Interim Response Action
Well Abandonment PW-713 GWIC Id: 186072
Talen Montana's Colstrip Steam Electric Station (Colstrip SES)

INTERIM RESPONSE ACTION WORK PLAN OUTLINE

AREA: *East of Units 1&2 Stage II Evaporation Pond Main Dam*

LAND USE AND OWNERSHIP: *Montana Department of Transportation – Colstrip Maintenance Facility*

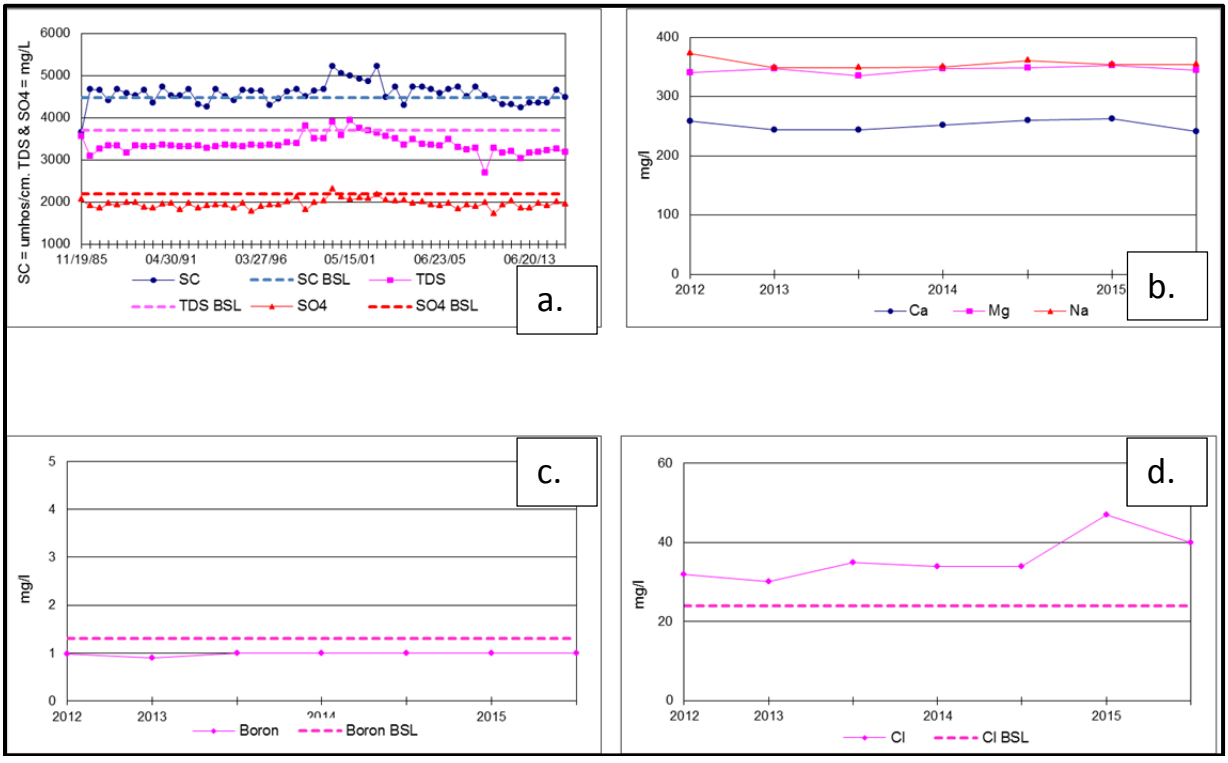
MEDIA: Soil

Surface Water (identify water body):_____

Groundwater

Alluvial McKay/Rosebud Sub-McKay Other: _____

WATER QUALITY INDICATOR PARAMETERS



From top left to bottom right: a.) SC, TDS, sulfate; b.) calcium, magnesium, sodium; c.) boron; d.) chloride

PROJECT SCOPE & OBJECTIVE: Investigation Capture Well Abandonment

SITE ASSESSMENT HISTORY *(List reports/summary of work done in area in chronological order)*:

Well PW-713 is a domestic water well owned by the Montana Department of Transportation that is located downgradient of the Stage II Evaporation Pond (STEP). Well PW-713 was installed in 1978; and Talen and/or previous owners of the Colstrip SES have monitored groundwater quality at PW-713 since 1985. There has been no formal investigation or Interim Response Action (IRA) conducted at PW-713 to date; and there have been no evident water quality changes during the period of observation at well PW-713.

NEAREST DOMESTIC OR STOCK WELL(S)*: (indicate direction, distance, and completion zone)

Well ID/ GWIC ID	Approximate Distance from Project Area	Direction	Formation of Completion/ (Depth)	Well Owner/Note
186072	*0 feet*	*Not applicable*	*Sub-McKay/ 208 ft-bgs*	*MDOT well – to be abandoned*
154780	*480 feet*	*East*	*Sub-McKay/ 320 ft-bgs*	CHILDERS, MIKE
1078	*670 feet*	*Southeast*	*Sub-McKay/ 120 ft-bgs*	MCDONALD
1077	*1200 feet*	*Northeast*	*Sub-McKay/ 122 ft-bgs*	SEWARD I.
242581	*2600 feet*	*North-northeast*	*Sub-McKay/ 60 ft-bgs*	BURTON, BRENT

From *Montana Bureau of Mines and Geology Groundwater Information Center (GWIC)

DISTANCE FROM PROPERTY BOUNDARY: *Subject well is on adjacent property, owned by The Montana Department of Transportation*

PROPOSED ACTION: *Well PW-713 will be plugged and abandoned in this IRA. The IRA is intended to preemptively protect groundwater resources in sub-McKay bedrock that has yet to exhibit process water impacts but that may be susceptible to mixing with water from vertically upgradient hydrostratigraphic intervals because of a suspect well seal.*

MAPS/FIGURES:

Figure 1. General Project Location
Figure 2. Project Area Monitoring and Capture Well Network
Figure 3. PW-713 Groundwater Quality Trend Plots
Figure 4. Potentiometric Surface Map
Figure 5. SC Iso-contour Map
Figure 6. 2027D Groundwater Quality Trend Plots
Figure 7. 2029D Groundwater Quality Trend Plots
Figure 8. 2036D Groundwater Quality Trend Plots

SCHEDULE

The proposed timeline to complete the scope of work outlined above is as follows.

- *Work described in this plan will be completed within 60 days of notice to proceed.*
- *A final report (memorandum) with the attached well abandonment form will be submitted within 60 days of well abandonment.*

REFERENCES

Hydrometrics, Inc. (April 2016). *Evaluation of 2015 Hydrologic Monitoring Data from Colstrip Units 1 through 4 Process Pond System Colstrip Steam Electric Station .*

Interim Response Action Work Plan
PW-713 Well Abandonment
East of the Stage Two Evaporation Pond
Talen Montana LLC -- Colstrip Steam Electric Station

Executive Summary

This Work Plan was prepared as an Interim Response Action (IRA) in accordance with the Administrative Order on Consent (AOC) Regarding Impacts Related to Wastewater Facilities Comprising the Closed-Loop System at the Colstrip Steam Electric Station, Colstrip, Montana between Talen Montana, LLC as Operator of the Colstrip Steam Electric Station and the Montana Department of Environmental Quality.

Talen Montana, LLC (Talen) maintains effluent holding ponds and evaporation ponds for disposal of fly ash scrubber slurry from four electrical power generation units at the Colstrip Steam Electric Station (Colstrip SES). Concurrent with pond operations, Talen maintains an extensive monitoring and capture well network to detect and mitigate impacts on local groundwater that are attributable to seepage from the ponds. The monitoring network downgradient of the Stage II Evaporation Pond (STEP) is comprised primarily of wells owned by and installed on land owned by Talen; however, several wells owned by separate private owners have also been included in the groundwater monitoring network. Well PW-713 is a domestic water well owned by the Montana Department of Transportation (MDT) that is located downgradient of the STEP. Well PW-713 was installed in 1978; and Talen and/or previous owners of the Colstrip SES have monitored groundwater quality at PW-713 since 1985. There have been no evident water quality changes during the period of observation at well PW-713. However, domestic use of the well was discontinued in 2005 when Talen's predecessor (PPL Montana, LLC) provided water from the City of Colstrip to neighborhoods east of the STEP. The documented well completion at PW-713 indicates that the well seal may be inadequate to vertically isolate the screened interval of the well from shallower hydrostratigraphic intervals of the formation. Well completion details and upgradient groundwater quality are reviewed in this Work Plan.

For precautionary purposes, Talen is proposing to plug and abandon well PW-713. This brief Work Plan outlines procedures of the well abandonment process in accordance with Montana Department of Natural Resources and Conservation regulations (ARM 36.21.670). Written approval to abandon the well has been granted by the well owner (MDT) and is included as Attachment B to this Work Plan. Note that MDT has requested that Talen construct an extension of their existing city water connection to be used for truck washing in exchange for permission to abandon well PW-713. Talen has subsequently agreed to provide the pipeline extension. Aside from fulfilling requirements necessary for Talen to obtain permission to abandon the well from its owner, details related to pipeline construction are outside the scope of this Interim Response Action Work Plan.

Finally, circumstances that might necessitate drilling more monitoring or capture wells in the vicinity of PW 713 are evaluated; but no specific scope of work for additional well completions is presented herein. Abandonment of PW-713 should not leave any appreciable gaps in the well network, as a sufficient distribution of wells is already present in this area to detect future groundwater impacts. However, Talen will continue to evaluate groundwater conditions downgradient of the STEP through ongoing water level monitoring, semi-annual sample collection, and water quality trend analysis.

Interim Response Action Work Plan
PW-713 Well Abandonment
East of the Stage Two Evaporation Pond
Talen Montana LLC -- Colstrip Steam Electric Station

Introduction

This Work Plan was prepared as an Interim Response Action (IRA) in accordance with the Administrative Order on Consent (AOC) Regarding Impacts Related to Wastewater Facilities Comprising the Closed-Loop System at the Colstrip Steam Electric Station, Colstrip, Montana between Talen Montana, LLC as Operator of the Colstrip Steam Electric Station and Montana Department of Environmental Quality (MT-DEQ. While the AOC provides for work to be done as an IRA, the examples provided in the AOC are not exhaustive, and the prompt action described in the following Work Plan is to respond to the circumstances identified in the Work Plan and not because of an acute threat to human health or a recent spill.

Talen Montana, LLC (Talen) maintains effluent holding ponds and evaporation ponds for disposal of fly ash scrubber slurry from four electrical power generation units at the Colstrip Steam Electric Station (Colstrip SES). A list of these facilities is included in PPL Montana's annual hydrologic monitoring data report *Evaluation of 2014 Hydrologic Monitoring Data from Colstrip Units 1 through 4 Process Pond System Colstrip Steam Electric Station* (Hydrometrics, Inc., April 2015). Concurrent with pond operations, Talen maintains an extensive monitoring and capture well network to detect and mitigate impacts on local groundwater that are attributable to seepage from the ponds. The general Talen Colstrip-SES project area is presented in Figure 1. The capture/monitoring well network east of the Stage II Evaporation Pond (STEP) is presented in Figure 2. Monitoring and capture wells are segregated by color as shown in the legend. Wells completed in bedrock are assigned a "D" suffix; and wells completed in alluvium are designated with an "A".

The monitoring network downgradient of the STEP consists primarily of wells owned by and installed on land owned by Talen; however, several wells owned by separate private owners have also been included in the groundwater monitoring network. The subject of this Work Plan is well PW-713, a domestic water well owned by the Montana Department of Transportation

(MDT) that is located downgradient of the STEP. Although referred to as PW-713 in this Work Plan, the well has also been assigned the identification number 186072, by the Montana Bureau of Mining and Geology's (MBMG) Groundwater Information Center (GWIC). The well was installed in 1978; and Talen and/or previous owners of the Colstrip SES have monitored groundwater quality at PW-713 since 1985.

Typical water quality parameters used by Talen to indicate potential process water impacts include increased levels of specific conductance (SC), sulfate, boron, chloride, and bromide. A low ratio of dissolved calcium to magnesium (Ca:Mg < 1) may also be attributable to process water impacts on local groundwater. Trends of SC, TDS, sulfate, boron, and chloride at well PW-713 are presented in Figure 3. Groundwater at well PW-713 is elevated in SC and TDS; but concentrations of boron and chloride in the well are low. The ratio of dissolved calcium to magnesium is also greater than one, which suggests that SC and TDS are naturally elevated and not subject to influences from process water. The plots (Figure 3) indicate some natural variability in water quality parameters but they do not exhibit consistent trends that would be attributable to an external source such as the STEP. Despite no evidence of water quality changes during the period of observation at well PW-713, the domestic use of the well was discontinued in 2005 when Talen's predecessor (PPL Montana, LLC) provided city water to neighborhoods east of the STEP.

Well PW-713 is completed in bedrock at a depth of 204 feet below ground surface (ft-bgs). The private well is downgradient of several capture wells (e.g. 932D, 933D, 934D, 989D, etc.) owned and operated by Talen. These upgradient capture wells are completed in either unconsolidated sediments or shallow bedrock at depths typically ranging from 50 to 100 ft-bgs. The well log for PW-713 is included in Attachment A. The documented well completion at PW-713 indicates that the well seal may be inadequate to vertically isolate the screened interval of the well from shallower hydrostratigraphic intervals of the formation. A summary of key completion details and justification for abandonment of PW-713 is as follows:

- PW-713 is completed to a depth of 204 ft-bgs;
- Six-inch diameter steel surface casing was installed to a depth of 10 ft-bgs;
- Four-inch PVC casing was installed from seven to 204 ft-bgs;
- Saw cut perforations were made in the casing from 100 to 184 ft-bgs;

- A cement seal was placed in the annulus between the steel and PVC casing (presumably from seven to 10 ft-bgs since a pitless adapter was also installed);
- A single neoprene packer was set at 90 ft-bgs; and
- The well is located downgradient of existing capture wells, ranging in depth from about 50 to 100 ft-bgs.

Based on the depth of well perforations and the neoprene packer, there is a potential overlap with the completion interval (90 to 204 feet) and zones that are currently being targeted for capture (90 to 100 foot interval) at upgradient wells. Furthermore, PW-713 was drilled on September 20, 1978, when cuttings were commonly used to backfill the annular space. There is no mention of a low permeability seal being installed above the neoprene packer and the bottom of the cement seal. It is likely that drill cuttings were used to fill the annulus across this interval. This would coincide with shallower zones that are being targeted for capture upgradient.

Potential shortcomings in well completion, coupled with the fact that PW-713 has been replaced with water from the City of Colstrip, indicate that it would be prudent to abandon the well. In the absence of an observed trend of water quality impacts, reasons for abandonment are purely precautionary. However, abandoning well PW-713 will prevent the local comingling of groundwater from otherwise isolated hydrostratigraphic intervals. Permission to abandon the well has been granted by MDT, contingent on construction of an extension of MDT's existing pipeline from the city water connection to a hydrant to be used for truck washing. Talen has subsequently agreed to extend the pipeline and install a new hydrant. A copy of MDT's letter of approval is included as Attachment B.

A review of site hydrogeology and previous work conducted in the project area are typically presented in each Interim Response Action Work Plan prior to developing the pertinent scope of work. In this case, the MT-DEQ has requested a discussion of circumstances that might necessitate drilling more monitoring or capture wells in the vicinity of abandoned well PW-713. A brief evaluation of current groundwater flow paths and distribution of process water indicator parameters is presented following the Scope of Work to abandon well PW-713. Based on the review, no additional monitoring or capture well completions are included in the current IRA; however, Talen will continue to evaluate groundwater conditions downgradient of the STEP

through ongoing water level monitoring, semi-annual sample collection, and water quality trend analysis.

Scope of Work

Well PW-713 will be plugged and abandoned by a licensed Water Well Contractor. Abandonment will be conducted in accordance with Montana Department of Natural Resources and Conservation (MT-DNRC) regulations as follows.

- A grout seal consisting of materials as defined in ARM 36.21.634(34) (such as Type I/II Portland cement grout, bentonite amended cement grout, or bentonite) will be pumped down the well starting at total depth (204 ft-bgs) and proceeding toward the ground surface in accordance with ARM 36.21.677.
- Cement grout will be allowed to settle for approximately 24 hours. If the cement grout sealing material settles to a depth lower than three ft-bgs, 3/8" bentonite chips will be added to the borehole from the top of the cement grout to ground surface. The composite grout/bentonite seal will fulfill DNRC requirements of ARM 36.21.670(2).
- Well casing will be cut off or driven to a depth of at least three ft-bgs, as required by ARM 36.21.670(6).
- In accordance with ARM 36.21.678, abandonment procedures will be documented and submitted to GWIC on a water well log report, Form No. 603, within 60 days of abandoning the well. The selected licensed water well contractor will be responsible for completing and submitting the Form No. 603.

Potential Gaps In Monitoring Network after Abandonment of PW-713

At the request of MT-DEQ, Hydrometrics reviewed current flow paths and groundwater quality to identify circumstances that may necessitate installation of new monitoring or capture wells near the abandoned well PW-713. As noted previously, no groundwater quality trends were observed at well PW-713 that would indicate of process water impacts. However, process water impacts have been identified and groundwater is actively captured at a dense network of bedrock capture wells upgradient of PW-713. The monitoring and capture well network is shown in Figure 2.

In recent years, bedrock monitoring wells have been installed at increasing distances from the STEP and the existing capture well network to evaluate the eastern extent of the capture zone. Specifically, wells 2027D and 2029D were installed in 2012 and well 2036D was installed in 2014 at approximately the same lateral distance from the STEP as PW-713. Private well PW-713 and new wells 2027D, 2029D, and 2036D are located within 1400 to 1500 feet of the STEP. Each of wells 2027D, 2029D, and 2036D are screened solely in the uppermost water-bearing bedrock and are constructed such that overlying units are adequately sealed with steel casing and/or bentonite. Discrete completion intervals and modern well completion techniques used at the new wells makes them more effective monitoring locations than well PW-713, which was completed in a deeper bedrock interval using antiquated completion methods. Note that well 2027D is located on MDT property, approximately 200 feet northwest of PW-713.

A potentiometric map constructed of bedrock groundwater level elevations recorded in Fall 2014 is included as Figure 4. Based on the map, the general direction of groundwater flow in the sub-McKay bedrock is to the west/northwest; but overlapping capture radii of the pumping wells creates a noticeable potentiometric depression. Within the cumulative potentiometric depression, radial groundwater flow to individual capture wells is expected. The location of well PW-713 is included on the map; but the water level elevation for well PW-713 was not used to develop the potentiometric contours because the well is completed in a deeper hydrostratigraphic interval. However, potentiometric contours and the interpolated direction of groundwater flow in the uppermost bedrock interval near PW-713 suggests that the private well is near the eastern extent of the capture radii and coincident with an artificially induced divide that separates flow direction from either eastward to the capture wells or north/northwest along the native flow path. The divergent flow path is evident by groundwater potential mapped at nearby monitoring wells 2027D and 2029D. Further, the interpolated potentiometric surface suggests that there is a southerly flow component from the area of well 2027D toward capture wells such as 933D, 934D, and 989D, etc.

Well 2036D is located near existing capture wells such as 927D, 928D, 932D, and PW-704D2; and the water level elevation at the new monitoring well is apparently influenced by the ongoing

pumping. Although control points east of 2036D are limited, those that are present in Figure 4 suggest that the direction of groundwater flow at well 2036D is toward the existing capture wells.

An iso-contour map of groundwater specific conductance (SC) is presented as Figure 5. For this analysis, SC is used as a general indicator of groundwater quality; and the SC map is provided to illustrate the current distribution of potential process water impacts. Draft Baseline Screening Levels (BSLs) were established for many individual constituents to evaluate potential process water impacts to local groundwater downgradient of Colstrip-SES facilities. A draft BSL of 4,470 μmhos/cm was established for SC (Neptune, 2016). Although the current SC at the well is higher than the statistically derived BSL for sub-McKay SC, groundwater quality at well PW-713 has been fairly consistent throughout the period of record. SC at wells 2027D, 2029D, and 2036D is less than the BSL. Further, based on the direction of groundwater flow inferred from the potentiometric map presented in Figure 4, SC in the area of these wells is not likely to be influenced by the STEP under the existing capture regime. Rather, groundwater quality at these wells is more likely to be influenced by the flow of bedrock groundwater from the west toward the capture wells.

Plots of typical process water indicator parameters, including SC, Total Dissolved Solids (TDS), sulfate, boron, chloride, calcium, and magnesium for the period of record at wells 2027D, 2029D, and 2036D are included in Figures 6, 7, and 8, respectively.

Current groundwater quality conditions observed at new wells 2027D, 2029D, and 2036D are not indicative of process water impacts. Further, groundwater potential at these monitoring wells suggests that they are within or are near the cumulative capture radius of existing pumping wells. Ongoing monitoring of water levels and groundwater quality at new wells 2027D, 2029D, and 2036D will indicate if impacts migrate beyond existing capture wells.

Timeline and Reporting

The timeline to abandon well PW-713 is weather dependent; but the target date for abandonment will fall within 60 days of approval of this Work Plan. A brief memorandum of the

abandonment process will be prepared as the Final Report for this IRA. The memorandum will be submitted to Talen and forwarded to MT-DEQ. The completed Form No. 603 will be included as an attachment to the memo. Consistent with submittal requirements of Form No. 603, the Final Report (memo) will be submitted within 60 days of abandoning well PW-713.

Reference

Hydrometrics, Inc. (April 2016). Evaluation of 2015 Hydrologic Monitoring Data from Colstrip Units 1 through 4 Process Pond System Colstrip Steam Electric Station.

Neptune and Company, Inc. January 2016. *Final Report on Updated Background Screening Levels, Plant Site, 1&2 SOEP and STEP, and 3&4 EHP, Colstrip Steam Electric Power Station, Colstrip, Montana*, January 22, 2016.

Figures

Figure 1. General Project Location
I:\Land Projects\TALEN\127915\ 127915B008-FIG 1.pdf

Figure 2. Project Area Monitoring and Capture Well Network
I:\Land Projects\TALEN\127915\ 127915B008-FIG 2.pdf

Figure 3. PW-713 Groundwater Quality Trend Plots
H:\PROJECTS\TALEN\Proposals\PW-713\ Fig3_PW-713_WQ.pdf

Figure 4. Potentiometric Surface Map
I:\Land Projects\TALEN\127915\ Fall 2014 GWE-FIG 4.pdf

Figure 5. SC Iso-contour Map
I:\Land Projects\TALEN\127915\ Fall 2014 SC-FIG 5.pdf

Figure 6. 2027D Groundwater Quality Trend Plots
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Figure 7. 2029D Groundwater Quality Trend Plots
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Figure 8. 2036D Groundwater Quality Trend Plots
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Attachments

Attachment A. PW-713 Well Log (GWIC ID # 186072)
H:\PROJECTS\TALEN\Proposals\PW-713\Well Log_186072.PDF

Attachment B. Letter of Approval from MDT
H:\PROJECTS\TALEN\Proposals\PW-713\ Attachment B_Talen Ltr Colstrip Well Abnd 4-22-16.pdf

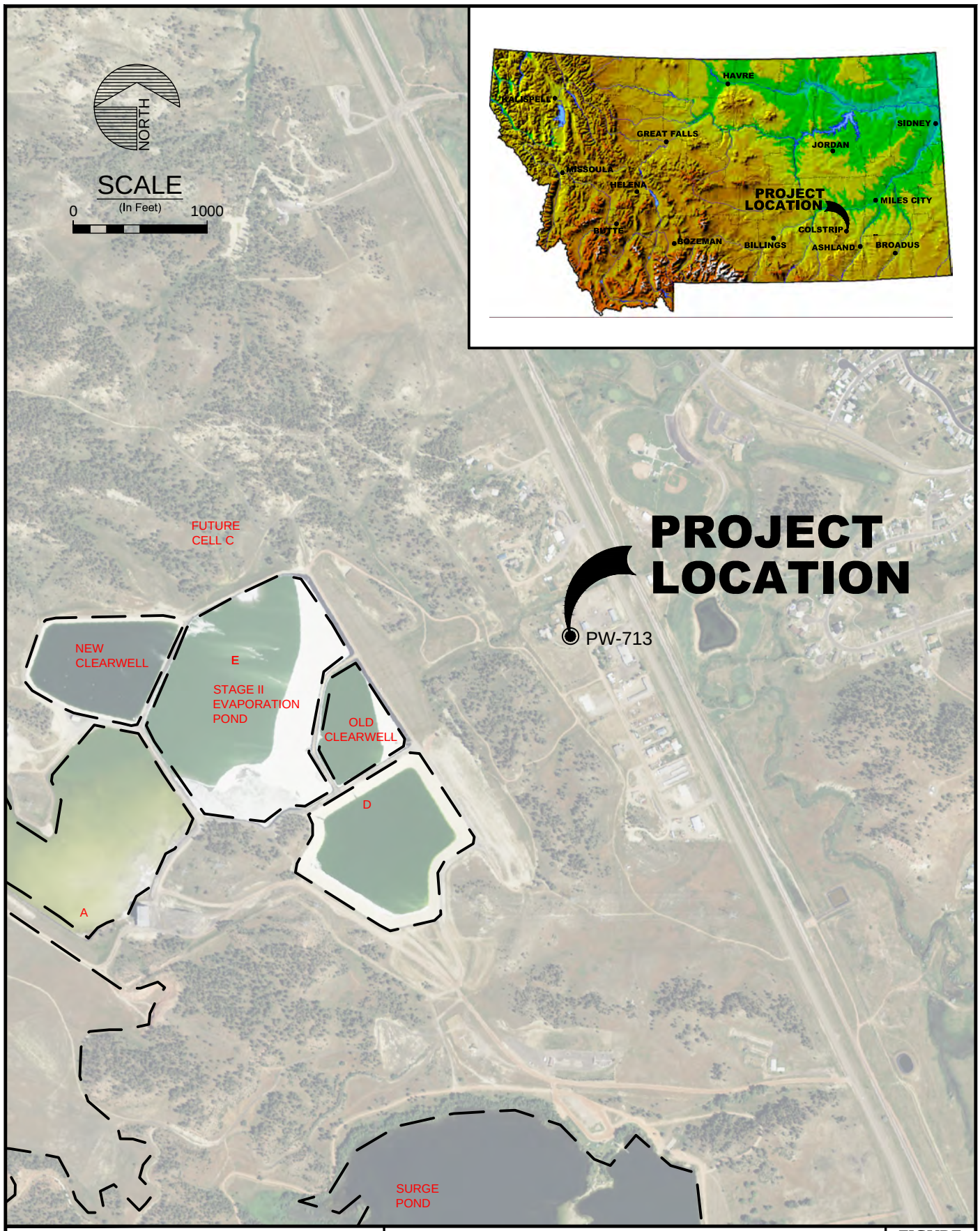
Interim Response Action Work Plan
PW-713 Well Abandonment
East of the Stage Two Evaporation Pond
Talen Montana LLC -- Colstrip Steam Electric Station

Pursuant to: ADMINISTRATIVE ORDER ON CONSENT REGARDING IMPACTS RELATED TO WASTEWATER FACILITIES COMPRISING THE CLOSED-LOOP SYSTEM AT COLSTRIP STEAM ELECTRIC STATION, COLSTRIP, MONTANA SECTION XI – SUBMISSIONS

CERTIFICATION:

I, the undersigned, hereby certify that this document was prepared under my direction and to the best of my knowledge the information contained herein is correct and accurate.

Name	Title	Date
[signature]	Environmental Mgr.	6-8-2016



INTERIM RESPONSE ACTION WORK PLAN PW-713 WELL ABANDONMENT EAST OF THE STAGE TWO EVAPORATION POND TALEN MONTANA LLC -- COLSTRIP STEAM ELECTRIC STATION	**GENERAL LOCATION MAP**	FIGURE **1**

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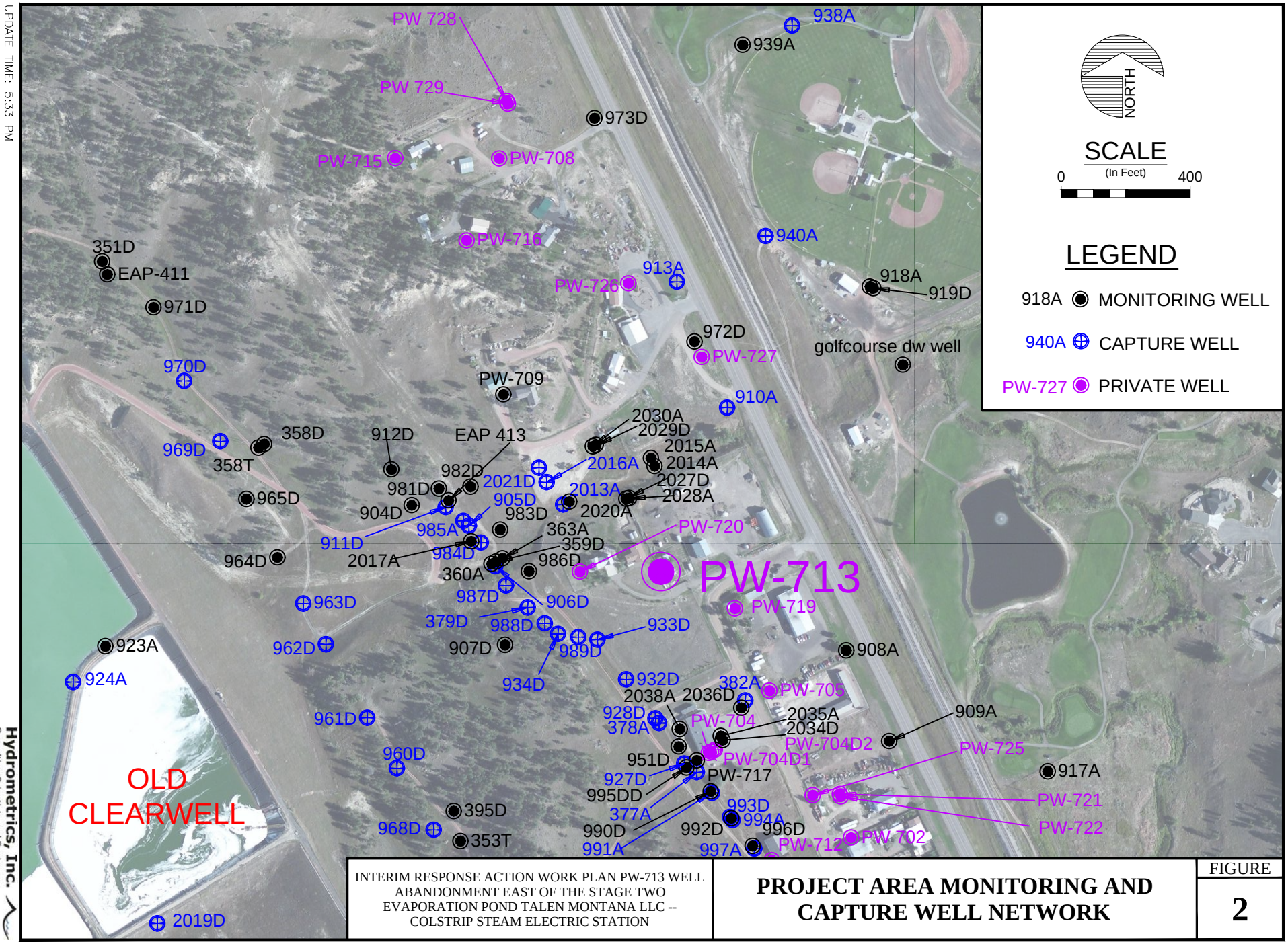

INTERIM RESPONSE ACTION WORK PLAN PW-713 WELL ABANDONMENT EAST OF THE STAGE TWO EVAPORATION POND TALEN MONTANA LLC -- COLSTRIP STEAM ELECTRIC STATION

PROJECT AREA MONITORING AND CAPTURE WELL NETWORK

FIGURE

2

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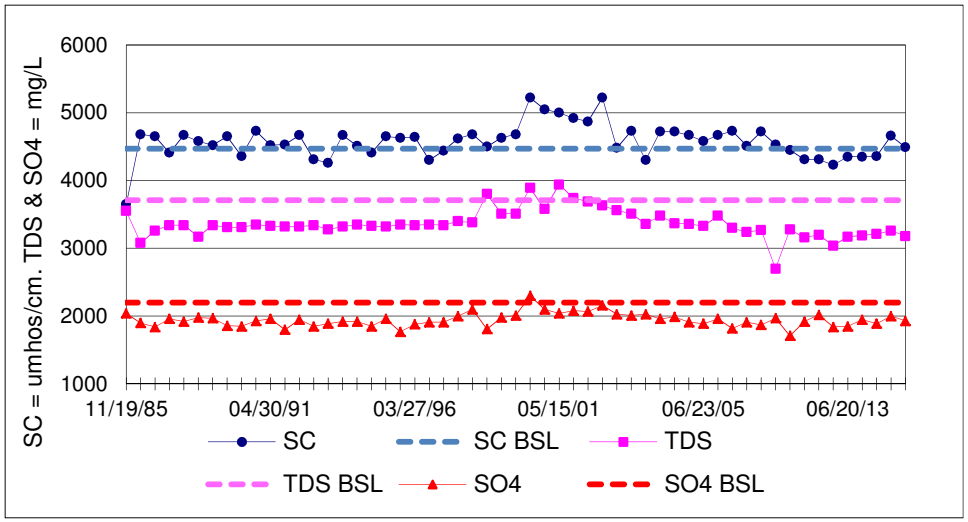
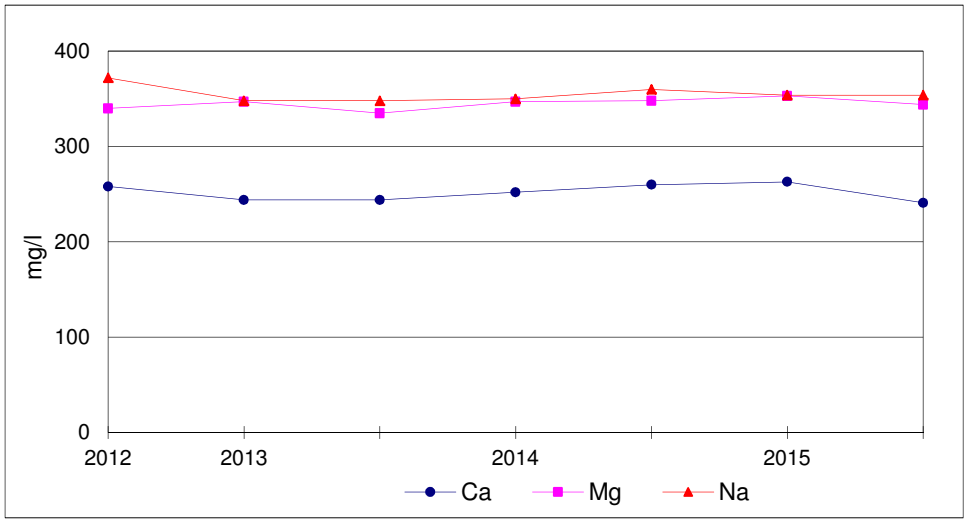
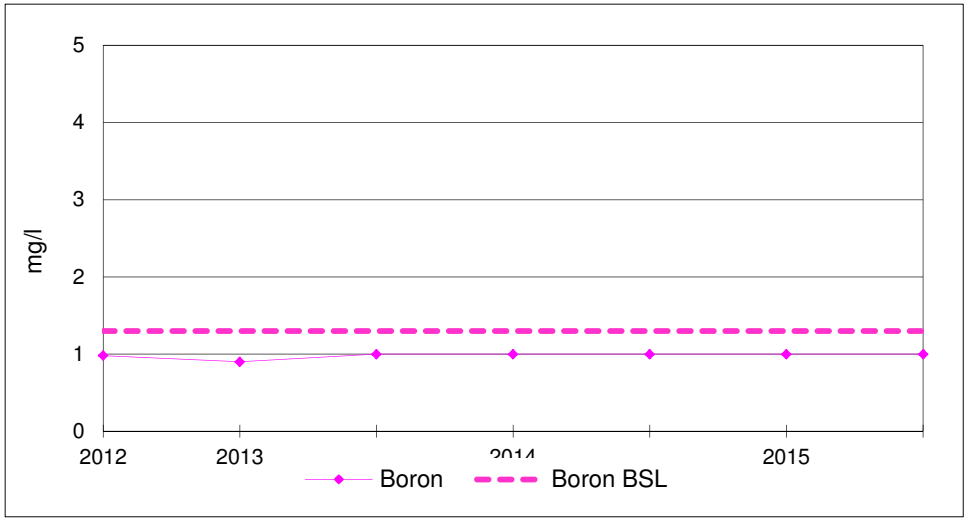
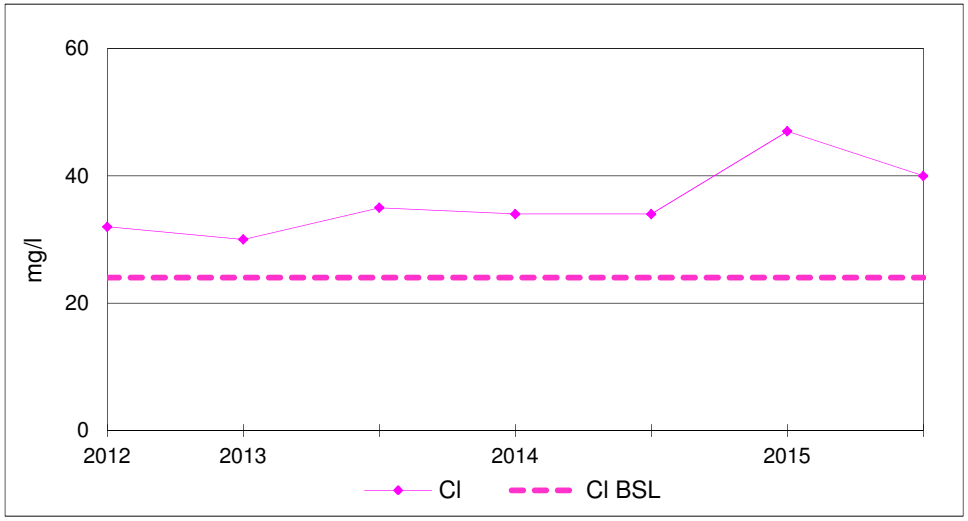
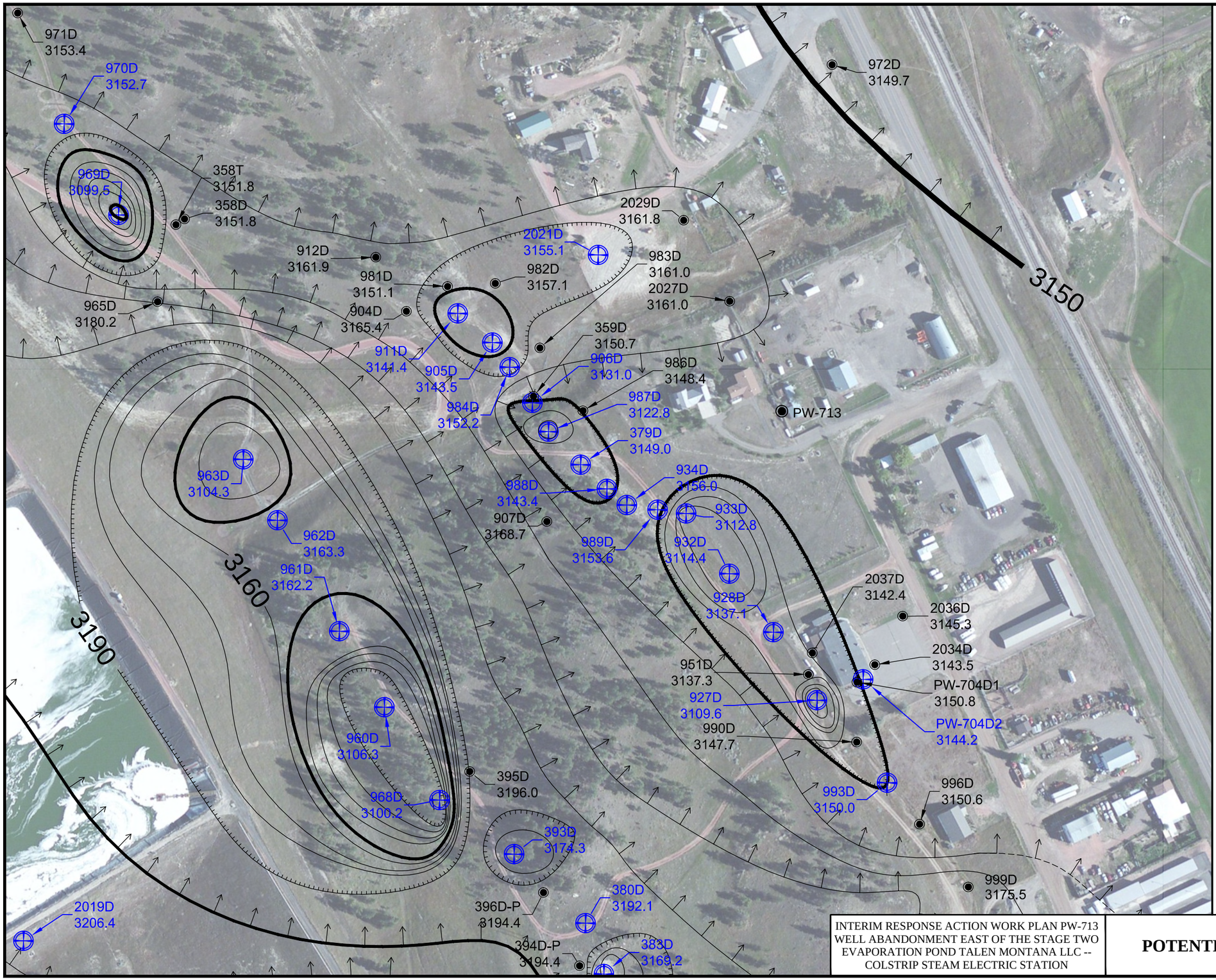








INTERIM RESPONSE ACTION WORK PLAN PW-713 WELL ABANDONMENT EAST OF THE STAGE TWO EVAPORATION POND TALEN MONTANA LLC -- COLSTRIP STEAM ELECTRIC STATION	**WATER QUALITY TRENDS AT WELL PW-713**	**FIGURE 3**



NORTH

SCALE

(In Feet)

0 200

LEGEND

970D	GROUNDWATER CAPTURE WELL
2029D	GROUNDWATER MONITORING WELL
3161.8	GROUNDWATER ELEVATION (FEET)
	SUB-MCKAY POTENTIOMETRIC DEPRESSION
	SUB-MCKAY POTENTIOMETRIC LINE WITH FLOW DIRECTION ARROW (5 FOOT CONTOUR INTERVALS)
	INFERRED SUB-MCKAY POTENTIOMETRIC LINE WITH FLOW DIRECTION ARROW (5 FOOT CONTOUR INTERVALS)

INTERIM RESPONSE ACTION WORK PLAN PW-713 WELL ABANDONMENT EAST OF THE STAGE TWO EVAPORATION POND TALEN MONTANA LLC -- COLSTRIP STEAM ELECTRIC STATION

POTENTIOMETRIC SURFACE MAP

FIGURE 4

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Hydrometrics, Inc.
Consulting Scientists and Engineers

971D
4080

970D
4150

969D
5030

358D
4880

912D
4990

981D
6180

982D
5990

2021D
6610

911D
7210

965D
9330

904D
4350

905D
5280

983D
4040

984D
4380

359D
4440

906D
5620

986D
4800

963D
6940

987D
4780

934D
6770

989D
8120

379D
5400

933D
4970

907D
9100

988D
6710

962D
7150

961D
7820

932D
4750

960D
6670

928D
3860

927D
5890

395D
5930

968D
5960

393D
5680

380D
4690

383D
4300

2019D
4900

PW-727
2950

2029D
3670

2027D
4000

PW-713
4660

2036D
3970

2034D
3950

PW-704D2
5670

PW-704D1
5380

2037D
3920

990D
4410

993D
4260

PW-721
4210

PW-722
4370

996D
3510

999D
3130

9000
8000
7000
5000
4000

NORTH

SCALE
(In Feet)
0 200

LEGEND

383D — GROUNDWATER CAPTURE WELL

2027D — GROUNDWATER MONITORING WELL

4000 — GROUNDWATER SC CONCENTRATION (µMHOS/CM)

SUB-MCKAY SC CONCENTRATION (1,000 µMHOS/CM CONTOUR INTERVALS, DASHED WHERE INFERRED)

NOTE:
SUB-MCKAY DRAFT BACKGROUND SCREENING LEVELS (BSL) FOR SC OF 4470 µMHOS/CM.
WELLS ABOVE BSL ARE SHOWN IN RED

INTERIM RESPONSE ACTION WORK PLAN PW-713 WELL ABANDONMENT EAST OF THE STAGE TWO EVAPORATION POND TALEN MONTANA LLC -- COLSTRIP STEAM ELECTRIC STATION

SC ISO-CONTOUR MAP

FIGURE
5

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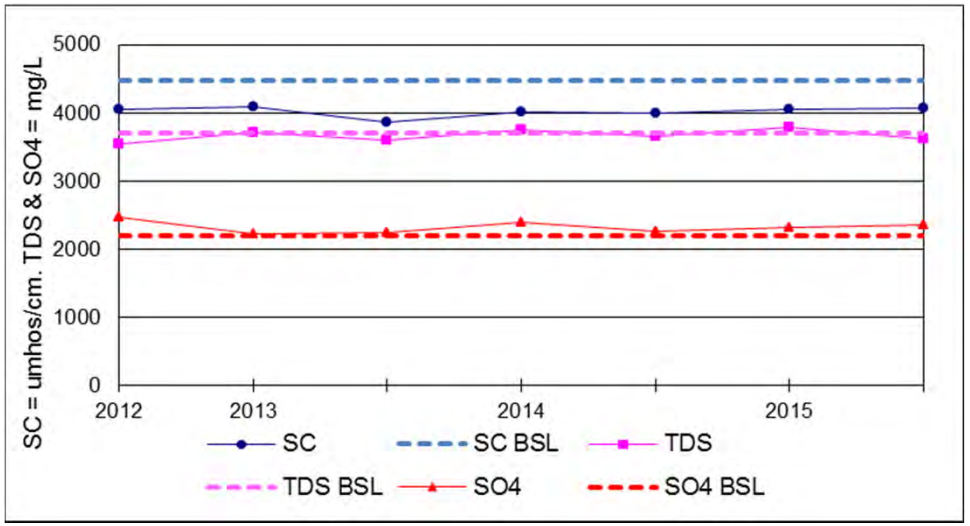
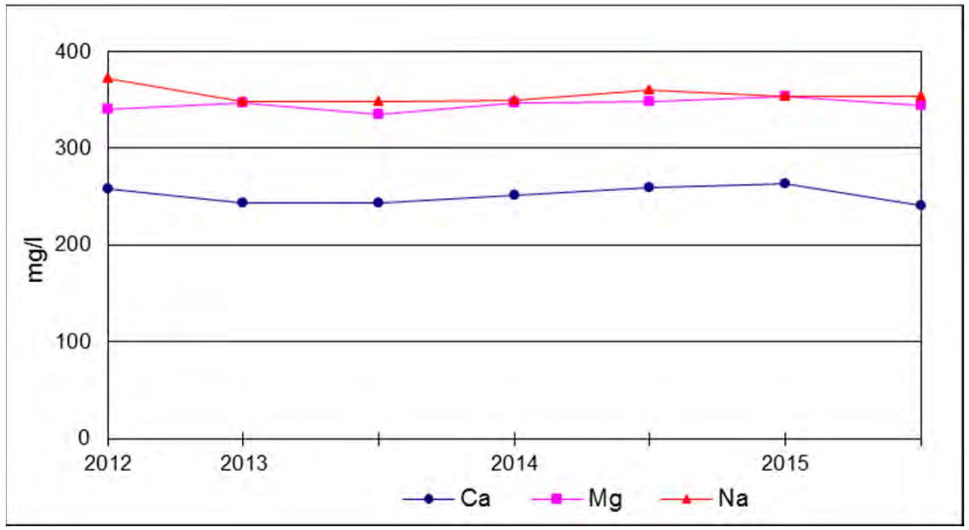
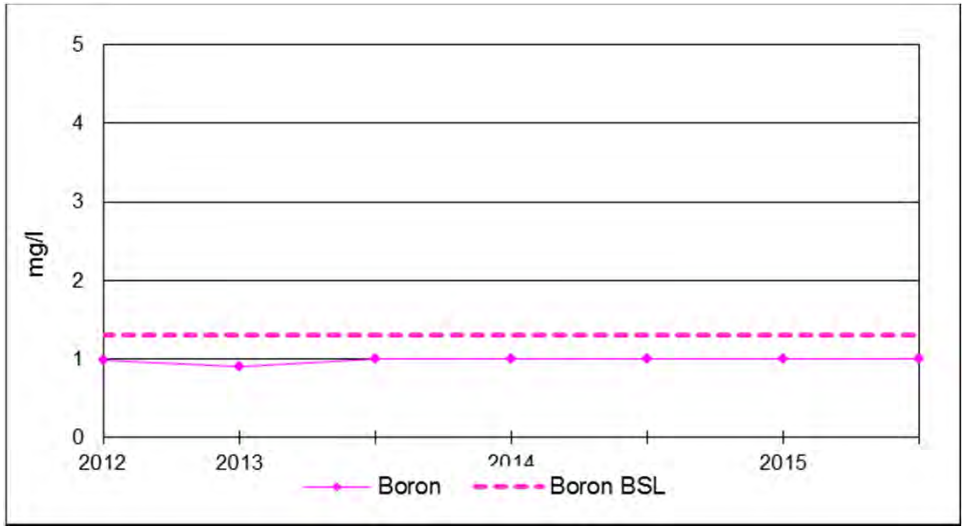
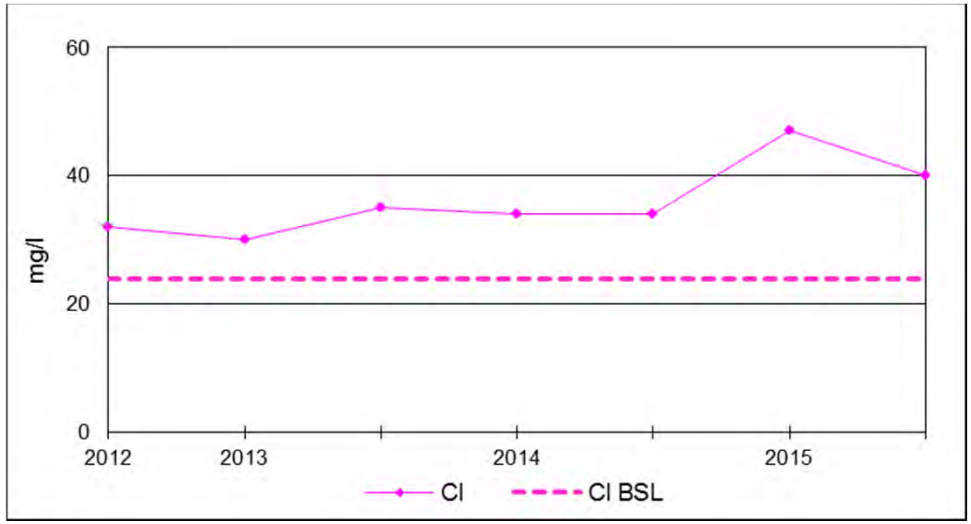
Hydrometrics, Inc.
Consulting Scientists and Engineers

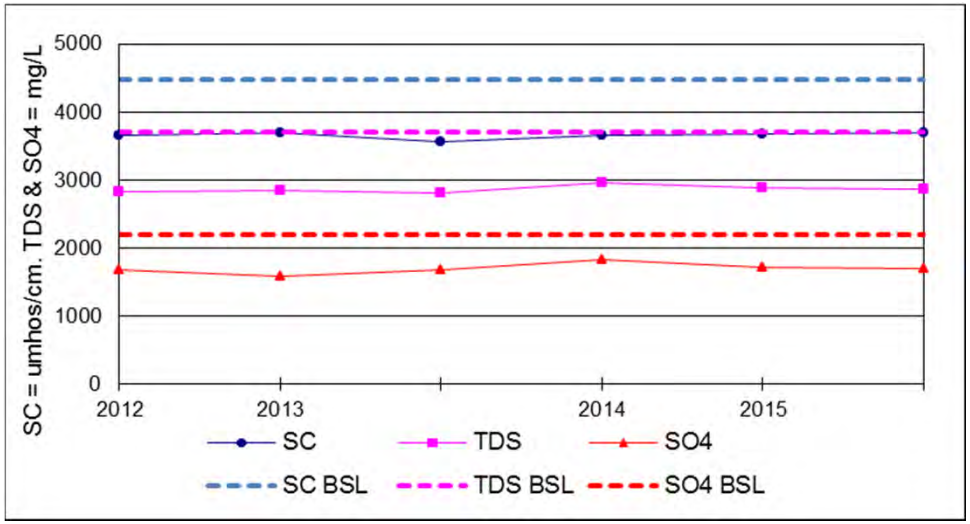


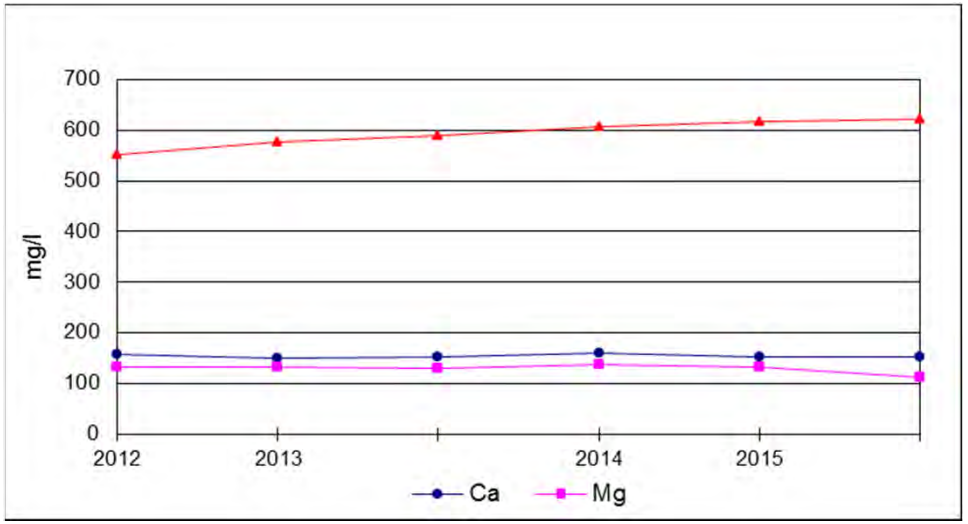


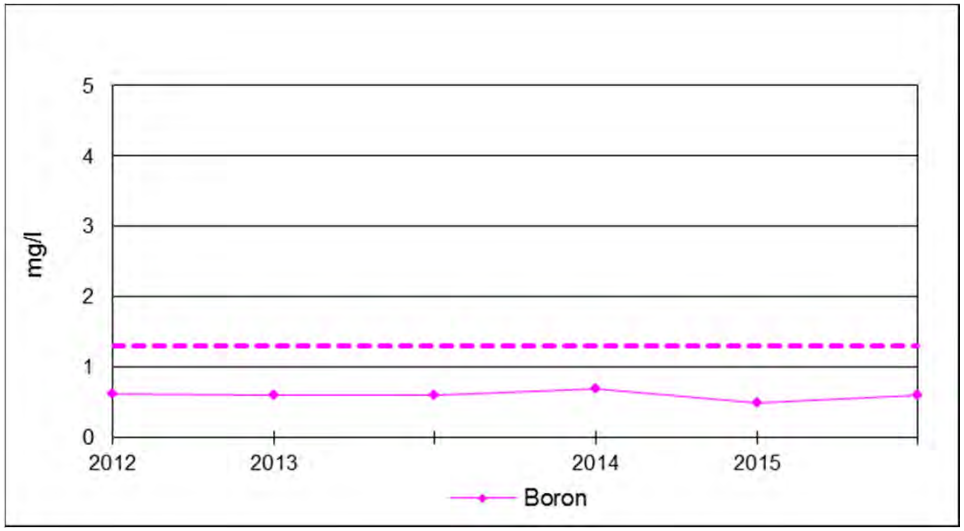


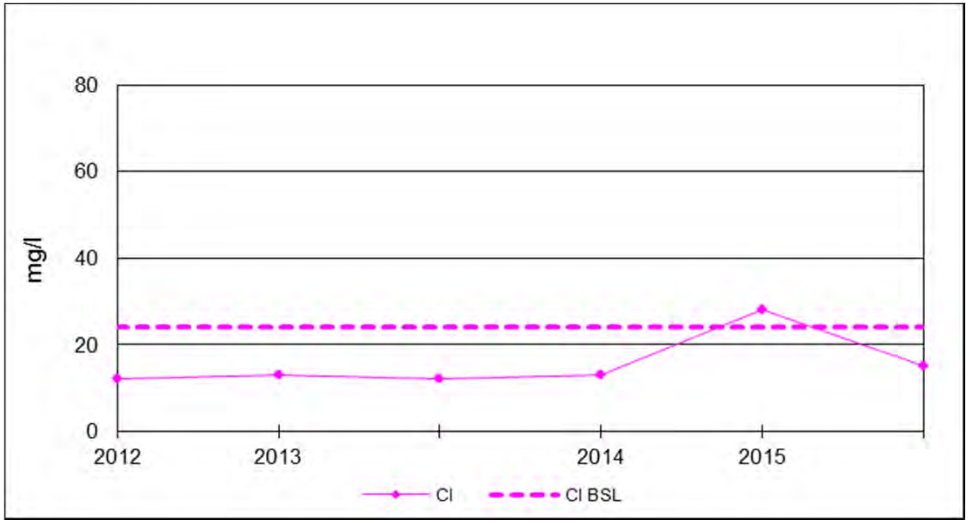


INTERIM RESPONSE ACTION WORK PLAN PW-713 WELL ABANDONMENT EAST OF THE STAGE TWO EVAPORATION POND TALEN MONTANA LLC -- COLSTRIP STEAM ELECTRIC STATION	**WATER QUALITY TRENDS AT WELL 2027D**	**FIGURE 6**

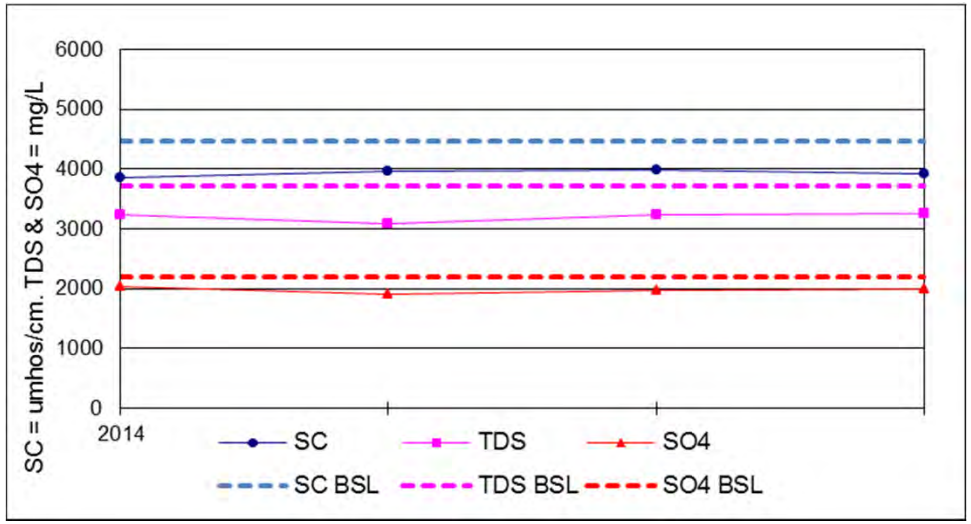


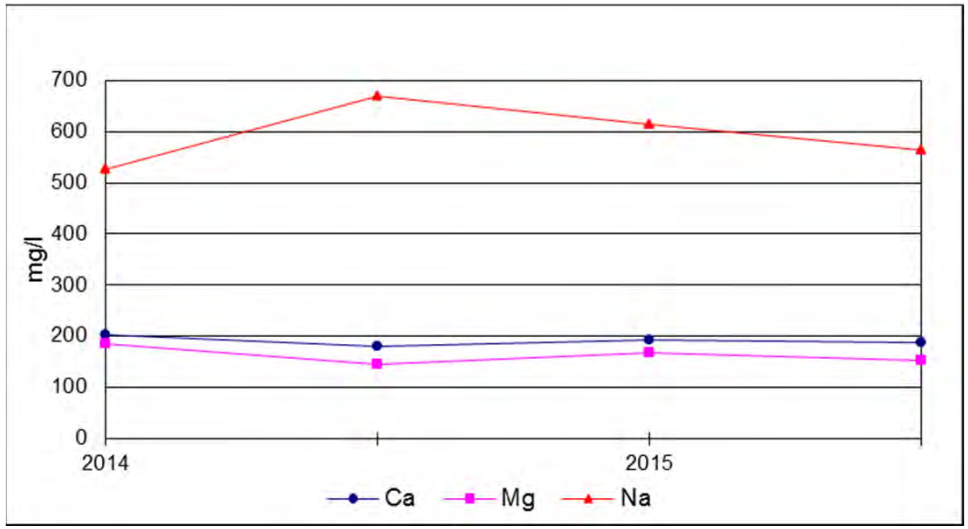


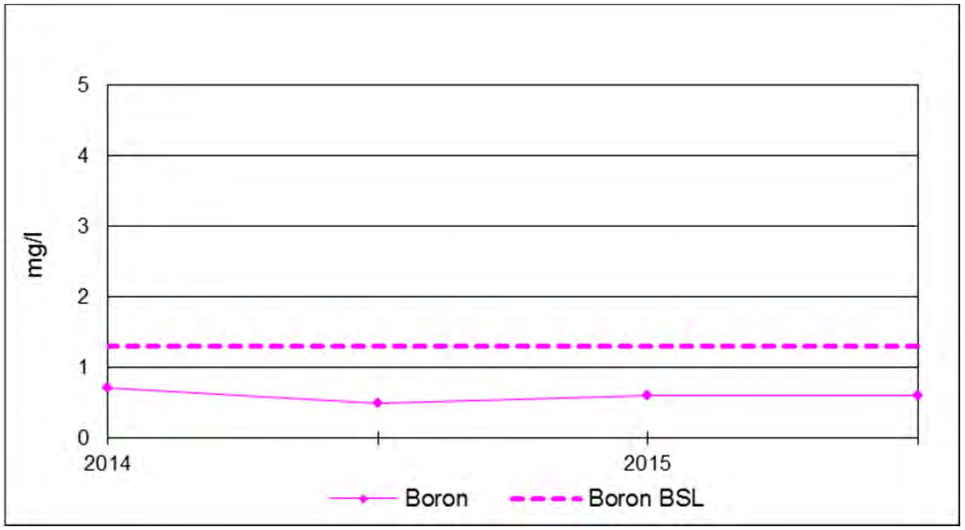


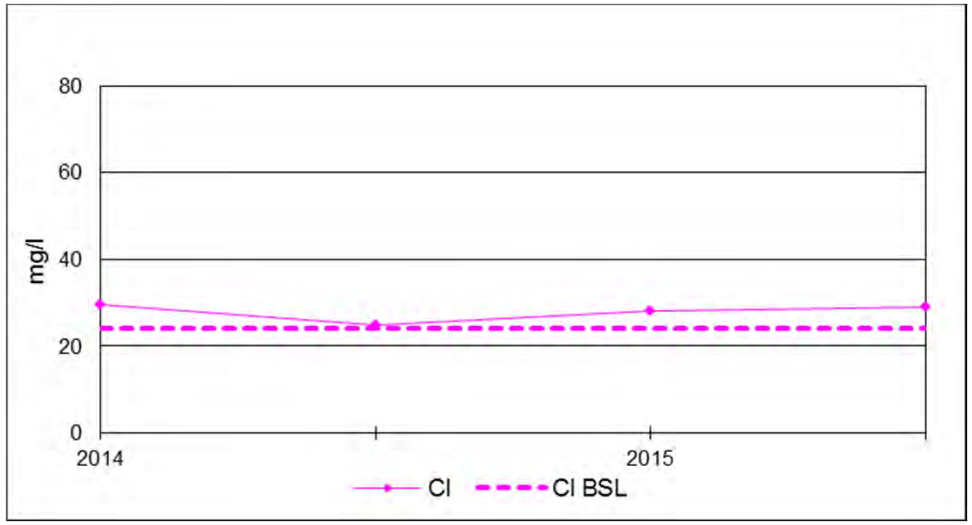


INTERIM RESPONSE ACTION WORK PLAN PW-713 WELL ABANDONMENT EAST OF THE STAGE TWO EVAPORATION POND TALEN MONTANA LLC -- COLSTRIP STEAM ELECTRIC STATION	**WATER QUALITY TRENDS AT WELL 2029D**	**FIGURE 7**









INTERIM RESPONSE ACTION WORK PLAN PW-713 WELL ABANDONMENT EAST OF THE STAGE TWO EVAPORATION POND TALEN MONTANA LLC -- COLSTRIP STEAM ELECTRIC STATION	**WATER QUALITY TRENDS AT WELL 2036D**	**FIGURE 8**

02N41E21CD

FORM E. S. 26

COLSTR MAINTENANCE SECTION HOUSE WELL AWP 5220-1446-1820 Rosebud

(Elev. above sea level 3187.0)

Top of Ground

Tan sandy silt with trace of clay

25.0

Sandy gravel (Water)

32.0

Grey shale

120.0

Grey sandstone with thin shale seams (Water)

200.0

Grey shale

208.0

Bottomed hole in grey shale at 208.0 ft.

MONTANA STATE DEPARTMENT OF HEALTH

Division of Environmental Sanitation

Helena, Montana

WELL DRILLER'S REPORT

Driller's Registration No. 208

Driller VINCENT R. KEILEY, DEPARTMENT OF HIGHWAYS, CORE DRILL SECTION Address HELENA, MT.

Owner of Well STATE OF MONTANA

Exact Location of Well SE 1/4, SW 1/4, Sec 21, T2N, R41E

Nearest Post Office COLSTRIP County ROSEBUD

Water to be Used for HIGHWAY SECTION HOUSE

Drilling Begun Sept. 18, 1978 Well Finished Sept. 20, 1978

☞ Indicate on the diagram the character and thickness of the different strata met with in drilling, such as soil, clay, shale, gravel, rock or sand, etc. Show depth at which water is encountered, thickness and character of water-bearing strata and height to which the water rises in the well.

Casing Record LA

Size of Pipe	Kind and Weight of Material Used	From (Feet)	To (Feet)	PERFORATIONS Kind Size	From (Feet)	To (Feet)
6"	Steel 19#	+2.0	10.0	None		
4"	Plastic BE 225 lb.	-7.0	204.0	Saw	100.0	184.0
	Noeprene packer set at 90.0 ft.					
	Area between plastic pipe and steel surface casing grouted with cement					

Describe the type of joints in casing Glued

Describe any screens used

Capacity of Well 6 G.P.M. (In Gallons or Barrels)

How Determined Pumped with air (Pump, Bailer, Weir, Etc)

Signed Vincent R Keiley

Date December 12, 1978

ORIGINAL—TO BE SENT TO THE STATE DEPARTMENT OF HEALTH

Show exact depth of bottom. 208.0 Ft.

M:186072

MONTANA MDT DEPARTMENT OF TRANSPORTATION

Montana Department of Transportation

2701 Prospect
PO Box 201001
Helena MT 59620-1001

Michael T. Tooley, Director
Steve Bullock, Governor

April 22, 2016

Mike Holzwarth
Sr. Compliance Professional
Talen Montana, LLC.
P.O. Box 38
Colstrip, MT 59323

Subject: Proposed Water Well Abandonment MDT Colstrip Maintenance Facility

The Montana Department of Transportation (MDT) has been contacted by your consultant, Rich Labbe with Hydrometrics Inc., concerning the water well (GWIC well ID 186072) located at the MDT Colstrip Maintenance Facility. Rich indicated that Talen Montanan LLC (Talen) wants to abandon the MDT well due to the well construction that may allow shallow groundwater contaminants to migrate down the well casing annulus to deeper bedrock aquifers where the well is completed.

Groundwater quality problems in the shallow aquifer under and adjacent to our facility apparently developed from leakage originating from the nearby Talen fly ash impoundment. MDT agreed with the previous plant operator (PP&L) in 2005 to accept a connection to the City of Colstrip public water system. My review of those documents does not indicate that there was any commitment by MDT to abandon the shop water well. Since 2005 MDT continued to use the well for outside washing of equipment and view the well as a real estate asset. The use of equipment washing has become more imperative for MDT in recent years to inhibit the corrosion of snow plow equipment during winter operations.

In order for, MDT to accept the proposal to abandon the well, it is requesting that Talen extend a subsurface water supply line from MDT shop building to the existing water well hydrant to allow continued washing of equipment away from the shop building and related ice buildup.

Please let me know if this proposal is acceptable to Talen and provide a work schedule as you earliest convenience. Feel free to contact me at any time to discuss any questions or concerns.

Sincerely,

Brian S. Goodman
MDT Environmental Services
(406) 444-7632
bgoodman@mt.gov

copies: Tom Roberts, MDT Mile City Maintenance Chief
Mike Patch, MDT Miles City Maintenance
Tom Martin, MDT Environmental Services
Joe Radonich, MDT Environmental Services
MDT Colstrip Environmental Project File
Rich Labbe, Hydrometrics. Inc. Billings, MT