2002 ANNUAL REPORT
TO THE
UTAH DIVISION OF OIL, GAS AND MINING

DUGOUT CANYON MINE
C/007/039

Canyon Fuel Company, LLC
P.O. Box 1029
Wellington, UT 84542

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Canyon Fuel Company,
Soldier Canyon Mine
P.O. Box 1029
Wellington, Utah 84542
(435) 637-6360 Fax: (435) 637-0108

COPY

0021

OK

March 27, 2003

Orig. C/007/018
Copy C/007/034
Copy C/007/039 ✓

Ms. Pamela Grubaugh-Littig
Utah Coal Regulatory Program
Utah Division of Oil, Gas and Mining
1594 West North Temple, Suite 1210
Salt Lake City, UT 84114-5801

RE: 2002 Annual Reports for Dugout Canyon Mine, C/007/039; Soldier Canyon Mine, C/007/018; and Banning Loadout, C/007/034

Dear Ms. Pamela Grubaugh-Littig,

Enclosed please find two copies of the Annual Reports for 2002 for the Dugout Canyon Mine, Soldier Canyon Mine, and Banning Loadout.

Should you have any questions concerning this submittal, either contact myself at (435) 636-2869 or Chris Hansen at (435) 448-2669.

Sincerely yours,

Vicky S. Miller

Vicky S. Miller

enclosures

cc: Chris Hansen (letter only)
Dave Spillman (enclosures)
Central Files (enclosures)

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GENERAL INFORMATION

Permitte Name	Canyon Fuel Company, LLC
Mine Name	Dugout Canyon Mine
Operator Name (If other then permittee)	
Permit Expiration Date	March 16, 2008
Permit Number	C/007/039
Authorized Representative Title	Rick Olsen, General Manager
Phone Number	(435) 637-6360
Fax Number	(435) 636-2897
E-mail Address	rolsen@archcoal.com
Mailing Address	P.O. Box 1029, Wellington, Utah 84542
Resident Agent	C.T. Corporate Systems
Resident Agent Mailing Address	50 West Broadway, Salt Lake City, UT 84104
Number of Binders Submitted	(1) One Binder, Two copies

IDENTIFICATION OF OTHER PERMITS

Identify other permits that are required in conjunction with mining and reclamation activities.

Permit Type	ID Number	Description	Expiration Date
MSHA Mine ID(s)	42-01890	Rock Canyon Seam (West Side)	N/A
	42-01888	Gilson Seam (West Side)	N/A
MSHA Impoundment(s)	N/A		
NPDES/UPDES Permit(s)	UTG 040020	UPDES Discharge Permit	April 30, 2003
PSD Permit(s) (Air)	DAQE-001-1999	Air Quality Permit	N/A

Other

Refuse Pile (MSHA)	1211-UT-09-01890-01	Refuse Pile MSHA Number	N/A
Storm Water Permit	UTR000573	Storm Water Discharge Permit	December 1, 2006

CERTIFIED REPORTS

List the certified inspection reports as required by the rules and udder the approved plan that must be periodically submitted t the Division. Specify whether the information is included as Appendix A to this report or currently on file with the Division.

Certified Reports:	Required		Included or on file with DOGM		Comments
	Yes	No	Included	On File	
Excess Spoil Piles	☐	☒	☐	☐	N/A
Refuse Piles	☐	☒	☐	☐	N/A
Impoundments	☒	☐	☒	☐	
Other					
_____	☐	☐	☐	☐	
_____	☐	☐	☐	☐	

REPORTING OF OTHER TECHNICAL DATA

List other technical data and information as required under the approved plan, which must be periodically submitted to the Division. Specify whether the information is included as Appendix B to this report or currently on file with the Division.

Technical Data:	Required		Included or on file with DOGM		Comments
	Yes	No	Included	On file	
Climatological	☐	☒	☐	☐	Not Required
Subsidence Monitoring	☒	☐	☒	☐	
Vegetation Monitoring	☐	☒	☐	☐	Not Required
Raptor Survey	☒	☐	☒	☐	2002 Dugout Canyon Mine
Soils Monitoring	☐	☒	☐	☐	Not Required
Water Monitoring	☒	☐	☐	☒	
First quarter	☒	☐	☐	☒	
Second quarter	☒	☐	☐	☒	
Third quarter	☒	☐	☐	☒	
Fourth quarter	☒	☐	☐	☒	
Geological / Geophysical	☐	☒	☐	☐	Not Required
Engineering	☐	☒	☐	☐	Not Required
Non Coal Waste / Abandoned Underground Equipment*	☐	☒	☐	☐	Not Required
Other Data					
Bat Survey	☒	☐	☒	☐	JBR Environmental Consultants
Drought Study	☒	☐	☒	☐	Petersen Hydrologic
Spotted Owl Report	☐	☒	☒	☐	David W. Willey, Ph.D.
SNOTEL Report	☒	☐	☒	☐	

*Reminder: If equipment has been abandoned during 2002, an amendment must be submitted that includes a map showing its location, a description of what was abandoned, whether there was any hazardous or toxic materials and any revision to the PHC as necessary.

LEGAL, FINANCIAL, COMPLIANCE AND RELATED INFORMATION

Change in administration or corporate structure can often bring about necessary changes to information found in the mining and reclamation plan. The Division is Requesting that each permittee review and update the legal, financial, compliance and related information in the plan as part of the annual report. Provide the department of Commerce, annual Report of Officers, or other equivalent information as necessary to ensure that the information provided in the plan is current. Provide any other change as necessary regarding land ownership, lease acquisitions, legal results from appeals of violations, or other changes as necessary to update information required in the mining and reclamation plan. Include and certified financial statements, audits or worksheets which may be required to meet bonding requirements. Specify whether the information is currently on file with the Division or included as Appendix C to the report.

Legal / Financial Update	**Required** Yes	No	**Included or on File with DOGM** Included	On file	**Comments**
Department of Commerce, Annual Report Officers	☐	☒	☐	☐	
Other					
Officers & Directors	☒	☐	☒	☐	
	☐	☐	☐	☐	
	☐	☐	☐	☐	

MINE MAPS

Copies of mine maps, current and up-to-date through at least December 31, 2001, are to be provided to the Division as Appendix D to this report in accordance with the requirements of R 645-301-525.270. These map copies shall be made in accordance with 30 CFR 75.1200 as required by MSHA. Upon request, the Division shall keep mine maps confidential.

Map Number(s)	**Map Title/ Description**	**Confidential** Yes	No
2002 Gil Prod.	Gilson Seam 2002 Production Map	☒	☐
2002 RC Prod.	Rock Canyon Seam 2002 Production Map	☒	☐
		☐	☐
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		☐	☐
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		☐	☐
		☐	☐

OTHER INFORMATION

Please provide any comments of further information to be included as part of the Annual Report. Any other attachments are to be provided as Appendix E to this report. If information is submitted as a group rather then by individual mine, please identify each of the mine's data in the list below.

Additional attachment to this report? **Yes** ☐ **No** ☒

APPENDIX A

Certified Reports

Excess Spoil Piles
Refuse Piles
Impoundments

As required under R645-301-514

CONTENTS

CERTIFIED IMPOUNDMENT REPORTS

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT			Page 1 of 2
Permit Number	*ACT/007/039*	**Report Date**	*12/31/02*
Mine Name	*Dugout Canyon Mine*		
Company Name	*Canyon Fuel Company, LLC*		
Impoundment Identification	**Impoundment Name**	*Surface Facility Sedimentation Pond*	
	Impoundment Number	*None*	
	UPDES Permit Number	*UTG040020*	
	MSHA ID Number	*Impoundment –None (Mine - 42-01890)*	

IMPOUNDMENT INSPECTION

Inspection Date	*11/15/02*
Inspected By	*Dave Spillman*
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)	*Routine Quarterly Inspection and Annual Certification*

1. Describe any appearance of any instability, structural weakness, or any other hazardous condition.

There were no signs of instability, structural weakness or other hazardous conditions observed during this inspection.

Required for an impoundment which functions as a SEDIMENTATION POND.

2. Sediment storage capacity, including elevation of 60% and 100% sediment storage volumes, and, estimated average elevation of existing sediment.

Sediment Storage Capacity (as designed) - 100% = 0.40 acre-feet @ an elevation of 6,954.4 feet

- 60% = 0.24 acre-feet @ an elevation of 6,952.2 feet

3. Principle and emergency spillway elevations.

Principal Spillway Elevation (as designed) - 6,964.0 feet

Emergency Spillway Elevation (as designed) - 6,964.5 feet

4. Field Information. Provide current water elevation, whether pond is discharging, type and number-of samples taken, monitoring/instrumentation information, inlet/outlet conditions, or other related activities associated with the pond including but not limited to sediment cleanout, pond decanting, embankment erosion/repairs, monitoring information, vegetation on outslopes of embankments, etc.

At the time of the inspection, there had been no discharge from the pond during November. There had been one discharge in October. This discharge was planned and necessary to perform scheduled maintenance on the pond's decanting mechanism.

5. Field Evaluation. Describe any changes in the geometry of the impounding structure, average and maximum depths and elevations of impounded water, estimated sediment or slurry volume and remaining storage capacity, estimated volume of water impounded, and any other aspect of the impounding structure affecting its stability or function which has occurred during the reporting period.

Qualification Statement

I hereby certify that; I am experienced in the construction of impoundments; I am qualified and authorized under the direction of a Registered Professional Engineer to inspect the condition and appearance of impoundments in accordance with the certified and approved designs for this structure; that the impoundment has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability.

Signature: _____ **Date:** _____

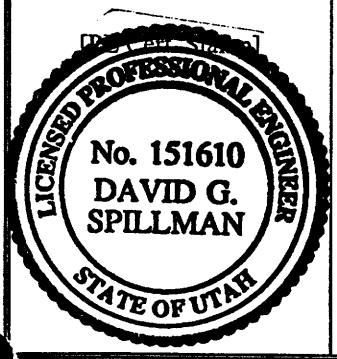
CERTIFIED REPORT

IMPOUNDMENT EVALUATION (If NO, explain under Comments)	YES	NO
1. Is impoundment designed and constructed in accordance with the approved plan?	X	
2. Is impoundment free of instability, structural weakness, or any other hazardous condition?	X	
3. Has the impoundment met all applicable performance standards and effluent limitations from the previous date of inspection?	X	

COMMENTS AND OTHER INFORMATION

Certification Statement:

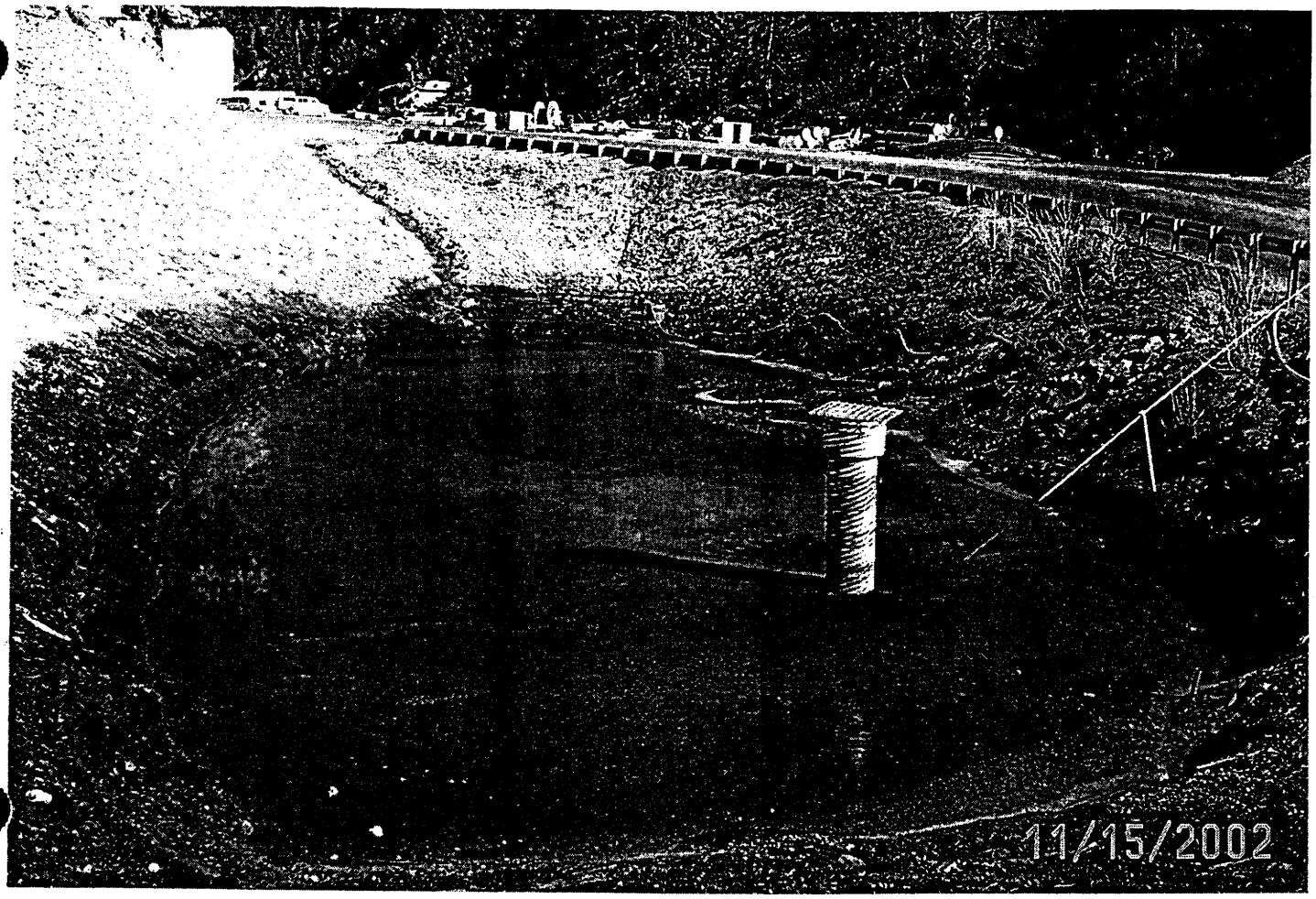
I hereby certify that; I am experienced in the construction of impoundments; I am qualified and authorized in the State of Utah to inspect and certify the condition and appearance of impoundments in accordance with the certified and approved designs for this structure; that the impoundment has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself or under my direction and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability in accordance with the Utah R645 Coal Mining Rules.



By: *David G. Spillman, Technical Services Manager*
(Full Name and Title)

Signature: *David G. Spillman* **Date:** *12/31/02*

P.E. Number & State: *No. 151610, State of Utah*


11/15/2002

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT			Page 1 of 2
Permit Number	*ACT/007/039*	**Report Date**	*12/31/02*
Mine Name	*Dugout Canyon Mine*		
Company Name	*Canyon Fuel Company, LLC*		
Impoundment Identification	**Impoundment Name**	*Surface Facility Wastewater Disposal System (Leach Field)*	
	Impoundment Number	*None*	
	UPDES Permit Number	*None*	
	MSHA ID Number	*None (Mine - 42-01890)*	

IMPOUNDMENT INSPECTION

Inspection Date	*11/15/02*
Inspected By	*Dave Spillman*
Reason for Inspection (Annual, Quarterly or Other Periodic Inspection, Critical Installation, or Completion of Construction)	*Routine Quarterly Inspection and Annual Certification*

1. Describe any appearance of any instability, structural weakness, or any other hazardous condition.

There were no signs of instability, structural weakness or other hazardous conditions observed during this inspection.

Required for an impoundment which functions as a SEDIMENTATION POND.	**2. Sediment storage capacity, including elevation of 60% and 100% sediment storage volumes, and, estimated average elevation of existing sediment.**
	3. Principle and emergency spillway elevations.

4. Field Information. Provide current water elevation, whether pond is discharging, type and number of samples taken, monitoring/instrumentation information, inlet/outlet conditions, or other related activities associated with the pond including but not limited to sediment cleanout, pond decanting, embankment erosion/repairs, monitoring information, vegetation on outslopes of embankments, etc.

At the time of the inspection, the site appeared to be functioning as designed. There was no evidence to suggest that any effluent was improperly flowing to the surface at the septic tank, at the distribution line clean-outs / air vent or down hill from the leach field.

Revegetation success on the site ranges from meager to nonexistent. This was due to the lack of precipitation and/or drought conditions that prevailed during most of 2002.

IMPOUNDMENT INSPECTION AND CERTIFIED REPORT		Page 2 of 2

5. Field Evaluation. Describe any changes in the geometry of the impounding structure, average and maximum depths and elevations of impounded water, estimated sediment or slurry volume and remaining storage capacity, estimated volume of water impounded, and any other aspect of the impounding structure affecting its stability or function which has occurred during the reporting period.

Qualification Statement	I hereby certify that; I am experienced in the construction of impoundments; I am qualified and authorized under the direction of a Registered Professional Engineer to inspect the condition and appearance of impoundments in accordance with the certified and approved designs for this structure; that the impoundment has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability. **Signature:** _____ **Date:** _____

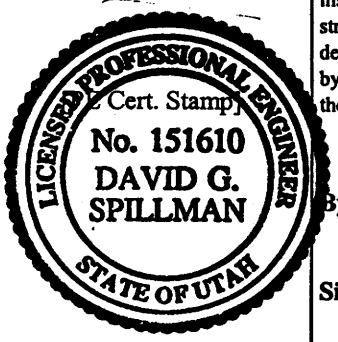
CERTIFIED REPORT

IMPOUNDMENT EVALUATION (If NO, explain under Comments)	YES	NO
1. Is impoundment designed and constructed in accordance with the approved plan?	*X*	
2. Is impoundment free of instability, structural weakness, or any other hazardous condition?	*X*	
3. Has the impoundment met all applicable performance standards and effluent limitations from the previous date of inspection?	*X*	

COMMENTS AND OTHER INFORMATION

The Dugout Canyon Mine wastewater disposal system was approved for operation on October 30, 2001. The Utah Department of Environmental Quality, Southeast Utah District, granted this approval.

Certification Statement:	I hereby certify that; I am experienced in the construction of impoundments; I am qualified and authorized in the State of Utah to inspect and certify the condition and appearance of impoundments in accordance with the certified and approved designs for this structure; that the impoundment has been maintained in accordance with approved design and meet or exceed the minimum design requirements under all applicable federal, state and local regulations; and, that inspections and inspection reports are made by myself or under my direction and include any appearances of instability, structural weakness or other hazardous conditions of the structure affecting stability in accordance with the Utah R645 Coal Mining Rules. **By:** *David G. Spillman, Technical Services Manager* (Full Name and ~~Title~~) **Signature:** *David G. Spillman* **Date:** *12-31-02* **P.E. Number & State:** *No. 151610, State of Utah*



11/15/2002

Report of 2002 Hydrologic Monitoring at the Soldier Canyon and Dugout Canyon Mines

Canyon Fuel Company, LLC
Soldier Canyon and Dugout Mines
Wellington, Utah

PETERSEN HYDROLOGIC
CONSULTANTS IN HYDROGEOLOGY

Report of 2002 Hydrologic Monitoring at the Soldier Canyon and Dugout Canyon Mines

25 March 2003

Canyon Fuel Company, LLC
Soldier Canyon and Dugout Mines
Wellington, Utah

PETERSEN HYDROLOGIC
CONSULTANTS IN HYDROGEOLOGY

Report of 2002 Hydrologic Monitoring at the Soldier Canyon and Dugout Canyon Mines

25 March 2003

Canyon Fuel Company, LLC
Soldier Canyon and Dugout Mines
Wellington, Utah

Prepared by:

Erik C. Petersen, P.G.

PETERSEN HYDROLOGIC
CONSULTANTS IN HYDROGEOLOGY

2695 N. 600 E.
LEHI, UTAH 84043
(801) 766-4006

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Appendix 2 Solute Laboratory reporting sheets

Report of 2002 Hydrologic Monitoring at the Soldier Canyon and Dugout Canyon Mines

1.0 Introduction

Canyon Fuel Company's Soldier Canyon and Dugout Canyon Mines are located in the Book Cliffs coal field, approximately 10 miles northeast of the town of Wellington, Utah (Figure 1). As part of a comprehensive groundwater and surface-water investigation performed by Mayo and Associates (1996) a rigorous hydrologic monitoring plan was recommended that would validate their findings that:

1) The Blackhawk Formation in which the mined coal seams exist does not contribute baseflow to streams in the permit area,
2) Groundwater systems in the Flagstaff Limestone and North Horn Formations operate independently of groundwater systems in the Blackhawk Formation
3) The temporal variability of spring discharge rates from the Flagstaff Limestone and North Horn Formations are due to climatic variability, and
4) Mining will not affect groundwater systems in the Flagstaff Limestone and North Horn Formation.

In order to validate these findings, the monitoring plan recommended by Mayo and Associates specifies that weekly monitoring of selected springs and streams and periodic sampling for tritium will occur between 1 April and 31 August during the first wet or dry year occurrence. Wet or dry years for the mine area are defined based on the Natural Resource Conservation Service snow pack measurements as of 1 March for the Price River-San Rafael River Basin. A wet year occurs when the snow pack water content is greater than 110% of normal. A dry year occurs when the snow pack water content is less than 70% of normal.

The recommended monitoring plan was approved by the Utah Division of Oil, Gas and Mining and implemented by Canyon Fuel Company. As of 1 March 2002, the snow pack for the Price-San Rafael Basin was less than 70% of normal, and the rigorous dry-year monitoring protocol was implemented. The purpose of this report is to:

1) Present the 2002 hydrologic monitoring data in tabular and graphical form, and
2) Analyze the monitoring data to provide verification that the findings of Mayo and Associates, listed above, are correct.

Including this introduction, this report contains the following sections:

1. Introduction
2. Methods of study
3. Climate
4. Presentation of data

5. Blackhawk Formation contributions to streams
6. Discharge characteristics and temporal variability of Flagstaff Limestone and North Horn Formation springs
7. Potential for mining-related impacts to Flagstaff Limestone and North Horn Formation springs
8. References cited

2.0 Methods of Study

Stream discharge measurements were performed by Canyon Fuel personnel using area-velocity techniques during high-flow periods and using a calibrated container and a stopwatch during low-flow periods. Spring discharge measurements were performed by Canyon Fuel personnel using a calibrated container and a stopwatch.

Samples for tritium analysis were collected in tightly sealed amber glass bottles by Canyon Fuel personnel. Tritium analyses were performed using direct counting techniques by the Tritium Laboratory, University of Miami, Florida. Tritium laboratory reporting sheets are included in Appendix A.

Samples of groundwater and surface water for solute analysis were collected in laboratory provided containers. Most solute analyses were performed by ACZ Laboratories, Inc. of Steamboat Springs, Colorado. Other solute analyses were performed by Commercial Testing

and Engineering Co. of Huntington, Utah. Solute laboratory reporting sheets are included in Appendix B.

Field water quality measurements including discharge temperature, pH, specific conductivity, and dissolved oxygen were measured in the field by Canyon Fuel personnel.

Solute data were analyzed using Stiff (1951) diagrams. Discharge and tritium data were plotted on X-Y graphs for analysis.

Climatic conditions in the region were evaluated using the Palmer Hydrologic Drought Index and precipitation data collected at the Dugout Canyon Mine.

3.0 Climate

Daily precipitation data are collected at the Dugout Canyon Mine weather station. Precipitation data for the period 1 April to 31 August 2002 (the period of hydrologic monitoring) are listed on Table 2. The total precipitation for this five-month period was 2.32 inches, which is reflective of the drought conditions that prevailed during the period of monitoring.

Plots of the Palmer Hydrologic Draught Index (PHDI; NCDC, 1997; Karl, 1986; Guttman, 1991) for Utah Divisions 6 and 7 are shown in Figure 2. The Soldier Canyon and Dugout

Canyon Mines lie near the intersection of these two regions and the PHDI for both regions has been utilized in this analysis. The PHDI indicates the long-term climatic trends for the region. It is a monthly value generated by the National Climatic Data Center that indicates the severity of a wet or dry spell. The PHDI is computed from climatic and hydrologic parameters such as temperature, precipitation, evapotranspiration, soil water recharge, soil water loss, and runoff. Because the PHDI takes into account parameters that affect the balance between moisture supply and moisture demand, the index is a useful tool for evaluating the long-term relationship between climate and groundwater recharge and discharge. The PHDI is useful for determining whether variations in spring or stream discharges are the result of climatic variability or whether they are the result of other factors.

The plots of the PHDI for Utah Regions 6 and 7 indicate that the period of hydrologic monitoring (1 April to 31 August 2002) was one of extreme drought.

4.0 Presentation of Data

Discharge, solute compositions, and tritium contents of groundwaters and surface waters monitored in 2002 are presented in Table 3. Solute compositions are plotted graphically as Stiff (1951) diagrams on Figure 3. The solute composition of groundwaters monitored historically in the Soldier Canyon Mine are listed in Table 4 and shown graphically as Stiff diagrams in Figure 4. Stiff diagrams are a useful tool to analyze and compare the major ion chemistry of groundwater and surface water. The shape of a stiff diagram is a function of the

chemical type of the water, while the size of the Stiff diagram is a function of the total dissolved solids concentration of the water.

Discharge hydrographs for each of the hydrologic monitoring sites for 2002 are presented in Figure 5. The daily precipitation data from the Dugout Canyon Mine are also plotted on bar graphs in Figure 5. Stream discharge hydrographs allowing comparison of discharge at different locations for each of the major stream drainages in the permit area are presented in Figure 6. Also included on Figures 5 and 6 are time series plots of tritium contents for each monitoring site. A brief overview of the practical application of tritium in hydrogeologic applications is given below.

Tritium (^{3}H) is the radioactive isotope of hydrogen. Tritium has been used in groundwater investigations to differentiate between groundwaters that recharged prior to or after the advent of atmospheric thermonuclear weapons testing. Tritium, with a half-life of 12.43 years, forms naturally in the upper stratosphere by the interaction of ^{14}N with cosmic ray neutrons. Tritium is rapidly incorporated into water molecules and is removed from the atmosphere by precipitation.

Prior to the advent of atmospheric thermonuclear weapons testing in 1952, tritium activity in precipitation ranged from about 4 to 25 tritium units (TU; Mayo and Associates, 1996). One TU equals one ^{3}H atom per 10^{8} hydrogen atoms. In mountainous areas, larger natural concentrations have been observed (Fontes, 1983). During the peak of atmospheric weapons testing, tritium levels in precipitation rose to more than 2,200 TU in some northern

hemisphere locations (Fontes, 1983). As of 1987, the ^{3}H concentrations in rain water varied from 25 to 50 TU. Unpublished data of 1991, 1992, and 1997 snow and rain samples collected in the central Wasatch Range, Utah have tritium concentrations ranging from about 5 to 20 TU or more (Mayo and Associates, 1996). Thus, at present, the tritium concentration of precipitation waters in the Wasatch Plateau and Book Cliffs area are similar to pre-bomb levels. Generally, groundwater that has a component of recharge older than about 50 years will contain some tritium (generally greater than about 1 TU), while groundwater older than about 50 years will contain little or no tritium (Clark and Fritz, 1997).

The analytical errors associated with the tritium analyses used in this investigation are indicated on the tritium laboratory reporting sheets (Appendix A). Tritium analyses used in this investigation were performed using direct counting methods. Generally, the eTU (laboratory analytical error) for direct-count tritium analysis is on the order of 2.5 to 3 TU.

In evaluating the tritium contents of groundwaters and surface waters monitored in the permit area during 2002, it is important to consider that most springs and streams in the Book Cliffs and Wasatch Plateau that receive annual recharge have tritium contents ranging from about 5 to 25 TU, while deep, Blackhawk Formation groundwater encountered in underground mine workings in the permit area are generally many thousands of years old and contain no tritium (average tritium content = 0.09 TU; Table 4). Discharge from the deep groundwater systems intercepted by coal mine workings in the region are not influenced by climatic or seasonal variations (Mayo and Associates, 1996). Therefore, were deep Blackhawk Formation

groundwater systems contributing baseflow to streams, this contribution would be anticipated to be entirely independent of seasonal or climatic variability.

5.0 Blackhawk Formation Contributions to Streams

Discharge and tritium data were collected from the four principal surface-water drainages during 2002. These include the Soldier Creek drainage, Dugout Creek drainage, Pace Canyon Creek drainage, and the Rock Canyon Creek drainage. Discharge hydrographs and tritium contents for these streams are shown on Figures 6a-6d. These data were collected for the purpose of determining whether the Blackhawk Formation (or other geologic formations stratigraphically above the coal seams) contributes baseflow to these drainages. Groundwater-surface-water interactions in each of the four principal drainages are discussed below.

Soldier Canyon Creek

Soldier Canyon Creek is monitored at site G-7, which is located in the North Horn Formation north of the permit area, and at G-6, which is located in the Blackhawk Formation above the mine discharge point. These sites are shown on Figure 1. It is apparent from the discharge hydrograph for Soldier Creek (Figure 6a) that, during the high-flow period, the discharge at the upper site is generally greater than at the lower site. During the low-flow period from early June to late August, the discharges at the upper and lower sites are essentially equal (within the error of the measurement technique). Thus, there is no significant contribution to

the discharge in Soldier Creek from bedrock lithologies in the monitored reach of the drainage. The fact that the discharge in Soldier Creek diminished to less than 1 gpm at the lower monitoring site (G-6) during August 2002 likewise indicates that there is not a significant contribution from deep, drought-resistant bedrock groundwater systems. It is likely that the stream losses observed between G-6 and G-7 are the result of evapotranspiration losses and possibly also as a result of the stream loosing water to shallow groundwater systems in hydraulic communication with the creek.

The solute composition of surface water in Soldier Creek measured at G-6 and G-7 is somewhat distinct from the other stream systems in the permit and adjacent areas (Figure 3). Most notably, the sodium content of Soldier Creek water at both G-6 and G-7 is elevated relative to other streams in the permit area (Figure 3; Table 3). The solute composition of Soldier Creek is likely influenced by discharge from the North Horn Formation Spring 10 (Sulfur Spring) and diffuse seepage from similar groundwater systems in the nearby vicinity. Spring 10 discharges water that is elevated in sodium content (and other constituents) relative to most shallow groundwater in the region.

Based on the stream discharge data at G-6 and G-7 (consistently lower discharge downstream relative to the upstream monitoring location), it is evident that there is no appreciable groundwater contribution to Soldier Creek below G-7 during drought conditions. In this stream reach, Soldier Creek flows over portions of the Price River Formation, Castlegate Sandstone, and Blackhawk Formation.

Dugout Canyon Creek

Dugout Canyon Creek is monitored at sites DC-4 and DC-5 (upper left and upper right forks, respectively), at DC-2 (lower main fork), and at DC-3 (lower right fork tributary). These sites are shown on Figure 1. Sites DC-4 and DC-5 are located at the upper Blackhawk Formation contact with the overlying Castlegate Sandstone. Sites DC-2 and DC-3 are located in the Blackhawk Formation above the mined coal seams. Discharge hydrographs and tritium contents in Dugout Canyon Creek are shown in Figure 6b. The upstream discharge in Dugout Canyon Creek (above the Blackhawk Formation) is represented by the combined discharge in DC-4 and DC-5. The downstream discharge (lower Blackhawk Formation) is measured at DC-2. It is apparent from Figure 6b that during the 2002 high-flow season, the discharge in the upstream reach of Dugout Canyon Creek is similar to or greater than that measured at the lower reach. During the mid-season, discharge at the lower site was consistently lower than that above. During the 2002 low-flow season, all of the monitoring stations in Dugout Canyon Creek eventually became dry. Based on these observations, it is concluded that there is not a measurable contribution to the baseflow of Dugout Canyon Creek from the Blackhawk Formation during drought conditions. The lower right fork tributary to Dugout Canyon Creek (measured at DC-3) flows over the entire section of the Blackhawk Formation above the coal seams. The fact that DC-3 went dry in mid-May 2002 (Table 2) indicates that there is not a significant contribution to baseflow discharge in Dugout Canyon Creek from the Blackhawk Formation during drought conditions.

The tritium content measured at both upstream and downstream locations in Dugout Canyon Creek are similar, and the concentrations are consistent with modern recharge. There is no

decrease in the tritium content at downstream monitoring locations as would be anticipated were deep, tritium-free groundwater from the Blackhawk Formation entering the stream channel. Likewise, the solute compositions of stream water monitored at upstream and downstream locations are similar. The solute composition of deep Blackhawk Formation groundwater (as monitored in the Soldier Canyon Mine; Table 4; Figure 6) is fundamentally different from stream water in Dugout Canyon Creek.

Pace Canyon Creek

Pace Canyon Creek is monitored at PC-1A, which is situated on the North Horn Formation east of the permit area, and at PC-2, which is situated on the Blackhawk Formation (Figure 1). Discharge hydrographs and tritium plots for Pace Canyon Creek are shown on Figure 6c. During April and May, the discharge measured at PC-1A was greater than that measured at PC-2. During June, July, and August, the discharge at PC-1A stabilized at approximately 7 to 8 gpm, while the discharge at PC-2 ceased. This indicates that the Blackhawk Formation (which would be expected to be drought resistant) is not yielding water to the Pace Canyon Creek drainage. The 7 to 8 gpm loss between PC-1A and PC-2 is likely the result of evapotranspiration loss and possibly to recharge of shallow groundwater systems over this approximately 3.5 mile reach of the stream.

The increase in TDS and other chemical constituents in PC-2 relative to PC-1A is likely caused by dissolution of soluble minerals as the meager stream discharge flows over the 3.5 mile stream reach. The tritium content measured at both PC-1A and PC-2 are similar and are

consistent with modern recharge water. There is no indication of an influx of tritium-free Blackhawk Formation water into the stream.

Rock Canyon Creek

Rock Canyon Creek is monitored at RC-1, which is located on the Blackhawk Formation immediately above the mined coal seams (Figure 1). No discharge occurred at RC-1 during the 2002 hydrologic monitoring. This indicates that there is not any appreciable contribution to baseflow in Rock Canyon Creek derived from the Blackhawk Formation.

6.0 Discharge characteristics and Temporal Variability of Flagstaff Limestone and North Horn Formation Springs

Selected springs from the Flagstaff Limestone and North Horn Formation were monitored weekly for discharge and field parameters in 2002 to determine spring discharge characteristics in these geologic formations. Selected springs from the Colton Formation and Castlegate Sandstone were also monitored. The discharge characteristics of springs in each of these formations are described below.

Colton Formation

Two springs in the Colton Formation were monitored in 2002. These include SC-65 and spring 260. Discharge hydrographs and tritium contents for these springs are shown on Figures 5a and 5b. Discharge from SC-65 during 2002 was meager, ranging from 0.12 to 0.76 gpm. From mid-May through the end of August, 2002, discharge at SC-65 declined

continuously. Discharge at spring 260 showed a sporadic, gradual decline during the 2002 monitoring, with a discharge ranging from 6.4 to 19 gpm. Rather than a gradual, predictable discharge recession as would be anticipated were a large, buffered groundwater system being drained, discharge from spring 260 was sporadic. The sporadic discharge from spring 260 suggests local recharge influences to the spring.

The fact that both of the Colton Formation springs show marked seasonal variability in discharge rate and rapid responses to local recharge and/or climatic events (as evidenced by the sporadic nature of the hydrograph recessions) suggests that the groundwater systems from which these springs discharge are local in nature. The solute compositions of these springs are consistent with shallow groundwaters encountered elsewhere in the region and are dissimilar to deep groundwaters encountered in the Blackhawk Formation. The low-flow and high-flow tritium samples from both Colton Formation springs are consistent with modern recharge. There is no late-season decline in the tritium concentrations relative to the high-flow concentrations at the Colton Formation springs that could be indicative of a deeper, drought-resistant component of recharge to the springs. There is no indication that these springs are sustained from a deep, regional aquifer such as the deep Blackhawk Formation groundwater systems encountered in the mine.

Flagstaff Limestone

Two springs from the Flagstaff Limestone were monitored during 2002. These include SP-20 and SC-100. Discharge hydrographs and tritium plots for these springs are shown in Figures 5c and 5d, respectively. Discharge from both Flagstaff springs is meager. Discharge

from SP-20 during 2002 ranged from 2.26 to 0.16 gpm. The recession characteristics of SP-20 are consistent with that of the fractured limestone groundwater system that supports the spring. Because the groundwater storage capacity of the fractured limestone is low, the discharge declines rapidly after the annual snowmelt event. The discharge from SC-100 shows a meager discharge and a rapid discharge recession. The initial discharge from SC-100 during 2002 was only 0.13 gpm and within two weeks the spring was dry.

The discharge characteristics of the Flagstaff Limestone springs monitored in 2002 clearly demonstrate that there is no contribution from deep aquifers to the Flagstaff Limestone. The tritium contents of both springs are consistent with modern recharge water. The low-flow tritium sample from SP-20 is similar to that of the high-flow sample. The solute compositions of the Flagstaff Limestone springs in the permit area are consistent with shallow groundwaters encountered elsewhere in the region and are dissimilar to deep groundwaters encountered in the Blackhawk Formation in the permit area. These factors indicate that there is not a component of deep groundwater sustaining the Flagstaff Limestone springs.

North Horn Formation

Most springs in the Soldier Canyon and Dugout Canyon Mine area discharge from the North Horn Formation. The North Horn springs monitored during 2002 include SC-116, SC-14, and springs 5, 10, 23, 24, 200, 203, and 259. Discharge hydrographs and tritium plots for these springs are shown on Figures 5e-5m. Four of these springs, springs 23, 24, 227, and 259 were dry throughout the 2002 monitoring, and spring 200 discharged only for a few days

at a meager 0.0013 gpm (Table 3). With the exception of spring 203, where discharge ranged from 2.5 to 6.7 gpm, all North Horn Formation springs had peak discharges less than 2 gpm. All of the North Horn Formation springs showed marked discharge declines as the year progressed in 2002. With the exception of Spring 10 (discussed below), there is no evidence of any significant baseflow component that could be derived from discharge from a deep aquifer system. Likewise, the chemical compositions of these springs are generally similar to other springs discharging from shallow groundwater systems in the region. Significant seasonable variability in solute composition at individual springs is also not apparent (Figure 3). This is significant because, were deep Blackhawk Formation groundwaters contributing to the discharge of North Horn Formation springs, it would be anticipated that the solute compositions of North Horn Formation springs would become similar to the Blackhawk Formation groundwater during the late season. This is not the case.

Similarly, the tritium contents of these springs are consistent with modern recharge and do not show significant late-season declines that could indicate a baseflow component derived from deeper aquifer systems.

Mayo and Associates (1996) determined that spring 10, unlike most other springs in the region, is supported by discharge from deeper groundwater systems. Spring 10 is believed to be associated with upwelling of groundwater along a fracture system that was encountered underground in the Soldier Canyon Mine. Radiocarbon dating of spring 10 groundwater indicates a mean groundwater residence time of approximately 10,000 years (Mayo and Asociates, 1996). Tritium concentrations at spring 10 measured during 2002 were low,

ranging from 0 to 2 TU. The discharge from spring 10 shows a gradual decline during 2002 (Figure 5h), suggesting that there is some component of modern recharge to the spring. The solute composition of groundwater from spring 10 is similar to groundwaters encountered in some portions of the Soldier Canyon Mine, suggesting similar geochemical evolutionary pathways.

Castlegate Sandstone

A single spring from the Castlegate Sandstone (spring 227) was monitored during 2002. This spring was dry throughout the 2002 monitoring (Figure 5n). This indicates that there is not a deep source of groundwater that can sustain discharge from the spring during drought conditions.

7.0 Potential for mining-related impacts to Flagstaff Limestone and North Horn Formation springs

As was discussed in Section 6, discharge, solute, and tritium data clearly demonstrate that springs in the Colton Formation, Flagstaff Limestone, and North Horn Formation are supported by local, shallow groundwater systems. Spring discharge from these formations is not supported from deep Blackhawk Formation groundwater systems such as those encountered in the Soldier Canyon and Dugout Canyon Mines. As was described by Mayo and Associates (1996) the deep Blackhawk Formation groundwater systems are not in hydraulic communication with the perched, shallow groundwater systems that overlie the Blackhawk Formation. This is evidenced by the very old groundwater encountered in the

coal mines, and the lack of seasonal variability in groundwater discharge in the mine. Consequently, the interception and dewatering of deep Blackhawk Formation groundwater systems will likely have no impact on the discharge from springs in the Colton Formation, Flagstaff Limestone, North Horn Formation, or Castlegate Sandstone.

Mining has already been completed beneath spring 10 in the now sealed Soldier Canyon Mine. Impacts to discharge or water quality at spring 10 were not observed (Mayo and Asociates, 1996).

8.0 References Cited

Clark, I.D., and Fritz, P., 1997, Environmental isotopes in hydrogeology, Lewis Publishers, Boca Raton, New York, 329 p.

Fontes, J.Ch., 1983, Dating of groundwater in Guidebook on nuclear techniques in hydrology, 1983 edition: International Atomic Energy Agency, Technical Report, Series 91, p. 285-317.

Karl, T.R., 1986, The sensitivity of the Palmer Drought Severity Index and Palmer's Z-Index to their calibration coefficients including potential evapotranspiration: Journal of Climate and Applied Meteorology, v. 25, p. 77-86.

Guttman, N.B., 1991, A Sensitivity analysis of the Palmer Hydrologic Drought Index: Water Resources Bulletin, v. 27, n. 5, p. 797-807.

Mayo and Associates, 1996, Investigation of groundwater and surface-water systems at the Alkali Creek and Dugout Canyon areas, Utah, unpublished consulting report.

NDCD (National Climatic Data Center), 1998, Online monthly climatic parameters: www.ncdc.noaa.gov/coop-precip.html.

Stiff, A.H., Jr., 1951, The interpretation of chemical water analyses by means of patterns: Journal of Petroleum Techniques, Technical Note 84, p. 15-17.

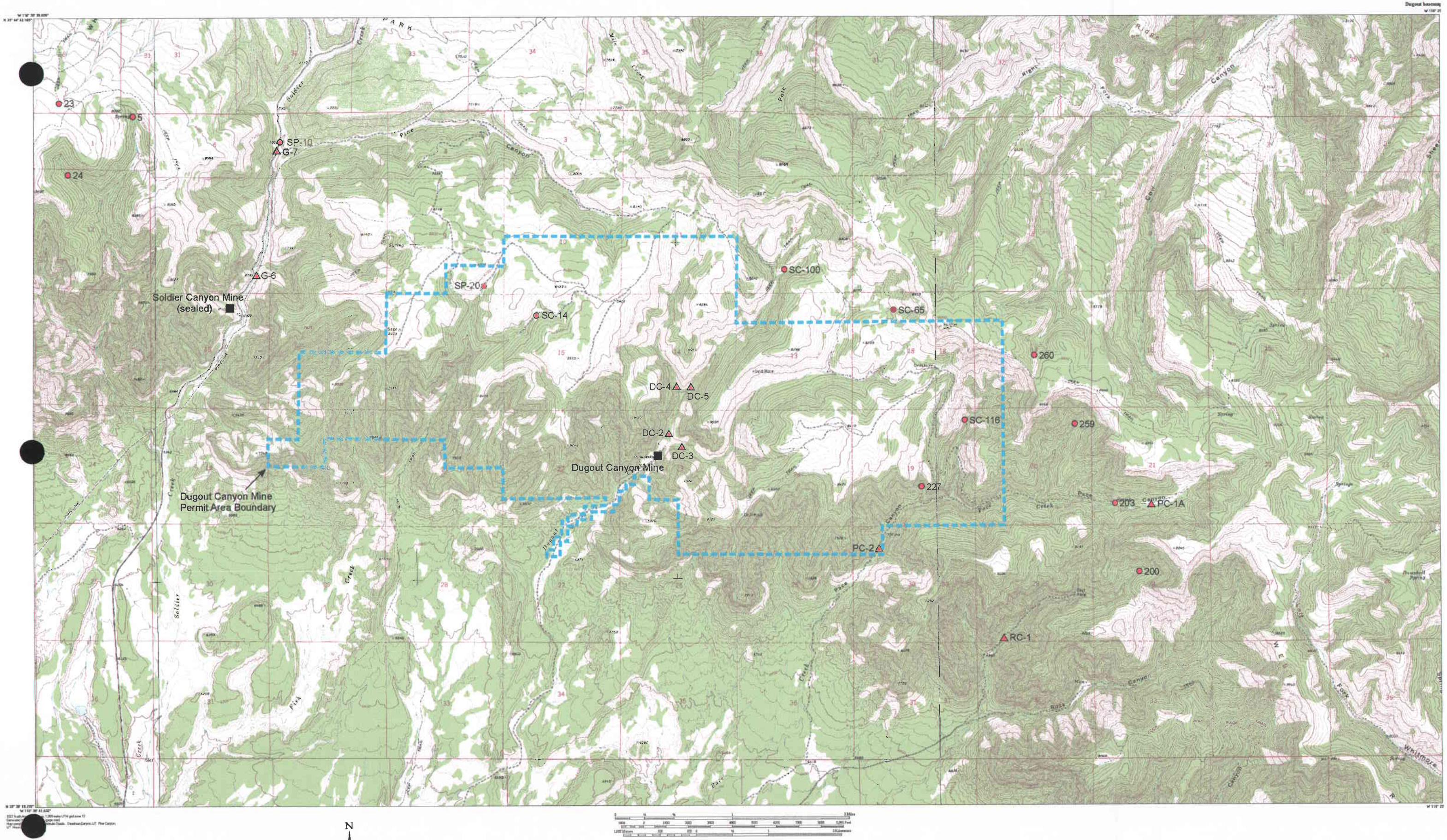
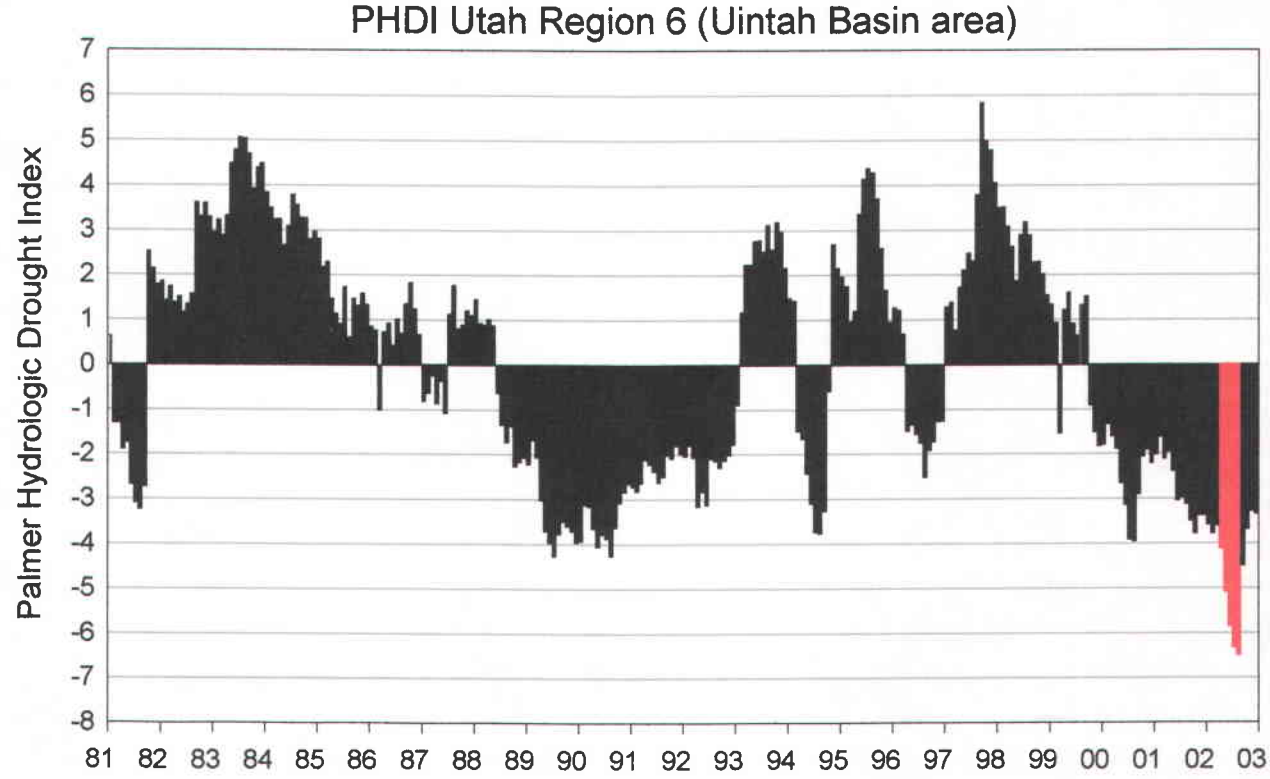
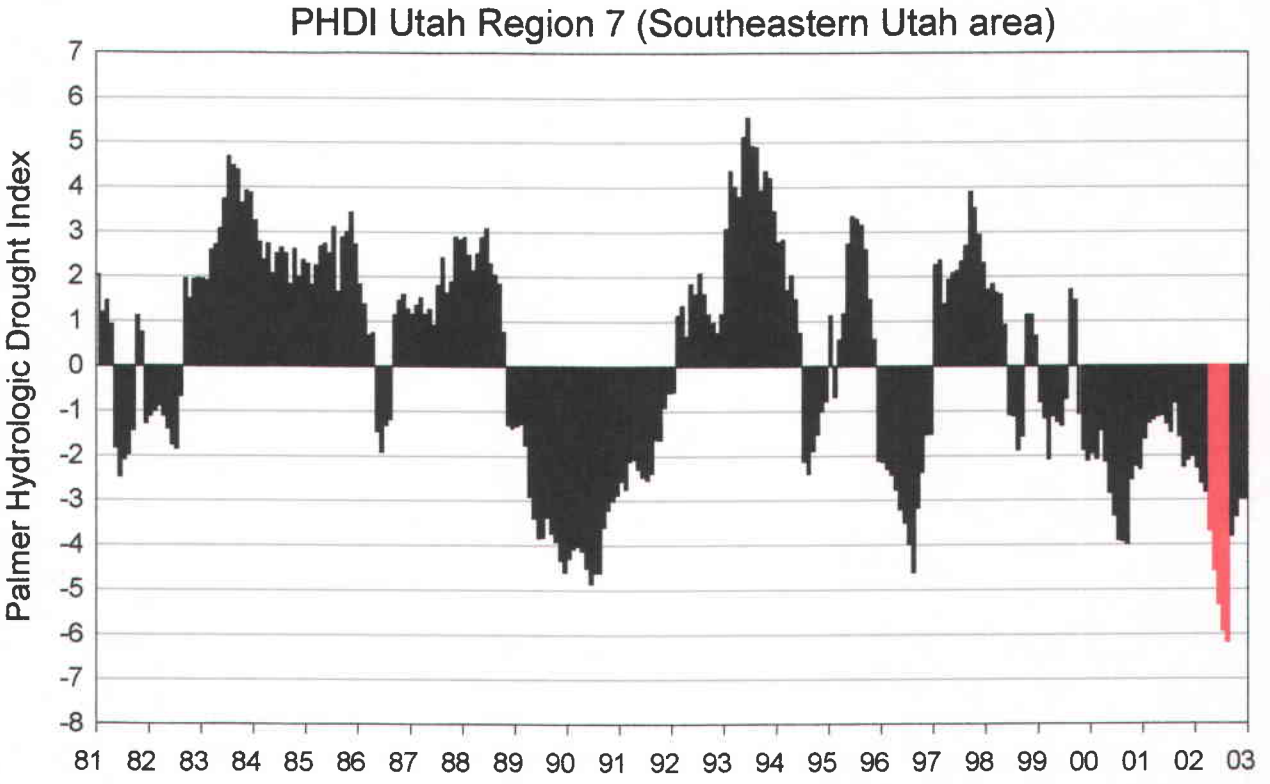


Figure 1 Monitoring locations at the Soldier Canyon and Dugout Canyon Mines.





-1 to -2 Mild Drought	1 to 2 Mild Wet Spell
-2 to -3 Moderate Drought	2 to 3 Moderate Wet Spell
-3 to -4 Severe Drought	3 to 4 Severe Wet Spell
-4 to -5 Extreme Drought	4 to 5 Extreme Wet Spell

Figure 2 Palmer Hydrologic Drought Index, Utah Region 6 and 7.
Time period of 2002 hydrologic monitoring shown in red.

PETERSEN HYDROLOGIC
14 Mar 03 Dugout basemap.cdr

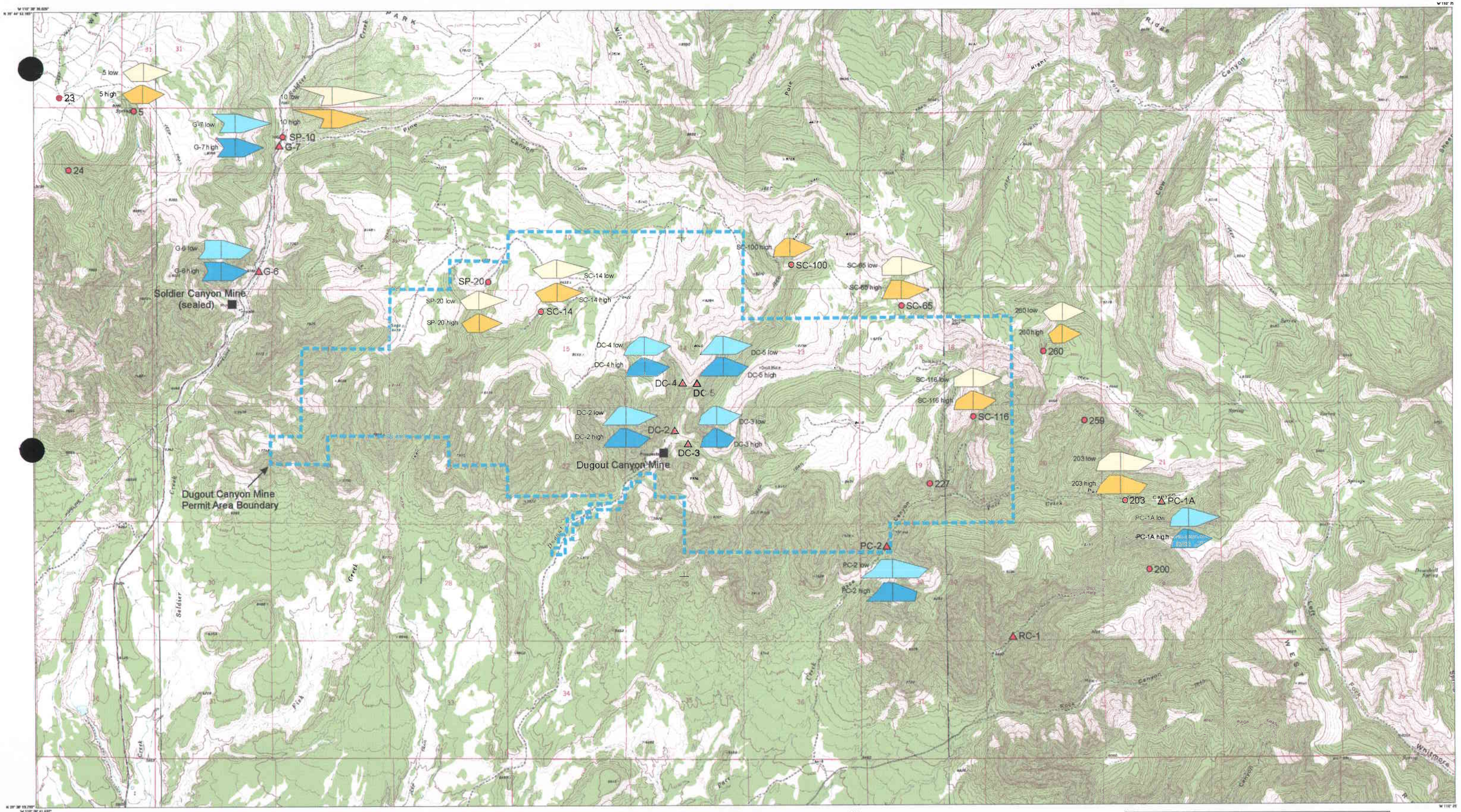


Figure 3 Stiff diagrams for springs and streams in the Soldier Creek / Dugout Mines area.

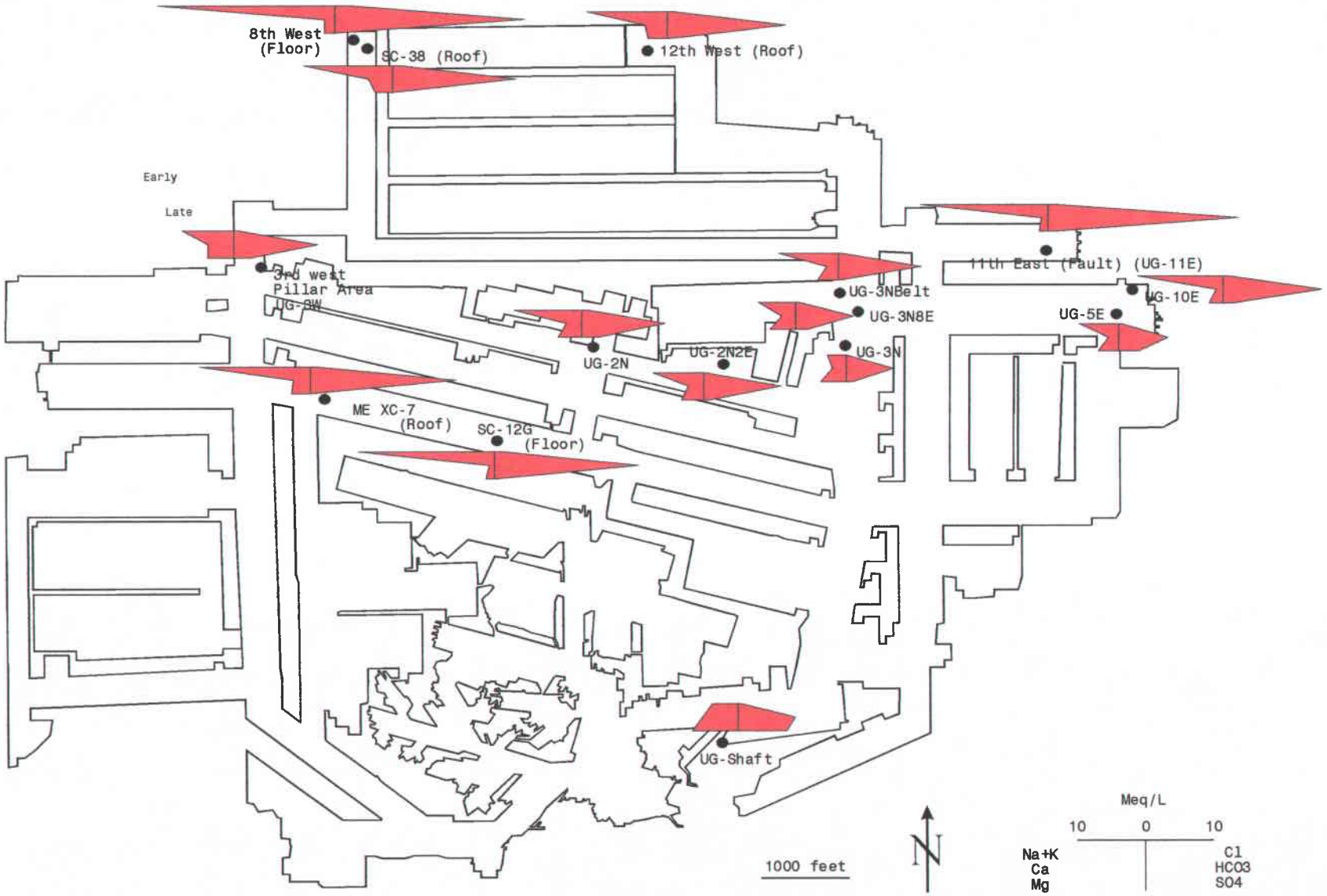
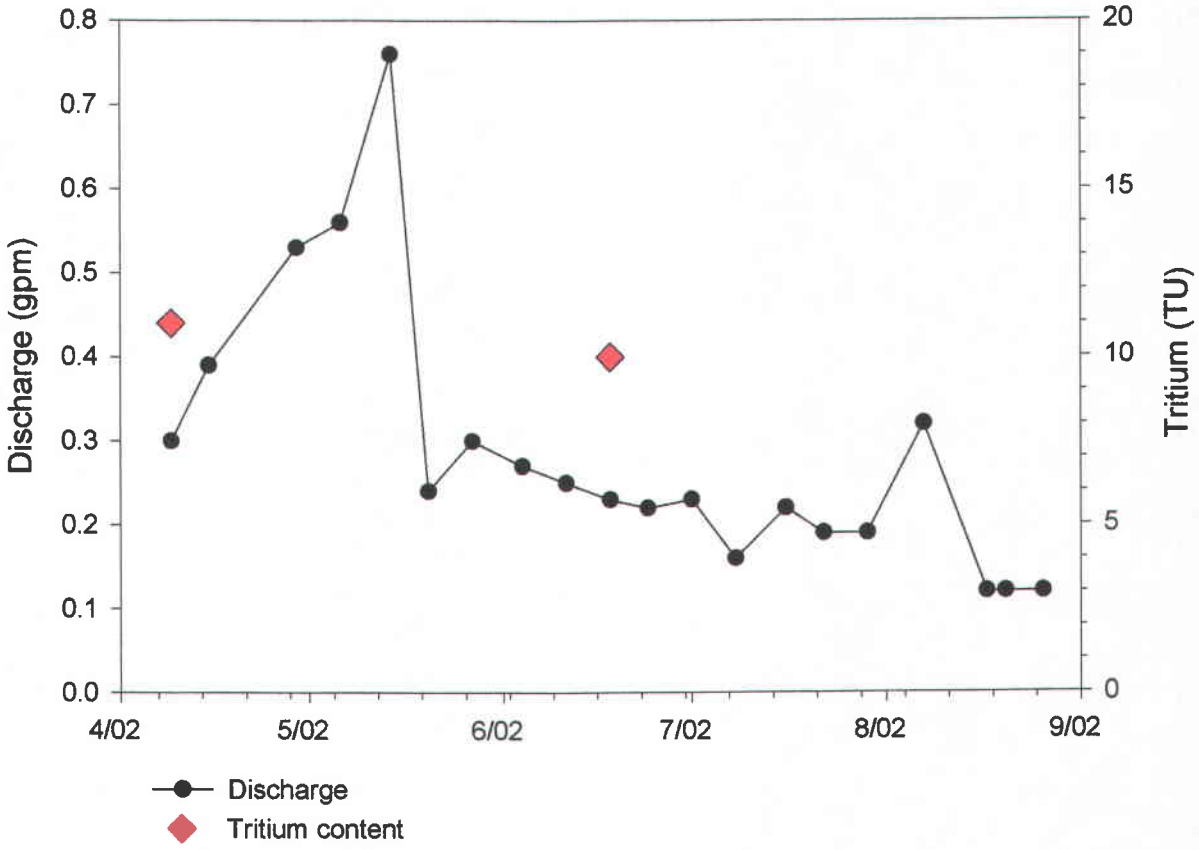


Figure 4 Stiff diagrams of the solute compositions of Soldier Canyon Mine groundwaters.
(Data from Soldier Canyon monitoring data and Mayo and Associates 1995 sampling)

SC-65



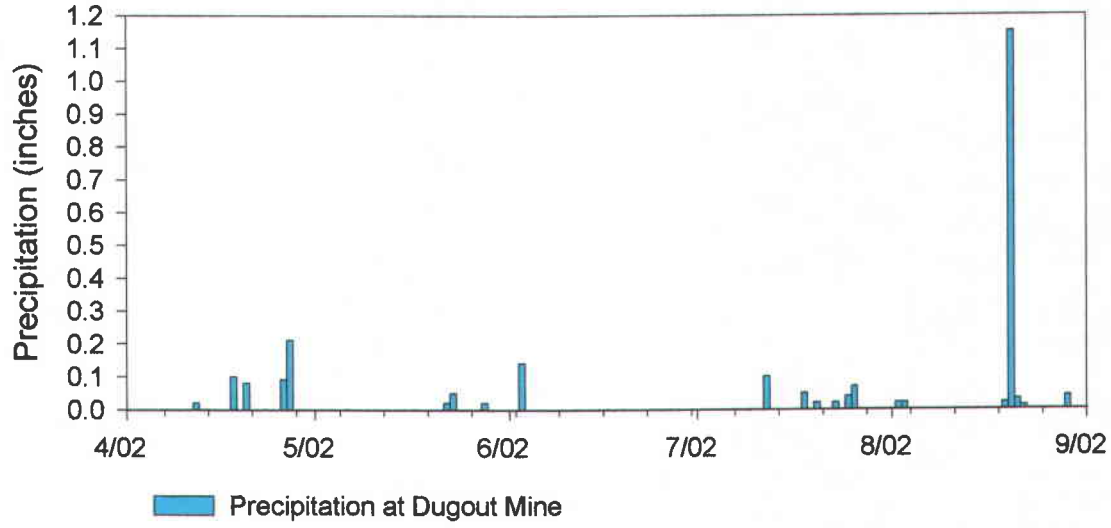
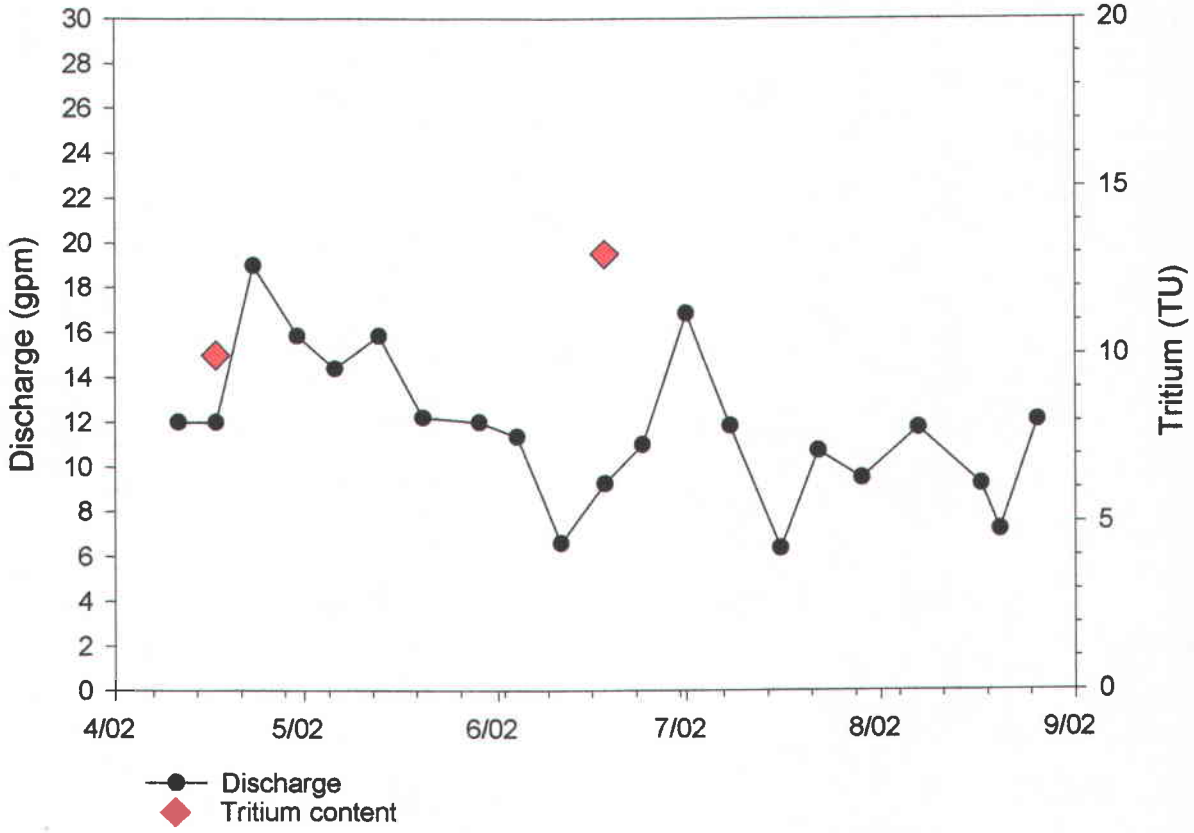


Figure 5a Plots of discharge and tritium content at SC-65, and precipitation at the Dugout Mine rain guage.



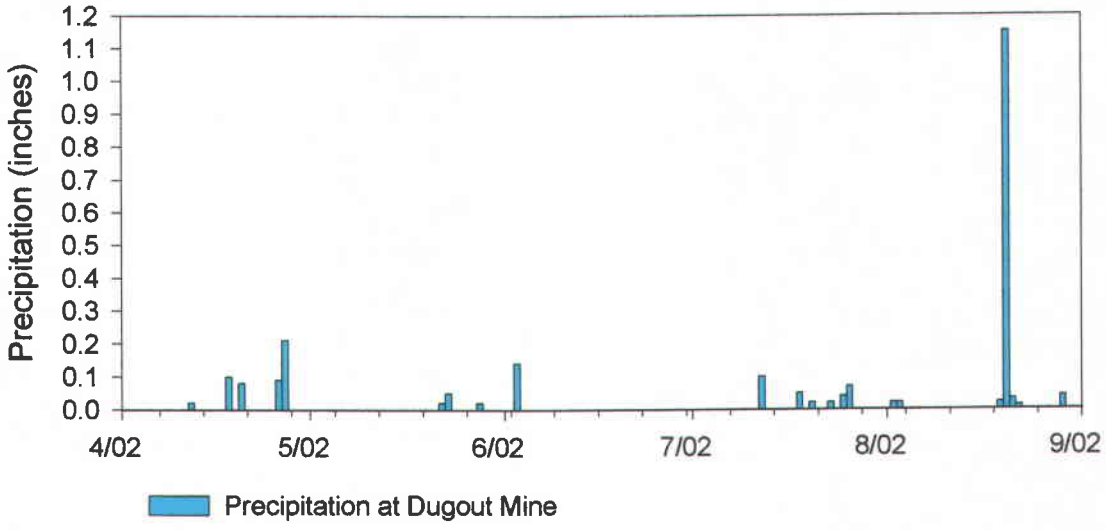
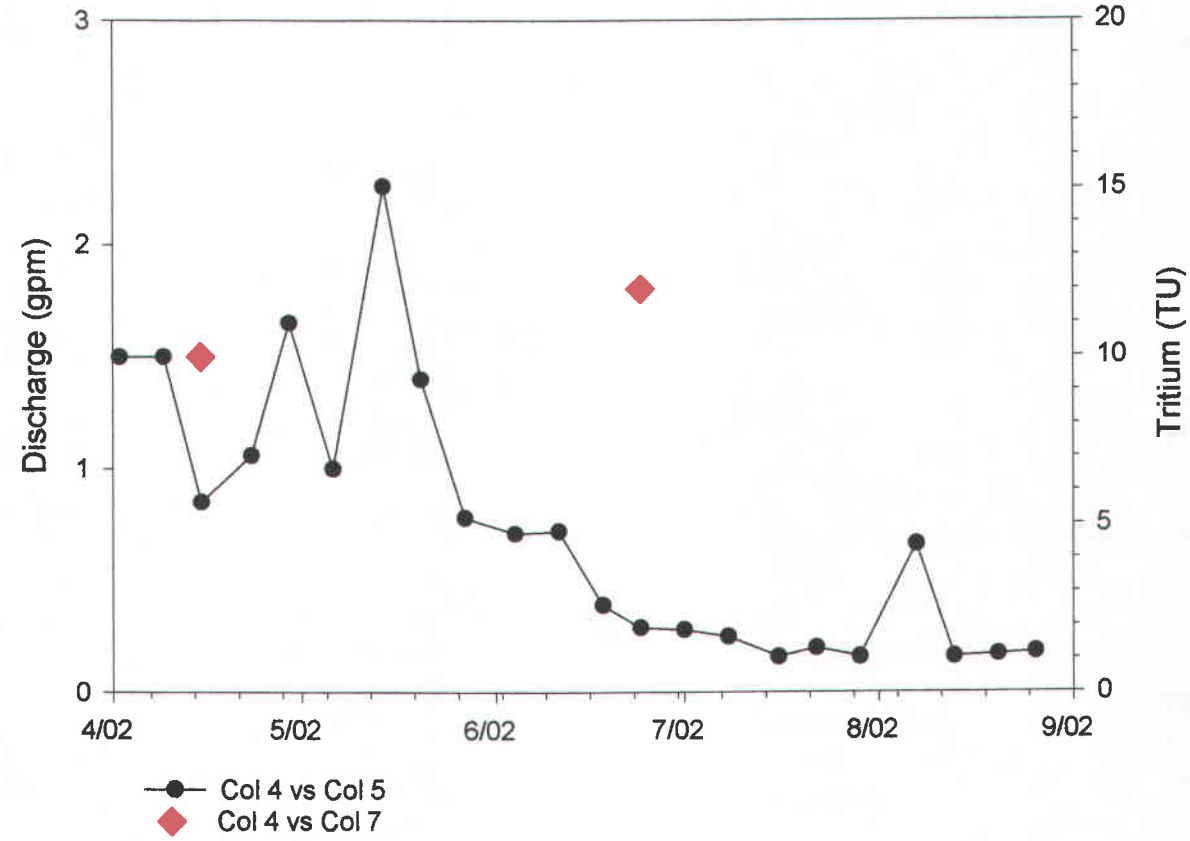


Figure 5b Plots of discharge and tritium content at site 260, and precipitation at the Dugout Mine rain guage.

SP-20



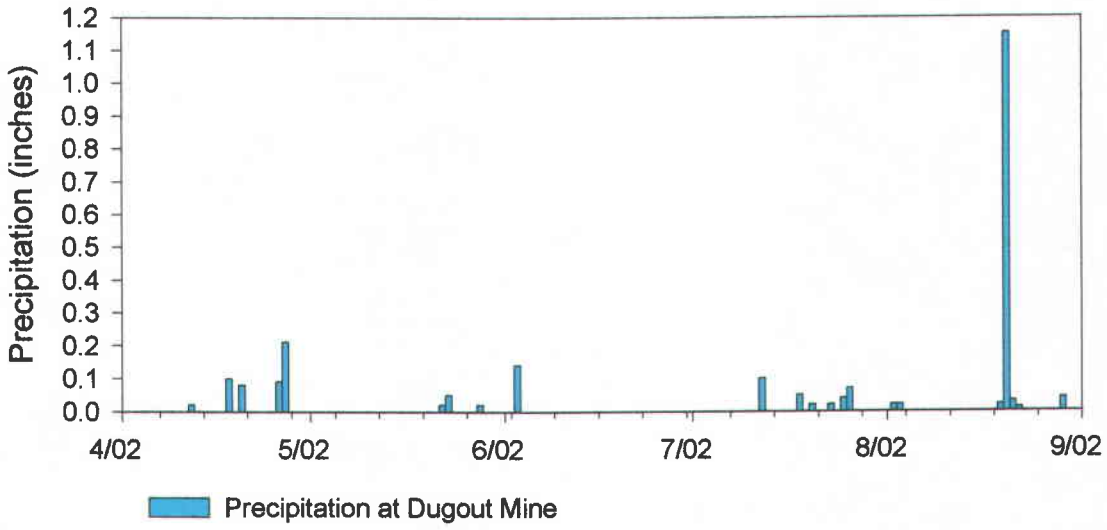
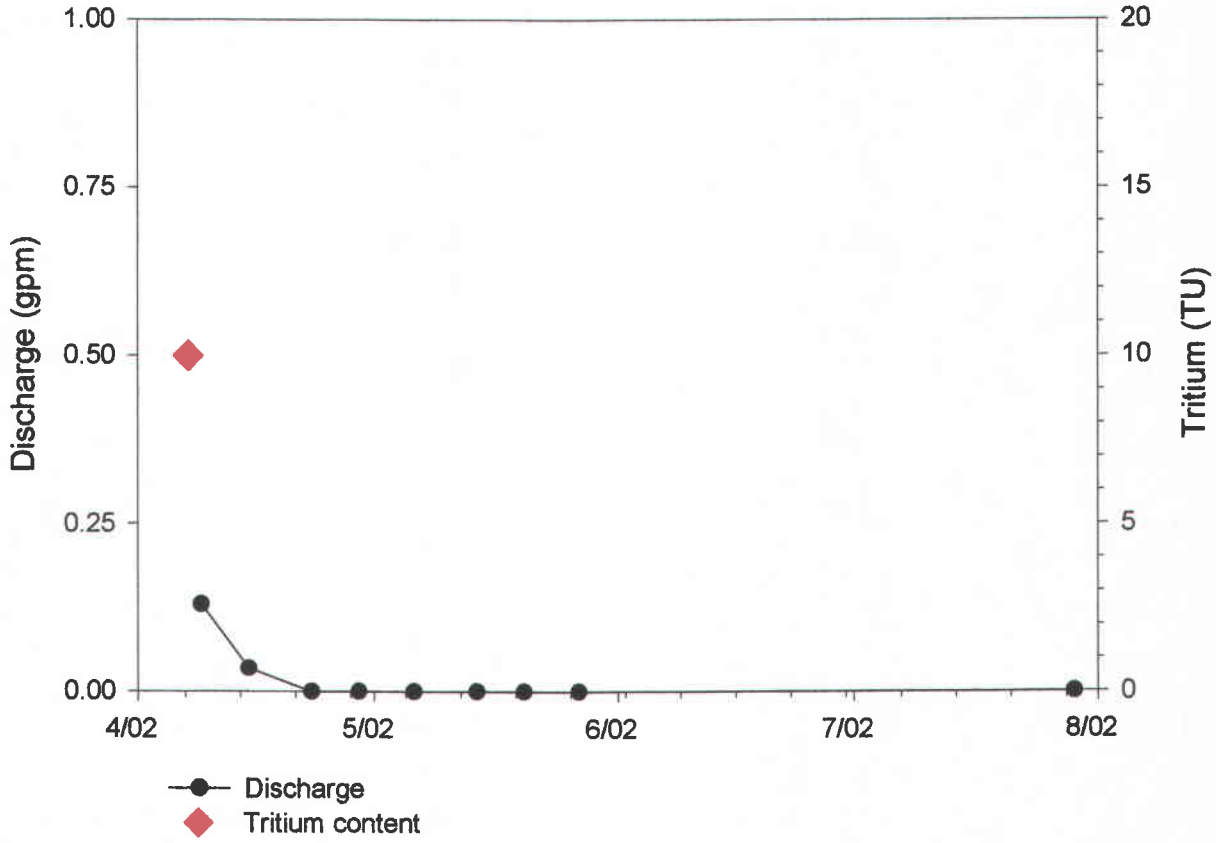


Figure 5c Plots of discharge and tritium content at SP-20, and precipitation at the Dugout Mine rain guage.

SC-100



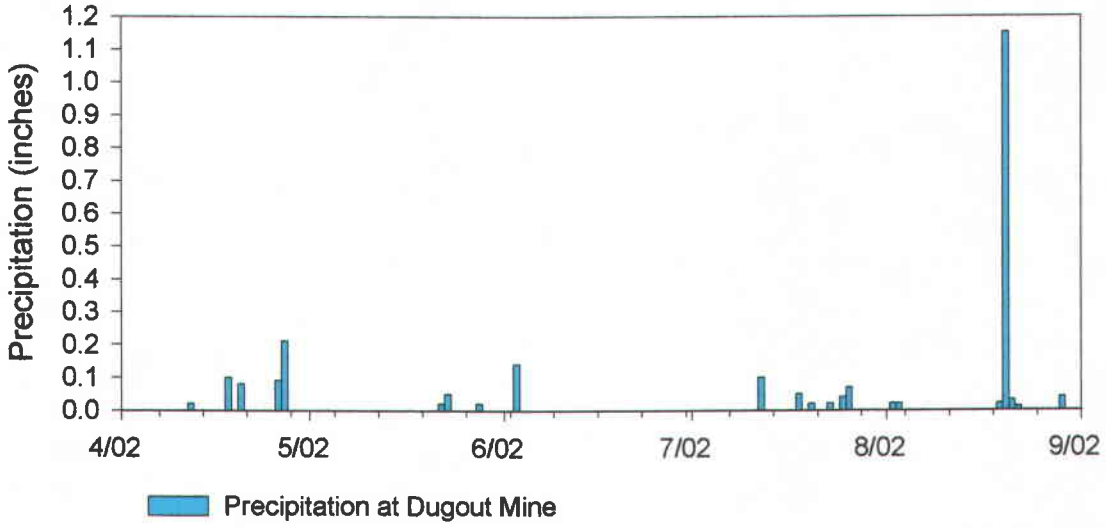
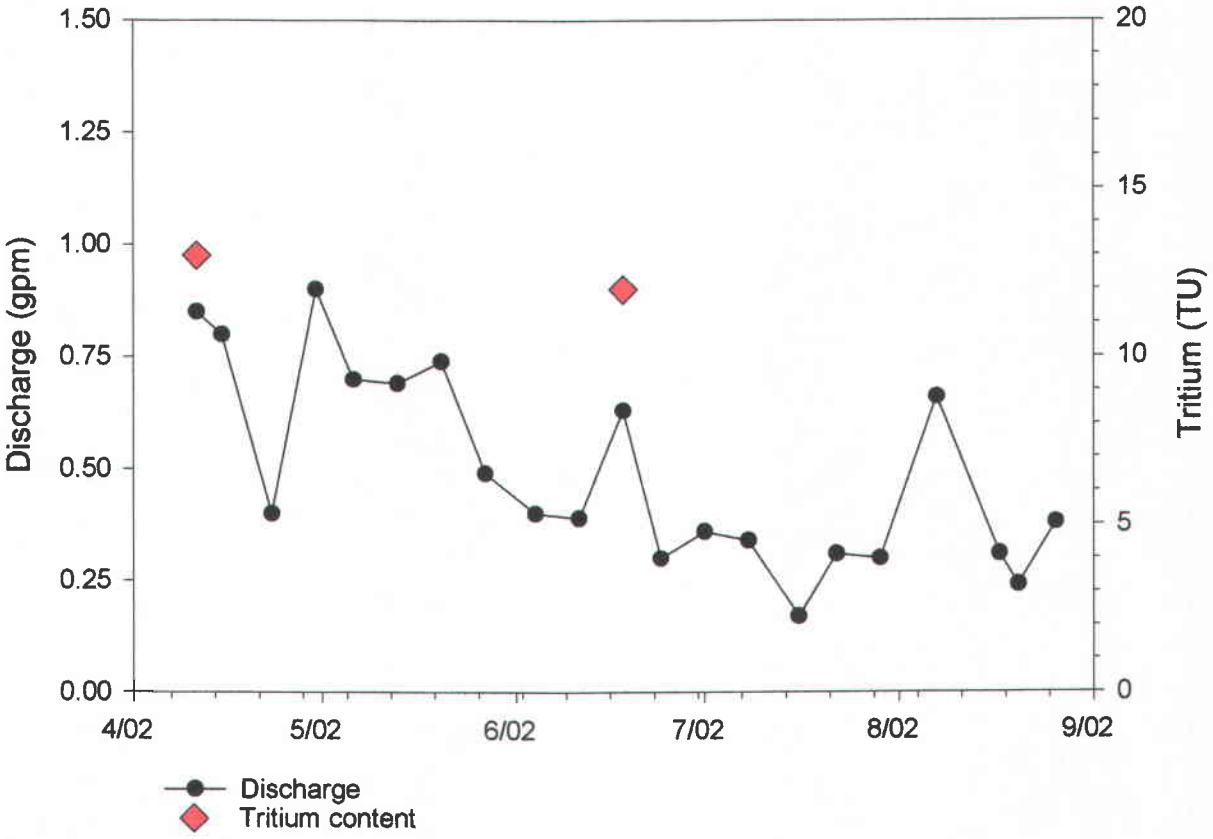


Figure 5d Plots of discharge and tritium content at SC-100, and precipitation at the Dugout Mine rain guage.

SC-116



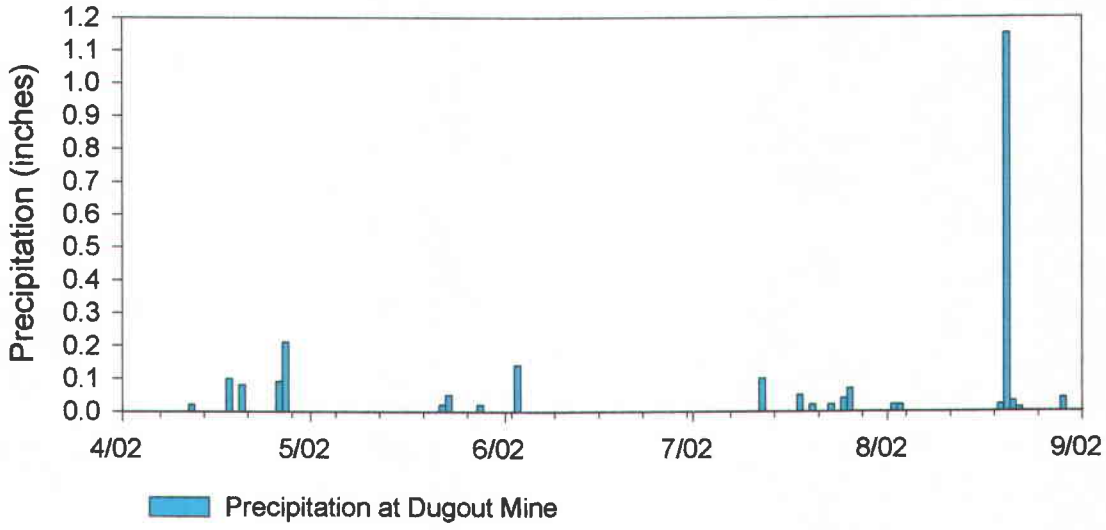
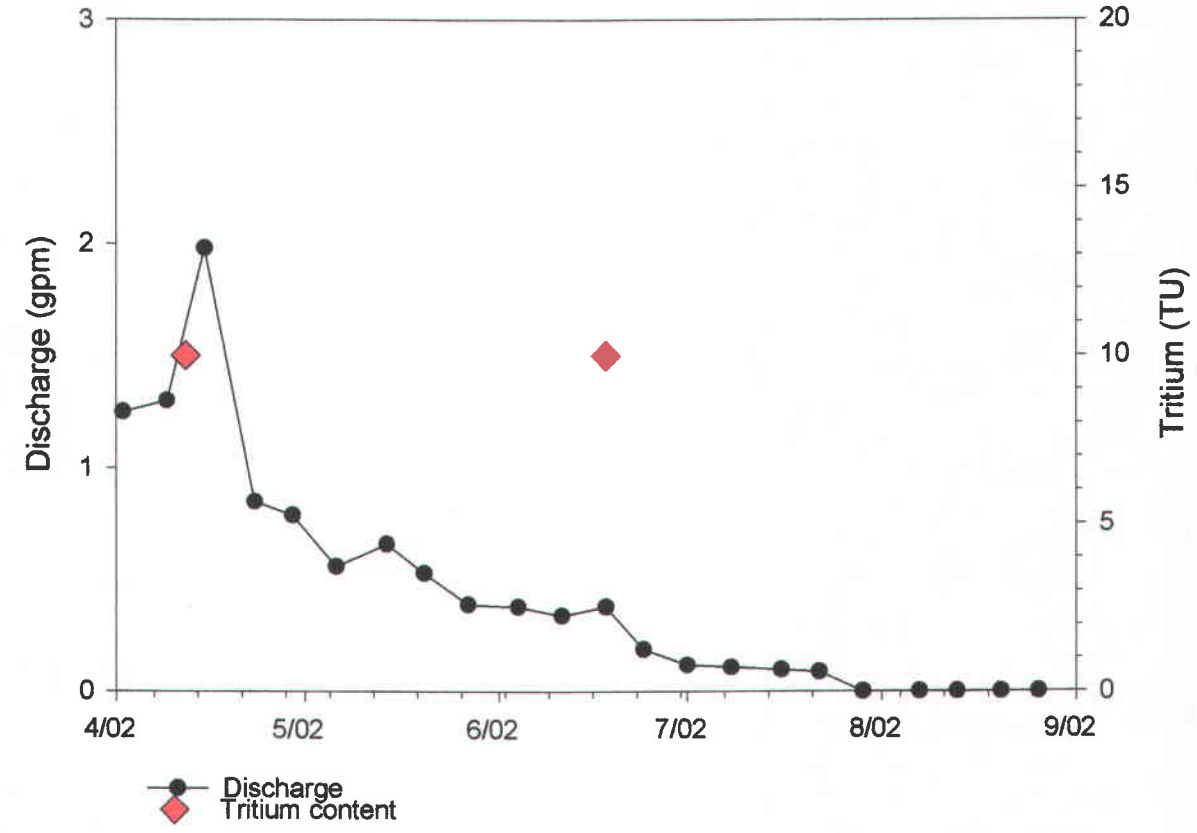


Figure 5e Plots of discharge and tritium content at SC-116, and precipitation at the Dugout Mine rain guage.

SC-14



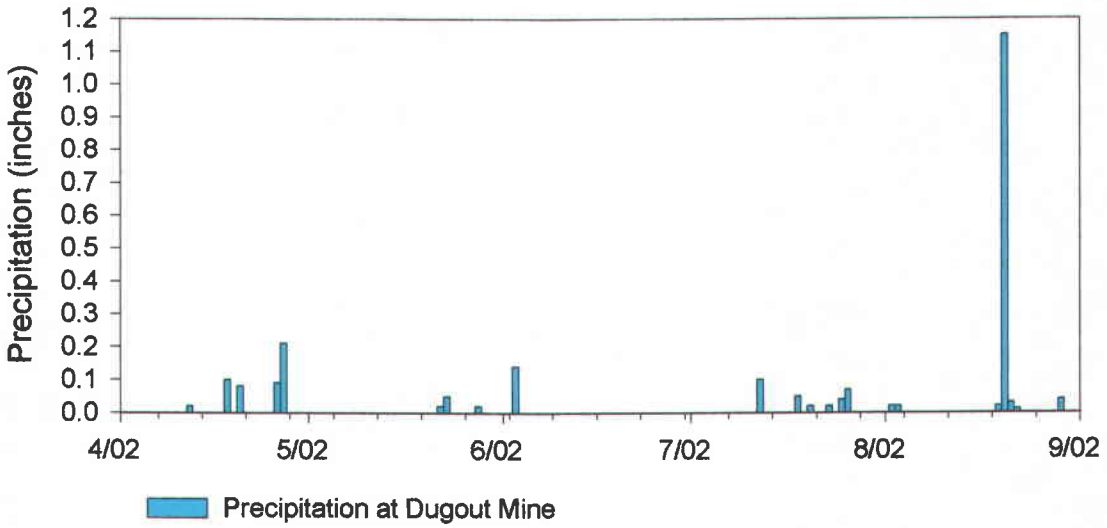
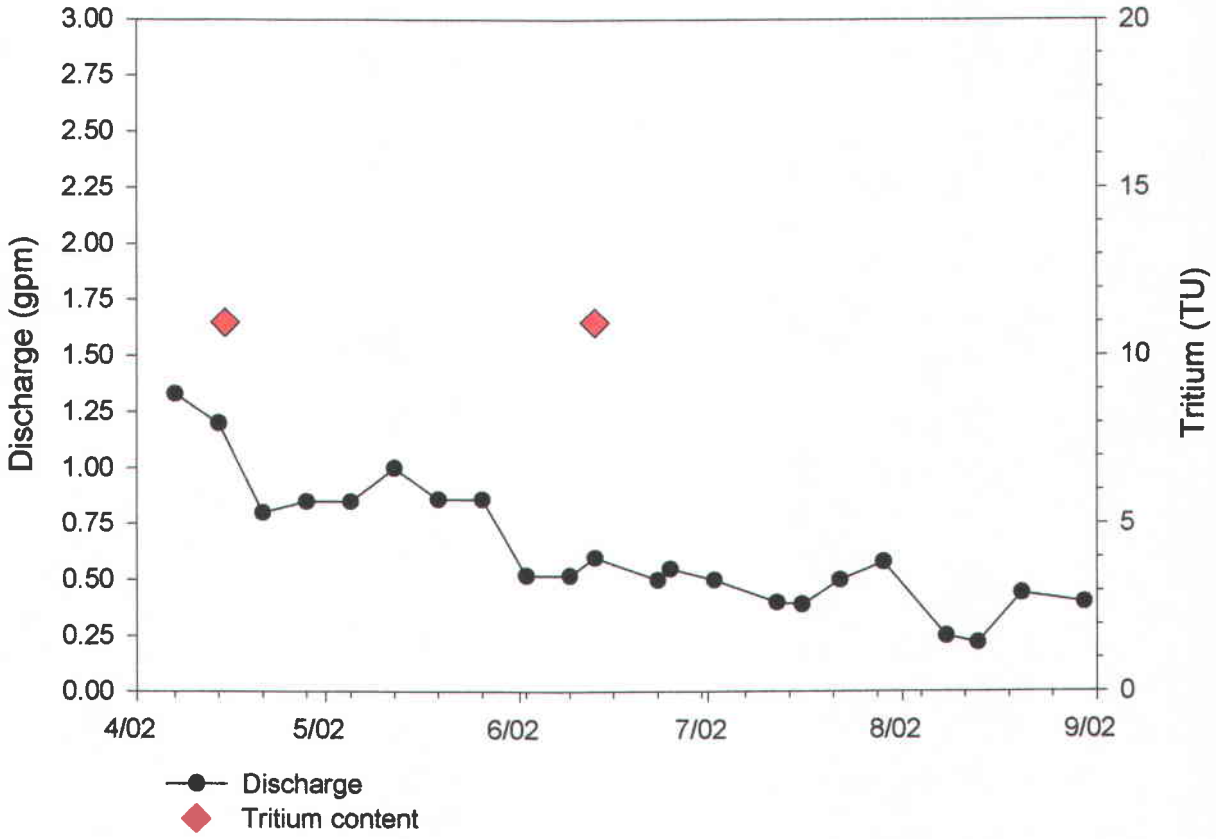


Figure 5f Plots of discharge and tritium content at SC-14, and precipitation at the Dugout Mine rain guage.



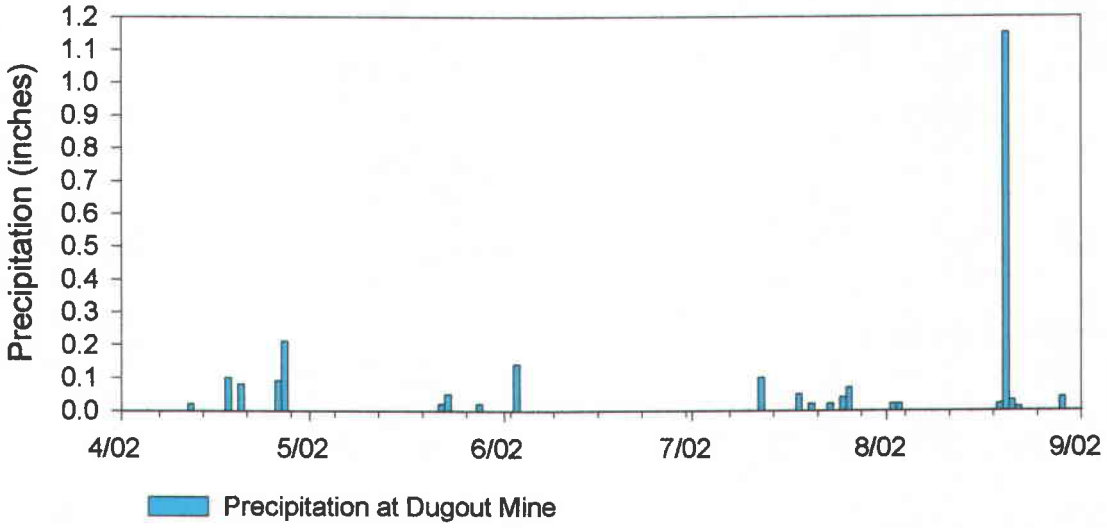
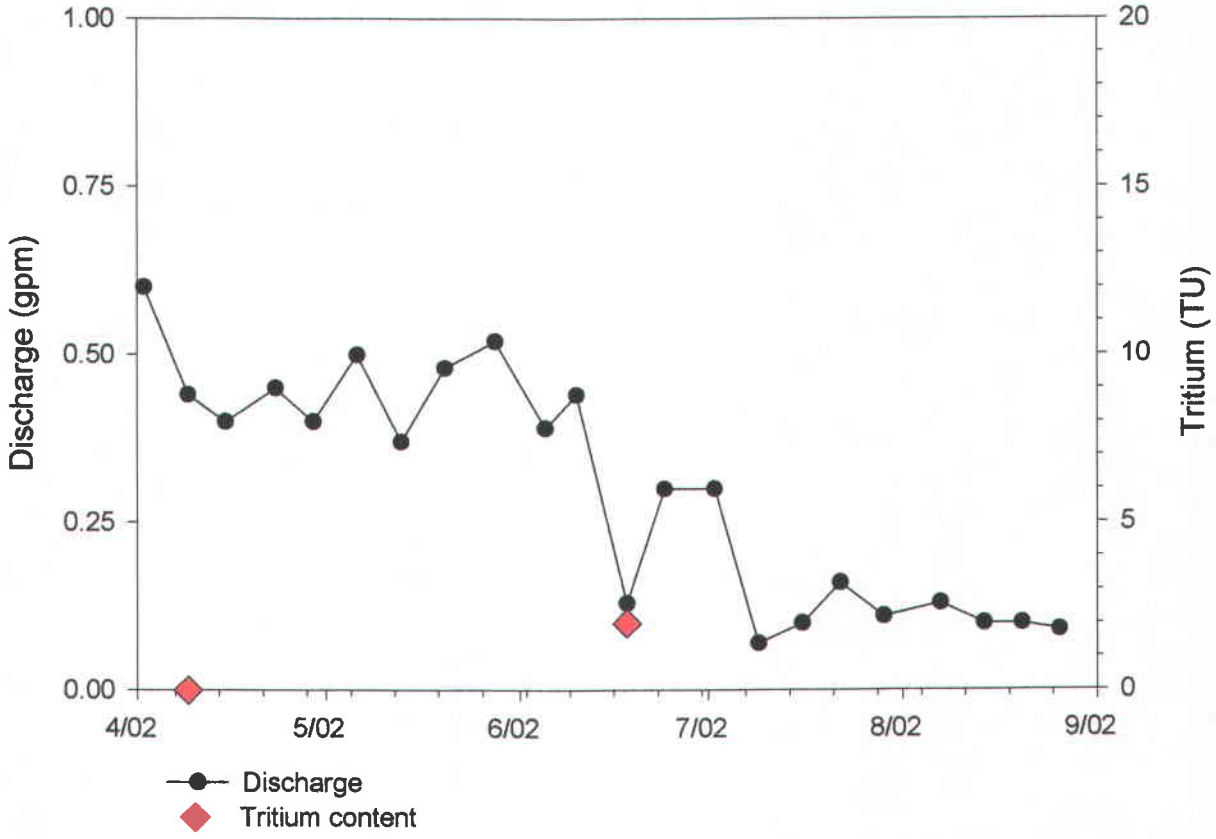


Figure 5g Plots of discharge and tritium content at site 5, and precipitation at the Dugout Mine rain guage.



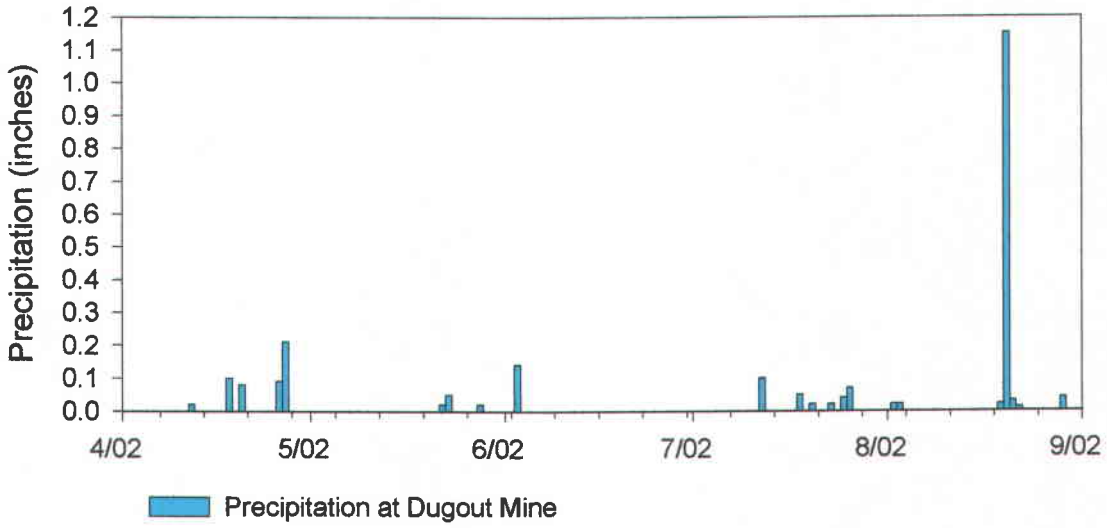
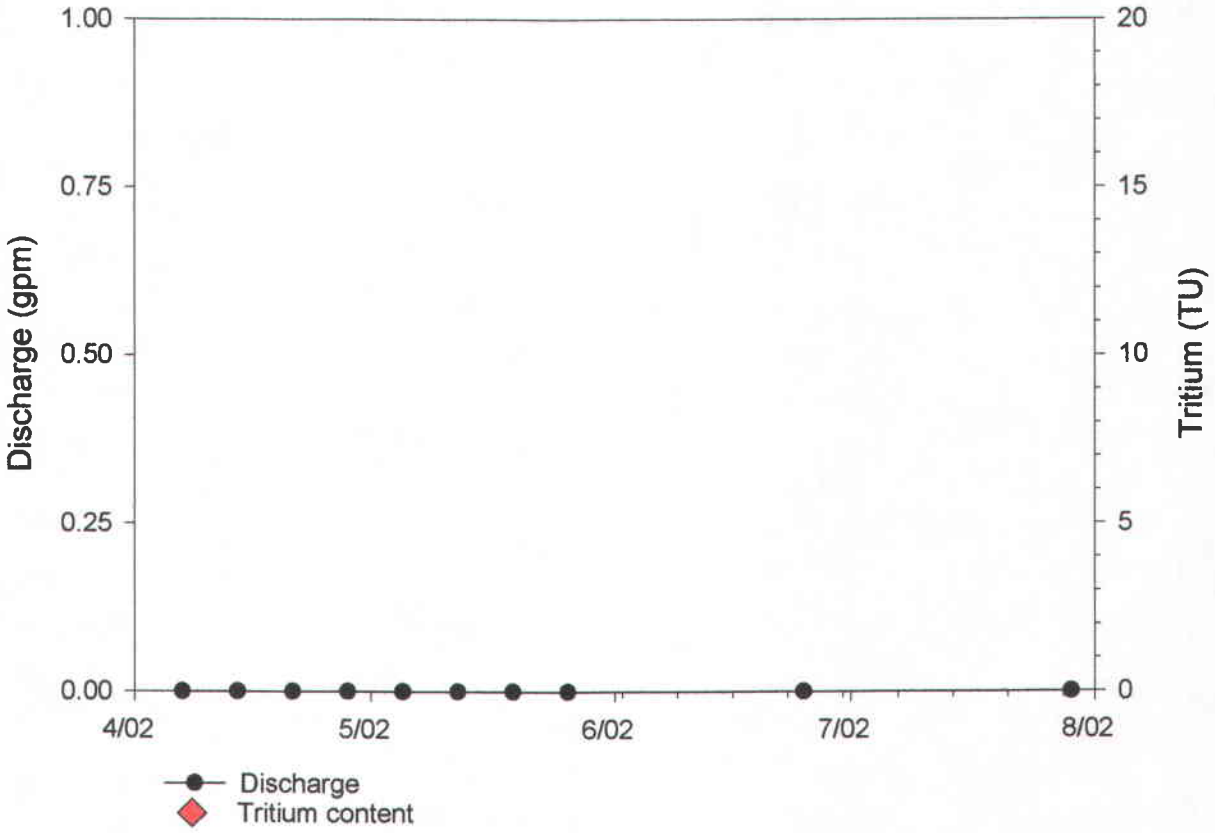


Figure 5h Plots of discharge and tritium content at site 10, and precipitation at the Dugout Mine rain guage.



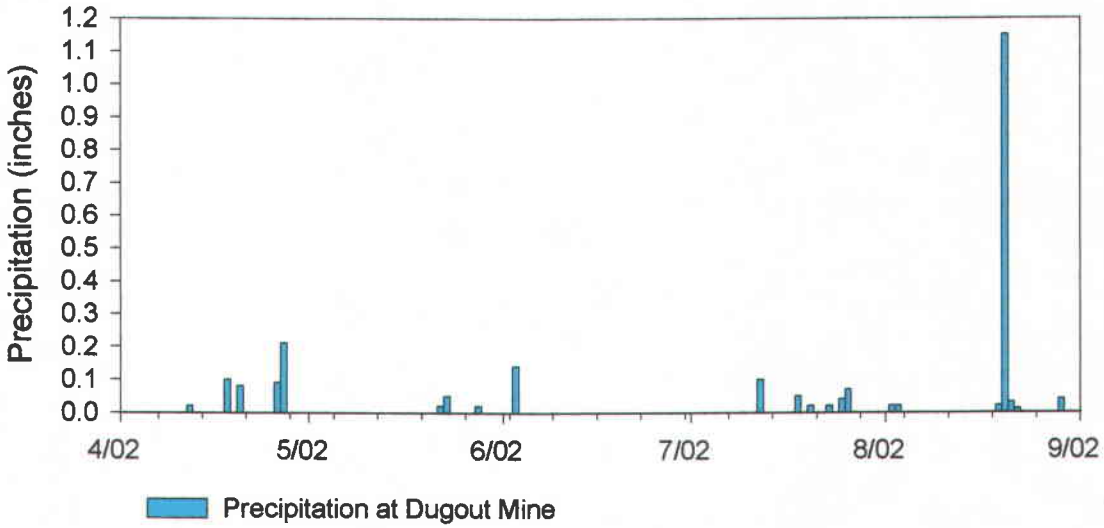
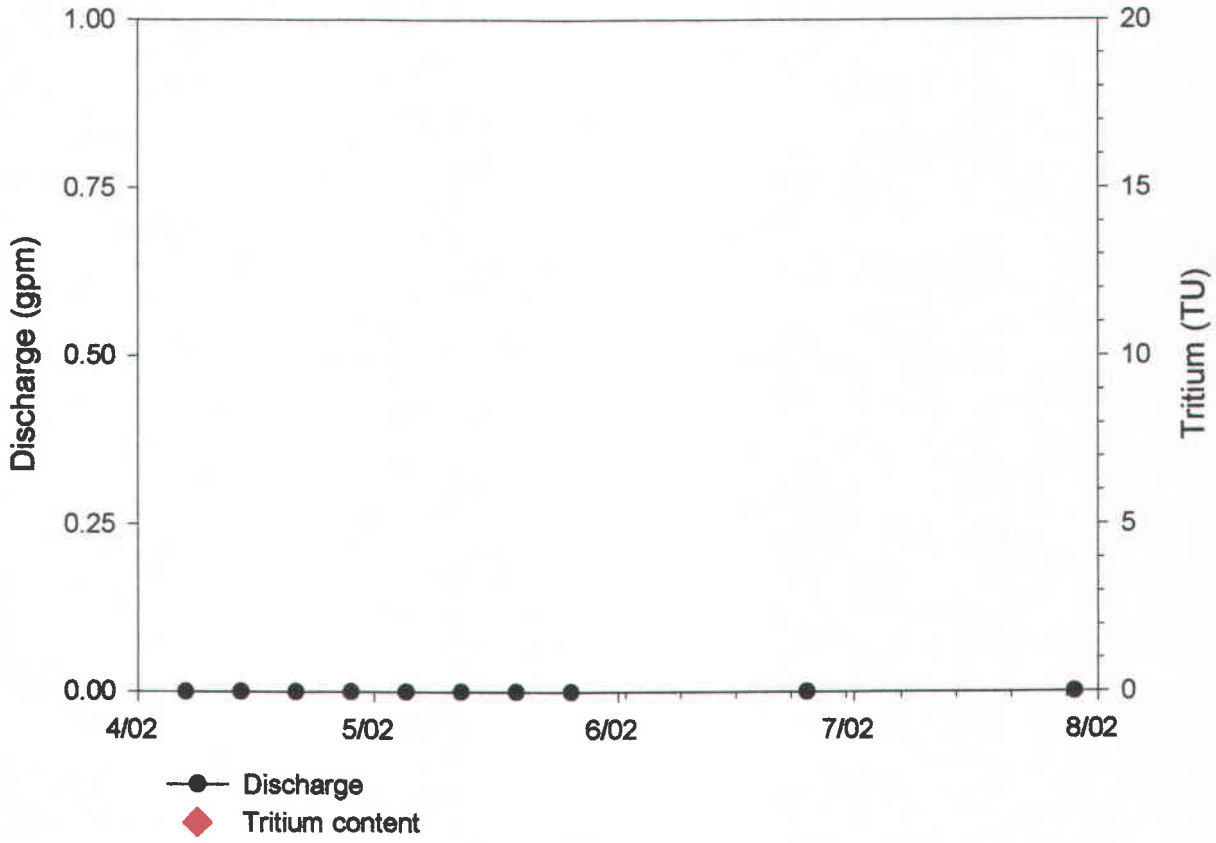


Figure 5i Plots of discharge and tritium content at site 23, and precipitation at the Dugout Mine rain guage.



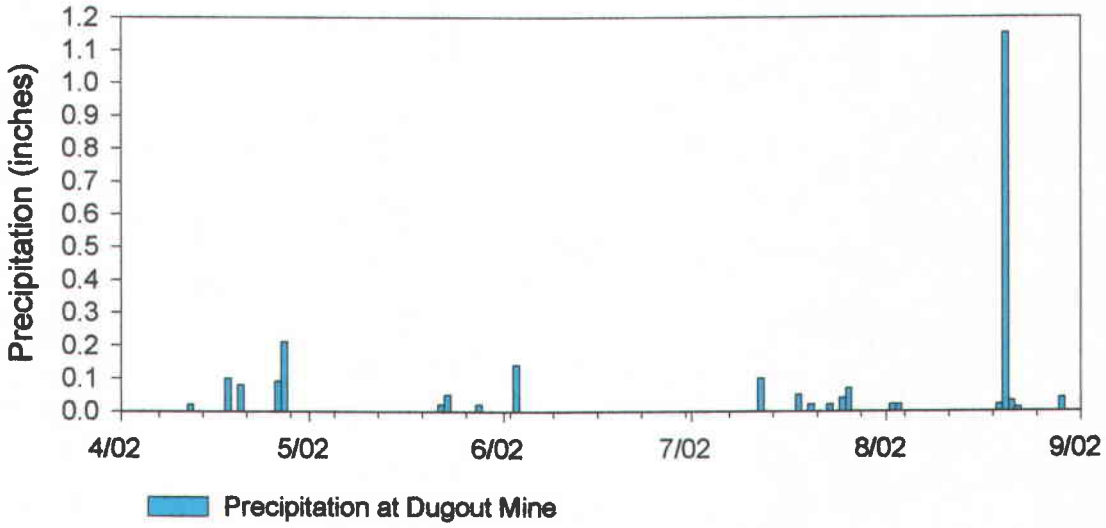
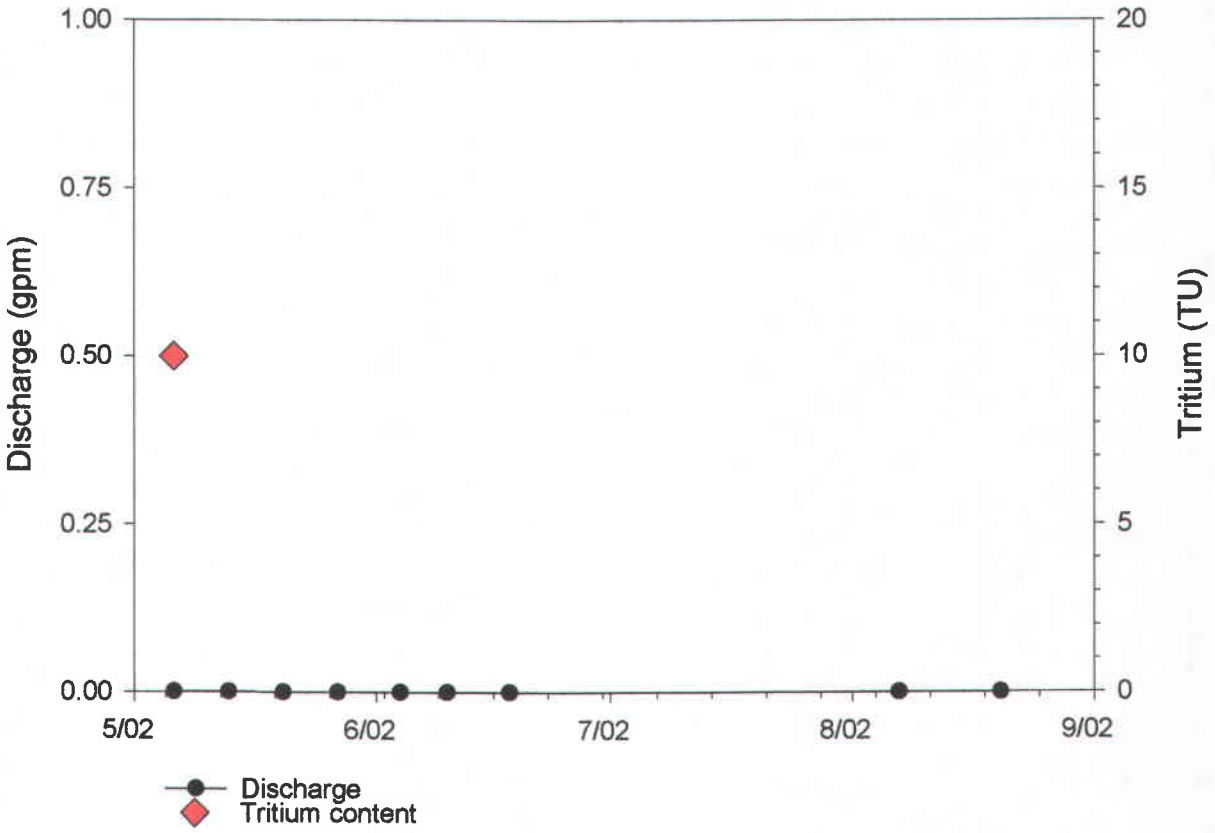


Figure 5j Plots of discharge and tritium content at site 24, and precipitation at the Dugout Mine rain guage.

200



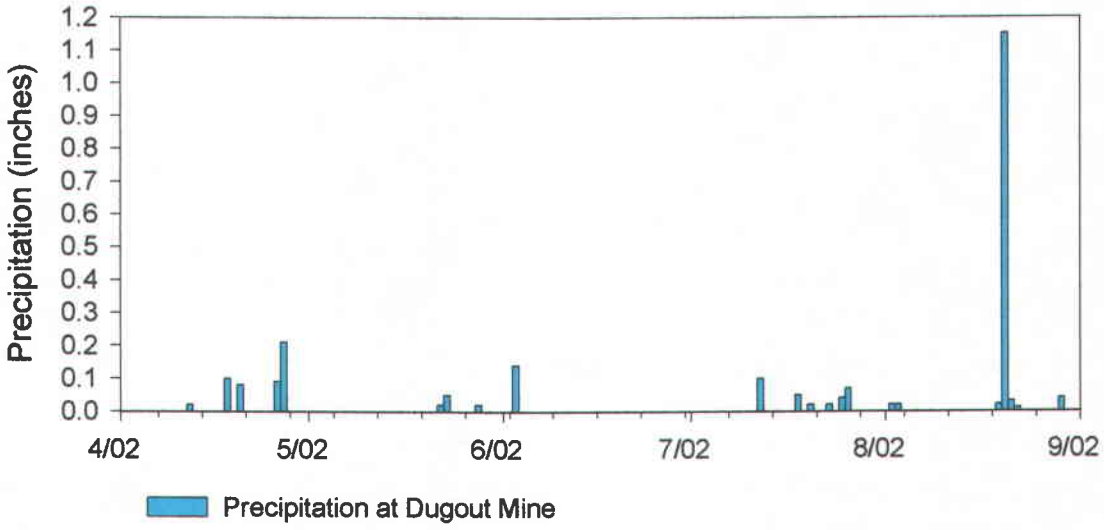
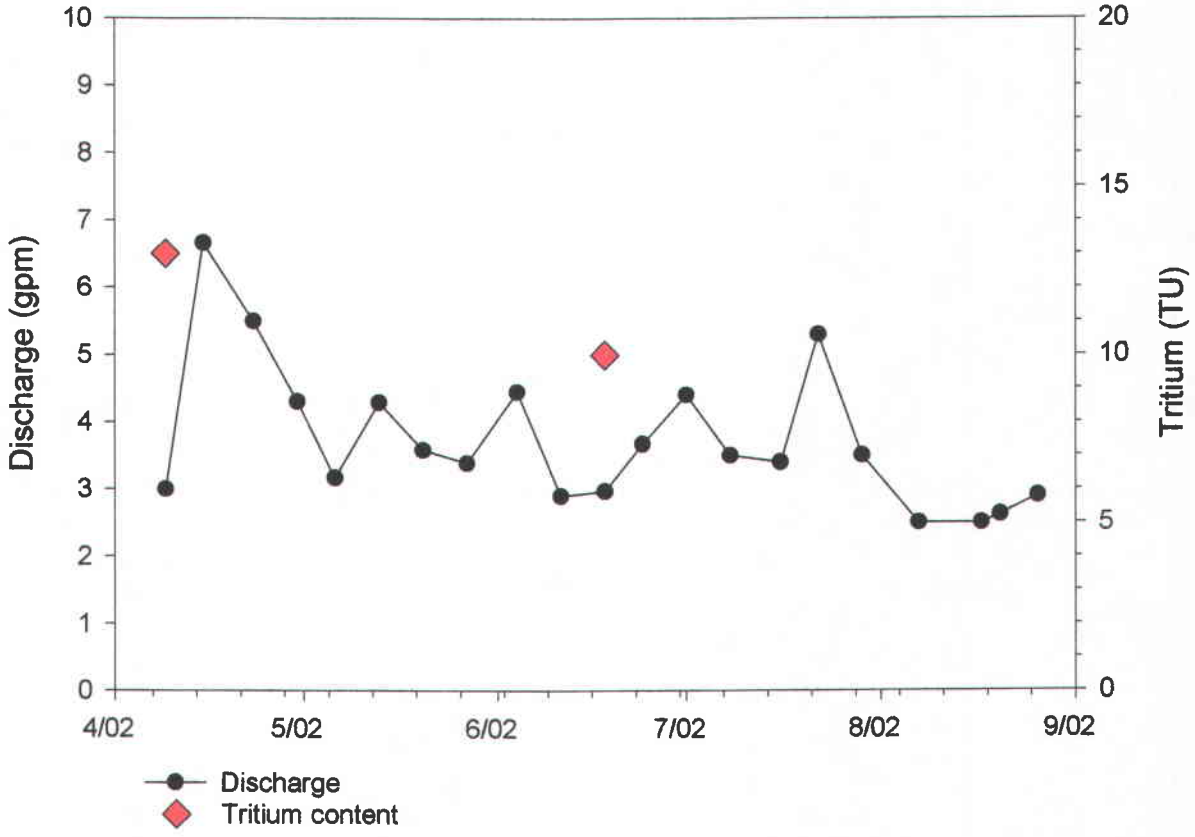


Figure 5k Plots of discharge and tritium content at site 200, and precipitation at the Dugout Mine rain guage.



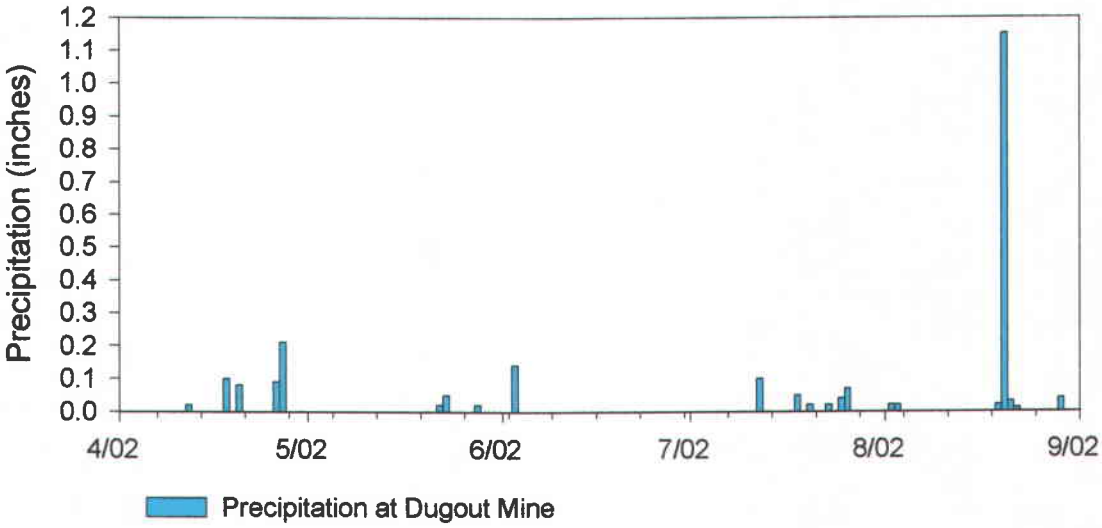
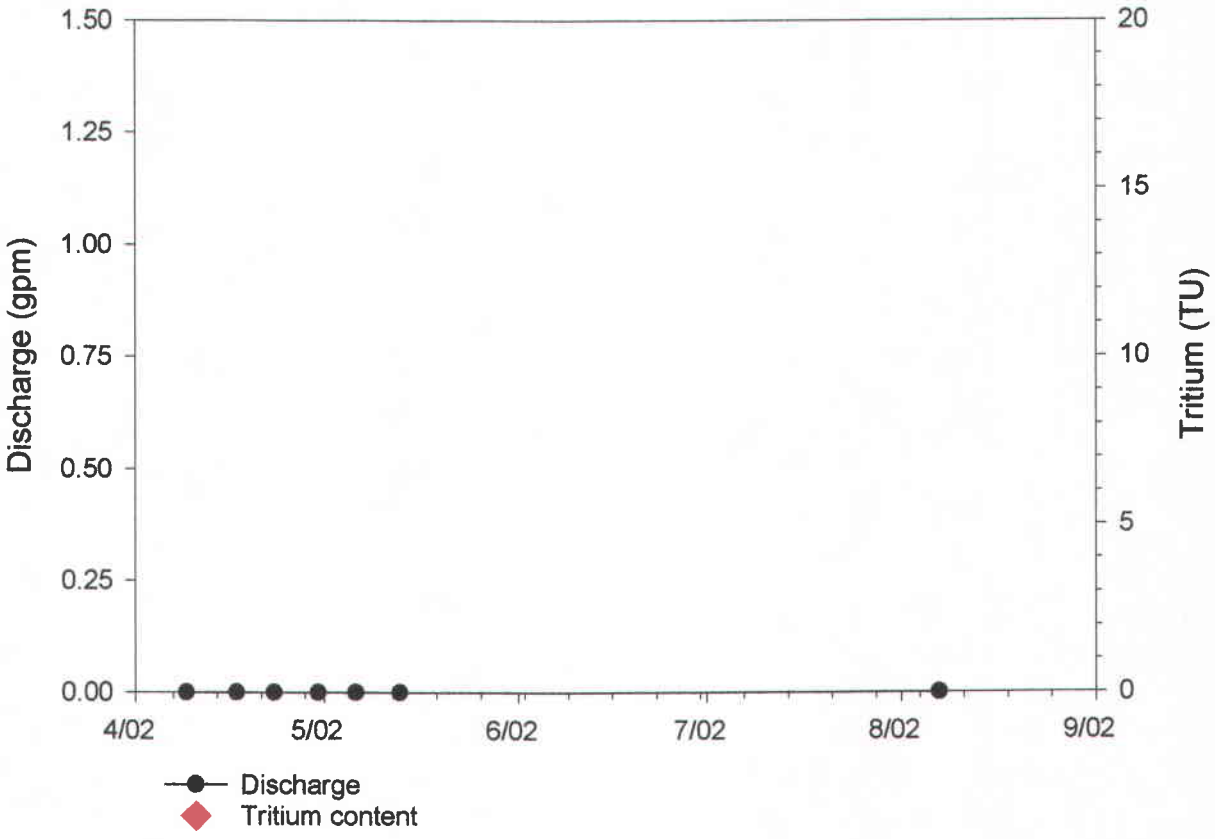


Figure 5l Plots of discharge and tritium content at site 203, and precipitation at the Dugout Mine rain guage.



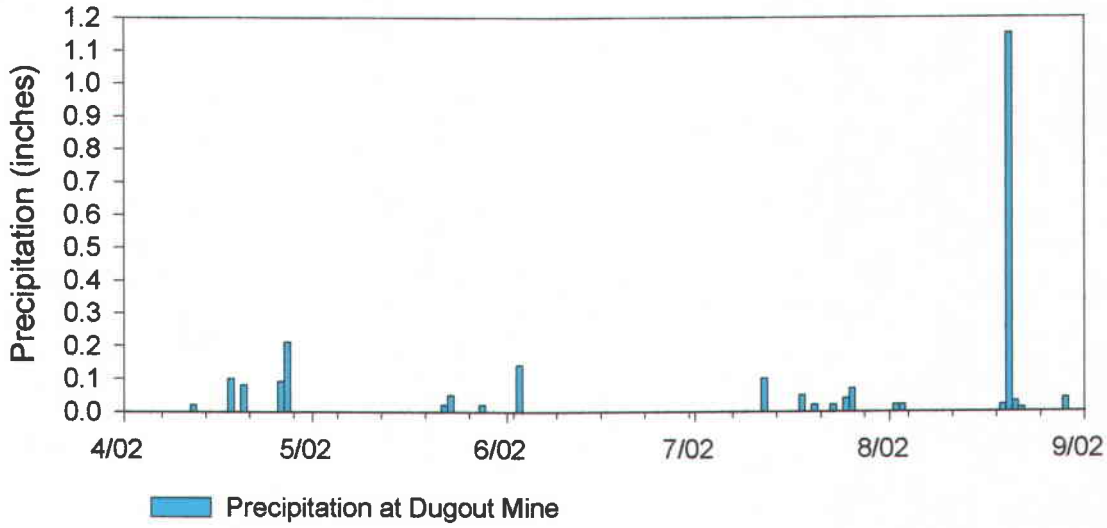
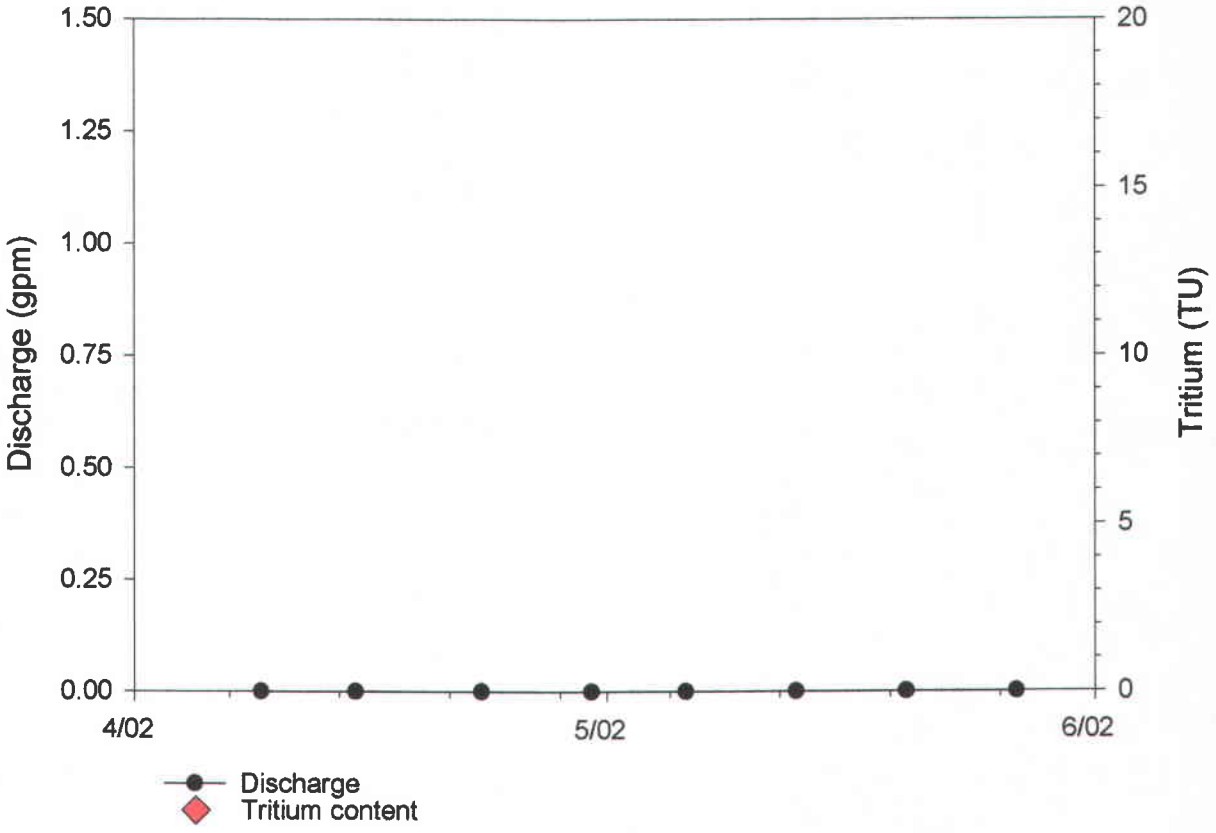


Figure 5m Plots of discharge and tritium content at site 259, and precipitation at the Dugout Mine rain guage.



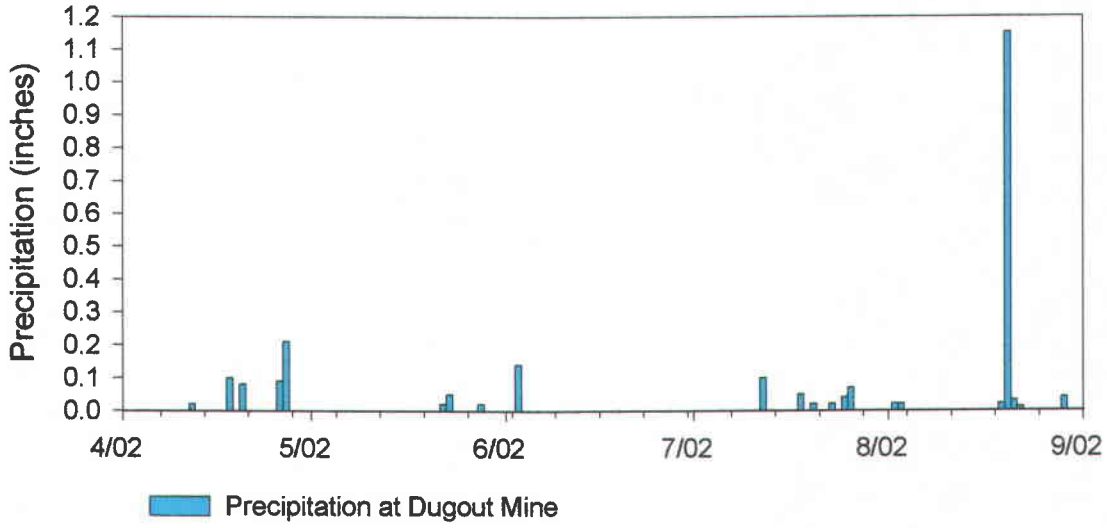
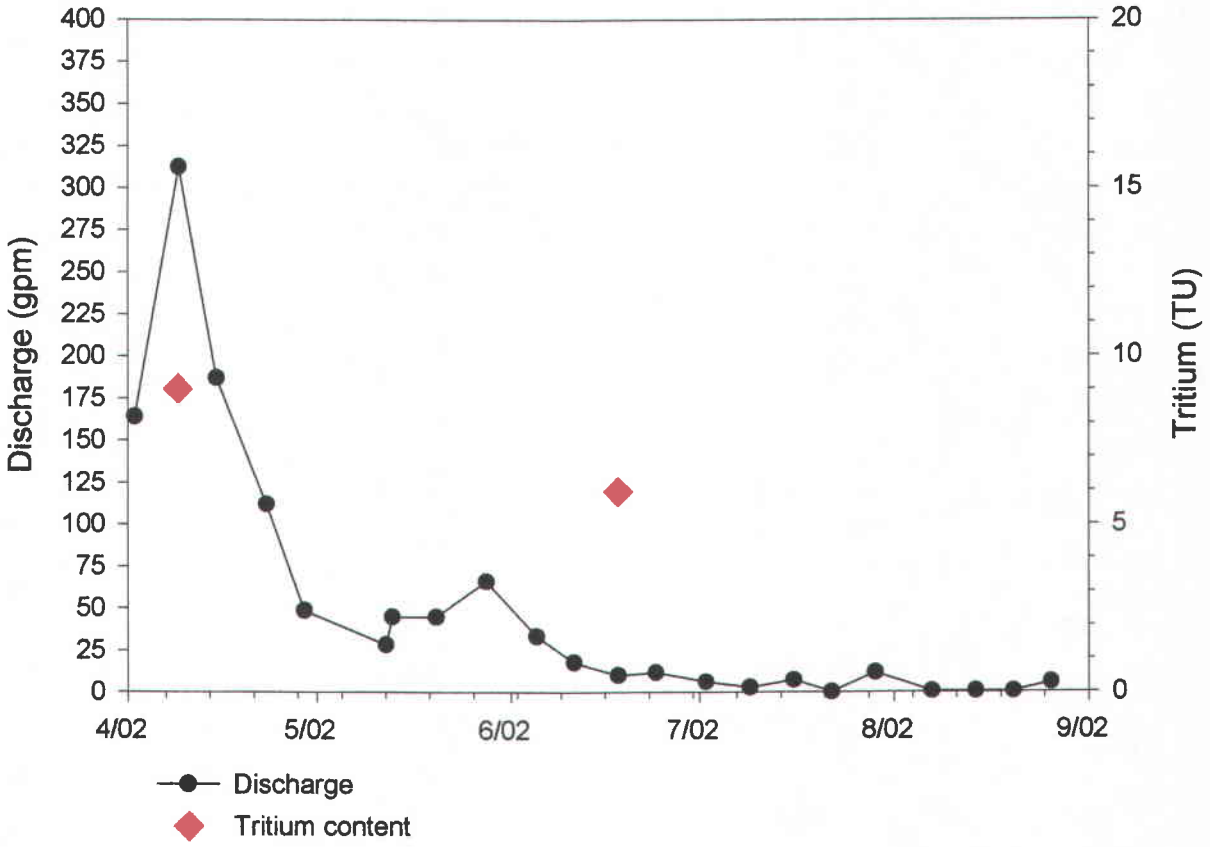


Figure 5n Plots of discharge and tritium content at site 227, and precipitation at the Dugout Mine rain guage.

G-6



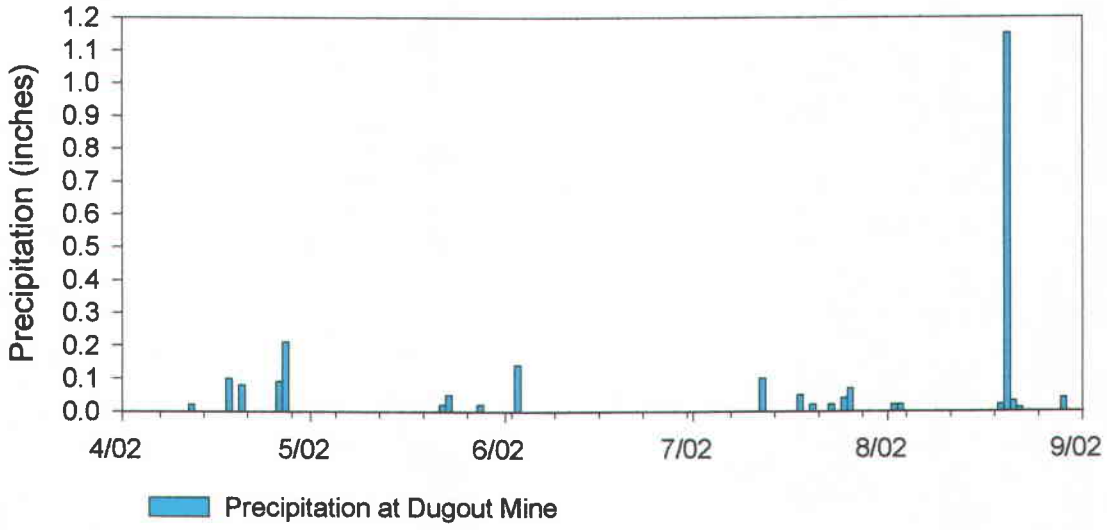
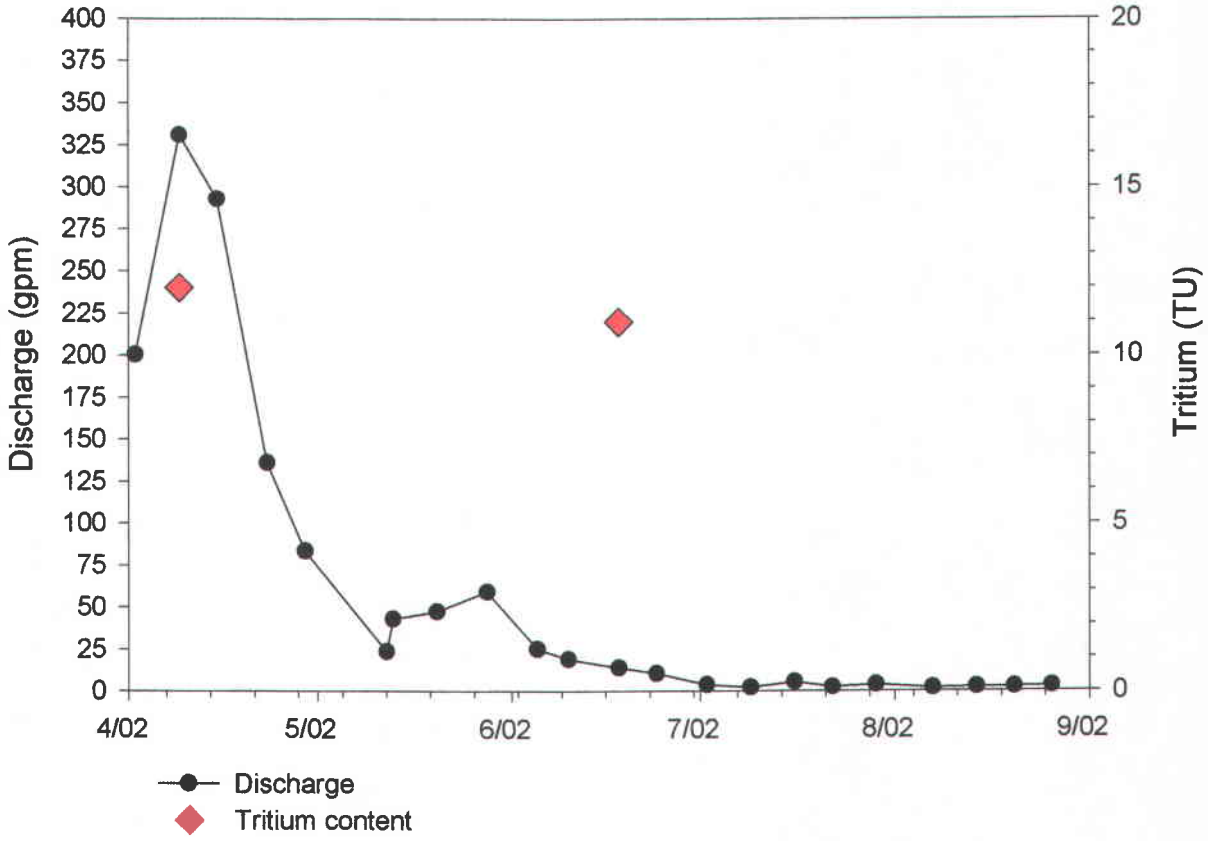


Figure 5o Plots of discharge and tritium content at G-6, and precipitation at the Dugout Mine rain guage.

G-7



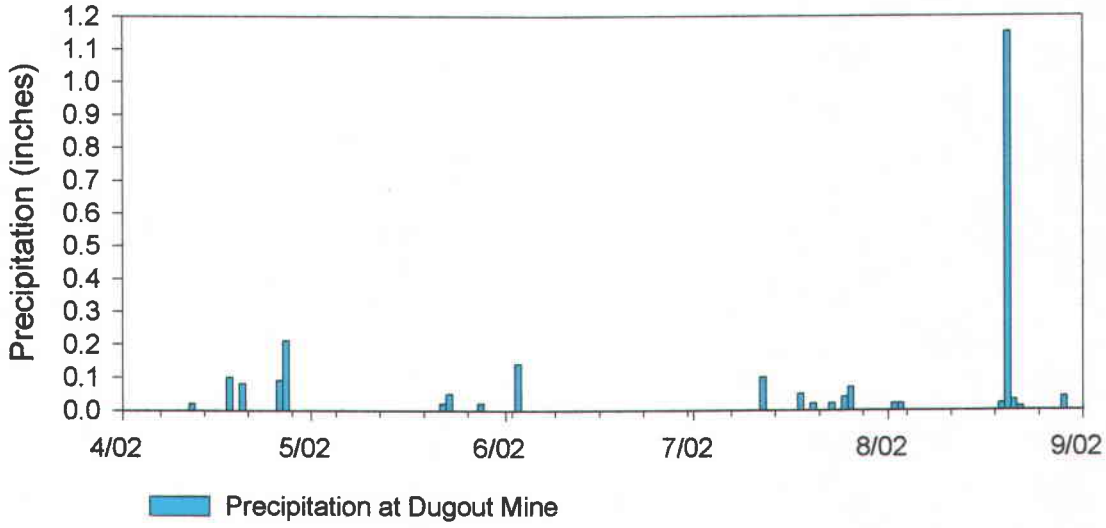


Figure 5p Plots of discharge and tritium content at G-7, and precipitation at the Dugout Mine rain guage.

DC-2

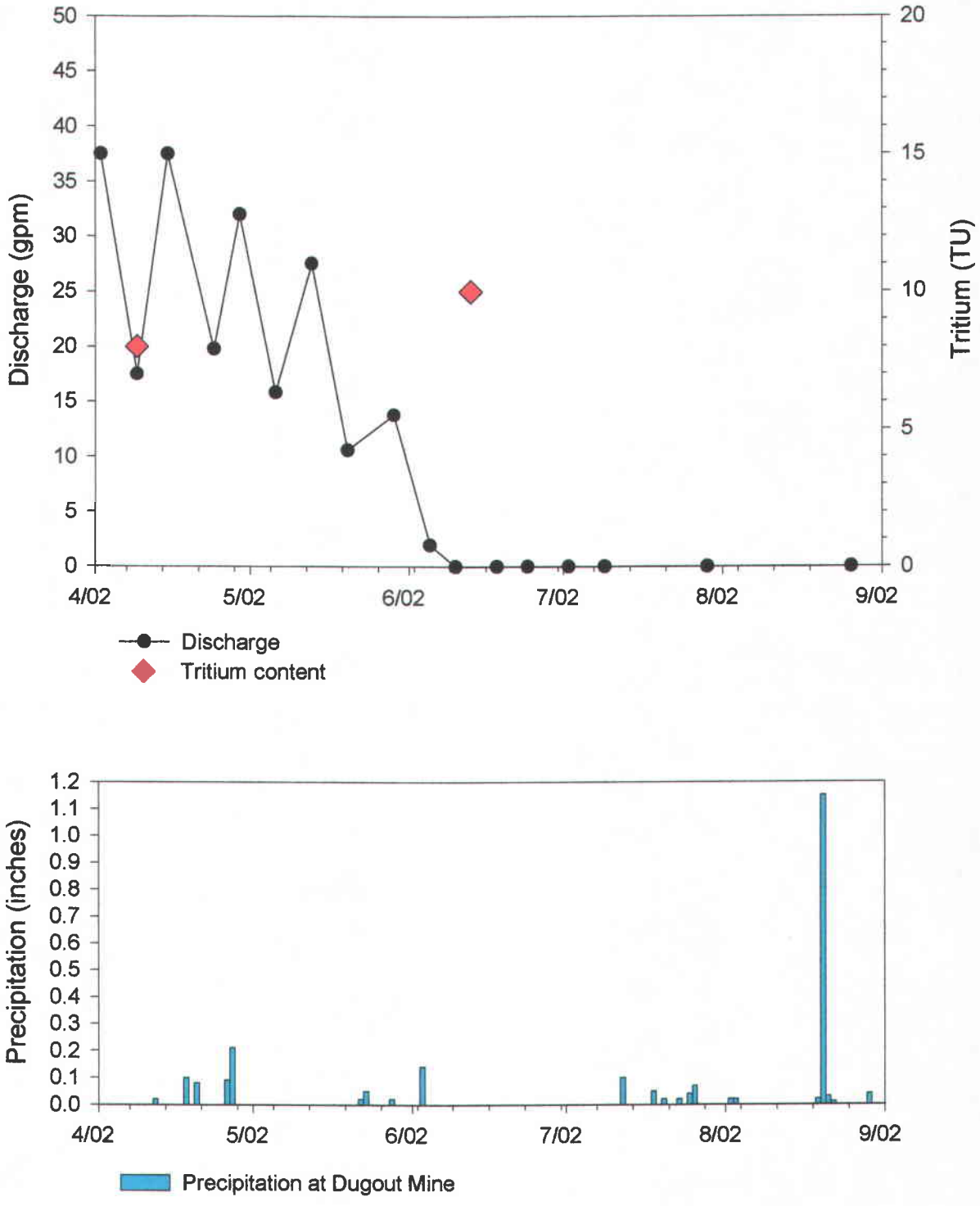
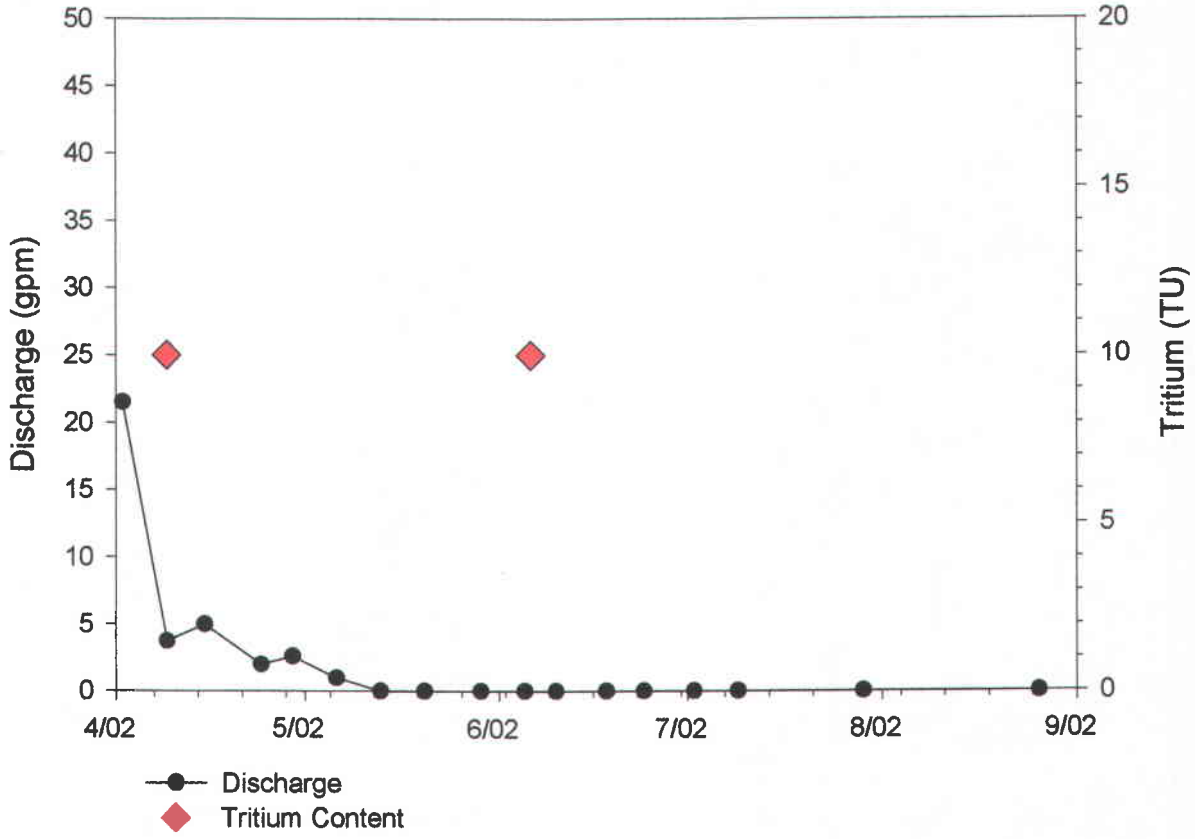


Figure 5q Plots of discharge and tritium content at DC-2, and precipitation at the Dugout Mine rain guage.

DC-3



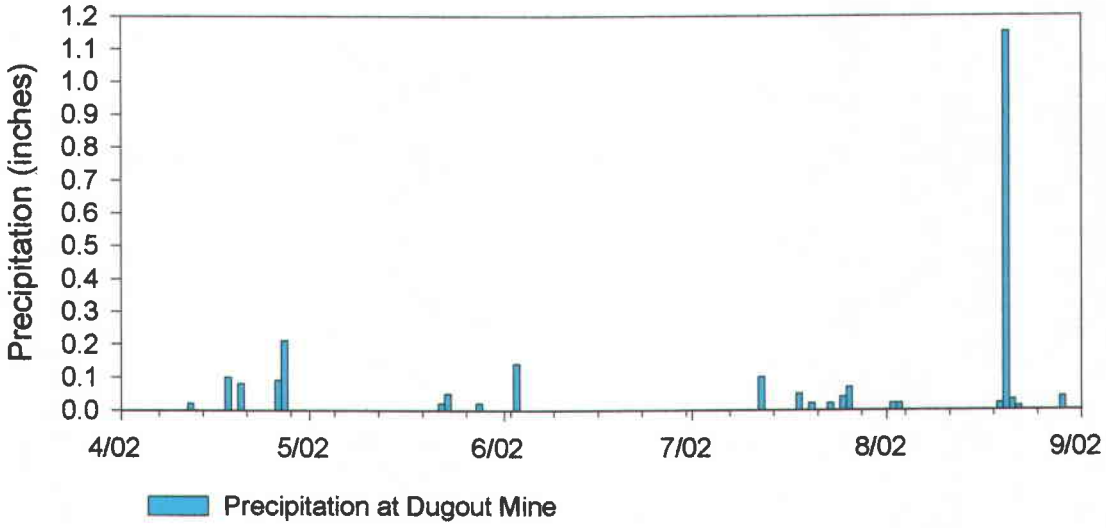
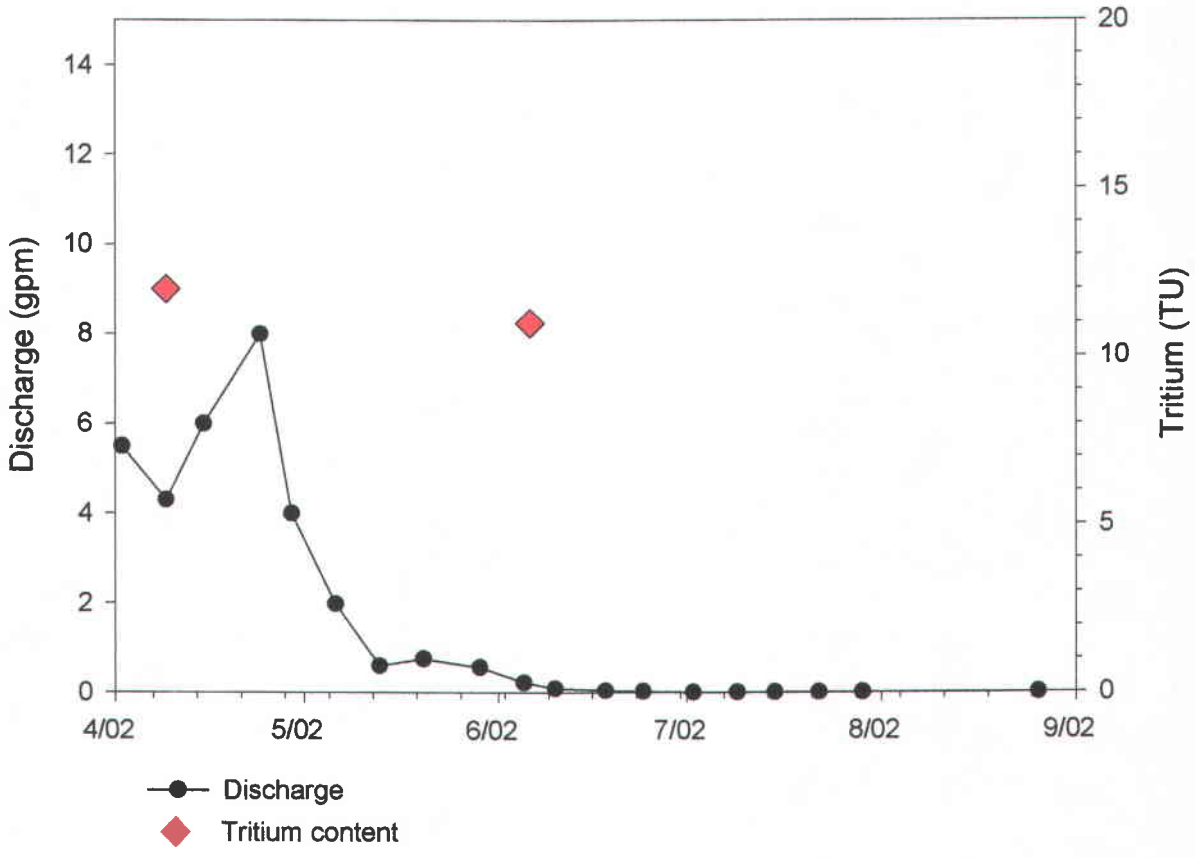


Figure 5r Plots of discharge and tritium content at DC-3, and precipitation at the Dugout Mine rain guage.

DC-4



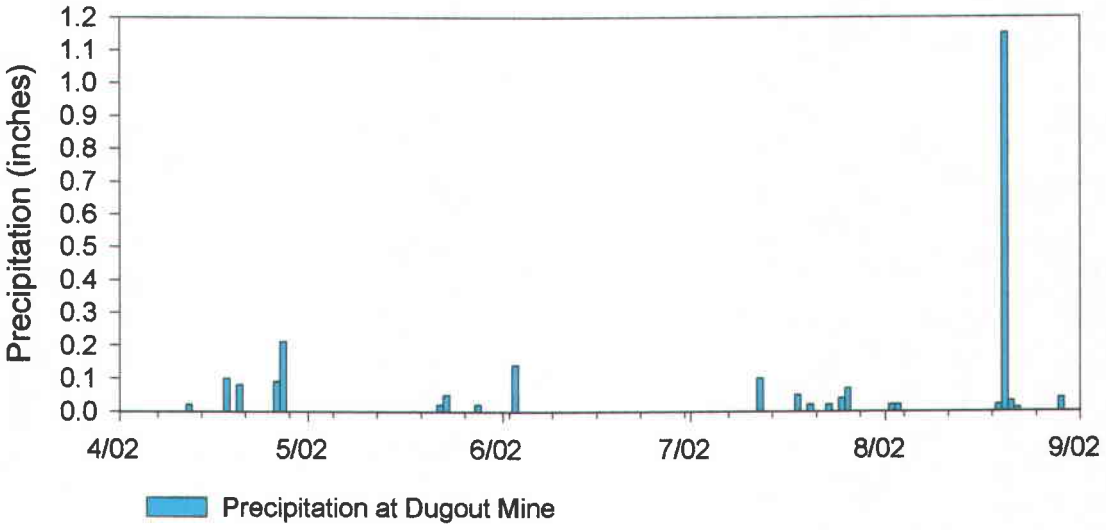
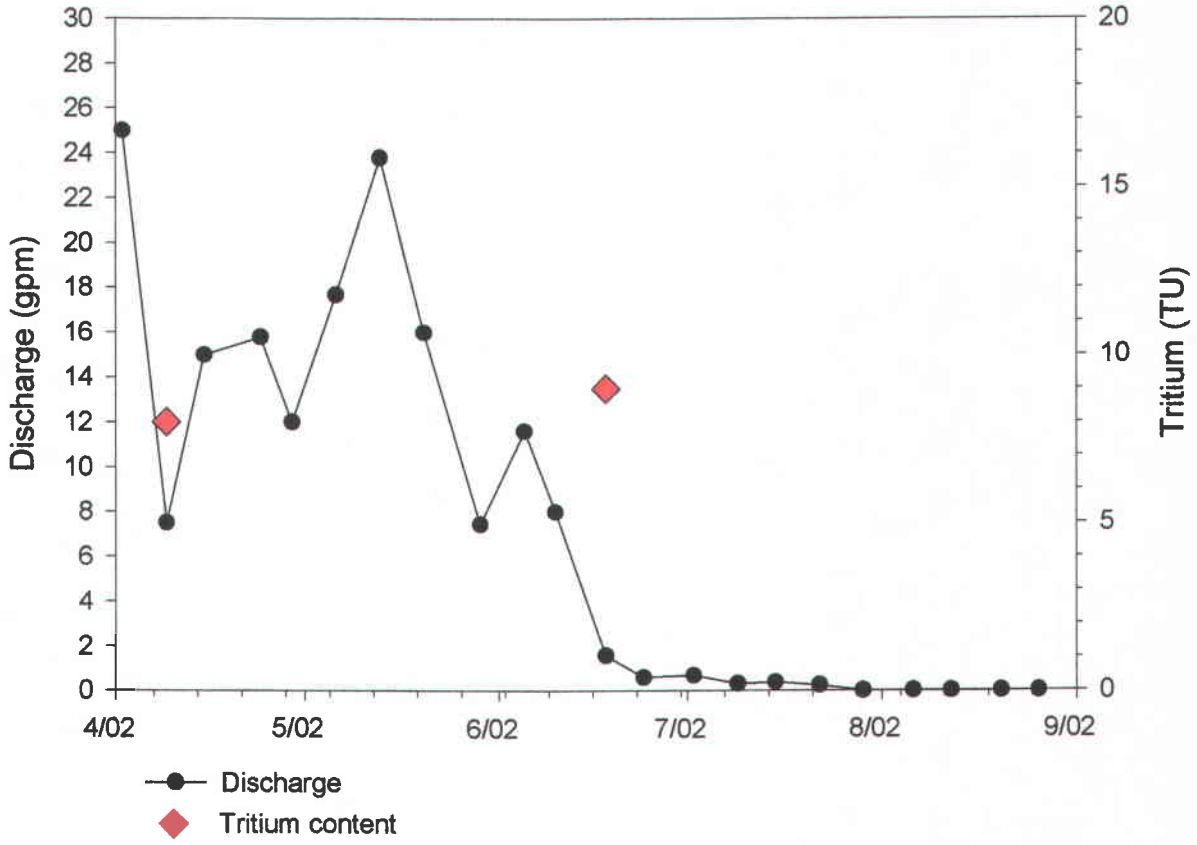


Figure 5s Plots of discharge and tritium content at DC-4, and precipitation at the Dugout Mine rain guage.

DC-5



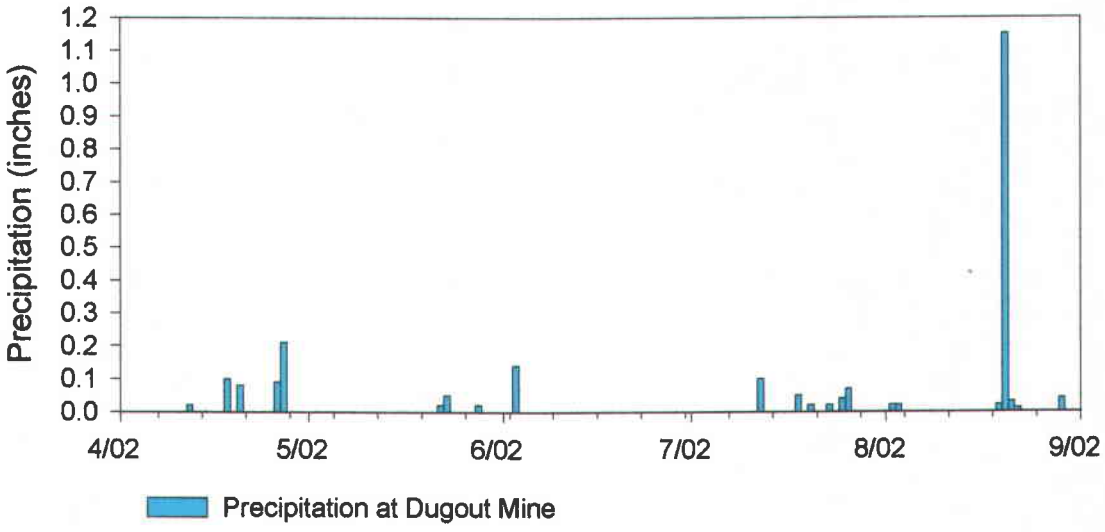
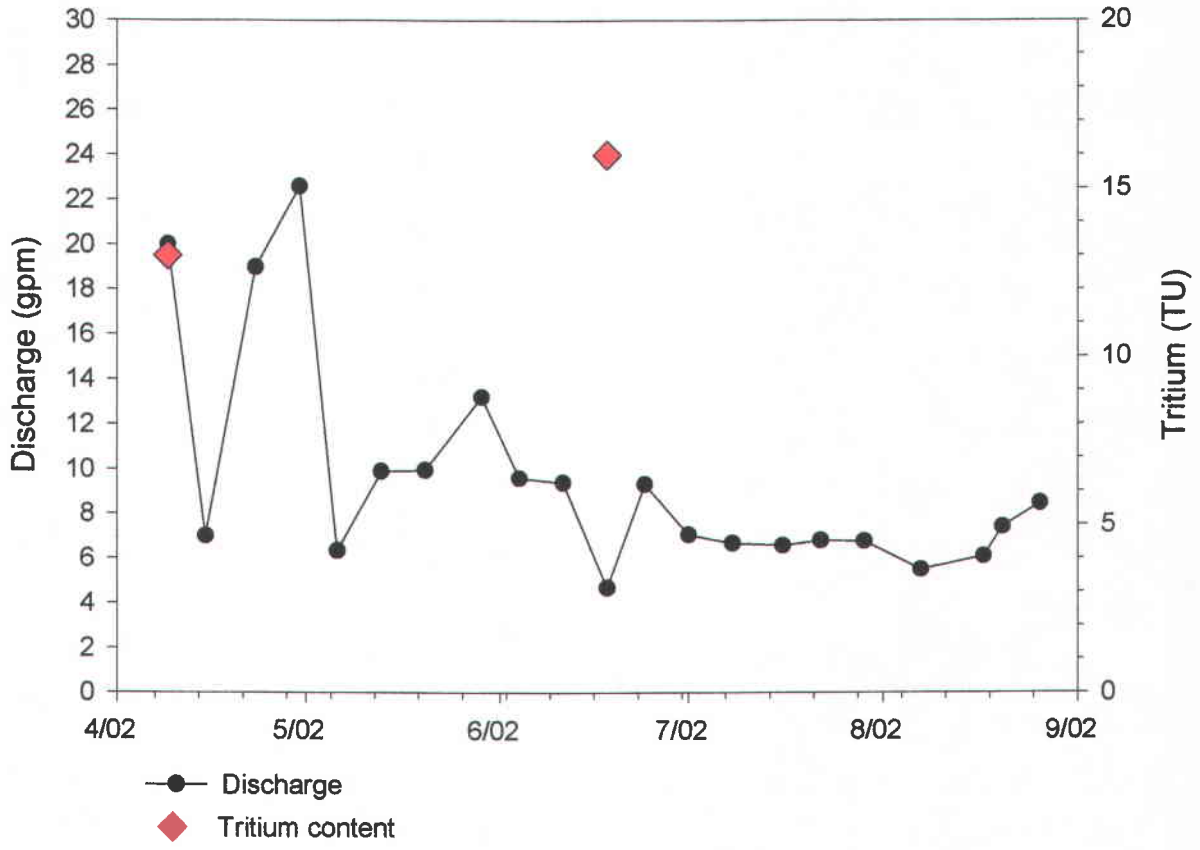


Figure 5t Plots of discharge and tritium content at DC-5, and precipitation at the Dugout Mine rain guage.

PC-1A



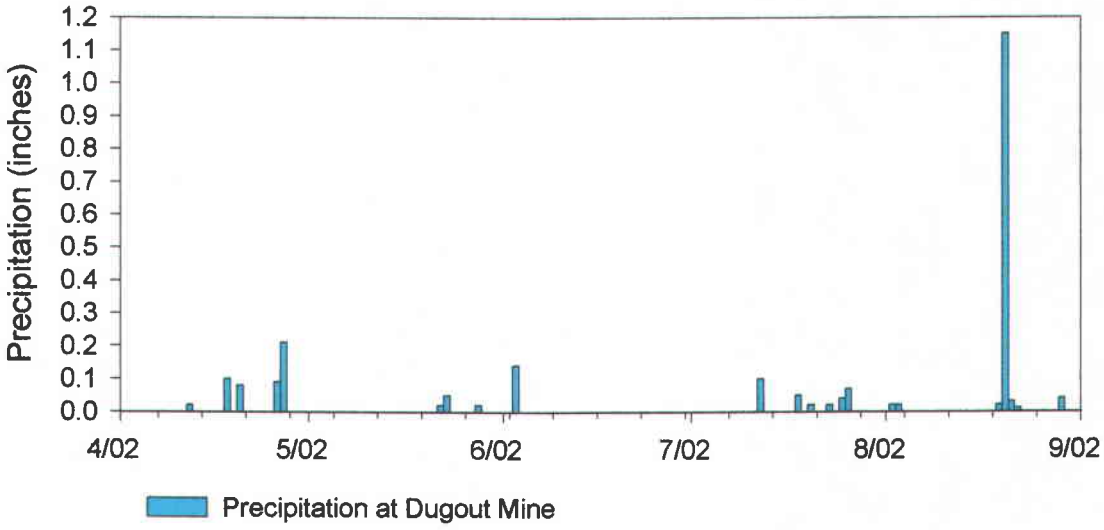


Figure 5u Plots of discharge and tritium content at PC-1A, and precipitation at the Dugout Mine rain guage.

PC-2

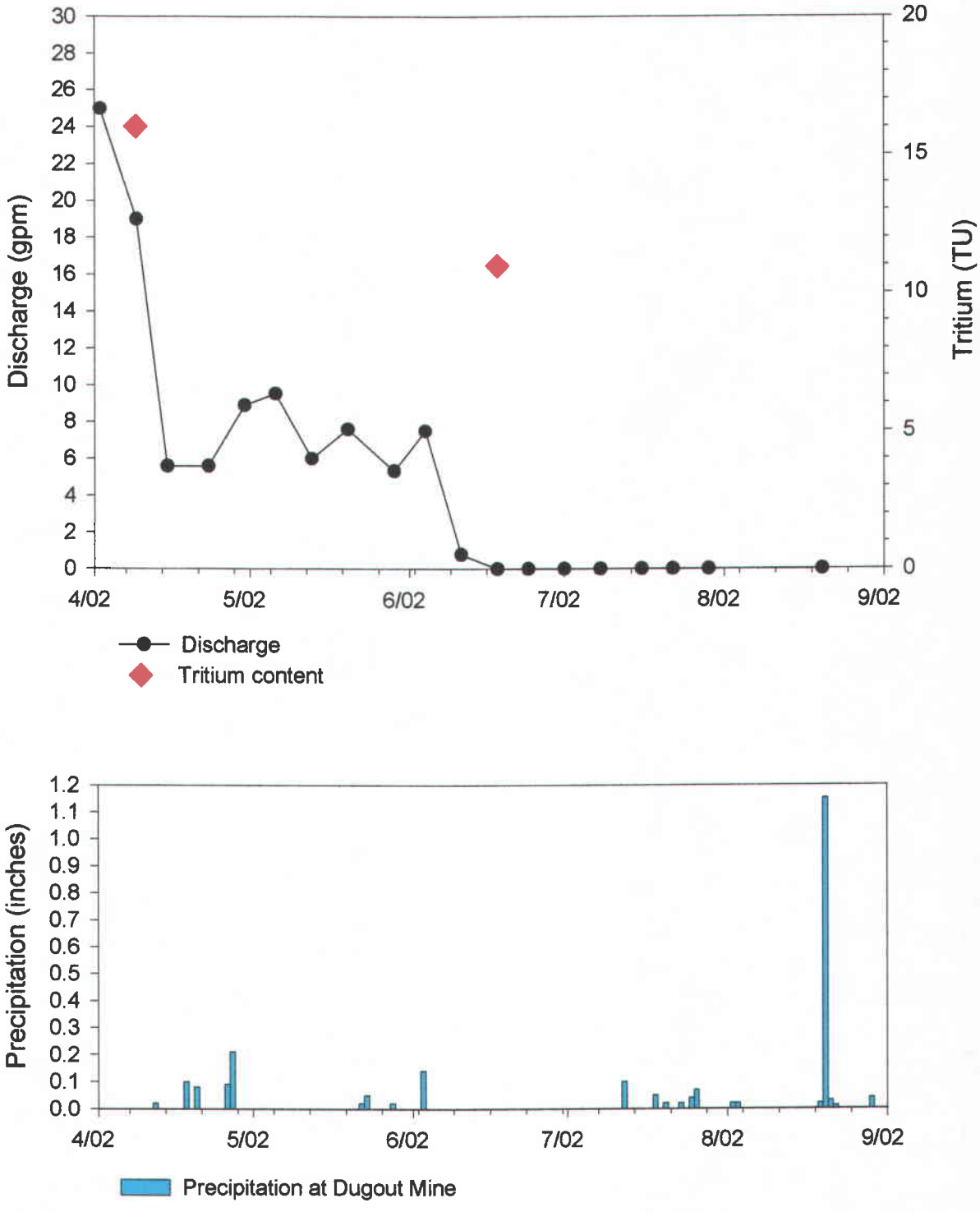
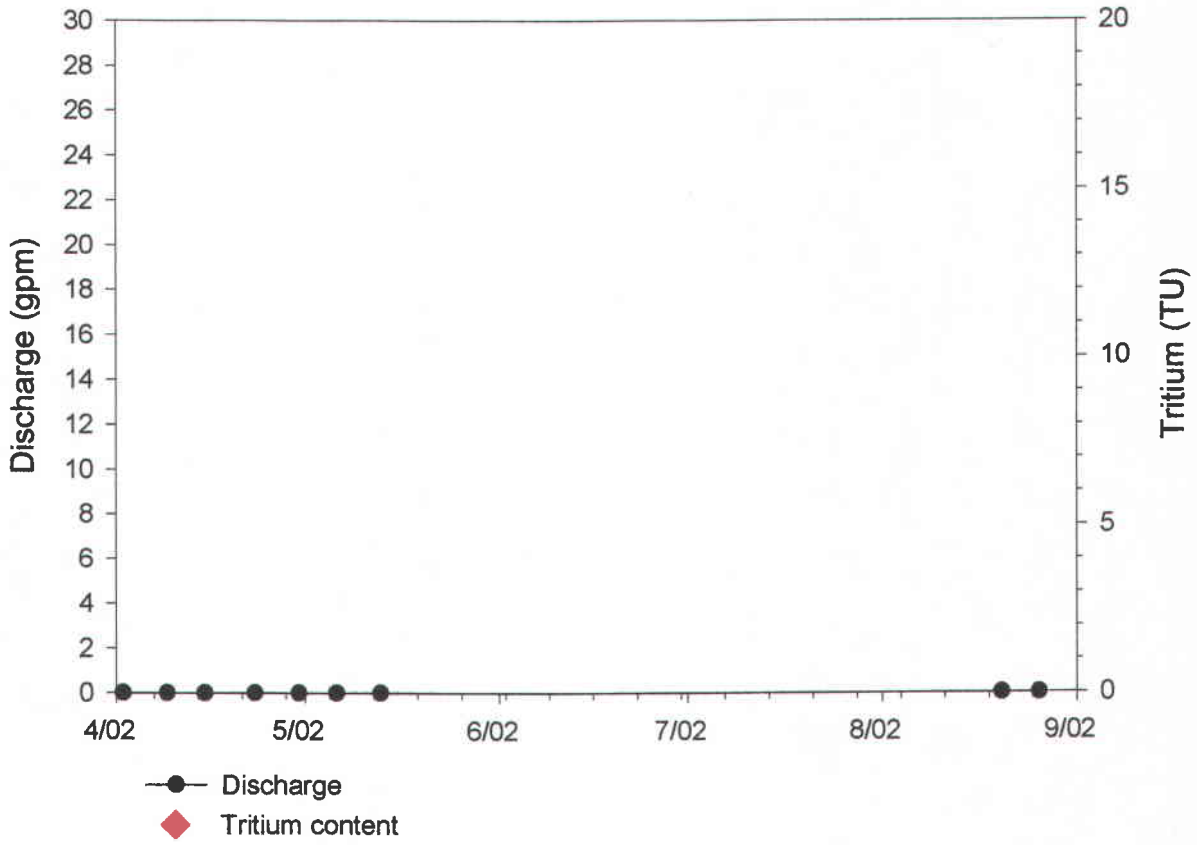


Figure 5v Plots of discharge and tritium content at PC-2, and precipitation at the Dugout Mine rain guage.

RC-1



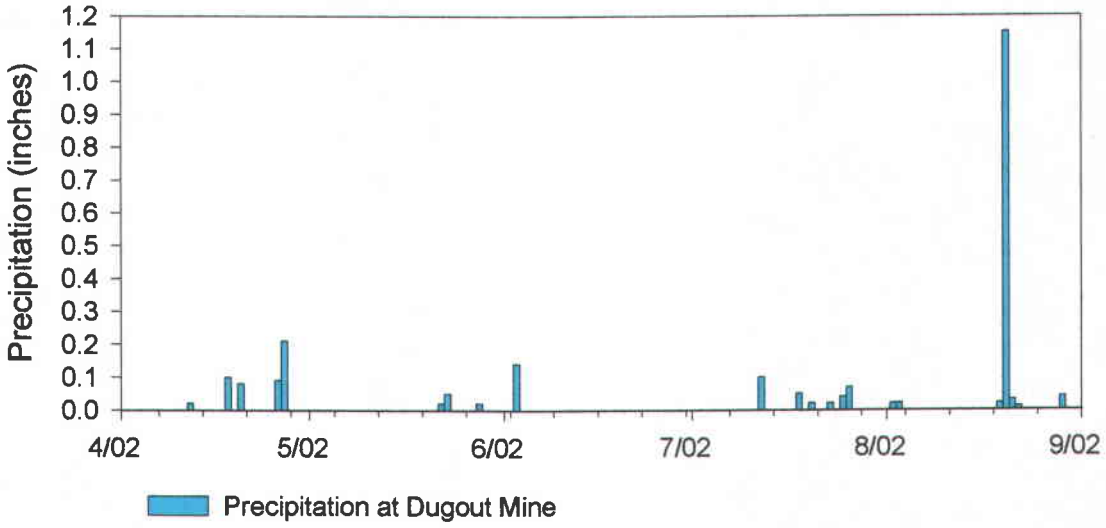


Figure 5w Plots of discharge and tritium content at RC-1, and precipitation at the Dugout Mine rain guage.

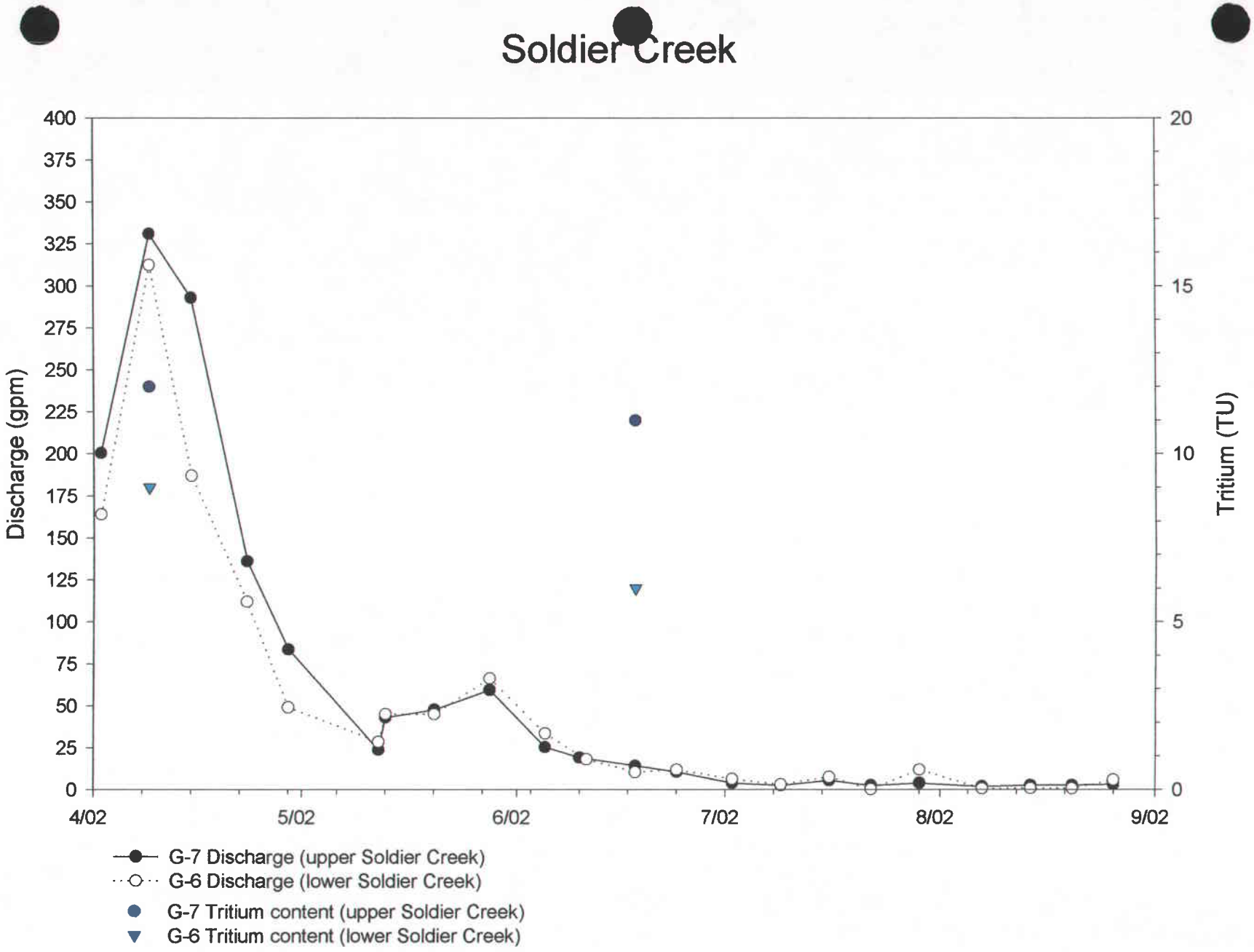


Figure 6a Plots of discharge and tritium content at G-7 (upper Soldier Creek), and G-6 (lower Soldier Creek).

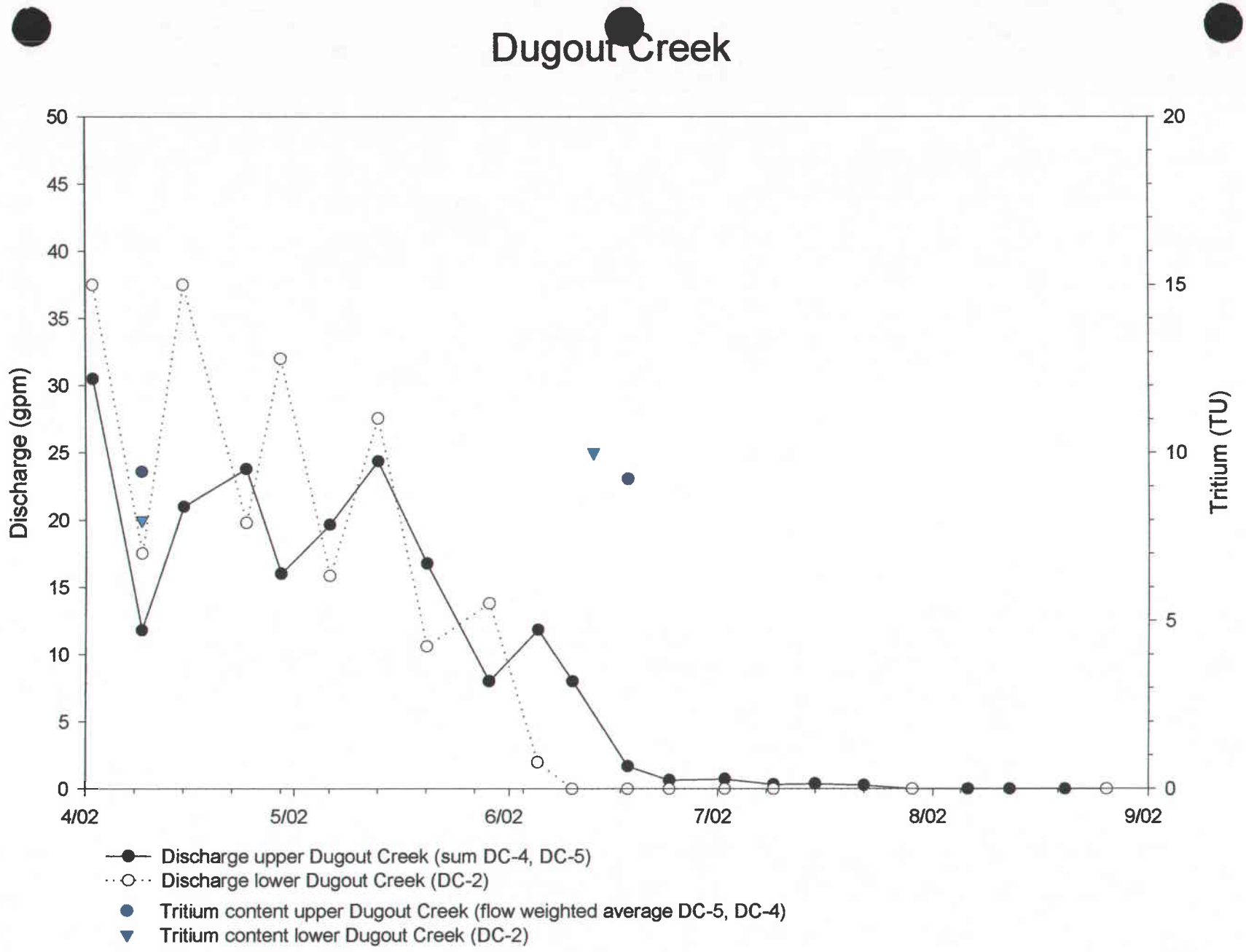


Figure 6b Plots of discharge and tritium content upper Dugout Creek (sum DC-4, DC-5), and G-6 (lower Dugout Creek (DC-2).

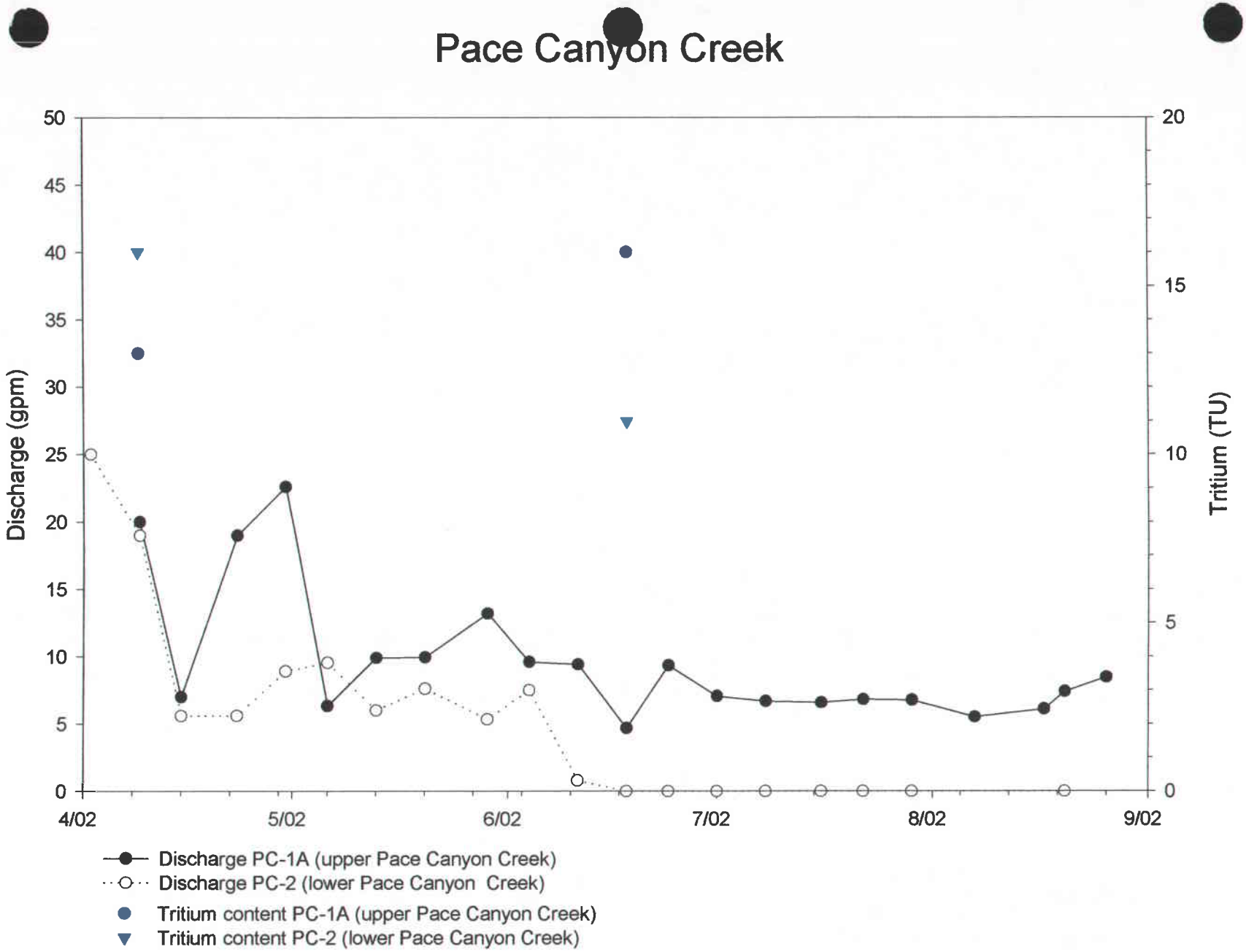


Figure 6c Plots of discharge and tritium content at PC-1A (upper Pace Canyon Creek) and PC-2 (lower Pace Canyon Creek).

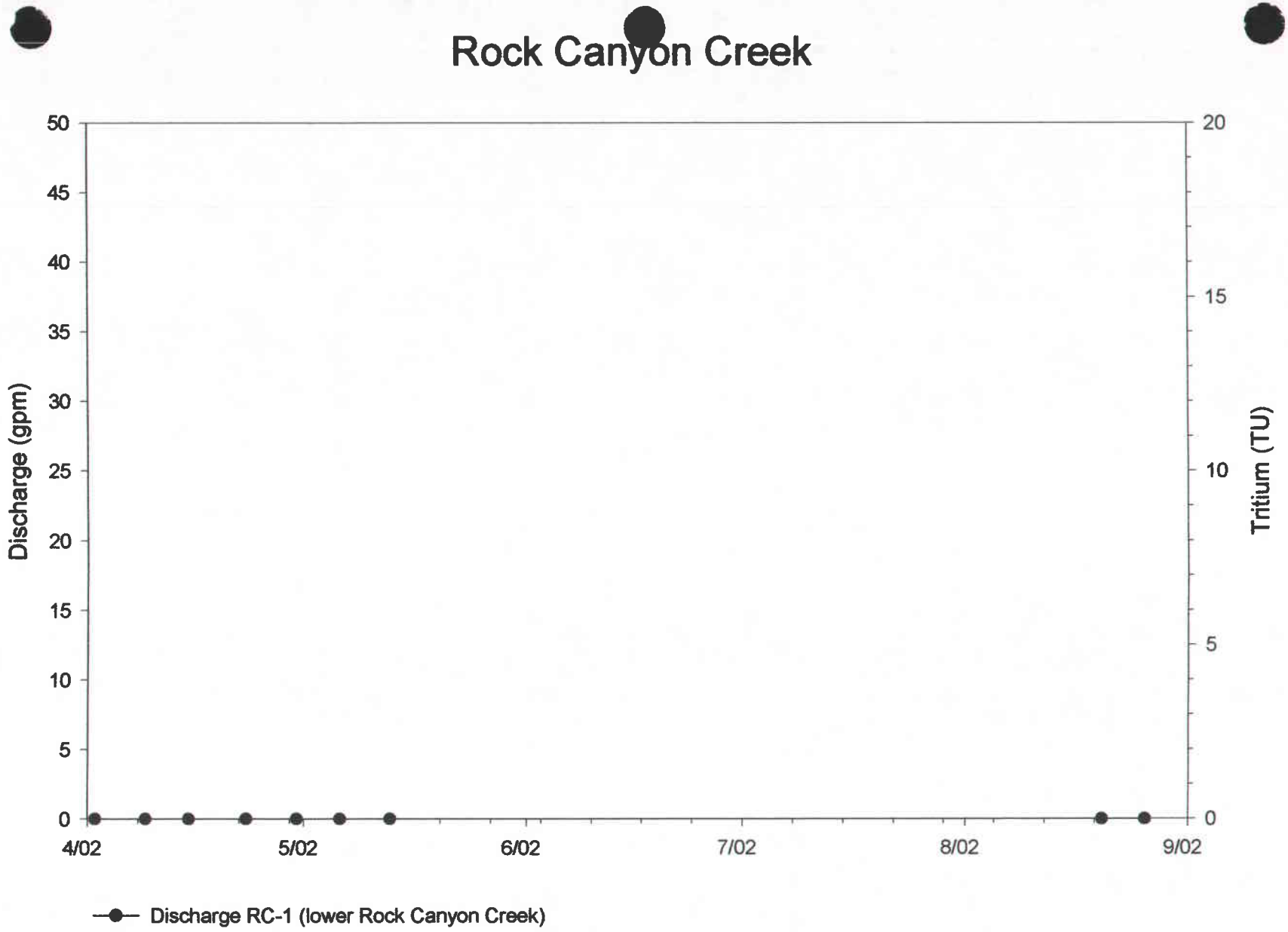


Figure 6d Plots of discharge and tritium content in Rock Canyon Creek.

Table 1 Soldier Creek/Dugout Mines sample locations and details

PETERSEN HYDROLOGIC, Table 1 Dugout-SC3.xls 16 Mar 03

Site	Geology	Comments
Springs		
Site SC-65	Colton Formation	
Site 260	Colton Formation	
Site SP-20	Flagstaff Limestone	Also known as S-30
Site SC-100	Flagstaff Limestone	
Site SC-116	North Horn Formation	
Site SC-14	North Horn Formation	
Site 5	North Horn Formation	Also known as S-5, CC-53
Site 10	North Horn Formation	Also known as Sulfur Spring 10, S-10, G89
Site 23	North Horn Formation	Also known as CC-36
Site 24	North Horn Formation	Also known as CC-40
Site 200	North Horn Formation	
Site 203	North Horn Formation	
Site 259	North Horn Formation	
Site 227	Castlegate Sandstone	
Streams		
Site DC-2	Blackhawk Formation	Dugout Creek (lower main fork)
Site DC-3	Blackhawk Formation	Dugout Creek (lower right fork)
Site DC-4	Blackhawk Formation/Castlegate SS contact	Dugout Creek (upper left fork)
Site DC-5	Blackhawk Formation/Castlegate SS contact	Dugout Creek (upper left fork)
Site PC-1A	North Horn Formation	Pace Creek (above permit area)
Site PC-2	Blackhawk Formation	Pace Creek (below permit area)
Site RC-1	Blackhawk Formation / Qa	Rock Creek (below permit area)
Site G-6	Blackhawk Formation	Soldier Creek lower
Site G-7	North Horn Formation	Soldier Creek upper

Table 2 Precipitation measured at the Dugout Canyon Mine.

PETERSEN HYDROLOGIC, Table2.xls 20 Mar 03

Date	Precipitation (inches)
4/12/2002	0.02
4/18/2002	0.1
4/20/2002	0.08
4/26/2002	0.09
4/27/2002	0.21
5/22/2002	0.02
5/23/2002	0.05
5/28/2002	0.02
6/3/2002	0.14
7/12/2002	0.1
7/18/2002	0.05
7/20/2002	0.02
7/23/2002	0.02
7/25/2002	0.04
7/26/2002	0.07
8/2/2002	0.02
8/3/2002	0.02
8/19/2002	0.02
8/20/2002	1.15
8/21/2002	0.03
8/22/2002	0.01
8/29/2002	0.04

Note: precipitation data shown only for those days with precipitation.

Table 3 Soldier Canyon and Dugout Mines 2002 solute and isotopic compositions.

PETERSEN HYDROLOGIC, Table3.xls 20 Mar 03

									Major Ions								Trace Metals														Nutrients				Other Parameters							
	Date	Time	Flow	Tritium	T	pH	Cond	TDS	Ca^{2+} (d)	Mg^{2+} (d)	Na^{+} (d)	K^{+} (d)	HCO_3^-	CO_3^-	SO_4^{2-}	Cl^-	Al (d)	As (d)	B (d)	Cd (d)	Cu (d)	Fe (d)	Fe (t)	Pb (d)	Mn (d)	Mn (t)	Mo (d)	Se (d)	Zn (d)	NH_4	NO_3^-	NO_2^{2-}	$O\text{-}PO_4^{2-}$	D.O.	Acidity	OH-	Tot. Alk.	Hardness	O&G	TSS	SAR
			(gpm)	(TU)	(°C)		(µS/cm)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L N)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L CaCO3)	(mg/L)	(mg/L CaCO3)	(mg/L)	(mg/L)	(mg/L)	
Site SP-20	4/2/2002	800	1.5																																					
Site SP-20	4/9/2002	920	1.5		4	7.58	472																																	
Site SP-20	4/12/2002	800		10				340	77.6	29.9	11.6	0.9	302	<2	30	4						<0.01	2.25		<0.005	0.368									<2	248			0.28
Site SP-20	4/15/2002	940	0.85																																					
Site SP-20	4/23/2002	1050	1.06																																					
Site SP-20	4/29/2002	1310	1.65		8	7.76	507																																	
Site SP-20	5/6/2002	925	1																																					
Site SP-20	5/14/2002	810	2.26																																					
Site SP-20	5/20/2002	1400	1.4																																					
Site SP-20	5/27/2002	908	0.78		5	7	642																																	
Site SP-20	6/4/2002	935	0.71																																					
Site SP-20	6/11/2002	950	0.72			8.62	873																																	
Site SP-20	6/18/2002	902	0.39	12	7	8.9	762	330	84.2	30.6	12.5	1.2	368	<2	20	4	0.06	<0.0005	0.03	<0.0001	<0.01	<0.01	0.03	<0.0001	0.006	0.033	<0.01	<0.001	<0.01	<0.05	0.07	<0.03	<0.05		<2	<2	302	336			0.3
Site SP-20	6/24/2002	924	0.29																																					
Site SP-20	7/1/2002	1010	0.28		9	7.88	841																																	
Site SP-20	7/8/2002	1000	0.25																																					
Site SP-20	7/16/2002	1000	0.16		12	7.53	658																																	
Site SP-20	7/22/2002	1020	0.2																																					
Site SP-20	7/29/2002	950	0.16		11	7.62	817																																	
Site SP-20	8/7/2002	1700	0.66		10	7.97	784																																	
Site SP-20	8/13/2002	1735	0.16																																					
Site SP-20	8/20/2002	900	0.17		12	7.32	798																																	
Site SP-20	8/26/2002	1030	0.18																																					
Site SC-14	4/2/2002	730	1.25																																					
Site SC-14	4/9/2002	830	1.3		3	7.35	584																																	
Site SC-14	4/12/2002	730		10				420	94.6	38.5	9.7	1.2	340	<2	50	4						<0.01	0.39		<0.005	0.023									<2	279			0.21
Site SC-14	4/15/2002	925	1.98																																					
Site SC-14	4/23/2002	1025	0.85																																					
Site SC-14	4/29/2002	1240	0.79		9	6.93	627																																	
Site SC-14	5/6/2002	905	0.56																																					
Site SC-14	5/14/2002	835	0.66																																					
Site SC-14	5/20/2002	1340	0.53																																					
Site SC-14	5/27/2002	840	0.39		4	6.5	616																																	
Site SC-14	6/4/2002	915	0.38																																					
Site SC-14	6/11/2002	930	0.34			8.49	1009																																	
Site SC-14	6/18/2002	931	0.38	10	7	7.44	945	420	105	39.2	11.9	1.5	438	<2	60	4	0.04	6E-04	0.03	<0.0001	<0.01	0.05	2.9	<0.0001	0.027	0.182	<0.01	0.001	<0.01	0.07	0.27	<0.03	<0.05		<2	<2	359	424			0.25
Site SC-14	6/24/2002	910	0.19																																					
Site SC-14	7/1/2002	945	0.12		15	8.04	1004																																	
Site SC-14	7/8/2002	940	0.11																																					
Site SC-14	7/16/2002	940	0.1		11	7.2	931																																	
Site SC-14	7/22/2002	1005	0.09																																					
Site SC-14	7/29/2002	930	0																																					
Site SC-14	8/7/2002	1645	0																																					
Site SC-14	8/13/2002	1710	0																																					
Site SC-14	8/20/2002	850	0																																					
Site SC-14	8/26/2002	1010	0																																					
Site SC-65	4/2/2002	1000	NOA																																					
Site SC-65	4/9/2002	1425	0.3	11	8	7.8	600	460	63.3	49.7	47.2	2.1	357	<2	70	6						<0.01	0.27		<0.005	0.014									<2	293			1.09
Site SC-65	4/15/2002	840	0.39																																					
Site SC-65	4/29/2002	1425	0.53		12	7.8	777																																	
Site SC-65	5/6/2002	815	0.56																																					
Site SC-65	5/14/2002	935	0.76																																					
Site SC-65	5/20/2002	850	0.24		7	6.75	658																																	
Site SC-65	5/27/2002	1006	0.3		5	7.28	660																																	
Site SC-65	6/4/2002	1029	0.27																																					
Site SC-65	6/11/2002	1050	0.25			8.58	1045																																	
Site SC-65	6/18/2002	1023	0.23	10	8	7.71	980	450	83.5	49.9	44.9	2.4	441	<2	70	6	0.04	5E-04	0.09	<0.0001	<0.01	0.05	4.09	0.0001	0.028	0.296	0.01	0.001	<0.01	<0.05	0.17	<0.03	<0.05		<2	<2	362	414			0.97
Site SC-65	6/24/2002	1000	0.22																																					
Site SC-65	7/1/2002	1115	0.23		16	8.05	1068																																	
Site SC-65	7/8/2002	1045	0.16																																					
Site SC-65	7/16/2002	1025	0.22		7	7.55	760																																	
Site SC-65	7/22/2002	1100	0.19																																					
Site SC-65	7/29/2002	1030	0.19		10	7.36	1122																																	
Site SC-65	8/7/2002	1230	0.32		14	7.79	1026																																	
Site SC-65	8/17/2002	840	0.12																																					
Site SC-65	8/20/2002	1330	0.12		15	7.88	1082																																	
Site SC-65	8/26/2002	1120	0.12																																					
Site SC-100	4/2/2002	1000	NOA																																					
Site SC-100	4/9/2002	1315	0.13	10	2	7.9	590																																	
Site SC-100	4/15/2002	805	0.035					380	63.5	43.7	22.4	1.2	312	<2	50	5						<0.01	0.08		<0.005	0.005									<2	256			0.53
Site SC-100	4/23/2002	840	0																																					
Site SC-100	4/29/2002	1340	0																																					
Site SC-100	5/6/2002	740	0																																					
Site SC-100	5/14/2002	850	0																																					
Site SC-100	5/20/2002	805	0																																					
Site SC-100	5/27/2002	818	0																																					
Site SC-100	7/29/2002	1000	0																																					
Site SC-116	4/2/2002	1000	NOA																																					
Site SC-116	4/11/2002	1055	0.85	13	6	7.78	701	440	74.6	50.9	11.7	1.3	304	<2	100	4						<0.01	2.56		<0.005	0.065									<2	249			0.25
Site SC-116	4/15/2002	1430	0.8																																					
Site SC-116	4/23/2002	1430	0.4																																					
Site SC-116	4/30/2002	1045	0.9		6	7.87	680																																	
Site SC-116	5/6/2002	1335	0.7																																					

									Major Ions								Trace Metals														Nutrients				Other Parameters						
	Date	Time	Flow	Tritium	T	pH	Cond	TDS	Ca^{2+} (d)	Mg^{2+} (d)	Na^{+} (d)	K^{+} (d)	HCO_3^-	CO_3^-	SO_4^{2-}	Cl^-	Al (d)	As (d)	B (d)	Cd (d)	Cu (d)	Fe (d)	Fe (t)	Pb (d)	Mn (d)	Mn (t)	Mo (d)	Se (d)	Zn (d)	NH_4	NO_3^-	NO_2^{2-}	$O\text{-}PO_4^{2-}$	D.O.	Acidity	OH-	Tot. Alk.	Hardness	O&G	TSS	SAR
			(gpm)	(TU)	(°C)		(µS/cm)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L N)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L $CaCO_3$)	(mg/L)	(mg/L $CaCO_3$)	(mg/L)	(mg/L)	(mg/L)	
Site SC-116	5/13/2002	1730	0.69																																				
Site SC-116	5/20/2002	955	0.74																																				
Site SC-116	5/27/2002	1051	0.49		6	7.31	602																																
Site SC-116	6/4/2002	1141	0.4																																				
Site SC-116	6/11/2002	1153	0.39			8.47	1026																																
Site SC-116	6/18/2002	1130	0.63	12	6	8.41	899	440	84.0	50.8	11.8	1.2	366	<2	100	4	<0.03	<0.0005	0.03	0.0001	<0.01	<0.01	0.52	<0.0001	<0.005	0.052	<0.01	<0.001	<0.01	<0.05	<0.03	<0.03	<0.05		<2	<2	300	419			0.25
Site SC-116	6/24/2002	1038	0.3																																				
Site SC-116	7/1/2002	1220	0.36			7.95	994																																
Site SC-116	7/8/2002	1135	0.34																																				
Site SC-116	7/16/2002	1115	0.17		7	7.66	875																																
Site SC-116	7/22/2002	1132	0.31																																				
Site SC-116	7/29/2002	1100	0.3		8	7.41	978																																
Site SC-116	8/7/2002	1330	0.66		8	7.76	947																																
Site SC-116	8/17/2002	810	0.31																																				
Site SC-116	8/20/2002	1415	0.24		9	7.92	868																																
Site SC-116	8/26/2002	1200	0.38																																				
Site 200	4/2/2002	1010	NOA																																				
Site 200	4/11/2002	1320	NOA																																				
Site 200	4/15/2002	1345	NOA																																				
Site 200	4/23/2002	1345	NOA																																				
Site 200	4/30/2002	855	NOA																																				
Site 200	5/6/2002	1620	0.0013	10	13	7.46	1347																																
Site 200	5/13/2002	1545	0.0013																																				
Site 200	5/20/2002	1230	0																																				
Site 200	5/27/2002	1236	0																																				
Site 200	6/4/2002	1330	0																																				
Site 200	6/10/2002	1400	0																																				
Site 200	6/18/2002	1150	0																																				
Site 200	8/7/2002	1420	0																																				
Site 200	8/20/2002	1320	0																																				
Site 203	4/2/2002	1000	NOA																																				
Site 203	4/9/2002	1425	3	13	6	7.76	898	970	86.0	64.4	52.8	2.5	358	<2	200	7						<0.01	<0.01		<0.05	<0.05										<2	294			1.06
Site 203	4/15/2002	1410	6.66																																				
Site 203	4/23/2002	1405	5.5																																				
Site 203	4/30/2002	915	4.3		6	7.7	885																																
Site 203	5/6/2002	1400	3.17																																				
Site 203	5/13/2002	1515	4.29																																				
Site 203	5/20/2002	1048	3.58																																				
Site 203	5/27/2002	1139	3.39		5	7.33	763																																
Site 203	6/4/2002	1250	4.45																																				
Site 203	6/11/2002	1310	2.9				800	1415																																
Site 203	6/18/2002	1210	2.97	10	7	8.4	1194	620	92.2	63.2	46.5	2.4	443	<2	190	7	<0.03	<0.0005	0.06	<0.0001	<0.01	<0.01	0.08	<0.0001	<0.005	0.023	<0.01	<0.001	<0.01	<0.05	0.72	<0.03	<0.05		<2	<2	363	490			0.92
Site 203	6/24/2002	1138	3.67																																				
Site 203	7/1/2002	1330	4.4		8	7.8	1333																																
Site 203	7/8/2002	1220	3.5																																				
Site 203	7/16/2002	1130	3.4		9	7.46	1174																																
Site 203	7/22/2002	1200	5.3																																				
Site 203	7/29/2002	1120	3.5		7	7.53	1323																																
Site 203	8/7/2002	1400	2.5		7	7.7	1274																																
Site 203	8/17/2002	750	2.5																																				
Site 203	8/20/2002	1445	2.62		9	7.76	1130																																
Site 203	8/26/2002	1230	2.9																																				
Site 227	4/2/2002	950	0																																				
Site 227	4/9/2002	1415	0																																				
Site 227	4/15/2002	1450	0																																				
Site 227	4/23/2002	1445	0																																				
Site 227	4/30/2002	720	0																																				
Site 227	5/6/2002	1310	0																																				
Site 227	5/13/2002	1445	0																																				
Site 227	8/7/2002	1550	0																																				
Site 259	4/2/2002	1000	NOA																																				
Site 259	4/9/2002	1600	0																																				
Site 259	4/17/2002	1335	0																																				
Site 259	4/23/2002	1415	0																																				
Site 259	4/30/2002	1000	0 (damp)																																				
Site 259	5/6/2002	1715	0																																				
Site 259	5/13/2002	1500	0																																				
Site 259	8/7/2002	1530	0																																				
Site 260	4/2/2002	1000	NOA																																				
Site 260	4/11/2002	1225	12		2.5	8.24	440	290	60.9	25.3	12.7	1.2	257	<2	20	3						<0.01	0.10		<0.005	<0.005										<2	211			0.34
Site 260	4/17/2002	1240	12	10	3	7.74	470																																
Site 260	4/23/2002	1310	19																																				
Site 260	4/30/2002	815	15.85		3	7.78	482																																
Site 260	5/6/2002	1445	14.4																																				
Site 260	5/13/2002	1635	15.85																																				
Site 260	5/20/2002	1130	12.2																																				
Site 260	5/29/2002	1730	12		5	7.7	501																																
Site 260	6/4/2002	1345	11.36																																				
Site 260	6/11/2002	1410	6.6																																				
Site 260	6/18/2002	1300	9.26	13	6	8.88	634	300	85.5	31.2	14.5	1	300	<2	30	4	<0.03	<0.0005	0.01	0.0001	<0.01	0.15	0.09	0.0002	<0.005	0.017	<0.01	0.001	<0.01	<0.05	0.15	<0.03	<0.05		<2	<2	246	342			0.34
Site 260	6/24/2002	1235	11																																				
Site 260	7/1/2002	1430	16.85		7	8.06	720																																
Site 260	7/8/2002	1330	11.83																																				
Site 260	7/16/2002	1230	6.37		10	7.95	577																																

									Major Ions								Trace Metals													Nutrients				Other Parameters						
	Date	Time	Flow	Tritium	T	pH	Cond	TDS	Ca^{2+} (d)	Mg^{2+} (d)	Na^{+} (d)	K^{+} (d)	HCO_3^-	CO_3^-	SO_4^{2-}	Cl^-	Al (d)	As (d)	B (d)	Cd (d)	Cu (d)	Fe (d)	Fe (t)	Pb (d)	Mn (d)	Mn (t)	Mo (d)	Se (d)	Zn (d)	NH_4	NO_3^-	NO_2^{2-}	$O\text{-}PO_4^{2-}$	D.O.	Acidity	OH-	Tot. Alk.	Hardness	O&G	TSS	SAR
			(gpm)	(TU)	(°C)		(µS/cm)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L N)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L CaCO3)	(mg/L)	(mg/L CaCO3)	(mg/L)	(mg/L)	(mg/L)	
Site 260	7/22/2002	1235	10.71																																				
Site 260	7/29/2002	1225	9.49		6	7.63	722																																
Site 260	8/7/2002	1500	11.74		5	8.18	689																																
Site 260	8/17/2002	700	9.2		8																																		
Site 260	8/20/2002	1520	7.18		8	8.27	660																																
Site 260	8/26/2002	1330	12.06																																				
Site DC-2	4/2/2002	1220	37.5		4	7.95	747																																
Site DC-2	4/9/2002	1255	17.5	8	6	8.46	780	520	67.9	59.9	28.7	2.4	317	<2	140	9						<0.01	0.01		<0.005	<0.005								4.5		<2	260		<2	<5	0.62
Site DC-2	4/15/2002	1245	37.5																																				
Site DC-2	4/24/2002	740	19.8																																				
Site DC-2	4/29/2002	730	32																																				
Site DC-2	5/6/2002	1105	15.85																																				
Site DC-2	5/13/2002	1230	27.57		9	8.1	642																																
Site DC-2	5/20/2002	735	10.6																																				
Site DC-2	5/29/2002	1410	13.8		7	7.59	615																																
Site DC-2	6/5/2002	1135	1.98																																				
Site DC-2	6/10/2002	955	0																																				
Site DC-2	6/14/2002	10:30						490	64.5	61.2	33.7	2.6	417	<2	130	8	<0.03	6E-04	0.05	<0.0001	<0.01	0.02	0.09	<0.0002	0.007	<0.005	<0.01	<0.001	0.01	0.08					<2	<2	342	413	<2	12	0.73
Site DC-2	6/13/2002			10																										<0.03	<0.03	<0.05							
Site DC-2	6/18/2002	1500	0																																				
Site DC-2	6/24/2002	1025	0																																				
Site DC-2	7/2/2002	705	0																																				
Site DC-2	7/9/2002	715	0																																				
Site DC-2	7/29/2002	725	0																																				
Site DC-2	8/26/2002	930	0																																				
Site DC-3	4/2/2002	1235	21.5		1	8.29	466																																
Site DC-3	4/9/2002	1310	3.75	10	4	8.53	559	390	59.2	43.9	16.5	1.8	244	<2	110	6						<0.01	0.05		<0.005	<0.005								5		<2	200		<2	<5	0.40
Site DC-3	4/15/2002	1220	5																																				
Site DC-3	4/24/2002	730	2																																				
Site DC-3	4/29/2002	750	2.6																																				
Site DC-3	5/6/2002	1055	1																																				
Site DC-3	5/13/2002	1245	0.01		13	8.02	517																																
Site DC-3	5/20/2002	725	0																																				
Site DC-3	5/29/2002	1416	0																																				
Site DC-3	6/5/2002	1130	0																																				
Site DC-3	6/6/2002	950		10				430	67.5	48.6	19.8	2.2	328	<2	110	6						<0.01	0.20		<0.005	0.005					0.04	<0.03	<0.05			<2	269		<2	22	0.45
Site DC-3	6/10/2002	1505	0																																				
Site DC-3	6/18/2002	1020	0																																				
Site DC-3	6/24/2002	710	0																																				
Site DC-3	7/2/2002	710	0																																				
Site DC-3	7/9/2002	730	0																																				
Site DC-3	7/29/2002	935	0																																				
Site DC-3	8/26/2002		0																																				
Site DC-4	4/2/2002	1200	5.5		4	7.43	659																																
Site DC-4	4/9/2002	1230	4.3	12	6	8.25	672	440	65.6	49.5	19.8	2.1	330	<2	130	7						<0.01	0.08		<0.005	<0.005								5		<2	271		<2	<5	0.45
Site DC-4	4/15/2002	1230	6																																				
Site DC-4	4/24/2002	710	8																																				
Site DC-4	4/29/2002	715	4																																				
Site DC-4	5/6/2002	1120	1.98																																				
Site DC-4	5/13/2002	1215	0.6		12	8.18	598																																
Site DC-4	5/20/2002	745	0.76																																				
Site DC-4	5/29/2002	1357	0.57		10	7.96	640																																
Site DC-4	6/5/2002	1145	0.23		10	7.15	845																											5						
Site DC-4	6/6/2002			11				480	69.6	54.7	22.5	2.6	350	<2	130	7						0.02	0.27		<0.005	0.009					<0.03	<0.03	<0.05			<2	287		<2	14	0.49
Site DC-4	6/10/2002	1000	0.1																																				
Site DC-4	6/18/2002	1515	0.05		17	8.72	955																											5						
Site DC-4	6/24/2002	1005	0.03																																				
Site DC-4	7/2/2002	720	0																																				
Site DC-4	7/9/2002	720	0																																				
Site DC-4	7/15/2002	810	0																																				
Site DC-4	7/22/2002	840	0																																				
Site DC-4	7/29/2002	715	0																																				
Site DC-4	8/26/2002	945	0																																				
Site DC-5	4/2/2002	1150	25		4	7.69	784																																
Site DC-5	4/9/2002	1240	7.5	8	4	8.12	776	540	72.4	64.7	31.3	2.5	333	<2	150	9						<0.01	0.03		<0.005	0.005								5		<2	273		<2	<5	0.65
Site DC-5	4/15/2002	1235	15																																				
Site DC-5	4/24/2002	720	15.8																																				
Site DC-5	4/29/2002	720	12																																				
Site DC-5	5/6/2002	1125	17.68																																				
Site DC-5	5/13/2002	1220	23.78		8	8.06	693																																
Site DC-5	5/20/2002	750	16																																				
Site DC-5	5/29/2002	1402	7.44		7	8.05	654																																
Site DC-5	6/5/2002	1150	11.6																																				
Site DC-5	6/10/2002	1010	8																																				
Site DC-5	6/18/2002	1520	1.59	9	16	8.73	860	490	63.8	60.7	35.5	2.8	390	<2	130	8	<0.03	6E-04	0.07	<0.0001	<0.01	0.01	0.1	<0.0001	0.010	0.013	<0.05	<0.001	<0.01	0.13	<0.03	<0.03	<0.05	6	<2	<2	320	409	<2	<5	0.77
Site DC-5	6/24/2002	1010	0.6																																				
Site DC-5	7/2/2002	715	0.7																																				
Site DC-5	7/9/2002	720	0.33																																				
Site DC-5	7/15/2002	810	0.39																																				
Site DC-5	7/22/2002	840	0.26		10	8.37	1090																																
Site DC-5	7/29/2002	715	0																																				
Site DC-5	8/6/2002	1200	0																																				
Site DC-5	8/12/2002	700	0																																				
Site DC-5	8/20/2002	740	0																																				
Site DC-5	8/26/2002	950	0																																				

									Major Ions								Trace Metals												Nutrients				Other Parameters						
	Date	Time	Flow	Tritium	T	pH	Cond	TDS	Ca^{2+} (d)	Mg^{2+} (d)	Na^{+} (d)	K^{+} (d)	HCO_3^-	CO_3^-	SO_4^{2-}	Cl^-	Al (d)	As (d)	B (d)	Cd (d)	Cu (d)	Fe (d)	Fe (t)	Pb (d)	Mn (d)	Mn (t)	Mo (d)	Se (d)	Zn (d)	NH_4	NO_3^-	NO_2^{2-}	$O\text{-}PO_4^{2-}$	D.O.	Acidity	OH-	Tot. Alk.	Hardness	O&G	TSS	SAR
			(gpm)	(TU)	(°C)		(µS/cm)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L N)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L $CaCO_3$)	(mg/L)	(mg/L $CaCO_3$)	(mg/L)	(mg/L)	(mg/L)	
Site PC-1A	4/2/2002	1000	NOA																																				
Site PC-1A	4/9/2002	1445	20	13	4	7.48	499	430	64.8	46.6	26.9	2.1	313	<2	90	3						0.01	6.72		0.007	0.116							6		<2	257		<2	80	0.63
Site PC-1A	4/15/2002	1405	7																																				
Site PC-1A	4/23/2002	1400	19																																				
Site PC-1A	4/30/2002	910	22.6		3	8.06	613																																
Site PC-1A	5/6/2002	1405	6.34																																				
Site PC-1A	5/13/2002	1520	9.9																																				
Site PC-1A	5/20/2002	1100	9.94																																				
Site PC-1A	5/29/2002	1150	13.2		7	7.71	614																																
Site PC-1A	6/4/2002	1300	9.6																																				
Site PC-1A	6/11/2002	1320	9.4			8.5	1081																																
Site PC-1A	6/18/2002	1217	4.68	16	12	8.45	860	450	72.6	49.3	29.7	2.4	415	<2	80	3	<0.03	<0.000	0.04	<0.0001	<0.01	<0.01	1.06	<0.0001	0.019	0.023	<0.01	<0.001	<0.01	0.15	0.12	<0.03	<0.05	5	<2	<2	340	384	<2	110	0.66
Site PC-1A	6/24/2002	1140	9.33																																				
Site PC-1A	7/1/2002	1345	7.05		16	8.22	1027																																
Site PC-1A	7/8/2002	1230	6.68																																				
Site PC-1A	7/16/2002	1137	6.57		9	7.98	813																																
Site PC-1A	7/22/2002	1210	6.8																																				
Site PC-1A	7/29/2002	1125	6.76		7	7.79	1057																																
Site PC-1A	8/7/2002	1410	5.5		14	7.92	1039																										6						
Site PC-1A	8/17/2002	740	6.1																																				
Site PC-1A	8/20/2002	1545	7.4		13	8.48	952																																
Site PC-1A	8/26/2002	1240	8.46																																				
Site PC-2	4/2/2002	930	25		3	7.65	803																																
Site PC-2	4/9/2002	1640	19	16	7	7.94	706	640	69.6	70.0	42.5	3.2	317	<2	230	8						<0.01	<0.01		0.006	<0.005							5		<2	260		<2	<5	0.87
Site PC-2	4/15/2002	1500	5.6																																				
Site PC-2	4/23/2002	1450	5.6																																				
Site PC-2	4/30/2002	1115	8.9		6	8.01	872																																
Site PC-2	5/6/2002	1305	9.54																																				
Site PC-2	5/13/2002	1430	6																																				
Site PC-2	5/20/2002	1030	7.6																																				
Site PC-2	5/29/2002	1119	5.34		10	7.77	763																																
Site PC-2	6/4/2002	1230	7.5																																				
Site PC-2	6/11/2002	1234	0.79			8.29	1675																																
Site PC-2	6/18/2002	1400	0	11				720	81.7	83.4	53.7	4.9	423	21	270	10	<0.03	7E-04	0.09	<0.0001	<0.01	<0.01	0.15	<0.0001	<0.005	0.011	<0.01	<0.001	<0.01	<0.05	<0.03	<0.03	<0.05		<2	<2	364	547	<2	6	1.01
Site PC-2	6/24/2002	1100	0																																				
Site PC-2	7/1/2002	1300	0																																				
Site PC-2	7/8/2002	1145	0																																				
Site PC-2	7/16/2002	1255	0																																				
Site PC-2	7/22/2002	1300	0																																				
Site PC-2	7/29/2002	710	0																																				
Site PC-2	8/20/2002	1430	0																																				
Site RC-1	4/2/2002	840	0																																				
Site RC-1	4/9/2002	1335	0																																				
Site RC-1	4/15/2002	1320	0																																				
Site RC-1	4/23/2002	1115	0																																				
Site RC-1	4/30/2002	1855	0																																				
Site RC-1	5/6/2002	1245	0																																				
Site RC-1	5/13/2002	1345	0																																				
Site RC-1	8/20/2002	1615	0																																				
Site RC-1	8/26/2002	1410	0																																				
Site 5	4/7/2002	1210	1.33		6	7.8	510																																
Site 5	4/14/2002	1300	1.2		6	7.9	520																																
Site 5	4/15/2002			11																																			
Site 5	4/21/2002	1230	0.8		3	8.1		360	87.0	30.2	13.5	0.9	289	<2	60	9																			<2	237				0.32
Site 5	4/28/2002	1210	0.85		5	8.1																																	
Site 5	5/5/2002	1115	0.85		6	8																																	
Site 5	5/12/2002	1250	1																																				
Site 5	5/19/2002	1310	0.86		9	7.4	650																																
Site 5	5/26/2002	1315	0.86		6	7.7	510																																
Site 5	6/2/2002	1050	0.52		10	7.75	858																																
Site 5	6/9/2002	1220	0.52		6	7.7																																	
Site 5	6/13/2002	1200	0.6	11	7	8.28	840																							1.05	<0.03	<0.05								
Site 5	6/14/2002	1200							88.9	31.0	13.8	1.1	369	<2	50	8						<0.01	0.17		0.014	0.016									<2	303	350				
Site 5	6/23/2002	1130	0.5																																				
Site 5	6/25/2002	830	0.55			6.68	923																																
Site 5	7/2/2002	1045	0.5																																				
Site 5	7/12/2002	920	0.4																																				
Site 5	7/16/2002	840	0.39																																				
Site 5	7/22/2002	1730	0.5																																				
Site 5	7/29/2002	850	0.58																																				
Site 5	8/8/2002	1310	0.25		14	7.89	875																																
Site 5	8/13/2002	710	0.22																																				
Site 5	8/20/2002	1040	0.44		12	7.57	808																																
Site 5	8/30/2002	730	0.4																																				
Site 10	4/2/2002	1335	0.6		14	8.03	929																																
Site 10	4/9/2002	1015	0.44	0	6.5	7.47	966	650	31.8	30.5	190	3.2	494	<2	80	10																			<2	405				5.85
Site 10	4/15/2002	1015	0.4																																				
Site 10	4/23/2002	1545	0.45																																				
Site 10	4/29/2002	1530	0.4		7	7.51	964																																
Site 10	5/6/2002	1005	0.5																																				
Site 10	5/13/2002	1120	0.37		12	7.77	1163																																
Site 10	5/20/2002	1425	0.48																																				
Site 10	5/28/2002	730	0.52		10	7.75	858																																
Site 10	6/5/2002	955	0.39																																				

									Major Ions							Trace Metals												Nutrients				Other Parameters						
	Date	Time	Flow	Tritium	T	pH	Cond	TDS	Ca^{2+} (d)	Mg^{2+} (d)	Na^{+} (d)	K^{+} (d)	HCO_3^-	CO_3^-	SO_4^{2-}	Cl^-	Al (d)	As (d)	B (d)	Cd (d)	Cu (d)	Fe (d)	Fe (t)	Pb (d)	Mn (d)	Mn (t)	Mo (d)	Se (d)	Zn (d)	NH_4	NO_3^-	NO_2^{2-}	O-PO_4^{2-}	D.O.	Acidity	OH-	Tot. Alk.	Hardness	O&G	TSS	SAR
			(gpm)	(TU)	(°C)		(µS/cm)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L N)	(mg/L)	(mg/L)	(mg/L)	(mg/L)	(mg/L $CaCO_3$)	(mg/L)	(mg/L $CaCO_3$)	(mg/L)	(mg/L)	(mg/L)	
Site 10	6/10/2002	845	0.44																																				
Site 10	6/18/2002	800	0.13	2	8	8.31	1527	650	34.9	29.2	177	2.9	655	32	<10	41						<0.01	0.03		0.009	0.011									<2	564	207			5.41
Site 10	6/24/2002	1130	0.3																																				
Site 10	7/2/2002	805	0.3																																				
Site 10	7/9/2002	930	0.07																																				
Site 10	7/16/2002	745	0.1																																				
Site 10	7/22/2002	430	0.16			8.24	1463																																
Site 10	7/29/2002	805	0.11																																				
Site 10	8/7/2002	1730	0.13		12	8.04	872																																
Site 10	8/14/2002	1245	0.1																																				
Site 10	8/20/2002	1000	0.1		12	8.35	1418																																
Site 10	8/26/2002	1110	0.09																																				
Site 23	4/7/2002	1130	0																																				
Site 23	4/14/2002	1220	0																																				
Site 23	4/21/2002	1115	0																																				
Site 23	4/28/2002	1145	0																																				
Site 23	5/5/2002	1040	0																																				
Site 23	5/12/2002	1315	0																																				
Site 23	5/19/2002	1300	0																																				
Site 23	5/26/2002	1210	0																																				
Site 23	6/25/2002	745	0																																				
Site 23	7/29/2002	835	0																																				
Site 24	4/7/2002	1050	0																																				
Site 24	4/14/2002	1145	0																																				
Site 24	4/21/2002	1200	0																																				
Site 24	4/28/2002	1100	0																																				
Site 24	5/5/2002	1000	0																																				
Site 24	5/12/2002	1225	0																																				
Site 24	5/19/2002	1300	0																																				
Site 24	5/26/2002	1220	0																																				
Site 24	6/25/2002	750	0																																				
Site 24	7/29/2002	840	0																																				
Site G-6	4/2/2002	1320	164		13	8.27	805																																
Site G-6	4/9/2002	1100	312.5	9	4	8.32	758	560	57.4	51.5	84.5	2.2	354	<2	120	13																	5		<2	290		<2		1.97
Site G-6	4/15/2002	1040	187																																				
Site G-6	4/23/2002	1535	112																																				
Site G-6	4/29/2002	1548	49		15	8.11	951																										6						
Site G-6	5/12/2002	1025	28.5																																				
Site G-6	5/13/2002	1150	45		11	7.99	1062																																
Site G-6	5/20/2002	1440	45																																				
Site G-6	5/28/2002	755	66.22		8	8.06	678																																
Site G-6	6/5/2002	1015	33.51																																				
Site G-6	6/11/2002	910	18.1																																				
Site G-6	6/18/2002	745	10.48	6	7	8.51	1451	620	71.2	60.5	81.1	3.6	413	<2	200	12						<0.01	0.19		<0.005	0.013								7		<2	339		<2		1.73
Site G-6	6/24/2002	1120	11.9																																				
Site G-6	7/2/2002	755	6.4																																				
Site G-6	7/9/2002	925	3.1																																				
Site G-6	7/16/2002	755	7.5																																				
Site G-6	7/22/2002	1620	0.39		17	8.48	1351																																
Site G-6	7/29/2002	750	11.9																																				
Site G-6	8/7/2002	1800	0.69		17	8.08	1332																										5						
Site G-6	8/14/2002	1300	0.9																																				
Site G-6	8/20/2002	1135	0.79		17	8.6	1395																																
Site G-6	8/26/2002	1105	5.9																																				
Site G-7	4/2/2002	1350	200.5			8.37	752																																
Site G-7	4/9/2002	1040	331	12	3	8.28	743	530	47.1	46.3	91.4	1.3	376	<2	90	14																	5		<2	308		<2		2.29
Site G-7	4/15/2002	1030	293																																				
Site G-7	4/23/2002	1600	136																																				
Site G-7	4/29/2002	1540	83.5		16	7.77	920																										6						
Site G-7	5/12/2002	1015	23.78																																				
Site G-7	5/13/2002	1130	43		12	7.86	925																																
Site G-7	5/20/2002	1430	47.6																																				
Site G-7	5/28/2002	740	59.45		8	8.06	605																																
Site G-7	6/5/2002	1005	25.32																																				
Site G-7	6/10/2002	855	19.2																																				
Site G-7	6/18/2002	815	14.27	11	7	8.31	1225	520	44.1	40.5	113	2.1	479	<2	70	12						<0.01	0.14		0.026	0.030							7		<2	393	277			2.99
Site G-7	6/24/2002	1140	10.57																																		<2		
Site G-7	7/2/2002	810	4																																				
Site G-7	7/9/2002	935	2.5																																				
Site G-7	7/16/2002	755	5.6																																				
Site G-7	7/22/2002	1635	2.64		16	8.14	1369																																
Site G-7	7/29/2002	805	4																																				
Site G-7	8/7/2002	1740	1.99																																				
Site G-7	8/14/2002	1240	2.79																																				
Site G-7	8/20/2002	1005	2.8		14	8.14	1272																																
Site G-7	8/26/2002	1115	3.2																																				

Table 4 Tritium and solute compositions of Soldier Canyon Mine groundwaters.

	Date	Tritium (TU)	T (°C)	pH	Cond. µS/cm	Ca^{2+} (mg/L)	Mg^{2+} (mg/L)	Na^{+} (mg/L)	K^{+} (mg/L)	Fe (d) (mg/L)	Fe (t) (mg/L)	HCO_3^{-} (mg/L)	CO_3^{2-} (mg/L)	SO_4^{2-} (mg/L)	Cl^{-} (mg/L)
Drill Hole SC-38	23-Feb-95	0.14	15	7.88	1250	67.74	31	287.1	20.3	0.113	0.118	1116	0	0.48	46.08
Main East X-Cut 7	23-Feb-95	0	14.7	8.07	1500	50.24	33.7	366.2	16.5	0.009	0.051	1308	0	1.44	39.11
12th West	23-Feb-95	0.15	16.5	8.05	1150	66.77	32.1	256.2	24.4	0	0.039	1062	0	1.25	38.37
Drill Hole SC-12G	23-Feb-95	0.06	17.2	7.75	1480	17.18	14.61	449.4	16.44	0.044	1.479	1304	0	6.1	41.1
8th West	23-Feb-95	0.15	18.2	7.5	2050	32.26	18.7	580.5	30.5	0.008	0.079	1704	0	2.76	96.07
11th East (UG-11E)	23-Feb-95	0.08	22.8	7.85	1710	16.3	11.97	449.5	17	0.009	0.165	1249	0	67.01	51.56
Degas Hole, Sun Seam	23-Feb-95	0.11	17	7.7	700	50.97	35.8	115	13.86	0.023	0.287	680	0	3.76	9.491
3rd West pillar area	23-Feb-95	0.06	17.5	7.25	1060	75.28	46	165.1	10.6	0.008	0.294	770	0	114.8	25.33
Average		**0.09**	**17.4**	**7.76**	**1360**	**47.1**	**28.0**	**334**	**19**	**0.03**	**0.31**	**1149**	**0**	**24.7**	**43.4**

Appendix A

Laboratory Reporting Sheets

Tritium Analyses

University of Miami Tritium Laboratory

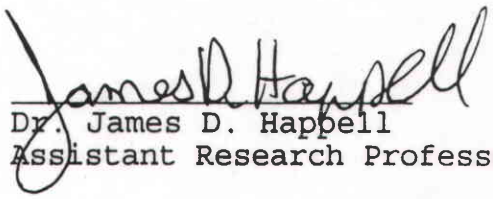
UNIVERSITY OF Miami
THE ROSENSTIEL SCHOOL

August 9, 2002

TRITIUM LABORATORY

Data Release #02-073
Job # 1635

PETERSEN HYDROLOGIC
TRITIUM SAMPLES



Dr. James D. Happell
Assistant Research Professor

Distribution:
Erik C. Petersen
Petersen Hydrologic
2695 N. 600 E.
Lehi, UT 84043

Rosenstiel School of Marine and Atmospheric Science
Tritium Laboratory
4600 Rickenbacker Causeway
Miami, FL 33149-1098
Phone: (305) 361-4100
Fax: (305) 361-4112
email: tritium@rsmas.miami.edu

Revised 1 January 2002

GENERAL COMMENTS ON TRITIUM RESULTS

Tritium Scale New Half-life

Tritium concentrations are expressed in TU, where 1 TU indicates a T/H abundance ratio of 10^{-18}. The values refer to the tritium scale recommended by U.S. National Institute of Science and Technology (NIST, formerly NBS), and International Atomic Energy Agency (IAEA). The TU-numbers are based on the NIST tritium water standard #4926E. Age corrections and conversions are made using the recommended half-life of **12.32 years**, i.e., a decay rate of $\lambda = 5.626\%\ \text{year}^{-1}$. In this scale, 1 TU is equivalent to 7.151 dpm/kg H_2O, or 3.222 pCi/kg H_2O, or 0.1192 Bq/kg H_2O (Bq = disint/sec).

TU values are calculated for date of sample collection, REFDATE in the table, as provided by the submitter. If no such date is available, date of sample arrival at our laboratory is used.

The stated errors, eTU, are one standard deviation (1 sigma) including all conceivable contributions. In the table, QUANT is quantity of sample received, and ELYS is the amount of water taken for electrolytic enrichment. DIR means direct run (no enrichment).

Remark: From 1 Jan 1994 through 31 Dec 2001 we used the previously recommended value for the half-life, 12.43 years. The use of the new number, 12.32 years will in practice increase the reported TU-values by 0.9 %. This is insignificant since our reported values carry 1 sigma uncertainties of 3 % or more.

It is interesting to note that before 1994 we used the older, then recommended value of 12.26 years.

Very low tritium values

In some cases, negative TU values are listed. Such numbers can occur because the net tritium count rate is, in principle the difference between the count rate of the sample and that of a tritium-free sample (background count or blank sample). Given a set of "unknown" samples with no tritium, the distribution of net results should become symmetrical around 0 TU. The negative values are reported as such for the benefit of allowing the user unbiased statistical treatment of sets of the data. For other applications, 0 TU should be used.

Additional information

Refer to Services Rendered (Tritium), Section II.8, in the "Tritium Laboratory Price Schedule; Procedures and Standards; Advice on Sampling", and our Web-site www.rsmas.edu/groups/tritium.

Tritium efficiencies and background values are somewhat different in each of the nine counters and values are corrected for cosmic intensity, gas pressure and other parameters. For tritium, the efficiency is typically 1.00 cpm per 100 TU (direct counting). At 50× enrichment, the efficiency is equivalent to 1.00 cpm per 2.4 TU. The background is typically 0.3 cpm, known to about ± 0.02 cpm. Our reported results include not only the Poisson statistics, but also other experimental uncertainties such as enrichment error, etc.

End

Client: PETERSON HYDROLOGIC-DUGOUT MINE
Recvd : 02/07/22
Job# : 1635
Final : 02/08/08 Dugout/Soldier Cyn Mine Investigation 2002

Pur. Order: Inv. to V. Miller
Contact: E. Petersen, 801/766-4006
2695 N. 600 E.
Nehi, UT 84043

Cust	LABEL INFO		JOB.SX	REFDATE	QUANT	ELYS	TU		eTU
PETERSEN-CFC	200	DIRECT	1635.01	020506	30	DIR	10		2
PETERSEN-CFC	DC-3	DIRECT	1635.02	020409	30	DIR	10		2
PETERSEN-CFC	PC2	DIRECT	1635.03	020409	30	DIR	16		3
PETERSEN-CFC	SC-100	DIRECT	1635.04	020409	30	DIR	10		3
PETERSEN-CFC	SC-116	DIRECT	1635.05	020411	30	DIR	13		2
PETERSEN-CFC	SP-20	DIRECT	1635.06	020412	30	DIR	10		2
PETERSEN-CFC	203	DIRECT	1635.07	020409	30	DIR	13	*	3
PETERSEN-CFC	10	DIRECT	1635.08	020409	30	DIR	0	*	2
PETERSEN-CFC	DC-2	DIRECT	1635.09	020409	30	DIR	8	*	3
PETERSEN-CFC	G7	DIRECT	1635.10	020409	30	DIR	12		3
PETERSEN-CFC	SC-65	DIRECT	1635.11	020409	30	DIR	11		2
PETERSEN-CFC	DC-5	DIRECT	1635.12	020409	30	DIR	8		2
PETERSEN-CFC	DC-4	DIRECT	1635.13	020409	30	DIR	12		2
PETERSEN-CFC	PC1A	DIRECT	1635.14	020409	30	DIR	13		3
PETERSEN-CFC	5	DIRECT	1635.15	020415	30	DIR	11	*	3
PETERSEN-CFC	260	DIRECT	1635.16	020417	30	DIR	10		2
PETERSEN-CFC	SC-14	DIRECT	1635.17	020412	30	DIR	10		2
PETERSEN-CFC	G6	DIRECT	1635.18	020409	30	DIR	9		2
PETERSEN-CFC	SP-20	DIRECT	1635.19	020618	30	DIR	12		2
PETERSEN-CFC	SC-14	DIRECT	1635.20	020618	30	DIR	10		2
PETERSEN-CFC	SC-65	DIRECT	1635.21	020618	30	DIR	10		2
PETERSEN-CFC	260	DIRECT	1635.22	020618	30	DIR	13		2
PETERSEN-CFC	DC-3	DIRECT	1635.23	020606	30	DIR	10		2
PETERSEN-CFC	PC-2	DIRECT	1635.24	020618	30	DIR	11		2
PETERSEN-CFC	DC-2	DIRECT	1635.25	020613	30	DIR	10		2
PETERSEN-CFC	10	DIRECT	1635.26	020618	30	DIR	2	*	3
PETERSEN-CFC	G-7	DIRECT	1635.27	020618	30	DIR	11		3
PETERSEN-CFC	DC-5	DIRECT	1635.28	020618	30	DIR	9		2
PETERSEN-CFC	G-6	DIRECT	1635.29	020618	30	DIR	6		2
PETERSEN-CFC	DC-4	DIRECT	1635.30	020606	30	DIR	11		2
PETERSEN-CFC	PC-1A	DIRECT	1635.31	020618	30	DIR	16		2
PETERSEN-CFC	203	DIRECT	1635.32	020618	30	DIR	10		2
PETERSEN-CFC	5	DIRECT	1635.33	020613	30	DIR	11		2
PETERSEN-CFC	SC-116	DIRECT	1635.34	020618	30	DIR	12		2

* Average of duplicate runs

Appendix B

Laboratory Reporting Sheets

Solute Analyses

ACZ, Inc. and CT&E Co.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487 (800) 334-5493

Inorganic Reference

Report Header Explanations

Batch	A distinct set of samples analyzed at a specific time
Found	Value of the QC Type of interest
Limit	Upper limit for RPD, in %.
Lower	Lower Recovery Limit, in % (except for LCSS, mg/Kg)
MDL	Method Detection Limit. Same as Minimum Reporting Limit. Allows for instrument and annual fluctuations.
PCN/SCN	A number assigned to reagents/standards to trace to the manufacturer's certificate of analysis
PQL	Practical Quantitation Limit, typically 5 times the MDL.
QC	True Value of the Control Sample or the amount added to the Spike
Rec	Amount of the true value or spike added recovered, in % (except for LCSS, mg/Kg)
RPD	Relative Percent Difference, calculation used for Duplicate QC Types
Upper	Upper Recovery Limit, in % (except for LCSS, mg/Kg)
Sample	Value of the Sample of interest

QC Sample Types

AS	Analytical Spike (Post Digestion)	*LFM*	Laboratory Fortified Matrix
ASD	Analytical Spike (Post Digestion) Duplicate	*LFMD*	Laboratory Fortified Matrix Duplicate
DUP	Sample Duplicate	*LRB*	Laboratory Reagent Blank
LCSS	Laboratory Control Sample - Soil	*MS/MSD*	Matrix Spike/Matrix Spike Duplicate
LCSW	Laboratory Control Sample - Water	*PBS*	Prep Blank - Soil
LFB	Laboratory Fortified Blank	*PBW*	Prep Blank - Water

QC Sample Type Explanations

Blanks	Verifies that there is no or minimal contamination in the prep method procedure.
Control Samples	Verifies the accuracy of the method, including the prep procedure.
Duplicates	Verifies the precision of the instrument and/or method.
Spikes/Fortified Matrix	Determines sample matrix interferences, if any.

ACZ Qualifiers (Qual)

B	Analyte concentration detected at a value between MDL and PQL.
H	Analysis exceeded method hold time. pH is a field test with an immediate hold time.
R	Poor spike recovery accepted because the other spike in the set fell within the given limits.
T	High Relative Percent Difference (RPD) accepted because sample concentrations are less than 10x the MDL.
U	Analyte was analyzed for but not detected at the indicated MDL
V	High blank data accepted because sample concentration is 10 times higher than blank concentration
W	Poor recovery for Silver quality control is accepted because Silver often precipitates with Chloride.
X	Quality control sample is out of control.
Z	Poor spike recovery is accepted because sample concentration is four times greater than spike concentration.

Method References

(1)	EPA 600/4-83-020. Methods for Chemical Analysis of Water and Wastes, March 1983.
(2)	EPA 600/R-93-100. Methods for the Determination of Inorganic Substances in Environmental Samples, August 1993.
(3)	EPA 600/R-94-111. Methods for the Determination of Metals in Environmental Samples - Supplement I, May 1994.
(5)	EPA SW-846. Test Methods for Evaluating Solid Waste, Third Edition with Update III, December 1996.
(6)	Standard Methods for the Examination of Water and Wastewater, 19th edition, 1995.

Comments

(1)	QC results calculated from raw data. Results may vary slightly if the rounded values are used in the calculations.
(2)	Soil, Sludge, and Plant matrices for Inorganic analyses are reported on a dry weight basis.
(3)	Animal matrices for Inorganic analyses are reported on an "as received" basis.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487(800) 334-5493

Inorganic Analytical Results

Soldier Creek Coal Company
Project ID: 2ND QTR
Sample ID: SC100

ACZ ID: *L36454-12*
Date Sampled: *04/09/02 13:15*
Date Received: *04/12/02*
Sample Matrix: *Ground Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Calcium, dissolved	M200.7 ICP	63.5		mg/L	0.2	1	04/21/02 4:51	bf
Iron, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	04/21/02 4:51	bf
Iron, total	M200.7 ICP	0.08		mg/L	0.01	0.05	04/30/02 11:47	ct
Magnesium, dissolved	M200.7 ICP	43.7		mg/L	0.2	1	04/21/02 4:51	bf
Manganese, dissolved	M200.7 ICP		U	mg/L	0.005	0.03	04/21/02 4:51	bf
Manganese, total	M200.7 ICP	0.005	B	mg/L	0.005	0.03	04/25/02 2:04	bf
Potassium, dissolved	M200.7 ICP	1.2		mg/L	0.3	1	04/21/02 4:51	bf
Sodium, dissolved	M200.7 ICP	22.4		mg/L	0.3	1	04/21/02 4:51	bf

Metals Prep

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Total Hot Plate Digestion	M200.2 ICP						04/29/02 19:55	ct

Wet Chemistry

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B							
Bicarbonate as CaCO3		256		mg/L	2	10	04/19/02 0:00	lc
Carbonate as CaCO3			U	mg/L	2	10	04/19/02 0:00	lc
Hydroxide as CaCO3			U	mg/L	2	10	04/19/02 0:00	lc
Total Alkalinity		256		mg/L	2	10	04/19/02 0:00	lc
Cation-Anion Balance	Calculation							
Cation-Anion Balance		10.0		%			04/24/02 0:00	calc
Sum of Anions		6.3		meq/L	0.1	0.5	04/24/02 0:00	calc
Sum of Cations		7.7		meq/L	0.1	0.5	04/24/02 0:00	calc
Chloride	M325.2 - Colorimetric (RFA)	5		mg/L	1	5	04/23/02 14:39	ksj
Residue, Filterable (TDS) @180C	M160.1 - Gravimetric	380		mg/L	10	20	04/16/02 17:47	teb
Sodium Absorption Ratio in Water	USGS - I1738-78	0.53			0.03	0.15	04/24/02 0:00	calc
Sulfate	M375.3 - Gravimetric	50		mg/L	10	20	04/23/02 11:52	lc
TDS (calculated)	Calculation	339		mg/L	10	50	04/24/02 0:00	calc
TDS (ratio - measured/calculated)	Calculation	1.12					04/24/02 0:00	calc

Note: Suspected analytes were retested to verify the Cation-Anion Balance.

ACZ Laboratories, Inc.
2773 Downhill Drive Steamboat Springs, CO 80487(800) 334-5493

Inorganic Analytical Results

Soldier Creek Coal Company
Project ID: DUGOUT MINE
Sample ID: SC116

ACZ ID: *L36493-04*
Date Sampled: *04/11/02 10:55*
Date Received: *04/16/02*
Sample Matrix: *Ground Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Calcium, dissolved	M200.7 ICP	74.6		mg/L	0.2	1	04/25/02 16:43	ct
Iron, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	04/25/02 16:43	ct
Iron, total	M200.7 ICP	2.56		mg/L	0.01	0.05	04/27/02 21:14	bf
Magnesium, dissolved	M200.7 ICP	50.9		mg/L	0.2	1	04/25/02 16:43	ct
Manganese, dissolved	M200.7 ICP		U	mg/L	0.005	0.03	04/25/02 16:43	ct
Manganese, total	M200.7 ICP	0.065		mg/L	0.005	0.03	04/27/02 21:14	bf
Potassium, dissolved	M200.7 ICP	1.3		mg/L	0.3	1	04/25/02 16:43	ct
Sodium, dissolved	M200.7 ICP	11.7		mg/L	0.3	1	04/25/02 16:43	ct

Metals Prep

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Total Hot Plate Digestion	M200.2 ICP						04/18/02 18:13	ct

Wet Chemistry

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B							
Bicarbonate as CaCO3		249		mg/L	2	10	04/20/02 0:00	lc
Carbonate as CaCO3			U	mg/L	2	10	04/20/02 0:00	lc
Hydroxide as CaCO3			U	mg/L	2	10	04/20/02 0:00	lc
Total Alkalinity		249		mg/L	2	10	04/20/02 0:00	lc
Cation-Anion Balance	Calculation							
Cation-Anion Balance		8.4		%			04/26/02 0:00	calc
Sum of Anions		7.1		meq/L	0.1	0.5	04/26/02 0:00	calc
Sum of Cations		8.4		meq/L	0.1	0.5	04/26/02 0:00	calc
Chloride	M325.2 - Colorimetric (RFA)	4	B	mg/L	1	5	04/23/02 15:55	ksj
Residue, Filterable (TDS) @180C	M160.1 - Gravimetric	440		mg/L	10	20	04/08/02 12:50	teb
Sodium Absorption Ratio in Water	USGS - I1738-78	0.25			0.03	0.15	04/26/02 0:00	calc
Sulfate	M375.3 - Gravimetric	100		mg/L	10	20	04/23/02 11:41	lc
TDS (calculated)	Calculation	392		mg/L	10	50	04/26/02 0:00	calc
TDS (ratio - measured/calculated)	Calculation	1.12					04/26/02 0:00	calc

Note: Suspected analytes were retested to verify the Cation-Anion Balance.

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Inorganic Analytical Results

Soldier Creek Coal Company
Project ID: 2ND QTR
Sample ID: 203

ACZ ID: *L36454-15*
Date Sampled: *04/09/02 14:25*
Date Received: *04/12/02*
Sample Matrix: *Ground Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Calcium, dissolved	M200.7 ICP	86.0		mg/L	0.2	1	04/21/02 4:59	bf
Iron, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	04/21/02 4:59	bf
Iron, total	M200.7 ICP		U	mg/L	0.01	0.05	04/24/02 5:21	bf
Magnesium, dissolved	M200.7 ICP	64.4		mg/L	0.2	1	04/21/02 4:59	bf
Manganese, dissolved	M200.7 ICP		U	mg/L	0.005	0.03	04/21/02 4:59	bf
Manganese, total	M200.7 ICP		U	mg/L	0.005	0.03	04/24/02 5:21	bf
Potassium, dissolved	M200.7 ICP	2.5		mg/L	0.3	1	04/21/02 4:59	bf
Sodium, dissolved	M200.7 ICP	52.8		mg/L	0.3	1	04/21/02 4:59	bf

Metals Prep

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Total Hot Plate Digestion	M200.2 ICP						04/18/02 9:17	ct

Wet Chemistry

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B							
Bicarbonate as CaCO3		294		mg/L	2	10	04/19/02 0:00	lc
Carbonate as CaCO3			U	mg/L	2	10	04/19/02 0:00	lc
Hydroxide as CaCO3			U	mg/L	2	10	04/19/02 0:00	lc
Total Alkalinity		294		mg/L	2	10	04/19/02 0:00	lc
Cation-Anion Balance	Calculation							
Cation-Anion Balance		7.6		%			04/24/02 0:00	calc
Sum of Anions		10.3		meq/L	0.1	0.5	04/24/02 0:00	calc
Sum of Cations		12.0		meq/L	0.1	0.5	04/24/02 0:00	calc
Chloride	M325.2 - Colorimetric (RFA)	7		mg/L	1	5	04/23/02 14:42	ksj
Residue, Filterable (TDS) @180C	M160.1 - Gravimetric	970		mg/L	10	20	04/16/02 17:54	teb
Sodium Absorption Ratio in Water	USGS - I1738-78	1.06			0.03	0.15	04/24/02 0:00	calc
Sulfate	M375.3 - Gravimetric	200		mg/L	10	20	04/23/02 11:57	lc
TDS (calculated)	Calculation	589		mg/L	10	50	04/24/02 0:00	calc
TDS (ratio - measured/calculated)	Calculation	1.65					04/24/02 0:00	calc

Note: Suspected analytes were retested to verify the Cation-Anion Balance.

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Inorganic Analytical Results

Soldier Creek Coal Company
Project ID: DUGOUT MINE
Sample ID: 260

ACZ ID: *L36493-05*
Date Sampled: *04/11/02 12:25*
Date Received: *04/16/02*
Sample Matrix: *Ground Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Calcium, dissolved	M200.7 ICP	60.9		mg/L	0.2	1	04/25/02 16:46	ct
Iron, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	04/25/02 16:46	ct
Iron, total	M200.7 ICP	0.10		mg/L	0.01	0.05	04/30/02 21:43	ct
Magnesium, dissolved	M200.7 ICP	25.3		mg/L	0.2	1	04/25/02 16:46	ct
Manganese, dissolved	M200.7 ICP		U	mg/L	0.005	0.03	04/25/02 16:46	ct
Manganese, total	M200.7 ICP		U	mg/L	0.005	0.03	04/27/02 21:26	bf
Potassium, dissolved	M200.7 ICP	1.2		mg/L	0.3	1	04/25/02 16:46	ct
Sodium, dissolved	M200.7 ICP	12.7		mg/L	0.3	1	04/25/02 16:46	ct

Metals Prep

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Total Hot Plate Digestion	M200.2 ICP						04/18/02 18:30	ct

Wet Chemistry

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B							
Bicarbonate as CaCO3		211		mg/L	2	10	04/20/02 0:00	lc
Carbonate as CaCO3			U	mg/L	2	10	04/20/02 0:00	lc
Hydroxide as CaCO3			U	mg/L	2	10	04/20/02 0:00	lc
Total Alkalinity		211		mg/L	2	10	04/20/02 0:00	lc
Cation-Anion Balance	Calculation							
Cation-Anion Balance		9.6		%			04/26/02 0:00	calc
Sum of Anions		4.7		meq/L	0.1	0.5	04/26/02 0:00	calc
Sum of Cations		5.7		meq/L	0.1	0.5	04/26/02 0:00	calc
Chloride	M325.2 - Colorimetric (RFA)	3	B	mg/L	1	5	04/23/02 15:56	ksj
Residue, Filterable (TDS) @180C	M160.1 - Gravimetric	290		mg/L	10	20	04/08/02 12:51	teb
Sodium Absorption Ratio in Water	USGS - I1738-78	0.34			0.03	0.15	04/26/02 0:00	calc
Sulfate	M375.3 - Gravimetric	20		mg/L	10	20	04/23/02 11:44	lc
TDS (calculated)	Calculation	250		mg/L	10	50	04/26/02 0:00	calc
TDS (ratio - measured/calculated)	Calculation	1.16					04/26/02 0:00	calc

Note: Suspected analytes were retested to verify the Cation-Anion Balance.

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Inorganic Analytical Results

Soldier Creek Coal Company
Project ID: 2ND QTR
Sample ID: DC4

ACZ ID: *L36454-09*
Date Sampled: *04/09/02 12:30*
Date Received: *04/12/02*
Sample Matrix: *Surface Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Calcium, dissolved	M200.7 ICP	65.6		mg/L	0.2	1	04/23/02 21:06	bf
Iron, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	04/23/02 21:06	bf
Iron, total	M200.7 ICP	0.08		mg/L	0.01	0.05	04/24/02 5:09	bf
Magnesium, dissolved	M200.7 ICP	49.5		mg/L	0.2	1	04/23/02 21:06	bf
Manganese, dissolved	M200.7 ICP		U	mg/L	0.005	0.03	04/23/02 21:06	bf
Manganese, total	M200.7 ICP		U	mg/L	0.005	0.03	04/24/02 5:09	bf
Potassium, dissolved	M200.7 ICP	2.1		mg/L	0.3	1	04/23/02 21:06	bf
Sodium, dissolved	M200.7 ICP	19.8		mg/L	0.3	1	04/23/02 21:06	bf

Metals Prep

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Total Hot Plate Digestion	M200.2 ICP						04/18/02 7:07	ct

Wet Chemistry

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B							
Bicarbonate as CaCO3		271		mg/L	2	10	04/19/02 0:00	lc
Carbonate as CaCO3			U	mg/L	2	10	04/19/02 0:00	lc
Hydroxide as CaCO3			U	mg/L	2	10	04/19/02 0:00	lc
Total Alkalinity		271		mg/L	2	10	04/19/02 0:00	lc
Cation-Anion Balance	Calculation							
Cation-Anion Balance		-0.6		%			04/24/02 0:00	calc
Sum of Anions		8.3		meq/L	0.1	0.5	04/24/02 0:00	calc
Sum of Cations		8.2		meq/L	0.1	0.5	04/24/02 0:00	calc
Chloride	M325.2 - Colorimetric (RFA)	7		mg/L	1	5	04/23/02 14:36	ksj
Oil & Grease, Total Recoverable	M1664 - Gravimetric		U	mg/L	2	10	04/24/02 8:09	ecr
Residue, Filterable (TDS) @180C	M160.1 - Gravimetric	440		mg/L	10	20	04/16/02 17:39	teb
Residue, Non-Filterable (TSS) @105C	M160.2 - Gravimetric		U	mg/L	5	20	04/15/02 13:17	teb
Sodium Absorption Ratio in Water	USGS - I1738-78	0.45			0.03	0.15	04/24/02 0:00	calc
Sulfate	M375.3 - Gravimetric	130		mg/L	10	20	04/23/02 11:15	lc
TDS (calculated)	Calculation	437		mg/L	10	50	04/24/02 0:00	calc
TDS (ratio - measured/calculated)	Calculation	1.01					04/24/02 0:00	calc

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Inorganic Analytical Results

Soldier Creek Coal Company
Project ID: 2ND QTR
Sample ID: DC5

ACZ ID: *L36454-10*
Date Sampled: *04/09/02 12:40*
Date Received: *04/12/02*
Sample Matrix: *Surface Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Calcium, dissolved	M200.7 ICP	72.4		mg/L	0.2	1	04/23/02 21:09	bf
Iron, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	04/23/02 21:09	bf
Iron, total	M200.7 ICP	0.03	B	mg/L	0.01	0.05	04/24/02 5:13	bf
Magnesium, dissolved	M200.7 ICP	64.7		mg/L	0.2	1	04/23/02 21:09	bf
Manganese, dissolved	M200.7 ICP		U	mg/L	0.005	0.03	04/23/02 21:09	bf
Manganese, total	M200.7 ICP	0.005	B	mg/L	0.005	0.03	04/24/02 5:13	bf
Potassium, dissolved	M200.7 ICP	2.5		mg/L	0.3	1	04/23/02 21:09	bf
Sodium, dissolved	M200.7 ICP	31.3		mg/L	0.3	1	04/23/02 21:09	bf

Metals Prep

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Total Hot Plate Digestion	M200.2 ICP						04/18/02 7:51	ct

Wet Chemistry

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B							
Bicarbonate as CaCO3		273		mg/L	2	10	04/19/02 0:00	lc
Carbonate as CaCO3			U	mg/L	2	10	04/19/02 0:00	lc
Hydroxide as CaCO3			U	mg/L	2	10	04/19/02 0:00	lc
Total Alkalinity		273		mg/L	2	10	04/19/02 0:00	lc
Cation-Anion Balance	Calculation							
Cation-Anion Balance		8.3		%			04/24/02 0:00	calc
Sum of Anions		8.8		meq/L	0.1	0.5	04/24/02 0:00	calc
Sum of Cations		10.4		meq/L	0.1	0.5	04/24/02 0:00	calc
Chloride	M325.2 - Colorimetric (RFA)	9		mg/L	1	5	04/23/02 14:37	ksj
Oil & Grease, Total Recoverable	M1664 - Gravimetric		U	mg/L	2	10	04/25/02 9:20	haw
Residue, Filterable (TDS) @180C	M160.1 - Gravimetric	540		mg/L	10	20	04/16/02 17:41	teb
Residue, Non-Filterable (TSS) @105C	M160.2 - Gravimetric		U	mg/L	5	20	04/15/02 13:20	teb
Sodium Absorption Ratio in Water	USGS - I1738-78	0.65			0.03	0.15	04/24/02 0:00	calc
Sulfate	M375.3 - Gravimetric	150		mg/L	10	20	04/23/02 11:18	lc
TDS (calculated)	Calculation	494		mg/L	10	50	04/24/02 0:00	calc
TDS (ratio - measured/calculated)	Calculation	1.09					04/24/02 0:00	calc

Note: Suspected analytes were retested to verify the Cation-Anion Balance.

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Inorganic Analytical Results

Soldier Creek Coal Company
Project ID: 2ND QTR
Sample ID: PC1A

ACZ ID: *L36454-06*
Date Sampled: *04/09/02 14:45*
Date Received: *04/12/02*
Sample Matrix: *Surface Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Calcium, dissolved	M200.7 ICP	64.8		mg/L	0.2	1	04/23/02 19:27	ct
Iron, dissolved	M200.7 ICP	0.01	B	mg/L	0.01	0.05	04/23/02 19:27	ct
Iron, total	M200.7 ICP	6.72		mg/L	0.01	0.05	04/24/02 4:38	bf
Magnesium, dissolved	M200.7 ICP	46.6		mg/L	0.2	1	04/23/02 19:27	ct
Manganese, dissolved	M200.7 ICP	0.007	B	mg/L	0.005	0.03	04/23/02 19:27	ct
Manganese, total	M200.7 ICP	0.116		mg/L	0.005	0.03	04/24/02 4:38	bf
Potassium, dissolved	M200.7 ICP	2.1		mg/L	0.3	1	04/23/02 19:27	ct
Sodium, dissolved	M200.7 ICP	26.9		mg/L	0.3	1	04/23/02 19:27	ct

Metals Prep

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Total Hot Plate Digestion	M200.2 ICP						04/18/02 3:32	ct

Wet Chemistry

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B							
Bicarbonate as CaCO3		257		mg/L	2	10	04/19/02 0:00	lc
Carbonate as CaCO3			U	mg/L	2	10	04/19/02 0:00	lc
Hydroxide as CaCO3			U	mg/L	2	10	04/19/02 0:00	lc
Total Alkalinity		257		mg/L	2	10	04/19/02 0:00	lc
Cation-Anion Balance	Calculation							
Cation-Anion Balance		7.8		%			04/24/02 0:00	calc
Sum of Anions		7.1		meq/L	0.1	0.5	04/24/02 0:00	calc
Sum of Cations		8.3		meq/L	0.1	0.5	04/24/02 0:00	calc
Chloride	M325.2 - Colorimetric (RFA)	3	B	mg/L	1	5	04/23/02 14:34	ksj
Oil & Grease, Total Recoverable	M1664 - Gravimetric		U	mg/L	2	10	04/24/02 0:53	ecr
Residue, Filterable (TDS) @180C	M160.1 - Gravimetric	430		mg/L	10	20	04/16/02 17:28	teb
Residue, Non-Filterable (TSS) @105C	M160.2 - Gravimetric	80		mg/L	5	20	04/15/02 13:10	teb
Sodium Absorption Ratio in Water	USGS - I1738-78	0.63			0.03	0.15	04/24/02 0:00	calc
Sulfate	M375.3 - Gravimetric	90		mg/L	10	20	04/23/02 11:07	lc
TDS (calculated)	Calculation	388		mg/L	10	50	04/24/02 0:00	calc
TDS (ratio - measured/calculated)	Calculation	1.11					04/24/02 0:00	calc

Note: Suspected analytes were retested to verify the Cation-Anion Balance.

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Inorganic Analytical Results

Soldier Creek Coal Company
Project ID: 2ND QTR
Sample ID: PC2

ACZ ID: *L36454-08*
Date Sampled: *04/09/02 14:40*
Date Received: *04/12/02*
Sample Matrix: *Surface Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Calcium, dissolved	M200.7 ICP	69.6		mg/L	0.2	1	04/23/02 21:02	bf
Iron, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	04/23/02 21:02	bf
Iron, total	M200.7 ICP		U	mg/L	0.01	0.05	04/24/02 5:05	bf
Magnesium, dissolved	M200.7 ICP	70.0		mg/L	0.2	1	04/23/02 21:02	bf
Manganese, dissolved	M200.7 ICP	0.006	B	mg/L	0.005	0.03	04/23/02 21:02	bf
Manganese, total	M200.7 ICP		U	mg/L	0.005	0.03	04/24/02 5:05	bf
Potassium, dissolved	M200.7 ICP	3.2		mg/L	0.3	1	04/23/02 21:02	bf
Sodium, dissolved	M200.7 ICP	42.5		mg/L	0.3	1	04/23/02 21:02	bf

Metals Prep

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Total Hot Plate Digestion	M200.2 ICP						04/18/02 6:24	ct

Wet Chemistry

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B							
Bicarbonate as CaCO3		260		mg/L	2	10	04/19/02 0:00	lc
Carbonate as CaCO3			U	mg/L	2	10	04/19/02 0:00	lc
Hydroxide as CaCO3			U	mg/L	2	10	04/19/02 0:00	lc
Total Alkalinity		260		mg/L	2	10	04/19/02 0:00	lc
Cation-Anion Balance	Calculation							
Cation-Anion Balance		4.2		%			04/24/02 0:00	calc
Sum of Anions		10.3		meq/L	0.1	0.5	04/24/02 0:00	calc
Sum of Cations		11.2		meq/L	0.1	0.5	04/24/02 0:00	calc
Chloride	M325.2 - Colorimetric (RFA)	8		mg/L	1	5	04/23/02 14:35	ksj
Oil & Grease, Total Recoverable	M1664 - Gravimetric		U	mg/L	2	10	04/24/02 5:44	ecr
Residue, Filterable (TDS) @180C	M160.1 - Gravimetric	640		mg/L	10	20	04/16/02 17:36	teb
Residue, Non-Filterable (TSS) @105C	M160.2 - Gravimetric		U	mg/L	5	20	04/15/02 13:15	teb
Sodium Absorption Ratio in Water	USGS - I1738-78	0.87			0.03	0.15	04/24/02 0:00	calc
Sulfate	M375.3 - Gravimetric	230		mg/L	10	20	04/23/02 11:13	lc
TDS (calculated)	Calculation	579		mg/L	10	50	04/24/02 0:00	calc
TDS (ratio - measured/calculated)	Calculation	1.11					04/24/02 0:00	calc

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Inorganic Analytical Results

Soldier Creek Coal Company
Project ID: 2ND QTR
Sample ID: 10

ACZ ID: *L36454-13*
Date Sampled: *04/09/02 10:15*
Date Received: *04/12/02*
Sample Matrix: *Ground Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Calcium, dissolved	M200.7 ICP	31.8		mg/L	0.2	1	04/21/02 4:55	bf
Magnesium, dissolved	M200.7 ICP	30.5		mg/L	0.2	1	04/21/02 4:55	bf
Potassium, dissolved	M200.7 ICP	3.2		mg/L	0.3	1	04/21/02 4:55	bf
Sodium, dissolved	M200.7 ICP	190		mg/L	2	10	04/21/02 4:55	bf

Wet Chemistry

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B							
Bicarbonate as CaCO3		405		mg/L	2	10	04/19/02 0:00	lc
Carbonate as CaCO3			U	mg/L	2	10	04/19/02 0:00	lc
Hydroxide as CaCO3			U	mg/L	2	10	04/19/02 0:00	lc
Total Alkalinity		405		mg/L	2	10	04/19/02 0:00	lc
Cation-Anion Balance	Calculation							
Cation-Anion Balance		10.6		%			04/24/02 0:00	calc
Sum of Anions		10.1		meq/L	0.1	0.5	04/24/02 0:00	calc
Sum of Cations		12.5		meq/L	0.1	0.5	04/24/02 0:00	calc
Chloride	M325.2 - Colorimetric (RFA)	10		mg/L	1	5	04/23/02 14:41	ksj
Residue, Filterable (TDS) @180C	M160.1 - Gravimetric	650		mg/L	10	20	04/16/02 17:49	teb
Sodium Absorption Ratio in Water	USGS - I1738-78	5.85			0.03	0.15	04/24/02 0:00	calc
Sulfate	M375.3 - Gravimetric	80		mg/L	10	20	04/23/02 11:54	lc
TDS (calculated)	Calculation	589		mg/L	10	50	04/24/02 0:00	calc
TDS (ratio - measured/calculated)	Calculation	1.10					04/24/02 0:00	calc

Note: Suspected analytes were retested to verify the Cation-Anion Balance.

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Inorganic Analytical Results

Soldier Creek Coal Company
Project ID:
Sample ID: 5

ACZ ID: *L36599-01*
Date Sampled: *04/21/02 12:30*
Date Received: *04/24/02*
Sample Matrix: *Ground Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Calcium, dissolved	M200.7 ICP	87.0		mg/L	0.2	1	05/04/02 17:29	bf
Magnesium, dissolved	M200.7 ICP	30.2		mg/L	0.2	1	05/04/02 17:29	bf
Potassium, dissolved	M200.7 ICP	0.9	B	mg/L	0.3	1	05/04/02 17:29	bf
Sodium, dissolved	M200.7 ICP	13.5		mg/L	0.3	1	05/04/02 17:29	bf

Wet Chemistry

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B							
Bicarbonate as CaCO3		237		mg/L	2	10	04/24/02 0:00	lc
Carbonate as CaCO3			U	mg/L	2	10	04/24/02 0:00	lc
Hydroxide as CaCO3			U	mg/L	2	10	04/24/02 0:00	lc
Total Alkalinity		237		mg/L	2	10	04/24/02 0:00	lc
Cation-Anion Balance	Calculation							
Cation-Anion Balance		8.8		%			05/07/02 0:00	calc
Sum of Anions		6.2		meq/L	0.1	0.5	05/07/02 0:00	calc
Sum of Cations		7.4		meq/L	0.1	0.5	05/07/02 0:00	calc
Chloride	M325.2 - Colorimetric (RFA)	9		mg/L	1	5	05/04/02 14:37	sjs
Residue, Filterable (TDS) @180C	M160.1 - Gravimetric	360		mg/L	10	20	04/26/02 15:22	haw
Sodium Absorption Ratio in Water	USGS - I1738-78	0.32			0.03	0.15	05/07/02 0:00	calc
Sulfate	M375.3 - Gravimetric	60		mg/L	10	20	04/30/02 13:16	teb
TDS (calculated)	Calculation	343		mg/L	10	50	05/07/02 0:00	calc
TDS (ratio - measured/calculated)	Calculation	1.05					05/07/02 0:00	calc

Note: Suspected analytes were retested to verify the Cation-Anion Balance after the applicable holdtime had expired.

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Inorganic Analytical Results

Soldier Creek Coal Company
Project ID: 2ND QTR
Sample ID: G7

ACZ ID: *L36454-04*
Date Sampled: *04/09/02 10:40*
Date Received: *04/12/02*
Sample Matrix: *Surface Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Calcium, dissolved	M200.7 ICP	47.1		mg/L	0.2	1	04/23/02 19:04	ct
Magnesium, dissolved	M200.7 ICP	46.3		mg/L	0.2	1	04/23/02 19:04	ct
Potassium, dissolved	M200.7 ICP	1.3		mg/L	0.3	1	04/23/02 19:04	ct
Sodium, dissolved	M200.7 ICP	91.4		mg/L	0.3	1	04/23/02 19:04	ct

Wet Chemistry

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B							
Bicarbonate as CaCO3		308		mg/L	2	10	04/19/02 0:00	lc
Carbonate as CaCO3			U	mg/L	2	10	04/19/02 0:00	lc
Hydroxide as CaCO3			U	mg/L	2	10	04/19/02 0:00	lc
Total Alkalinity		308		mg/L	2	10	04/19/02 0:00	lc
Cation-Anion Balance	Calculation							
Cation-Anion Balance		9.7		%			04/24/02 0:00	calc
Sum of Anions		8.4		meq/L	0.1	0.5	04/24/02 0:00	calc
Sum of Cations		10.2		meq/L	0.1	0.5	04/24/02 0:00	calc
Chloride	M325.2 - Colorimetric (RFA)	14		mg/L	1	5	04/23/02 14:32	ksj
Oil & Grease, Total Recoverable	M1664 - Gravimetric		U	mg/L	2	10	04/23/02 22:28	ecr
Residue, Filterable (TDS) @180C	M160.1 - Gravimetric	530		mg/L	10	20	04/16/02 17:23	teb
Sodium Absorption Ratio in Water	USGS - I1738-78	2.29			0.03	0.15	04/24/02 0:00	calc
Sulfate	M375.3 - Gravimetric	90		mg/L	10	20	04/23/02 11:05	lc
TDS (calculated)	Calculation	475		mg/L	10	50	04/24/02 0:00	calc
TDS (ratio - measured/calculated)	Calculation	1.12					04/24/02 0:00	calc

Note: Suspected analytes were retested to verify the Cation-Anion Balance.

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Inorganic Analytical Results

Soldier Creek Coal Company
Project ID: 2ND QTR
Sample ID: G6

ACZ ID: *L36454-03*
Date Sampled: *04/09/02 11:00*
Date Received: *04/12/02*
Sample Matrix: *Surface Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Calcium, dissolved	M200.7 ICP	57.4		mg/L	0.2	1	04/21/02 4:43	bf
Magnesium, dissolved	M200.7 ICP	51.5		mg/L	0.2	1	04/21/02 4:43	bf
Potassium, dissolved	M200.7 ICP	2.2		mg/L	0.3	1	04/21/02 4:43	bf
Sodium, dissolved	M200.7 ICP	84.5		mg/L	0.3	1	04/21/02 4:43	bf

Wet Chemistry

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B							
Bicarbonate as CaCO3		290		mg/L	2	10	04/19/02 0:00	lc
Carbonate as CaCO3			U	mg/L	2	10	04/19/02 0:00	lc
Hydroxide as CaCO3			U	mg/L	2	10	04/19/02 0:00	lc
Total Alkalinity		290		mg/L	2	10	04/19/02 0:00	lc
Cation-Anion Balance	Calculation							
Cation-Anion Balance		11.8		%			04/24/02 0:00	calc
Sum of Anions		8.6		meq/L	0.1	0.5	04/24/02 0:00	calc
Sum of Cations		10.9		meq/L	0.1	0.5	04/24/02 0:00	calc
Chloride	M325.2 - Colorimetric (RFA)	13		mg/L	1	5	04/23/02 14:32	ksj
Oil & Grease, Total Recoverable	M1664 - Gravimetric		U	mg/L	2	10	04/23/02 20:03	ecr
Residue, Filterable (TDS) @180C	M160.1 - Gravimetric	560		mg/L	10	20	04/16/02 17:20	teb
Sodium Absorption Ratio in Water	USGS - I1738-78	1.97			0.03	0.15	04/24/02 0:00	calc
Sulfate	M375.3 - Gravimetric	120		mg/L	10	20	04/23/02 11:47	lc
TDS (calculated)	Calculation	503		mg/L	10	50	04/24/02 0:00	calc
TDS (ratio - measured/calculated)	Calculation	1.11					04/24/02 0:00	calc

Note: Suspected analytes were retested to verify the Cation-Anion Balance.

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Inorganic Analytical Results

Soldier Creek Coal Company
Project ID: DUGOUT MINE
Sample ID: ~~SC20~~ SP 20

ACZ ID: *L36493-02*
Date Sampled: *04/12/02 08:00*
Date Received: *04/16/02*
Sample Matrix: *Ground Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Calcium, dissolved	M200.7 ICP	77.6		mg/L	0.2	1	04/25/02 16:39	ct
Iron, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	04/25/02 16:39	ct
Iron, total	M200.7 ICP	2.25		mg/L	0.01	0.05	04/27/02 21:10	bf
Magnesium, dissolved	M200.7 ICP	29.9		mg/L	0.2	1	04/25/02 16:39	ct
Manganese, dissolved	M200.7 ICP		U	mg/L	0.005	0.03	04/25/02 16:39	ct
Manganese, total	M200.7 ICP	0.368		mg/L	0.005	0.03	04/27/02 21:10	bf
Potassium, dissolved	M200.7 ICP	0.9	B	mg/L	0.3	1	04/25/02 16:39	ct
Sodium, dissolved	M200.7 ICP	11.6		mg/L	0.3	1	04/25/02 16:39	ct

Metals Prep

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Total Hot Plate Digestion	M200.2 ICP						04/18/02 17:56	ct

Wet Chemistry

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B							
Bicarbonate as CaCO3		248		mg/L	2	10	04/20/02 0:00	lc
Carbonate as CaCO3			U	mg/L	2	10	04/20/02 0:00	lc
Hydroxide as CaCO3			U	mg/L	2	10	04/20/02 0:00	lc
Total Alkalinity		248		mg/L	2	10	04/20/02 0:00	lc
Cation-Anion Balance	Calculation							
Cation-Anion Balance		8.8		%			04/26/02 0:00	calc
Sum of Anions		5.7		meq/L	0.1	0.5	04/26/02 0:00	calc
Sum of Cations		6.8		meq/L	0.1	0.5	04/26/02 0:00	calc
Chloride	M325.2 - Colorimetric (RFA)	4	B	mg/L	1	5	04/23/02 15:54	ksj
Residue, Filterable (TDS) @180C	M160.1 - Gravimetric	340		mg/L	10	20	04/08/02 12:48 4/28/02	teb
Sodium Absorption Ratio in Water	USGS - I1738-78	0.28			0.03	0.15	04/26/02 0:00	calc
Sulfate	M375.3 - Gravimetric	30		mg/L	10	20	04/23/02 11:39	lc
TDS (calculated)	Calculation	303		mg/L	10	50	04/26/02 0:00	calc
TDS (ratio - measured/calculated)	Calculation	1.12					04/26/02 0:00	calc

Note: Suspected analytes were retested to verify the Cation-Anion Balance.

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Inorganic Analytical Results

Soldier Creek Coal Company
Project ID: DUGOUT MINE
Sample ID: SC14

ACZ ID: ***L36493-01***
Date Sampled: *04/12/02 07:30*
Date Received: *04/16/02*
Sample Matrix: *Ground Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Calcium, dissolved	M200.7 ICP	94.6		mg/L	0.2	1	04/25/02 16:35	ct
Iron, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	04/25/02 16:35	ct
Iron, total	M200.7 ICP	0.39		mg/L	0.01	0.05	04/30/02 17:18	ct
Magnesium, dissolved	M200.7 ICP	38.5		mg/L	0.2	1	04/25/02 16:35	ct
Manganese, dissolved	M200.7 ICP		U	mg/L	0.005	0.03	04/25/02 16:35	ct
Manganese, total	M200.7 ICP	0.023	B	mg/L	0.005	0.03	04/27/02 21:05	bf
Potassium, dissolved	M200.7 ICP	1.2		mg/L	0.3	1	04/25/02 16:35	ct
Sodium, dissolved	M200.7 ICP	9.7		mg/L	0.3	1	04/25/02 16:35	ct

Metals Prep

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Total Hot Plate Digestion	M200.2 ICP						04/18/02 17:39	ct

Wet Chemistry

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B							
Bicarbonate as CaCO3		279		mg/L	2	10	04/20/02 0:00	lc
Carbonate as CaCO3			U	mg/L	2	10	04/20/02 0:00	lc
Hydroxide as CaCO3			U	mg/L	2	10	04/20/02 0:00	lc
Total Alkalinity		279		mg/L	2	10	04/20/02 0:00	lc
Cation-Anion Balance	Calculation							
Cation-Anion Balance		10.7		%			04/26/02 0:00	calc
Sum of Anions		6.7		meq/L	0.1	0.5	04/26/02 0:00	calc
Sum of Cations		8.3		meq/L	0.1	0.5	04/26/02 0:00	calc
Chloride	M325.2 - Colorimetric (RFA)	4	B	mg/L	1	5	04/23/02 15:53	ksj
Residue, Filterable (TDS) @180C	M160.1 - Gravimetric	420		mg/L	10	20	04/08/02 12:47	teb
Sodium Absorption Ratio in Water	USGS - I1738-78	0.21			0.03	0.15	04/26/02 0:00	calc
Sulfate	M375.3 - Gravimetric	50		mg/L	10	20	04/23/02 11:36	lc
TDS (calculated)	Calculation	365		mg/L	10	50	04/26/02 0:00	calc
TDS (ratio - measured/calculated)	Calculation	1.15					04/26/02 0:00	calc

Note: Suspected analytes were retested to verify the Cation-Anion Balance.

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Inorganic Analytical Results

Soldier Creek Coal Company
Project ID: 2ND QTR
Sample ID: SC65

ACZ ID: *L36454-05*
Date Sampled: *04/09/02 14:25*
Date Received: *04/12/02*
Sample Matrix: *Ground Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Calcium, dissolved	M200.7 ICP	63.3		mg/L	0.2	1	04/21/02 4:47	bf
Iron, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	04/21/02 4:47	bf
Iron, total	M200.7 ICP	0.27		mg/L	0.01	0.05	04/24/02 4:34	bf
Magnesium, dissolved	M200.7 ICP	49.7		mg/L	0.2	1	04/21/02 4:47	bf
Manganese, dissolved	M200.7 ICP		U	mg/L	0.005	0.03	04/21/02 4:47	bf
Manganese, total	M200.7 ICP	0.014	B	mg/L	0.005	0.03	04/24/02 4:34	bf
Potassium, dissolved	M200.7 ICP	2.1		mg/L	0.3	1	04/21/02 4:47	bf
Sodium, dissolved	M200.7 ICP	47.2		mg/L	0.3	1	04/21/02 4:47	bf

Metals Prep

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Total Hot Plate Digestion	M200.2 ICP						04/18/02 2:49	ct

Wet Chemistry

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B							
Bicarbonate as CaCO3		293		mg/L	2	10	04/19/02 0:00	lc
Carbonate as CaCO3			U	mg/L	2	10	04/19/02 0:00	lc
Hydroxide as CaCO3			U	mg/L	2	10	04/19/02 0:00	lc
Total Alkalinity		293		mg/L	2	10	04/19/02 0:00	lc
Cation-Anion Balance	Calculation							
Cation-Anion Balance		10.7		%			04/24/02 0:00	calc
Sum of Anions		7.5		meq/L	0.1	0.5	04/24/02 0:00	calc
Sum of Cations		9.3		meq/L	0.1	0.5	04/24/02 0:00	calc
Chloride	M325.2 - Colorimetric (RFA)	6		mg/L	1	5	04/23/02 14:33	ksj
Residue, Filterable (TDS) @180C	M160.1 - Gravimetric	460		mg/L	10	20	04/16/02 17:26	teb
Sodium Absorption Ratio in Water	USGS - I1738-78	1.09			0.03	0.15	04/24/02 0:00	calc
Sulfate	M375.3 - Gravimetric	70		mg/L	10	20	04/23/02 11:49	lc
TDS (calculated)	Calculation	414		mg/L	10	50	04/24/02 0:00	calc
TDS (ratio - measured/calculated)	Calculation	1.11					04/24/02 0:00	calc

Note: Suspected analytes were retested to verify the Cation-Anion Balance.

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Inorganic Analytical Results

Soldier Creek Coal Company
Project ID: DC-2
Sample ID: D-2 DC-2

ACZ ID: *L37279-01*
Date Sampled: *06/14/02 10:30*
Date Received: *06/18/02*
Sample Matrix: *Surface Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Acidity as CaCO3	SM2310B - Titration		U	mg/L	2	10	06/26/02 14:36	ecr
Alkalinity as CaCO3	SM2320B - Titration							
Bicarbonate as CaCO3		342		mg/L	2	10	06/18/02 0:00	hap
Carbonate as CaCO3			U	mg/L	2	10	06/18/02 0:00	hap
Hydroxide as CaCO3			U	mg/L	2	10	06/18/02 0:00	hap
Total Alkalinity		342		mg/L	2	10	06/18/02 0:00	hap
Cation-Anion Balance	Calculation							
Cation-Anion Balance		0.5		%			07/05/02 0:00	calc
Sum of Anions		9.7		meq/L	0.1	0.5	07/05/02 0:00	calc
Sum of Cations		9.8		meq/L	0.1	0.5	07/05/02 0:00	calc
Chloride	M325.2 - Colorimetric	8		mg/L	1	5	06/24/02 16:05	ksj
Hardness as CaCO3	SM2340B - Calculation	413		mg/L	1	7	07/05/02 0:00	calc
Lab Filtration	SM 3030 B						06/18/02 15:24	lsa
Nitrogen, ammonia	M350.1 - Automated Phenate	0.08	B	mg/L	0.05	0.3	06/22/02 12:31	clt
Oil & Grease, Total Recoverable	M1664 - Gravimetric		U	mg/L	2	10	06/19/02 16:00	hap
Residue, Filterable (TDS) @180C	M160.1 - Gravimetric	490		mg/L	10	20	06/20/02 21:50	wfg
Residue, Non-Filterable (TSS) @105C	M160.2 - Gravimetric	12	B	mg/L	5	20	06/18/02 20:58	wfg
Sodium Absorption Ratio in Water	USGS - I1738-78	0.73			0.03	0.15	07/05/02 0:00	calc
Sulfate	M375.3 - Gravimetric	130		mg/L	10	20	12/30/99 15:35	wfg
TDS (calculated)	Calculation	505		mg/L	10	50	07/05/02 0:00	calc
TDS (ratio - measured/calculated)	Calculation	0.97					07/05/02 0:00	calc

Note: The Nitrogen Ammonia value is estimated due to matrix interferences.

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Inorganic Analytical Results

Soldier Creek Coal Company
Project ID: DC-2
Sample ID: D-2

ACZ ID: *L37279-01*
Date Sampled: *06/14/02 10:30*
Date Received: *06/18/02*
Sample Matrix: *Surface Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.7 ICP		U	mg/L	0.03	0.2	07/13/02 19:50	bf
Arsenic, dissolved	M200.8 ICP-MS	0.0006	B	mg/L	0.0005	0.003	07/06/02 16:47	jb
Boron, dissolved	M200.7 ICP	0.05		mg/L	0.01	0.05	07/09/02 19:03	kdw
Cadmium, dissolved	M200.8 ICP-MS		U	mg/L	0.0001	0.0005	07/06/02 16:47	jb
Calcium, dissolved	M200.7 ICP	64.5		mg/L	0.2	1	07/13/02 19:50	bf
Copper, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	07/09/02 19:03	kdw
Iron, dissolved	M200.7 ICP	0.02	B	mg/L	0.01	0.05	07/09/02 19:03	kdw
Iron, total	M200.7 ICP	0.09		mg/L	0.01	0.05	07/05/02 22:22	bf
Lead, dissolved	M200.8 ICP-MS		U	mg/L	0.0002	0.001	07/10/02 5:16	lcj
Magnesium, dissolved	M200.7 ICP	61.2		mg/L	0.2	1	07/09/02 19:03	kdw
Manganese, dissolved	M200.7 ICP	0.007	B	mg/L	0.005	0.03	07/17/02 11:27	bf
Manganese, total	M200.7 ICP		U	mg/L	0.005	0.03	06/27/02 23:30	kdw
Molybdenum, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	07/09/02 19:03	kdw
Potassium, dissolved	M200.7 ICP	2.6		mg/L	0.3	1	07/09/02 19:03	kdw
Selenium, dissolved	SM 3114 C, AA-Hydride		U	mg/L	0.001	0.005	07/01/02 16:15	dm/kw
Sodium, dissolved	M200.7 ICP	33.7		mg/L	0.3	1	07/09/02 19:03	kdw
Zinc, dissolved	M200.7 ICP	0.01	B	mg/L	0.01	0.05	07/17/02 21:41	bf

Metals Prep

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Total Hot Plate Digestion	M200.2 ICP						07/03/02 11:45	dlm

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Inorganic Analytical Results

Soldier Creek Coal Company
Project ID:
Sample ID: 5

ACZ ID: *L37279-02*
Date Sampled: *06/14/02 12:00*
Date Received: *06/18/02*
Sample Matrix: *Ground Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Calcium, dissolved	M200.7 ICP	88.9		mg/L	0.2	1	07/03/02 13:59	kdw
Iron, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	07/09/02 19:21	kdw
Iron, total	M200.7 ICP	0.17		mg/L	0.01	0.05	07/05/02 22:35	bf
Magnesium, dissolved	M200.7 ICP	31.0		mg/L	0.2	1	07/03/02 13:59	kdw
Manganese, dissolved	M200.7 ICP	0.014	B	mg/L	0.005	0.03	07/03/02 13:59	kdw
Manganese, total	M200.7 ICP	0.016	B	mg/L	0.005	0.03	06/27/02 23:35	kdw
Potassium, dissolved	M200.7 ICP	1.1		mg/L	0.3	1	07/03/02 13:59	kdw
Sodium, dissolved	M200.7 ICP	13.8		mg/L	0.3	1	07/03/02 13:59	kdw

Metals Prep

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Total Hot Plate Digestion	M200.2 ICP						07/03/02 12:07	dlm

Wet Chemistry

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration							
Bicarbonate as CaCO3		303		mg/L	2	10	06/18/02 0:00	hap
Carbonate as CaCO3			U	mg/L	2	10	06/18/02 0:00	hap
Hydroxide as CaCO3			U	mg/L	2	10	06/18/02 0:00	hap
Total Alkalinity		303		mg/L	2	10	06/18/02 0:00	hap
Cation-Anion Balance	Calculation							
Cation-Anion Balance		2.0		%			07/05/02 0:00	calc
Sum of Anions		7.3		meq/L	0.1	0.5	07/05/02 0:00	calc
Sum of Cations		7.6		meq/L	0.1	0.5	07/05/02 0:00	calc
Chloride	M325.2 - Colorimetric	8		mg/L	1	5	06/24/02 16:05	ksj
Hardness as CaCO3	SM2340B - Calculation	350		mg/L	1	7	07/05/02 0:00	calc
Lab Filtration	SM 3030 B						06/18/02 15:48	lsa
Residue, Filterable (TDS) @180C	M160.1 - Gravimetric	360		mg/L	10	20	06/20/02 21:51	wfg
Sodium Absorption Ratio in Water	USGS - I1738-78	0.32			0.03	0.15	07/05/02 0:00	calc
Sulfate	M375.3 - Gravimetric	50		mg/L	10	20	12/30/99 15:39	wfg
TDS (calculated)	Calculation	375		mg/L	10	50	07/05/02 0:00	calc
TDS (ratio - measured/calculated)	Calculation	0.96					07/05/02 0:00	calc

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Inorganic Analytical Results

Soldier Creek Coal Company
Project ID:
Sample ID: SP-20

ACZ ID: *L37352-01*
Date Sampled: *06/18/02 09:02*
Date Received: *06/21/02*
Sample Matrix: *Ground Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.7 ICP	0.06	B	mg/L	0.03	0.2	07/18/02 0:28	kdw
Arsenic, dissolved	M200.8 ICP-MS		U	mg/L	0.0005	0.003	07/10/02 11:38	lcj
Boron, dissolved	M200.7 ICP	0.03	B	mg/L	0.01	0.05	07/14/02 21:40	bf
Cadmium, dissolved	M200.8 ICP-MS		U	mg/L	0.0001	0.0005	07/10/02 11:38	lcj
Calcium, dissolved	M200.7 ICP	84.2		mg/L	0.2	1	07/14/02 21:40	bf
Copper, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	07/18/02 0:28	kdw
Iron, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	07/14/02 21:40	bf
Iron, total	M200.7 ICP	0.63		mg/L	0.01	0.05	07/19/02 14:34	bf
Lead, dissolved	M200.8 ICP-MS		U	mg/L	0.0001	0.0005	07/10/02 11:38	lcj
Magnesium, dissolved	M200.7 ICP	30.6		mg/L	0.2	1	07/14/02 21:40	bf
Manganese, dissolved	M200.7 ICP	0.006	B	mg/L	0.005	0.03	07/18/02 0:28	kdw
Manganese, total	M200.7 ICP	0.033		mg/L	0.005	0.03	07/19/02 14:34	bf
Molybdenum, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	07/14/02 21:40	bf
Potassium, dissolved	M200.7 ICP	1.2		mg/L	0.3	1	07/18/02 0:28	kdw
Selenium, dissolved	SM 3114 C, AA-Hydride		U	mg/L	0.001	0.005	07/09/02 14:11	kdw
Sodium, dissolved	M200.7 ICP	12.5		mg/L	0.3	1	07/18/02 0:28	kdw
Zinc, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	07/14/02 21:40	bf

Metals Prep

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Total Hot Plate Digestion	M200.2 ICP						06/25/02 2:36	dlm

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Inorganic Analytical Results

Soldier Creek Coal Company
Project ID:
Sample ID: SP-20

ACZ ID: *L37352-01*
Date Sampled: *06/18/02 09:02*
Date Received: *06/21/02*
Sample Matrix: *Ground Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Acidity as CaCO3	SM2310B - Titration		U	mg/L	2	10	06/29/02 9:51	hap
Alkalinity as CaCO3	SM2320B - Titration							
Bicarbonate as CaCO3		302		mg/L	2	10	06/24/02 0:00	hap
Carbonate as CaCO3			U	mg/L	2	10	06/24/02 0:00	hap
Hydroxide as CaCO3			U	mg/L	2	10	06/24/02 0:00	hap
Total Alkalinity		302		mg/L	2	10	06/24/02 0:00	hap
Cation-Anion Balance	Calculation							
Cation-Anion Balance		5.8		%			07/26/02 13:52	calc
Sum of Anions		6.5		meq/L	0.1	0.5	07/26/02 13:52	calc
Sum of Cations		7.3		meq/L	0.1	0.5	07/26/02 13:52	calc
Chloride	M325.2 - Colorimetric	4	B	mg/L	1	5	06/29/02 11:17	clt
Hardness as CaCO3	SM2340B - Calculation	336		mg/L	1	7	07/26/02 13:52	calc
Lab Filtration	SM 3030 B						06/21/02 15:14	hap
Nitrogen, ammonia	M350.1 - Automated Phenate		U	mg/L	0.05	0.3	06/25/02 11:56	ksj
Residue, Filterable (TDS) @180C	M160.1 - Gravimetric	330		mg/L	10	20	06/21/02 20:20	wfg
Sodium Absorption Ratio in Water	USGS - I1738-78	0.30			0.03	0.15	07/26/02 13:52	calc
Sulfate	M375.3 - Gravimetric	20		mg/L	10	20	06/21/02 14:15	wfg
TDS (calculated)	Calculation	334		mg/L	10	50	07/26/02 13:52	calc
TDS (ratio - measured/calculated)	Calculation	0.99					07/26/02 13:52	calc

Note: The Aluminum, Potassium, Sodium and Zinc values are estimated due to matrix interferences.

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Inorganic Analytical Results

Soldier Creek Coal Company
Project ID:
Sample ID: DC-3

ACZ ID: *L37194-01*
Date Sampled: *06/06/02 00:00*
Date Received: *06/10/02*
Sample Matrix: *Surface Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Calcium, dissolved	M200.7 ICP	67.5		mg/L	0.2	1	06/30/02 17:41	kr
Iron, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	06/30/02 17:41	kr
Iron, total	M200.7 ICP	0.20		mg/L	0.01	0.05	06/18/02 23:41	ct
Magnesium, dissolved	M200.7 ICP	48.6		mg/L	0.2	1	06/30/02 4:17	ct
Manganese, dissolved	M200.7 ICP		U	mg/L	0.005	0.03	06/30/02 17:41	kr
Manganese, total	M200.7 ICP	0.005	B	mg/L	0.005	0.03	06/18/02 23:41	ct
Potassium, dissolved	M200.7 ICP	2.2		mg/L	0.3	1	06/30/02 17:41	kr
Sodium, dissolved	M200.7 ICP	19.8		mg/L	0.3	1	07/08/02 23:30	ct

Metals Prep

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Total Hot Plate Digestion	M200.2 ICP						06/17/02 10:04	dlm

Wet Chemistry

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration							
Bicarbonate as CaCO3		269		mg/L	2	10	06/14/02 0:00	hap
Carbonate as CaCO3			U	mg/L	2	10	06/14/02 0:00	hap
Hydroxide as CaCO3			U	mg/L	2	10	06/14/02 0:00	hap
Total Alkalinity		269		mg/L	2	10	06/14/02 0:00	hap
Cation-Anion Balance	Calculation							
Cation-Anion Balance		2.5		%			07/10/02 0:00	calc
Sum of Anions		7.8		meq/L	0.1	0.5	07/10/02 0:00	calc
Sum of Cations		8.2		meq/L	0.1	0.5	07/10/02 0:00	calc
Chloride	M325.2 - Colorimetric	6		mg/L	1	5	06/21/02 10:12	clt
Oil & Grease, Total Recoverable	M1664 - Gravimetric		U	mg/L	2	10	06/13/02 14:30	er/hp
Residue, Filterable (TDS) @180C	M160.1 - Gravimetric	430		mg/L	10	20	06/13/02 16:03	wfg
Residue, Non-Filterable (TSS) @105C	M160.2 - Gravimetric	22		mg/L	5	20	06/12/02 12:29	jmr
Sodium Absorption Ratio in Water	USGS - I1738-78	0.45			0.03	0.15	07/10/02 0:00	calc
Sulfate	M375.3 - Gravimetric	110		mg/L	10	20	06/11/02 15:44	jmr
TDS (calculated)	Calculation	416		mg/L	10	50	07/10/02 0:00	calc
TDS (ratio - measured/calculated)	Calculation	1.03					07/10/02 0:00	calc

Note: The TDS value is estimated due to a high LCSW recovery.

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Inorganic Analytical Results

Soldier Creek Coal Company
Project ID:
Sample ID: DC-4

ACZ ID: *L37194-02*
Date Sampled: *06/06/02 00:00*
Date Received: *06/10/02*
Sample Matrix: *Surface Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Calcium, dissolved	M200.7 ICP	69.6		mg/L	0.2	1	07/13/02 19:46	bf
Iron, dissolved	M200.7 ICP	0.02	B	mg/L	0.01	0.05	07/12/02 20:18	bf
Iron, total	M200.7 ICP	0.27		mg/L	0.01	0.05	06/18/02 23:46	ct
Magnesium, dissolved	M200.7 ICP	54.7		mg/L	0.2	1	07/12/02 20:18	bf
Manganese, dissolved	M200.7 ICP		U	mg/L	0.005	0.03	07/09/02 22:33	kdw
Manganese, total	M200.7 ICP	0.009	B	mg/L	0.005	0.03	06/18/02 23:46	ct
Potassium, dissolved	M200.7 ICP	2.6		mg/L	0.3	1	07/12/02 20:18	bf
Sodium, dissolved	M200.7 ICP	22.5		mg/L	0.3	1	07/16/02 22:26	kdw

Metals Prep

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Total Hot Plate Digestion	M200.2 ICP						06/17/02 10:36	dlm

Wet Chemistry

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration							
Bicarbonate as CaCO3		287		mg/L	2	10	06/14/02 0:00	hap
Carbonate as CaCO3			U	mg/L	2	10	06/14/02 0:00	hap
Hydroxide as CaCO3			U	mg/L	2	10	06/14/02 0:00	hap
Total Alkalinity		287		mg/L	2	10	06/14/02 0:00	hap
Cation-Anion Balance	Calculation							
Cation-Anion Balance		2.3		%			07/10/02 0:00	calc
Sum of Anions		8.6		meq/L	0.1	0.5	07/10/02 0:00	calc
Sum of Cations		9.0		meq/L	0.1	0.5	07/10/02 0:00	calc
Chloride	M325.2 - Colorimetric	7		mg/L	1	5	06/21/02 10:12	clt
Oil & Grease, Total Recoverable	M1664 - Gravimetric		U	mg/L	2	10	06/13/02 15:05	er/hp
Residue, Filterable (TDS) @180C	M160.1 - Gravimetric	480		mg/L	10	20	06/13/02 16:05	wfg
Residue, Non-Filterable (TSS) @105C	M160.2 - Gravimetric	14	B	mg/L	5	20	06/11/02 17:01	wfg
Sodium Absorption Ratio in Water	USGS - I1738-78	0.49			0.03	0.15	07/10/02 0:00	calc
Sulfate	M375.3 - Gravimetric	130		mg/L	10	20	06/11/02 15:47	jmr
TDS (calculated)	Calculation	459		mg/L	10	50	07/10/02 0:00	calc
TDS (ratio - measured/calculated)	Calculation	1.05					07/10/02 0:00	calc

Note: The TDS value is estimated due to a high LCSW recovery.

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Inorganic Analytical Results

Soldier Creek Coal Company
Project ID:
Sample ID: SC-14

ACZ ID: *L37352-02*
Date Sampled: *06/18/02 09:31*
Date Received: *06/21/02*
Sample Matrix: *Ground Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.7 ICP	0.04	B	mg/L	0.03	0.2	07/18/02 23:32	bf
Arsenic, dissolved	M200.8 ICP-MS	0.0006	B	mg/L	0.0005	0.003	07/11/02 20:51	jb
Boron, dissolved	M200.7 ICP	0.03	B	mg/L	0.01	0.05	07/18/02 23:32	bf
Cadmium, dissolved	M200.8 ICP-MS		U	mg/L	0.0001	0.0005	07/11/02 20:51	jb
Calcium, dissolved	M200.7 ICP	105		mg/L	0.2	1	07/18/02 0:32	kdw
Copper, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	07/18/02 23:32	bf
Iron, dissolved	M200.7 ICP	0.05		mg/L	0.01	0.05	07/19/02 20:04	bf
Iron, total	M200.7 ICP	2.90		mg/L	0.01	0.05	07/19/02 14:37	bf
Lead, dissolved	M200.8 ICP-MS		U	mg/L	0.0001	0.0005	07/11/02 20:51	jb
Magnesium, dissolved	M200.7 ICP	39.2		mg/L	0.2	1	07/18/02 23:32	bf
Manganese, dissolved	M200.7 ICP	0.027	B	mg/L	0.005	0.03	07/18/02 23:32	bf
Manganese, total	M200.7 ICP	0.182		mg/L	0.005	0.03	07/19/02 14:37	bf
Molybdenum, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	07/18/02 23:32	bf
Potassium, dissolved	M200.7 ICP	1.5		mg/L	0.3	1	07/18/02 23:32	bf
Selenium, dissolved	SM 3114 C, AA-Hydride	0.001	B	mg/L	0.001	0.005	07/09/02 14:13	kdw
Sodium, dissolved	M200.7 ICP	11.9		mg/L	0.3	1	07/18/02 23:32	bf
Zinc, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	07/18/02 0:32	kdw

Metals Prep

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Total Hot Plate Digestion	M200.2 ICP						06/25/02 3:12	dlm

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Inorganic Analytical Results

Soldier Creek Coal Company
Project ID:
Sample ID: SC-14

ACZ ID: *L37352-02*
Date Sampled: *06/18/02 09:31*
Date Received: *06/21/02*
Sample Matrix: *Ground Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Acidity as CaCO3	SM2310B - Titration		U	mg/L	2	10	06/26/02 15:42	ecr
Alkalinity as CaCO3	SM2320B - Titration							
Bicarbonate as CaCO3		359		mg/L	2	10	06/24/02 0:00	hap
Carbonate as CaCO3			U	mg/L	2	10	06/24/02 0:00	hap
Hydroxide as CaCO3			U	mg/L	2	10	06/24/02 0:00	hap
Total Alkalinity		359		mg/L	2	10	06/24/02 0:00	hap
Cation-Anion Balance	Calculation							
Cation-Anion Balance		2.9		%			07/26/02 13:52	calc
Sum of Anions		8.5		meq/L	0.1	0.5	07/26/02 13:52	calc
Sum of Cations		9.0		meq/L	0.1	0.5	07/26/02 13:52	calc
Chloride	M325.2 - Colorimetric	4	B	mg/L	1	5	06/29/02 11:18	clt
Hardness as CaCO3	SM2340B - Calculation	424		mg/L	1	7	07/26/02 13:52	calc
Lab Filtration	SM 3030 B						06/21/02 15:19	hap
Nitrogen, ammonia	M350.1 - Automated Phenate	0.07	B	mg/L	0.05	0.3	06/25/02 11:57	ksj
Residue, Filterable (TDS) @180C	M160.1 - Gravimetric	420		mg/L	10	20	06/21/02 20:21	wfg
Sodium Absorption Ratio in Water	USGS - I1738-78	0.25			0.03	0.15	07/26/02 13:52	calc
Sulfate	M375.3 - Gravimetric	60		mg/L	10	20	06/21/02 14:17	wfg
TDS (calculated)	Calculation	437		mg/L	10	50	07/26/02 13:52	calc
TDS (ratio - measured/calculated)	Calculation	0.96					07/26/02 13:52	calc

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Inorganic Analytical Results

Soldier Creek Coal Company
Project ID:
Sample ID: SC-65

ACZ ID: ***L37352-03***
Date Sampled: *06/18/02 10:23*
Date Received: *06/21/02*
Sample Matrix: *Ground Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.7 ICP	0.04	B	mg/L	0.03	0.2	07/18/02 23:36	bf
Arsenic, dissolved	M200.8 ICP-MS	0.0005	B	mg/L	0.0005	0.003	07/10/02 11:53	lcj
Boron, dissolved	M200.7 ICP	0.09		mg/L	0.01	0.05	07/18/02 23:36	bf
Cadmium, dissolved	M200.8 ICP-MS		U	mg/L	0.0001	0.0005	07/10/02 11:53	lcj
Calcium, dissolved	M200.7 ICP	83.5		mg/L	0.2	1	07/18/02 0:37	kdw
Copper, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	07/18/02 23:36	bf
Iron, dissolved	M200.7 ICP	0.05	B	mg/L	0.01	0.05	07/19/02 20:08	bf
Iron, total	M200.7 ICP	4.09		mg/L	0.01	0.05	07/19/02 14:41	bf
Lead, dissolved	M200.8 ICP-MS	0.0001	B	mg/L	0.0001	0.0005	07/10/02 11:53	lcj
Magnesium, dissolved	M200.7 ICP	49.9		mg/L	0.2	1	07/18/02 23:36	bf
Manganese, dissolved	M200.7 ICP	0.028	B	mg/L	0.005	0.03	07/18/02 23:36	bf
Manganese, total	M200.7 ICP	0.296		mg/L	0.005	0.03	07/19/02 14:41	bf
Molybdenum, dissolved	M200.7 ICP	0.01	B	mg/L	0.01	0.05	07/18/02 23:36	bf
Potassium, dissolved	M200.7 ICP	2.4		mg/L	0.3	1	07/18/02 23:36	bf
Selenium, dissolved	SM 3114 C, AA-Hydride	0.001	B	mg/L	0.001	0.005	07/09/02 14:14	kdw
Sodium, dissolved	M200.7 ICP	44.9		mg/L	0.3	1	07/18/02 23:36	bf
Zinc, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	07/18/02 0:37	kdw

Metals Prep

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Total Hot Plate Digestion	M200.2 ICP						06/25/02 3:48	dlm

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Inorganic Analytical Results

Soldier Creek Coal Company
Project ID:
Sample ID: SC-65

ACZ ID: *L37352-03*
Date Sampled: *06/18/02 10:23*
Date Received: *06/21/02*
Sample Matrix: *Ground Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Acidity as CaCO3	SM2310B - Titration		U	mg/L	2	10	06/26/02 16:48	ecr
Alkalinity as CaCO3	SM2320B - Titration							
Bicarbonate as CaCO3		362		mg/L	2	10	06/24/02 0:00	hap
Carbonate as CaCO3			U	mg/L	2	10	06/24/02 0:00	hap
Hydroxide as CaCO3			U	mg/L	2	10	06/24/02 0:00	hap
Total Alkalinity		362		mg/L	2	10	06/24/02 0:00	hap
Cation-Anion Balance	Calculation							
Cation-Anion Balance		7.9		%			07/26/02 13:52	calc
Sum of Anions		8.8		meq/L	0.1	0.5	07/26/02 13:52	calc
Sum of Cations		10.3		meq/L	0.1	0.5	07/26/02 13:52	calc
Chloride	M325.2 - Colorimetric	6		mg/L	1	5	06/29/02 11:19	clt
Hardness as CaCO3	SM2340B - Calculation	414		mg/L	1	7	07/26/02 13:52	calc
Lab Filtration	SM 3030 B						06/21/02 15:23	hap
Nitrogen, ammonia	M350.1 - Automated Phenate		U	mg/L	0.05	0.3	06/25/02 11:57	ksj
Residue, Filterable (TDS) @180C	M160.1 - Gravimetric	450		mg/L	10	20	06/21/02 20:24	wfg
Sodium Absorption Ratio in Water	USGS - I1738-78	0.97			0.03	0.15	07/26/02 13:52	calc
Sulfate	M375.3 - Gravimetric	70		mg/L	10	20	06/21/02 14:21	wfg
TDS (calculated)	Calculation	474		mg/L	10	50	07/26/02 13:52	calc
TDS (ratio - measured/calculated)	Calculation	0.95					07/26/02 13:52	calc

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Inorganic Analytical Results

Soldier Creek Coal Company
Project ID:
Sample ID: SC-116

ACZ ID: *L37352-04*
Date Sampled: *06/18/02 11:30*
Date Received: *06/21/02*
Sample Matrix: *Ground Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.7 ICP		U	mg/L	0.03	0.2	07/18/02 23:52	bf
Arsenic, dissolved	M200.8 ICP-MS		U	mg/L	0.0005	0.003	07/10/02 11:58	lcj
Boron, dissolved	M200.7 ICP	0.03	B	mg/L	0.01	0.05	07/18/02 23:52	bf
Cadmium, dissolved	M200.8 ICP-MS	0.0001	B	mg/L	0.0001	0.0005	07/10/02 11:58	lcj
Calcium, dissolved	M200.7 ICP	84.0		mg/L	0.2	1	07/18/02 0:41	kdw
Copper, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	07/18/02 23:52	bf
Iron, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	07/19/02 20:12	bf
Iron, total	M200.7 ICP	0.52		mg/L	0.01	0.05	07/19/02 14:44	bf
Lead, dissolved	M200.8 ICP-MS		U	mg/L	0.0001	0.0005	07/10/02 11:58	lcj
Magnesium, dissolved	M200.7 ICP	50.8		mg/L	0.2	1	07/18/02 23:52	bf
Manganese, dissolved	M200.7 ICP		U	mg/L	0.005	0.03	07/18/02 23:52	bf
Manganese, total	M200.7 ICP	0.052		mg/L	0.005	0.03	07/19/02 14:44	bf
Molybdenum, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	07/18/02 23:52	bf
Potassium, dissolved	M200.7 ICP	1.2		mg/L	0.3	1	07/18/02 23:52	bf
Selenium, dissolved	SM 3114 C, AA-Hydride		U	mg/L	0.001	0.005	07/09/02 14:16	kdw
Sodium, dissolved	M200.7 ICP	11.8		mg/L	0.3	1	07/18/02 23:52	bf
Zinc, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	07/18/02 0:41	kdw

Metals Prep

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Total Hot Plate Digestion	M200.2 ICP						06/25/02 4:24	dlm

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Inorganic Analytical Results

Soldier Creek Coal Company
Project ID:
Sample ID: SC-116

ACZ ID: *L37352-04*
Date Sampled: *06/18/02 11:30*
Date Received: *06/21/02*
Sample Matrix: *Ground Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Acidity as CaCO3	SM2310B - Titration		U	mg/L	2	10	06/29/02 10:02	hap
Alkalinity as CaCO3	SM2320B - Titration							
Bicarbonate as CaCO3		300		mg/L	2	10	06/24/02 0:00	hap
Carbonate as CaCO3			U	mg/L	2	10	06/24/02 0:00	hap
Hydroxide as CaCO3			U	mg/L	2	10	06/24/02 0:00	hap
Total Alkalinity		300		mg/L	2	10	06/24/02 0:00	hap
Cation-Anion Balance	Calculation							
Cation-Anion Balance		4.1		%			07/26/02 13:52	calc
Sum of Anions		8.2		meq/L	0.1	0.5	07/26/02 13:52	calc
Sum of Cations		8.9		meq/L	0.1	0.5	07/26/02 13:52	calc
Chloride	M325.2 - Colorimetric	4	B	mg/L	1	5	06/29/02 11:20	clt
Hardness as CaCO3	SM2340B - Calculation	419		mg/L	1	7	07/26/02 13:52	calc
Lab Filtration	SM 3030 B						06/21/02 15:27	hap
Nitrogen, ammonia	M350.1 - Automated Phenate		U	mg/L	0.05	0.3	07/02/02 10:02	clt
Residue, Filterable (TDS) @180C	M160.1 - Gravimetric	440		mg/L	10	20	06/21/02 20:25	wfg
Sodium Absorption Ratio in Water	USGS - I1738-78	0.25			0.03	0.15	07/26/02 13:52	calc
Sulfate	M375.3 - Gravimetric	100		mg/L	10	20	06/21/02 14:23	wfg
TDS (calculated)	Calculation	432		mg/L	10	50	07/26/02 13:52	calc
TDS (ratio - measured/calculated)	Calculation	1.02					07/26/02 13:52	calc

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Inorganic Analytical Results

Soldier Creek Coal Company
Project ID:
Sample ID: 203

ACZ ID: *L37352-05*
Date Sampled: *06/18/02 12:10*
Date Received: *06/21/02*
Sample Matrix: *Ground Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.7 ICP		U	mg/L	0.03	0.2	07/18/02 23:55	bf
Arsenic, dissolved	M200.8 ICP-MS		U	mg/L	0.0005	0.003	07/10/02 12:03	lcj
Boron, dissolved	M200.7 ICP	0.06		mg/L	0.01	0.05	07/18/02 23:55	bf
Cadmium, dissolved	M200.8 ICP-MS		U	mg/L	0.0001	0.0005	07/10/02 12:03	lcj
Calcium, dissolved	M200.7 ICP	92.2		mg/L	0.2	1	07/18/02 0:54	kdw
Copper, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	07/18/02 23:55	bf
Iron, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	07/19/02 20:17	bf
Iron, total	M200.7 ICP	0.08		mg/L	0.01	0.05	07/19/02 14:47	bf
Lead, dissolved	M200.8 ICP-MS		U	mg/L	0.0001	0.0005	07/10/02 12:03	lcj
Magnesium, dissolved	M200.7 ICP	63.2		mg/L	0.2	1	07/18/02 23:55	bf
Manganese, dissolved	M200.7 ICP		U	mg/L	0.005	0.03	07/18/02 23:55	bf
Manganese, total	M200.7 ICP	0.023	B	mg/L	0.005	0.03	07/19/02 14:47	bf
Molybdenum, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	07/18/02 23:55	bf
Potassium, dissolved	M200.7 ICP	2.4		mg/L	0.3	1	07/18/02 23:55	bf
Selenium, dissolved	SM 3114 C, AA-Hydride		U	mg/L	0.001	0.005	07/09/02 14:17	kdw
Sodium, dissolved	M200.7 ICP	46.5		mg/L	0.3	1	07/18/02 23:55	bf
Zinc, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	07/18/02 0:54	kdw

Metals Prep

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Total Hot Plate Digestion	M200.2 ICP						06/25/02 5:00	dlm

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Inorganic Analytical Results

Soldier Creek Coal Company
Project ID:
Sample ID: 203

ACZ ID: *L37352-05*
Date Sampled: *06/18/02 12:10*
Date Received: *06/21/02*
Sample Matrix: *Ground Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Acidity as CaCO3	SM2310B - Titration		U	mg/L	2	10	06/29/02 10:14	hap
Alkalinity as CaCO3	SM2320B - Titration							
Bicarbonate as CaCO3		363		mg/L	2	10	06/24/02 0:00	hap
Carbonate as CaCO3			U	mg/L	2	10	06/24/02 0:00	hap
Hydroxide as CaCO3			U	mg/L	2	10	06/24/02 0:00	hap
Total Alkalinity		363		mg/L	2	10	06/24/02 0:00	hap
Cation-Anion Balance	Calculation							
Cation-Anion Balance		2.1		%			07/26/02 13:52	calc
Sum of Anions		11.4		meq/L	0.1	0.5	07/26/02 13:52	calc
Sum of Cations		11.9		meq/L	0.1	0.5	07/26/02 13:52	calc
Chloride	M325.2 - Colorimetric	7		mg/L	1	5	06/29/02 11:21	clt
Hardness as CaCO3	SM2340B - Calculation	490		mg/L	1	7	07/26/02 13:52	calc
Lab Filtration	SM 3030 B						06/21/02 15:31	hap
Nitrogen, ammonia	M350.1 - Automated Phenate		U	mg/L	0.05	0.3	07/02/02 10:03	clt
Residue, Filterable (TDS) @180C	M160.1 - Gravimetric	620		mg/L	10	20	06/21/02 20:26	wfg
Sodium Absorption Ratio in Water	USGS - I1738-78	0.92			0.03	0.15	07/26/02 13:52	calc
Sulfate	M375.3 - Gravimetric	190		mg/L	10	20	06/21/02 14:25	wfg
TDS (calculated)	Calculation	619		mg/L	10	50	07/26/02 13:52	calc
TDS (ratio - measured/calculated)	Calculation	1.00					07/26/02 13:52	calc

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Inorganic Analytical Results

Soldier Creek Coal Company
Project ID:
Sample ID: 260

ACZ ID: *L37352-06*
Date Sampled: *06/18/02 13:00*
Date Received: *06/21/02*
Sample Matrix: *Ground Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.7 ICP		U	mg/L	0.03	0.2	07/19/02 0:07	bf
Arsenic, dissolved	M200.8 ICP-MS		U	mg/L	0.0005	0.003	07/10/02 12:08	lcj
Boron, dissolved	M200.7 ICP	0.01	B	mg/L	0.01	0.05	07/19/02 0:07	bf
Cadmium, dissolved	M200.8 ICP-MS	0.0001	B	mg/L	0.0001	0.0005	07/10/02 12:08	lcj
Calcium, dissolved	M200.7 ICP	85.5		mg/L	0.2	1	07/18/02 1:12	kdw
Copper, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	07/19/02 0:07	bf
Iron, dissolved	M200.7 ICP	0.15		mg/L	0.01	0.05	07/19/02 20:30	bf
Iron, total	M200.7 ICP	0.09		mg/L	0.01	0.05	07/19/02 14:51	bf
Lead, dissolved	M200.8 ICP-MS	0.0002	B	mg/L	0.0001	0.0005	07/10/02 12:08	lcj
Magnesium, dissolved	M200.7 ICP	31.2		mg/L	0.2	1	07/19/02 0:07	bf
Manganese, dissolved	M200.7 ICP		U	mg/L	0.005	0.03	07/19/02 0:07	bf
Manganese, total	M200.7 ICP	0.017	B	mg/L	0.005	0.03	07/19/02 14:51	bf
Molybdenum, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	07/19/02 0:07	bf
Potassium, dissolved	M200.7 ICP	1.0		mg/L	0.3	1	07/19/02 0:07	bf
Selenium, dissolved	SM 3114 C, AA-Hydride	0.001	B	mg/L	0.001	0.005	07/09/02 14:22	kdw
Sodium, dissolved	M200.7 ICP	14.5		mg/L	0.3	1	07/19/02 0:07	bf
Zinc, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	07/18/02 1:12	kdw

Metals Prep

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Total Hot Plate Digestion	M200.2 ICP						06/25/02 5:36	dlm

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Inorganic Analytical Results

Soldier Creek Coal Company
Project ID:
Sample ID: 260

ACZ ID: *L37352-06*
Date Sampled: *06/18/02 13:00*
Date Received: *06/21/02*
Sample Matrix: *Ground Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Acidity as CaCO3	SM2310B - Titration		U	mg/L	2	10	06/29/02 10:25	hap
Alkalinity as CaCO3	SM2320B - Titration							
Bicarbonate as CaCO3		246		mg/L	2	10	06/24/02 0:00	hap
Carbonate as CaCO3			U	mg/L	2	10	06/24/02 0:00	hap
Hydroxide as CaCO3			U	mg/L	2	10	06/24/02 0:00	hap
Total Alkalinity		246		mg/L	2	10	06/24/02 0:00	hap
Cation-Anion Balance	Calculation							
Cation-Anion Balance		14.5		%			07/26/02 13:52	calc
Sum of Anions		5.6		meq/L	0.1	0.5	07/26/02 13:52	calc
Sum of Cations		7.5		meq/L	0.1	0.5	07/26/02 13:52	calc
Chloride	M325.2 - Colorimetric	4	B	mg/L	1	5	06/29/02 11:22	clt
Hardness as CaCO3	SM2340B - Calculation	342		mg/L	1	7	07/26/02 13:52	calc
Lab Filtration	SM 3030 B						06/21/02 15:35	hap
Nitrogen, ammonia	M350.1 - Automated Phenate		U	mg/L	0.05	0.3	07/02/02 10:04	clt
Residue, Filterable (TDS) @180C	M160.1 - Gravimetric	300		mg/L	10	20	06/21/02 20:27	wfg
Sodium Absorption Ratio in Water	USGS - I1738-78	0.34			0.03	0.15	07/26/02 13:52	calc
Sulfate	M375.3 - Gravimetric	30		mg/L	10	20	06/21/02 14:27	wfg
TDS (calculated)	Calculation	314		mg/L	10	50	07/26/02 13:52	calc
TDS (ratio - measured/calculated)	Calculation	0.96					07/26/02 13:52	calc

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Inorganic Analytical Results

Soldier Creek Coal Company
Project ID:
Sample ID: DC-5

ACZ ID: *L37352-07*
Date Sampled: *06/18/02 15:20*
Date Received: *06/21/02*
Sample Matrix: *Surface Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.7 ICP		U	mg/L	0.03	0.2	07/19/02 2:19	bf
Arsenic, dissolved	M200.8 ICP-MS	0.0006	B	mg/L	0.0005	0.003	07/10/02 12:13	lcj
Boron, dissolved	M200.7 ICP	0.07		mg/L	0.01	0.05	07/19/02 2:19	bf
Cadmium, dissolved	M200.8 ICP-MS		U	mg/L	0.0001	0.0005	07/10/02 12:13	lcj
Calcium, dissolved	M200.7 ICP	63.8		mg/L	0.2	1	07/19/02 2:19	bf
Copper, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	07/19/02 2:19	bf
Iron, dissolved	M200.7 ICP	0.01	B	mg/L	0.01	0.05	07/19/02 20:34	bf
Iron, total	M200.7 ICP	0.10		mg/L	0.01	0.05	07/19/02 14:54	bf
Lead, dissolved	M200.8 ICP-MS		U	mg/L	0.0001	0.0005	07/10/02 12:13	lcj
Magnesium, dissolved	M200.7 ICP	60.7		mg/L	0.2	1	07/19/02 2:19	bf
Manganese, dissolved	M200.7 ICP	0.010	B	mg/L	0.005	0.03	07/19/02 2:19	bf
Manganese, total	M200.7 ICP	0.013	B	mg/L	0.005	0.03	07/19/02 14:54	bf
Molybdenum, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	07/20/02 15:14	bf
Potassium, dissolved	M200.7 ICP	2.8		mg/L	0.3	1	07/19/02 20:34	bf
Selenium, dissolved	SM 3114 C, AA-Hydride		U	mg/L	0.001	0.005	07/09/02 14:23	kdw
Sodium, dissolved	M200.7 ICP	35.5		mg/L	0.3	1	07/19/02 20:34	bf
Zinc, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	07/19/02 2:19	bf

Metals Prep

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Total Hot Plate Digestion	M200.2 ICP						06/25/02 6:12	dlm

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Inorganic Analytical Results

Soldier Creek Coal Company
Project ID:
Sample ID: DC-5

ACZ ID: *L37352-07*
Date Sampled: *06/18/02 15:20*
Date Received: *06/21/02*
Sample Matrix: *Surface Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Acidity as CaCO3	SM2310B - Titration		U	mg/L	2	10	06/29/02 10:36	hap
Alkalinity as CaCO3	SM2320B - Titration							
Bicarbonate as CaCO3		320		mg/L	2	10	06/24/02 0:00	hap
Carbonate as CaCO3			U	mg/L	2	10	06/24/02 0:00	hap
Hydroxide as CaCO3			U	mg/L	2	10	06/24/02 0:00	hap
Total Alkalinity		320		mg/L	2	10	06/24/02 0:00	hap
Cation-Anion Balance	Calculation							
Cation-Anion Balance		2.6		%			07/26/02 13:52	calc
Sum of Anions		9.3		meq/L	0.1	0.5	07/26/02 13:52	calc
Sum of Cations		9.8		meq/L	0.1	0.5	07/26/02 13:52	calc
Chloride	M325.2 - Colorimetric	8		mg/L	1	5	06/29/02 11:22	clt
Hardness as CaCO3	SM2340B - Calculation	409		mg/L	1	7	07/26/02 13:52	calc
Lab Filtration	SM 3030 B						06/21/02 15:39	hap
Nitrogen, ammonia	M350.1 - Automated Phenate	0.13	B	mg/L	0.05	0.3	07/02/02 10:04	clt
Oil & Grease, Total Recoverable	M1664 - Gravimetric		U	mg/L	2	10	07/03/02 15:25	hap/e
Residue, Filterable (TDS) @180C	M160.1 - Gravimetric	490		mg/L	10	20	06/21/02 20:28	wfg
Residue, Non-Filterable (TSS) @105C	M160.2 - Gravimetric		U	mg/L	5	20	06/21/02 18:53	wfg
Sodium Absorption Ratio in Water	USGS - I1738-78	0.77			0.03	0.15	07/26/02 13:52	calc
Sulfate	M375.3 - Gravimetric	130		mg/L	10	20	06/21/02 14:29	wfg
TDS (calculated)	Calculation	493		mg/L	10	50	07/26/02 13:52	calc
TDS (ratio - measured/calculated)	Calculation	0.99					07/26/02 13:52	calc

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Inorganic Analytical Results

Soldier Creek Coal Company
Project ID:
Sample ID: PC1A

ACZ ID: *L37352-08*
Date Sampled: *06/18/02 12:17*
Date Received: *06/21/02*
Sample Matrix: *Surface Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.7 ICP		U	mg/L	0.03	0.2	07/19/02 2:23	bf
Arsenic, dissolved	M200.8 ICP-MS		U	mg/L	0.0005	0.003	07/10/02 12:18	lcj
Boron, dissolved	M200.7 ICP	0.04	B	mg/L	0.01	0.05	07/19/02 2:23	bf
Cadmium, dissolved	M200.8 ICP-MS		U	mg/L	0.0001	0.0005	07/10/02 12:18	lcj
Calcium, dissolved	M200.7 ICP	72.6		mg/L	0.2	1	07/19/02 2:23	bf
Copper, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	07/19/02 2:23	bf
Iron, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	07/19/02 20:38	bf
Iron, total	M200.7 ICP	1.06		mg/L	0.01	0.05	06/29/02 19:41	ct
Lead, dissolved	M200.8 ICP-MS		U	mg/L	0.0001	0.0005	07/10/02 12:18	lcj
Magnesium, dissolved	M200.7 ICP	49.3		mg/L	0.2	1	07/19/02 2:23	bf
Manganese, dissolved	M200.7 ICP	0.019	B	mg/L	0.005	0.03	07/19/02 2:23	bf
Manganese, total	M200.7 ICP	0.023	B	mg/L	0.005	0.03	06/27/02 1:36	bf
Molybdenum, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	07/20/02 15:17	bf
Potassium, dissolved	M200.7 ICP	2.4		mg/L	0.3	1	07/19/02 20:38	bf
Selenium, dissolved	SM 3114 C, AA-Hydride		U	mg/L	0.001	0.005	07/09/02 14:25	kdw
Sodium, dissolved	M200.7 ICP	29.7		mg/L	0.3	1	07/19/02 20:38	bf
Zinc, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	07/19/02 2:23	bf

Metals Prep

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Total Hot Plate Digestion	M200.2 ICP						06/26/02 0:48	dlm

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Inorganic Analytical Results

Soldier Creek Coal Company
Project ID:
Sample ID: PC1A

ACZ ID: *L37352-08*
Date Sampled: *06/18/02 12:17*
Date Received: *06/21/02*
Sample Matrix: *Surface Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Acidity as CaCO3	SM2310B - Titration		U	mg/L	2	10	06/29/02 10:48	hap
Alkalinity as CaCO3	SM2320B - Titration							
Bicarbonate as CaCO3		340		mg/L	2	10	06/22/02 0:00	hap
Carbonate as CaCO3			U	mg/L	2	10	06/22/02 0:00	hap
Hydroxide as CaCO3			U	mg/L	2	10	06/22/02 0:00	hap
Total Alkalinity		340		mg/L	2	10	06/22/02 0:00	hap
Cation-Anion Balance	Calculation							
Cation-Anion Balance		2.9		%			07/26/02 13:53	calc
Sum of Anions		8.5		meq/L	0.1	0.5	07/26/02 13:53	calc
Sum of Cations		9.0		meq/L	0.1	0.5	07/26/02 13:53	calc
Chloride	M325.2 - Colorimetric	3	B	mg/L	1	5	06/29/02 11:23	clt
Hardness as CaCO3	SM2340B - Calculation	384		mg/L	1	7	07/26/02 13:53	calc
Lab Filtration	SM 3030 B						06/21/02 15:43	hap
Nitrogen, ammonia	M350.1 - Automated Phenate	0.15	B	mg/L	0.05	0.3	07/02/02 10:05	clt
Oil & Grease, Total Recoverable	M1664 - Gravimetric		U	mg/L	2	10	07/03/02 20:51	hap/e
Residue, Filterable (TDS) @180C	M160.1 - Gravimetric	450		mg/L	10	20	06/21/02 20:29	wfg
Residue, Non-Filterable (TSS) @105C	M160.2 - Gravimetric	110		mg/L	5	20	06/21/02 19:50	wfg
Sodium Absorption Ratio in Water	USGS - I1738-78	0.66			0.03	0.15	07/26/02 13:53	calc
Sulfate	M375.3 - Gravimetric	80		mg/L	10	20	06/21/02 14:31	wfg
TDS (calculated)	Calculation	441		mg/L	10	50	07/26/02 13:53	calc
TDS (ratio - measured/calculated)	Calculation	1.02					07/26/02 13:53	calc

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Inorganic Analytical Results

Soldier Creek Coal Company
Project ID:
Sample ID: PC2

ACZ ID: *L37352-09*
Date Sampled: *06/18/02 14:00*
Date Received: *06/21/02*
Sample Matrix: *Surface Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Aluminum, dissolved	M200.7 ICP		U	mg/L	0.03	0.2	07/19/02 2:27	bf
Arsenic, dissolved	M200.8 ICP-MS	0.0007	B	mg/L	0.0005	0.003	07/10/02 12:23	lcj
Boron, dissolved	M200.7 ICP	0.09		mg/L	0.01	0.05	07/19/02 2:27	bf
Cadmium, dissolved	M200.8 ICP-MS		U	mg/L	0.0001	0.0005	07/10/02 12:23	lcj
Calcium, dissolved	M200.7 ICP	81.7		mg/L	0.2	1	07/19/02 2:27	bf
Copper, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	07/19/02 2:27	bf
Iron, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	07/19/02 20:42	bf
Iron, total	M200.7 ICP	0.15		mg/L	0.01	0.05	07/25/02 19:12	bf
Lead, dissolved	M200.8 ICP-MS		U	mg/L	0.0001	0.0005	07/10/02 12:23	lcj
Magnesium, dissolved	M200.7 ICP	83.4		mg/L	0.2	1	07/19/02 2:27	bf
Manganese, dissolved	M200.7 ICP		U	mg/L	0.005	0.03	07/19/02 2:27	bf
Manganese, total	M200.7 ICP	0.011	B	mg/L	0.005	0.03	07/22/02 20:28	ct
Molybdenum, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	07/20/02 15:28	bf
Potassium, dissolved	M200.7 ICP	4.9		mg/L	0.3	1	07/19/02 20:42	bf
Selenium, dissolved	SM 3114 C, AA-Hydride		U	mg/L	0.001	0.005	07/09/02 14:26	kdw
Sodium, dissolved	M200.7 ICP	53.7		mg/L	0.3	1	07/19/02 20:42	bf
Zinc, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	07/20/02 15:28	bf

Metals Prep

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Total Hot Plate Digestion	M200.2 ICP						07/24/02 19:07	dlm

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Inorganic Analytical Results

Soldier Creek Coal Company
Project ID:
Sample ID: PC2

ACZ ID: *L37352-09*
Date Sampled: *06/18/02 14:00*
Date Received: *06/21/02*
Sample Matrix: *Surface Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Acidity as CaCO3	SM2310B - Titration		U	mg/L	2	10	06/29/02 10:59	hap
Alkalinity as CaCO3	SM2320B - Titration							
Bicarbonate as CaCO3		347		mg/L	2	10	06/22/02 0:00	hap
Carbonate as CaCO3		17		mg/L	2	10	06/22/02 0:00	hap
Hydroxide as CaCO3			U	mg/L	2	10	06/22/02 0:00	hap
Total Alkalinity		364		mg/L	2	10	06/22/02 0:00	hap
Cation-Anion Balance	Calculation							
Cation-Anion Balance		0.8		%			07/26/02 13:53	calc
Sum of Anions		13.2		meq/L	0.1	0.5	07/26/02 13:53	calc
Sum of Cations		13.4		meq/L	0.1	0.5	07/26/02 13:53	calc
Chloride	M325.2 - Colorimetric	10		mg/L	1	5	06/29/02 11:24	clt
Hardness as CaCO3	SM2340B - Calculation	547		mg/L	1	7	07/26/02 13:53	calc
Lab Filtration	SM 3030 B						06/21/02 15:47	hap
Nitrogen, ammonia	M350.1 - Automated Phenate		U	mg/L	0.05	0.3	07/02/02 10:06	clt
Oil & Grease, Total Recoverable	M1664 - Gravimetric		U	mg/L	2	10	07/04/02 2:17	hap/e
Residue, Filterable (TDS) @180C	M160.1 - Gravimetric	720		mg/L	10	20	06/21/02 20:30	wfg
Residue, Non-Filterable (TSS) @105C	M160.2 - Gravimetric	6	B	mg/L	5	20	06/21/02 19:53	wfg
Sodium Absorption Ratio in Water	USGS - I1738-78	1.01			0.03	0.15	07/26/02 13:53	calc
Sulfate	M375.3 - Gravimetric	270		mg/L	10	20	06/21/02 14:33	wfg
TDS (calculated)	Calculation	729		mg/L	10	50	07/26/02 13:53	calc
TDS (ratio - measured/calculated)	Calculation	0.99					07/26/02 13:53	calc

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Inorganic Analytical Results

Soldier Creek Coal Company
Project ID:
Sample ID: 10

ACZ ID: *L37352-10*
Date Sampled: *06/18/02 08:00*
Date Received: *06/21/02*
Sample Matrix: *Ground Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Calcium, dissolved	M200.7 ICP	34.9		mg/L	0.2	1	07/18/02 1:16	kdw
Iron, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	07/19/02 20:59	bf
Iron, total	M200.7 ICP	0.03	B	mg/L	0.01	0.05	07/19/02 14:58	bf
Magnesium, dissolved	M200.7 ICP	29.2		mg/L	0.2	1	07/18/02 21:32	bf
Manganese, dissolved	M200.7 ICP	0.009	B	mg/L	0.005	0.03	07/18/02 21:32	bf
Manganese, total	M200.7 ICP	0.011	B	mg/L	0.005	0.03	07/19/02 14:58	bf
Potassium, dissolved	M200.7 ICP	2.9		mg/L	0.3	1	07/18/02 21:32	bf
Sodium, dissolved	M200.7 ICP	177		mg/L	0.3	1	07/18/02 21:32	bf

Metals Prep

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Total Hot Plate Digestion	M200.2 ICP						06/25/02 6:48	dlm

Wet Chemistry

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration							
Bicarbonate as CaCO3		537		mg/L	2	10	06/22/02 0:00	hap
Carbonate as CaCO3		26		mg/L	2	10	06/22/02 0:00	hap
Hydroxide as CaCO3			U	mg/L	2	10	06/22/02 0:00	hap
Total Alkalinity		564		mg/L	2	10	06/22/02 0:00	hap
Cation-Anion Balance	Calculation							
Cation-Anion Balance		-1.6		%			07/26/02 13:53	calc
Sum of Anions		12.4		meq/L	0.1	0.5	07/26/02 13:53	calc
Sum of Cations		12.0		meq/L	0.1	0.5	07/26/02 13:53	calc
Chloride	M325.2 - Colorimetric	41		mg/L	1	5	06/29/02 11:26	clt
Hardness as CaCO3	SM2340B - Calculation	207		mg/L	1	7	07/26/02 13:53	calc
Lab Filtration	SM 3030 B						06/21/02 15:51	hap
Residue, Filterable (TDS) @180C	M160.1 - Gravimetric	650		mg/L	10	20	06/21/02 20:31	wfg
Sodium Absorption Ratio in Water	USGS - I1738-78	5.41			0.03	0.15	07/26/02 13:53	calc
Sulfate	M375.3 - Gravimetric		U	mg/L	10	20	06/21/02 14:35	wfg
TDS (calculated)	Calculation	633		mg/L	10	50	07/26/02 13:53	calc
TDS (ratio - measured/calculated)	Calculation	1.03					07/26/02 13:53	calc

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Inorganic Analytical Results

Soldier Creek Coal Company
Project ID:
Sample ID: G-7

ACZ ID: *L37352-11*
Date Sampled: *06/18/02 08:15*
Date Received: *06/21/02*
Sample Matrix: *Surface Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Calcium, dissolved	M200.7 ICP	44.1		mg/L	0.2	1	07/19/02 2:31	bf
Iron, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	07/19/02 21:04	bf
Iron, total	M200.7 ICP	0.14		mg/L	0.01	0.05	07/25/02 19:31	bf
Magnesium, dissolved	M200.7 ICP	40.5		mg/L	0.2	1	07/19/02 2:31	bf
Manganese, dissolved	M200.7 ICP	0.026	B	mg/L	0.005	0.03	07/19/02 2:31	bf
Manganese, total	M200.7 ICP	0.030		mg/L	0.005	0.03	07/22/02 20:32	ct
Potassium, dissolved	M200.7 ICP	2.1		mg/L	0.3	1	07/19/02 21:04	bf
Sodium, dissolved	M200.7 ICP	113		mg/L	0.3	1	07/19/02 21:04	bf

Metals Prep

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Total Hot Plate Digestion	M200.2 ICP						07/24/02 20:48	dlm

Wet Chemistry

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration							
Bicarbonate as CaCO3		393		mg/L	2	10	06/22/02 0:00	hap
Carbonate as CaCO3			U	mg/L	2	10	06/22/02 0:00	hap
Hydroxide as CaCO3			U	mg/L	2	10	06/22/02 0:00	hap
Total Alkalinity		393		mg/L	2	10	06/22/02 0:00	hap
Cation-Anion Balance	Calculation							
Cation-Anion Balance		5.0		%			07/26/02 0:00	calc
Sum of Anions		9.6		meq/L	0.1	0.5	07/26/02 0:00	calc
Sum of Cations		10.6		meq/L	0.1	0.5	07/26/02 0:00	calc
Chloride	M325.2 - Colorimetric	12		mg/L	1	5	06/29/02 11:28	clt
Hardness as CaCO3	SM2340B - Calculation	277		mg/L	1	7	07/26/02 0:00	calc
Lab Filtration	SM 3030 B						06/21/02 15:55	hap
Oil & Grease, Total Recoverable	M1664 - Gravimetric	See note						N/A
Residue, Filterable (TDS) @180C	M160.1 - Gravimetric	520		mg/L	10	20	06/21/02 20:32	wfg
Sodium Absorption Ratio in Water	USGS - I1738-78	2.99			0.03	0.15	07/26/02 0:00	calc
Sulfate	M375.3 - Gravimetric	70		mg/L	10	20	06/21/02 14:37	wfg
TDS (calculated)	Calculation	518		mg/L	10	50	07/26/02 0:00	calc
TDS (ratio - measured/calculated)	Calculation	1.00					07/26/02 0:00	calc

Note: The Oil & Grease analysis was not performed due to insufficient sample volume.

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Inorganic Analytical Results

Soldier Creek Coal Company
Project ID:
Sample ID: G-7

ACZ ID: *L37416-01*
Date Sampled: *06/24/02 00:00*
Date Received: *06/27/02*
Sample Matrix: *Surface Water*

Wet Chemistry

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Oil & Grease, Total Recoverable	M1664 - Gravimetric		U	mg/L	2	10	07/11/02 0:05	ecr

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Inorganic Analytical Results

Soldier Creek Coal Company
Project ID:
Sample ID: G-6

ACZ ID: *L37352-12*
Date Sampled: *06/18/02 07:45*
Date Received: *06/21/02*
Sample Matrix: *Surface Water*

Metals Analysis

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Calcium, dissolved	M200.7 ICP	71.2		mg/L	0.2	1	07/19/02 2:35	bf
Iron, dissolved	M200.7 ICP		U	mg/L	0.01	0.05	07/19/02 21:08	bf
Iron, total	M200.7 ICP	0.19		mg/L	0.01	0.05	07/25/02 19:44	bf
Magnesium, dissolved	M200.7 ICP	60.5		mg/L	0.2	1	07/19/02 2:35	bf
Manganese, dissolved	M200.7 ICP		U	mg/L	0.005	0.03	07/19/02 2:35	bf
Manganese, total	M200.7 ICP	0.013	B	mg/L	0.005	0.03	07/22/02 20:36	ct
Potassium, dissolved	M200.7 ICP	3.6		mg/L	0.3	1	07/19/02 21:08	bf
Sodium, dissolved	M200.7 ICP	81.1		mg/L	0.3	1	07/19/02 21:08	bf

Metals Prep

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Total Hot Plate Digestion	M200.2 ICP						07/24/02 21:21	dlm

Wet Chemistry

Parameter	EPA Method	Result	Qual	Units	MDL	PQL	Date	Analyst
Alkalinity as CaCO3	SM2320B - Titration							
Bicarbonate as CaCO3		339		mg/L	2	10	06/22/02 0:00	hap
Carbonate as CaCO3			U	mg/L	2	10	06/22/02 0:00	hap
Hydroxide as CaCO3			U	mg/L	2	10	06/22/02 0:00	hap
Total Alkalinity		339		mg/L	2	10	06/22/02 0:00	hap
Cation-Anion Balance	Calculation							
Cation-Anion Balance		3.8		%			07/26/02 13:53	calc
Sum of Anions		11.3		meq/L	0.1	0.5	07/26/02 13:53	calc
Sum of Cations		12.2		meq/L	0.1	0.5	07/26/02 13:53	calc
Chloride	M325.2 - Colorimetric	12		mg/L	1	5	06/29/02 11:29	clt
Hardness as CaCO3	SM2340B - Calculation	427		mg/L	1	7	07/26/02 13:53	calc
Lab Filtration	SM 3030 B						06/21/02 15:59	hap
Oil & Grease, Total Recoverable	M1664 - Gravimetric		U	mg/L	2	10	07/04/02 13:08	hap/e
Residue, Filterable (TDS) @180C	M160.1 - Gravimetric	620		mg/L	10	20	06/21/02 20:33	wfg
Sodium Absorption Ratio in Water	USGS - I1738-78	1.73			0.03	0.15	07/26/02 13:53	calc
Sulfate	M375.3 - Gravimetric	200		mg/L	10	20	06/21/02 14:39	wfg
TDS (calculated)	Calculation	632		mg/L	10	50	07/26/02 13:53	calc
TDS (ratio - measured/calculated)	Calculation	0.98					07/26/02 13:53	calc

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June 26, 2002

CANYON FUEL CO, LLC.
SOLDIER/DUGOUT CANYON MINES
P.O. BOX 1029
WELLINGTON, UT 84542
DAVID SPILLMAN

Sample identification by
Soldier/Dugout Canyon Mines

ID:5

Kind of sample reported to us: Water

RECEIVED 0705
SAMPLED 1200

Sample taken at: DUGOUT

Sample taken by: VICKY MILLER

Date sampled: June 13, 2002

Date received: June 14, 2002

Analysis report no. 59-24119

Parameter	Result	MRL	Units		Method	Analyzed Date/Time/Analyst	
Nitrogen, Nitrate	1.05	0.03	mg/l as	N	EPA 300.0	06-14-2002 1128	SC
Nitrogen, Nitrite	<0.03	0.03	mg/l as	N	EPA 300.0	06-14-2002 1128	SC
Phosphorous, Ortho-PO_4	<0.05	0.05	mg/l as	P	EPA 300.0	06-14-2002 1128	SC

FAXED 6-27-02

Respectfully submitted,
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June 26, 2002

CANYON FUEL CO, LLC.
SOLDIER/DUGOUT CANYON MINES
P.O. BOX 1029
WELLINGTON, UT 84542
DAVID SPILLMAN

Sample identification by
Soldier/Dugout Canyon Mines

ID:DC-2

Kind of sample reported to us: Water

RECEIVED 0705
SAMPLED 1030

Sample taken at: DUGOUT

Sample taken by: VICKY MILLER

Date sampled: June 13, 2002

Date received: June 14, 2002

Analysis report no. 59-24120

Parameter	Result	MRL	Units		Method	Analyzed Date/Time/Analyst	
Nitrogen, Nitrate	<0.03	0.03	mg/l as	N	EPA 300.0	06-14-2002 1128	SC
Nitrogen, Nitrite	<0.03	0.03	mg/l as	N	EPA 300.0	06-14-2002 1128	SC
Phosphorous, Ortho-PO_4	<0.05	0.05	mg/l as	P	EPA 300.0	06-14-2002 1128	SC

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June 26, 2002

CANYON FUEL CO, LLC.
SOLDIER/DUGOUT CANYON MINES
P.O. BOX 1029
WELLINGTON, UT 84542

Sample identification by
Soldier Canyon

ID:SP-20

Kind of sample reported to us: Water

RECEIVED 1000
SAMPLED 0902

Sample taken at: Soldier Canyon

Sample taken by: R.K.

Date sampled: June 18, 2002

Date received: June 19, 2002

Analysis report no. 59-24138

Parameter	Result	MRL	Units		Method	Analyzed Date/Time/Analyst
Nitrogen, Nitrate-Nitrite	0.07	0.03	mg/l as	N	EPA 300.0	06-19-2002 0840 SC
Nitrogen, Nitrite	<0.03	0.03	mg/l as	N	EPA 300.0	06-19-2002 0840 SC
Phosphorous, Ortho-PO_4	<0.05	0.05	mg/l as	P	EPA 300.0	06-19-2002 0840 SC

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June 26, 2002

CANYON FUEL CO, LLC.
SOLDIER/DUGOUT CANYON MINES
P.O. BOX 1029
WELLINGTON, UT 84542

Sample identification by
Soldier Canyon

ID:SC-14

Kind of sample reported to us: Water

RECEIVED 1000
SAMPLED 0931

Sample taken at: Soldier Canyon

Sample taken by: R.K.

Date sampled: June 18, 2002

Date received: June 19, 2002

Analysis report no. 59-24139

Parameter	Result	MRL	Units		Method	Analyzed Date/Time/Analyst
Nitrogen, Nitrate-Nitrite	0.27	0.03	mg/l as	N	EPA 300.0	06-19-2002 0840 SC
Nitrogen, Nitrite	<0.03	0.03	mg/l as	N	EPA 300.0	06-19-2002 0840 SC
Phosphorous, Ortho-PO_4	<0.05	0.05	mg/l as	P	EPA 300.0	06-19-2002 0840 SC

FAXED 6-27-02

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June 26, 2002

CANYON FUEL CO, LLC.
SOLDIER/DUGOUT CANYON MINES
P.O. BOX 1029
WELLINGTON, UT 84542

Sample identification by
Soldier Canyon

ID:PC-2

Kind of sample reported to us: Water

RECEIVED 1000
SAMPLED 1400

Sample taken at: Soldier Canyon

Sample taken by: R.K.

Date sampled: June 18, 2002

Date received: June 19, 2002

Analysis report no. 59-24140

Parameter	Result	MRL	Units		Method	Analyzed Date/Time/Analyst
Nitrogen, Nitrate-Nitrite	<0.03	0.03	mg/l as	N	EPA 300.0	06-19-2002 0840 SC
Nitrogen, Nitrite	<0.03	0.03	mg/l as	N	EPA 300.0	06-19-2002 0840 SC
Phosphorous, Ortho-PO_4	<0.05	0.05	mg/l as	P	EPA 300.0	06-19-2002 0840 SC

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June 26, 2002

CANYON FUEL CO, LLC.
SOLDIER/DUGOUT CANYON MINES
P.O. BOX 1029
WELLINGTON, UT 84542

Sample identification by
Soldier Canyon

ID:PC-1A

Kind of sample reported to us: Water

RECEIVED 1000
SAMPLED 1217

Sample taken at: Soldier Canyon

Sample taken by: R.K.

Date sampled: June 18, 2002

Date received: June 19, 2002

Analysis report no. 59-24141

Parameter	Result	MRL	Units		Method	Analyzed Date/Time/Analyst
Nitrogen, Nitrate-Nitrite	0.12	0.03	mg/l as	N	EPA 300.0	06-19-2002 0840 SC
Nitrogen, Nitrite	<0.03	0.03	mg/l as	N	EPA 300.0	06-19-2002 0840 SC
Phosphorous, Ortho-PO_4	<0.05	0.05	mg/l as	P	EPA 300.0	06-19-2002 0840 SC

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June 26, 2002

CANYON FUEL CO, LLC.
SOLDIER/DUGOUT CANYON MINES
P.O. BOX 1029
WELLINGTON, UT 84542

Sample identification by
Soldier Canyon

ID:DC-5

Kind of sample reported to us: Water

RECEIVED 1000
SAMPLED 1520

Sample taken at: Soldier Canyon

Sample taken by: R.K.

Date sampled: June 18, 2002

Date received: June 19, 2002

Analysis report no. 59-24142

Parameter	Result	MRL	Units		Method	Analyzed Date/Time/Analyst
Nitrogen, Nitrate-Nitrite	<0.03	0.03	mg/l as	N	EPA 300.0	06-19-2002 0840 SC
Nitrogen, Nitrite	<0.03	0.03	mg/l as	N	EPA 300.0	06-19-2002 0840 SC
Phosphorous, Ortho-PO_4	<0.05	0.05	mg/l as	P	EPA 300.0	06-19-2002 0840 SC

FAXED 6-27-02

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

Huntington Laboratory

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FAX: (435) 653-2436

June 26, 2002

CANYON FUEL CO, LLC.
SOLDIER/DUGOUT CANYON MINES
P.O. BOX 1029
WELLINGTON, UT 84542

Sample identification by
Soldier Canyon

ID:260

Kind of sample reported to us: Water

RECEIVED 1000
SAMPLED 1300

Sample taken at: Soldier Canyon

Sample taken by: R.K.

Date sampled: June 18, 2002

Date received: June 19, 2002

Analysis report no. 59-24143

Parameter	Result	MRL	Units		Method	Analyzed Date/Time/Analyst
Nitrogen, Nitrate-Nitrite	0.15	0.03	mg/l as	N	EPA 300.0	06-19-2002 0840 SC
Nitrogen, Nitrite	<0.03	0.03	mg/l as	N	EPA 300.0	06-19-2002 0840 SC
Phosphorous, Ortho-PO_4	<0.05	0.05	mg/l as	P	EPA 300.0	06-19-2002 0840 SC

FAXED 6-27-02

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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June 26, 2002

CANYON FUEL CO, LLC.
SOLDIER/DUGOUT CANYON MINES
P.O. BOX 1029
WELLINGTON, UT 84542

Sample identification by
Soldier Canyon

ID:203

Kind of sample reported to us: Water

RECEIVED 1000
SAMPLED 1210

Sample taken at: Soldier Canyon

Sample taken by: R.K.

Date sampled: June 18, 2002

Date received: June 19, 2002

Analysis report no. 59-24144

Parameter	Result	MRL	Units		Method	Analyzed Date/Time/Analyst
Nitrogen, Nitrate-Nitrite	0.72	0.03	mg/l as	N	EPA 300.0	06-19-2002 0840 SC
Nitrogen, Nitrite	<0.03	0.03	mg/l as	N	EPA 300.0	06-19-2002 0840 SC
Phosphorous, Ortho-PO_4	<0.05	0.05	mg/l as	P	EPA 300.0	06-19-2002 0840 SC

FAXED 6-27-02

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June 26, 2002

CANYON FUEL CO, LLC.
SOLDIER/DUGOUT CANYON MINES
P.O. BOX 1029
WELLINGTON, UT 84542

Sample identification by
Soldier Canyon

ID:SC-65

Kind of sample reported to us: Water

RECEIVED 1000
SAMPLED 1023

Sample taken at: Soldier Canyon

Sample taken by: R.K.

Date sampled: June 18, 2002

Date received: June 19, 2002

Analysis report no. 59-24146

Parameter	Result	MRL	Units		Method	Analyzed Date/Time/Analyst	
Nitrogen, Nitrate-Nitrite	0.17	0.03	mg/l as	N	EPA 300.0	06-19-2002 0840	SC
Nitrogen, Nitrite	<0.03	0.03	mg/l as	N	EPA 300.0	06-19-2002 0840	SC
Phosphorous, Ortho-PO_4	<0.05	0.05	mg/l as	P	EPA 300.0	06-19-2002 0840	SC

FAXED 6-27-02

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FAX: (435) 653-2436

June 26, 2002

CANYON FUEL CO, LLC.
SOLDIER/DUGOUT CANYON MINES
P.O. BOX 1029
WELLINGTON, UT 84542

Sample identification by
Soldier Canyon

ID:SC-116

Kind of sample reported to us: Water

RECEIVED 1000
SAMPLED 1130

Sample taken at: Soldier Canyon

Sample taken by: R.K.

Date sampled: June 18, 2002

Date received: June 19, 2002

Analysis report no. 59-24145

Parameter	Result	MRL	Units		Method	Analyzed Date/Time/Analyst
Nitrogen, Nitrate-Nitrite	<0.03	0.03	mg/l as	N	EPA 300.0	06-19-2002 0840 SC
Nitrogen, Nitrite	<0.03	0.03	mg/l as	N	EPA 300.0	06-19-2002 0840 SC
Phosphorous, Ortho-PO_4	<0.05	0.05	mg/l as	P	EPA 300.0	06-19-2002 0840 SC

FAXED 6-27-02

Respectfully submitted,
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www.comteco.com

June 11, 2002

CANYON FUEL CO, LLC.
SOLDIER/DUGOUT CANYON MINES
P.O. BOX 1029
WELLINGTON, UT 84542

Sample identification by
Soldier Canyon

ID:DC-3

Kind of sample reported to us Water

RECEIVED 1730
SAMPLED 1230

Sample taken at Soldier Canyon

Sample taken by Vicky Miller

Date sampled June 6, 2002

Date received June 6, 2002

Analysis report no. 59-24073

Parameter	Result	MRL	Units		Method	Analyzed Date/Time/Analyst	
Nitrogen, Nitrate-Nitrite	0.04	0.03	mg/l as	N	EPA 300.0	06-07-2002 0935	SC
Nitrogen, Nitrite	<0.03	0.03	mg/l as	N	EPA 300.0	06-07-2002 0935	SC
Phosphorous, Ortho-PO_4	<0.05	0.05	mg/l as	P	EPA 300.0	06-07-2002 0935	SC

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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June 11, 2002

CANYON FUEL CO, LLC.
SOLDIER/DUGOUT CANYON MINES
P.O. BOX 1029
WELLINGTON, UT 84542

Sample identification by
Soldier Canyon

ID:DC-4

Kind of sample reported to us Water

RECEIVED 1730
SAMPLED 1200

Sample taken at Soldier Canyon

Sample taken by Vicky Miller

Date sampled June 6, 2002

Date received June 6, 2002

Analysis report no. 59-24074

Parameter	Result	MRL	Units		Method	Analyzed Date/Time/Analyst
Nitrogen, Nitrate-Nitrite	<0.03	0.03	mg/l as	N	EPA 300.0	06-07-2002 0935 SC
Nitrogen, Nitrite	<0.03	0.03	mg/l as	N	EPA 300.0	06-07-2002 0935 SC
Phosphorous, Ortho-PO_4	<0.05	0.05	mg/l as	P	EPA 300.0	06-07-2002 0935 SC

Respectfully submitted,
COMMERCIAL TESTING & ENGINEERING CO.

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United States Department of Agriculture

Natural Resources Conservation Service

Water and Climate Center
Portland, Oregon

S N O W - P R E C I P I T A T I O N U P D A T E

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□

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S N O W - P R E C I P I T A T I O N U P D A T E

Based on Mountain Data from NRCS SNOTEL Sites
As of TUESDAY: MARCH 4 , 2003

STATE RIVER BASIN	Number of Sites	PERCENT OF AVERAGE Snow Water Equivalent	Accum Precip
UTAH			
BEAR RIVER	8 of 8	67	73
WEBER-OGDEN RIVERS	14 of 14	63	66
PROVO R.-UTAH LAKE-JORDAN R.	13 of 13	60	66
TOOELE VALLEY-VERNON CREEK	3 of 3	54	64
GREEN RIVER	6 of 6	75	82
DUCHESNE RIVER	12 of 12	64	65
PRICE-SAN RAFAEL	5 of 5	70	80
DIRTY DEVIL	3 of 3	80	82
SOUTH EASTERN UTAH	3 of 3	75	71
SEVIER RIVER	14 of 15	70	79
BEAVER RIVER	2 of 2	71	79
ESCALANTE RIVER	2 of 3	87	*
VIRGIN RIVER	7 of 7	56	77

Basin wide percent of average 75

DUCHESNE RIVER

LAKEFORK BASIN	11100	10.2	17.1	60	9.6	17.5	55
FIVE POINTS LAKE	11000	9.3	14.2	65	10.6	16.2	65
BROWN DUCK	10600	10.4	15.3	68	11.3	16.5	68
CHEPETA	10300	8.8	11.7	75	7.6	12.9	59
LAKEFORK #1	10200	7.5	10.7	70	8.4	11.8	71
TRIAL LAKE	9960	10.5	21.1	50	12.5	21.0	60
MOSBY MTN.	9500	8.1	9.6	84	9.0	11.5	78
INDIAN CANYON	9100	8.1	9.9	82	9.7	12.0	81
STRAWBERRY DIVIDE	8400	9.1	16.6	55	10.4	18.6	56
DANIELS-STRAW ERRY	8000	11.2	15.2	74	11.6	17.5	66
ROCK CREEK	7900	5.6	8.1	69	6.7	10.9	61
Basin wide percent of average				64			65

PRICE-SAN RAFAEL

SEELEY CREEK	10000	8.0	12.6	63	9.3	11.4	82
BUCK FLAT	9800	12.2	15.6	78	13.8	16.4	84
RED PINE RIDGE	9200	9.8	14.5	68	11.7	15.4	76
MAMMOTH-COTTONWOOD	8800	13.3	18.1	73	10.8	13.7	79
WHITE RIVER #1	8550	7.5	11.8	64	9.3	12.1	77
Basin wide percent of average				70			80

DIRTY DEVIL

DONKEY RESERVOIR	9800	7.1	6.8	104	-M	7.8	*
BLACK FLAT-U.M. CK	9400	6.0	8.7	69	7.1	9.6	74
DILL'S CAMP	9200	9.4	12.6	75	12.6	14.4	88
Basin wide percent of average				80			82

SOUTH EASTERN UTAH

LASAL MOUNTAIN	9400	9.0	10.9	83	11.2	17.3	65
CAMP JACKSON	8600	9.4	13.2	71	12.6	16.2	78
EAST WILLOW CREEK	8100	5.1	7.3	70	6.7	9.2	73
Basin wide percent of average				75			71

SEVIER RIVER

CLAYTON SPRINGS	10000	8.0	-M	*	9.6	-M	*
MIDWAY VALLEY	9800	12.9	20.0	64	13.0	17.7	73
BOX CREEK	9800	8.6	11.3	76	9.6	12.1	79
FARNSWORTH LAKE	9600	11.9	15.2	78	12.2	15.8	77
PICKLE KEG	9600	11.2	14.5	77	12.7	15.0	85
CASTLE VALLEY	9580	7.0	12.2	57	8.5	12.2	70
WIDTSOE #3	9500	7.6	10.0	76	8.9	11.2	79
KIMBERLY MINE	9300	9.5	13.7	69	12.9	16.4	79
AGUA CANYON	8900	5.6	7.6	74	8.3	12.5	66
PINE CREEK	8800	11.3	19.9	57	11.9	14.8	80
MAMMOTH-COTTONWOOD	8800	13.3	18.1	73	10.8	13.7	79
GOOSEBERRY R.S.	8000	8.1	8.2	99	9.4	12.8	73
BEAVER DAMS	8000	7.3	10.4	70	12.7	13.8	92
HARRIS FLAT	7700	5.3	7.0	76	9.3	10.2	91
LONG VALLEY JCT	7500	2.3	5.8	40	9.3	10.9	85

National Water & Climate Center

SEELEY CREEK SNOTEL Data Report - Daily Readings

Basin: San Rafael (HUC 14060009) Elevation: 10000

Provisional data, subject to revision

(As of: Thu Mar 13 16:01:55 PST 2003)

Date	Time	Snow Water Equivalent	Snow Depth	Precip (YTD)	Current Temp	Previous Day's Temp		
						Max	Min	Avg
02/28/2003	0000	7.4	29.9	9.0	12.2	27.4	10.1	15.3
03/01/2003	0000	7.5	31.9	9.0	5.9	20.6	5.8	12.6
03/02/2003	0000	7.8	34.0	9.3	5.4	25.3	5.2	12.7
03/03/2003	0000	8.1	33.9	9.3	15.9	22.1	-0.3	13.2
03/04/2003	0000	8.1	32.2	9.3	16.9	31.4	15.5	21.5
03/05/2003	0000	8.3	38.1	9.5	9.4	16.6	9.1	13.0
03/06/2003	0000	8.3	30.9	9.5	18.4	18.8	6.5	12.0
03/07/2003	0001	8.3	29.3	9.5		27.9	18.9	22.6
03/08/2003	0000	8.3	29.7	9.5	25.6	32.3	20.7	26.5
03/09/2003	0000	8.3	28.4	9.5	29.7	33.5	18.1	27.9
03/10/2003	0000	8.3	27.3	9.5	29.1	37.1	26.4	32.0
03/11/2003	1500	6.8	23.8	9.5	37.8	35.9	25.5	30.2
03/12/2003	0000	6.8	25.9	9.6	32.1	37.8	27.9	32.5
03/13/2003	0000	7.0	26.1	9.6	26.1	41.6	26.1	32.8

Provisional data, subject to revision

*Precip(YTD) = Precipitation from October 1 to current date.
*Snow Water Equivalent, Snow Depth, and Precipitation are recorded in inches.
*Temperature data converted to degrees Fahrenheit.
*-99.9 indicates invalid data received.
*M = Missing data for the selected day.
*A blank field indicates a missing sensor or problems with the sensor.

National Water & Climate Center

BUCK FLAT SNOTEL Data Report - Daily Readings

Basin: San Rafael (HUC 14060009) Elevation: 9800

Provisional data, subject to revision

(As of: Thu Mar 13 16:01:12 PST 2003)

Date	Time	Snow Water Equivalent	Snow Depth	Precip (YTD)	Current Temp	Previous Day's Temp		
						Max	Min	Avg
02/28/2003	0000	11.9	46.9	13.4	10.3	23.9	8.7	17.9
03/01/2003	0000	11.9	45.5	13.4	3.4	30.2	3.2	15.7
03/02/2003	0000	12.1	48.5	13.7	6.7	28.2	3.0	15.8
03/03/2003	0000	12.1	46.7	13.9	21.0	37.9	0.8	17.7
03/04/2003	0000	12.1	46.1	13.9	20.9	38.5	18.9	26.9
03/05/2003	0000	12.1	48.4	14.1	13.8	28.0	13.3	19.5
03/06/2003	0000	12.5	50.8	14.1	22.1	25.2	12.1	18.3
03/07/2003	0000	12.5	48.7	14.2	27.7	37.8	22.0	28.5
03/08/2003	0000	12.5	48.1	14.2	27.8	41.6	24.0	32.0
03/09/2003	0000	12.5	46.6	14.2	25.6	43.0	21.4	31.6
03/10/2003	0000	12.5	44.8	14.2	30.3	47.2	24.4	35.3
03/11/2003	0000	12.8	44.0	14.2	29.5	44.5	28.4	35.0
03/12/2003	0000	12.3	39.3	14.3	32.7	45.7	27.8	36.2
03/13/2003	0000	13.5	42.6	14.3	29.4	47.5	23.3	35.3

Provisional data, subject to revision

*Precip(YTD) = Precipitation from October 1 to current date.
*Snow Water Equivalent, Snow Depth, and Precipitation are recorded in inches.
*Temperature data converted to degrees Fahrenheit.
*-99.9 indicates invalid data received.
*M = Missing data for the selected day.
*A blank field indicates a missing sensor or problems with the sensor.

National Water & Climate Center

RED PINE RIDGE SNOTEL Data Report - Daily Readings

Basin: San Rafael (HUC 14060009) Elevation: 9200

Provisional data, subject to revision

(As of: Thu Mar 13 16:00:21 PST 2003)

Date	Time	Snow Water Equivalent	Snow Depth	Precip (YTD)	Current Temp	Previous Day's Temp		
						Max	Min	Avg
02/28/2003	0000	9.4	42.2	11.5	8.9	28.0	8.9	17.6
03/01/2003	0000	9.5	40.8	11.5	0.5	32.1	0.5	15.9
03/02/2003	0000	9.7	43.2	11.6	-1.5	26.4	-1.5	12.7
03/03/2003	0000	9.7	42.4	11.7	4.9	-147.8	-4.3	18.6
03/04/2003	0000	9.8	40.8	11.7	20.6	43.6	1.6	21.5
03/05/2003	0000	10.2	47.3	12.0	13.3	25.7	12.5	18.1
03/06/2003	0000	10.3	45.5	12.1	22.1	26.7	10.2	17.7
03/07/2003	0000	10.3	43.4	12.1	25.6	36.3	22.4	27.8
03/08/2003	0000	10.3	42.2	12.1	27.1	44.4	12.3	30.3
03/09/2003	0000	10.3	41.3	12.1	20.8	47.4	12.5	28.2
03/10/2003	0000	10.3	40.7	12.1	20.4	49.9	14.9	31.9
03/11/2003	0000	10.3	39.0	12.1	22.3	46.1	19.8	32.7
03/12/2003	0000	10.1	38.1	12.1	28.8	47.4	22.1	34.0
03/13/2003	0000	10.5	37.6	12.1	22.2	49.7	20.4	32.7

Provisional data, subject to revision

*Precip(YTD) = Precipitation from October 1 to current date.
*Snow Water Equivalent, Snow Depth, and Precipitation are recorded in inches.
*Temperature data converted to degrees Fahrenheit.
*-99.9 indicates invalid data received.
*M = Missing data for the selected day.
*A blank field indicates a missing sensor or problems with the sensor.

National Water & Climate Center

MAMMOTH-COTTONWOOD SNOTEL Data Report - Daily Readings

Basin: San Pitch (HUC 16030004) Elevation: 8800

Provisional data, subject to revision

(As of: Thu Mar 13 15:58:57 PST 2003)

Date	Time	Snow Water Equivalent	Snow Depth	Precip (YTD)	Current Temp	Previous Day's Temp		
						Max	Min	Avg
02/28/2003	0000	13.1	44.8	10.4	10.2	36.0	9.5	19.5
03/01/2003	0000	13.1	44.3	10.4	7.0	38.9	6.0	17.0
03/02/2003	0000	13.3	46.1	10.5	3.9	39.8	3.9	17.5
03/03/2003	0000	13.4	45.0	10.7	15.7	32.1	-5.2	15.5
03/04/2003	0000	13.3	44.2	10.8	22.0	37.3	11.0	24.8
03/05/2003	0000	13.6	48.9	10.9	14.2	25.9	10.7	18.4
03/06/2003	0000	13.6	46.3	10.9	21.0	21.0	10.5	16.2
03/07/2003	0000	13.6	43.5	10.9	27.3	35.6	20.6	27.8
03/08/2003	0000	13.7	42.6	10.9	28.5	41.1	21.0	30.8
03/09/2003	0000	13.8	41.9	10.9	24.6	44.0	17.6	29.2
03/10/2003	0000	13.8	41.0	10.9	21.5	46.4	21.2	33.6
03/11/2003	0000	13.7	40.4	11.0	29.0	50.1	17.9	32.9
03/12/2003	0000	13.7	38.9	11.0	27.4	48.5	26.1	36.0
03/13/2003	0000	13.5	38.2	11.0	29.6	53.6	22.8	35.1

Provisional data, subject to revision

*Precip(YTD) = Precipitation from October 1 to current date.
*Snow Water Equivalent, Snow Depth, and Precipitation are recorded in inches.
*Temperature data converted to degrees Fahrenheit.
*-99.9 indicates invalid data received.
*M = Missing data for the selected day.
*A blank field indicates a missing sensor or problems with the sensor.

National Water & Climate Center

WHITE RIVER #1 SNOTEL Data Report - Daily Readings

Basin: Price (HUC 14060007) Elevation: 8550

Provisional data, subject to revision

(As of: Thu Mar 13 15:57:26 PST 2003)

Date	Time	Snow Water Equivalent	Snow Depth	Precip (YTD)	Current Temp	Previous Day's Temp		
						Max	Min	Avg
02/28/2003	0000	7.2		8.8	11.1	34.2	4.2	16.7
03/01/2003	0000	7.2		8.8	11.2	27.6	2.7	13.4
03/02/2003	0000	7.2		8.8	10.3	30.4	5.3	14.9
03/03/2003	0000	7.2		9.0	10.5	31.2	3.2	15.1
03/04/2003	0000	7.5		9.3	21.1	36.1	9.8	22.6
03/05/2003	0000	7.6		9.3	12.9	30.7	11.2	18.1
03/06/2003	0000	7.7		9.3	16.4	23.9	10.9	16.8
03/07/2003	0000	7.8		9.5	26.1	37.1	16.9	26.8
03/08/2003	0000	7.8		9.5	25.2	39.7	21.3	29.8
03/09/2003	0000	7.8		9.5	26.2	42.5	20.4	30.5
03/10/2003	0000	7.8		9.5	27.2	46.4	20.8	33.2
03/11/2003	0000	7.7		9.7	31.9	45.9	22.8	33.2
03/12/2003	0000	7.7		9.7	31.0	49.2	29.4	36.6
03/13/2003	0000	7.5		9.5	30.1	51.0	25.2	35.7

Provisional data, subject to revision

*Precip(YTD) = Precipitation from October 1 to current date.
*Snow Water Equivalent, Snow Depth, and Precipitation are recorded in inches.
*Temperature data converted to degrees Fahrenheit.
*-99.9 indicates invalid data received.
*M = Missing data for the selected day.
*A blank field indicates a missing sensor or problems with the sensor.

APPENDIX C

Legal Financial, Compliance and Related Information

Annual Report of Officers
As submitted to the Utah Department of Commerce

Other change in ownership and control information
As required under R645-301-110

CONTENTS

OFFICERS AND DIRECTORS

Canyon Fuel Company, LLC
2002 Annual Report

Officers and Directors

The following lists describe the officers and directors of Canyon Fuel Company, LLC, Arch Western Resources, LLC, Arch Coal, Inc., Itochu Corporation, and Itochu Coal International, Inc. The addresses for the officers, directors, representatives to the management board listed are the same as those of the respective business entities as listed above, for which the individuals are officers, directors or representatives.

ADDRESSES:

Canyon Fuel Company, LLC
6955 South Union Park Center, Suite 540
Midvale, UT 84047

Arch Western Resources, LLC
City Place One, Suite 300
St. Louis, MO 63141

Arch Coal, Inc.
City Place One, Suite 300
St. Louis, MO 63141

Delta Housing, Inc.
515 South Flower Street
Los Angeles, CA 90071

Atlantic Richfield Company
515 South Flower Street
Los Angeles, CA 90071

ITOCHU Coal International Inc.
555 17th Street, Suite 845
Denver, Colorado 80202

ITOCHU Corporation, 5-1
Kita-Aoyama 2-Chome
Minato-ku, Tokyo 107-77, Japan

CANYON FUEL COMPANY, LLC:

Directors:

Robert W. Shanks Effective : 06/01/1998	Chairman
Masayoshi Araya Effective : 06/01/2001	
Yuzo Hirono Effective : 12/14/1999	
Steven F. Leer Effective : 06/01/1998	
Kenneth G. Woodring Effective : 12/01/2000	
John W. Eaves Effective : 12/01/2000	Alternative Representative
Joe Y. Nakazawa Effective : 06/01/2001	Alternative Representative
Tsutomu Niwa Effective : 10/09/2001	Alternative Representative

Officers

Richard D. Pick Effective : 06/01/1998	President, Chief Executive Officer and General Manager
Robert J. Messey Effective : 10/09/2001	Chief Financial Officer
James E. Florczak Effective : 05/25/1999	Vice President, Finance
John W. Eaves Effective : 06/23/1998	Vice President, Marketing
Robert G. Jones Effective : 03/08/2000	Vice President, General Counsel and Assistant Secretary

Janet L. Hogan — Secretary
Effective : 10/11/2000

William H. Rose — Assistant Secretary
Effective : 06/01/1998

ARCH COAL, INC.: 2/03/03

Directors:

James R. Boyd — Chairman
Effective : 07/01/1997

Frank M. Burke
Effective :09/07/2000

Robert G. Potter
Effective: 04/26/2001

Theodore D. Sands
Effective: 02/25/1999

Michael A. Perry
Effective: 09/28/1998

Douglas H. Hunt
Effective: 04/04/1995

Steven F. Leer
Effective: 07/1/1997

James L. Parker
Effective: 07/01/1997

Thomas A. Lockhart
Effective: 02/24/2003

Officers:

Steven F. Leer — President and Chief Executive Officer
Effective: 07/1/1997

Kenneth G. Woodring — Executive Vice President-Mining Operations
Effective: 07/01/1997

C. Henry Besten, Jr. Effective: 07/01/1997	Vice President - Strategic Marketing
Larry R. Brown Effective: 07/01/1997	Vice President & Chief Information Officer
John W. Eaves Effective: 07/01/1997	Executive Vice President/COO
David B. Peugh Effective: 07/01/1997	Vice President - Business Development
Robert W. Shanks Effective: 07/01/1997	Vice President - Operations
William H. Rose Effective: 04/22/1998	Vice President - Tax Planning
Robert J. Messey Effective : 12/1/2000	Vice President, Chief Financial Officer
Robert G. Jones Effective : 10/16/2000	Vice President, General Counsel and Secretary
James E. Florczak Effective : 08/17/1998	Vice President, Finance, Treasurer
Deck S. Slone Effective : 04/26/2001	Vice President
Bradley M. Allbritten Effective : 03/1/2000	Vice President, Marketing
Janet L. Hogan Effective : 10/16/2000	Assistant Secretary
John W. Lorson Effective : 04/9/1999	Controller
Charles David Steele Effective : 06/22/1998	Internal Auditor
Shiela Feldman Effective : 02/03/2003	Vice President, Human Resources

ARCH WESTERN RESOURCES, LLC 1/10/03

Directors:

Patrick A. Kriegshauser
Effective: 05/07/98

David B. Peugh
Effective: 05/07/98

Jeffry N. Quinn
Effective: 05/07/98

Officers:

Robert W. Shanks Effective: 06/28/98	President - Operations
David B. Peugh Effective: 05/17/98	Vice President
William H. Rose Effective: 05/07/98	Assistant Secretary
Robert G. Jones Effective : 03/01/00 and 6/2/98	Vice President and Assistant Secretary
Janet L. Hogan Effective : 3/17/98	Secretary
James E. Florczak Effective : 05/15/98	Vice President, Finance, Treasurer

ITOCHU Coal International Inc. Representatives to the Management Board:

Akio Shigetomi
Effective: 11/30/1996

Masayoshi Araya
Effective: 11/30/1996

Yuzo Hirono
Effective: 12/31/1999

Alternates:

Tsutomu Niwa
Effective : 6/01/2001

Yutaka Nakazawa
Effective : 12/20/1996

ITOCHU CORPORATION 9/1/02

Name	Title	Date of Appointment
Minoru Murofushi	Chairman	April 1998
Masahisa Naitoh	Vice Chairman	April 2000
Uichiro Niwa	President, CEO	April 1998
Hiroshi Sumie	Executive Vice President	April 2000
Makoto Kato	Executive Vice President	April 2001
Yushin Okazaki	Executive Vice President	April 2001
Sumitaka Fujita	Executive Vice President	April 2001
Mitsuaki Fukuda	Sr. Managing Director	April 2000
Akira Yokota	Sr. Managing Director	April 2001
Kouhei Watanabe	Managing Director	April 2002
Hiroshi Ueda	Managing Director	April 2002
Motonori Toyota	Managing Director	June 2001

ITOCHU COAL INTERNATIONAL INC.

Masayoshi Araya — Chairman of the Board
Effective : Dec. 1999

Yuzo Hirono — President and Chief Executive Officer
Effective: : Dec. 1999

Tsutomu Niwa — Chief Financial Officer
Effective : June 1996

Dietz Fry — Vice President, Finance and Administration
Effective : March 1997

Yutaka Nakazawa Effective : Dec. 1996	Vice President Commercial and Secretary
Hiroshi Akiba Effective : Feb. 2000	Assistant Secretary

APPENDIX D

Mine Maps

As required under R645-302-525-270

CONTENTS

GILSON SEAM 2002 PRODUCTION MAP
ROCK CANYON SEAM 2002 PRODUCTION MAP

APPENDIX E

Other Information

In accordance with the requirements of R645-301 and R645-302

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