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RECEIVED
JUN 14 1990
DIVISION OF
OIL, GAS & MINING

June 13, 1990

Mr. Rick Summers
Utah Division of Oil, Gas & Mining
3 Triad Center - Suite 350
Salt Lake City, Utah 84001

RE: Water quality monitoring plan and map submittal.

Dear Rick:

As agreed, we are hereby submitting to your office the information required to meet the June 14, 1990 water quality and mapping deadline. Information contained within this submittal includes the following:

1. A revised water quality monitoring program. The program Valley Camp of Utah, Inc. intends to use during the next five year permit term is outlined within Section R614-301-731.200 of the permit application (See attachment). As discussed yesterday, it is felt that no new sampling locations will be required over the next five year period based upon projected mining sequences.

2. Revised mapping for the permit area is also submitted (except for mapping associated with mine reclamation which will be submitted at a later date). We request that all old mapping be discarded since corrections have been made to the enclosed set. We have attempted to review carefully all maps in order to eliminate inconsistencies which have been noted.

Should you have any questions, please call.

Sincerely,

David E. Hansen

David E. Hansen, Ph.D., P.E.
Project Engineer

DEH/dh

cc: Steve Tanner - Valley Camp of Utah, Inc.

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R614-301-731.200. WATER MONITORING.

This section includes a description of the surface and ground water monitoring programs which will be implimented within the Valley Camp permit area during this permit renewal term. The program outlined herein is a continued modification of previous monitoring programs developed between Valley Camp personnel and the regulatory agency. A complete review of water quality parameters including a careful review of the "Guidelines for Establishment of Surface and Ground Water Monitoring Programs for Coal Mining and Reclamation Operations" has been made in response to this permit renewal. In response to this review, further clarification has been made relative to the overall timing of samples as well as reconsideration of water quality parameters to be included within the monitoring program.

Surface and ground water quality monitoring stations and identified water quality parameters will aid in determining local impacts due to mining. Changes which may potentially occur to the ground water system which will be identified through the monitoring plan found herein include the loss of water due to subsidence or mine dewatering, and the potential water quality deterioration due to increase sediments, oil & grease, decreased pH, or the increase of other water quality parameter concentrations. The monitoring and analysis programs outlined throughout the following sections will help identify impacts to the water systems through graphical and analytical methods and aid in identifying potential solutions where required.

R614-301-731.210. GROUND WATER MONITORING.

R614-301-731.211. GROUND WATER MONITORING PLAN.

The ground water monitoring plan used and implemented by the applicant includes the parameters and sampling schedule shown in Table R614-301-731.211a. The locations of the sampling sites are shown on Ground and Surface Water Sampling Locations with Seasonal Water Quality Map R614-301-722.100a, and information related to quality of the waters is discussed in Section R614-301-722.

The ground water monitoring program as required within the regulations includes where applicable the monitoring of springs, wells, and selected in-mine waters within the permit area. The water quality monitoring program as instituted for the Valley Camp mine permit area presently includes consistent and scheduled monitoring or springs and (when applicable) in-mine seeps and springs. No wells are currently monitored in the mine permit area. In-mine sampling is discussed in more detail in the following pages. Springs monitored as part of this program consist of stations S7-11, S24-12, S25-13, S31-13, S36-17, S36-19, and S36-23. These stations have been chosen because of their strategic location relative to mine workings, and their potential ability to indicate changes in ground water conditions.

As agreed to in previous permit applications, a review of projected mine workings over the next five years has been completed to identify the need for additional water quality monitoring stations. The need for additional water monitoring stations is evaluated based upon the potential for impact to an area by mining activitites. In the event that projected mine workings extend into areas not currently monitored, new sampling sites will be considered for addition to the water quality monitoring plan.

Mining activities projected over the next five years will be concentrated within the Belina No. 2 Mine in the general areas shown in Figure R614-301-722.100a. The area of impact of these

prejected mine workings falls well within the existing area of impact, therefore no additional water quality monitoring stations (beyond those already being sampled) are planned for this permit renewal.

As shown in Table R614-301-731.211a a comprehensive set of water quality parameters (identified as Baseline Parameters) is measured twice during the year prior to permit renewal. Because of the timing of this permit renewal, the baseline parameters required for permit renewal will be collected during the low flow period in the fall of 1990 and the high flow period in the spring of 1991. The timing of the baseline samples is scheduled to coincide with high and low flow events. As shown in the table, the high and low flow events generally occur during the months of April or May and September or October respectively. The list of baseline parameters was developed from UDOGM guidelines as outlined in "Guidelines for Establishment of Surface and Ground Water Monitoring Programs for Coal Mining and Reclamation Operations". An overview of the water quality monitoring program developed by Valley Camp follows. Since this is a repermit application, only the operational and postmining phases of the monitoring program are presented. Other aspects of the guidelines including the location of surface and ground water resources etc., have already either been approved in prior submittals or are presented throughout the appropriate sections of this permit renewal application.

Water quality data collected through the ground water monitoring program outlined herein will be used to identify impacts resulting by mining through graphical and statistical analyses completed on a yearly basis. Selected data will be plotted on time graphs over a moving five year period of record to identify the occurrence of trends in the data. If an undesirable trend is believed to be occurring, further evaluations will be conducted including statistical trend analyses. Should the analyses completed indicate that trends do exist, a more in-depth study will be conducted to identify the source of the trend, and solutions will be investigated which may potentially decrease or reverse the trend. Water quality parameters which are anticipated for use in these ground water trend analyses include Flow, pH, Iron, TDS and the Anions-Cations. The use of spring depletion curves to determine impact are also proposed as discussed in Section R614-301-731.222.

Spring Monitoring

All spring locations applicable to this permit which are sampled, or are proposed to be sampled have been identified and shown on Figure R614-301-722.100a. The springs shown are believed to be representative of water quality for the area and are chosen so as to include currently mined areas as well as mined areas projected for the next 5 year period. Monitoring and sampling of these springs is scheduled to be completed as shown in Table R614-301-731.211a as per the recommended guidelines.

TABLE R614-301-731.211a
WATER QUALITY ANALYTICAL SCHEDULE

Parameter	Month of Sample					Type of Sample	
	April (High Flow)	May	June	July	September or October (Low Flow)	Surface Water	Ground Water
FIELD MEASUREMENTS							
Air Temperature	X	X	X	X	X	X	X
Dissolved Oxygen	X	X	X	X	X	X	
Water Level or Flow	X	X	X	X	X	X	X
pH	X	X	X	X	X	X	X
Specific Conductivity @25°C	X	X	X	X	X	X	X
Water Temperature	X	X	X	X	X	X	X
LABORATORY ANALYSES							
Acidity	Once at High Flow *				X	X	
o Aluminum, Total	Once at High Flow *				X	X	X
o Arsenic, Total	Once at High Flow *				X	X	X
o Barium, Total	Once at High Flow *				X	X	X
Bicarbonate	X	X	X	X	X	X	X
o Boron, Total	Once at High Flow *				X	X	X
o Cadmium, Total	Once at High Flow *				X	X	X
Calcium, Total	X	X	X	X	X	X	X
Carbonate	X	X	X	X	X	X	X
Chloride, Dissolved	X	X	X	X	X	X	X
o Chromium	Once at High Flow *				X	X	X
o Copper, Total	Once at High Flow *				X	X	X
o Flouride, Dissolved	Once at High Flow *				X	X	X
Iron, Total	Once at High Flow *				X	X	
Iron, Dissolved	Once at High Flow *				X	X	X
o Lead, Total	Once at High Flow *				X	X	X
Magnesium, Total	X	X	X	X	X	X	X
Manganese, Total	Once at High Flow *				X	X	X
o Mercury, Total	Once at High Flow *				X	X	X
o Molybdenum, Total	Once at High Flow *				X	X	X
o Nickel, Total	Once at High Flow *				X	X	X
o Nitrate	Once at High Flow *				X	X	X
o Nitrite	Once at High Flow *				X	X	X
o Nitrogen: Ammonia	Once at High Flow *				X	X	X
Oil & Grease **	Once at High Flow *				X	X	
o Phosphate, Total	Once at High Flow *				X	X	X
Potassium, Total	X	X	X	X	X	X	X
o Selenium, Total	Once at High Flow *				X	X	X
Sodium, Total	X	X	X	X	X	X	X
Sulfate	X	X	X	X	X	X	X
o Sulfide	Once at High Flow *				X	X	X
Total Dissolved Solids	X	X	X	X	X	X	X
Total Hardness	Once at High Flow *				X	X	X
Total Settleable Solids	X	X	X	X	X	X	
Total Suspended Solids	X	X	X	X	X	X	
o Zinc, Total	Once at High Flow *				X	X	X
LABORATORY REPORTING							
Cation-Anion Balance	X	X	X	X	X	X	X

o Baseline parameter, to be included in monitoring program (for Total and Dissolved) during high and low flow events during year preceding Permit Renewal.

* As allowed by site accessibility.

** To be collected during each sample date at sites VC-1 and VC-4.

In-Mine Waters

The in-mine ground water monitoring program consists of 1) monitoring ground water inflow to the Belina Mines from individual or locally collected sources which exceed five gallons per minute for discharge periods in excess of 30 consecutive days, and 2) determining the consumption of ground water through evaporation, production, and mine discharge. According to Valley Camp personnel, no discharges exceeding the 5 gpm or 30 day criteria have been encountered within the past, and therefore no in-mine water quality data is available.

When new sources or areas of measurable flow are encountered (measurable flow meaning 5 gpm or more for a period in excess of 30 days), a sampling program will be initiated on a quarterly sampling schedule as recommended in the UDOGM guidelines. The sampling program will consist of the ground water parameters and monitoring frequency shown in Table R614-301-731.211a. Data submittals of sampling completed will be prepared for the regulatory agency on a quarterly basis, including a copy of a map indicating the location of new flow sources. Quarterly sampling will continue until in-mine flows diminish to less than 5 gallons per minute, or until the regulatory authority approves discontinuance of the sampling site.

When in-mine monitoring is found to be required, an annual in-mine ground water monitoring report will be submitted to the regulatory authority within 90 days after the end of the reporting year. Included within the report will be an estimate of the ground water balance including mine inflows, outflows, ventilation, evaporation, coal production, and mine discharge.

Mine Discharge

Mine water discharges from Sediment Pond 005A are monitored according to the current NPDES permit. Grab samples taken monthly are analyzed for pH, TDS, Iron, and Oil and Grease. Flow and TSS samples are taken bi-monthly. All discharge samples are collected at the Parshall Flume installed at the pond outlet prior to mixing of the mine discharge water with Whisky Creek.

R614-301-731.212. GROUND WATER MONITORING SUBMITTALS.

Ground water quality and quantity data is submitted quarterly to the Division as required under this regulation. Data showing noncompliance of the permit conditions will continue to be brought immediately to the attention of the Division, with follow up action as required under R614-301-145 and R614-301-731 being taken. Annual reports will be submitted which will analyze any variance in flow and water quality characteristics.

When collected, a copy of all in-mine water quality data analyses will be submitted to the appropriate agencies prior to the 28th of the month following the sample. All historic data and sample results are on file at the offices of the Utah Division of Oil, Gas and Mining.

R614-301-731.213. SIGNIFICANT AQUIFER DETERMINATION.

It has previously been determined that the materials lying beneath the Mine Permit Area generally consist of one of two types of geologic formations. The upper formation is identified as the Blackhawk Formation which consists of three types of shale, all continental in origin. It is within this formation that the three major coal seams are identified. The lower formation

consists of the Star Point Sandstone. Both formations are generally tight, and therefore are generally incapable of yielding large amounts of water. The exception to this statement might be in the case where movement occurs through tension cracking. In the 1983 hydrology report prepared by Vaughn Hansen Associates, it is stated that "testing has shown the Star Point Sandstone to be extremely tight, yielding water in quantities of less than 5 to 10 gpm". Similarly, in a report prepared by Cordova, 1964, it is noted that the Blackhawk sands are 1) generally discontinuous in nature, 2) have low specific yields, and 3) are only locally important.

The regional importance of the Blackhawk sands as an aquifer is again minimized when it is understood that downward moving water is often impeded by discontinuous shale barriers within the formation. The presence of the shale tends to redirect any ground water movement to the surface or other drain system (such as a sandstone finger).

In summary, the overall water carrying capability of the geologic stratum within, and adjacent to the Mine Permit Area is low, and therefore, the geologic stratum does not play a significant part in regional water movement. It could also be said that in general terms, a ground water aquifer of major importance does not exist within the Mine Permit Area or adjacent area.

R614-301-731.214 thru 301-731.214.2. MONITORING THROUGH BOND RELEASE.

Annual monitoring of low flow water quality parameters for each ground water sampling location will continue between the cessation of mining until termination of bonding unless modified through subsequent permit renewals or through action by the regulatory agency. The data to be collected includes all regularly collected water quality parameters shown in Table R614-301-731.211a.

R614-301-731.215. INSTALLATION/REMOVAL OF MONITORING EQUIPMENT.

All monitoring equipment which is potentially used for the purpose of measuring water quality and or quality of ground water will be properly installed, maintained, operated during the mining process, and will be removed when no longer needed.

R614-301-731.220. SURFACE WATER MONITORING.

R614-301-731.221. SURFACE WATER MONITORING PLAN.

The surface water monitoring plan used and implemented by the applicant includes the parameters and sampling schedule shown in Table R614-301-731.211a. The locations of the sampling sites are shown on Map R614-301-722.100a, and information related to quality of the waters is discussed in Section R614-301-722. Sampling locations for the NPDES permit discharge points are shown on the sediment control facilities Maps R614-301-731.720a and R614-301-731.720d. Specifics related to NPDES discharges are given later in this section.

As agreed to in previous permit applications, a review of projected mine workings over the next five years has been completed to identify the need for additional water quality monitoring stations. The need for additional water monitoring stations is evaluated based upon the potential for impact to an area by mining activitites. In the event that projected mine workings extend into areas not currently monitored, new sampling sites will be considered for addition to the water quality monitoring plan.

Mining activities projected over the next five years will be concentrated within the Belina No. 2 Mine in the general areas shown in Figure R614-301-722.100a. The area of impact of these prejected mine workings falls well within the existing area of impact, therefore no additional water quality monitoring stations (beyond those already being sampled) are planned for this permit renewal.

The current surface water monitoring program includes sampling locations from adjacent streams. Surface water monitoring stations include VC-1, VC-2, VC-4, VC-5, VC-10, VC-11, and VC-12. No lakes, reservoirs or impoundments are located on or immediately adjacent to the mine permit area, and are therefore not included in the water quality sampling program for the mine. Station VC-4 was identified for inclusion in the monitoring program because of its location above the Belina Mine. VC-5 monitors water quality at the mouth of Whiskey Canyon, thereby allowing for a direct comparison between water above and below the mine and its impact area. Station VC-10, located in Eccles Canyon provides a basis for comparison between impacted Whiskey Canyon waters and other mine impacted waters from adjacent mining operations. Stations VC-11 and VC-12 have been identified for inclusion within the monitoring program because of their ability to isolate drainage basin waters adjacent to the mining operation. Should ground water be impacted through mining efforts, a change in water quality in these stations might provide an indicator as to the overall relative magnitude and timing of the impact. Station VC-2 located along Mud Creek immediately above the Valcam Loadout Facility, and VC-1 located immediately below the facility will provide an indicator as to the relative impact of the Loadout Facilities on Mud Creek.

Water quality data for selected parameters were presented in tabular form in Section R614-301-724.200. The data shown documents the minimum, maximum, average, and standard deviation of sample results for each surface water quality station. From the data shown in the table it can be seen that TDS values generally vary from the low 100's to the 300 to mid 500 range. A few samples are reported at higher values, however they are sporadic in nature and do not show normal operating conditions or water quality. Since the primary drinking water standard for TDS is 2,000 mg/l with 1,000 mg/l being the generally accepted limit (unless other water sources are not available), the water appears to be well within limits required for current and future water uses for this parameter.

The recommended limits for pH as given by the secondary drinking water standards are 6.5 to 8.5 standard units. Standards under the NPDES permit issued to Valley Camp range from 6.5 to 9.0. From the data it can be seen that average values for pH are generally found within the high seven to low eight range. Some maximum and minimum reported values have exceeded these limits, however it is felt that the number of such occurrences is small and not typical of normal operating conditions.

Iron has been reported at surface stream locations (not NPDES discharge locations) to be generally found within the range of between 0.01 and 8 mg/l. Some higher values have also been reported. The NPDES permit for point iron discharges at Ponds 001A through 005A allows a limit of 2.0 mg/l. The State Secondary Drinking Water Regulations have a limit of 0.3 mg/l for the secondary standard. The secondary standards are recommended limits and are in place from the standpoint of aesthetic water quality concerns. The concentrations of iron as reported in this permit renewal are not felt to change significantly the existing or future water uses of local area streams or Scofield Reservoir.

Manganese, as with iron is listed under the State Secondary Drinking Water Standards as an aesthetic parameter (with a limit of 0.05 mg/l) but not under the Primary Standards, nor within the NPDES standards. Reported values for manganese from samples taken from surface water stations have been as low as 0.001 and as high as 7.15 mg/l. It is not felt that the concentrations of manganese found within local surface water stations will alter significantly the existing or future water uses of receiving water systems.

No construction activities are planned for the Valley Camp mining operation. Should any begin, the applicant agrees to submit a monitoring plan which is agreeable to the regulatory agency. Such a plan would include weekly measurements for total suspended solids and total settleable solids. Other water quality parameters to be monitored during any future construction activities will be set by the applicant and the regulatory agency. The surface water quality monitoring program is outlined in detail in Table R614-301-731.211a. From the table, both the parameters to be monitored as well as the timing of monitoring can be identified.

NPDES Discharges

There are five NPDES discharge points located on the Valley Camp permit area. All five discharge points are associated with sedimentation ponds used in conjunction with surface water and mine water containment facilities installed for the mining operation. The discharge points associated with the Valcam Loadout Facility include NPDES numbers 001A, 002A, and 003A which are associated with runoff and sediment control ponds 001A, 002A, and 003A respectively as shown on Map R614-301-731.720a. NPDES discharge points located with runoff control and sediment ponds 004A and 005A are found in the Belina mine area as shown on Map R614-301-731.720d. Abbreviated specifics related to the NPDES permit are summarized on Table R614-301-731.221a. A complete copy of the permit is included in Appendix R614-301-750.

As requested, NPDES reporting will be copied and submitted to UDOGM on a monthly basis as defined in the permit for the Utah Department of Health. Violations to the permit as given in the preceding table and as outlined in Appendix R614-301-750 which seriously endanger health or the environment must be reported to the EPA, Region VIII, Emergency Response Branch in Colorado as soon as possible but in no case longer than 24 hours. Other less serious violations, their timing and reporting requirements can be reviewed in the accompanying appendix material submitted with this permit as identified above.

R614-301-731.222. DETERMINATION OF MINING IMPACTS.

The reporting format for monitoring data will be based upon results provided by an independent certified laboratory. The data records will contain as a minimum information relating to the date and time of collection, analysis conducted, and when appropriate, the related detection limits of all constituents tested for. The independent testing laboratory will provide documentation, upon request, as to the methods utilized for quality testing, and the associated detection limits.

Water quality data collected through the surface and ground water monitoring program outlined herein will be used to identify impacts resulting by mining through graphical and statistical analyses completed on a yearly basis as described herein. Selected data will be plotted on time graphs for individual water samples over a moving five year period of record to identify the occupance of trends in the data. If an undesirable trend is believed to be occurring, further evaluations will be conducted including statistical trend analyses. Should the analyses

completed indicate that trends do exist, a more in-depth study will be conducted to identify the source of the trend and whether the trend is acknowledging a condition outlined in the PHC. Solutions will be investigated which may potentially decrease or reverse negative trends. Water quality parameters which are anticipated for use in these surface water trend analyses include Flow, Oil & Grease, pH, Iron, TDS, TSS and the Anions-Cations.

TABLE R614-301-731.221a
NPDES WATER QUALITY SAMPLING REQUIREMENTS

Parameter	30-Day Average	7-Day Average	Daily Maximum	Measurement Frequency
Flow, gpd[1]	N/A	N/A	N/A	Twice Monthly
TSS, mg/L	25	35	70	Twice Monthly
Total Iron, mg/L	N/A	N/A	2.0	Monthly
TDS, mg/L	N/A	N/A	700	Monthly
Oil & Grease, mg/L	10	10	10	Monthly
pH	>6.5 & <9.0	>6.5 & <9.0	>6.5 & <9.0	Monthly
Floating Solids	Trace Only	Trace Only	Trace Only	N/A
Visible Foam	Trace Only	Trace Only	Trace Only	N/A
Sanitary Wastes	None	None	None	N/A
Acute Toxicity from 005A	None	None	None	N/A
TSS, mL/L[2]	0.5	0.5	0.5	See Note 2

1. The flow measurement from discharge point 005A is taken via a reading from a discharge flume. Other discharge points may be measured via a depth of flow reading over the top of the respective discharge structure. Should safety considerations make these measurement locations nonaccessible, flows will be estimated by measuring the discharge depth exiting each pond spillway discharge pipe. The depths so taken will be converted to flow rates to comply with this requirement.

2. To be measured during any overflow or increase in discharge volume caused by precipitation or snowmelt of equivalent volume (including bypass systems) from an event less than or equal to a 10-Year 24-Hour event.

As an additional aid to monitoring the potential impacts due to mine dewatering or subsidence, spring depletion curves will be prepared for each spring on an annual basis. These curves will be plotted for at least the previous five years so that trends may be identified over time.

R614-301-731.222.1 thru 301-222.2. ADDITIONAL MONITORING REQUIREMENTS.

The additional monitoring requirements for R614-301-731.222.1 are met as shown in Table R614-301-731.211a. Requirements of 40 CFR Parts 122 and 123, R614-301-751, and by the Utah Division of Environmental Health for National Pollutant Discharge Elimination System (NPDES) permits are being met as discussed in Section R614-301-751. Additional details related to the locations of NPDES discharge locations and water quality requirements are given in Section R614-301-731.221.

R614-301-731.223. SURFACE WATER MONITORING SUBMITTALS.

Surface water quality and quantity data will be submitted regularly to the Division as required under this regulation on a quarterly basis. Data showing noncompliance of the permit conditions will continue to be brought immediately to the attention of the Division, with follow up action as required under R614-300-145 and R614-301-731. Annual reports will be submitted which will analyze any variance in flow and water quality characteristics.

R614-301-731.224 thru 301-731.224.2. MONITORING THROUGH BOND RELEASE.

Water quality monitoring of surface water sampling locations will begin one year after the cessation of mining activities. The monitoring program will include those parameters shown in the Table R614-301-731.211a under the standard monitoring program. The monitoring program will include two samples per year, one during high flow and the other during low flow, and will continue until termination of bonding unless modified through subsequent permit renewals or through action by the regulatory agency.

R614-301-731.225. INSTALLATION/REMOVAL OF MONITORING EQUIPMENT.

No permanent structures exist within the permit area, which are used in conjunction with monitoring the quality and quantity of surface water with the exception of the discharge flume for Sediment Pond 005A. This pond is located in the Belina mine area and collects pumped discharge water from Belina mine workings. The dicharge flume will be maintained throughout the period of mining in order to continue to obtain flow discharge data from the mine, and will be removed along with the sediment pond upon mine reclamation.

Field and laboratory equipment utilized for water quality monitoring will include, but not be limited to pH, DO, conductivity, and other such meters as required to obtain certifiable results. An independent testing lab will provide documentation, upon request, that certified testing proceedures are used for off-site quality monitoring. Quantity monitoring of all surface water will be measured by the use of V-notch weirs and/or flow meters including Gurley, Pigmey or Magnetic Flow meters.

All monitoring equipment which would potentially be used for the purpose of measuring water quality and or quality of surface water will be properly installed, maintained, operated during the mining process, and will be removed when no longer needed.