties) **DATE:** 8/24/2016

APPLICANT/OWNER: West Hills Land Development **SAMPLING POINT:** DP-12

INVESTIGATOR(S): Matt Kuzienschky and Julie Fox

| Tree Stratum | Plot Size: <u>r = 30ft</u> | Absolute Cover (%) | Native? (Y/N) | |
|---------------------------------|----------------------------|--------------------|---------------|--------------------------------------------------------|
| 1. <u>Fraxinus latifolia</u> | | 40 | Y | Vegetated Corridor Condition Good |
| 2. <u>Pseudotsuga menziesii</u> | | 10 | Y | |
| 3. <u>Quercus garryana</u> | | 25 | Y | |
| 4. _____ | | | | |
| 5. _____ | | | | |
| 6. _____ | | | | |
| 7. _____ | | | | |
| 8. _____ | | | | |
| 9. _____ | | | | |
| 10. _____ | | | | |
| Total Tree Cover = | | 75 | | |

| Native Combined Cover | |
|-----------------------|--------------------|
| | Absolute Cover (%) |
| Tree = | 75 |
| Shrub = | 116 |
| Herb = | 21 |
| Total Cover = | 212 |

| Sapling/Shrub Stratum | Plot Size: <u>r = 30ft</u> | Absolute Cover (%) | Native? (Y/N) | Invasive? (Y/N) | |
|------------------------------|----------------------------|--------------------|---------------|-----------------|-----------------------------------------------------------------------------------|
| 1. <u>Acer circinatum</u> | | 20 | Y | N | Tree Canopy Cover Absolute Cover (%) Total Cover = 75 |
| 2. <u>Corylus cornuta</u> | | 30 | Y | N | |
| 3. <u>Rubus parviflorus</u> | | 20 | Y | N | |
| 4. <u>Fraxinus latifolia</u> | | 5 | Y | N | |
| 5. <u>Ilex aquifolium</u> | | 5 | N | N | |
| 6. <u>Rubus ursinus</u> | | 40 | Y | N | |
| 7. <u>Rosa nutkana</u> | | 1 | Y | N | |
| 8. <u>Crataegus monogyna</u> | | 1 | N | N | |
| 9. _____ | | | | | |
| 10. _____ | | | | | |
| Total Shrub Cover = | | 122 | | | |

| Percent Invasives | |
|-------------------|--------------------|
| | Absolute Cover (%) |
| Tree = | n/a |
| Shrub = | |
| Herb = | |
| Total Cover = | 0 |

| Herb Stratum | Plot Size: <u>r = 10ft</u> | Absolute Cover (%) | Native? (Y/N) | Invasive? (Y/N) | | | | | | | |
|-------------------------------|------------------------------------------------------------|--------------------|---------------|-----------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|--------------------------------------------------------|----------|------------------------------------------------------------|----------|--------------------------------------------------------|
| 1. <u>Pteridium aquilinum</u> | | 15 | Y | N | Corridor Condition Parameters <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%; text-align: center;">Good</td> <td>>80% Native Combined Cover and >50% Tree Canopy Exists</td> </tr> <tr> <td style="text-align: center;">Marginal</td> <td>50-80% Native Combined Cover and 26-50% Tree Canopy Exists</td> </tr> <tr> <td style="text-align: center;">Degraded</td> <td><50% Native Combined Cover and <25% Tree Canopy Exists</td> </tr> </table> | Good | >80% Native Combined Cover and >50% Tree Canopy Exists | Marginal | 50-80% Native Combined Cover and 26-50% Tree Canopy Exists | Degraded | <50% Native Combined Cover and <25% Tree Canopy Exists |
| Good | >80% Native Combined Cover and >50% Tree Canopy Exists | | | | | | | | | | |
| Marginal | 50-80% Native Combined Cover and 26-50% Tree Canopy Exists | | | | | | | | | | |
| Degraded | <50% Native Combined Cover and <25% Tree Canopy Exists | | | | | | | | | | |
| 2. <u>Polystichum munitum</u> | | 5 | Y | N | | | | | | | |
| 3. <u>Athyrium angustum</u> | | 1 | Y | N | | | | | | | |
| 4. _____ | | | | | | | | | | | |
| 5. _____ | | | | | | | | | | | |
| 6. _____ | | | | | | | | | | | |
| 7. _____ | | | | | | | | | | | |
| 8. _____ | | | | | | | | | | | |
| 9. _____ | | | | | | | | | | | |
| 10. _____ | | | | | | | | | | | |
| Total Herb Cover = | | 21 | | | | | | | | | |

Comments:
Vegetated corridor surrounding Wetland G

VEGETATED CORRIDOR COMMUNITY TYPE DATA SHEET



6650 SW Redwood Lane, Suite 333
Portland, OR 97224
Office: (503) 670-1108 Fax: (503) 670-1128

| | | |
|-------------------------|---------------------------------------------------|------------------------------|
| PROJECT NAME: | The Ridge at SCM (Bellairs and Lolich Properties) | DATE: 8/24/2016 |
| APPLICANT/OWNER: | West Hills Land Development | SAMPLING POINT: DP-13 |
| INVESTIGATOR(S): | Matt Kuziinsky and Julie Fox | |

| Tree Stratum | Plot Size: <u>r = 30ft</u> | Absolute Cover (%) | Native? (Y/N) |
|------------------------------|----------------------------|--------------------|---------------|
| 1. <i>Fraxinus latifolia</i> | | 20 | Y |
| 2. <i>Ilex aquifolium</i> | | 5 | N |
| 3. <i>Quercus garryana</i> | | 35 | Y |
| 4. _____ | | | |
| 5. _____ | | | |
| 6. _____ | | | |
| 7. _____ | | | |
| 8. _____ | | | |
| 9. _____ | | | |
| 10. _____ | | | |
| Total Tree Cover = | | 60 | |

Vegetated Corridor Condition

Good

Native Combined Cover

| | |
|--------------------|------------|
| Absolute Cover (%) | |
| Tree = | 55 |
| Shrub = | 98 |
| Herb = | 11 |
| Total Cover = | 164 |

| Sapling/Shrub Stratum | Plot Size: <u>r = 30ft</u> | Absolute Cover (%) | Native? (Y/N) | Invasive? (Y/N) |
|--------------------------------------|----------------------------|--------------------|---------------|-----------------|
| 1. <i>Acer circinatum</i> | | 20 | Y | N |
| 2. <i>Corylus cornuta</i> | | 5 | Y | N |
| 3. <i>Physocarpus capitatus</i> | | 15 | Y | N |
| 4. <i>Gaultheria shallon</i> | | 20 | Y | N |
| 5. <i>Quercus garryana</i> | | 5 | Y | N |
| 6. <i>Rubus ursinus</i> | | 30 | Y | N |
| 7. <i>Acer macrophyllum</i> | | 2 | Y | N |
| 8. <i>Toxicodendron diversilobum</i> | | 1 | Y | N |
| 9. _____ | | | | |
| 10. _____ | | | | |
| Total Shrub Cover = | | 98 | | |

Tree Canopy Cover

| | |
|--------------------|-----------|
| Absolute Cover (%) | |
| Total Cover = | 60 |

Percent Invasives

| | |
|--------------------|----------|
| Absolute Cover (%) | |
| Tree = | n/a |
| Shrub = | _____ |
| Herb = | _____ |
| Total Cover = | 0 |

| Herb Stratum | Plot Size: <u>r = 10ft</u> | Absolute Cover (%) | Native? (Y/N) | Invasive? (Y/N) |
|-------------------------------|----------------------------|--------------------|---------------|-----------------|
| 1. <i>Pteridium aquilinum</i> | | 1 | Y | N |
| 2. <i>Polystichum munitum</i> | | 10 | Y | N |
| 3. _____ | | | | |
| 4. _____ | | | | |
| 5. _____ | | | | |
| 6. _____ | | | | |
| 7. _____ | | | | |
| 8. _____ | | | | |
| 9. _____ | | | | |
| 10. _____ | | | | |
| Total Herb Cover = | | 11 | | |

Corridor Condition Parameters

| | |
|----------|------------------------------------------------------------|
| Good | >80% Native Combined Cover and >50% Tree Canopy Exists |
| Marginal | 50-80% Native Combined Cover and 26-50% Tree Canopy Exists |
| Degraded | <50% Native Combined Cover and <25% Tree Canopy Exists |

Comments:
Vegetated corridor surrounding Wetland G

VEGETATED CORRIDOR COMMUNITY TYPE DATA SHEET



6650 SW Redwood Lane, Suite 333
Portland, OR 97224
Office: (503) 670-1108 Fax: (503) 670-1128

PROJECT NAME: The Ridge at SCM (Bellairs and Lolic Properties) **DATE:** 8/24/2016

APPLICANT/OWNER: West Hills Land Development **SAMPLING POINT:** DP-14

INVESTIGATOR(S): Matt Kuziinsky and Julie Fox

| Tree Stratum | Plot Size: <u>r = 30ft</u> | Absolute Cover (%) | Native? (Y/N) |
|--------------------|----------------------------|--------------------|---------------|
| 1. None | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| Total Tree Cover = | | <u>0</u> | |

Vegetated Corridor Condition

Degraded

Native Combined Cover

Absolute Cover (%)

Tree = _____

Shrub = 2

Herb = _____

Total Cover = 2

Tree Canopy Cover

Absolute Cover (%)

Total Cover = 0

| Sapling/Shrub Stratum | Plot Size: <u>r = 30ft</u> | Absolute Cover (%) | Native? (Y/N) | Invasive? (Y/N) |
|------------------------------------------------|----------------------------|--------------------|---------------|-----------------|
| 1. <i>Populus balsamifera ssp. Trichocarpa</i> | | 2 | Y | N |
| 2. | | | | |
| 3. | | | | |
| 4. | | | | |
| 5. | | | | |
| 6. | | | | |
| 7. | | | | |
| 8. | | | | |
| 9. | | | | |
| 10. | | | | |
| Total Shrub Cover = | | <u>2</u> | | |

Percent Invasives

Absolute Cover (%)

Tree = n/a

Shrub = _____

Herb = 10

Total Cover = 10

| Herb Stratum | Plot Size: <u>r = 10ft</u> | Absolute Cover (%) | Native? (Y/N) | Invasive? (Y/N) |
|---------------------------------|----------------------------|--------------------|---------------|-----------------|
| 1. <i>Agrostis capillaris</i> | | 20 | N | N |
| 2. <i>Bromus arvensis</i> | | 40 | N | N |
| 3. <i>Anthoxanthum odoratum</i> | | 15 | N | N |
| 4. <i>Hypochaeris radicata</i> | | 2 | N | N |
| 5. <i>Centaurea erythraea</i> | | 10 | N | N |
| 6. <i>Cirsium vulgare</i> | | 10 | N | Y |
| 7. <i>Lolium perenne</i> | | 20 | N | N |
| 8. | | | | |
| 9. | | | | |
| 10. | | | | |
| Total Herb Cover = | | <u>117</u> | | |

| Corridor Condition Parameters | |
|-------------------------------|------------------------------------------------------------|
| Good | >80% Native Combined Cover and >50% Tree Canopy Exists |
| Marginal | 50-80% Native Combined Cover and 26-50% Tree Canopy Exists |
| Degraded | <50% Native Combined Cover and <25% Tree Canopy Exists |

Comments:
Vegetated corridor surrounding Wetland G

VEGETATED CORRIDOR COMMUNITY TYPE DATA SHEET



6650 SW Redwood Lane, Suite 333
Portland, OR 97224
Office: (503) 670-1108 Fax: (503) 670-1128

PROJECT NAME: The Ridge at SCM (Bellairs and Lolich Properties) **DATE:** 8/24/2016

APPLICANT/OWNER: West Hills Land Development **SAMPLING POINT:** DP-15

INVESTIGATOR(S): Matt Kuziinsky and Julie Fox

| <u>Tree Stratum</u> | Plot Size: <u>r = 30ft</u> | Absolute Cover (%) | Native? (Y/N) | <u>Vegetated Corridor Condition</u> |
|---------------------|----------------------------|--------------------|---------------|-------------------------------------|
| 1. <u>None</u> | | | | Degraded |
| 2. _____ | | | | |
| 3. _____ | | | | |
| 4. _____ | | | | |
| 5. _____ | | | | |
| 6. _____ | | | | |
| 7. _____ | | | | |
| 8. _____ | | | | |
| 9. _____ | | | | |
| 10. _____ | | | | |
| Total Tree Cover = | | <u>0</u> | | |

| <u>Native Combined Cover</u> | |
|------------------------------|--------------------|
| | Absolute Cover (%) |
| Tree = | _____ |
| Shrub = | _____ |
| Herb = | <u>1</u> |
| Total Cover = | <u>1</u> |

| <u>Sapling/Shrub Stratum</u> | Plot Size: <u>r = 30ft</u> | Absolute Cover (%) | Native? (Y/N) | Invasive? (Y/N) | <u>Tree Canopy Cover</u> |
|------------------------------|----------------------------|--------------------|---------------|-----------------|----------------------------------------------|
| 1. <u>Rubus armeniacus</u> | | <u>5</u> | <u>N</u> | <u>Y</u> | Absolute Cover (%) Total Cover = <u>0</u> |
| 2. _____ | | | | | |
| 3. _____ | | | | | |
| 4. _____ | | | | | |
| 5. _____ | | | | | |
| 6. _____ | | | | | |
| 7. _____ | | | | | |
| 8. _____ | | | | | |
| 9. _____ | | | | | |
| 10. _____ | | | | | |
| Total Shrub Cover = | | <u>5</u> | | | |

| <u>Percent Invasives</u> | |
|--------------------------|--------------------|
| | Absolute Cover (%) |
| Tree = | <u>n/a</u> |
| Shrub = | <u>5</u> |
| Herb = | _____ |
| Total Cover = | <u>5</u> |

| <u>Herb Stratum</u> | Plot Size: <u>r = 10ft</u> | Absolute Cover (%) | Native? (Y/N) | Invasive? (Y/N) | <u>Corridor Condition Parameters</u> | | | | | | |
|---------------------------------|------------------------------------------------------------|--------------------|---------------|-----------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|--------------------------------------------------------|----------|------------------------------------------------------------|----------|--------------------------------------------------------|
| 1. <u>Agrostis capillaris</u> | | <u>25</u> | <u>N</u> | <u>N</u> | <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%; text-align: center;">Good</td> <td>>80% Native Combined Cover and >50% Tree Canopy Exists</td> </tr> <tr> <td style="text-align: center;">Marginal</td> <td>50-80% Native Combined Cover and 26-50% Tree Canopy Exists</td> </tr> <tr> <td style="text-align: center;">Degraded</td> <td><50% Native Combined Cover and <25% Tree Canopy Exists</td> </tr> </table> | Good | >80% Native Combined Cover and >50% Tree Canopy Exists | Marginal | 50-80% Native Combined Cover and 26-50% Tree Canopy Exists | Degraded | <50% Native Combined Cover and <25% Tree Canopy Exists |
| Good | >80% Native Combined Cover and >50% Tree Canopy Exists | | | | | | | | | | |
| Marginal | 50-80% Native Combined Cover and 26-50% Tree Canopy Exists | | | | | | | | | | |
| Degraded | <50% Native Combined Cover and <25% Tree Canopy Exists | | | | | | | | | | |
| 2. <u>Lolium perenne</u> | | <u>50</u> | <u>N</u> | <u>N</u> | | | | | | | |
| 3. <u>Anthoxanthum odoratum</u> | | <u>25</u> | <u>N</u> | <u>N</u> | | | | | | | |
| 4. <u>Madia glomerata</u> | | <u>1</u> | <u>Y</u> | <u>N</u> | | | | | | | |
| 5. <u>Centaureum erythraea</u> | | <u>10</u> | <u>N</u> | <u>N</u> | | | | | | | |
| 6. <u>Lactuca serriola</u> | | <u>1</u> | <u>N</u> | <u>N</u> | | | | | | | |
| 7. _____ | | | | | | | | | | | |
| 8. _____ | | | | | | | | | | | |
| 9. _____ | | | | | | | | | | | |
| 10. _____ | | | | | | | | | | | |
| Total Herb Cover = | | <u>112</u> | | | | | | | | | |

Comments:
Vegetated corridor surrounding Wetland G

VEGETATED CORRIDOR COMMUNITY TYPE DATA SHEET



6650 SW Redwood Lane, Suite 333
Portland, OR 97224
Office: (503) 670-1108 Fax: (503) 670-1128

PROJECT NAME: The Ridge at SCM (Bellairs and Lolic Properties) **DATE:** 8/24/2016

APPLICANT/OWNER: West Hills Land Development **SAMPLING POINT:** DP-16

INVESTIGATOR(S): Matt Kuziinsky and Julie Fox

| Tree Stratum | Plot Size: <u>r = 30ft</u> | Absolute Cover (%) | Native? (Y/N) |
|--------------------|----------------------------|-----------------------|------------------|
| 1. None | | | |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| Total Tree Cover = | | <u>0</u> | |

Vegetated Corridor Condition

Degraded

| Sapling/Shrub Stratum | Plot Size: <u>r = 30ft</u> | Absolute Cover (%) | Native? (Y/N) | Invasive? (Y/N) |
|----------------------------|----------------------------|-----------------------|------------------|--------------------|
| 1. <i>Rubus ursinus</i> | | 20 | Y | N |
| 2. <i>Quercus garryana</i> | | 2 | Y | N |
| 3. | | | | |
| 4. | | | | |
| 5. | | | | |
| 6. | | | | |
| 7. | | | | |
| 8. | | | | |
| 9. | | | | |
| 10. | | | | |
| Total Shrub Cover = | | <u>22</u> | | |

Native Combined Cover

Absolute Cover (%)

Tree = _____

Shrub = 22

Herb = _____

Total Cover = 22

Tree Canopy Cover

Absolute Cover (%)

Total Cover = 0

| Herb Stratum | Plot Size: <u>r = 10ft</u> | Absolute Cover (%) | Native? (Y/N) | Invasive? (Y/N) |
|---------------------------------|----------------------------|-----------------------|------------------|--------------------|
| 1. <i>Holcus lanatus</i> | | 10 | N | N |
| 2. <i>Agrostis capillaris</i> | | 20 | N | N |
| 3. <i>Anthoxanthum odoratum</i> | | 40 | N | N |
| 4. <i>Lolium perenne</i> | | 20 | N | N |
| 5. <i>Plantago lanceolata</i> | | 15 | N | N |
| 6. <i>Cirsium vulgare</i> | | 5 | N | Y |
| 7. | | | | |
| 8. | | | | |
| 9. | | | | |
| 10. | | | | |
| Total Herb Cover = | | <u>110</u> | | |

Percent Invasives

Absolute Cover (%)

Tree = n/a

Shrub = _____

Herb = 5

Total Cover = 5

| <u>Corridor Condition Parameters</u> | |
|---------------------------------------------|------------------------------------------------------------|
| Good | >80% Native Combined Cover and >50% Tree Canopy Exists |
| Marginal | 50-80% Native Combined Cover and 26-50% Tree Canopy Exists |
| Degraded | <50% Native Combined Cover and <25% Tree Canopy Exists |

Comments:
Vegetated corridor surrounding Wetland G

VEGETATED CORRIDOR COMMUNITY TYPE DATA SHEET



6650 SW Redwood Lane, Suite 333
Portland, OR 97224
Office: (503) 670-1108 Fax: (503) 670-1128

PROJECT NAME: The Ridge at SCM (Bellairs and Lolich Properties) **DATE:** 9/6/2016

APPLICANT/OWNER: West Hills Land Development **SAMPLING POINT:** DP-17

INVESTIGATOR(S): Matt Kuziinsky and Julie Fox

| <u>Tree Stratum</u> | Plot Size: r = 30ft | Absolute Cover (%) | Native? (Y/N) | |
|------------------------------|---------------------|--------------------|---------------|-------------------------------------------------------------------|
| 1. <i>Fraxinus latifolia</i> | | 10 | Y | <u>Vegetated Corridor Condition</u> Degraded |
| 2. <i>Crataegus monogyna</i> | | 90 | N | |
| 3. _____ | | | | |
| 4. _____ | | | | |
| 5. _____ | | | | |
| 6. _____ | | | | |
| 7. _____ | | | | |
| 8. _____ | | | | |
| 9. _____ | | | | |
| 10. _____ | | | | |
| Total Tree Cover = | | 100 | | |

| <u>Native Combined Cover</u> | |
|-------------------------------------|--------------------|
| | Absolute Cover (%) |
| Tree = | 10 |
| Shrub = | 10 |
| Herb = | _____ |
| Total Cover = | 20 |

| <u>Tree Canopy Cover</u> | |
|---------------------------------|--------------------|
| | Absolute Cover (%) |
| Total Cover = | 100 |

| <u>Sapling/Shrub Stratum</u> | Plot Size: r = 30ft | Absolute Cover (%) | Native? (Y/N) | Invasive? (Y/N) | |
|------------------------------|---------------------|--------------------|---------------|-----------------|--------------------------------------------------------------------------------------------------------------------------------------|
| 1. <i>Rubus armeniacus</i> | | 30 | N | Y | <u>Percent Invasives</u> Absolute Cover (%) Tree = n/a Shrub = 30 Herb = _____ Total Cover = 30 |
| 2. <i>Corylus cornuta</i> | | 10 | Y | N | |
| 3. <i>Crataegus monogyna</i> | | 20 | N | N | |
| 4. _____ | | | | | |
| 5. _____ | | | | | |
| 6. _____ | | | | | |
| 7. _____ | | | | | |
| 8. _____ | | | | | |
| 9. _____ | | | | | |
| 10. _____ | | | | | |
| Total Shrub Cover = | | 60 | | | |

| <u>Corridor Condition Parameters</u> | |
|---------------------------------------------|------------------------------------------------------------|
| Good | >80% Native Combined Cover and >50% Tree Canopy Exists |
| Marginal | 50-80% Native Combined Cover and 26-50% Tree Canopy Exists |
| Degraded | <50% Native Combined Cover and <25% Tree Canopy Exists |

| <u>Herb Stratum</u> | Plot Size: r = 10ft | Absolute Cover (%) | Native? (Y/N) | Invasive? (Y/N) | |
|---------------------|---------------------|--------------------|---------------|-----------------|-----------------------------|
| 1. None | | | | | Total Herb Cover = 0 |
| 2. _____ | | | | | |
| 3. _____ | | | | | |
| 4. _____ | | | | | |
| 5. _____ | | | | | |
| 6. _____ | | | | | |
| 7. _____ | | | | | |
| 8. _____ | | | | | |
| 9. _____ | | | | | |
| 10. _____ | | | | | |

Comments:
Vegetated corridor surrounding the Southwest Drainage

VEGETATED CORRIDOR COMMUNITY TYPE DATA SHEET



6650 SW Redwood Lane, Suite 333
Portland, OR 97224
Office: (503) 670-1108 Fax: (503) 670-1128

PROJECT NAME: The Ridge at SCM (Bellairs and Lolich Properties) **DATE:** 9/6/2016

APPLICANT/OWNER: West Hills Land Development **SAMPLING POINT:** DP-18

INVESTIGATOR(S): Matt Kuziinsky and Julie Fox

| Tree Stratum | Plot Size: r = 30ft | Absolute Cover (%) | Native? (Y/N) |
|------------------------------|---------------------|--------------------|---------------|
| 1. <i>Crataegus monogyna</i> | | 50 | N |
| 2. | | | |
| 3. | | | |
| 4. | | | |
| 5. | | | |
| 6. | | | |
| 7. | | | |
| 8. | | | |
| 9. | | | |
| 10. | | | |
| Total Tree Cover = | | 50 | |

Vegetated Corridor Condition

Degraded

| Sapling/Shrub Stratum | Plot Size: r = 30ft | Absolute Cover (%) | Native? (Y/N) | Invasive? (Y/N) |
|----------------------------|---------------------|--------------------|---------------|-----------------|
| 1. <i>Rubus armeniacus</i> | | 10 | N | Y |
| 2. <i>Rubus ursinus</i> | | 10 | Y | N |
| 3. | | | | |
| 4. | | | | |
| 5. | | | | |
| 6. | | | | |
| 7. | | | | |
| 8. | | | | |
| 9. | | | | |
| 10. | | | | |
| Total Shrub Cover = | | 20 | | |

Native Combined Cover

Absolute Cover (%)

Tree = _____

Shrub = 10

Herb = _____

Total Cover = 10

Tree Canopy Cover

Absolute Cover (%)

Total Cover = 50

| Herb Stratum | Plot Size: r = 10ft | Absolute Cover (%) | Native? (Y/N) | Invasive? (Y/N) |
|--------------------|---------------------|--------------------|---------------|-----------------|
| 1. None | | | | |
| 2. | | | | |
| 3. | | | | |
| 4. | | | | |
| 5. | | | | |
| 6. | | | | |
| 7. | | | | |
| 8. | | | | |
| 9. | | | | |
| 10. | | | | |
| Total Herb Cover = | | 0 | | |

Percent Invasives

Absolute Cover (%)

Tree = n/a

Shrub = 10

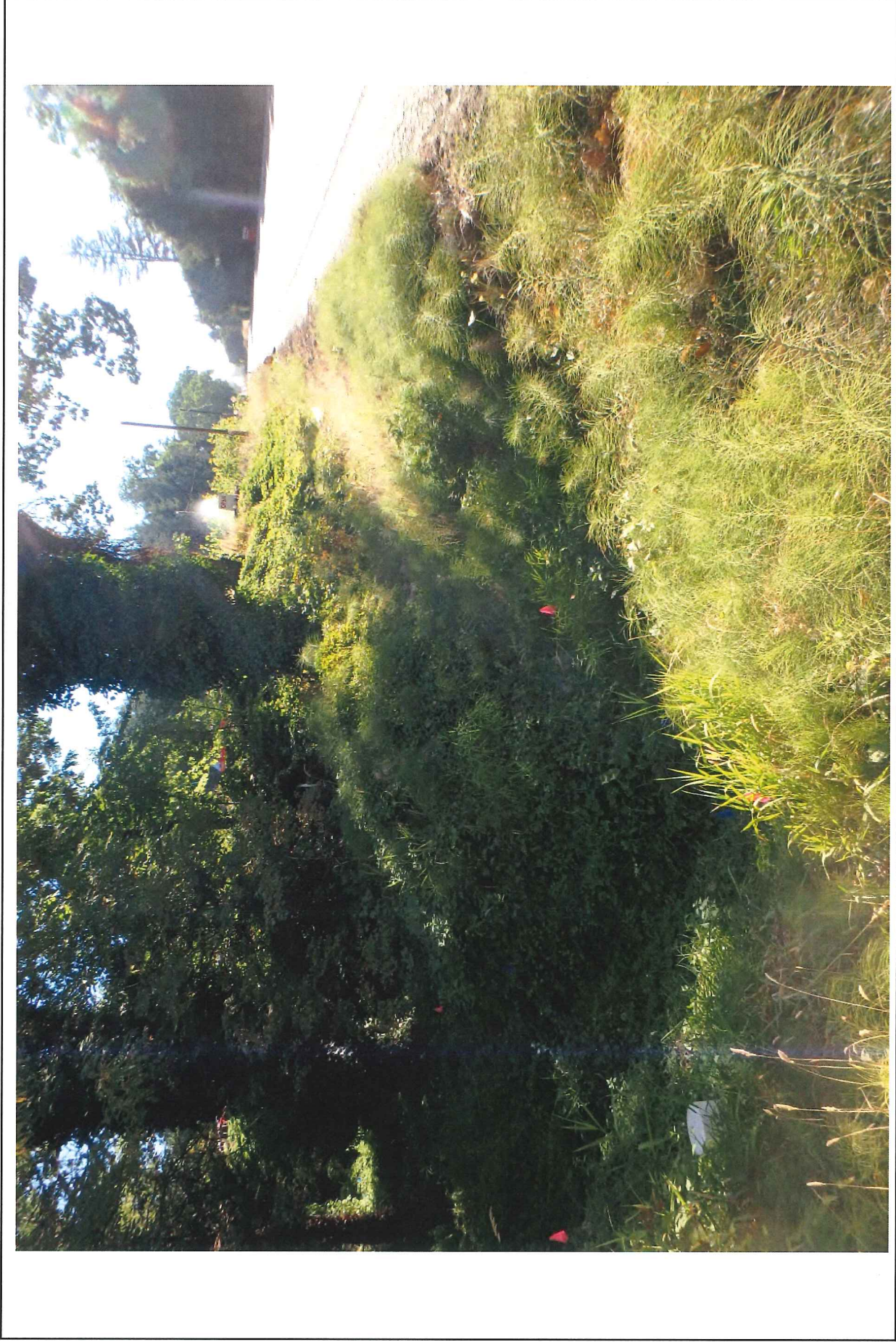
Herb = _____

Total Cover = 10

| Corridor Condition Parameters | |
|-------------------------------|------------------------------------------------------------|
| Good | >80% Native Combined Cover and >50% Tree Canopy Exists |
| Marginal | 50-80% Native Combined Cover and 26-50% Tree Canopy Exists |
| Degraded | <50% Native Combined Cover and <25% Tree Canopy Exists |

Comments:
Vegetated corridor surrounding the Southwest Drainage

APPENDIX F
PROJECT SITE PHOTOGRAPHS











Appendix F, Photo 5

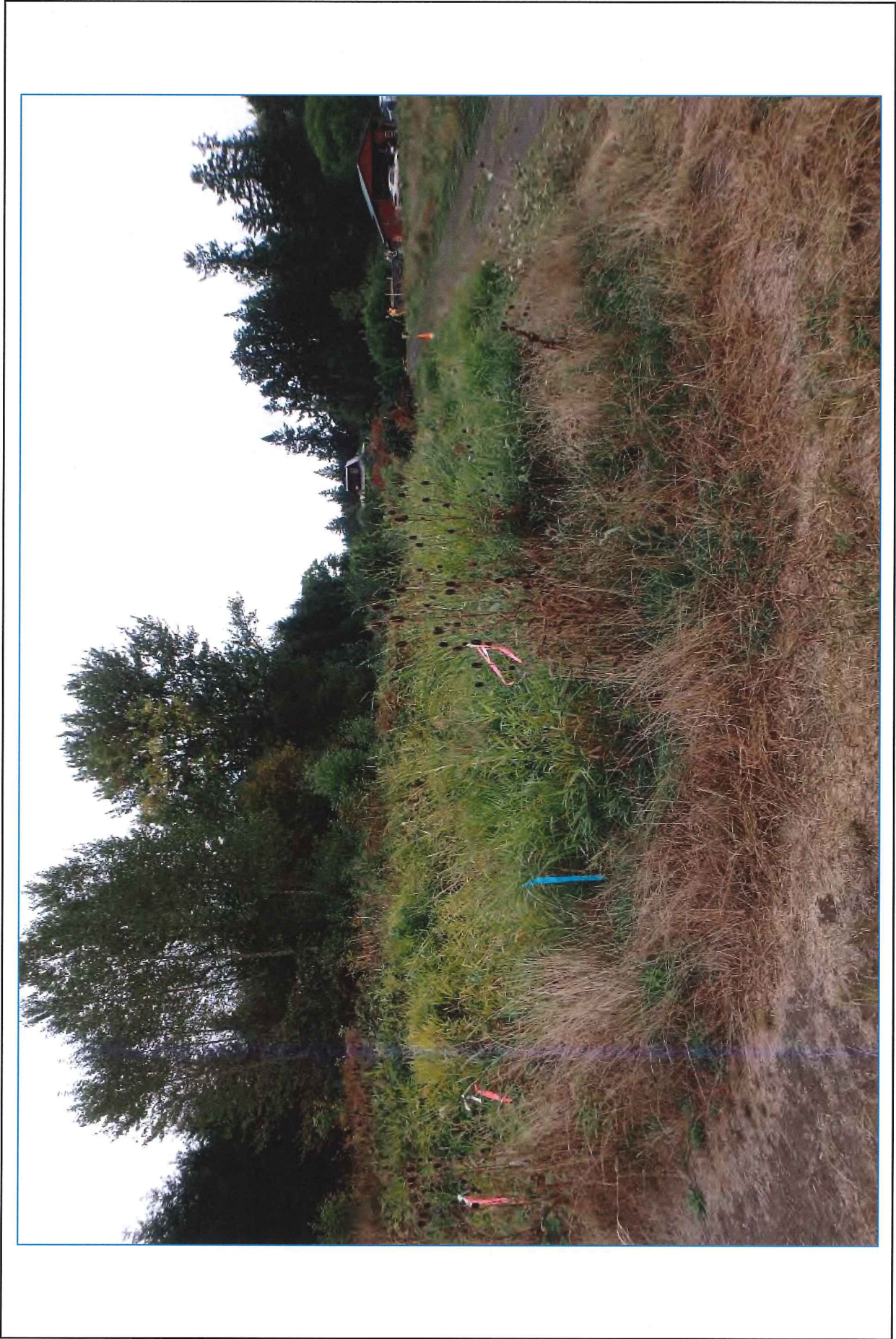
Good and Degraded Condition Vegetated Corridor along Wetland D and Unnamed Tributary, Looking Northeast
Natural Resource Assessment (Bellairs and Lolich Properties)
West Hills Land Development: The Ridge at South Cooper Mountain



Appendix F, Photo 6
Degraded Condition Vegetated Corridor along Wetland D and Unnamed Tributary, Looking Southwest
Natural Resource Assessment (Bellairs and Lolich Properties)
West Hills Land Development: The Ridge at South Cooper Mountain



Appendix F, Photo 7
Degraded Condition Vegetated Corridor along Wetland E and Unnamed Tributary, Looking Northeast
Natural Resource Assessment (Bellairs and Lolich Properties)
West Hills Land Development: The Ridge at South Cooper Mountain









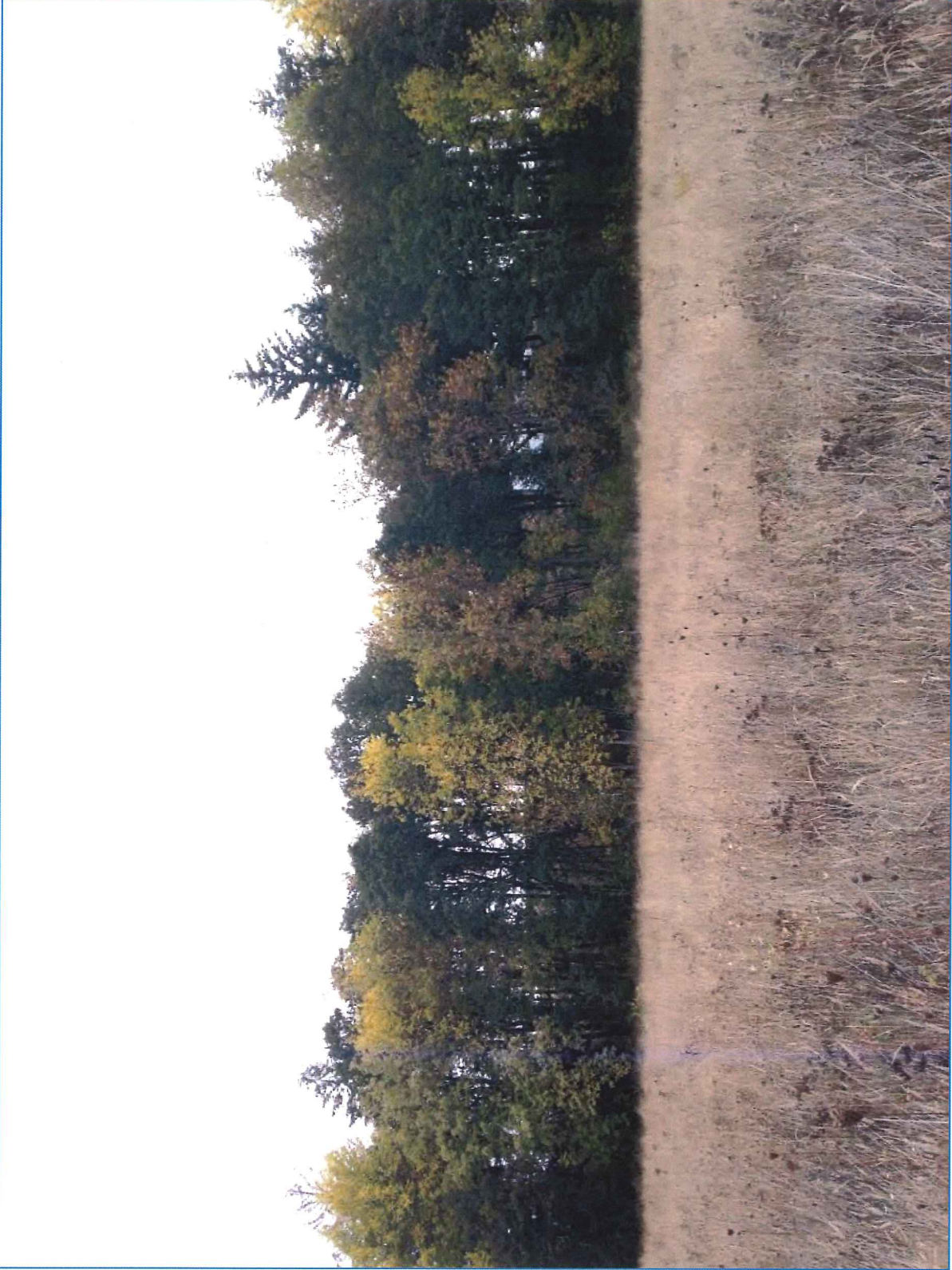
Appendix F, Photo 11
Degraded Condition Vegetated Corridor along Wetland F, Looking Northeast
Natural Resource Assessment (Bellairs and Lolich Properties)
West Hills Land Development: The Ridge at South Cooper Mountain



Appendix F, Photo 12
Degraded Condition Vegetated Corridor along Wetland F, Looking Southwest
Natural Resource Assessment (Bellairs and Lolich Properties)
West Hills Land Development: The Ridge at South Cooper Mountain



Appendix F, Photo 13
Degraded Condition Vegetated Corridor along Wetland G, Looking Southwest
Natural Resource Assessment (Bellairs and Lolich Properties)
West Hills Land Development: The Ridge at South Cooper Mountain







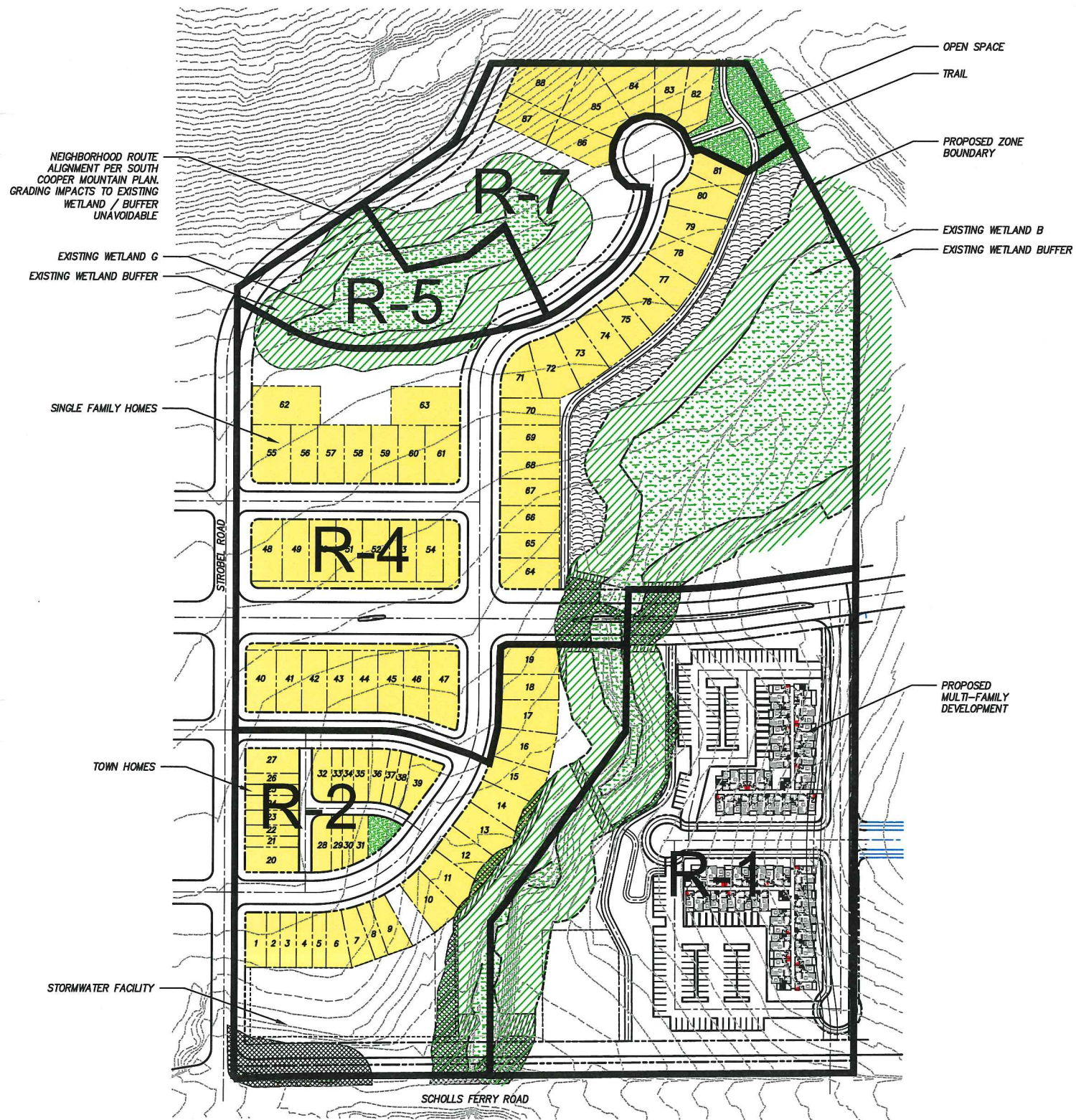




Appendix F, Photo 18
Degraded Condition Vegetated Corridor along Southwest Drainage, Looking West
Natural Resource Assessment (Bellairs and Lolich Properties)
West Hills Land Development: The Ridge at South Cooper Mountain



APPENDIX G
ALTERNATIVE DEVELOPMENT DESIGNS



Alternative 1A Plan Summary

- This alternative explores the feasibility of total avoidance of impacts to Wetland G.
- While local roads and residential lots have been removed from the wetland and buffer, some impacts to the upper edge of the buffer remain due to the alignment of the proposed neighborhood route that runs along the northwest edge of the site. The alignment of this road is mandated by the South Cooper Mountain Community Plan and cannot be moved.
- Due to the removal of lots in and around Wetland G, this plan does not meet minimum density standards of the zoning ordinance.

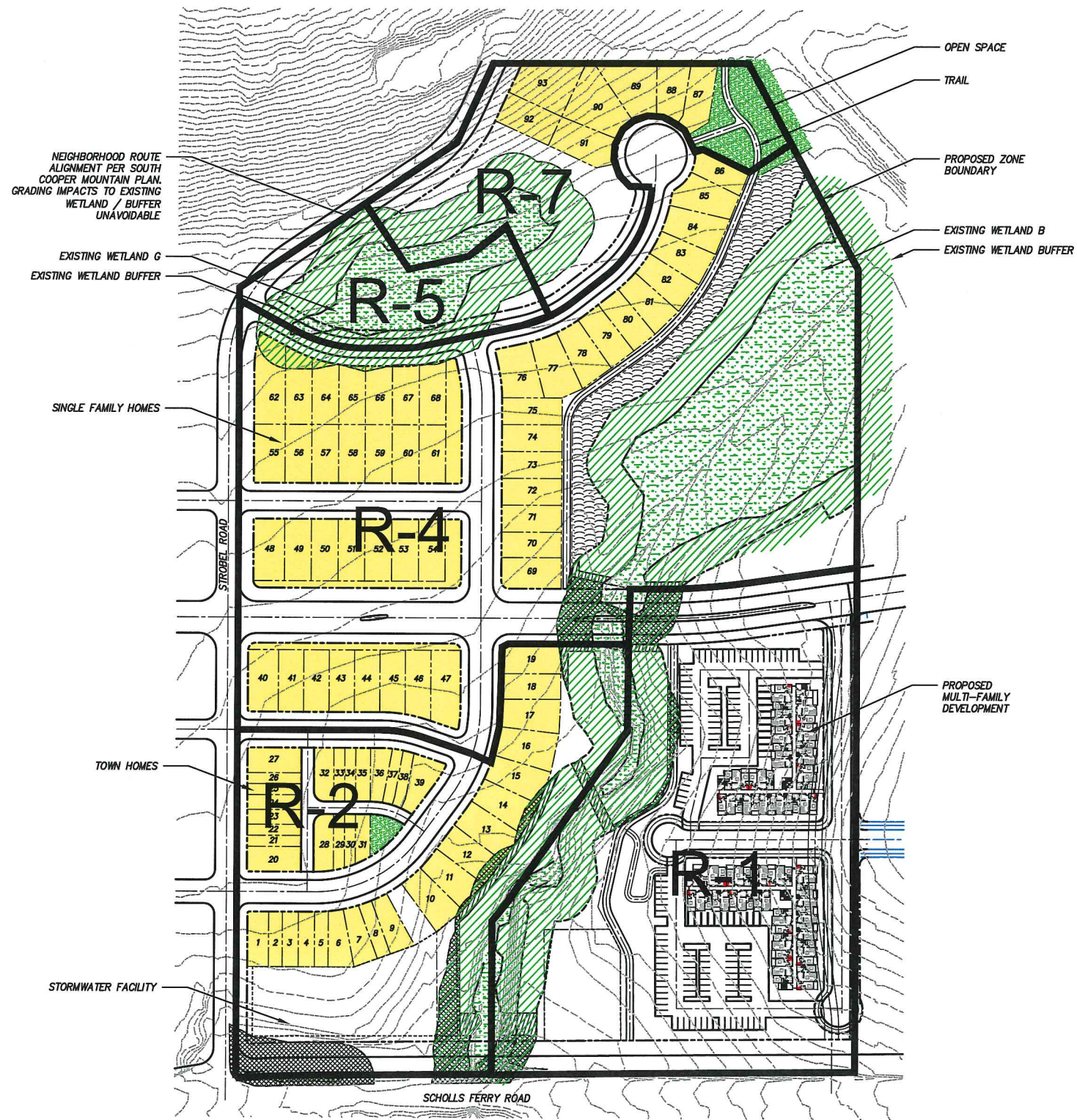
Alternative 1A Land Use Summary

| | Gross site (± Gross site (ac.) | Resource Land | Right of way | OS Tracts | WQ Tracts | Net Site | Net-Net (80%) sf | Net-Net (80%) ac | Zoning Mix | Net-Net site (ac.) | Required Min Units | Maximum Units allowed | Proposed Units | |
|------------------|--------------------------------|---------------|--------------|-----------|-----------|----------|------------------|------------------|------------|--------------------|--------------------|-----------------------|----------------|---------------|
| High Density | 306,317 | | | | | | | | | | | | | |
| R-1 | 306,317 | 7.03 | 56,046 | 73,841 | 17,673 | 158,757 | 127,006 | 2.92 | 100% | | 127 | 306 | 128 | Multi-Family |
| Medium Density | 749,286 | 17.20 | 214,388 | 199,080 | 35,619 | | | | | | | | | |
| R-4 | 515,472 | 11.83 | 162,746 | 118,185 | | 234,541 | 187,633 | 4.31 | 70% | 4.31 | 47 | 129 | 42 | |
| R-2 | 233,814 | 5.37 | 51,642 | 44,878 | 35,619 | 101,675 | 81,340 | 1.87 | 30% | 1.87 | 41 | 117 | 39 | |
| Standard Density | 167,193 | 3.84 | | 21,406 | | | | | | | | | | |
| R-7 | 112,358 | 2.58 | 32,919 | 14,049 | | 65,390 | 52,312 | 1.20 | 98% | | 7 | 16 | 7 | |
| R-5 | 54,835 | 1.26 | 46,406 | 7,357 | | 1,072 | 858 | 0.02 | 2% | | 0 | 11 | 0 | |
| | 1,222,796 | 28.07 | 303,353 | 258,310 | 53,292 | 607,841 | | | | | 95 | 273 | 88 | Single Family |
| | | | | | | | | | | | 127 | 306 | 128 | Multi-Family |
| | | | | | | | | | | | 222 | 579 | 216 | Total |

The Ridge at South Cooper Mountain Alternatives Analysis

Alternative 1A-Total Avoidance





Alternative 1B Plan Summary

- This alternative explores the feasibility of partial avoidance of impacts to Wetland G.
- An additional east-west local road has been added along the southern edge of Wetland G to accommodate additional lots and meet minimum density.
- Due to the removal of lots in and around Wetland G, this plan does not meet minimum density standards of the zoning ordinance.

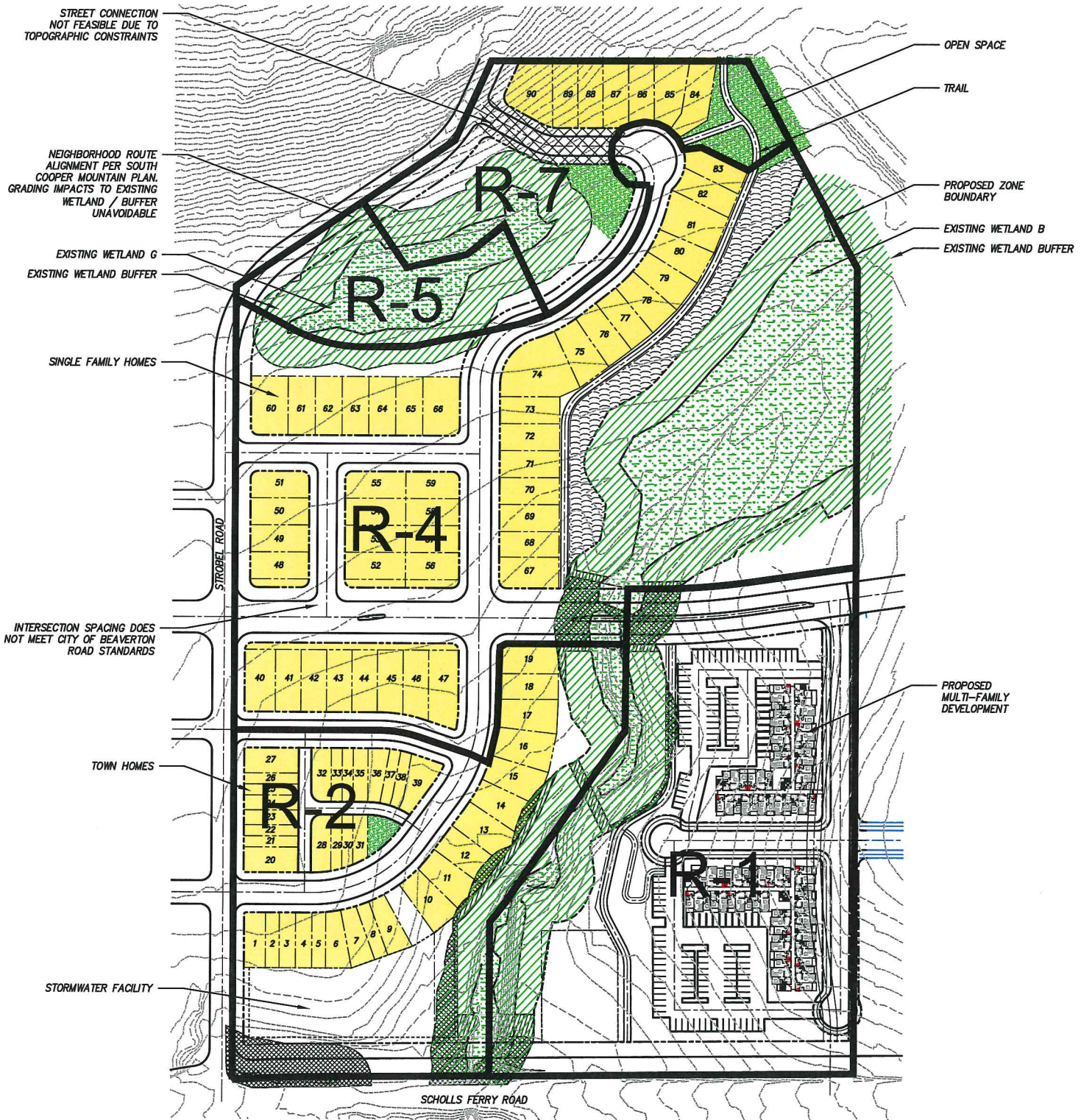
Alternative 1B Land Use Summary

| | Gross site (± Gross site (ac.)) | Resource Land | Right of way | WQ OS Tracts | WQ Tracts | Net Site | Net-Net (80%) sf | Net-Net (80%) ac | Zoning Mix | Net-Net site (ac.) | Required Min Units | Maximum Units allowed | Proposed Units | |
|------------------|---------------------------------|---------------|--------------|--------------|-----------|----------|------------------|------------------|------------|--------------------|--------------------|-----------------------|----------------|---------------|
| High Density | 306,317 | | | | | | | | | | | | | |
| R-1 | 306,317 | 7.03 | 56,046 | 73,841 | 17,673 | 158,757 | 127,006 | 2.92 | 100% | 4.36 | 127 | 306 | 128 | Multi-family |
| Medium Density | 749,286 | 17.20 | 202,913 | 199,080 | 35,619 | | | | | | | | | |
| R-4 | 515,472 | 11.83 | 151,271 | 127,005 | | 237,196 | 189,757 | 4.36 | 70% | 4.36 | 47 | 129 | 47 | |
| R-2 | 233,814 | 5.37 | 51,642 | 44,878 | 35,619 | 101,675 | 81,340 | 1.87 | 30% | 1.87 | 41 | 117 | 39 | |
| Standard Density | 167,193 | 3.84 | | 30,093 | | | | | | | | | | |
| R-7 | 112,358 | 2.58 | 32,919 | 14,049 | | 65,390 | 52,312 | 1.20 | 98% | | 7 | 16 | 7 | |
| R-5 | 54,835 | 1.26 | 37,411 | 16,044 | | 1,380 | 1,104 | 0.03 | 2% | | 0 | 11 | 0 | |
| | 1,222,796 | 28.07 | 291,878 | 275,817 | 53,292 | 601,809 | | | | | 96 | 273 | 93 | Single Family |
| | | | | | | | | | | | 127 | 306 | 128 | Multi-family |
| | | | | | | | | | | | 223 | 579 | 221 | Total |

The Ridge at South Cooper Mountain Alternatives Analysis

Alternative 1B-Partial Avoidance





Alternative 2 Plan Summary

- This alternative explores the feasibility of partial avoidance of impacts to Wetland G.
- The east-west local road along the southern edge of Wetland G has been moved to the south to avoid impacts to Wetland G while accommodating additional lots.
- The block pattern created by this plan does not meet intersection spacing standards on a collector road and is not feasible.
- Due to the removal of lots in and around Wetland G, this plan does not meet minimum density standards of the zoning ordinance.

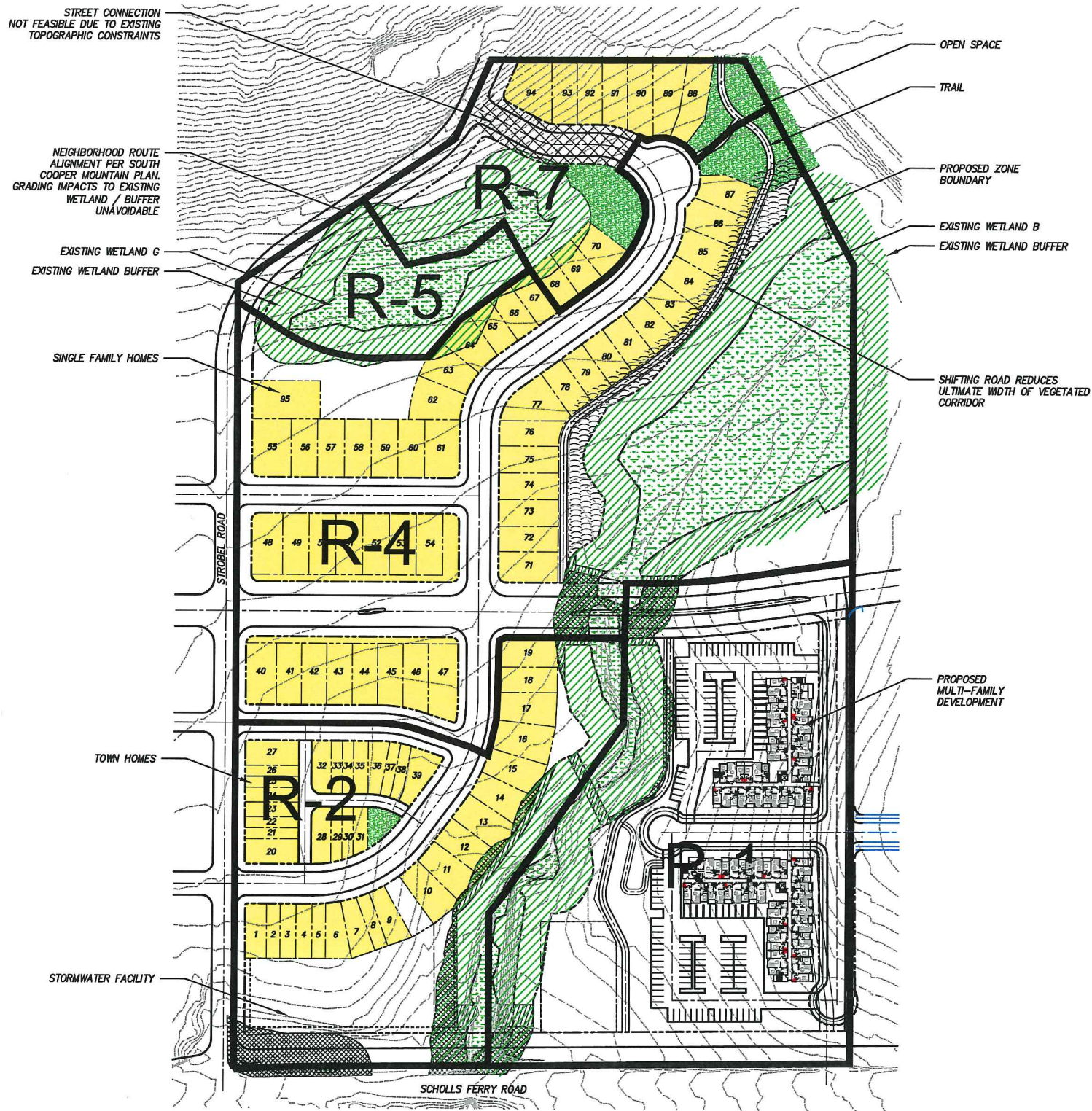
Alternative 2 Land Use Summary

| | Gross site | (Gross site (ac.) | Resource Land | Right of way | OS Tracts | WQ Tracts | Net Site | Net-Net (80%) sf | Net-Net (80%) ac | Zoning Mix | Net-Net site (ac.) | Required Min Units | Maximum Units allowed | Proposed Units | |
|------------------|------------|--------------------|---------------|--------------|-----------|-----------|----------|------------------|------------------|------------|--------------------|--------------------|-----------------------|----------------|--------------|
| High Density | 306,317 | | | | | | | | | | | | | | |
| R-1 | 306,317 | 7.03 | 56,046 | 73,841 | 17,673 | 158,757 | 127,006 | 2.92 | 100% | | | 127 | 306 | 128 | Multi-family |
| Medium Density | 749,286 | 17.20 | 214,388 | 199,080 | 35,619 | | | | | | | | | | |
| R-4 | 515,472 | 11.83 | 162,746 | 127,169 | | 225,557 | 180,446 | 4.14 | 69% | 4.14 | 45 | 129 | 44 | | |
| R-2 | 233,814 | 5.37 | 51,642 | 44,878 | 35,619 | 101,675 | 81,340 | 1.87 | 31% | 1.87 | 41 | 117 | 39 | | |
| Standard Density | 167,193 | 3.84 | | 31,096 | | | | | | | | | | | |
| R-7 | 112,358 | 2.58 | 32,919 | 23,739 | | 55,700 | 44,560 | 1.02 | 98% | | 6 | 16 | 7 | | |
| R-5 | 54,835 | 1.26 | 46,406 | 7,357 | | 1,072 | 858 | 0.02 | 2% | | 0 | 11 | 0 | | |
| | 1,222,796 | 28.07 | 303,353 | 276,984 | 53,292 | 589,167 | | | | | 92 | 273 | 90 | Single Family | |
| | | | | | | | | | | | 127 | 306 | 128 | Multi-family | |
| | | | | | | | | | | | 219 | 579 | 218 | Total | |

The Ridge at South Cooper Mountain Alternatives Analysis

Alternative 2-Total Avoidance





Alternative 3 Plan Summary

- This alternative explores the feasibility of shifting the northern road adjacent to the R-5 and R-7 zones to the east in order to reduce impacts to Wetland G.
- While shifting the road to the east reduces impacts to Wetland G somewhat, it also severely reduces the width of potential enhancement area adjacent to the main drainage corridor.
- An alternative that extends this road up to the proposed neighborhood route was also considered but found to be not feasible due to existing steep topography.

Alternative 3 Land Use Summary

| | Gross site (± Gross site (ac.)) | Resource Land | Right of way | OS Tracts | WQ Tracts | Net Site | Net-Net (80%) sf | Net-Net (80%) ac | Zoning Mix | Net-Net site (ac.) | Required Min Units | Maximum Units allowed | Proposed Units | |
|------------------|---------------------------------|---------------|--------------|-----------|-----------|----------|------------------|------------------|------------|--------------------|--------------------|-----------------------|----------------|---------------|
| High Density | 306,317 | | | | | | | | | | | | | |
| R-1 | 306,317 | 7.03 | 56,046 | 73,841 | 17,673 | 158,757 | 127,006 | 2.92 | 100% | | 127 | 306 | 128 | Multi-family |
| Medium Density | 749,286 | 17.20 | 212,883 | 199,080 | 35,619 | | | | | | | | | |
| R-4 | 515,472 | 11.83 | 161,241 | 118,185 | | 236,046 | 188,837 | 4.34 | 70% | 4.34 | 47 | 129 | 46 | |
| R-2 | 233,814 | 5.37 | 51,642 | 44,878 | 35,619 | 101,675 | 81,340 | 1.87 | 30% | 1.87 | 41 | 117 | 39 | |
| Standard Density | 167,193 | 3.84 | | 29,922 | | | | | | | | | | |
| R-7 | 112,358 | 2.58 | 32,919 | 24,899 | | 54,540 | 43,632 | 1.00 | 90% | | 6 | 16 | 10 | |
| R-5 | 54,835 | 1.26 | 43,923 | 5,023 | | 5,889 | 4,711 | 0.11 | 10% | | 1 | 11 | 0 | |
| | 1,222,796 | 28.07 | 301,848 | 266,826 | 53,292 | 600,830 | | | | | 95 | 273 | 95 | Single Family |
| | | | | | | | | | | | 127 | 306 | 128 | Multi-family |
| | | | | | | | | | | | 222 | 579 | 223 | Total |

The Ridge at South Cooper Mountain Alternatives Analysis

Alternative 3-Partial Avoidance



APPENDIX H

FUNCTIONAL ASSESSMENT REPORTS

Oregon Hydrogeomorphic-Based Wetland Functional Assessment The Ridge at South Cooper Mountain Wetland G

1 INTRODUCTION

Anchor QEA, LLC, wetland scientists conducted an assessment of wetland functions on The Ridge at South Cooper Mountain residential development site (project site) using a hydrogeomorphic (HGM)-based assessment technique developed by the Oregon Department of State Lands (DSL) for wetland and riparian sites in Oregon (Adamus and Field 2001). This methodology, commonly referred to as the Oregon HGM method, is an adaptation of a national wetland functional assessment approach developed by the U.S. Army Corps of Engineers that is based on the concept that hydrologic and geomorphic factors control how wetlands function. This approach uses HGM classification, reference wetlands, assessment models, and functional indices to assess the ability of a wetland to perform selected functions (Smith et al. 1995).

2 ASSESSMENT AREA SELECTION

The assessment area for the functional assessment consisted of one 0.76-acre wetland (Wetland G) located in the northern portion of the project site (Figure H-1). Wetland G is located between an agricultural field and the toe of a slope and partially situated within a forested area and an agricultural field.

Anchor QEA wetland scientists conducted wetland delineation fieldwork for the assessment area in August and September 2016. The results of this study were compiled in a January 2017 report entitled *Wetland Delineation Report – West Hills Land Development: The Ridge at South Cooper Mountain (Bellairs and Lolich Properties)* (Anchor QEA 2017), which was submitted to DSL on January 27, 2017, for verification and assigned wetland delineation number #WD 2017-0049.

3 WETLAND CLASSIFICATION AND DESCRIPTION

As required by the Oregon HGM method, the HGM classification of Wetland G was determined prior to performing the assessment method. Based on its location at the toe of a slope and the fact that it is primarily fed by surface and subsurface flows moving down that slope, Wetland G is classified as a slope/flats wetland. This classification was determined in accordance with the HGM-based classification system for Oregon presented in the *Guidebook for Hydrogeomorphic (HGM)-based Assessment of Oregon Wetland and Riparian Sites: Statewide Classification and Profiles* (Adamus 2001). Wetland G is classified as a palustrine forested (PFO)/palustrine scrub-shrub (PSS)/palustrine emergent (PEM) wetland under the U.S. Fish and Wildlife Service's *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979).

Wetland G consists of two-thirds PFO/PSS wetland and one-third PEM wetland. The dominant trees in the PFO/PSS portions include Oregon white oak (*Quercus garryana*), Oregon ash (*Fraxinus latifolia*), Douglas fir (*Pseudotsuga menziesii*), bitter cherry (*Prunus emarginata*), and big-leaf maple (*Acer macrophyllum*). Understory species include saplings of these trees and common snowberry (*Symphoricarpos albus*), beaked hazelnut (*Corylus cornuta*), Pacific ninebark (*Physocarpus capitatus*), common hawthorn (*Crataegus monogyna*), clustered rose (*Rosa pisocarpa*), vine maple (*Acer circinatum*), poison oak (*Toxicodendron diversilobum*), salal (*Gaultheria shallon*), red osier dogwood (*Cornus alba*), Saskatoon (*Amelanchier alnifolia*), cascara (*Frangula purshiana*), Himalayan blackberry (*Rubus armeniacus*), and trailing blackberry (*Rubus ursinus*). Common herbs include sword fern (*Polystichum munitum*), slough sedge (*Carex obnupta*), soft rush (*Juncus effusus*), bracken fern (*Pteridium aquilinum*), reed canarygrass (*Phalaris arundinacea*), and various other grasses.

The PEM portion of Wetland G is part of the agricultural field and is dominated by common velvetgrass (*Holcus lanatus*), colonial bentgrass (*Agrostis capillaris*), and perennial ryegrass (*Lolium perenne*). California wild oatgrass (*Danthonia californica*), sweet vernal grass (*Anthoxanthum odoratum*), and tall fescue (*Schedonorus arundinaceus*) are also common, as are scattered Oregon oak saplings and Himalayan blackberry.

The predominant soils in Wetland G are mapped as Cascade silt loam, Cornelius and Kinton silt loams, and Delena silt loam. Of these soils, Delena is classified as hydric. The other soil types are considered non-hydric but are known to contain hydric inclusions. Upon inspection, the predominant texture was determined to be silt loam. Soil matrices were generally dark, and samples contained abundant redoximorphic features in both the matrix and along pore linings, along with areas of depletions.

The primary hydrologic sources sustaining Wetland G appear to be groundwater seepage, overland runoff, and direct precipitation. Waters from this wetland drain into the agricultural field and into the Unnamed Tributary. Wetland G is in the Rock Creek subwatershed (hydrologic unit code 170900100503) of the Tualatin River subbasin of the Willamette River basin.

4 STUDY AREA ASSESSMENT

The Oregon HGM method evaluates the ability of a wetland to perform 13 different functions using data collected by the visual observation of various indicators in the field, as well as information obtained from existing maps, aerial photographs, and other data sources (e.g., local soil surveys). The 13 functions assessed by HGM are as follows:

1. Water Storage and Delay
2. Sediment Stabilization and Phosphorus Retention
3. Nitrogen Removal
4. Thermoregulation
5. Primary Production
6. Resident Fish Habitat Support
7. Anadromous Fish Habitat Support
8. Invertebrate Habitat Support
9. Amphibian and Turtle Habitat Support
10. Breeding Waterbird Support
11. Wintering and Migratory Waterbird Support
12. Songbird Habitat Support
13. Support of Characteristic Vegetation

Of these functions, the following three were not assessed because they are not applicable to slope/flats wetlands: thermoregulation, resident fish habitat support, and anadromous fish habitat support. In addition, Wetland G was not assessed for breeding waterbird support because that function requires the presence of greater than 0.5 acre of stagnant surface waters that remain until July 1 of most years. Wetland G does not exhibit such characteristics.

The Oregon HGM method allows for two approaches for the assessment of wetland functions: 1) the reference-based method, which assesses functions quantitatively by comparing observations of functional indicators within the wetland being assessed to data from reference wetlands; and 2) the judgmental method, which assesses functions based on a qualitative checklist. Currently, the Oregon HGM method only has reference-based methods for wetlands and riparian sites in the riverine impounding, slope/flats, and tidal HGM classes. Functional assessment of wetlands in other HGM classes must use the judgmental method.

4.1 Assessment Methods Used

Anchor QEA used the reference-based method for the assessment of Wetland G and completed the Excel-based HGM slope/flats data form available from the DSL Aquatic Resource Management Forms and Publications page for the assessment area. Under this method, functions are assessed by comparing the assessment area to a series of indicators representing either the highest functioning or least altered conditions, as determined during development of the HGM method. Anchor QEA opted to compare the wetland to the highest functioning wetland scores because Wetland G has been altered by agricultural activities.

4.2 Functional Assessment Results

Table 1 summarizes the qualitative function levels based on the scores returned by each of the assessment methods. The function score rating from the HGM methodology is assigned a rating level from low to high based upon an even distribution of the potential scores. Results of the Oregon HGM functional assessment for Wetland G are summarized in Table 2 and briefly discussed in the following sections. A copy of the Oregon HGM functional assessment data forms is provided in Attachment H-1.

Table 1
Interpretation of Functional Assessment Scores

| Function Score Range | Qualitative Function Level |
|----------------------|----------------------------|
| 0 – 0.19 | Low |
| 0.20 – 0.39 | Moderately low |
| 0.40 – 0.59 | Moderate |
| 0.60 – 0.79 | Moderately high |
| 0.80 – 1.00 | High |

Table 2
Summary of Wetland Functional Assessment Results for Wetland G

| Functions | Wetland Scores (HFR = 1.0) | Qualitative Function Level |
|-------------------------------------------------|-------------------------------|----------------------------|
| Water Storage and Delay | 0.00 | Low |
| Sediment Stabilization and Phosphorus Retention | 0.32 | Moderately low |
| Nitrogen Removal | 0.35 | Moderately low |
| Primary Production | 0.47 | Moderate |
| Invertebrate Habitat Support | 0.35 | Moderately low |
| Amphibian and Turtle Habitat Support | 0.68 | Moderately high |
| Wintering and Migratory Waterbird Support | 0.25 | Moderately low |
| Songbird Habitat Support | 0.68 | Moderately high |
| Support of Characteristic Vegetation | 0.83 | High |

Note:
HFR = highest functioning reference

4.2.1 Water Storage and Delay

Wetland G received a low score (0.00) for the Water Storage and Delay function. This is primarily because the wetland does not exhibit permanent or seasonal inundation, has only minimal areas of shallow seasonal ponding, and is located on a gradual slope that drains waters into an agricultural field containing drain tile.

4.2.2 Sediment Stabilization and Phosphorus Retention

Wetland G received a moderately low score (0.32) for the Sediment Stabilization and Phosphorous Retention function. Site characteristics that limit the performance of this function include the absence of permanent and seasonal inundation, the lack of dense herbaceous vegetation within the PFO/PSS portions of the wetland, and the annual mixing and leveling of soils in the PEM portions. Factors that contribute to this function include the abundance of woody vegetation and microtopography within the PFO/PSS portions of the wetland and the presence of dense grass and forbs in the PEM portion, all of which contribute to the wetland's ability to intercept suspended inorganic sediments, resist erosion of sediments, and retain phosphorus.

4.2.3 Nitrogen Removal

The Nitrogen Removal functional capacity of Wetland G was rated moderately low (0.35). Limiting factors for this function include the absence of permanent and seasonal inundation, limited extent and depth of seasonal ponding, and recurrent soil leveling activities (e.g., plowing) in the agricultural portions of the wetland. Characteristics that contribute to this function include the presence of shrubs and trees and the presence of redoximorphic features.

4.2.4 Primary Production

Wetland G received a moderate functional capacity score (0.47) for Primary Production. Factors that contribute to the site's ability to perform this function include the presence of diverse shrubs and trees in the PFO/PSS portions, a dense herbaceous layer in the PEM portions, and the prevalence of natural land cover within 200 feet of the site. Soil mixing and compaction from farm equipment in the PEM portions of the wetland and the limited extent and depth of seasonal ponding in the wetland limit this function.

4.2.5 Invertebrate Habitat Support

The Invertebrate Habitat Support function was rated moderately low (0.35) for the Wetland G assessment area. Factors limiting this function are the lack of permanent surface water and seasonal inundation, lack of aquatic bed habitats, and extent of soil disturbance

from agriculture in the PEM portion of the wetland. Factors that positively influence this function include the occurrence of underlying hydric soils, the presence of some seasonal ponding, presence of natural land cover in the vicinity and contributing watershed, and the abundance of diverse vegetation.

4.2.6 Amphibian and Turtle Habitat Support

Wetland G received a moderately high score (0.68) for the Amphibian and Turtle Habitat function. Site characteristics that positively influence this function include the presence of some seasonal ponding, the abundance of trees and deadwood, saturated soils, and diverse woody and herbaceous vegetation. Limiting factors include the lack of permanent and seasonal open water, the lack of seasonal inundation, and regular soil mixing and leveling from agricultural practices. Given these limiting factors, Anchor QEA is of the opinion that this score is too high and that a moderately low rating is more appropriate for this function.

4.2.7 Wintering and Migratory Waterbird Support

The Wetland G assessment area received a moderately low score (0.25) for the Wintering and Migratory Waterbird Support function. Site characteristics that limit the ability of the wetland to perform this function include the absence of seasonal inundation and vernal pools in the wetland. Factors that positively influence the performance of this function include presence of vegetative cover in the wetland and nearby grassland and row crops.

4.2.8 Songbird Habitat Support

Wetland G received a moderately high score (0.68) for the Songbird Habitat Support function. Site characteristics that positively influence this function include the abundance of vegetative cover, the presence of closed-canopy forest and dense understory in the wetland, and the proximity to adjacent grasslands and wooded areas for foraging and cover. Factors that limit the performance of this function include the absence of permanent inundation and frequent soil disturbance due to agriculture.

4.2.9 Support of Characteristic Vegetation

For the Support of Characteristic Vegetation function, Wetland G received a high score (0.83). Limiting factors include the presence of rotational row and cover crops and active farming practices in the wetland. Site characteristics that favor the performance of this function include the presence of hydric soils, the abundance of diverse vegetation forms and trees, the presence of deadwood, and proximity to natural areas near the assessment area.

5 SUMMARY

Overall, Wetland G received predominantly moderately low scores for most wetland functions. The Amphibian and Turtle Habitat function was rated moderately high, but Anchor QEA is of the opinion that this score is too high and that a moderately low rating is more appropriate for this function, given the lack of permanent and seasonal open water, regular soil leveling and mixing in the PEM portion of the wetland from agricultural practices, the absence of a direct connection to a stream channel, the lack of natural grass and forb cover, and the high percent of surrounding land cover that is cropland. These same site characteristics limit the overall functionality of Wetland G.

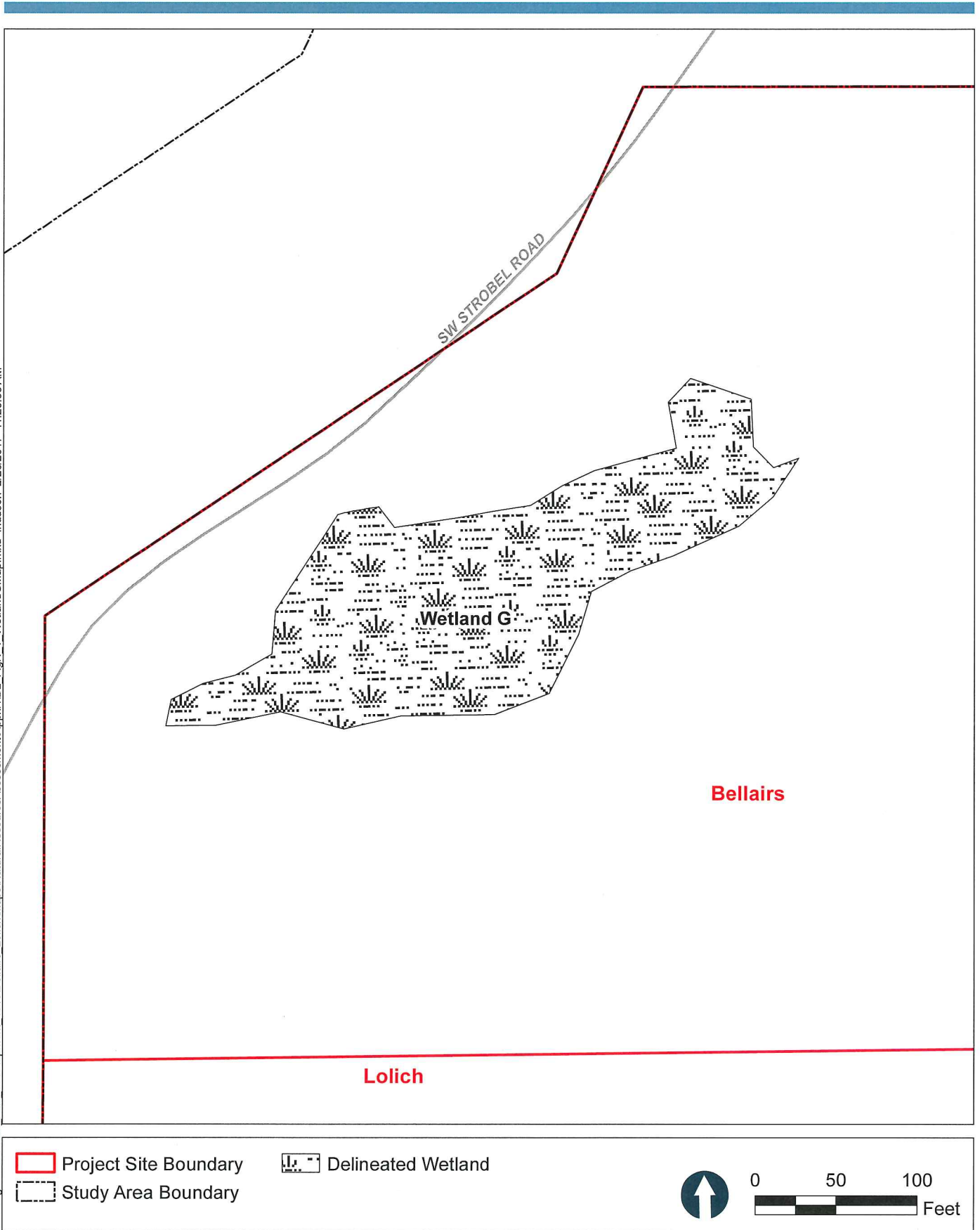
6 REFERENCES

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FIGURE

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ATTACHMENT H-1
FUNCTIONAL ASSESSMENT DATA FORM

SHEET FOR AUTOMATIC CALCULATION OF FUNCTION SCORES - revised June 2008***Slope or Flats subclass***

Site Name: Wetland G

Date: 10/3/2016

The Ridge at South Cooper Mountain Property

It is recommended to do a "Save As" from this blank spreadsheet for each use, assigning different file names. This will help reduce the chance of accidentally confusing new data with previously entered data.

For reference, the function(s) addressed by each indicator are noted in column E. Codes are shown below next to the function names. The capital letter in the code (e.g., sp-**B**) in column E refers to the code for the indicator in the published Volume IA.

HFR= scaled to highest functioning site of this subclass found by DSL; **LAR**= scaled to least-altered site of this subclass found by DSL. Scores greater than 1 indicate the capacity of the function at the site you assessed may be greater than in all sites of this subclass assessed by the DSL team during model calibration.

Data **must** be entered for every indicator, unless the scale block for this subclass is shaded. Each value in column D must be less than or equal to 1.

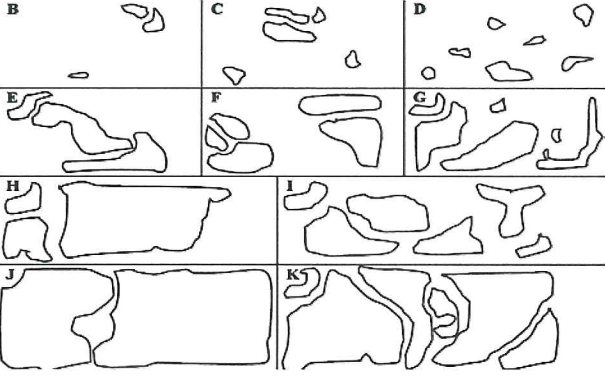
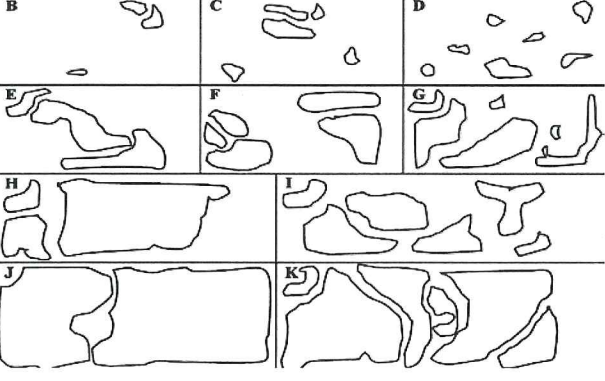
| Function: | Calculated Function Capacity for SF sites | |
|----------------------------------------------------|-------------------------------------------|---------|
| | if HFR: | if LAR: |
| Water Storage & Delay (ws) | 0.00 | 0.00 |
| Sediment Stabilization & Phosphorus Retention (sp) | 0.32 | 0.34 |
| Nitrogen Removal (n) | 0.35 | 0.41 |
| Primary Production (pp) | 0.47 | 0.47 |
| Invertebrate Habitat Support (i) | 0.35 | 0.35 |
| Amphibian & Turtle Habitat (at) | 0.68 | 0.90 |
| Breeding Waterbird Support (bw) | 0.00 | 0.00 |
| Wintering & Migrating Waterbird Support (ww) | 0.25 | 0.28 |
| Songbird Habitat Support (sb) | 0.68 | 1.05 |
| Support of Characteristic Vegetation (v) | 0.83 | 0.86 |

Note 1: Models and scores for ws, sp, n, and pp intentionally do not account for the **area** of the wetland, an especially important factor for these functions.

Note 2: This method should be applied to an entire contiguous wetland, not just to the portion affected directly by a planned alteration or restoration.

| Indicator | Raw Datum | Scale for SF sites | Scaled Datum | Function |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|---------------------------------------------------------------------------|--------------|--------------------|
| Presence of permanent surface water (water year-round during most years)? (p. 82) | absent | absent = 0 present = 1.0 | 0 | sb-P rf-X |
| Percent of permanent zone that is open water (i.e., lacking emergent and underwater plants) (p. 79) (Answer "0" if no permanent zone is present) | 0 | 100 =.1 80-99 =.8 60-80 = 1.0 40-60 =.8 20-40 =.4 0-20 =.2 | 0.2 | at-M |
| Percent of site that is inundated only seasonally (i.e., watermarks, moss lines, debris lines, etc.) (p. 81) | none | none = 0 1-10 =.1 10-25 =.6 25-50 =.8 > 50 = 1.0 | 0 | i-B n-A ws-A |
| | | none = 0 1-20 =.5 20-40 =.7 40-60 =.8 60-80 =.9 >80 = 1.0 | 0 | ww-A |
| At least 0.5 acre of surface water persists until at least July 1 and water is mostly wider than 10 ft? | No | Yes = 1 No = 0 | 0 | bw-X |

| | | | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|----------------------------------------------------------------|-----|---------------------|
| Predominant water depth during biennial low water (p. 82) | 0 | 0" = 0 1-2" =.6 2-24" = 1.0 2-6 ft =.8 >6 ft =.6 | 0 | bw-D |
| | | 0 =.1 1-2" = 1.0 2-24" =.8 >24" =.2 | 0.1 | i-D |
| Percent of site occupied by the most extensive depth category at this site during biennial low water. (p. 81). (Delimit the low water zone first, then break into these depth categories, then identify the category that predominates horizontally). (Possible categories are: 0 inches; 1-2 inches; 2-24 inches; 2-6 feet; < 6 feet) | 100 | 100 = 0 80-100 =.1 50-80 =.4 30-50 =.8 <30 = 1.0 | 0 | bw-B |
| Difference between the predominating biennial high and low water levels (p. 71) 0) = No change 1) = Difference of 1 class 2) = Difference of 2 classes 3) = Difference of 3 classes 4) = Difference of 4 classes Class 1 = 0 inches Class 2 = 1-2 inches Class 3 = 2-24 inches Class 4 = 2-6 feet Class 5 = > 6 feet | No Change | 0) = 0 1) =.3 2) =.5 3) =.8 4) = 1.0 | 0 | n-B at-E bw-E |
| | | 0) = 0 1) = .25 2) = .5 3) = .75 4) = 1.0 | 0 | ww-F |
| Predominant vertical increase in surface water level (ft) in most of the seasonal zone (i.e., water marks, moss lines, debris lines, etc. Look at the highest point for 2 year flood and measure the difference from biennial low) | 0 | 0 = 0 .1 - .4 =.25 .5- 1.0 =.5 1 - 2 =.75 >2 = 1.0 | 0 | ws-B |
| Number of depth categories during biennial high water. (p. 77) Categories are: ___ 1 - 2 inches ___ 2 - 24 inches ___ 2 - 6 ft ___ > 6 ft | 1 | 1 = 0 2 =.3 3 =.6 4 = 1.0 | 0 | bw-C |
| | | 1 = .1 2 = .3 3 = .6 4 = 1.0 | 0.1 | ww-E |

| | | | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|----------------------------------------------------------------------------------------------------------------|-------------------|-----------------------------------------------------------------|
| <p>Percent & distribution of pools during biennial high water. (p. 80)</p> <p>(Note: if site is > 1 acre, select the condition that predominates in 1 acre sub-units of the site.)</p> <p>A = None</p>  | <p>None</p> | <p>A = 0 B =.6 C =.65 D =.7 E,F =.75 K =.8 H =.85 I =.9 J =.95 G = 1.0</p> | <p>0</p> <p>0</p> | <p>sp-C ww-D i-E, at-A</p> |
| <p>Percent & distribution of pools during biennial low water. (p. 80)</p> <p>(Note: if site is > 1 acre, select the condition that predominates in 1 acre sub-units of the site.)</p> <p>A = None</p>  | <p>None</p> | <p>A = 0 B =.6 C =.65 D =.7 E,F =.75 J =.8 H =.85 I =.9 K =.95 G = 1.0</p> | <p>0</p> <p>0</p> | <p>bw-A, pp-E, n-1</p> |
| <p>Percent of the site occupied by hummocks (p. 74, 75)</p> | <p>none</p> | <p>none = 0 1-10 =.6 10-90 =.8 >90 = 1.0</p> | <p>0</p> | <p>at-B ww-C sb-M sp-B pp-C n-G i-F</p> |

| | | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------------------------------------------------------------------------|-----|----------------------------|
| <p>Maximum annual extent of vernal pools/ shorebird scrapes and mudflats: (p. 76)</p> <p>A = none B = 1 – 100 sq. ft. C = 100-1000 sq. ft. D = 1000 – 10,000 sq. ft. E = >10,000 sq. ft.</p> <p>Must meet ALL of the following: a) herbs are generally < 4" and comprise < 80% ground cover during winter or early spring b) topography is basically flat c) inundated to a depth of < 6" for 2 or more continuous weeks d) never shaded by trees, shrubs, or buildings e) not entirely a constructed ditch</p> | A | A = 0 B = .6 C = .7 D = .8 E = 1.0 | 0 | ww-B |
| Presence of logs or boulders that extend above the surface of permanent water (p. 84) | absent | absent = 0 present = 1.0 | 0 | at-G |
| Predominant soil texture: (p 83) GC= gravel or cobble SA=sand, sandy loam, or loamy sand L= loam, silty loam, gravelly loam C= clay, sandy clay, silty clay, clay loam, silty clay loam O= organic particles<1mm <u>Guidance:</u> 1. Soil remains in a ball when squeezed YES...Go to 3; NO ...Go to 2 2. > 50% of the particles (by weight) are > 1 mm YES..."GC"; NO ..."SA" 3. Squeezed soil forms an even ribbon YES...Go to 4; NO ..."SA" 4. Soil ribbon extended > 1" without breaking YES..."C/O"; NO ...Go to 5 5. Soils feels very gritty YES... "SA"; NO..."L" | L | GC =.1 SA =.2 L =.8 C/O = 1.0 | 0.8 | sp-D |
| Presence of some mottling and/or other features that indicate oxygen deficits, or, permanent water is present | present | absent = 0 present = 1.0 | 1 | n-X |
| Mapped soil series is hydric (not simply a hydric inclusion). See county soil map and p. 75. | yes | 1= yes 0= no | 1 | v-C at-D ww-G i-I |
| Percent of site that was constructed on former uplands (non-hydric soil) (p. 81): 6) = recent, >90% of site 5) = recent, 10-90% of site 4) = recent, 1-10% of site 3) = >5 years ago, >90% of site 2) = >5 years ago, 10-90% of site 1) = >5 years ago, 1-10% of site 0) = none | 1 | 6) = 0 5) = .1 4) = .2 3) = .3 2) = .4 1) = .5 0) = 1.0 | 0.5 | i-J at-K v-K n-D |

Tally the percent of surrounding land cover (exclude the site itself) as exists during a typical May. Answer each row independently. **They do not necessarily sum to 100%.**

within 200 ft of the site boundary:

| | |
|--------------------------------------------------|----|
| a. % Water, wetland = | 0 |
| b. % Grassland, water, wetland = | 0 |
| c. % Grassland, row crops = | 50 |
| d. % Wooded = | 40 |
| e. % Natural (not lawn, crops, paved, building)= | 40 |

within 1000 ft:

| | |
|----------------------------------|----|
| f. % Water, wetland = | 20 |
| g. % Grassland, water, wetland = | 25 |
| h. % Grassland, row crops = | 50 |
| i. % Wooded = | 15 |
| j. % Natural = | 40 |

within 5,280 ft:

| | |
|-----------------------------|----|
| k. % Water, wetland = | 10 |
| l. % Grassland, row crops = | 50 |
| m. % Wooded = | 25 |

| | | | | |
|------------------------------------------------------------------------------------|----|------------------------------------------------------------------------------------|-----|--------------------|
| In column D, enter the scaled value for the number in column B. (= a), above) | 0 | 0 = 0 1-10 =.4 10-20 =.8 >20 = 1.0 | 0 | bw-I ww-I |
| In column D, enter the scaled value for the number in column B. (=b), above) | 0 | <10 =.1 10-20 =.2 20-40 =.4 40-60 =.6 60-80 =.8 >80 = 1.0 | 0 | sb-N |
| In column D, enter the scaled value for the number in column B. (=c), above) | 50 | <10 = 0 10-20 = .1 20-40 = .3 40-80 = .5 80-90 = .7 90-100 = 1.0 | 0.5 | ww-K |
| In column D, enter the scaled value for the number in column B. (=d), above) | 40 | 0 = 0 1-10 =.1 10-20 =.2 20-40 =.4 40-60 =.6 60-80 =.8 >80 = 1.0 | 0.4 | sb-I |
| In column D, enter the scaled value for the number in column B. (=e), above) | 40 | <10 = 0 10-20 = .1 20-40 = .3 40-80 = .5 80-90 = .7 90-100 = 1.0 | 0.3 | i-L at-O v-R |
| In column D, enter the scaled value for the number in column B. =(a+f+k)/3, above) | 10 | none = 0 1 - 10 =.4 10-20 =.8 >20 = 1.0 | 0.4 | ww-H bw-J |

| | | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|---------------------------------------------------------------------------------------------------------|-----|-----------------------------|
| In column D, enter the scaled value for the number in column B. $(=(c+h+l)/3)$, above) | 50 | <10 = 0 10-20 = .1 20-40 = .3 40-80 = .5 80-90 = .7 90-100 = 1.0 | 0.5 | ww-J |
| In column D, enter the scaled value for the number in column B. $(=(d+i+m)/3)$, above) | 26.66666667 | <10 =.1 10-20 =.2 20-40 =.4 40-60 =.6 60-80 =.8 >80 = 1.0 | 0.4 | sb-J |
| In column D, enter the scaled value for the number in column B. $(=(e+j)/2)$, above) | 40 | <10 = 0 10-20 = .1 20-40 = .3 40-80 = .5 80-90 = .7 90-100 = 1.0 | 0.3 | bw-K |
| In column D, enter the scaled value for the number in column B. $(=(b+g)/2)$, above) | 12.5 | <10 =.1 10-20 =.2 20-40 =.4 40-60 =.6 60-80 =.8 >80 = 1.0 | 0.2 | sb-O |
| Percent of land cover within 200 ft (but only in the contributing watershed) that is “natural” – that is, NOT cropland, lawns, pavement, or buildings (p. 79) | 60 | <10 = 0 10-20 =.1 20-40 =.3 40-90 =.5 90-100 = 1.0 | 0.5 | pp-F |
| | | <10 = 0 10-20 =.1 20-40 =.3 40-90 =.5 90-99 =.9 100 = 1.0 | 0.5 | i-M v-Q |
| Percent woodland divided by percent grassland-crops within 200 ft of the site (p. 71) | 0.8 | <.1 =.1 0.1-0.8 =.6 0.8-1.2 = 1.0 1.2 -2.0 =.6 >2.0 =.1 | 0.6 | at-P |
| Distance (ft) to nearest busy road (p. 71) This includes a) any road or parking lot in a develop area that contains >4 buildings per acre, b) any road with a maximum traffic rate of > 6 vehicles per minute, during an average day during the summer | 1050 | <100 = 0 100-300 =.3 300-600 =.5 600-1200 =.7 1200-2400 =.8 2400-4800 =.9 >4800 = 1.0 | 0.7 | bw-G at-N v-P sb-R |

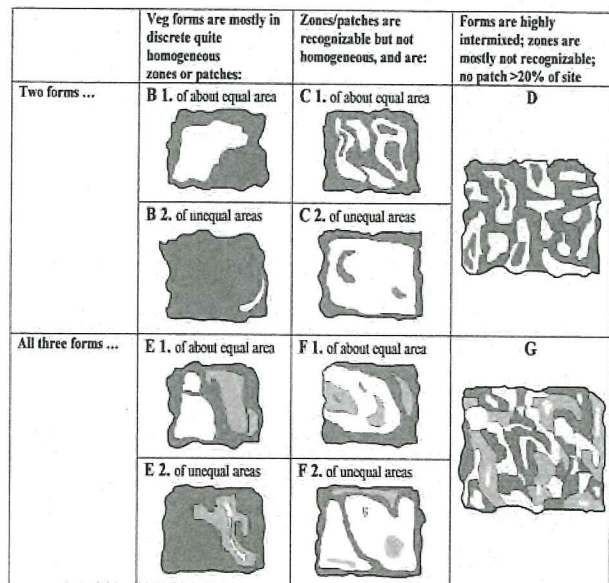
Note: The following 5 rows must sum to 100%. The number of visitors is immaterial.

| | |
|------------------------------------------------------------------------------------------------------------------------|----|
| Percent of site including 100-ft buffer that is visited 365 days a year or almost so = | 0 |
| Percent of site including 100-ft buffer that is visited more than 80 days a year (>20% of year), but less than daily = | 0 |
| Percent of site including 100-ft buffer that is visited 20-80 days a year (e.g., about once a week) = | 20 |
| Percent of site including 100-ft buffer that is visited just a few days a year = | 40 |
| Percent of site including 100-ft buffer that is almost never visited = | 40 |

| | | | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|--------------------------------------------------------------------------|-----|-------------------------------------------|
| Scale the calculated value in the box on the right (sum of the above 5 rows) and enter the scaled value in column D (p. 72) | 420 | 100-200 = 0 200-300 =.3 300-400 =.7 400-500 =1.0 | 1 | bw-H v-O sb-Q |
| Percent of site affected by soil leveling (i.e., portion previously leveled by equipment for farming) | 25 | 100 =.1 10-99 =.3 1-10 =.6 0 = 1.0 | 0.3 | at-C i-G pp-D sp-F n-H |
| Percent of site currently affected by soil compaction: (i.e., by equipment, vehicles, livestock, humans, fill) 6 = recent, at >90% of site 5 = recent, at 10-90% of site 4 = recent, at 1-10% of site 3 = >5 years ago, >90% of site 2 = >5 years ago, 10-90% of site 1 = >5 years ago, 1-10% of site 0 = none | 5 | 5/6) =.1 4) =.2 3) =.4 2) =.6 1) =.8 0) = 1.0 | 0.1 | sp-G v-M sb-K |
| Percent of site's vegetation that is mowed or subject to extreme grazing at least annually (p. 81) | 25 | >90 = 0 10-90 =.2 1-10 =.4 none = 1.0 | 0.2 | sb-L v-N |
| Most of site is burned, or harvested for hay or timber, at least biennially? (p. 72) | no | no = 0 yes = 1.0 | 0 | n-J |
| Percent of site currently affected by soil mixing (plowing, excavation, bulldozing, etc.): (p. 81) 6 = recent, at >90% of site 5 = recent, at 10-90% of site 4 = recent, at 1-10% of site 3 = >5 years ago, >90% of site 2 = >5 years ago, 10-90% of site 1 = >5 years ago, 1-10% of site 0 = none | 5 | 5 or 6 =.1 4 =.2 3 =.4 2 =.6 1 =.8 0 = 1.0 | 0.1 | at-f i-H v-L pp-A n-C sp-E |
| Percent of the site that is vegetated (including submersed aquatics) (p. 82) | 100 | <10 =.1 10-20 =.2 20-40 =.4 40-60 =.6 60-80 =.8 >80 = 1.0 | 1 | sb-A v-A |

| | | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|----|--------------------------------------------------------------------------|-----|--------------|
| Percent of site with woody vegetation (p. 82) | 75 | <10 =.1 10-20 =.2 20-40 =.4 40-60 =.6 60-80 =.8 >80 = 1.0 | 0.8 | sb-b |
| Percent of seasonal zone that is bare during most of the dry season. (i.e., devoid of vegetation, except trees) (Answer "0" if no seasonal zone) | 25 | >80 = 0 60-80 =.2 40-60 =.4 20-40 =.6 1-20 =.8 0 = 1.0 | 0.6 | pp-G sp-H |
| Percent of site that is inundated permanently and contains emergent, floating, or submersed plants (p. 72) | 0 | 0 = 0 1-10 =.9 >10 = 1.0 | 0 | i-A |
| | | 0 = 0 1-10 =.4 10-30 =.8 30-60 = 1.0 60-90 =.9 >90 =.6 | 0 | bw-F |
| Percent cover of herbs within the seasonal zone (p. 72) | 50 | 0 = 0 1-30 =.1 30-50 =.6 50-70 =.75 70-100 = 1.0 | 0.6 | at-L |
| Percent of whole site that has closed canopy (p. 80) | 65 | <10 =.1 10-20 =.2 20-40 =.4 40-60 =.6 60-80 =.8 >80 = 1.0 | 0.8 | sb-C |
| Percent understory shrub & vine cover beneath the drip line of trees (p. 82) (Answer "0" if no wooded areas) | 70 | <10 =.1 10-20 =.2 20-40 =.4 40-60 =.6 60-80 =.8 >80 = 1.0 | 0.8 | sb-D |

Number & distribution of vegetation forms --- herbs, shrubs, trees. If only one form, answer "A". To count, the patch must comprise >0.5 acre or >5% of vegetated area. See p. 77 for enlargement of diagram.



F1

A = 0
B2 = .60
C2 = .65
B1 = .70
C1,D = .75
E2 = .80
F2 = .85
E1 = .90
F1 = .95
G = 1.0

0.95

pp-B
v-B
at-J
i-K
sb-H

Number of woody species (p. 82)

20

unwooded= 0
1-2 =.1
3-4 =.25
5-6 =.5
7-9 =.75
10-18 =.9
>18 = 1.0

1

sb-E

Number of native woody species (p. 78)

17

0 = 0
1 =.1
2-3 =.25
4-5 =.5
6-9 =.75
10-13 =.9
>14 = 1.0

1

v-F

Percent of woody species list consisting of species that are native (p. 78)

85%

0 = 0
1-57 =.1
58-66 =.25
67-74 =.5
75-79 =.75
80-99 =.9
100 = 1.0

0.9

v-g

Percent of woody cover within stratum that is comprised of non-native species (p. 82)

20

100 = 0
80-99 =.1
30-79 =.25
10-29 =.5
5-9 =.75
1-4 =.9
0 = 1.0

0.5

v-H

(Use the greater of the tree, understory shrub, or open shrub stratum's percent)

Spatial predominance of non-native herbs (p. 84)

B

A = 0
B =.5
C = 1.0

0.5

v-D

A = Non-natives predominate

B = Cannot determine (about equal)

C = Natives predominate

Oregon Hydrogeomorphic-Based Wetland Functional Assessment The Ridge at South Cooper Mountain Unnamed Tributary and Wetlands A through F

1 INTRODUCTION

Anchor QEA, LLC, wetland scientists conducted an assessment of wetland functions on The Ridge at South Cooper Mountain residential development site (project site) using a hydrogeomorphic (HGM)-based assessment technique developed by the Oregon Department of State Lands (DSL) for wetland and riparian sites in Oregon (Adamus and Field 2001). This methodology, commonly referred to as the Oregon HGM method, is an adaptation of a national wetland functional assessment approach developed by the U.S. Army Corps of Engineers that is based on the concept that hydrologic and geomorphic factors control how wetlands function. This approach uses HGM classification, reference wetlands, assessment models, and functional indices to assess the ability of a wetland to perform selected functions (Smith et al. 1995).

2 ASSESSMENT AREA SELECTION

The assessment area for the functional assessment consisted of a perennial Unnamed Tributary that flows from northeast to southwest across the project site and six associated wetlands (Wetlands A through F; Table 1; Figure H-2). The Unnamed Tributary consists of a relatively narrow (less than 4 feet wide) stream channel that receives surface water from the majority of the project site. The stream originates at the base of an earthen embankment of a constructed pond that is located off site to the northeast. Because Wetlands A through F have similar HGM classifications, the majority of the Unnamed Tributary is contained within the boundaries of Wetlands A through F, and the stream channel and wetlands are interconnected, this stream/wetland complex is treated as one assessment area.

Anchor QEA wetland scientists conducted wetland delineation field work for the assessment area in November and December 2015, and in August, September, and December 2016. The results of this study were compiled in a January 2017 report entitled *Wetland Delineation*

Report – West Hills Land Development: The Ridge at South Cooper Mountain (Bellairs and Lolich Properties) (Anchor QEA 2017), which was submitted to DSL on January 27, 2017, for verification and assigned wetland delineation number #WD 2017-0049.

Table 1
Wetlands and Non-Wetland Other Waters Delineated on the Project Site

| Wetlands | Description | Classification | | On-site Area | |
|------------------------------------------------------------|--------------------------------------|-----------------------|------------|----------------|--------------|
| | | Cowardin ¹ | Oregon HGM | Square Feet | Acres |
| Unnamed Tributary | Perennial stream | R3SBC | N/A | 7,808 | 0.179 |
| Wetland A | Forested/herbaceous riparian wetland | PFO/PEM | Slope | 1,527 | 0.035 |
| Wetland B | Forested/herbaceous riparian wetland | PFO/PEM | Slope | 3,265 | 0.075 |
| Wetland C | Forested/herbaceous riparian wetland | PFO/PEM | Slope | 745 | 0.017 |
| Wetland D | Forested/herbaceous riparian wetland | PFO/PEM | Slope | 1,119 | 0.026 |
| Wetland E | Scrub-shrub/herbaceous wetland | PEM | Slope | 7,370 | 0.169 |
| Wetland F | Forested/scrub-shrub wetland | PFO/PSS | Slope | 87,736 | 2.014 |
| Total area of wetlands and non-wetland other waters | | | | 109,570 | 2.515 |

Notes:

1. Cowardin system wetland codes:
 - PEM = palustrine emergent
 - PFO = palustrine forested
 - PSS = palustrine scrub-shrub
 - R3SBC = riverine, upper perennial, stream bed, seasonally flooded
 - R4SBC = riverine, intermittent, stream bed, seasonally flooded

HGM = hydrogeomorphic

N/A = not applicable

3 WETLAND CLASSIFICATION AND DESCRIPTION

As required by the Oregon HGM method, the HGM classifications of the Unnamed Tributary and Wetlands A through F were determined prior to performing the assessment method. The Unnamed tributary is a perennial channel classified in the Riverine Flow-through subclass. Based on their location at the toe of a slope and the fact that they are primarily fed by surface

and subsurface flows moving down that slope, Wetlands A through E are classified as slope wetlands. Because Wetland F is located on a gradual slope, contains microtopography, and is inundated only seasonally, it is classified as a slope/flats wetland. These classifications were determined in accordance with the HGM-based classification system for Oregon presented in the *Guidebook for Hydrogeomorphic (HGM)-based Assessment of Oregon Wetland and Riparian Sites: Statewide Classification and Profiles* (Adamus 2001).

Wetlands A through D were classified as a palustrine forested (PFO)/palustrine emergent (PEM) wetlands under the U.S. Fish and Wildlife Service's *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979). Wetland E was classified as a PEM/palustrine scrub-shrub (PSS) wetland, and Wetland F was classified as a PFO/PSS/PEM wetland under the Cowardin system.

The Unnamed Tributary and Wetlands A through F are in the Rock Creek subwatershed (hydrologic unit code 170900100503) of the Tualatin River subbasin of the Willamette River basin.

3.1 Unnamed Tributary

The Unnamed Tributary is a perennial stream that flows from northeast to southwest across the project site, exits the site through a 36-inch concrete culvert under SW Scholls Ferry Road, continues southward through a forested riparian corridor, and eventually drains into the Tualatin River. The stream channel substrate consists predominantly of fine silts with some sand, gravel, and cobble. The northern and southern sections of the channel in the study area are covered by overhanging woody vegetation with little instream vegetation present, whereas in the central portion of the channel, very little woody vegetation overhangs the stream, and it is instead dominated by dense herbaceous vegetation, specifically reed canarygrass, both adjacent to and within the channel.

3.2 Wetlands A through D

Wetlands A through D are PFO/PEM wetlands located adjacent to the southern portion of the Unnamed Tributary in the former floodplain of this stream. Dominant vegetation in Wetlands A through D generally includes Oregon ash (*Fraxinus latifolia*) and western red

cedar (*Thuja plicata*) in the overstory; Himalayan blackberry (*Rubus armeniacus*) and English ivy (*Hedera helix*) in the shrub layer; and reed canarygrass (*Phalaris arundinacea*), bittersweet nightshade (*Solanum dulcamara*), and field horsetail (*Equisetum arvense*) in the herbaceous layer. A small patch of small-fruited bulrush (*Scirpus microcarpus*) was also observed in Wetland A, near the channel of the Unnamed Tributary.

Soils in Wetlands A through D are mapped as Cascade silt loam, a soil type that is not classified as hydric but is known to contain hydric inclusions in swales. Upon inspection, the predominant texture was confirmed to be silt loam. Soil matrices were generally dark, and samples contained abundant redoximorphic features in both the matrix and along pore linings, along with areas of depletions.

The primary hydrologic sources sustaining Wetlands A through D appear to be overland flow, seasonal high water table, and direct precipitation. Although these wetlands may have also historically received overbank flows from the Unnamed Tributary during storm events, the construction of the off-site impounded pond upstream of the study area likely limits the amount of flow moving through this stream system to such an extent that overbank flooding no longer occurs.

3.3 Wetland E

Wetland E is a PEM/PSS wetland located in and around the central section of the Unnamed Tributary on the project site. It includes the channel of the Unnamed Tributary that is completely overgrown with reed canarygrass. Dominant vegetation in Wetland E includes reed canarygrass, which is found both in the stream channel and on the side slopes. Other species present include saplings of Oregon ash and black cottonwood (*Populus balsamifera*), Himalayan blackberry, common snowberry (*Symphoricarpos albus*), red osier dogwood (*Cornus alba*), bittersweet nightshade, soft rush (*Juncus effusus*), fringed willowherb (*Epilobium ciliatum*), and Canada thistle (*Cirsium arvense*).

Soils in Wetland E are mapped as a mix of Cascade silt loam and Delena silt loam. Of these soil types, Delena is classified as hydric, and Cascade is classified as non-hydric but known to contain hydric inclusions. Upon inspection, the predominant texture of the soils in

Wetland E was confirmed to be silt loam. Soil matrices were generally dark brown to brown with redoximorphic features in both the matrix and along pore linings.

The primary hydrologic sources sustaining Wetland E appear to be instream flow, overland runoff, seasonal high water table, and direct precipitation.

3.4 Wetland F

Wetland F is a PFO/PSS/PEM wetland in the northeastern portion of the project site. Wetland F is adjacent to the section of the Unnamed Tributary that is upstream from Wetland E and is connected to that wetland via a culverted road crossing that consists of twin 24-inch concrete culverts.

Dominant overstory vegetation in the forested areas of Wetland F includes Oregon ash, with some scattered Oregon white oak (*Quercus garryana*), red alder (*Alnus rubra*), and black cottonwood also present. Understory scrub-shrub vegetation in forested areas includes saplings of Oregon ash, English hawthorn (*Crataegus monogyna*), Himalayan blackberry, trailing blackberry (*Rubus ursinus*), red osier dogwood, Scouler's willow (*Salix scouleriana*), and common snowberry. Common understory herbaceous vegetation includes reed canarygrass, taperfruit shortscale sedge (*Carex leptopoda*), avens (*Geum* sp.), and sword fern (*Polystichum munitum*). Dominant vegetation in the PSS/PEM portions of this wetland includes vine maple (*Acer circinatum*), Nootka rose (*Rosa nutkana*), Pacific ninebark (*Physocarpus capitatus*), reed canarygrass, common velvetgrass (*Holcus lanatus*), fringed willowherb, colonial bentgrass (*Agrostis capillaris*), tall fescue (*Schedonorus arundinaceus*), and Canada thistle.

Soils in Wetland F are mapped as Delena silt loam, a soil type that is classified as hydric. Upon inspection, the predominant texture was confirmed to be silt loam. Soil matrices were generally dark, and samples contained abundant redoximorphic features in both the matrix and along pore linings, along with areas of depletions.

The primary hydrologic sources sustaining Wetland F appear to be instream flow, overland runoff, seasonal high water table, and direct precipitation.

4 STUDY AREA ASSESSMENT

The Oregon HGM method evaluates the ability of a wetland to perform 13 different functions using data collected by the visual observation of various indicators in the field, as well as information obtained from existing maps, aerial photographs, and other data sources (e.g., local soil surveys). The 13 functions assessed by HGM are as follows:

1. Water Storage and Delay
2. Sediment Stabilization and Phosphorus Retention
3. Nitrogen Removal
4. Thermoregulation
5. Primary Production
6. Resident Fish Habitat Support
7. Anadromous Fish Habitat Support
8. Invertebrate Habitat Support
9. Amphibian and Turtle Habitat Support
10. Breeding Waterbird Support
11. Wintering and Migratory Waterbird Support
12. Songbird Habitat Support
13. Support of Characteristic Vegetation

Of these functions, the following three were not assessed for Wetlands A through F because they are not applicable to slope or flats wetlands: thermoregulation, resident fish habitat support, and anadromous fish habitat support. For the Unnamed Tributary, Anchor QEA wetland scientists checked both the Oregon Explorer website (OSU 2016) and the StreamNet online mapper (StreamNet 2016) for information on fish habitat/presence both on and in the vicinity of the project site. Neither of these sources indicate that any essential salmonid habitat or fish presence occurs within the section of the Unnamed Tributary in the project site or in the unnamed stream immediately downstream of the site.

In addition, the assessment area was not assessed for breeding waterbird support because that function requires the presence of greater than 0.5 acre of stagnant surface waters that remain until July 1 of most years. The stream/wetland complex on the project site does not exhibit such characteristics.

The Oregon HGM method allows for two approaches for the assessment of wetland functions: 1) the reference-based method, which assesses functions quantitatively by comparing observations of functional indicators within the wetland being assessed to data from reference wetlands; and 2) the judgmental method, which assesses functions based on a qualitative checklist. Currently, the Oregon HGM method only has reference-based methods for wetlands and riparian sites in the riverine impounding, slope/flats, and tidal HGM classes. Functional assessment of wetlands in other HGM classes must use the judgmental method.

4.1 Assessment Methods Used

Anchor QEA used the reference-based method for the assessment of the Unnamed Tributary and Wetlands A through F and completed the Excel-based HGM slope/flats data form available from the DSL Aquatic Resource Management Forms and Publications page for the assessment area. Under this method, functions are assessed by comparing the assessment area to a series of indicators representing either the highest functioning or least altered conditions, as determined during development of the HGM method. Anchor QEA opted to compare the wetland to the highest functioning wetland scores because the assessment area has been altered by agricultural activities and rural development activities.

4.2 Functional Assessment Results

Table 1 summarizes the qualitative function levels based on the scores returned by each of the assessment methods. The function score rating from the HGM methodology is assigned a rating level from low to high based upon an even distribution of the potential scores. Results of the Oregon HGM functional assessment for the assessment area are summarized in Table 2 and briefly discussed in the following sections. A copy of the Oregon HGM functional assessment data forms is provided in Attachment H-2.

Table 1
Interpretation of Functional Assessment Scores

| Function Score Range | Qualitative Function Level |
|----------------------|----------------------------|
| 0 – 0.19 | Low |
| 0.20 – 0.39 | Moderately low |
| 0.40 – 0.59 | Moderate |
| 0.60 – 0.79 | Moderately high |
| 0.80 – 1.00 | High |

Table 2
Summary of Wetland Functional Assessment Results for the Unnamed Tributary and Wetlands A through F

| Functions | Wetland Scores (HFR = 1.0) | Qualitative Function Level |
|-------------------------------------------------|----------------------------|----------------------------|
| Water Storage and Delay | 0.30 | Moderately low |
| Sediment Stabilization and Phosphorus Retention | 0.57 | Moderate |
| Nitrogen Removal | 0.72 | Moderately high |
| Primary Production | 0.69 | Moderately high |
| Invertebrate Habitat Support | 0.57 | Moderate |
| Amphibian and Turtle Habitat Support | 0.71 | Moderately high |
| Wintering and Migratory Waterbird Support | 0.64 | Moderately high |
| Songbird Habitat Support | 0.71 | Moderately high |
| Support of Characteristic Vegetation | 0.72 | Moderately high |

Note:
 HFR = highest functioning reference

4.2.1 Water Storage and Delays

The assessment area received a moderately low score (0.30) for the Water Storage and Delay function. This is primarily because the stream portion of the stream/wetland complex conveys flow of surface waters to an unnamed stream located south of the project site, resulting in limited water storage and delay within the complex. Site characteristics that enhance the performance of this function include the presence of permanent and seasonal inundation and areas of shallow seasonal ponding in some areas of the stream/wetland complex.

4.2.1 Sediment Stabilization and Phosphorus Retention

The assessment area received a moderate score (0.57) for the Sediment Stabilization and Phosphorous Retention function. Site characteristics that limit the performance of this function include the limited ability of the stream/wetland complex to store water, relatively steep side slopes adjacent to portions of the stream/wetland complex increasing overland flow velocity, and adjacent agricultural and rural activities resulting in increased sediment loading. Factors that contribute to this function include the abundance of woody vegetation and microtopography within the PFO/PSS portions of the wetlands and the presence of dense grass and forbs in the PEM portions, all of which contribute to the stream/wetland complex's ability to intercept suspended inorganic sediments, resist erosion of sediments, and retain phosphorus.

4.2.2 Nitrogen Removal

The Nitrogen Removal functional capacity of the assessment area was rated moderately high (0.72). Limiting factors for this function include fertilizer loading from adjacent agricultural fields and a relatively narrow riparian corridor surrounding the majority of the stream/wetland complex. Characteristics that contribute to this function include the presence of shrubs and trees in and around the stream/wetland complex, woody debris in the stream channel, and redoximorphic features indicating ample microbial activity in the soil to perform denitrification.

4.2.3 Primary Production

The assessment area received a moderately high functional capacity score (0.69) for Primary Production. Factors that contribute to the site's ability to perform this function include the presence of diverse shrubs and trees in the PFO/PSS portions, a dense herbaceous layer in the PEM portions, presence of submerged and emergent vegetation in portions of the stream channel, and the prevalence of natural land cover within 200 feet of the site. Moderately low water storage in the stream/wetland complex inhibits this function.

4.2.4 Invertebrate Habitat Support

The Invertebrate Habitat Support function was rated moderate (0.57) for the assessment area. Factors limiting this function are the lack of open water aquatic bed habitats and disturbance from adjacent agricultural and rural activities. Factors that positively influence this function include the presence of flowing water and submerged and emergent vegetation in the stream channel, occurrence of underlying hydric soils in the wetlands, the presence of some seasonal ponding, presence of natural land cover in the vicinity and contributing watershed, and the abundance of diverse woody and herbaceous vegetation.

4.2.5 Amphibian and Turtle Habitat Support

The assessment area received a moderately high score (0.71) for the Amphibian and Turtle Habitat function. Site characteristics that positively influence this function include the presence of a perennial stream channel with basking sites, some seasonal ponding within the wetlands, the abundance of trees and deadwood, saturated soils, and diverse woody and herbaceous vegetation. Limiting factors include the presence of steep side slopes along portions of the stream/wetland complex, the lack of open water interspersion, lower watershed water quality resulting from adjacent agricultural practices, and moderately low water storage ability. Given these limiting factors, Anchor QEA is of the opinion that this score is too high and that a moderate rating is more appropriate for this function.

4.2.6 Wintering and Migratory Waterbird Support

The assessment area received a moderately high score (0.64) for the Wintering and Migratory Waterbird Support function. Site characteristics that limit the ability of the wetland to perform this function include the absence of vernal pools in the stream/wetland complex and the absence of mud flats. Factors that positively influence the performance of this function include presence of vegetative cover in the stream/wetland complex and nearby cropland, presence of large standing trees, a dominant depth class of 2 to 24 inches, and the proximity of site to nearby open water and other stream/wetland complexes.

4.2.7 Songbird Habitat Support

The assessment area received a moderately high score (0.71) for the Songbird Habitat Support function. Site characteristics that positively influence this function include the abundance of vegetative cover, the presence of closed-canopy forest and shrub/sapling understory along portions of the Unnamed Tributary and surrounding wetlands, and the proximity to adjacent fallow agricultural fields and wooded areas for foraging and cover. Factors that limit the performance of this function include the absence of woody vegetation throughout the entire stream/wetland complex and the presence of human disturbance due to agricultural practices and rural development.

4.2.8 Support of Characteristic Vegetation

For the Support of Characteristic Vegetation function, the assessment area received a moderately high score (0.72). Limiting factors include lower watershed water quality resulting from nutrient and herbicide loading from adjacent agricultural practices, which negatively impact vegetation, and a lack of broad floodplain along the steeper portions surrounding the stream/wetland complex. Site characteristics that favor the performance of this function include the presence of microtopography in the wetlands, the abundance of diverse vegetation forms (grasses, forbs, shrubs, and trees) and age classes, and the absence of large fluctuations in water level within the stream channel and associated wetlands.

5 SUMMARY

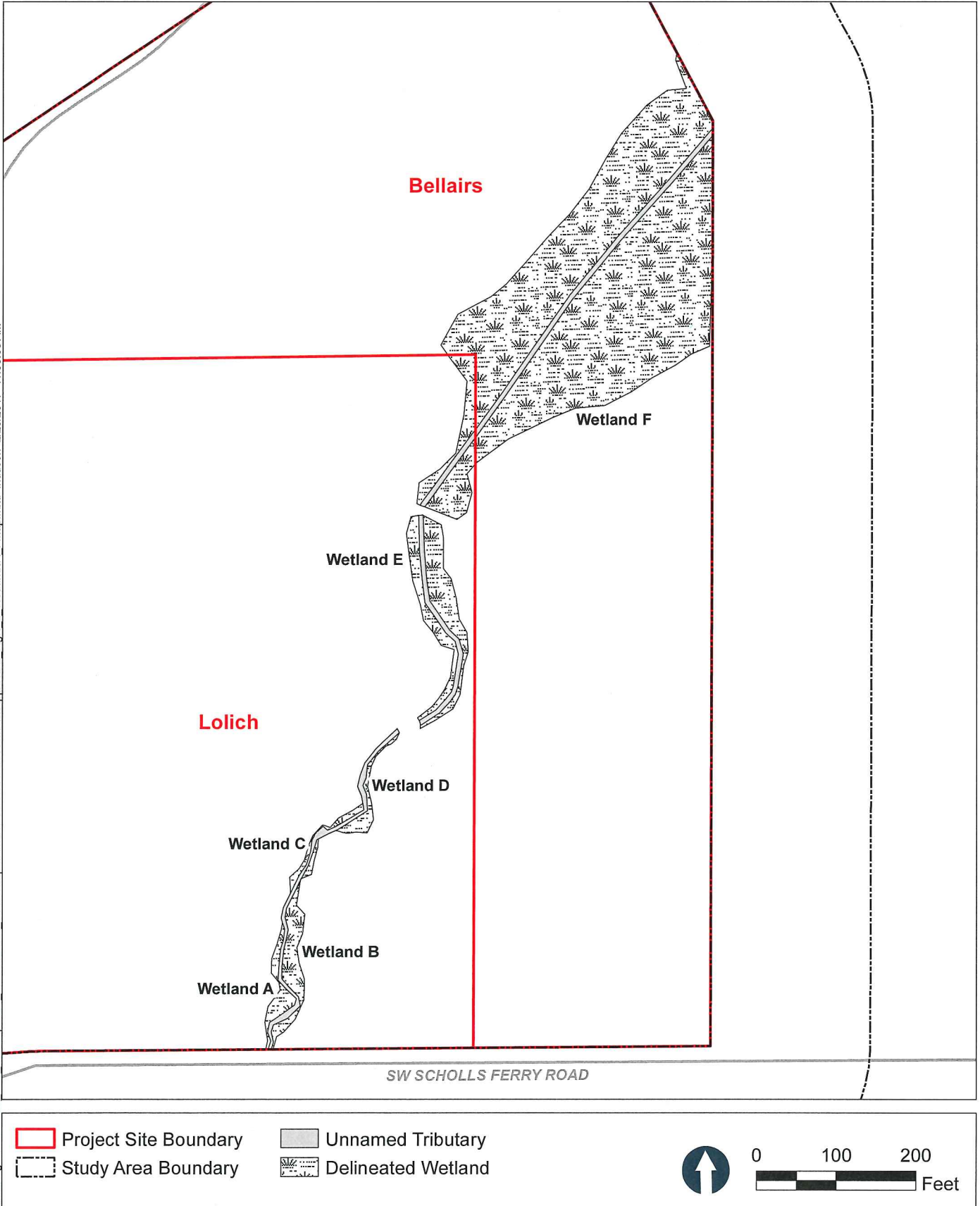
Overall, the assessment area (Unnamed Tributary and Wetlands A through F) received predominantly moderately high scores for most functions. The Amphibian and Turtle Habitat function was rated moderately high, but Anchor QEA is of the opinion that this score is too high and that a moderate rating is more appropriate for this function, given the presence of steep side slopes along several portions of the stream/wetland complex, the lack of open water interspersions, lower watershed water quality resulting from adjacent agricultural practices, and moderately low water storage ability.

6 REFERENCES

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FIGURE

\\orcascgis\jobs\West_Hills_Development_101515\Bellairs_Lolich\Maps\NaturalResourceAssessment\Appendix\HBL_FigH_2_WetlandsA_FMap.mxd Inudson 2/28/2017 11:38:05 AM



ATTACHMENT H-2
FUNCTIONAL ASSESSMENT DATA FORM

SHEET FOR AUTOMATIC CALCULATION OF FUNCTION SCORES - revised June 2008***Slope or Flats subclass***

Site Name: Unnamed Tributary and Wetlands A-F The Ridge at South Cooper Mountain

Date: 2/22/2017

It is recommended to do a "Save As" from this blank spreadsheet for each use, assigning different file names. This will help reduce the chance of accidentally confusing new data with previously entered data.

For reference, the function(s) addressed by each indicator are noted in column E. Codes are shown below next to the function names.

The capital letter in the code (e.g., sp-**B**) in column E refers to the code for the indicator in the published Volume IA.

HFR= scaled to highest functioning site of this subclass found by DSL; **LAR**= scaled to least-altered site of this subclass found by DSL Scores greater than 1 indicate the capacity of the function at the site you assessed may be greater than in all sites of this subclass assessed by the DSL team during model calibration.

Data **must** be entered for every indicator, unless the scale block for this subclass is shaded. Each value in column D must be less than or equal to 1.

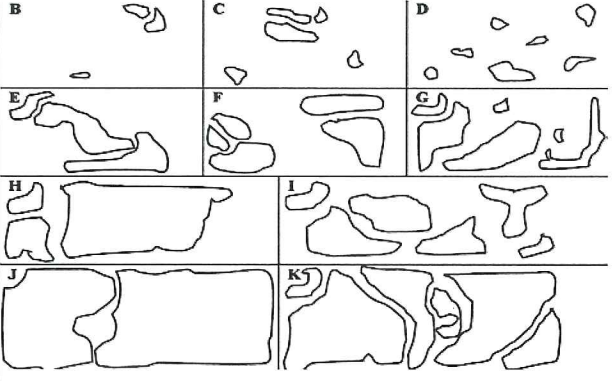
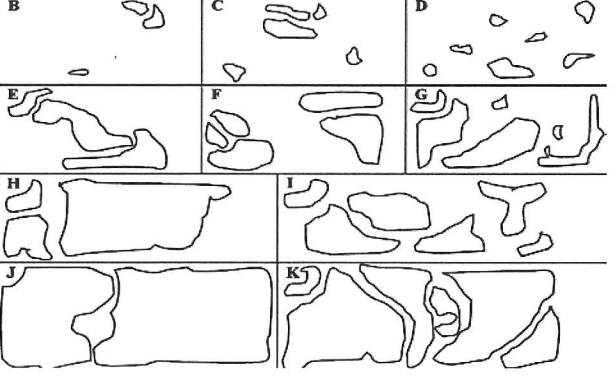
| Function: | Calculated Function Capacity for SF sites | |
|----------------------------------------------------|-------------------------------------------|---------|
| | if HFR: | if LAR: |
| Water Storage & Delay (ws) | 0.30 | 0.67 |
| Sediment Stabilization & Phosphorus Retention (sp) | 0.57 | 0.61 |
| Nitrogen Removal (n) | 0.72 | 0.85 |
| Primary Production (pp) | 0.69 | 0.71 |
| Invertebrate Habitat Support (i) | 0.57 | 0.57 |
| Amphibian & Turtle Habitat (at) | 0.71 | 0.93 |
| Breeding Waterbird Support (bw) | 0.00 | 0.00 |
| Wintering & Migrating Waterbird Support (ww) | 0.64 | 0.73 |
| Songbird Habitat Support (sb) | 0.71 | 1.09 |
| Support of Characteristic Vegetation (v) | 0.72 | 0.74 |

Note 1: Models and scores for ws, sp, n, and pp intentionally do not account for the **area** of the wetland, an especially important factor for these functions.

Note 2: This method should be applied to an entire contiguous wetland, not just to the portion affected directly by a planned alteration or restoration.

| Indicator | Raw Datum | Scale for SF sites | Scaled Datum | Function |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|---------------------------------------------------------------------------|--------------|--------------------|
| Presence of permanent surface water (water year-round during most years)? (p. 82) | present | absent = 0 present = 1.0 | 1 | sb-P rf-X |
| Percent of permanent zone that is open water (i.e., lacking emergent and underwater plants) (p. 79) (Answer "0" if no permanent zone is present) | 5 | 100 =.1 80-99 =.8 60-80 = 1.0 40-60 =.8 20-40 =.4 0-20 =.2 | 0.2 | at-M |
| Percent of site that is inundated only seasonally (i.e., watermarks, moss lines, debris lines, etc.) (p. 81) | 15 | none = 0 1-10 =.1 10-25 =.6 25-50 =.8 > 50 = 1.0 | 0.6 | i-B n-A ws-A |
| | | none = 0 1-20 =.5 20-40 =.7 40-60 =.8 60-80 =.9 >80 = 1.0 | 0.5 | ww-A |
| At least 0.5 acre of surface water persists until at least July 1 and water is mostly wider than 10 ft? | No | Yes = 1 No = 0 | 0 | bw-X |

| | | | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|----------------------------------------------------------------|------|---------------------|
| Predominant water depth during biennial low water (p. 82) | 1-2" | 0" = 0 1-2" =.6 2-24" = 1.0 2-6 ft =.8 >6 ft =.6 | 0.6 | bw-D |
| | | 0 =.1 1-2" = 1.0 2-24" =.8 >24" =.2 | 1 | i-D |
| Percent of site occupied by the most extensive depth category at this site during biennial low water. (p. 81). (Delimit the low water zone first, then break into these depth categories, then identify the category that predominates horizontally). (Possible categories are: 0 inches; 1-2 inches; 2-24 inches; 2-6 feet; < 6 feet) | 40 | 100 = 0 80-100 =.1 50-80 =.4 30-50 =.8 <30 = 1.0 | 0.8 | bw-B |
| Difference between the predominating biennial high and low water levels (p. 71) 0) = No change 1) = Difference of 1 class 2) = Difference of 2 classes 3) = Difference of 3 classes 4) = Difference of 4 classes Class 1 = 0 inches Class 2 = 1-2 inches Class 3 = 2-24 inches Class 4 = 2-6 feet Class 5 = > 6 feet | 3 | 0) = 0 1) =.3 2) =.5 3) =.8 4) = 1.0 | 0.8 | n-B at-E bw-E |
| | | 0) = 0 1) = .25 2) = .5 3) = .75 4) = 1.0 | 0.75 | ww-F |
| Predominant vertical increase in surface water level (ft) in most of the seasonal zone (i.e., water marks, moss lines, debris lines, etc. Look at the highest point for 2 year flood and measure the difference from biennial low) | 0.5 | 0 = 0 .1 - .4 =.25 .5- 1.0 =.5 1 - 2 =.75 >2 = 1.0 | 0.5 | ws-B |
| Number of depth categories during biennial high water. (p. 77) Categories are: ___ 1 - 2 inches ___ 2 - 24 inches ___ 2 - 6 ft ___ > 6 ft | 2 | 1 = 0 2 =.3 3 =.6 4 = 1.0 | 0.3 | bw-C |
| | | 1 = .1 2 = .3 3 = .6 4 = 1.0 | 0.3 | ww-E |

| | | | | |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Percent & distribution of pools during biennial high water. (p. 80)</p> <p>(Note: if site is > 1 acre, select the condition that predominates in 1 acre sub-units of the site.)</p> <p>A = None</p>  | <p>D</p> | <p>A = 0 B =.6 C =.65 D =.7 E,F =.75 K =.8 H =.85 I =.9 J =.95 G = 1.0</p> | <p>0.7</p> | <p>sp-C ww-D i-E, at-A</p> |
| <p>Percent & distribution of pools during biennial low water. (p. 80)</p> <p>(Note: if site is > 1 acre, select the condition that predominates in 1 acre sub-units of the site.)</p> <p>A = None</p>  | <p>B</p> | <p>A = 0 B =.6 C =.65 D =.7 E,F =.75 J =.8 H =.85 I =.9 K =.95 G = 1.0</p> | <p>0.6</p> | <p>bw-A, pp-E, n-1</p> |
| <p>Percent of the site occupied by hummocks (p. 74, 75)</p> | <p>5</p> | <p>none = 0 1-10 =.6 10-90 =.8 >90 = 1.0</p> | <p>0.6</p> | <p>at-B ww-C sb-M sp-B pp-C n-G i-F</p> |

| | | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------------------------------------------------------------------------|-----|----------------------------|
| <p>Maximum annual extent of vernal pools/ shorebird scrapes and mudflats: (p. 76)</p> <p>A = none B = 1 – 100 sq. ft. C = 100-1000 sq. ft. D = 1000 – 10,000 sq. ft. E = >10,000 sq. ft</p> <p>Must meet ALL of the following: a) herbs are generally < 4” and comprise < 80% ground cover during winter or early spring b) topography is basically flat c) inundated to a depth of < 6” for 2 or more continuous weeks d) never shaded by trees, shrubs, or buildings e) not entirely a constructed ditch</p> | A | A = 0 B = .6 C = .7 D = .8 E = 1.0 | 0 | ww-B |
| Presence of logs or boulders that extend above the surface of permanent water (p. 84) | present | absent = 0 present = 1.0 | 1 | at-G |
| Predominant soil texture: (p 83) GC= gravel or cobble SA=sand, sandy loam, or loamy sand L= loam, silty loam, gravelly loam C= clay, sandy clay, silty clay, clay loam, silty clay loam O= organic particles<1mm <u>Guidance:</u> 1. Soil remains in a ball when squeezed YES...Go to 3; NO ...Go to 2 2. > 50% of the particles (by weight) are > 1 mm YES...”GC”; NO ...”SA” 3. Squeezed soil forms an even ribbon YES...Go to 4; NO ...”SA” 4. Soil ribbon extended > 1" without breaking YES...”C/O”; NO ...Go to 5 5. Soils feels very gritty YES... "SA"; NO...”L” | L | GC =.1 SA =.2 L =.8 C/O = 1.0 | 0.8 | sp-D |
| Presence of some mottling and/or other features that indicate oxygen deficits, or, permanent water is present | present | absent = 0 present = 1.0 | 1 | n-X |
| Mapped soil series is hydric (not simply a hydric inclusion). See county soil map and p. 75. | yes | 1= yes 0= no | 1 | v-C at-D ww-G i-I |
| Percent of site that was constructed on former uplands (non-hydric soil) (p. 81): 6) = recent, >90% of site 5) = recent, 10-90% of site 4) = recent, 1-10% of site 3) = >5 years ago, >90% of site 2) = >5 years ago, 10-90% of site 1) = >5 years ago, 1-10% of site 0) = none | 2) | 6) = 0 5) = .1 4) = .2 3) = .3 2) = .4 1) = .5 0) = 1.0 | 0.4 | i-J at-K v-K n-D |

Tally the percent of surrounding land cover (exclude the site itself) as exists during a typical May. Answer each row independently. They do not necessarily sum to 100%.

within 200 ft of the site boundary:

| | |
|--------------------------------------------------|----|
| a. % Water, wetland = | 20 |
| b. % Grassland, water, wetland = | 20 |
| c. % Grassland, row crops = | 40 |
| d. % Wooded = | 15 |
| e. % Natural (not lawn, crops, paved, building)= | 35 |

within 1000 ft:

| | |
|----------------------------------|----|
| f. % Water, wetland = | 10 |
| g. % Grassland, water, wetland = | 10 |
| h. % Grassland, row crops = | 50 |
| i. % Wooded = | 20 |
| j. % Natural = | 30 |

within 5,280 ft:

| | |
|-----------------------------|----|
| k. % Water, wetland = | 10 |
| l. % Grassland, row crops = | 50 |
| m. % Wooded = | 20 |

| | | | | |
|---------------------------------------------------------------------------------------|----|------------------------------------------------------------------------------------|-----|--------------------|
| In column D, enter the scaled value for the number in column B. (= a), above) | 20 | 0 = 0 1-10 =.4 10-20 =.8 >20 = 1.0 | 0.8 | bw-I ww-I |
| In column D, enter the scaled value for the number in column B. (=b), above) | 20 | <10 =.1 10-20 =.2 20-40 =.4 40-60 =.6 60-80 =.8 >80 = 1.0 | 0.2 | sb-N |
| In column D, enter the scaled value for the number in column B. (=c), above) | 40 | <10 = 0 10-20 = .1 20-40 = .3 40-80 = .5 80-90 = .7 90-100 = 1.0 | 0.3 | ww-K |
| In column D, enter the scaled value for the number in column B. (=d), above) | 15 | 0 = 0 1-10 =.1 10-20 =.2 20-40 =.4 40-60 =.6 60-80 =.8 >80 = 1.0 | 0.2 | sb-I |
| In column D, enter the scaled value for the number in column B. (=e), above) | 35 | <10 = 0 10-20 = .1 20-40 = .3 40-80 = .5 80-90 = .7 90-100 = 1.0 | 0.3 | i-L at-O v-R |
| In column D, enter the scaled value for the number in column B. (= (a+f+k)/3), above) | 13 | none = 0 1 - 10 =.4 10-20 =.8 >20 = 1.0 | 0.8 | ww-H bw-J |































| | | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------|---------------------------------------------------------------------------------------------------------|-----|-----------------------------|
| In column D, enter the scaled value for the number in column B. $(=(c+h+l)/3)$, above) | 47 | <10 = 0 10-20 = .1 20-40 = .3 40-80 = .5 80-90 = .7 90-100 = 1.0 | 0.5 | ww-J |
| In column D, enter the scaled value for the number in column B. $(=(d+i+m)/3)$, above) | 18.33333333 | <10 =.1 10-20 =.2 20-40 =.4 40-60 =.6 60-80 =.8 >80 = 1.0 | 0.2 | sb-J |
| In column D, enter the scaled value for the number in column B. $(=(e+j)/2)$, above) | 32.5 | <10 = 0 10-20 = .1 20-40 = .3 40-80 = .5 80-90 = .7 90-100 = 1.0 | 0.3 | bw-K |
| In column D, enter the scaled value for the number in column B. $(=(b+g)/2)$, above) | 15 | <10 =.1 10-20 =.2 20-40 =.4 40-60 =.6 60-80 =.8 >80 = 1.0 | 0.2 | sb-O |
| Percent of land cover within 200 ft (but only in the contributing watershed) that is “natural” – that is, NOT cropland, lawns, pavement, or buildings (p. 79) | 35 | <10 = 0 10-20 =.1 20-40 =.3 40-90 =.5 90-100 = 1.0 | 0.3 | pp-F |
| | | <10 = 0 10-20 =.1 20-40 =.3 40-90 =.5 90-99 =.9 100 = 1.0 | 0.3 | i-M v-Q |
| Percent woodland divided by percent grassland-crops within 200 ft of the site (p. 71) | 0.38 | <.1 =.1 0.1-0.8 =.6 0.8-1.2 = 1.0 1.2 -2.0 =.6 >2.0 =.1 | 0.6 | at-P |
| Distance (ft) to nearest busy road (p. 71) This includes a) any road or parking lot in a develop area that contains >4 buildings per acre, b) any road with a maximum traffic rate of > 6 vehicles per minute, during an average day during the summer | <100 | <100 = 0 100-300 =.3 300-600 =.5 600-1200 =.7 1200-2400 =.8 2400-4800 =.9 >4800 = 1.0 | 0 | bw-G at-N v-P sb-R |

Note: The following 5 rows must sum to 100%. The number of visitors is immaterial.

| | |
|------------------------------------------------------------------------------------------------------------------------|----|
| Percent of site including 100-ft buffer that is visited 365 days a year or almost so = | 20 |
| Percent of site including 100-ft buffer that is visited more than 80 days a year (>20% of year), but less than daily = | 25 |
| Percent of site including 100-ft buffer that is visited 20-80 days a year (e.g., about once a week) = | 30 |
| Percent of site including 100-ft buffer that is visited just a few days a year = | 20 |
| Percent of site including 100-ft buffer that is almost never visited = | 5 |

| | | | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----|--------------------------------------------------------------------------|-----|-------------------------------------------|
| Scale the calculated value in the box on the right (sum of the above 5 rows) and enter the scaled value in column D (p. 72) | 265 | 100-200 = 0 200-300 =.3 300-400 =.7 400-500 =1.0 | 0.3 | bw-H v-O sb-Q |
| Percent of site affected by soil leveling (i.e., portion previously leveled by equipment for farming) | 5 | 100 =.1 10-99 =.3 1-10 =.6 0 = 1.0 | 0.6 | at-C i-G pp-D sp-F n-H |
| Percent of site currently affected by soil compaction: (i.e., by equipment, vehicles, livestock, humans, fill) 6 = recent, at >90% of site 5 = recent, at 10-90% of site 4 = recent, at 1-10% of site 3 = >5 years ago, >90% of site 2 = >5 years ago, 10-90% of site 1 = >5 years ago, 1-10% of site 0 = none | 15 | 5/6) =.1 4) =.2 3) =.4 2) =.6 1) =.8 0) = 1.0 | 0.1 | sp-G v-M sb-K |
| Percent of site's vegetation that is mowed or subject to extreme grazing at least annually (p. 81) | 10 | >90 = 0 10-90 =.2 1-10 =.4 none = 1.0 | 0.4 | sb-L v-N |
| Most of site is burned, or harvested for hay or timber, at least biennially? (p. 72) | no | no = 0 yes = 1.0 | 0 | n-J |
| Percent of site currently affected by soil mixing (plowing, excavation, bulldozing, etc.): (p. 81) 6 = recent, at >90% of site 5 = recent, at 10-90% of site 4 = recent, at 1-10% of site 3 = >5 years ago, >90% of site 2 = >5 years ago, 10-90% of site 1 = >5 years ago, 1-10% of site 0 = none | 4 | 5 or 6 =.1 4 =.2 3 =.4 2 =.6 1 =.8 0 = 1.0 | 0.2 | at-f i-H v-L pp-A n-C sp-E |
| Percent of the site that is vegetated (including submersed aquatics) (p. 82) | >80 | <10 =.1 10-20 =.2 20-40 =.4 40-60 =.6 60-80 =.8 >80 = 1.0 | 1 | sb-A v-A |

| | | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------|----|--------------------------------------------------------------------------|-----|--------------|
| Percent of site with woody vegetation (p. 82) | 60 | <10 =.1 10-20 =.2 20-40 =.4 40-60 =.6 60-80 =.8 >80 = 1.0 | 0.6 | sb-b |
| Percent of seasonal zone that is bare during most of the dry season. (i.e., devoid of vegetation, except trees) (Answer "0" if no seasonal zone) | 2 | >80 = 0 60-80 =.2 40-60 =.4 20-40 =.6 1-20 =.8 0 = 1.0 | 0.8 | pp-G sp-H |
| Percent of site that is inundated permanently and contains emergent, floating, or submersed plants (p. 72) | 2 | 0 = 0 1-10 =.9 >10 = 1.0 | 0.9 | i-A |
| | | 0 = 0 1-10 =.4 10-30 =.8 30-60 = 1.0 60-90 =.9 >90 =.6 | 0.4 | bw-F |
| Percent cover of herbs within the seasonal zone (p. 72) | 40 | 0 = 0 1-30 =.1 30-50 =.6 50-70 =.75 70-100 = 1.0 | 0.6 | at-L |
| Percent of whole site that has closed canopy (p. 80) | 50 | <10 =.1 10-20 =.2 20-40 =.4 40-60 =.6 60-80 =.8 >80 = 1.0 | 0.6 | sb-C |
| Percent understory shrub & vine cover beneath the drip line of trees (p. 82) (Answer "0" if no wooded areas) | 35 | <10 =.1 10-20 =.2 20-40 =.4 40-60 =.6 60-80 =.8 >80 = 1.0 | 0.4 | sb-D |

| | | | | | | | | | | | | | | | | | | | | |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------|---------------|---------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|---------------------|---------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------|-----------|------------------------------------------------------------------------------------------------------------------------------------|-------------|-----------------------------------------------|
| <p>Number & distribution of vegetation forms --- herbs, shrubs, trees. If only one form, answer "A". To count, the patch must comprise >0.5 acre or >5% of vegetated area. See p. 77 for enlargement of diagram.</p> <table border="1"> <tr> <td></td> <td>Veg forms are mostly in discrete quite homogeneous zones or patches:</td> <td>Zones/patches are recognizable but not homogeneous, and are:</td> <td>Forms are highly intermixed; zones are mostly not recognizable; no patch >20% of site</td> </tr> <tr> <td rowspan="2">Two forms ...</td> <td>B 1. of about equal area </td> <td>C 1. of about equal area </td> <td rowspan="2">D </td> </tr> <tr> <td>B 2. of unequal areas </td> <td>C 2. of unequal areas </td> </tr> <tr> <td rowspan="2">All three forms ...</td> <td>E 1. of about equal area </td> <td>F 1. of about equal area </td> <td rowspan="2">G </td> </tr> <tr> <td>E 2. of unequal areas </td> <td>F 2. of unequal areas </td> </tr> </table> | | Veg forms are mostly in discrete quite homogeneous zones or patches: | Zones/patches are recognizable but not homogeneous, and are: | Forms are highly intermixed; zones are mostly not recognizable; no patch >20% of site | Two forms ... | B 1. of about equal area  | C 1. of about equal area  | D  | B 2. of unequal areas  | C 2. of unequal areas  | All three forms ... | E 1. of about equal area  | F 1. of about equal area  | G  | E 2. of unequal areas  | F 2. of unequal areas  | <p>F2</p> | <p>A = 0 B2 = .60 C2 = .65 B1 = .70 C1,D = .75 E2 = .80 F2 = .85 E1 = .90 F1 = .95 G = 1.0</p> | <p>0.85</p> | <p>pp-B v-B at-J i-K sb-H</p> |
| | Veg forms are mostly in discrete quite homogeneous zones or patches: | Zones/patches are recognizable but not homogeneous, and are: | Forms are highly intermixed; zones are mostly not recognizable; no patch >20% of site | | | | | | | | | | | | | | | | | |
| Two forms ... | B 1. of about equal area  | C 1. of about equal area  | D  | | | | | | | | | | | | | | | | | |
| | B 2. of unequal areas  | C 2. of unequal areas  | | | | | | | | | | | | | | | | | | |
| All three forms ... | E 1. of about equal area  | F 1. of about equal area  | G  | | | | | | | | | | | | | | | | | |
| | E 2. of unequal areas  | F 2. of unequal areas  | | | | | | | | | | | | | | | | | | |
| <p>Number of woody species (p. 82)</p> | <p>7</p> | <p>unwooded= 0 1-2 =.1 3-4 =.25 5-6 =.5 7-9 =.75 10-18 =.9 >18 = 1.0</p> | <p>0.75</p> | <p>sb-E</p> | | | | | | | | | | | | | | | | |
| <p>Number of native woody species (p. 78)</p> | <p>6</p> | <p>0 = 0 1 =.1 2-3 =.25 4-5 =.5 6-9 =.75 10-13 =.9 >14 = 1.0</p> | <p>0.75</p> | <p>v-F</p> | | | | | | | | | | | | | | | | |
| <p>Percent of woody species list consisting of species that are native (p. 78)</p> | <p>90</p> | <p>0 = 0 1-57 =.1 58-66 =.25 67-74 =.5 75-79 =.75 80-99 =.9 100 = 1.0</p> | <p>0.9</p> | <p>v-g</p> | | | | | | | | | | | | | | | | |
| <p>Percent of woody cover within stratum that is comprised of non-native species (p. 82)</p> <p>(Use the greater of the tree, understory shrub, or open shrub stratum's percent)</p> | <p>20</p> | <p>100 = 0 80-99 =.1 30-79 =.25 10-29 =.5 5-9 =.75 1-4 =.9 0 = 1.0</p> | <p>0.5</p> | <p>v-H</p> | | | | | | | | | | | | | | | | |
| <p>Spatial predominance of non-native herbs (p. 84)</p> <p>A = Non-natives predominate B = Cannot determine (about equal) C = Natives predominate</p> | <p>A</p> | <p>A = 0 B = .5 C = 1.0</p> | <p>0</p> | <p>v-D</p> | | | | | | | | | | | | | | | | |

Oregon Hydrogeomorphic-Based Wetland Functional Assessment The Ridge at South Cooper Mountain Southwest Drainage

1 INTRODUCTION

Anchor QEA, LLC, wetland scientists conducted an assessment of wetland functions on the Ridge at South Cooper Mountain residential development site (project site) using a hydrogeomorphic (HGM)-based assessment technique developed by the Oregon Department of State Lands (DSL) for wetland and riparian sites in Oregon (Adamus and Field 2001). This methodology, commonly referred to as the Oregon HGM method, is an adaptation of a national wetland functional assessment approach developed by the U.S. Army Corps of Engineers that is based on the concept that hydrologic and geomorphic factors control how wetlands function. This approach uses HGM classification, reference wetlands, assessment models, and functional indices to assess the ability of a wetland to perform selected functions (Smith et al. 1995).

2 ASSESSMENT AREA SELECTION

The assessment area for the functional assessment consisted of a 0.23-acre short, excavated roadside drainage ditch (Southwest Drainage) located along SW Scholls Ferry Road and the southern boundary of the project site (Figure H-3). The Southwest Drainage receives intermittent flow from an impounded pond located on the adjacent property to the west and discharges through a 36-inch concrete culvert that conveys the flow toward the south under the roadway. Anchor QEA wetland scientists conducted wetland delineation fieldwork for the assessment area in August and September 2016. The results of this study were compiled in a January 2017 report entitled *Wetland Delineation Report – West Hills Land Development: The Ridge at South Cooper Mountain (Bellairs and Lolich Properties)* (Anchor QEA 2017), which was submitted to DSL on January 27, 2017 for verification and assigned wetland delineation number #WD 2017-0049.

3 HGM CLASSIFICATION AND DESCRIPTION

As required by the Oregon HGM method, the HGM classification of the Southwest Drainage was determined prior to performing the assessment method. Based on its location in a channel that it is primarily fed by direct inflow of surface waters, the Southwest Drainage is classified as a Riverine Flow-through (RFT) subclass; the ditch is not associated with any wetlands. This classification was determined in accordance with the HGM-based classification system for Oregon presented in the *Guidebook for Hydrogeomorphic (HGM)-based Assessment of Oregon Wetland and Riparian Sites: Statewide Classification and Profiles* (Adamus 2001). The Southwest Drainage is classified as a riverine, intermittent, streambed with a seasonally flooded hydrologic regime (R4SBC) under the U.S. Fish and Wildlife Service's *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin et al. 1979).

The Southwest Drainage is approximately 6 feet wide and 4 to 5 feet deep on average. The substrate primarily consists of mud and drain rock. Much of the channel is overgrown with reed canarygrass (*Phalaris arundinacea*) and Himalayan blackberry (*Rubus armeniacus*), but there is no vegetation rooted in the bottom of the channel. The boundary of the Southwest Drainage was mapped using its ordinary high water level, which was assumed to be the top-of-bank, based on a clear break between vegetated and unvegetated areas. The Southwest Drainage is in the Rock Creek subwatershed (hydrologic unit code 170900100503) of the Tualatin River subbasin of the Willamette River basin.

4 STUDY AREA ASSESSMENT

The Oregon HGM method evaluates the ability of a wetland to perform 13 different functions using data collected by the visual observation of various indicators in the field, as well as information obtained from existing maps, aerial photographs, and other data sources (e.g., local soil surveys). RFT sites perform all the functions covered by the Oregon HGM guidebook to some degree. The 13 functions assessed by HGM are as follows:

1. Water Storage and Delay
2. Sediment Stabilization and Phosphorus Retention
3. Nitrogen Removal
4. Thermoregulation
5. Primary Production

6. Resident Fish Habitat Support
7. Anadromous Fish Habitat Support
8. Invertebrate Habitat Support
9. Amphibian and Turtle Habitat Support
10. Breeding Waterbird Support
11. Wintering and Migratory Waterbird Support
12. Songbird Habitat Support
13. Support of Characteristic Vegetation

4.1 Assessment Methods Used

The Oregon HGM guidebook does not provide a specific assessment method for RFT sites; therefore, Anchor QEA used best professional judgement and Oregon HGM guidance for the qualitative functional assessment of the Southwest Drainage assessment area.

4.2 Functional Assessment Results

Results of the qualitative Oregon HGM functional assessment for the Southwest Drainage are discussed in the following sections.

4.2.1 Water Storage and Delay and Sediment Stabilization and Phosphorus Retention

According to the Oregon HGM guidebook, most RFT sites probably have lower capacity for the Water Storage and Delay and Sediment Stabilization and Phosphorus Retention functions. This is primarily because the Southwest Drainage was excavated to convey flow and only temporarily store or delay surface waters; therefore, the assessment area exhibits a low functional capacity for these functions.

4.2.2 Nitrogen Removal

The Southwest Drainage assessment area exhibits a moderately low capacity for the Nitrogen Removal function. Although much of the channel is overgrown with reed canarygrass and Himalayan blackberry, no vegetation is rooted in the bottom of the channel to remove dissolved forms of nitrogen. Microbial denitrification and algal uptake of nitrogen

may be present to some degree; however, the intermittent flows and elevated nutrient loading from surrounding agricultural activity limit the capacity of this function.

4.2.3 Thermoregulation

The Southwest Drainage assessment area primarily receives intermittent flow from an off-site impounded pond. There is very little vegetation overstory shading present, and temperatures of surface waters conveyed through the ditch are likely highly variable; therefore, the assessment area exhibits a low functional capacity for regulating temperature in downstream receiving waters.

4.2.4 Primary Production

No plants are present in the channel bottom of the Southwest Drainage, and a busy roadway is immediately adjacent to the roadside ditch; therefore, the ditch exhibits a low functional capacity for Primary Production.

4.2.5 Resident Fish Habitat and Anadromous Fish Habitat Support

Because the Southwest Drainage contains intermittent flows, it does not provide suitable fish habitat for feeding, breeding, nursery, overwintering, and/or refuge areas; therefore, a low functional capacity was determined for these functions.

4.2.6 Invertebrate Habitat Support

The Invertebrate Habitat Support function was determined to be moderately low for the Southwest Drainage assessment area. Factors limiting this function are the lack of permanent surface water, lack of aquatic bed habitats, lack of vegetation in the bottom of the channel, and the close proximity to the adjacent roadway. Factors that positively influence this function include the presence of intermittent flow and some seasonal ponding and the presence of natural land cover to the north in the vicinity and contributing watershed.

4.2.7 Amphibian and Turtle Habitat Support

The Southwest Drainage assessment area was determined to have low functional capacity for the Amphibian and Turtle Habitat function. Site characteristics that limit this function

include the lack of permanent open water and shallow pools, the lack of emergent vegetation in the ditch, and regular disturbance from vehicular traffic on the adjacent roadway.

4.2.8 Breeding Waterbird and Wintering and Migratory Waterbird Support

The Southwest Drainage assessment area was determined to have low functional capacity for the Breeding Waterbird and Wintering and Migratory Waterbird Support function. Site characteristics that limit the ability of the ditch to perform this function include the absence of permanent inundation and vernal pools, limited herbaceous cover in the ditch, and close proximity to a busy road.

4.2.9 Songbird Habitat Support

The Southwest Drainage assessment area was determined to have low functional capacity for the Songbird Habitat Support function. Factors that limit the performance of this function include the absence of deadwood for cover, the lack of closed-canopy forest and dense understory within the ditch, and close proximity to a busy road.

4.2.10 Support of Characteristic Vegetation

For the Support of Characteristic Vegetation function, the Southwest Drainage assessment area was determined to have low functional capacity. Limiting factors include the lack of diverse vegetation forms and trees, the absence of deadwood, and close proximity to a busy road.

5 SUMMARY

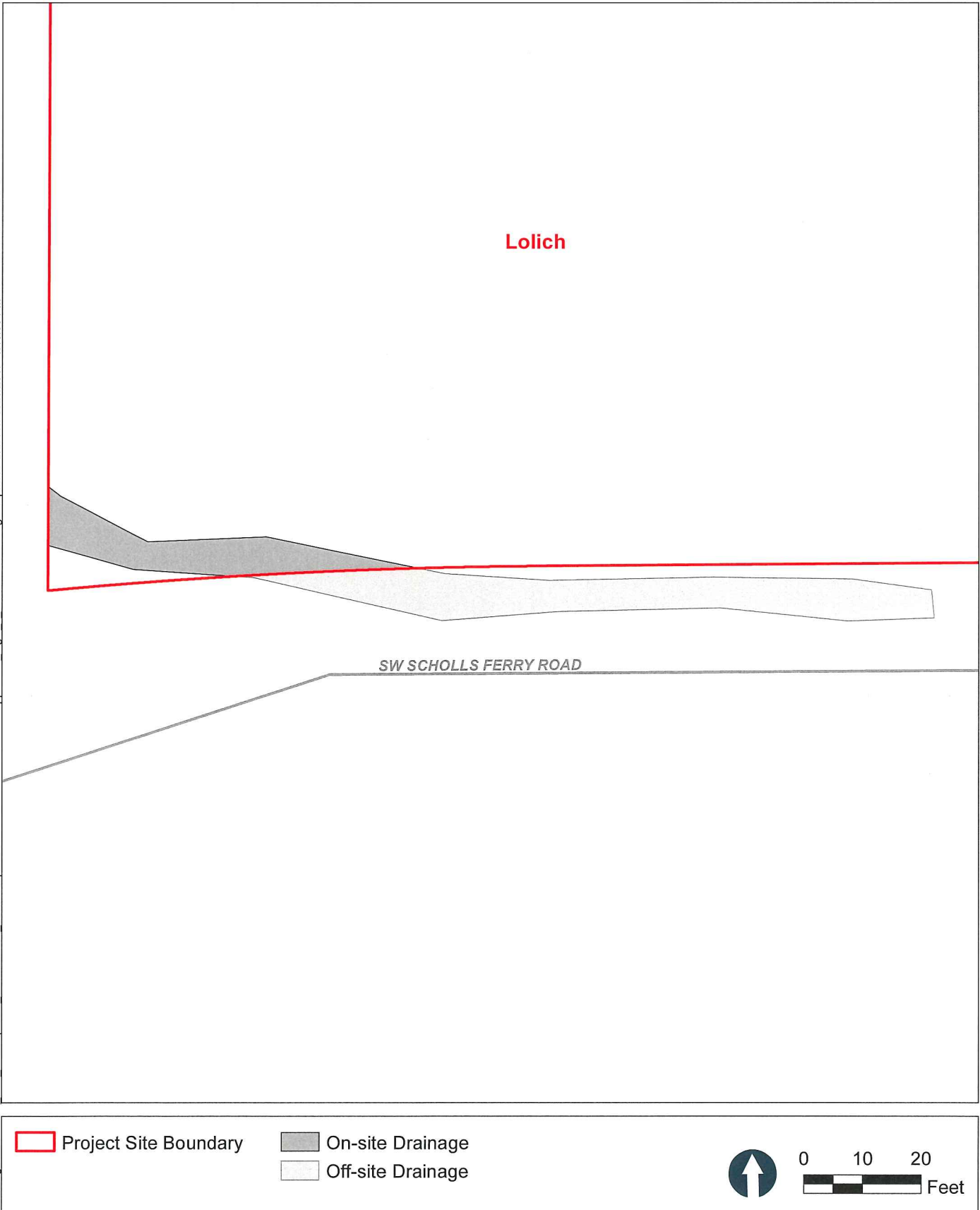
Overall, the Southwest Drainage exhibits low scores for most riverine functions. The assessment area is an excavated roadside ditch that conveys intermittent surface water, lacks native woody vegetation cover, and is situated alongside a busy road. These site characteristics limit the overall functionality of the Southwest Drainage.

6 REFERENCES

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FIGURE

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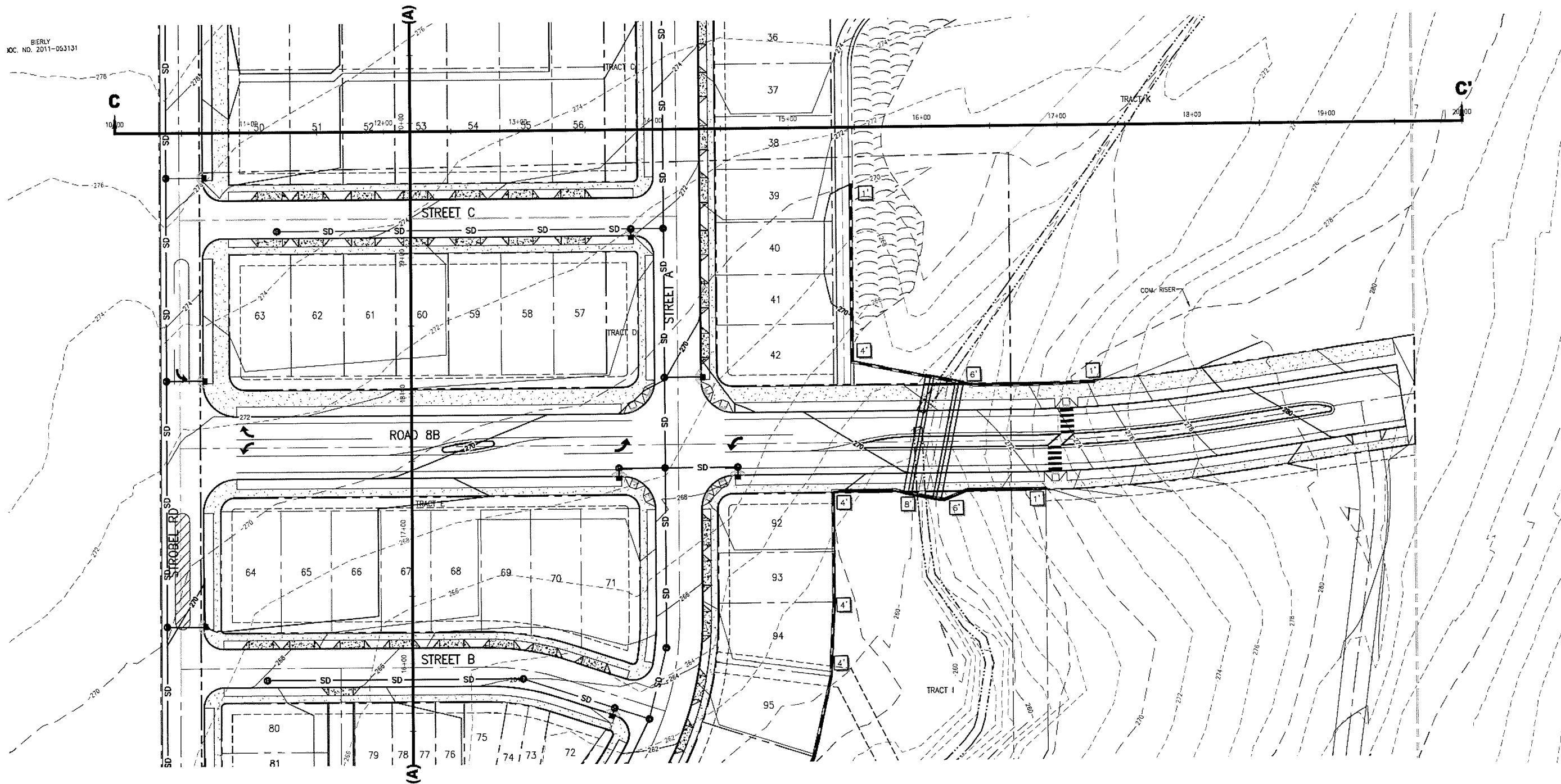


APPENDIX I
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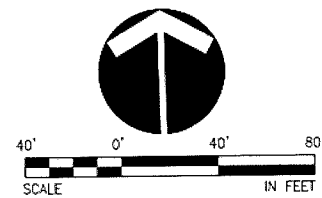
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- PROPOSED 10' CONTOUR --- 275 ---
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- WETLAND [dotted pattern]
- CWS 50' VEGETATED CORRIDOR [hatched pattern]
- STORM DRAIN LINE --- SD ---
- DAYLIGHT BASEMENT LOT (DL)
- GARAGE UNDER LOT (GU)
- SITE SECTION [D] [D']
- SITE SECTION MATCH LINE (D)



SEE SHEETS P4.3 TO P4.4
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THE RIDGE AT SOUTH COOPER MOUNTAIN
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PRELIMINARY GRADING PLAN
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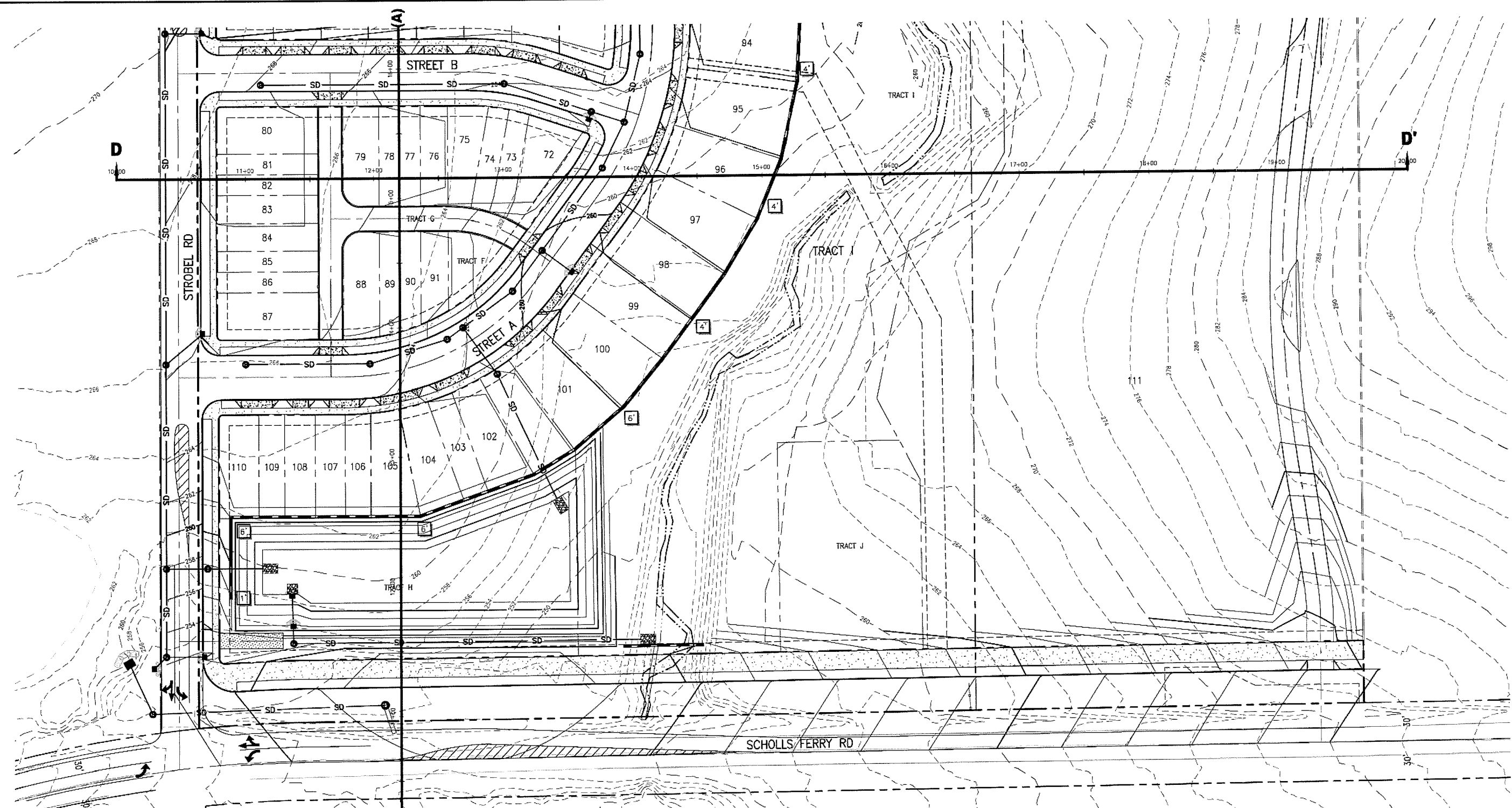
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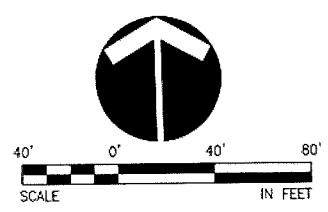
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| WETLAND | ----- |
| CWS 50' VEGETATED CORRIDOR | ----- |
| STORM DRAIN LINE | — SD — |
| DAYLIGHT BASEMENT LOT | (DL) |
| GARAGE UNDER LOT | (GU) |
| SITE SECTION | D D' |
| SITE SECTION MATCH LINE | (D) |



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LAND USE SUBMITTAL - FEBRUARY 10, 2017

THE RIDGE AT SOUTH COOPER MOUNTAIN
 BEAVERTON, OREGON

PRELIMINARY GRADING PLAN
 SOUTH

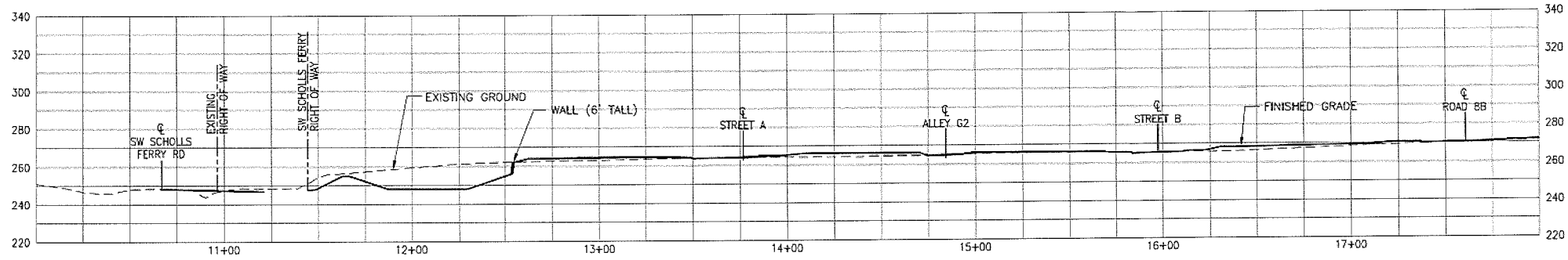
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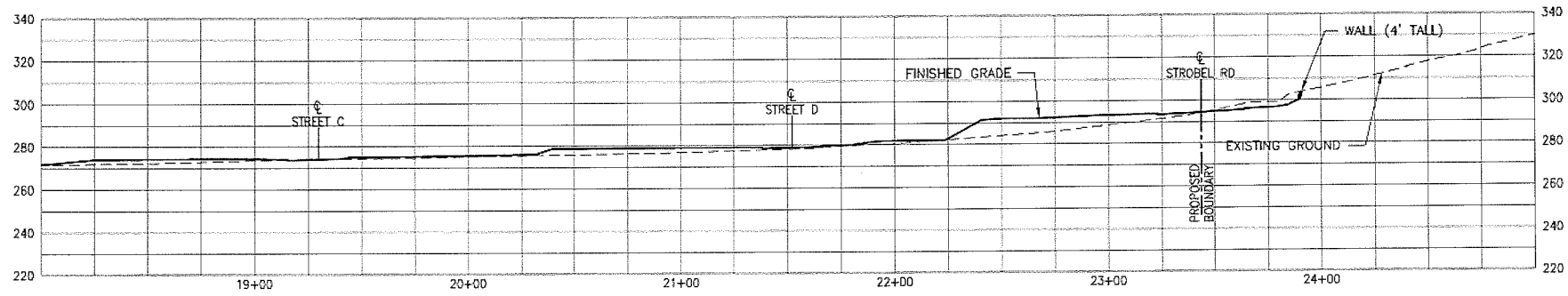
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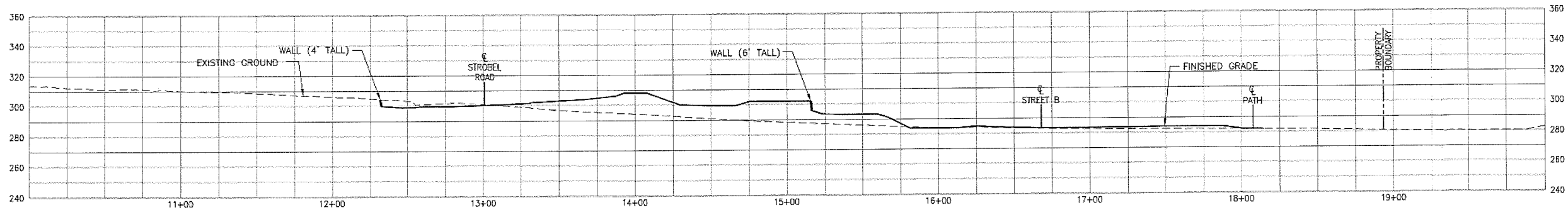
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THE RIDGE AT SOUTH COOPER MOUNTAIN
 BEAVERTON, OREGON

PRELIMINARY SITE SECTIONS
 SECTION A-A' & SECTION B-B'



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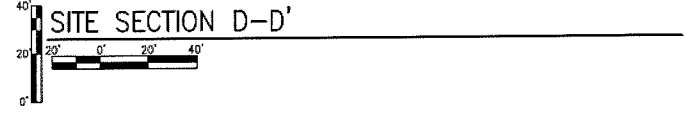
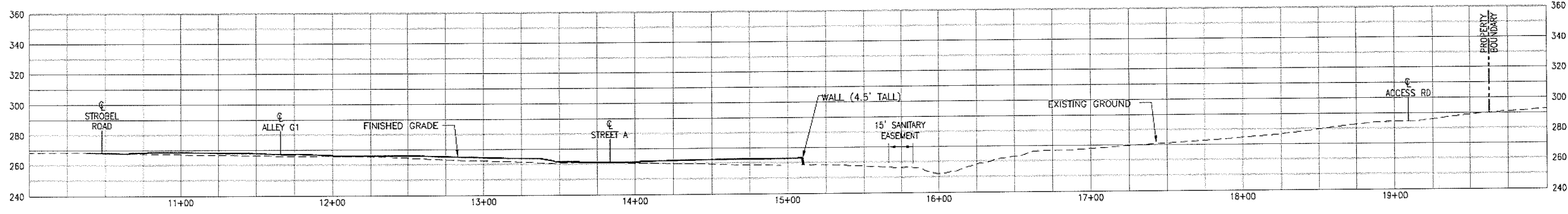
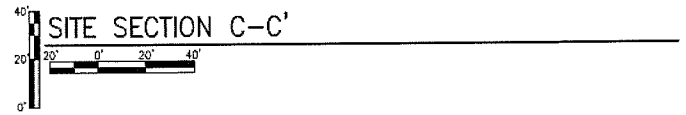
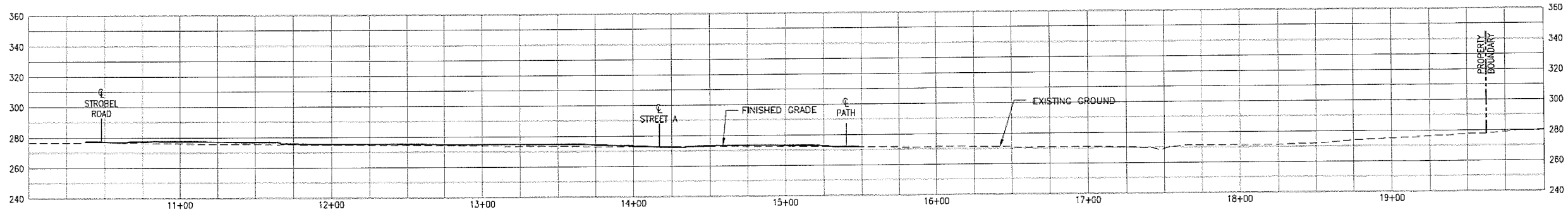
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LAND USE SUBMITTAL - FEBRUARY 10, 2017

THE RIDGE AT SOUTH COOPER MOUNTAIN
 BEAVERTON, OREGON

PRELIMINARY SITE SECTIONS
 SECTION C-C' AND SECTION D-D'

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Memorandum

January 10, 2017

To: Dan Grimberg, Director of Land Development
West Hills Land Development

From: Greg Summers and Matt Kuziinsky
Anchor QEA, LLC

cc: Mike Peebles, PE
Otak, Inc.

Mike Robinson, Partner
Perkins Coie LLP

**Re: The Ridge at South Cooper Mountain Residential Development
Oregon Freshwater Wetland Assessment Method (OFWAM) Analysis for Wetland G**

Introduction

The following memorandum summarizes the results of an Oregon Freshwater Wetland Assessment Methodology (OFWAM) functions and conditions assessment for Wetland G, a 0.76-acre wetland located on the site of West Hills Land Development's proposed The Ridge at South Cooper Mountain residential development project (project site) in the City of Beaverton, Washington County, Oregon (Figure 1). The 27.95-acre project site is located in the NW 1/4 of Section 6, Township 2 South, Range 1 West and includes two properties: the 15.95-acre Bellairs property (tax lot 2S1060000500) and the 12.0-acre Lolich property (tax lot 2S1060000600) (Figures 2 and 3). Wetland G occurs in the northern portion of the Bellairs Property (Figure 4).

The intent of this OFWAM assessment is to confirm that Wetland G does not qualify as a *locally significant wetland* as defined in Oregon Administrative Rules (OARs) 141-086-0300 through 141-086-0350. Locally significant wetlands are considered *significant natural resource areas* by the City of Beaverton (City), pursuant to Oregon Statewide Planning Goal 5, and are subject to more restrictive land use planning requirements under the City's development code.

After applying OFWAM to Wetland G, it was determined that the wetland does not qualify as a significant wetland. The methods and results of the OFWAM are further discussed in the following text.

Background

Wetland G was previously identified as Probable Wetland (PW)-I by David Evans and Associates, Inc. (DEA), in their February 2016 *South Cooper Mountain Annexation Area – Local Wetland Inventory* (LWI) report (the LWI maps are included as Attachment 1). At the time the LWI was prepared, PW-I

was described as a 0.40-acre wetland that was classified as a palustrine, forested, broad-leaved deciduous wetland with a saturated/semi-permanent/seasonal water regime (PFO1Y) under the U.S. Fish and Wildlife's *Classification of Wetlands and Deepwater Habitats of the United States* (Cowardin system; Cowardin et al. 1979) and a slope wetland under the Oregon Department of State Lands' (DSL's) hydrogeomorphic (HGM) classification system (Adamus 2001). PW-I was mapped as a *probable wetland* in the LWI because it met wetland criteria but was estimated to be less than 0.5 acre in size, per the LWI Inventory Development Process and Standards rules under OAR 141-086-0210(11). In accordance with DSL guidance on probable wetlands, PW-I was not assessed using OFWAM in the LWI.

At the request of West Hills Land Development, the project site was delineated in the field by Anchor QEA, LLC (Anchor QEA), wetland scientists in August and September 2016, with the results summarized in a January 2017 wetland delineation report (Anchor QEA 2017). During this delineation, the presence of PW-I was confirmed and its boundary was identified using the methods presented in the *Corps of Engineers Wetland Delineation Manual* (Environmental Laboratory 1987), the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (U.S. Army Corps of Engineers 2010), and OARs 141-090-0005 to 141-090-0055. Based on these procedures, PW-I, which was renamed Wetland G during the delineation, was determined to be 0.76 acre in size (Figure 4). Since Wetland G no longer meets the definition of a probable wetland under the LWI rules, Anchor QEA performed an OFWAM assessment to determine if it would meet the criteria required for a locally significant wetland under both the mandatory and optional criteria specified in OAR 141-086-0350.

Methods

OFWAM is a planning-level assessment tool that is used to compare the functions and conditions of groups of wetlands. It is primarily used for planning and education and not for detailed impact analysis on individual wetlands (Roth et al. 1996). As part of the state's LWI process, OFWAM assessment results are used to determine the relative quality of mapped wetlands and to designate locally significant wetlands as defined in OAR 141-086-0300 through 141-086-0350 as required by Oregon Statewide Planning Goal 5.

OFWAM assesses four ecological wetland functions (wildlife habitat, fish habitat, water quality, and hydrologic control), three social wetland functions (education, recreation, and aesthetic quality), the sensitivity of the wetland to future impacts, and its enhancement potential (Roth et al. 1996). The assessment is performed by answering multiple sets of questions about the larger watershed and the specific wetlands being assessed (assessment site) using information obtained from existing maps, natural resource reports, and site visits. The initial series of questions is directed at characterizing the watershed setting of the assessment site to provide an understanding of how the wetlands within it interact with the surrounding landscape. A second series of questions is then answered for the

individual wetlands in the assessment area to characterize each of those areas. Once both the watershed and wetlands are characterized, the assessor responds to a series of assessment questions for each of the ecological and social wetland functions addressed by OFWAM.

The responses to the wetland characterization questions are summarized on a data sheet and used to prepare a brief summary narrative of watershed and individual wetland characteristics. The responses to the function assessment questions are tallied and the results compared to OFWAM's assessment criteria for each function to provide an indication of the condition of that function in each wetland. For wildlife habitat, the OFWAM assessment provides an indication of the following: 1) whether the wetland provides diverse wildlife habitat; 2) whether the wetland provides habitat for some wildlife species; or 3) whether wildlife habitat function is lost or not present. For the fish habitat, water quality, and hydrologic control functions, OFWAM provides an indication of whether a wetland function is 1) intact; 2) degraded or impacted; or 3) lost or not present. For sensitivity to future impacts, OFWAM indicates that the wetland is either 1) sensitive; 2) potentially sensitive; or 3) not sensitive to future impacts. For the enhancement potential, OFWAM indicates if the wetland has either high, moderate, or low enhancement potential.

In addition to the characterization and assessment questions, OFWAM also includes a series of questions designed to identify *wetlands of special interest for protection*. These include wetlands that contain threatened, endangered, or sensitive species (or critical habitat for such species); wetlands with specific state, federal, or private designations (e.g., Registered State Natural Area, Federal Research Natural Area, Nature Conservancy Preserve); or wetlands that are considered rare or unique in Oregon (e.g., bogs, vernal pools, old growth forested wetlands), among others.

Upon completion of the OFWAM assessment, the resulting function condition levels for the wildlife habitat, fish habitat, water quality, hydrologic control, and education functions¹; information from the wetland characterization summary; and the results of the wetlands of special interest for protection questionnaire are compared to DSL's mandatory and optional Locally Significant Wetland criteria contained in OAR 141-086-0350(2). If one or more of these criteria are met, then the wetland is identified as a locally significant wetland.

Assessment Site

The assessment site for this OFWAM assessment includes Wetland G, which was characterized by Anchor QEA as a mixed forested/herbaceous wetland that occurs along the interface where a wooded slope transitions into a fallow agricultural field. Wetland G was determined to contain two Cowardin system (Cowardin et al. 1979) wetland classes—palustrine forested (PFO) and palustrine emergent (PEM)—and was determined to be a slope/flats wetland under DSL's HGM classification

¹ The recreation, aesthetic quality, sensitivity to impact, and enhancement potential function condition scores are not used in the evaluation of whether the assessment site meets locally significant wetland criteria.

system (Adamus 2001). Wetland G is not connected to any other waterbodies. The vegetation, soils, and hydrology of Wetland G are summarized in Table 1.

Table 1
Typical Vegetation, Soil, and Hydrology Characteristics of Wetland G

| Parameter | | Description |
|-------------------------|--------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Vegetation ¹ | Forested Portion | <u>Dominant Vegetation:</u> Oregon ash (<i>Fraxinus latifolia</i> , FACW), Oregon white oak (<i>Quercus garryana</i> , FACU), Pacific ninebark (<i>Physocarpus capitatus</i> , FACW), common snowberry (<i>Symphoricarpos albus</i> , FACU), Himalayan blackberry (<i>Rubus armeniacus</i> , FAC), trailing blackberry (<i>Rubus ursinus</i> , FACU), red osier dogwood (<i>Cornus alba</i> , FACW), common hawthorn (<i>Crataegus monogyna</i> , FAC), clustered rose (<i>Rosa pisocarpa</i> , FAC), twinberry (<i>Lonicera involucrata</i> , FAC), poison oak (<i>Toxicodendron diversilobum</i> , FAC), cascara false buckthorn (<i>Frangula purshiana</i> , FAC), slough sedge (<i>Carex obnupta</i> , OBL), soft rush (<i>Juncus effusus</i> , FACW) |
| | Herbaceous Portion | <u>Dominant Vegetation:</u> common velvetgrass (<i>Holcus lanatus</i> , FAC), colonial bentgrass (<i>Agrostis capillaris</i> , FAC), perennial ryegrass (<i>Lolium perenne</i> , FAC), California oatgrass (<i>Danthonia californica</i> , FAC), sweet vernal grass (<i>Anthoxanthum odoratum</i> , FACU), and tall fescue (<i>Schedonorus arundinaceus</i> , FAC) |
| Soils | | <u>Mapped Soils:</u> Cascade silt loam (non-hydric with hydric inclusions), Cornelius and Kinton silt loams (non-hydric with hydric inclusions), and Delena silt loam (hydric) <u>Predominant Soil Texture:</u> silt loam |
| Hydrology | | <u>Water Regime:</u> seasonally saturated <u>Hydrologic Sources:</u> overland flow, seasonal high water table, direct precipitation |

Notes:

1. Plant species are listed with their scientific names and wetland indicator status in parentheses. Scientific names and wetland indicators status obtained from the 2016 National Wetland Plant List (Lichvar et al. 2016).

Wetland indicator status: OBL = obligate wetland, FACW = facultative wetland, FAC = facultative, FACU = facultative upland

Assessment Results

The OFWAM assessment prepared for Wetland G tiers off the watershed characterization information that was assembled by DEA for the South Cooper Mountain Annexation Area LWI (DEA 2016). For reference, the LWI watershed characterization summary sheet is provided in Attachment 2.

Anchor QEA prepared an individual wetland characterization for Wetland G using the required OFWAM data form (Attachment 3). This characterization is summarized in Table 2.

Anchor QEA also completed the Wetland of Special Interest for Protection questionnaire for Wetland G (Attachment 4). Wetland G was not identified as a wetland of special interest for protection for the following reasons:

- Does not contains threatened, endangered, or sensitive wildlife, fish, invertebrate, or plant species
- Is not designated as critical or essential habitat for a threatened, endangered, or sensitive wildlife, fish, invertebrate, or plant species
- Is not a dedicated or proposed Registered State Natural Area or Area of Critical Environmental Concern, State Natural Heritage Conservation Area, Federal Research Natural Area, or a Nature Conservancy Preserve
- Is not a wetland of regional or national significance to migratory birds
- Is not protected in a local wetland conservation plan or a local comprehensive plan as a Goal 5 or Goal 17 resource (as confirmed by the LWI and this OFWAM assessment)
- Is not designated as a State Outstanding Resource Water
- Is not a recognized protected area in a federal, state, or local management plan
- Is not a protected wetland mitigation area
- Is not a wetland restoration or protected area included in the Wetland Reserve Program administered by the Natural Resources Conservation Service

Following wetland characterization, Anchor QEA assessed the functions of Wetland G by completing the OFWAM function assessment forms (Attachment 5). The results of these assessments are summarized in Table 3. As indicated, Wetland G was found to provide some level of wildlife habitat, water quality, and hydrologic control functions, although many of these functions have been impacted or degraded by past activities in the surrounding area. Based on the OFWAM assessment, no fish habitat, education, or recreation functions are provided by Wetland G.

Table 2
Oregon Freshwater Wetland Assessment Methodology Characterization for Wetland G

| Category | Characterization |
|---------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Wetland Structure and Relation to Surrounding Landscape | <ul style="list-style-type: none"> • Existing land uses within 500 feet of wetland: <20% open space; >50% agriculture; 0% exclusive forest uses; <20% developed uses; 0% other • Dominant existing land use within 500 feet of the wetland on the downstream or down slope edge: Agriculture • Wetland area: 0.76 acre • Surface water connectivity: None • 100-year floodplain connectivity: Not connected • Zoning within 500 feet of wetland edge: 20 to 50% open space; 0% agriculture; 0% exclusive forest uses; >50% developed uses; 0% other |

| Category | Characterization |
|-------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Wetland Habitat | <ul style="list-style-type: none"> • Cowardin wetland classes in wetland: 0% open water; 20 to 50% emergent; 0% scrub-shrub; 50 to 70% forested • Dominant vegetation cover type: Equal parts forested and herbaceous cover • Interspersion of Cowardin wetland classes: Low • Percentage of wetland edge bordered by upland wildlife habitat that is at least 150 feet wide: <10% • Connection to other wetlands: Not connected by surface waters but other unconnected wetlands within 3-mile radius • Area of unvegetated open water in wetland: None |
| Fisheries Habitat | <ul style="list-style-type: none"> • Surface waters connected to wetland: None |
| Wetland Hydrology | <ul style="list-style-type: none"> • Primary source of water: Groundwater (high seasonal water table) • Evidence of flooding or ponding in wetland during growing season: None • Restriction of water flow out of wetland: None (no channel or outlet) • Restriction of water flow into wetland: No surface (i.e., stream flow) enters wetland; stream flow cannot be diverted to wetland • Modification of stream flow or stream bank by human activities within 1 mile above wetland: No; no stream flow enters wetland |
| Public Access to Wetland Site | <ul style="list-style-type: none"> • Wetland site open to public for direct access/observation: No • Visible hazards to public at wetland site: No • Natural landscape features or agricultural land contiguous or adjacent to wetland: Yes, both agricultural and forested lands area contiguous and adjacent to wetland • Existing public access to adjacent natural and agricultural features: None; cannot be easily created • Available public access viewing spot or wetland edge for persons of limited mobility: None • Presence of maintained or unmaintained public access point within 250 feet of wetland edge: None |
| Recreation | <ul style="list-style-type: none"> • Wetland accessible by boat: No • Existing trails or other recreational structures in wetland: None • Opportunities for fishing: None (no fish habitat present) • Opportunities for hunting: None (wetland is within the city limits of Beaverton) |
| Aesthetics | <ul style="list-style-type: none"> • Extent of visual contrast with surrounding landscape: Significant contrast • Visual detractors (e.g., litter, abandoned cars) present: No • Unpleasant odors present: None detected • Audible noises: Some traffic; other similar background sounds; naturally occurring sounds • Percentage of wetland visible from viewing area: Between 25 and 50% • Number of Cowardin wetland classes visible from viewing area: One |

Table 3
Summary of Oregon Freshwater Wetland Assessment Methodology Results for Wetland G

| Function | Assessment Results |
|-------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Wildlife Habitat | Provides Habitat for Some Wildlife Species – Wildlife habitat in Wetland G is limited by presence of only two Cowardin wetland classes (PFO and PEM), the low interspersion of these classes, the lack of a surface water connection to other waterbodies, the dominance of agricultural land use in the vicinity, and the limited amount of adjacent upland wildlife habitat. |
| Fish Habitat | Not Present – Fish habitat is not present in Wetland G; it does not contain a stream, pond, or lake and has no direct surface water connection to other waterbodies. |
| Water Quality | Impacted/Degraded – Wetland G’s ability to perform water quality functions is limited because it does not receive surface flow from streams or ditches, is not inundated by flooding, and is less than 5 acres in size, is surrounded by agricultural land use, and due to the absence of 303(d)-listed stream reaches upstream from the wetland. |
| Hydrologic Control | Impacted/Degraded – Wetland G’s ability to perform hydrologic control functions is limited because it is not located within floodplain, is not inundated by flooding, is less than 5 acres in size, does not have a restricted outlet, is surrounded by agricultural land uses, |
| Sensitivity to Future Impacts | Potentially Sensitive – Wetland G is potentially sensitive to future impacts because it is an isolated wetland that is located within the Portland metropolitan area Urban Growth Boundary in an area that has been recently re-zoned for residential development. It was not rated as Sensitive because upstream and adjacent stream reaches are not listed as water quality limited (i.e., 303(d) listed). |
| Enhancement Potential | Little Enhancement Potential – Wetland G was determined to have little enhancement potential because fish habitat functions are not present, the wetland does not receive surface (i.e., stream) flow and has no surface water connection to other waterbodies, and because adjacent upland wildlife habitat is limited. |
| Education | Not Appropriate – Wetland G was determined to be inappropriate for educational use because it is a privately owned site that is not accessible to the public. |
| Recreation | Does Not Provide – Wetland G does not provide recreational opportunities because it is not accessible to the public, has no recreational amenities (e.g., trails, open water), and does not offer opportunities for fishing or hunting. |
| Aesthetic Quality | Moderately Pleasing – Aesthetically, Wetland G was determined to be moderately pleasing due to its contrast with surrounding areas, lack of unpleasant odors, lack of visible litter and debris, and low noise levels. Conditions that restrict this function include the limited visibility of multiple Cowardin wetland classes. |

Determination of Wetland Significance

Table 4 compares the results of the Wetland G OFWAM assessment to DSL’s mandatory and optional criteria for locally significant wetlands in accordance with OAR 141-086-350. As indicated, Wetland G

does not meet any of these criteria. As such, it was determined that Wetland G is not a locally significant wetland as defined by DSL.

Table 4
Determination of Wetland Significance for Wetland G

| Mandatory Locally Significant Wetland Criteria per OAR 141-086-0350(2) | Determination |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>(a) The wetland performs any of the following functions at the levels indicated below using OFWAM:</p> <ul style="list-style-type: none"> (A) "Diverse" wildlife habitat; or (B) "Intact" fish habitat; or (C) "Intact" water quality function; or (D) "Intact" hydrologic control function. | <p>No – Wetland G received the following OFWAM assessment ratings (Table 3):</p> <ul style="list-style-type: none"> (A) Wildlife Habitat: <i>Provides for Some Species</i> (B) Fish Habitat: <i>None Present</i> (C) Water Quality Function: <i>Impacted/Degraded</i> (D) Hydrologic Control Function: <i>Impacted/Degraded</i> |
| <p>(b) The wetland or a portion of the wetland occurs within a horizontal distance less than one-fourth mile from a water body listed by the Department of Environmental Quality (DEQ) as a water quality limited water body (303 (d) list), and the wetland's water quality function is described as "intact" or "impacted or degraded" using OFWAM. The 303(d) list specifies which parameters (e.g., temperature, pH) do not meet state water quality standards for each water body. A local government may determine that a wetland is not significant under this subsection upon documentation that the wetland does not provide water quality improvements for the specified parameter(s).</p> | <p>No – Although Wetland G's water quality function was rated <i>Impacted/Degraded</i> using OFWAM (Table 3), it is more than 1.4 miles away from the nearest DEQ 303(d)-listed waterbody (Tualatin River).</p> |
| <p>(c) The wetland contains one or more rare plant communities, as defined in this rule.</p> | <p>No – Wetland G does not contain any rare plant communities as defined by Appendix G of the OFWAM Manual (Roth et al. 1996); all plants present are common to the area.</p> |
| <p>(d) The wetland is inhabited by any species listed by the federal government as threatened or endangered, or listed by the state as sensitive, threatened or endangered, unless the appropriate state or federal agency indicates that the wetland is not important for the maintenance of the species.</p> | <p>No – Wetland G is not known to support any federal or state listed sensitive, threatened, or endangered species.</p> |

| Optional Locally Significant Wetland Criteria per OAR 141-086-0350(3) | Determination |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>(a) The wetland represents a locally unique native plant community: wetland is or contains the only representative of a particular native wetland plant community in the Urban Growth Boundary (UGB)/Urban Unincorporated Community (UUC), which is only applicable if the entire UGB/UUC is inventoried. To be identified as a LSW, such a wetland must also have been assessed to perform at least one of the following functions at the levels indicated below using OFWAM:</p> <ul style="list-style-type: none"> (A) Its wildlife habitat descriptor is either "provides diverse habitat", or "provides habitat for some wildlife species"; or (B) Its fish habitat descriptor is either "intact", or "impacted or degraded"; or (C) Its water quality function descriptor is either "intact", or "impacted or degraded"; or (D) Its hydrologic control function descriptor is either "intact", or "impacted or degraded". | <p>No – Wetland G does not represent a locally unique native plant community. The plant community present is common for the region and found throughout the Portland metropolitan area’s UGB.</p> |
| <p>(b) The wetland is publicly owned and determined to "have educational uses" using OFWAM, and such use by a school or organization is documented for that site.</p> | <p>No – Wetland G is privately owned and was not determined to have educational uses using OFWAM (Table 3).</p> |

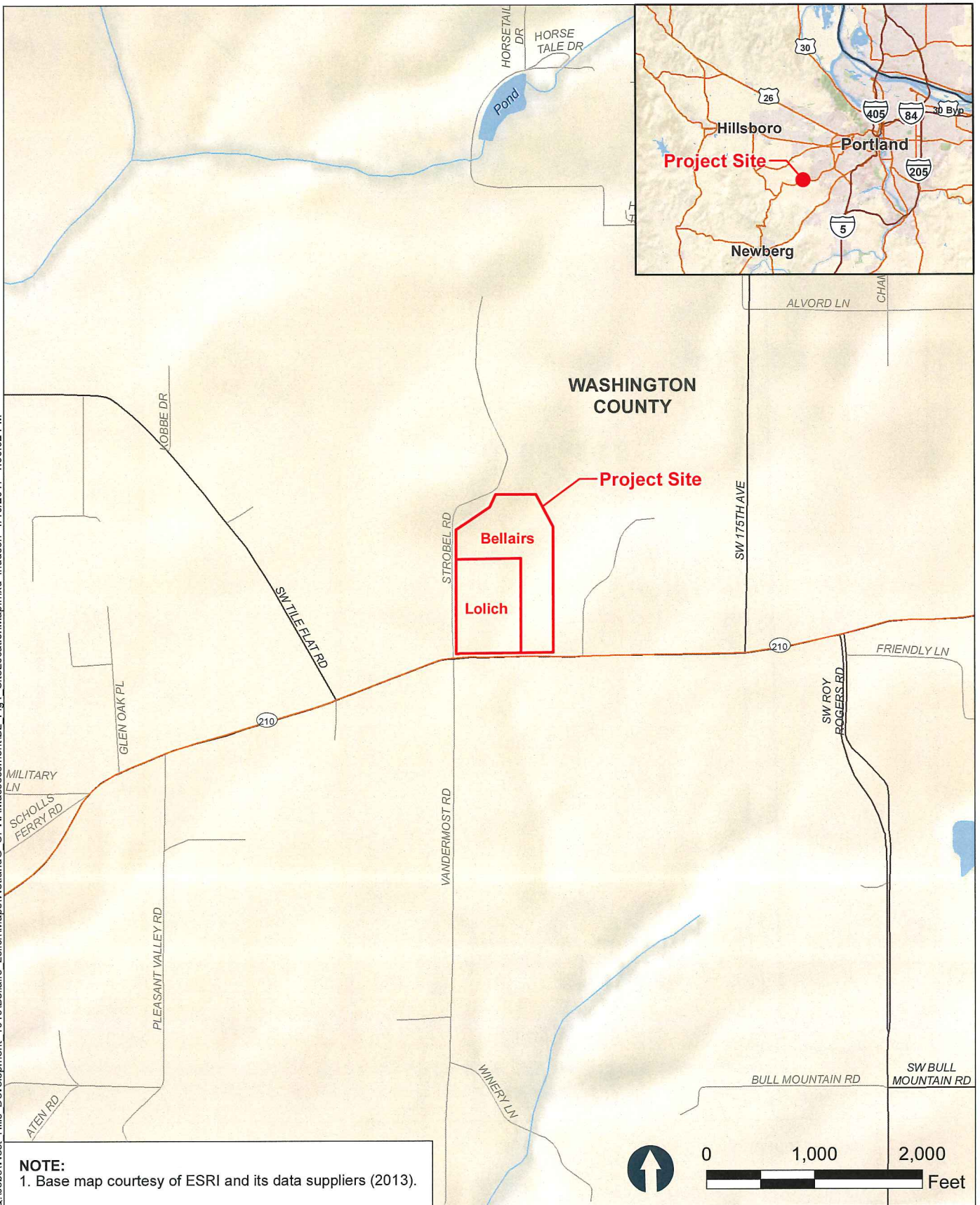
References

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- Anchor QEA, LLC, 2017. *Wetland Delineation Report: The Ridge at South Cooper Mountain (Bellairs and Lolich Properties)*. Prepared for West Hills Land Development. January 2017.
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- DEA (David Evans and Associates, Inc.), 2016. *South Cooper Mountain Annexation Area: Local Wetland Inventory*. Prepared for City of Beaverton. February 2016.
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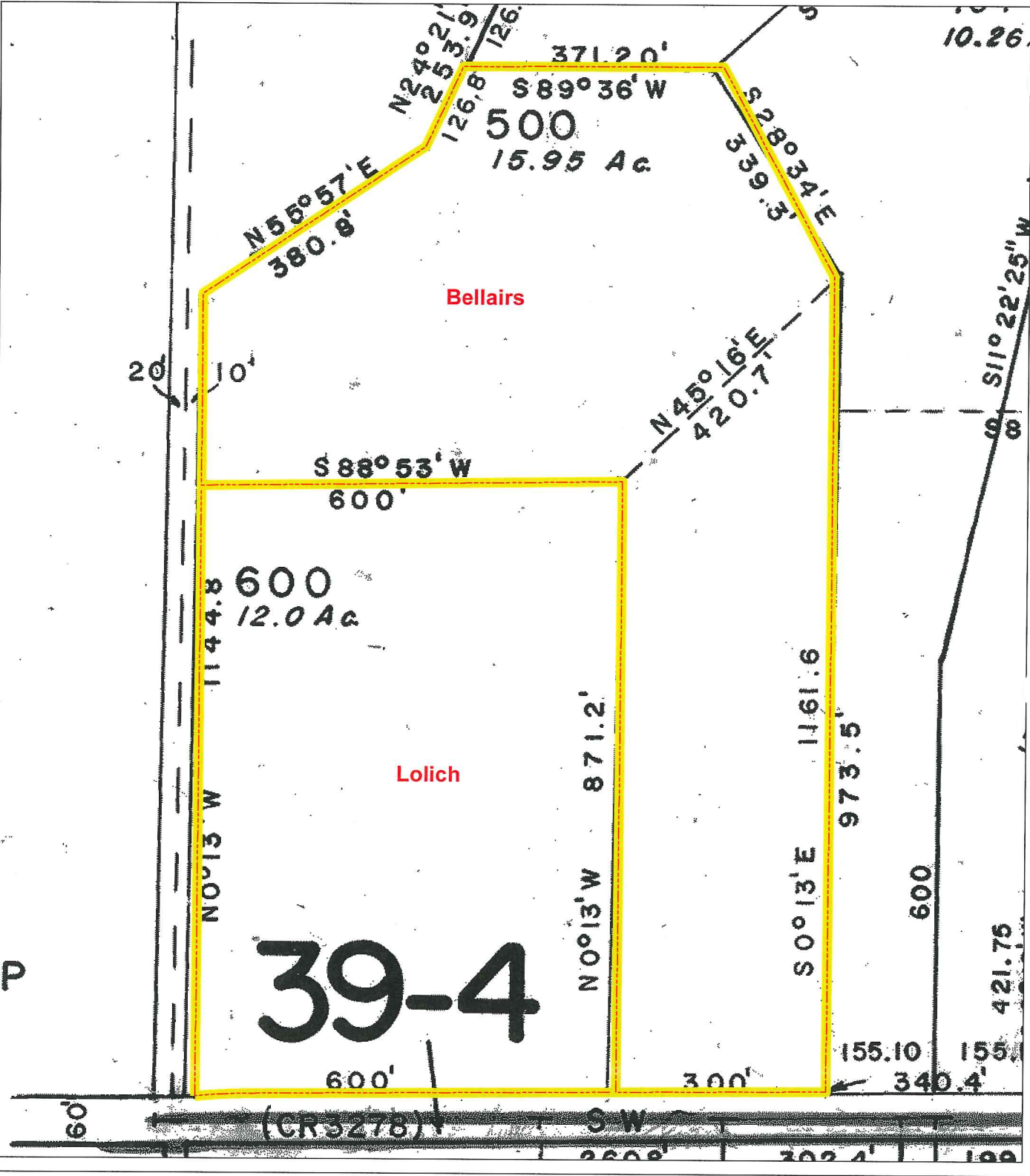
U.S. Army Corps of Engineers, 2010. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region (Version 2.0)*, edited by J.S. Wakeley, R.W. Lichvar, and C.V. Noble. ERDC/EL TR-10-3. Final Report. U.S. Army Engineer Research and Development Center. May 2010.

Figures

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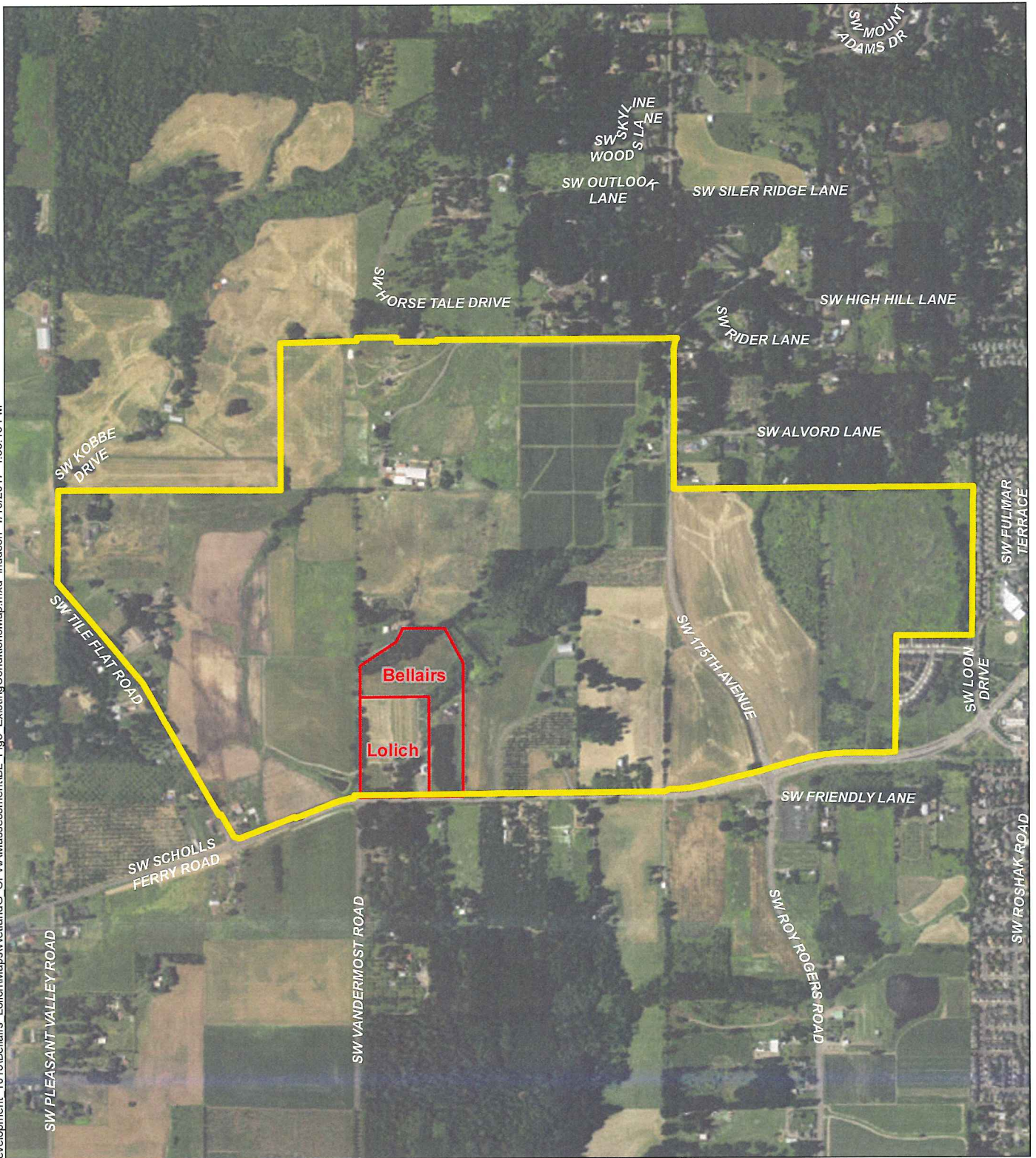
Tax Lot Boundary

NOTE:
1. Tax lot map acquired from Washington County.



Figure 2
Tax Lot Map
Wetland G OFWAM Assessment
West Hills Land Development: The Ridge at South Cooper Mountain

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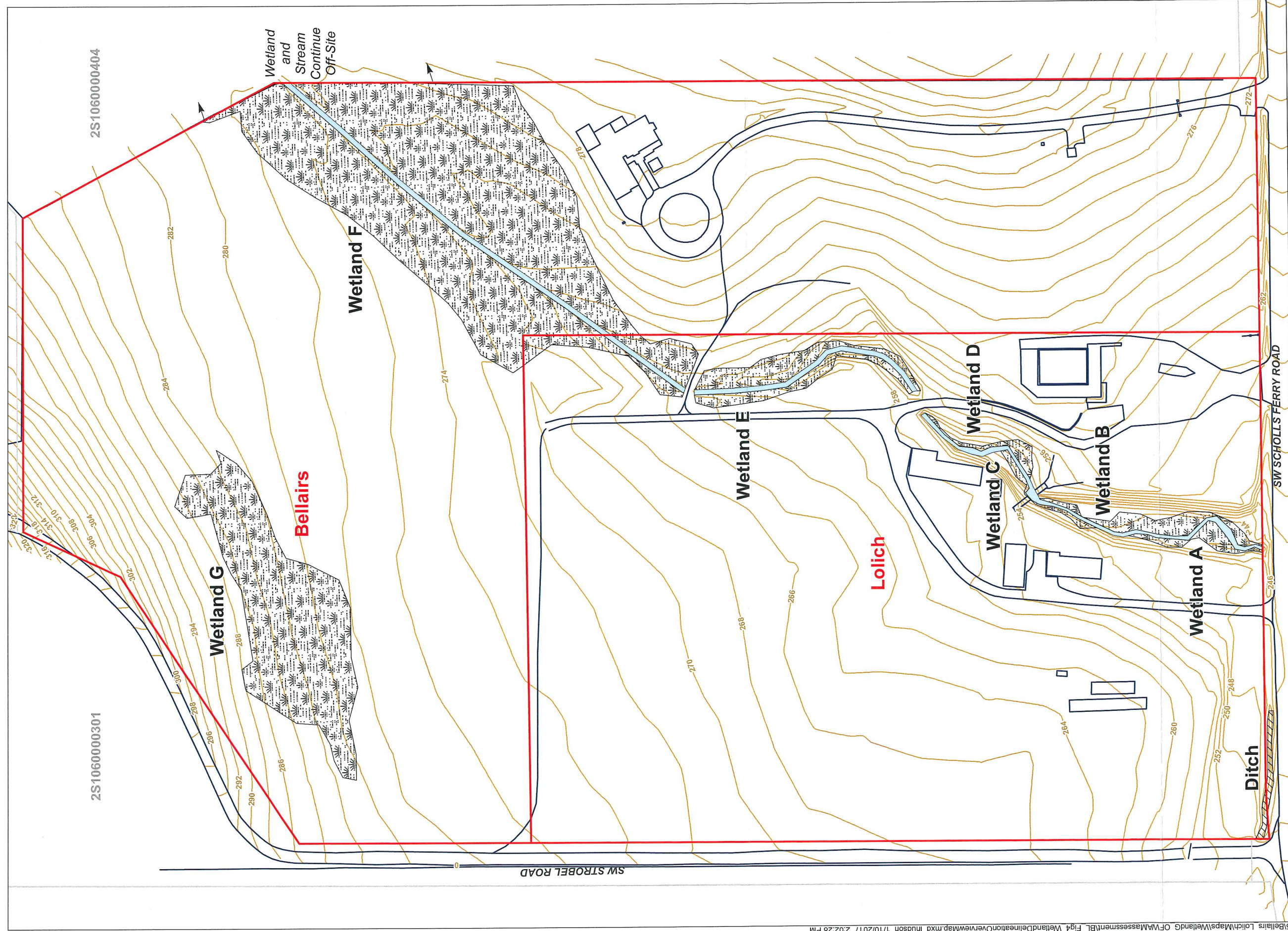


Project Area Boundary
 South Cooper Mountain Community Boundary

NOTE:

1. Aerial imagery acquired from Google Earth (2016).





- Project Site Boundary
- Tax Lot Boundary
- Stream
- Ditch
- Delineated Wetland
- Existing Features (as surveyed by Otak)
- 2-foot Contour

NOTES:
 1. Wetland boundaries and stream flagged and field surveyed by Otak, Inc., to 0.1-foot accuracy.
 2. Tax lot boundaries provided by Washington County, Oregon.
 3. The OHWL of the stream within Wetlands A through E was flagged and surveyed by Otak; the maximum width of the OHWL is 10 feet.
 4. Within Wetlands F and G, the channel was mapped using 2-foot contour data and the OHWL was surveyed in using a Trimble GPS unit; the maximum width of the OHWL is 6 feet.



Figure 4
 Wetland Delineation Map
 Wetland G OFWAM Assessment
 West Hills Land Development: The Ridge at South Cooper Mountain

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Attachment 1











South Cooper Mountain Annexation Area
Local Wetland Inventory Maps

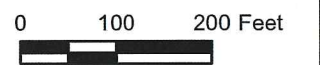
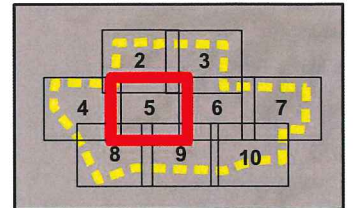
**Figure 5, Sheet 5
Local Wetland Inventory Map**

**City of Beaverton
South Cooper Mountain
Annexation Area**

LOCAL WETLAND INVENTORY

Legend

-  LWI Study Area
 -  Washington County Tax Lot
 -  Section
 -  Street
 -  CWS Small Streamsheds Boundary
 -  Data Plot
 -  LWI Stream
 - Wetlands***
 -  Emergent (PEM)
 -  Forested (PFO)
 -  Pond/Open Water (PUB)
- * W = Wetlands
PW = Probable Wetlands



Data Sources:
 LWI Study Area: Metro RLIS, 2012. Modified by DEA.
 PLSS, City Limits, Streets: Metro RLIS, 2012
 Wetlands, Streamsheds: AKS Engineering, Anchor QEA, DEA, PHS 2015. Also City of Beaverton, Metro RLIS, 2012. Modified by DEA.
 Data Plots: DEA, 2015.
 Streams: Metro RLIS, 2012 and USGS NHD, 2015. Modified by DEA.

Disclaimer: Information shown on this map is for planning purposes, represents the conditions that exist at the map date, and is subject to change. The location and extent of wetlands and other waters is approximate. There may be unmapped wetlands and other waters present that are subject to regulation. A current Oregon Department of State Lands-approved wetland delineation is required for state removal-fill permits. You are advised to contact the Department of State Lands and the U.S. Army Corps of Engineers with any regulatory questions.



North

Information Current as of:
August 2015

Printed on and Corrections as of:
August 31, 2015

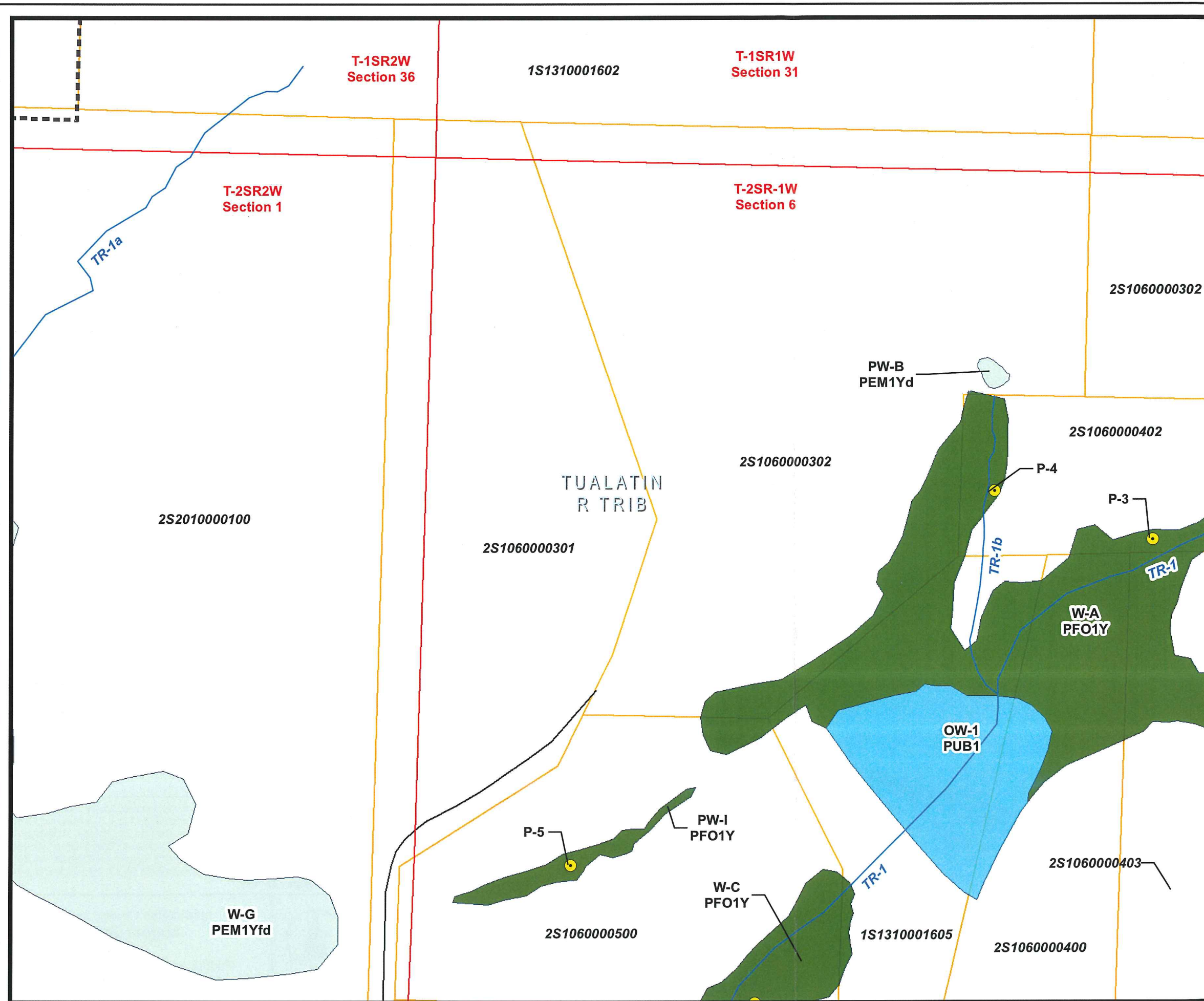













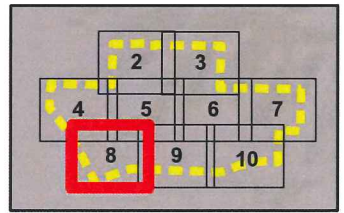
Figure 5, Sheet 8
Local Wetland Inventory Map

City of Beaverton
South Cooper Mountain
Annexation Area

LOCAL WETLAND INVENTORY

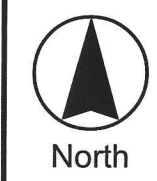
Legend

-  LWI Study Area
 -  Washington County Tax Lot
 -  Section
 -  Street
 -  CWS Small Streamsheds Boundary
 -  Data Plot
 -  LWI Stream
 -  NHD Stream
 -  Emergent (PEM)
 -  Forested (PFO)
 -  Pond/Open Water (PUB)
- * W = Wetlands
 PW = Probable Wetlands

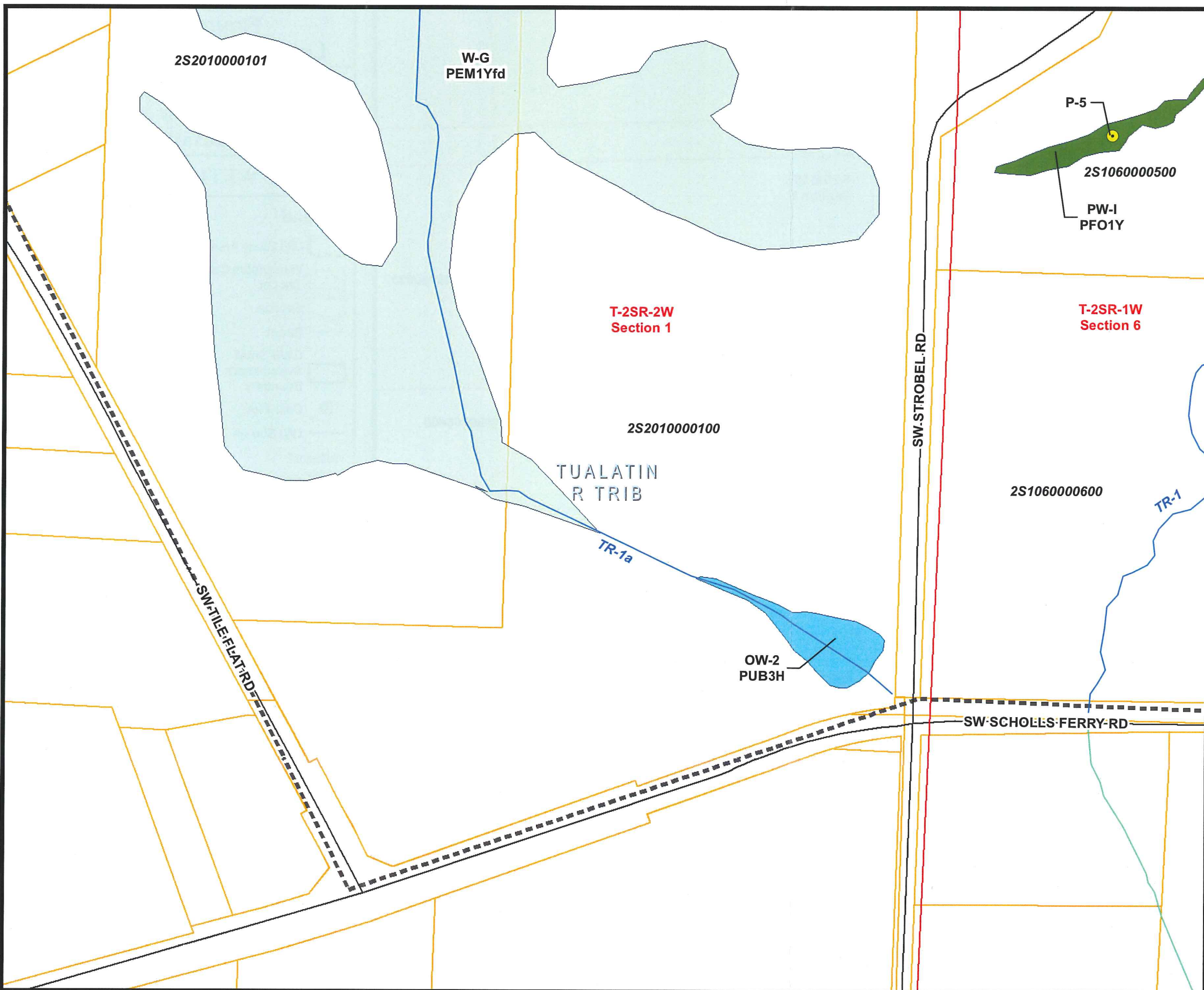


Data Sources:
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 Wetlands, Streamsheds: AKS Engineering, Anchor QEA, DEA, PHS 2015. Also City of Beaverton, Metro RLIS, 2012. Modified by DEA.
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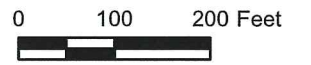
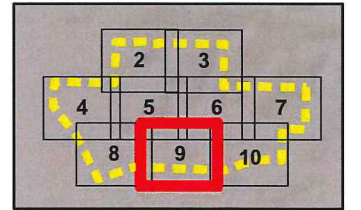
**Figure 5, Sheet 9
Local Wetland Inventory Map**

**City of Beaverton
South Cooper Mountain
Annexation Area**

LOCAL WETLAND INVENTORY

Legend

-  LWI Study Area
 -  Washington County Tax Lot
 -  Section
 -  Street
 -  CWS Small Streamsheds Boundary
 -  Data Plot
 -  LWI Stream
 -  NHD Stream
 - Wetlands***
 -  Emergent (PEM)
 -  Forested (PFO)
 -  Pond/Open Water (PUB)
- * W = Wetlands
PW = Probable Wetlands



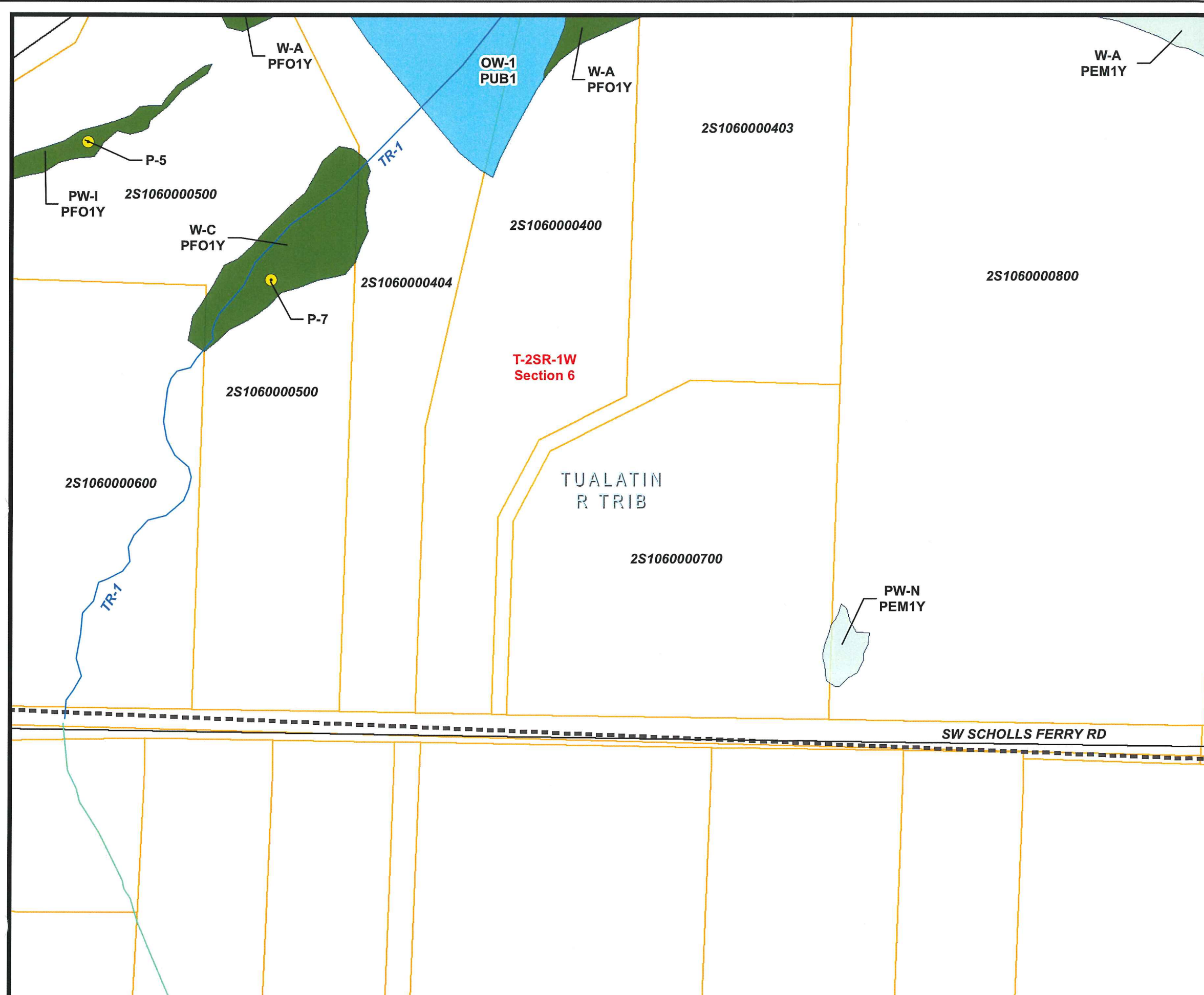
Data Sources:
 LWI Study Area: Metro RLIS, 2012. Modified by DEA.
 PLSS, City Limits, Streets: Metro RLIS, 2012
 Wetlands, Streamsheds: AKS Engineering, Anchor QEA, DEA, PHS 2015. Also City of Beaverton, Metro RLIS, 2012. Modified by DEA.
 Data Plots: DEA, 2015.
 Streams: Metro RLIS, 2012 and USGS NHD, 2015. Modified by DEA.

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Information Current as of:
August 2015

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Attachment 2
South Cooper Mountain Annexation Area
Local Wetland Inventory Watershed
Summary Sheet

Watershed summary sheet for the Oregon Method

Watershed or community identification: Lower Willamette Drainage Basin

| Characteristic | Description |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>Physical characteristics of the watershed</p> | <p>Gentle to fairly steep slope south facing watershed. Drains to Tualatin River or tributaries of the Tualatin River. Drainages are typically headwater drainages, with much of the stream length likely only flowing intermittently, drying out in the late summer. Small irrigation dams/water control structures occur on two of the drainages.</p> <p>The watershed draining to the LWI study area covers an area of approximately 770 acres. The average slope of the watershed is approximately 7 percent, with lower gradient slopes occurring in the southern/lower portion and steeper slopes occurring in the northern/upper portion. All streams in the watershed have been modified to varying degrees. For the most part, water is not being taken out of the streams through diking, drainage or irrigation districts in the watershed upstream of the assessment area.</p> |
| <p>Land uses within the watershed</p> | <p>The dominant land use in the watershed upstream from the assessment area is agriculture; however, forested areas and rural residential dwellings are also prevalent. The area within the assessment area is clearly dominated by agricultural land uses, including a mix of annual crops, pasture, orchards, and viticulture.</p> |
| <p>Water quality</p> | <p>No streams within the study area are listed as water quality limited according to DEQ 303(d) databases. A recent Oregon Statewide Assessment of Nonpoint Sources of Water Pollution was not available. It is assumed that project stream reaches would be classified as "no data available" since they are intermittent headwater streams. However, riparian areas are lacking substantial native vegetation, especially trees and shrubs, along most streams reaches. This results in a lack of stream shading and affective water quality buffers to capture sediment from agricultural fields. These factors likely lead to reduced water quality.</p> |
| <p>Biological characteristics of the watershed</p> | <p>Assessment area streams are intermittent streams and contain fish passage barriers at the downstream end of the assessment area. They drain to stream reaches that support an anadromous fishery.</p> <p>Native plant communities have largely been replaced by agricultural lands. Therefore sensitive wildlife species are presumed absent. Wildlife that persist or thrive in agricultural settings, such as deer, coyote, raccoon, etc. are present within the watershed. High quality native habitat exists to the north of the watershed within Cooper Mountain Nature Park and are generally accessible to wildlife that may occur within the LWI study area.</p> |
| <p align="center">Narrative summary of watershed description</p> | |
| <p>The project study area primarily consists of rural lands that are bordered to the east by suburban development and to the north, south, and west by rural land. Slopes range from gently rolling in the south half to moderately steep in the north half of the study area. The majority of the land drains to the south, with a portion of the area draining to the southeast. Land use is predominantly agricultural, with a mix of annual crop production, pasture, orchards, and viticulture. Several small remnant patches of native forest habitat occur within the area, including mixed upland fir-deciduous forest, Oregon ash dominated wetland forest, and patches of Oregon oak forest. Several fir dominated lots were being logged or had recently been logged as observed during the March 2013 site visits.</p> | |

Attachment 3

Wetland Characterization Data Form for Wetland G

Wetland Characterization

The Wetland Characterization is designed for information collection in a systematic manner. The Characterization is divided into a landscape section, for which all the information can be gathered in the office with appropriate maps and references (and maybe a few phone calls), and a site-specific section, which requires field observation and measurement. (*Questions that must be answered in the field are marked with a check.*) You may want to record the observation, not just the letter answer, when given the choice, because you might find the descriptive information useful later. Also, take some blank sheets of paper into the field for making sketches of the wetland area that you can refer to later. Another alternative is to put an overlay on an aerial photo and sketch and note information on the overlay. If done thoroughly, this should prevent you from having to return to the field or having to seek additional information when completing the assessment.

The information gathered is used to answer function and condition assessment questions (copies of these questions appear directly following the Characterization). The Characterization should not lead you to any conclusions; this will be done as the assessment sheets are completed.

What you need to take with you into the field:

- Clipboard
- Pencils (various colors for sketching)
- Blank paper to sketch on
- Long tape measure (200 feet if you have one), or measure your pace before going into the field
- Aerial photos (you may want to attach a mylar overlay to draw on)
- Ruler
- Base maps (optional or make copies)
- Binoculars (optional)

Watershed Notes

Watershed setting

All questions pertaining to the watershed can be answered in the office from aerial photographs, U.S. Geological Service topographical maps, and other reference materials. (See Appendix A.) The answers to these questions are used to give decision makers a broader understanding of ecological functions and land uses in the watershed. The answers are summarized on the Watershed Summary Sheet at the end of the Assessment Questions section.

Drainage basin

The Oregon Water Resources Department has divided the state into 18 drainage basins. Check the map in Appendix H to see which drainage basin contains the study site.

1. What is the name of the drainage basin that contains your assessment area?

Physical characteristics of the watershed being assessed (within the drainage basin)

Topography

2. What is the watershed's area in square miles? The watershed area is often much smaller than the drainage basin (see Appendix E).
3. Calculate the average slope of the watershed (see Appendix F).

Hydrologic profile

4. Is the stream flow in the watershed modified by dams, channelization or levees? (Choose all that are appropriate.)
 - a. Tributary streams to the main stem stream are modified.
 - b. Main stem stream is modified.
 - c. Stream flow is not modified (free-flowing.)
5. Is water being taken out of the stream(s) through active diking, drainage or irrigation districts in the watershed upstream of the assessment area?
 - a. Yes.
 - b. No.

Watershed Notes

LOWER WILLAMETTE

WETLAND G IS IN THE
ROCK CREEK-TUALATI RIVER
WATERSHED (HUC 1709001005)

WATERSHED FOR WETLAND H
IS SMALL ~ 3.4 AC.
~ 0.005 SQ MILES

→ AVG. SLOPE ~ 17%

→ NO STREAM FLOW IN
WETLAND H WATERSHED

→ NO STREAM FLOW IN
WETLAND H WATERSHED

Land uses within the watershed

6. What is the dominant land use in the watershed upstream from the assessment area?
- Urban.
 - Urbanizing (mix of urban, agriculture and forest uses).
 - Agriculture (farming, ranching or grazing).
 - Forested or natural area.

Water quality (Use more specific water quality information, if available. Contact local DEQ office, or call the DEQ lab at (503) 229-5983 for sampling information.)

7. Consult the most recent State of Oregon Department of Environmental Quality 305(b) Report to determine whether any streams in the study area are listed as a *water quality limited*. (You may want to ask DEQ whether there are any proposed changes.) This information is included in Clean Water Act section 303(d) reporting.
- Streams or portions of streams within the study area are listed as *water quality limited*.
 - No streams or portions of streams within the study area are listed as *water quality limited*.
8. Consult the most recent *Oregon Statewide Assessment of Nonpoint Sources of Water Pollution* to determine the water quality condition of stream reaches in the watershed upstream from the assessment area. (If both "b" and "c" apply, choose "c.")
- All upstream reaches are listed as *no problem* (or no data available).
 - One or more upstream reaches are listed in *moderate* water quality condition.
 - One or more upstream reaches are listed in *severe* water quality condition.

Watershed Notes

NO DATA

Biological characteristics of the watershed

Watershed Notes

9. Fisheries: Select all that are appropriate and list type if known. (Contact local Oregon Department of Fish and Wildlife office for this information.)

Type

- a. Cold water.
- b. Warm water.
- c. Anadromous.
- d. Wild population.
- e. Introduced or hatchery populations.
- f. None.
- g. Other (list).

10. Are known sensitive, threatened or endangered fish species present in the watershed? If so, list which species.

Species

- a. Yes.
- b. No.
- c. Unknown.

11. Wildlife species: Select all that are appropriate and list species if known. (Contact local Oregon Department of Fish and Wildlife office for this information.)

Species

- a. Migratory birds.
- b. Big game.
- c. Nesting birds.

12. Are known sensitive, threatened or endangered plant species or wildlife species other than fish present in the watershed? If so, list which species. (Contact local ODFW office or Natural Heritage Council for this information.)

Species

- a. Yes.
- b. No.
- c. Unknown.

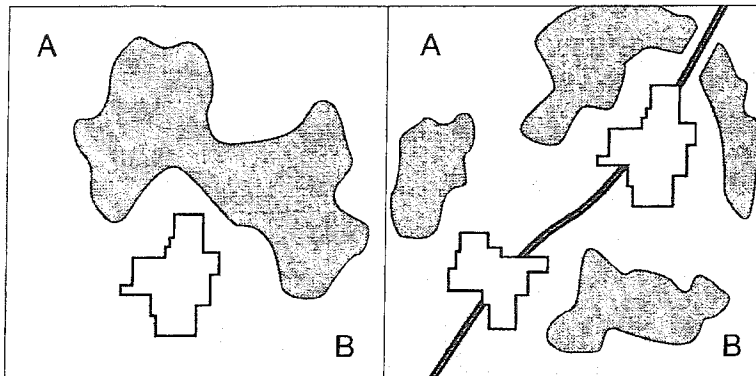


Figure 1. Watersheds as corridors for wildlife movement.

Areas A and B are the end points of a movement corridor through the watershed. Natural areas are shaded darkly, the irregular polygons represent highly developed areas, and the thick black line represents an impassable barrier such as an interstate highway. In the first part of the illustration, the contiguous natural area connects both ends of the corridor. The developed area is a barrier, but it does not obstruct species movement. The second half of the illustration shows fragmented natural areas with an impassable barrier. If the barrier stopped at the smaller developed area and did not continue off the lower left, species movement would still be possible.

13. Does the watershed provide a natural corridor for fish or wildlife movement? (Observe from aerial photographs.) **List whether for fish, wildlife or both.** Consider fences, dams and other barriers to travel. Aerial photographs of the watershed area are the best source of information. Fragmented systems have barriers to movement or a section where the natural area is broken by developed area.

A corridor is a landscape feature that enables fish or wildlife species to travel between broad geographical areas. (See Figure 1.)

- There are contiguous natural areas that allow species movement, and if barriers exist, they do not stop animal or fish movement.
 - The natural areas are fragmented, but species movement is still possible.
 - The habitat system is fragmented, and there are barriers to species movement.
14. What are the landscape features at both ends of the movement corridor? (These may lie outside the assessment area.) From an aerial photo, observation or local knowledge, determine whether there are large natural areas at either end of the movement corridor. The natural area does not have to be a wetland.
- Large natural habitat areas are at both ends.
 - One end has a natural habitat area and the other end is developed.
 - Both ends are developed.

Watershed Notes

WETLAND G HAS STEEP SLOPE,
ROAD, AND FENCE TO NORTH,
ROAD AND AG. FIELDS TO SW,
AG. FIELDS TO SOUTH. IS A
WOODED CORRIDOR CONNECTING
TO OFF-SITE WETLAND TO EAST
BUT A FENCE IS PRESENT.

FRAGMENTED CORRIDOR
FOR WILDLIFE ONLY

AG. FIELD TO ONE SIDE
(SW), LARGER NATURAL
HABITAT TO OTHER (NE)

H

Wetland 1 Wetland 2 Wetland 3

Individual wetland sites

Fill out this part of the characterization for each wetland in the assessment area. Some of the information can be gathered in the office; some must be gathered at the site. You may want to do a rough sketch of the site (doesn't have to be to scale) to refer to back in the office.

Wetland structure and relation to surrounding landscape

✓15. What percentage of the area within 500 feet of the wetland's edge is dedicated to the land uses listed below? (From overlay 2 or in the field.)

It is best to determine the land uses from a recent aerial photo. If an aerial photo is not available, measure 500 feet in the field to get an idea of distance to evaluate. Use the following ranges for your answers for each land-use category:

- a. Less than 20%.
- b. Between 20% and 50%.
- c. Greater than 50%.
- 1. Open Space (includes natural areas, parks and developed recreation areas, but not land designated for Exclusive Forest Use).
- 2. Agriculture (pasture, cropped lands, orchards, range land).
- 3. Exclusive Forest Use lands.
- 4. Developed uses (residential, commercial or industrial—rural and urban).
- 5. Other (list).

✓16. What is the dominant existing land use within 500 feet of the wetland on the **downstream or down-slope edge** of the wetland? Use the same land-use categories as question 15.

17. What is the wetland's area in acres? (Measure the entire area of contiguous wetland, not just the portion within the assessment area. Use the dimensions of the wetland as outlined on the base map.)

- a. Greater than 5 acres.
- ⓑ Between 0.5 acres and 5 acres.
- c. Less than 0.5 acres.

0.76 AC

| Wetland 1 | Wetland 2 | Wetland 3 |
|-----------|-----------|-----------|
| 1-a. | | |
| 2-C. | | |
| 4-a. | | |
| 1-a | | |
| 2-C | | |
| 4-a. | | |

✓ Questions preceded by a check mark can be completed in the field.

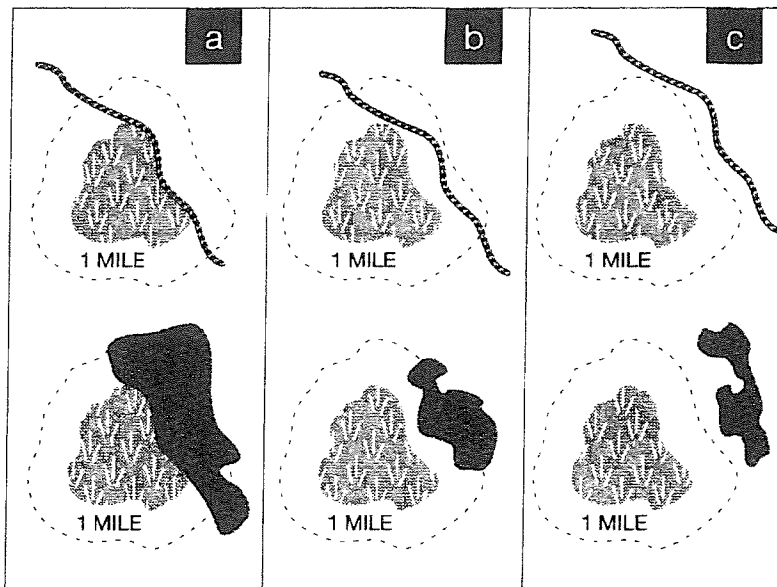


Figure 2. Connectivity to streams, lakes and ponds.
 The lightly shaded area represents a wetland, the darkly shaded area represents a lake or pond and the dark line represents a stream. Part "a" shows the wetland connected to a stream, lake or pond, part "b" shows a stream, lake or pond within 1 mile but no surface connection, and part "c" shows no stream, lake or pond within 1 mile and no surface connection.

Wetland 1 Wetland 2 Wetland 3

18. How is the wetland connected to another body of water, such as a stream, lake or pond? (See Figure 2.)
- a. The wetland is connected by surface water to another body of water. This may be by a culvert, irrigation ditch, intermittent stream or perennial stream.
 - b. No surface-water connection exists to another body of water, but other bodies of water lie within 1 mile of the wetland.
 - c. No surface-water connection exists to another body of water, and no other bodies of water lie within 1 mile of the wetland.
19. Is all or part of the wetland located within the 100-year floodplain (use floodplain maps to determine) or within an enclosed basin? An enclosed basin has no inlet or outlet.
- a. Yes.
 - b. No.

| Wetland 1 | Wetland 2 | Wetland 3 |
|-----------|-----------|-----------|
| | | |

20. What percentage of the area within 500 feet of the wetland's edge is **zoned** for each of the land uses listed below?

Use the following ranges for your answers:

- a. Less than 20%
 - b. Between 20% and 50%
 - c. Greater than 50%.
1. Open Space (includes natural areas, parks and developed recreation areas, but not lands zoned for Exclusive Forest Use). *b.*
 2. Agriculture (pasture, cropped lands, orchards, range land). *a.*
 3. Exclusive Forest Use lands. *a.*
 4. Developed uses (residential, commercial, industrial). *c.*
 5. Other (list). *a.*

Wetland habitat

✓21. What percentage of the wetland's area is covered by the following Cowardin wetland classes? (Cowardin wetland classes refer to a classification of wetland type by vegetation cover. See Appendix D.) Only list those that compose 10% or more of the overall wetland.

The percentages can be estimated in the field or from aerial photographs. Use the following categories for your answers:

- a. Between 70% and 100%.
 - b. 50% or more, but less than 70%.
 - c. 20% or more, but less than 50%.
 - d. 10% or more, but less than 20%.
1. Open water (deep water habitat, greater than or equal to 6.6 feet or 2 meters).
 2. Emergent (includes floating aquatics—herbaceous plants that can tolerate flooding and living in wet soils).
 3. Scrub-shrub (woody vegetation under 20 feet tall).
 4. Forested (woody vegetation 20 feet or taller).

✓22. For urban areas, how many wetland plant species are present? (You need not list the species name.)

- a. More than 5 plant species.
- b. Between 2 and 5 plant species. *NOT URBAN*
- c. 1 plant species (monotypic).

✓23. What is the dominant wetland vegetation cover type?

- a. Woody vegetation (forested and scrub-shrub).
- b. Emergent vegetation and ponding, or open water only.
- c. Emergent vegetation only or wet meadow.

| | Wetland 1 | Wetland 2 | Wetland 3 |
|------------------------------------------------------------------------------------------------------------------------|--------------------------------------|-----------|-----------|
| 20. What percentage of the area within 500 feet of the wetland's edge is zoned for each of the land uses listed below? | | | |
| 21. What percentage of the wetland's area is covered by the following Cowardin wetland classes? | 1 - N/A 2 - C 3 - N/A 4 - b | | |
| 22. For urban areas, how many wetland plant species are present? | - | | |
| 23. What is the dominant wetland vegetation cover type? | | | |

✓24. Refer to the diagrams in Figure 3 and select the one that most closely resembles the interspersions of Cowardin wetland classes and, if present, upland inclusions. (An upland inclusion is an island or an upland area surrounded on three sides by wetland.)

Wetlands composed of only one wetland class or with two wetland classes and a simple pattern have low interspersions. Wetland and upland complexes that have at least two wetland classes and a complex pattern have a moderate interspersions pattern. Wetlands with two or more wetland classes or upland inclusions with a complex pattern and lots of edge have a high interspersions pattern. If the wetland you are observing does not reflect any of the diagrams, use the above guidance to determine the complexity of the interspersions pattern and draw a sketch of the wetland.

- a. High.
- b. Moderate.
- c. Low.

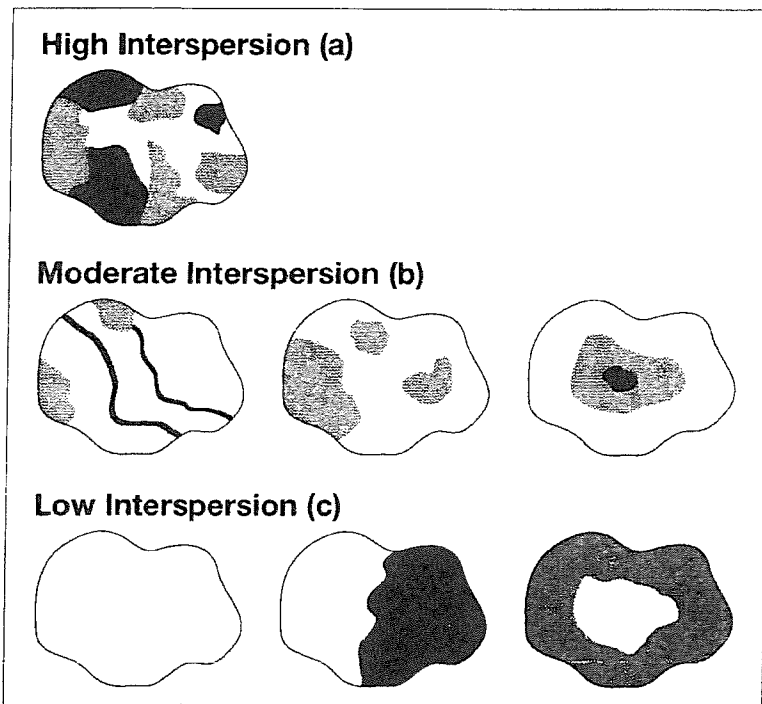


Figure 3. Interspersion of Cowardin classes and upland inclusions.

| Wetland 1 | Wetland 2 | Wetland 3 |
|-----------|-----------|-----------|
| | | |

| | Wetland 1 | Wetland 2 | Wetland 3 |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------|-----------|-----------|
| <p>✓25. For rural areas: What percentage of the wetland's edge is bordered by upland wildlife habitat that is at least 150 feet wide? Brush, woodland, non-farmed agricultural land and range land are considered upland habitat for this question. Actively farmed lands are not considered wildlife habitat. (See Figure 4.)</p> <p>a. Greater than 40%. <i>ONLY NE END OF WETLAND</i></p> <p>b. Between 10% and 40%.</p> <p>c. <input checked="" type="radio"/> Less than 10%.</p> | | | |
| <p>✓26. For urban areas: What percentage of the wetland's edge is bordered by a vegetative buffer at least 25 feet wide? A vegetative buffer consists of trees, bushes or vegetation that is not regularly mowed or farmed. (See Figure 5.)</p> <p>a. Greater than 40%.</p> <p>b. Between 10% and 40%. <i>N/A</i></p> <p>c. Less than 10%.</p> | | | |
| <p>27. How is the wetland connected to other wetlands? (Look at an aerial photo or map to determine this.)</p> <p>a. Connected to other wetlands within a 3-mile radius by a perennial or intermittent stream, irrigation or drainage ditch, culvert, canal or lake.</p> <p>b. <input checked="" type="radio"/> Not connected by surface waters, but other unconnected wetlands lie within a 3-mile radius.</p> <p>c. Not connected to other wetlands by surface waters, and no other unconnected wetlands lie within a 3-mile radius.</p> | | | |
| <p>28. Estimate the area of unvegetated, open water within the wetland.</p> <p>a. More than 3 acres.</p> <p>b. Greater than 1 acre, up to 3 acres. <i>THERE IS NONE</i></p> <p>c. Between 0.5 acre and 1 acre.</p> <p>d. Less than 0.5 acre.</p> | | | |

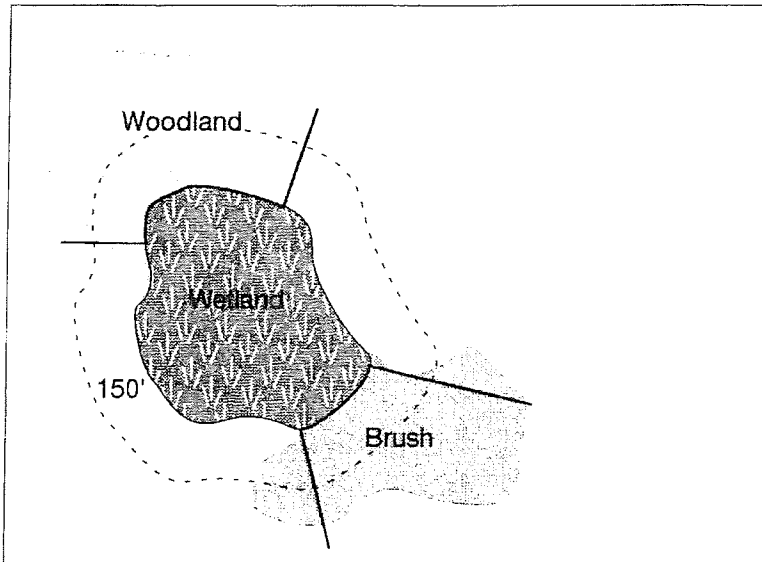


Figure 4. Percent of wetland edge bordered by upland habitat (for Question 25).

The dashed line delineates the area within 150 feet of the wetland; the "woodland" and "brush" areas are upland habitat; and the lines perpendicular to the wetland edge indicate where the upland habitat adjacent to the wetland habitat is at least 150 feet wide. The dark lines (portions of the wetland bordered by upland habitat at least 150 feet wide) make up roughly one-third (between 10% and 40%) of the wetland perimeter.

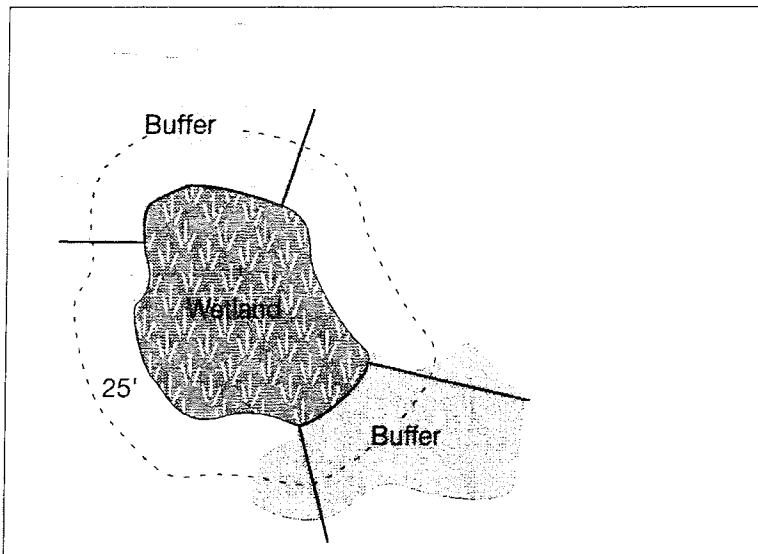


Figure 5. Percent of wetland edge bordered by vegetative buffer (for Question 26).

The dashed line delineates the area within 25 feet of the wetland; the vegetative buffer areas are labeled "buffer"; and the lines perpendicular to the wetland edge indicate where the vegetative buffer adjacent to the wetland habitat is at least 25 feet wide. The dark lines (portions of the wetland bordered by a vegetative buffer at least 25 feet wide) make up roughly one-third (between 10% and 40%) of the wetland perimeter.

| | Wetland 1 | Wetland 2 | Wetland 3 |
|--|-----------|-----------|-----------|
| | | | |

Fisheries habitat

- 29. Are fish present in a stream, lake or pond connected to the wetland.
 - a. Salmon, trout or sensitive species are present at some time during the year.
 - b. Species not covered in "a" are present at some time during the year.
 - c. No species are present at any time during the year.

Streams connected to the wetland - N/A

Complete this section only if the wetland being assessed has an unimpeded surface water connection to a stream.

- ✓30. What is the physical character of the stream channel? To observe stream channel modifications, look for built rock banks, cement sides, straightened areas or other human-created features.
 - a. The stream is in a natural channel, or modified portions of the stream are returning to a natural channel.
 - b. Only portions of the stream are modified.
 - c. The stream is extensively modified or confined in a non-vegetated channel or pipe.
- ✓31. What percentage of the stream is shaded by streamside (riparian) vegetation?
 - a. Greater than 75%.
 - b. Between 50 and 75%.
 - c. 25% or more, but less than 50%.
 - d. Less than 25%.
- ✓32. What percentage of the stream contains instream structures such as large woody debris, floating or submerged vegetation, large rocks or boulders?
 - a. Greater than 25%.
 - b. Between 10% and 25%.
 - c. Less than 10%.

Lakes or ponds (entire lake or pond and wetland complex) - N/A

Complete this section only if the wetland being assessed has a surface water connection to a lake or pond.

- 33. Does the lake or pond contain areas of deep and shallow water? ("Deep" is defined as more than 6.5 feet deep.)
 - a. Yes.
 - b. Cannot be determined.
 - c. No.

| Wetland 1 | Wetland 2 | Wetland 3 |
|-----------|-----------|-----------|
| | | |

- ✓34. What percentage of the shoreline is shaded at the water's edge by forested or scrub-shrub vegetation?
 - a. 60% or more.
 - b. 20% or more, but less than 60%.
 - c. Less than 20%.
- ✓35. What percentage of the wetland complex contains cover objects such as submerged logs, floating or submerged vegetation, large rocks or boulders?
 - a. Greater than 25%
 - b. Between 10 and 25%
 - c. Less than 10%

Wetland hydrology

- 36. What is the wetland's **primary** source of water? (Determine in the field or in the office. This may be difficult to determine. If a surface water connection exists—stream, lake, ditch—use it as the primary source. If no surface water connection is present, talk to local natural resource people for hints.)
 - a. Surface flow, including streams and ditches.
 - b. Precipitation or sheet flow.
 - c. Groundwater, including springs or seeps. - SEASONAL HIGH WATER TABLE
- ✓37. Is there evidence of flooding or ponding during a portion of the growing season? Look for evidence of water fluctuation such as sediment stains on trees, drift lines, surface scour or sediment deposits. Also look at the location of the wetland. Is it in a distinct topographic depression or adjacent to a stream that is known to flood or fluctuate because of storm pulses?
 - a. Yes (describe).
 - b. Unable to determine or not applicable.
 - c. No.
- ✓38. Is water flow out of the wetland restricted (e.g., beaver dam, concrete structure, undersized culvert)?
 - a. Yes, the outlet is restricted or the wetland has no outlet.
 - b. Minor restrictions slow down the water (e.g., undersized culvert).
 - c. No, the outlet has unrestricted flow.

| Wetland 1 | Wetland 2 | Wetland 3 |
|-----------|-----------|-----------|
| | | |

PRIMARY SOURCE OF WATER IS NOT SURFACE (I.E., STREAM) FLOW AND THERE ARE NO SURFACE WATER CONNECTIONS TO OTHER WATERBODIES SO OPPORTUNITIES TO RECONNECT FLOW

- ✓39. If the primary source of water is surface flow, is the water flow into the wetland restricted?
- a. Flow is not restricted, or if blocked, the obstruction can be removed easily.
 - b. Permanent blockage to the flow exists but may be breached or a new flow channel created (engineering or earth moving solution).
 - c. Flow is restricted and cannot be restored.
40. Has the stream flow or stream bank been modified by human activities less than 1 mile above the wetland? Modifications include dams, channelizations and levees, and confinement of the stream in a pipe.
- a. Yes.
 - b. No. — NO SUCH MODS ABOVE THE WETLAND

Public access to wetland site (select an appropriate area to observe the wetland to answer these questions.)

41. Is the wetland site open to the public for direct access or observation?
- a. Yes, the wetland is open to the public.
 - b. Yes, but wetland access is allowed only by permission of the landowner or managing entity.
 - c. No, access is not allowed.
- ✓42. Are there visible hazards to the public at the wetland site? (Examples: busy road adjacent to the site, and no buffer or sidewalk exists; steep embankment; and contaminated water.)
- a. No.
 - b. One or two visible safety hazards exist (describe).
 - c. More than two visible safety hazards exist (describe).
- ✓43. Are there other natural landscape features, such as a stream, lake, pond, forest or agricultural land contiguous or adjacent to the wetland?
- a. Yes. (List type and extent.)
 - b. No.

AG. LAND
FOREST LAND

| Wetland 1 | Wetland 2 | Wetland 3 |
|-----------|-----------|-----------|
| | | |

WE WERE DETERMINE TO BE RESTRICTED

- ✓44. Is there existing physical public access to features listed in Question 43? If not, can such access be created easily, or can other habitats be observed from the site? For a stream, pond or lake, access may require dry ground to the water's edge. Stream access could also be at a road crossing, but consider the safety at such locations
 - a. Public access to other habitats exists or can be created easily.
 - b. Public access doesn't exist and can't be created easily, but observation of other features can be made from the site.
 - c. Public access doesn't exist and can't be created easily. In addition, observation of other features can't be made from the site.

- ✓45. Does it appear that access to a viewing spot or wetland edge is available for individuals with limited mobility? (To see whether the site meets ADA requirements, a more thorough examination should be done.)
 - a. Yes.
 - b. No. (List physical barriers.)

- ✓46. Is there a public access point within 250 feet of the wetland's edge? Access points include parking lots, transit stops, bike lanes, trails and water courses. Maintained means that the area is designated as a car or transit area by the managing entity. Unmaintained would be a road pull-off or other area that people use but is not designated for such use. Describe the type of access.
 - a. Yes, a maintained access point exists (describe).
 - b. Yes, an unmaintained access point exists (describe).
 - c. No access point exists, or the access point is hazardous.

Recreation

- ✓47. Is the wetland accessible by boat?
 - a. Boat launching areas or access points exist on site or within 1/2 mile on a connected lake, river, bay or other body of water.
 - b. Potential to develop boat launching areas or access points exists, or such features are more than 1/2 mile but less than 1 mile from the wetland.
 - c. No boat launching areas or access points exist within 1 mile of the wetland, and potential to develop launching areas or access points is limited.

| Wetland 1 | Wetland 2 | Wetland 3 |
|-----------|-----------|-----------|
| | | |

- ✓48. Are there trails, viewing areas or other structures that guide user movement to a particular area or areas in or around the wetland?
 - a. Yes, developed or maintained trails or viewing areas exist.
 - b. Yes, undeveloped trails or viewing areas exist that do not disrupt wildlife or plant habitat.
 - c. No trails or viewing areas exist, or those that do disrupt wildlife or plant habitat.
- 49. Is fishing allowed at the wetland or connected water body? (Contact local Oregon Department of Fish and Wildlife office.) Answer "not applicable" if question 18 was answered "b" or "c," unless question 21 indicates that 10% or more of the wetland's area is covered by open water.
 - a. Yes (either all or part of the year).
 - b. No.
 - c. Not applicable.
- 50. Is hunting allowed at the wetland? (If the wetland is within the city limits, hunting is not allowed. Otherwise, contact the local Oregon Department of Fish and Wildlife office for this information.)
 - a. Yes (either all or part of the year).
 - b. No.

Aesthetics

- ✓51. For **rural areas**, what is the extent of visual contrast with the surrounding landscape? (See Figure 6.)
 - a. Significant contrast with surrounding landscape.
 - b. Limited contrast with surrounding landscape.
 - c. Little or no contrast with surrounding landscape.
- ✓52. For **urban areas**, what is the visual character of the surrounding area? (See Figure 7.)
 - a. Open space or naturally landscaped areas.
 - b. Areas landscaped or manipulated by people.
 - c. Developed with no landscaping.
- ✓53. Are there visual detractors at the wetland site such as abandoned cars, litter, shopping carts or other objects that distract the viewer from the wetland?
 - a. Yes.
 - b. No.
- ✓54. If the wetland contains visual detractors, as indicated in question 53, can they be removed easily?
 - a. Yes.
 - b. No. *N/A*

| Wetland 1 | Wetland 2 | Wetland 3 |
|-----------|-----------|-----------|
| | | |

- WETLAND IS ONLY FORESTED AREA IN IMMEDIATE VICINITY - SURROUNDED BY AG FIELDS

STROBEL ROAD TO NORTH WOULD BE PRIMARY VIEWING AREA

Locate the primary viewing area(s) for the following four questions (be sure to indicate the location on the overlay).

- ✓55. What odors are present at the primary viewing location(s)?
 - a. Natural, pleasant odors only.
 - b. Unpleasant odors such as automobile exhaust or stench from a sewage treatment plant are present at certain times.
 - c. Unpleasant odors are distinct and continuously present.

Wetland 1 Wetland 2 Wetland 3



Figure 6. Visual contrast.

The top part of the figure shows a wetland with significant visual contrast with the surrounding landscape. The bottom part shows a wetland with little or no visual contrast with the surrounding landscape.

| Wetland 1 | Wetland 2 | Wetland 3 |
|-----------|-----------|-----------|
| | | |

- ✓56. What noises are audible at the primary viewing location(s)?
- a. Bird and wildlife noises and other naturally occurring sounds.
 - b. Some traffic and other similar background sounds are audible in addition to naturally occurring sounds.
 - c. Continuous traffic or other intrusive noise is audible in addition to naturally occurring sounds.
 - d. Continuous traffic or other intrusive noise is audible, but no naturally occurring sounds are.
- ✓57. How much of the wetland is visible from the viewing area(s)? Describe the view.
- a. Greater than 50%.
 - b. Between 25% and 50%.
 - c. Less than 25%.
- ✓58. How many Cowardin classes are visible from the primary viewing area(s)? (See question 21 for list of Cowardin classes to use.)
- a. More than two.
 - b. Two
 - c. One *COULD ONLY SEE PFO PORTION*

Wetland 1 Wetland 2 Wetland 3

| Wetland 1 | Wetland 2 | Wetland 3 |
|-----------|-----------|-----------|
| | | |

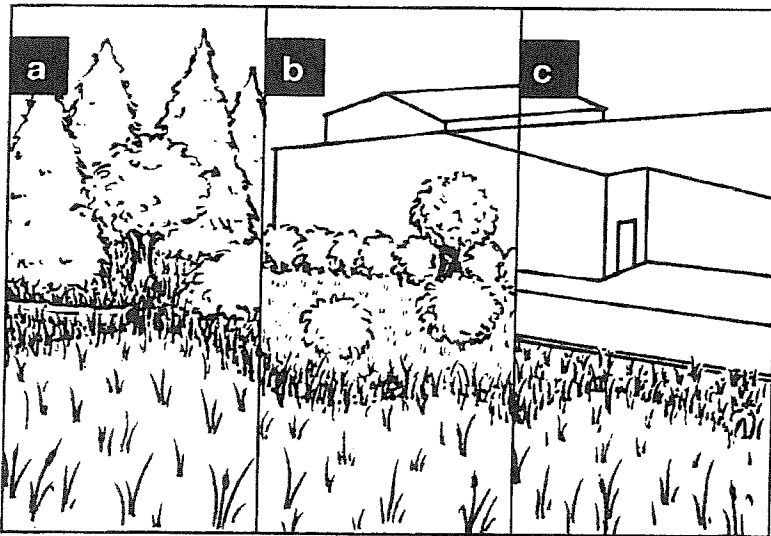


Figure 7. Visual character of urban wetlands.
 Beginning with the left part, this figure shows an urban wetland with naturally landscaped areas, areas landscaped by people and with unlandscaped developed areas.

Attachment 4

Wetlands of Special Interest for Protection
Data Form for Wetland G

THE RIDGE AT SOUTH COOPER MOUNTAIN
(BELLARS/LOLICH PROPERTIES)

Wetland 1 Wetland 2 Wetland 3

Wetlands of Special Interest for Protection

The first filter in the Oregon Method is to see whether the wetland is in a management plan, is protected by regulatory rules or statutes, or is uncommon in Oregon. A "yes" answer to any of the following questions will place the wetland into this category and management decisions should be made to protect the site. You still may want to evaluate the functions and conditions of each wetland to give you an overall evaluation of the wetlands in your assessment area. You should note on the Function and Condition Summary Sheet (Chapter VI and Appendix C) the information from this section. You do not need to contact every agency listed, but all those listed have all or some of the information you need.

Question 1

Does the wetland contain threatened, endangered or sensitive species of wildlife, plants, invertebrates or fish? (Either federal- or state-listed. Include species.) If yes, list.

a. Yes
 b. No
 c. Unknown
 List:

Information source

Oregon Natural Heritage Program, The Nature Conservancy, U.S. Fish and Wildlife Service, National Marine Fisheries Service, Oregon Department of Fish and Wildlife, Oregon Department of Agriculture.

Question 2

Is the wetland designated as critical habitat or essential habitat for federal- or state-listed threatened or endangered species of wildlife, plants, invertebrates or fish? If yes, list species.

a. Yes
 b. No
 c. Unknown
 List:

Information source

U.S. Fish and Wildlife Service, National Marine Fisheries Service, The Nature Conservancy.

| Wetland 1 | Wetland 2 | Wetland 3 |
|-----------|-----------|-----------|
| | | |

Wetland 1 Wetland 2 Wetland 3

Question 3

Is the wetland a dedicated or proposed Registered State Natural Area or Area of Critical Environmental Concern, State Natural Heritage Conservation Area, Federal Research Natural Area, or a Nature Conservancy Preserve?

a. Yes
 b. No
 c. Unknown
 List which it is:

Information source

The Nature Conservancy, the Oregon Natural Heritage Program, U.S. Forest Service, Bureau of Land Management, U.S. Fish and Wildlife Service, National Park Service and Corps of Engineers.

Question 4

Is the wetland of regional or national significance for migratory birds?

a. Yes
 b. No
 c. Unknown
 List which species:

Information source

U.S. Fish and Wildlife Service, Oregon Department of Fish and Wildlife.

Question 5

Is the wetland protected in a local wetland conservation plan or a local comprehensive plan as a Goal 5 or Goal 17 resource?

a. Yes
 b. No ← ?
 c. Unknown

Information source

Local planning office.

Question 6

Is the wetland a designated State Outstanding Resource Water?

a. Yes
 b. No
 c. Unknown

Information source

Oregon Department of Environmental Quality. (As of 1996, DEQ has not made any such designations.)

| Wetland 1 | Wetland 2 | Wetland 3 |
|-----------|-----------|-----------|
| | | |

Question 7

Is the wetland a protected area in a recognized federal, state or local management plan, e.g., for a park, refuge or scenic river?

- a. Yes
- b. No
- c. Unknown

List name:

Information source

Oregon Department of Fish and Wildlife, State Parks, U.S. Fish and Wildlife Service, Bonneville Power Administration, Bureau of Land Management, National Park Service, METRO, local parks department.

Question 8

Is the wetland a *protected* mitigation site for a removal-fill permit, federal 404 fill permit, or enforcement action? Protected means there is a legal instrument, such as a conservation easement, that will preclude a wetland impact permit from being issued for this site.

- a. Yes
- b. No
- c. Unknown

Information source

Oregon Division of State Lands, Corps of Engineers, Environmental Protection Agency.

Question 9

Is the wetland a restoration or protected area included in the wetland reserve program administered by the Natural Resources Conservation Service? The length of protection may vary depending on landowner agreements.

- a. Yes
- b. No
- c. Unknown

Information source

Natural Resources Conservation Service, Consolidated Farm Services Agency.

Wetland 1 Wetland 2 Wetland 3

| Wetland 1 | Wetland 2 | Wetland 3 |
|-----------|-----------|-----------|
| | | |

Question 10

Is the wetland considered rare or unique in Oregon? Examples include bogs, vernal pools and old growth forested wetlands (See Appendix G).

- a. Yes
- b. No
- c. Unknown

Information source

The Nature Conservancy, Oregon Division of State Lands, the Oregon Natural Heritage Program.

Wetland 1 Wetland 2 Wetland 3

| Wetland 1 | Wetland 2 | Wetland 3 |
|-----------|-----------|-----------|
| | | |

Attachment 5

OFWAM Wetland Function Assessment Data Forms for Wetland G

THE RIDGE AT SOUTH COOPER MOUNTAIN (BELLAIRS/LOLICH)

Wetland identification WETLAND G

Notes

**Assessment questions: wildlife habitat
(Page 1 of 3)**

Question

Answer

- | | |
|--------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>1. How many Cowardin wetland classes are present? (Characterization: 21)</p> | <p><i>Rural areas:</i> a. Three or four. b. Two. c. One.</p> <p><i>Urban areas:</i> a. Two or more. b. One class with more than five plant species. c. One class with five or fewer plant species.</p> |
| <p>2. What is the dominant wetland vegetation cover type? (Characterization: 23)</p> | <p>a. Woody vegetation. b. Emergent vegetation and ponding, or open water only. c. Emergent vegetation or wet meadow.</p> |
| <p>3. What is the degree of Cowardin class interspersions for the wetland being observed? (Characterization: 24)</p> | <p>a. High. b. Moderate. c. Low.</p> |
| <p>4. If the wetland contains unvegetated open water, how many acres of unvegetated open water are present? (Characterization: 28)</p> | <p><i>Rural areas:</i> a. More than 3 acres. b. Between 0.5 and 3 acres. c. Less than 0.5 acres.</p> <p><i>Urban areas:</i> a. More than 1 acre. b. Between 0.5 and 1 acre. c. Less than 0.5 acres.</p> |

PFO1Y + PEM1Y

MOST OF WETLAND IS PFO

CLASSES HAVE LOW INTERSPERSIAN - ARE LARGELY DEMARCATED BY THE FIELD EDGE

DOES NOT CONTAIN UNVEGETATED OPEN WATER

Wetland identification WETLAND G

Notes

**Assessment questions: wildlife habitat
(Page 2 of 3)**

Question

Answer

WETLAND IS ISOLATED BUT THERE ARE WETLAND/STREAM/PONDS W/IN 1 MILE. - UNNAMED TRIB, WETLANDS A, B, D, E, F, + G, OFF-SITE IMPOUNDED PONDS

NOT CONNECTED TO OTHER WETLANDS BUT WETLANDS DO OCCUR W/IN 3 MILE RADIUS - WETLAND A, B, D, E, F, G; OFF-SITE WETLAND TO NORTHEAST

NO UPSTREAM REACHES ARE LISTED ON 303(D) LIST. THIS RESPONSE IS CONSISTENT W/ LWI OFWAM RESULTS

- | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>5. How is the wetland connected to another body of water, such as a stream, lake or pond? (Characterization: 18)</p> | <p>a. The wetland is connected by surface water to another body of water.</p> <p><input checked="" type="radio"/> b. No surface water connection exists to another body of water, but other bodies of water lie within 1 mile of the wetland.</p> <p>c. No surface-water connection exists to another body of water, and no other bodies of water lie within 1 mile of the wetland.</p> |
| <p>6. How is the wetland connected to other wetlands? (Characterization: 27)</p> | <p>a. Connected to other wetlands within a 3-mile radius by a perennial or intermittent stream, irrigation or drainage ditch, culvert, canal or lake.</p> <p><input checked="" type="radio"/> b. Not connected by surface waters, but other unconnected wetlands lie within a 3-mile radius.</p> <p>c. Not connected to other wetlands by surface waters, and no other unconnected wetlands lie within a 3-mile radius.</p> |
| <p>7. What is the water quality condition of stream reaches in the watershed upstream of the wetland or adjacent to the wetland? (Characterization: 8)</p> | <p><input checked="" type="radio"/> a. No upstream or adjacent reaches are listed as <i>water quality limited</i>, and all upstream or adjacent reaches are listed as <i>no problem</i> (or no data available) for nonpoint source pollutants.</p> <p>b. One or more upstream or adjacent reaches are listed in <i>moderate</i> water quality condition for nonpoint source pollutants.</p> <p>c. One or more upstream or adjacent reaches are listed as <i>water quality limited</i> or in <i>severe</i> water quality condition for nonpoint source pollutants.</p> |

Wetland identification WETLAND G

Notes

**Assessment questions: wildlife habitat
(Page 3 of 3)**

Question

Answer

8. What is the dominant existing land use within 500 feet of the wetland's edge?
(Characterization: 15)

- a. Exclusive Forest Use or Open Space.
- b. Agriculture.
- c. Developed uses.

9a. For **rural areas**: What percentage of the wetland's edge is bordered by upland wildlife habitat that is at least 150 feet wide?
(Characterization: 25)

- a. Greater than 40%.
- b. Between 10% and 40%.
- c. Less than 10%.

9b. For **urban areas**: What percent of the wetland's edge is bordered by a vegetative buffer at least 25 feet wide?
(Characterization: 26)

- a. Greater than 40%.
- b. Between 10 and 40%.
- c. Less than 10%.

DOMINANT LAND USE IN ALL DIRECTIONS IS AGRICULTURAL USE - ROW CROPS, HAYFIELDS, HORSE FARM

WETLAND BORDERS UPL FOREST HABITAT TO NE AND NW. ONLY AREA TO NE IS $\geq 150'$ WIDE; REST IS $\leq 130'$ MAX

Wildlife habitat: assessment criteria

The wetland provides diverse wildlife habitat if:

At least four questions are answered "a," and no more than one is answered "c."

The wetland provides habitat for some wildlife species if:

Answers do not satisfy the above- or below-listed criteria.

The wetland's wildlife habitat function is lost or not present if:

All questions are answered "c."

RESPONSES:

A = 2
B = 4
C = 2

Wetland identification

W000000G

**Assessment questions: fish habitat
(Page 1 of 3)**

Part A—streams

Question

1. What percentage of the stream is shaded by streamside (riparian) vegetation?
(Characterization: 31)

Answer

Western Oregon:

- a. More than 75%.
- b. Between 50% and 75%.
- c. Less than 50%.

Eastern Oregon:

- a. 50% or more.
- b. 25% or more, but less than 50%.
- c. Less than 25%.

2. What is the physical character of the stream channel?
(Characterization: 30)

- a. The stream is in a natural channel, or modified portions of the stream are returning to a natural channel.
- b. Only portions of the stream channel are modified.
- c. The stream is extensively modified or confined in a non-vegetated channel or pipe.

3. What percentage of the entire stream contains instream structures such as large woody debris, floating submerged vegetation, large rocks or boulders?
(Characterization: 32)

- a. More than 25%.
- b. Between 10% and 25%.
- c. Less than 10%.

4. What is the water quality condition of stream reaches in the watershed upstream of the wetland or adjacent to the wetland?
(Characterization: 8)

- a. No upstream or adjacent reaches are listed as *water quality limited*, and all upstream or adjacent reaches are listed as *no problem* (or no data available) for nonpoint source pollutants.
- b. One or more upstream or adjacent reaches are listed in *moderate* water quality condition for nonpoint source pollutants.
- c. One or more upstream or adjacent reaches are listed as *water quality limited* or in *severe* water quality condition for nonpoint source pollutants.

Notes

NO STREAMS IN
WETLAND

Wetland identification Wetland G

Notes

**Assessment questions: fish habitat
(Page 2 of 3)**

Question

Answer

- | | |
|------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 5. What is the dominant existing land use within 500 feet of the wetland's edge? (Characterization: 15) | a. Exclusive Forest Use or Open Space. b. Agriculture. c. Developed uses. |
| 6. Are fish present in a stream, lake or pond associated with the wetland? (Characterization: 29) | a. Salmon, trout or sensitive species are present at some time during the year. b. Species not covered in "a" are present at some time during the year. c. No species are present at any time during the year. |

Part B—lakes and ponds

- | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------|
| 1. Does the lake or pond contain areas of both deep and shallow water? (Characterization: 33) | a. Yes. b. Cannot be determined. c. No. |
| 2. What percentage of the wetland complex contains cover objects such as submerged logs, floating or submerged vegetation, large rocks or boulders? (Characterization: 35) | a. More than 25%. b. Between 10% and 25%. c. Less than 10%. |
| 3. What percentage of the shoreline is shaded at the water's edge by forested or scrub-shrub vegetation? (Characterization: 34) | a. 60% or more. b. 20% or more, but less than 60%. c. Less than 20%. |

Wetland identification WETLAND G

Notes

**Assessment questions: fish habitat
(Page 3 of 3)**

Question

Answer

- | | |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>4. What is the water quality condition of stream reaches in the watershed upstream of the wetland or adjacent to the wetland? (Characterization: 8)</p> | <p>a. No upstream or adjacent reaches are listed as <i>water quality limited</i>, and all upstream or adjacent reaches are listed as <i>no problem</i> (or no data available) for nonpoint source pollutants.</p> <p>b. One or more upstream or adjacent reaches are listed in <i>moderate</i> water quality condition for nonpoint source pollutants.</p> <p>c. One or more upstream or adjacent reaches are listed as <i>water quality limited</i> or in <i>severe</i> water quality condition for nonpoint source pollutants.</p> |
| <p>5. What is the dominant existing land use within 500 feet of the wetland's edge? (Characterization: 15)</p> | <p>a. Exclusive Forest Use or Open Space.</p> <p>b. Agriculture.</p> <p>c. Developed uses.</p> |
| <p>6. Are fish in a stream, lake or pond associated with the wetland? (Characterization: 29)</p> | <p>a. Salmon, trout or sensitive species are present at some time during the year.</p> <p>b. Species not covered in "a" are present at some time during the year.</p> <p>c. No species are present at any time during the year.</p> |

Fish habitat: assessment criteria

The wetland's fish habitat function is intact if:

Any three questions are answered "a," and no more than one is answered "c."

The wetland's fish habitat function is impacted or degraded if:

Answers do not satisfy the above- or below-listed criteria.

The wetland's fish habitat function is lost or not present if:

All questions are answered "c."

Wetland identification

Wetland G

Notes

Assessment questions: water quality (Page 1 of 2)

| Question | Answer |
|---------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. What is the wetland's primary source of water? (Characterization: 36) | <ul style="list-style-type: none"> a. Surface flow, including streams and ditches. <input checked="" type="radio"/> b. Precipitation or sheet flow. c. Groundwater, including seeps and springs. |
| 2. Is there evidence of flooding or ponding during a portion of the growing season? (Characterization: 37) | <ul style="list-style-type: none"> a. Yes. b. Unable to determine or not applicable. <input checked="" type="radio"/> c. No. |
| 3. What is the degree of wetland vegetation cover? (Characterization: 21) | <ul style="list-style-type: none"> <input checked="" type="radio"/> a. High (greater than 60%). b. Moderate (approximately 60%). c. Low (less than 60%). |
| 4. What is the wetland's area in acres? (Characterization: 17, 27) | <ul style="list-style-type: none"> a. More than 5 acres. <input checked="" type="radio"/> b. Between 0.5 acres and 5 acres; or wetland area is less than 0.5 acres, and the wetland is connected to other wetlands within a 3-mile radius by a perennial or intermittent stream, irrigation or drainage ditch, canal or lake. c. Less than 0.5 acres, and the wetland is not connected to other wetlands within a 3-mile radius by a perennial or intermittent stream, irrigation or drainage ditch, canal or lake. |
| 5. What is the dominant, existing land use within 500 feet of the wetland's edge? (Characterization: 15) | <ul style="list-style-type: none"> a. Developed uses. <input checked="" type="radio"/> b. Agriculture. c. Exclusive Forest Use or Open Space. |

Wetland identification Wetland 6

Notes

**Assessment questions: water quality
(Page 2 of 2)**

Question

6. What is the water quality condition of stream reaches in the watershed upstream of the wetland or adjacent to the wetland?
(Characterization: 8)

Answer

- a. One or more upstream or adjacent reaches are listed as *water quality limited* or in *severe* water quality condition for nonpoint source pollutants.
- b. One or more upstream or adjacent reaches are listed in *moderate* water quality condition for nonpoint source pollutants.
- c. No upstream or adjacent reaches are listed as *water quality limited*, and all upstream or adjacent reaches are listed as *no problem* (or no data available) for nonpoint source pollutants.

Water quality: assessment criteria

A wetland's water-quality function is intact if:

Question 1 is answered "a" or "b," questions 2 and 3 are answered "a," and any other question is answered "a" or "b."

A wetland's water-quality function is impacted or degraded if:

Answers do not satisfy the above- or below-listed criteria.

A wetland's water-quality function is lost or not present if:

Four out of six questions are answered "c."

RESULTS

A = 1
B = 3
C = 2

Wetland identification

WETLAND G

Notes

**Assessment questions: hydrologic control
(Page 1 of 2)**

| Question | Answer |
|----------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Is all or part of the wetland located within the 100-year floodplain or within an enclosed basin? (Characterization: 19) | a. Yes. <input checked="" type="radio"/> b. No. |
| 2. Is there evidence of flooding or ponding during a portion of the growing season? (Characterization: 37) | a. Yes. b. Unable to determine or not applicable. <input checked="" type="radio"/> c. No. |
| 3. What is the wetland's area in acres? (Characterization: 17) | a. More than 5 acres. <input checked="" type="radio"/> b. Between .5 acres and 5 acres. c. Less than .5 acres. |
| 4. Is waterflow out of the wetland restricted (e.g., beaver dam, concrete structure, undersized culvert)? (Characterization: 38) | a. Yes, the outlet is restricted or the wetland has no outlet. b. Minor restrictions slow down the water (i.e., undersized culvert.) <input checked="" type="radio"/> c. No, the outlet has unrestricted flow. |
| 5. What is the dominant wetland vegetation cover type? (Characterization: 23) | <input checked="" type="radio"/> a. Woody vegetation. b. Emergent vegetation and ponding, or open water only. c. Emergent vegetation or wet meadow. |
| 6. What is the dominant existing land use, within 500 feet of the wetland on the downstream or down-slope edge of the wetland? (Characterization: 16) | a. Developed uses. <input checked="" type="radio"/> b. Agriculture. c. Exclusive Forest Use and Open Space. |
| 7. What is the dominant land use in the watershed upstream from the assessment area? (Characterization: 6) | a. Urban or urbanizing. <input checked="" type="radio"/> b. Agriculture. c. Forested or natural area. |

Wetland identification WETLAND G

Notes

**Assessment questions: hydrologic control
(Page 2 of 2)**

| Hydrologic control: assessment criteria | |
|---------------------------------------------------------------------|-------------------------------------------------------------|
| A wetland's hydrologic control function is intact if: | Four or more questions are answered "a." |
| A wetland's hydrologic control function is impacted or degraded if: | Answers do not satisfy the above- or below-listed criteria. |
| A wetland's hydrologic control function is lost or not present if: | Four or more questions are answered "c." |

RESULTS

A = 1

B = 4

C = 2

Wetland identification

WETLAND G**Assessment questions: sensitivity
(Page 1 of 2)****Question****Answer**

Notes

1. Has the stream flow or stream bank been modified by human activities less than 1 mile above the wetland, or is the wetland isolated?
(Characterization: 27, 40)
- a. Yes.
b. No.
2. Is water being taken out of the stream(s) through active diking, drainage or irrigation districts upstream of the assessment area, or is the wetland isolated?
(Characterization: 5, 27)
- a. Yes.
b. No.
3. What is the water quality condition of stream reaches in the watershed upstream of the wetland or adjacent to the wetland?
(Characterization: 8)
- a. One or more upstream or adjacent reaches are listed as *water quality limited* or in *severe* water quality condition for nonpoint source pollutants.
b. One or more upstream or adjacent reaches are listed in *moderate* water quality condition for nonpoint source pollutants.
c. No upstream or adjacent reaches are listed as *water quality limited*, and all upstream or adjacent reaches are listed as *no problem* (or no data available) for nonpoint source pollutants.
4. What is the dominant, existing land use within 500 feet of the wetland's edge?
(Characterization: 15)
- a. Developed uses.
b. Agriculture.
c. Exclusive Forest Use or Open Space.
5. What is the dominant zoned land use within 500 feet of the wetland's edge?
(Characterization: 20)
- a. Developed uses.
b. Agriculture.
c. Exclusive Forest Use or Open Space.

Wetland identification

WETLAND 6

Notes

**Assessment questions: sensitivity
(Page 2 of 2)**

Question

Answer

6. What is the dominant wetland vegetation cover type?
(Characterization: 23)
- a. Woody vegetation.
 - b. Emergent vegetation only or wet meadow.
 - c. Emergent vegetation and ponding, or open water only.

**Sensitivity to impact:
assessment criteria**

A wetland is sensitive to future impacts if:

Questions 1, 2 and 3 are answered "a," and one other question is answered "a."

A wetland is potentially sensitive to future impacts if:

Answers do not satisfy the above- or below-listed criteria.

A wetland is not sensitive to future impacts if:

Questions 1 and 2 are answered "b", and no other questions are answered "a."

A = 4

B = 1

C = 1

Wetland identification

WETLAND G

Notes

**Assessment questions: enhancement
(Page 1 of 2)****Question****Answer**

1. What are the assessment results for wildlife habitat, fish habitat, water quality and hydrologic control?
- a. One or more of the functions is impacted or degraded.
 b. The wetland has lost one or more of the functions or one or more of the functions is not present.
2. What is the wetland's primary source of water?
(Characterization: 36)
- a. Surface flow, including streams and ditches.
 b. Groundwater, including springs or seeps.
 c. Precipitation or sheet flow.
3. If the primary source of water is surface flow, is the water flow into the wetland restricted?
(Characterization: 39)
- a. Flow is not restricted, or if blocked, the obstruction can be removed easily.
 b. Permanent blockage to the flow exists, but may be breached or a new flow channel created.
 c. Flow is restricted and cannot be restored.
4. What is the wetland's area in acres?
(Characterization: 17)
- a. Greater than 5 acres.
 b. Between .5 acres and 5 acres.
 c. Less than .5 acres.
- 5a. For **rural areas**: What percentage of the wetland's edge is bordered by upland wildlife habitat that is at least 150 feet wide?
(Characterization: 25)
- a. Greater than 40%.
 b. Between 10% and 40%.
 c. Less than 10%.
- 5b. For **urban areas**: What percent of the wetland's edge is bordered by a vegetative buffer at least 25 feet wide?
(Characterization: 26)

N/A

FISH HABITAT IS NOT PRESENT

- SEASONAL HIGH WATER TABLE AT BASE OF SLOPE

SURFACE FLOW NOT A HYDROLOGY SOURCE - NO SURFACE CONNECTIONS ARE PRESENT

Wetland identification

Wetland G

Notes

**Assessment questions: enhancement
(Page 2 of 2)**

Question

6. What is the result of the sensitivity to impact index?

Answer

- a. The wetland is not sensitive to future impacts.
- b. The wetland is potentially sensitive to future impacts.
- c. The wetland is sensitive to future impacts.

**Enhancement potential:
assessment criteria**

A wetland has high enhancement potential if:

Question 1 is answered "a," and not more than one other question is answered "c."

A wetland has moderate potential for enhancement if:

Answers do not satisfy the above- or below-listed criteria.

A wetland has little enhancement potential if:

Question 1 is answered "b," and two or more other questions are answered "c."

A = 1

B = 3

C = 2

Wetland identification

WETLAND

Notes

Assessment questions: education (Page 1 of 2)

Question

Answer

1. Is the wetland site open to the public for direct access or observation?
(Characterization: 41)
 - a. Yes, the wetland is open to the public.
 - b. Yes, but wetland access is allowed only by permission of the landowner or managing entity.
 - c. No, access is not allowed.

2. Are there visible hazards to the public at the wetland site?
(Characterization: 41)
 - a. No.
 - b. One or two visible safety hazards exist.
 - c. More than two visible safety hazards exist.

3. What are the results for the wildlife habitat and fish habitat assessment criteria?
 - a. The wetland provides diverse wildlife habitat, or the fish habitat function is intact.
 - b. Results for the wildlife habitat and fish habitat assessment criteria do not meet the criteria for responses "a" or "c."
 - c. Both wildlife habitat function and fish habitat function are lost or not present.

4. Is there existing physical public access to other features? If not, can such access be created easily, or can other habitats be observed from the site?
(Characterization: 44)
 - a. Public access to other habitats exists or can be created easily.
 - b. Public access doesn't exist and can't be created easily, but observation of other features can be made from the site.
 - c. Public access doesn't exist and can't be created easily. In addition, observation of other features can't be made from the site.

ON
PRIVATELY-OWNED
LAND

Wetland identification G

Notes

**Assessment questions: education
(Page 2 of 2)**

Question

Answer

- | | |
|-------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <p>5. Is there a public access point within 250 feet of the wetland's edge? (Characterization: 46)</p> | <p>a. Yes, a maintained access point exists. b. Yes, an unmaintained access point exists. <input checked="" type="radio"/> c. No access point exists, or the access point is hazardous.</p> |
| <p>6. Does it appear that access to a viewing spot or wetland edge is available for individuals with limited mobility? (Characterization: 45)</p> | <p>a. Yes. <input checked="" type="radio"/> b. No.</p> |

Education: assessment criteria

| | |
|--------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|
| A wetland has educational uses if: | Questions 1 and 2 are answered "a," and questions 3, 4 and 5 are either "a" or "b." |
| A wetland has potential for educational use if: | Answers do not satisfy the above- or below-listed criteria. |
| <input checked="" type="radio"/> A wetland site is not appropriate for educational use if: | The answer to 1 or 2 is "c." |

A = 1
B = 3
C = 2

Wetland identification G

Notes

Assessment questions: recreation (Page 1 of 2)

| Question | Answer |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1. Is there a public access point within 250 feet of the wetland's edge? (Characterization: 46) | <ul style="list-style-type: none"> a. Yes, a maintained access point exists. b. Yes, an unmaintained access point exists. <input checked="" type="radio"/> c. No access point exists, or the access point is hazardous. |
| 2. Is the wetland accessible by boat? (Characterization: 47) | <ul style="list-style-type: none"> a. Boat launching areas or access points exist on site or within 1/2 mile on a connected lake, river, bay or other body of water. b. Potential to develop boat launching areas or access points exists, or such features are more than 1/2 mile but less than 1 mile from the wetland. <input checked="" type="radio"/> c. No boat launching areas or access points exist within 1 mile of the wetland, and potential to develop launching areas or access points is limited |
| 3. Are there trails, viewing areas or other structures that guide user movement to a particular area or areas in or around the wetland? (Characterization: 48) | <ul style="list-style-type: none"> a. Yes, developed or maintained trails or viewing areas exist. b. Yes, undeveloped trails or viewing areas exist that do not disrupt wildlife or plant habitat. <input checked="" type="radio"/> c. No trails or viewing areas exist, or those that do disrupt wildlife or plant habitat. |
| 4. What is the result of the wildlife habitat index? | <ul style="list-style-type: none"> a. The wetland provides diverse wildlife habitat. <input checked="" type="radio"/> b. The wetland provides habitat for some wildlife species. c. The wetland's wildlife habitat function is lost or not present. |
| 5. Is fishing allowed at the wetland or adjacent water body? (Characterization: 49) | <ul style="list-style-type: none"> a. Yes. <input checked="" type="radio"/> b. No or not applicable. |

Wetland identification G

Notes

**Assessment questions: recreation
(Page 2 of 2)**

Question

6. Is hunting allowed at the wetland?
(Characterization: 50)

Answer

- a. Yes.
- b. No.

| Recreation: assessment criteria | |
|---------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|
| The wetland provides recreational opportunities if: | Question 1 or 2 is answered "a," and at least one other question is answered "a." |
| The wetland has the potential to provide recreational opportunities if: | Answers do not satisfy the above- or below- listed criteria. |
| The wetland is not appropriate for or does not provide recreational opportunities if: | Questions 1 and 2 are answered "c"; or questions 3 and 4 are answered "c," and 5 and 6 are answered "b." |

A = 0

B = 3

C = 3

Wetland identification G

Notes

Assessment questions: aesthetics
(Page 2 of 2)

Question

6. What noises are audible at the primary viewing location?
(Characterization: 56)

Answer

Rural

- a. Bird and wildlife noises and other naturally occurring sounds.
- b. Some traffic and other similar background sounds are audible in addition to naturally occurring sounds.
- c. Continuous traffic or other intrusive noise is audible in addition to naturally occurring sounds.

Urban

- a. Some traffic and other similar background sounds are audible in addition to naturally occurring sounds.
- b. Continuous traffic or other intrusive noise is audible in addition to naturally occurring sounds.
- c. Continuous traffic or other intrusive noise is audible, but no naturally occurring sounds are.

Aesthetics: assessment criteria

| | |
|-------------------------------------------------------|-----------------------------------------------------------------------------------|
| A wetland is considered to be pleasing if: | Question 1 or 2 is answered "a," and all other questions are answered "a" or "b." |
| A wetland is considered to be moderately pleasing if: | Answers do not satisfy the above- or below-listed criteria. |
| A wetland is not pleasing if: | Two or more questions are answered "c." |

A = 3
B = 2
C = 1

THE RIDGE AT SOUTH COOPER MOUNTAIN
(BELLAIRS/LOLICH PROPERTIES)

| Wetland Assessment Questions: Answer Sheet | | | |
|--------------------------------------------|-------------------|--|--|
| Wetland identifier | WETLAND G | | |
| Wildlife habitat | | | |
| Question 1 | B | | |
| Question 2 | A | | |
| Question 3 | C | | |
| Question 4 | — | | |
| Question 5 | B | | |
| Question 6 | B | | |
| Question 7 | A | | |
| Question 8 | B | | |
| Question 9 | C | | |
| Assessment descriptor | PROVIDES FOR SOME | | |
| Fish habitat | | | |
| Streams and rivers | | | |
| Question 1 | — | | |
| Question 2 | — | | |
| Question 3 | — | | |
| Question 4 | — | | |
| Question 5 | — | | |
| Question 6 | — | | |
| Lakes and ponds | | | |
| Question 1 | — | | |
| Question 2 | — | | |
| Question 3 | — | | |
| Question 4 | — | | |
| Question 5 | — | | |
| Question 6 | — | | |
| Assessment descriptor | NOT PRESENT | | |
| Water quality | | | |
| Question 1 | B | | |
| Question 2 | C | | |
| Question 3 | A | | |
| Question 4 | B | | |
| Question 5 | B | | |
| Question 6 | C | | |
| Assessment descriptor | IMPACTED/DEGRADED | | |

| Wetland Assessment Questions: Answer Sheet | | | |
|--------------------------------------------|-----------------------|--|--|
| Wetland identifier | WETLAND G | | |
| Hydrologic control | | | |
| Question 1 | B | | |
| Question 2 | C | | |
| Question 3 | B | | |
| Question 4 | C | | |
| Question 5 | A | | |
| Question 6 | B | | |
| Question 7 | C | | |
| Assessment descriptor | IMPACTED/DEGRADED | | |
| Sensitivity to future impacts | | | |
| Question 1 | A | | |
| Question 2 | A | | |
| Question 3 | C | | |
| Question 4 | B | | |
| Question 5 | A | | |
| Question 6 | A | | |
| Assessment descriptor | POTENTIALLY SENSITIVE | | |
| Enhancement potential | | | |
| Question 1 | B | | |
| Question 2 | B | | |
| Question 3 | C | | |
| Question 4 | B | | |
| Question 5 | C | | |
| Question 6 | — | | |
| Assessment descriptor | LITTLE POTENTIAL | | |
| Education | | | |
| Question 1 | C | | |
| Question 2 | A | | |
| Question 3 | B | | |
| Question 4 | B | | |
| Question 5 | C | | |
| Question 6 | B | | |
| Assessment descriptor | NOT APPROPRIATE | | |

| Wetland Assessment Questions: Answer Sheet | | | | |
|--------------------------------------------|------------------|--|--|--|
| Wetland identifier | WETLAND E | | | |
| Recreation | | | | |
| Question 1 | C | | | |
| Question 2 | C | | | |
| Question 3 | C | | | |
| Question 4 | B | | | |
| Question 5 | B | | | |
| Question 6 | B | | | |
| Assessment descriptor | DOES NOT PROVIDE | | | |
| Aesthetic quality | | | | |
| Question 1 | C | | | |
| Question 2 | B | | | |
| Question 3 | A | | | |
| Question 4 | B | | | |
| Question 5 | A | | | |
| Question 6 | B | | | |
| Assessment descriptor | MODERATE | | | |

Function & condition summary sheet for the Oregon Method

Wetland identification:

LOW INTERSPERSION!

| Function | Assessment Descriptor | Rationale |
|--------------------------------------------------------------------------|---------------------------|-------------------------------------------------------------------------------------------------------------|
| Wildlife habitat | PROVIDES FOR SOME SPECIES | ONLY 2 COWARDIN CLASSES; LIMITED CONNECTIVITY, HIGH DEGREE OF AG. DISTURBANCE IN ADJACENT AREAS |
| Fish habitat | NOT PRESENT | NO STREAM OR OPEN WATER AREAS ARE PRESENT IN OR ADJACENT TO THE WETLAND |
| Water quality | IMPACTED/DEGRADED | SURROUNDING LAND USE IS MOSTLY AG; NO PONDING OR FLOODING OCCURS IN WETLAND; LIMITED OPPORTUNITY TO PROVIDE |
| Hydrologic control | IMPACTED/DEGRADED | NO PONDING OR FLOODING OCCURS IN WETLAND NO OUTLET PRESENT |
| Sensitivity to future impacts | POTENTIALLY SENSITIVE | SURROUNDING USES DOMINATED BY AGRICULTURE; FUTURE DEVELOPMENT PROPOSED IN ADJACENT AREAS |
| Enhancement potential | LITTLE POTENTIAL | MAIN WATER SOURCE IS PRECIP. + SHEET-FLOW (NOT EASY TO ENHANCE HYDRO); LIMITED EXTENT OF ADJ. WILDLIFE HAB. |
| Education | NOT APPROPRIATE | NO PUBLIC ACCESS; LIMITED WILDLIFE HABITAT; NO FISH HABITAT; LACK OF ACCESSIBILITY |
| Recreation | NOT APPROPRIATE | NO PUBLIC ACCESS; NO FISHING/HUNTING OPPORTUNITIES; NO TRAILS; NO BOAT ACCESS |
| Aesthetic quality | MODERATELY PLEASING | SOME VISUAL CONTRAST; LITTLE TO NO UNPLEASANT ODORS/SOUNDS; ONLY ONE WETLAND CLASS IS VISIBLE |
| Narrative description of overall wetland functions and conditions | | |
| | | |

Li Alligood

From: Mike Peebles
Sent: Monday, April 03, 2017 2:09 PM
To: Li Alligood
Subject: Fwd: CWS File No. 17-000670; The ridge at South Cooper Mountain
Attachments: The ridge at SCM- Alternative 3-28-17.pdf; ATT00001.htm; _BL_NRA_Figures_20170322.pdf; ATT00002.htm

Follow Up Flag: Follow up
Flag Status: Flagged

Mike Peebles
Otak, Inc
503-415-2354 W)
503-313-8758 (M)

Begin forwarded message:

From: "Matt Kuziinsky" <mkuziinsky@anchoragea.com>
To: "Amber Wierck" <WierckA@CleanWaterServices.org>
Cc: "Greg Summers" <gsummers@anchoragea.com>, "Julie Fox" <jfox@anchoragea.com>, "Mike Peebles" <mike.peebles@otak.com>
Subject: RE: CWS File No. 17-000670; The ridge at South Cooper Mountain

Hello Amber,

Please see our responses to your comments on the February 2017 Natural Resource Assessment (NRA) report for The Ridge at South Cooper Mountain (CWS File No. 17-000670) in *blue italics* below.

- 1) Please provide a grading plan so we can understand the difference between the temporary and permanent encroachment calculations that are shown.

As Julie and you already discussed, the grading plans were included under Appendix I of the report. Per your 3/21/2017 response to Julie, we understand that these plans are sufficient and that there are no further questions related to this comment.

- 2) Please provide more information through the Alternative Analysis that documents the project minimized the encroachment into the Vegetated Corridor (VC) associated with Wetlands A and C. It seems like there is a Tier 2 level of encroachment in the VC of Wetland A for the stormwater quality facility and the VC of Wetland C for the lots. Were there any alternatives with less encroachment (per Section 3.07.4.b.1)?

As discussed on page 27 of the February 2017 NRA, vegetated corridor encroachment associated with the proposed water quality facility was determined to be unavoidable. For the stormwater detention pond to function correctly, it needs to be in the lowest portion of the project site to enable gravity-conveyance of stormwater. Proposed impacts to the vegetated corridors of Wetland A, Wetland C, and the Unnamed Tributary are needed to accommodate the stormwater detention capacity required for the development. The applicant looked at the option of pulling

the eastern edge of the proposed stormwater pond out of the vegetated corridor. If this were done, the pond would either need to be deepened or expanded to the north by at least 12 feet to provide the required detention capacity. Deepening the pond was determined to be impracticable since pond depth is constrained by the outfall elevation; if the pond were made deeper the outfall would no longer function correctly. The option of expanding the pond to the north to obtain sufficient capacity would also require shifting the adjacent lots and residential roadway (Street A) to the north (see attached alternative design figure). Relocating these features would render proposed Lots 72,73 and 88 through 91 (6 lots) in the "island area" that is bounded by Street A and Alleys G1 and G2 unbuildable because the resulting lots would be too shallow to accommodate the attached single-family structures proposed for these areas. Because the loss of 6 attached single-family dwellings was considered to be economically-infeasible, this alternative was rejected.

Regarding the avoidance and minimization of the proposed Wetland C vegetated corridor impacts associated with Lots 96 through 101, a similar outcome to the northern pond expansion option described in the preceding paragraph would occur. To get these lots out of the vegetated corridor, the only option is to shift them to the northwest (see attached alternative design figure). This would push Street A to the north and reduce the number of lots that fit in the island area, again resulting in the loss of 6 lots. For the reasons previously stated above, this alternative was rejected.

- 3) Please show the house and existing setback along Wetland F. Without the footprint on the figures, it's unclear as to why the VC is reduced in that area.

We have added the Bellairs house footprint to both the existing conditions and proposed development maps (see the attached revised figure set). Note that on the proposed development map, we included a note stating that the house would be remodeled to accommodate the road alignment. The applicant has not developed the specifics for that remodel yet but has stated that the changes would not affect the portion of the house that establishes the vegetated corridor setback.

Please let me know if you have any question on the above information or require any additional information to complete the review process.

Thanks!

Matt

Matt Kuziinsky, PWS | ANCHOR QEA, LLC
Managing Wetlands Scientist

ANCHOR QEA, LLC

mkuziinsky@anchoragea.com

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From: Amber Wierck [<mailto:WierckA@CleanWaterServices.org>]
Sent: Monday, March 20, 2017 1:56 PM
To: Matt Kuziinsky <mkuziinsky@anchoragea.com>
Subject: CWS File No. 17-000670; The ridge at South Cooper Mountain

Hi Matt,

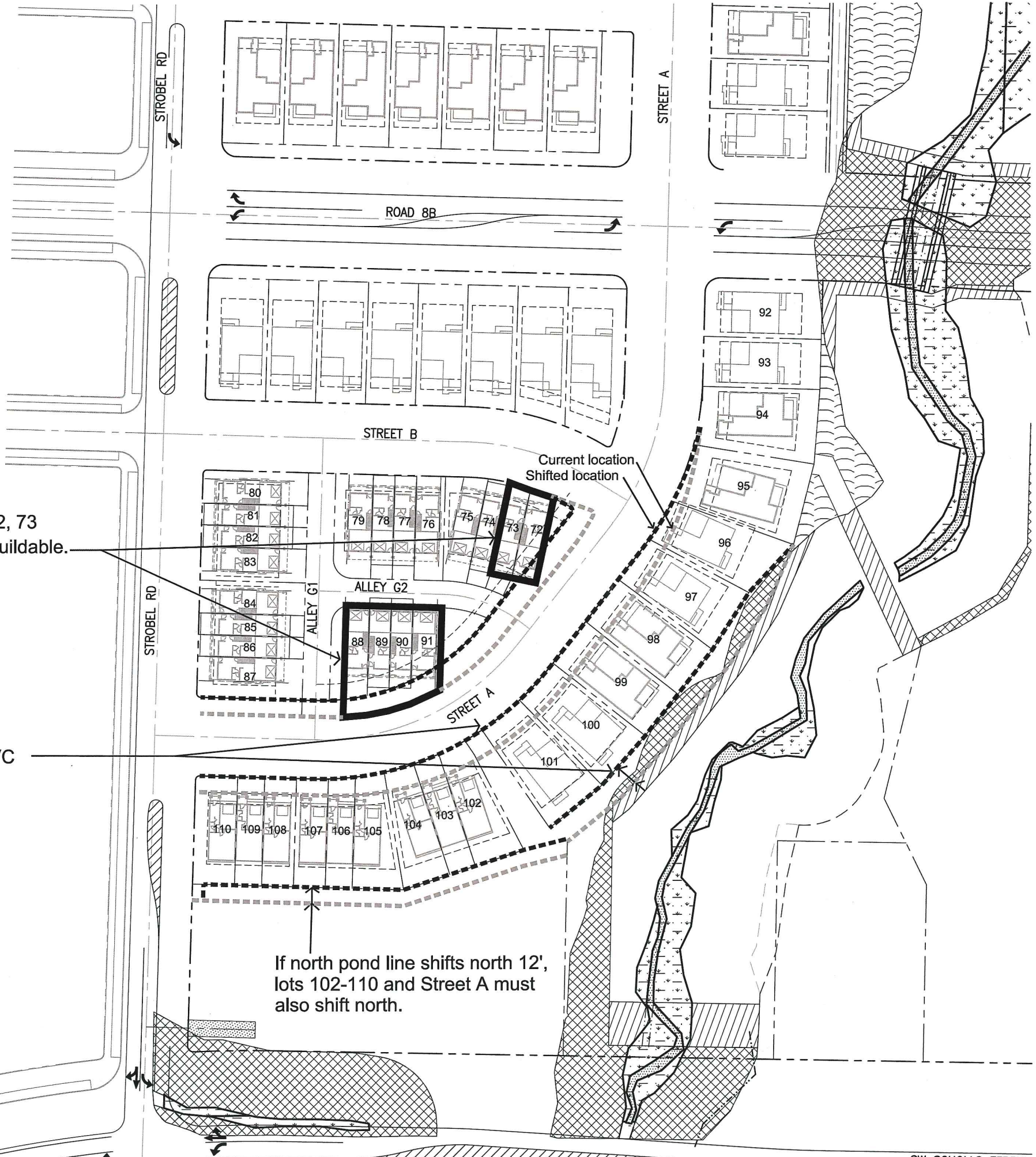
Thank you for the submittal. I had the opportunity to conduct the review and unfortunately there are a few items (listed below) that we need to continue the review.

- 1) Please provide a grading plan so we can understand the difference between the temporary and permanent encroachment calculations that are shown.
- 2) Please provide more information through the Alternative Analysis that documents the project minimized the encroachment into the Vegetated Corridor (VC) associated with Wetlands A and C. It seems like there is a Tier 2 level of encroachment in the VC of Wetland A for the stormwater quality facility and the VC of Wetland C for the lots. Were there any alternatives with less encroachment (per Section 3.07.4.b.1)?
- 3) Please show the house and existing setback along Wetland F. Without the footprint on the figures, it's unclear as to why the VC is reduced in that area.

Please let me know if you have any questions.

Thank you,

Amber Wierck, PWS | Environmental Review Project Manager
[Clean Water Services](#) | Development Services
2550 SW Hillsboro Hwy | Hillsboro OR 97123
o 503.681.3653 | f 503.681.4439
[engage permits](#) | [news](#) | [facebook](#) | [twitter](#)

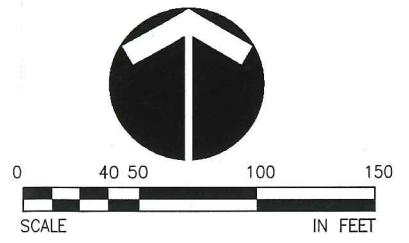


Shifting Street A renders lots 72, 73 and 88-91 too shallow and unbuildable.

Shifting Lots 96-101 to avoid VC impacts requires that Street A shift to the northwest.

If north pond line shifts north 12', lots 102-110 and Street A must also shift north.

The Ridge at South Cooper Mountain
 Alternatives Analysis
 Alternative 1A-Pond reconfiguration



03/28/2017

SW SCHOLLS FERRY
 C.R. 3278 (PUBLIC)

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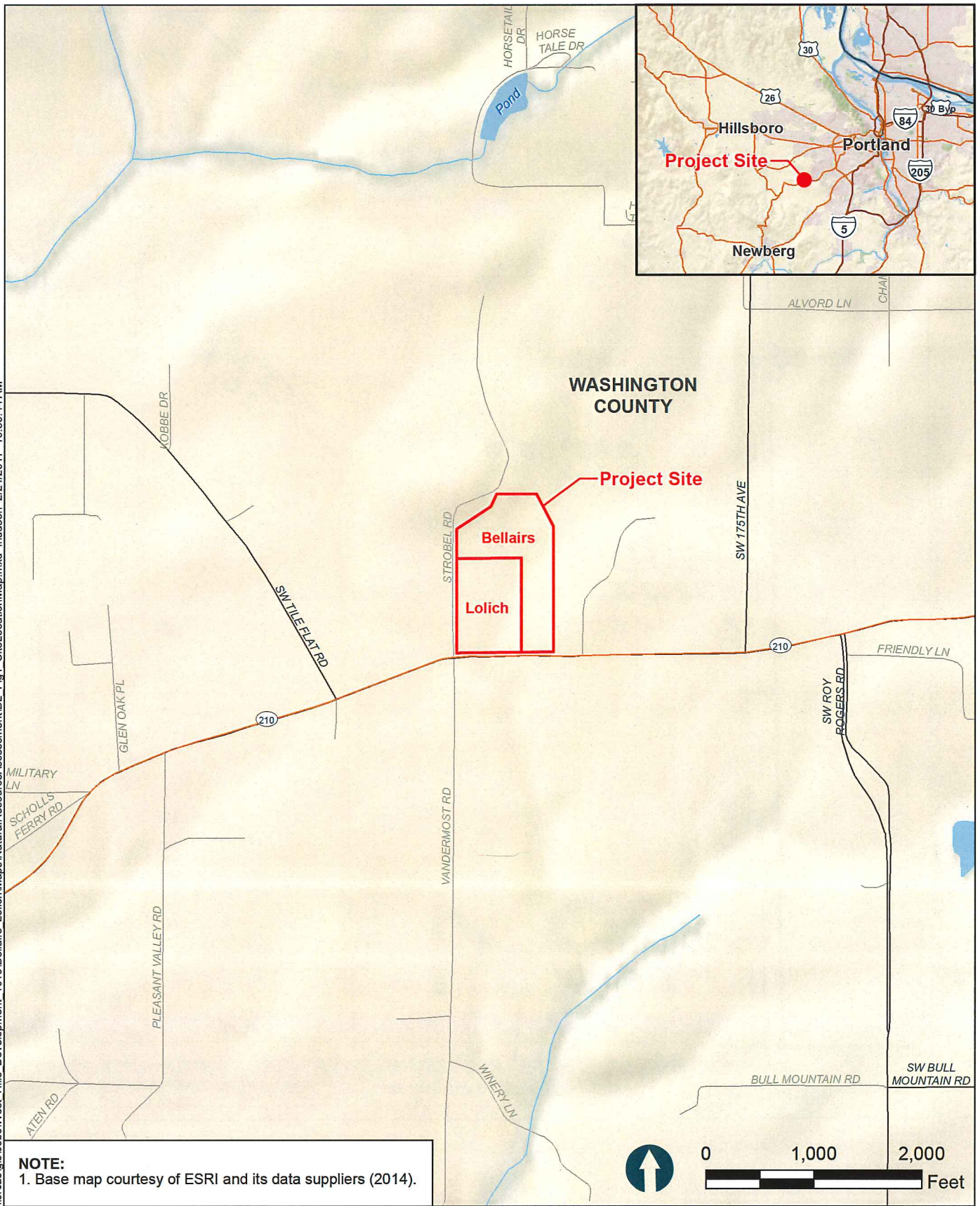
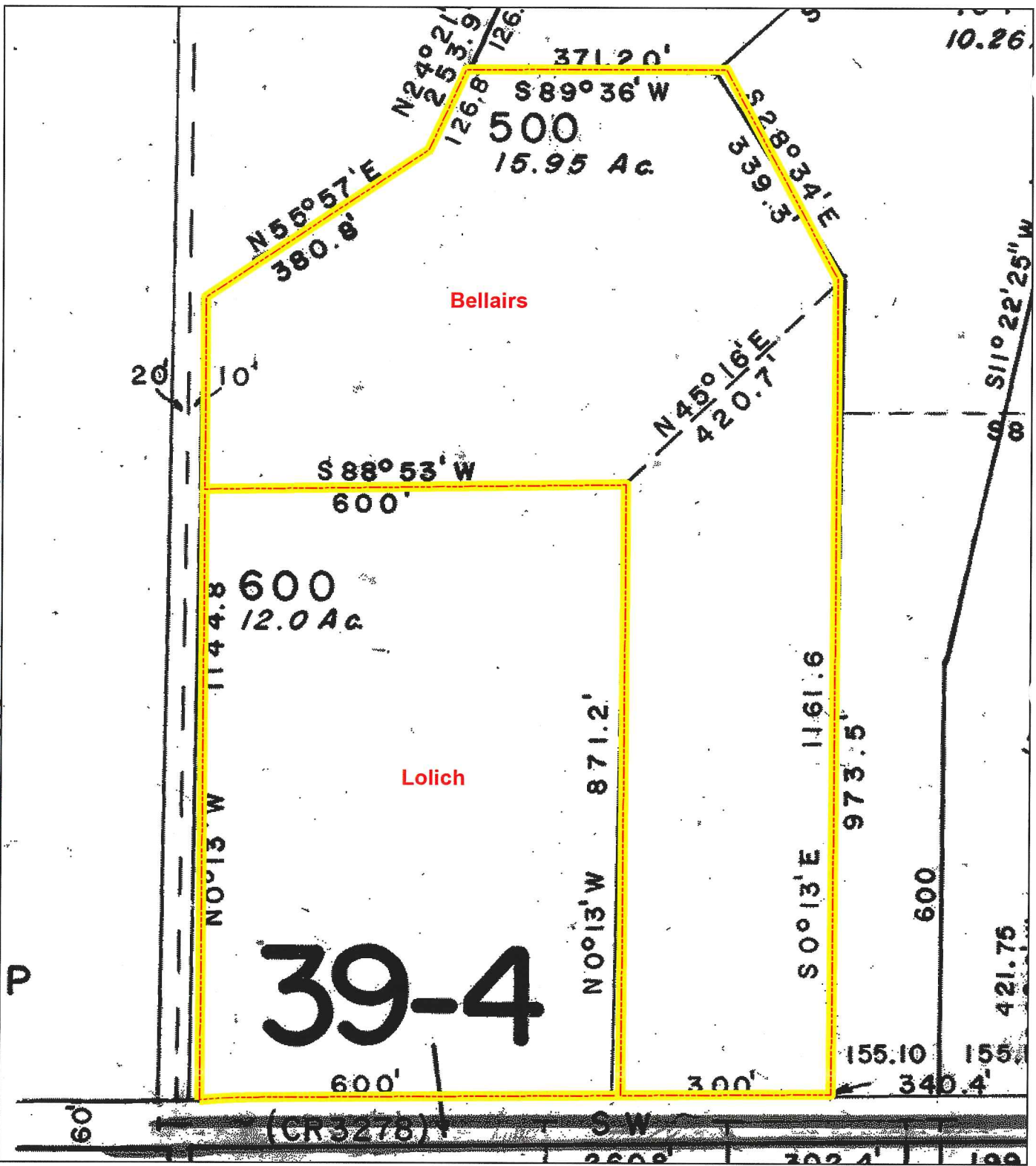


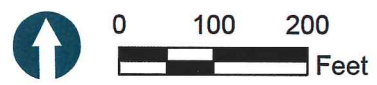
Figure 1
Site Location Map
Natural Resource Assessment (Bellairs and Lolich Properties)
West Hills Land Development: The Ridge at South Cooper Mountain

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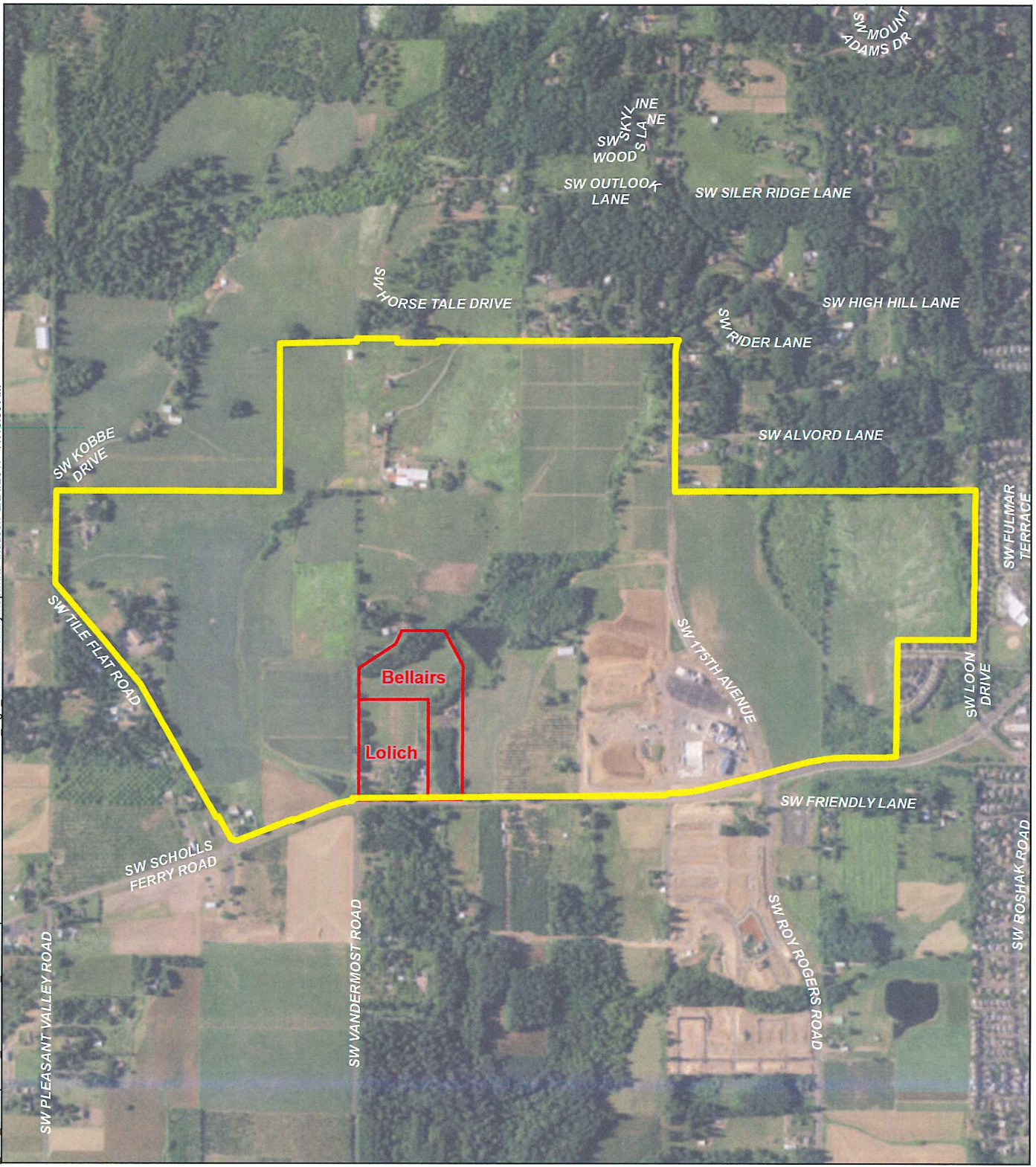


 Project Site Boundary

NOTE:
1. Tax lot map acquired from Washington County.



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Project Site Boundary
 South Cooper Mountain Community Boundary

NOTE:
 1. Aerial imagery acquired from Google Earth (2016).

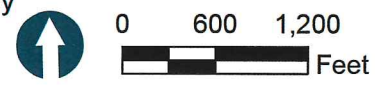


Figure 3
 South Cooper Mountain Community Map
 Natural Resource Assessment (Bellairs and Lolich Properties)
 West Hills Land Development: The Ridge at South Cooper Mountain

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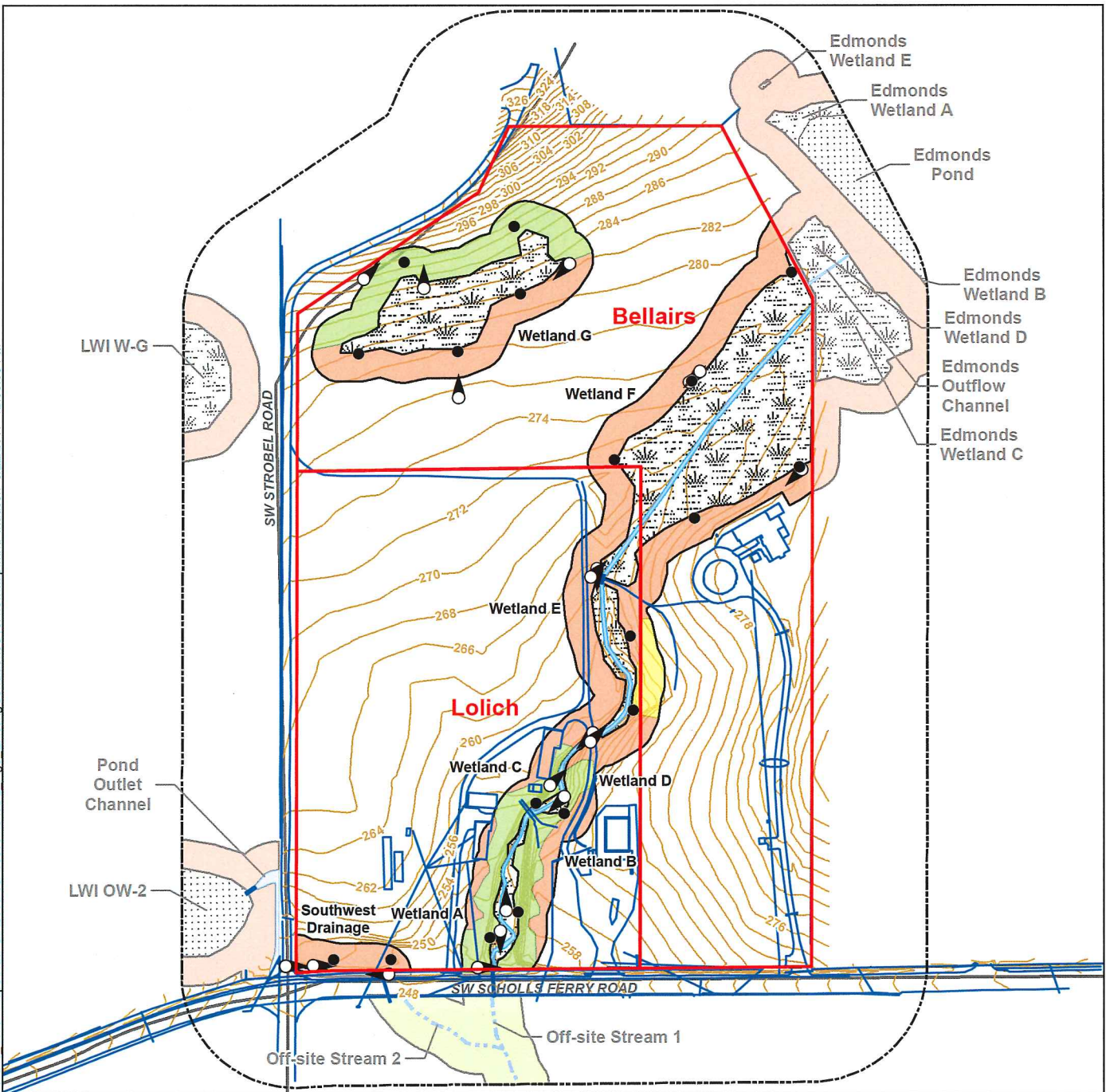
 Project Site Boundary  Study Area Boundary

NOTE:
1. Aerial imagery acquired from Google Earth (2016).



0 100 200
Feet

\\orca\gis\Jobs\West_Hills_Development_1015\Bellairs_Lolich\Maps\NaturalResourceAssessment\BL_Fig5_ExistingConditionsOverviewMap.mxd | Hudson 3/22/2017 12:55:59 PM

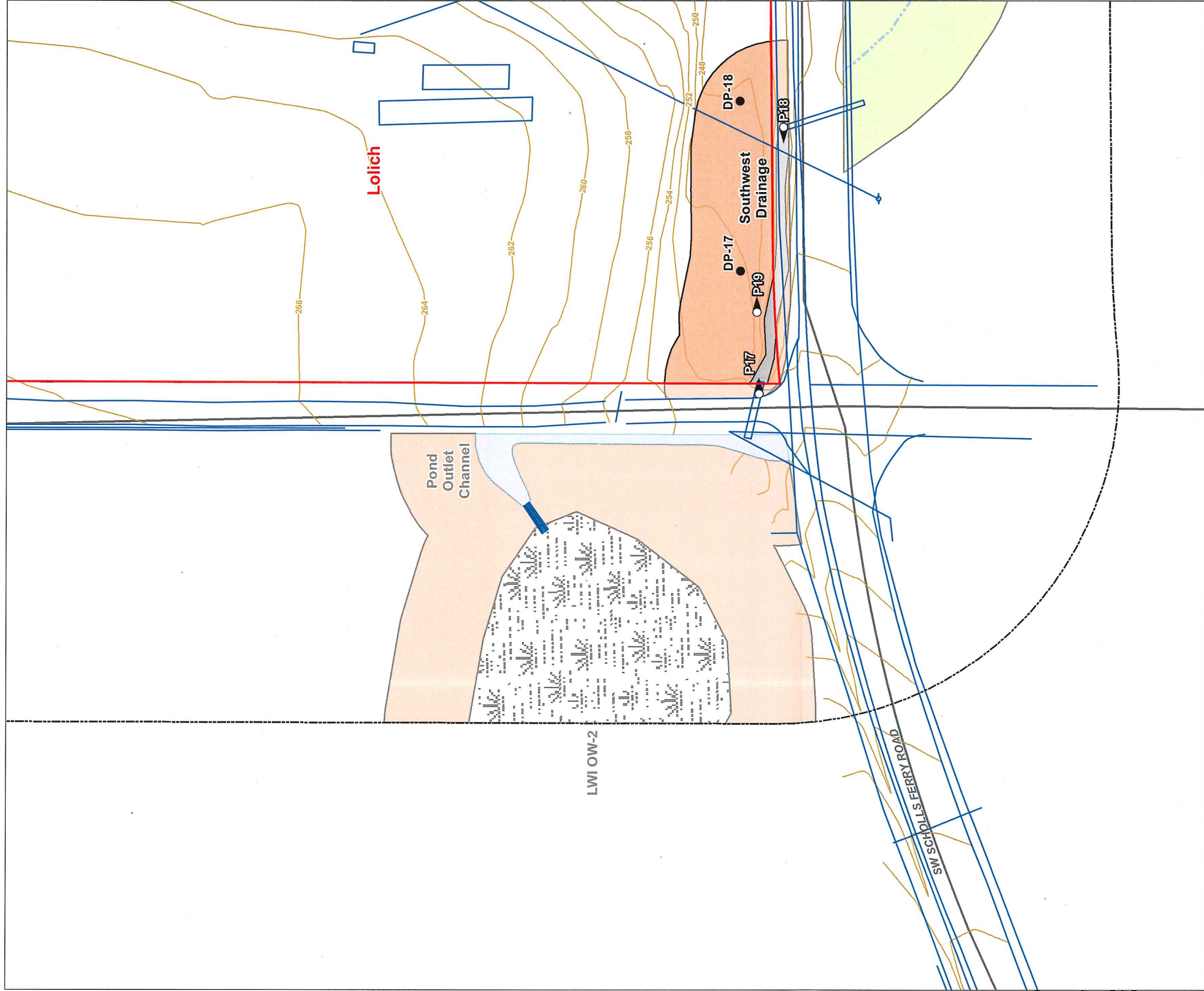


| | | | |
|-----------------------------------|-------------------------------|--------------------------------|--------------------------------------|
| Project Site Boundary | VC Photo Point | Off-site Sensitive Area | Existing Feature |
| Study Area Boundary | On-site Sensitive Area | Stream | Good VC (60,554 sq ft) |
| Road | Stream | Drainage | Marginal VC (6,715 sq ft) |
| 2-ft Contour | Drainage | Wetland | Degraded VC (137,653 sq ft) |
| Vegetated Corridor (VC) Data Plot | Delineated Wetland | Pond | Off-site Good VC (32,661 sq ft) |
| | VC | VC | Off-site Degraded VC (108,180 sq ft) |

NOTES:
 1. Wetland boundaries flagged and field surveyed by Otak, Inc., to 0.1-foot accuracy.
 2. Contours and existing features acquired from Otak, Inc.



Figure 5
 Existing Conditions Overview Map
 Natural Resource Assessment (Bellairs and Lolich Properties)
 West Hills Land Development: The Ridge at South Cooper Mountain



- Project Site Boundary
- Study Area Boundary
- Road
- 2-ft Contour
- Existing Feature
- Vegetated Corridor
- Data Plot
- Vegetated Corridor Photo Point

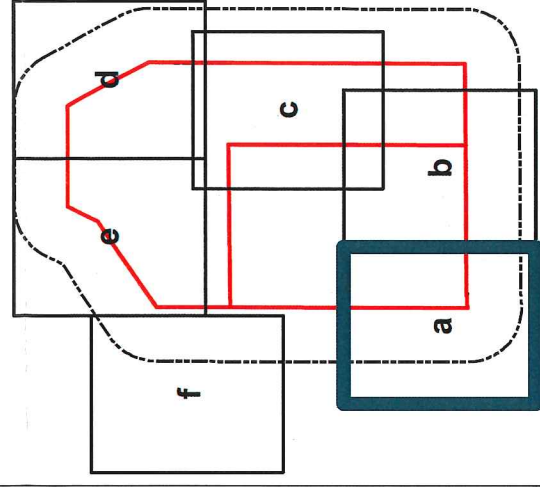
- Off-site Sensitive Area**
- Stream
- Wetland
- Drainage
- Stream
- Vegetated Corridor
- On-site Sensitive Area**
- Drainage
- Vegetated Corridor

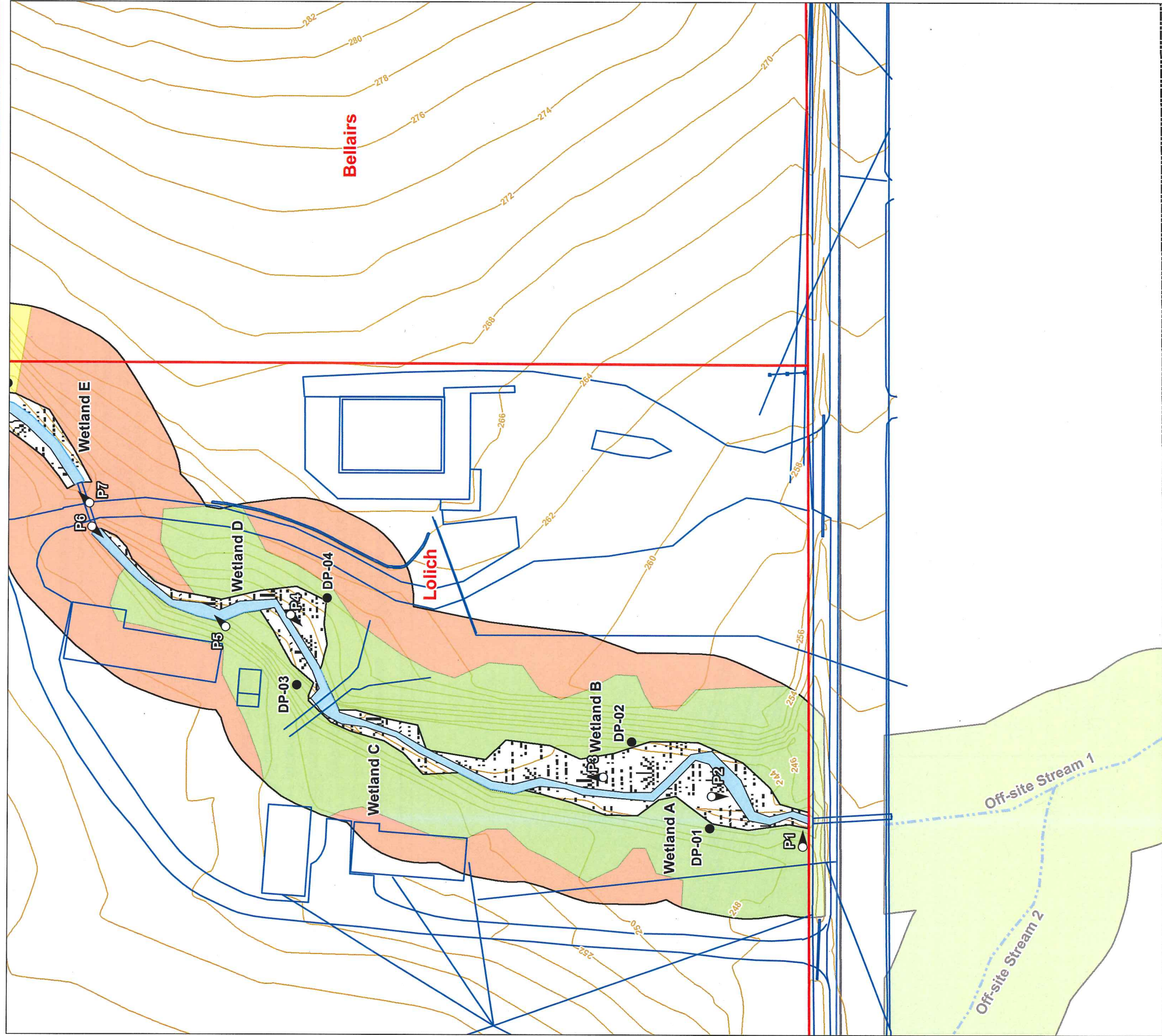
- Degraded Vegetated Corridor (137,653 sq ft)
- Off-site Good Vegetated Corridor (32,661 sq ft)
- Off-site Degraded Vegetated Corridor (108,180 sq ft)

NOTES:

1. Contours and existing features acquired from Otak, Inc.
2. Wetland boundaries flagged and field surveyed by Otak, Inc., to 0.1-foot accuracy.
3. Features shown to scale (1"=60') when printed on 11in x 17in page size.

1 in = 60 ft





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- | | | |
|-----------------------|------------------------|-------------------------------------------------|
| Project Site Boundary | Off-site Stream | Good Vegetated Corridor (60,554 sq ft) |
| Study Area Boundary | Stream | Marginal Vegetated Corridor (6,715 sq ft) |
| Road | Vegetated Corridor | Degraded Vegetated Corridor (137,653 sq ft) |
| 2-ft Contour | On-site Sensitive Area | Off-site Good Vegetated Corridor (32,661 sq ft) |
| Existing Feature | Stream | |
| Vegetated Corridor | Delineated Wetland | |
| Data Plot | Vegetated Corridor | |
| Vegetated Corridor | | |
| Photo Point | | |

NOTES:
 1. Contours and existing features acquired from Otak, Inc.
 2. Wetland boundaries flagged and field surveyed by Otak, Inc., to 0.1-foot accuracy.
 3. Features shown to scale (1"=60') when printed on 11in x 17in page size.

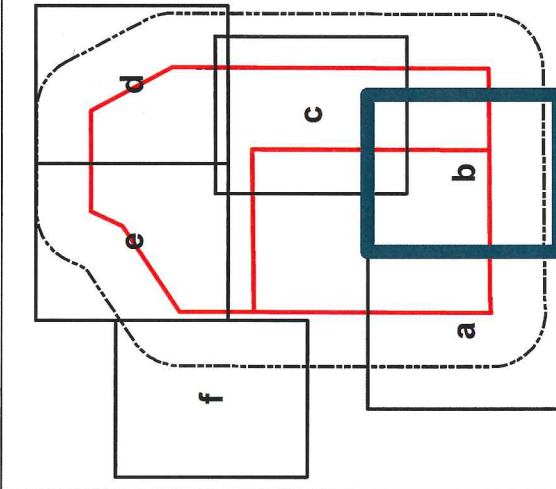
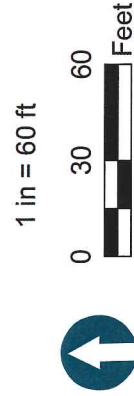


Figure 6b
 Existing Conditions Map
 Natural Resource Assessment (Bellairs and Lolich Properties)
 West Hills Land Development: The Ridge at South Coon Mountain



Project Site Boundary On-site Sensitive Area Good Vegetated Corridor (60,554 sq ft)
 Study Area Boundary Delineated Wetland Degraded Vegetated Corridor (137,653 sq ft)
 Road Vegetated Corridor

2-ft Contour
 Existing Feature
 Vegetated Corridor
 Data Plot
 Vegetated Corridor
 Photo Point

NOTES:
 1. Contours and existing features acquired from Otak, Inc.
 2. Wetland boundaries flagged and field surveyed by Otak, Inc., to 0.1-foot accuracy.
 3. Features shown to scale (1"=60') when printed on 11in x 17in page size.

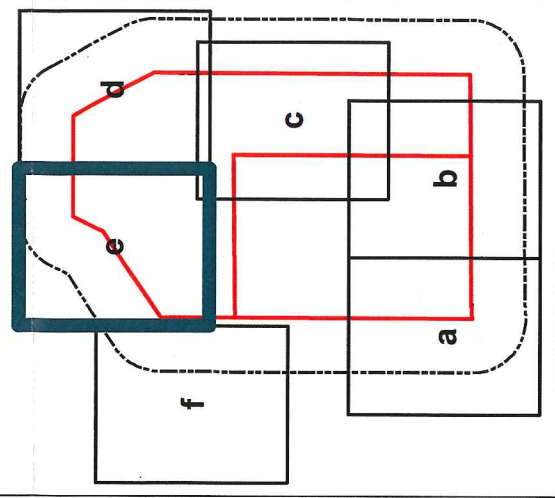
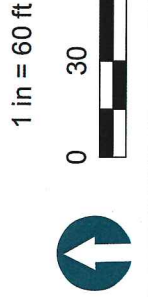
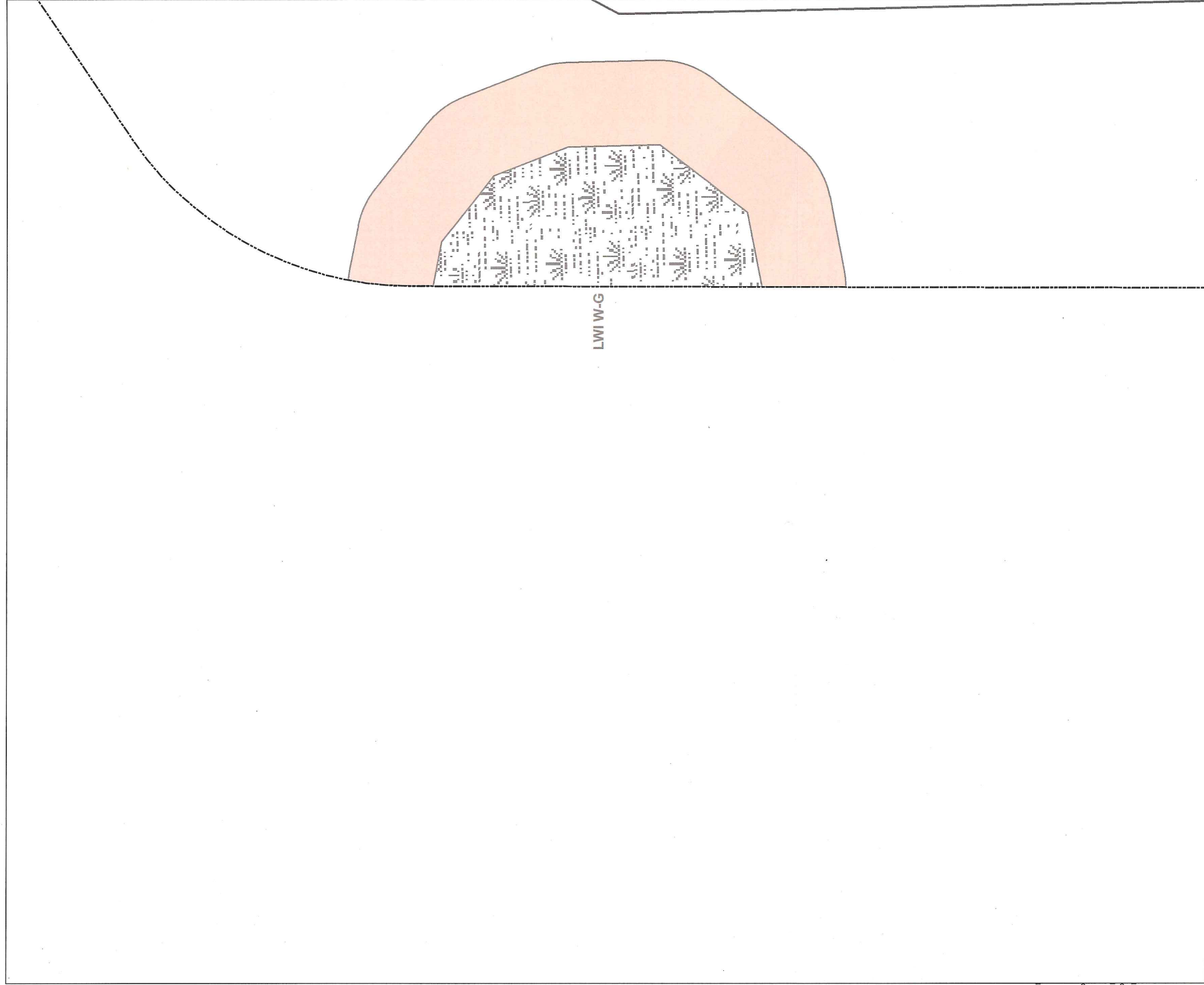
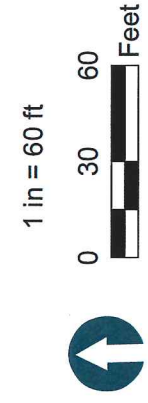
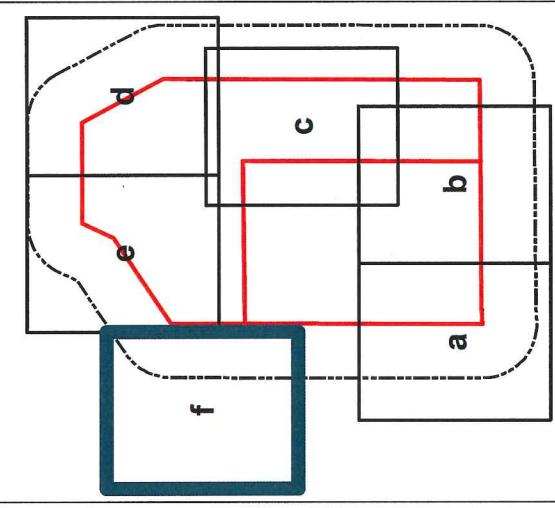


Figure 6e
 Existing Conditions Map
 Natural Resource Assessment (Bellairs and Lolich Properties)
 West Hills Land Development: The Ridge at South Cooper Mountain



Study Area Boundary
 Road
 Off-site Sensitive Area
 Wetland
 Vegetated Corridor
 Off-site Degraded Vegetated Corridor (108,180 sq ft)



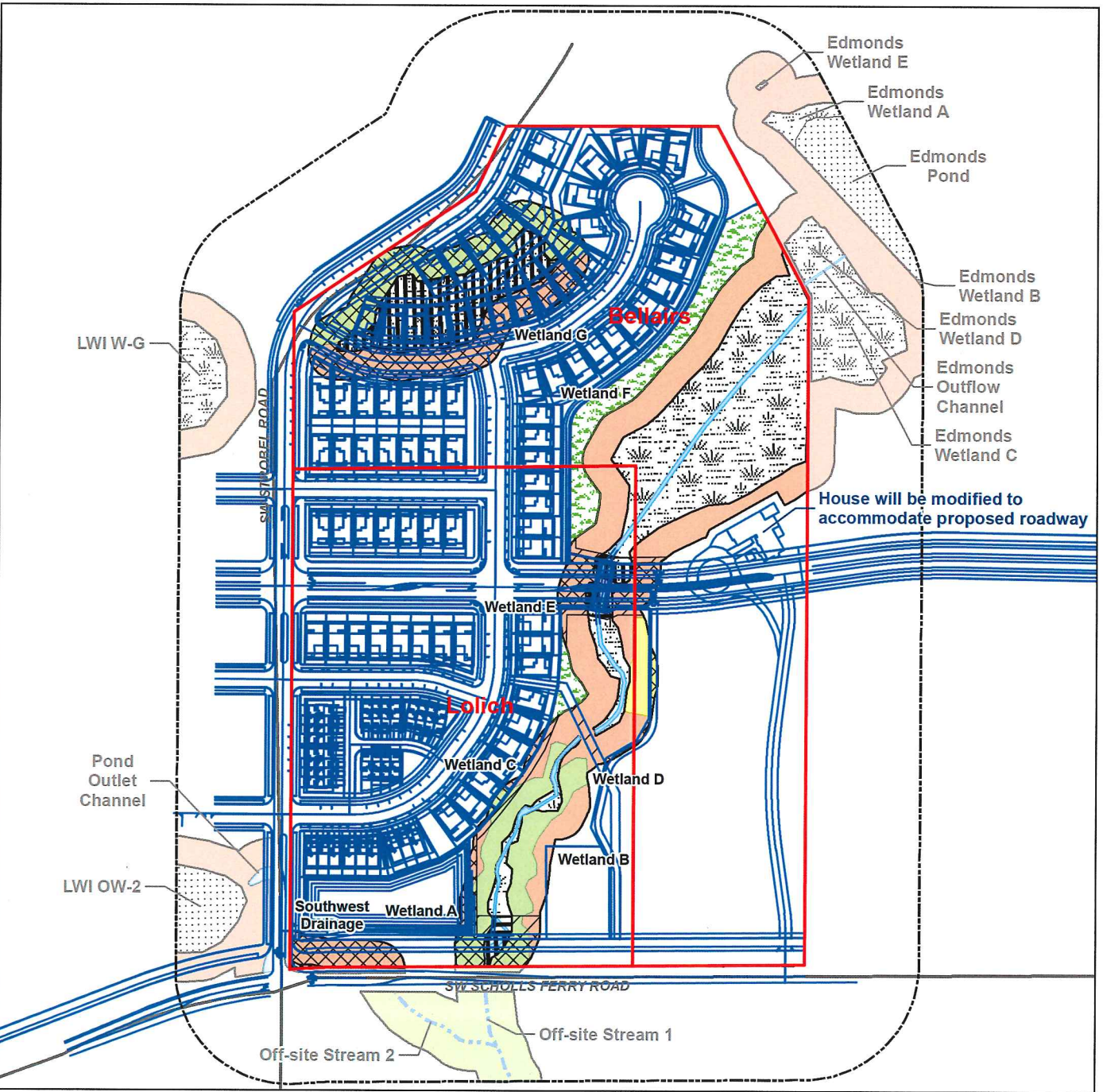
NOTES:
 1. Contours and existing features acquired from Otak, Inc.
 2. Wetland boundaries flagged and field surveyed by Otak, Inc., to 0.1-foot accuracy.
 3. Features shown to scale (1"=60') when printed on 11in x 17in page size.

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Figure 6f
 Existing Conditions Map
 Natural Resource Assessment (Bellairs and Lolic Properties)
 West Hills Land Development: The Ridge at South Co Mountain

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| | | | | |
|---------------------------------------------------------------------------------------|-----------------------------------------|---------------------------------|--------------------------------|-------------------------------|
| Project Site Boundary | VC Permanent Impact (91,945 sq ft) | Good VC (60,554 sq ft) | Off-site Sensitive Area | On-site Sensitive Area |
| Study Area Boundary | VC Temporary Impact (9,177 sq ft) | Marginal VC (6,715 sq ft) | Stream | Stream |
| Road | Wetland Permanent Impact (38,964 sq ft) | Degraded VC (137,653 sq ft) | Drainage | Drainage |
| Proposed Site Plan | Wetland Temporary Impact (2,151 sq ft) | Off-site Good VC (32,661 sq ft) | Wetland | Delineated Wetland |
| Proposed Mitigation (30,565 sq ft) | Off-site Degraded VC (108,180 sq ft) | Off-site Good VC (32,661 sq ft) | Pond | VC |
| NOTES: | | | VC | VC |
| 1. Wetland boundaries flagged and field surveyed by Otak, Inc., to 0.1-foot accuracy. | | | | 0 100 200 |
| 2. Proposed site plan acquired from Otak, Inc. | | | | Feet |
| 3. VC = Vegetated Corridor | | | | |



Figure 7
 Proposed Development Overview Map
 Natural Resource Assessment (Bellairs and Lolich Properties)
 West Hills Land Development: The Ridge at South Cooper Mountain

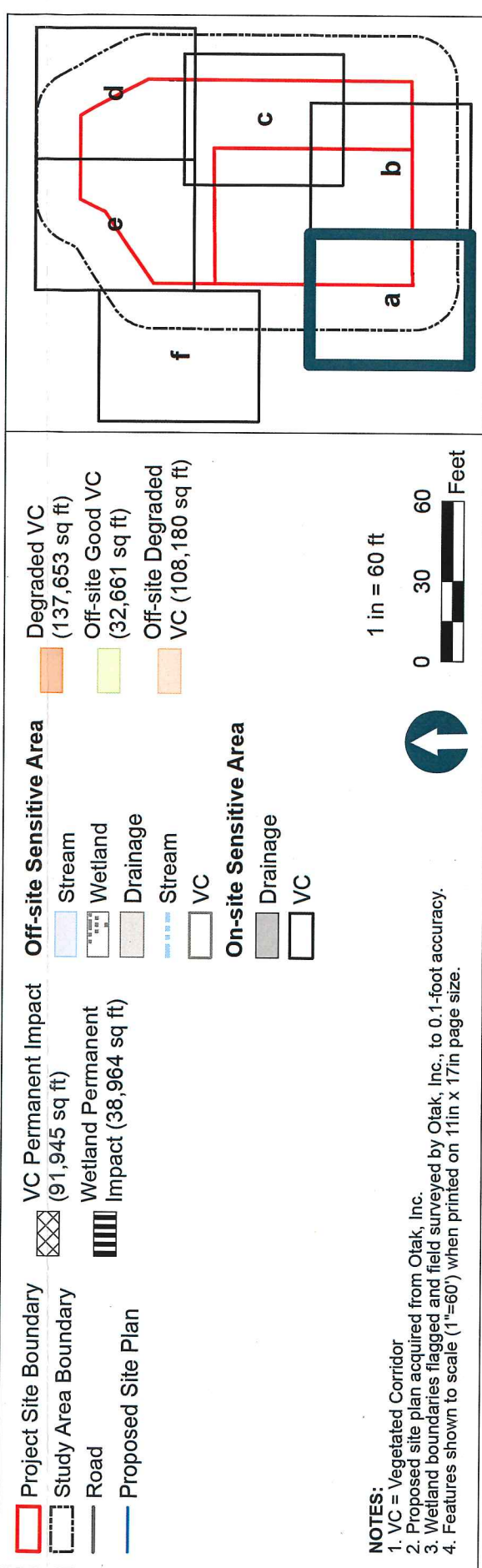
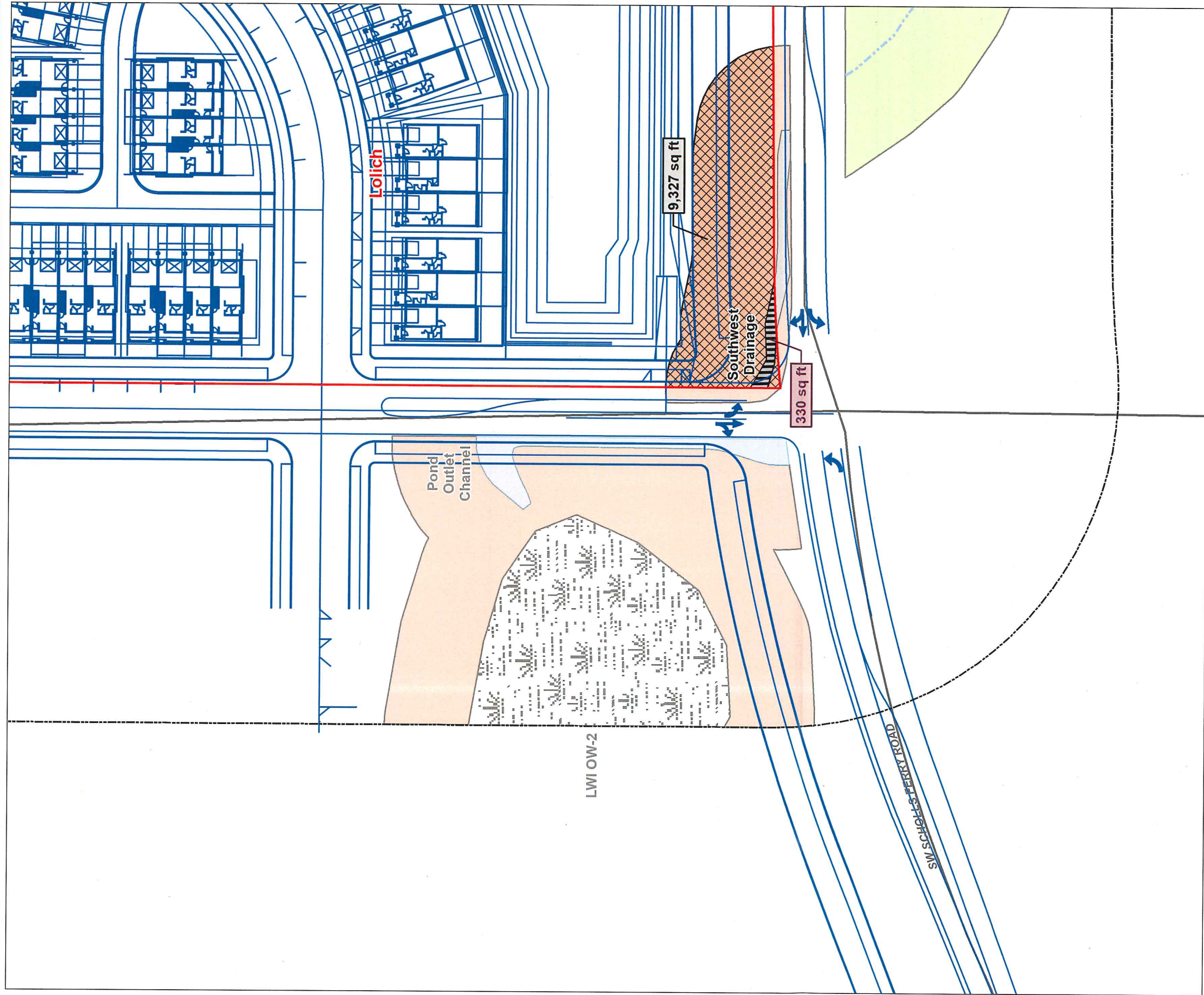
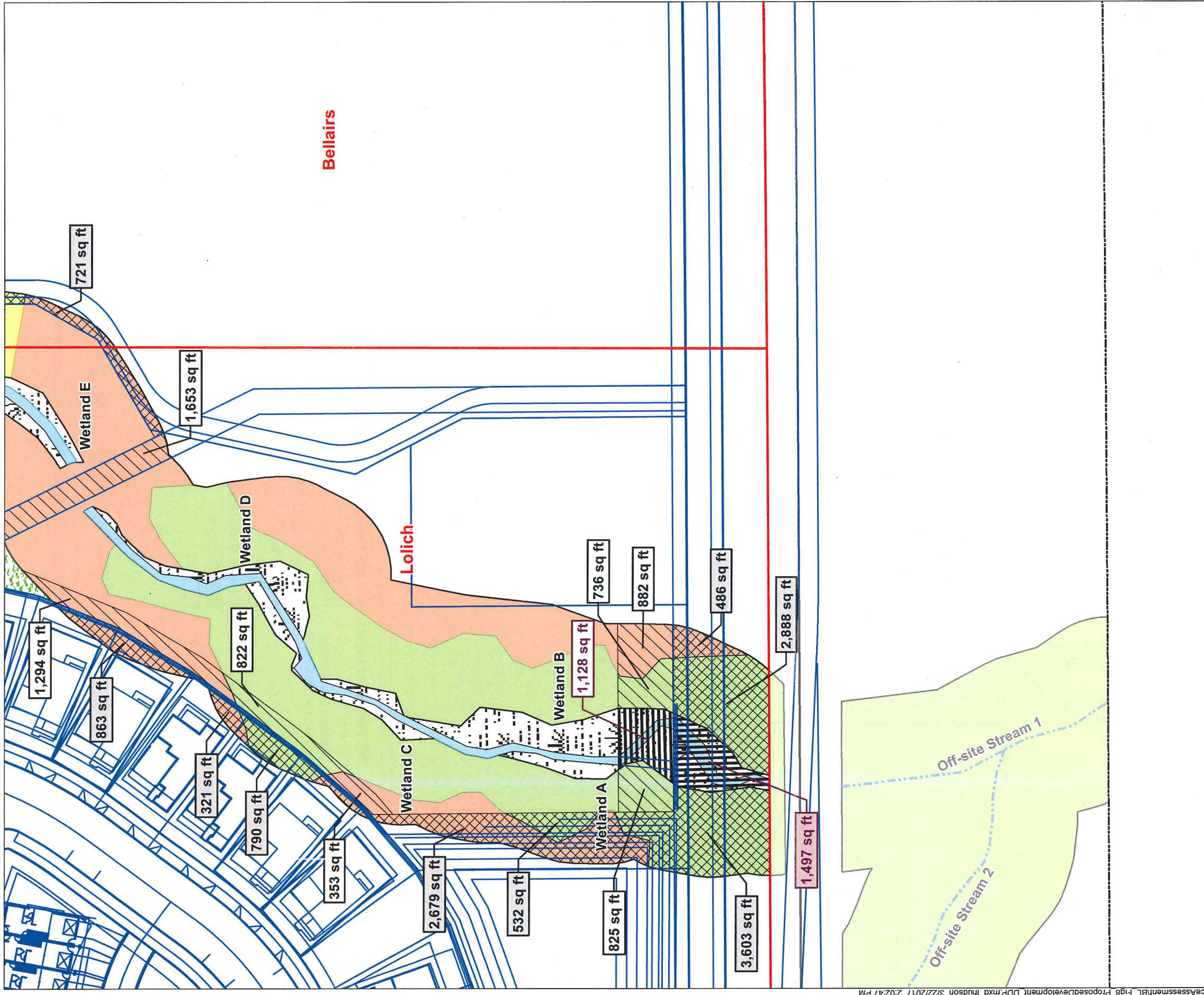


Figure 8a
Proposed Development Map
Natural Resource Assessment (Bellairs and Lolich Properties)
West Hills Land Development: The Ridge at South Cooper Mountain

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Project Site Boundary (Red outline)
Study Area Boundary (Dashed blue outline)
Road (Black line)
Proposed Site Plan (Blue lines)

Proposed Mitigation (Green hatched)
 (30,565 sq ft)

VC Permanent Impact (Cross-hatched)
 (91,945 sq ft)

VC Temporary Impact (Diagonal hatched)
 (9,177 sq ft)

Wetland Permanent Impact (Vertical hatched)
 (38,964 sq ft)

Wetland Temporary Impact (Horizontal hatched)
 (2,151 sq ft)

Off-site Sensitive Area
 Stream (Blue dashed line)
 VC (White box)

On-site Sensitive Area
 Stream (Blue solid line)
 Delineated Wetland (Black hatched)
 VC (White box)

Good VC (Light green)
 (60,554 sq ft)

Marginal VC (Yellow)
 (6,715 sq ft)

Degraded VC (Orange)
 (137,653 sq ft)

Off-site Good VC (Light green)
 (32,661 sq ft)

Legend:
 1 in = 60 ft
 0 30 60 Feet

NOTES:
 1. VC = Vegetated Corridor
 2. Proposed site plan acquired from Otak, Inc.
 3. Wetland boundaries flagged and field surveyed by Otak, Inc., to 0.1-foot accuracy.
 4. Features shown to scale (1"=60') when printed on 11in x 17in page size.

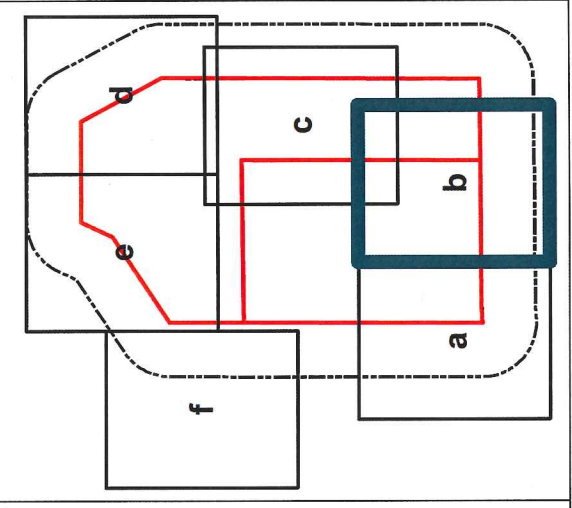
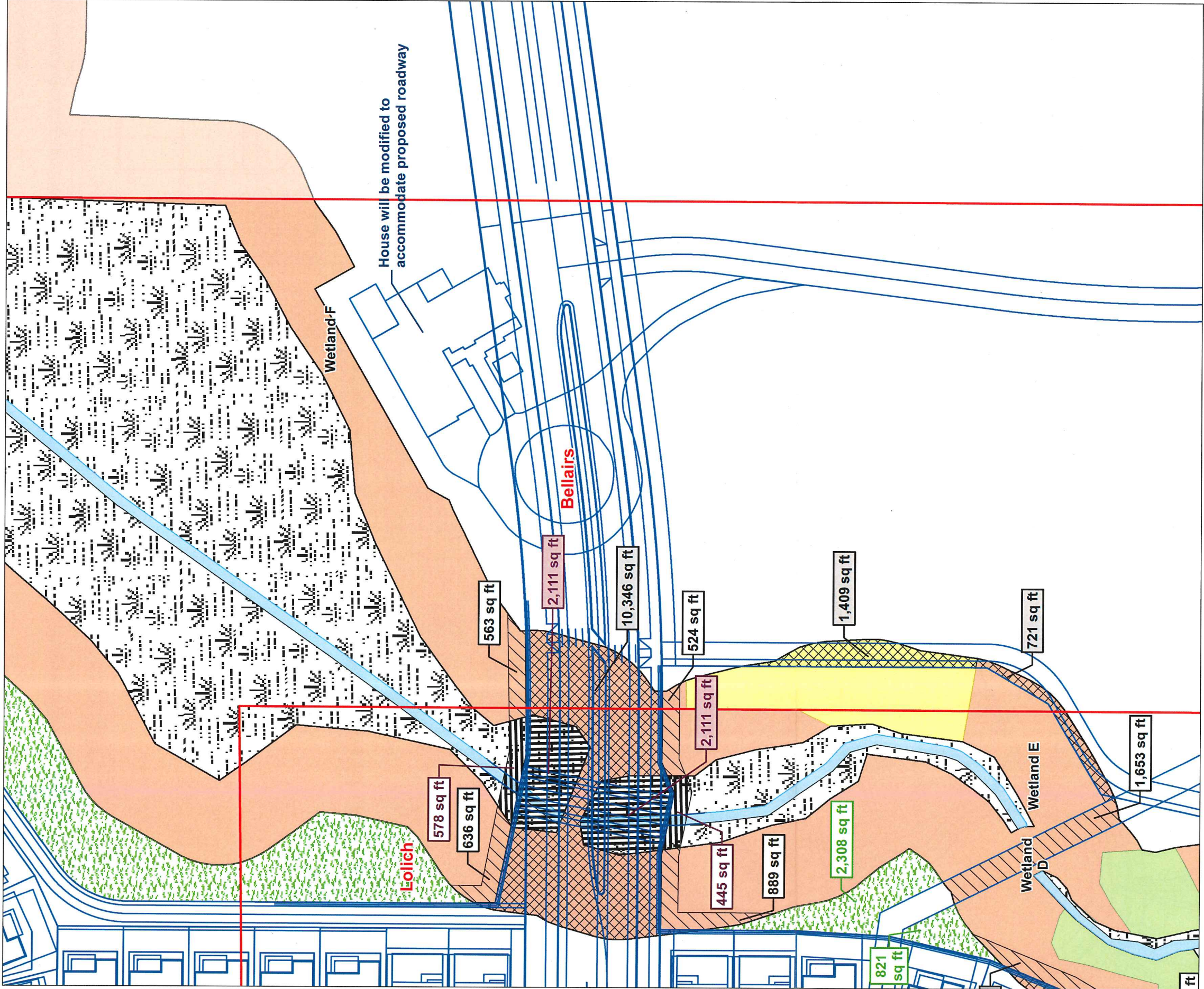


Figure 8b
 Proposed Development Map
 Natural Resource Assessment (Bellairs and Lolich Properties)
 West Hills Land Development: The Ridge at South Coc Mountain



House will be modified to accommodate proposed roadway

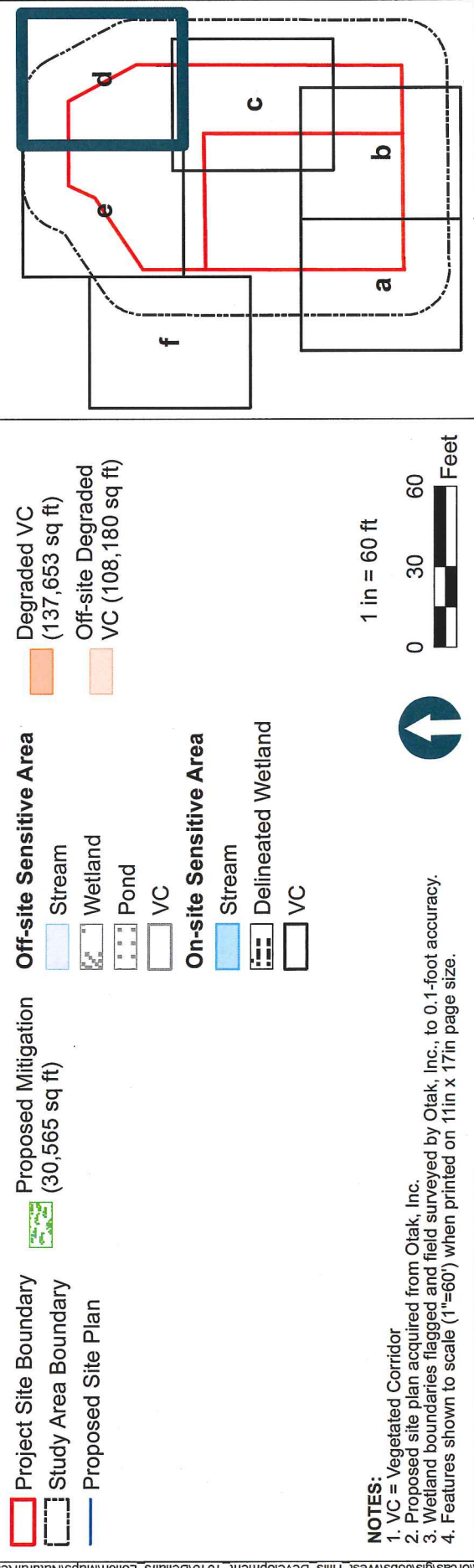
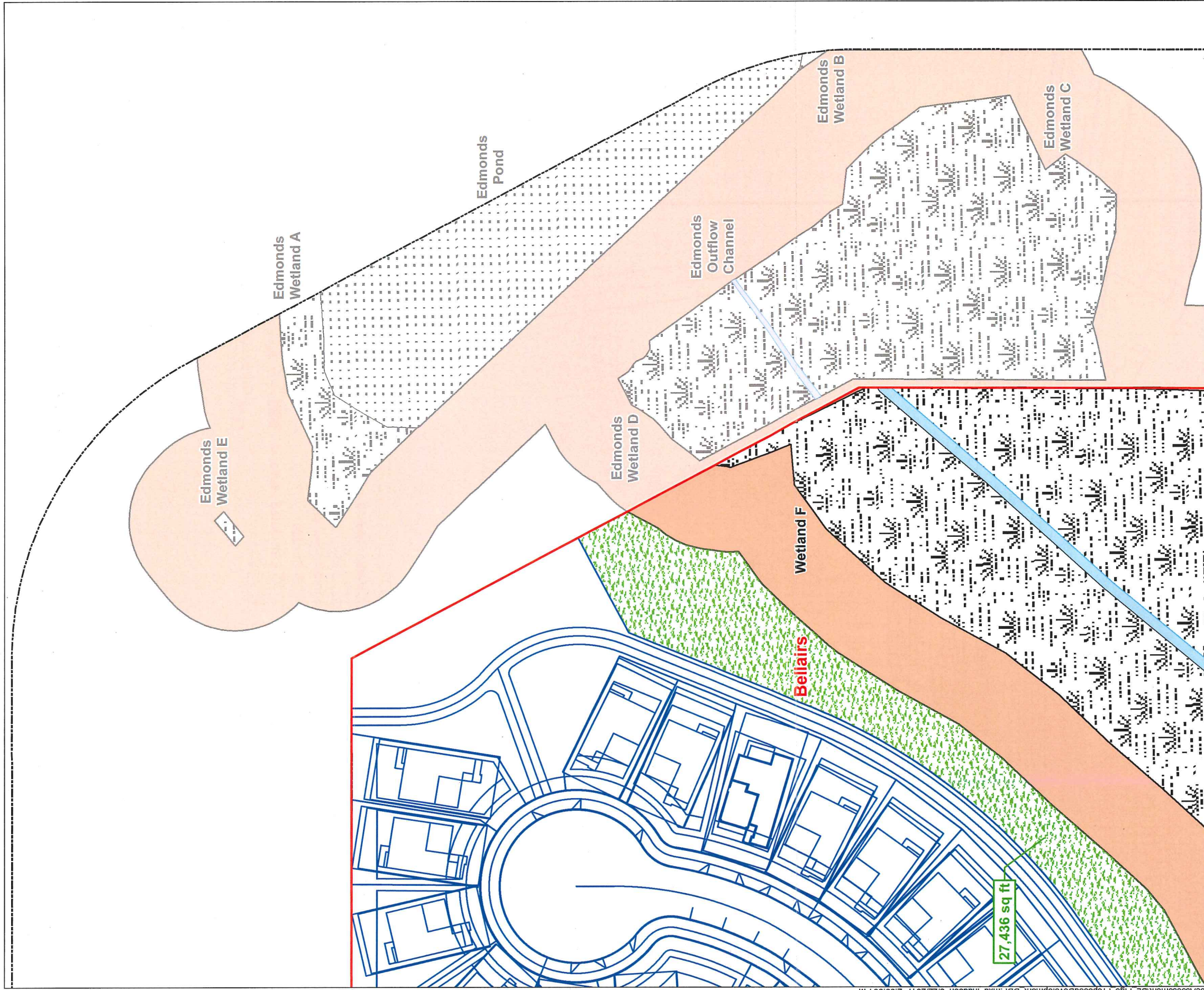
| | | |
|-----------------------|-----------------------------------------|--------------------------------------|
| Project Site Boundary | Proposed Mitigation (30,565 sq ft) | Good VC (60,554 sq ft) |
| Study Area Boundary | VC Permanent Impact (91,945 sq ft) | Marginal VC (6,715 sq ft) |
| Proposed Site Plan | VC Temporary Impact (9,177 sq ft) | Degraded VC (137,653 sq ft) |
| | Wetland Permanent Impact (38,964 sq ft) | Off-site Degraded VC (108,180 sq ft) |
| | Wetland Temporary Impact (2,151 sq ft) | |
| | Off-site Sensitive Area VC | |
| | On-site Sensitive Area Stream | |
| | Delineated Wetland VC | |

1 in = 60 ft
0 30 60 Feet

NOTES:
 1. VC = Vegetated Corridor
 2. Proposed site plan acquired from Otak, Inc.
 3. Wetland boundaries flagged and field surveyed by Otak, Inc., to 0.1-foot accuracy.
 4. Features shown to scale (1"=60') when printed on 11in x 17in page size.



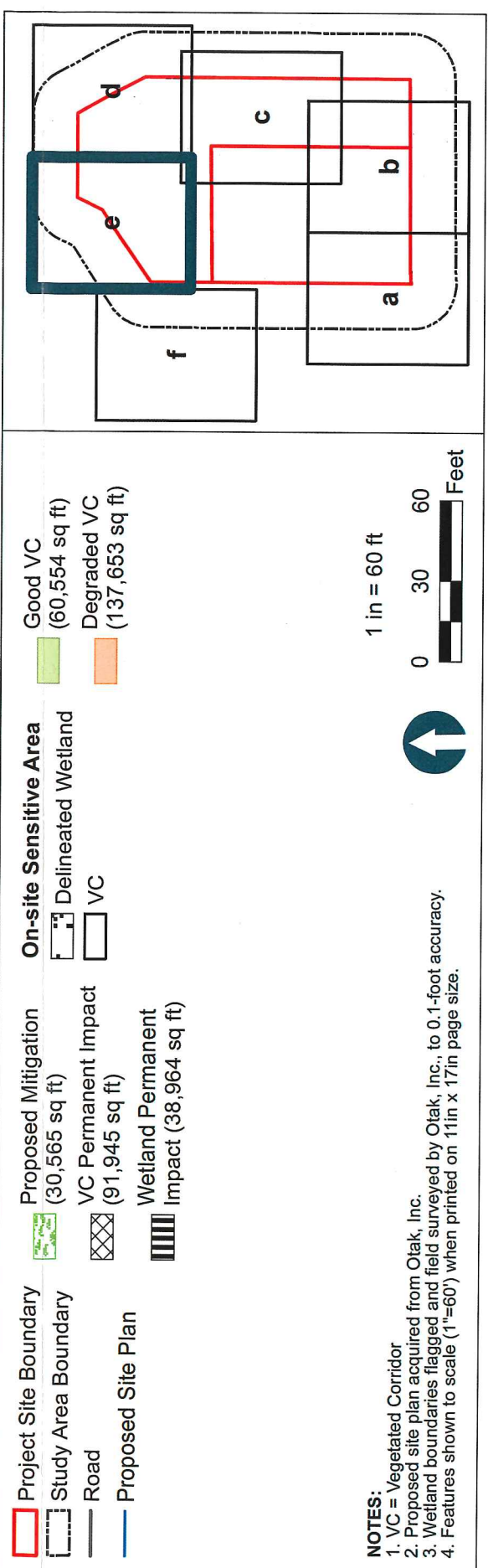
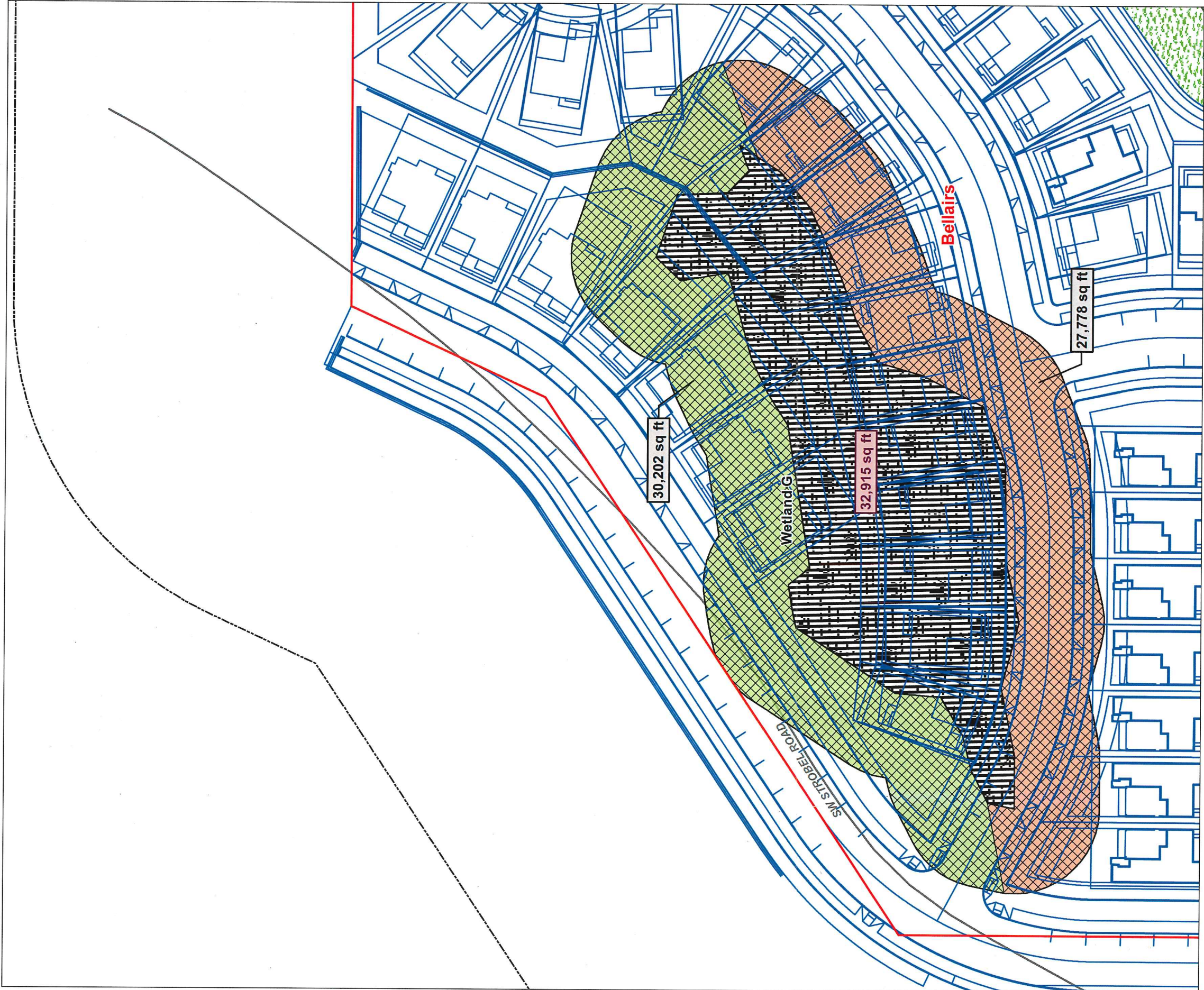
Figure 8c
 Proposed Development Map
 Natural Resource Assessment (Bellairs and Lolich Properties)
 West Hills Land Development: The Ridge at South Cooper Mountain



NOTES:
 1. VC = Vegetated Corridor
 2. Proposed site plan acquired from Otak, Inc.
 3. Wetland boundaries flagged and field surveyed by Otak, Inc., to 0.1-foot accuracy.
 4. Features shown to scale (1"=60') when printed on 11in x 17in page size.

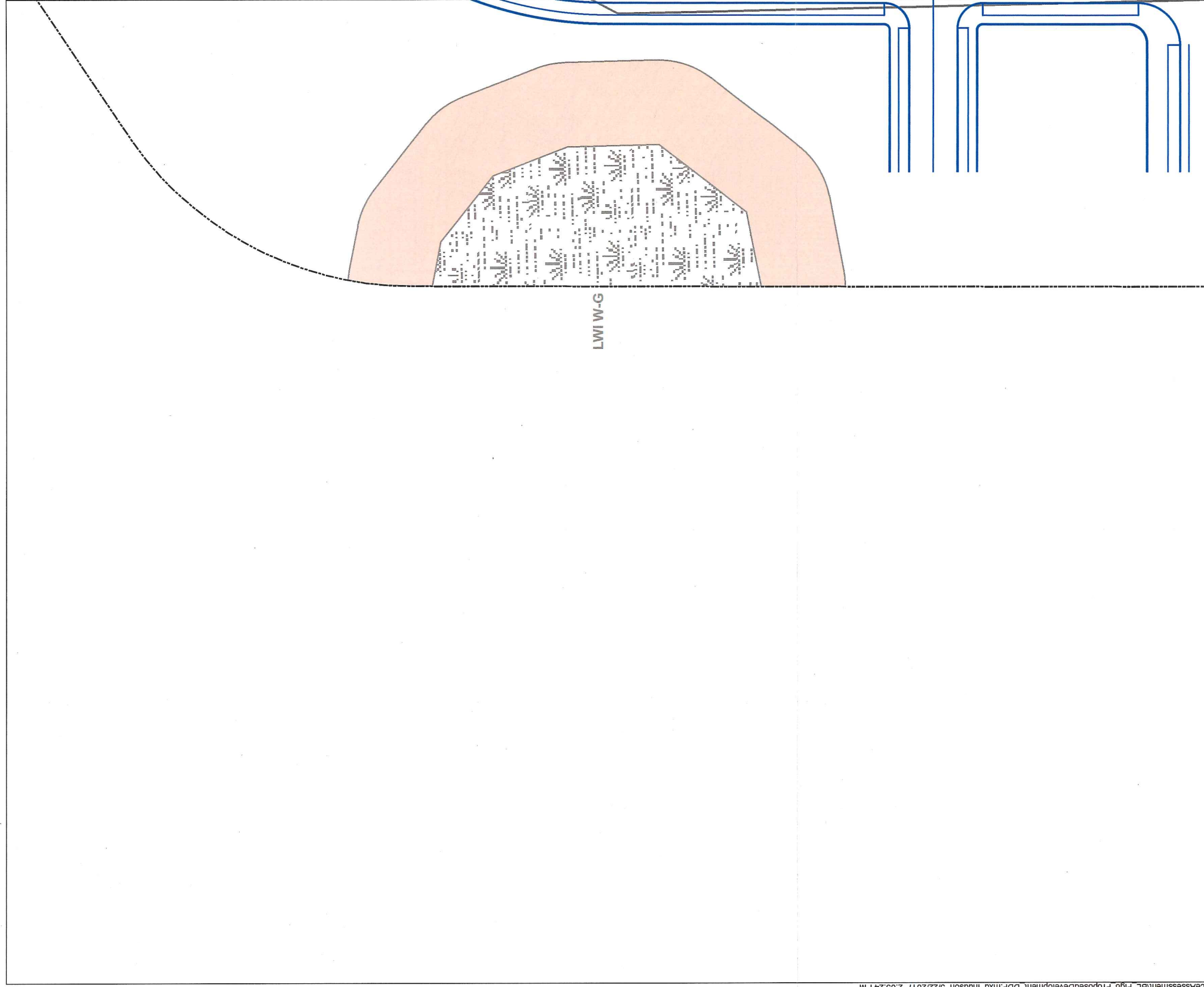


Figure 8d
 Proposed Development Map
 Natural Resource Assessment (Bellairs and Lolich Properties)
 West Hills Land Development: The Ridge at South Coo Mountain



NOTES:
 1. VC = Vegetated Corridor
 2. Proposed site plan acquired from Otak, Inc.
 3. Wetland boundaries flagged and field surveyed by Otak, Inc., to 0.1-foot accuracy.
 4. Features shown to scale (1"=60") when printed on 11in x 17in page size.

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Study Area Boundary
 Road
 Proposed Site Plan

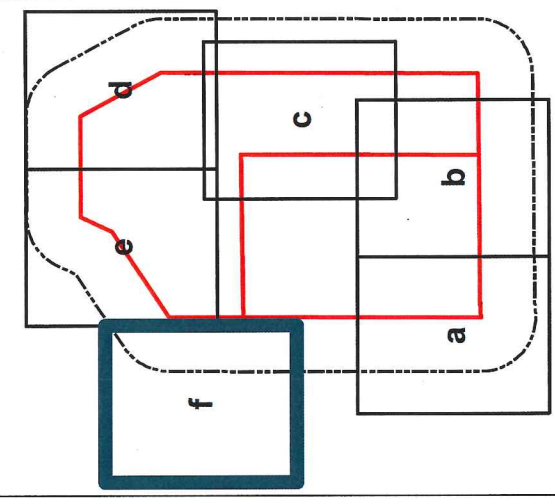
Off-site Sensitive Area
 Wetland
 VC

Off-site Degraded VC (108,180 sq ft)

NOTES:

1. VC = Vegetated Corridor
2. Proposed site plan acquired from Otak, Inc.
3. Wetland boundaries flagged and field surveyed by Otak, Inc., to 0.1-foot accuracy.
4. Features shown to scale (1"=60') when printed on 11in x 17in page size.

1 in = 60 ft



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Figure 8f
 Proposed Development Map
 Natural Resource Assessment (Bellairs and Lolich Properties)
 West Hills Land Development: The Ridge at South Coc Mountain