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State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

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December 2, 1992

Mr. Ben Grimes
Cyprus Plateau Mining Corporation
P. O. Drawer PMC
Price, Utah 84501

Dear Mr. Grimes:

Re: Updated Probable Hydrologic Consequences (PHC) Review, Cyprus Plateau Mining Corporation, Star Point Mine, ACT/007/006, Folder #2, Carbon County, Utah

Enclosed please find the review for the September 28, 1992 response for the updated PHC. There are six starred items on the review that require a response. Please submit your complete and adequate responses to these items by January 15, 1993.

If you have any questions, please call me.

Sincerely,

A handwritten signature in black ink, appearing to read 'Pamela Grubaugh-Littig'.

Pamela Grubaugh-Littig
Permit Supervisor

pgl
Enclosure



State of Utah

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November 30, 1992

TO: Pamela Grubaugh-Littig, Permit Supervisor

FROM: Tom Munson, Senior Reclamation Hydrologist *TM*
Ken Wyatt, Reclamation Hydrologist
Hugh Klein, Reclamation Hydrologist

RE: Updated Probable Hydrologic Consequences (PHC) Review, Cyprus Plateau Mining Corporation, Star Point Mine, ACT/007/006, Folder #3, Carbon County, Utah

SYNOPSIS

In May 1992, Cyprus Plateau Mining Corporation (CPMC) submitted an updated PHC as requested by the Division. A Division review of this updated PHC resulted in a letter dated August 4, 1992, which listed additional requests for information which were to be responded to by September 28, 1992. On September 28, 1992, CPMC resubmitted the responses as requested. This memo serves to review the September 28, 1992 submittal as related to information requests in the Division's August 4, 1992 letter.

ANALYSIS

Page 6 of the cover letter submitting this updated PHC lists materials to be inserted into the MRP. Included in this table are several pages and plate 521.121c, Surface Facilities. This information is related to the installation of the weather station and removal of the Watchman's House. Portions of this material was previously approved and inserted into the MRP.

Close examination shows that Plate 521.121c was changed to show removal of the Watchman's House. Page 500-33 was changed to show the new weather station in place of the Watchman's House. This page should be approved and placed into the MRP. Page 1 of Exhibit 542.800a was previously approved on November 6, 1992 and inserted into the MRP. According to Jesse Kelley, Plate

521.121c. is acceptable except that item 15: Sediment Pond #7 needs to show a corridor through the undisturbed area by which CPMC can access this pond for cleaning and maintenance.

The latest submittal responded to the Division's request on a comment by comment basis. Additionally, pages of the mine's permit were modified for inclusion into the permit once approved. In this review, the page of the PHC that the comment focused on with the Division's comment will be listed, followed by a synopsis of CPMC's response and a statement of response adequacy.

728-4:

Statements regarding "an upward vertical gradient between the Storrs and the Spring Canyon member of the Star Point sandstone" at the Bear Canyon Mine are incorrect. The final report on groundwater characterization at Bear Canyon has not been submitted to the Division. Initial results showed that each member of the Star Point is confined by a Mancos Shale aquitard which produces a piezometric surface above the confining layer but below the piezometric surface of the member above. Thus, the overall vertical gradient is downward. **Why were the in-mine wells only completed in the Spring Canyon Member of the Star Point Sandstone? Is other data available from lower members of the Star Point Sandstone (i.e., Storrs and Panther Tongues)? Please provide water level data, drill logs or other information to support the conclusion that the gradient is upward in the Gentry Ridge area.**

CPMC Response

The statement regarding upward vertical gradients at the Co-Op Mine was changed to reflect more general conditions. The wells were only completed in the upper most member of the Star Point Sandstone in accordance with the regulations specifying the hydrologic system below the coal seam. The Spring Canyon member is the first strata below the coal seam. Water level data for the for piezometer P92-01-WD has been added to the text and Table 728b.

DOGM Review

- * The operator has stated that the Spring Canyon Member of the Star Point Sandstone is the first strata below the coal seam. The language contained in R645-301-724.100 is as follows: "... depth to the water in the coal seam, and each water-bearing stratum above and potentially impacted stratum below the coal seam." The language does not specifically say the first strata but potentially impacted stratum below the coal seam. The operator has not supplied the necessary data to demonstrate that the Spring Canyon Member is only potentially impacted stratum below the coal seam.

728-7:

A contradiction of mine inflow sources exists in the second paragraph. This paragraph states that 95 percent of mine inflow originates from channel sands. The following paragraphs state major inflows are associated with the western boundary fault of the Gentry Ridge Horst. Specifically, the source of these inflows is believed to be the interception of finger faults associated with the western boundary fault by mine workings. **Please clarify this statement about mine inflow sources.**

CPMC Response

The difference in mine inflows are discussed for two distinct sections of the mine. The first is presented in the description of areas East of Gentry Ridge while the second was presented for the Gentry and Castle Valley Ridge areas. No changes were made in this regard.

DOGM Review

This response is considered adequate.

728-8:

The second paragraph on this page discusses the exploration holes drilled in the Castle Valley Ridge area. These holes were drilled as exploration holes and were not intended to be groundwater monitoring wells. Although a

general piezometric surface can be derived from these data, the fact that water was introduced into the holes for logging and the fact that the holes were developed mainly for coal exploration does not provide specific water elevations for various strata. The need still exists for baseline groundwater data. In-mine wells in the Castle Valley Ridge area and development of wells in the Nuck Woodward Canyon/Wild Cattle Hollow area (as discussed in previous meetings at the Division office) would aid in satisfying this requirement. **Please clarify CPMC's plans for baseline data collection in the Castle Valley Ridge area. Exploration wells and in-mine wells developed as groundwater monitoring wells specific to the Castle Valley Ridge area need to be identified and monitored for baseline quality and quantity data for at least one year prior to permit issuance.**

CPMC Response

CPMC contends that their coal exploratory program and water levels associated with these wells do provide adequate data to show that the water level is below the coal seam in the Castle Valley Ridge area with the exception of one hole (CVR-10) which had a water level 257 feet above the coal. They contend that for this well only the water level was high due to water injected into the well during drilling.

CPMC plans to drill three holes in the Castle Valley Ridge lease area as they drive entries to the breakout in Little Park Canyon. Baseline data will be collected from these drill holes for a period of one year.

DOGM Review

Hole CVR-10 is located near the north end of the CV Ridge lease. Additionally, this hole is adjacent to the Western Boundary Fault of the Bear Canyon Graben which could be related to the high water level. The fact that this hole repeatedly lost circulation and was eventually lost could be related to loose fault gouge material associated with this fault.

* The Division will work with CPMC in the event of emergencies but cannot give exclusions to the baseline water quality and quantity requirements. All well locations and specific completion plans will be approved by the Division 30 days prior to drilling and the Division notified of drilling dates so the option of witnessing completion is available to Division Hydrologists.

728-9:

No submittal from Co-Op Mining Company has been received by the Division. This paragraph is in error as described in the comment for Page 728-4 above.

CPMC Response

Plateau contends that no submittal was referenced by CPMC's submittal.

DOGM Review

This response is considered adequate.

728-9:

A typographical error exists in the last paragraph: completed not competed.

CPMC Response

This typographical error was corrected.

DOGM Review

The typographical if corrected is adequate.

728-10:

The third paragraph indicates that water flowing in Nuck Woodward Canyon is lost into the western boundary fault of the Pleasant Valley Graben. **What reference, study or source was used for this conclusion?**

CPMC Response

CPMC indicates that this statement is their opinion.

DOGM Review

* It appears that no changes have been made to the text and it would be appropriate that the operator provide data to back up their opinion and a reference to that data be included following that statement.

728-13:

The third paragraph indicates CPMC's commitment to install new groundwater monitoring wells in the Nuck Woodward area and from within the mine. **Proposed drill sites within the mine and in Nuck Woodward Canyon should be included on Map 728b to show their relation to the mine workings.**

CPMC Response

Potential surface well locations have been added to plate 728b. In-mine hole locations have also been added to map 728b. Figure 728a has been added to show eight potential sites which are not shown on map 728b due to the areas being outside the area of the map 728b.

DOGM Review

These potential hole locations are shown on map 728b and figure 728a. This response is considered adequate.

728-19:

Section 731.100 of the mine PAP indicates that CPMC uses an active exploration program as mining is advanced to determine when mining approaches faults and fractures. The second paragraph of page 728-19 states that CPMC is drilling ahead of mining in an attempt to identify faults and finger faults that may have significant water. **Please elaborate on the procedures used in this exploration drilling and what action CPMC will take if unexpected fault and fractures are found or if significant quantities of water are discovered (i.e., will the drill holes be hydrologically tested?)**

CPMC Response

The operator responded by stating that in-mine drilling is done in section 631. Page 700-82f discusses the horizontal exploratory drilling.

DOGM Review

This discussion is adequate to define the reasons for exploratory drilling ahead of the advancing coal front near faults and fractures. No discussion of hydrologic testing is presented in relation to this question. The operator does mention that the hole will be packed off and sealed if significant quantities of water are encountered.

728-19:

The last sentence of the fourth paragraph indicates that a potential for high inflows could be encountered along water-bearing fracture systems. **What action does CPMC propose to avoid mining through an identified water-bearing fracture system? What does CPMC propose to do if mining intersects an unidentified water-bearing fracture system?**

CPMC Response

The operator responded by stating that in-mine drilling is done in section 631. Page 700-82f discusses the horizontal exploratory drilling.

DOGM Review

* This discussion is adequate to define the reasons for exploratory drilling ahead of the coal front near faults and fracture. **The operator must notify the Division immediately should in-mine drill holes produce significant amounts of water (greater than 5 GPM for a period of one month) This language must be incorporated into the text of the PAP.**

728-22:

On page 728-19, the statement is made that "Should significant water-bearing fracture systems be encountered, higher flows on the order of those experienced by U.S. Fuel may be experienced." This amount is 800-900 gallons per minute. Although the Birch and Bear Canyon Springs are located about six miles from the CPMC permit area, high inflows from interception of the Bear Canyon fault and subsequent interbasin transfer could create impacts to the flow regime of these springs. **Some discussion of these potential impacts and mitigation is appropriate and needs to be included.**

CPMC Response

The operator indicates that they plan to pump excess mine water into the abandoned workings east of the Bear Canyon Graben. They further believe that they will have no impacts on Birch or Bear springs. They plan to monitor flows throughout the mine where encountered.

DOGM Review

The operator has stated his options concerning mitigation of increased groundwater flows and it is very apparent at this point in time these options will have to be monitored if implemented to determine any potential impacts.

728-23:

Paragraph 5 states: "The source of Birch Springs and Bear Canyon Springs has yet to be defined thoroughly." Despite this, minimal to no impact is anticipated by CPMC. CPMC proposes to discharge excess mine water produced into abandoned mine workings east of the Bear Canyon fault or inject it directly into this fault. **Could these increased flows along the fault potentially increase flows to the U.S. Fuels Mine, Bear Canyon Spring, or the Bear Canyon Mine? A discussion of the hydrological consequences of these activities must be provided.**

CPMC Response

A discussion related to the hydrological consequences of pumping water into abandoned mine sections east of the Bear Canyon fault is discussed within Section 728 under the heading "Mine Water Control".

DOGM Review

This response is considered adequate based on the lack of reliable data or means to collect reliable data to predict any conclusive impacts to the hydrologic balance at this point in time.

728-23:

Paragraph 6, item 4 implies that other mines are responsible for hydrologic impacts to these springs which would mask impacts from CPMC. **This statement should be eliminated or the reference or study determining that these impacts are associated with local mines must be provided.**

CPMC Response

Their response is that the discussion was changed to reflect a more subjective nature.

DOGM Review

This response is considered adequate.

728-24:

The second paragraph discusses pumping water encountered from the Gentry Ridge area across the Bear Canyon Graben into abandoned mine workings. **A map showing areas to be used for sumps and water containment needs to be submitted, as well as a discussion of the associated potential effects on the hydrologic system (i.e., where will this water eventually flow along the Eastern Boundary Fault of the Bear Canyon Graben?)**

CPMC Response

All existing sump locations within the mining operations east of Gentry Ridge are shown on map 722.100e in the PAP.

DOGM Review

This response is considered adequate.

728-24:

The statement in the third paragraph indicates that interbasin transfer may occur through the Mud Canyon Breakout and potential impacts to Huntington Canyon water rights could occur. **A discussion of the hydrologic consequences of interbasin transfer must be provided. How will impacts to the water rights be determined and what mitigation is planned?**

CPMC Response

The operator's response is found in section 728 under the heading of "Interbasin Transfer of Water".

DOGM Review

This response is considered adequate.

728-24:

The fourth paragraph indicates a potential alternative as re-injection of mine water into local fault systems. **Where are the proposed locations of these injection wells? These injection locations should be placed on the appropriate map. A discussion of the hydrologic consequences of this activity must be provided.**

CPMC Response

Mitigation through the reinjection of mine waters into fault and fracture systems has been dropped from consideration as an alternative.

DOGM Review

This response is considered adequate.

728-25:

In the second paragraph, a commitment is made to drill additional monitoring wells in the Gentry Ridge, Castle Valley Ridge and the area west of the Castle Valley Ridge. **A description of the proposed well development and potential locations is appropriate and should be included in the text and the locations shown on Map 728b.**

CPMC Response

A discussion of the proposed well development methods is found within section 728.

DOGM Review

* The operator is required to notify the Division 30 days prior to the drilling of any monitoring wells and submit details regarding exact location, specifics regarding proposed depths, and drilling schedule. A Division hydrologist would like the opportunity to observe the drilling, the completion and any hydrologic testing.

728-25:

The third paragraph concerning water quality indicates that annual samples will be collected from the in-mine wells. **A discussion summarizing seasonal water quality and quantity based on the baseline data collected to date is appropriate here and must be included. Annual sampling and operational parameters are not adequate to meet the baseline sampling**

requirements of the Division. Please make the appropriate revisions to the proposed sampling plan.

CPMC Response

The operator proposes the monitoring plan found on page 700-82n for the new wells drilled west of Castle Valley Ridge and within Castle Valley Ridge as mining progresses northward. If impacts are identified, then the monitoring schedule will be changed from quarterly water levels and annual water quality to monthly water levels and quarterly quality.

DOGM Review

* This response does not allow the Division the latitude to make an assessment of baseline data adequacy and therefore the wording in the plan needs to reflect the acceptance by the Division of the Baseline Data collection prior to any reduction in sampling of water quality or water levels after one year. The Division's baseline data collection requirement runs for two years with no exceptions except for review and acceptance of a different plan after a minimum of one year. It is the operator's responsibility to establish seasonal quality and quantity per the requirements of R645-301-724.100.

728-26:

The discussion concerning water rights mitigation does not include those above the mine workings located on U.S. Forest Service (USFS) land with USFS water rights attached. **A discussion of these potential impacts should be considered.**

CPMC Response

Water Rights associated with the USFS are discussed within Section 728 under the heading "Probable Mining Impacts - Perched aquifers and springs". The USFS has also been added to the discussion of water rights within the discussion related to mitigation.

DOGM Review

This response is considered adequate.

In order to supplement the existing information provided by the maps, the following revisions and/or additions are requested:

Map 728a:

Delete the purple shading.

CPMC Response

Not done because it would change the map.

DOGM Review

This response is considered adequate.

Map 728b:

Expand this map to include the entire permit area. Add all previous mine workings. Add all existing and proposed mine water sumps. Add all in-mine wells. Add all proposed in-mine water handling facilities; this includes any proposed re-injection wells and monitoring wells. Add all inflow and discharge points.

CPMC Response

This was not done by the operator.

DOGM Review

The Division is disappointed that the operator is not willing to make these changes since it will make the CHIA process more difficult and harder to complete in a timely manner, so as a consequence will have to work with the existing Maps.

Map 722.100A:

Provide a clear copy. Add geology to the inset.

CPMC Response

Geology has been added to the inset as requested.

DOGM Review

This response is considered adequate.

Map 722.100C:

Show all wells used in constructing the groundwater contours.

CPMC Response

This was completed as requested.

DOGM Review

This response is considered adequate.

Map for subsidence:

Provide a subsidence map at a scale of 1:1000 with five foot isopleths of subsidence and all other surface expressions of subsidence.

CPMC Response

The operator will attempt to update this map as AutoCad files become available.

DOGM Review

This response is considered adequate.

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PHC Review Memo
ACT/007/006
November 30, 1992

RECOMMENDATION

All information or commitments requested will be submitted as soon as possible so the installation of monitoring wells can proceed, approvals can be given and baseline data collected prior to final approval of the mining plan.

* **Note: All starred (*) items need to be responded to.**

jbe
PLAT-PHC.REV