

NATURAL RESOURCE DAMAGE PROGRAM



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Mr. Nikia Greene
Remedial Project Manager
USEPA Region 8 - Montana Operations Office
10 West 15th St., Suite 3200
Helena, MT 59626

Re: NRDP Comments on the Butte Priority Soils Operable Unit (BPSOU) Draft Blacktail Creek Groundwater Hydraulic Control System Pre-Design Investigation Evaluation Report; Silver Bow Creek/Butte Area NPL Site Butte Priority Soils Operable Unit (dated September 2023)

Dear Mr. Greene:

NRDP is providing comments on the *Draft Blacktail Creek Groundwater Hydraulic Control System Pre-Design Investigation Evaluation Report; Silver Bow Creek/Butte Area NPL Site Butte Priority Soils Operable Unit (dated September 2023)*.

NRDP has reviewed CTEC's November 17, 2023, extensive and well-articulated comments on this document and support their entire inclusion in EPA's comments or, if not, we suggest that EPA should respond to these comments separately. Because of these robust comments, we have provided more general comments so as to not reproduce the issues and concerns that the CTEC comments covered.

Summary of recommended actions (as explained further below):

- Installation of additional multi-level piezometers/monitoring wells near the subdrain.
- Additional pumping and tracer tests to support the design of the hydraulic control, e.g., a physical test of using the dewatering system at the Parrot in combination with another pumping test at the confluence.
- Model the capture of the Parrot water at the Parrot.

- Further calibration of the groundwater model to a point that it can be reliably used for remedy alternative evaluation.
 - E.g., use data from wells adjacent to the Subdrain (including use of NRDP's wells near the Subdrain and/or installation of new wells in similar locations adjacent to the Subdrain), because measured water levels within the subdrain pipe do not accurately represent conditions within the adjacent aquifer.
- Additional alternatives, including potentially the control of the primary source of alluvial contamination the Parrot Project, for the BTC hydraulic controls should be evaluated.
- Run the modeled hydraulic control alternatives and baseline model of existing conditions as transient simulations to capture seasonal effects on the capture system performance.
- Further analyses of the data from the pumping tests to understand the implications of the reversal of the vertical groundwater gradient and its effects on groundwater capture in the subdrain.
- Provide NRDP with a copy of the EPA-approved PDI Work Plan for this action.
- Submit a 30% Design addressing these comments and EPA and CTEC's comments.

EPA's Recent Comment Incorporation Process:

In the November 30, 2023, draft, EPA noted that the CTEC comments were incorporated and some of the CTEC comments were modified slightly to fit the format of the rest of the comments. However, from a review of the CTEC comments, it seemed like not all of the comments were incorporated, or they were changed in ways that may be substantive, and the rationale for not including or changing comments is not explained. NRDP requests that any CTEC, NRDP, or other comments from CD parties not directly incorporated into EPA comments be responded to in writing by EPA or BP-AR on all BPSOU CD documents. NRDP believes written responses will aid in identifying concerns and differences that need to be addressed early in the projects, which will ultimately expedite the project schedule by reducing the potential for miscommunication and conflicts at the end. Written responses also provide transparency to other stakeholders and the public as to the issues and progress of the CD-required remedial work.

The Draft Blacktail Creek (BTC) Groundwater Hydraulic Control System (GWHCS) Pre-Design Investigation Evaluation Report (PDI ER) presents a good initial evaluation of the BTC Pumping Test and the Butte Priority Soils Operable Unit (BPSOU) Site-wide Groundwater Model, but more work needs to be done. Comments provided below are intended to encourage more detailed and robust analyses and continued calibration of the groundwater model prior to a 30% design. NRDP does not recommend moving straight to a 60% design for the reasons provided in this letter and the details in CTEC's comments.

Groundwater Model Comments:

The groundwater model encompasses a large area of the Butte alluvial valley with an increased cell density in the area of BTC GHCS. The calibration information indicates relatively large head and flux residuals near the confluence of Silver Bow Creek and Blacktail Creek, where more precision is needed. The head residuals are biased high in the upper SBC corridor and then biased low near the confluence indicating the flow dynamics are not well-calibrated in the model in the main area of interest.

The magnitude of the residuals and the fact that the pumping test information does not correlate well with model results in the simulation indicates that the model does not adequately represent the physical hydraulic system with enough accuracy to support moving directly to the 60% design of BTC hydraulic controls.

Installation of additional multi-level piezometers/monitoring wells near the subdrain would greatly reduce the uncertainty in flow parameters from this hydraulic structure. Additional pumping and tracer tests would provide site-specific hydraulic data for design of the hydraulic controls.

The model simulations of possible capture and hydraulic alternatives were very limited. A wider range of possibilities should be investigated. Although a scenario that replaced the lowest segment of the subdrain with solid pipe was helpful, it would also be helpful to model the capture of the Parrot water at the Parrot to simulate removal of the most contaminated water from the system before it reaches the confluence. A physical test of using the dewatering system at the Parrot in combination with another pumping test at the confluence would also be helpful to look at effects on the flow regime and contaminant concentrations in the extraction water and subdrain.

The groundwater model needs significant further calibration before it can be reliably used for remedy evaluation. In addition, the modeled hydraulic control alternatives and baseline model of existing conditions should be run as transient simulations to capture seasonal effects on the capture system performance.

Because of the complexity in this area with the subdrain, storm drain, vault, confluence of surface water, discharge of polishing plant water and surfacing bedrock, etc. more physical testing of the groundwater system should be completed to support a 30% design.

Pumping Test:

The BTC pumping test reversed hydraulic vertical gradients from upward to downward near the subdrain and affected flow in the subdrain. The implications of this reversal and its effects on groundwater capture in the subdrain are concerning given its proximity to existing areas of

known waste and Blacktail Creek.

Further analyses of the data from the pumping tests are needed. There is a large difference in transmissivities ranging from 4500 ft²/d to 14,000 ft²/day in the new piezometers near the pumping well, again indicating the heterogeneity of the aquifer in this area. The storage values indicate a confined aquifer which does not match well with the leaky confined conditions observed. Additional analyses using the derivative method could provide additional information on the aquifer conditions in this area.

Remedy Evaluation:

NRDP believes that the evaluation provided in the PDIER and appendices is currently inadequate to select the BTC hydraulic controls. Additional evaluation of groundwater hydraulic controls and their effects on the existing groundwater remedial elements and waste sources, such as the subdrain and Parrot Project, are needed prior to remedy selection and design. The groundwater model needs significant additional calibration before it can be reliably used for remedy evaluation. Once sufficiently calibrated, additional alternatives, including the control of the primary source of alluvial contamination, the Parrot Project, for the BTC controls should be evaluated. The PDIER, Model Memo, and groundwater modeling effort should evaluate a greater range of possible capture and hydraulic alternatives.

As an example of model components that need additional refinement, BP-AR's current depiction of the subdrain capture zone is based on measured water levels within the subdrain pipe, which does not accurately represent conditions within the adjacent aquifer. It appears that BP-AR did not use water levels in NRDP's 2017 installed monitoring wells; many of these wells were constructed directly adjacent to the subdrain for this purpose. Use of this data and installation of additional wells by BP-AR would provide a more accurate interpretation of the potentiometric contours than are currently being drawn using subdrain water levels that are not representative of the adjacent aquifer. NRDP has previously provided comments on this specific issue and can provide these upon request.

Submittal of 30% Design as Next Deliverable:

BP-AR, through their contractor, indicated at the November BPSOU CD progress meeting that they would like to move straight to 60% design of BTC hydraulic controls. We request that the remedial design steps as described in Appendix D to the BPSOU Consent Decree be followed in its entirety, including a Work Plan and 30% design. NRDP also notes that a 30% Remedial Design is indicated as the next deliverable in the December 2, 2022, Draft Final Blacktail Creek Groundwater Hydraulic Control System (BTC GWHC) Remedial Design Work Plan.

A 30% design submittal should provide the major design elements of the project, allow BP-AR to estimate costs, and provide a timeline of the project. If this 30% design stage is skipped then

there is risk of having to go backwards if fundamental design concepts, parameters, or CD requirements are incorrect or missing.

Receipt of Submittals/Requirements of the BPSOU CD: In accordance with the BPSOU CD Appendix D Section 3.3 and the December 2, 2022, Draft Final Blacktail Creek Groundwater Hydraulic Control System (BTC GWHC) Remedial Design Work Plan (RDWP), the development and submittal of the Pre-Design Investigation (PDI) Work Plan is to be the initial step of the PDI and is to precede the investigation and the PDI Evaluation Report (ER). To date, NRDP has not received a PDI Work Plan, although we recognize that there is a potential that it was missed. Work Plans are the foundation to developing effective projects because they should explicitly lay out goals, objectives, and CD requirements. Please include us on all CD submittals. Also, please provide us with a copy of the approved PDI Work Plans.

If this PDI Work Plan was not submitted and approved prior to this document submittal, then NRDP has concerns about consistency with the CD requirements. We renew our request for a agreed-upon tracking document to ensure CD requirements are being met. NRDP also suggests an iterative process where there is continued evaluation against the requirements of the CD, so as to ensure that what is constructed complies with the CD. This will help all CD parties feel confident that a decision made early in the process does not inadvertently result in non-compliance with the CD.

If you have any questions or concerns, please feel free to contact me.

Sincerely,



Jim Ford
NRDP Project Manager

cc: Pat Cunneen, NRDP
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