

2017 Annual Inspection Report

for Compliance with the Coal
Combustion Residuals Rule
(40 CFR Part 257)

Hayden Station

*13125 U.S. Highway 40
Hayden, Colorado 81638*

January 18, 2018



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Certification

Hayden Station - CCR Unit 2017 Annual Inspection for Compliance with the Federal Coal Combustion Residuals Rule

I hereby certify that the Coal Combustion Residuals (CCR) unit (i.e. the landfill) at Hayden Station meets the inspection and operation standards specified in 40 CFR Part 257.84(b) of the Federal CCR Rule. The Hayden Station is owned by the Public Service Company of Colorado (PSCo), an Xcel Energy Company.

I am duly licensed Professional Engineer under the laws of the State of Colorado.



Brian Brown, PE

Colorado PE License 0041644

License renewal date October 31, 2019

1 Introduction

On April 17, 2015 the U.S. Environmental Protection Agency (EPA) published regulations under Subtitle D of the Resources Conservation and Control Act (RCRA) meant to control the safe disposal of coal combustion residuals (CCR) generated by coal fired electric utilities. The rule defines a set of requirements for the disposal and handling of CCR within CCR units (defined as either landfills or surface impoundments). Hayden Station has one CCR unit: a landfill. As specified in 40 CFR 257.84(b), *“Existing and new CCR landfills and any lateral expansion of a CCR landfill must be inspected on a periodic basis by a qualified professional engineer to ensure that the design, construction, operation, and maintenance of the CCR unit is consistent with recognized and generally accepted good engineering standards.”*

This is the third annual inspection report for the existing Hayden CCR landfill. This report must be completed and placed into the facility operating record no later than January 18, 2018

The requirements of the annual inspection include:

- A review of available information regarding the status and condition of the CCR unit - §257.84 (B)(1)(i),
- A visual inspection of the CCR unit to identify signs of distress or malfunction - §257.84 (B)(1)(ii),
- An inspection report that includes the following:
 - o Changes in geometry since the last inspection - §257.84 (B)(2)(i)
 - o Approximate volume of CCR in unit at time of inspection - §257.84 (B)(2)(ii)
 - o Appearance of actual or potential structural weakness of the CCR unit - §257.84 (B)(2)(iii)
 - o Any other changes which may have affected the stability or operation of the CCR unit since the last inspection - §257.84 (B)(2)(iv)

2 Site Inspection

In accordance with §257.84(b)(ii), a site inspection of the Hayden CCR unit was conducted by an independent Professional Engineer on November 1st, 2017. This site inspection was performed in advance of the CCR submittal deadline to ensure that the inspection was completed prior to snow covering the ground given the high elevation of this facility. The visual site inspection was conducted by Brian Brown, a Colorado Professional Engineer of HDR Engineering Inc. Review of the associated paper work and inspection reports was conducted by Brian Brown and Mark Stewart, an Xcel Energy Environmental Analyst for the Hayden Station.

The weather during the site visit was sunny with temperatures ranging from 55 to 65 degrees Fahrenheit. The site was free of snow cover.

3 Review of Available Information

Numerous documents pertaining to the site operation and structural integrity were reviewed including:

1. Engineering Design and Operation Plan (EDOP) (DRAFT EDOP dated November 2013, prepared by Walsh Environmental Scientists and Engineers, LLC.). Document included an Existing Conditions Plan, a Site Development Plan, and a Final Closure Plan. Xcel Energy Environmental Analyst reported no change in document and still operating under this document. Document not reviewed again since the document is unchanged. A revision to the EDOP is in progress and is expected to be submitted to CDPHE in early 2018. The revised EDOP will include design modifications submitted to CDPHE in 2017 as discussed below.
2. Curt Stovall of the CDPHE provided written approval of the drainage modifications by letter dated May 15, 2017.
3. Curt Stovall of the CDPHE provided written approval of the Revised Perimeter Berm Interim Construction Requirements by letter dated October 3, 2017. This document established requirements for constructing perimeter berms until the revised Engineering Design and Operations Plan is approved by the CDPHE.
4. Brian Long of the Colorado Department of Public Health and Environment (CDPHE) notified PSCo of a Compliance Advisory on October 4, 2017. The Compliance Advisory identified one issue related to the landfill; the landfill is operating under the draft 2013 EDOP while the approved EDOP is from 2002. This letter was based on a records review and a site visit on May 22 and 23, 2017. The letter states actions required of PSCo including working with CDPHE to get the revised EDOP approved.
5. Weekly CCR Landfill Inspection Forms (per Section 257.84(a)).
6. As-Built updated topographic survey with the most recent field work dates of October 6 and October 11, 2017, performed by Four Points Surveying and Engineering, provided via email by Xcel Energy on October 23, 2017.
7. Records of annual ash tonnage delivered to the CCR landfill from the generation facility from October 2016 through October 2017.

Review of the above documents did not contain any indications of operation, safety, or structural concerns regarding the CCR landfill.

4 Visual Inspection

Brian Brown completed a site inspection covering the entire landfill area. As the CCR rule pertains only to the CCR landfill itself, this report does not address existing topsoil stockpiles and native earth excavations that lie east of the landfill (located on native ground).

The site inspection included an evaluation of the following landfill features:

1. landfill side slopes and toe of slope;
2. landfill side slope benches;
3. contact storm water pond;
4. upper water quality pond (northwest pond);
5. stormwater drainage conveyance channels (southern, western, northwestern, and under construction eastern);
6. lower storm water ponds (toe of landfill – northwest and southwest);
7. access roads;
8. active CCR fill areas (CCR disposal, spreading, and compaction); and
9. temporarily soil covered CCR landfilled areas.

The following are the findings of the site inspection:

- The landfill side slopes have grades of approximately 4 horizontal to 1 vertical (4H:1V); well established vegetation; and show little to no signs of erosion and no signs of operational or functional concerns.
- The side slopes are constructed with erosion control benches at regular intervals. Benches are approximately 10 feet in width. In areas of more recent filling, benches were developed with a back slope to create a swale that directs stormwater runoff to a downchute channel. In older portions of the landfill, benches simply create a flat area to slow stormwater flow. The older portions of the benches have substantial vegetation cover and limited areas of minor rill erosion. The benches showed no signs of operational or functional concern.
- In general, areas that had a topsoil layer were stabilized with a dense stand of vegetation and were functioning as intended. Small and localized areas of minor rill erosion were observed in isolated areas around the vegetated areas. These should continue to be monitored.
- In general, areas more recently constructed where a topsoil layer has not yet been installed and vegetation not yet established were showing signs of rill erosion. This is expected due to the slope grades and lack of vegetation. Rill erosion in these areas posed no apparent operational or structural concerns. Once the topsoil layer is placed,

seeded, and a dense stand of vegetation established, the bank faces are anticipated to be stabilized.

- All four site stormwater management ponds (three non-contact ponds and one contact pond) appear to be functioning as intended with no operational or structural concerns. The conveyance channels into the three perimeter non-contact stormwater ponds appear adequately armored with articulated concrete block or erosion control blankets to minimize concentrated conveyance erosion in the conveyance channels. The conveyance routes to these three perimeter stormwater ponds and the ponds themselves were not observed to have functional or operational concerns. The Contact Stormwater Pond on the top landfill bench near the southern end of the landfill, has steep side slope banks and showed gulley erosion at one of the conveyance channels to the pond. This small, shallow pond is an interior pond and the gulley erosion is not anticipated to have an impact on the overall site stability. The function of this pond is planned to cease as PSCo is in the process of implementing grading changes to route contact stormwater to a new pond that will be constructed in 2018.
- There is active moderate rill erosion on the northern internal slope of the landfill, southeast of the Upper Water Quality Pond. This active rill erosion area is roughly thirty (30) feet in width and has a run length of a single landfill lift. This area will be covered by continued CCR placement expected in 2017 or 2018, depending on CCR production and CCR placement.
- The access roads to the top of the landfill showed no signs of operational or structural concern. The road side slopes were vegetated and had minimal rill erosion. The plateau road showed no signs of operational or structural concern. The east end of the most eastern access road was experiencing rill and minor gulley erosion. This erosion was contained within the active landfill area and had no larger operational or structural concerns for the landfill.
- There was active CCR disposal during the site inspection with placement of CCR material. The material was observed during spreading but compaction was not observed during the inspection. On-site equipment and reported operational procedures have not changed since the prior inspection. Wind blown CCR was not observed during site observation.
- The capped CCR landfill areas, excluding the conveyance route to and immediately adjacent the Contact Stormwater Pond, appeared to have adequate soil cover, had established vegetation, and showed no signs of operational or structural concern.

5 Changes in Geometry

The Federal CCR Rules require that site geometry changes be identified since the last inspection. The site geometry changed in three areas since the initial inspection due to continued CCR disposal, stormwater grading modifications, and soil cover placement:

1. The Upper Water Quality Pond did not have additional CCR placed in the area draining to this pond, but the down-gradient berm on the western edge of the pond was raised by

approximately five feet. The western berm height increase is stepped to match the remainder of the western landfill face.

2. The top plateau of the main landfill area continued to accept CCR on the northern half of the plateau in a lift of roughly eight feet. This lift continues to be constructed with CCR placement, followed by top soil cover to create a stepped slope that matches the remainder of the western face.
3. Minor surface geometry changes were created on the eastern, southern, and western sides of the site with the construction of the stormwater conveyance swales.

No structural or safety concerns were observed due the site geometric changes. Fill placement is expected to continue in a similar manner in the main landfill plateau top in 2018.

6 Approximate CCR Volume

The reported estimated CCR volume is based on the tonnage of CCR delivered to the landfill from the power plant. The CCR volume was estimated based on the power plant operation and electric load type from 1984 to December 1999. From January 2000 up to the present, Xcel Energy has recorded monthly CCR volumes. The total combined volume of CCR deposited within the landfill is estimated to be 4,082,700 cubic yards through September, 2016. The addition CCR deposited from October 2016 to October 2017 is estimated to be 224,254 CY, assuming one cubic yard of CCR material equates to one ton. The total CCR volume in the landfill as of the end of October 2017 is estimated to be 4,306,950 CY.

7 Appearance of Structural Weakness

Based on the site inspection, no apparent or potential structural weaknesses were observed. Continued monitoring and minor repairs should be completed to address rill and gully erosion before it becomes a potential structural landfill weakness.

8 Changes Affecting Stability or Operation

There were no observed or reported operation changes that are anticipated to impact the site's near-term or long-term stability. The southern perimeter stormwater conveyance channel that was previously noted to have gully erosion has been regraded and is now armored.

Appendix A – Landfill Site Map

NOTES:

- 1) THIS EXHIBIT WAS PREPARED WITHOUT THE BENEFIT OF A CURRENT TITLE COMMITMENT AND DOES NOT CONSTITUTE A TITLE SEARCH BY FOUR POINTS SURVEYING AND ENGINEERING, LLC. TO DETERMINE TITLE OR EASEMENTS OF RECORD. THIS EXHIBIT DOES NOT PURPORT TO REFLECT ANY OF THE FOLLOWING WHICH MAY BE APPLICABLE TO THE SUBJECT REAL ESTATE: EASEMENTS, OTHER THAN POSSIBLE EASEMENTS THAT WERE VISIBLE AT THE TIME OF MAKING THIS EXHIBIT; BUILDING SETBACK LINES; RESTRICTIVE COVENANTS; SUBDIVISION RESTRICTIONS; ZONING OR OTHER LAND-USE REGULATIONS; AND ANY OTHER FACTS THAT AN ACCURATE AND CURRENT TITLE SEARCH MAY DISCLOSE.
- 2) THIS EXHIBIT WAS PREPARED FOR THE EXCLUSIVE USE OF BASELINE ENGINEERING, INC. AND XCEL ENERGY, INC., NAMED IN THE STATEMENT HEREON. SAID STATEMENT DOES NOT EXTEND TO ANY UNNAMED PERSON WITHOUT AN EXPRESS STATEMENT BY THE SURVEYOR NAMING SAID PERSON.
- 3) THIS EXHIBIT IS VALID ONLY IF PRINT HAS ORIGINAL SEAL AND SIGNATURE OF SURVEYOR.
- 4) THE LOCATIONS FOR UNDERGROUND UTILITIES ARE BASED UPON VISIBLE SURFACE EVIDENCE AND MAPS PROVIDED BY THE APPROPRIATE UTILITY COMPANIES AND MUNICIPALITIES. LOCATIONS OF UNDERGROUND UTILITIES AND/OR STRUCTURES MAY VARY FROM LOCATIONS SHOWN HEREON. ADDITIONAL BURIED UTILITIES AND/OR STRUCTURES MAY BE ENCOUNTERED. NO EXCAVATIONS WERE MADE DURING THE PROCESS OF THIS EXHIBIT TO LOCATE BURIED UTILITIES AND/OR STRUCTURES. ALL UNDERGROUND UTILITIES SHOULD BE FIELD LOCATED BY THE APPROPRIATE UTILITY COMPANY PRIOR TO ANY CONSTRUCTION OR EXCAVATION ON OR ADJACENT TO THE SUBJECT PROPERTY. UTILITIES (CULVERTS, MONITORING WELLS, AND OTHER SELECT UTILITIES) WERE LOCATED FROM THE ORIGINAL SURVEY PERFORMED IN MAY 2014 BY FREMONT ENGINEERING AND SURVEYING AND HAVE ONLY BEEN UPDATED IF CHANGED OR IF THE UTILITIES WERE LOCATED DURING THE 2015 AS-BUILT DRAWING.
- 5) THE DISTANCE MEASUREMENTS SHOWN HEREON ARE U.S. SURVEY FOOT.
- 6) HORIZONTAL AND VERTICAL CONTROL ARE 1 1/2" ALUMINUM CAPS AS INDICATED HEREON.
- 7) BASIS OF ELEVATIONS: VERTICAL CONTROL WAS ESTABLISHED BY RTK GPS FROM NGS MONUMENT 'AP 1973 STA B HDN', PID AB8070, A 3 1/2" BRASS SURVEY DISK IN A CONCRETE MONUMENT HAVING A PUBLISHED ELEVATION OF 6598.5' (NAVD 88 USING GEOID 12A).
- 8) COORDINATE SYSTEM AND DATUM: COORDINATE SYSTEM USED IS A MODIFIED COLORADO STATE PLANE, NORTH ZONE, NAD 83 (2011). CALCULATED COMBINED SCALE FACTOR USED FOR THIS PROJECT IS 0.99965141 AND SCALED FROM THE AFOREMENTIONED NGS MONUMENT USING ITS RECIPROCAL.
- 9) FLOOD INFORMATION: THE SUBJECT PROPERTY IS LOCATED IN ZONE X, AREAS DETERMINED TO BE LOCATED OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN ACCORDING TO THE FEMA FLOOD INSURANCE RATE MAP; COMMUNITY-PANEL NO. 08107C0810D, DATED FEBRUARY 4, 2005. FLOOD INFORMATION IS SUBJECT TO CHANGE.
- 10) DATES OF FIELDWORK:
- ORIGINAL FIELD WORK WAS PERFORMED BY WALSH ENVIRONMENTAL SCIENTISTS AND ENGINEERS, LLC ON MAY 15-21, 2013. THIS SURVEY LAID GROUND CONTROL FOR THE AERIAL SURVEY THAT WAS COLLECTED AUGUST 28, 2013. AERIAL SURVEY WAS PERFORMED BY ROCKY MOUNTAIN AERIAL SURVEYS, INC. USING LIDAR.
 - OCTOBER 2014 SURVEY WAS PERFORMED TO CONVEY THE WORK PERFORMED FOR THE 2014 CONSTRUCTION SEASON. DATES FOR THESE SELECT AREAS WAS PERFORMED ON OCTOBER 22-23, 2014.
 - OCTOBER 2015 SURVEY WAS PERFORMED BY FOUR POINTS SURVEYING AND ENGINEERING TO CONVEY THE WORK PERFORMED FOR THE 2015 CONSTRUCTION SEASON. DAYS FOR THESE SELECT AREAS WAS PERFORMED ON OCTOBER 14-15, 2015.
 - OCTOBER 2016 SURVEY WAS PERFORMED BY FOUR POINTS SURVEYING AND ENGINEERING TO CONVEY THE WORK PERFORMED FOR THE 2016 CONSTRUCTION SEASON. DAYS FOR THESE SELECT AREAS WAS PERFORMED ON OCTOBER 5, 2016.
 - OCTOBER 2017 SURVEY WAS PERFORMED BY FOUR POINTS SURVEYING AND ENGINEERING TO CONVEY THE WORK PERFORMED FOR THE 2017 CONSTRUCTION SEASON. DAYS FOR THESE SELECT AREAS WAS PERFORMED ON OCTOBER 6 AND OCTOBER 11, 2017.
- 11) BOUNDARY DETERMINATION IS NOT A PART OF THIS EXHIBIT. THIS IS NOT A "LAND SURVEY PLAT" OR "IMPROVEMENT SURVEY PLAT" AND THIS EXHIBIT IS NOT INTENDED FOR PURPOSES OF TRANSFER OF TITLE OR SUBDIVISIONS OF LAND. PROPERTY LINES AND SECTION LINES ARE APPROXIMATED FOR INFORMATIONAL PURPOSES ONLY. THIS EXHIBIT IS NOT A LAND SURVEY.
- 12) STOCK PILE AREAS HIGHLIGHTED HEREON DO NOT REFLECT ACCURATE TOPOGRAPHY DO TO THE INHERENT IRREGULARITIES THAT EXIST.
- 13) PROPERTY OWNERSHIP INFORMATION SHOWN HERE ON WAS RESEARCHED ON ROUTT COUNTY'S ONLINE MAPPING INFORMATION AS RESEARCHED ON NOVEMBER 3, 2016.
- 14) BOTTOM OF POND WAS NOT SURVEYED AND THEREFORE ELEVATIONS SHOWN ARE NOT REPRESENTATIVE FOR THE BOTTOM OF POND.

LEGEND

- ESTIMATED PROPERTY LINE
- ESTIMATED SECTION LINE
- EXISTING CONTOUR MINOR
- EXISTING CONTOUR MAJOR
- MINOR CONTOUR 2017
- MAJOR CONTOUR 2017
- FENCE
- PAVED ROAD
- UNPAVED ROAD 2017
- OVERHEAD UTILITY LINE
- FIBER OPTIC LINE
- GAS LINE
- CREEK
- UTILITY POLE
- CULVERT
- MONITORING WELL
- BORE LOCATION
- OVERHEAD UTILITY LINE EASEMENT
- BLACK MAT - TEMPORARY
- EROSION MAT
- ESTIMATED 2017 CONSTRUCTION LIMITS
- ESTIMATED ACTIVE ASH LIMITS AT TIME OF 2017 SURVEY

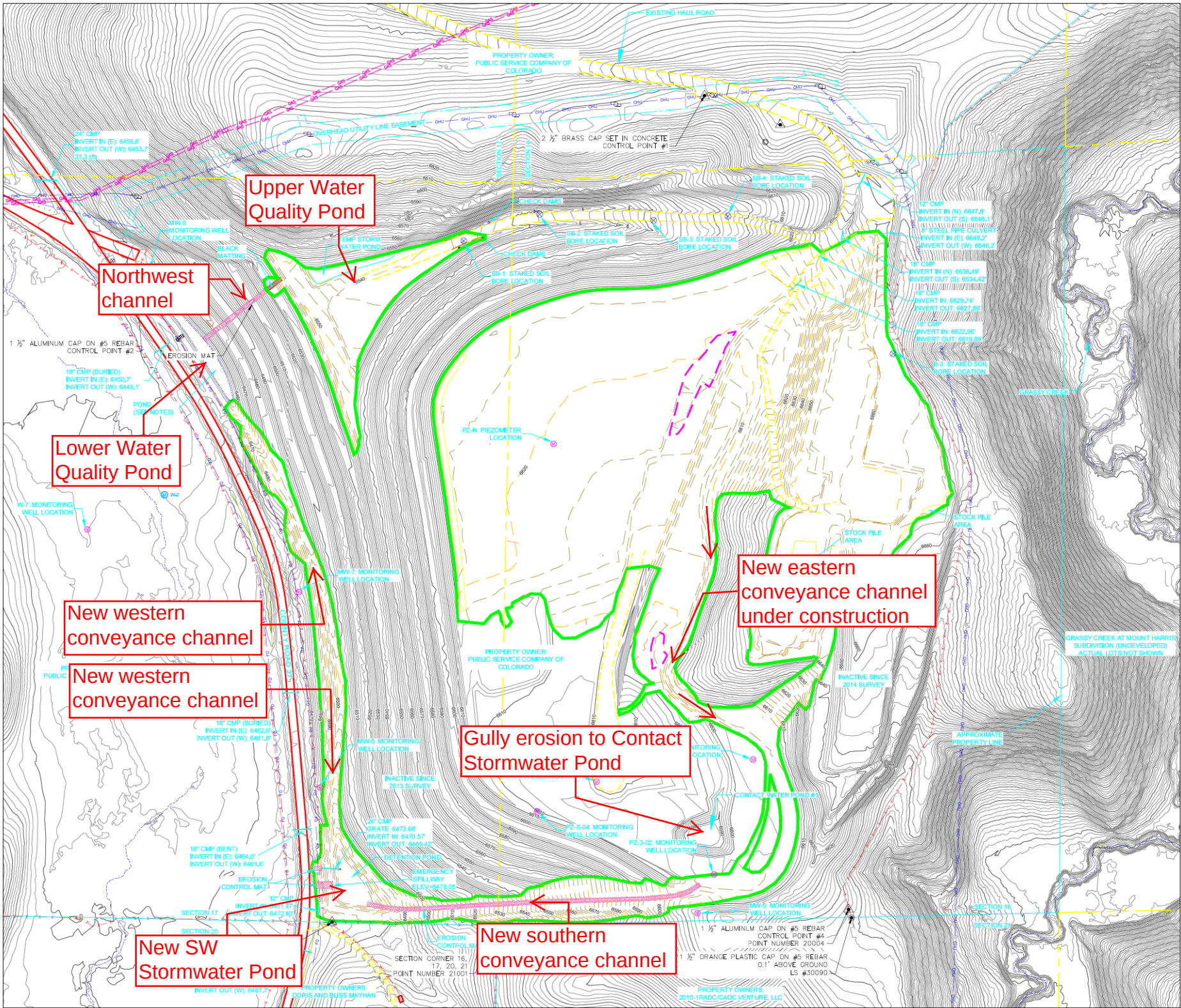
SURVEYOR'S CERTIFICATE

I, WALTER N. MAGILL, BEING A DULY REGISTERED LAND SURVEYOR IN THE STATE OF COLORADO, DO HEREBY CERTIFY THAT THE SURVEY (I) WAS PERFORMED BY ME OR UNDER MY DIRECT SUPERVISION, (II) HAS BEEN PREPARED IN COMPLIANCE WITH ALL APPLICABLE LAWS OF THE STATE OF COLORADO AT THE TIME OF THIS SURVEY (III) IS ACCURATE TO THE BEST OF MY KNOWLEDGE AND (IV) CONTAINS ALL OF THE INFORMATION REQUIRED BY C.R.S. 38-51-102 (9) AND C.R.S. 38-51-103, 38-51-104 38-51-105 AND 38-51-106.

WALTER N. MAGILL, REGISTERED LAND SURVEYOR, PLS 38024
STATE OF COLORADO

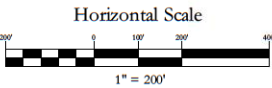
TOPOGRAPHIC EXHIBIT

LOCATED IN THE SOUTHEAST QUARTER OF SECTION 17 AND THE SOUTHWEST QUARTER OF SECTION 16, TOWNSHIP 6 NORTH, RANGE 87 WEST OF THE 6TH P.M.,
COUNTY OF ROUTT, STATE OF COLORADO
SHEET 1 OF 1



Hayden Power Plant
Hayden, CO 80487

October 2017
As-Built Survey



IF THIS DRAWING IS PRESENTED IN A FORMAT OTHER THAN 24" X 36", THE GRAPHIC SCALE SHOULD BE UTILIZED.

Contour Interval
2 Feet

NO.	DATE	REVISIONS	INT

DATE: 10-16-2017 DESIGN: JDM
JOB NO. 1453-001 DRAFTED: JDM
DWG. NAME October 2017 EX REVIEW: WNM

Four Points
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SHEET NO.
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OF 1

Notes in red text boxes added by
HDR Engineering for CCR Annual
Inspection Report, January 2018