STATE OF UTAH
DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF WATER QUALITY
UTAH WATER QUALITY BOARD
SALT LAKE CITY, UTAH 84114-4870

GROUND WATER DISCHARGE PERMIT
Permit No. UGW150002

In compliance with the provisions of the Utah Water Quality Act, Title 19, Chapter 5, Utah Code Annotated 1953, as amended, the Act,

PACIFICORP
1407 West North Temple
Salt Lake City, Utah 84116

Hereinafter referred to as the "Permittee", is granted a ground water discharge permit for the operation of the Huntington Power Plant in Emery County, Utah.

The Huntington Power Plant is located on a tract of land encompassed in Section 1, Township 17 South, Range 7 East, Salt Lake Base and Meridian. (39° 22' 53" North Latitude, 111° 4' 36" West Longitude)

This permit is based on representations made by the permittee and other information contained in the administrative record. It is the responsibility of the permittee to read and understand all provisions of this permit.

The facility shall be maintained and operated in accordance with conditions set forth in the permit and the Utah Administrative Rules for Ground Water Quality Protection (R317-6).

This permit shall become effective on December 1, 2019.

This permit and authorization to operate shall expire at midnight December 5, 2024.

Signed this 6th day of December, 2019.

Erica Gaddis, PhD
Director

DWQ-2019-012728

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I. SPECIFIC PERMIT CONDITIONS

A. Ground Water Classification and Protection Levels

Ground water quality varies from Class II to Class IV across the power plant site, and in some areas it has been impacted by operation of the power plant. Because of this and the other factors cited in the Statement of Basis, comparison of ground water quality upgradient and down-gradient of the plant facilities cannot be used to evaluate any impacts caused by the facilities. Therefore, protection levels are not derived from water quality data in upgradient monitor wells, but rather from initial data taken from down-gradient wells.

Because of site conditions, the main threat posed by ground water contamination at this site is discharge of contaminants from the land application sites and other plant facilities to Huntington Creek. Background ground water quality in down-gradient monitor wells that are used to determine compliance is defined in Table 1; protection levels derived from background data are listed in Table 2.

The currently-active (new) combustion waste landfill will be regulated under a future permit from the Division of Waste Management and Radiation Control (DWMRC). Until that permit is in place, that landfill and associated monitor wells will continue to be regulated under this permit.

Table 1. Average Background Concentrations in Compliance Monitor Wells

WELL	Boron (mg/l)	Nitrate as N (mg/l)	Total Dissolved Solids (mg/l)
Research Farm Wells			
NH1 W	5.1	4.5	3,951
NH3 W	1.4	3.3	1,777
NH6 W	0.4	0.8	599
NH8 W	0.2	1.2	467
NH-9W	1.6	1.6	1520
NH-10W	1.7	0.8	2021
RG-1	3.7	8.4	5200
Old Combustion Waste Landfill Wells			
HLF-6O	<0.5	1.9	6,475
HLF-7Od	3.9	123	18,933
Duck Pond Drainage Wells			
HDP-1	49	10.0	10,738
HDP-2	22	34	15,375

Plant Site Wells

HSW-1	4.5	3.8	3,849
HCP-6	0.74	1.7	2,013
HPS-1	0.69	5.19	4,730
HWW-4	0.52	1.4	1,479
HWW-6	0.3[2]	0.14[2]	43042[2]
HWW-7	2.0	0.04	43000
HRW-1	<0.50	0.14	937
HRW-2	<0.50	0.29	271

Table 2. Protection Levels in Compliance Monitoring Wells

Well	Ground Water Class	Nitrate as N (mg/l)	Total Dissolved Solids (mg/l)
NH1 W	III	10.7	5,847
NH3 W	II	9.7	2,527
NH6 W	II	2.6	1,311
NH8 W	II	3.4	589
NH-9W	II	2.0	2,172
RG-1	III	12.4	6,300
HSW-1	III	6.5	4,905
HCP-6	II	1.9	2,390
HPS-1	III	8.4	6,544
HWW-4	II	2.2	1,863
HWW-6	IV	0.52[2]	51204[2]
HWW-7	IV	1.8	66380
HLF-6O	*	4.1	9,131
HLF-7Od	*	183	21,205
HLF-3Nd[1]	III	0.4	4,951
HLF-3Ns[1]	III	0.6	5017
HLF-4N[1]	III	0.14	4,500
HDP-1	*	18	12,536
HDP-2	*	41	16,863
HRW-2	IA	0.29	369

[*]Well affected by previous discharges; ground water class will not be determined

[1]The new combustion waste landfill and associated wells will be regulated under this permit until the permit from DWMRC is in place.

[2]Preliminary values based on existing data.

All protection levels are mean + (2 x standard deviation), except values for HRW-2, which are mean x 1.25.

B. Permitted Facilities

This permit covers all facilities and activities at the Huntington Power Plant site which have a potential to discharge contaminants to ground water, and are not regulated by other permits (Table 3). These include land application of wastewater at the Research Farm, the old combustion waste landfill, the new combustion waste landfill until the CCR permit is in place, the Raw Water basin, coal storage and blending areas, handling of wastewater, fuels and other industrial chemicals at the plant site, and several concrete basins and the irrigation storage (evaporation) pond.

Table 3. Huntington Plant Permitted Facilities

Permitted Facilities	Discharge Control Technology	Volume	Associated Ground Water Well(s)
Irrigation Storage Pond	24" clay liner	327 ac-ft	HWW-7
Truck Wash Sump	concrete liner	48,000 gal	HPS-1
Wastewater Decanting Basins	concrete liner	303,000 gal	HWW-4
Waste Disposal/Neutralizing Basin	concrete liner	275,000 gal	HWW-4
Holding Basin	concrete liner	72,000 gal	HWW-4
Lacey's Pad Sump	concrete liner	3,600 gal	HSW-1
Dewatering Sump	concrete liner	3,740 gal	HSW-1, HCP-6
Process Sump	concrete liner	5,500 gal	HWW-4, HPS-1
U1 Bottom Ash Bunker Sump	concrete liner	1,500 gal	HWW-4, HPS-1
U2 Bottom Ash Bunker Sump	concrete liner	1,500 gal	HWW-4, HPS-1
Plant Drains Settling Basin	concrete liner	45,000 gal	HWW-4, HPS-1
Lift Station Sump	concrete liner	16,000 gal	NH-6W
Cooling Tower #1 Sump	concrete liner	842,000 gal	HWW-4, HPS-1
Cooling Tower #2 Sump	concrete liner	842,000 gal	HWW-4, HPS-1
Raw Water Settling Basin	24” clay liner	336 ac-ft	HRW-1, HRW-2

C. Discharge Minimization Technology

Discharge minimization technology requirements for this permit shall consist of utilizing best management practices for land application of wastewater at the Research Farm, the plant site, coal storage and handling areas, and the various ponds and impoundments associated with the power plant.

By the end of this permit term, PacifiCorp shall have in place alternative methods of disposal for the wastewater streams currently land-applied at the Research Farm, that are protective of ground water quality.

1. Corrective Action

Monitored natural attenuation of ground water contamination associated with wastewater facilities that have been removed, or practices that have been ended, shall continue for this permit term. This includes monitor wells associated with

the old combustion waste landfill, Lacey's Lake, the Wastewater Pond, and the Scrubber Pond, or any other facilities that may be closed in the future due to ground water contamination. Monitoring of wells associated with the Research Farm will continue after land application there has been stopped.

In most cases, ground water recharge at these sites is very slow due to the dry climate in the area, and improvement in ground water quality may not occur rapidly. If DWQ determines that ground water quality has not improved in areas affected by past discharges within a reasonable amount of time, additional corrective measures may be required.

2. Land Application at the Research Farm

While land application is still conducted at the Huntington Power Plant site, PacifiCorp shall follow the "Huntington Research Farm Wastewater Land Application Plan" contained in the Appendix A. Monitoring frequency of wells adjacent to Huntington Creek shall be increased to quarterly. If four or more consecutive quarterly samples from a compliance monitoring well adjacent to Huntington Creek exceed protection levels (Table 2) and PacifiCorp cannot demonstrate the exceedances are not due to land application of wastewater, DWQ may require PacifiCorp to stop land application to the portion of the Research Farm site that may influence that well until at least four consecutive samples from the affected monitor well are below protection levels.

All land application of wastewater shall end by March 31, 2023.

After the end of wastewater land application at all sites where land application has taken place must be closed in a manner that is protective of waters of the state.

3. New Wastewater Disposal Practices

PacifiCorp shall implement the plan for new wastewater disposal by recycling, evaporation and reverse osmosis outlined in Appendix E.

4. Best Management Practices

PacifiCorp shall follow best management practices for facilities on the power plant site that could potentially affect ground or surface water quality, as listed in Appendix B. For the time that the new combustion waste landfill is still regulated under this permit, only combustion wastes, including fly ash, bottom ash, slaker grits, scrubber sludge and pyrites may be accepted for disposal at the landfill.

D. Best Available Technology Requirement for New Construction

Any construction, modification, or operation of new waste or wastewater disposal, treatment or storage facilities shall require review of engineering design plans and specifications. All engineering plans or specifications submitted shall demonstrate

compliance with all Best Available Technology requirements stipulated by the Utah Ground Water Quality Regulations (UAC R317-6). Upon Director approval, a Construction Permit may be issued and this Permit may be re-opened and modified to include provisions for the new facilities, if necessary.

E. Monitoring

1. General Provisions

a. *Future* Modification *of Monitoring Program* – If at any time the Director determines the monitoring program to be inadequate, PacifiCorp shall submit within 30 days of receipt of written notice from the Director a modified monitoring plan that addresses the inadequacies noted by the Director.

b. *Compliance Monitoring Period* – Monitoring shall commence upon issuance of this permit and shall continue through the term of this permit. For any new facilities with a potential discharge to ground water that are constructed during the term of this permit, or any new monitor wells installed at existing facilities, at least eight background samples shall be collected over a one- year period. Monitoring shall commence before operation of new facility or modification of an existing facility. At least one background ground water sample shall be collected at new facilities before operation commences.

c. *Laboratory Approval and Analytical Methods*– All water quality analyses shall be performed by a laboratory certified by the state of Utah to perform such analyses. Analytical methods shall conform to Table I of Appendix C of this permit. Analytical methods may only be changed after approval by DWQ.

d. *Water Level Measurement* – In association with each well sampling event, water level measurements shall be made in each monitor well prior to removal of any water from the well bore. These measurements will be made from a permanent single reference point clearly marked on the top of the well or surface casing. Measurements will be made to the nearest 0.01 foot.

e. *Sampling Protocol* – Ground and surface water quality samples will be collected, handled and analyzed in conformance with the Ground Water & Surface Water Sampling and Analysis Plan contained in Appendix D of this permit, or the most currently-approved Sampling and Analysis Plan.

2. Ground Water Monitoring

a. *Wells to be Monitored* – Monitor wells NH-3W, NH-6W, NH-8W, H8W and NH-9W shall be sampled quarterly. Other wells, used for compliance monitoring and informational purposes, shall be sampled semi-annually. Locations, elevations and depth of screened intervals for compliance monitoring wells are listed in Table 4.

b. *Constituents Sampled* – The following analyses shall be performed on all monitoring samples from the wells listed in Table II of Appendix C:

(1) Field Measurements: pH, specific conductance, water level, temperature

(2) Laboratory Analysis: Total Dissolved Solids, Major Ions (Na, K, Mg, Ca, Cl, SO_4, alkalinity), nitrate + nitrite, boron

Table 4. Location of Monitoring Wells

Well	North Latitude	West Longitude	Elevation (top of casing)	Depth of Screened Interval (feet below TOC)
NH1 W	39° 22.032'	111º 03.566'	6185.8	4.5-24.5
NH2 W	39° 22.088'	111º 03.728'	6196.6	5-20
NH3 W	39° 22.169'	111º 03.622'	6193.9	5.5-20.5
NH4 W	39° 22.353'	111º 04.117'	6254.5	39-64
NH5 W	39° 22.427'	111º 04.078'	6249.1	19-44
NH6 W	39° 22.515'	111º 04.026'	6241.8	10-25
NH7 W	39° 22.516'	111º 04.323'	6292.4	15-40
NH8 W	39° 22.706'	111º 04.326'	6273.7	5-25
NH-9W	39°22´16.52118″	111°03´49.29806″	6210.8	15-25
NH-10W	39°22´19.03240″	111°03´43.52972″	6221.8	25-35
H8 W	39°22’43.26”N	111°04’28.68”W	6291.37	4-32
RG-1	39° 22.440'	111º 03.463'	6362.2	45-75
HLF-4O	39º 22.108'	111º 04.670'	6592.3	46-66
HLF-6O	39º 22.044'	111º 04.706'	6567.05	46.4-56.4
HLF-7Od	39º 22.165'	111º 04.612'	6549.14	50-60
HLF-3Nd	39º 21.985'	111º 04.562'	6575.73	115-125
HLF-3Ns	39º 21.985'	111º 04.562'	6575.76	48-66
HLF-4N	39º 22.024'	111º 04.529'	6554.8	100-110
HDP-1	39º 22.252'	111º 04.487'	6388.27	13.4-18.4
HDP-2	39º 22.410'	111º 04.402'	6327.11	13.8-23.8
HSW-1	39º 22.546'	111º 04.640'	6437.27	80-100
HPS-1	39º 22.737'	111º 04.602'	6441.44	75-85
HWW-4	39º 22.920'	111º 04.695'	6389.32	41-51
HWW-6	39°22’33.48”	111°03’54.60”	6271.19	10-20
HWW-7	39°22’31.50”	111°03’49.92”	6256.96	12-22
HCP-6	39º 22.597 '	111 04.813’	6452.41	80-90
HRW-1	39° 23’11.9277”	111° 05’34.7099”	6522.91	59-79
HRW-2	39° 23’04.2937”	111° 05’17.8026”	6433.67	20-38

3. Surface Water Monitoring

PacifiCorp shall collect semi-annual grab samples of surface water at the locations listed in Appendix C and analyze them for the parameters listed in Part

I.E.2(b), as well as field pH, specific conductance and temperature, and dissolved selenium. Stream flow at the sites in Huntington Creek designated H-1, H-2 and UPL-9 (locations in Table 5) shall be determined at the time of sampling.

PacifiCorp shall collect monthly grab samples from the Raw Water pond for one year, beginning at least two months before water from the Rilda Canyon portals of the Deer Creek Mine is discharged to the pond. These samples shall be analyzed for the parameters listed in Part I.E.2(b), as well as total iron. After 12 monthly samples have been collected, sampling of the Raw Water pond shall be done quarterly.

Table 5. Location of Surface Water Monitoring Points

Site ID	North Latitude	West Longitude
H-1	39 23.106′	**111 05.083′**
H-2	39 22.875′	**111 04.607′**
UPL-9	**39 22.034′**	**111 03.516′**

F. Reporting Requirements

1. Ground water quality sampling results shall be submitted semi-annually to the Director as follows:

   Half Report Due On

   1st (January- June) August 15
   2nd (July – December) February 15

   Semi-annual reports shall include all sampling data taken in the half-year period reported, including quarterly sampling and sampling due to protection level exceedance or other compliance matters. Unless a submittal date extension has been requested by the Permittee and granted by the Division of Water Quality, failure to submit reports within the time frame due shall be deemed as noncompliance and may result in enforcement action.

   PacifiCorp shall calculate the amount of dissolved solids passing surface water monitoring points H-1, H-2 and UPL-9 in tons per day for each sampling event, and report this information in the regular semi-annual reports.

   All reports required under this permit shall be submitted to:

   Division of Water Quality
   PO Box 144870
   Salt Lake City, Utah 84114-4870
   Attention: Ground Water Protection Program

2. When the permittee becomes aware of an incident of noncompliance with the terms of this permit, the Division of Water Quality shall be notified verbally by the next business day, and in writing within 5 business days. Verbal reports of noncompliance should be made at (801) 536-4300.

3. Electronic Filing Requirements - In addition to submittal of the hard copy data, upon the request of the Director the permittee will submit the required ground water monitoring data in the electronic format to be specified. The data may be sent by e-mail, floppy disc, CD, modem or other approved transmittal mechanism.

G. Demonstration of Compliance

1. General

The permittee shall comply with the Discharge Minimization Technology, Corrective Action, Monitoring, Reporting and Compliance Schedule requirements contained in this permit.

2. Ground Water Protection Levels

If the analytical results for any ground water monitoring event at a well listed in Table 2 exceed the protection levels for that well, PacifiCorp shall notify DWQ according to the provisions of Section I.F.2 and immediately re-sample the well for all parameters listed in Section I.E.2(b). The permittee shall continue to follow a monthly monitoring schedule for the well until the parameter no longer exceeds the protection level or until notification by the Director that a semi-annual monitoring schedule may be resumed. Additional investigation and remedial action may also be required by the Director.

3. Surface Water Standards

Surface water quality at downstream sampling point UPL-9 must not exceed the following standards due to PacifiCorp's activities:

Surface Water Standards

Parameter	Numeric Standard
pH	6.5-9
Total Dissolved Solids	1200 mg/l
Dissolved Selenium	4.6 µg/l
Nitrate + Nitrite, Dissolved	10 mg/l
Boron	0.75 mg/l

If the analytical results from any regularly-scheduled monitoring event at sampling point UPL-9 exceed any surface water quality standard, PacifiCorp shall notify DWQ according to the provisions of Section I.F.2 and immediately re-sample at that point and analyze the sample for the parameters listed in Part I.E.2(b), as well as field pH, specific conductance and temperature, and dissolved selenium. PacifiCorp shall follow a monthly monitoring schedule for UPL-9 until all parameters are below the surface water quality standards or until informed by DWQ that a semi-annual monitoring schedule may be resumed. PacifiCorp shall investigate the sources of the exceedance and report the results of its investigation

within 60 days of the initial detection. If necessary, DWQ may require remedial action to restore water quality in Huntington Creek.

4. Noncompliance Due to Failure of Discharge Minimization Technology or Best Available Technology

The facility will be determined to be in noncompliance status if the Discharge Minimization Technology or other measures developed pursuant to Part I.C or I.D have failed or have not been maintained according to the provisions required by this permit, unless:

a. The permittee has notified the Director of the potential noncompliance situation verbally within 24 hours and in writing within 5 days of becoming aware of it, and

b. The failure was not intentional or was not caused by the permittee's negligence, either in action or failure to act, and

c. The permittee has taken adequate remedial measures in a timely manner or has developed an approvable remedial action plan and implementation schedule for restoration of discharge minimization technology, an equivalent technology or closure of the facility (implementation of an equivalent technology will require permit modification and reissuance), and

d. The permittee has demonstrated that any discharge of a pollutant from the facility is not in violation of the provisions of UCA 19-5-107.

H. Compliance Schedule

1. Background Sampling

PacifiCorp shall collect eight samples from any new monitor wells constructed for this permit, or any existing wells designated for compliance monitoring which have insufficient background data, within a one-year period and analyze them for the parameters listed in Part 1.E.2(b). The analytical results shall be reported in the first semi-annual monitoring report after background sampling is completed, in Excel spreadsheet format. After completion of background sampling, the wells shall be sampled under a schedule approved by DWQ and according to the provisions of Part 1.E.2.

2. New Wastewater Disposal Practices

PacifiCorp shall implement the new wastewater disposal plan outlined in Appendix E and cease all land application of wastewater by March 31, 2023.

II. MONITORING, RECORDING AND REPORTING REQUIREMENTS

A. Representative Sampling. Measurements and samples taken in compliance with the monitoring requirements established under Part I shall be representative of the monitored activity.

B. Analytical Procedures. Water sample analysis must be conducted according to test procedures specified under UAC R317-6-6.12, unless other test procedures have been specified in this permit.

C. Penalties for Tampering. The Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate, any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than six months per violation, or by both.

D. Reporting of Monitoring Results. Monitoring results obtained for each monitoring period specified in the permit, shall be submitted to the Director, Utah Division of Water Quality at the following address no later than 45 days after the end of the monitoring period:

Utah Division of Water Quality
PO Box 144870
Salt Lake City, Utah 84114-4870
Attention: Ground Water Protection Program

E. Compliance Schedules. Reports of compliance or noncompliance with, or any progress reports on interim and final requirements contained in any Compliance Schedule of this permit shall be submitted no later than 14 days following each schedule date.

F. Additional Monitoring by the Permittee. If the permittee monitors any pollutant more frequently than required by this permit, using approved test procedures as specified in this permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted. Such increased frequency shall also be indicated.

G. Records Contents. Records of monitoring information shall include:

1. The date, exact place, and time of sampling or measurements:
2. The individual(s) who performed the sampling or measurements;
3. The date(s) and time(s) analyses were performed;
4. The individual(s) who performed the analyses;
5. The analytical techniques or methods used; and,
6. The results of such analyses.

H. Retention of Records. The permittee shall retain records of all monitoring information, including all calibration and maintenance records and copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least three years from the date of the sample, measurement, report or application. This period may be extended by request of the Director at any time.

I. Twenty-four Hour Notice of Noncompliance and Spill Reporting.

1. The permittee shall verbally report any noncompliance, or spills subject to the provisions of UCA 19-5-114, which may endanger public health or the environment as soon as possible, but no later than twenty-four (24) hours from the time the permittee first became aware of the circumstances. The report shall be made to the Utah Department of Environmental Quality 24 hour number, (801) 231-1769, or to the Division of Water Quality, Ground Water Protection Section at (801) 536-4300, during normal business hours (8:00 am - 5:00 pm Mountain Time).
2. A written submission shall also be provided to the Director within five days of the time that the permittee becomes aware of the circumstances. The written submission shall contain:

   a. A description of the noncompliance and its cause;
   b. The period of noncompliance, including exact dates and times;
   c. The estimated time noncompliance is expected to continue if it has not been corrected; and,
   d. Steps taken or planned to reduce, eliminate, and prevent reoccurrence of the noncompliance.

3. Reports shall be submitted to the addresses in Part II D, Reporting of Monitoring Results.

J. Other Noncompliance Reporting. Instances of noncompliance not required to be reported within 24 hours, shall be reported at the time that monitoring reports for Part II D are submitted.

K. Inspection and Entry. The permittee shall allow the Director, or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to:

1. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of the permit;

2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;

3. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and,

4. Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the Act, any substances or parameters at any location.

III. COMPLIANCE RESPONSIBILITIES

A. Duty to Comply. The permittee must comply with all conditions of this permit. Any permit noncompliance constitutes a violation of the Act and is grounds for enforcement action; for permit termination, revocation and re-issuance, or modification; or for denial of a permit renewal application. The permittee shall give advance notice to the Director of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

B. Penalties for Violations of Permit Conditions. The Act provides that any person who violates a permit condition implementing provisions of the Act is subject to a civil penalty not to exceed $10,000 per day of such violation. Any person who willfully or negligently violates permit conditions is subject to a fine not exceeding $25,000 per day of violation. Any person convicted under Section 19-5-115(2) of the Act a second time shall be punished by a fine not exceeding $50,000 per day. Nothing in this permit shall be construed to relieve the permittee of the civil or criminal penalties for noncompliance.

C. Need to Halt or Reduce Activity not a Defense. It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

D. Duty to Mitigate. The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.

E. Proper Operation and Maintenance. The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.

IV. GENERAL REQUIREMENTS

A. Planned Changes. The permittee shall give notice to the Director as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required when the alteration or addition could significantly change the nature of the facility or increase the quantity of pollutants discharged.

B. Anticipated Noncompliance. The permittee shall give advance notice of any planned changes in the permitted facility or activity which may result in noncompliance with permit requirements.

C. Permit Actions. This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and re-issuance, or termination, or a notification of planned changes or anticipated noncompliance, does not stay any permit condition.

D. Duty to Reapply. If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a permit renewal or extension. The application should be submitted at least 180 days before the expiration date of this permit.

E. Duty to Provide Information. The permittee shall furnish to the Director, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Director, upon request, copies of records required to be kept by this permit.

F. Other Information. When the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or any report to the Director, it shall promptly submit such facts or information.

G. Signatory Requirements. All applications, reports or information submitted to the Director shall be signed and certified.

1. All permit applications shall be signed as follows:

   a. For a corporation: by a responsible corporate officer;
   b. For a partnership or sole proprietorship: by a general partner or the proprietor, respectively.
   c. For a municipality, State, Federal, or other public agency: by either a principal executive officer or ranking elected official.

2. All reports required by the permit and other information requested by the Director shall be signed by a person described above or by a duly authorized representative of that person. A person is a duly authorized representative only if:

a. The authorization is made in writing by a person described above and submitted to the Director, and,

b. The authorization specified either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.)

3. Changes to Authorization. If an authorization under Part IV G 2. is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Part IV G 2. must be submitted to the Director prior to or together with any reports, information, or applications to be signed by an authorized representative.

4. Certification. Any person signing a document under this section shall make the following certification:

> "I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

H. Penalties for Falsification of Reports. The Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction be punished by a fine of not more than $10,000 per violation, or by imprisonment for not more than six months per violation, or by both.

I. Availability of Reports. Except for data determined to be confidential by the permittee, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Director. As required by the Act, permit applications, permits, effluent data, and ground water quality data shall not be considered confidential.

J. Property Rights. The issuance of this permit does not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations.

K. Severability. The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.

L. Transfers. This permit may be automatically transferred to a new permittee if:

1. The current permittee notifies the Director at least 30 days in advance of the proposed transfer date;

2. The notice includes a written agreement between the existing and new permittee containing a specific date for transfer of permit responsibility, coverage, and liability between them; and,

3. The Director does not notify the existing permittee and the proposed new permittee of his or her intent to modify, or revoke and reissue the permit. If this notice is not received, the transfer is effective on the date specified in the agreement mentioned in paragraph 2 above.

M. State Laws. Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, penalties established pursuant to any applicable state law or regulation under authority preserved by Section 19-5-117 of the Act.

N. Reopener Provision. This permit may be reopened and modified (following proper administrative procedures) to include the appropriate limitations and compliance schedule, if necessary, if one or more of the following events occurs:

1. If new ground water standards are adopted by the Board, the permit may be reopened and modified to extend the terms of the permit or to include pollutants covered by new standards. The permittee may apply for a variance under the conditions outlined in R317-6.4(D)

2. If alternate compliance mechanisms are required.

3. If water quality of the facility is significantly worse than represented in the original permit application.

Appendix A
Huntington Research Farm Waste Water Land Application Plan

1. Objective

The Huntington Research Farm was established on company owned property to dispose of plant waste water, as an efficient, cost effective and environmentally sound method to accomplish disposal.

The amount of water used on the Huntington Research Farm is carefully controlled to ensure that all the waste water is evaporated, absorbed by vegetation, or otherwise used so that no waste water escapes the company owned property into surface water or percolates through the soil and into the ground water system. This is accomplished by balancing environmental and weather information using sophisticated weather data and computer modeling through Utah State University and/or private consultant, by contract. The ground water system is monitored semi-annually using monitoring wells located in strategic places around the farm properties. This information is reported to the Utah Division of Water Quality semi-annually.

The Huntington Research Farm operates under the following set of objectives:

1. Dispose of power plant waste water by efficient agricultural irrigation within environmental regulations
2. Perform research and monitoring programs, which support the continued use of waste water in agricultural irrigation.
3. Operate the farm in the most economical and efficient manner possible.
4. Investigate revenue-generating options to reduce the operating cost of the Huntington Research Farm.

The Huntington Research Farm is composed of an estimated five different soil series with seven different soil types within these five different series (USDA et al. 1970). A complete text of each soil series and soil type are contained in **Appendix A.1**. The many different soil types pose a very complex challenge to uniform irrigation application and consistent crop growth over the field surface. Each soil series also offers a complicated set of water table and ground water problems. Water infiltration and holding capacities vary by soil type. Depth limitations and other problems with the soil profiles pose differing sets of problems for uniform irrigation application on the farm.

In order to comply with the first research farm objective, 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 waste water.

Alfalfa is grown on the largest amount of the acreage possible because of its deep root system, high water consumptive use factor, perennial growth habit, salt tolerance and high tolerance to boron. The choice for alfalfa is also supported by research conducted by Dr. John Hanks (Hanks, 1990), which showed that alfalfa yields are higher when irrigated with saline wastewater than when irrigated with fresh water. Small grains are used in a crop rotation with alfalfa for weed control and maximum nutrient utilization.

2.1. Soil Moisture Determination

Field determination of the initial level of available moisture is essential where correct soil moisture control for high water use and efficient irrigation in the crop with no leaching is required. During the entire season, amount and frequency of irrigation should be varied in accordance with the actual moisture used by the crop during any growing period. At the beginning of the irrigation season, the soil moisture level should be known before staring irrigation. This is accomplished each spring; farm wide, by using the annual water balance information supplied by the evapotranspiration instrumentation and can be checked with the manual, "feel" method (**appendix A.2**) of soil moisture determination. This soil moisture information is used to give a starting point for irrigation requirements at the beginning of the irrigation season.

2.2. Actual Evapotranspiration (ET_a) Determination

A procedure to measure the amount of water lost from the soil surface through evaporation and the amount of water lost through transpiration from the crop canopy, evapotranspiration (**ET**) (**appendix A.3**), helps to determine the amount of water that is needed to be introduced, by irrigation, into the soil profile for continued crop production and maximum water utilization. The ET rate on the Huntington Research Farm is determined by using the Eddy Covariance instrument pack, installed in the middle of an alfalfa (Medicago sativa, L.) field on the lower Huntington Farm and an irrigated pasture with a mix of grass and alfalfa on the Huntington Rock Garden, with enough fetch to measure ET over the fields (500 foot radius from the station).

The watering rates at the Huntington Research Farm are carefully monitored and controlled to prevent surface runoff and deep percolation, so as to minimize impacts to surface water and ground water. In the water budget method, the moisture in the soil is regarded as being a balance between what enters it as a result of precipitation and irrigation, and what leaves through evapotranspiration. The budget becomes merely a balance of putting back into the soil, through irrigation, water that is lost through ET. This is achieved by irrigation at or below the reported daily ET_a rate.

2.3. Application Rates

Application rate of a sprinkler system is the rate at which water is applied, expressed in units of inch/hour. The Huntington sprinkler system is designed so that the average application rate over the irrigated area is less than the basic intake rate of the surface soil to prevent runoff. The design application rate for the Huntington Research Farm is 0.25 inches/hour. At this rate, approximately 2.78 inches of waste water is applied during an eleven hour set. Application rates per sprinkler head are estimated by size of the nozzle in the sprinkler head and the pressure at which it operates (**appendix A.4**).

2.4. Irrigation Frequency

Irrigation frequency refers to the number of days between irrigations. In practice, irrigation frequency is determined by means of water balance calculations, using available soil water capacity and the ET_a value calculated by the Eddy Covariance station.

Waste water irrigation frequency on the Huntington Research Farm is determined by using the daily ET_a rate over the previous days since last irrigation to get the total water usage from the available soil reservoir. When approximately 2.5 inches of water has been lost, as indicated by ET_a measurements, then an irrigation sequence is scheduled. The weather forecast is also taken into account so as to anticipate any potential precipitation events.

2. Controls

The primary control that is in place on the Huntington Research Farm to prevent surface runoff or leaching to ground water is the judicious application of the waste water in relation to ET_a measurements. The following measures are in place to handle the infrequent upset condition, or the unusual weather event, such as a 50 year storm.

3.1. Surface Runoff

Each area of the farm is surrounded by an earthen berm that is used to channel any excess surface water to a retention pond. The ponds are of adequate size to contain a sprinkler system spill or system failure of up to 10 hours. These same ponds are designed to contain the surface runoff of a significant precipitation event. The intent of these ponds is that the bottoms would seal over time as water moved clay particles into the pore spaces. Water would then be lost through evaporation or by pumping into tank trucks.

Any surface spills that do enter waters of the State, are immediately reported to the State Division of Water Quality.

3.2. Ground Water

Ground water is protected from waste water contamination by careful control of the application of waste water from irrigation. By limiting the amount of waste water applied to a quantity less than the volume of water lost through evapotranspiration, the amount of water in the soil profile will not exceed the capacity of the soil and will not allow leaching into the shallow aquifers under the farm fields.

3.3 Sprinkler Spray

All sprinkler wheel lines that boarder Huntington Creek will have the following measures taken to eliminate possible over spray into Huntington Creek. All sprinkler heads on end caps of sprinkler lines that boarder Huntington Creek will have 180^o deflectors installed on the sprinkler heads. All end cap sprinkler heads will also use directional sprinkler heads. All Solid set sprinklers bordering Huntington Creek will use directional sprinkler heads.

4.1. <u>Irrigation Records</u>

Knowing how much waste water has been applied to any area is essential to a successful waste water land application plan. An irrigation record is kept in the Huntington Research Farm office. Each sprinkler line is identified on the farm by its own name (**Appendix A.5**). The name contains the farm area where it is located (rock garden, east or west), the field name, and the direction locator (east, west, north, south or center). The number of risers available for each sprinkler line is also recorded. For each of these risers, there is a record of how many sprinkler

heads are on the line for that riser setting (**Appendix A.6**). Each day the riser position of each sprinkler line on the farm that is running is recorded. The duration of the set is recorded daily. An example of the daily irrigation record sheet is contained in **Appendix A.7**. Knowing the number of sprinkler heads, the operating pressure and the length of time of the irrigation set, the volume of water applied for that area can be calculated. Using this number and the TDS value for the waste water, a rough estimate of the amount of salt applied can also be calculated.

4.2. Flow and Storage Records

The Huntington Farm uses three inline propeller type *Macrometer* flow meters to measure the gross amount of waste water delivered to each area of the farm. Flow is measured instantaneously in gallons per minute (gpm) and a totalizing meter measures total flow in acre feet (acft). One flow meter is located in the main water delivery line (mainline) before it branches to go to the two production areas of the farm and upstream of a line that gives the capacity to introduce fresh water into the waste water irrigation system. This first meter measures the flow of total waste water to the entire Huntington Farm before any fresh water is introduced. This fresh water line is metered with its own flow meter (Note: This fresh water line has not been used for over 20 years). The second flow meter is located in the lateral line just before the water enters a booster pump to deliver waste water to the rock garden area. It has the capacity to measure the gpm and total flow of water delivered, whether it is fresh water, waste water or a mix. A third meter is located in the lateral line that serves the lower farm, measuring gpm and the total flow, whether fresh or waste or a mix.

The present record keeping scheme has these three flow meters being read weekly by the farm. Waste water output to the irrigation storage reservoir (evap pond) by the power plant is recorded weekly also. This information is recorded by two flow meters located in a pump house servicing the two waste lines flowing from the Huntington Power Plant to the evaporation pond. The information from the three waste water irrigation flow meters and the two power plant waste water disposal lines is collected weekly by the farm. The data is forwarded to the farm manager. The manager takes the data and records the weekly irrigation rates for the two areas of the Huntington Farm and the amount of waste water added to the storage pond by the Huntington power plant. During the irrigation season an irrigation water sample is also taken from the evaporation pond. This sample is used to report the TDS and pH of the waste water. Weekly irrigation values and acres irrigated, by farm area are reported to ET Consultant to be compared against the actual ET (ET_a) curve for addition into the annual report from ET Consultant to PacifiCorp. The daily ET_a summaries are kept on file in the research farm office.

The actual level of waste water in the evaporation pond is also recorded weekly by reading the elevation off of staff gauges that are located in the pond. This data is used to calculate the amount of waste water that remains in storage in the evaporation pond. At the beginning of the irrigation season, this storage volume data is used to determine the number of acres that will be required to be irrigated on the farm, in order to dispose of all the waste water in an efficient manner and within environmental regulations. This data is also used weekly, as a gross check, of the flow meters, on the water balance of water out to the farm and water into the evaporation pond from the power plant.

4.3. Crop Records

Crop field records, indicating which crops were grown where, are recorded and saved. Crop inputs, such as seed, fertilizer and pesticides are also recorded.

4.4. Ground Water Report

Semi-annual ground water and surface water samples are collected. Spring samples are collected in late March or early April before waste water irrigation commences and the fall sampling is completed during late October or early November, as waste water irrigation is finishing or has been terminated. Results of these two sampling events are reported as required in the ground water permit. If any anomalies or exceedances are observed, they are indicated in the cover letter of the report.

4.5. Calculated Application Rate

The actual irrigation rate in inches of waste water applied will be calculated each week, combined with the weekly precipitation and compared with the measured actual evapotranspiration provided by the ET consultant. The farm manager will be responsible for this weekly evaluation and will prepare a report each month during the irrigation season to document the values. The report will be submitted to the environmental engineer. The report will contain the following:

a. Dates of each weekly period
b. Weekly flow quantity, totaled from the several flow monitors, in acre feet
c. Number of actively irrigated acres
d. Total precipitation during the week, in inches
e. Calculated irrigation rate, in inches
f. Total water applied, sum of irrigation and precipitation, in inches
g. Actual evapotranspiration amount for the week, in inches
h. Water balance calculation, in inches
i. Comments, e.g. estimated field moisture determinations, adjustments, etc.

The calculated irrigation rate will be determined by the following formula:

$$\text{Irrigation rate} = \frac{\text{Total gallons} \times 12}{\text{Acres irrigated} \times 7.481 \times 43{,}560}, \text{ inches}$$

The acres irrigated value is determined by the following formula:

$$\text{Acres irrigated} = \Sigma \frac{(N * SH * SR)}{43{,}560} \text{ for each irrigation line used}$$

N = number of sprinkler heads on the irrigation line
SH = spacing between sprinkler heads on the line, in feet, equals 40’
SR = spacing between the risers, in feet, equals 60’

The weekly water balance calculation will be found by taking the initial available soil moisture reading and subtracting the weekly ET_a sum and adding any irrigation and precipitation values. Subsequent water balance numbers are calculated by taking the previous week's soil moisture number and adding the total water applied plus precipitation and subtracting the ET_a for the week to get a value in inches.

$$A_m = \sum ET_a - (I + P)$$

Where A_m = Available soil moisture, inches
ET_a = Sum of weekly actual evapotranspiration, inches
I = Irrigation amount, inches
P = Precipitation, inches

The precipitation and evapotranspiration rate are reported from the ET station instruments to the farm manager's office every day with the previous day's values.

Appendix B Best Management Practices

INTRODUCTION

The Huntington Power Plant has implemented Best Management Practices (BMPs) to prevent or minimize the potential for degradation of the surface and ground water sources. These practices are utilized in conjunction with Huntington's Storm Water Pollution Prevention Plan, Spill Prevention Control and Countermeasures Plan, Solid and Hazardous Waste Management Plan, Waste Water Land Application Plan, and Site Wide Monitoring and Sampling Plan.

Ground Water Discharge Permit (GWDP) Facilities

The facilities included in the Ground Water Discharge Permit No. UGW150002 (Table 1) are inspected on a monthly basis. In addition to the routine visual inspection of the permitted facilities, a network of surface and ground water monitoring locations have been established to monitor for any degradation of the water leaving the site. These facilities are listed in Table 1, along with the surface and ground water monitoring points established for each facility.

Table 1.

Monitoring Points for Ground Water Discharge Facilities
Huntington Power Plant

Pond/PSA	Year of Construction	Volume (acre-ft)	Liner Type	Monitoring Point(s)	
				Ground Water	Surface Water
Raw Water Pond	1972	336	Clay		H-1
Irrigation Pond	1977	329	Clay	HWW-7	UPL-13
Duck Pond	1979	6	None	HDP-3 NH-4W	Ck @ HDP-3 H-11 H-12
Waste Water Decanting Basins	2015	1	Concrete	HWW-4	H-2

Potential Source Areas (PSAs)

Scrap Yards
Best management practices include:

- Consolidate scrap yards where possible and minimize their size.
- Control the storage of scrap and materials that may contain residual fluids.
- Provide level grades and gravel surfaces to retard flows and limit the spread of spills.
- Minimize storm water run-on/runoff through the construction, maintenance, and use of berms, ditches, storage facilities, and/or collection/treatment systems.
- Inspect scrap areas at least annually. Inspections will monitor compliance with operating plans.
- Take fugitive dust control measures to minimize emissions.

- Monitor upstream and downstream surface and ground water locations in accordance with Ground Water Permit. Specific monitoring points for the scrap areas are listed in Table 2.

Table 2.
Scrap Area Monitoring Point
Huntington Power Plant

Monitoring Point	Location in Flow Field
HPS-1	Down gradient of Plant Activities
HSW-1	Down gradient of Plant Activities

Old Combustion Waste (Ash) Landfill
Best management practices include:

- Minimize storm water run-on/runoff through the construction, maintenance, and use of berms, ditches, storage facilities, and/or collection/treatment systems.
- Inspect class IIIb industrial waste landfill at least once per quarter. Inspections will monitor compliance with operating plans.
- Monitor the construction and contemporaneous reclamation of the ash pile.
- Take fugitive dust control measures to minimize emissions.
- Monitor upstream and downstream surface and ground water locations in accordance with Ground Water Permit. Specific monitoring points for the old combustion waste landfill are listed in Table 3.

Table 3.
Old FGD Waste Landfill Monitoring Points
Huntington Power Plant

Monitoring Point	Location in Flow Field
LF-1O	Upgradient of old Combustion Waste Landfill
LF-2O	Upgradient of old Combustion Waste Landfill
LF-3O	Down gradient of old Combustion Waste Landfill
LF-4O	Down gradient of old Combustion Waste Landfill
LF-6O	Down gradient of old Combustion Waste Landfill
LF-7O (Nested)	Down gradient of old Combustion Waste Landfill
NF-OLF	Surface Down gradient of old Combustion Waste Landfill
Ck@DP3	Surface Down gradient of old/new Combustion Waste Landfill

Discharge Minimization for the Old Combustion Waste Landfill

The closure of the Old Landfill area consists of leaving all combustion wastes in place and

constructing an Evapotranspiration (ET) cover over all the material except the footprint of the industrial waste landfill, and Monitored Natural Attenuation (MNA). The cover is constructed to prevent water deposited on the surface of the cap from infiltrating into the combustion waste. The Sampling and Analysis Plan focuses on the ground water and surface water down-gradient of the landfill area.

Reducing infiltration combined with monitored natural attenuation (MNA) is the preferred way to restore water quality.

- Within the capped area, the expanded ET cap will eliminate the infiltration of precipitation into the landfill and eliminate run on from the surrounding terrain, thereby, allowing the existing liquid in the landfill to drain.
- MNA is allowing PacifiCorp to track the ground water elevations and contaminant concentrations over time. If decreases in contaminant concentrations are not observed, then the industrial waste landfill will also be capped and the industrial waste landfill would be relocated. This monitoring allows PacifiCorp to document the effectiveness of the corrective action and to ensure protection of public health and the environment.

Research Farm

Best management practices include:

- Minimize storm water run-on/runoff through the construction, maintenance, and use of berms, ditches, and/or storage facilities. The control devices will be inspected regularly to confirm the integrity of the facilities.
- Control irrigation application rate to prevent surface runoff and deep percolation.
- Monitor upstream and downstream surface and ground water locations in accordance with Ground Water Permit. Monitoring Points specific to the Research Farm are listed in Table 4.

Table 4.
Research Farm Monitoring Points
Huntington Power Plant

Monitoring Point	Location in Flow Field
NH-1W	Down gradient Research Farm
NH-2W	Lower Research Farm
NH-3W	Lower Research Farm
NH-4W	Mid- Research Farm/Down gradient of Duck Pond Drainage
NH-5W	Mid- Research Farm
NH-6W	Mid- Research Farm
NH-7W	Upgradient of Research Farm
NH-8W	Upgradient of Research Farm
NH-9W	Mid- Research Farm
RG-1	Down gradient Research Farm
UPL-13	Surface Irrigation Pond
H-1	Surface Upgradient of Facility
H-2	Surface Upgradient of Research Farm
UPL-9	Surface Down gradient of Facility & Research Farm

Process Water Ponds

Best management practices include:

- Clay, synthetic membrane, or concrete liners will be utilized in future construction where appropriate.
- Liner integrity will be maintained on ponds constructed with liners. Inspect ponds at a minimum semi-annual for seeps or other signs of leakage.

- Avoid overfilling ponds.
- Minimize waste water flows.
- Monitor upstream and downstream surface and ground water locations in accordance with Ground Water Permit. Monitoring points for process water ponds are shown in Table 1.

Flue Gas Desulfurization (FGD) Waste
Best management practices include:

- Eliminate free liquid content of FGD slurry. Use drum vacuum filters to remove free liquid from slurry prior to placement on the ash landfill.
- Clean-up spills and take fugitive dust control measures to minimize emissions.
- Monitor upstream and downstream surface and ground water locations in accordance with the Ground Water Permit. Monitoring points for FGD wastes at the old combustion waste landfill are shown in Table 3.

Coal Pile
Best management practices include:

- Storm water run-on/runoff should be minimized through the construction, maintenance, and use of berms, ditches, storage facilities, and/or collection/treatment systems.
- Minimize fugitive dust by taking measures to control emissions.
- Monitor upstream and downstream surface and ground water locations in accordance with Ground Water Permit. Monitoring well **HCP-6** will be included in the semi-annual monitoring network of wells to give early warning of potential discharge of contaminants to ground water.

Plant Facilities
Specific best management practices have been developed for the following plant site categories. Each category is listed below and BMPs are described in detail in the following paragraphs.

- Good Housekeeping
- Vehicle and Equipment Cleaning, Storage, Fueling, and Maintenance Areas
- Material Storage Areas
- Loading/Unloading Areas
- Delivery Vehicles
- Ash Loading and Haul Road Areas
- Above Ground Storage Tanks, Substations, and Storage Areas
- Preventative Maintenance
- Facility Security
- Employee Training
- Continuous Improvement
- Monitor upstream and downstream surface and ground water locations in accordance with Ground Water Permit. Monitoring well **HPS-1** will be included in the semi-annual monitoring network of wells to give early warning of potential discharge of contaminants to ground water.

Good Housekeeping
Good housekeeping requires the operation and maintenance of a clean and orderly facility. All plant operations crews have specific clean-up areas assigned. In addition, site-wide clean-up days are scheduled as needed.

Vehicle and Equipment Cleaning, Storage, Fueling, and Maintenance Areas
Cleaning, storage, and maintenance of vehicles and equipment are confined to designated areas whereby the potential to degrade water sources is prevented or minimized.

The co-mingling of storm water with products used to service the vehicles and equipment is prevented or minimized through the construction, maintenance, and use of berms, ditches, storage facilities, and/or collection/treatment systems.

Appropriate devices will be utilized to collect oil, grease and vehicle and equipment fuels. Spills will be contained, absorbed and cleaned-up in a timely manner.

Material Storage Areas
Storage containers are clearly labeled and maintained in good condition. Whenever possible, enclosed facilities will be used to store materials or provide temporary covering to minimize the potential for pollutants to come in contact with storm water.
Storm water run-on/runoff will be minimized through the construction, maintenance, and use of berms, ditches, storage facilities, and/or collection/treatment systems.

Spills will be cleaned-up in a timely manner using dry clean-up methods.

Loading/Unloading Areas
Ensure that an appropriate spill control plan is in place and plant personnel are familiar with the plan. Locate shipping and receiving activities where spills or leaks can be contained.

Storm water run-on/runoff will be minimized through the construction, maintenance, and use of berms, ditches, storage facilities, and/or collection/treatment systems.

Delivery Vehicles
Vehicles that arrive to make a delivery are responsible for vehicle maintenance, and for any spills incurred while on plant site. In case of spills, the driver should call the control room for needed assistance in cleaning up any spill. Adequate spill containment and countermeasures should be in place to respond to leakage or spillage from the vehicle.

The vehicle should not be left unattended during the unloading process.

Ash Hauling Vehicles
Ash hauling vehicles will be inspected, cleaned and maintained to ensure the overall integrity of the vehicle and ash container.

Fly ash will be mixed to contain the proper amount of liquid such that fugitive dust emissions are minimized.

Ash Loading and Haul Road Areas
Good housekeeping practices will be observed to reduce and/or control the tracking of ash or residue from loading areas. The ash silo building and adjacent roadways will be cleared and cleaned of spillage and debris to minimize any contact with storm water.

Ash haul roads will be maintained in good condition to minimize bumps and uneven surfaces. The speed of the vehicles on the ash haul road will be maintained at a reasonable level for the road conditions.

Fugitive dust control measures will be taken to minimize emissions.

Storm water run-on/runoff should be minimized through the construction, maintenance, and use of berms, ditches, storage facilities, and/or collection/treatment systems.

Above Ground Storage Tanks, Substations, and Storage Areas
Above ground petroleum storage tanks and electrical transformers will be inspected in accordance with the Spill Prevention, Control and Countermeasures (SPCC) Plan and all other bulk storage tanks will be inspected on a routine basis. Appropriate secondary containment will be provided for petroleum and bulk storage tanks to prevent spills from leaving the plant site.

Liquid level gauging devices will be provided to avoid overfilling tanks. All mobile or portable tanks will be located in a position that prevents a discharge.

All spills or releases will be cleaned-up in a timely manner.

Storm water run-on/runoff will be minimized through the construction, maintenance, and use of berms, ditches, storage facilities, and/or collection/treatment systems.

Collection Systems
Collection systems were installed to intercept leachate leaving both the New and Old Landfill areas and surface water in the Duck Pond area. A total of three collection systems were installed. The systems were installed directly below the new landfill, in the drainage below the new and old landfills, in the West End Canyon and springs near the Duck Pond inflow. The systems capture all existing surface water and a percentage of storm water generated in the area. Captured water gravity flows to the pump house sump, where it is pumped back to the facility for re-use in plant operations.

Collection System #1
Collection System #1 is located below the toe of the northwest corner of the New Landfill. System #1 intercepts and directs the surface water and shallow groundwater flows down a collection ditch. The ditch is lined with an HDPE channel lining system. A perforated 4” HDPE pipe is placed in the bottom of the ditch liner and conveys the fluid to the flanged bulkhead connection at the lowest end of the collection ditch. The ditch is covered with filter fabric and riprap and filled with medium gravel. Using a flanged connection, the perforated pipe is joined to 4-inch, solid HDPE pipe and routed from the collection system, then to the west of the existing storm water retention pond, and down an existing drainage to Collection System #2.

The pipeline is constructed with 4 inch HDPE pipe. The pipe was installed in lengths up to 40 feet and heat-welded together at the joints. The completed pipeline was placed in a ditch approximately 3 feet deep and buried with native soils to prevent freezing. The total length of the pipeline is approximately 4,000 feet.

Collection System #2
Collection System #2 is located in the natural drainage approximately 100 feet below the confluence of the drainage from the Old Landfill and the New Landfill. This system intercepts any drainage originating from the old landfill or New Landfill that is not collected by System #1.

Collection System #2 is constructed similarly to System #1. In the event of a large storm water runoff volume flowing down the natural drainage, all flows over 120 gpm will proceed down the drainage to the existing Duck Pond. The Duck Pond will be used as a storm water collection basin which will then be discharged to the Pump house when flows from the collection systems have returned to normal.

Collection System #3A
Collection System #3A collects surface water flowing through the West End Canyon. System #3A is constructed similarly to Systems #1 and #2.

Collection System #3A is not connected to Systems #1 and #2.

Collection System #3B
Collection System #3B collects water flowing from a seep/spring area located between the Duck Pond and the West End Canyon. System #3B is constructed similar to the previously described systems. The pipeline from System #3B is connected to the pipeline from System #3A and routed to the Pump house.

Pond Dredging
Periodically, dredging of site holding ponds is required. Dredging wastes will be disposed of according to the following procedure.

- Dredging materials will be removed from the pond and spread in one of two dewatering pads.
- Storm water within the dewatering pads will be contained.
- When the material passes a paint filter test, it will be transported for disposal in the appropriate waste landfill.
- Multiple ground water monitoring wells are completed both up and down-gradient of the plant area and are sampled semi-annually to monitor water quality.

Preventative Maintenance
The Plant's work management system will be utilized to monitor and inspect systems and detect conditions that could cause breakdowns or failures which have the potential to pollute.

Facility Security
Plant property will be monitored using security personnel and other surveillance tools so that the ingress and egress of those entering and exiting the property is known and the likelihood of vandalism is minimized.

Employee Training
When properly trained, Plant personnel are more capable of preventing spills, responding safely and effectively to an incident when one occurs, and recognizing a situation or condition that could result in surface or ground water contamination.

Continuous Improvement
The effectiveness of BMPs will be monitored using inspection programs whereby the information garnered can be utilized to improve upon current practices.

Appendix C Monitoring Program

Ground Water
Ground water monitoring will be conducted for the constituents shown in **Table I** in the monitoring wells shown in **Table II**.

Surface Water
The surface water monitoring locations (**Table II**) will also be sampled for the analytes shown in **Table I**.

Table I. Field & Analytical Monitoring Parameters

Field Measurements		
Water Level	pH	
Temperature	Specific Conductance	
Analytical Data		
Analyte	**Method**	**Detection Limit**
Total Dissolved Solids	E160.1/A2540C	10 mg/l
Sodium	E273.1/E200.7/E200.8	1 mg/l
Potassium	E258.1/E200.7/E200.8	1 mg/l
Magnesium	E242.1/E200.7/E200.8	1 mg/l
Calcium	E215.1/E200.7/E200.8	1 mg/l
Sulfate	E300.0	1 mg/l
Selenium	E200.8	.002 mg/l
Alkalinity	E310.1/A2320B	5 mg/l
Carbonate	A2320B	5 mg/l
Bicarbonate	A2320B	5 mg/l
Chloride	E300.0/A4500CLB	1 mg/l
Nitrate + Nitrite	E353.2	0.1 mg/l
Boron	E200.7/E200.8	0.01 mg/l

Table II. Monitoring Locations

Potential Source Areas w/ Well IDs	Purpose	Justification
Ash Landfill (Old)		
LF-1O	CAP/BMP	Upgradient well for Old Ash Lf
LF-2O	CAP/BMP	Down gradient well for Old Ash Lf
LF-3O	CAP/BMP	Upgradient well for Old Ash Lf and storm water pond
LF-4O	CAP/BMP	Down gradient well for Old Ash Lf and storm water
LF-6O	CAP/BMP	Down gradient well for Old Ash Lf and storm water
LF-7Od	CAP/BMP	Down gradient well for Old Ash Landfill
Ash Landfill (New)*		
HLF-3Ns	GWD/BMP	Down gradient well for New Ash Landfill
HLF-3Nd	GWD/BMP	Down gradient well for New Ash Landfill
HLF-4N	GWD/BMP	Down gradient well for New Ash Landfill
Coal Pile		
HCP-4	BMP	Upgradient well for Coal Pile
HCP-6	BMP	Down gradient well for the Coal Pile
Process Ponds		
HWW-4	/CAP	Down gradient well for WW Holding Basins
HWW-7	BMP	Down gradient well for Evaporation Pond
HSW-1	BMP/CAP	Down gradient well for Storm Water
Plant Site		
HPS-1	BMP	Down gradient for Plant Activities
Fuel Oil Sump MW	BMP	Down gradient for Fuel Oil Sump
Research Farm		
NH1W	GWD/BMP	Down gradient for Research Farm
NH2W	GWD/BMP	Lower Research Farm
NH3W	GWD/BMP	Lower Research Farm
NH4W	GWD/BMP	Mid-Research Farm/Down gradient of Duck Pond
NH5W	GWD/BMP	Mid-Research Farm
NH6W	GWD/BMP	Mid-Research Farm
NH7W	GWD/BMP	Upgradient of Research Farm
NH8W	GWD/BMP	Upgradient of Research Farm
NH-9W	GWD/BMP	Down gradient Research Farm
NH-10W	GWD/BMP	Upgradient of Research Farm
RG-1	GWD/BMP	Down gradient Research Farm

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Potential Source Areas w/ Well IDs	Purpose	Justification
Raw Water Settling Basin		
HRW-1	GWD/BMP	Upgradient of Raw Water Settling Basin
HRW-2	GWD/BMP	Down gradient of Raw Water Settling Basin
Surface Water Locations		
H-1	GWD/BMP	Upgradient Huntington Creek
H-2	GWD/BMP	Midpoint on Huntington Creek
UPL-9	GWD/BMP	Down gradient Huntington Creek
H-11	CAP	Spring
H-12	CAP	Duck Pond
NF-OLF	CAP	Down gradient of Old Landfill
SF-NLF	CAP	Down gradient of New Landfill
West End Canyon	CAP	Down gradient of Plant Activities
UPL-13	GWD/BMP	Routine Network for Research Farm
Landfill @ Pump house	CAP	Down gradient of New Landfill
Duck pond @ Pump house	CAP	Down gradient of Old Landfill
Ck@DP3	CAP	Down gradient of old/new Landfill
Raw Water Settling Basin	GWD/BMP	Raw Water Settling Basin

BMP – Best Management Practice
CAP – Corrective Action Plan Monitoring
GWD – Ground Water Discharge Permit Monitoring
* - New Landfill CCR wells will be monitored until DWMRC begins regulating CCR Units.

Operational Monitoring Schedule
Operational monitoring at the Huntington Power Plant will be completed semi-annually for all ground and surface water locations for the monitoring points in **Table II**, except for Research Farm wells next to Huntington Creek (NH-3W, NH-6W, NH-8W, NH-9W and H8W) which will be sampled quarterly, until modified in writing.

Table III. Monitoring Frequency

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Monitoring Location	Sample Frequency	Duration
Farm Wells away from Huntington Creek	Semi-Annual	Until Modified in Writing
Farm Wells Next to Huntington Creek	Quarterly	Until Modified in Writing
PSA Wells	Semi-Annual	Until Modified in Writing
Surface Water	Semi-Annual	Until Modified in Writing

Further detailed information on ground and surface water monitoring at the Huntington Power Plant can be found in the Ground Water and Surface Water Sampling and Analysis Plan included as Appendix D.

2.3 Post-Operational Monitoring Schedule

In order to tailor post-operational monitoring plans to adequately monitor ground water conditions at the site, a post-operational monitoring schedule will be determined by the State of Utah and Huntington Power Plant personnel as plant closure approaches. At that time, the State of Utah and Huntington Power Plant personnel will also determine post-operational monitoring points and sampling frequency.

Appendix D
Ground Water & Surface Water Sampling and Analysis Plan
Huntington Power Plant

1.1 INTRODUCTION

This Sampling & Analysis Plan (SAP) is written to: 1) provide descriptions of existing monitoring locations; 2) describe sample parameters and frequency; 3) provide the Quality Assurance/Quality Control (QA/QC) requirements for the water monitoring at the Huntington Power Plant that meets State of Utah and RCRA Subtitle D regulations; and, 4) properly document all sampling procedures and sampling data.

The SAP is written to satisfy the monitoring requirements of the Ground Water Discharge Permit (permit No. UGW150002).

1.2 Responsible Person

Implementation of the Sampling and Analysis Plan at the Huntington Power Plant is the responsibility of the Plant's Environmental Engineer.

1.3 Corrective Action

Corrective actions may occur during the implementation of this SAP. Any changes in the sampling schedule, sampling forms, sample locations, choice of laboratory, parameters, standard operating procedures (SOP's), and methods will be documented and explained. The sampling personnel and the Huntington Power Plant Environmental Engineer are responsible for the implementation, documentation, and evaluation of the corrective actions.

2.1 GROUND WATER & SURFACE WATER MONITORING PLAN

Currently, the ground and surface water sampling conducted at the Huntington Power Plant is part of the Site-Wide Monitoring Plan.

- **Ground Water Discharge Permit**: The specific requirements of the discharge permit are incorporated into this SAP to monitor, track, and document compliance with the discharge permit.

The monitoring at the facility includes ground water and surface water monitoring. The ground water monitoring points are sampled for water level, field parameters, and laboratory parameters. All surface water monitoring points are monitored for field parameters, and laboratory parameters, select points will also be monitored for flow.

2.2 Monitoring Network

2.1.1 Ground Water

The monitoring system consists of ground water sampling in the area of the Old Landfill, the plant site, waste water facilities, coal pile and the Research Farm. Ground water monitoring is conducted through sampling of monitoring wells (Table III & Figure 1). The monitoring wells are located down-gradient of the old landfill, along the Duck Pond Drainage, the plant site, waste water facilities, coal pile and on the Research Farm Property. Field and analytical parameters are listed in Table II.

2.1.2 Surface Water

The surface water monitoring locations are along the Duck Pond Drainage, upgradient on Huntington Creek, above the farm on Huntington Creek, irrigation storage reservoir and down-gradient of the farm on Huntington Creek.

All water sample locations will be monitored for the constituents shown in Table II.

Table II. Field & Analytical Monitoring Parameters

Field Measurements		
Water Level	pH	
Temperature	Specific Conductance	
Analytical Data		
Analyte	**Method**	**Detection Limit**
Total Dissolved Solids	E160.1/A2540C	10 mg/l
Sodium	E273.1/E200.7/E200.8	1 mg/l
Potassium	E258.1/E200.7/E200.8	1 mg/l
Magnesium	E242.1/E200.7/E200.8	1 mg/l
Selenium	E200.8	0.002 mg/l
Calcium	E215.1/E200.7/E200.8	1 mg/l
Sulfate	E300.0	1 mg/l
Alkalinity	E310.1/A2320B	5 mg/l
Carbonate	A2320B	5 mg/l
Bicarbonate	A2320B	5 mg/l
Chloride	E300.0/A4500CLB	1 mg/l
Nitrate + Nitrite	E353.2	0.1 mg/l
Boron	E200.7/E200.8	0.01 mg/l

Table III lists the wells and surface water locations included in the water monitoring plan for the Huntington Power Plant facility. All existing monitoring locations are shown in Figure 1.

Table III. Monitoring Locations

Potential Source Areas w/ Well IDs	Purpose	Justification
Ash Landfill (Old)		
LF-1O	CAP/BMP	Upgradient well for Old Ash Landfill
LF-2O	CAP/BMP	Down gradient well for Old Ash Landfill
LF-3O	CAP/BMP	Upgradient well for Old Ash Landfill
LF-4O	CAP/BMP	Down gradient well for Old Ash Landfill
LF-6O	CAP/BMP	Down gradient well for Old Ash Landfill
LF-7Od	CAP/BMP	Down gradient well for Old Ash Landfill
Ash Landfill (New)*		
HLF-3Ns	CAP/BMP	Down gradient well for New Ash Landfill
HLF-3Nd	CAP/BMP	Down gradient well for New Ash Landfill
HLF-4N	CAP/BMP	Down gradient well for New Ash Landfill
Coal Pile		
HCP-4	BMP	Upgradient well for the Coal Pile
HCP-6	BMP	Down gradient well for the Coal Pile
Plant Site		
HFOS-mw	CAP	Down gradient well for historic oil spill
HPS-1	BMP	Down gradient well for Plant
Process Ponds		
HWW-4	BMP	Down gradient well for Wastewater Decanting Basins and Drying Pad
HWW-7	BMP	Down gradient well for Evaporation Pond
HSW-1	BMP	Down gradient well for Drying Pad
Research Farm		
NH1W	GWD/BMP	Down gradient for Research Farm
NH2W	GWD/BMP	Lower Research Farm
NH3W	GWD/BMP	Lower Research Farm
NH4W	GWD/BMP	Mid-Research Farm/Down gradient of Duck Pond
NH5W	GWD/BMP	Mid-Research Farm
NH6W	GWD/BMP	Mid-Research Farm
NH7W	GWD/BMP	Upgradient of Research Farm
NH8W	GWD/BMP	Upgradient of Research Farm
NH-9W	GWD/BMP	Mid-Research Farm
NH-10W	GWD/BMP	Upgradient of Research Farm
RG-1	GWD/BMP	Down gradient for Research Farm
Raw Water Settling Basin		
HRW-1	GWD/BMP	Upgradient of Raw Water Settling Basin

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Potential Source Areas w/ Well IDs	Purpose	Justification
HRW-2	GWD/BMP	Down gradient of Raw Water Settling Basin
Surface Water Locations		
H-1	GWD/BMP	Upgradient Huntington Creek
H-2	GWD/BMP	Midpoint on Huntington Creek
UPL-9	GWD/BMP	Down gradient Huntington Creek
H-11	CAP	Spring
H-12	CAP	Duck Pond Surface
Drain-O	CAP	Down gradient of Old Landfill
Drain-N	CAP	Down gradient of New Landfill
West End Canyon	CAP	Down gradient of Landfill
UPL-13	GWD/BMP	Routine Network for Research Farm
Landfill @ Pump house	CAP	Down gradient of Landfill
Duck Pond @ Pump house	CAP	Down gradient of Landfill
HG-FD	CAP	Down gradient of Landfill
Creek at DP3	CAP	Down gradient of Landfill
Raw Water Settling Basin	GWD/BMP	Raw Water Settling Basin

BMP – Best Management Practice
CAP – Corrective Action Plan Monitoring
GWD – Ground Water Discharge Permit Monitoring
* - New Landfill CCR wells will be monitored until DWMRC begins regulating CCR Units.

2.2 Operational Monitoring Schedule

Operational monitoring at the Huntington Power Plant will be completed semi-annually for all ground water wells and surface water locations for the monitoring points in Table III, except for Research Farm wells next to Huntington Creek (NH-3W, NH-6W, NH-8W, NH-9W and H8W) which will be sampled quarterly, until modified in writing.

Table IV. Monitoring Frequency
Huntington Power Plant

Monitoring Location	Sample Frequency	Duration
Farm Wells, away from Huntington Creek	Semi-Annual	**Until Modified in Writing**
Farm Wells, next to Huntington Creek	Quarterly	**Until Modified in Writing**
PSA Wells	Semi-Annual	**Until Modified in Writing**
Surface Water	Semi-Annual	**Until Modified in Writing**

2.3 Post-Operational Monitoring Schedule

In order to tailor post-operational monitoring plans to adequately monitor ground water conditions at the site, a post-operational monitoring schedule will be determined by the State of Utah and Huntington Power Plant personnel as plant closure approaches. At that time, the State of Utah and Huntington Power Plant personnel will also determine post-operational monitoring points and sampling frequency.

2.4 Reporting Requirements

Semi-annual reports describing all water sampling, static water level measurements, and a summary of surface water data will be submitted to the State of Utah-Division of Water Quality and the Huntington Power Plant. Analytical results of each sampling event, inspections and maintenance, and any well construction activities, and any recommendations concerning modifications to the sampling frequency, analytical constituents or monitoring network will be submitted to the State of Utah-Division of Water Quality and Huntington Power Plant with the ground water monitoring reports.

Copies of all Field Log Books used for water monitoring must be retained. The field records must be available for UDEQ. Field Log Books will be comprised of detailed notes, forms and narratives documenting site sampling conditions and procedures to demonstrate the SAP and QA/QC Plan are being followed. Variances from the SAP will be documented and explained in the field notes. Records will be archived until the project is inactive plus five years. All data will be maintained in electronic format.

2.5 Monitoring Well Network Maintenance

2.5.1 Monitoring Well Inspections

Monitoring well inspections will be conducted and the results reported on the ground water sampling form. Ground water sampling personnel will inspect each well whenever sampling or monitoring activities are conducted. Wells will be inspected for the integrity of the locking cap, padlock, and steel well protector, and PVC well casing riser and cap.

Any foreign material removed from a well during purging or sampling activities will be described.

Monitoring well inspections will be recorded in the Field Log Book during each monitoring event.

2.5.2 Monitoring Well Inspection Reports

Any breach of integrity observed by the ground water sampling personnel will be reported to the Huntington Power Plant Environmental Engineer. If for any reason a well is destroyed or otherwise fails to function properly or its integrity is determined to be breached, the Huntington Power Plant Environmental Engineer will coordinate well repair or replacement.

2.5.3 Monitoring Well Abandonment

If the damage to or integrity of the well cannot be repaired, the well may be recommended for and properly abandoned and replaced within 180 days unless otherwise approved in writing by the State of Utah.

Well abandonment procedures are as follows:

1. Break bottom cap with a spear;
2. Pump well full of bentonite grout with a packer to force injection of grout into formation;
3. Let well sit for 24 hours;
4. Refill with grout (if necessary); and
5. Remove surface completion (if possible).

A well log report fully describing all abandonment procedures will be submitted to the State of Utah within 90 days of the abandonment activity.

2.5.4 Installation of Replacement Wells

Replacement wells, if needed, will be installed at locations which allow them to fulfill the intended purpose of the well they are replacing. Wells will be installed and completed as specified in Section 2.5 of this report. The Huntington Power Plant Environmental Engineer and his consultants, in conjunction with the State of Utah, will determine the exact well locations.

The replacement well will be developed and sampled upon installation. Following the initial sampling event, the well will be included and sampled in accordance with the established schedule for all other ground water monitoring network wells.

2.5.5 Documentation of Well Construction

If a major plan or report, including semi-annual reports of ground water monitoring activities, is in preparation at the time of new well construction, development or rehabilitation, the lithologic log, well construction logs, and other well construction and development details will be attached as an appendix to the major document. Otherwise, replacement well construction documentation will be submitted to the State of Utah within 90 days.

3.1 WATER SAMPLING & ANALYSIS PLAN

3.2 Objectives

The objective of this SAP is to provide detailed procedures, which are to be followed during all sampling events scheduled at the Huntington Power Plant.

3.3 Sampling Personnel

Experienced PacifiCorp personnel will conduct the routine monitoring, as needed.

3.4 Water Monitoring Locations

The locations of existing sampling locations at the Huntington Power Plant are shown in Figure 1.

3.5 Water Monitoring Parameters

A summary of the field and analytical data to be collected during each sampling event is detailed in Section 2.1, Table II.

3.6 Sampling Schedule

Ground and surface water sampling will be conducted semi-annually except for Research Farm wells next to Huntington Creek (NH-3W, NH-6W, NH-8W, NH-9W and H8W) which will be sampled quarterly, with reporting on a semi-annual basis. A certified laboratory will conduct laboratory analysis. Semi-annual reports and accompanying lab sheets will summarize all ground and surface water sampling results.

3.7 Safety

It is the sampler's responsibility to obtain, maintain, and operate all equipment in a safe manner during a sampling event. The sampler's personal safety and that of any persons who accompany the sampler must be the primary concern at all times and in all sampling situations. A sampler who encounters a condition that may exceed the protection of their safety equipment or represent a potential hazard to human health should leave the area immediately and contact the Huntington Power Plant Environmental Engineer. Safety equipment may include but is not limited to:

- Safety glasses;
- Hard hat;
- Safety boots;
- Gloves;
- Cell phone;
- Protective clothing.

3.8 Sample Labeling and Shipping

Each sample sent to the laboratory must be labeled on the container in permanent, waterproof marking pen able to withstand long-term exposure to water. The label identification must cross-reference to the chain-of-custody form and the sampler's Field Log Book.

Sample labeling must identify four elements:

1. Day of the year;
2. Time;
3. Sample ID code; and
4. Name or chemical formula of the preservative used.

3.9 Waste Disposal

Solid and liquid wastes generated by field sampling will be disposed of in a proper manner. Any non-hazardous liquid will be disposed of at the sampling site. Solid waste products will be disposed of at an approved waste collection facility.

4.1 QUALITY ASSURANCE/QUALITY CONTROL PLAN

Activities required to produce accurate, precise, and repeatable results are an integral part of field sampling activities and laboratory analytical procedures.

4.2 Field Quality Assurance/Quality Control Plan

A QA/QC Plan depends on meticulous attention to detail and documentation by field personnel. Field sampling personnel are responsible for following standard operating procedures for equipment calibration and decontamination, well monitoring, sample collection including QA/QC samples, sample preservation, labeling, storage, and transportation to the analytical laboratory. All activities must be documented with care to verify correct handling and to permit accurate reporting of results.

4.1.1 Field Sampling Procedures

Field sampling procedures will include the following:

1. Equipment maintenance;
2. Equipment decontamination;
3. Equipment calibration;
4. Sample collection and preservation;
5. Sample storage and handling; and,
6. Field documentation of sampling activities.

4.1.1.1 Equipment Maintenance

Sampling equipment must be properly maintained. Table V lists sampling equipment maintenance procedures.

Table V. Equipment Maintenance

Equipment:	**Procedure:**
Solinst (or equivalent)Water Level Meter & Graduated Tape	Clean after each field use; Wash with mild detergent; and Rinse well, Replace 9-volt battery when the auditory or visual signal weakens or fails.
Horiba Water Quality Checker U-10, U-52 or equivalent	Rinse thoroughly after each field use; For longer storage, fill the small rubber cap with water and use it to cover the pH sensor. If storage is for a prolonged period (>6 months), remove the battery from the main unit.

4.1.1.2 Equipment Decontamination

All equipment, which comes in contact with ground water, will be decontaminated prior to use in a new sampling area. Table VI lists sampling equipment decontamination procedures.

Table VI. Equipment Decontamination

Equipment:	Procedure:
Solinst (or equivalent) Water Level Meter & Graduated Tape	Wash with mild detergent or (alcanox) and a brush; Rinse with tap water; and Air dry.
Horiba Water Quality Checker U-10, U-52 or equivalent	<u>Turbidity sensor</u> Wash out the tube using tap water; And Rinse with tap water. Do not use abrasives or cleaners. <u>Conductivity sensor</u> Wash out using tap water and rinse with tap water.

4.1.2 Field Documentation Procedures

A Field Log Book or Data Sheets will be maintained and prepared prior to the sampling event. Sufficient details including, but not limited to, those listed below will be included to document and permit reconstruction of all sampling events without relying on memory. The records will be completed in waterproof ink and will be legible and complete. The Field Log Book will be a compendium of forms pertinent to the specific field activity. More than one Field Log Book may be in use at one time; however, information will be recorded in only one of the logbooks to prevent duplication or omission of information, except for that required to adequately cross-reference other information.

The first page in the Field Log Book will contain

- Name of Facility

For each site visit or sampling event, the following information will be provided:

- Date(s) of sampling;
- Names of persons sampling;
- Weather conditions;
- Field activities conducted and their purposes;
- Sample collection time;
- Sample ID;
- Description of the condition, if not normal, of the protective casing, well casing, and annular seal; and
- Initials of person providing the information.

The Field Log Book will be specific to each field event and will be a compendium of forms pertinent to that specific field activity or time period. The Field Log Book for ground water sampling events will include:

- Map of sample locations at the Huntington Power Plant;
- Ordered list of sampling activities;
- Chain-of-custody Record; and.
- Field Data Sheets and Notes

4.1.3 Field Equipment Calibration

Calibration procedures are specific to each instrument. At a minimum the Horiba (or equivalent) will be calibrated before each sampling day and the Solinist (or equivalent) will be calibrated annually or after repairs. Table VII lists sampling equipment and its calibration procedures.

Table VII. Equipment Calibration

Equipment:	**Calibration Procedure:**
Solinst (or equivalent)Water Level Meter & Graduated Tape	Power instrument, as probe is held vertically or horizontally 10-20 ft from cable reel, use a steel tape graduated in 0.01 ft increments to measure distance from the tip of the probe to the sensor level, the sensor to the 1 ft mark on the graduated portion of the tape, & the sensor to the 10 and/or 20 ft mark on the graduated portion of the tape. Calculate calibration correction factor (if necessary).
Equipment:	**Auto-Calibration Procedure:**
Horiba Water Quality Checker U-10, U-52 or equivalent	Fill the calibration beaker 2/3 with standard solution, fit the probe over the beaker, turn power on, press MODE key which puts unit into MAINT mode, check that lower cursor is in the AUTO sub-mode, press ENT key and the readout shows "CAL", after a few minutes the upper cursor will cycle through all calibration parameters, and when complete, "End" will show briefly and then return to the MEAS mode.

4.1.4 Chain-of-Custody Procedures

A chain-of-custody record supplied by the analytical laboratory will be completed for all samples as they are collected. The record will include or be similar to, depending on the laboratory requirements:

- The project name and number;
- Name of the analytical laboratory destination;
- Sampler's signature;
- Sample identification number, date and time of collection;
- Number of containers and type of sample;
- Analysis requested and number of containers provided per analysis; and
- Any special instructions or hazard warnings.

When sampling is complete, the samples will be packed for transport. A completed chain-of-custody will be enclosed in a Ziploc bag, placed inside the cooler. The samples will then be ready for shipping or delivery. Upon delivery, both parties to the exchange will sign and date the record noting the time of the exchange of custody. The sampler will be the first relinquishing signature and the laboratory personnel will be the final receiving signature. Intermediate signatures may or may not be present.

4.2 Sample Acquisition Methods

The sampling procedures described herein are designed to obtain representative ground water and surface water samples from the Huntington Power Plant.

Ground Water

Depth to water or static water level measurements will be collected during each sampling event. If previous sampling data is available, and sample collection proceeds from the well with the lowest concentration of TDS to the well with the highest concentration of TDS, decontamination is only required between PSA,s. Otherwise, decontamination is required between each well. Before being placed in each monitoring well, the water level probe will be decontaminated by rinsing the end of the probe with distilled water. Depth to water will be measured in each monitoring well. This will allow the calculation of static ground water elevations for approximately the same time period.

To ensure that a representative sample is collected at each sampling location, the following sampling steps will be followed at each location. Sampling steps in order of performance at each well include:

- Transport all appropriate equipment to the sampling site;
- Inspect well;
- Don disposable gloves;
- Determine depth to water;
- Calculate water column volume;
- Purge well (three well volumes);
- Measure field parameters during purge and at the end of full purge;
- Withdraw sample;

- Field filter (as required); and
- Containerize/preserve sample aliquots.

If a well is purged dry prior to removing three well volumes, that well will be allowed to recover and then sampled. A note of explanation will be included in the Field Log Book. If past data shows the well will not recover in 24 hours, purge a small amount, then collect sample.

Surface Water
Surface water samples will be collected at locations shown on Figure 1. Grab samples from surface water bodies will be acceptable at the Huntington Power Plant.

- Transport all appropriate equipment to the sampling site;
- Don disposable gloves;
- Measure field parameters ;
- Withdraw sample;
- Field filter (if required); and
- Containerize/preserve sample aliquots.

In order to ensure reproducible sample data, surface water sample points will be clearly marked or located with GPS coordinates.

4.2.1 Well Inspection

In accordance with Section 2.5.1, the protective casing will be examined for damage during each monitoring event. The padlock and cap will be inspected and then removed. The riser casing and cap will also be inspected for damage. Observed odors will be noted. Detailed notes of any damage ascertained will be recorded in the Field Log Book.

4.2.2 Determine Static Water Height

Static water level measurements will be taken at each monitoring well sampled. The steps are as follows:

1. Locate well and note general condition in Field Log Book;
2. Unlock casing and uncap monitor well;
3. Don clean disposable sample gloves;
4. Measure and record (±0.01 ft) static water level in Field Log Book;
5. Calculate volume of well water to be removed and record in Field Log Book;
6. Cap and lock well if not sampling immediately; and
7. Rinse water level probe with distilled water.

4.2.3 Well Purging

Well purging will be performed at each monitoring well sampled. The steps are as follows:

1. Purge minimum of 3 well volumes or until well is purged dry,
2. Record total volume of water removed in Field Log Book;
3. Record observations of purged water; and
4. Properly dispose of purge water.

4.2.4 Surface Water Discharge Measurements

Select gauging station near sample site H-1, H-2, and UPL-9. Location should have a uniform channel shape and flow should be as uniform as possible. Location should not have the possibility of bypass and should not be located downstream of any in-stream structures such as bridges.

Cold weather conditions, when sampling personnel must be in the water must be minimized and periods when ice has built up or is breaking up will be avoided, as well as periods of high flows due to rapid precipitation or snow melt

Samples and measurements will be collected semi-annual to coincide with the groundwater sampling schedule of April and October.

1. Extend Tape across channel and measure total channel width (w).
2. Divide the channel into one foot equal sections (b).
3. Collect velocity readings (v) in the horizontal center of each stream segment
4. Record the stage reading from each location.
5. Record all measurements in a field notebook.

4.2.5 Sample Withdrawal

Sample withdrawal procedures are as follows:

1. Don disposable gloves;
2. Label bottles using waterproof marker;
3. Lower bailer or pump to collect ground water samples, add preservatives (if required) to the sample bottle;
4. Collect sample for field parameters;
5. Measure and record field parameters;
6. Withdraw sample and fill all sample bottles;
7. Check all sample bottle caps for tightness;
8. Place sample in cooler for on-site storage and transport to the lab;
9. Record sample ID, location, well ID, date, time, and other observations in Field Log Book;
10. Rinse all equipment with distilled water; and
11. Cap and lock well.

4.2.6 Sample Containerization, Preservation, and Holding Times

Each sample parameter has a specific container requirement, volume requirement, preservative, and maximum holding time. Table VIII lists sample containerization, preservation, and holding times.

Table VIII. Sample Containerization, Preservation, & Holding Times

Parameter	Container Plastic (P) Glass (G)	Minimum Volume (ml)	Preservative	Maximum Holding Time
Alkalinity	P or G	250*	ice	14 days
Boron	P or G	250*	ice	28 days
Calcium	P or G	250*	ice, unpreserved	6 months
Chloride	P or G	250*	none required	28 days
Metals, except those specifically listed	P or G	500**	ice, nitric acid (HNO_3) to pH 2	6 months
Nitrate-Nitrite	P or G	250*	ice, sulfuric acid (H_2SO_4) to pH 2	28 days
pH	P or G	250*	none required	analyze immediately
Sodium	P or G	250*	ice, unpreserved	6 months
Specific Conductance	P or G	250*	none required	analyze immediately
Sulfate	P or G	250*	ice	28 days

Reference: *Energy Laboratories Analytical Services, 1998

4.2.7 Field Parameter Measurement

The calibration and field parameter measurements will be documented in the Field Log Book.

1. Don disposable gloves;
2. Lower bailer or pump to collect ground water samples;
3. Place sample in container large enough to accommodate Horiba;
4. Record field parameters, pH, specific conductivity and temperature, in field log book;
5. Cap and lock well if not sampling immediately; and
6. Rinse Horiba probe (or equivalent) with distilled water.

4.3 Shipping and Handling

Sampling personnel will retain custody of the samples or assure their integrity between the time of collection and delivery to the analytical laboratory. Table VIII will be consulted to ensure that samples were properly preserved and submitted within the allowable holding times. Coolers will be packed with ice to ensure they are received with an acceptable cooler temperature of 4ºC. Any transfer of custody will be recorded on the chain-of-custody record. Chain-of-custody procedures are presented in Section 5.2.

4.4 Analytical Parameters

The site-specific monitoring parameters for Huntington Power Plant are shown in Section 2.1, Table II.

5.1 LABORATORY QUALITY ASSURANCE/QUALITY CONTROL PLAN

5.2 Laboratory Identification

A certified and accredited laboratory will analyze the ground water monitoring samples from the Huntington Power Plant.

5.3 Sample Custody

When accepting custody of the samples, laboratory personnel record them in the sample receipt log and give each container a unique sample-tracking number. Samples that are preserved by the sample collector are checked for proper preservation. Laboratory personnel will check the chain-of-custody for accuracy. If samples are improperly preserved or the maximum holding time has been exceeded, the sampler is notified and re-sampling is requested.

5.4 Analytical Turn-Around Time

Analytical turn-a-round time is dependent on the number of samples awaiting analysis and/or by arrangement with the sampler. All samples are analyzed within the holding time period for the specific method. Water quality sampling analysis holding times are different for each individual parameter and are shown in Section 4.2.6, Table VIII.

5.5 Calibration Procedures and Frequency

Analytical laboratories follow instrument and equipment manufacturer's calibration instructions and EPA, ASTM or other published method procedures. Initial instrument calibration curves are generated, verified and routinely monitored by continuing calibration checks throughout the duration of all instrumental analysis. When possible, the laboratory uses certified stock calibration standards. Standard preparation notebooks document the source, purity, content, concentration, data and analyst.

Samples are only quantitated within the limits of the response of the calibration standards. Volumetric dilution of high concentration samples is used to bring sample analyte concentrations within the calibration range. Calibrations may occur more frequently as indicated by instrument maintenance activities or out-of-control conditions.

5.6 Data Reduction, Validation and Reporting

Data reduction refers to the process of converting raw data to reportable units. Whenever possible, the analytical instrument is calibrated to read out directly in the reporting units and the values are recorded directly into a laboratory notebook or logbook and onto the raw data forms for review. In cases where calculation is required prior to reporting, raw data is recorded in the appropriate laboratory notebook and on the appropriate laboratory form. In this case, the calculations specified in the method are used to determine the reported value, which is also entered in the laboratory notebook and on the draft of the client report. Most of the calculations are computerized to reduce the potential for arithmetic or transcription errors.

Data validation includes procedures to ensure that the reported values are consistent with the raw data and the calculated values.
The data recorded on the draft laboratory report is validated with four steps:

1. The analyst, who submits the report, checks all reported values for omissions and accuracy.
2. The report is reviewed and necessary data reduction is performed by the supervisor.
3. The reports are typed, proofread and reviewed by the word processing staff.
4. The manager or his designee examines the validity of the data and the final report.

One copy of the report is mailed to the client on the day the data is reported and one copy is filed in the separate client file maintained at the analytical laboratory.

5.7 Internal Quality Control Checks

The Quality Control Program at the analytical laboratory includes a demonstration of laboratory capability, a demonstration of the analyst's ability, the analysis of quality control samples and the maintenance of performance records.

Laboratory glassware conforms to National Bureau of Standards (NBS) Class A standards. All mechanical pipetors are calibrated monthly. Distilled and deionized water are used in laboratory analyses. For each procedure, water quality is monitored for acceptability. Chemical reagents and gases are purchased from reliable sources. Laboratory stock and working standards are derived from commercially available primary standards and solvents whenever possible.

Analytical Equipment Standard Operating Procedures (AESOPs) have been developed for each major piece of equipment and instrumentation. The AESOPs detail the sequence of operations involved in instrument start-up, calibration, analyzing and shutdown. AESOPs also include recommended schedules for routine preventative maintenance and identify those parameters, which dictate other types of maintenance. Acceptable instrument response/performance criteria are based upon the manufacturer's analytical method specifications.

Analytical Method Standard Operating Procedures (AMSOPs) have been developed by the laboratory for well-detailed EPA, ASTM and published procedures. Qualified personnel capable of performing each method are on staff at the analytical laboratory. It is the responsibility of each analyst to become thoroughly familiar with methodology and instrument operation before performing the analysis. The performance of each analyst is monitored during the training period by a supervisor until the analyst demonstrated the ability to generate results of acceptable accuracy and precision as required by each method.

Quality control monitoring requires that five to ten percent of all samples analyzed be fortified (spiked) with a known concentration of the analytes stipulated by the method. Percent recovery is calculated as a means of monitoring method accuracy. Where appropriate, the use of surrogates is included in the method to monitor method performance on each sample. The method may also require duplicate samples to be prepared and analyzed when possible. When duplicate samples are analyzed, relative percent difference is calculated and used to monitor precision of the method. In the instances where there are no specific method requirements, it is the policy of the laboratory to analyze five to ten percent of all samples in duplicate. Matrix Spike duplicates replace duplicates for certain methods. Continuing calibration checks of the established calibration curves are included for the appropriate methods.

All quality control monitoring is recorded on the appropriate quality control form, graph or chart as required by the individual AESOPs. This data is filed and is available for internal inspection and assessment.

5.8 Performance System Audits

The Quality Assessment program at the analytical laboratory includes performance evaluation samples, quality control check samples and quality control audits.

Performance Evaluation (PE) samples are supplied by an outside agency and contain known amounts of constituents. Typically the analyst does not have access to the known values prior to the analysis. Results of the PE analyses are sent to the outside agency for evaluation. Established procedures must be followed regarding the timeliness of analysis and the return of results.

Quality Control (QC) reference samples may come from a commercial source or may be prepared in-house as required by the specific method. QC samples are processed through the system in the same manner as any other sample.

The analytical laboratory conducts internal Quality Control Audit inspections on a quarterly basis to monitor adherence to quality control requirements. Samples, which have been previously submitted and reported, are chosen at random for the audit. The audit checks general laboratory operations, adherence to QA program goals, sample tracking procedures, holding times, storage requirements, adherence to procedures during analysis, calculations, completion of required quality control samples within the group surrounding the sample, and proper record keeping. The audit results are reported to management personnel with recommendations for corrective action if any discrepancies are found. A follow-up audit is conducted to determine that problems have been corrected.

5.9 Records and Reporting

The laboratory maintains several different kinds of notebooks, including but not limited to: project notebooks, instrument/equipment use and maintenance logbooks, standard preparation logbooks, sample receipt logbooks, and a safety logbook. The general purpose of maintaining each of these notebooks is to record the activity details, which may be pertinent to repeating a procedure, interpreting data or documenting certain operations. It is the responsibility of each analyst to maintain a laboratory notebook. The analyst's notebook is particularly important in documenting analyses, which deviate in any way from routine or standard practices.

Records of chemical analyses including all quality control records are kept by the laboratory for a minimum of five years. The records include chain-of-custody forms, sample submittal and analysis dates, person responsible for performing analyses, analytical technique/method used, results of analysis, quality control results, laboratory notebooks, electronic instrument data files, and a copy of the final report.

Corrective action is taken when quality control checks indicate that an analysis is not within the established control limits. The appropriate corrective action is dependent on the specific method and/or instrument. If a duplicate or spike analysis fails to fall within control limits, the analysis is

repeated to verify that a problem exists. If the repeated analysis is not within control limits, the instrument and/or method procedure is checked according to specific protocols outlined in the AESOP and/or AMSOP. Once results are within control limits, analysis of all samples that were analyzed while the procedure was out of control is repeated. If the analyst is unable to achieve acceptable results after following the guidelines detailed in the AESOP and/or the AMSOP, supervision may determine that the instrument requires repair, or it is possible that the problems cannot be corrected to satisfy QC criteria. If all possible solutions are examined and the sample results appear to be valid, comments are attached to the sample report describing the non-compliance to QC and the probable cause. If a QC audit or other informational review shows an analysis report to be incorrect or incomplete, a written corrected report is submitted to the client with details of the correction, an explanation of the error and an assessment of the accuracy of the amended report.

5.10 Method Detection Limits and Instrument Detection Limits

Method Detection Limits (MDLs) will be calculated and reported by the analytical laboratory for each applicable analytical instrument and procedure. The MDL is defined as the minimum concentration of a substance that can be measured and reported with 99 percent confidence that the analyte concentration is greater than zero. The MDL is determined from analysis of a sample in a given matrix containing the analyte. It is based on a specific, well-defined analytical method and is calculated from the results of seven or more replicate analyses of samples with analyte levels at or near the detection limit of the method. Typically MDLs are calculated using prepared samples in a relatively clean matrix. Instrument Detection Limits (IDLs) are similar to MDLs, but are based on instrument detection limits independent of the method used to prepare the extract. Actual IDLs and MDLs may increase due to interferences found in samples and sample extracts. When MDLs are limited by analytical instrument sensitivity, IDLs are used to estimate MDLs.

6.1 DATA AND REPORTS

6.2 Data Entry

Data will be entered correctly, following established procedure for documenting and correcting data entry errors.

6.3 Data Archiving

The groundwater sampling data collected is required to be archived. Table IX lists data archiving details.

Table IX. Data Archiving

Data Item	Data Format Paper (P) Electronic(E)	Backup Copy & Format	Location	Retention Time
Chain-of-Custody forms	P	none	Huntington Power Plant, PacifiCorp	Inactive 5+ Years
Equipment calibration	P	none	Huntington Power Plant, PacifiCorp	Inactive 5+ Years

logs				
Field data sheets	P	none	Huntington Power Plant, PacifiCorp	Inactive 5+ Years
Field Log Books	P	none	Huntington Power Plant, PacifiCorp	Inactive 5+ Years
Laboratory test results	P & E	disk	Huntington Power Plant, PacifiCorp	Inactive 5+ Years
Spreadsheet	P & E	disk	Huntington Power Plant, PacifiCorp	Inactive 5+ Years
Statistical analyses	P & E	disk	Huntington Power Plant, PacifiCorp	Inactive 5+ Years
Final report	E	disk	Huntington Power Plant, PacifiCorp	Inactive 5+ Years
Photographs	P & E	disk	Huntington Power Plant, PacifiCorp	Inactive 5+ Years

6.4 Semi-annual Report

Reports will be written and submitted to the State of Utah, Division of Water Quality on a semi-annual basis. The contents will include all sampling and monitoring data as mentioned in Sections 2.1, 2.5.1, and 3.5. The reports will be a summary of ground water sampling activities conducted during each sampling event.

Appendix E
New Wastewater Treatment Plan

Change 4: All land application at the Huntington Power Plant site will be phased out by the end of this permit term. PacifiCorp shall develop plans for alternative wastewater disposal within two years of the effective date of this permit. The plans will be fully implemented by the end of this permit term.

Huntington Ground Water Discharge Permit UGW150002:

Section I.C. By the end of this permit term, PacifiCorp shall have in place alternative methods of disposal for the wastewater steams currently land-applied at the Research Farm, that are protective of ground water quality.

Section I.H.2. Within two years of the date of permit renewal, PacifiCorp shall submit plans for disposal of the wastewater streams that are currently land-applied at the Huntington Power Plant site. Methods for wastewater disposal must be protective of quality of waters of the state.

Compliance: PacifiCorp conducted studies of all possible methods of process water including discharging, treatment, reuse in process systems, reuse after treatment, and storage with evaporation. Based on the evaluation of all potential options, PacifiCorp has determined that a combination of reuse of process water within the plant systems coupled with treatment of remaining process water which will then be utilized in the plant processes is the preferred alternative. There will be a small amount of water that will not be able to be utilized in the plant processes. This waste water will be transported to the existing evaporation pond and allowed to evaporate.

The plant processes require varying degrees of water quality to function . Waste water produced from the processes requiring very high quality water can be utilized in other plant processes that have lower water quality requirements. A major source of waste water at the plant is blow-down from the cooling towers. The studies conducted determined that the blow-down from the cooling tower could be mixed with raw water and used for rinsing of the mist eliminators in the scrubber. The rinse water is consumed in the process. The required changes to allow for the use of cooling tower blow-down in the scrubber is system is currently underway. A Reverse Osmosis (RO) system will be installed to treat any remaining waste water. The treated water would be utilized in the cooling towers. The waste stream from the RO will be used for makeup to the Submerged Drag Chain Conveyor (SDCC) or the Flue Gas Desulphurization (FGD) system .

The RO system will be integrated into the plant waste water systems to accept several waste water streams. Primary flow will be provided from the cooling tower blow down tank .To provide necessary surge capacity for the system excess waste water can be redirected to the irrigation pond.

The RO system has been sized to accept 285 gpm with a recovery rate of greater than 90%. Expected water quality will be 330 mg/L TDS. This is comparable to our current source of water from the river with a TDS of 225 mg/L. Current waste water flow is approximately 275 gpm into the irrigation pond.

Any waste water not directed to the RO will be allowed to flow to the existing irrigation pond and allowed to evaporate. Should the level in the pond become too high the excess will be pumped back to the plant for use in the Unit 2 FGD mist eliminator system or treated in the RO.

Schedule

An equipment manufacture for the RO unit has been selected. Equipment lead time is approximately 40 weeks. Final engineering began following equipment selection. The anticipated schedule for installation is:

- September 17, 2019- Procurement of Installation contractor begins.
- November 1, 2019- Apply for Construction Permit
- January 2, 2020- Construction Start
- March 15, 2020- RO Equipment Arrives on Site
- May 18, 2020- Redirect Irrigation Pond Starts
- September 1, 2020- Irrigation and Farm Work Complete
- October 15, 2020- Stop Irrigation on the Farm
- April15, 2021-lrrigate Farm Only if Needed During RO Commissioning
- May 24, 2021- Commission RO System
- June 30, 2021- Project Complete
- September 30, 2022- Apply for New Ground Water Permit This schedule will allow 1year for testing and fine tuning of the system.

Section I.C.2. After the end of wastewater land application at all sites where land application has taken place must be closed in a manner that is protective of waters of the state.

Compliance: Final Closure Plan for the Huntington Research Farm

- Maintain all diversion and storm water structures.
- Over seed all farm fields and bare areas with a mixture of native forbes, shrubs and grasses.

All storm water diversion structures and storm water ponds will remain on the farm site to keep any storm water from running onto or off of the farm site. Storm water that does not fall on the farm will be diverted around the farm site and into the Huntington River. Storm water that falls on the farm site will be consumed by the vegetative cover or stored in the storm water ponds.

All fields and bare areas will be over seeded with a mixture of native forbes, shrubs and grasses. The natural precipitation will help to establish the cover of native plant materials. The native plant cover will be sufficient to consume any precipitation that falls on the farm site so as to leave the sequestered salt layer in the soil profile above the static water level of the ground water. There is not sufficient natural precipitation to allow leaching of the salt into the saturated zone.

7.0 REFERENCES

National Handbook of Water Quality Monitoring, Natural Resources Conservation Services, May 1998.

Manual of Standard Operating Procedures for Sample Collection and Analysis, Wyoming Department of Environmental Quality, Water Quality Division, Watershed Program, March 2001.

National Oceanic & Atmospheric Administration (NOAA), 2000.

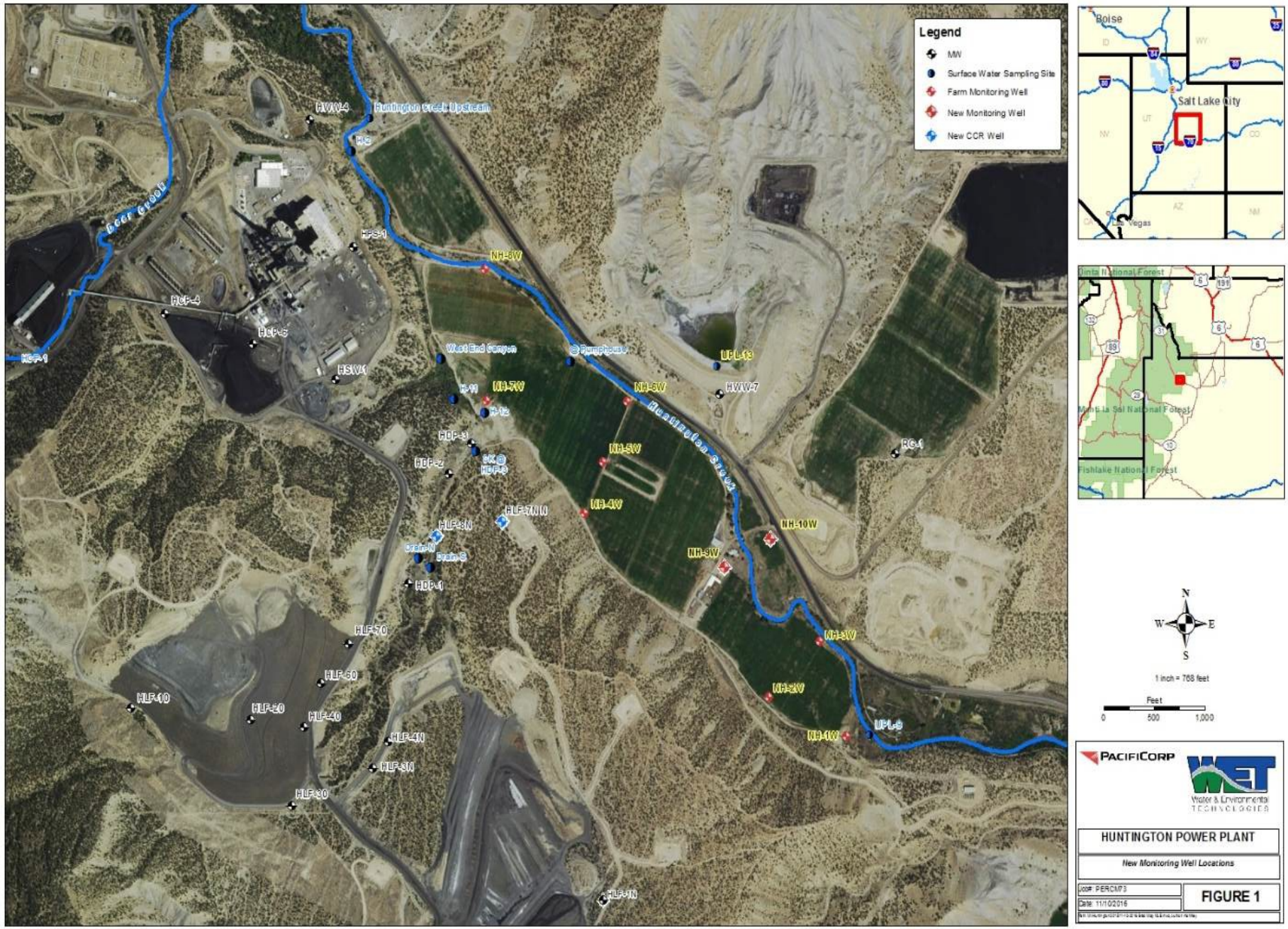
Huntington Power Plant-Ground Water Analysis Huntington Farms Report, Water & Environmental Technologies, August 2002.

Huntington Power Plant, 2004 Annual Monitoring Report and Site-Wide Investigation, Water & Environmental Technologies, August 2005.

Huntington Power Plant, 2005 Annual Monitoring Report, Water & Environmental Technologies, May 22, 2006.

Techniques of Water-Resource Investigations of the United States Geological Survey, Book A6, A7, A8, and A10, USGS 1976.

FIGURES


Legend
MW
Surface Water Sampling Site
Farm Monitoring Well
New Monitoring Well
New CCR Well
Huntington Creek Upstream
Deer Creek
West End Canyon
Pump Station
Huntington Canyon
HWW-4
HS
HPS-1
NH-6W
HCP-4
HCP-5
HCP-1
HSW-1
P-11
NH-7W
P-12
NH-8W
HWW-7
UPL-13
HDP-3
HDP-2
SK @ HDP-3
NH-5W
RG-1
NH-4W
HLF-7N
HLF-8N
Drain-N
Drain-S
HDP-1
NH-10W
NH-9W
HLF-7O
HLF-6O
HLF-1O
HLF-2O
HLF-4O
HLF-4N
HLF-3N
HLF-3O
NH-3W
NH-2W
NH-1W
UPL-9
HLF-1N
Boise
Salt Lake City
Las Vegas
Uinta National Forest
Manti La Sal National Forest
Fishlake National Forest
N
W
E
S
1 inch = 768 feet
Feet
0
500
1,000
PACIFICORP
Water & Environmental Technologies
HUNTINGTON POWER PLANT
New Monitoring Well Locations
Job#: PERCM73
Date: 11/10/2016
FIGURE 1

ATTACHMENT 1 TO APPENDIX D
SAMPLING EQUIPMENT CHECKLIST

Ground Water Sampling Checklist

Monitoring Equipment

□ Electronic Water Tape (Backup)
□ pH Meter
□ DO Meter
□ SCT Meter
□ Sample/Purge Pump
□ Disposable Tubing
□ Replacement Batteries

Sample Containers

□ Sample Bottles and Preservative
□ Coolers
□ Plastic Bags
□ Ice
□ Permanent Marking Pens
□ Field Book

Decon Equipment

□ Decon Buckets
□ Mild Detergent
□ Brush
□ Distilled Water
□ Sample Gloves

Miscellaneous Equipment

□ Tool Box
□ Well Keys
□ Map
□ Well List
□ Last Round Water Levels
□ Extra Bailers
□ Bailer String

PPE

□ Rain Gear
□ Steel Toe Boots
□ Safety Glasses
□ Hardhat
□ Cold Weather Gear