



# **SWCA Wetlands and Waters Memo**

## TECHNICAL MEMORANDUM

**Date:** May 19, 2009  
**To:** Kathleen Dixon, E&E; Bill Richards, E&E  
**Cc:** Nicole Hughes, RES America Developments, Inc.  
Stephanie Butler, SWCA  
**From:** Stacy Benjamin, Senior Wetland Ecologist and Jesse Wilson, Wetland Scientist  
**Subject:** Lower Snake River Wind Energy Project, Garfield & Columbia Counties  
Wetlands and Waters Determination

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### SUMMARY

The Portland Office of SWCA Environmental Consultants (SWCA) was contracted by RES America Developments, Inc. to delineate wetlands and waters for the Lower Snake River Wind Energy Project in Columbia County and Garfield County, Washington. This memorandum summarizes the results of the initial wetlands and waters determination for Columbia and Garfield Counties. Wetlands and waters delineation field work has occurred throughout the project site and includes documentation of spring wetland hydrology. Field work will continue through the summer of 2009, during which the remainder of the wetland and water features will be mapped. Wetland delineation reports will be prepared for Columbia and Garfield Counties during the summer of 2009 to meet the Washington State Department of Ecology (Ecology) and the U.S. Army Corps of Engineers (Corps) Seattle District wetlands and waters delineation requirements.

Drainage features in the permitting buffers or in close proximity to the permitting buffers were mapped throughout the project site. The majority of the drainage features, with the exception of those features with associated wetlands, were dry during the October, November and December 2008 site visits. Additional site visits were conducted in February and May 2009 during which evidence of recent flow was observed in several of the drainage features. Drainage features were mapped if they displayed a defined bed and bank and/or any indicators of surface flow. The mapped drainage features are likely regulated by the Corps, Washington Department of Fish and Wildlife (WDFW) and the Columbia County Critical Areas Ordinance (CCAO) or the Garfield County Critical Areas Ordinance (GCAO). Several wetland areas were identified in the project site. The majority of the wetlands areas are associated with relatively permanent waters and will likely be regulated by the Corps and Ecology. Preliminary wetland ratings were conducted to determine the potential buffers that will be required under the CCAO and GCAO.

### SITE DESCRIPTION

The Garfield County portion of the project consists of three project areas: Oliphant Ridge west of Pomeroy and south of Highway 12, Kuhl Ridge west of Pomeroy and north of Highway 12, and Dutch Flats south of Pomeroy. The Columbia County portion of the project consists of two project areas: Oliphant Ridge west of Pomeroy and south and west of Highway 12 and Tucannon north of Dayton and east of Highway 12. Prominent geographic features in the project vicinity include the Blue Mountains to the south and the Snake River to the north. The project site is primarily located along the tops of ridges; however, there are several

areas along lower lying streams and access roads that are included in the study area. Site elevations range from 1,000 feet above sea level along Tucannon Creek in the eastern portion of the project site to 3,100 feet above sea level in the southern portion of the Dutch Flats project. The site generally consists of gently rolling ridgetops with ephemeral streams occurring in valleys with steep hillsides that flow to broader valleys with more permanent waters. The primary land use is dryland wheat farming with some Conservation Reserve Program areas and open range land with limited cattle ranching. A few residential homes and farm buildings exist within and in the vicinity of the project site. Several gravel and dirt farm access roads cross through the site. Highway 12 crosses through the central portion of the study area and is the largest transportation corridor in the vicinity.

## METHODOLOGY

The methodology used for determining the presence of wetlands and delineating wetland boundaries was the routine wetland determination methodology and plant community approach of the 1987 Corps of Engineers Wetlands Delineation Manual and the Arid West Regional Supplement to the Corps Manual. SWCA will prepare a wetland and water delineation report that meets the requirements of the Washington State Wetlands Identification and Delineation Manual (Ecology 1997) per WAC 173-22-080 as well as the Corps Wetland Delineation Manual and Arid West Regional Supplement. Initial determinations of wetland and water jurisdictional status will be made for confirmation by the U.S. Army Corps of Engineers Seattle District. Delineated wetland boundaries are subject to verification and approval by the Corps and Ecology. The site is located in the Columbia/Snake River Plateau Land Resource Region (LRR B).

The study area for the wetland and waters determination consisted of the permitting buffers provided by RES in October and November 2008 and April 2009 which contain the proposed turbine strings and associated infrastructure. Areas near the edge of the permitting buffers were also examined if they were determined to have the potential to contain wetlands or waters based on our review of background information. The field investigation focused on areas with USGS and National Wetlands Inventory (NWI) mapped streams or wetlands, mapped hydric soils, and areas determined to have the potential to contain wetlands or waters based on aerial photograph interpretation.

Areas containing mapped USGS streams, NWI features or mapped hydric soils were the highest priority for field verification and documentation. After the initial review of high priority sites, areas that appeared to contain features based on aerial photograph interpretation or other background information were visited. The majority of high priority sites have been visited in the field to date, and site conditions have been documented for each feature type in each project area.

The wetland and waters determination fieldwork was conducted on October 27-31, November 17-21, December 10-13, 2008 and February 4 - 11 and May 3 – 8, 2009. The RES permitting buffers were located in the field using a Trimble GPS unit. Soils, vegetation and indicators of hydrology were recorded at sample plot locations to document site conditions. Sample plot locations, wetland boundaries, the centerline of smaller ephemeral or intermittent drainages, and Ordinary High Water (OHW) of larger more permanent streams were GPS surveyed by SWCA using a GeoExplorer XT Mapping Grade GPS unit, capable of accuracy of one meter or less with wide-area augmentation system activated.

Wetland determination data sheets are not included in this memo and will be included in the wetlands and waters delineation report. Representative site photographs are included in Attachment A.

## RESULTS

### Waters

Several streams and drainage features were identified and mapped in or in close proximity to the permitting buffers. The features have been grouped into similar feature types and are described below. All of the delineated drainages and stream segments displayed a defined bed and bank and/or defined channel. Observations have been made throughout the project area for each type of drainage feature. These observations as well as maps of the features found within the permitting buffers will be provided in the Columbia and Garfield County Wetlands and Waters Delineation Reports.

#### Grassed Drainages

Grassed drainages are characterized as a natural swale or constructed waterway, usually broad and shallow, covered with grasses, which conduct surface water from or through cropland. Swales are often 5 to 10 feet wide and dominated by upland grasses. Swales are discontinuous and usually crossed by farm roads. Defined channels are not present within swales except in occasional small discontinuous and discrete sections. The centerline was mapped for these features, which are likely not jurisdictional by state or federal agencies.

#### Erosional Features

Erosional features are characterized as natural features, formed by flows associated with large precipitation events. No defined bed and bank or channel are present, and there is no evidence of recent flow. Ephemeral gullies are also included in this feature type and consist of small channels eroded by concentrated flow that can be easily filled by normal tillage, only to reform again in subsequent years in the same location as a result of storm events. These features are often associated with manmade drainage features such as berms in farmed fields. These features were documented at observation points and were not mapped. These features are likely not jurisdictional by state or federal agencies.

#### Ephemeral Drainages

The majority of the streams and drainage features within the project site are ephemeral drainages. Ephemeral drainages have short duration flow in response to large precipitation events. These drainages have a defined bed and bank and/or defined channel, with or without evidence of recent flow, and appear to be connected to downstream waters through surface channels. The centerline was mapped for features less than 3 feet wide and OHW was mapped on features greater than 3 feet wide. These features may be jurisdictional by the Corps, and a state HPA may be required for fill within OHW.

DNR Stream Type Ns

Columbia & Garfield County Type 4 and 5

#### Intermittent Drainages

Intermittent drainages are typically associated with upstream springs and have longer duration flow than ephemeral drainages (continuous flow at least seasonally). These streams do not provide fish habitat and typically go dry at some portion of the year. The centerline was mapped for features less than 3 feet wide and OHW was mapped on features greater than 3 feet wide. These features may be jurisdictional by the Corps, and a state HPA is likely required for fill within OHW.

DNR Stream Type Ns

Columbia & Garfield County Type 4 and 5

Perennial Drainages (Non-Fish Bearing)

Perennial streams have a defined bed and bank with flow present throughout the year during years of normal precipitation. These are non-fish habitat streams due to downstream blockages or limited seasonal flow. These features are jurisdictional by the Corps, and a state HPA is required for fill within OHW.

DNR Stream Type Np

Columbia & Garfield County Type 3

Perennial Drainages (Fish Bearing)

Perennial streams have a defined bed and bank with flow present throughout the year during years of normal precipitation. These are fish bearing streams that are wider than the non-fish bearing streams and tend to occur in lower landscape positions. Riverine wetlands were found to occur along portions of these streams outside of the defined bed and bank of the stream channels but within the OHW line. Riverine wetlands occurring outside of the OHW line were mapped as associated wetlands. These features are jurisdictional by the Corps, and a state HPA is required for fill within OHW.

DNR Stream Type F and S

Columbia & Garfield County Type 1, 2 and 3

The majority of the drainage features delineated within the project site consist of ephemeral drainages. These drainages range in size from channels less than a foot in width to gulches averaging 10 feet in width. These ephemeral drainages are often connected downstream to intermittent and perennial features. Many of the ephemeral drainages were dry during the site visits, however, recent indicators of flow and/or areas of flow were observed in portions of the ephemeral drainage features during the spring 2009 site visits. The intermittent streams were dry during the fall 2008 site visits with flow present during the late winter and spring 2009 site visits. Perennial features contained flow throughout the year within the defined bed and bank. OHW determinations were made on perennial features during OHW events observed during the late winter and spring 2009 site visits. The onsite perennial and intermittent drainages are likely to be considered by the Corps to be Relatively Permanent Waters (RPW) with perennial or seasonal flows which connect to a downstream Traditional Navigable Water (TNW), the Snake River. The Corps considers Relatively Permanent Waters to be jurisdictional. The ephemeral drainages are often connected to these features through surface flows and may be determined to have a significant nexus to the downstream TNW and therefore may be considered jurisdictional waters.

The Washington Department of Natural Resources (DNR) Water Type Maps were referenced and used as a basis for the water type classifications where applicable. Streams are classified by DNR as Type S (shoreline), F (fish bearing), Np (non-fish, perennial), and Ns (non-fish, seasonal) in accordance with DNR's newer water typing system WAC 222-16-031. The few named perennial streams located within the project site are typically mapped by DNR as Type S and F streams. The remainder of the DNR mapping consists of Type U (unknown) streams that have not yet been classified by DNR.

The onsite drainage features are grouped according to mapping designations provided by DNR, when available, or a visual analysis of the stream type. The stream types and associated stream buffers outlined in the CCAO and GCAO have been provided in the table below for project planning purposes. It is recommended that impacts to the stream buffers be avoided or minimized where possible.

Table 1. Stream Buffer Widths			
Stream Type	DNR Stream Type	Columbia County Buffer Width*	Garfield County Buffer Width*
Perennial (Fish-bearing) Shoreline of the State	Type S	250 feet (Type 1 and 2)	250 feet (Type 1 and 2)
Perennial (Fish-bearing)	Type F	200 feet (Type 3, 5 - 20 feet wide)	200 feet (Type 3, 5 - 20 feet wide)
Perennial (Non fish-bearing)	Type Np	150 feet (Type 3, > 5 feet wide)	150 feet (Type 3, > 5 feet wide)
Intermittent / Ephemeral (Non fish-bearing)	Type Ns	150 feet – Low mass wasting potential 200 feet – High mass wasting potential (Type 4 and 5)	150 feet (Type 4 and 5)

\*The CCAO and GCAO diverges from the DNR Water Typing System and utilizes channel width, not fish presence, to determine stream type and buffer requirements for perennial and fish bearing streams. The water typing presented in this column refers to the CCAO and GCAO and not the DNR Stream Type.

## Wetlands

Several wetland areas have been identified within or near the permitting buffers. The wetlands are typically associated with on-site drainages. The wetland boundaries were mapped using GPS and representative data plots and photographs were taken. Preliminary ratings of the delineated wetlands were conducted in accordance with the Washington State Wetland Rating System for Eastern Washington (Hruby 2004) to determine the buffers that would likely be required by CCAO and GCAO. The general characteristics of the wetland types and preliminary wetland ratings (expected to vary by wetland) are provided below.

### Riverine Wetlands Associated with Perennial Streams

This wetland type is associated with the larger perennial streams within the project area. A wetland fringe is common adjacent to (directly abutting) the defined bed and bank of these perennial streams; however, this wetland fringe is often within the OHW of the stream and therefore is not delineated unless the wetland extends outside of the OHW. These wetlands are typically dominated by wetland grasses, forbs and scattered trees and shrubs. Dominant herbaceous vegetation included reed canarygrass, giant goldenrod and poison hemlock with scattered willow, black cottonwood and black locust. These riverine wetland areas primarily receive hydrology from the adjacent stream and typically have low chroma soils with redoxomorphic features. The preliminary wetland ratings assessment determined that these types of wetlands within the project area will likely be rated as Category III wetlands.

### Riverine Wetlands Associated with Intermittent Streams

This wetland type is common downstream of spring areas located at the initiation of intermittent drainages. These wetlands often directly abut the bed and bank of intermittent drainages but are not within the OHW. These wetlands are typically dominated by a thick overstory of willow with reed canarygrass being the dominant herbaceous vegetation. A high groundwater table contributes to the hydrology of these wetland

areas, and the soils are typically low chroma with redoxomorphic features. The preliminary wetland ratings assessment determined that these types of wetlands will likely be rated as Category III or IV wetlands.

#### Spring Areas

Several spring areas were located at the initiation of various intermittent drainages. These spring areas were often dominated by cattail. Springs contribute to the hydrology within these wetland areas, and the soils are typically low chroma with redoxomorphic features. The preliminary wetland ratings assessment determined that these types of wetlands will likely be rated as Category III or IV wetlands.

#### Wetlands Associated with Modified Natural Drainages

This wetland type is comprised of wetlands that occur primarily in areas of historic natural drainages that have been modified by past land use. This wetland type includes slope and depressional wetlands with high groundwater and adjacent runoff providing hydrology. Soils within these wetlands vary but are typically low chroma with redoxomorphic features. These wetlands are typically dominated by herbaceous vegetation and the vegetation characteristics vary throughout the wetlands. The preliminary wetland ratings assessment determined that these types of wetlands will likely be rated as Category III or IV wetlands.

A preliminary assessment of Corps jurisdiction of delineated wetlands has also been conducted. The majority of the wetland areas would likely be determined to be jurisdictional due to their association with perennial or intermittent streams. A few wetland areas may not be within the Corps jurisdiction due to the isolation of the wetlands from adjacent waters; however, impacts to isolated wetland areas would still be regulated by Ecology.

The table below summarizes Ecology wetland rating categories and the associated CCAO and GCAO buffer requirements.

Table 2. Wetland Buffer Widths		
Wetland Rating Category	Columbia County Buffer High, Moderate, Low (intensity of land use)	Garfield County Buffer
Category I	300, 250, 200	200 foot minimum
Category II	200, 150, 100	100 foot minimum
Category III	100, 75, 50	50 foot minimum
Category IV	50, 35, 25	25 foot minimum

#### Uplands

The majority of the site consists of actively managed agricultural areas or grassland communities. The actively managed agricultural areas are dominated by cultivated dryland wheat. Many of the areas had recently been plowed and consisted of bare ground during many of the site visits. The grassland areas were dominated by common yarrow, crested wheat grass, bluebunch wheatgrass, brome, downy cheat grass, lupine, bluegrass, Russian thistle, tall tumbled mustard and vetch. A few small shrub areas were found within portions of the site mostly on steep hillsides and were dominated by snowberry and woods rose. A native eastside bunchgrass community was found in a few portions of the project site, primarily in areas where steep slopes occur and the land is not managed for agricultural use.

## CONCLUSION

Drainage features were identified and mapped in or in close proximity to the permitting buffers. Drainage features were delineated if they displayed a defined channel and/or defined bed and bank. Flow was observed during the fall 2009 site visits in the perennial drainages. Seasonal flow was observed in the intermittent drainages during the spring 2009 site visits. The majority of the ephemeral drainages were dry during all site visits; however, indicators of recent flow and small areas of flow in portions of the ephemeral drainages were observed during the spring 2009 site visits. The perennial and intermittent drainages are likely to be considered by the Corps to be Relatively Permanent Waters with perennial or seasonal flows which connect to a downstream Traditional Navigable Water, the Snake River. The Corps considers Relatively Permanent Waters to be jurisdictional. The ephemeral drainages are often connected to Relatively Permanent Waters through surface flow and may be determined to have a significant nexus to a TNW and therefore may be considered jurisdictional waters. Several wetland areas have been identified within the project area. The wetlands are primarily associated with perennial streams or spring areas at the initiation of intermittent streams. The Corps will likely determine the wetlands associated with jurisdictional waters to be jurisdictional. In addition, all waters and wetlands mapped within the study area meet the jurisdictional requirements of the Washington State Department of Ecology and are subject to the CCAO or GCAO.

## Minimization of Impacts

Project impacts to jurisdictional waters and wetlands have been minimized by siting the proposed turbine strings, associated infrastructure, and access roads along ridgetops and avoiding canyons wherever possible. We recommend the following project design and construction elements be incorporated into the project to further avoid and minimize impacts to jurisdictional waters and wetlands: 1) use of directional boring to install buried collection systems at jurisdictional stream crossings where practicable; 2) design access road crossings of streams to be perpendicular to the stream where practicable to minimize the length of new culvert; and 3) incorporate arch culverts into the design for new road crossings of streams.

## Permitting

To address work within 200 feet of project area waterways, a Joint Aquatic Resources Permit Application (JARPA) will be submitted to the state and federal permitting agencies. The JARPA is likely to include applications for the following:

- U.S. Army Corps of Engineers (Corps) Section 404 Wetland Permit
- Washington Department of Ecology 401 Water Quality Certification
- Washington Department of Fish and Wildlife Hydraulic Project Approval (HPA)
- Compliance with the Columbia County or Garfield County Critical Areas Ordinance

The project can likely be permitted under the Corps Nationwide Permit #12 (NWP #12) provided that the total project impacts do not result in the loss of greater than 1/2 acre of waters of the United States (including wetlands) and that the project adheres to the terms and conditions of the Nationwide Permit as well as the Regional Conditions for the Seattle District. The project will also need to comply with the State of Washington Section 401 Water Quality Certification general conditions issued by the Washington State Department of Ecology.



### **Mitigation**

The Corps preferred mitigation option at this time is purchase of wetland mitigation bank credits, followed by use of in-lieu fee programs, and then permittee conducted mitigation (on-site or off-site mitigation). According to the Corps Seattle District, there are no wetland mitigation banks or in-lieu fee programs available to meet the compensatory wetland mitigation requirements in Garfield or Columbia Counties. If the project results in wetland or water impacts to resources that are determined to be jurisdictional by the agencies, on-site mitigation will be the preferred method of mitigation. Wetland functions will be evaluated using Ecology's Washington State Wetland Rating System for Eastern Washington. Once proposed impact areas have been determined, stream and wetland functions to be impacted by the project will be evaluated and a mitigation plan will be designed to provide functional replacement for the proposed impacts. Opportunities for wetland and buffer mitigation exist along the larger perennial streams in the watershed. It is recommended that stream and wetland impacts that occur within the project area be mitigated for through restoration and enhancement activities along the larger perennial streams rather than having many smaller mitigation sites located adjacent to the impact sites. If properly sited, it is expected that wetland mitigation and riparian buffer enhancement can occur in quantities sufficient to compensate for impacts to upstream intermittent and ephemeral drainages and wetland areas.

## Lower Snake River Wind Energy Project Wetland and Waters Determination



Photo 1. View of typical ephemeral drainage from initiation point.



Photo 2. View of typical ephemeral drainage from road crossing.



## Lower Snake River Wind Energy Project Wetland and Waters Determination

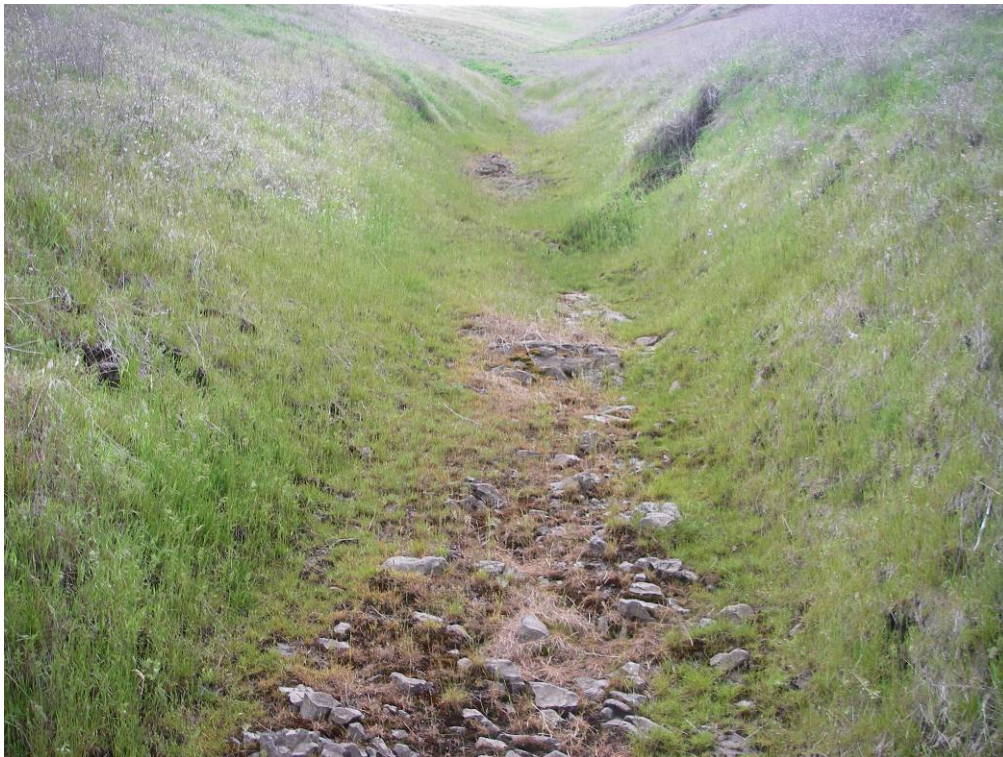


Photo 3. View of typical ephemeral drainage.



Photo 4. View of typical spring area at intermittent drainage initiation point.



## Lower Snake River Wind Energy Project Wetland and Waters Determination



Photo 5. View of typical intermittent drainage and associated wetland.



Photo 6. View of typical perennial drainage (Pataha Creek).



## Lower Snake River Wind Energy Project Wetland and Waters Determination



Photo 7. View of typical perennial drainage Ordinary High Water event (Pataha Creek).



Photo 8. View of typical Ordinary High Water event (Tucannon River).



## Lower Snake River Wind Energy Project Wetland and Waters Determination



Photo 9. View of typical Ordinary High Water event (Willow Creek).



Photo 10. View of typical farmed swale.



## Lower Snake River Wind Energy Project Wetland and Waters Determination



Photo 11. View of wetland occurring in a historically modified drainage.



Photo 12. View of typical spring-fed wetland.