

Chapter 3 — Affected Environment

In this Chapter:

- Existing natural environment
- Existing human environment
- Protected resources

This chapter describes the existing environment that may be affected by the alternatives. Each section describes a specific resource. The natural environment is discussed first, then the human environment.

Segments A through F, described in Chapter 2, *Alternatives*, and shown on Map 2, *Alternatives*, are used in most, but not all, of the resource discussions to help describe the existing environment.

3.1 Water Resources

3.1.1 Precipitation

Weather patterns in central Washington vary greatly with topography. Most of the study area is in the rain shadow of the Cascades, which results in a semiarid climate. Most precipitation in the study area falls as rain, with as little as 7 to 8 inches of precipitation per year at lower elevations. The amount of sediment in streams varies seasonally, and streams and rivers carry the most sediment when rain or snowmelts occur. Occasional intense summer rains also raise flows and the amount of sediment in rivers and streams.

3.1.2 Watersheds

River basins crossed by the project are the Central Columbia and Yakima. Within these basins the streams crossed by the line segments, including the fiber line from Vantage to Columbia, fall into six watersheds: the Lower Yakima, Upper-Columbia-Priest Rapids, Lower Crab, Upper Yakima, Upper Columbia-Entiat, and Moses Coulee. Some of the **perennial streams** crossed include Lower Crab Creek, Naneum Creek, and Wilson Creek, in addition to the Columbia River. (See Map 4, *Water Resources*.) Many smaller perennial and **intermittent stream** drainages and irrigation ditches may also be crossed. Table 3.1-1, *Potential Stream/Lake Crossings*, and Table 3.1-2, *Potential Stream/Lake Crossings Midway to Columbia Fiber Optic Route*, shows the stream crossings for each line segment and the associated watersheds.

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A **perennial stream** flows throughout the year.

An **intermittent stream** flows only seasonally.

**Table 3.1-1
Potential Stream/Lake Crossings**

		Watershed				
		Lower Crab	Lower Yakima	Upper Yakima	Upper Columbia Priest Rapids	Upper Columbia Entiat
Perennial Stream Crossing	Segment A					
	Caribou Creek			■		
	Coleman Creek			■		
	Cooke Creek			■		
	Naneum Creek			■		
	Schnebly Creek			■		■
	Wilson Creek			■		
	Parke Creek			■		
	Middle Canyon Creek					■
	Segment B					
	Columbia River					■
	Johnson Creek					■
	Segment C					
	Alkali Creek				■	
	Cold Creek		■			
	Corral Creek				■	
	Hanson Creek				■	
	Johnson Creek					■
	Segment D					
	Cold Creek		■			
	Columbia River				■	
	Lower Crab Creek	■				
	Segment E					
	Columbia River				■	
	Lower Crab Creek	■				
	Nunnally Lake	■				
	Saddle Mountain Lake				■	
	Segment F					
	Columbia River				■	
	Lower Crab Creek	■				
Nunnally Lake	■					
Saddle Mountain Wasteway					■	

Table has been updated for the FEIS.

**Table 3.1-2
Potential Stream/Lake Crossings
Midway to Columbia Fiber Optic Route**

		Watershed		
		Lower Crab	Lower Yakima	Moses Coulee
Perennial Stream Crossing	Fiber Optic (Vantage to Columbia & Loop near Wautoma)			
	Sand Hollow	■		
	Evergreen Reservoir	■		
	Burke Lake	■		
	H-Lake	■		
	Lynch Coulee	■		
	Moses Coulee			■
	Dry Creek		■	

Table has been updated for the FEIS.

The study area lies at the western edge of the Interior Columbia Basin. The area lies in the rain shadow of the Cascade Mountains, and thus receives very little precipitation. With the exception of the Columbia River, which bisects the study area, water is scarce. Streams are generally small and intermittent. The northern part of the study area near Ellensburg and including Segment A drains into the Yakima River. The remainder of the project (Segments B, C, D, E, and F) contains a number of local drainages that drain directly into the Columbia River.

Most streams crossed in Segment A are part of the Wilson-Naneum Creek sub-basin, a part of the Yakima basin. Streams in this sub-basin are heavily diverted on the Kittitas valley floor and have been channelized into an intricate drainage\irrigation system. There are over 200 unscreened diversions in this drainage (WDFW, 2001). Grazing and other agricultural practices extensively impact the riparian zone of the valley portions of these streams. In their upper reaches, these streams flow through timbered canyons with good year-round flows. One perennial drainage, Middle Canyon Creek drains the northeastern corner of the YTC. Extensive past grazing, military maneuvers, and other disturbances have caused changes in water flow and a general reduction in the quality of fish habitat within the two perennial drainages.

Segment B crosses one perennial drainage and the Columbia River between the northern end of Segment C and the Vantage Substation. Johnson Creek drains the northeastern corner of the YTC. Extensive past grazing, military maneuvers, and other disturbances have caused changes in water flow and a general reduction in the quality of fish habitat within the two perennial drainages.

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Regime refers to the pattern and direction of the flow of the river.

In Segment C, extensive past grazing, military maneuvers, and other disturbances have caused changes in flow *regimes* and a general reduction in the quality of fish habitat within the two perennial drainages crossed. In recent years, severe fires have damaged riparian vegetation and reduced the amount of vegetative cover on upland areas.

3.1.2.1 Water Quality

The Lower Yakima and Upper Columbia-Priest Rapids are identified as having serious water quality problems, such that aquatic conditions are well below state and tribal water quality goals (EPA, 2000). The remaining three watersheds (Lower Crab, Upper Yakima, and Upper Columbia-Entiat) have less serious problems, although their aquatic conditions are also below state or tribal water quality goals (EPA, 2000). Lower Crab Creek, Mattawa Drain, Sand Hollow and the Columbia River are listed as *water quality limited* under Section 303(d) of the Federal Clean Water Act, due to extensive habitat modification. Corrective actions may currently be underway for these water bodies. It is possible that they are in compliance with state water quality standards, despite the fact that they are presently listed as water quality limited.

water quality limited under Section 303(d) of the Federal Clean Water Act refers to streams that do not meet current water quality standards.

Table 3.1-3, *303(d) – Listed Water Bodies*, lists the parameters of concern for the 303(d)-listed water bodies in the study area. Data for this table were taken from the Washington State Department of Ecology’s Final 1998 Section 303(d) List of Impaired and Threatened Waterbodies provided to the U.S. Environmental Protection Agency (EPA).

**Table 3.1-3
303(d) – Listed Water Bodies**

	Water Quality Parameters						
	pH	Temperature	PCB	DDE	Dissolved Gas	Dissolved Oxygen	Fecal Coliform
Columbia River	■				■		
Crab Creek	■	■	■	■			
Mattawa Drain		■					
Sand Hollow	■	■					

PCB: A family of industrial chemical compounds, noted as an environmental pollutant that accumulates in animal tissue.

DDE: A product of the metabolic breakdown of DDT by an organism.

Acronyms are listed in Chapter 10.

Source: Washington Department of Ecology 1998
Table has been updated for the FEIS.

3.1.2.2 Shorelines

The Washington State Shoreline Management Act allows for cities or counties to guide the planning and management necessary to prevent the potential harmful effects of uncontrolled development along the shorelines of Washington State. It is based on the idea that the shorelines of the State are among the most valuable natural resources and unrestricted development is detrimental to the preservation of these resources.

The various line segments cross one river (Columbia), two creeks (Naneum and Lower Crab), and one lake (Nunnally) that have been designated as shorelines. Table 3.1-4, *Shorelines Crossed*, lists the shoreline, the line segment(s) that cross it and the jurisdiction.

**Table 3.1-4
Shorelines Crossed**

Shoreline	Line Segment	County
Naneum Creek	A	Kittitas
Columbia River	B	Kittitas, Grant
Nunnally Lake	E and F	Grant
Lower Crab Creek	D, E, and F	Grant
Evergreen Reservoir	Fiber Optic Vantage - Columbia	Grant
Quincy Lake	Fiber Optic Vantage - Columbia	Grant
Burke Lake	Fiber Optic Vantage - Columbia	Grant
Moses Coulee	Fiber Optic Vantage - Columbia	Douglas

Table has been updated for the FEIS.

Naneum Creek is crossed by Segment A in Section 20 and 21 of T19N R19E in Kittitas County. The environmental designation of the shoreline in this area is Rural, and is characterized primarily by agricultural activities with some compatible recreational uses.

In Kittitas County, Segment B crosses the west shore of the Columbia River in Section 20 of T16N R23E. The environmental designation of this area is Conservancy, which is characterized by uses primarily related to natural resource use. Recreational uses and low intensity recreational homes may be found within this designation. In Grant County, on the east side of the river (Section 21 of T16N R23E), the environmental designation of the shoreline is Rural.

Southeast of the Vantage Substation, Segments E (in Sections 25 and 36 of T16N R23E) and F (in Section 35 of T16N R23E) cross Nunnally Lake. This lake has a shoreline designation of Conservancy due to the lack of development around the lake.

Just south of Nunnally Lake is Lower Crab Creek. This east-west oriented creek is crossed by all three alternatives in Grant County, Segments D (in Section 2 of T15N R23E), E (in Section 2 of T15N

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Shorelines are lakes, including reservoirs, of 20 acres or greater; streams with a mean annual flow of 20 cubic ft per second or greater; marine waters; plus an area landward 200 ft from the ordinary high water mark of the resource; and all associated marshes, bogs, swamps, and river deltas.

See Map 4, Water Resources, for locations of water bodies.

R23E), and F (in Section 36 of T16N R23E). The environmental designation of the shoreline at all three of these crossings is Conservancy due to the lack of development around these areas of the creek.

Segments D, E, and F cross the Columbia River in the Hanford Reach National Monument (Segment D in Section 11 T13N R24E and Segment E and F in Sections 28 and 29, T14N, R26E). The Grant County and Benton County Shoreline Master Programs do not apply to the Columbia River in this area due to it being federal land. Therefore, the Columbia River is not considered a shoreline of statewide significance at these crossings.

The fiber optic line between the Vantage and Columbia substations would cross the Evergreen Reservoir (Section 22, T19N, R23E), and Quincy and Burke Lakes (Section 15, T19N, R23E) in Grant County and Moses Coulee (Section 27, T21N, R22E) in Douglas County. The Evergreen Reservoir and Quincy and Burke Lakes have a shoreline designation of Conservancy due to the lack of development, physical features and ownership by State and Federal governments. Moses Coulee is designated Rural due to the minimal development near and within its shoreline.

 **For Your Information**

An **aquifer** is a layer of underground sand, gravel, or spongy rock in which water collects.

3.1.2.3 Aquifers

Aquifers between Miocene basaltic rocks are prominent in the Columbia Plateau basaltic aquifer system. These aquifers consist of numerous flows of basaltic lava. Permeable zones between the lava flows form these aquifer layers. Groundwater quality in the proposed study area is variable, depending on the layer of basalt from which the groundwater is taken. Groundwater quality issues are mostly due to elevated concentrations of nutrients, trace organic compounds, and sodium and nitrates (USGS, 1991 & Kevin Lindsay, May 23, 2001). Nitrates found in the groundwater are mostly associated with irrigated farming areas. The Columbia Plateau basaltic aquifer system is a major source of water for municipal, agricultural, and domestic uses (USGS, 1991).