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Significant inflows of ground waters were encountered in the 10 Left area of the mine (Drawing PHC A-2). This resulted in Skyline Mine drilling ~~two~~three mine dewatering wells in James Canyon. The first well, JC-1, was pumped at a rate of approximately 2100 gpm from November 2001 to October 2002. At that time, a new pump and motor was placed in the well and produced approximately 4200 gpm. JC-2 well was only capable of producing approximately 300 gpm and was shut in shortly after completion. The details of the two wells are discussed in detail in the July 2002 Addendum to the PHC. A third well, JC-3, was drilled and completed by PacifiCorp in March-April of 2003 to discharge water from the 10 Left area of the mine to Electric Lake. Details of the well are included in Section 3.2.11(a) of this M&RP. JC-3 is anticipated to produce approximately 4700 gpm of mine water when completed.

In most cases it appears the faults within the Blackhawk Formation in the permit area are not allowing significant vertical movement of ground water. The most logical cause of this apparently low permeability along most of the faults is clay content. However, as discussed in Section 2.2, the north-south trending faults in the Mine 2 area appear to be the result of extensional forces acting upon the formations and resulting in pathways for the water to move upward out of the Star Point and into Mine 2. The formations in Mine 3 and North Lease areas are under compression and the east-west trending faults in the area do not create pathways for the upward migration of ground water. Therefore, as mining proceeds to the North Lease area, it is likely water encountered in the mine will come mainly from the draining of sandstone channels in the mine roof, as was the case in the previously mined portions of Mine 3.

A detailed discussion of the geological characteristics of the project area is presented in the preceding section (Section 2.2).

2.3.2 Characteristics of Seeps and Springs

As a result of field investigations during 1978, 174 seeps and springs were located on and immediately adjacent to the Skyline project area

quarterly basis. The results of these analyses will be compared to previous analyses to determine if the age of the water is getting perceptively younger. ~~If it is determined that the waters are getting younger, the Division will be notified as soon as the data analyses are completed.~~ A report detailing the results of the age-dating analyses will be submitted to the Division each quarter in conjunction with the quarterly water monitoring results.

Mine #2 will be sealed by the end of 2004, with the exception of the west mains. The west mains will be maintained to allow access to the 14, 15, and 16 Left sumps. Skyline will complete mining the 11 and 12 Left A and B panels before the end of 2004. No additional significant inflows are anticipated in these areas. If sustained significant flows of ground water (flows greater than 800 gpm) are encountered in the headgates or tailgates of these panels, tritium and carbon 14 samples will be obtained and sampled on a quarterly basis as long as the sites are accessible. If similar flows are encountered as Mine #3 extends into the North Lease area, the same age-monitoring program will be applied.

Table 2.3.7-1
 Comprehensive Water Quality Analytical Schedule
 (Surface and Ground Water Stations)
 -Low Summer Flow-
 (August - September)

Annual - Water Quality Stations CS-1, CS-2, CS-3, CS-4, CS-6, CS-7 (F-5), CS-8, CS-9, CS-10, CS-11, CS-12, CS-13, CS-14, CS-16, CS-17, CS-18, CS-19, CS-20, CS-21, F-9*, F-10, UP&L-10, VC-6, VC-9, VC10, S10-1, S12-1, S13-2, S13-7, S14-4, S15-3, S17-2, S22-5, S22-11, S23-4, S24-12, S26-13, S34-12, S35-8, S36-12, WRDS #1, WRDS #2, WRDS #3, WRDS #4, 2-413, 3-290, MC-1*, MC-2*, MC-3*, MC-4*, MC-5*, MC-6*, JC1*, **JC-3***, MD-1*, WQ1-39, WQ3-6, WQ3-26, WQ3-41 WQ3-43, WQ4-12.

Field Measurements	Laboratory Measurements	
Flow	Acidity	Lead, Total and Dissolved
Dissolved Oxygen	Alkalinity	Magnesium
pH	Bicarbonate	Manganese, Total and
Specific Conductance	Ammonia	Nitrate
Temperature, Air	Barium, Total and	Phosphate
Temperature, Water	Boron, Total and	Potassium
Turbidity	Calcium	Sodium
	Chloride	Sulfate
	Copper, Total and	Suspended Solids
	Fluoride	Total Dissolved Solids
	Iron, Total and	

Note: Station VC-9 will use calculated flow from Station CS-6 and CS-13.
 *F-9 to be monitored for field parameters only. Flows at F-9 and F-10 will be monitored monthly when accessible. MC-1, -2, -3, -4, -5, -6, JC-1, **JC-3** and MD-1 samples to be analyzed for flow, TDS, TSS, and total phosphorous only. JC-1 and MD-1 monitored for flows and reported monthly. JC-1 to be analyzed for C14, tritium, and stable isotopes deuterium and oxygen 18. CS-2 and VC-9 to be also analyzed for total phosphorous.

ADDITIONS TO THE COMPREHENSIVE SCHEDULE FOR
 ECCLES CANYON STREAM STATIONS
 AND WASTE ROCK DISPOSAL SITE

Includes stations CS-1, CS-2, CS-3, CS-4, CS-6, CS-9, CS-11, CS-12, CS-13, CS-14, VC-6, VC-9, VC-10, WRDS #1, WRDS #2, WRDS #3, AND WRDS #4.

Cyanide

Phenols

Total Organic Carbon

WELLS - WATER LEVELS ONLY

Well locations: W79-10-1A, W79-10-1B, W79-14-2A, , W79-26-1, W79-35-1A, W79-35-1B, W2-1 (98-2-1), W20-4-1, W20-4-2, W99-4-1, W99-21-1, W99-28-1, W20-28-1, 91-26-1, and 91-35-1.

TABLE 2.3.7-2

ABBREVIATED WATER QUALITY ANALYTICAL SCHEDULE
(SURFACE AND GROUNDWATER STATIONS)
-HIGH SPRING (APRIL - JUNE) AND
LATE FALL (OCTOBER - NOVEMBER) FLOWS-

SEASONAL - WATER QUALITY STATIONS CS-1, CS-2*, CS-3, CS-4, CS-6, CS-7 (F-5), CS-8, CS-9, CS-10, CS-11, CS-12, CS-13, CS-14, CS-16, CS-17, CS-18, CS-19, CS-20, CS-21, F-9*, F-10, UPL-10, VC-6, VC-9*, VC-10, S10-1, S12-1, S13-2, S13-7, S14-4, S15-3, S17-2, S22-5, S22-11, S23-4, S24-12, S26-13, S34-12, S35-8, S36-12, WRDS #1, WRDS #2, WRDS #3, WRDS #4, 2-413, 3-290, MC-1*, MC-2*, MC-3*, MC-4*, MC-5*, MC-6*, JC-1*, JC-3*, MD-1*, WQ1-39, WQ3-6, WQ3-26, WQ3-41, WQ3-43, WQ4-12.

FIELD MEASUREMENTSLABORATORY MEASUREMENTS

Flow	Ammonia	Nitrate
pH	Bicarbonate	Phosphate
Specific Conductance	Calcium	Potassium
Temperature, Air	Chloride	Sodium
Temperature, Water	Iron, Total	Sulfate
Turbidity	Magnesium	Suspended Solids
	Manganese, Total	Total Dissolved Solids

NOTES: Station VC-9 will use calculated flow data from Stations CS-6 and CS-13. Dissolved oxygen will be measured at Stations CS-2, CS-6, VC-6 and VC-9.

*F-9 to be monitored for field parameters only. Flows at F-9 & F-10 will be monitored monthly when accessible. MC-1, -2, -3, -4, -5, -6, JC-1, JC-3, and MD-1 samples to be analyzed for flow, TDS, TSS, and total phosphorous only. JC-1 and MD-1 monitored for flows and reported monthly. JC-1 to be analyzed for C14, tritium, and stable isotopes deuterium and oxygen 18. CS-2 and VC-9 to be also analyzed for total phosphorous.

SEASONAL ADDITIONS TO THE ABBREVIATED SCHEDULE
FOR ECCLES CANYON STREAM STATIONS
AND WASTE ROCK DISPOSAL SITE STATIONS

Includes stations CS-1, CS-2, CS-3, CS-4, CS-6, CS-9, CS-11, CS-12, CS-13, CS-14, VC-6, VC-9, VC-10, WRDS #1, WRDS #2, WRDS #3 and WRDS #4.

Phenols
Oil & Grease

WELLS - WATER LEVEL ONLY

Well locations: W79-10-1A, W79-10-1B, W79-14-2A, , W79-26-1, W79-35-1A, W79-35-1B, W2-1 (98-2-1), W20-4-1, W20-4-2, W99-4-1, W99-21-1, W99-28-1, W20-28-1, 91-26-1, and 91-35-1.

In addition to the high spring and late fall monitorings taken at all stations, winter season monitoring (Dec. - Feb.) for the above abbreviated schedule, including seasonal additions, will be taken at the following stations as accessibility permits: CS-2, CS-3, CS-6, CS-9, CS-11, CS-12, CS-13, CS-14, VC-6, VC-9, VC-10, MC-1, MC-2, MC-3, MC-4, MC-5, and MC-6. Station CS-15 will be monitored for flow only each Spring, Summer and Fall beginning Fall 1988.

the area under final reclamation begins, except for periodic inspections. The culvert trash rack and portal highwall will be inspected at a minimum of three times a year: (1) early spring; (2) mid-summer at the beginning of the thunderstorm season, and (3) late fall before freeze-up.

3.2.11(a) James Canyon Area

The Upper O'Connor B seam has a large inflow of ground water into the active mining operations. To reduce the amount of inflow, **three** ~~two~~ de-watering wells were drilled in James Canyon (see map **Drawings 1.6-3, 1.6-3A, and 3.4-1 James Canyon**). Access to the water well site is via an **existing** road in James Canyon. The road had been water barred and reseeded in the 1970's. Approximately, 4,400 feet of the James Canyon was reopened to reach the drill pad location. As construction started the topsoil from the road was pushed aside and used a berm. A 18-inch culvert was installed in a side drainage to James Canyon. The water bars were left in place and silt fences were installed at the outflow of each bar for sediment control.

A track hoe was used to remove the topsoil from the drill pad and stored at the head of James Canyon. The topsoil was encircled by silt fence for sediment control and marked with a sign. The subsoils were used as fill to create the drill pad. The drill pad is approximately 100 feet wide and 200 feet long or about 0.46 acres. A ditch was constructed above the drill pad to divert water from the undisturbed area. The runoff calculations and ditch design are included in Volume 5, Section 22 James Canyon. An 18-inch culvert was placed in the road just east of the drill pad to allow drainage from the undisturbed area to enter James Canyon Creek. The culvert design calculation are included in Volume 5, Section 22 James Canyon. A sediment pond was dug on the west end of the drill pad to treat runoff from the disturbed area. The sediment pond is designed for total containment and the design calculations are in Volume 5, Section 22 James Canyon. Silt fence was placed at the toe of the out-slope for sediment control.

Two water wells were drilled **in the fall of 2001**. The first hole, JC-1, was bored to a 19-inch diameter and cased with 14-inch diameter steel pipe **and wire-wrap screen**. **The hole was drilled at an approximate angle of 22 degrees from vertical, dips to the east, and penetrates the water producing fault below the 10 Left panel area**. The total length of the drill hole is 1,030 feet. The second hole, JC-2, was drilled vertically, has a 29-inch diameter borehole, and was cased with 20-inch diameter steel pipe **and wire-wrap screen**. The hole was drilled into the sandstone below the coal seam and bottoms out at 1,010 feet. Electric well pumps were installed in each well and were initially operated using a diesel generator. The diesel generator was replaced by underground

power cables in November 2001 ~~that run from a PacifiCorp power line located near the head of James Canyon to the well site.~~ An 8-inch wide three foot deep trench was dug on the outer edge of the James Canyon road for routing power cables to the drill pad. Three power cables and one communication cable were placed in the trench. The cables are rated for 12,400 volts. A transformer is used to reduce the voltage to 4,160 volts and switch gear are used to turn the pumps on and off.

A 16-inch diameter HDPE pipe, capable of carrying 10,300 gpm of water. was buried from the drill pad to Electric Lake. The pipeline was routed along the old James Canyon road to the lake. Once the pipeline was buried, the road surface was deep gouged, the water bars were reestablished, silt fences installed at the outflow of the water bars for sediment control, and the disturbed area was reseeded.

~~A third well, JC-3, will be drilled at the James Canyon well pad site in March-April 2003. This well will be drilled and completed within the 10 Left area of Skyline mine. This area of the mine was sealed in October 2002 after mining of the 9 Left panel was complete. The purpose of the well is to remove water from the mine and discharge it to Electric Lake. It is likely the pumping rate will not exceed 4700 gpm from this well. PacifiCorp will obtain a UPDES permit and operate the well to discharge mine water to the lake. Water from the JC-3 well will be pumped to the lake through the existing buried 16-inch HDPE pipe. A transformer and switching gear separate from the JC-1 and JC-2 equipment will be used to operate this well. No additional disturbance outside the existing James Canyon well pad disturbed area is anticipated as a result of drilling and completing JC-3. Plate 3.4-1 illustrates the location of the JC-3 well and related power equipment.~~

~~While Skyline Mine remains the SMCRA permittee and operator regarding the installation and operation of the JC-3 well, PacifiCorp has chosen to be the holder of the UPDES permit for the discharge of mine-water from the well and on this well, PacifiCorp will be the operator of JC-3. Skyline will obtain from PacifiCorp and provide to the Division with the monthly UPDES DMR records for this well discharge.~~

~~The JC-3 well will be drilled at an angle of 13.61° from vertical and in an eastward direction from the well pad. The depth of the hole will be approximately 1090 to 1100 feet deep vertically with an angle length of approximately 1120 to 1130 feet. The boring will drill through the mine workings and terminate approximately 350 feet below the workings. The details of the well construction and surface piping were provided by PacifiCorp and Hansen, Allen, and Luce and are included as Drawing 3.2.11-A, Sheets C-1 through C-4.~~The detailed plans were prepared by Hansen, Allen,~~~~

~~and Luce for PacifiCorp.~~ Please note the "Future Fence" as illustrated on sheet C-1 of Drawing 3.2-11-A would only be built if the wells are transferred to Pacific Corp and are no longer part of this M&RP.

The JC-1 well currently produces 3,900 gpm of water (March 31, 2003), a slight decrease from the initial 4,200 gpm produced from the well after a new pump was installed in October 2002. The JC-2 well was capable of producing less than 300 gpm and was shut-in shortly after completion. The JC-3 well should be capable of producing 4,700 gpm of mine water after completion. The combined flow from JC-1 and JC-3 to Electric Lake is anticipated to be about 8,600 gpm, well below the carrying capacity of the 16-inch HDPE pipe.

Skyline Mine will reclaim the entire James Canyon well site at final mine reclamation unless other arrangements are made and agreed upon by the Division, the Manti-LaSal National Forest, and PacifiCorp. Skyline Mine has included the costs of reclaiming the three dewatering wells in James Canyon, including the plugging and abandonment of the wells, in the mine reclamation bond.

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James Canyon Disturbed Area Map	3.4-1

Significant inflows of ground waters were encountered in the 10 Left area of the mine (Drawing PHC A-2). This resulted in Skyline Mine drilling three mine dewatering wells in James Canyon. The first well, JC-1, was pumped at a rate of approximately 2100 gpm from November 2001 to October 2002. At that time, a new pump and motor was placed in the well and produced approximately 4200 gpm. JC-2 well was only capable of producing approximately 300 gpm and was shut in shortly after completion. The details of the two wells are discussed in detail in the July 2002 Addendum to the PHC. A third well, JC-3, was drilled and completed by PacifiCorp in March-April of 2003 to discharge water from the 10 Left area of the mine to Electric Lake. Details of the well are included in Section 3.2.11(a) of this M&RP. JC-3 is anticipated to produce approximately 4,700 gpm of mine water when completed.

In most cases it appears the faults within the Blackhawk Formation in the permit area are not allowing significant vertical movement of ground water. The most logical cause of this apparently low permeability along most of the faults is clay content. However, as discussed in Section 2.2, the north-south trending faults in the Mine 2 area appear to be the result of extensional forces acting upon the formations and resulting in pathways for the water to move upward out of the Star Point and into Mine 2. The formations in Mine 3 and North Lease areas are under compression and the east-west trending faults in the area do not create pathways for the upward migration of ground water. Therefore, as mining proceeds to the North Lease area, it is likely water encountered in the mine will come mainly from the draining of sandstone channels in the mine roof, as was the case in the previously mined portions of Mine 3.

A detailed discussion of the geological characteristics of the project area is presented in the preceding section (Section 2.2).

2.3.2 Characteristics of Seeps and Springs

As a result of field investigations during 1978, 174 seeps and springs were located on and immediately adjacent to the Skyline project area

Late fall samples are obtained in October through November. These time periods were selected because the sites are usually inaccessible until late June and after November due to snow depth and frozen water courses. Several sites on Eccles Creek are monitored in December through February since they are adjacent to a maintained road and the water discharged from the mine normally keeps the stream from freezing over.

Water quality samples are collected from the 23 selected springs in the project area. The samples are comprehensively analyzed each year for the parameters listed in Tables 2.3.7-1 and Table 2.3.7-2. All water samples collected for use in this permit have been collected and analyzed according to methods in either the "Standard Methods for the Examination of Water and Wastewater" or the 40 CFR parts 136 and 434. A listing identifying the station types is shown on Table 2.3.7-3.

In addition to the collection of the outlined water quality data, water level data has been collected from each of the wells (if functional) as scheduled on Tables 2.3.7-1, 2.3.7-2 and 2.3.7-3, and noted on Plate 2.3.6-1. Water quality samples will be collected from the Waste Rock Disposal Site Well 92-91-03 in accordance with the schedule and parameter list shown on table 2.3.7-5. Summary information on these observation wells is found on Table 2.3.7-4. Three wells, 79-14-2B and 79-22-2-1 and 79-22-2-2 have experienced casing failures, and are currently nonfunctional. There are no plans to replace these wells.

The amount of water discharged from each mine on each monitoring occasion will also be monitored at the mine mouth through the use of a totalizing flow meter or similar device. Significant changes in the source of water in the mine will be noted during the period of operation. Underground water pumped from each mine will be monitored for water quality. Mine #1 discharge is sampled at Station CS-14. Mine #3 discharge is sampled at Station CS-12. Mine #2 water is discharged at JC-3.

monitoring at the selected sites. The initial field work for this project was completed in August 2002 but the interim report is not yet available. Skyline will submit this first and subsequent first progress reports for this project with its annual reports.

Samples obtained at the MC-sites will be monitored for total flow, TDS, TSS, and total phosphorous. In addition a stream stability cross-section and reach survey will be conducted approximately 75 yards downstream of the MC-6 monitoring location. The results of these analyses will be reported with the other mine water quality monitoring reports.

Sites MD-1, JC-1, and JC-3 were also added to the monitoring site list. MD-1 is a composite sample of the all water discharged from Skyline Mine to Eccles Creek. JC-1 and JC-3 are samples of the water discharged from the two James Canyon ground and mine dewatering wells.

Each of these sites are monitored for total flow and the results are reported to the Division on a monthly basis. Quarterly, these sites are also monitored for TSS, TDS, and total phosphorous. Since JC-3 is a UPDES site, it is monitored each month for flow, TSS, TDS, oil and grease, and total iron. The UPDES sampling results are forwarded to the Division monthly.

Spring monitoring sites WQ1-39, WQ3-6, WQ3-26, WQ3-41 WQ3-43, and WQ4-12 were added to the permit. Surface water sites CS-19, CS-20, and CS-21 were added as were wells 91-26-1 and 91-35-1. All of these sites are in the North Lease area. Location of these samples sites are illustrated on Drawing 2.3.6-1.

Skyline Mine has also obtained numerous water samples from within the mine for age-dating purposes. Samples have been analyzed for both stable and unstable isotopes; the majority being analyzed for tritium and carbon 14 content. The analyses results of these samples is discussed in detail in the July 2002 Addendum to the PHC. The results of repeated tritium sampling and analysis in a few location in the

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mine, specifically those in the 9 and 10 Left panel areas that began in August 2001, suggest that the majority of the water is not younger than 50 years. Only a few carbon 14 samples have been obtained from these sites but the results indicate the waters are several thousand years old. The sampling sites in the 9 and 10 Left panel areas became inaccessible as that portion of the mine was sealed in September 2002. Remaining significant inflow sites, particularly the east submains site (previously identified as the west submains) and a few of the sites in the 11 and 12 left panel areas, will be accessible through June of 2004. The mine will obtain carbon 14 and tritium samples from these sites on a quarterly basis. The results of these analyses will be compared to previous analyses to determine if the age of the water is getting perceptively younger. A report detailing the location of where samples were obtained and the results of the age-dating analyses will be submitted to the Division each quarter in conjunction with the quarterly water monitoring results.

Mine #2 will be sealed by the end of 2004, with the exception of the west mains. The west mains will be maintained to allow access to the 14, 15, and 16 Left sumps. Skyline will complete mining the 11 and 12 Left A and B panels before the end of 2004. No additional significant inflows are anticipated in these areas. If sustained significant flows of ground water (flows greater than 800 gpm) are encountered in the headgates or tailgates of these panels, tritium and carbon 14 samples will be obtained and sampled on a quarterly basis as long as the sites are accessible. If similar flows are encountered as Mine #3 extends into the North Lease area, the same age-monitoring program will be applied.

Samples will also be obtained from the JC-1 well and analyzed for carbon 14, tritium, and stable isotopes deuterium and oxygen 18 for age dating purposes. JC-1 is, at this time, a ground water discharge site

that is assumed to discharge water similar to or the same as the mine inflow waters in the southern portions of Mine #2. Discharge from JC-1 should be accessible for the next several years. The results of the analyses will be monitored for changes in ages that may indicate changes in the source of the mine water inflows. These samples will be obtained as outlined in Tables 2.3.7-1 and 2.3.7-2.

Table 2.3.7-1
 Comprehensive Water Quality Analytical Schedule
 (Surface and Ground Water Stations)
 -Low Summer Flow-
 (August - September)

Annual - Water Quality Stations CS-1, CS-2, CS-3, CS-4, CS-6, CS-7 (F-5), CS-8, CS-9, CS-10, CS-11, CS-12, CS-13, CS-14, CS-16, CS-17, CS-18, CS-19, CS-20, CS-21, F-9*, F-10, UP&L-10, VC-6, VC-9, VC10, S10-1, S12-1, S13-2, S13-7, S14-4, S15-3, S17-2, S22-5, S22-11, S23-4, S24-12, S26-13, S34-12, S35-8, S36-12, WRDS #1, WRDS #2, WRDS #3, WRDS #4, 2-413, 3-290, MC-1*, MC-2*, MC-3*, MC-4*, MC-5*, MC-6*, JC1*, JC-3*, MD-1*, WQ1-39, WQ3-6, WQ3-26, WQ3-41, WQ3-43, WQ4-12.

Field Measurements	Laboratory Measurements	
Flow	Acidity	Lead, Total and Dissolved
Dissolved Oxygen	Alkalinity	Magnesium
pH	Bicarbonate	Manganese, Total and
Specific Conductance	Ammonia	Nitrate
Temperature, Air	Barium, Total and	Phosphate
Temperature, Water	Boron, Total and	Potassium
Turbidity	Calcium	Sodium
	Chloride	Sulfate
	Copper, Total and	Suspended Solids
	Fluoride	Total Dissolved Solids
	Iron, Total and	

Note: Station VC-9 will use calculated flow from Station CS-6 and CS-13.
 *F-9 to be monitored for field parameters only. Flows at F-9 and F-10 will be monitored monthly when accessible. MC-1, -2, -3, -4, -5, -6, JC-1, JC-3 and MD-1 samples to be analyzed for flow, TDS, TSS, and total phosphorous only. JC-1 and MD-1 monitored for flows and reported monthly. JC-1 to be analyzed for C14, tritium, and stable isotopes deuterium and oxygen 18. CS-2 and VC-9 to be also analyzed for total phosphorous.

ADDITIONS TO THE COMPREHENSIVE SCHEDULE FOR
 ECCLES CANYON STREAM STATIONS
 AND WASTE ROCK DISPOSAL SITE

Includes stations CS-1, CS-2, CS-3, CS-4, CS-6, CS-9, CS-11, CS-12, CS-13, CS-14, VC-6, VC-9, VC-10, WRDS #1, WRDS #2, WRDS #3, AND WRDS #4.

Cyanide

Phenols
 Total Organic Carbon

WELLS - WATER LEVELS ONLY

Well locations: W79-10-1A, W79-10-1B, W79-14-2A, , W79-26-1, W79-35-1A, W79-35-1B, W2-1 (98-2-1), W20-4-1, W20-4-2, W99-4-1, W99-21-1, W99-28-1, W20-28-1, 91-26-1, and 91-35-1.

TABLE 2.3.7-2

ABBREVIATED WATER QUALITY ANALYTICAL SCHEDULE
(SURFACE AND GROUNDWATER STATIONS)
-HIGH SPRING (APRIL - JUNE) AND
LATE FALL (OCTOBER - NOVEMBER) FLOWS-

SEASONAL - WATER QUALITY STATIONS CS-1, CS-2*, CS-3, CS-4, CS-6, CS-7 (F-5), CS-8, CS-9, CS-10, CS-11, CS-12, CS-13, CS-14, CS-16, CS-17, CS-18, CS-19, CS-20, CS-21, F-9*, F-10, UPL-10, VC-6, VC-9*, VC-10, S10-1, S12-1, S13-2, S13-7, S14-4, S15-3, S17-2, S22-5, S22-11, S23-4, S24-12, S26-13, S34-12, S35-8, S36-12, WRDS #1, WRDS #2, WRDS #3, WRDS #4, 2-413, 3-290, MC-1*, MC-2*, MC-3*, MC-4*, MC-5*, MC-6*, JC-1*, JC-3*, MD-1*, WQ1-39, WQ3-6, WQ3-26, WQ3-41, WQ3-43, WQ4-12.

FIELD MEASUREMENTSLABORATORY MEASUREMENTS

Flow	Ammonia	Nitrate
pH	Bicarbonate	Phosphate
Specific Conductance	Calcium	Potassium
Temperature, Air	Chloride	Sodium
Temperature, Water	Iron, Total	Sulfate
Turbidity	Magnesium	Suspended Solids
	Manganese, Total	Total Dissolved Solids

NOTES: Station VC-9 will use calculated flow data from Stations CS-6 and CS-13. Dissolved oxygen will be measured at Stations CS-2, CS-6, VC-6 and VC-9.

*F-9 to be monitored for field parameters only. Flows at F-9 & F-10 will be monitored monthly when accessible. MC-1, -2, -3, -4, -5, -6, JC-1, JC-3, and MD-1 samples to be analyzed for flow, TDS, TSS, and total phosphorous only. JC-1 and MD-1 monitored for flows and reported monthly. JC-1 to be analyzed for C14, tritium, and stable isotopes deuterium and oxygen 18. CS-2 and VC-9 to be also analyzed for total phosphorous.

SEASONAL ADDITIONS TO THE ABBREVIATED SCHEDULE
FOR ECCLES CANYON STREAM STATIONS
AND WASTE ROCK DISPOSAL SITE STATIONS

Includes stations CS-1, CS-2, CS-3, CS-4, CS-6, CS-9, CS-11, CS-12, CS-13, CS-14, VC-6, VC-9, VC-10, WRDS #1, WRDS #2, WRDS #3 and WRDS #4.

Phenols
Oil & Grease

WELLS - WATER LEVEL ONLY

Well locations: W79-10-1A, W79-10-1B, W79-14-2A, W79-26-1, W79-35-1A, W79-35-1B, W2-1 (98-2-1), W20-4-1, W20-4-2, W99-4-1, W99-21-1, W99-28-1, W20-28-1, 91-26-1, and 91-35-1.

In addition to the high spring and late fall monitorings taken at all stations, winter season monitoring (Dec. - Feb.) for the above abbreviated schedule, including seasonal additions, will be taken at the following stations as accessibility permits: CS-2, CS-3, CS-6, CS-9, CS-11, CS-12, CS-13, CS-14, VC-6, VC-9, VC-10, MC-1, MC-2, MC-3, MC-4, MC-5, and MC-6. Station CS-15 will be monitored for flow only each Spring, Summer and Fall beginning Fall 1988.

the area under final reclamation begins, except for periodic inspections. The culvert trash rack and portal highwall will be inspected at a minimum of three times a year: (1) early spring; (2) mid-summer at the beginning of the thunderstorm season, and (3) late fall before freeze-up.

3.2.11(a) James Canyon Area

The Upper O'Connor B seam has a large inflow of ground water into the active mining operations. To reduce the amount of inflow, three de-watering wells were drilled in James Canyon (see Drawings 1.6-3, 1.6-3A, and 3.4-1). Access to the water well site is via an existing road in James Canyon. The road had been water barred and reseeded in the 1970's. Approximately, 4,400 feet of the James Canyon was reopened to reach the drill pad location. As construction started the topsoil from the road was pushed aside and used a berm. A 18-inch culvert was installed in a side drainage to James Canyon. The water bars were left in place and silt fences were installed at the outflow of each bar for sediment control.

A track hoe was used to remove the topsoil from the drill pad and stored at the head of James Canyon. The topsoil was encircled by silt fence for sediment control and marked with a sign. The subsoils were used as fill to create the drill pad. The drill pad is approximately 100 feet wide and 200 feet long or about 0.46 acres. A ditch was constructed above the drill pad to divert water from the undisturbed area. The runoff calculations and ditch design are included in Volume 5, Section 22 James Canyon. An 18-inch culvert was placed in the road just east of the drill pad to allow drainage from the undisturbed area to enter James Canyon Creek. The culvert design calculation are included in Volume 5, Section 22 James Canyon. A sediment pond was dug on the west end of the drill pad to treat runoff from the disturbed area. The sediment pond is designed for total containment and the design calculations are in Volume 5, Section 22 James Canyon. Silt fence was placed at the toe of the out-slope for sediment control.

Two water wells were drilled in the fall of 2001. The first hole, JC-1, was bored to a 19-inch diameter and cased with 14-inch diameter steel pipe and wire-wrap screen. The hole was drilled at an approximate angle of 22 degrees from vertical, dips to the east, and penetrates the water producing fault below the 10 Left panel area. The total length of the drill hole is 1,030 feet. The second hole, JC-2, was drilled vertically, has a 29-inch diameter borehole, and was cased with 20-inch diameter steel pipe and wire-wrap screen. The hole was drilled into the sandstone below the coal seam and bottoms out at 1,010 feet. Electric well pumps were installed in each well and were initially operated using a diesel generator. The diesel generator was replaced by underground power cables in November 2001

that run from a PacifiCorp power line located near the head of James Canyon to the well site. An 8-inch wide three foot deep trench was dug on the outer edge of the James Canyon road for routing power cables to the drill pad. Three power cables and one communication cable were placed in the trench. The cables are rated for 12,400 volts. A transformer is used to reduce the voltage to 4,160 volts and switch gear are used to turn the pumps on and off.

A 16-inch diameter HDPE pipe, capable of carrying 10,300 gpm of water, was buried from the drill pad to Electric Lake. The pipeline was routed along the old James Canyon road to the lake. Once the pipeline was buried, the road surface was deep gouged, the water bars were reestablished, silt fences installed at the outflow of the water bars for sediment control, and the disturbed area was reseeded.

A third well, JC-3, will be drilled at the James Canyon well pad site in March-April 2003. This well will be drilled and completed within the 10 Left area of Skyline mine. This area of the mine was sealed in October 2002 after mining of the 9 Left panel was complete. The purpose of the well is to remove water from the mine and discharge it to Electric Lake. It is likely the pumping rate will not exceed 4700 gpm from this well. . Water from the JC-3 well will be pumped to the lake through the existing buried 16-inch HDPE pipe. A transformer and switching gear separate from the JC-1 and JC-2 equipment will be used to operate this well. No additional disturbance outside the existing James Canyon well pad disturbed area is anticipated as a result of drilling and completing JC-3. Plate 3.4-1 illustrates the location of the JC-3 well and related power equipment.

While Skyline Mine remains the SMCRA permittee and operator regarding the installation and operation of the JC-3 well, PacifiCorp has chosen to be the holder of the UPDES permit for the discharge of mine-water from the well. Skyline will obtain from PacifiCorp and provide to the Division with the monthly UPDES DMR records for this well discharge.

The JC-3 well will be drilled at an angle of 13.61° from vertical and in an eastward direction from the well pad. The depth of the hole will be approximately 1090 to 1100 feet deep vertically with an angle length of approximately 1120 to 1130 feet. The boring will drill through the mine workings and terminate approximately 350 feet below the workings. The details of the well construction and surface piping were provided by PacifiCorp and Hansen, Allen, and Luce and are included as Drawing 3.2.11-A, Sheets C-1 through C-4. Please note the "Future Fence" as illustrated on sheet C-1 of Drawing 3.2-11-A would only be built if the wells are transferred to Pacific Corp and are no longer part of this M&RP.

The JC-1 well currently produces 3,900 gpm of water (March 31, 2003), a slight decrease from the initial 4,200 gpm produced from the well after a new pump was installed in October 2002. The JC-2 well was capable of producing less than 300 gpm and was shut-in shortly after completion. The JC-3 well should be capable of producing 4,700 gpm of mine water after completion. The combined flow from JC-1 and JC-3 to Electric Lake is anticipated to be about 8,600 gpm, well below the carrying capacity of the 16-inch HDPE pipe.

Skyline Mine will reclaim the entire James Canyon well site at final mine reclamation unless other arrangements are made and agreed upon by the Division, the Manti-LaSal National Forest, and PacifiCorp. Skyline Mine has included the costs of reclaiming the three dewatering wells in James Canyon, including the plugging and abandonment of the wells, in the mine reclamation bond.

REVISIONS		<p style="text-align: center;">JAMES CANYON WELL JC-3 PUMP AND PIPING DETAILS SHEETS C-1 THROUGH C-4</p>  <p style="text-align: right;">Canyon Fuel Company, LLC Skyline Mines</p>			
DATE	BY				P.O. BOX 719 HELPER, UTAH 84526 435-448-6463
		P:permits\... \JC-3\plate3-2-11-a <td>SCALE: NA <td>DR.BY:</td> <td> </td> </td>	SCALE: NA <td>DR.BY:</td> <td> </td>	DR.BY:	
		DWG. NO.:	PLATE#:	3.2.11-A	



JC-3 WELL HEAD COORDINATES				
	EAST	NORTH	LOFF VERTICAL	AZIMUTH
187988'	2077249'	476376'	13.61'	N 78°11'34" E

EXISTING 16" HDPE DISCHARGE PIPE

FUTURE 16" HDPE PIPELINE EXTENSION

GENERAL CONTRACTOR TO SPREAD DIRT PILE OVER PAD SITE

APPROXIMATE SITE OF FUTURE POWER AND CONTROL FACILITIES FOUNDATION TO BE PLACED AND COMPACTED PER SPECIFICATION.

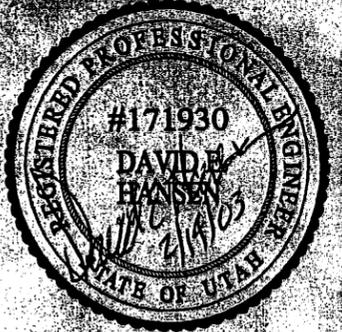
PROBABLE RELOCATION OF JC-2 POWER CONNECT (TO BE USED FOR WELL JC-3)
WELL JC-1 POWER CONNECT
WELL JC-2 POWER CONNECT (TO BE RELOCATED AND USED FOR WELL JC-3)

CONTRACTOR TO VERIFY LOCATION OF POWER CONDUITS AND LOW VOLTAGE SERVICE

FUTURE SECURITY FENCE

HORIZONTAL PROJECTION OF WELL JC-3

FUTURE GATE



FILE NAME: 005.13.1301 CADFILES JAMES-2_MOD.DWG
FILE DATE: 2-14-2003 09:44:39 (CAH)

FEB 18 2003



DESIGNED MPW	2				
DRAFTED MPW	1				
CHECKED DEH	0		RELEASE FOR CONSTRUCTION		
PROJECT ENGINEER	DATE FEBRUARY 2003	NO.	DATE	REVISIONS	BY APVD.

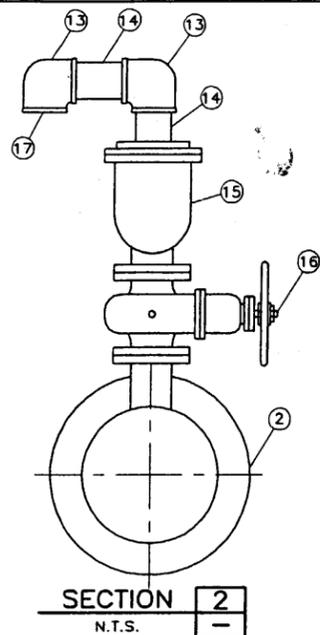
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VERIFY SCALE
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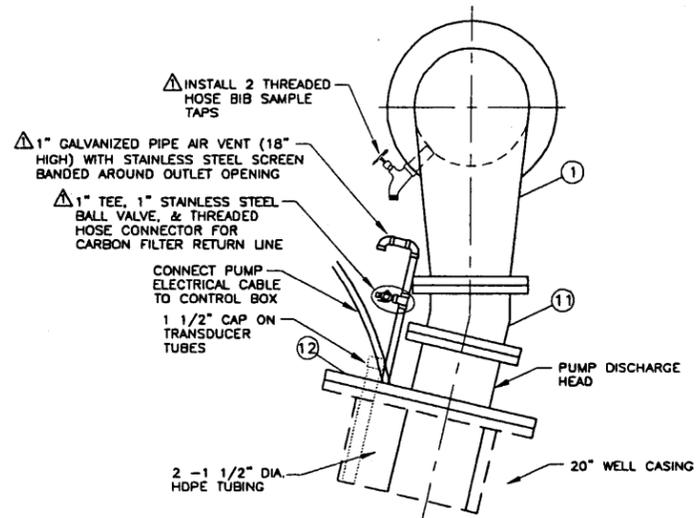
JAMES CANYON WELL JC-3
PUMP AND PIPING
SITE PLAN

SHEET NO
C-1
OF 4
005.13.1



STA. 0+00

SEE FIGURE 1



SECTION 1
N.T.S.

- EXISTING JC-2 WELL
- EXISTING JC-1 WELL
- EXISTING 10" STEEL PIPE TO BE SHORTENED
- RELOCATE EXISTING 16" X 10" REDUCER, INSERT NEW 16" WYE BETWEEN HOPE AND REDUCER
- EXISTING 16" HOPE PIPE WITH FLANGE CONNECTOR AND DI BACK-UP-RING

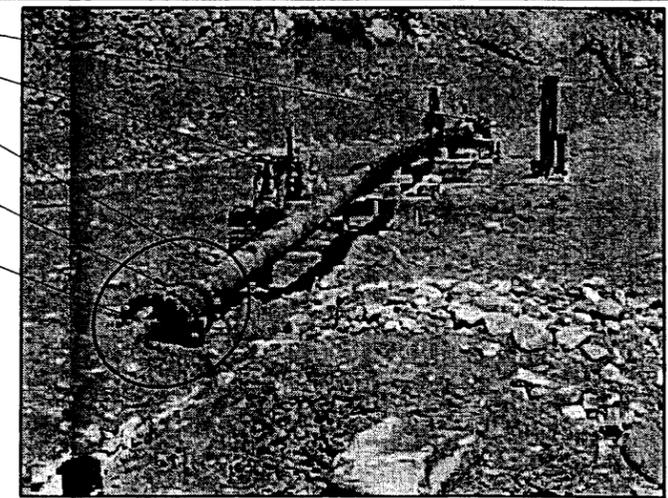
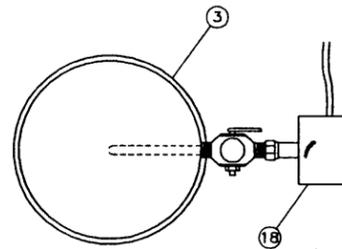
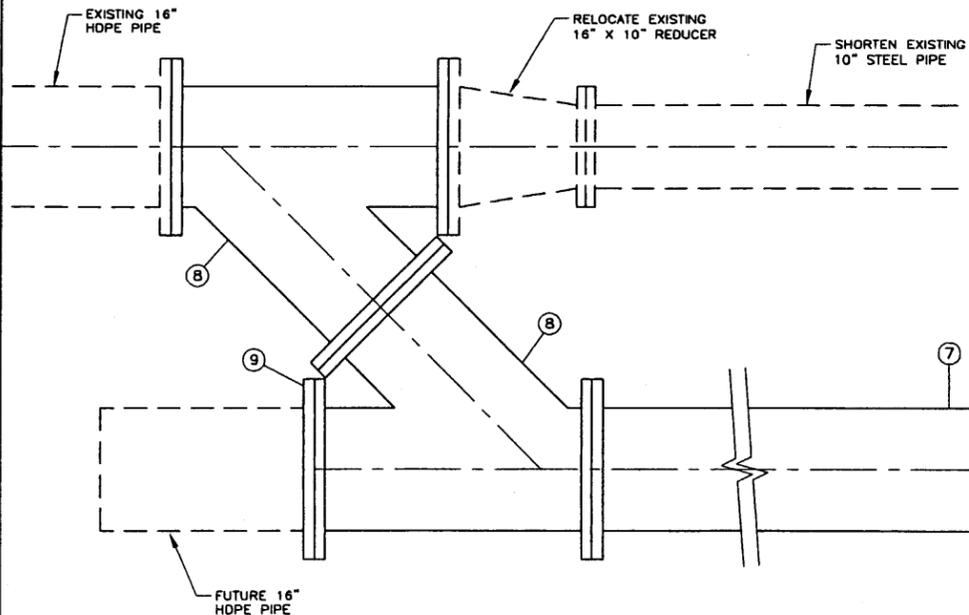


FIGURE 1: PAD SITE

VALVE & FITTING SCHEDULE			
NO.	DESCRIPTION	SIZE	JOINT
1.	LONG RADIUS REDUCING ELBOW	16" X 13 3/8"	FLG
2.	TEE	16" X 4"	FLG
3.	SPOOL PIECE	16" X 8'-0"	FLG
4.	MAG METER (ABB MAG MASTER W/GND RINGS)	16"	FLG
5.	SPOOL PIECE	16" X 4'-0"	FLG
6.	GATE VALVE (MUELER RESILLIANT SEAT WEDGE)	16"	FLG
7.	SPOOL PIECE - STEEL (FIELD VERIFY LENGTH)	16"	FLG
8.	45° WYE	16"	FLG
9.	BLIND FLANGE	16"	FLG
10.	SPOOL PIECE (FIELD VERIFY LENGTH & ANGLE AFTER COMPLETED)	16" X 6'-0"	FLG
11.	13.61° ELBOW (FIELD VERIFY AFTER COMPLETED)	13 3/8"	FLG
12.	SURFACE PLATE	20" X 13 3/8"	FLG
13.	90° ELBOW (BRASS)	4"	THD
14.	PIPE (BRASS)	4"	THD
15.	APCO 1604/152 DAT (AIR VALVE)	4"	FLG
16.	GATE VALVE (MUELLER RESILLIANT SEAT WEDGE)	4"	FLG
17.	#14 MESH STAINLESS STEEL SCREEN	-	-
18.	CONDUCTIVITY SENSOR (ROSEMONT UNILOC CONDUCTIVITY PROBE W/1" STAINLESS STEEL BALL VALVE CAT #140-04)	-	-



SECTION 3
N.T.S.



PLAN VIEW
N.T.S.

NOTES:

1. CONTRACTOR TO SUPPLY PIPE SUPPORT AND FOUNDATIONS EVERY 10 FEET. SHOP DRAWINGS TO BE SUBMITTED FOR REVIEW.
2. CONTRACTOR TO PRIME AND PAINT PIPE TO MATCH EXISTING PIPING FACILITIES.

INSTALL HOSE BIB SAMPLE TAP IN BOTTOM OF PIPE AT 45° OFF VERTICAL

INSTALL OWNER PROVIDED ACTIVATED CARBON SAMPLING SYSTEM

ELECTRICAL CABLE AND 2 1 1/2" HOPE TUBING TO BE INSTALLED ON TOP SIDE OF PUMP COLUMN

FILE NAME: 005.13-130.CADFILES.JAMES CANYON WELL NO. 3_REV.2.DWG
FILE DATE: 3.2.2003 10:47:00 (DRB)



DESIGNED MPW	3-5-03	REVISED SPOOL PIECE (10) LOCATION
DRAFTED MPW	2-24-03	ADDED WELL VENT PIPE AND ACTIVATED CARBON SAMPLING SYSTEM
CHECKED DEH	0	RELEASE FOR CONSTRUCTION
DATE FEBRUARY 2003	NO.	DATE

NO.	DATE	REVISIONS	BY	APVD.

SCALE NOT TO SCALE

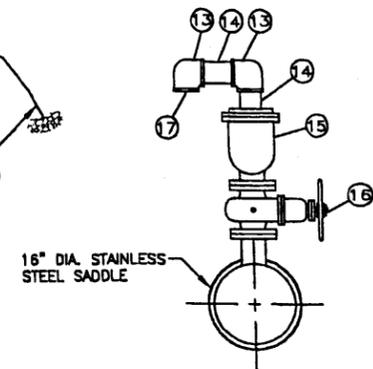
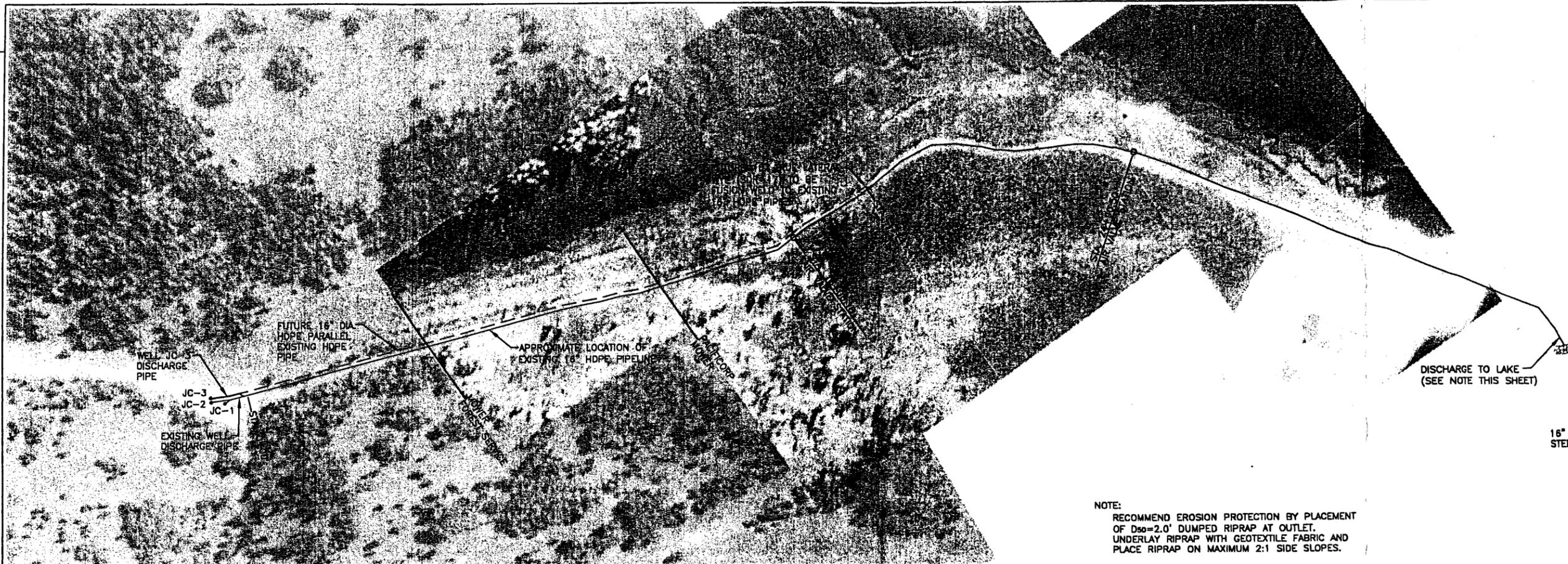
VERIFY SCALE
0" = 1"
BAR IS ONE INCH ON ORIGINAL DRAWING IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.



JAMES CANYON WELL JC-3
PUMP AND PIPING
PLAN VIEW

SHEET NO. C-2
OF 4
005.13.130

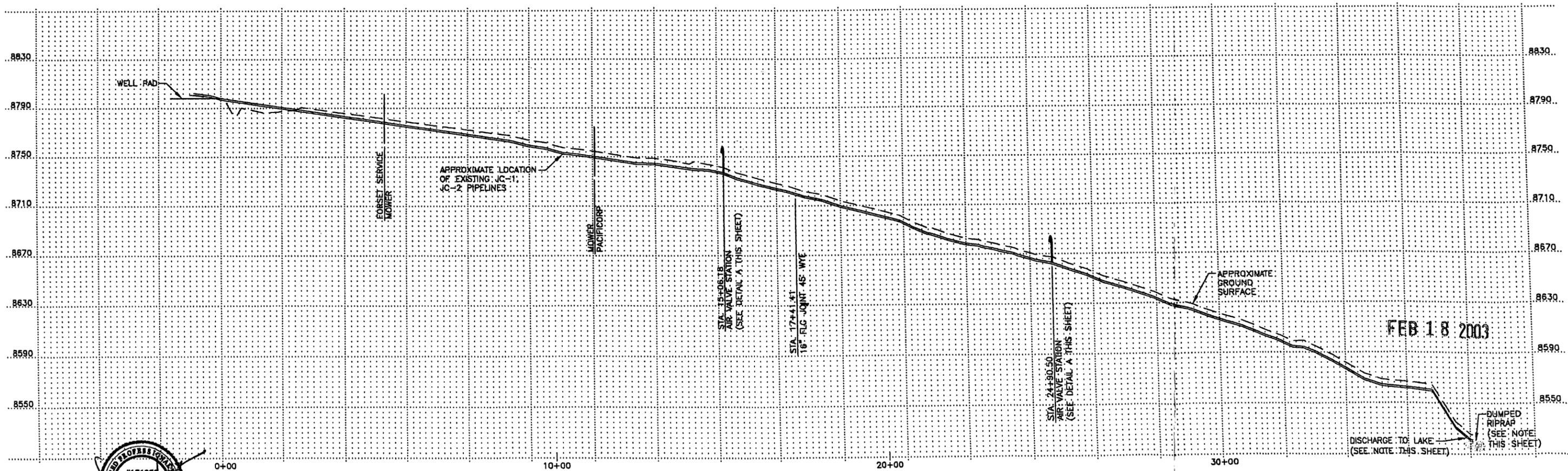
MAR 05 2003



4" AIR VAC DETAIL A
N.T.S.

(SEE VALVE AND FITTING SCHEDULE SHEET C-2)

NOTE:
RECOMMEND EROSION PROTECTION BY PLACEMENT OF $D_{50}=2.0'$ DUMPED RIPRAP AT OUTLET. UNDERLAY RIPRAP WITH GEOTEXTILE FABRIC AND PLACE RIPRAP ON MAXIMUM 2:1 SIDE SLOPES.



FILE NAME: 005.13-130 GAUFILES PIPE LINE PROFILE.DWG
FILE DATE: 2.14.2003 10:58:45 (GMT)

HANSEN ALLEN & LUCE
ENGINEERS



DESIGNED MPW	2
DRAFTED MPW	1
CHECKED DEH	0
DATE FEBRUARY 2003	NO. DATE

RELEASE FOR CONSTRUCTION	
REVISIONS	BY APVD.

SCALE
VERIFY SCALE
0" = 1"
BAR IS ONE INCH ON ORIGINAL DRAWING. THIS SHEET ADJUSTS SCALES ACCORDINGLY.



JAMES CANYON WELL JC-3
PUMP AND PIPING
LOCATION & DETAILS OF NEW JC-3 PIPELINE

SHEET NO. C-4
OF 4
005.13.1

Map(s) is kept with this application located in the Public Information Center of our Salt Lake City office.