Huntington Power Plant

CCR LANDFILL CLOSURE PLAN

Prepared for:

PACIFICORP
A MIDAMERICAN ENERGY HOLDINGS COMPANY

Prepared by:

Water & Environmental TECHNOLOGIES

Moonlight Professional Building
480 East Park Street
Butte, MT 59701

September 2016

INDEX AND CERTIFICATION

PacifiCorp
Huntington Power Plant
CCR Landfill
Closure Plan

REPORT INDEX

Chapter Number	Chapter Title	Number of Pages
1.0	Introduction	1
2.0	Closure Plan	5
Attachment 1	Construction Drawings	4

CERTIFICATION

I certify, as a Professional Engineer in the State of Utah, that this document was assembled by me or by someone under my direct supervision. This report is not intended or represented to be suitable for reuse by PacifiCorp or others without specific verification or adaptation by the Engineer.

I certify, as a Professional Engineer in the State of Utah, that, to the best of my knowledge and engineering judgment, the CCR landfill post-closure plan provided in this document meets the requirements of 40 Code of Federal Regulations §257.104.

Steven M. Anderson , P.E.

Date: 9/6/16

Steven M. Anderson
License Number UT PE 8049139-2202

My license renewal date is March 31st, 2017

Table of Contents

1.0 INTRODUCTION 1
1.1 Facility Description 1
1.2 Maximum Inventory of Waste 1
2.0 CLOSURE PLAN 2
2.1 Notice of Intent to Close 2
2.2 Final Grading 2
2.3 Temporary Erosion and Sediment Control 3
2.4 Final Closure 3
2.5 Final Cover Description 3
2.5.1 Erosion Control Features 3
2.6 Testing Requirements 4
2.7 Recording/Notice in Deed to the Property 4
2.8 Closure Schedule 4
2.9 Closure Certification 4
2.10 Largest Area Requiring Final Closure 5
2.11 Landfill Geometry and Slope Stability 5
3.0 SUMMARY 5

List of Attachments

Attachment 1	Construction Drawings
Attachment 2	Construction Gantt Chart

List of Abbreviations

Abbreviation	Term/Phrase
CCR	Coal Combustion Residual

1.0 INTRODUCTION

This Closure Plan describes the steps necessary to partially or entirely close the Huntington Power Plant CCR Landfill at any point during its active life or at the end of its operating life. This Plan will be updated if any changes occur at the facility which requires a deviation from the approved Closure and Post Closure Plan.

1.1 Facility Description

The Huntington Plant is a coal-fired power plant owned and operated by PacifiCorp and located near Huntington, Utah. The Huntington Plant disposes of coal combustion ash at a combustion waste landfill located southeast of the existing plant.

Huntington Plant produces 895 megawatts of electricity per year. The plant burns approximately 3 million tons of sub-bituminous coal per year.

1.2 Maximum Inventory of Waste

The estimated maximum inventory of waste over the active life of the landfill is estimated to be about 8.4 million cubic yards. This is based on the current operations plan. Upon final closure of this facility, PacifiCorp – Huntington Power Plant shall submit to the appropriate agencies an estimate of the maximum amount of waste that has been disposed in the landfill. This may be accomplished by comparing the initial and final contours of the facility or the use of volume reports completed during the active life of the landfill.

2.0 CLOSURE PLAN

The purpose of this Closure Plan is to describe the steps necessary to close the landfill or portion thereof at any point during its intended operating life in accordance with the CCR current regulations. These procedures apply to the final closing of the solid waste disposal cells during the landfill operation and at final closure of the landfill.

2.1 Notice of Intent to Close

PacifiCorp – Huntington Power Plant shall begin closure of the CCR Landfill, per the approved closure plan no later than thirty (30) days after the last receipt of waste in the CCR Landfill. PacifiCorp – Huntington Power Plant shall notify appropriate parties, by letter, the date closure of the CCR Landfill begins, and, unless otherwise approved, the application of final cover on the CCR Landfill shall be completed within six (6) months of the last receipt of waste in the CCR Landfill.

2.2 Final Grading

The final surface of the landfill cover shall be graded to promote drainage, minimize erosion of cover, prevent ponding, and provide a surface drainage system consistent with the surrounding area without adversely affecting proper drainage from adjacent areas. The side slopes of the landfill's final cover surface will not be any steeper than 3 horizontal to 1 vertical to prevent erosion and facilitate maintenance. The exterior side slope of this landfill vertical expansion will include terraces to reduce the velocity of storm water runoff and minimize erosion of the final cover. The final grade maintained on top of the landfill between the crest of the side slope and the center of the landfill shall be at least 3 percent but not greater than 5 percent. An alternate final cover design may be submitted for review and approval.

The maximum height of the landfill will be approximately 240 feet above the lowest elevation of the landfill. The final cover will be placed on top of the waste. Terraces will be constructed to convey storm water and will be sloped to drain storm water runoff from high points to down drains at low points on the terraces. Additional terraces will be located approximately every 50 feet of vertical rise in elevation.

The top of waste surface for the terraces will slope away from the landfill to allow for sheet flow of storm water runoff over the side slopes until the down drains and final cover on the terrace can be installed. The final cover surface on the drainage terraces will be built up above the surface of the waste to allow for the installation of the down drains and to divert storm water away from the side slopes. Grade and slope stakes will be set up as needed prior to placement of the final waste layers to assist the operator in placing the waste. This will ensure that the maximum disposal capacity of the landfill is fully utilized. Grade stakes will minimize the need to move waste or add fill soil to achieve final subgrade elevations.

2.3 Temporary Erosion and Sediment Control

Prior to the start of final cover construction, temporary erosion control features (i.e., silt fencing, temporary sediment control areas) will be installed. During final cover construction activities, the temporary erosion control features will be inspected every seven (7) calendar days until adequate vegetative cover is achieved; or, according to schedule, in compliance with the most current storm water regulation. Temporary erosion control features will be repaired or replaced if any such features have been damaged from runoff or if there is excessive sediment buildup behind the silt fence or other erosion control device that would impede the performance of the feature. When the inspection results show that a repair is required, the repair or replacement shall occur within 30 days of such a notice.

2.4 Final Closure

The landfill will be progressively closed by constructing a final cover (i.e., cap). Final cover shall be completed within 6 months, unless such activity is delayed by an event of force majeure, after last receipt of waste. Just prior to final closure, the landfill cell shall be surveyed to assist the landfill operator in placing and grading the final layers of waste. The site engineer shall develop a detailed set of Construction Drawings with control points for final closure of the landfill based on the approved closure plan and the actual survey data just prior to closure.

2.5 Final Cover Description

The final cover system or cap for the landfill will be designed to minimize infiltration and erosion and improve the esthetics. The final cover system for this landfill will consist of thirty (30) inches of soil with a maximum permeability of 1×10^{-5} centimeters per second, and a minimum of six (6) additional inches of soil capable of supporting native vegetation or an approved alternative final cover system. This layer is designed to minimize infiltration through the closed landfill and prevent erosion of the landfilled material. This layer shall be free from deleterious material and consist of natural soils classified as MH, CH, CL, SC, ML or SC-SM according to the unified soil classification system, or approved equal. Soil used for the compacted earth cover shall be placed over the waste in loose lift thicknesses of 12 inches or less and compacted to greater than 80 percent of its standard Proctor maximum dry density. If the underlying waste foundation is soft, a lesser degree of compaction may be acceptable provided it still meets the thickness requirement. The Construction Quality Assurance I Quality Control (CQA/QC) engineer should approve any compaction less than 80 percent.

2.5.1 Erosion Control Features

Dozer basins will be installed as soon as a significant section of slope is covered with the design thickness of cover material. Dozer basins, if properly constructed, are effective in limiting erosion on steep slopes. The dozer basins will be constructed with as straight of dozer blade as possible, with the outer rim of one basin aligning vertically with the central-third of the down-slope basin.

Contour ditches will be completed on benches at varying lengths not greater than 800 feet of the landfill slope length. The contour ditches will be constructed according to design specifications and sloped at no more than 5% and no less than 0.25 % toward the conveyance channels. These ditches will be grass lined following the revegetation of the landfill cover surface. The maximum flow for each contour ditch will be calculated by using the rational method with the area between adjacent contour ditches and the maximum length of a contour ditch as the area used in the Rational Equation.

Conveyance channels will be constructed to convey the storm water collected by the contour ditches to the existing sediment catch basins in as little time as possible. Conveyance channels will convey the 10-year and 100-year storm events in the main channel. The slope of these ditches will range from 2.5:1 (40%) to 20:1 (5%) depending on the site topography. Conveyance ditches will be rip-rap lined at all locations where the slope exceeds 10%. Maximum allowable velocities for rip rap-lined channels on steep slopes range between 9 ft/s and 11 ft/s. Maximum allowable velocities for grass-lined channels on flat to moderate slopes range from 4 ft/s to 6 ft/s.

An important component of erosion control on steep slopes is establishing vegetation as quickly as possible. The seed mix will include native species as well as strong-establishing, introduced species, primarily crested wheatgrass, and sheep fescue. Broadcast seeding followed by a chain harrow to loosen the topsoil and lightly cover the seeds is recommended. On steep slopes, a dozer may need to be used for seeding activities. Seeding will be done in the fall or spring, to take advantage of cooler temperatures and increased precipitation.

2.6 Testing Requirements

A minimum of four thickness checks per acre per lift will be conducted to verify the thickness of the infiltration layer is at least thirty inches thick. Field density testing may also be performed at the same time and location. A Utah Registered Professional Engineer must certify that the required thickness has been achieved.

2.7 Recording/Notice in Deed to the Property

Following completion of closure activities, a notation will be placed on the property deed, or some other instrument normally examined during a title search, indicating in perpetuity that the property has been used for the disposal of solid waste. The notation will define the final boundaries of the waste disposal area including the latitude, longitude, and identify the type, location, and quantity of solid waste disposed of on the property.

2.8 Closure Schedule

PacifiCorp – Huntington Power Plant will begin final closure activities no later than within thirty (30) days of receipt of the final load of waste at the landfill. Closure activities will be completed within six (6) months following the last receipt of waste.

2.9 Closure Certification

PacifiCorp – Huntington Power Plant shall notify appropriate agencies by letter the date that closure of the CCR Landfill begins, and, unless otherwise approved, the application

of final cover on the CCR Landfill shall be completed within six (6) months of the last receipt of waste in the CCR Landfill. Following closure of the entire landfill, PacifiCorp – Huntington Power Plant will submit a certification to the appropriate agencies that the landfill has been properly closed. The Certification shall be signed and sealed by a Utah Registered Professional Engineer, verifying that closure has been completed in accordance with the Closure Plan. Any deviations from the Closure Plan shall be identified and include an explanation. A copy of the certification will be kept on file in the facility operating record.

2.10 Largest Area Requiring Final Closure

Currently none of the 73-acre landfill has received final cover or certificate of closure. Therefore the largest area to ever require final closure is the full 73 acres.

2.11 Landfill Geometry and Slope Stability

A veneer stability analysis will be conducted to check the stability of a 3-foot thick cap section on the 3-horizontal to 1-vertical side slopes. An adequate factor of safety will be determined to insure stability.

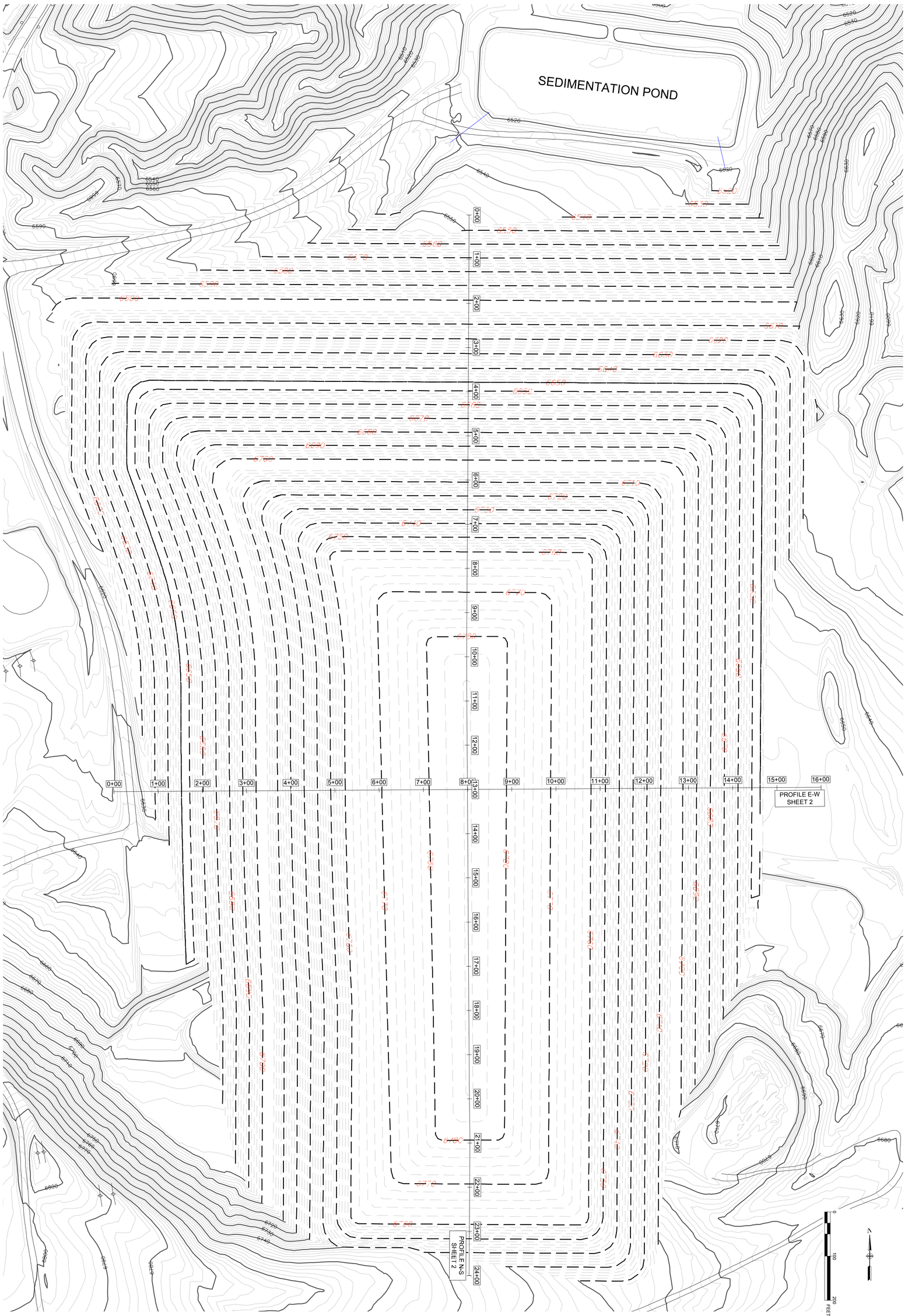
3.0 SUMMARY

The purpose of final closure implementation is to preclude post closure release of pollutants to the environment. The final cover system will minimize infiltration of precipitation into the waste and erosion of the cap in order to protect public health and the environment. Final closure details may vary as operation of the landfill proceeds. After final closure, the post closure plan will be implemented.

ATTACHMENT 1

CONSTRUCTION DRAWINGS

M:\PERCM70-Huntington CCR Compliance\CAD\CIVIL\SC_GP01_Landfill FG.dwg PLOT DATE 2016-4-19 16:57 USER: bsiddoway



SHEET 1

JOB NO: PERCM70
DATE: 4/19/16
DRAWN BY: SS
CHECKED BY: SA

HUNTINGTON CCR DISPOSAL LANDFILL
FINAL SITE PLAN

PROJECT NAME: HUNTINGTON CCR CLOSURE PLAN
LOCATION: HUNTINGTON, UTAH
FILE NO. SC_GP01_Landfill FG.dwg

Water & Environmental TECHNOLOGIES
480 E. Park Street
Butte, MT 59701
(406) 782-5220
WATERENVTECH.COM

PACIFICORP
A MIDAMERICAN ENERGY HOLDINGS COMPANY

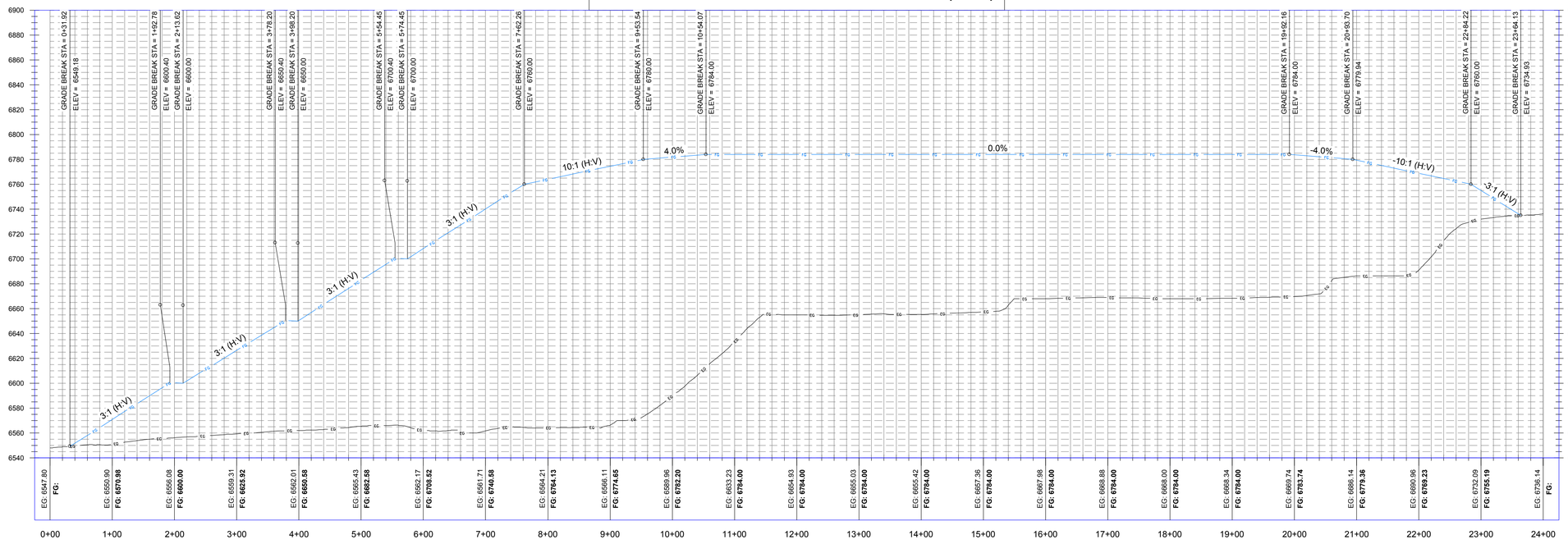
No.	Description	Date	Drawn By

COPYRIGHT 2016
Water & Environmental Technologies PC hereby reserves our common law copyright in this document and the ideas and designs incorporated herein as an instrument of professional service which shall not be used in whole or part for any other projects or other use without our express written authorization.

PROFILE N-S
VERTICAL EXAGGERATION = 2:1 (H:V)

NORTH ←

→ SOUTH



HORIZONTAL SCALE:

0 100 200 FEET

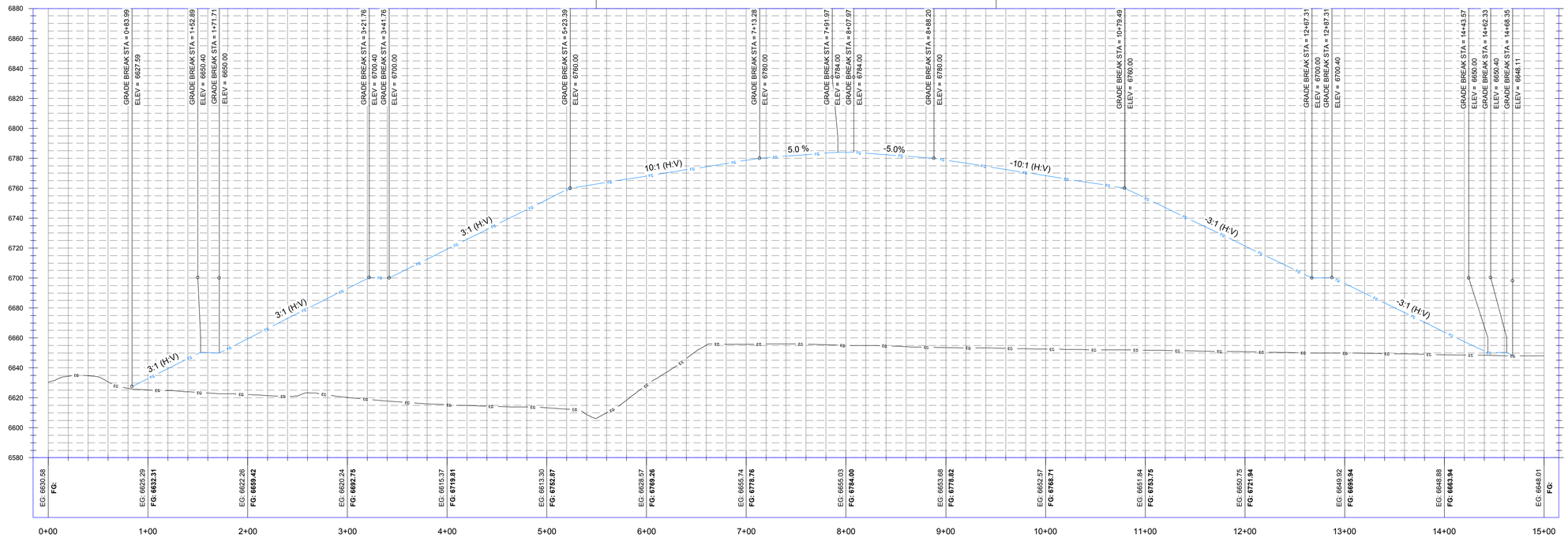
Profile E-W
VERTICAL EXAGGERATION = 2:1 (H:V)

WEST ←

→ EAST

HORIZONTAL SCALE:

0 60 120 FEET



No.	Description	Date	Drawn By

COPYRIGHT 2016
Water & Environmental TECHNOLOGIES PC hereby reserves our common law copyright in this document and the ideas and designs incorporated herein as an instrument of professional service which shall not be used in whole or part for any other projects or other use without our express written authorization.

PACIFICORP
A MIDAMERICAN ENERGY HOLDINGS COMPANY

Water & Environmental TECHNOLOGIES
480 E. Park Street
Butte, MT 59701
(406) 782-5220
WATERENVTECH.COM

HUNTINGTON CCR DISPOSAL LANDFILL
TYPICAL PROFILES

PROJECT NAME: HUNTINGTON CCR CLOSURE PLAN
LOCATION: HUNTINGTON, UTAH
FILE NO.: SC_GP01_Landfill FG.dwg

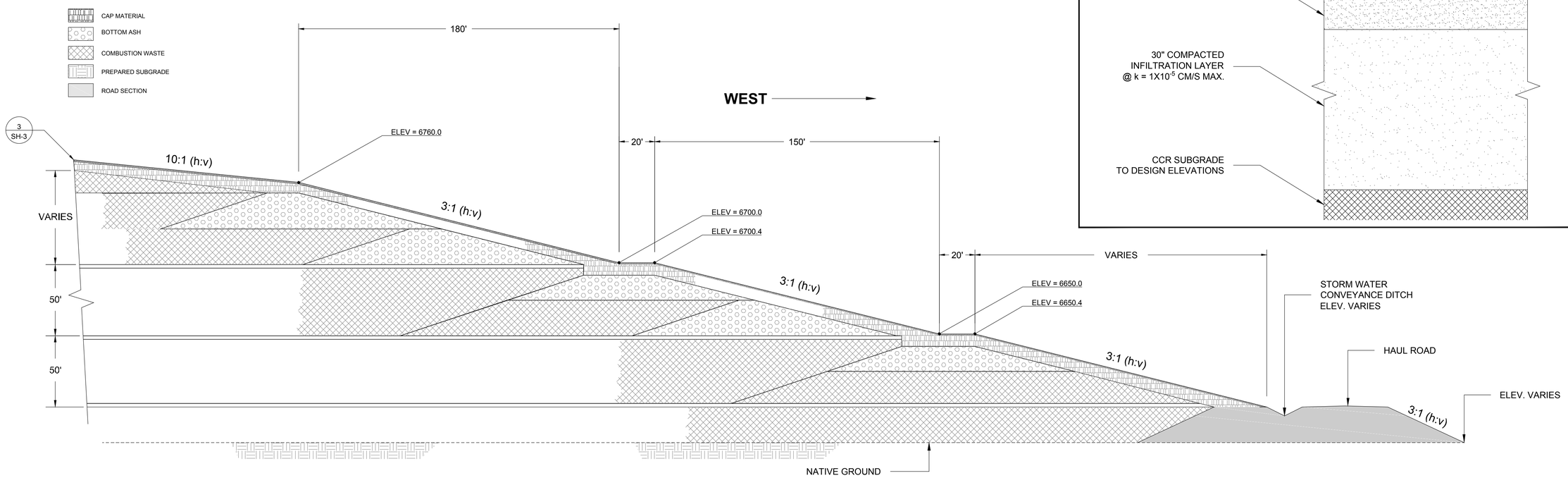
JOB NO:	PERCM70
DATE:	4/19/16
DRAFTER:	BS
CHECKED BY:	SA

SHEET
2

M:\PERCM70-Huntington CCR Compliance\CAD\CIVIL\SC_GP01_Landfill FG.dwg PLOT DATE 2016-4-19 16:58 USER: bstidsway

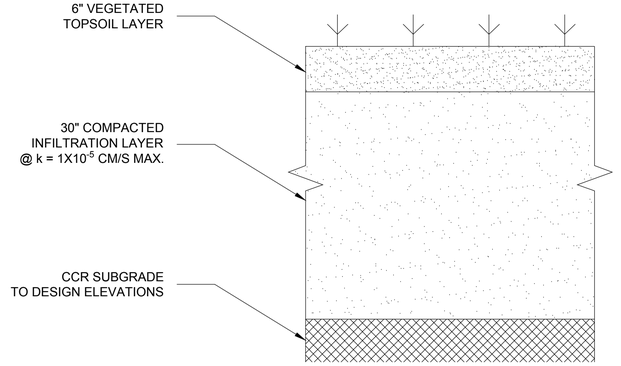
1 TYPICAL FILL PLAN W/ HAUL ROAD - SECTION VIEW

Scale: NTS



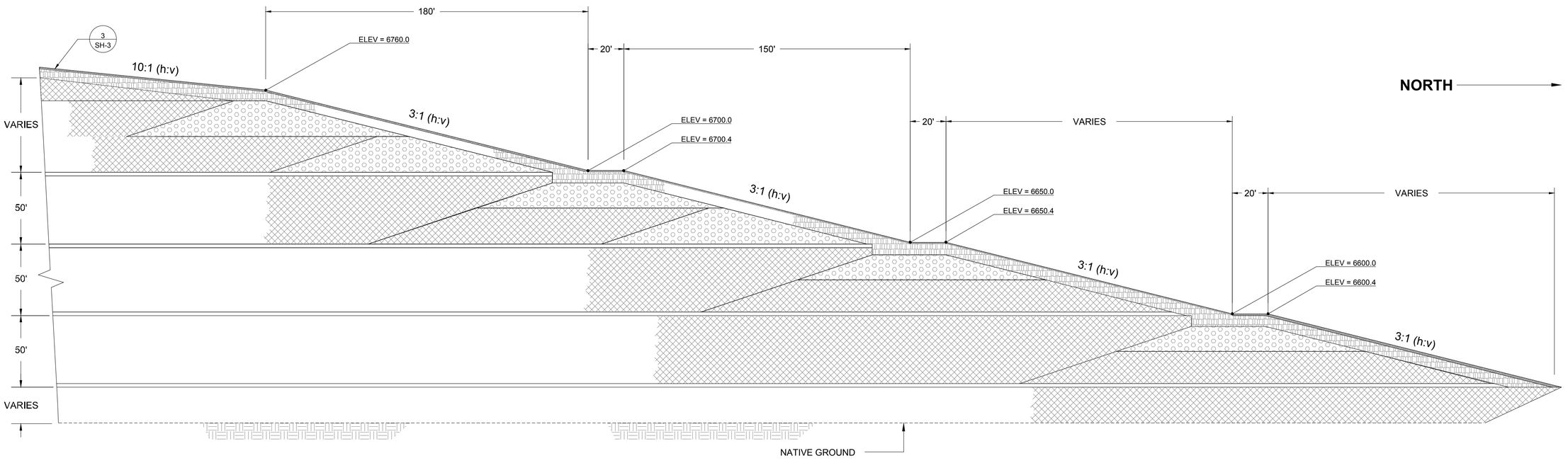
3 VEGETATED CAP DETAIL - SECTION VIEW

Scale: NTS



2 TYPICAL FILL PLAN NORTH FACE - SECTION VIEW

Scale: NTS



No.	Description	Date	Drawn By

COPYRIGHT 2016
Pacificorp and Energy Holdings PC hereby reserves our common law copyright in this document and the ideas and designs incorporated herein as an instrument of professional service which shall not be used in whole or part for any other projects or other use without our express written authorization.

PACIFICORP
A MIDAMERICAN ENERGY HOLDINGS COMPANY

Water & Environmental TECHNOLOGIES
480 E. Park Street
Butte, MT 59701
(406) 782-5220
| WATERENVTECH.COM

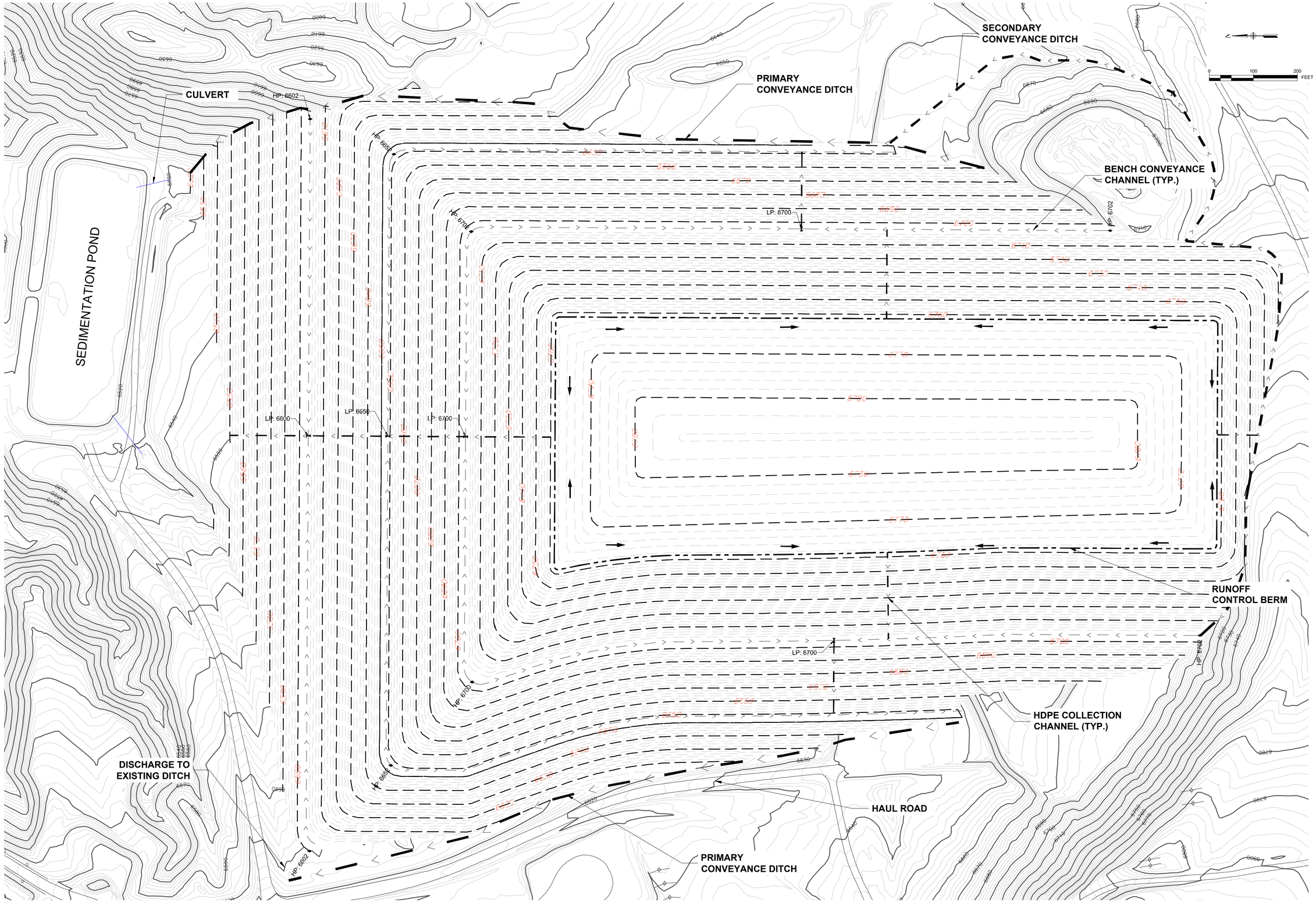
HUNTINGTON CCR DISPOSAL LANDFILL
TYPICAL SECTIONS

PROJECT NAME: HUNTINGTON CCR CLOSURE PLAN
LOCATION: HUNTINGTON, UTAH
FILE NO.: SC_GP01_Landfill FG.dwg

JOB NO:	PERCM70
DATE:	4/19/16
DRAFTER:	BS
CHECKED BY:	SA

SHEET
3

M:\PERCM70-Huntington CCR Compliance\CAD\CIVIL\SC_GP01_Landfill FG.dwg PLOT DATE 2016-4-19 16:58 USER: bstidsley



No.	Description	Date	Drawn By

COPYRIGHT 2016
Water & Environmental Technologies, Inc. and Pacificorp PC hereby reserves our common law copyright in this document and the ideas and designs incorporated herein as an instrument of professional service which shall not be used in whole or part for any other projects or other uses without our express written authorization.

PACIFICORP
A MIDAMERICAN ENERGY HOLDINGS COMPANY

Water & Environmental TECHNOLOGIES
480 E. Park Street
Butte, MT 59701
(406) 782-5220
WATERENVTECH.COM

HUNTINGTON CCR DISPOSAL LANDFILL
RUNOFF MANAGEMENT PLAN

PROJECT NAME: HUNTINGTON CCR CLOSURE PLAN
LOCATION: HUNTINGTON, UTAH
FILE NO.: SC_GP01_Landfill FG.dwg

JOB NO:	PERCM70
DATE:	4/19/16
DRAFTER:	BS
CHECKED BY:	SA

SHEET
4

M:\PERCM70-Huntington CCR Compliance\CAD\CIVIL\SC_GP01_Landfill FG.dwg PLOT DATE 2016-4-19 16:58 USER: bsiddoway

ATTACHMENT 2

CONSTRUCTION GANTT CHART

Closure Construction Gantt Chart

Activity	Plan Start	Duration (Days)	January-36	February-36	March-36	April-36	May-36	June-36	July-36	August-36	September-36	October-36	November-36
Permitting/Closure NOI	1/1/2036	120											
Contractor Mobilization	4/30/2036	30											
Grading/Placing Cap	5/30/2036	135											
Final Grading/Revegetation	10/12/2036	15											
Closure Certification	10/27/2036	15											

You created this PDF from an application that is not licensed to print to novaPDF printer (http://www.novapdf.com)