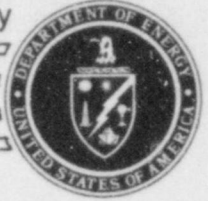


United States Department of Energy



**Data for the Geochemical
Investigation of UMTRAP
Designated Sites at
Slick Rock, Colorado.**

September 1983

Uranium Mill Tailings Remedial Action Project



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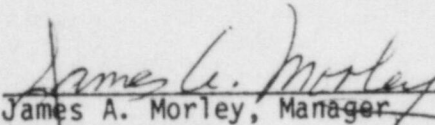
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1983

DATA FOR THE GEOCHEMICAL INVESTIGATION OF UMTRAP DESIGNATED SITES AT
SLICK ROCK, COLORADO

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UMTRA Project

SUMMARY

This report contains the geochemical data and the methods of data collection from the former tailings sites at Slick Rock, Colorado, performed under contract from the U.S. Department of Energy, Uranium Mill Tailings Remedial Action (UMTRA) Project. Data are from a one-time sampling of waters and solid material from the background, the area adjacent to the site, and the site. Selected solid samples are water extracted to remove easily soluble salts. The waters and extracts of solid samples were analyzed for selected major and trace elements.

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CHAPTER 1

INTRODUCTION AND BACKGROUND TO THE INVESTIGATION

1.1 Introduction

- 1.1 The Uranium Mill Tailings Remedial Action (UMTRA) Project [1] of the Department of Energy includes twenty-four designated abandoned uranium mill tailings (UMT) and is responsible for containing contaminated material and for controlling further movements of contaminants as required by Title I of Public Law 95-604, "Uranium Mill Tailings Radiation Control Act of 1978". Under the UMTRA Project, research, technology development, and engineering programs are in progress.

This report contains the geochemical data and the methods of data collection from the two former tailings sites at Slick Rock, Colorado. The data are from a one-time sampling of the soils and waters from the tailings pile, their adjacent area, and their background. Selected waters and extracts of solids were chemically analyzed for major and trace elements. Many solid samples are in archival storage, available for analysis at a later date. The objectives of the data were to characterize the geochemistry of the tailings materials, to determine the contaminant distribution resulting from the former milling activities and the tailings, and to infer chemical pathways and transport mechanisms from the contaminant distribution. The characterization study was omitted, however, and this data report represents the final product.

CHAPTER 2

METHODS OF INVESTIGATION

2.1 Sampling Plan

Samples for the Slick Rock tailings investigation are from three areas defined as: (1) the source, (2) the area adjacent to the source where contaminants may physically or chemically be transported, and (3) the local background which is the area not affected by the presence of the tailings. The sampling locations from the background are shown on Figure 2-1. The sampling locations from the source and adjacent area are shown on Figures 2-2 and 2-3. Site descriptions with coordinates of sample locations are in Tables 2-1 and 2-2.

The objective of sampling the background was to establish a baseline chemical composition of waters in the Slick Rock area to compare with the concentrations of elements in waters adjacent to the tailings. Soil sampling sites in the adjacent area were located where contaminant migration was suspected. Locations were chosen which appeared to be associated with water movement, which is a requirement for migration of elements. Vegetation patterns, salt precipitates on the surface, and dispersed or cemented materials were the major criteria for choosing locations adjacent to the tailings. Samples from the tailings were used to characterize the sands ($> 74\mu\text{m}$) and the slimes ($< 74\mu\text{m}$) of the tailings and the distribution of elements within the pile and across the interfaces with soil and cover. The distribution patterns across the interfaces indicate the migration that has occurred.

2.2 Field Methods

The following section describes the procedures used for sampling waters and solids and measuring the chemical conditions. Care was taken to minimize contamination of samples from the sampling devices and cross-contamination between samples. Also, representation of the field conditions required immediate attention to pH and Eh measurements and preservation of samples.

The surface water samples were collected in new polyethylene bottles after rinsing the bottles with the water being sampled. The bottles were completely filled to exclude air bubbles and sealed. Within eight hours of collecting a sample, the pH, Eh, and specific conductance were measured. The cations, chloride, and sulfate in the waters were stabilized by filtering through a $0.45\mu\text{m}$ filter and acidifying with nitric acid to a pH less than 2 [2].

Both Eh and pH were determined potentiometrically. A combination platinum/saturated calomel electrode for the Eh measurements was

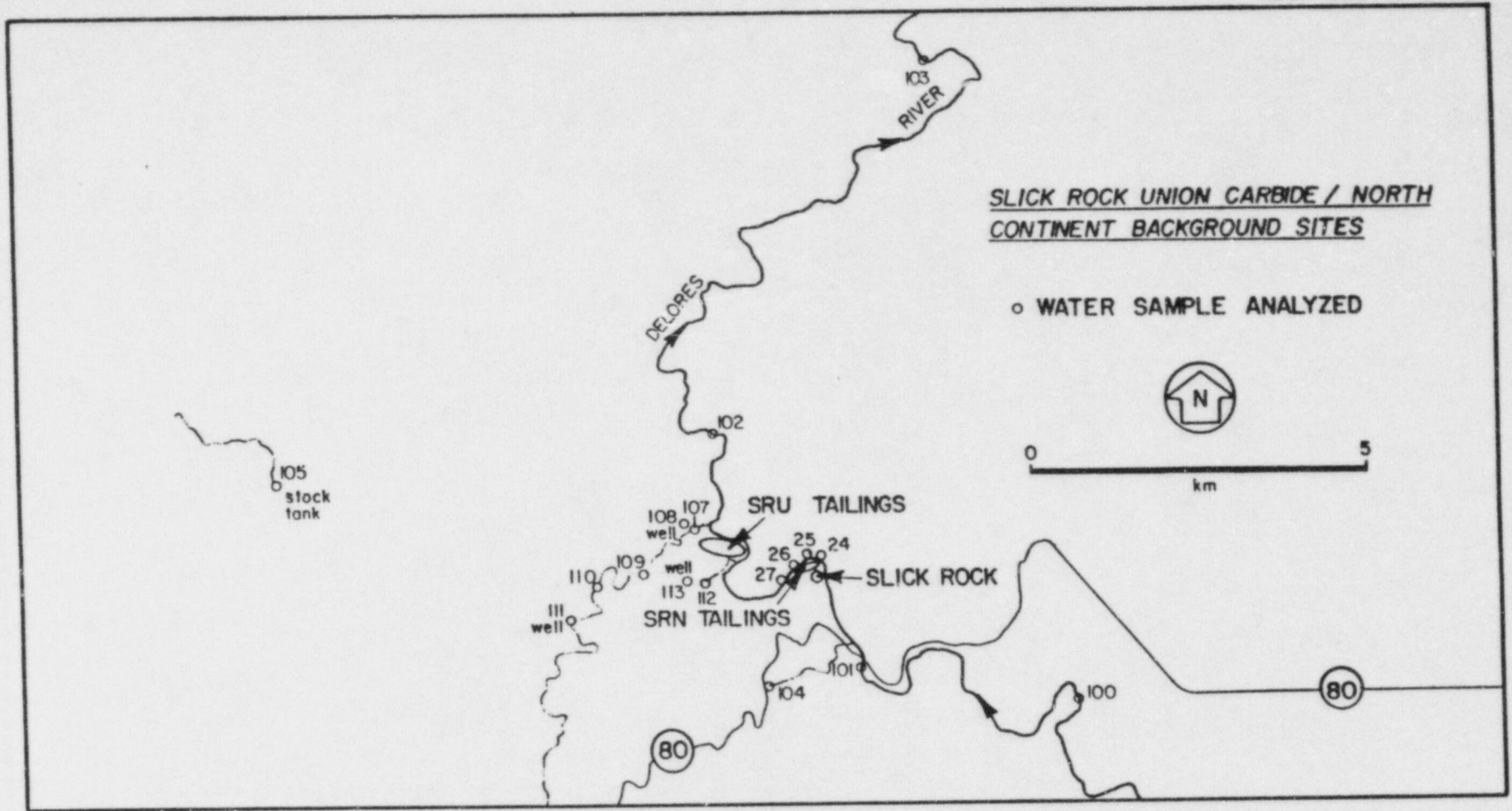


Figure 2-1. Background sampling sites in the Slick Rock area.

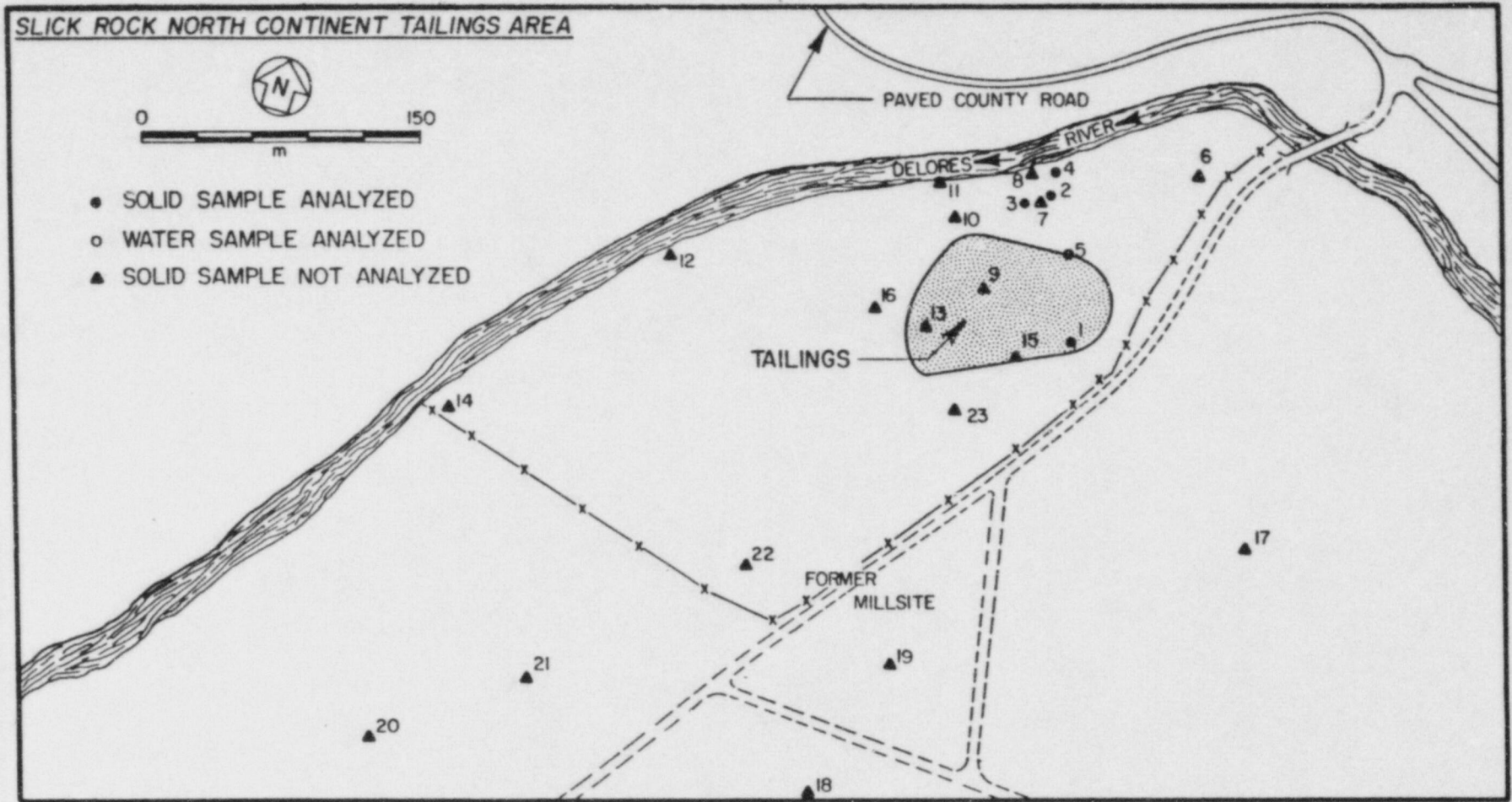


Figure 2-2. Sampling sites on the Slick Rock, North Continent tailings piles and in the adjacent area.

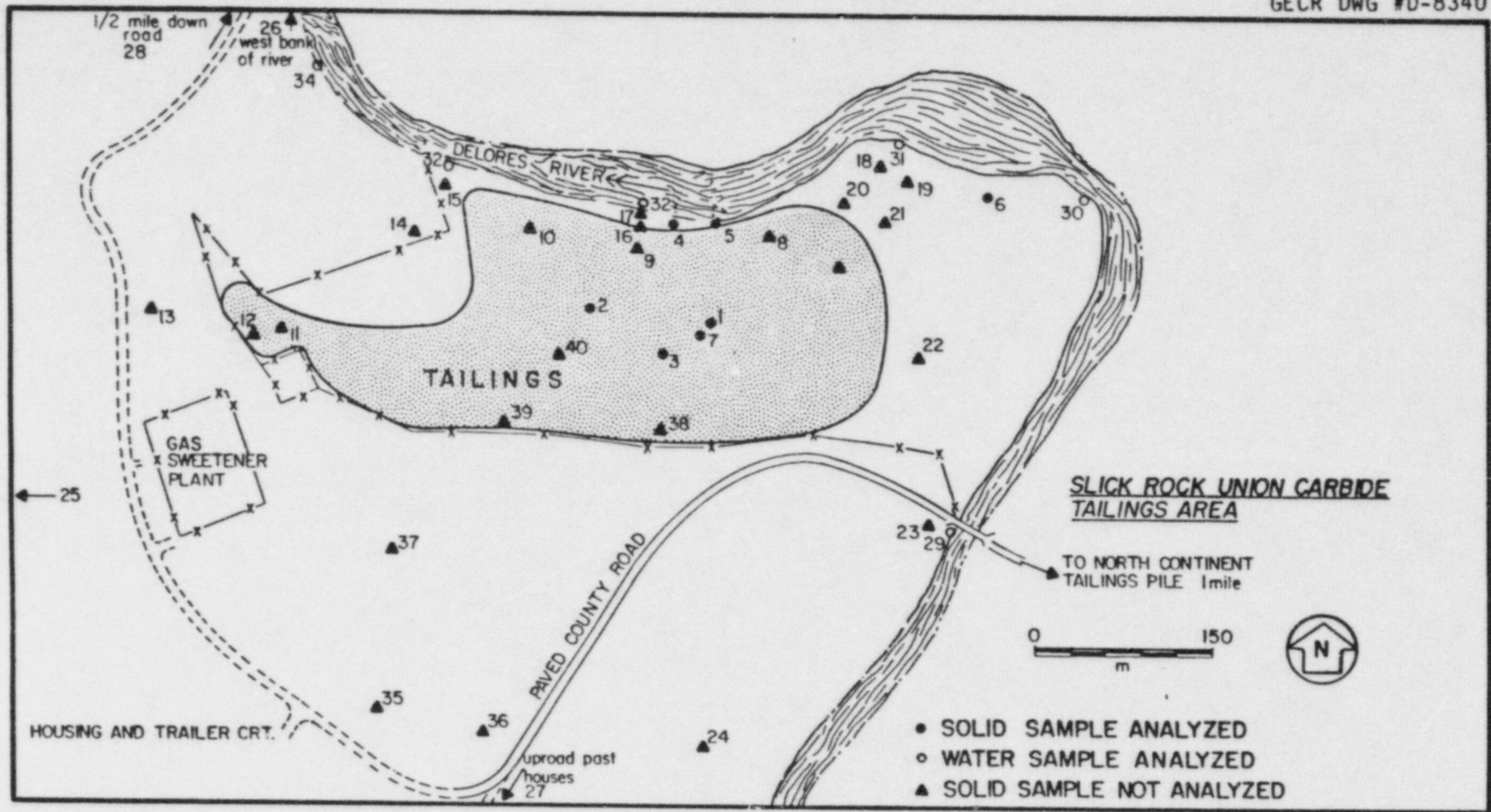


Figure 2-3. Sampling sites on the Slick Rock, Union Carbide tailings pile and in the adjacent area.

TABLE 2-1. LOCATIONS AND DESCRIPTIONS OF SLICK ROCK, NORTH CONTINENT, SAMPLING SITES

Site Number	Latitude	Longitude	Location Type ¹	Sample Type(s) ²	Description	Description
SRN 1	38.0433	108.8916	S	SF	South edge of SRN tailings.	
SRN 2	38.0443	108.8919	A	SF	Just off the north edge of SRN tailings.	
SRN 3	38.0443	108.8921	A	SF	Just off the north edge of SRN tailings.	
SRN 4	38.0445	108.8919	A	S	Riverbank just north of SRN tailings.	
SRN 5	38.0439	108.8917	S	W	Borehole on the east edge of the SRN tailings 60 m south of Delores River.	
SRN 24	38.0445	108.8910	A	W	Delores River at washed-out bridge site just east of SRN tailings.	
SRN 25	38.0445	108.8924	A	W	Delores River just north of SRN tailings.	
SRN 26	38.0433	108.8952	A	W	Delores River just west of SRN tailings.	
SRN 27	38.0417	108.8967	A	W	Hanks Pocket Wash where it enters Delores River west of SRN tailings.	
SRN/U100	38.0253	108.8475	B	W	Delores River 4.5 km SE of SRN tailings.	
SRN/U101	38.0293	108.8831	B	W	Delores River at the Slick Rock bridge, 1.6 km SE of SRN tailings.	
SRN/U102	38.0619	108.9081	B	W	Delores River 1.8 km north of SRU tailings.	
SRN/U103	38.1109	108.8710	B	W	Delores River 8 km NE of SRU tailings in Big Gypsum Valley.	
SRN/U104	38.0270	108.8988	B	W	Spring 3 km west of Delores River and 3.5 km south of SRN tailings.	
SRN/U105	38.0552	108.9814	B	W	Stock tank 6.6 km west of SRU tailings.	
SRN/U107	38.0484	108.9116	B	W	Pond 100 m west of Delores River above SRU tailings.	
SRN/U108	38.0490	108.9130	B	W	Well west of Poverty Flats at the mouth of Summit Canyon above SRU tailings.	
SRN/U109	38.0428	108.9209	B	W	Artesian drill holes 1.3 km up Summit Canyon west of tailings.	
SRN/U110	38.0411	108.9287	B	W	Spring 2.2 km up Summit Canyon west of tailings.	
SRN/U111	38.0366	108.9330	B	W	Artesian well 3 km up Summit Canyon SW of tailings.	
SRN/U112	38.0417	108.9102	B	W	Spring 0.5 km south of SRU tailings.	
SRN/U113	38.0428	108.9130	B	W	Artesian well 0.6 km SW of SRU tailings.	

¹ S - source area; A - potentially contaminated area adjacent to source area; B - background area

² W - water sample; S - sediment sample; SF - surface sample

TABLE 2-2. LOCATIONS AND DESCRIPTIONS OF SLICK ROCK, UNION CARBIDE, SAMPLING SITES

Site Number	Latitude	Longitude	Location Type ¹	Sample Type(s) ²	Description	Description
SRU 2	38.0455	108.9062	S	SF	Center of SRU tailings.	
SRU 3	38.0450	108.9056	S	C	East of center on the SRU tailings.	
SRU 4	38.0465	108.9055	A	SF	Riverbank above SRU tailings.	
SRU 5	38.0465	108.9052	A	SF	Riverbank above SRU tailings.	
SRU 6	38.0468	108.9045	A	SF	Flat between Delores River and SRU tailings.	
SRU 7	38.0452	108.9055	S	C	East of center on the SRU tailings.	
SRU 29	38.0439	108.9045	A	W	Delores River at bridge by SRU tailings.	
SRU 30	38.0468	108.9031	A	W	Delores River east of SRU tailings.	
SRU 31	38.0473	108.9030	A	W	Delores River above SRU tailings.	
SRU 32	38.0468	108.9059	A	W	Delores River above SRU tailings.	
SRU 33	38.0484	108.9088	A	W	Delores River above SRU tailings.	
SRU 34	38.0495	108.9095	A	W	Summit Canyon Wash where it enters Delores River above SRU tailings.	
SRN/U100	38.0253	108.8475	B	W	Delores River 4.5 km SE of SRN tailings.	
SRN/U101	38.0293	108.8831	B	W	Delores River at the Slick Rock bridge, 1.6 km SE of SRN tailings.	
SRN/U102	38.0619	108.9081	B	W	Delores River 1.8 km north of SRU tailings.	
SRN/U103	38.1109	108.8710	B	W	Delores River 8 km NE of SRU tailings in Big Gypsum Valley.	
SRN/U104	38.0270	108.8988	B	W	Spring 3 km west of Delores River and 3.5 km south of SRN tailings.	
SRN/U105	38.0552	108.9814	B	W	Stock tank 6.6 km west of SRU tailings.	
SRN/U107	38.0484	108.9116	B	W	Pond 100 m west of Delores River above SRU tailings.	
SRN/U108	38.0490	108.9130	B	W	Well west of Poverty Flats at the mouth of Summit Canyon above SRU tailings.	
SRN/U109	38.0428	108.9209	B	W	Artesian drill holes 1.3 km up Summit Canyon west of tailings.	
SRN/U110	38.0411	108.9287	B	W	Spring 2.2 km up Summit Canyon west of tailings.	
SRN/U111	38.0366	108.9330	B	W	Artesian well 3 km up Summit Canyon SW of tailings.	
SRN/U112	38.0417	108.9102	B	W	Spring 0.5 km south of SRU tailings.	
SRN/U113	38.0428	108.9130	B	W	Artesian well 0.6 km SW of SRU tailings.	

¹ S - source area; A - potentially contaminated area adjacent to source area; B - background area

² W - water sample; C - core sample; SF - surface sample

calibrated in Zobell solution [3]. A combination glass/saturated calomel electrode for pH measurements was calibrated with standard buffer solutions of pH 4 and 7. A one-liter sample collected for total gross alpha analysis was not filtered or acidified.

The cores were drilled with an 18-inch split spoon sampler (ASTM D-1586) on a 1-1/2 inch outside diameter drill rod, driven either by a sledge hammer or by a truck-mounted drill rig. The holes were opened above the split spoon with a hollow-stem auger. This minimized material from the top of the hole falling into the bottom. The split spoons were opened in the field, and the top 10-20 cm were discarded to prevent cross-contamination. The core was sampled at intervals where the color, moisture content, particle size, or mineralogy changed. The depth of the sample interval was recorded. A 1:4 solid/water slurry was prepared from each solid sample for pH and Eh measurements taken in the field or in a laboratory set up in a nearby motel room.

2.3 Sample Processing

The solids were dried under ambient conditions in the laboratory, dispersed to at least 100 mesh (0.150 mm) with a porcelain mortar and pestle by gentle grinding, and split with a precision chute-type stainless steel sample splitter. Two splits of approximately twenty-five grams each were stored for solid analysis and for future extraction. The remainder of the sample was stored for later experiments.

For many sites, water extracts were done by a procedure developed in our laboratory to obtain maximum removal of soluble materials in the shortest time at the chemical conditions of the samples. A measured weight (approximately twenty-five grams) of solid was added to approximately 100 ml of distilled water and agitated with a wrist action shaker at a rate which maintains the solid in suspension. After fifteen minutes, the solution was centrifuged, the pH, Eh, and specific conductance of the solution measured, and the supernatant decanted. The solid residue was washed twice by repeating the shaking with 100 ml of water. After each washing, the solution was centrifuged and the supernatant decanted off. The extract was filtered with a 0.45 μ m filter, acidified with concentrated nitric acid, and diluted volumetrically to 500 ml.

2.4 Chemical and Radiochemical Analysis

Some of the waters and water extracts were chemically analyzed by the laboratory of the Center for Environmental Sciences at the University of Colorado, Denver. Atomic absorption, inductively coupled plasma, and UV-VIS spectrophotometry were used for the cations: Ag, Al, As, Ba, Ca, Cd, Co, Cr, Cu, Fe, K, Mg, Mn, Mo, Na, Pb, Se, Si, Sr, and V. The anions Cl and SO₄ were determined by ion chromatography. Uncertainties in the measurements were less than 10 percent for concentrations greater than one order of magnitude above the detection

limit for each element, but the uncertainty increases as the detection limit is approached. Other aqueous samples were analyzed by Travis Laboratory of Rapid City, SD. Atomic absorption and inductively coupled plasma were used for the cations: Ag, Al, As, Ba, Ca, Cd, Co, Cr, Fe, K, Mg, Mn, Mo, Na, Ni, Pb, Se, Si, Sr, and V. Sulfate was determined by a gravimetric method. The chloride analyses were done by the ion-selective electrode by the GECR, Inc. laboratory.

Uranium in waters and extracts of solids was analyzed by GECR with a Scintrex UA-3 uranium analyzer. The measurement is based on the fluorescence of a uranyl complex formed by addition of the reagent Fluran, which converts the various uranyl species into a single species with a high degree of luminescence. The selectivity of the system provides a detection limit of 5 ppb uranium.

The chemical data were entered into a data management system as it was received from the laboratories. Data from the extracts were converted to gram of element per gram of solid sample used in the extracts.

REFERENCES

- [1] Department of Energy. Annual Status Report on the Uranium Mill Tailings Remedial Action Program. DOE/NE-0011, 1980.
- [2] U. S. Environmental Protection Agency. Methods for Chemical Analysis of Water and Wastes. EPA-600/4-79-020. Office of Research and Development, Cincinnati, OH, 1979.
- [3] Langmuir, D. Eh-pH Determination. Procedures in Sedimentary Petrology, R. E. Carver (ed.). Wiley, NY, 1972, pp. 597-635.

APPENDIX A

CHEMICAL DATA FROM SLICK ROCK, NORTH CONTINENT, COLORADO

Table 1. Data for Water Samples: Slick Rock, North Continent, Colorado
Table 2. Data for Water Extracts: Slick Rock, North Continent, Colorado

APPENDIX B

CHEMICAL DATA FROM SLICK ROCK, UNION CARBIDE, COLORADO

Table 1. Data for Water Samples: Slick Rock, Union Carbide, Colorado
Table 2. Data for Water Extracts: Slick Rock, Union Carbide, Colorado

NOTES ON APPENDICES

The locations of the site numbers are shown on Figures 2-1, 2-2, and 2-3 of the text. Descriptions of the sites are contained in Table 2-1 and 2-2. Descriptions of three digit codes for sample types in the data tables are as follows:

112 SOURCE - water-shallow subsurface
130 SOURCE - water extract
311 ADJACENT - water-surface
330 ADJACENT - water-extract
411 BACKGROUND - water-surface
413 BACKGROUND - water-deep subsurface

TABLE 1. Data for water samples; SLICKROCK, NORTH CONTINENT, COLORADO

Site & Sample Number	Sam- ple Type	Sample Top Base cm cm		Eh mV	pH	cond. umho/ cm ²	
5.14	112	325	0	330	7.60	10000	1
24.01	311	1	10	380	6.70	130	2
25.01	311	1	10	395	7.00	140	3
26.01	311	1	10	400	7.00	140	4
27.01	311	1	10	400	6.90	140	5
100.01	411	1	10	340	6.80	140	6
101.01	411	1	10	330	7.10	145	7
102.01	411	1	10	360	7.60	150	8
103.01	411	1	10	310	6.90	140	9
104.01	411	1	10	340	7.40	1500	10
105.01	413	0	0	320	7.50	580	11
107.01	411	1	10	360	7.20	1150	12
108.01	413	0	0	370	7.20	600	13
109.01	413	0	0	380	7.20	850	14
110.01	411	1	10	370	7.10	900	15
111.01	413	0	0	360	7.20	550	16
112.01	411	1	10	360	7.90	550	17
113.01	413	0	0	380	7.30	1500	18

NOTE: Zero value indicates no determination was made.

Negative sign indicates values less than the detection limits.

TABLE 1 (continuation) page 2

As ug/g	Al ug/g	As ug/g	Ba ug/g	Ca ug/g	
1.00E-002	3.00E-001	1.00E-002	6.80E-002	2.30E+002	1
-1.00E-002	-2.00E-001	-1.00E-002	6.90E-002	2.38E+001	2
-1.00E-002	-2.00E-001	-1.00E-002	6.50E-002	2.35E+001	3
-1.00E-002	-2.00E-001	-1.00E-002	6.50E-002	2.31E+001	4
-1.00E-002	-2.00E-001	-1.00E-002	6.80E-002	2.39E+001	5
-1.00E-002	-2.00E-001	-1.00E-002	6.40E-002	2.38E+001	6
-1.00E-002	-2.00E-001	-1.00E-002	6.70E-002	2.49E+001	7
-1.00E-002	-2.00E-001	-1.00E-002	6.90E-002	2.41E+001	8
-1.00E-002	-2.00E-001	-1.00E-002	6.30E-002	2.38E+001	9
-1.00E-002	-2.00E-001	-1.00E-002	1.14E-001	1.74E+002	10
-1.00E-002	-2.00E-001	-1.00E-002	2.19E-001	8.44E+001	11
-1.00E-002	-2.00E-001	-1.00E-002	3.54E-001	9.80E+001	12
-1.00E-002	-2.00E-001	-1.00E-002	1.83E-001	6.53E+001	13
-1.00E-002	-2.00E-001	-1.00E-002	4.20E-002	5.31E+001	14
-1.00E-002	-2.00E-001	-1.00E-002	2.21E-001	7.18E+001	15
-1.00E-002	-2.00E-001	-1.00E-002	8.80E-002	4.59E+001	16
-1.00E-002	-2.00E-001	-1.00E-002	1.77E-001	4.49E+001	17
-1.00E-002	2.00E-001	-1.00E-002	3.50E-002	7.27E+001	18

TABLE 1 (continuation) Page 3

Cd us/g	Cl us/g	Co us/g	Cr us/g	
7.00E-004	1.10E+003	-2.00E-002	5.00E-002	1
-5.00E-004	2.90E+000	-2.00E-002	-1.00E-002	2
-5.00E-004	3.40E+000	-2.00E-002	-1.00E-002	3
-5.00E-004	2.90E+000	-2.00E-002	-1.00E-002	4
-5.00E-004	4.40E+000	-2.00E-002	-1.00E-002	5
-5.00E-004	3.40E+000	-2.00E-002	-1.00E-002	6
-5.00E-004	3.90E+000	-2.00E-002	-1.00E-002	7
-5.00E-004	3.40E+000	-2.00E-002	-1.00E-002	8
-5.00E-004	3.90E+000	-2.00E-002	-1.00E-002	9
-5.00E-004	9.80E+001	-2.00E-002	-1.00E-002	10
-5.00E-004	1.65E+001	-2.00E-002	-1.00E-002	11
-5.00E-004	6.23E+001	-2.00E-002	-1.00E-002	12
-5.00E-004	5.10E+001	-2.00E-002	-1.00E-002	13
-5.00E-004	5.90E+001	-2.00E-002	-1.00E-002	14
-5.00E-004	7.00E+001	2.00E-002	2.00E-002	15
-5.00E-004	3.00E+001	-2.00E-002	2.00E-002	16
-5.00E-004	2.70E+001	-2.00E-002	-1.00E-002	17
-5.00E-004	3.56E+002	-2.00E-002	-1.00E-002	18

TABLE 1 (continuation) page 4

Fe ug/g	K ug/g	Mg ug/g	Mn ug/g	Mo ug/g	
1.30E-001	2.20E+001	6.04E+002	1.26E+000	3.00E-002	1
1.00E-001	1.10E+000	4.69E+000	3.00E-002	-2.00E-002	2
6.00E-002	1.10E+000	4.22E+000	3.00E-002	-2.00E-002	3
5.00E-002	7.00E-001	4.36E+000	2.00E-002	-2.00E-002	4
5.00E-002	1.10E+000	4.51E+000	3.00E-002	-2.00E-002	5
4.00E-002	1.30E+000	4.47E+000	1.00E-002	-2.00E-002	6
4.00E-002	1.40E+000	4.63E+000	1.00E-002	-2.00E-002	7
5.00E-002	9.00E-001	4.48E+000	1.00E-002	-2.00E-002	8
8.00E-002	1.10E+000	4.40E+000	2.00E-002	-2.00E-002	9
2.00E-002	2.20E+001	9.10E+001	2.00E-002	-2.00E-002	10
-1.00E-002	1.30E+000	1.80E+001	-1.00E-002	-2.00E-002	11
1.00E-002	9.20E+000	5.10E+001	1.00E-002	-2.00E-002	12
6.00E-002	6.60E+000	4.10E+001	2.00E-002	-2.00E-002	13
8.00E-002	3.20E+001	3.60E+001	6.00E-002	-2.00E-002	14
5.00E-002	7.40E+000	5.20E+001	1.00E-002	-2.00E-002	15
2.00E-002	9.60E+000	4.70E+001	1.00E-002	-2.00E-002	16
3.00E-002	6.80E+000	4.30E+001	1.00E-002	-2.00E-002	17
3.10E-001	2.60E+001	3.90E+001	1.70E-001	-2.00E-002	18

TABLE 1 (continuation) Page 5

Na ug/g	Ni ug/g	Pb ug/g	Se ug/g	Si ug/g	
1.80E+003	3.00E-002	9.00E-003	2.60E-001	1.10E+001	1
6.50E+000	-2.00E-002	-5.00E-003	-1.00E-002	2.60E+000	2
6.30E+000	-2.00E-002	-5.00E-003	-1.00E-002	2.50E+000	3
6.00E+000	-2.00E-002	-5.00E-003	-1.00E-002	2.50E+000	4
6.80E+000	-2.00E-002	-5.00E-003	-1.00E-002	2.70E+000	5
7.20E+000	-2.00E-002	-5.00E-003	-1.00E-002	2.50E+000	6
7.20E+000	-2.00E-002	-5.00E-003	-1.00E-002	2.50E+000	7
6.70E+000	-2.00E-002	-5.00E-003	-1.00E-002	2.50E+000	8
6.50E+000	-2.00E-002	-5.00E-003	-1.00E-002	2.50E+000	9
6.10E+001	-2.00E-002	-5.00E-003	-1.00E-002	1.40E+001	10
2.20E+001	-2.00E-002	-5.00E-003	-1.00E-002	9.90E+000	11
8.80E+000	-2.00E-002	-5.00E-003	-1.00E-002	1.00E+000	12
8.40E+000	-2.00E-002	-5.00E-003	-1.00E-002	5.10E+000	13
1.40E+001	-2.00E-002	-5.00E-003	-1.00E-002	6.50E+000	14
7.60E+001	-2.00E-002	-5.00E-003	-1.00E-002	7.30E+000	15
4.60E+001	-2.00E-002	-5.00E-003	-1.00E-002	4.50E+000	16
3.20E+001	-2.00E-002	-5.00E-003	-1.00E-002	6.10E+000	17
3.49E+002	-2.00E-002	7.00E-003	-1.00E-002	6.70E+000	18

TABLE 1 (continuation) Page 6

S04 us/g	Sr us/g	U us/g	V us/g	
5.21E+003	5.32E+000	5.70E-001	4.00E-002	1
2.00E+001	2.15E-001	6.00E-003	-2.00E-002	2
2.00E+001	2.15E-001	8.00E-004	-2.00E-002	3
2.00E+001	2.09E-001	6.00E-004	-2.00E-002	4
2.80E+001	2.14E-001	1.00E-003	-2.00E-002	5
2.80E+001	2.11E-001	1.20E-004	-2.00E-002	6
2.80E+001	2.22E-001	1.10E-004	-2.00E-002	7
2.80E+001	2.19E-001	-1.00E-004	-2.00E-002	8
2.80E+001	2.05E-001	-1.00E-004	-2.00E-002	9
2.77E+002	2.39E+000	6.50E-002	-2.00E-002	10
2.00E+001	8.77E-001	3.50E-003	-2.00E-002	11
1.12E+002	1.13E+000	1.20E-002	-2.00E-002	12
2.90E+001	9.68E-001	1.50E-002	-2.00E-002	13
1.09E+002	1.87E+000	4.80E-003	-2.00E-002	14
5.00E+001	9.67E-001	1.10E-002	-2.00E-002	15
9.00E+000	8.93E-001	1.10E-002	-2.00E-002	16
9.00E+000	7.36E-001	1.10E-002	-2.00E-002	17
1.75E+002	3.22E+000	6.80E-003	-2.00E-002	18

TABLE 2. Data for water extracts; SLICKROCK, NORTH CONTINENT, COLORADO

Site & Sample Number	Sample Type	Sample Top cm	Sample Base cm	Eh mV	pH	
1.01	130	1	10	410	7.30	1
2.01	330	1	10	420	6.90	2
3.01	330	1	10	410	7.00	3
4.01	330	1	10	495	5.40	4

NOTE: Zero value indicates no determination was made.

Negative sign indicates values less than the detection limits.

TABLE 2 (continuation) page 2

As ug/g	Al ug/g	As ug/g	Ba ug/g	Ca ug/g	
0.00E+000	-1.10E+000	-1.10E-001	1.10E-001	5.51E+002	1
0.00E+000	-9.01E-001	5.41E-001	-4.50E-002	3.87E+003	2
0.00E+000	-9.21E-001	5.52E-001	-4.60E-002	3.22E+003	3
0.00E+000	-9.82E-001	-9.82E-002	2.46E-001	2.16E+003	4

TABLE 2 (continuation) Page 3

Cd ug/g	Cl ug/g	Co ug/g	Cr ug/g	Cu ug/g	
4.30E-002	1.21E+002	0.00E+000	2.20E-001	2.20E-001	1
6.31E-002	8.29E+002	0.00E+000	2.70E-001	1.08E+000	2
4.70E-002	5.80E+002	0.00E+000	1.84E-001	1.20E+000	3
6.09E-002	5.70E+002	0.00E+000	1.96E-001	8.84E-001	4

TABLE 2 (continuation) Page 4

Fe ug/g	K ug/g	Mg ug/g	Mn ug/g	Mo ug/g	
1.21E+000	1.98E+001	3.30E+000	-1.10E-001	-1.10E-001	1
1.17E+000	1.08E+002	2.16E+002	1.80E-001	1.35E+000	2
1.29E+000	1.29E+002	5.16E+002	7.37E-001	3.87E+000	3
3.93E-001	2.75E+002	8.45E+002	8.84E-001	1.67E+000	4

TABLE 2 (continuation) page 5

Na ug/g	Ni ug/g	Pb ug/g	Se ug/g	Si ug/g	
9.36E+002	0.00E+000	7.71E-001	-1.10E-001	4.63E+001	1
8.83E+002	0.00E+000	1.08E+000	1.71E+000	6.85E+001	2
1.47E+003	0.00E+000	1.01E+000	2.49E+000	8.56E+001	3
8.35E+002	0.00E+000	8.84E-001	9.82E-001	1.77E+001	4

TABLE 2 (continuation) page 6

S04 ug/g	Sr ug/g	U ug/g	V ug/g	
1.17E+003	0.00E+000	4.41E-001	-1.10E+000	1
6.26E+003	0.00E+000	3.96E-001	5.41E+002	2
7.73E+003	0.00E+000	1.47E-001	1.20E+003	3
2.76E+003	0.00E+000	9.82E-003	2.95E+000	4

TABLE 1. Data for water samples; SLICKROCK, UNION CARBIDE, COLORADO

Site & Sample Number	Sample Type	Sample Top cm	Sample Base cm	Eh mV	pH	cond. umho/cm ²	
29.01	311	1	10	320	7.30	140	1
30.01	311	1	10	300	7.20	140	2
31.01	311	1	10	310	7.10	140	3
32.01	311	1	10	330	7.30	140	4
33.01	311	1	10	320	7.20	140	5
34.01	311	1	10	330	7.10	140	6
100.01	411	1	10	340	6.80	140	7
101.01	411	1	10	330	7.10	145	8
102.01	411	1	10	360	7.60	150	9
103.01	411	1	10	310	6.90	140	10
104.01	411	1	10	340	7.40	1500	11
105.01	413	0	0	320	7.50	580	12
107.01	411	1	10	360	7.20	1150	13
108.01	413	0	0	370	7.20	600	14
109.01	413	0	0	380	7.20	850	15
110.01	411	1	10	370	7.10	900	16
111.01	413	0	0	360	7.20	550	17
112.01	411	1	10	360	7.90	550	18
113.01	413	0	0	380	7.30	1500	19

NOTE: Zero value indicates no determination was made.

Negative sign indicates values less than the detection limits.

TABLE 1 (continuation) Page 2

As us/g	Al us/g	As us/g	Ba us/g	Ca us/g	
-1.00E-002	-2.00E-001	-1.00E-002	6.10E-002	2.41E+001	1
-1.00E-002	-2.00E-001	-1.00E-002	6.20E-002	2.31E+001	2
-1.00E-002	-2.00E-001	-1.00E-002	6.20E-002	2.34E+001	3
-1.00E-002	-2.00E-001	-1.00E-002	6.10E-002	2.31E+001	4
-1.00E-002	-2.00E-001	-1.00E-002	6.40E-002	2.48E+001	5
-1.00E-002	-2.00E-001	-1.00E-002	6.40E-002	2.37E+001	6
-1.00E-002	-2.00E-001	-1.00E-002	6.40E-002	2.38E+001	7
-1.00E-002	-2.00E-001	-1.00E-002	5.70E-002	2.49E+001	8
-1.00E-002	-2.00E-001	-1.00E-002	6.90E-002	2.41E+001	9
-1.00E-002	-2.00E-001	-1.00E-002	6.30E-002	2.38E+001	10
-1.00E-002	-2.00E-001	-1.00E-002	1.14E-001	1.74E+002	11
-1.00E-002	-2.00E-001	-1.00E-002	2.19E-001	8.44E+001	12
-1.00E-002	-2.00E-001	-1.00E-002	3.54E-001	9.80E+001	13
-1.00E-002	-2.00E-001	-1.00E-002	1.83E-001	6.53E+001	14
-1.00E-002	-2.00E-001	-1.00E-002	4.20E-002	5.31E+001	15
-1.00E-002	-2.00E-001	-1.00E-002	2.21E-001	7.18E+001	16
-1.00E-002	-2.00E-001	-1.00E-002	8.80E-002	4.59E+001	17
-1.00E-002	-2.00E-001	-1.00E-002	1.77E-001	4.49E+001	18
-1.00E-002	2.00E-001	-1.00E-002	3.50E-002	7.27E+001	19

TABLE 1 (continuation) Page 3

Cd ug/g	Cl ug/g	Co ug/g	Cr ug/g	
-5.00E-004	2.90E+000	-2.00E-002	-1.00E-002	1
-5.00E-004	3.40E+000	-2.00E-002	-1.00E-002	2
-5.00E-004	3.40E+000	-2.00E-002	-1.00E-002	3
-5.00E-004	3.40E+000	-2.00E-002	-1.00E-002	4
-5.00E-004	2.30E+000	-2.00E-002	-1.00E-002	5
-5.00E-004	2.90E+000	-2.00E-002	-1.00E-002	6
-5.00E-004	3.40E+000	-2.00E-002	-1.00E-002	7
-5.00E-004	3.90E+000	-2.00E-002	-1.00E-002	8
-5.00E-004	3.40E+000	-2.00E-002	-1.00E-002	9
-5.00E-004	3.90E+000	-2.00E-002	-1.00E-002	10
-5.00E-004	9.80E+001	-2.00E-002	-1.00E-002	11
-5.00E-004	1.65E+001	-2.00E-002	-1.00E-002	12
-5.00E-004	6.23E+001	-2.00E-002	-1.00E-002	13
-5.00E-004	5.10E+001	-2.00E-002	-1.00E-002	14
-5.00E-004	5.90E+001	-2.00E-002	-1.00E-002	15
-5.00E-004	7.00E+001	2.00E-002	2.00E-002	16
-5.00E-004	3.00E+001	-2.00E-002	2.00E-002	17
-5.00E-004	2.70E+001	-2.00E-002	-1.00E-002	18
-5.00E-004	3.56E+002	-2.00E-002	-1.00E-002	19

TABLE 1 (continuation) page 4

Fe ug/g	K ug/g	Mg ug/g	Mn ug/g	Mo ug/g	
6.00E-002	6.00E-001	4.30E+000	2.00E-002	-2.00E-002	1
6.00E-002	7.00E-001	4.20E+000	2.00E-002	-2.00E-002	2
7.00E-002	7.00E-001	4.30E+000	2.00E-002	-2.00E-002	3
7.00E-002	7.00E-001	4.40E+000	2.00E-002	-2.00E-002	4
7.00E-002	7.00E-001	4.50E+000	2.00E-002	-2.00E-002	5
5.00E-002	7.00E-001	4.30E+000	2.00E-002	-2.00E-002	6
4.00E-002	1.30E+000	4.47E+000	1.00E-002	-2.00E-002	7
4.00E-002	1.40E+000	4.63E+000	1.00E-002	-2.00E-002	8
5.00E-002	9.00E-001	4.48E+000	1.00E-002	-2.00E-002	9
8.00E-002	1.10E+000	4.40E+000	2.00E-002	-2.00E-002	10
2.00E-002	2.20E+001	9.10E+001	2.00E-002	-2.00E-002	11
-1.00E-002	1.30E+000	1.80E+001	-1.00E-002	-2.00E-002	12
1.00E-002	9.20E+000	5.10E+001	1.00E-002	-2.00E-002	13
6.00E-002	6.60E+000	4.10E+001	2.00E-002	-2.00E-002	14
8.00E-002	3.20E+001	3.60E+001	6.00E-002	-2.00E-002	15
5.00E-002	7.40E+000	5.20E+001	1.00E-002	-2.00E-002	16
2.00E-002	9.60E+000	4.70E+001	1.00E-002	-2.00E-002	17
3.00E-002	6.80E+000	4.30E+001	1.00E-002	-2.00E-002	18
3.10E-001	2.60E+001	3.90E+001	1.70E-001	-2.00E-002	19

TABLE 1 (continuation) page 5

Na ug/g	Ni ug/g	Pb ug/g	Se ug/g	Si ug/g	
6.80E+000	-2.00E-002	-5.00E-003	-1.00E-002	2.50E+000	1
7.50E+000	-2.00E-002	-5.00E-003	-1.00E-002	2.50E+000	2
6.60E+000	-2.00E-002	-5.00E-003	-1.00E-002	2.50E+000	3
6.90E+000	-2.00E-002	-5.00E-003	-1.00E-002	2.50E+000	4
6.50E+000	-2.00E-002	-5.00E-003	-1.00E-002	2.60E+000	5
6.00E+000	-2.00E-002	-5.00E-003	-1.00E-002	2.40E+000	6
7.20E+000	-2.00E-002	-5.00E-003	-1.00E-002	2.50E+000	7
7.20E+000	-2.00E-002	-5.00E-003	-1.00E-002	2.50E+000	8
6.70E+000	-2.00E-002	-5.00E-003	-1.00E-002	2.50E+000	9
6.50E+000	-2.00E-002	-5.00E-003	-1.00E-002	2.50E+000	10
6.10E+001	-2.00E-002	-5.00E-003	-1.00E-002	1.40E+001	11
2.20E+001	-2.00E-002	-5.00E-003	-1.00E-002	9.90E+000	12
8.80E+000	-2.00E-002	-5.00E-003	-1.00E-002	1.00E+000	13
8.40E+000	-2.00E-002	-5.00E-003	-1.00E-002	5.10E+000	14
1.40E+001	-2.00E-002	-5.00E-003	-1.00E-002	6.50E+000	15
7.60E+001	-2.00E-002	-5.00E-003	-1.00E-002	7.30E+000	16
4.60E+001	-2.00E-002	-5.00E-003	-1.00E-002	4.50E+000	17
3.20E+001	-2.00E-002	-5.00E-003	-1.00E-002	6.10E+000	18
3.49E+002	-2.00E-002	7.00E-003	-1.00E-002	6.70E+000	19

TABLE 1 (continuation) Page 6

SO4 ug/g	Sr ug/g	U ug/g	V ug/g	
2.00E+001	2.10E-001	6.00E-004	-2.00E-002	1
2.80E+001	2.04E-001	1.00E-003	-2.00E-002	2
2.80E+001	2.02E-001	6.00E-004	-2.00E-002	3
2.40E+001	2.06E-001	1.10E-004	-2.00E-002	4
2.00E+001	2.11E-001	1.30E-004	-2.00E-002	5
2.00E+001	2.11E-001	1.10E-004	-2.00E-002	6
2.80E+001	2.11E-001	1.20E-004	-2.00E-002	7
2.80E+001	2.22E-001	1.10E-004	-2.00E-002	8
2.80E+001	2.19E-001	-1.00E-004	-2.00E-002	9
2.80E+001	2.05E-001	-1.00E-004	-2.00E-002	10
2.77E+002	2.39E+000	6.50E-002	-2.00E-002	11
2.00E+001	8.77E-001	3.50E-003	-2.00E-002	12
1.12E+002	1.13E+000	1.20E-002	-2.00E-002	13
2.90E+001	9.68E-001	1.50E-002	-2.00E-002	14
1.09E+002	1.87E+000	4.80E-003	-2.00E-002	15
5.00E+001	9.67E-001	1.10E-002	-2.00E-002	16
9.00E+000	8.93E-001	1.10E-002	-2.00E-002	17
9.00E+000	7.36E-001	1.10E-002	-2.00E-002	18
1.75E+002	3.22E+000	6.80E-003	-2.00E-002	19

TABLE 2. Data for water extracts; SLICKROCK, UNION CARBIDE, COLORADO

Site & Sample Number	Sam- ple Type	Sample Top Base cm cm		Eh mV	pH	
2.01	130	1	2	505	5.60	1
2.04	130	2	10	495	5.70	2
3.01	130	1	10	465	6.50	3
4.01	330	1	10	470	5.80	4
5.01	330	1	10	490	5.80	5
6.01	330	1	5	490	6.00	6
7.01	130	1	10	480	6.00	7
7.02	130	10	20	0	0.00	8
7.03	130	20	30	510	5.60	9
7.04	130	30	40	540	5.30	10

NOTE: Zero value indicates no determination was made.

TABLE 2 (continuation) page 2

Ag ug/g	Al ug/g	As ug/g	Ba ug/g	Ca ug/g	
0.00E+000	-9.98E-001	-9.98E-002	5.09E-001	8.08E+002	1
0.00E+000	-9.17E-001	-9.17E-002	2.48E-001	4.04E+002	2
0.00E+000	2.09E+000	-1.05E-001	3.03E-001	8.26E+001	3
0.00E+000	-1.02E+000	-1.02E-001	2.66E-001	1.33E+002	4
0.00E+000	-1.06E+000	-1.06E-001	2.76E-001	1.27E+002	5
0.00E+000	-1.14E+000	-1.14E-001	2.05E-001	7.39E+001	6
0.00E+000	-9.35E-001	-9.35E-002	2.43E-001	8.41E+001	7
0.00E+000	-7.39E-001	7.39E-002	8.86E-002	1.18E+003	8
0.00E+000	-9.31E-001	1.86E-001	6.52E-002	1.49E+003	9
0.00E+000	-9.17E-001	-9.17E-002	1.28E-001	2.11E+003	10

TABLE 2 (continuation) page 3

Cd ug/g	Cl ug/g	Co ug/g	Cr ug/g	Cu ug/g	
4.69E-002	9.98E+000	0.00E+000	2.00E-001	3.99E-001	1
8.35E-002	9.17E+000	0.00E+000	1.83E-001	3.67E-001	2
5.23E-002	1.05E+001	0.00E+000	2.09E-001	4.18E-001	3
5.12E-002	1.02E+001	0.00E+000	3.07E-001	4.10E-001	4
8.70E-002	2.12E+001	0.00E+000	3.18E-001	4.25E-001	5
5.91E-002	1.14E+001	0.00E+000	3.41E-001	4.55E-001	6
5.05E-002	9.35E+000	0.00E+000	1.87E-001	4.67E-001	7
4.43E-003	-3.69E+000	0.00E+000	2.95E-001	2.95E-001	8
5.59E-002	-4.66E+000	0.00E+000	2.79E-001	3.72E-001	9
6.79E-002	9.17E+000	0.00E+000	1.83E-001	5.50E+000	10

TABLE 2 (continuation) page 4

Fe ug/g	K ug/g	Mg ug/g	Mn ug/g	Mo ug/g	
1.60E+000	3.79E+001	3.49E+001	-9.98E-002	-9.98E-002	1
1.10E+000	5.50E+000	7.98E+001	-9.17E-002	-9.17E-002	2
2.09E+000	1.26E+001	1.05E+001	-1.05E-001	2.09E-001	3
1.13E+000	1.74E+001	8.20E+000	-1.02E-001	3.07E-001	4
1.49E+000	1.59E+001	9.55E+000	-1.06E-001	6.37E-001	5
1.93E+000	9.09E+000	4.55E+000	-1.14E-001	-1.14E-001	6
1.21E+000	1.50E+001	8.41E+000	-9.35E-002	3.74E-001	7
1.11E+000	5.17E+000	8.12E+000	1.48E-001	8.12E-001	8
1.02E+000	3.72E+000	2.79E+000	-9.31E-002	3.17E+000	9
7.34E-001	2.75E+000	5.50E+000	-9.17E-002	4.22E+000	10

TABLE 2 (continuation) page 5

Na ug/g	Ni ug/g	Pb ug/g	Se ug/g	Si ug/g	
3.99E+000	0.00E+000	6.99E-001	-9.98E-002	1.20E+001	1
2.29E+001	0.00E+000	7.34E-001	-9.17E-002	6.42E+000	2
8.37E+000	0.00E+000	8.37E-001	-1.05E-001	1.57E+001	3
2.36E+001	0.00E+000	7.17E-001	-1.02E-001	7.17E+000	4
9.02E+001	0.00E+000	6.37E-001	6.37E-001	4.25E+000	5
7.95E+001	0.00E+000	7.95E-001	-1.14E-001	6.82E+000	6
5.61E+000	0.00E+000	5.61E-001	-9.35E-002	1.31E+001	7
2.95E+000	0.00E+000	8.86E-001	1.48E+000	9.60E+000	8
2.79E+000	0.00E+000	6.52E-001	1.77E+000	3.72E+000	9
2.75E+000	0.00E+000	7.34E-001	1.56E+000	-9.17E-001	10

TABLE 2 (continuation) page 6

SO4 ug/g	Sr ug/g	U ug/g	V ug/g	
1.90E+003	0.00E+000	4.99E-002	-9.98E-001	1
1.13E+003	0.00E+000	1.28E-002	-9.17E-001	2
-1.05E+002	0.00E+000	1.05E-001	2.09E+000	3
3.07E+002	0.00E+000	1.23E-002	-1.02E+000	4
3.18E+002	0.00E+000	1.91E-002	-1.06E+000	5
2.95E+002	0.00E+000	2.50E-002	-1.14E+000	6
2.52E+002	0.00E+000	5.05E-002	3.74E+000	7
2.27E+003	0.00E+000	0.00E+000	3.69E+000	8
2.36E+003	0.00E+000	7.45E-003	5.59E+000	9
3.91E+003	0.00E+000	1.69E-001	2.75E+000	10

JUL 3 0 1986

SLUG TEST DATA

SITE ID: SRK-01 LOCATION ID: 501 STATIC WATER LEVEL: _____
 DATE: 6/27/86 TIME: 3:42p
 SLUG VOLUME (ft.³): .217 DEPTH (ft.): 15.55
 INITIAL WATER LEVEL (AT t₀): _____ OPEN INTERVAL (ft.) 10.0 to 20.0
 DATE: 6/27/86 TOTAL DEPTH OF WELL (ft.): 21.50
 TIME: 3:40p WELL DIAM. (ft.): 0.33
 DEPTH (ft FROM TOC): 15.55 FIELD REP: E Mignardot - L. Phylle

ELAPSED TIME (MIN. from to)	GROUNDWATER (ft. from TOC)	RESIDUAL DDN (ft.)	1/m	H/H ₀ or H-h H-H ₀
0:00	15.55			
:30.50	15.33			
1:00	15.48			
:30.50	15.49			
2:00	15.53			
:30.50	15.55			
3:00	15.55			
Stop				

COMMENTS: Dropped slug (injection method) at 3:42p,
6/27/86.

JUL 30 1986

SLUG TEST DATA

SITE ID: SRK-01 LOCATION ID: 503 STATIC WATER LEVEL: _____
 DATE: 6/27/86 TIME: 4:19p
 SLUG VOLUME (ft.³): 217 DEPTH (ft.): 18.88
 INITIAL WATER LEVEL (AT t₀): _____
 OPEN INTERVAL (ft.) 20.0 to 25.0
 DATE: ~~6/27~~ 6/27/86 TOTAL DEPTH OF WELL (ft.): 25.80
 TIME: 4:16p WELL DIAM. (ft.): 0.333
 DEPTH (ft FROM TOC): 18.88 FIELD REP: E. Mignardot - L. Phylfe

ELAPSED TIME (MIN. from t ₀)	GROUNDWATER (ft. from TOC)	RESIDUAL DDN (ft.)	1/m	H/H ₀ or $\frac{H-h}{H-H_0}$
0:00	18.88			
:30.50	18.47			
1:00	18.50			
:30.50	18.55			
2:00	18.57			
:30.50	18.58			
3:00	18.58			
:30.50	18.60			
4:00	18.61			
:30.50	18.62			
5:00	18.64			
7:00	18.67			
9:00	18.72			
10:00	18.73			
15:00	18.82			
20:00	18.88			

COMMENTS: Dropped slug at 4:19p, 86/6/27
Injection method

SLUG TEST DATA

JUL 30 1986

SITE ID: SRE-4 LOCATION ID: 504

STATIC WATER LEVEL:
 DATE: 6/30/86 TIME: 1:45 p.m.

SLUG VOLUME (ft.³): 0.217

DEPTH (ft.): 10.00

INITIAL WATER LEVEL:

OPEN INTERVAL 14.0 to 19.0

DATE: 6/30/86

TOTAL DEPTH OF WELL (ft.): 18.95

TIME: 1:45 p.m.

WELL DIAM. (ft.): 3.33

DEPTH (ft FROM TOC): 10.00

OBSERVERS: Fritts/Dorren

ELAPSED TIME (MIN, SEC from t ₀)	DEPTH TO WATER (ft. from TOC)	RESIDUAL DDN (ft.)	1/t _m	H/H ₀ or $\frac{H-h}{H-H_0}$
2.00	10.00			
.5	9.15			
1.0	9.50			
.5	9.72			
2.0	9.87			
.5	9.93			
3.0	9.97			
.5	10.00			
4.0	10.00			
stop				

COMMENTS: Injection method

JUL 30 1986

SLUG TEST DATA

SITE ID: SRK-01 LOCATION ID: 509
 SLUG VOLUME (ft.³): 0.217
 INITIAL WATER LEVEL:
 DATE: 6/28/86
 TIME: 3:15 p.m.
 DEPTH (ft FROM TOC): 9.42

STATIC WATER LEVEL:
 DATE: 6/28/86 TIME: 3:15 p.m.
 DEPTH (ft): 9.42
 OPEN INTERVAL 12.0 to 22.0
 TOTAL DEPTH OF WELL (ft): 23.0
 WELL DIAM. (ft): 1.332
 OBSERVERS: Frills / Ocarne

ELAPSED TIME (MIN, SEC from t ₀)	DEPTH TO WATER (ft. from TOC)	RESIDUAL DDN (ft.)	1/t _m	H/H ₀ or $\frac{H-h}{H-H_0}$
:00	9.42			
.5	9.75			
1.0	9.38			
.5	9.42			
2.0	Stop			
.5				
3.0				
.5				
4.0				

COMMENTS: Injection method

JUN 30 1986

SLUG TEST DATA

SITE ID: SRK-01 LOCATION ID: 668
 SLUG VOLUME (ft.³): 0.054
 INITIAL WATER LEVEL:
 DATE: 6/29/86
 TIME: 2:00p
 DEPTH (ft FROM TOC): 59.08

STATIC WATER LEVEL:
 DATE: 6/29/86 TIME: 2:02p
 DEPTH (ft): 59.08
 OPEN INTERVAL 12.80 to 125.00
 TOTAL DEPTH OF WELL (ft): 125.08
 WELL DIAM. (ft): 0.167
 OBSERVERS: Ed Mignardot - Larry Phife

ELAPSED TIME (MIN, SEC from t ₀)	DEPTH TO WATER (ft. from TOC)	RESIDUAL DDN (ft.)	1/m	H/H ₀ or $\frac{H-h}{H-H_0}$
0:00	59.08			
:30.50	—			
1:00	57.04			
:30.50	57.14			
2:00	57.24			
:30.50	57.29			
3:00	57.36			
:30.50	57.42			
4:00	57.48			
:30.50	57.53			
5:00	57.57			
7:00	57.72			
9:00	57.89			
10:00	57.92			
15:00	58.22			
20:00	58.36			
25:00	58.54			
30:00	58.62			
45:00	58.82			
60:00	58.90			

COMMENTS: Dropped slug (injection method) at 2:02p, 6-29-86.

JUL 30 1986

SLUG TEST DATA

SITE ID: SRK-01 LOCATION ID: 670 STATIC WATER LEVEL: _____
 DATE: 7-16-86 TIME: 2:30p
 SLUG VOLUME (ft.³): 0.054 DEPTH (ft.): 2.92
 INITIAL WATER LEVEL (AT t₀): _____ OPEN INTERVAL (ft.) 86.60 to 96.60
 DATE: 7/16/86 TOTAL DEPTH OF WELL (ft.): 96.46
 TIME: 2:30 p.m. WELL DIAM. (ft.): 0.187
 DEPTH (ft FROM TOC): 2.92 FIELD REP: E. Mignardot - L. Phylfe

ELAPSED TIME (MIN. from t ₀)	GROUNDWATER (ft. from TOC)	RESIDUAL DDN (ft.)	1/m	H/H ₀ or $\frac{H-h}{H-H_0}$
0:00	2.92			
:30.50	2.92			
1:00	0.61			
:30.50	0.58			
2:00	0.45			
:30.50	0.65			
3:00	0.65			
:30.50	0.65			
4:00	0.65			
:30.50	0.66			
5:00	0.69			
7:00	0.70			
9:00	0.73			
10:00	0.76			
15:00	0.85			
30:00	1.05			
45:00	1.28			
60:00	1.46			

COMMENTS: Dropped slug (injection method) at 2:30p, 86/7/16

JUL 30 1986

SLUG TEST DATA

SITE ID: SRK-01 LOCATION ID: 684 STATIC WATER LEVEL:
 SLUG VOLUME (ft.³): -0.54 DATE: 6/29/86 TIME: 12:25 p.m.
 INITIAL WATER LEVEL: _____ DEPTH (ft.): 13.73
 DATE: 6/29/86 OPEN INTERVAL _____ to _____
 TIME: 12:25 p.m. TOTAL DEPTH OF WELL (ft.): 24.45
 DEPTH (ft FROM TOC): 13.73 WELL DIAM. (ft.): 0.167
 OBSERVERS: Fritts / Dorrea

ELAPSED TIME (MIN, SEC from t ₀)	DEPTH TO WATER (ft. from TOC)	RESIDUAL DDN (ft.)	1/m	H/H ₀ or $\frac{H-h}{H-H_0}$
0:00	13.73			
.5	13.71			
1.0	13.73			
.5	13.73			
2.0	Stop			
.5				
3.0				

COMMENTS: Injection method

JUL 30 1986

SLUG TEST DATA

SITE ID: SRK-91 LOCATION ID: 687 STATIC WATER LEVEL:
 DATE: 7/17/86 TIME: 1:00 p.m.
 SLUG VOLUME (ft.³): .054 DEPTH (ft.): 49.13
 INITIAL WATER LEVEL (AT t₀):
 OPEN INTERVAL (ft.) 173.0 to 193.0
 DATE: 7/17/86 TOTAL DEPTH OF WELL (ft.): 195.0
 TIME: 1:00 p.m. WELL DIAM. (ft.): 0.67
 DEPTH (ft FROM TOC): 49.13 FIELD REP: Fritts / Dubyk

ELAPSED TIME (MIN. from t ₀)	GROUNDWATER (ft. from TOC)	RESIDUAL DDN (ft.)	1/t _m	H/H ₀ or $\frac{H-h}{H-H_0}$
0.00	49.13			
.5	—			
1.0	48.43			
.5	48.55			
2.0	48.60			
.5	48.63			
3.0	48.64			
.5	48.67			
4.0	48.68			
.5	48.69			
5.0	48.70			
6.0	48.74			
8.0	48.76			
10.0	48.79			
15.0	48.82			
20.0	48.83			
30.0	48.83			
40.0	48.83			
STOP				

COMMENTS: Injection method

JUL 30 1986

SLUG TEST DATA

SITE ID: SRK-1 LOCATION ID: 688 STATIC WATER LEVEL: _____
 DATE: 7/16/86 TIME: 1:00 p.m.
 SLUG VOLUME (ft.³): .054 DEPTH (ft.): 31.56
 INITIAL WATER LEVEL (AT t₀): _____ OPEN INTERVAL (ft.) 53.0 to 68.0
 DATE: 7/16/86 TOTAL DEPTH OF WELL (ft.): 70.0
 TIME: 1:00 p.m. WELL DIAM. (ft.): .167
 DEPTH (ft FROM TOC): 31.56 FIELD REP: Friths/Dalyko

ELAPSED TIME (MIN. from t ₀)	GROUNDWATER (ft. from TOC)	RESIDUAL DDN (ft.)	1/t _m	H/H ₀ or $\frac{H-h}{H-H_0}$
.00	31.56			
.5	31.56			
1.0	Stop instant recovery			
.5				
2.0				
.5				
3.0				
.5				
4.0				

COMMENTS: Injection method.

SLUG TEST DATA

JUL 30 1986

SITE ID: SAR-01 LOCATION ID: 690 STATIC WATER LEVEL:
 DATE: 7/17/86 TIME: 2:00
 SLUG VOLUME (ft. 3): .054 DEPTH (ft): 72.68
 INITIAL WATER LEVEL (AT t₀):
 DATE: 7/17/86 OPEN INTERVAL (ft.) 160.0 to 180.0
 TIME: 2:00 p.m. TOTAL DEPTH OF WELL (ft): 180.0
 DEPTH (ft FROM TOC): 72.68 WELL DIAM. (ft): .167
 FIELD REP: Fritts / DuBye

ELAPSED TIME (MIN. from to)	GROUNDWATER (ft. from TOC)	RESIDUAL DDN (ft.)	1/m	H/H ₀ or H-h H-H ₀
0.0	72.68			
.5	70.97			
1.0	71.20			
.5	71.37			
2.0	71.52			
.5	71.64			
3.0	71.73			
.5	71.83			
4.0	71.92			
.5	71.97			
5.0	72.06			
6.0	72.17			
7.0	72.25			
8.0	72.30			
10.0	72.40			
12.0	72.48			
14.0	72.53			
18.0	72.58			
22.0	72.65			
26.0	72.64			

COMMENTS: Injection method
page 1 of 2



SLUG TEST DATA

SITE ID: SRk-01 LOCATION ID: 668 STATIC WATER LEVEL:
 DATE: 86/2/19 TIME: 11:45 pm
 SLUG VOLUME (ft.³): .054 DEPTH (ft.): 59.10
 INITIAL WATER LEVEL: _____ OPEN INTERVAL _____ to _____
 DATE: 86/2/ TOTAL DEPTH OF WELL (ft.): 125.08
 TIME: 1.00 pm WELL DIAM. (ft.): .127
 DEPTH (ft FROM TOC): 59.20 OBSERVERS: D. Miller J. Fritti

ELAPSED TIME (MIN, SEC from t ₀)	DEPTH TO WATER (ft. from TOC)	RESIDUAL DDN (ft.)	1/m	H/H ₀ or $\frac{H-h}{H-H_0}$
:00	59.10			
.50 ^{dropped slug}				
1.0	57.16			
.50	57.24			
2.0	57.30			
.50	57.37			
3.0	57.48			
.50	57.53			
4.0	57.57			
.50	57.63			
5.0	57.67			
6.0	57.82			
8.0	57.96			
10.0	58.05			
15.0	58.29			
30.0	58.67			
45.0	58.82			
60.0	58.91			

COMMENTS: injection method

16



SLUG TEST DATA

SITE ID: SRK-01 LOCATION ID: 669 STATIC WATER LEVEL: _____
 DATE: 86/2/18 TIME: 10:25 A.M.
 SLUG VOLUME (ft.³): .054 DEPTH (ft.): .65
 INITIAL WATER LEVEL: _____ OPEN INTERVAL _____ to _____
 DATE: 86/2/18 TOTAL DEPTH OF WELL (ft.): 107.8
 TIME: 2:30 p.m. WELL DIAM. (ft.): .67
 DEPTH (ft FROM TOC): .70 OBSERVERS: Fr. Hs / Miller

ELAPSED TIME (MIN, SEC from t ₀)	DEPTH TO WATER (ft. from TOC)	RESIDUAL DDN (ft.)	1/m	H/H ₀ or $\frac{H-h}{H-H_0}$
:00	0.65			
.50	2.98			
1.0	2.96			
.50	2.95			
2.0	2.95			
.50	2.93			
3:00	2.93			
:50	2.93			
4:00	2.91			
:30	2.90			
5:00	2.90			
30:00	2.52			
60:00	2.52 2.17			

COMMENTS: Withdrawal method

