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**GROUND WATER DISCHARGE PERMIT UGW150001  
STATEMENT OF BASIS  
August, 2015**

PACIFICORP  
HUNTER PLANT  
CASTLE DALE, UT

**I. Purpose and Prior Permitting**

The purpose of this statement of basis is to describe the Hunter Power Plant facilities, ground water quality, and compliance monitoring program. Ground Water Discharge Permit UGW150001 was issued to PacifiCorp on September 15, 2005. A subsequent renewal of the permit was issued on September 15, 2010. This will be the second renewal of the permit.

**II. Description of Facility**

PacifiCorp operates the Hunter Plant in Emery County, Utah. Hunter Plant is situated on 2000 acres located 3 miles south of Castle Dale, Utah, in Section 16, T19S, R8E, Salt Lake Base and Meridian (39° 10' 28" N. Latitude and 111° 01' 51" W. Longitude).

Hunter Plant is an existing facility comprised of a three unit coal-fired steam electric generating power plant with integrated transmission facilities. Units #1 and #2 are 480-megawatt units constructed in 1978 and 1980, respectively. Unit #3 is a 495 megawatt unit constructed in 1983. The power plant operates the Hunter Research Farm for the disposal of process and cooling wastewater, and the Hunter Combustion Waste Landfill for the disposal of combustion wastes.

Land application is the current method of wastewater disposal for the Hunter Plant. The Research Farm consists of 480 acres of farmland that surrounds the plant on the north, west, and east. Power plant wastewater is stored in two lined holding ponds and is used as irrigation water for the Research Farm during the growing season from April through November. Berms have been constructed to prevent irrigation water from running off into surface streams that border the Research Farm. The amount of water used on the farm is controlled to ensure that all the wastewater is evaporated, absorbed by vegetation, or otherwise used so that no wastewater escapes the company owned property into surface water or percolates through the soil and into the ground water system. Any crop that is grown must have a high water consumptive use, be salt tolerant, have a perennial growth habit, be deep rooted, and tolerant of elements contained in the wastewater. Alfalfa is the crop of choice for meeting these conditions. Crops grown at the farm since 1978 have included alfalfa, barley, wheat, oats, hay, trees, and safflower. PacifiCorp has estimated that the farm can continue to support crops for 20 more years. A closure plan for the research farm has not been developed but options may include abandoning the

farm followed by controlled flushing of salt from the soil, or planting salt absorbing crops followed by incineration of the biomass.

The combustion waste landfill is a 381 acre area used for disposal of combustion wastes generated by the power plant, including bottom ash, fly ash, pyrites, slaker grits, and scrubber sludge. Landfill support features consist of collection and diversion ditches, culverts, haul access roads, and a storm water retention pond. The storm water pond is 23 acres with an 80 acre-feet volume, and is designed to contain a 6-hour, 100-year storm event equivalent to 1.8 inches of water. The pond is lined with 18 inches of low permeability clay. This landfill is subject to Coal Combustion Residual (CCR) regulations published by the USEPA in 2015. Going forward as it relates to the new CCR regulations, the combustion waste landfill will be removed from Ground Water Discharge Permit UGW150001 and will be authorized by the Solid Waste Program of the Utah Division of Waste Management and Radiation Control.

The following facilities at Hunter Plant are permitted by rule in accordance with Utah Administrative Code R317-6-6.2: 1) raw water pond and Snow Lake, 2) coal yard basins, and 3) storm water runoff basins and ponds.

### **III. Site Hydrogeology**

The farm area has two main surface water drainages, Rock Creek Canyon and South Wash (locally known as Buzzard Bench Creek). Both creeks flow eastward past the power plant and/or land application farms. Surface water drainage at the Hunter Plant is a network of ditches cut into the Mancos Shale. Surface water seeps in the Hunter area generally contain an area of soft saturated soil with a white calcite and gypsum precipitate.

The farm area is underlain by Holocene slope wash consisting of unconsolidated deposits of clay, silt, sand, and gravel. The slope wash is generally a thin sheet-like deposit ranging in thickness from zero to 25 feet. Slope wash deposits are well graded and have low permeability. They are underlain by the Blue Gate Member of the Mancos Shale, which is composed of shale and shaley siltstone containing large amounts of soluble minerals such as gypsum.

The hydrogeologic model for the site is thin Holocene slope wash underlain by a thick confining layer of weathered Mancos Shale. The alluvial aquifer (slope wash) has low hydraulic conductivity. The perennial nature of the surface water streams suggest an onsite and offsite gain of water from upgradient seeps, from slope wash deposits, from seeps within the Mancos, and from seepage during the irrigation season. Mancos Shale has an estimated ground water velocity of less than one foot per year.

Hunter Research Farm monitoring wells are screened within the slope wash and across the top of the Mancos Shale. Static saturated conditions appear to be within the lower

part of the slope wash and within the Mancos Shale ranging in depth from 10 to greater than 30 feet below ground surface. Most wells have very slow flow and recharge rates due to low formation permeability.

#### IV. Ground Water Quality and Classification

Water quality information has been collected since 1979 from Hunter Plant monitoring wells in the land application area. Background water quality is based on historical data prior to original permit issuance, subsequent compliance data collected as a permit requirement from the monitoring wells screened in site aquifers, and the Hunter Power Plant 2004, 2010, and 2015 Summary Monitoring Reports.

At the Hunter Plant site, the ground water in the Mancos Shale aquifer underlying the site and beyond is Class IV Saline Ground Water with a total dissolved solids load of greater than 10,000 mg/l. Total dissolved solids load in upgradient ground water in the slope wash sediments is 3200 mg/L Class III Limited Use Ground Water. Sulfate is a component of TDS in all waters underlying the site. Power Plant process water that is used for land application has a total dissolved solids load of 4,000 mg/L (Class III).

#### HUNTER PLANT BACKGROUND GROUND WATER QUALITY

Source	TDS	Boron	Nitrate	Chloride	Sulfate	pH
Mancos Shale	17860	1.3	1.79	865	7051	7.24
Alluvial Aquifer	5201	0.56	0.39	80	2653	7.46
Surface Water stream (UPL-7a)	8317	0.98	0.21	158	4640	8.22
Water Source (UPL-14)	386	<0.1	<0.1	13	124	8.48
Plant Wastewater	4000	4.97	1.20	270	2479	7.26

Mean background concentration units mg/L, except pH

#### V. Class IV Protection levels and Potential Impacts to Ground Water

In accordance with UAC R317-6-4.7, protection levels for Class IV ground water will be protective of human health and the environment.

Although the plant wastewater water is generally better quality than the ground water, Hunter Plant will continue to use controlled land application of wastewater, evapotranspiration, and evaporation as approaches to reduce impacts to ground water. Land application of Hunter Plant wastewater will conform to the proper application rates and procedures outlined in the Hunter Research Farm Wastewater Land Application Plan.

## **VI. Compliance Monitoring Program**

The administration of the permit, to assure compliance with ground water protection regulations, is founded on the use of periodic monitoring well sampling to assess potential impacts to ground water quality from the Hunter Plant discharges. Hunter Plant has installed monitoring wells surrounding the plant site facilities, including the coal pile and wastewater ponds. A semi-annual compliance monitoring program will be in effect during the permit term. PacifiCorp has submitted the *Site Wide Monitoring & Sampling and Analysis Plan for Hunter Power Plant*. Monitoring shall be conducted for key marker elements found in plant process waters: boron, nitrate+nitrite, chloride, sulfate, and other parameters listed in Permit Table 2.

The following key parameters were selected for compliance monitoring based on their concentrations in process water and shallow ground water:

- pH
- Total Dissolved Solids
- Major Ions
- Nitrate + Nitrite
- Boron
- Selenium

The permittee has submitted a Best Management Practices Plan (BMP) that describes inspection, maintenance, and operating procedures for sumps, tanks, ponds, and features not permitted-by-rule.

## **VII. Permit Reference Documents**

The following documents are considered part of the ground water quality discharge permit application and will be kept as part of the administrative file.

- 1) Hunter Research Farm Wastewater Land Application Plan Rev. 3 Feb 2015
- 2) Site Wide Monitoring & Sampling and Analysis Plan Rev. 2 Jan 2015
- 3) Best Management Practices Plan version: October 2005
- 4) Hunter Facility Closure Plan version: March 2005