STAR POINT MINES

MINING
AND
RECLAMATION PLAN

PLATEAU MINING CO.

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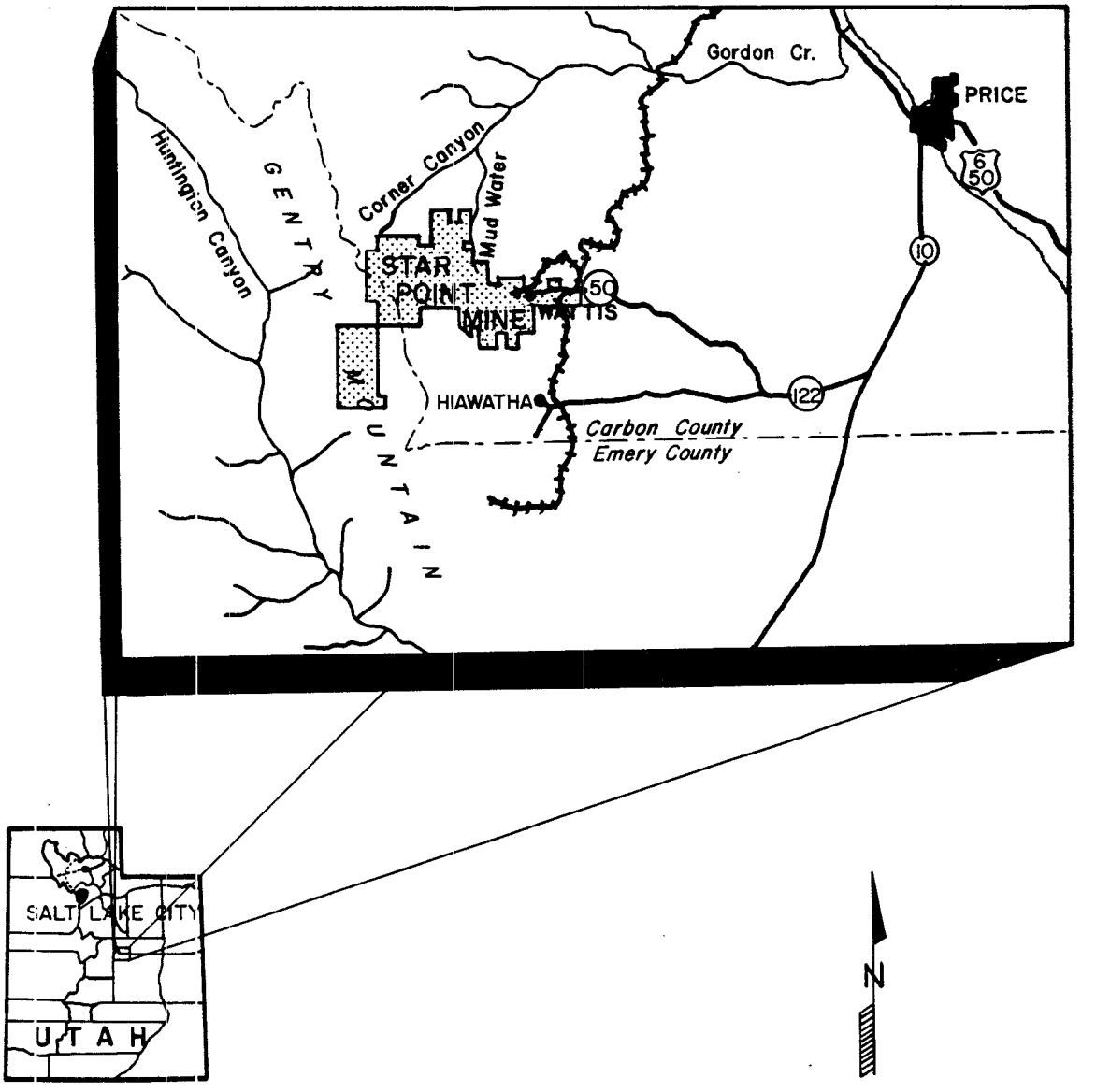
FIGURE 1

LOCATION MAP



0 4 8
Scale in Miles
(ENLARGED VIEW)

FIGURE 1

LOCATION MAP

PLATEAU MINING COMPANY

CARBON & EMERY COS., UTAH

FIGURE 2

AREAS OF INTEREST

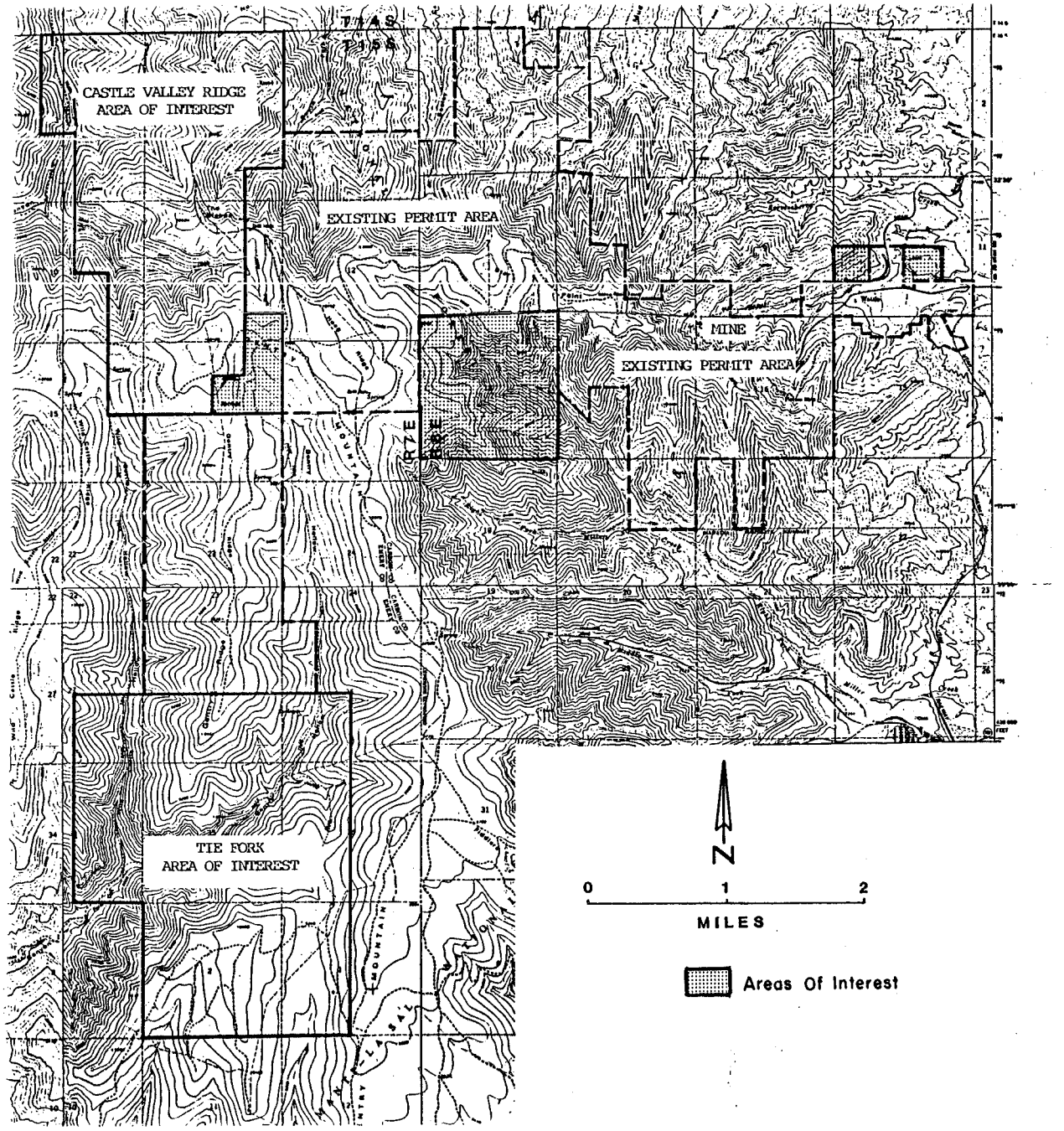


FIGURE 2

AREAS OF INTEREST

FIGURE 3

REGIONAL STRATIGRAPHIC COLUMN

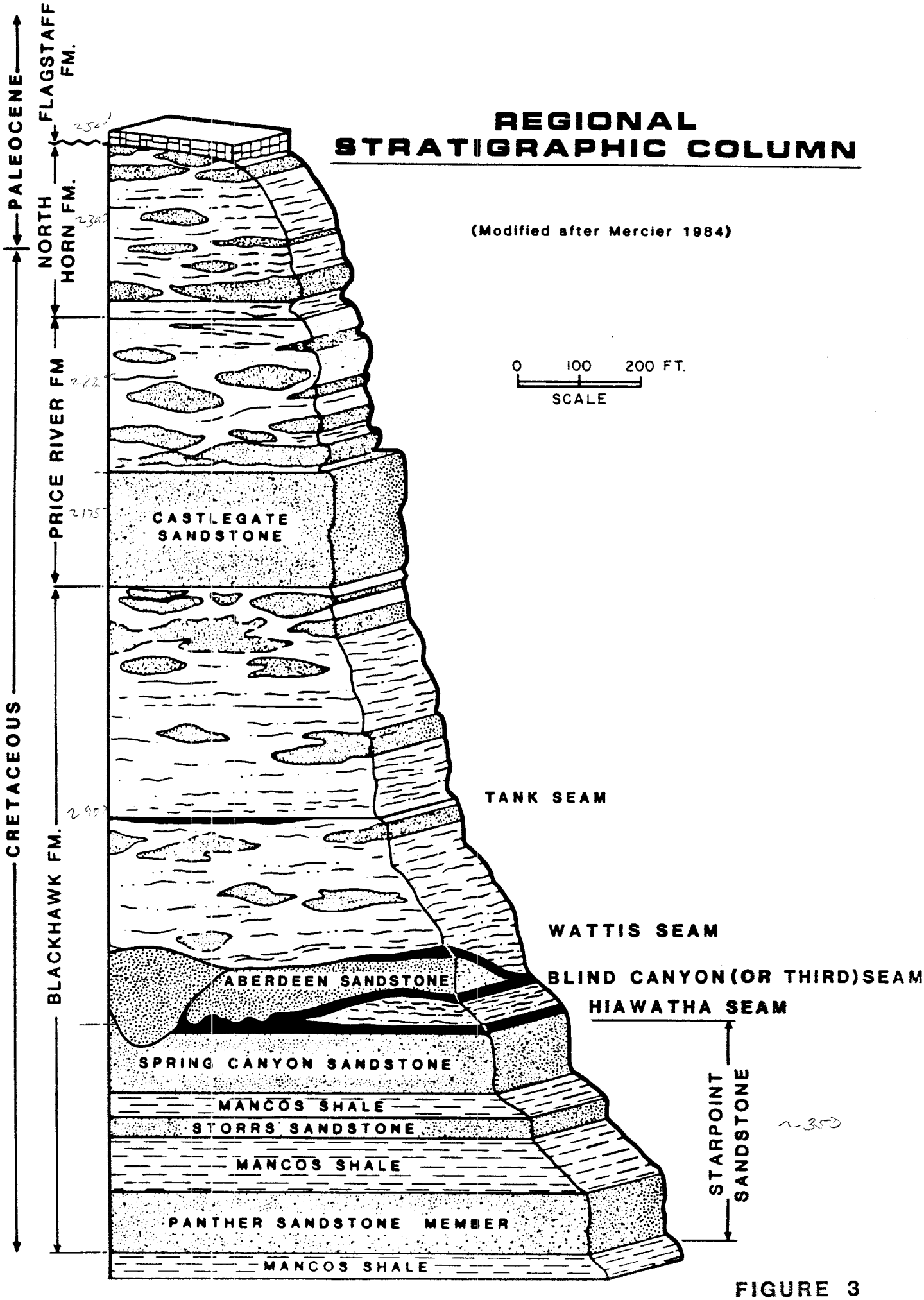

REGIONAL
STRATIGRAPHIC COLUMN
(Modified after Mercier 1984)
0 100 200 FT.
SCALE
PALEOCENE
FLAGSTAFF FM.
NORTH HORN FM.
PRICE RIVER FM
CRETACEOUS
BLACKHAWK FM.
CASTLEGATE SANDSTONE
TANK SEAM
WATTIS SEAM
BLIND CANYON (OR THIRD) SEAM
HIAWATHA SEAM
ABERDEEN SANDSTONE
SPRING CANYON SANDSTONE
MANCOS SHALE
STORRS SANDSTONE
MANCOS SHALE
PANTHER SANDSTONE MEMBER
MANCOS SHALE
STARPOINT SANDSTONE

FIGURE 3

FIGURE 4

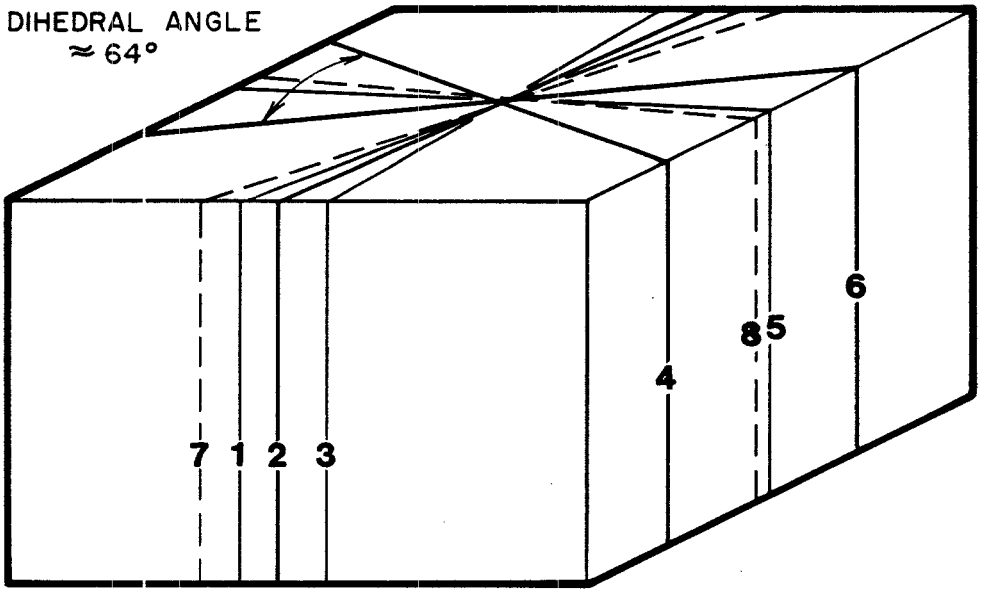
WASATCH PLATEAU REGIONAL FAULTS

PMC considers this information to be confidential.
Please contact DOGM or PMC management
to review this material.

FIGURE 5

SIMPLIFIED RELATIONSHIP BETWEEN SHEAR JOINTS,
EXTENSION JOINTS AND CLEATS

CASTLE VALLEY RIDGE, U-13097, TIE FORK & PLATEAU MINE



JOINTS

1- N.14° E. EXTENSION SET (EASTERN DOG-LEG)
2- N. 6° E. EXTENSION SET (PERPENDICULAR TO TENSION)
3- N. 5° W. EXTENSION SET (WESTERN DOG-LEG)
4- N.58° W. SHEAR SET
5- N.85° W. EXTENSION SET (PARALLEL TO MAX. COMPRESSION)
6- N.58° E. SHEAR SET

CLEATS

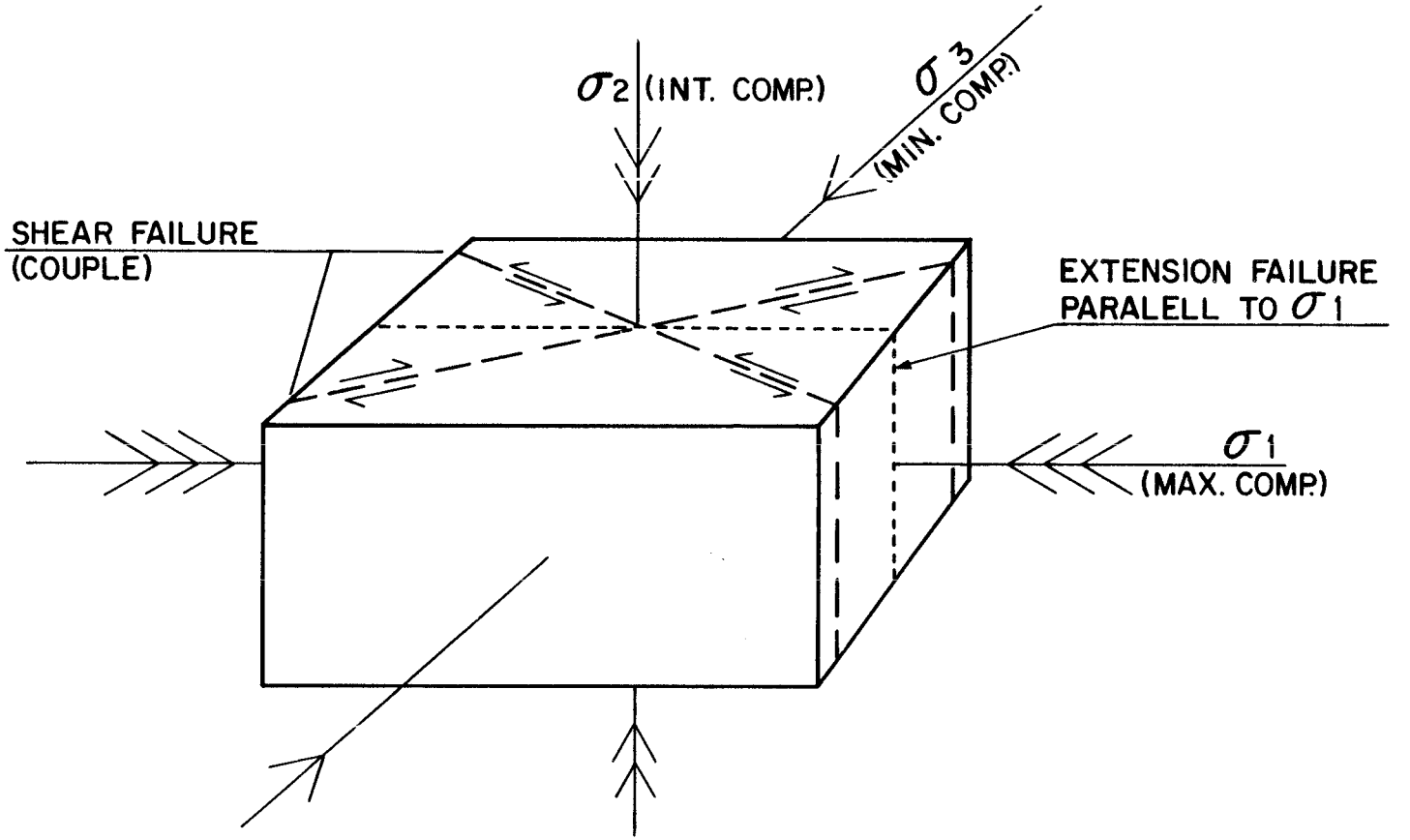
7- N.30° E. FACE (MAJOR)
8- N.75° W. BUTT (MINOR)

SIMPLIFIED RELATIONSHIP BETWEEN SHEAR JOINTS, EXTENSION JOINTS, AND CLEATS

FIGURE 5

FIGURE 6

IDEALIZED RELATION OF SHEAR PLANES (COUPLE) AND EXTENSIONAL PLANES TO MAXIMUM COMPRESSIVE STRESS



IDEALIZED RELATION OF SHEAR PLANES (COUPLE) AND EXTENSIONAL PLANES TO MAXIMUM COMPRESSIVE STRESS (Modified after Anderson 1951).

FIGURE 6

FIGURE 7

TYPICAL SECTION THROUGH AN IDEALIZED VERSION OF A FAULT

FIGURE 7

PLATEAU MINING COMPANY

TYPICAL SECTION THROUGH AN IDEALIZED VERSION OF A FAULT (after Hunt, 1985).

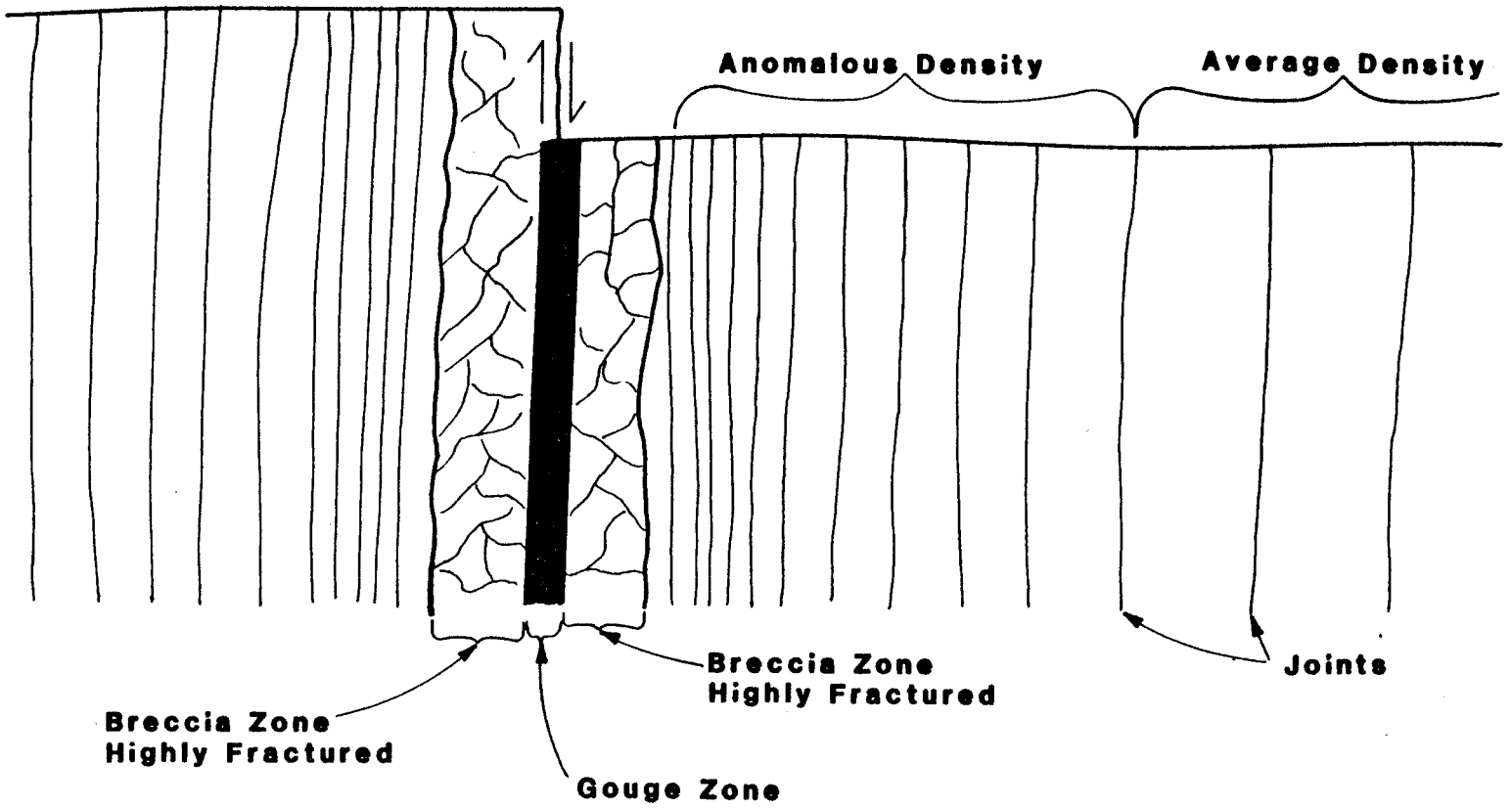


FIGURE 8

BEAR CANYON GRABEN - A-A' CROSS SECTION

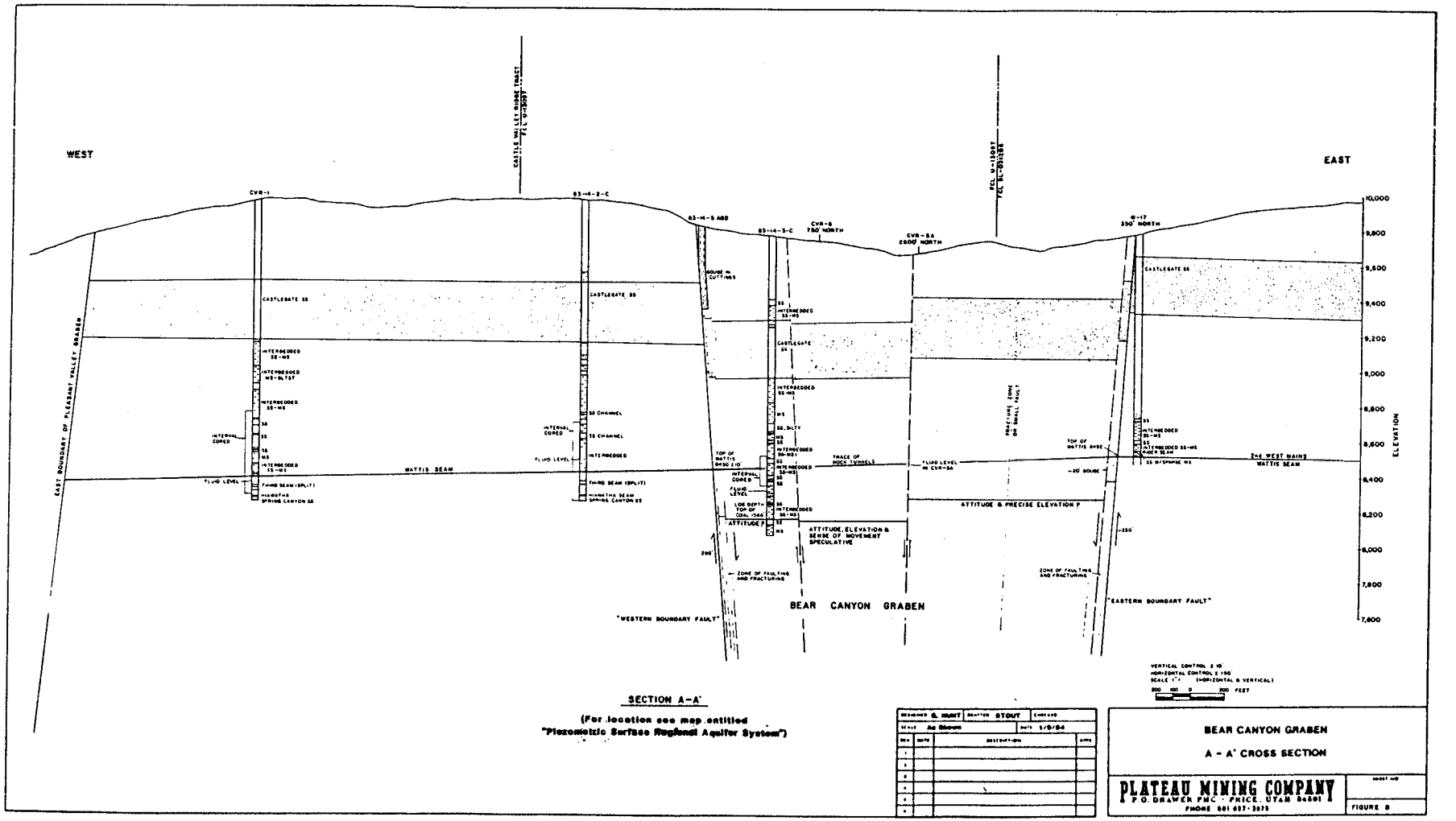
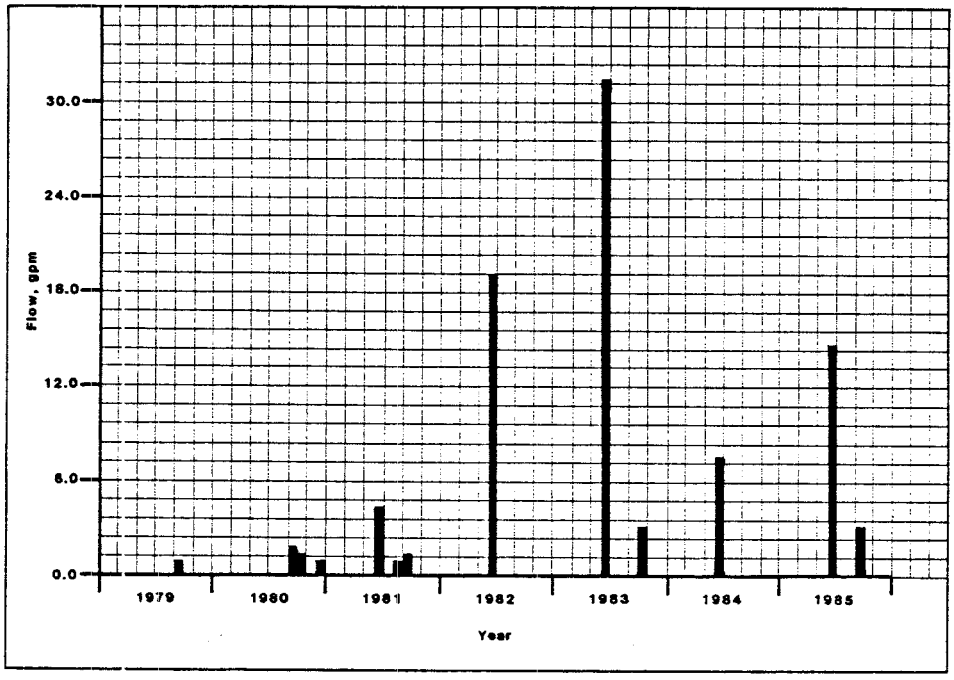

WEST
EAST
CASTLE VALLEY RIDGE TRACT
FEL U-13097
FEL U-01656
CVR-1
83-14-2-C
83-14-5 ABD
83-14-3-C
CVR-6
750' NORTH
CVR-5A
2800' NORTH
R-17
350' NORTH
CASTLEGATE SS
INTERBEDDED SS-MS
INTERBEDDED MS-SILTST
INTERBEDDED SS-MS
INTERVAL CORED
FLUID LEVEL
WATTIS SEAM
THIRD SEAM (SPLIT)
MANTHA SPRING CANYON SS
SS CHANNEL
HOUSE IN CUTTINGS
INTERBEDDED SS-MS
SS, SILTY
TOP OF WATTIS 8450 ±10'
LOG BOTTOM TOP OF COAL 7566
ATTITUDE?
TRACE OF ROCK TUNNELS
FLUID LEVEL IN CVR-5A
ATTITUDE, ELEVATION & SENSE OF MOVEMENT SPECULATIVE
ZONE OF FAULTING AND FRACTURING
PRECISE ZONE OF SHALE FAULT
TOP OF WATTIS 8450±
~20' SOUND
ATTITUDE & PRECISE ELEVATION P
2nd WEST MAINS WATTIS SEAM
SS W/SPHERIC MS
"WESTERN BOUNDARY FAULT"
BEAR CANYON GRABEN
"EASTERN BOUNDARY FAULT"
EAST BOUNDARY OF PLEASANT VALLEY GRABEN
ELEVATION
10,000
9,800
9,600
9,400
9,200
9,000
8,800
8,600
8,400
8,200
8,000
7,800
7,600
VERTICAL CONTROL ± 10'
HORIZONTAL CONTROL ± 100'
SCALE 1" = (HORIZONTAL & VERTICAL)
200 100 0 200 FEET
SECTION A-A'
(For location see map entitled "Piezometric Surface Regional Aquifer System")
DESIGNED G. HUNT
DRAFTED STOUT
CHECKED
SCALE As Shown
DATE 5/9/84
DATE
DESCRIPTION
APPR
BEAR CANYON GRABEN
A - A' CROSS SECTION
PLATEAU MINING COMPANY
P.O. DRAWER PMC · PRICE, UTAH 84501
PHONE 801 637-3675
SHEET NO
FIGURE 8

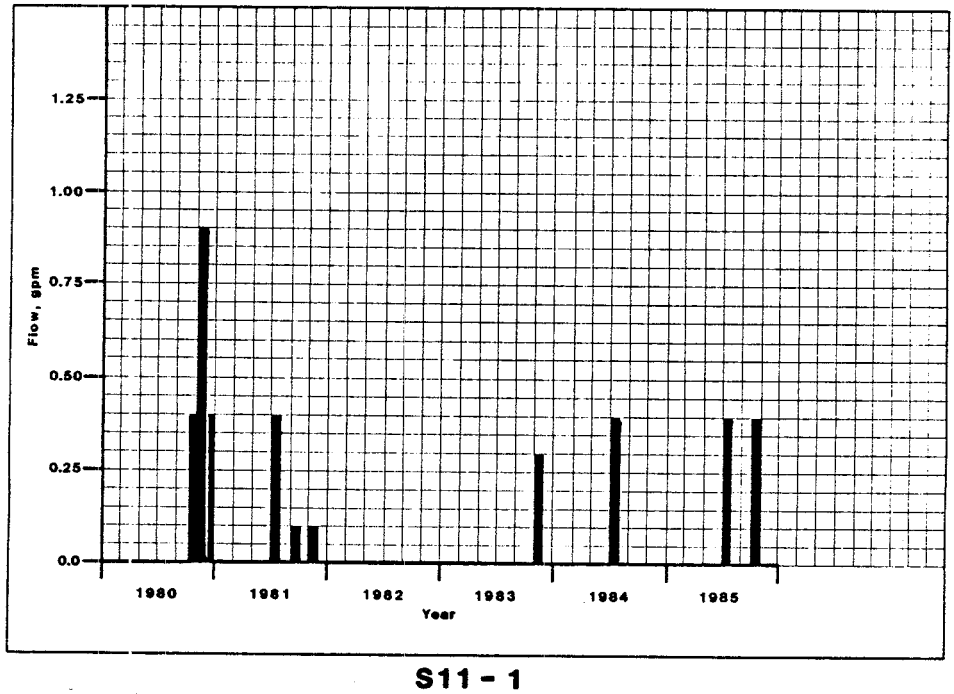
FIGURE 8

FIGURE 9

FLOW HYDROGRAPHS - SPRINGS



S7 - 1



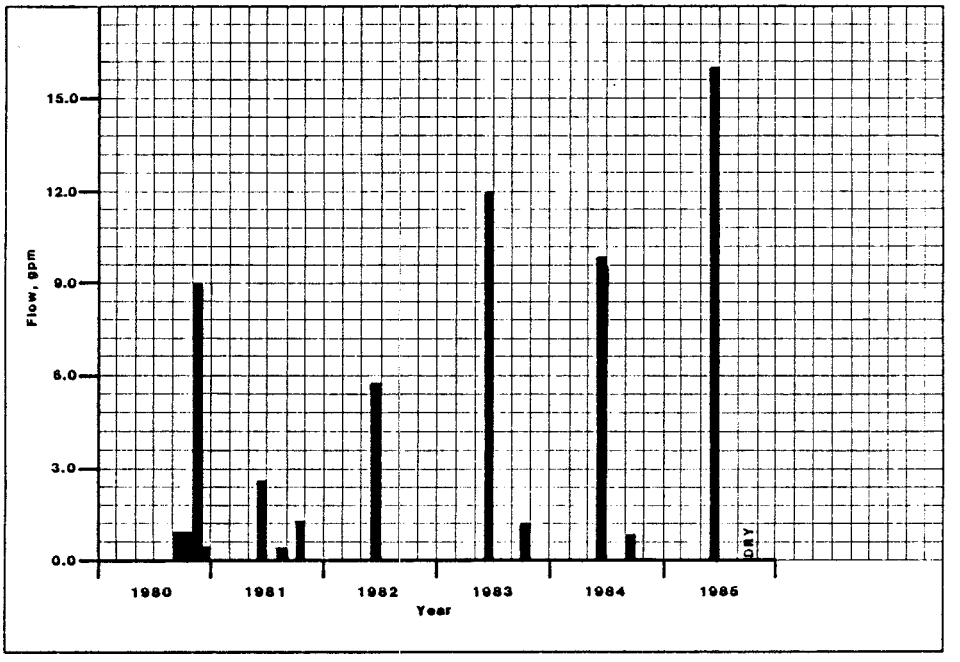
S11 - 1

FIGURE 9

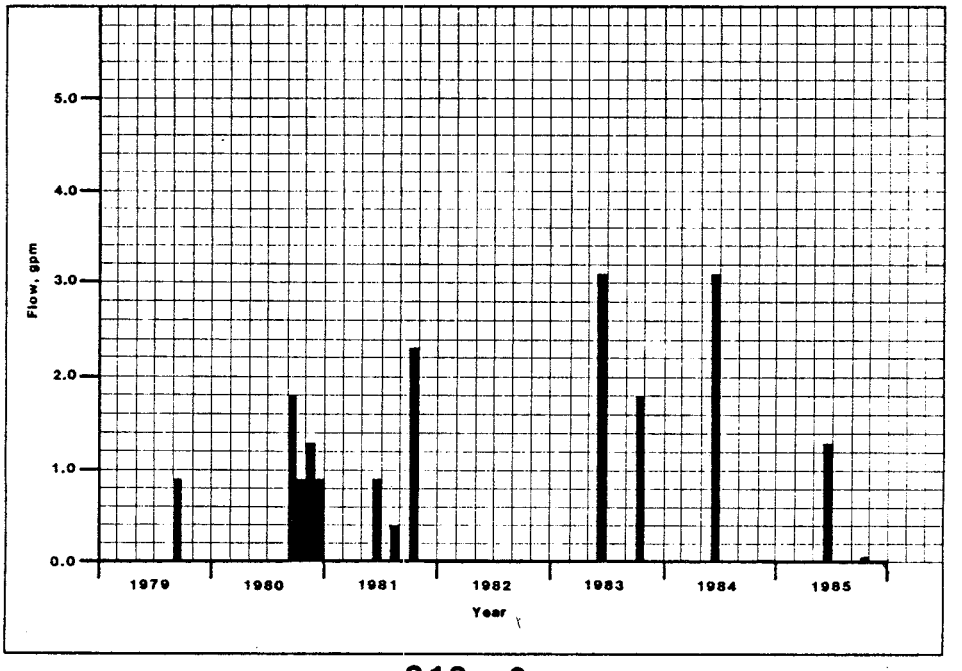
PLATEAU MINING COMPANY

FLOW HYDROGRAPHS

SPRINGS



S17 - 2



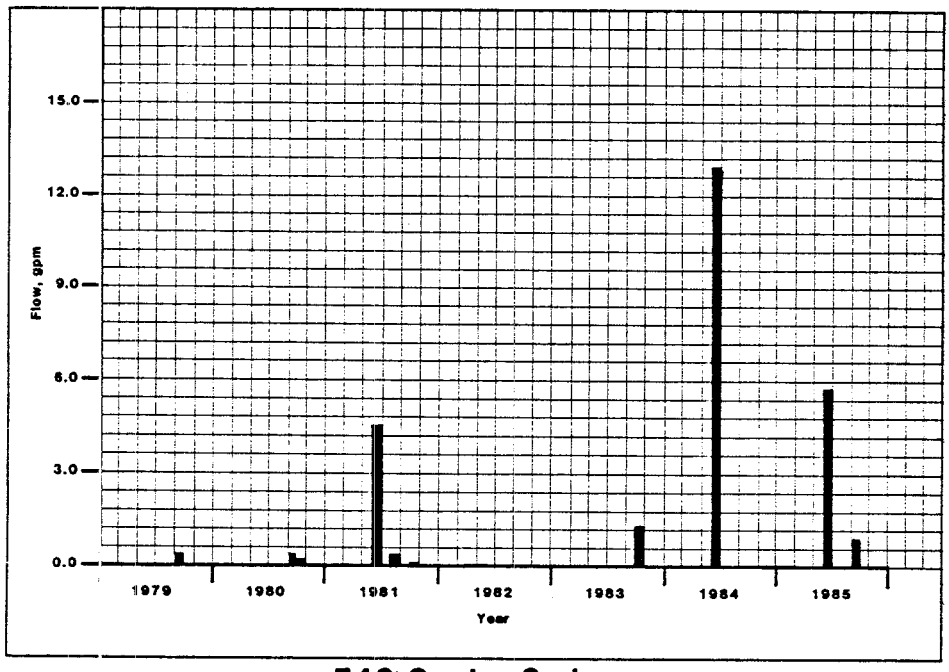
S18 - 2

FIGURE 9

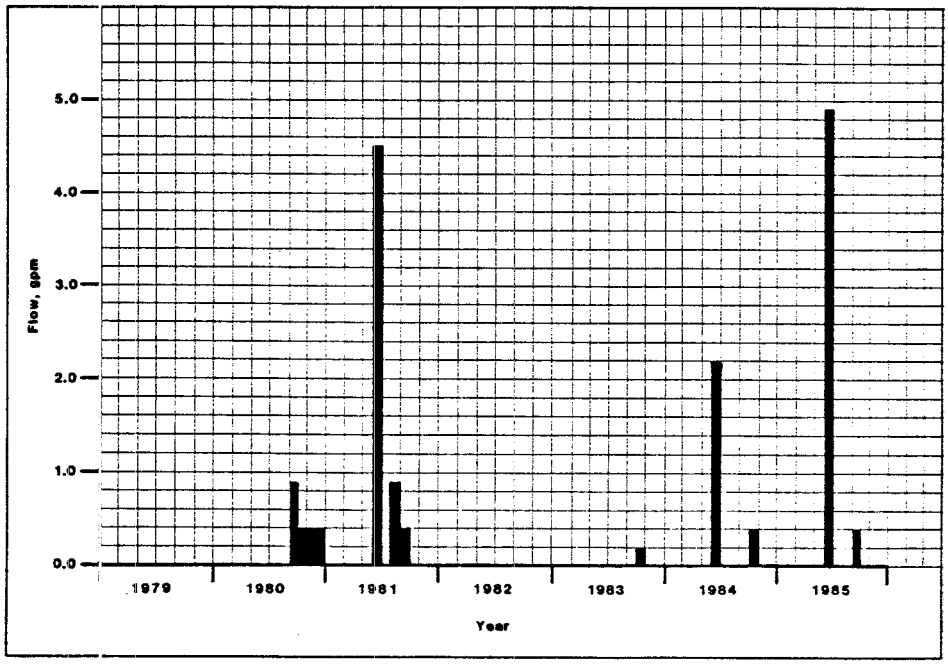
PLATEAU MINING COMPANY

FLOW HYDROGRAPHS

SPRINGS



748 Gentry Spring



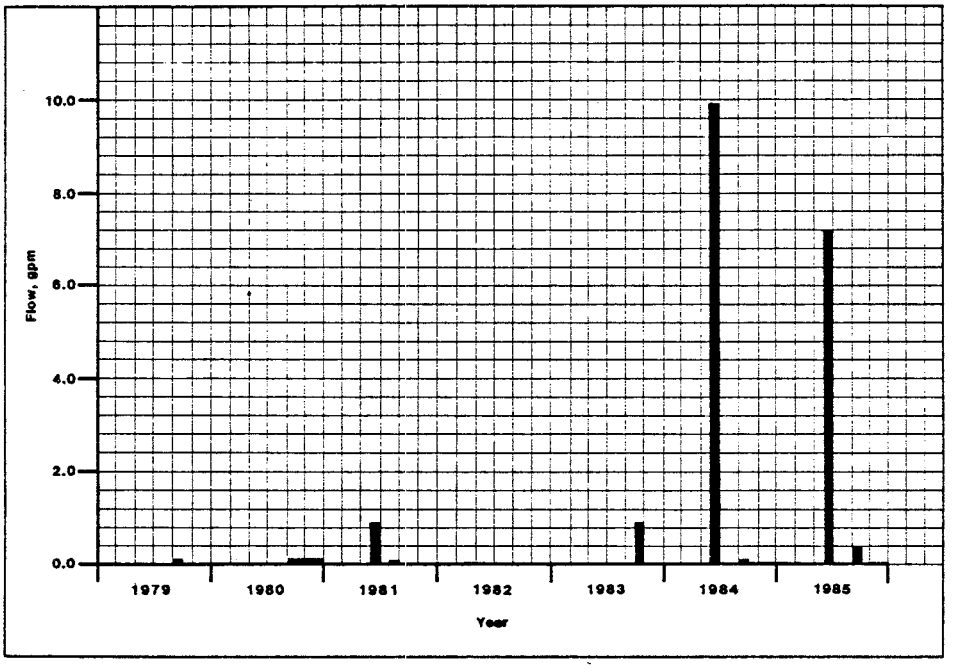
751 Gentry Pasture Spring

FIGURE 9

PLATEAU MINING COMPANY

FLOW HYDROGRAPHS

SPRINGS



753

FIGURE 9

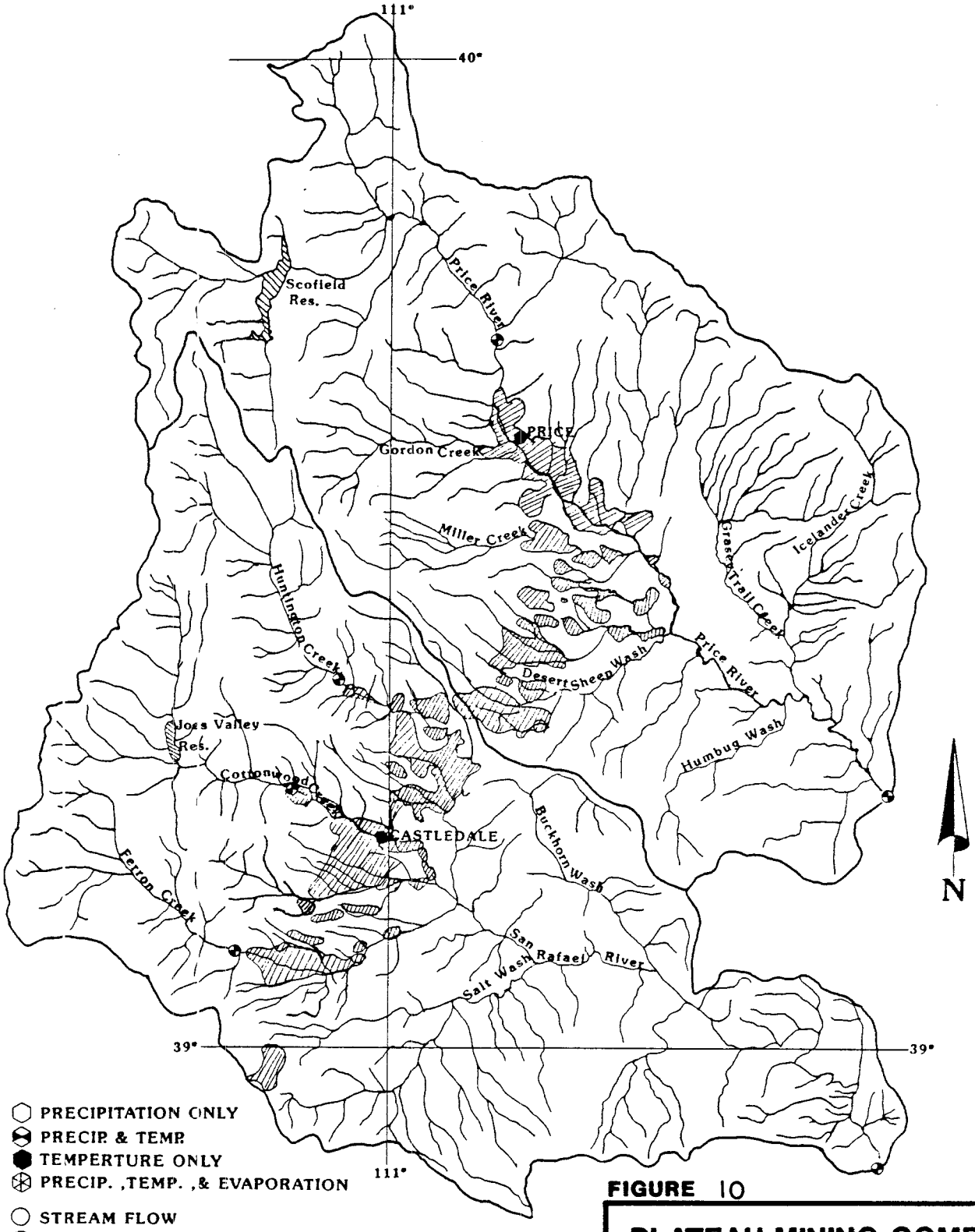
PLATEAU MINING COMPANY

FLOW HYDROGRAPHS

SPRINGS

FIGURE 10

PRICE AND SAN RAFEAL RIVER BASINS



- PRECIPITATION ONLY
- PRECIP. & TEMP.
- TEMPERTURE ONLY
- PRECIP. ,TEMP. ,& EVAPORATION
- STREAM FLOW
- WATER QUALITY & FLOW
- WATER QUALITY
- IRRIGATED LAND

FIGURE 10

PLATEAU MINING COMPANY

PRICE and SAN RAFAEL RIVER BASINS.

FIGURE 11

MONTHLY FLOW RATES - HUNTINGTON CREEK

FIGURE 11

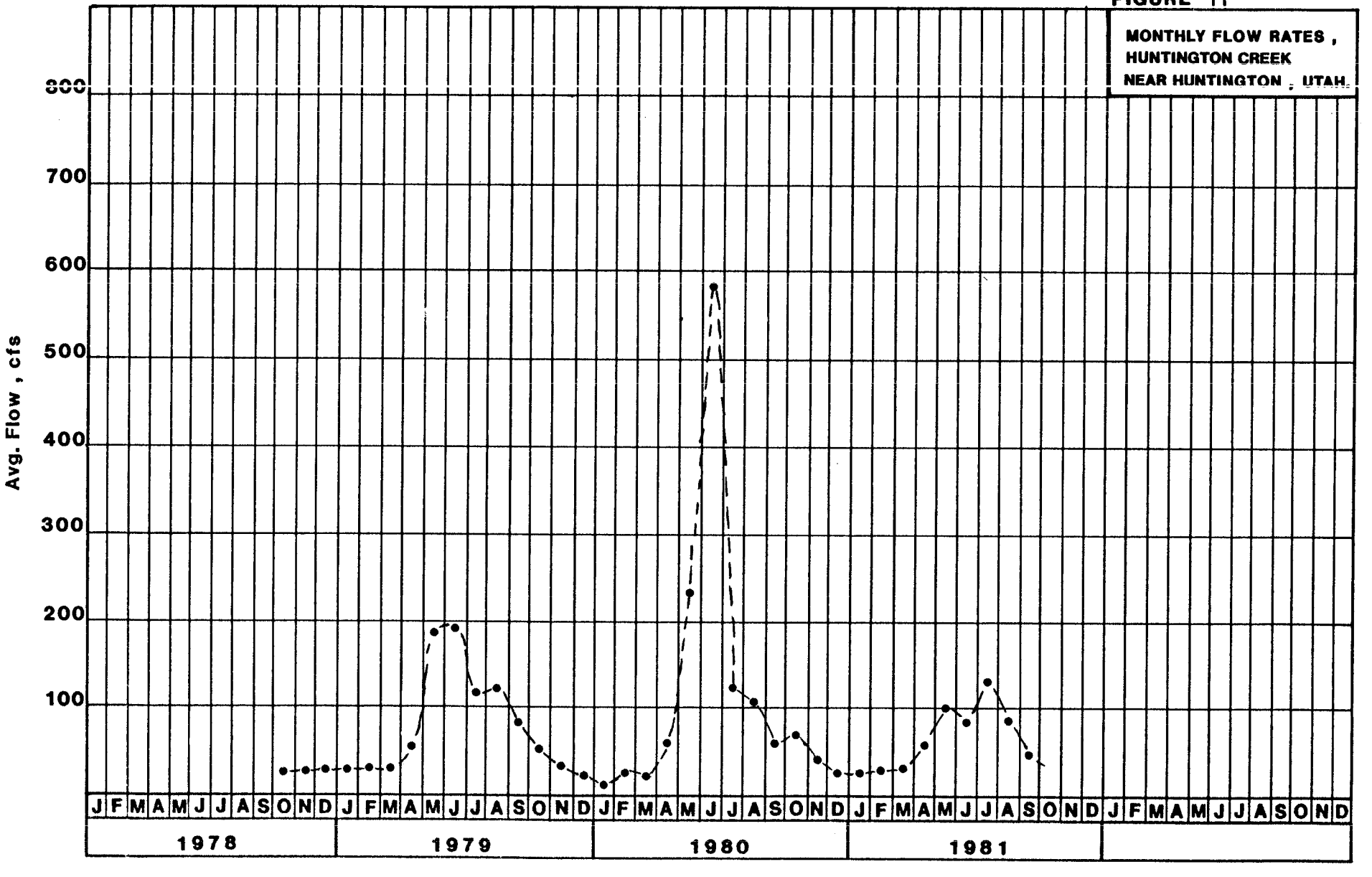

MONTHLY FLOW RATES ,
HUNTINGTON CREEK
NEAR HUNTINGTON , UTAH.
Avg. Flow , cfs
800
700
600
500
400
300
200
100
J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D
1978
1979
1980
1981

FIGURE 12

MONTHLY FLOW RATES - TIE FORK CANYON

FIGURE 12

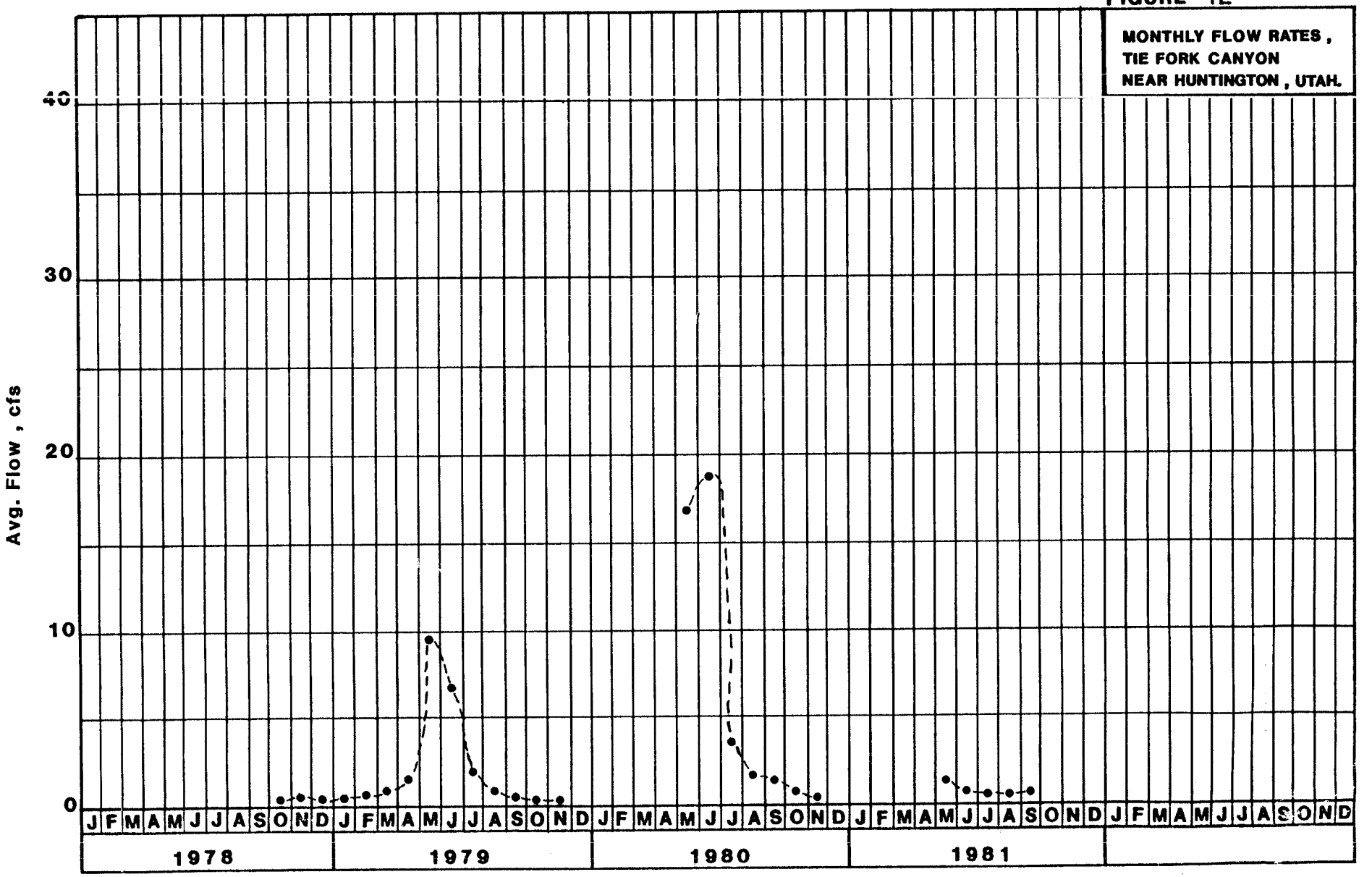
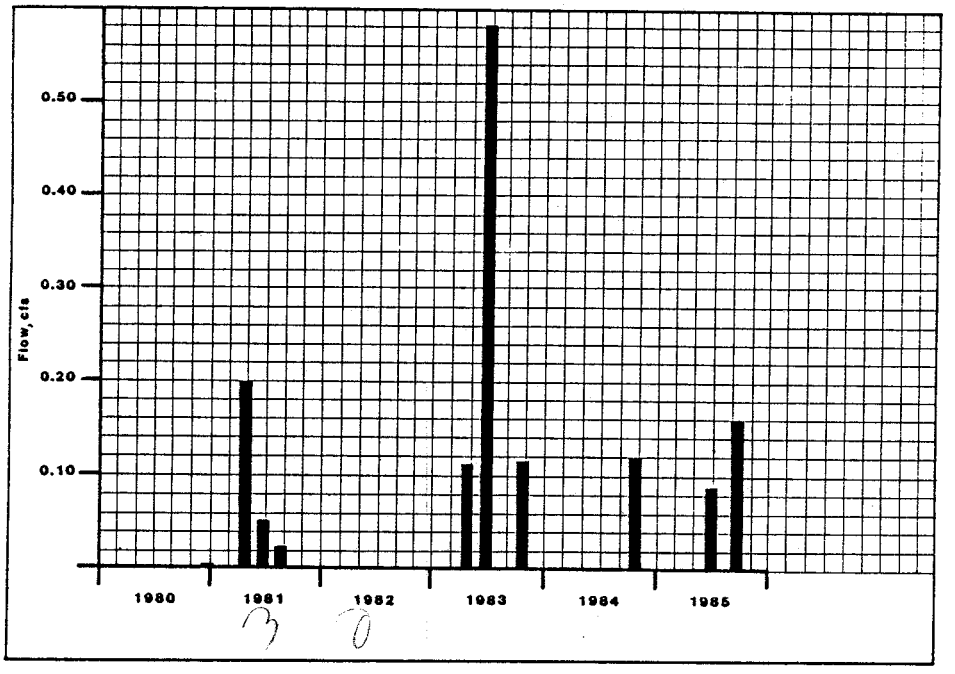
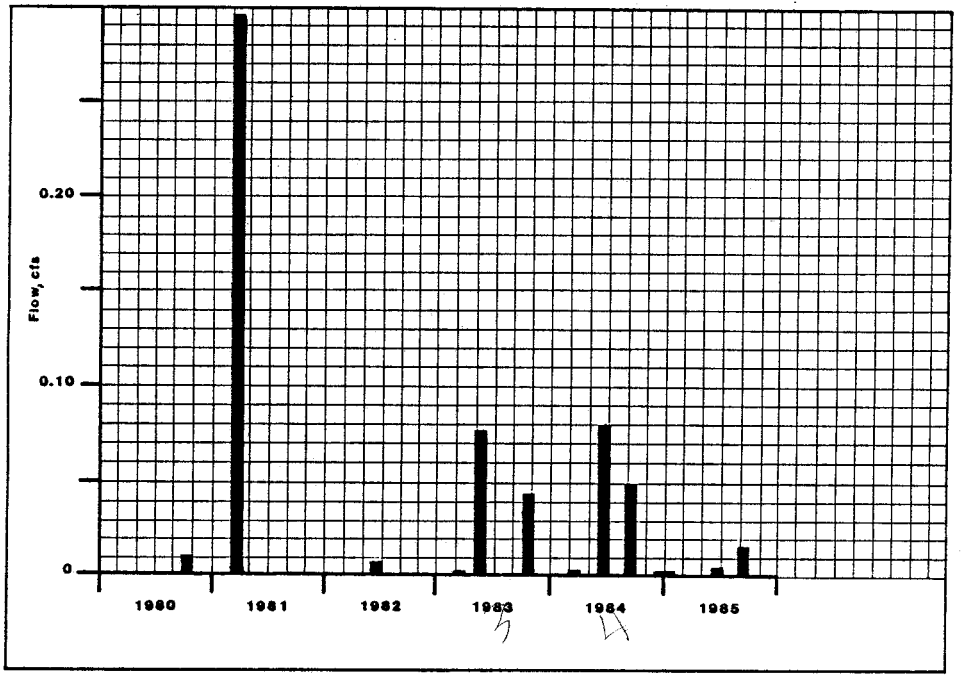

MONTHLY FLOW RATES,
TIE FORK CANYON
NEAR HUNTINGTON, UTAH.
Avg. Flow, cfs
40
30
20
10
0
J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D J F M A M J J A S O N D
1978
1979
1980
1981

FIGURE 13

FLOW HYDROGRAPHS



STATION 5-1



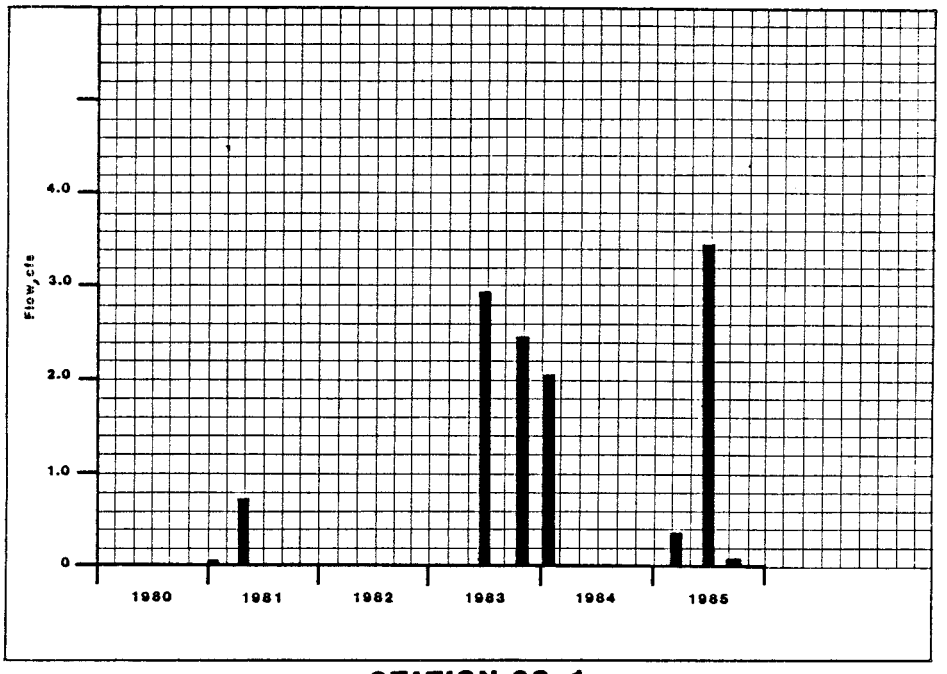
STATION 10-1

FIGURE 13

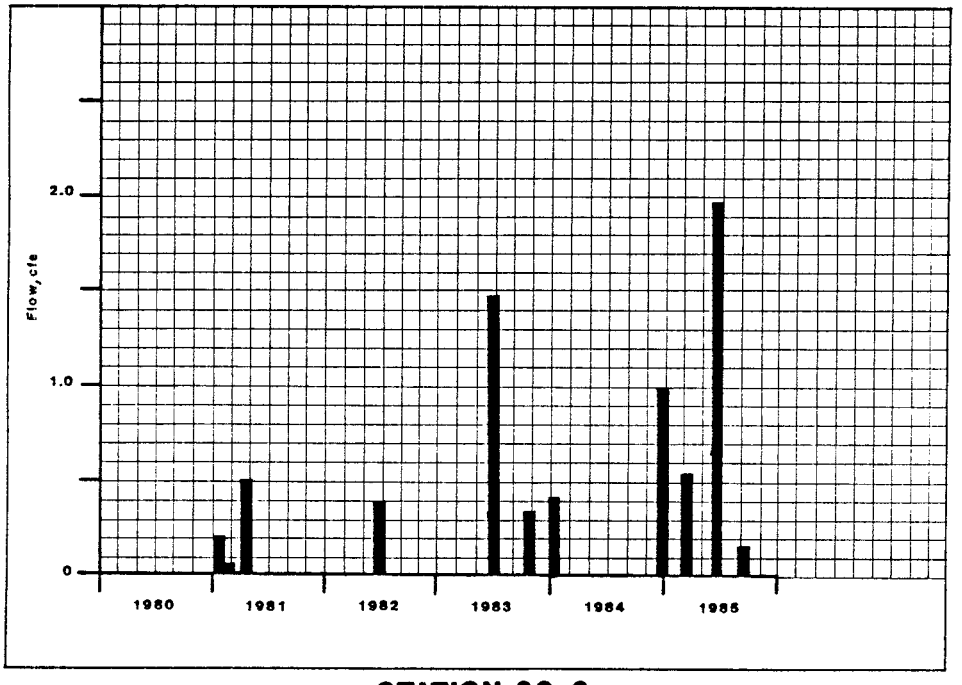
NOTE: FLOWS SHOWN ARE ONE TIME INSTANTANEOUS FLOWS TAKEN DURING MONTH SPECIFIED.

PLATEAU MINING COMPANY

FLOW HYDROGRAPHS FOR STATIONS 5-1 and 10-1



STATION 20-1



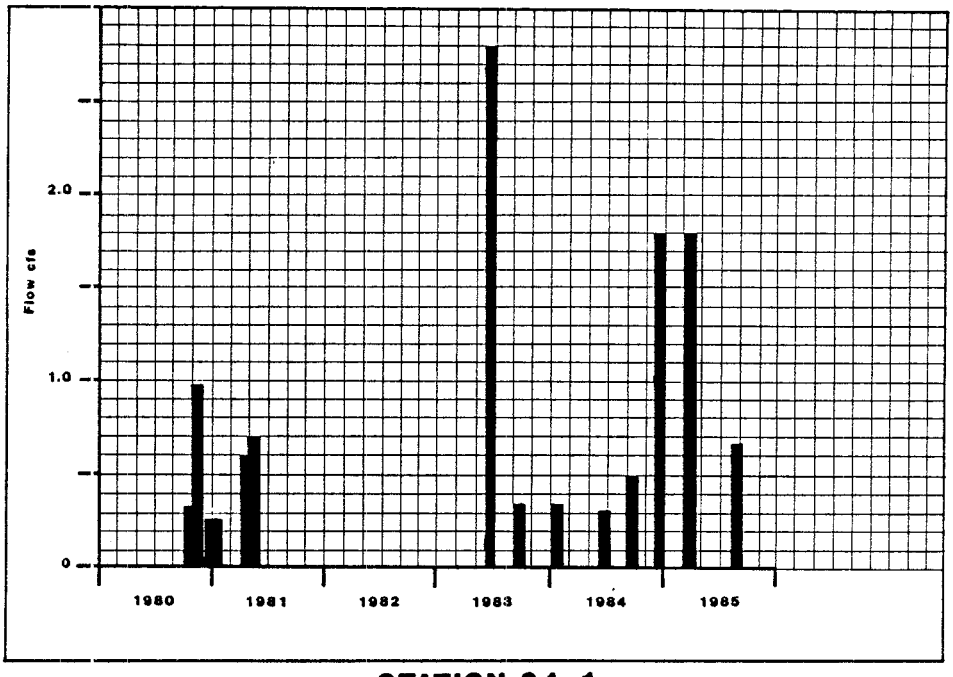
STATION 20-2

FIGURE 13

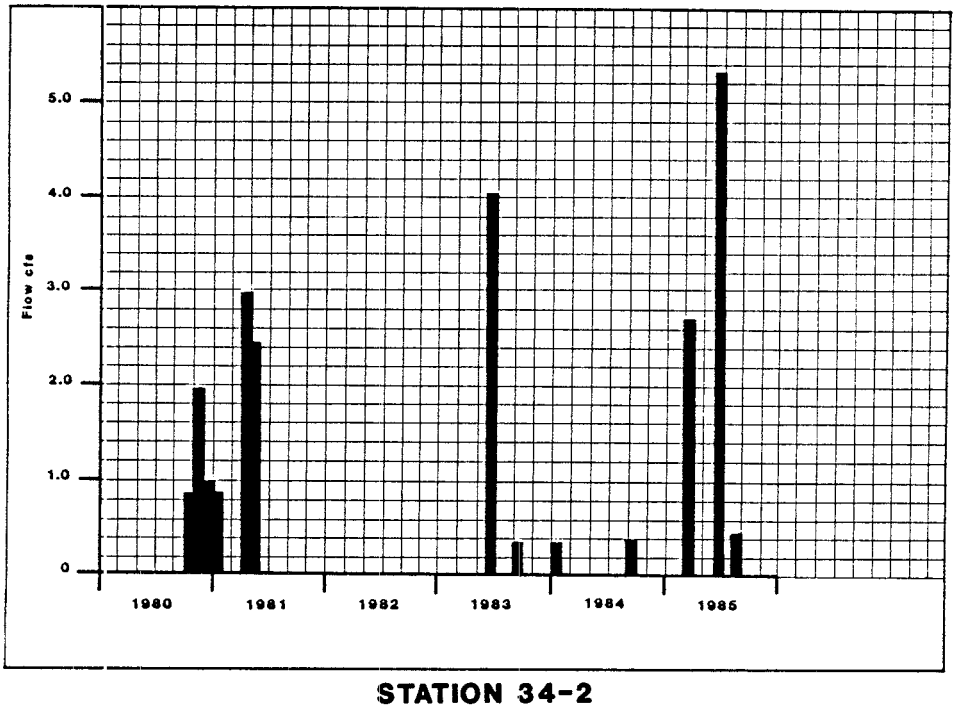
NOTE: FLOWS SHOWN ARE ONE TIME INSTANTANEOUS FLOWS TAKEN DURING MONTH SPECIFIED.

PLATEAU MINING COMPANY

FLOW HYDROGRAPHS FOR STATIONS 20-1 (ST-2) and 20-2 (ST-1)



STATION 34-1



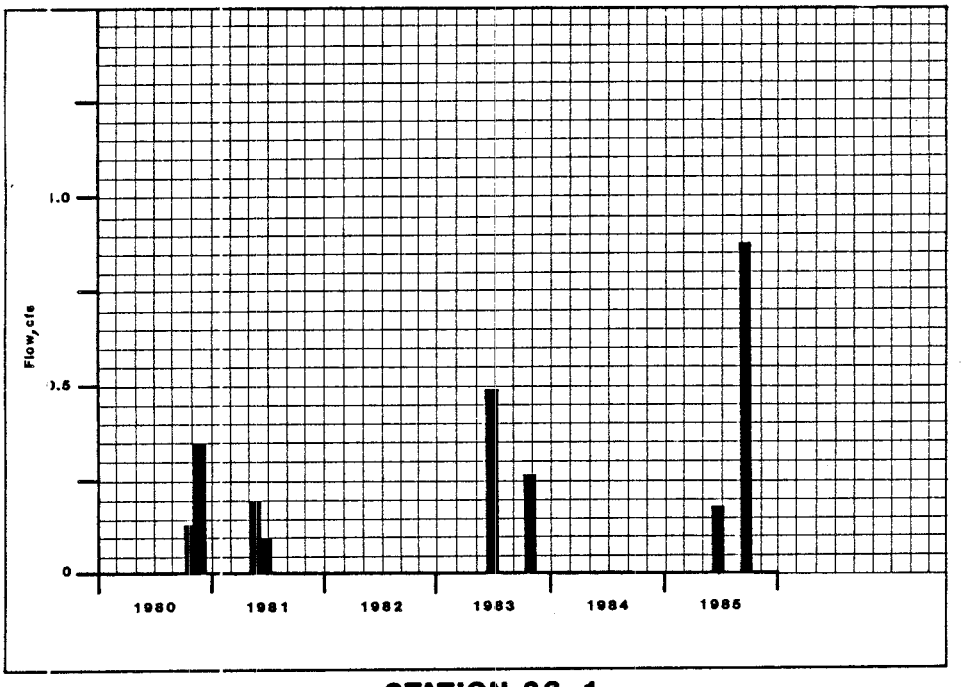
STATION 34-2

FIGURE 13

NOTE: FLOWS SHOWN ARE ONE TIME INSTANTANEOUS FLOWS TAKEN DURING MONTH SPECIFIED.

PLATEAU MINING COMPANY

FLOW HYDROGRAPHS FOR STATIONS 34-1 and 34-2



STATION 36-1

NOTE: FLOWS SHOWN ARE ONE TIME INSTANTANEOUS FLOWS TAKEN DURING MONTH SPECIFIED.

FIGURE 13

PLATEAU MINING COMPANY

FLOW HYDROGRAPH FOR STATION 36-1

FIGURE 14

SEASONAL VARIATION IN TDS

NOTE: CURVE FIT SHOWS APPROXIMATE SEASONAL VARIATION.

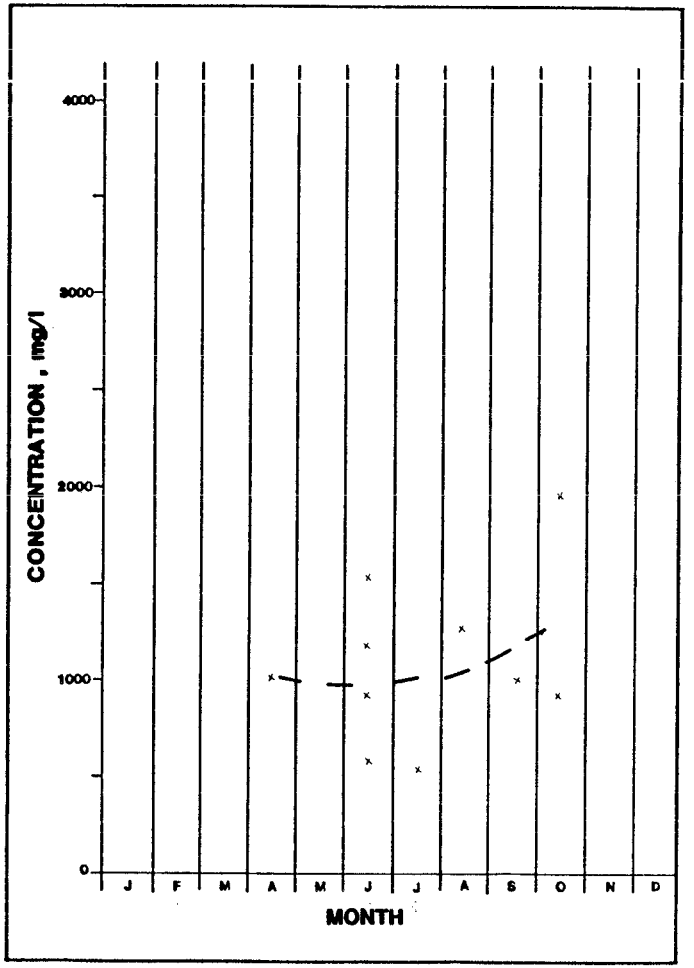


FIGURE 14

PLATEAU MINING COMPANY

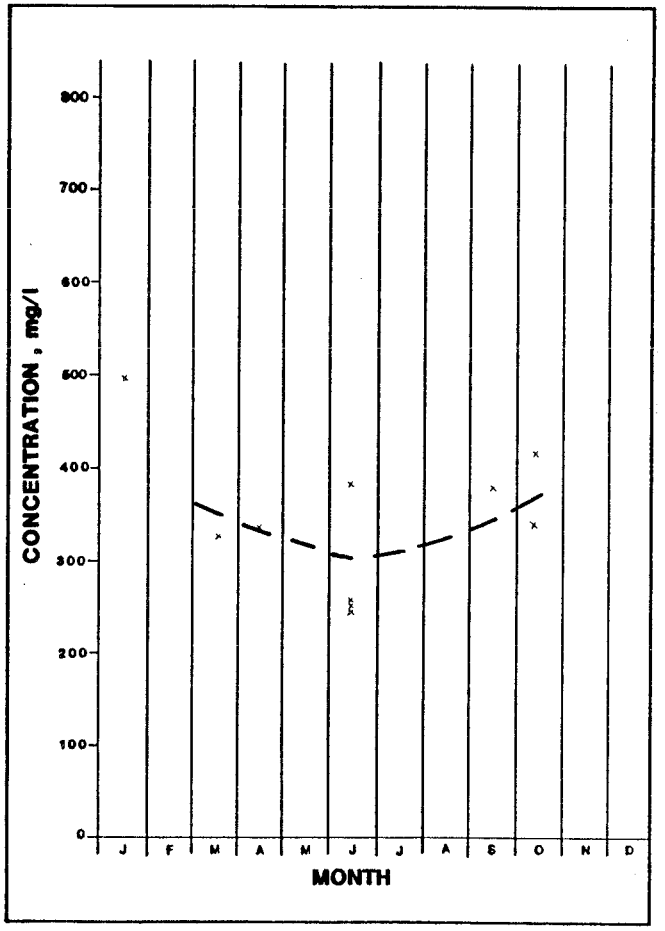
SEASONAL VARIATION IN TDS FOR STATION 5-1

NOTE: CURVE FIT SHOWS APPROXIMATE SEASONAL VARIATION.

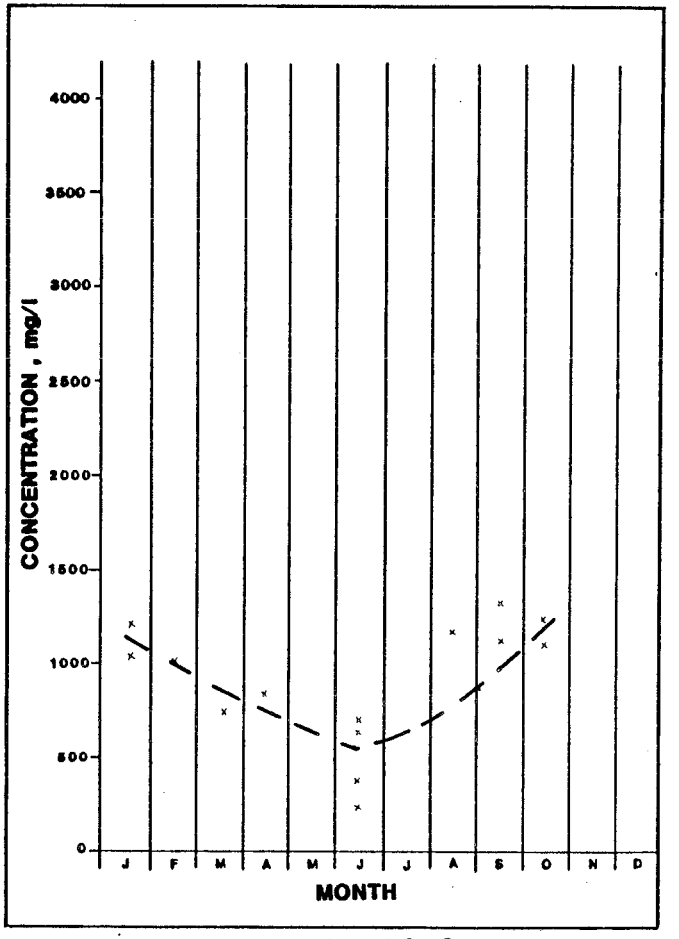
FIGURE 14

PLATEAU MINING COMPANY

SEASONAL VARIATION IN TDS FOR STATIONS 20-1 (ST-2) and 20-2 (ST-1)



STATION 20-1



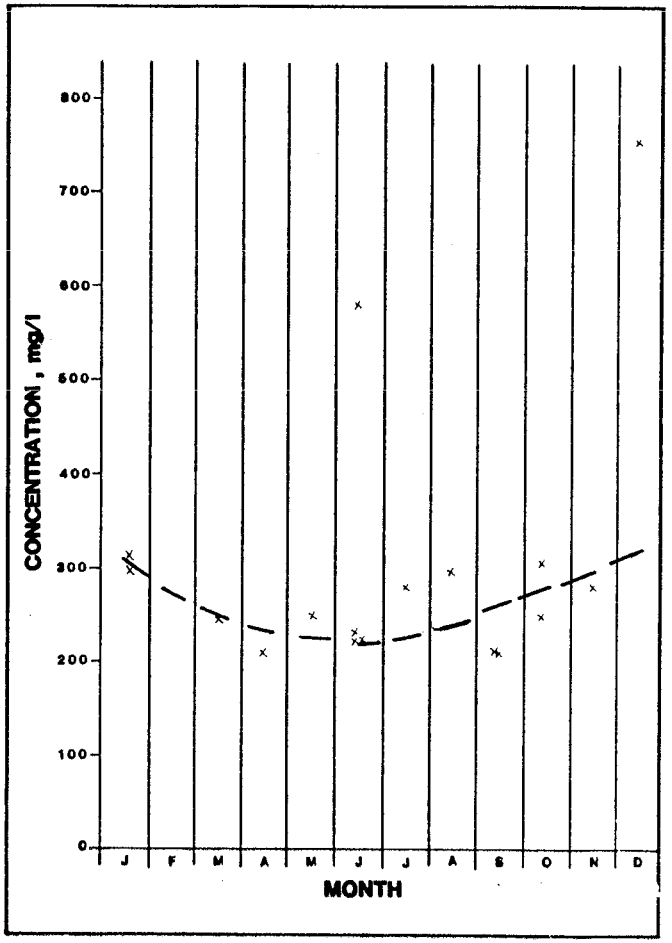
STATION 20-2

NOTE: CURVE FIT SHOWS APPROXIMATE SEASONAL VARIATION.

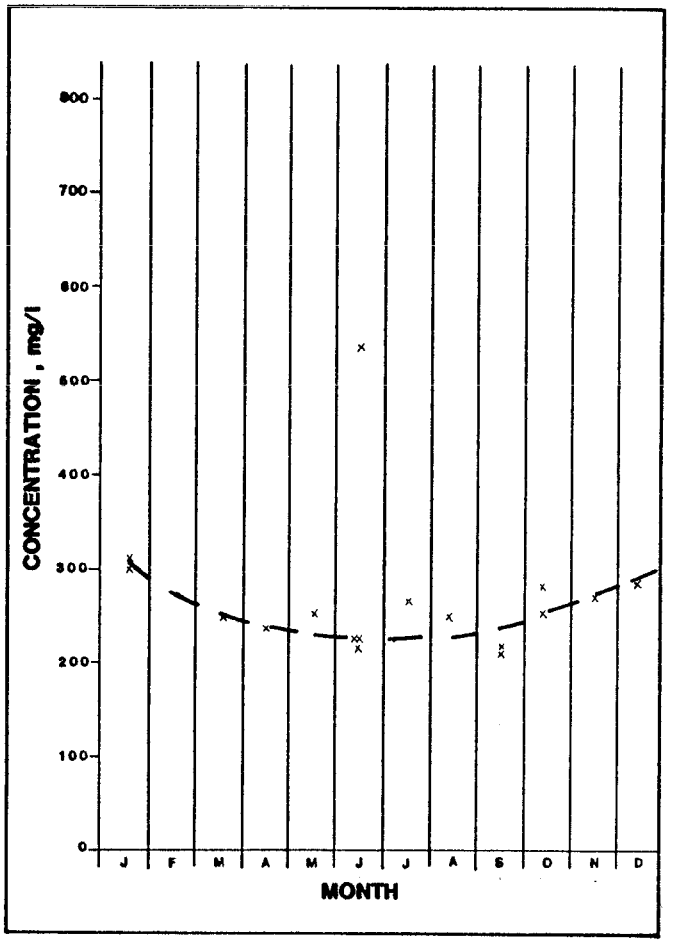
FIGURE 14

PLATEAU MINING COMPANY

SEASONAL VARIATION IN TDS FOR STATIONS 34-1 and 34-2



STATION 34-1



STATION 34-2

FIGURE 15

SEASONAL VARIATION IN TSS

FIGURE 15

PLATEAU MINING COMPANY

SEASONAL VARIATION IN TSS FOR STATION 20-2

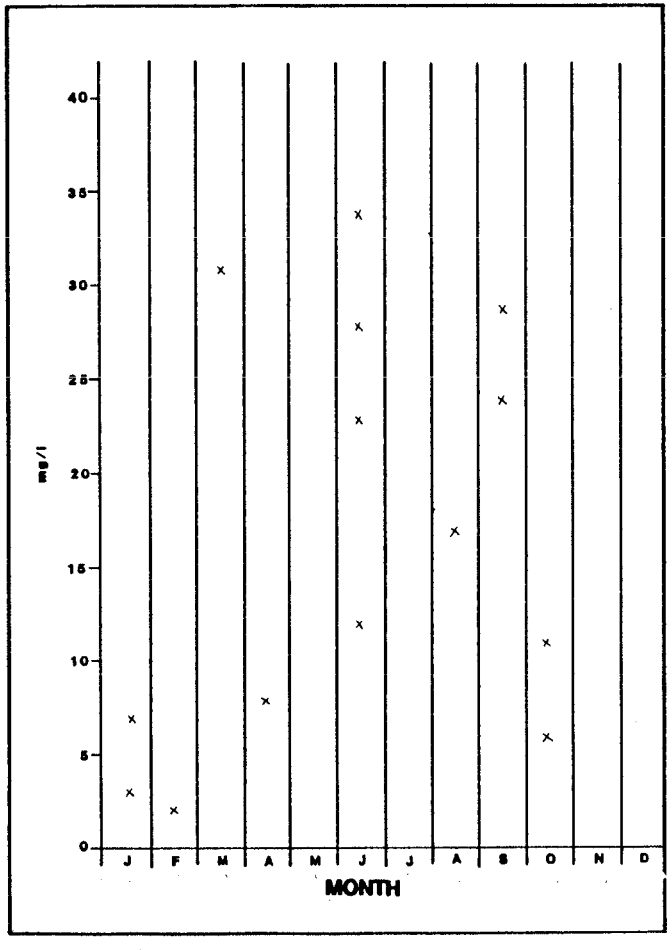
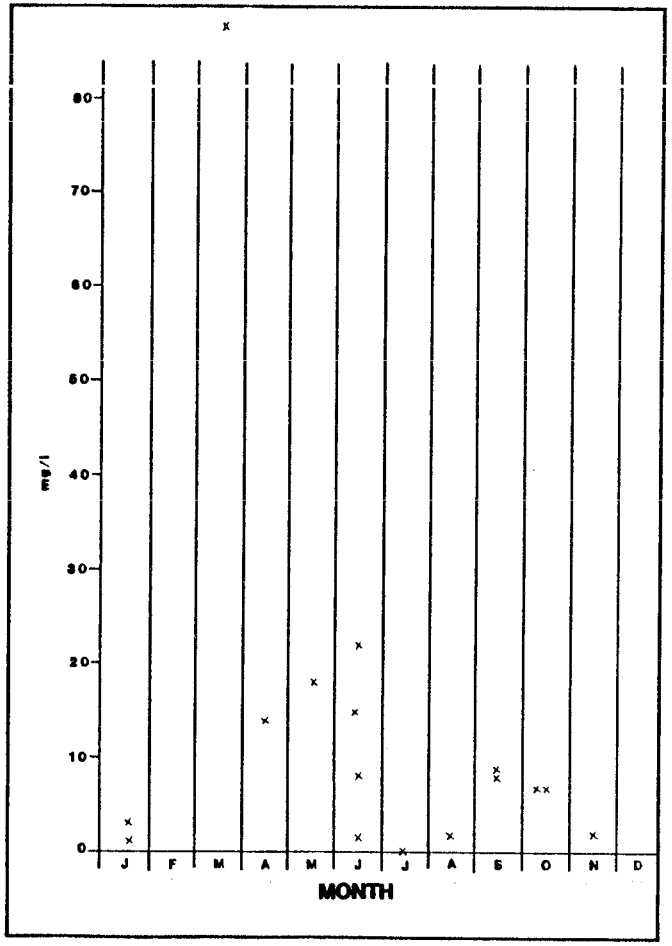


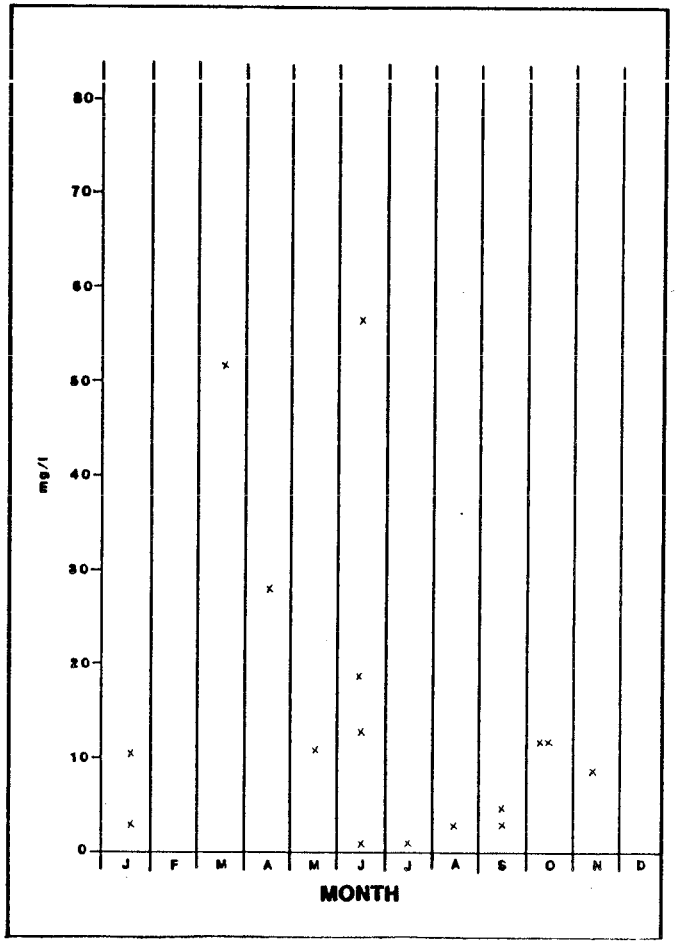
FIGURE 15

PLATEAU MINING COMPANY

SEASONAL VARIATION IN TSS FOR STATIONS 34-1 and 34-2



STATION 34-1



STATION 34-2

FIGURE 16

FLOW VS. TSS

FIGURE 16

PLATEAU MINING COMPANY

FLOW vs. TSS for STATIONS 20-2 (ST-1), 34-1, 34-2

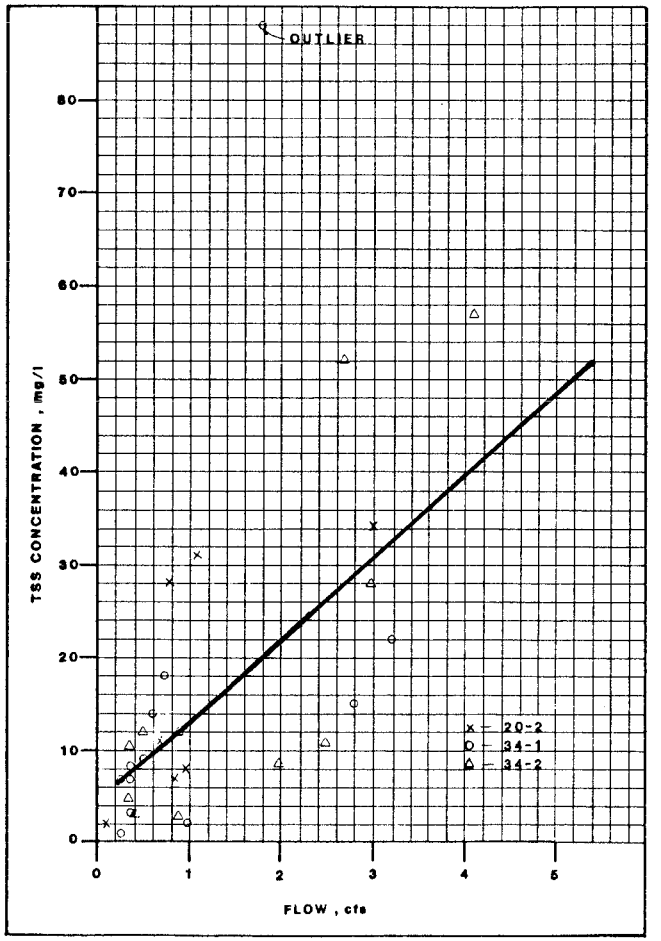


FIGURE 17

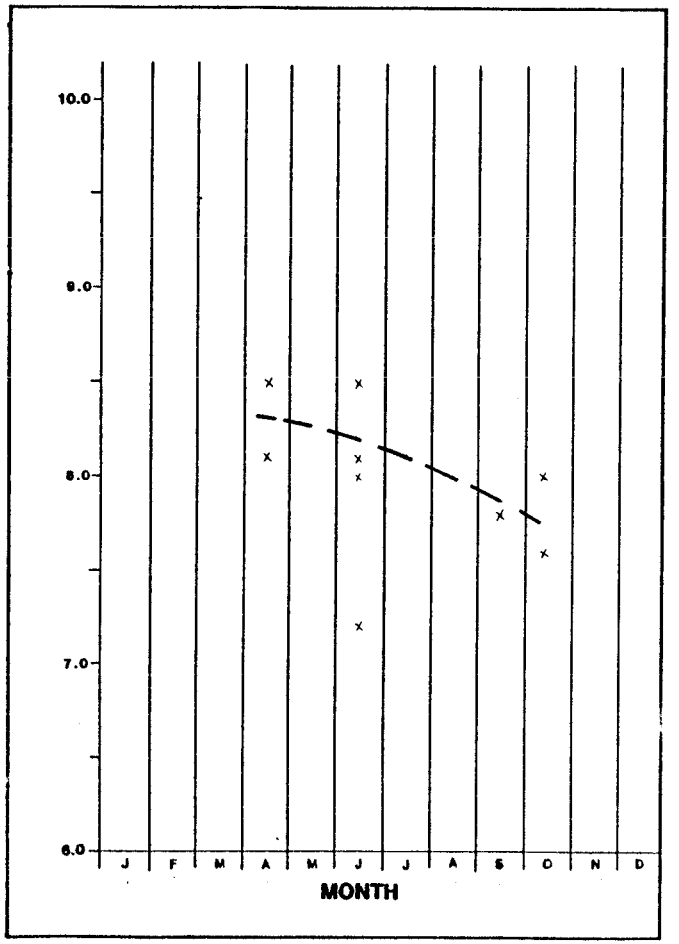
SEASONAL VARIATION IN pH

NOTE: CURVE FIT SHOWS APPROXIMATE SEASONAL VARIATION

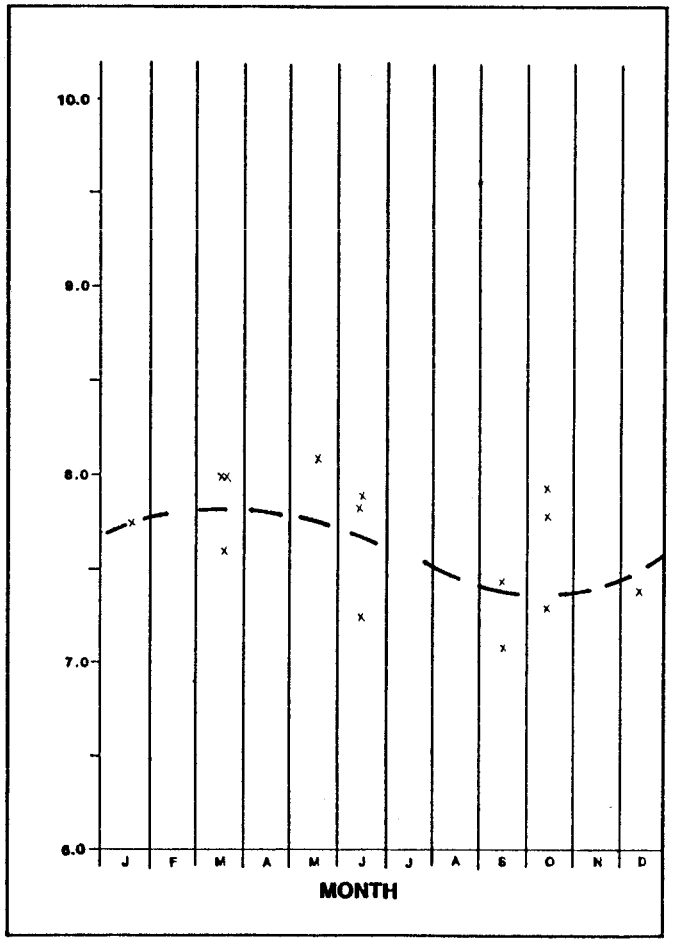
FIGURE 17

PLATEAU MINING COMPANY

SEASONAL VARIATION IN PH FOR STATIONS 5-1 and 10-1



STATION 5-1



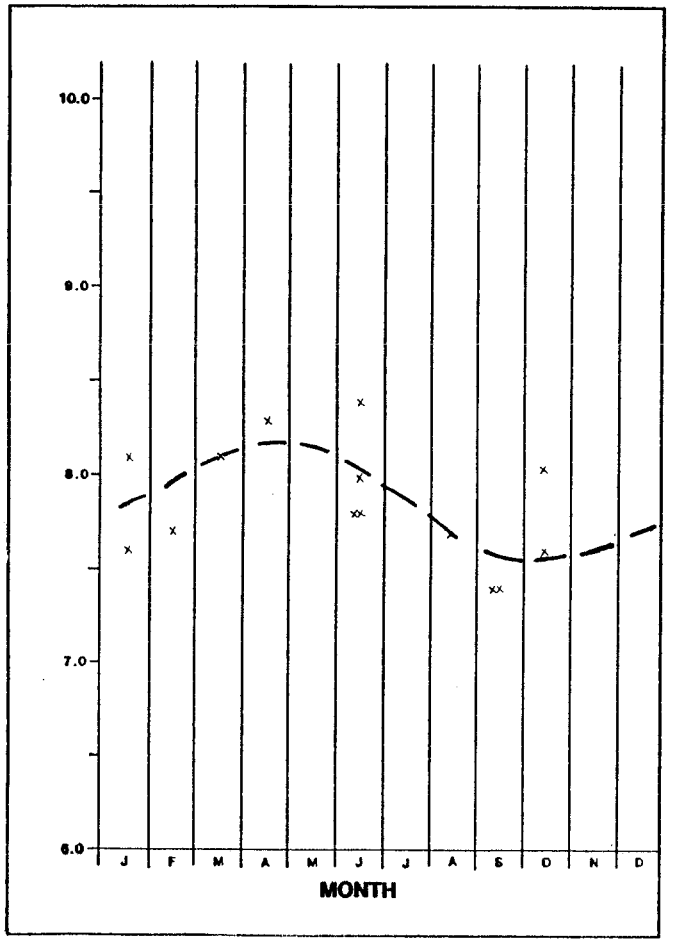
STATION 10-1

NOTE: CURVE FIT SHOWS APPROXIMATE SEASONAL VARIATION.

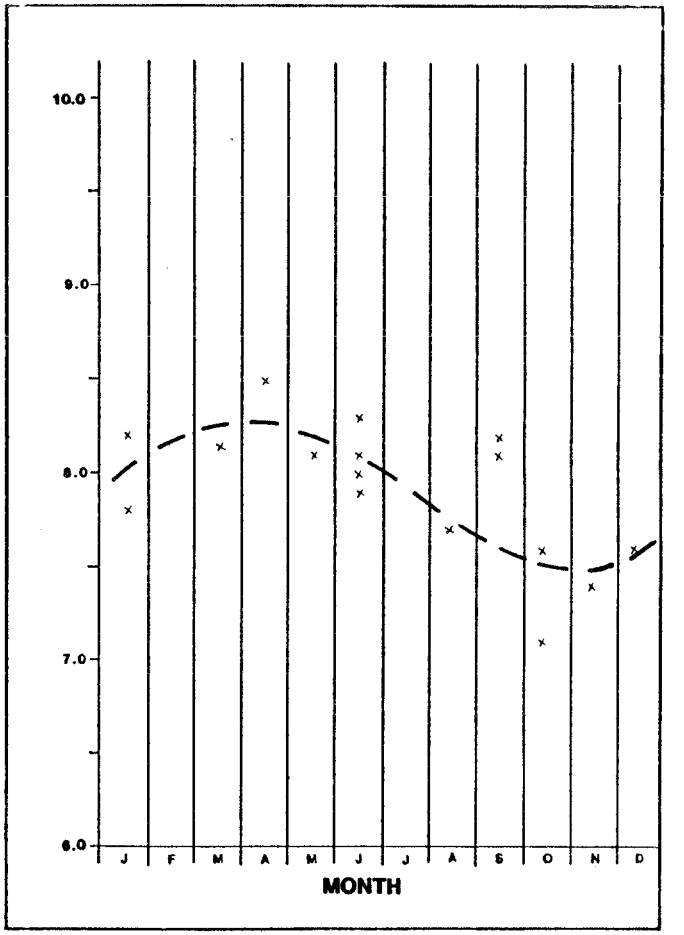
FIGURE 17

PLATEAU MINING COMPANY

SEASONAL VARIATION IN PH FOR STATIONS 20-2 (ST-1) and 34-1



STATION 20-2

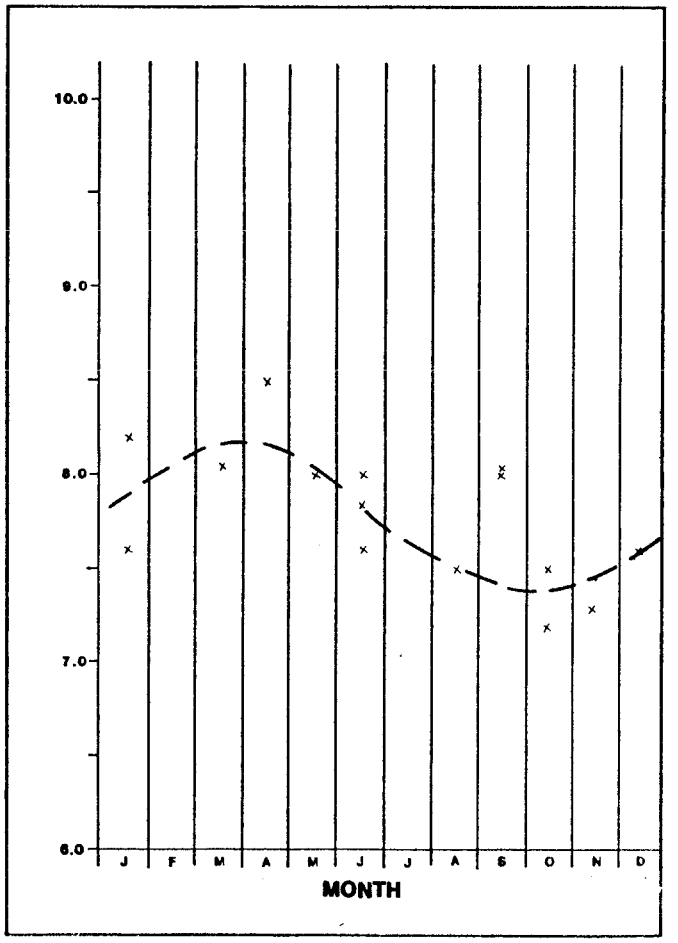


STATION 34-1

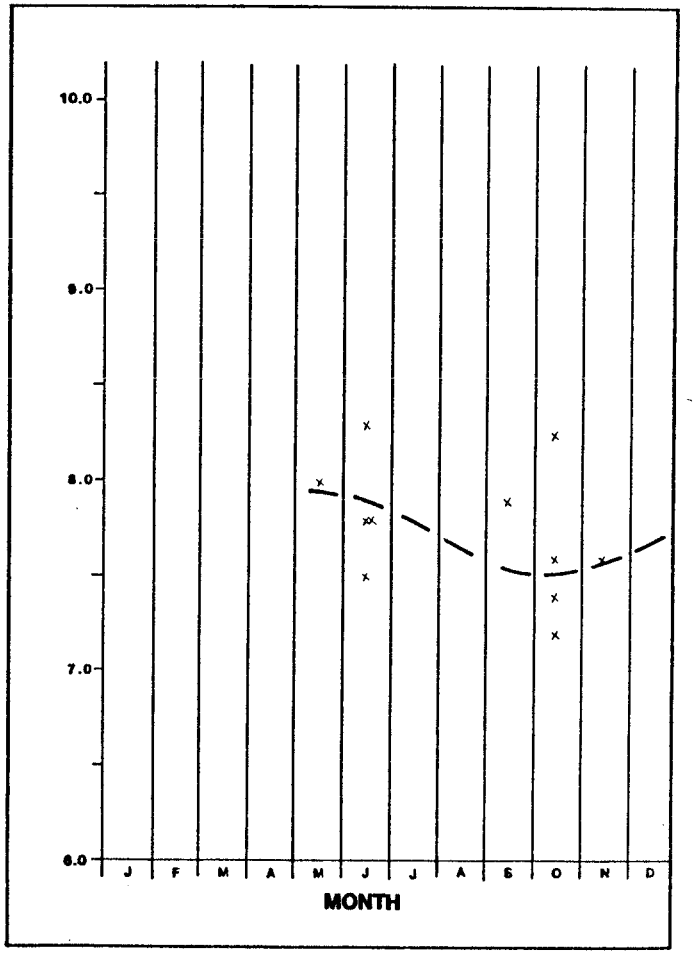
FIGURE 17

PLATEAU MINING COMPANY

SEASONAL VARIATION IN PH FOR STATIONS 34-2 and 36-1



STATION 34-2



STATION 36-1

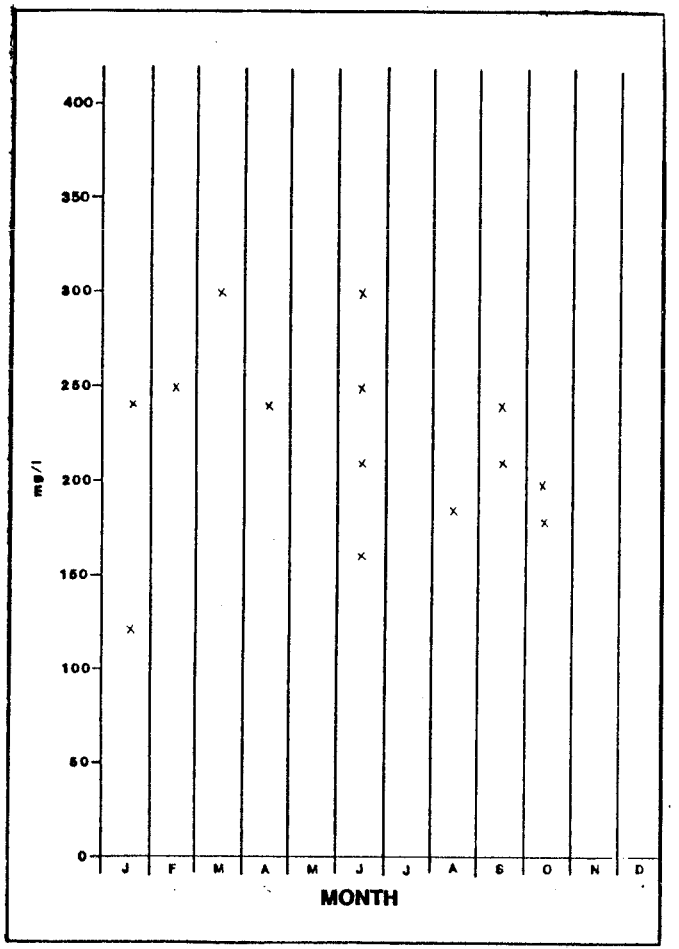
FIGURE 18

SEASONAL VARIATION IN TOTAL IRON

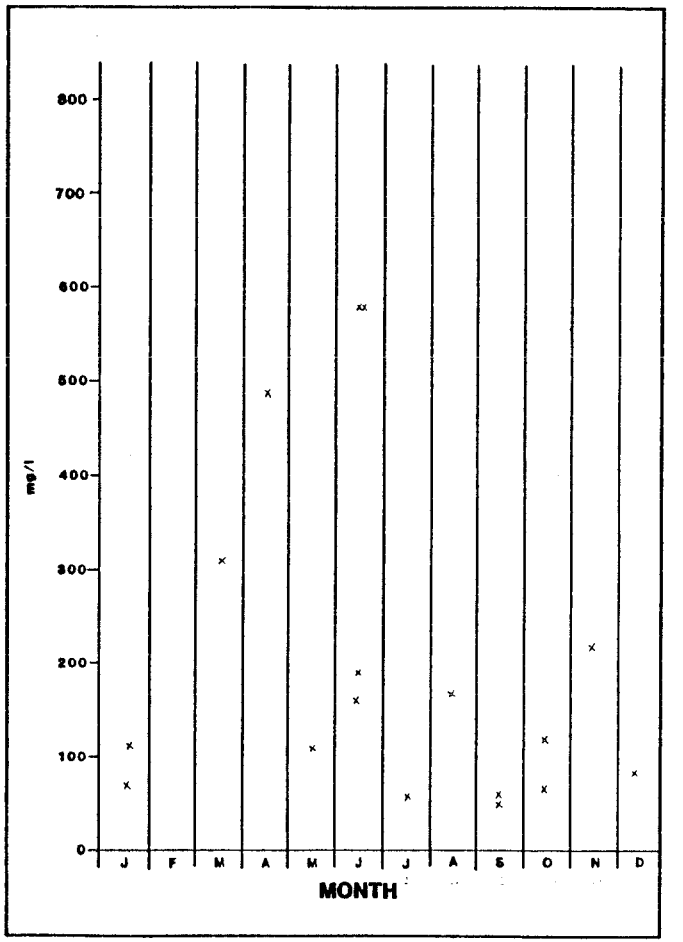
FIGURE 18

PLATEAU MINING COMPANY

SEASONAL VARIATION IN TOTAL IRON FOR STATIONS 20-2 (ST-1) and 34-2



STATION 20-2



STATION 34-2

FIGURE 19

ENDANGERED MAMMALIAN SPECIES IN RELATION TO PROPOSED IMPACT AREA

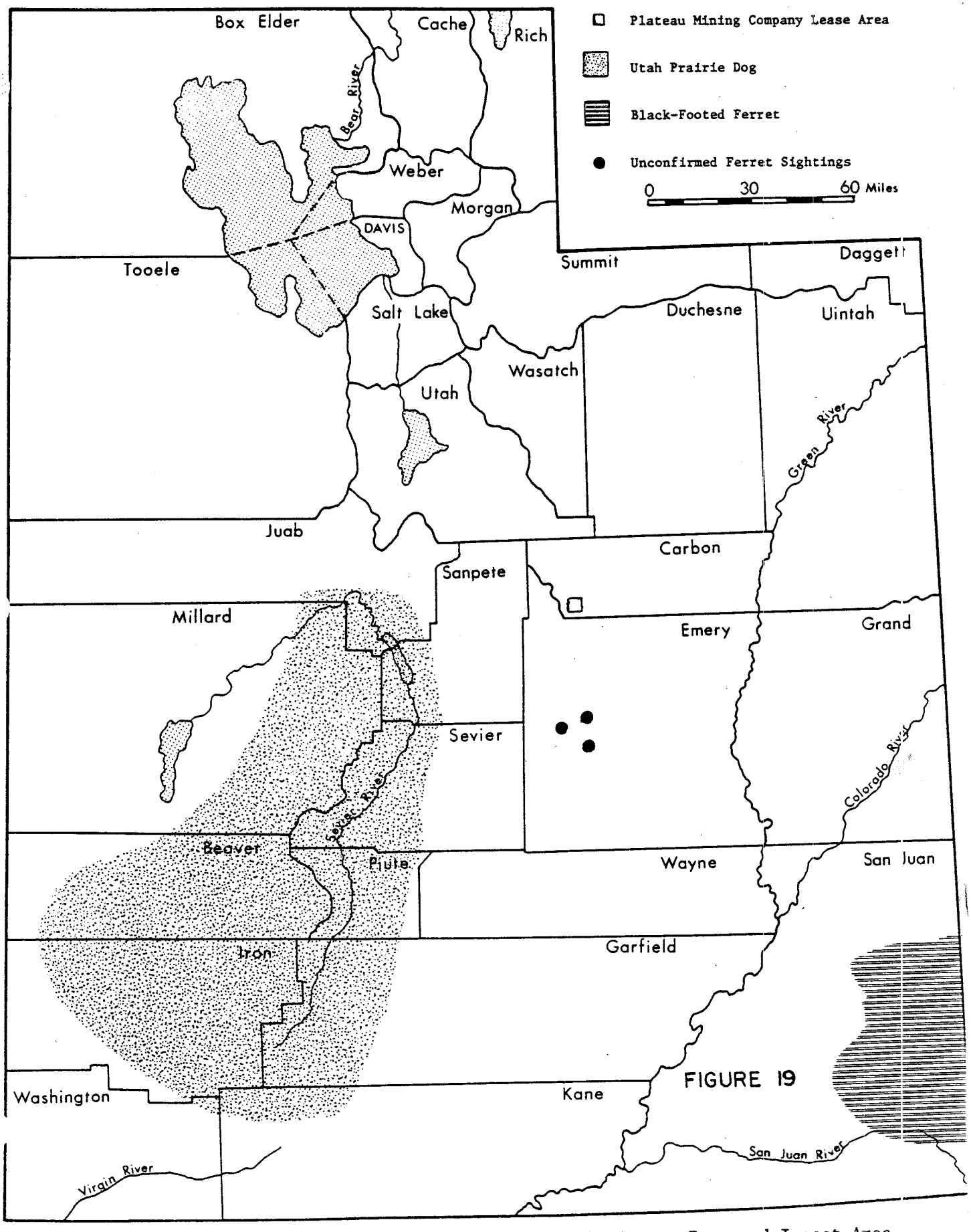


FIGURE 19

FIGURE 10-5. Endangered Mammalian Species in Relation to Proposed Impact Area

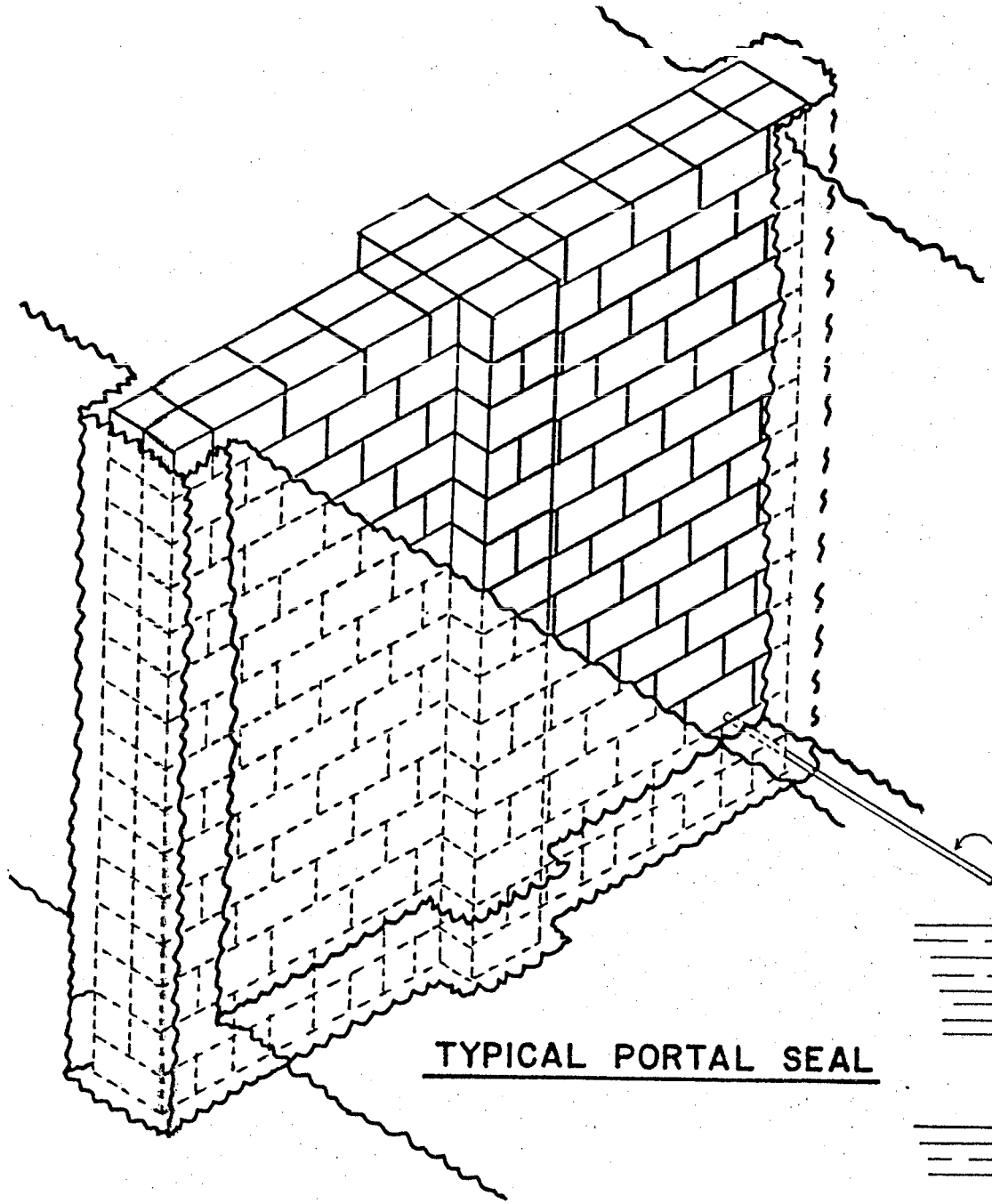
FIGURE 20

TYPICAL PERMANENT ENTRY SEAL DESIGN

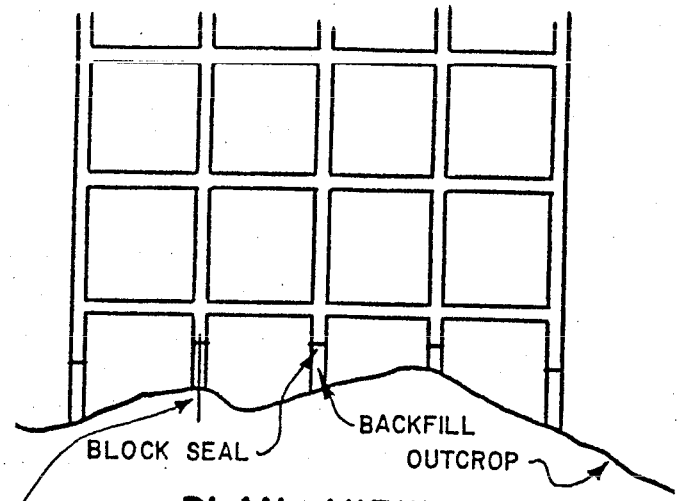
FIGURE 20

PLATEAU MINING COMPANY

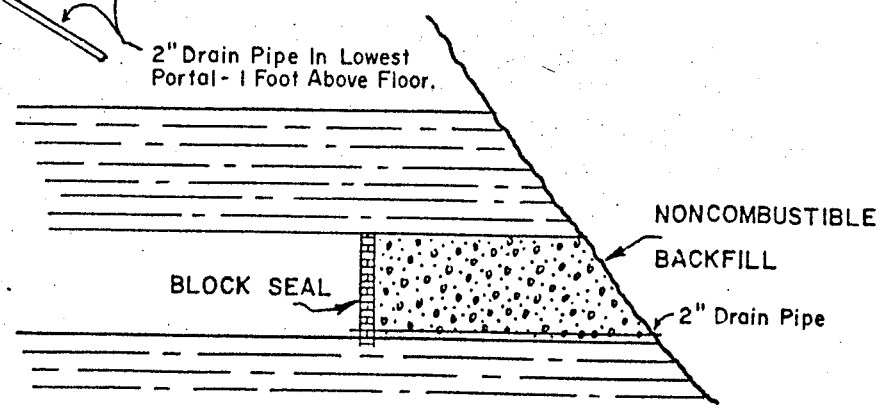
TYPICAL PERMANENT ENTRY SEAL DESIGN.



TYPICAL PORTAL SEAL



PLAN VIEW



SECTION VIEW

Revised 1/5/87

FIGURE 21

DIMENSIONLESS CIRVILINEAR UNIT HYDROGRAPH AND
EQUIVALENT TRIANGULAR HYDROGRAPH

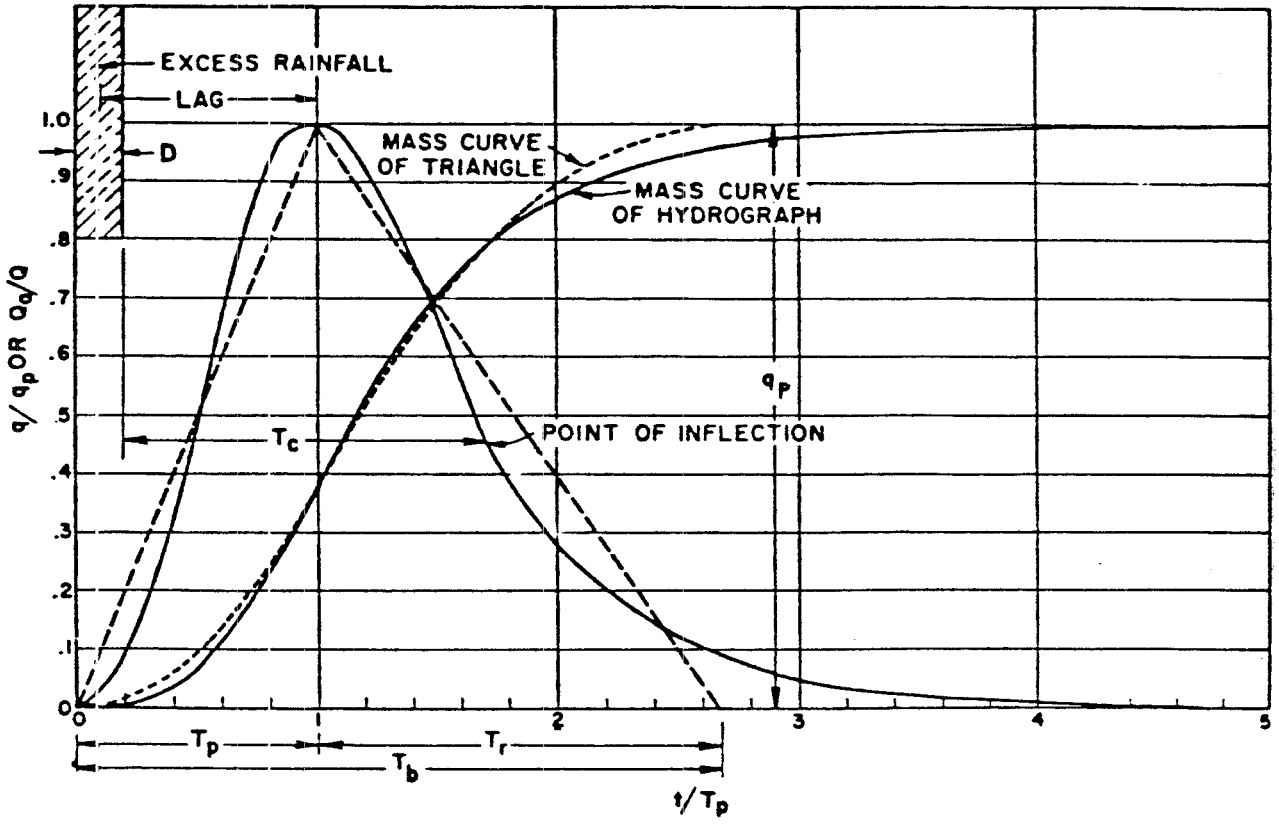


FIGURE 21

PLATEAU MINING COMPANY

DIMENSIONLESS CURVILINEAR UNIT HYDROGRAPH AND EQUIVALENT TRIANGULAR HYDROGRAPH.

FIGURE 22

UNIT HYDROGRAPH FAMILY CURVES

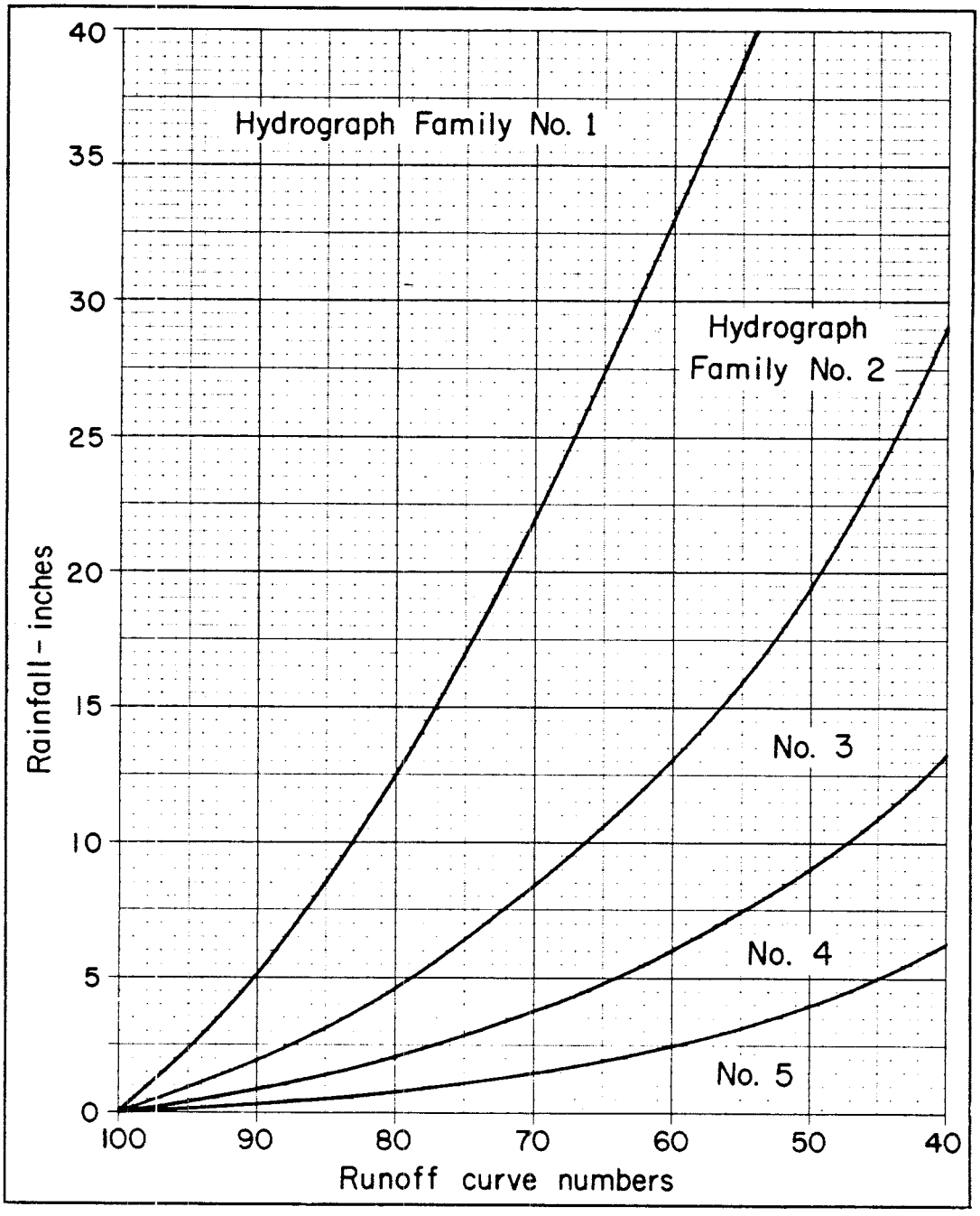


FIGURE 22

PLATEAU MINING COMPANY

UNIT HYDROGRAPH FAMILY CURVES.

FIGURE 23

TWENTY-FOUR HOUR RAINFALL DISTRIBUTIONS

FIGURE 23

PLATEAU MINING COMPANY

TWENTY-FOUR-HOUR RAINFALL DISTRIBUTIONS.

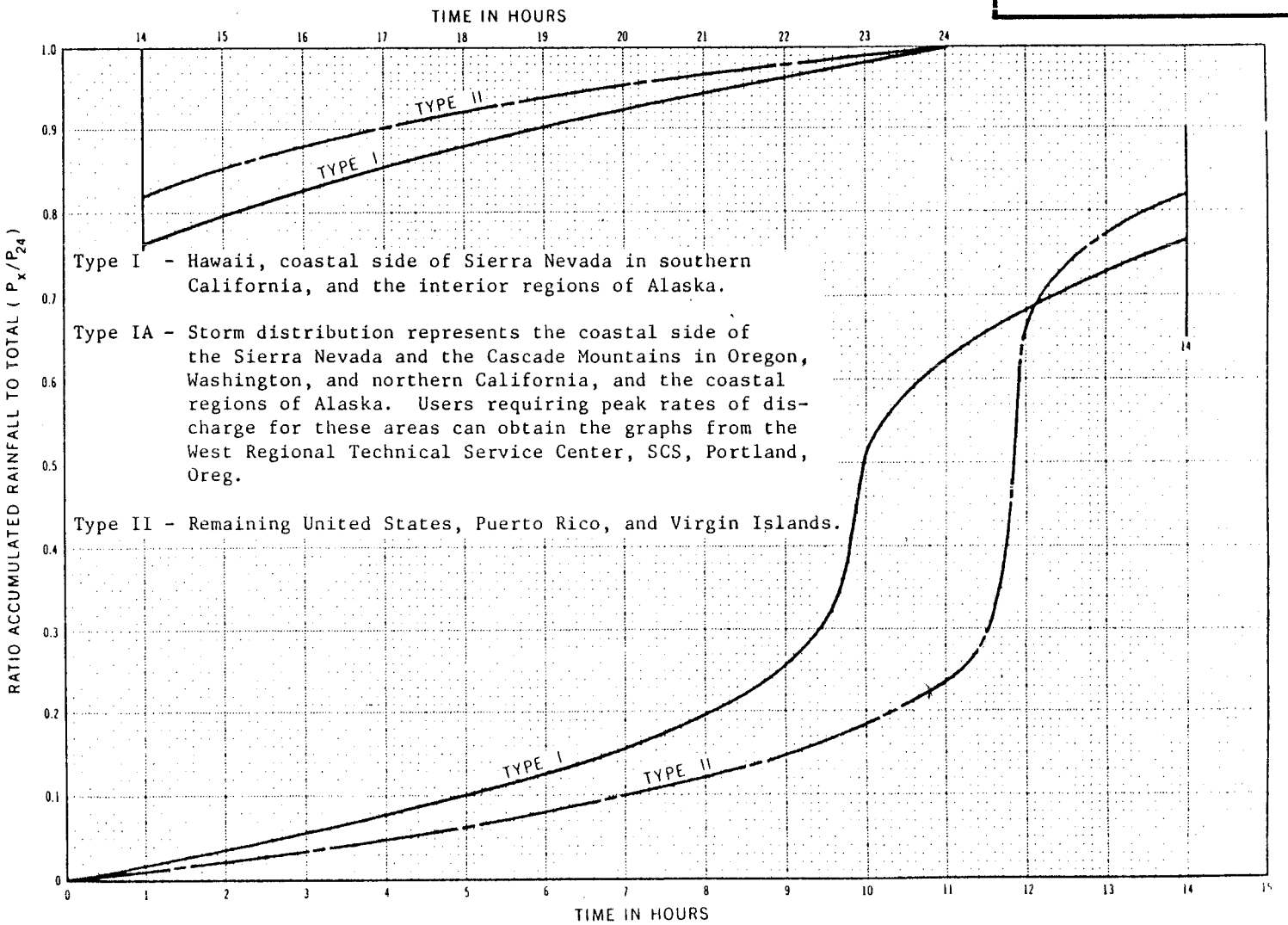


FIGURE 24

VARIATION IN HYDROGRAPH SHAPE WITH VARIATION IN C_3t_p

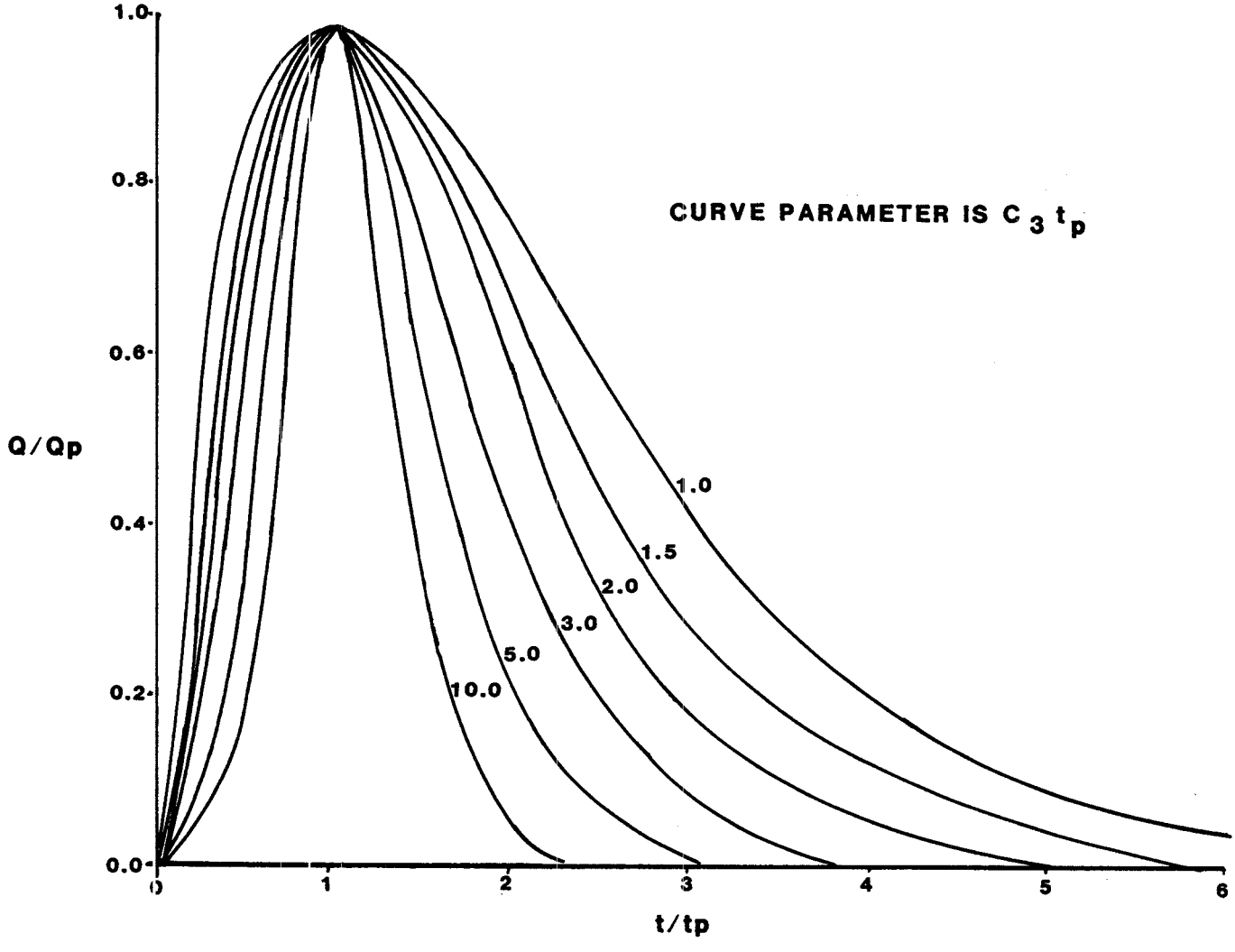


FIGURE 24

PLATEAU MINING COMPANY

VARIATION IN HYDROGRAPH SHAPE WITH VARIATION IN $C_3 t_p$

(TAKEN FROM HAAN, 1970).

FIGURE 25

STEEP SLOPE RIPRAP DESIGN

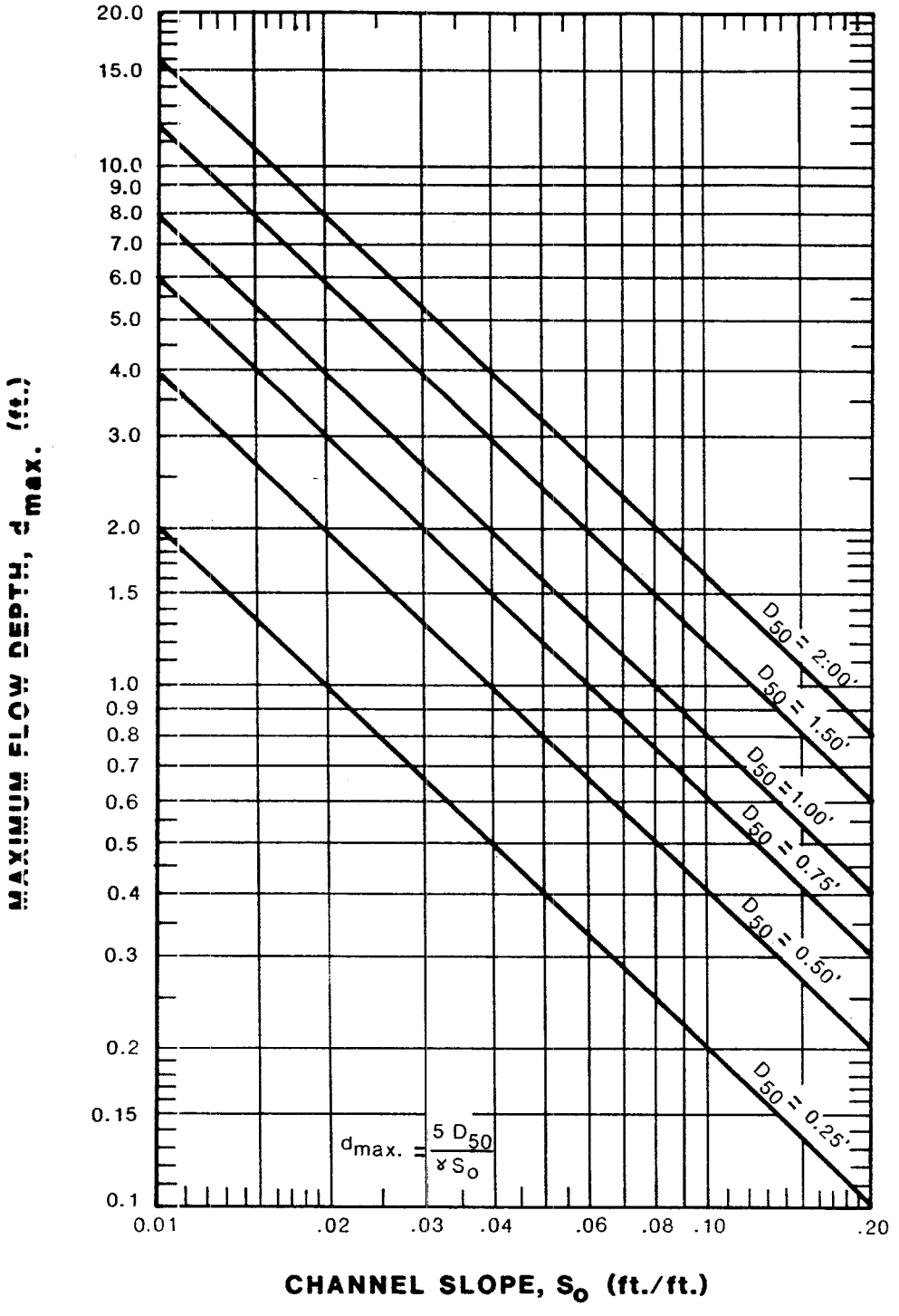


FIGURE 25

SOURCE:

"DESIGN OF STABLE CHANNELS WITH FLEXIBLE LININGS"
FEDERAL HIGHWAY ADMINISTRATION
OCTOBER, 1975

PLATEAU MINING COMPANY

U.S. DEPARTMENT OF TRANSPORTATION RIPRAP DESIGN

REVISED OCTOBER, 1987

FIGURE 26

HEADWATER DEPTH FOR CORRUGATED METAL PIPE CULVERTS
WITH INLET CONTROL

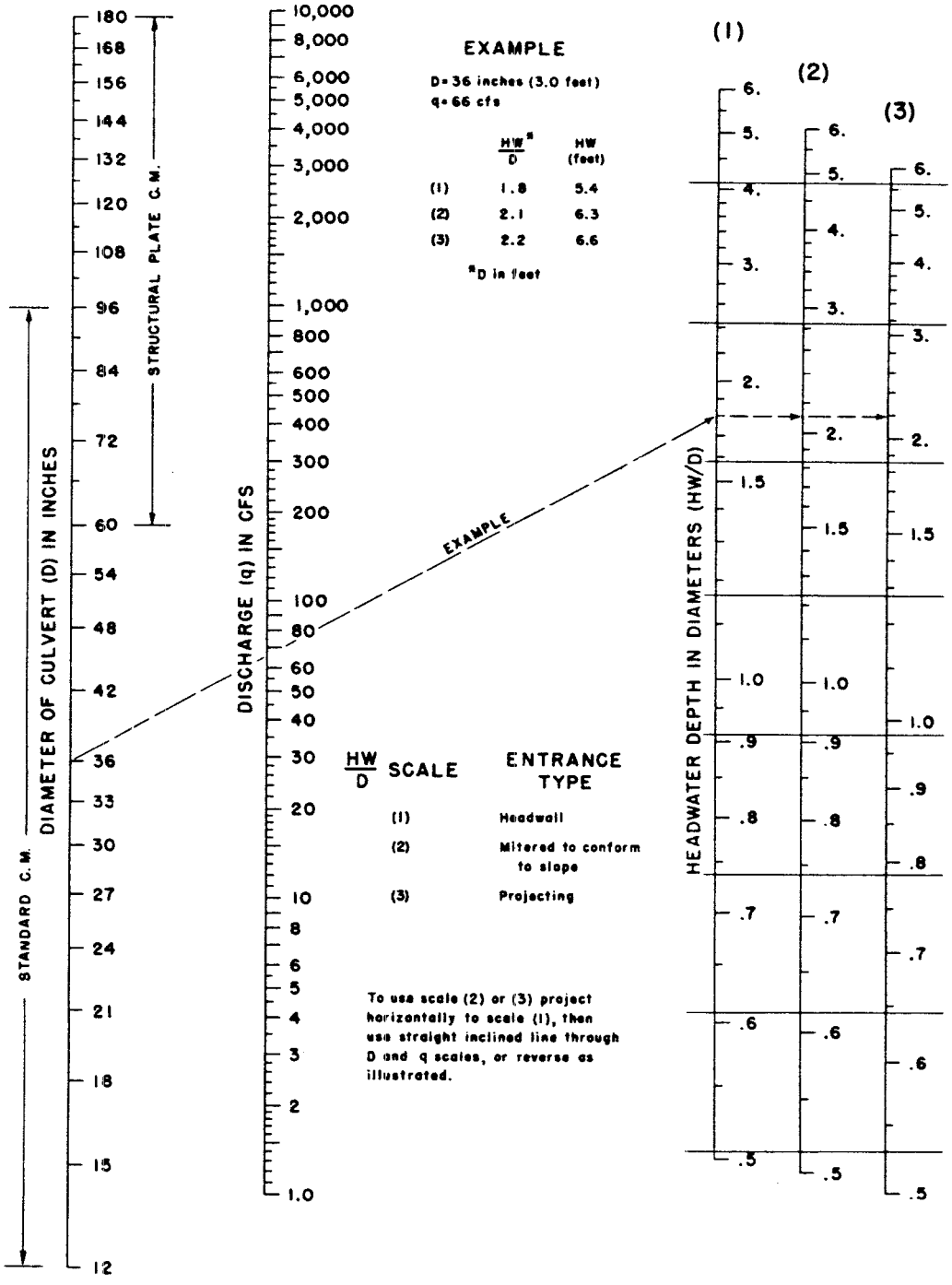


FIGURE 26

PLATEAU MINING COMPANY

HEADWATER DEPTH FOR CORRUGATED METAL PIPE CULVERTS WITH INLET CONTROL.

FIGURE 27

TYPICAL TRAPEZOIDAL DIVERSION CROSS SECTION

FIGURE 27

PLATEAU MINING COMPANY

TYPICAL TRAPEZOIDAL DIVERSION CROSS SECTION

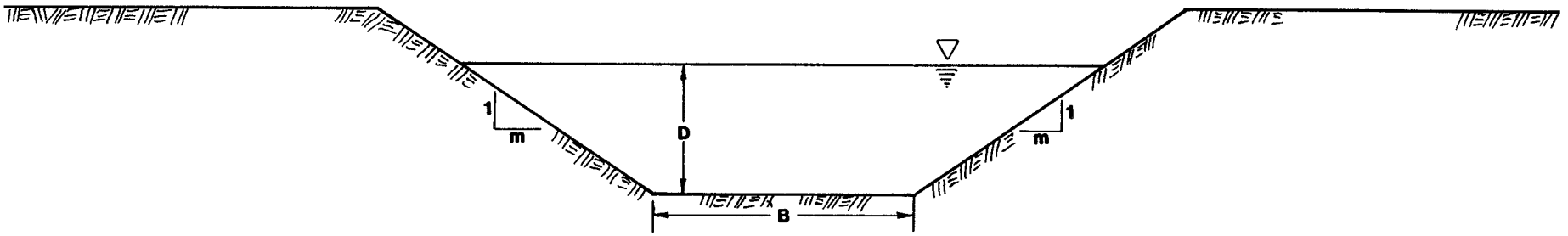


FIGURE 28

STAGE-CAPACITY CURVE FOR TREATMENT FACILITY NO. 1

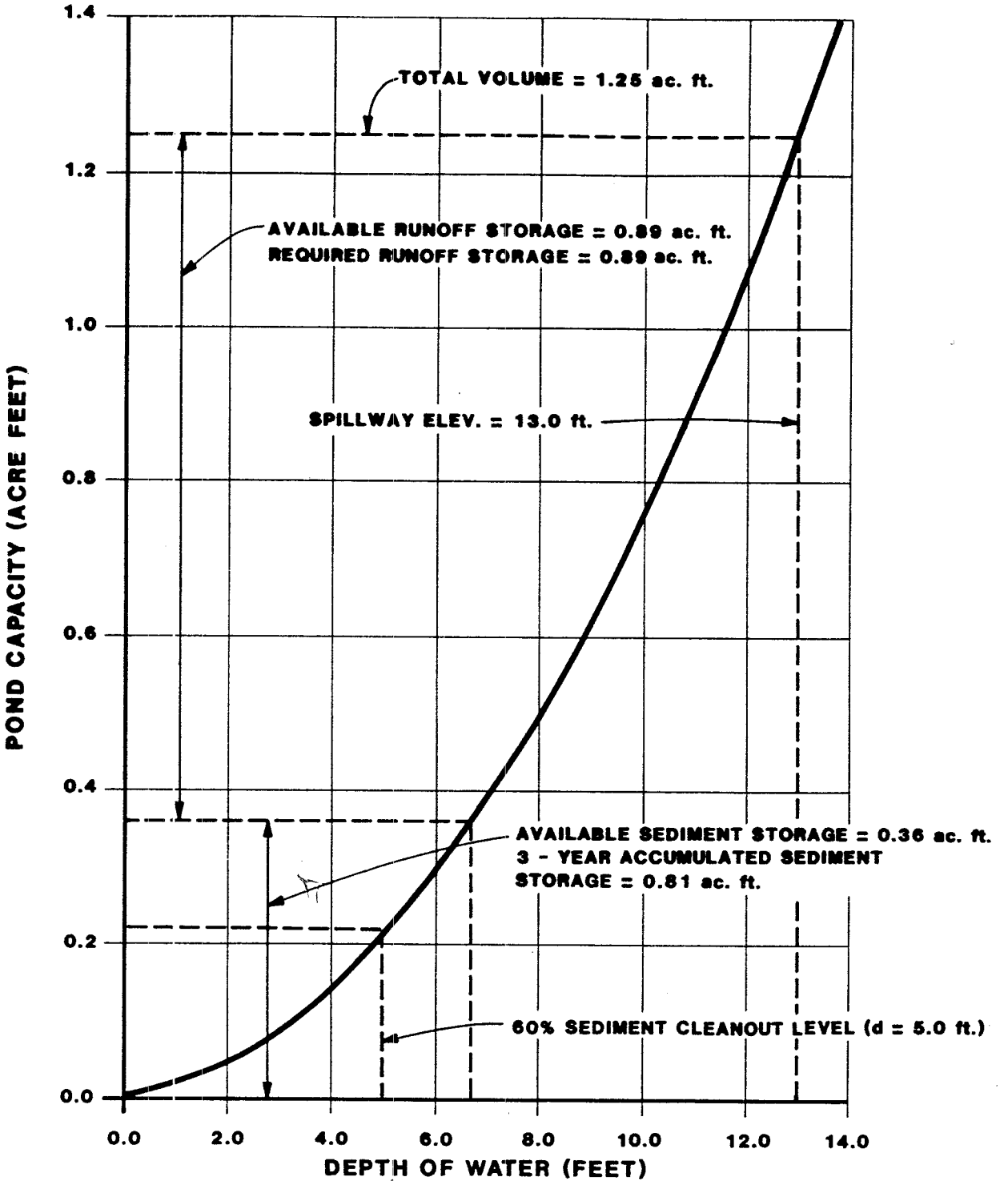


FIGURE 28

NOTE: TOTAL EMBANKMENT HEIGHT = 18.0 ft.

PLATEAU MINING COMPANY

STAGE-CAPACITY CURVE FOR TREATMENT FACILITY NO. 1

REVISED OCTOBER, 1987

FIGURE 29

STAGE-CAPACITY CURVE FOR SEDIMENT POND NO. 2

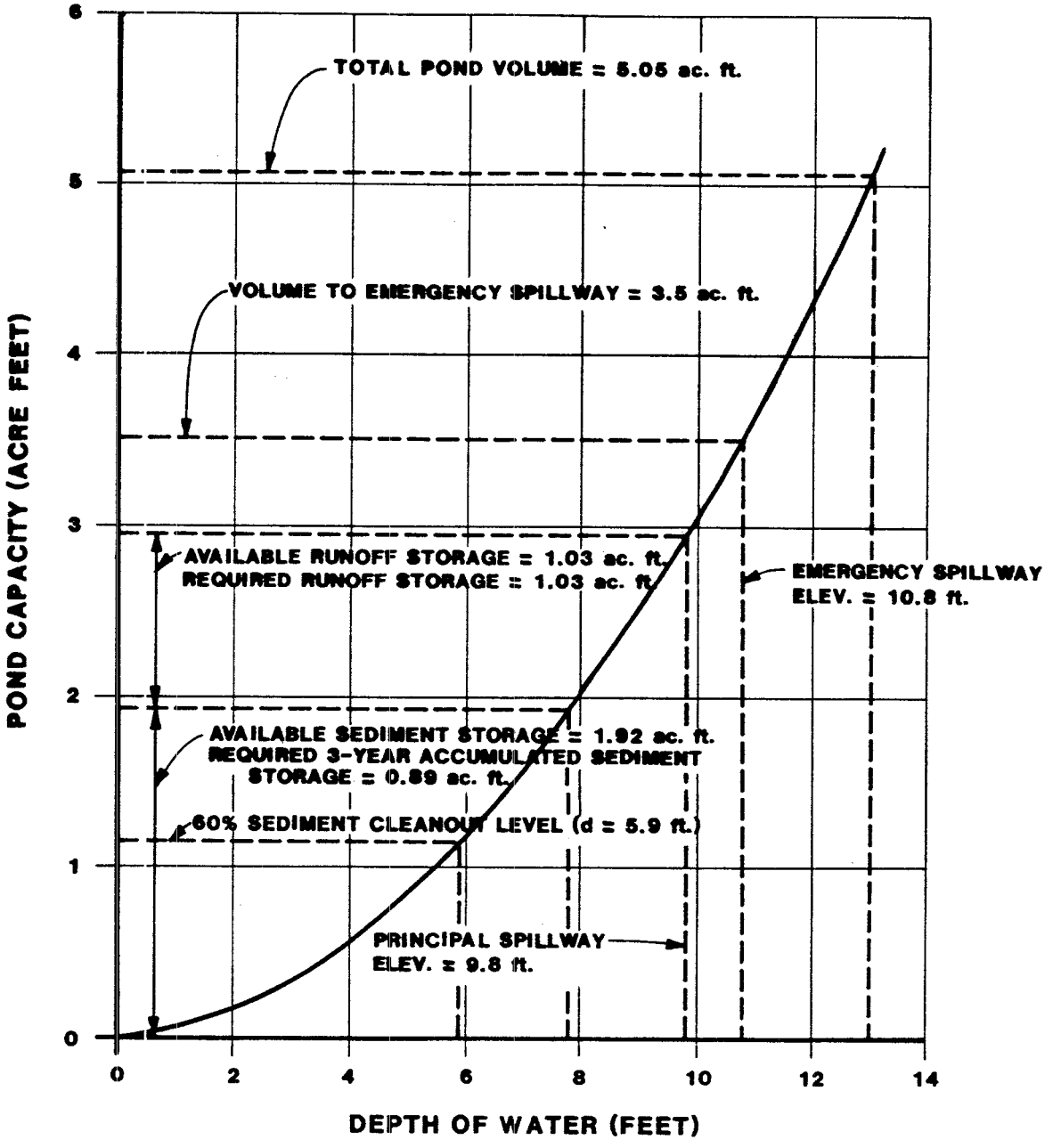


FIGURE 29

NOTE: TOTAL EMBANKMENT HEIGHT = 13.0 ft.

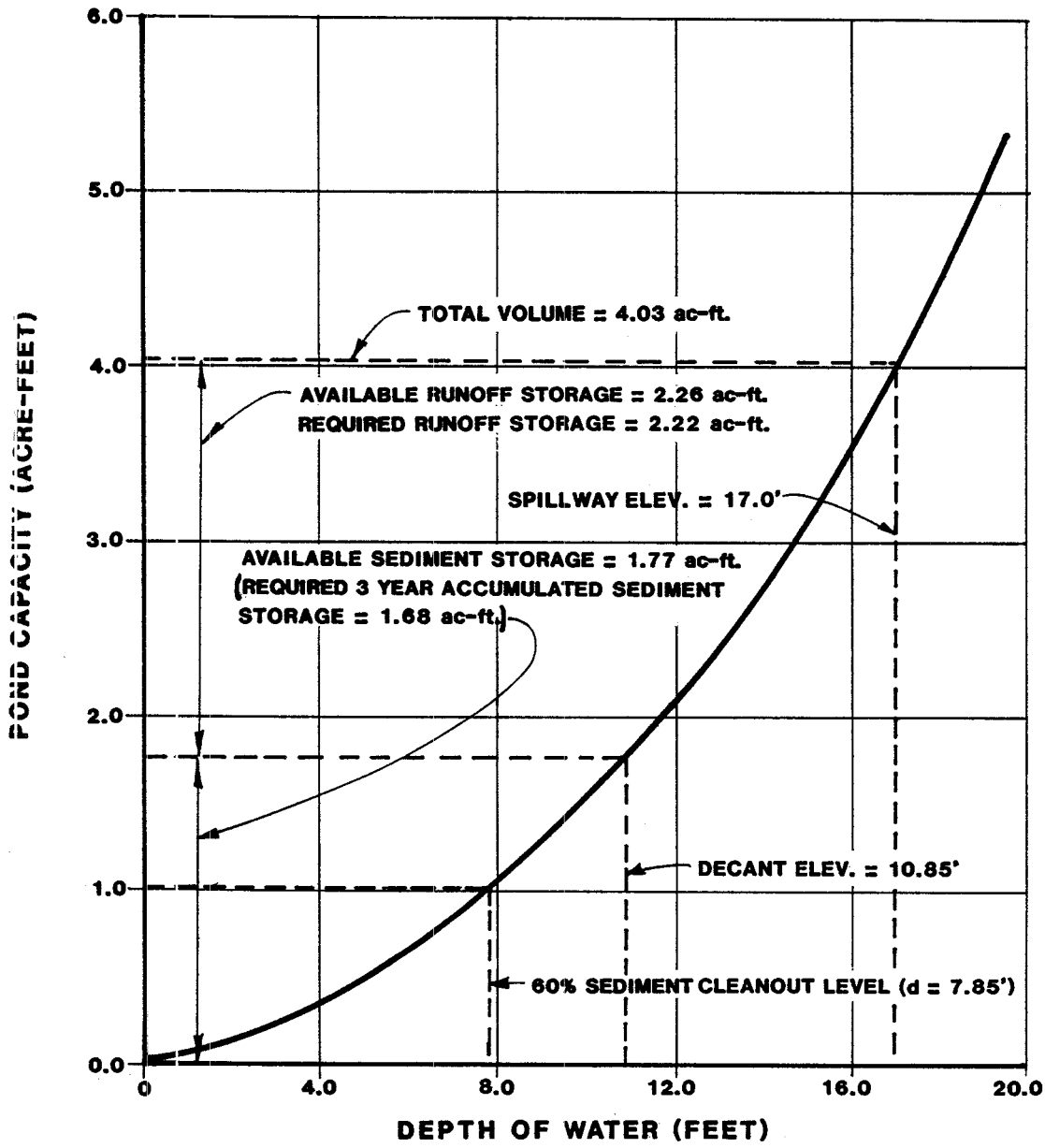
PLATEAU MINING COMPANY

STAGE-CAPACITY CURVE FOR SEDIMENT POND NO. 2

REVISED OCTOBER, 1987

FIGURE 30

STAGE-CAPACITY CURVE FOR SEDIMENT POND NO. 3



NOTE: TOTAL EMBANKMENT HEIGHT = 18.0 ft.

FIGURE 30

PLATEAU MINING COMPANY

STAGE-CAPACITY CURVE FOR SEDIMENT POND NO. 3

FIGURE 31

STAGE-CAPACITY CURVE FOR SEDIMENT POND NO. 4

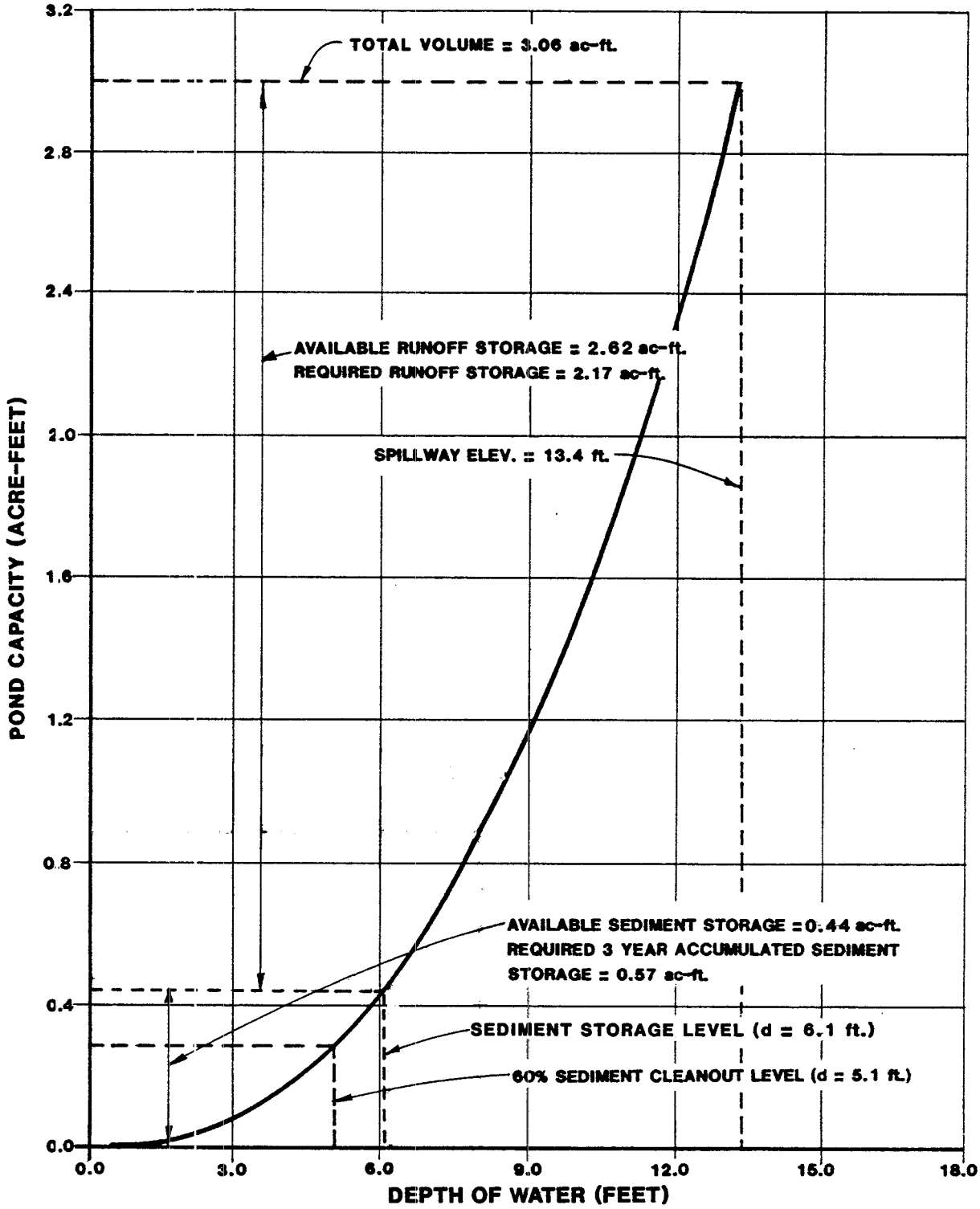


FIGURE 31

NOTE: TOTAL EMBANKMENT HEIGHT = 15.1 ft.

PLATEAU MINING COMPANY

STAGE-CAPACITY CURVE FOR SEDIMENTATION POND NO. 4

FIGURE 32

STAGE CAPACITY CURVE FOR SEDIMENT POND NO. 5

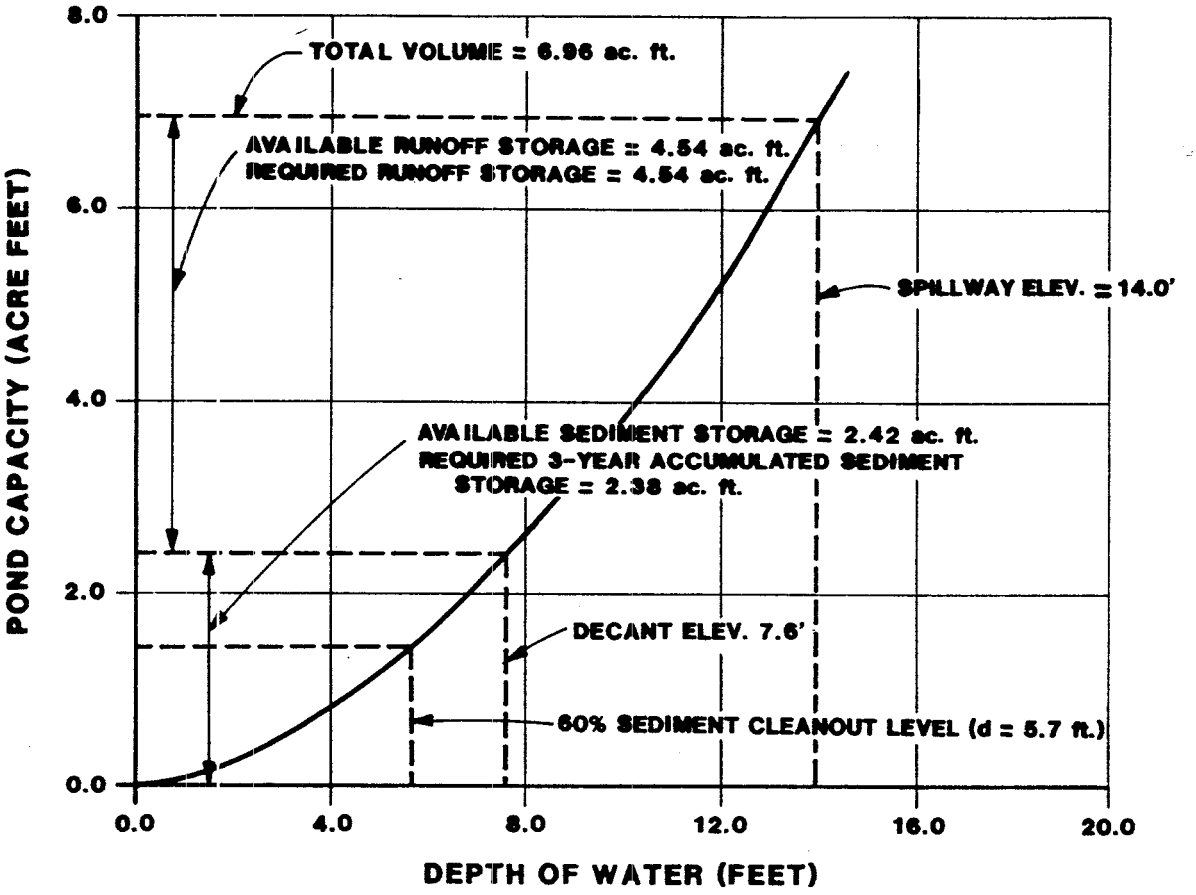


FIGURE 32

PLATEAU MINING COMPANY

STAGE-CAPACITY CURVE FOR SEDIMENTATION POND NO. 5

REVISED OCTOBER, 1987

FIGURE 33

STAGE-CAPACITY CURVE FOR SEDIMENT POND NO. 6

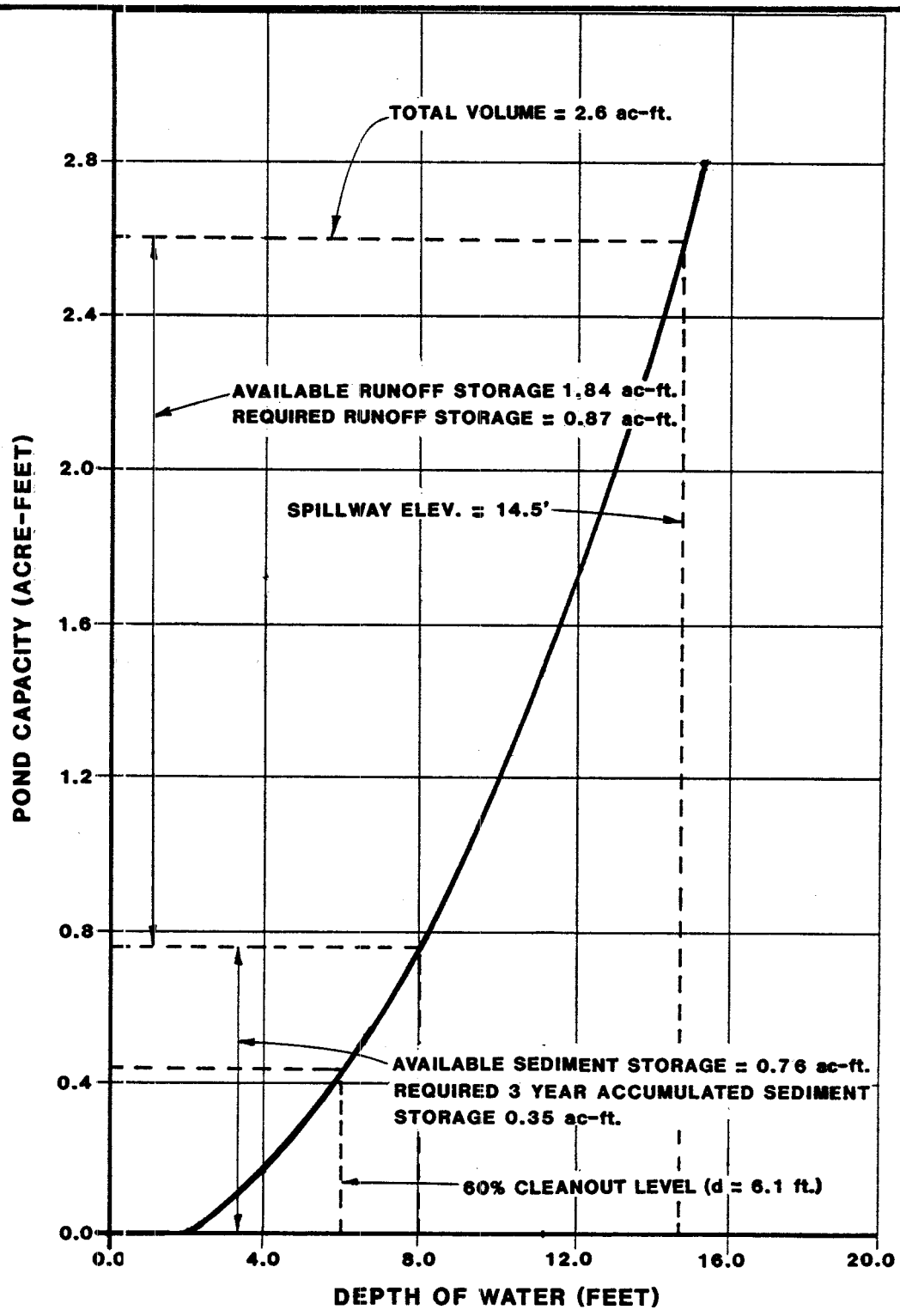


FIGURE 33

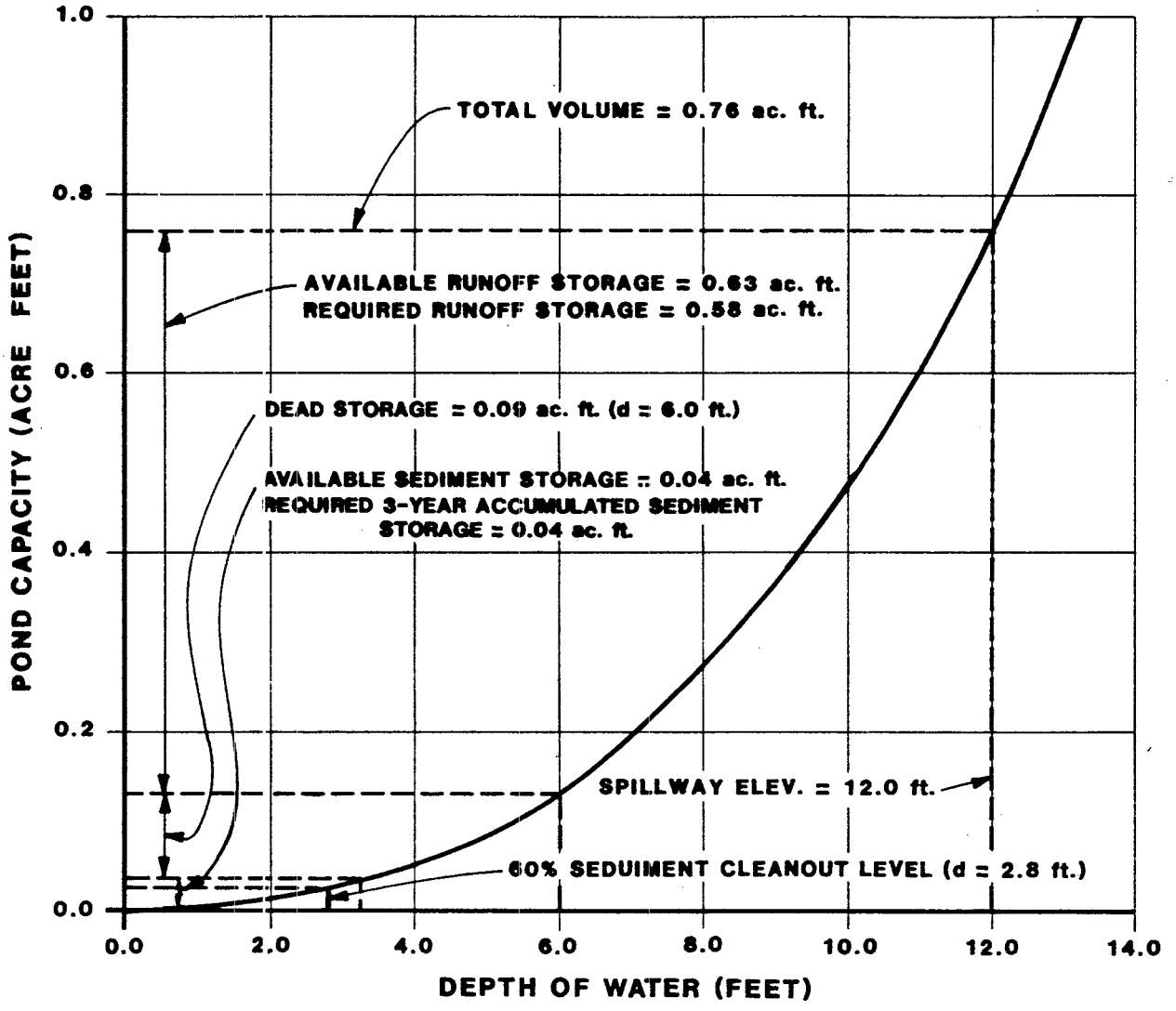
NOTE : TOTAL EMBANKMENT HEIGHT = 17.0'

PLATEAU MINING COMPANY

STAGE-CAPACITY CURVE FOR SEDIMENTATION POND NO. 6

FIGURE 34

STAGE-CAPACITY CURVE FOR SEDIMENT POND NO. 7



NOTE: TOTAL EMBANKMENT HEIGHT = 14.7 ft.

FIGURE 34

PLATEAU MINING COMPANY

STAGE-CAPACITY CURVE FOR SEDIMENT POND NO. 7

REVISED OCTOBER, 1987

FIGURE 35

STAGE-CAPACITY CURVE FOR SEDIMENT POND NO. 8

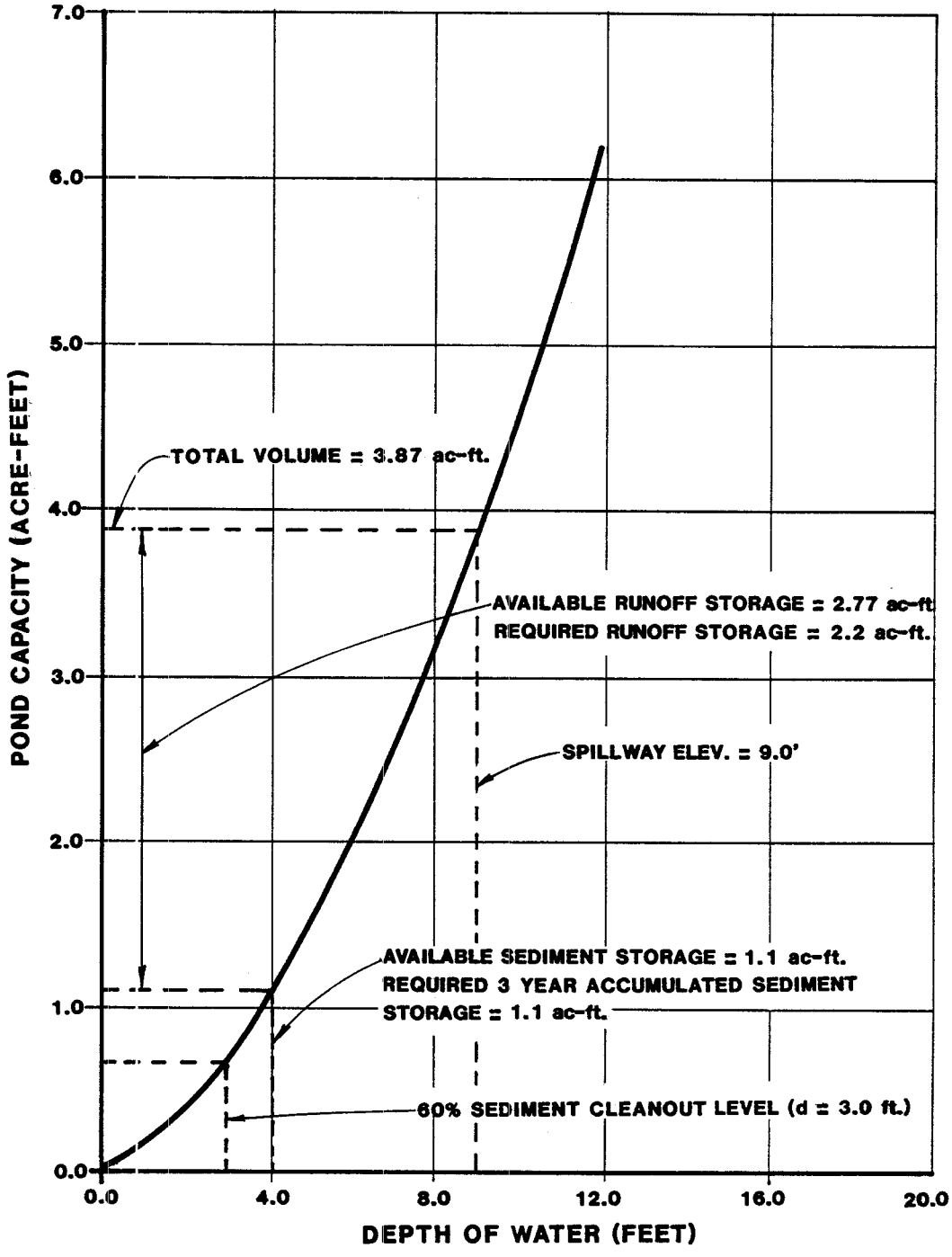


FIGURE 35

NOTE: TOTAL EMBANKMENT HEIGHT = 11.0 ft.

PLATEAU MINING COMPANY

STAGE-CAPACITY CURVE FOR SEDIMENTATION POND NO. 8

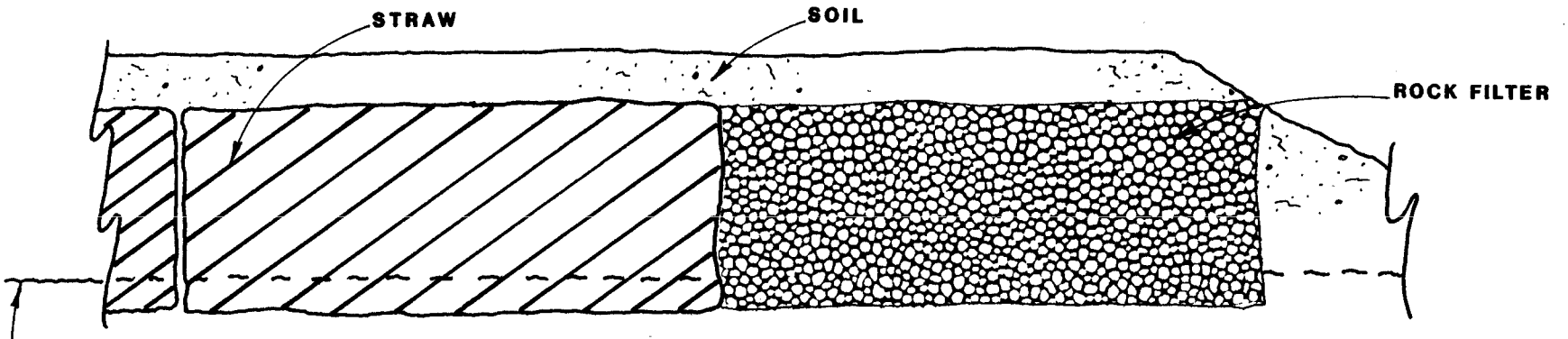
FIGURE 36

BERM CONSTRUCTION DETAIL

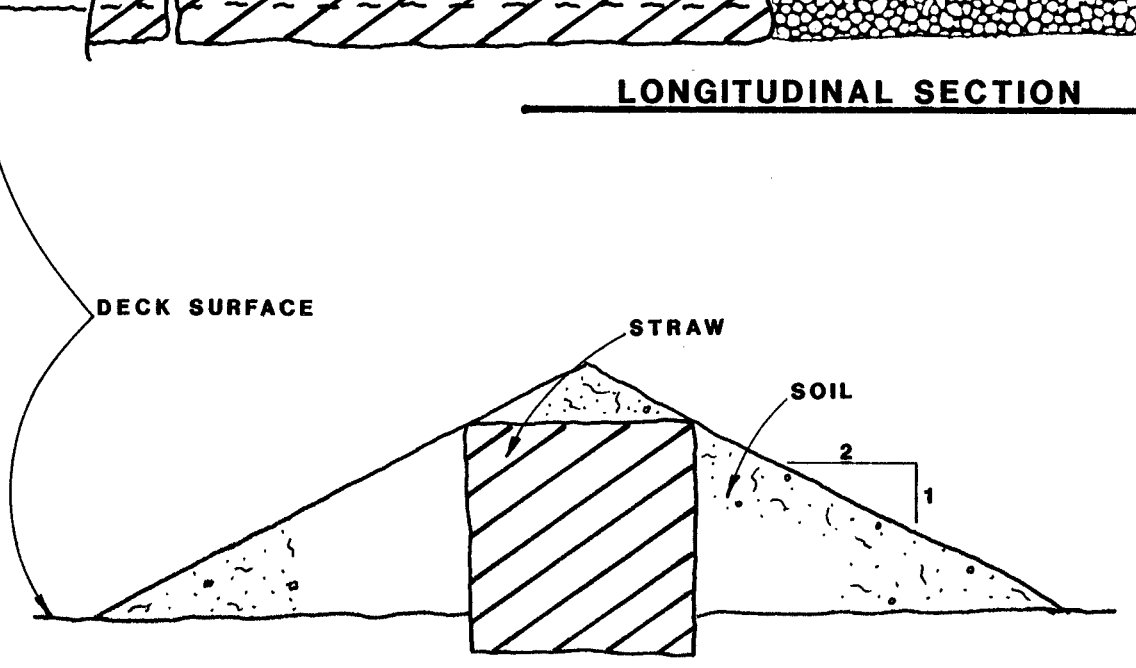
FIGURE 36

PLATEAU MINING COMPANY

BERM CONSTRUCTION DETAIL



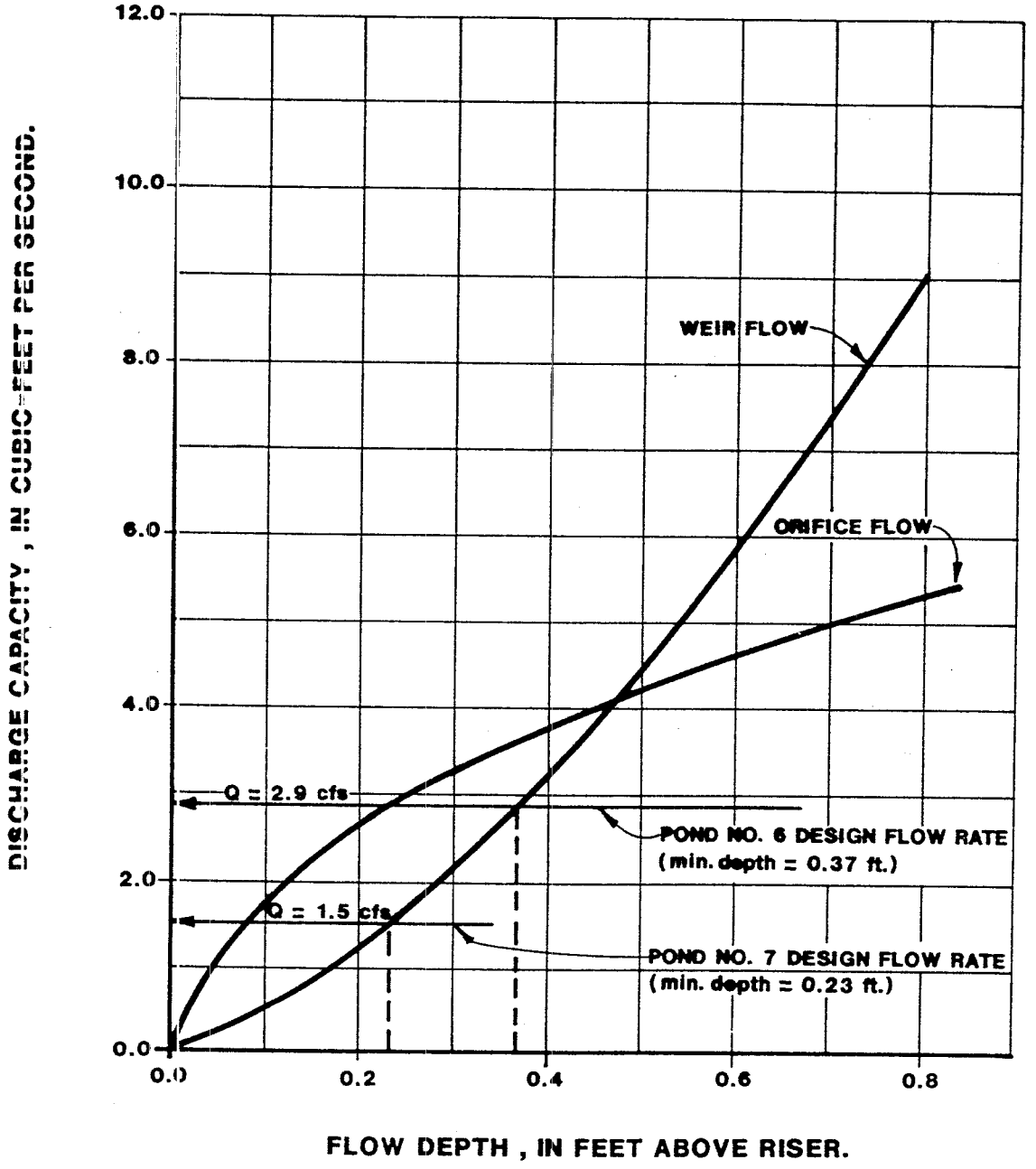
LONGITUDINAL SECTION



TRANSVERSE SECTION

FIGURE 37

STAGE DISCHARGE CURVES



NOTE: PIPE FLOW NOT LIMITING.

FIGURE 37

PLATEAU MINING COMPANY

STAGE-DISCHARGE CURVES FOR 15 INCH SPILLWAY RISER AND CONDUIT.

REVISED OCTOBER, 1987

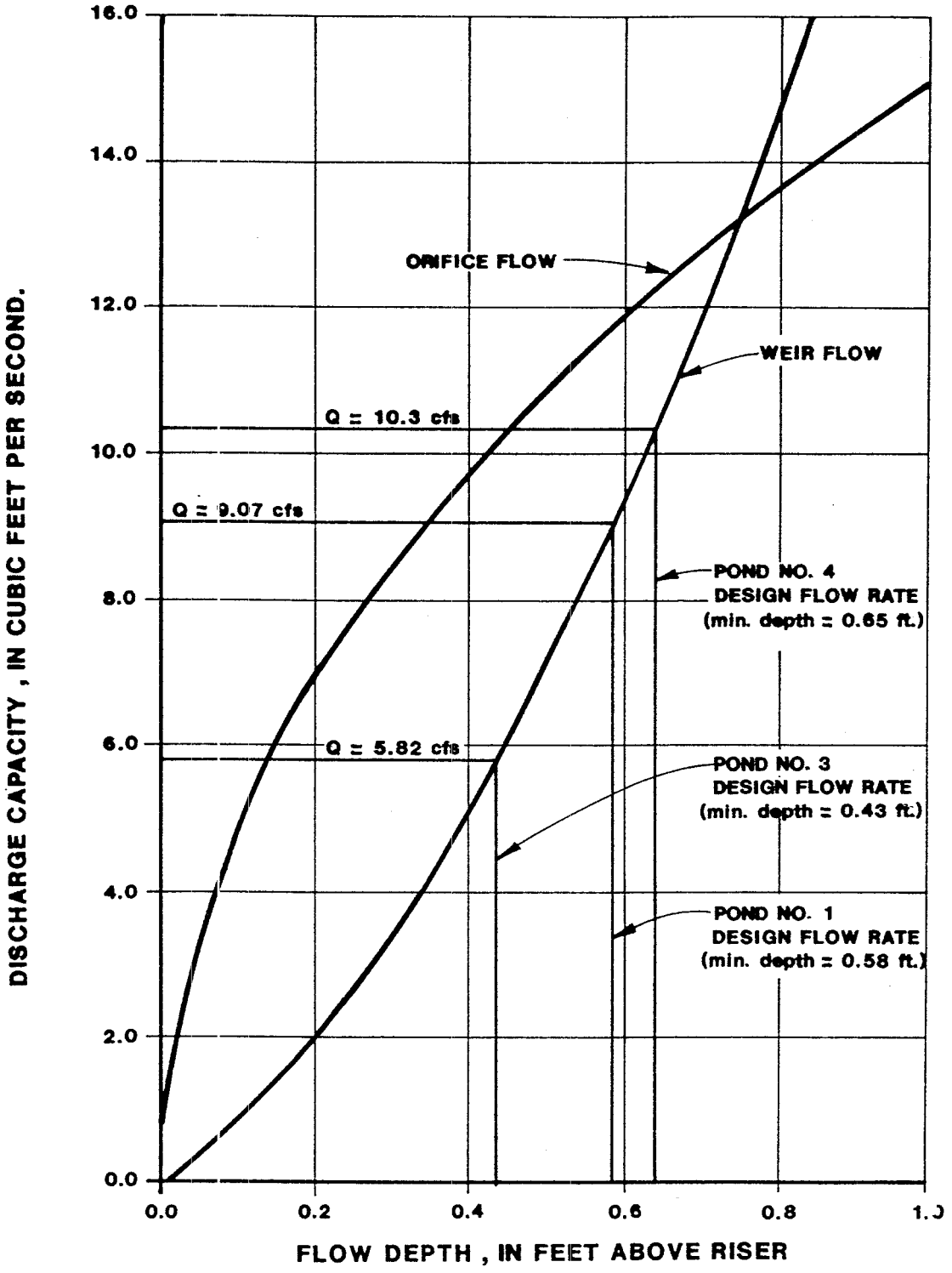


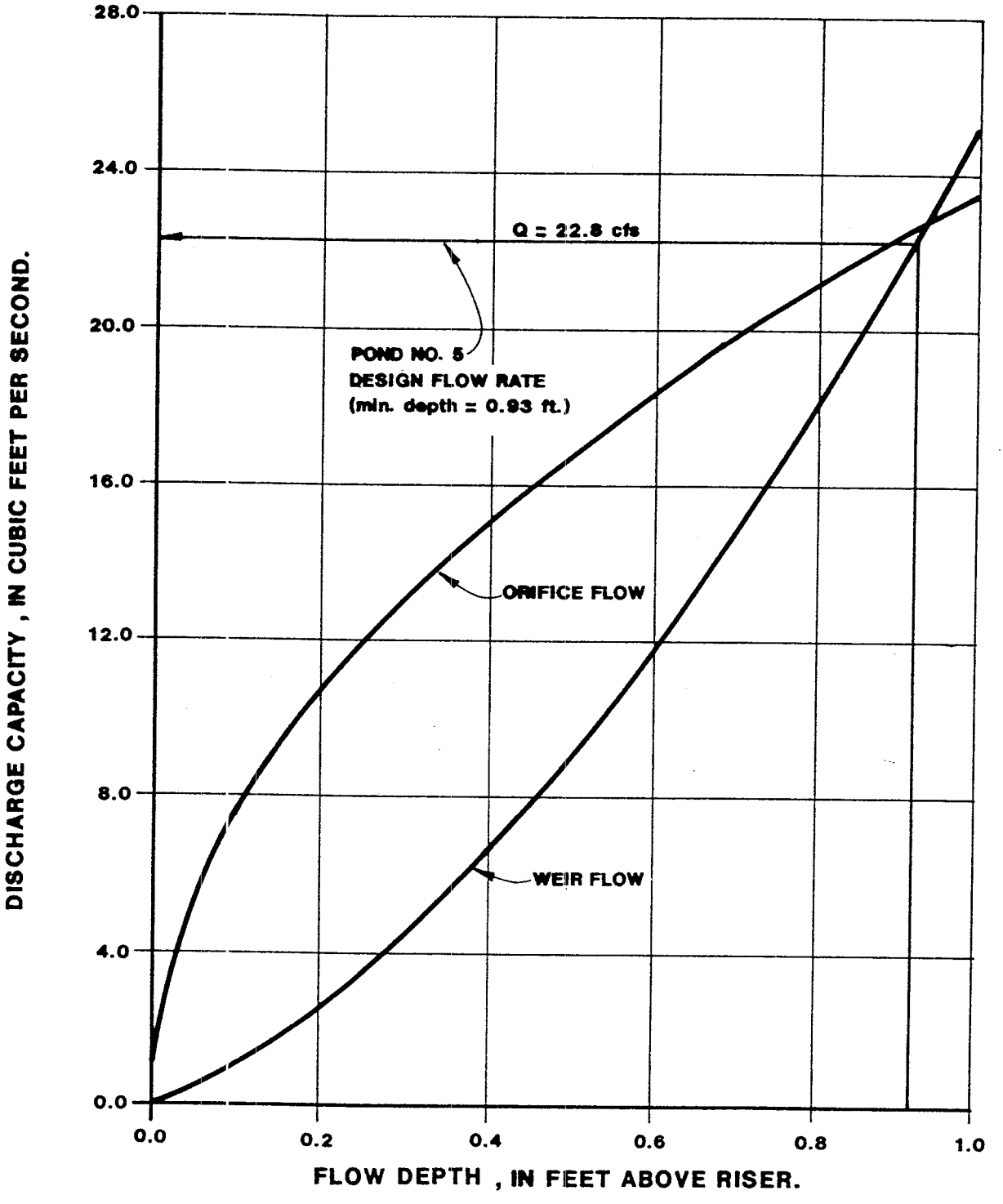
FIGURE 37

NOTE : PIPE FLOW NOT LIMITING.

PLATEAU MINING COMPANY

STAGE-DISCHARGE CURVES FOR 24 INCH SPILLWAY RISER AND CONDUIT.

REVISED OCTOBER, 1987



NOTE: PIPE FLOW NOT LIMITING.

FIGURE 37

PLATEAU MINING COMPANY

STAGE-DISCHARGE CURVE FOR 30 INCH SPILLWAY RISER AND CONDUIT.

REVISED OCTOBER, 1987

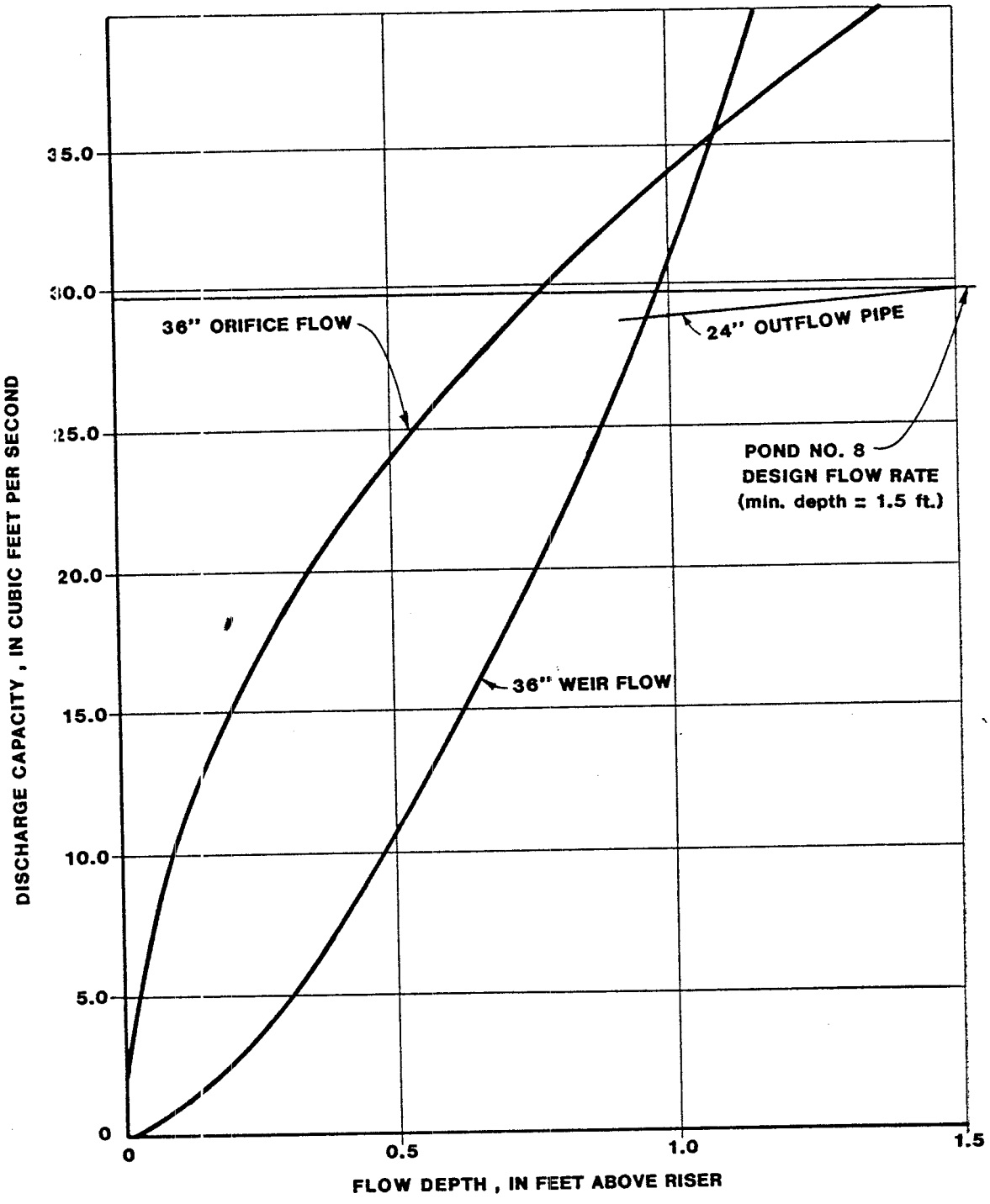


FIGURE 37

NOTE: PIPE FLOW GOVERNS AT AN APPROXIMATE FLOW DEPTH OF 0.93 ft.

PLATEAU MINING COMPANY

STAGE-DISCHARGE CURVES FOR 36 INCH SPILLWAY RISER and CONDUIT.

FIGURE 07

PLATEAU MINING COMPANY

STAGE-DISCHARGE RATING CURVES FOR SEDIMENTATION POND NO. 2

REVISED OCTOBER, 1987

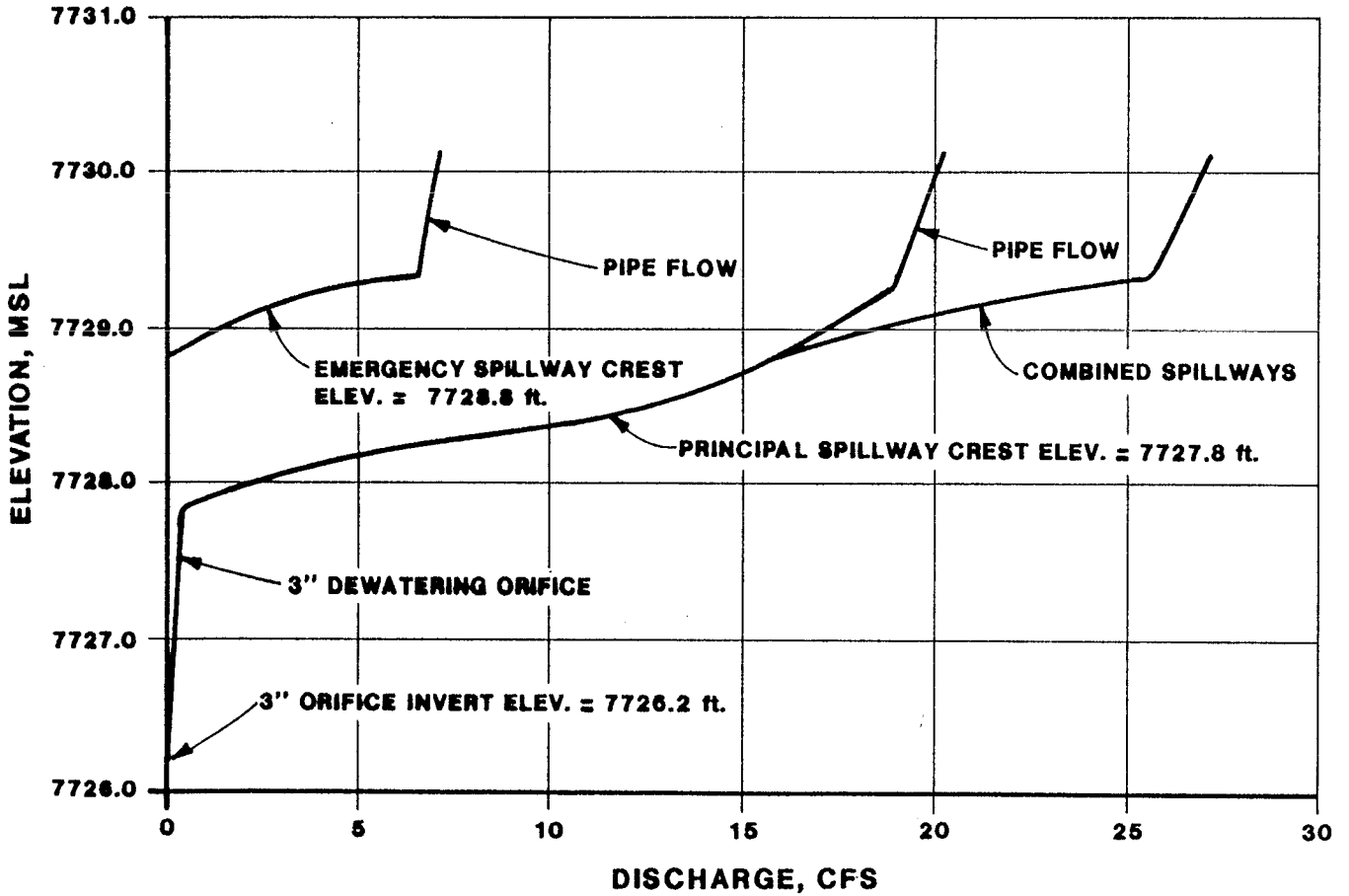


FIGURE 37

PLATEAU MINING COMPANY

STAGE-DISCHARGE RATING CURVES FOR SEDIMENT POND NO. 8

REVISED OCTOBER, 1987

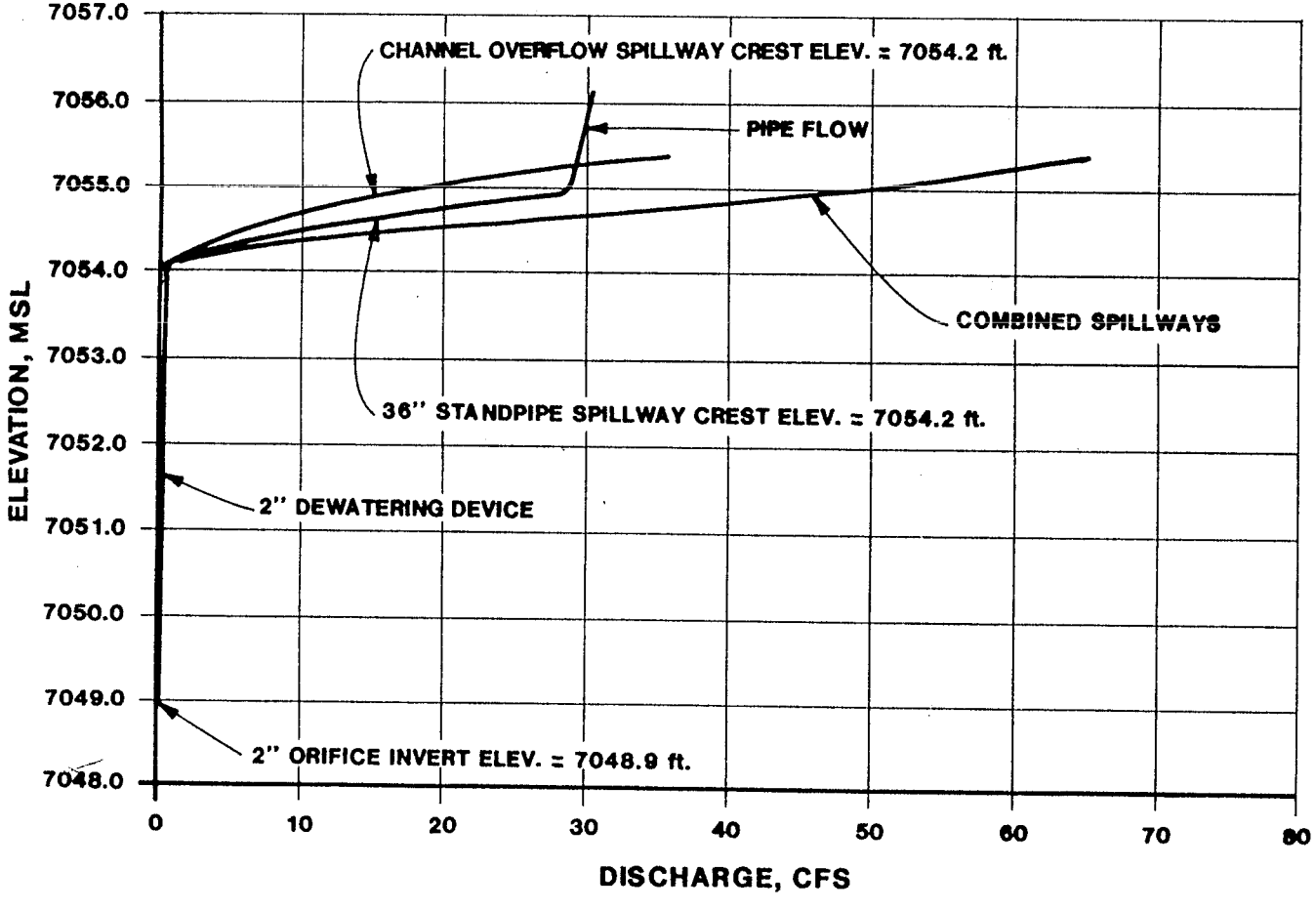


FIGURE 37

PLATEAU MINING COMPANY

STAGE-DISCHARGE RATING CURVES FOR SEDIMENT POND NO. 9

REVISED OCTOBER, 1987

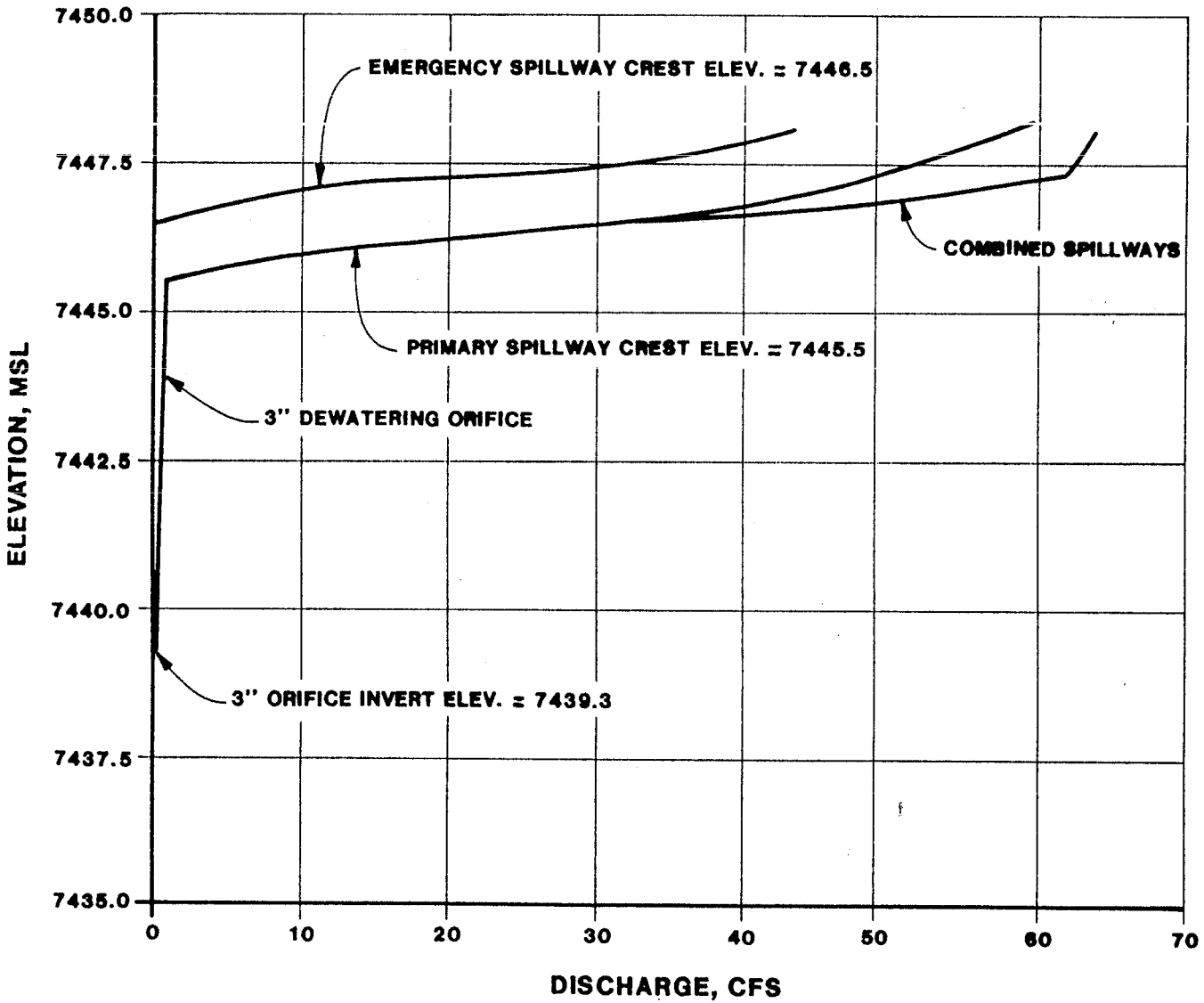


FIGURE 38

Section 18, T 15 S, R 8 E.

SUBSIDENCE PREDICTION - MINING WATTIS SEAM

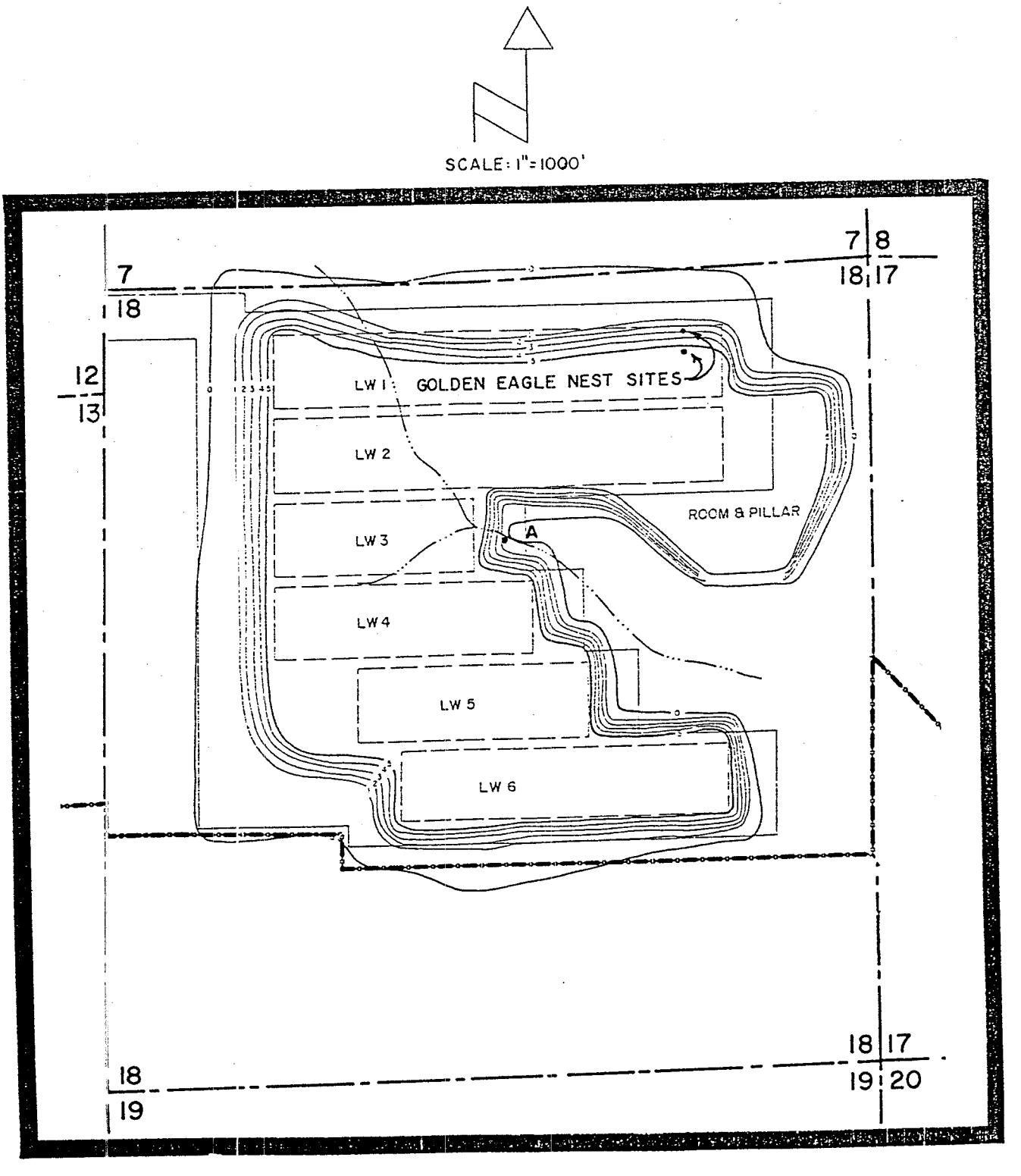
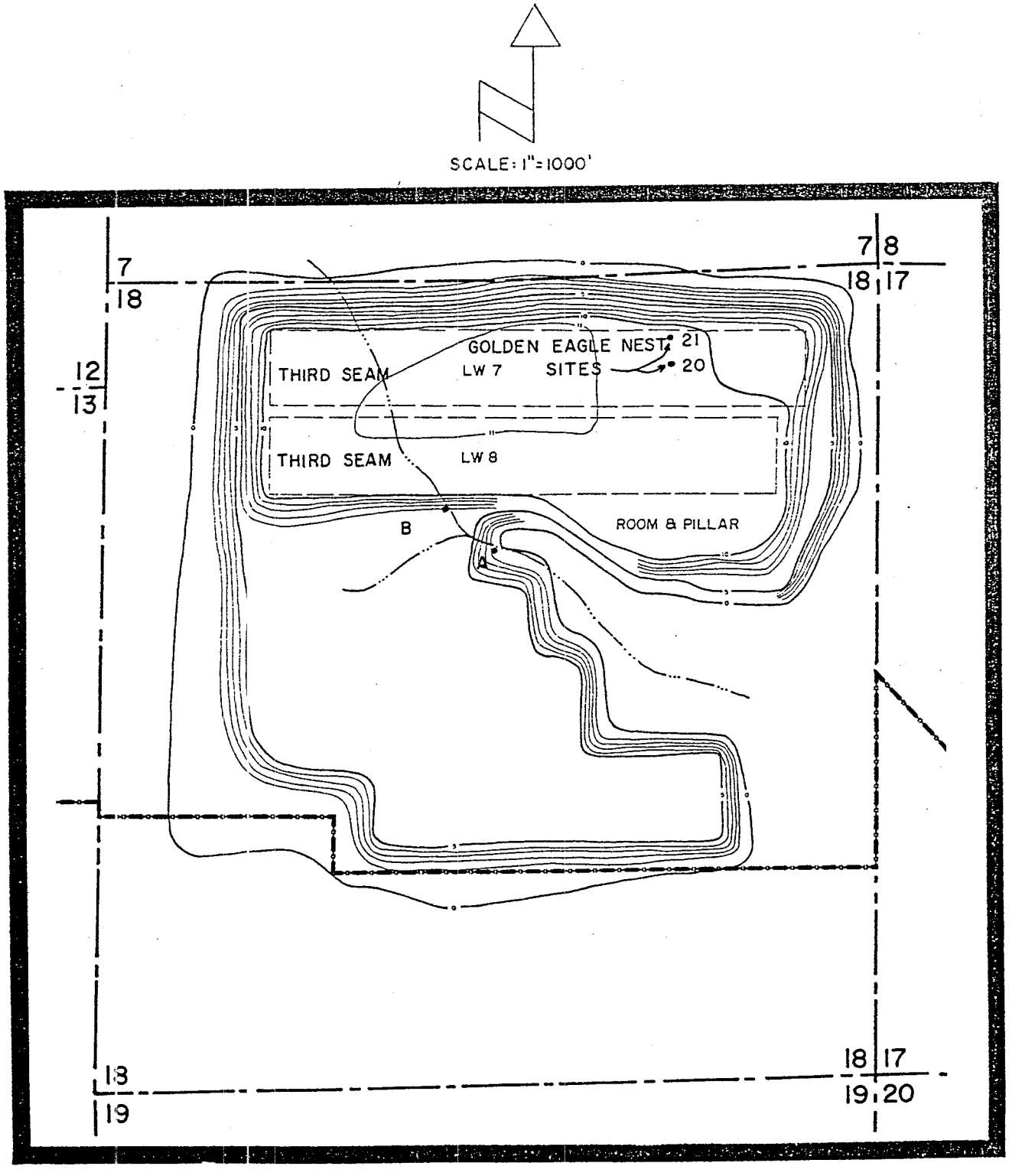
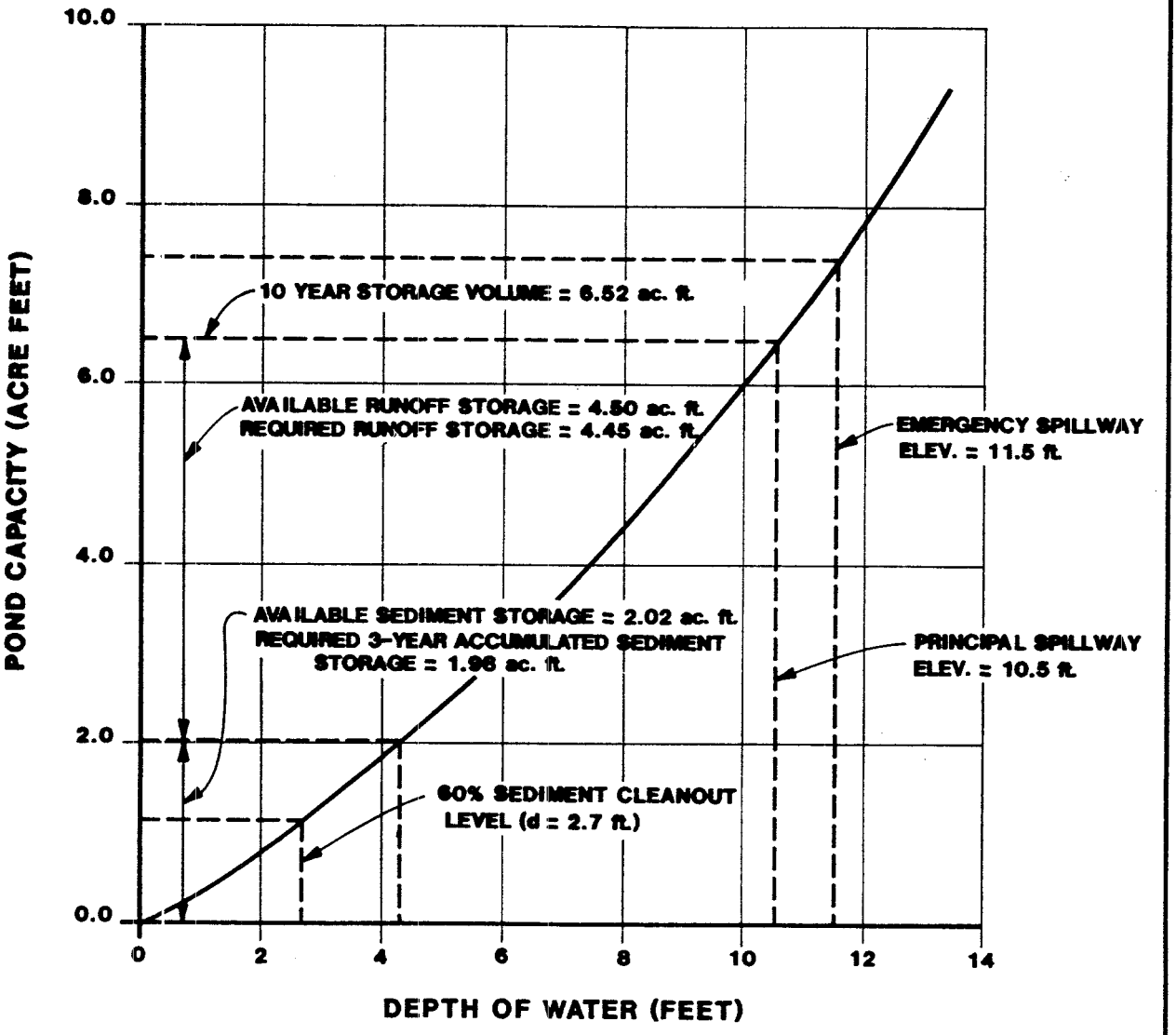


FIGURE 39

Section 18, T 15 S, R 8 E.

SUBSIDENCE PREDICTION - MINING WATTIS AND THIRD SEAMS



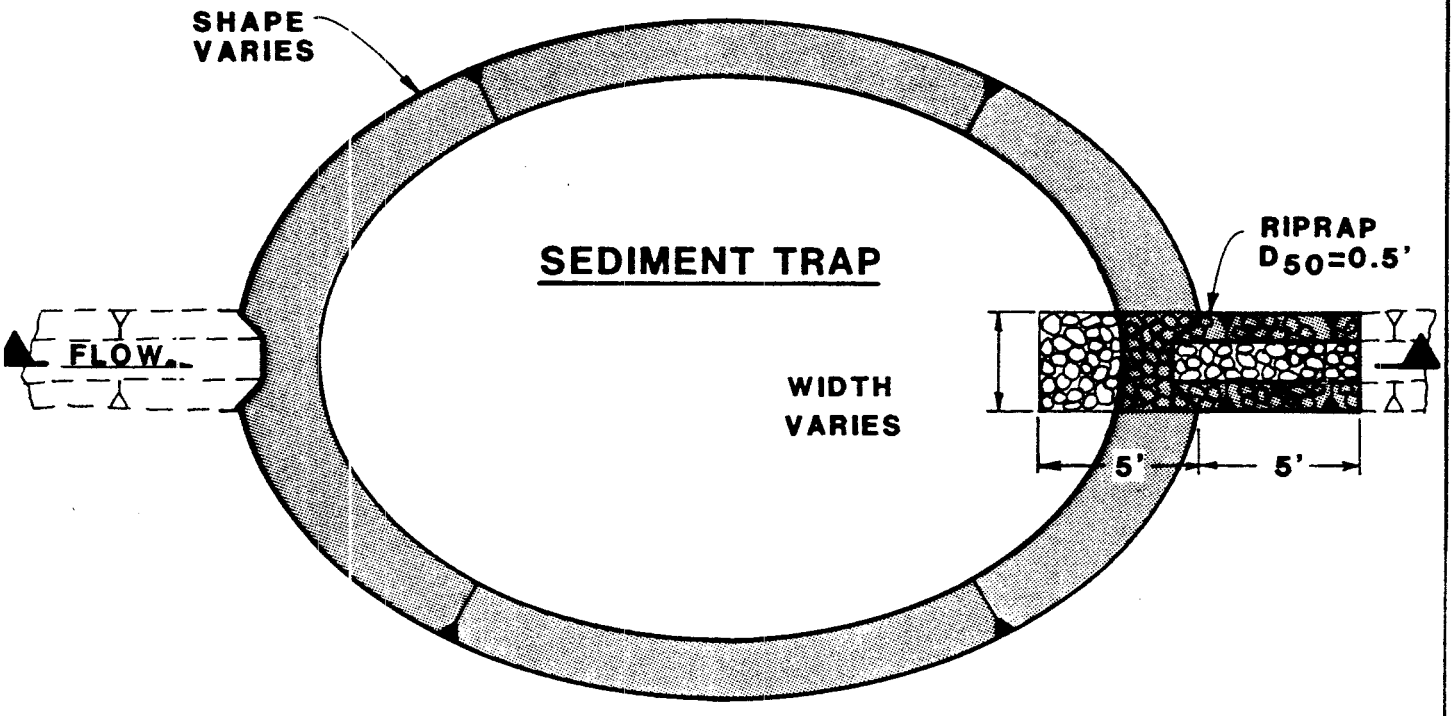


NOTE: TOTAL EMBANKMENT HEIGHT = 13.0 ft.

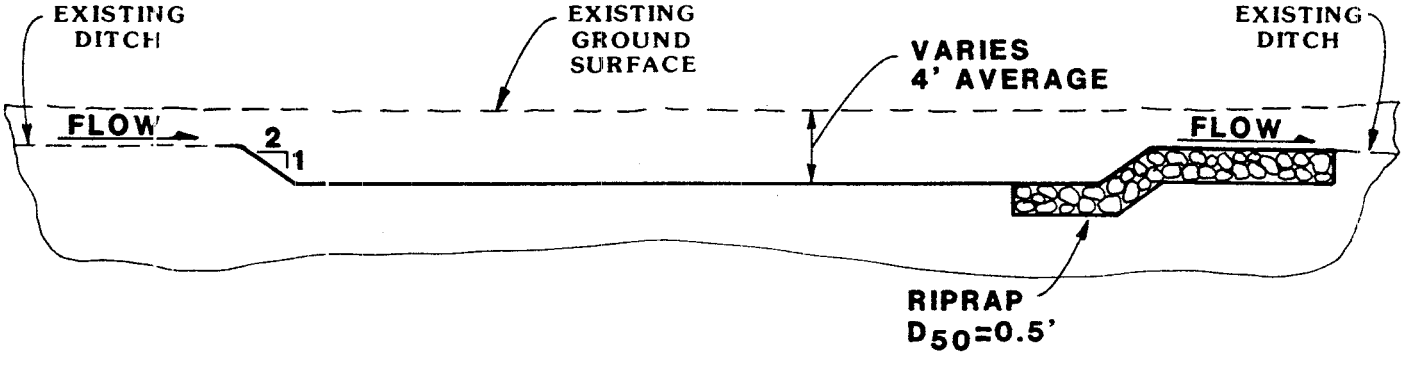
FIGURE 41

PLATEAU MINING COMPANY

STAGE CAPACITY CURVE FOR SEDIMENTATION POND NO. 9



PLAN VIEW



SECTION

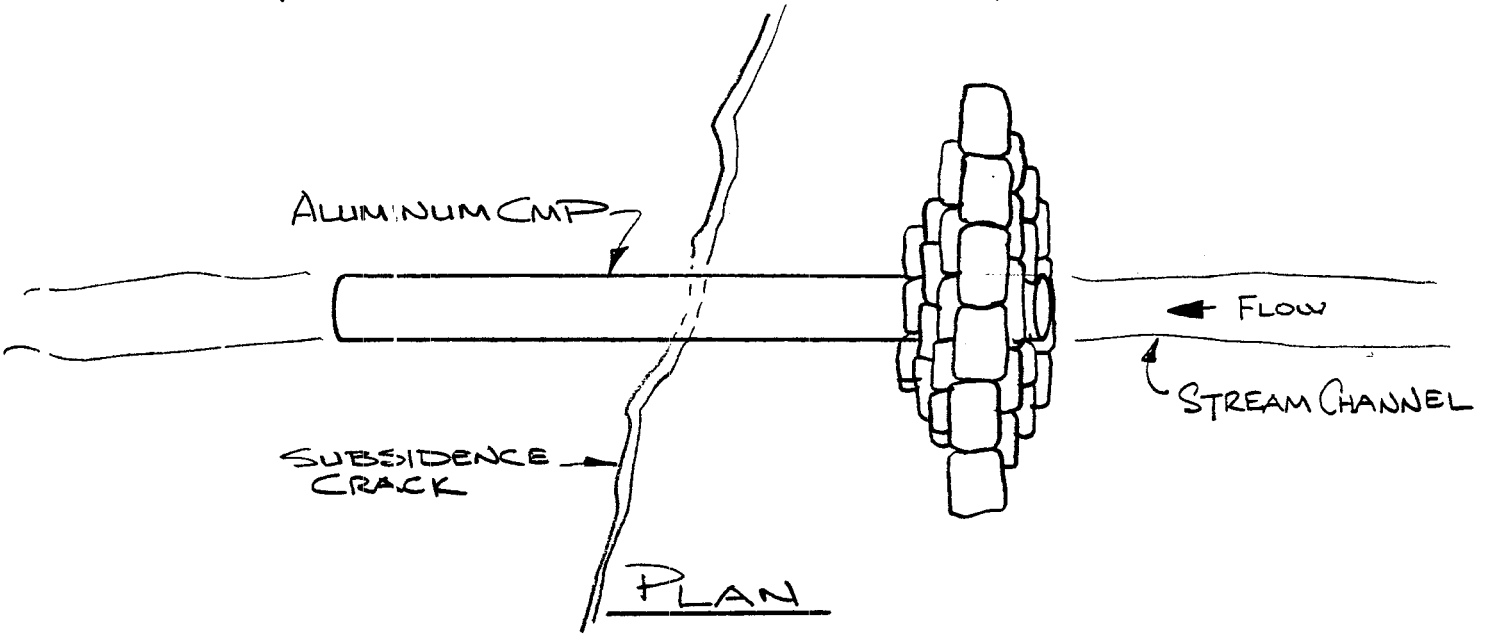
NOTE:

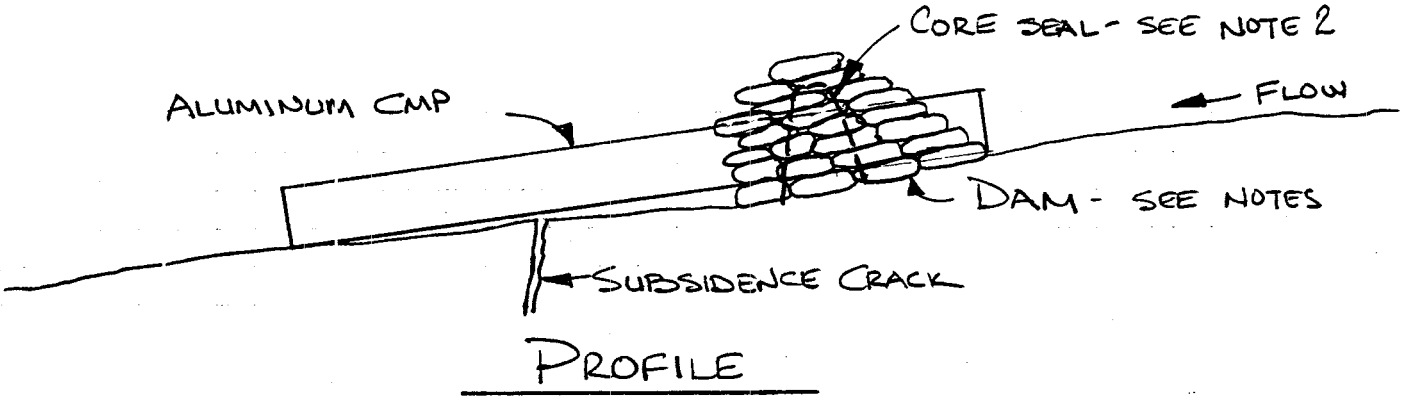
SEDIMENT TRAP OUTLET VARIES AT SOME LOCATIONS WHICH USE PIPE CULVERT OUTLET IN LIEU OF RIPRAP CHANNEL SHOWN.

FIGURE 42

PLATEAU MINING COMPANY
TYPICAL SEDIMENT TRAP DETAIL

FIGURE 43
STREAM DIVERSION STRUCTURE





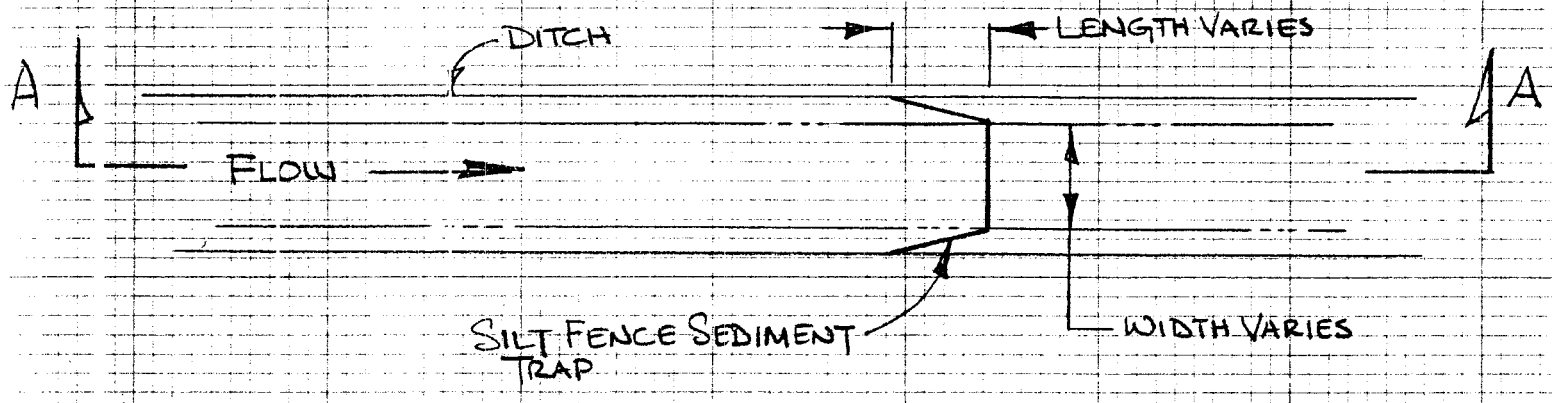
NOTES:

1- DAM CONSTRUCTED WITH FABRIC BAGS FILLED WITH CEMENT MIX, HAND PLACED AND WET DOWN ON SITE.

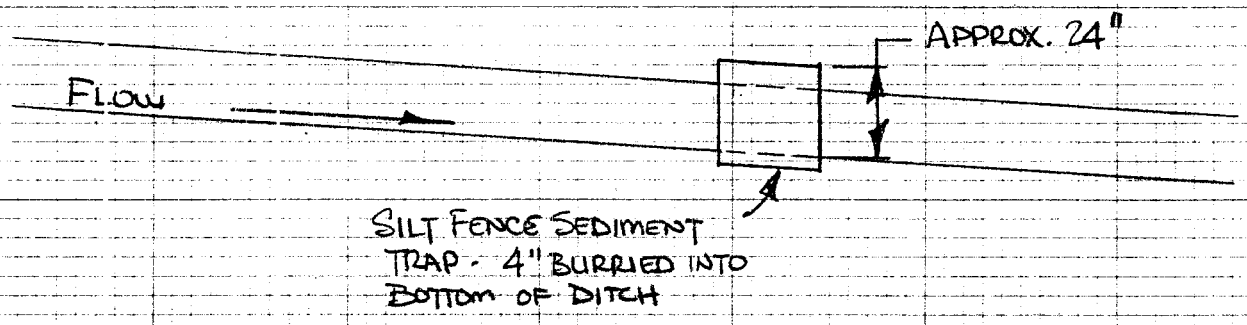
2- CORE SEAL AROUND PIPE INSIDE DAM CONSTRUCTED WITH CEMENT MIXED BY HAND ON SITE.

3- MATERIALS TRANSPORTED TO SITE BY HELICOPTER.

FIGURE 44
TYPICAL SILT FENCE SEDIMENT TRAP DETAIL



PLAN VIEW



SECTION A-A

NOTES:

1- SILT FENCE FABRIC TO BE ATTACHED TO WOODEN STAKES OR STEEL STAKES.

2- ANCHOR WING WALL SIDES OF THE TRAP INTO THE SIDES OF THE DITCH.

3- IF REINFORCING MATERIAL IS PROVIDED WITH FABRIC, PLACE IT ON DOWNSTREAM SIDE.

NOT TO SCALE

LIST OF EXHIBITS

No.	Title
1.	Bibliography
2.	Certificate of Insurance
3.	Proof of Publication
4.	Historical and Cultural Resources
5.	U.S. Geological Survey Data
6.	Laboratory Methods Used For Sample Analysis
7.	1985 and 1986 Water Quality Data
8.	Vegetation Information
9.	Terrestrial Wildlife
10.	Plateau Unit Train Loadout Expansion Area Wildlife Mitigation Plan
11.	An Inventory of the Terrestrial Wildlife of Corner Canyon
12.	Fish and Wildlife Resource Information
13.	Report on the Birds of the Proposed Mining Development Plan
14.	Wildlife Correspondence
15.	Mine Structure Photographs
16.	Aquatic Resources of Plateau Mine Permit Area
17.	Aquatic Resources Description of Tie Fork Creek and Tributary Streams, Gentry and Wild Cattle Hollows
18.	Mule Deer Passage Beneath an Overland Coal Conveyer
19.	Soils Information
20.	Prime Farmland Determination Correspondence
21.	Coal Handling Facilities (Unit Train)
22.	Coal Processing Waste Pile Extension Plan and Feasibility Study
23.	Treatment of Underflow from Thickener Tank Using Settling Ponds
24.	Pre-existing, Non-conforming Structures at the Wattis Mine Site
25.	Hydrology - Access Road - Unit Train Loadout Pad
26.	Inflow Hydrographs and Routing Calculations for Pond No. 5
27.	Water Surface Profiles for Ditch No. 14 Energy Dissipation Basin

Revised 2-10-90

LIST OF EXHIBITS (Continued)

No.	Title
28.	Thickener Underflow Design Details (7 maps)
29.	NPDES Discharge Water Quality Data Summaries
30.	Prediction of Subsidence Due to Two-Seam Longwall Mining in Section 18
31.	Sedimentation Pond Approval, Documentation and Certification
32.	Pond Detention Calculations
33.	Star Point Mines Refuse Pile Expansion - Operation and Monitoring Plan
34.	Air Quality Approval Correspondence
35.	Reclamation Bond
36.	Bond Calculations
37.	NPDES Permit
38.	Refuse Pile Stability Analysis
39.	Resource Recovery and Protection Plan Approvals
40.	An Annotated Literature Review on the Effects of Mulching on Surface Disturbances Associated with Reclamation in the Western States with Emphasis on Plant Establishment Water and Wind Erosion
41.	Golden Eagle Cliff Nesting and Subsidence Monitoring and Mitigation Plan
42.	Sediment Pond No. 2 Energy Dissipation Structure
43.	Water Rights Mitigation Plan
44.	Static Safety Factor on Reclaimed Areas Investigation
45.	Riprap Calculations
46.	Culvert Capacity Calculations
47.	Pond Inlet and Outlet Design Calculation
48.	Pond 9 Calculations
49.	Diversion Ditch and Culvert Peak Flow Calculations

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LIST OF EXHIBITS (Continued)

No.	Title
50.	Reclamation Channel Calculations
51.	An Evaluation of the Toxic and Acid Forming Properties of Overburden and Coal Refuse Materials
52.	Response to Initial Completeness Review Comment UMC 784.14(a)(1) Permit Renewal - August 1987
53.	Hydrologic Response to Land Subsidence Caused by Underground Coal Mining, Miller Creek Drainage, Carbon County, Utah
54.	Hydrologic Modifications
55.	Exploration Permits

EXHIBIT 1

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EXHIBIT 2

CERTIFICATE OF INSURANCE

ACORD CERTIFICATE OF INSURANCE

ISSUE DATE (MM/DD) 10/09/89

PRODUCER

FRED. S. JAMES & CO., INC.
P. O. BOX 19810
Knoxville, TN 37939
(615) 584-2222

CODE SUB-CODE

THIS CERTIFICATE IS ISSUED AS A MATTER OF INFORMATION ONLY AND CONFERS NO RIGHTS UPON THE CERTIFICATE HOLDER. THIS CERTIFICATE DOES NOT AMEND, EXTEND OR ALTER THE COVERAGE AFFORDED BY THE POLICIES BELOW.

COMPANIES AFFORDING COVERAGE

COMPANY LETTER A	A: NATIONAL UNION FIRE INS. CO.
COMPANY LETTER B	B:
COMPANY LETTER C	C:
COMPANY LETTER D	D:
COMPANY LETTER E	E:

INSURED

CYPRUS MINERALS CO.
AND ITS SUBSIDIARY CO.
P. O. BOX 3299
ENGLEWOOD, CO 80155

COVERAGES

THIS IS TO CERTIFY THAT POLICIES OF INSURANCE LISTED BELOW HAVE BEEN ISSUED TO THE INSURED NAMED ABOVE FOR THE POLICY PERIOD INDICATED. NOTWITHSTANDING ANY REQUIREMENT, TERM OR CONDITION OF ANY CONTRACT OR OTHER DOCUMENT WITH RESPECT TO WHICH THIS CERTIFICATE MAY BE ISSUED OR MAY PERTAIN, THE INSURANCE AFFORDED BY THE POLICIES DESCRIBED HEREIN IS SUBJECT TO ALL THE TERMS, EXCLUSIONS, AND CONDITIONS OF SUCH POLICIES. LIMITS SHOWN MAY HAVE BEEN REDUCED BY PAID CLAIMS.

CO LTR	TYPE OF INSURANCE	POLICY NUMBER	POLICY EFFECTIVE DATE (MM/DD/YY)	POLICY EXPIRATION DATE (MM/DD/YY)	ALL LIMITS IN THOUSANDS	
	GENERAL LIABILITY					
	C COMMERCIAL GENERAL LIABILITY				GENERAL AGGREGATE	$ 4000
	C [X] CLAIMS MADE [ ] OCCURRENCE				PRODUCTS-COMP/OPS AGGREGATE	$ 2000
A	CP OWNER'S & CONTRACTOR'S PROTECTIVE	RMGLA4596951	07/01/89	07/01/90	PERSONAL & ADVERTISING INJURY	$ 2000
	X - ~~PRODUCT/VENDOR~~				EACH OCCURRENCE	$ 2000
	X - ~~XCU/Subsidence~~				FIRE DAMAGE (ANY ONE FIRE)	$ 2000
					MEDICAL EXPENSE (ANY ONE PERSON)	$ 0
	AUTOMOBILE LIABILITY					
	A ANY AUTO				COMBINED SINGLE LIMIT	$ 1000
	A ALL OWNED AUTOS					
	SCHEDULED AUTOS				BODILY INJURY (PER PERSON)	$ 0
A	HIRED AUTOS	RMBA1459616	07/01/89	07/01/90		
	NON-OWNED AUTOS				BODILY INJURY (PER ACCIDENT)	$ 0
	GARAGE LIABILITY					
					PROPERTY DAMAGE	$ 0
	EXCESS LIABILITY				EACH OCCURRENCE	AGGREGATE
			/ /	/ /	$ 0	$ 0
	OTHER THAN UMBRELLA FORM					
	WORKERS' COMPENSATION AND EMPLOYERS' LIABILITY		/ /	/ /	STATUTORY	
					$ 0 (EACH ACCIDENT)	
					$ 0 (DISEASE-POLICY LIMIT)	
					$ 0 (DISEASE-EACH EMPLOYEE)	
	OTHER		/ /	/ /		

DESCRIPTION OF OPERATIONS/LOCATIONS/VEHICLES/RESTRICTIONS/SPECIAL ITEMS

CYPRUS PLATEAU MINING CORPORATION

CERTIFICATE HOLDER

STATE OF UTAH, DIV./OIL & GAS
355 N.W. TEMPLE
3 TRIAD CENTER, SUITE 350
SALT LAKE CITY, UT 84180

CANCELLATION

SHOULD ANY OF THE ABOVE DESCRIBED POLICIES BE CANCELLED BEFORE THE EXPIRATION DATE THEREOF, THE ISSUING COMPANY WILL ENDEAVOR TO MAIL 30 DAYS WRITTEN NOTICE TO THE CERTIFICATE HOLDER NAMED TO THE LEFT, BUT FAILURE TO MAIL SUCH NOTICE SHALL IMPOSE NO OBLIGATION OR LIABILITY OF ANY KIND UPON THE COMPANY, ITS AGENTS OR REPRESENTATIVES.

AUTHORIZED REPRESENTATIVE

Fred W. James

© ACORD CORPORATION 1988

August 1988

CERTIFICATE OF LIABILITY INSURANCE
Issued To:
State of Utah
Department of Natural Resources
Division of Oil, Gas and Mining
--ooOOoo--

THIS IS TO CERTIFY THAT:

National Union Fire Insurance Company of Pittsburgh, PA
(Name of Insurance Company)

70 Pine Street, New York, New York 10270
(Home Office Address of Insurance Company)

HAS ISSUED TO:

Cyprus Plateau Mining Corporation
(Name of Permit Applicant)

Star Point Mines
(Mine Name)

ACT/007/006
(Permit Number)

CERTIFICATE OF INSURANCE:

RMGLA4596951
(Policy Number)

July 1, 1989
(Effective Date)

UNDER THE FOLLOWING TERMS AND CONDITIONS:

Per UMC/SMC Part 800.60 Terms and Conditions for Liability Insurance;

A. The Division shall require the applicant to submit as part of its permit application a certificate issued by an insurance company authorized to do business in the state of Utah certifying that the applicant has a public liability insurance policy in force for the surface coal mining and reclamation operations for which the permit is sought. Such policy shall provide for personal injury and property damage protection in an amount adequate to compensate any persons injured or property damaged as a result of the surface coal mining and reclamation operations, including the use of explosives and who are entitled to compensation under the applicable provisions of state law. Minimum insurance coverage for bodily injury and property damage shall be $300,000 for each occurrence and $500,000 aggregate.

B. The policy shall be maintained in full force during the life of the permit or any renewal thereof, including the liability period necessary to complete all reclamation operations under this chapter.

C. The policy shall include a rider requiring that the insurer notify the Division whenever substantive changes are made in the policy including any termination or failure to renew.

IN ACCORDANCE WITH THE ABOVE TERMS AND CONDITIONS, and the Utah Code Annotated 40-10-1 et seq., the Insurance Company hereby attests to the fact that coverage for said Permit Application is in accordance with the requirements of the State of Utah and agrees to notify the Division of Oil, Gas and Mining in writing of any substantive change, including cancellation, failure to renew, or other material change. No change shall be effective until at least thirty (30) days after such notice is received by the Division. Any change unauthorized by the Division is considered breach of the RECLAMATION AGREEMENT and the Division may pursue remedies thereunder.

UNDERWRITING AGENT:

Becky Rowland (Account Executive) — 404-671-2000
(Agent's Name) — (Phone)

National Union Fire Insurance Co.
(Company Name)

5 Concourse Parkway, Suite 900 — Atlanta, GA 30328
(Mailing Address) — (City, State, Zip Code)

August 1988
CERTIFICATE OF LIABILITY INSURANCE

The undersigned affirms that the above information is true and complete to the best of his or her knowledge and belief, and that he or she is an authorized representative of the above-named insurance company. (An Affidavit of Qualification must be completed and attached to this form for each authorized agent or officer.)

8-28-89 Fred W. Smith - Vice President
(Date, Signature and Title of Authorized Agent of Insurance Company)

Signed and sworn before me by Fred W. Smith, III

this 28th day of August, 19 89.

Angela W. Rose
(Signature)

My Commission Expires: June 17, 1991
(Date) AHR FWS

EXHIBIT 3

PROOF OF PUBLICATION

AFFIDAVIT OF PUBLICATION

STATE OF UTAH
County of Emery, } ss.

I, Dan Stockburger, on oath, say that I am the General Manager of The Emery County Progress, a weekly newspaper of general circulation, published at Castle Dale, State and County aforesaid, and that a certain notice, a true copy of which is hereto attached, was published in the full issue of such newspaper for Four (4) consecutive issues, and that the first publication was on the 2nd day of June, 19 87 and that the last publication of such notice was in the issue of such newspaper dated the 23rd day of June, 19 87

Dan Stockburger

Subscribed and sworn to before me this 23rd day of June, 19 87

Holly J. Baker
Notary Public.

My Commission expires MY COMMISSION EXPIRES OCTOBER 22, 1990

Residing at Price, Utah

Publication fee, $ 146.40.

NOTICE OF APPLICATION
FOR PERMIT
PLATEAU MINING COMPANY

Notice is hereby given that Plateau Mining Company, P.O. Drawer PMC, Price, Utah 84501, a wholly owned subsidiary of Cyprus Western Coal Equipment Company, 7200 Alton Way, Englewood, Colorado 80112, has submitted an application to the State of Utah, Department of Natural Resources, Division of Oil, Gas and Mining, for a permit to add five new areas to its existing permit (ACT/007/006) to mine under the provisions of the Utah Coal Mining and Reclamation Act (Utah Code Annotated 40-10-1 et. seq.) and the Utah Coal Program Regulation UMC 770. The permit area is located in Carbon and Emery Counties, Utah as follows:

Township 15 South, Range 7 East, SLBM
Section 1, portion; Section 2 portion; Section 11, portion; Section 12, all; Section 13, portion; Section 14, portion; Section 23, all; Section 25, portion; Section 26, portion.

Township 15 South, Range 8 East, SLBM
Section 5, portion; Section 6, portion; Section 7, all; Section 8, portion; Section 9, portion; Section 10, portion; Section 11, portion; Section 15, portion; Section 16, all; Section 17, portion; Section 18, portion; Section 20, portion; Section 21, portion.

The project area is shown on the following U.S. Geological Survey 7.5 - Minute Quadrangle Maps: Pinnacle Peak, Wattis and Hiawatha.

Copies of the permit application which are available for public inspection are located at the following:

State of Utah
Department of Natural Resources
Division of Oil, Gas and Mining
355 West North Temple.
III Triad Center, Suite 350
Salt Lake City, Utah 84180-1203.

Carbon County Recorder's Office
Carbon County Courthouse
Price, Utah

Emery County Recorder's Office
Emery County Courthouse
Castle Dale, Utah

Pertinent comments are solicited from anyone affected by this proposal. Comments should be filed within the next thirty (30) days with:

State of Utah
Department of Natural Resources
Division of Oil, Gas and Mining
355 West North Temple.
III Triad Center, Suite 350
Salt Lake City, Utah 84180-1203.

Published in the Emery County Progress June 2, 9, 16 and 23, 1987.

JUN 1987

AFFIDAVIT OF PUBLICATION

STATE OF UTAH
County of Carbon, } ss.

I, Dan Stockburger, on oath, say that I am the General Manager of The Sun-Advocate, a weekly newspaper of general circulation, published at Price, State and County aforesaid, and that a certain notice, a true copy of which is hereto attached, was published in the full issue of such newspaper for Four (4) consecutive issues, and that the first publication was on the 2nd day of June, 19 87 and that the last publication of such notice was in the issue of such newspaper dated the 23rd day of June, 19 87

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Dan Stockburger

Subscribed and sworn to before me this 22nd day of October, 19 86

Holly Jo Baker
Notary Public.

My Commission expires My Commission Expires October 22, 1990 19

Publication fee, $ 105.60

NOTICE OF APPLICATION FOR RENEWAL OF PERMIT PLATEAU MINING COMPANY

Notice is hereby given that Plateau Mining Company, P.O. Drawer PMC, Price, Utah 84501, a wholly owned subsidiary of Cyprus Western Coal Equipment Company, 7200 South Alton Way, Englewood, Colorado 80112, has submitted an application to the State of Utah, Department of Natural Resources, Division of Oil, Gas and Mining, for renewal of its permit (ACT/007/006) to mine under the provisions of the Utah Coal Mining and Reclamation Act (Utah Code Annotated 40-10-1 et. seq.) and the Utah Coal Program Regulation UMC 788.13. The permit area is located in Carbon and Emery Counties, Utah as follows:

Township 15 South, Range 7 East, SLBM
Section 1, portion; Section 2, portion; Section 11, portion; Section 12, all; Section 13, portion; Section 14, portion; Section 23, all; Section 25, portion; Section 26, portion.

Township 15 South, Range 8 East, SLBM
Section 5, portion; Section 6, portion; Section 7, all; Section 8, portion; Section 9, portion; Section 10, portion; Section 11, portion; Section 14, portion; Section 15, portion; Section 16, all; Section 17, portion; Section 18, portion, Section 20, portion; Section 21, portion.

The project area is shown on the following U.S. Geological Survey 7.5-Minute Quadrangle Maps: Pinnacle Peak, Wattis and Hiawatha.

Pertinent comments are solicited from anyone affected by this proposal. Comments should be filed within the next thirty (30) days with:

State of Utah
Department of Natural Resources
Division of Oil, Gas and Mining
355 West North Temple
II Triad Center, Suite 350
Salt Lake City, Utah 84180-1203

Published in the Sun Advocate October 1, 8, 15 and 22, 1986.

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Dan Stockburger

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Notary Public.

My Commission expires My Commission Expires October 22, 1989

Residing at Price, Utah

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The project area is shown on the following U.S. Geological Survey 7.5-Minute Quadrangle Maps: Pinnacle Peak, Wattis and Hiawatha.

Pertinent comments are solicited from anyone affected by this proposal. Comments should be filed within the next thirty (30) days with:

State of Utah
Department of Natural Resources
Division of Oil, Gas and Mining
355 West North Temple
II Triad Center, Suite 350
Salt Lake City, Utah 84180-1203

Published in the Emery County Progress October 1, 8, 15 and 22, 1986.

5/12/92 taken out and put in 1991 permit.

NOTE:
Because of the limited availability and/or preproducable quality of this exhibit, it is requested that Exhibit 4 (new Exhibit 412.140a) be removed from the 1986 permit submittal and be inserted herein. Should a copy not be available for inclusion, the reader can review said exhibit at either the Emery and Carbon County Courthouses, or at the offices of the Division of Oil, Gas and Mining.

EXHIBIT 5

U.S. GEOLOGICAL SURVEY DATA

09318000 HUNTINGTON CREEK NEAR HUNTINGTON, UTAH

LOCATION.--Lat 39°22'17", long 111°03'47", in SW1/4SE1/4 sec.6, T.17 S., R.8 E., Emery County, Hydrologic Unit 14060009, on left bank about 300 feet (91 cm) downstream from farm-road bridge, 1 mile (2 km) upstream from Fish Creek, and 7 miles (11 km) northwest of Huntington.

DRAINAGE AREA.--190 mi^2 (492 km^2), approximately.

PERIOD OF RECORD.--May 1909 to September 1917, October 1918 to November 1920 (fragmentary), April 1921 to May 1930, October 1930 to September 1973, October 1973 to September 1977 (peaks only), October 1977 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 6,210 ft (1,893 m) from river profile map. Prior to Apr. 30, 1913, nonrecording gage 5 ft (2 m) downstream at different datum. May 1, 1913 to Sept. 10, 1917, water-stage recorder at site 95 ft (29 m) upstream, datum same as that of preceding gage. Sept. 11, 1917 to May 28, 1934, water-stage recorder at approximately same site and datum.

REMARKS.--Records good except those for winter period, which are poor. Small diversion for irrigation above station, including transmountain diversions to tributaries of San Pitch River (Sevier Lake basin). Slight regulation by small reservoirs above station.

AVERAGE DISCHARGE.--60 years (1910-17, 1921-29, 1930-73, 1979), 96.3 ft^3/s (2.73 m^3/s), 69,770 acre-ft/yr (86.0 hm^3/yr).

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 2,500 ft^3/s (70.8 m^3/s) Aug. 2 or 3, 1930 (gage height, 7.5 ft or 2.29 m, from floodmark), from rating curve extended above 600 ft^3/s (17.0 m^3/s); minimum, 0.87 ft^3/s (0.025 m^3/s) Nov. 28, 1978, bridge construction upstream.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 684 ft^3/s (19.4 m^3/s) Aug. 13, gage height, 4.84 ft (1.475 m); minimum, 0.87 ft^3/s (0.025 m^3/s) Nov. 28.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1978 TO SEPTEMBER 1979
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	29	22	33	34	32	34	36	98	219	152	125	68
2	29	43	30	34	32	33	37	95	214	150	125	65
3	28	41	25	34	31	27	42	93	214	147	125	57
4	28	36	33	34	31	27	31	94	217	138	121	74
5	28	36	33	34	29	37	32	118	224	141	121	105
6	35	32	24	34	32	29	42	115	242	138	123	102
7	33	31	16	32	32	27	48	105	255	123	140	98
8	27	32	23	29	31	26	53	86	232	115	176	98
9	26	31	23	32	30	24	57	70	212	109	175	98
10	25	32	23	34	30	39	45	63	200	107	164	101
11	25	47	26	33	31	24	34	56	203	103	111	101
12	26	35	27	33	32	27	32	61	210	103	112	105
13	25	24	27	31	29	21	33	66	221	101	156	105
14	19	21	25	31	25	24	36	96	239	105	143	103
15	19	15	22	34	22	26	43	136	226	107	153	103
16	19	15	21	34	23	25	56	156	210	100	161	102
17	27	14	20	29	26	25	76	180	202	107	164	101
18	31	12	19	26	18	24	83	278	189	115	158	87
19	22	22	19	27	17	28	53	304	166	113	164	56
20	22	20	18	30	29	30	51	320	177	117	121	69
21	29	19	18	28	32	27	49	294	134	117	109	76
22	15	18	19	32	27	27	54	301	139	117	89	73
23	17	18	22	29	29	27	62	294	161	117	90	69
24	22	15	26	30	31	30	89	283	172	117	85	69
25	22	20	29	32	30	31	94	263	164	115	78	66
26	20	15	30	32	33	36	89	265	163	113	77	66
27	21	7.0	31	21	34	37	96	299	167	109	80	66
28	21	7.5	31	25	31	38	100	333	168	111	78	78
29	21	30	32	20	---	40	97	322	166	111	76	78
30	21	35	33	26	---	36	94	275	166	111	73	76
31	23	---	33	25	---	36	---	237	---	119	72	---
TOTAL	755	745.5	791	939	809	922	1744	5756	5872	3648	3745	2515
MEAN	24.4	24.9	25.5	30.3	28.9	29.7	58.1	186	196	118	121	83.8
MAX	35	47	33	34	34	40	100	333	255	152	176	105
MIN	15	7.0	16	20	17	21	31	56	134	100	72	56
AC-FT	1500	1480	1570	1860	1600	1830	3460	11420	11650	7240	7430	4990

CAL YR 1978 TOTAL 31784.1 MEAN 87.1 MAX 539 MIN 3.3 AC-FT 63040
WTR YR 1979 TOTAL 28241.5 MEAN 77.4 MAX 333 MIN 7.0 AC-FT 56020

09318000 HUNTINGTON CREEK NEAR HUNTINGTON, UT--Continued

PERIOD OF RECORD.--October 1978 to September 1979.

SEDIMENT DATA: October 1978 to September 1979, monthly.

WATER QUALITY DATA, WATER YEAR OCTOBER 1978 TO SEPTEMBER 1979

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS (MG/L AS CACO3)	HARD-NESS, NONCAR-BONATE (MG/L CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)
OCT												
22...	1400	14	400	8.6	9.0	9.4	<1	31	220	21	53	22
NOV												
14...	1210	16	470	8.2	2.5	11.1	<1	19	250	44	60	24
17...	1545	13	570	8.3	3.0	10.6	K8	13	290	69	68	29
DEC												
12...	1430	27	460	8.6	2.0	11.3	K3	K8	240	12	58	22
JAN												
18...	1245	26	420	8.2	1.0	11.4	K1	K4	220	23	54	20
FEB												
19...	1230	17	470	8.2	1.0	11.3	K1	30	240	46	58	22
MAR												
16...	1130	25	410	8.4	3.0	10.6	<1	K8	260	56	65	23
APR												
20...	1200	31	520	8.6	6.0	9.6	K14	31	260	48	63	25
MAY												
11...	1300	55	470	8.5	5.5	10.5	<1	K16	240	31	64	20
JUN												
13...	1230	216	360	8.4	13.0	7.4	K1	90	190	14	52	15
JUL												
18...	1200	112	350	8.6	12.0	9.4	K34	140	180	14	49	15
AUG												
07...	1445	125	300	8.6	15.5	8.0	K13	31	150	12	43	11
SEP												
18...	1230	88	310	8.5	9.5	9.2	K4	19	160	17	46	12

DATE	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	SODIUM+ POTAS-SIUM DIS-SOLVED (MG/L AS NA)	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)	ALKA-LINITY (MG/L AS CACO3)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)
OCT											
22...	8.6	8	.3	--	1.5	210	16	199	1.0	41	6.7
NOV											
14...	9.2	7	.3	--	1.4	250	0	210	2.5	47	6.8
17...	15	10	.4	--	1.8	270	0	221	2.2	80	11
DEC											
12...	7.5	6	.2	--	1.5	260	6	220	1.1	40	5.8
JAN											
18...	6.3	6	.2	--	1.3	240	0	197	2.4	30	4.9
FEB											
19...	7.7	7	.2	--	1.3	250	0	200	2.5	45	6.1
MAR											
16...	8.5	7	.2	--	1.4	240	4	204	1.6	45	6.4
APR											
20...	9.0	7	.2	11	1.5	230	14	212	1.0	56	8.7
MAY											
11...	7.6	6	.2	9.0	1.4	230	12	209	1.3	40	6.9
JUN											
13...	4.2	5	.1	4.7	.5	210	2	176	1.4	21	3.3
JUL											
18...	3.8	4	.1	6.8	3.0	190	6	166	.8	22	3.3
AUG											
07...	2.5	5	.1	3.3	.8	160	4	138	.7	18	2.8
SEP											
18...	3.1	4	.1	4.0	.9	170	2	143	.9	20	2.7

K Results based on colony count outside the acceptable range (non-ideal colony count).

09318000 HUNTINGTON CREEK NEAR HUNTINGTON, UT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1978 TO SEPTEMBER 1979

DATE	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	SOLIDS, DISSOLVED (TONS PER DAY)	NITROGEN, NITRATE DISSOLVED (MG/L AS N)	NITROGEN, NITRITE DISSOLVED (MG/L AS NO2)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)	NITROGEN, ORGANIC DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)
OCT											
22...	.1	4.3	257	.35	9.71	.07	.00	.07	.00	.30	.35
NOV											
14...	.1	5.7	278	.38	12.5	.16	.00	.16	.00	.18	.30
17...	.1	5.9	345	.47	12.1	.22	.00	.22	.00	.25	.38
DEC											
12...	.1	5.3	276	.38	20.1	.24	.00	.24	.00	.18	.19
JAN											
18...	.1	5.0	241	.33	16.9	.18	.00	.18	.01	.03	.17
FEB											
19...	.1	5.6	261	.36	12.0	.22	.07	.24	.00	.18	.08
MAR											
16...	.1	4.3	277	.38	18.7	.11	.03	.12	.03	.20	.05
APR											
20...	.2	4.9	297	.40	24.9	.20	.03	.21	.00	.17	.28
MAY											
11...	.1	4.5	272	.37	40.4	.39	.03	.40	.01	.18	.33
JUN											
13...	.2	3.2	206	.28	120	.19	.03	.20	.01	.35	.51
JUL											
18...	.1	4.1	202	.27	61.1	.38	.03	.39	.00	.25	.48
AUG											
07...	.1	2.6	165	.22	55.7	.21	.03	.22	.03	.19	.20
SEP											
18...	.1	2.0	173	.24	41.1	.02	.03	.03	.00	.38	.32

DATE	NITROGEN, NH4 + ORG. SUSP. TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, ORTHO, DISSOLVED (MG/L AS P)	PHOSPHATE, ORTHO, DISSOLVED (MG/L AS PO4)	BORON, DISSOLVED (UG/L AS B)	CARBON, ORGANIC DISSOLVED (MG/L AS C)	CARBON, ORGANIC SUSPENDED TOTAL (MG/L AS C)	PHENOLS (UG/L)	OIL AND GREASE, TOTAL RECOV. GRAVIMETRIC (MG/L)
OCT										
22...	.05	.30	.010	.01	.03	70	3.4	--	2	--
NOV										
14...	.12	.18	.030	.00	.00	50	1.9	--	1	0
17...	.13	.25	.010	.01	.03	60	3.0	--	4	0
DEC										
12...	.01	.18	.030	.00	.00	50	2.0	.6	1	0
JAN										
18...	.13	.04	.020	.00	.00	30	2.1	.7	2	0
FEB										
19...	.00	.18	.010	.03	.09	40	11	.9	2	0
MAR										
16...	.00	.23	.000	.00	.00	40	2.2	.3	3	0
APR										
20...	.11	.17	.010	.04	.12	50	5.0	--	9	0
MAY										
11...	.14	.19	.020	.00	.00	50	3.4	2.3	2	0
JUN										
13...	.15	.36	.020	.01	.03	20	3.8	.9	1	0
JUL										
18...	.23	.25	.060	.12	.37	10	2.5	.4	1	0
AUG										
07...	.00	.22	.020	.03	.09	20	7.5	.8	2	0
SEP										
18...	.00	.38	.030	.07	.21	10	4.6	.6	1	0

DATE	TIME	ARSENIC DISSOLVED (UG/L AS AS)	CHROMIUM, DISSOLVED (UG/L AS CR)	IRON, DISSOLVED (UG/L AS FE)	LEAD, DISSOLVED (UG/L AS PB)	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, DISSOLVED (UG/L AS MN)	SELENIUM, DISSOLVED (UG/L AS SE)	STRONTIUM, DISSOLVED (UG/L AS SR)	ZINC, DISSOLVED (UG/L AS ZN)
OCT										
22...	1400	0	0	10	32	10	6	0	160	10
NOV										
14...	1210	0	0	20	31	10	20	0	160	10
17...	1545	1	0	20	82	10	30	2	190	6
DEC										
12...	1430	0	0	10	50	8	4	1	150	4
JAN										
18...	1245	0	0	10	36	7	4	0	140	4
FEB										
19...	1230	0	20	10	41	5	0	0	160	30
MAR										
16...	1130	1	0	10	0	10	10	1	170	10
APR										
20...	1200	1	0	10	0	8	4	1	180	<3
MAY										
11...	1300	0	10	20	0	10	10	0	210	10
JUN										
13...	1230	0	10	10	0	0	0	1	190	10
JUL										
18...	1200	1	10	10	0	<4	5	0	130	6
AUG										
07...	1445	1	0	<10	2	6	5	0	90	<3
SEP										
18...	1230	2	0	20	0	<4	5	0	110	<3

09318000 HUNTINGTON CREEK NEAR HUNTINGTON, UT--Continued

BENTHIC INVERTEBRATE ANALYSES, OCTOBER 1978 TO SEPTEMBER 1979

DATE	OCT 22,78	NOV 17,78	JAN 18,79	FEB 19,79	MAR 16,79
TIME	1400	1545	1245	1230	1130
TOTAL COUNT	1203	1216	132	34	31
DIVERSITY: PHYLUM	0.1	0.1	0.2	0.2	0.0
.CLASS	0.0	0.3	0.7	0.5	0.0
..ORDER	0.0	2.0	2.5	2.3	2.1
...FAMILY	0.0	0.0	0.0	0.0	0.0
....GENUS	0.0	0.0	0.0	0.0	0.0
....GENUS-INSECTA	0.0	0.0	0.0	0.0	0.0
ORGANISM	COUNT	COUNT	COUNT	COUNT	COUNT
ANNELIDA					
.OLIGOCHAETA					
..UNKNOWN ORDER	--	11	5	1	--
ARTHROPODA (ARTHROPODS)					
.ARACHNIDA					
..ACARINA	26	25	13	2	--
.INSECTA					
..COLEOPTERA					
...DRYOPIDAE	--	--	--	--	--
...ELMIDAE	82	109	39	3	2
..DIPTERA					
...ATHERICIDAE=RHAGIONIDAE	1	8	2	--	1
...CERATOPOGONIDAE=HELEIDAE	--	1	--	--	--
...CHIRONOMIDAE	128	110	11	11	2
...EMPIDIDAE	21	17	4	--	--
...EPHYDRIDAE	1	--	--	--	--
...SIMULIIDAE	4	--	--	--	--
...TIPULIDAE	8	6	--	--	1
..EPHEMEROPTERA	733	683	37	11	11
..HEMIPTERA	6	--	--	--	--
..PLECOPTERA	29	69	4	1	7
..TRICHOPTERA	148	173	17	5	7
NEMATODA (NEMATODES)	16	--	--	--	--
.UNKNOWN CLASS					
..UNKNOWN ORDER	--	4	--	--	--

DATE	APR 20,79	MAY 11,79	JUL 18,79	AUG 7,79	SEP 18,79
TIME	1200	1300	1200	1445	1230
TOTAL COUNT	383	105	308	586	678
DIVERSITY: PHYLUM	0.0	0.2	0.0	0.0	0.1
.CLASS	0.0	0.2	0.2	0.3	0.1
..ORDER	1.3	1.2	2.1	1.8	1.0
...FAMILY	0.0	0.0	0.0	0.0	0.0
....GENUS	0.0	0.0	0.0	0.0	0.0
....GENUS-INSECTA	0.0	0.0	0.0	0.0	0.0
ORGANISM	COUNT	COUNT	COUNT	COUNT	COUNT
ANNELIDA					
.OLIGOCHAETA					
..UNKNOWN ORDER	--	3	--	1	4
ARTHROPODA (ARTHROPODS)					
.ARACHNIDA					
..ACARINA	-	--	7	35	8
.INSECTA					
..COLEOPTERA					
...DRYOPIDAE	--	--	2	--	--
...ELMIDAE	7	--	76	152	90
..DIPTERA					
...ATHERICIDAE=RHAGIONIDAE	2	2	2	5	6
...CERATOPOGONIDAE=HELEIDAE	--	--	--	--	--
...CHIRONOMIDAE	192	8	64	87	534
...EMPIDIDAE	1	--	--	--	6
...EPHYDRIDAE	--	--	--	--	--
...SIMULIIDAE	--	--	5	7	--
...TIPULIDAE	--	--	5	1	--
..EPHEMEROPTERA	171	81	114	285	14
..HEMIPTERA	--	--	2	--	--
..PLECOPTERA	8	9	5	3	--
..TRICHOPTERA	2	2	26	10	16
NEMATODA (NEMATODES)	--	--	--	--	--
.UNKNOWN CLASS					
..UNKNOWN ORDER	--	--	--	--	--

09318000 HUNTINGTON CREEK NEAR HUNTINGTON, UT--Continued

SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1978 TO SEPTEMBER 1979

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT DIS-CHARGE, SUS-PENDED (T/DAY)
OCT				
22...	1400	14	75	2.8
NOV				
17...	1545	13	72	2.5
DEC				
12...	1430	27	76	5.5
JAN				
18...	1245	26	41	2.9
FEB				
19...	1230	17	40	1.8
MAR				
16...	1130	25	29	2.0
APR				
20...	1200	31	163	14
MAY				
11...	1300	55	181	27
JUN				
13...	1230	216	114	66
JUL				
18...	1200	112	108	33
AUG				
07...	1445	125	44	15
SEP				
18...	1230	88	52	12

PARTICLE-SIZE DISTRIBUTION OF SURFACE BED MATERIAL, WATER YEAR OCTOBER 1978 TO SEPTEMBER 1979

DATE	TIME	BED MAT. FALL DIAM. % FINER THAN .062 MM	BED MAT. FALL DIAM. % FINER THAN .125 MM	BED MAT. FALL DIAM. % FINER THAN .250 MM	BED MAT. FALL DIAM. % FINER THAN .500 MM	BED MAT. SIEVE DIAM. % FINER THAN 1.00 MM	BED MAT. SIEVE DIAM. % FINER THAN 2.00 MM	BED MAT. SIEVE DIAM. % FINER THAN 4.00 MM	BED MAT. SIEVE DIAM. % FINER THAN 8.00 MM	BED MAT. SIEVE DIAM. % FINER THAN 16.0 MM	BED MAT. SIEVE DIAM. % FINER THAN 32.0 MM
OCT											
22...	1400	3	10	37	57	61	63	65	72	86	100
NOV											
17...	1545	3	10	15	29	37	43	54	70	80	100
DEC											
12...	1430	1	2	6	12	14	16	20	27	37	40
JAN											
18...	1245	1	2	5	9	10	13	20	36	59	100
MAR											
16...	1130	1	2	3	4	5	6	10	20	37	59
JUL											
18...	1200	2	4	7	11	15	19	27	42	63	100
AUG											
07...	1445	1	2	5	11	14	18	24	34	52	100
SEP											
18...	1230	1	3	6	12	16	19	22	27	32	66

09317997 HUNTINGTON CREEK NEAR HUNTINGTON, UTAH

LOCATION.—Lat 39°23'07", long 111°05'15", in SE1/4NE1/4SW1/4 sec.36, T.16 S., R.7 E., Emery County, Hydrologic Unit 14060009, on right bank about 500 ft (150 m) upstream from bridge to Deer Creek Mine, 8 mi (12.9 km) northwest of Huntington.

DRAINAGE AREA.—181 mi^2 (469 km^2), approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.—October 1979 to September 1980.

GAGE.—Water-stage recorder. Altitude of gage is 6,450 ft (1,966 m) from topographic map.

REMARKS.—Records good except those for winter period, which are poor. Small transmountain diversions to tributaries of San Pitch River (Sevier Lake basin). Flow regulated by reservoirs above station.

COOPERATION.—Gage-height record was furnished by Utah Power & Light Co. and reviewed by U.S. Geological Survey.

EXTREMES FOR CURRENT YEAR.—Maximum discharge, 1,020 ft^3/s (28.9 m^3/s) June 11, gage height, 4.43 ft (1.350 m); minimum, 3.2 ft^3/s (0.091 m^3/s) Apr. 1.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	68	34	33	12	21	26	35	139	344	283	94	54
2	64	35	36	12	22	25	39	139	390	279	92	55
3	62	36	37	11	22	25	38	153	599	233	92	54
4	60	36	34	12	23	25	37	174	643	194	88	56
5	57	36	33	12	23	24	39	196	666	164	84	60
6	54	36	32	12	23	24	39	269	581	142	80	58
7	51	36	31	13	24	24	34	240	654	130	104	63
8	48	36	31	13	24	23	36	227	729	126	122	72
9	46	36	30	13	24	23	34	228	795	112	121	71
10	43	36	29	14	25	23	31	195	834	103	118	77
11	47	34	28	14	25	22	31	160	864	106	120	87
12	56	31	28	15	25	22	31	131	784	114	131	70
13	54	33	27	15	26	22	32	112	714	132	146	69
14	54	34	26	15	26	21	38	107	678	125	152	64
15	53	34	25	16	26	21	41	113	695	118	156	63
16	53	24	25	16	27	21	40	132	666	112	152	62
17	53	34	24	16	27	20	47	149	631	108	152	61
18	55	33	23	17	27	20	53	138	610	107	149	60
19	54	32	22	17	28	19	62	204	610	112	148	58
20	60	32	21	17	28	19	69	301	593	107	144	57
21	55	20	21	18	28	19	65	379	546	105	96	58
22	55	17	20	18	28	18	81	442	503	129	94	58
23	65	23	19	18	28	18	86	453	507	110	95	58
24	70	31	18	19	28	18	85	391	494	94	103	58
25	71	32	18	19	27	17	112	315	450	69	98	58
26	69	30	17	19	27	17	119	262	434	70	106	58
27	67	20	16	20	27	17	127	277	412	77	66	59
28	66	11	15	20	26	16	149	305	377	75	56	59
29	65	10	15	20	26	16	179	318	368	69	54	59
30	65	20	14	21	---	16	157	315	324	65	54	59
31	47	---	13	21	---	15	---	317	---	76	55	---
TOTAL	1787	892	761	495	741	636	1966	7281	17495	3846	3322	1855
MEAN	57.6	29.7	24.5	16.0	25.6	20.5	65.5	235	583	124	107	61.8
MAX	71	36	37	21	28	26	179	453	864	283	156	87
MIN	43	10	13	11	21	15	31	107	324	65	54	54
AC-FT	3540	1770	1510	982	1470	1260	3900	14440	34700	7630	6590	3680

WTR YR 1980 TOTAL 41077 MEAN 112 MAX 864 MIN 10 AC-FT 81480

09317997 HUNTINGTON CREEK NEAR HUNTINGTON, UT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1979 to September 1980.

SEDIMENT DATA: October 1979 to September 1980, monthly.

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH FIELD (UNITS)	TEMPER-ATURE, AIR (DEG C)	TEMPER-ATURE, WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	NITRO-GEN, DIS-SOLVED (MG/L AS N)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)
OCT										
14...	1030	54	315	8.5	15.5	8.0	9.5	.38	K3	K18
NOV										
11...	0930	32	435	8.3	4.5	.0	11.6	.66	K0	K5
DEC										
14...	1515	26	460	8.4	2.5	1.0	11.6	.60	K2	K5
JAN										
17...	1200	16	430	8.1	5.0	2.0	11.1	1.0	K0	K4
FEB										
07...	1415	24	430	8.4	2.0	1.0	11.3	--	<1	<1
MAR										
06...	1415	24	440	8.3	5.0	3.5	10.4	.57	<1	K1
APR										
10...	1500	32	445	8.2	5.0	6.0	9.6	--	K1	K1
MAY										
24...	1600	374	370	8.4	8.5	6.0	9.8	--	K8	24
JUN										
29...	1645	353	310	8.7	25.5	16.5	7.8	.62	K5	27
JUL										
13...	1630	125	335	8.6	20.0	13.5	8.5	--	K11	62
AUG										
18...	1030	142	310	8.6	18.0	10.0	9.2	--	K11	49
SEP										
20...	1015	61	355	8.4	10.5	9.5	9.5	.44	K6	47

DATE	HARD-NESS (MG/L AS CACO3)	HARD-NESS, NONCAR-BONATE (MG/L CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	SODIUM+ POTAS-SIUM DIS-SOLVED (MG/L AS NA)	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	BICAR-BONATE (MG/L AS HCO3)
OCT										
14...	170	3	44	15	3.1	4	.1	4.0	.9	200
NOV										
11...	230	25	59	21	5.8	8	.2	7.2	1.4	250
DEC										
14...	250	25	59	24	6.3	5	.2	7.8	1.5	270
JAN										
17...	220	23	54	20	4.9	5	.1	6.3	1.4	240
FEB										
07...	230	30	59	21	5.3	5	.2	6.6	1.3	240
MAR										
06...	220	25	53	21	6.9	6	.2	8.3	1.4	230
APR										
10...	230	17	55	23	7.3	6	.2	--	1.3	260
MAY										
24...	200	30	52	17	3.8	4	.1	--	1.0	220
JUN										
29...	160	11	46	12	2.8	4	.1	--	.8	170
JUL										
13...	170	4	46	14	3.1	4	.1	--	.9	190
AUG										
18...	160	6	45	11	2.5	3	.1	--	.8	180
SEP										
20...	190	16	48	16	3.5	4	.1	--	.9	210

K Results based on colony count outside the acceptable range (non-ideal colony count).

09317997 HUNTINGTON CREEK NEAR HUNTINGTON, UT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	CARBONATE (MG/L AS CO3)	ALKALINITY (MG/L AS CACO3)	CARBON DIOXIDE DISSOLVED (MG/L AS CO2)	SULFATE DISSOLVED (MG/L AS SO4)	CHLORIDE, DISSOLVED (MG/L AS CL)	FLUORIDE, DISSOLVED (MG/L AS F)	SILICA, DISSOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTITUENTS, DISSOLVED (MG/L)	SOLIDS, DISSOLVED (TONS PER AC-FT)	SOLIDS, DISSOLVED (TONS PER DAY)
OCT										
14...	2	170	1.2	20	2.5	.2	2.5	189	.26	27.6
NOV										
11...	0	210	2.0	33	4.4	.1	4.7	254	.35	21.9
DEC										
14...	2	220	1.7	30	4.5	.1	6.0	268	.36	18.8
JAN										
17...	0	200	3.1	27	4.7	.1	4.8	236	.32	10.2
FEB										
07...	2	200	1.6	33	5.0	--	4.8	250	.34	16.2
MAR										
06...	4	200	1.2	39	6.6	.1	4.5	251	.34	16.3
APR										
10...	0	210	2.6	38	8.2	--	4.6	265	.36	22.9
MAY										
24...	2	190	1.4	19	4.0	--	5.0	204	.28	206
JUN										
29...	6	150	.6	14	1.7	.1	3.4	171	.23	163
JUL										
13...	6	170	.8	21	3.0	--	3.7	191	.26	64.5
AUG										
18...	4	160	.8	24	5.0	--	2.5	183	.25	70.2
SEP										
20...	2	190	1.3	20	3.1	.1	3.1	197	.27	32.4

DATE	NITROGEN, NITRATE DISSOLVED (MG/L AS N)	NITROGEN, NITRATE DISSOLVED (MG/L AS NO3)	NITROGEN, NITRITE DISSOLVED (MG/L AS N)	NITROGEN, NITRITE DISSOLVED (MG/L AS NO2)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA DISSOLVED (MG/L AS NH4)	NITROGEN, ORGANIC DISSOLVED (MG/L AS N)
OCT								
14...	.08	.35	.000	.00	.08	.010	.01	.29
NOV								
11...	.25	1.1	.000	.00	.25	.010	.01	.40
DEC								
14...	.30	1.3	.000	.00	.30	.030	.04	.27
JAN								
17...	.25	1.1	.009	.03	.26	.020	.03	.76
MAR								
06...	.18	.80	.000	.00	.18	.000	.00	.39
JUN								
29...	.15	.66	.010	.03	.16	.030	.04	.43
SEP								
20...	.00	.00	.000	.00	.00	.030	.04	.41

DATE	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, NH4 + ORG. SUSP. TOTAL (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, TOTAL (MG/L AS PO4)	PHOSPHORUS, ORTHOPHOSPHATE DISSOL. (MG/L AS P)	PHOSPHORUS, ORTHOPHOSPHATE DISSOL. (MG/L AS PO4)
OCT							
14...	.50	.20	.30	.010	.03	.000	.00
NOV							
11...	.43	.02	.41	.000	.00	.000	.00
DEC							
14...	.53	.23	.30	.030	.09	.010	.03
JAN							
17...	.83	.05	.78	.030	.09	.010	.03
MAR							
06...	.50	.11	.39	.020	.06	.010	.03
JUN							
29...	.86	.40	.46	.180	.55	.010	.03
SEP							
20...	1.1	.66	.44	.020	.06	.000	.00

09317997 HUNTINGTON CREEK NEAR HUNTINGTON, UT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	TIME	ARSENIC DIS-SOLVED (UG/L AS AS)	BORON, DIS-SOLVED (UG/L AS B)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, DIS-SOLVED (UG/L AS PB)	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	ZINC, DIS-SOLVED (UG/L AS ZN)
OCT										
14...	1030	2	20	10	0	9	4	0	110	<3
NOV										
11...	0930	2	20	10	0	30	7	0	150	5
DEC										
14...	1515	1	20	20	0	10	5	0	170	7
JAN										
17...	1200	2	20	<10	0	<4	4	1	140	<3
MAR										
06...	1415	1	30	<10	0	9	4	0	140	<3
JUN										
29...	1645	1	0	<10	0	<4	8	0	110	<3
SEP										
20...	1015	1	20	10	1	8	5	0	120	7

BENTHIC INVERTEBRATE ANALYSES, OCTOBER 1979 TO SEPTEMBER 1980

Date:	Oct. 14, 1979	Nov. 11, 1979	Dec. 14, 1979	Jan. 17, 1980	Mar. 6, 1980	Sept. 20, 1980
Time:	1030	1140	1515	1200	1415	1015
Total Count	360	298	1,534	1,814	2,137	755
Diversity Phylum						
.Class						
..Order	2.6	1.8	1.5			
... Family	0.0	0.0	0.0	1.8	2.6	3.0
Organism						
Annelida						
.Oligochaeta	20	-	12	-	-	-
..Plesiopora						
...Enchytraeidae	-	-	-	9	3	-
...Naididae	-	-	-	48	14	18
...Tubificidae	-	-	-	4	2	1
Arthropoda						
.Arachnoidea						
..Hydracarina	16	-	8	-	-	-
...Hygrobatidae	-	-	-	-	-	1
...Lebertiidae	-	-	-	-	1	-
...Limnesiidae	-	-	-	-	1	-
...Sperchonidae	-	-	-	8	31	11
.Insecta						
..Coleoptera						
...Elmidae	84	18	76	60	144	83
..Diptera						
...Chironomidae	20	26	210	437	752	141
...Empididae	28	12	18	10	57	6
...Rhagionidae	-	-	-	3	7	3
...Simuliidae	-	-	-	-	-	4
...Tipulidae	4	-	8	11	12	8
..Ephemeroptera	144	182	1,108	-	-	-
...Baetidae	-	-	-	1,124	729	276
...Ephemeridae	-	-	-	22	88	66
...Heptageniidae	-	-	-	19	101	39
...Leptophlebiidae	-	-	-	-	-	2
...Tricorythidae	-	-	-	2	1	-
..Plecoptera	12	12	28	-	-	-
...Capniidae	-	-	-	4	-	11
...Chloroperlidae	-	-	-	-	9	4
...Nemouridae	-	-	-	3	8	-
...Perlodidae	-	-	-	5	40	5
...Pteronarcyidae	-	-	-	2	14	2
...Taeniopterygidae	-	-	-	2	2	8
..Trichoptera	20	48	66	-	-	-
...Brachycentridae	-	-	-	2	28	6
...Hydropsychidae	-	-	-	38	86	45
...Lepidostomatidae	-	-	-	1	-	1
...Limnephilidae	-	-	-	-	-	4
...Rhyacophilidae	-	-	-	-	2	3
Mollusca						
.Gastropoda						
..Aspidobranchia						
...Lymnaidae	-	-	-	-	-	1
Nematoda						
.Aphasmidia	12	-	-	-	-	-
..Enoplida						
...Dorycaimidae	-	-	-	-	2	6
Platyhelminthes						
.Turbellaria						
..Tricladida						
...Planariidae	-	-	-	-	3	-

09317997 HUNTINGTON CREEK NEAR HUNTINGTON, UT--Continued

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE, WATER (DEG C)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT DIS-CHARGE, SUS-PENDED (T/DAY)	SED. SUSP. FALL DIAM. % FINER THAN .002 MM	SED. SUSP. FALL DIAM. % FINER THAN .004 MM
NOV							
11...	0930	32	.0	91	7.9	--	--
DEC							
14...	1515	26	1.0	64	4.5	--	--
JAN							
17...	1200	16	2.0	51	2.2	--	--
MAR							
06...	1415	24	3.5	42	2.7	--	--
APR							
29...	1750	148	6.0	1690	675	41	55
MAY							
24...	1600	374	6.0	266	269	--	--
JUN							
12...	1300	820	10.0	827	1830	12	16
29...	1645	353	16.5	121	115	--	--
JUL							
13...	1630	125	13.5	84	28	--	--
AUG							
17...	1030	142	10.0	41	16	--	--
SEP							
20...	1015	61	9.5	23	3.8	--	--

DATE	SED. SUSP. FALL DIAM. % FINER THAN .016 MM	SED. SUSP. FALL DIAM. % FINER THAN .062 MM	SED. SUSP. FALL DIAM. % FINER THAN .125 MM	SED. SUSP. FALL DIAM. % FINER THAN .250 MM	SED. SUSP. FALL DIAM. % FINER THAN .500 MM	SED. SUSP. FALL DIAM. % FINER THAN 1.00 MM
NOV						
11...	--	--	--	--	--	--
DEC						
14...	--	--	--	--	--	--
JAN						
17...	--	--	--	--	--	--
MAR						
06...	--	--	--	--	--	--
APR						
29...	74	93	97	100	--	--
MAY						
24...	--	--	--	--	--	--
JUN						
12...	19	70	76	85	97	100
29...	--	--	--	--	--	--
JUL						
13...	--	--	--	--	--	--
AUG						
17...	--	--	--	--	--	--
SEP						
20...	--	--	--	--	--	--

PARTICLE-SIZE DISTRIBUTION OF SURFACE BED MATERIAL, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE, WATER (DEG C)	BED MAT. FALL DIAM. % FINER THAN .062 MM	BED MAT. FALL DIAM. % FINER THAN .125 MM	BED MAT. FALL DIAM. % FINER THAN .250 MM	BED MAT. FALL DIAM. % FINER THAN .500 MM
NOV							
11...	0930	32	.0	2	6	20	38
DEC							
14...	1515	26	1.0	1	2	4	7
JAN							
17...	1200	16	2.0	5	12	28	43

DATE	BED MAT. SIEVE DIAM. % FINER THAN 1.00 MM	BED MAT. SIEVE DIAM. % FINER THAN 2.00 MM	BED MAT. SIEVE DIAM. % FINER THAN 4.00 MM	BED MAT. SIEVE DIAM. % FINER THAN 8.00 MM	BED MAT. SIEVE DIAM. % FINER THAN 16.0 MM	BED MAT. SIEVE DIAM. % FINER THAN 32.0 MM
NOV						
11...	52	62	77	89	100	--
DEC						
14...	12	17	25	34	44	64
JAN						
17...	58	70	84	94	98	100

09317997 HUNTINGTON CREEK NEAR HUNTINGTON, UTAH

LOCATION.--Lat 39°23'07", long 111°05'15", in SE¼NE¼SW¼ sec.36, T.16 S., R.7 E., Emery County, Hydrologic Unit 14060009, on right bank about 500 ft (150 m) upstream from bridge to Deer Creek Mine, 8 mi (12.9 km) northwest of Huntington.

DRAINAGE AREA.--181 mi^2 (469 km^2), approximately.

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1979 to current year.

GAGE.--Water-stage recorder. Altitude of gage is 6,450 ft (1,966 m) from topographic map.

REMARKS.--Records good. Small transmountain diversions to tributaries of San Pitch River (Sevier Lake Basin). Flow regulated by reservoirs above station.

COOPERATION.--Gage-height record was furnished by Utah Power & Light Co., and reviewed by U.S. Geological Survey.

EXTREMES FOR PERIOD OF RECORD.--Maximum discharge, 1,020 ft^3/s (28.9 m^3/s) June 11, 1980, gage height, 4.43 ft (1.350 m); minimum, 3.0 ft^3/s (0.085 m^3/s) Feb. 2-5, 1981.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 395 ft^3/s (11.2 m^3/s) June 4, gage height, 3.13 ft (0.954 m); minimum, 3.0 ft^3/s (0.085 m^3/s) February 2-5.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	82	62	40	31	22	30	31	128	98	107	81	58
2	82	61	36	31	14	30	32	135	97	103	86	57
3	75	62	38	30	14	29	34	171	84	95	85	57
4	75	62	38	29	18	30	31	112	67	90	81	57
5	73	42	38	29	16	30	31	92	66	90	79	85
6	72	36	37	22	29	30	35	87	69	92	81	71
7	76	35	32	24	30	28	35	106	72	111	77	60
8	70	34	8.1	27	32	22	31	110	69	172	86	56
9	67	33	16	27	40	22	31	99	65	177	84	59
10	71	33	12	30	27	23	37	99	60	187	95	68
11	72	35	27	27	22	23	37	115	65	190	110	56
12	85	35	28	30	39	23	39	95	79	183	94	56
13	84	42	24	27	33	23	39	68	85	163	105	56
14	92	38	27	23	35	24	42	103	79	159	93	55
15	97	34	37	30	34	25	57	116	83	153	104	55
16	83	33	33	29	34	28	60	106	78	157	115	55
17	75	28	29	32	33	30	66	96	88	162	96	55
18	73	30	30	29	32	28	62	91	87	158	93	54
19	70	35	30	30	31	30	75	99	84	155	102	54
20	65	39	29	29	30	30	57	91	90	148	110	54
21	65	34	29	27	30	29	54	93	89	142	116	54
22	64	41	29	26	31	29	52	84	86	122	119	53
23	64	41	29	28	32	30	60	77	87	130	105	53
24	63	41	32	27	31	31	83	77	95	132	90	53
25	62	35	33	22	31	31	124	83	112	130	83	53
26	61	38	33	16	31	31	146	82	111	135	59	52
27	61	37	33	18	29	32	123	112	110	134	59	52
28	61	43	32	29	30	30	114	93	105	124	59	52
29	61	40	31	27	---	30	114	95	103	97	59	52
30	62	40	30	26	---	31	124	94	103	99	58	51
31	62	---	32	22	---	29	---	97	---	90	58	---
TOTAL	2225	1199	932.1	834	810	871	1856	3106	2566	4187	2722	1703
MEAN	71.8	40.0	30.1	26.9	28.9	28.1	61.9	100	85.5	135	87.8	56.8
MAX	97	62	40	32	40	32	146	171	112	190	119	85
MIN	61	28	8.1	16	14	22	31	68	60	90	58	51
AC-FT	4410	2380	1850	1650	1610	1730	3680	6160	5090	8300	5400	3380

CAL YR 1980	TOTAL	41993.1	MEAN	115	MAX 864	MIN 8.1	AC-FT	83290
WTR YR 1981	TOTAL	23011.1	MEAN	63.0	MAX 190	MIN 8.1	AC-FT	45640

09317997 HUNTINGTON CREEK NEAR HUNTINGTON, UT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1979 to current year.
SEDIMENT DATA: October 1979 to current year, monthly.

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE, AIR (DEG C)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	NITRO-GEN DIS-SOLVED (MG/L AS N)	HARD-NESS (MG/L AS CACO3)	HARD-NESS, NONCAR-BONATE (MG/L CACO3)
OCT											
20...	1530	65	355	8.6	14.5	7.5	9.6	101	.30	190	13
NOV											
17...	1500	28	470	8.5	.5	.0	11.6	99	--	220	7
DEC											
07...	1245	32	435	8.3	2.0	.5	11.4	100	--	220	21
JAN											
16...	0945	29	450	8.1	2.5	.0	11.6	99	.91	240	28
FEB											
16...	1445	34	420	8.4	13.0	3.0	10.8	99	--	220	25
MAR											
15...	1100	25	440	8.5	10.0	3.5	9.7	101	--	220	25
APR											
17...	0900	66	350	8.5	15.0	6.5	10.0	102	.56	180	11
MAY											
22...	0915	84	380	8.4	11.0	6.5	9.9	101	--	180	13
JUN											
26...	1515	111	305	8.6	30.5	16.5	7.7	99	--	160	11
JUL											
14...	1600	159	345	8.6	28.5	15.5	8.1	101	.80	160	12
AUG											
13...	1500	105	310	8.4	16.5	14.0	8.3	100	--	110	0
SEP											
03...	1000	63	290	8.6	22.0	12.0	8.5	--	--	160	--
05...	1630	107	290	8.4	16.0	14.0	8.0	98	--	140	0

DATE	HARD-NESS NONCAR-BONATE (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	BICAR-BONATE FET-FLD (MG/L AS HCO3)	CAR-BONATE FET-FLD (MG/L AS CO3)	ALKA-LINITY FIELD (MG/L AS CACO3)
OCT										
20...	--	50	16	4.0	4	.1	1.1	200	8	180
NOV										
17...	--	52	22	5.7	5	.2	1.5	250	5	210
DEC										
07...	--	54	21	5.4	5	.2	1.2	240	0	200
JAN										
16...	--	59	22	6.0	5	.2	1.5	250	0	210
FEB										
16...	--	57	20	5.5	5	.2	1.3	240	3	200
MAR										
15...	--	55	20	6.7	6	.2	1.3	230	4	200
APR										
17...	--	46	16	4.5	5	.1	1.5	200	6	170
MAY										
22...	3.0	50	14	3.8	4	.1	.9	200	3	170
JUN										
26...	9.0	44	12	2.7	4	.1	.6	170	6	150
JUL										
14...	--	44	12	2.7	4	.1	.8	170	5	150
AUG										
13...	--	--	13	2.8	5	.1	1.2	250	4	210
SEP										
03...	--	44	12	3.0	4	.1	1.1	--	--	--
05...	--	38	12	2.8	4	.1	1.4	250	1	200

09317997 HUNTINGTON CREEK NEAR HUNTINGTON, UT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 to SEPTEMBER 1981

DATE	ALKA-LINITY LAB (MG/L AS CACO3)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	SOLIDS, DIS-SOLVED (TONS PER DAY)
OCT										
20...	--	.9	20	3.5	.1	2.9	183	204	.25	32.1
NOV										
17...	--	1.3	31	5.1	.2	4.4	224	250	.30	16.9
DEC										
07...	--	1.9	29	4.7	.2	4.2	245	240	.33	21.2
JAN										
16...	--	3.2	33	4.8	.1	4.8	253	259	.34	19.8
FEB										
16...	--	1.6	30	4.5	.1	4.7	236	243	.32	21.7
MAR										
15...	--	1.2	33	6.8	.1	4.4	241	245	.33	16.3
APR										
17...	--	1.1	27	4.9	.2	3.9	226	208	.31	40.3
MAY										
22...	180	1.4	20	3.3	.1	3.1	191	203	.26	43.3
JUN										
26...	150	.7	7.6	2.5	.1	2.7	173	162	.24	51.8
JUL										
14...	--	.7	2.0	2.4	.1	2.7	170	156	.23	73.0
AUG										
13...	--	1.6	<1.0	5.4	.1	2.5	175	--	.24	49.6
SEP										
03...	--	--	13	3.5	.2	2.6	178	--	.24	30.3
05...	--	1.6	6.0	3.6	.1	2.7	164	191	.22	47.4

DATE	NITRO-GEN, AMMONIA TOTAL (MG/L AS N)	NITRO-GEN, AMMONIA TOTAL (MG/L AS NH4)	NITRO-GEN, ORGANIC TOTAL (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN,NH4 + ORG. SUSP. TOTAL (MG/L AS N)	NITRO-GEN,AM-MONIA + ORGANIC DIS. (MG/L AS N)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS TOTAL (MG/L AS PO4)	PHOS-PHORUS, DIS-SOLVED (MG/L AS P)	POTAS-SIUM 40 DIS-SOLVED (PCI/L AS K40)
OCT											
20...	.000	.00	2.9	2.90	2.6	.30	.00	.030	.09	.030	--
NOV											
17...	--	--	--	--	--	--	--	--	--	--	1.1
JAN											
16...	.040	.05	.75	.79	.15	.64	.27	.010	.03	.000	--
FEB											
16...	--	--	--	--	--	--	--	--	--	--	1.0
MAR											
15...	--	--	--	--	--	--	--	--	--	--	1.0
APR											
17...	.150	--	.95	1.10	.72	.38	.18	.110	.34	.020	1.1
MAY											
22...	--	--	--	--	--	--	--	--	--	--	.70
JUN											
26...	--	--	--	--	--	--	--	--	--	--	.40
JUL											
14...	.130	--	.65	.78	.07	.71	.09	.050	.15	.000	.60

09317997 HUNTINGTON CREEK NEAR HUNTINGTON, UT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	ARSENIC TOTAL (UG/L AS AS)	ARSENIC SUS-PENDED TOTAL (UG/L AS AS)	ARSENIC DIS-SOLVED (UG/L AS AS)	BARIUM, TOTAL RECOV-ERABLE (UG/L AS BA)	BARIUM, SUS-PENDED RECOV-ERABLE (UG/L AS BA)	BARIUM, DIS-SOLVED (UG/L AS BA)	BERYL-LIUM, TOTAL RECOV-ERABLE (UG/L AS BE)	BERYL-LIUM, DIS-SOLVED (UG/L AS BE)	BORON, DIS-SOLVED (UG/L AS B)	CADMIUM TOTAL RECOV-ERABLE (UG/L AS CD)
OCT											
20...	1530	--	--	--	100	30	70	--	--	20	--
NOV											
17...	1500	--	--	--	--	--	--	--	--	40	--
DEC											
07...	1245	--	--	--	--	--	--	--	--	40	--
JAN											
16...	0945	--	--	--	--	--	--	--	--	10	--
FEB											
16...	1445	--	--	--	--	--	--	--	--	20	--
MAR											
15...	1100	--	--	--	--	--	--	--	--	10	--
APR											
17...	0900	--	--	--	100	0	200	--	--	160	--
MAY											
22...	0915	1	1	0	--	--	--	0	<1	0	0
JUN											
26...	1515	--	--	--	--	--	--	--	--	10	--
JUL											
14...	1600	--	--	--	--	--	--	--	--	10	--
AUG											
13...	1500	--	--	--	--	--	--	--	--	20	--
SEP											
03...	1000	--	--	--	--	--	--	--	--	20	--
05...	1630	2	2	0	--	--	--	0	<1	20	0

DATE	CADMIUM DIS-SOLVED (UG/L AS CD)	CHRO-MIUM, TOTAL RECOV-ERABLE (UG/L AS CR)	CHRO-MIUM, SUS-PENDED RECOV. (UG/L AS CR)	CHRO-MIUM, DIS-SOLVED (UG/L AS CR)	COPPER, TOTAL RECOV-ERABLE (UG/L AS CU)	COPPER, SUS-PENDED RECOV-ERABLE (UG/L AS CU)	COPPER, DIS-SOLVED (UG/L AS CU)	IRON, TOTAL RECOV-ERABLE (UG/L AS FE)	IRON, SUS-PENDED RECOV-ERABLE (UG/L AS FE)	IRON, DIS-SOLVED (UG/L AS FE)	LEAD, TOTAL RECOV-ERABLE (UG/L AS PB)
OCT											
20...	--	--	--	--	--	--	--	270	160	110	--
NOV											
17...	--	--	--	--	--	--	--	490	--	<10	--
DEC											
07...	--	--	--	--	--	--	--	190	180	10	--
JAN											
16...	--	--	--	--	--	--	--	260	230	30	--
FEB											
16...	--	--	--	--	--	--	--	250	230	20	--
MAR											
15...	--	--	--	--	--	--	--	140	130	10	--
APR											
17...	--	--	--	--	--	--	--	5300	5300	30	--
MAY											
22...	<1	10	10	0	5	4	1	530	520	10	8
JUN											
26...	--	--	--	--	--	--	--	2500	2500	10	--
JUL											
14...	--	--	--	--	--	--	--	520	--	<10	--
AUG											
13...	--	--	--	--	--	--	--	15000	--	<10	--
SEP											
03...	--	--	--	--	--	--	--	50	40	10	--
05...	<1	20	10	10	36	35	1	21000	21000	30	41

09317997 HUNTINGTON CREEK NEAR HUNTINGTON, UT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	LEAD, SUS-PENDED RECOV-ERABLE (UG/L AS PB)	LEAD, DIS-SOLVED (UG/L AS PB)	LITHIUM TOTAL RECOV-ERABLE (UG/L AS LI)	LITHIUM SUS-PENDED RECOV-ERABLE (UG/L AS LI)	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MANGA-NESE, SUS-PENDED RECOV. (UG/L AS MN)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	MERCURY SUS-PENDED RECOV-ERABLE (UG/L AS HG)	MERCURY DIS-SOLVED (UG/L AS HG)
OCT											
20...	--	--	10	0	10	20	10	10	--	--	--
NOV											
17...	--	--	--	--	--	30	20	7	--	--	--
DEC											
07...	--	--	--	--	--	30	30	5	--	--	--
JAN											
16...	--	--	--	--	--	10	5	5	--	--	--
FEB											
16...	--	--	--	--	--	10	5	5	--	--	--
MAR											
15...	--	--	--	--	--	10	5	5	--	--	--
APR											
17...	--	--	10	0	10	130	120	10	--	--	--
MAY											
22...	8	0	--	--	--	30	30	5	.1	.1	.0
JUN											
26...	--	--	--	--	--	100	90	7	--	--	--
JUL											
14...	--	--	--	--	--	50	40	6	--	--	--
AUG											
13...	--	--	--	--	--	400	400	4	--	--	--
SEP											
03...	--	--	--	--	--	0	0	32	--	--	--
05...	40	1	--	--	--	660	660	4	.1	.1	.0

DATE	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)	NICKEL, SUS-PENDED RECOV-ERABLE (UG/L AS NI)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, TOTAL (UG/L AS SE)	SELE-NIUM, SUS-PENDED TOTAL (UG/L AS SE)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	STRON-TIUM, TOTAL RECOV-ERABLE (UG/L AS SR)	STRON-TIUM, SUS-PENDED RECOV. (UG/L AS SR)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	ZINC, DIS-SOLVED (UG/L AS ZN)
OCT											
20...	--	--	--	--	--	--	150	30	120	--	--
NOV											
17...	--	--	--	--	--	--	--	--	--	--	--
DEC											
07...	--	--	--	--	--	--	--	--	--	--	--
JAN											
16...	--	--	--	--	--	--	--	--	--	--	--
FEB											
16...	--	--	--	--	--	--	--	--	--	--	--
MAR											
15...	--	--	--	--	--	--	--	--	--	--	--
APR											
17...	--	--	--	--	--	--	160	20	140	--	--
MAY											
22...	3	1	2	0	0	0	--	--	--	0	<3
JUN											
26...	--	--	--	--	--	--	--	--	--	--	--
JUL											
14...	--	--	--	--	--	--	--	--	--	--	--
AUG											
13...	--	--	--	--	--	--	--	--	--	--	--
SEP											
03...	--	--	--	--	--	--	--	--	--	--	--
05...	36	35	1	1	1	0	--	--	--	110	<3

09317997 HUNTINGTON CREEK NEAR HUNTINGTON, UT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C)	CYANIDE TOTAL (MG/L AS CN)	PHENOLS (UG/L)	OIL AND GREASE, TOTAL RECOV. GRAVI-METRIC (MG/L)
OCT						
20...	1530	18	.7	.01	0	0
JAN						
16...	0945	7.0	.1	.00	14	--
APR						
17...	0900	3.0	.9	.00	14	--
JUL						
14...	1600	2.2	.4	.00	4	--

DATE	TIME	GROSS ALPHA, DIS-SOLVED (UG/L AS U-NAT)	GROSS ALPHA, SUSP. TOTAL (UG/L AS U-NAT)	GROSS BETA, DIS-SOLVED (PCI/L AS CS-137)	GROSS BETA, SUSP. TOTAL (PCI/L AS CS-137)	GROSS BETA, DIS-SOLVED (PCI/L AS SR/YT-90)	GROSS BETA, SUSP. TOTAL (PCI/L AS SR/YT-90)
SEP							
05...	1630	<4.0	110	2.9	43	2.8	42

09317997 HUNTINGTON CREEK NEAR HUNTINGTON, UT--Continued

PHYTOPLANKTON ANALYSES, OCTOBER 1980 TO AUGUST 1981

DATE	JUN 26,81		JUL 14,81		AUG 13,81	
TIME	1515		1600		1500	
TOTAL CELLS/ML	1400		460		75000	
DIVERSITY: DIVISION	1.1		1.7		0.5	
.CLASS	1.1		1.7		0.5	
..ORDER	1.3		1.9		1.4	
...FAMILY	2.1		2.4		1.9	
....GENUS	2.3		2.5		2.0	
ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CHLOROPHYTA (GREEN ALGAE)						
.CHLOROPHYCEAE						
..CHLOROCOCCALES						
...CHLOROCOCCACEAE						
....TETRAEDRON	--	-	--	-	b	0
...DICTYOSPHAERIACEAE						
....DICTYOSPHAERIUM	13	1	--	-	--	-
...MICRACTINIACEAE						
....MICRACTINIUM	--	-	--	-	1300	2
...OOCYSTACEAE						
....FRANCEIA	--	-	--	-	b	0
....OOCYSTIS	--	-	39	8	420	1
...SCENEDESMACEAE						
....COELASTRUM	--	-	--	-	500	1
....SCENEDESMUS	--	-	--	-	b	0
..VOLVOCALES						
...CHLAMYDOMONADACEAE						
....CHLAMYDOMONAS	13	1	39	8	b	0
CHRYSOPHYTA						
.BACILLARIOPHYCEAE						
..CENTRALES						
...COSCINODISCACEAE						
....CYCLOTELLA	64	5	--	-	b	0
..PENNALES						
...ACHNANTHACEAE						
....ACHNANTHES	64	5	13	3	2300	3
....COCCONEIS	--	-	13	3	--	-
...CYMBELLACEAE						
....CYMBELLA	26	2	--	-	--	-
...FRAGILARIACEAE						
....ASTERIONELLA	77	6	26	6	--	-
....FRAGILARIA	140	10	--	-	--	-
....SYNEDRA	--	-	--	-	b	0
...GOMPHONEMATACEAE						
....GOMPHONEMA	13	1	26	6	--	-
...NAVICULACEAE						
....NAVICULA	100	7	13	3	--	-
...NITZSCHIACEAE						
....NITZSCHIA	90	7	26	6	b	0
CRYPTOPHYTA (CRYPTOMONADS)						
.CRYPTOPHYCEAE						
..CRYPTOMONADALES						
...CRYPTOCHRYSIDACEAE						
....CHROOMONAS	--	-	--	-	b	0
...CRYPTOMONADACEAE						
....CRYPTOMONAS	--	-	13	3	--	-
CYANOPHYTA (BLUE-GREEN ALGAE)						
.CYANOPHYCEAE						
..NOSTOCALES						
...HAMMATOIDEACEAE						
....RAPHIDIOPSIS	--	-	--	-	23000a	31
...NOSTOCACEAE						
....ANABAENA	--	-	--	-	2300	3
....CYLINDROSPERMUM	--	-	--	-	8800	12
..OSCILLATORIALES						
...OSCILLATORIACEAE						
....LYNGBYA	770a	56	--	-	35000a	47
....OSCILLATORIA	--	-	240a	53	--	-
EUGLENOPHYTA (EUGLENOIDS)						
.EUGLENOPHYCEAE						
..EUGLENALES						
...EUGLENACEAE						
....TRACHELOMONAS	--	-	13	3	--	-
PYRRHOPHYTA (FIRE ALGAE)						
.DINOPHYCEAE						
..DINOKONTAE						
...PERIDINIACEAE						
....PERIDINIUM	--	-	--	-	b	0

NOTE.--(a) Dominant organism: Equal to or greater than 15 percent
(b) Observed organism, may not have been counted: Less than 1/2 percent

09317997 HUNTINGTON CREEK NEAR HUNTINGTON, UT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	PERI-PHYTON BIOMASS TOTAL DRY WEIGHT G/SQ M	PERI-PHYTON BIOMASS ASH WEIGHT G/SQ M	CHLOR-A PERI-PHYTON CHROMO-GRAPHIC FLUOROM (MG/M2)	CHLOR-B PERI-PHYTON CHROMO-GRAPHIC FLUOROM (MG/M2)	BIOMASS CHLORO-PHYLL RATIO PERI-PHYTON (UNITS)
NOV						
17...	1500	.472	.472	.020	.000	.00
JUL						
14...	1600	.236	.236	.110	.000	.00

SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)	COAL IN BOTTOM MATE-RIAL (GM/KG)
OCT						
20...	1530	65	7.5	29	5.1	12.0
NOV						
17...	1500	28	.0	54	4.1	--
DEC						
07...	1245	32	.5	20	1.7	--
JAN						
16...	0945	29	.0	5	.39	--
FEB						
16...	1445	34	3.0	11	1.0	--
MAR						
15...	1100	25	3.5	49	3.3	--
APR						
17...	0900	66	6.5	477	85	--
MAY						
22...	0915	84	6.5	54	12	--
JUN						
26...	1515	111	16.5	628	188	--
JUL						
14...	1600	159	15.5	89	38	--
AUG						
13...	1500	105	14.0	1220	346	--
SEP						
05...	1630	107	14.0	1830	529	--

09317920 TIE FORK CANYON NEAR HUNTINGTON, UTAH

LOCATION.--Lat 39°27'31", long 111°08'11", in NE1/4SE1/4 sec.4, T.16 S., R.7 E., Emery County, Hydrologic Unit 14060009, on right bank 0.4 mi (0.6 km) upstream from mouth, 0.4 mi (0.6 km) from highway 31, 15 mi (24.1 km) northwest of Huntington.

DRAINAGE AREA.--11.7 mi^2 (30.3 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1978 to September 1979.

GAGE.--Water-stage recorder. Altitude of gage is 7,400 ft (2,260 m) from topographic map.

REMARKS.--Records good, except for winter months and May 18 to June 8 when the flume was overtopped, which are poor.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 21 ft^3/s (0.59 m^3/s) May 26, 27; minimum, 0.17 ft^3/s (0.005 m^3/s) Mar. 10.

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1978 TO SEPTEMBER 1979
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.46	.48	.64	.50	.62	.64	.70	3.1	13	2.8	1.0	.64
2	.46	.77	.64	.50	.62	.64	.64	2.8	12	2.7	1.0	.66
3	.47	.65	.64	.50	.62	.56	.62	2.7	11	2.5	1.0	.67
4	.47	.57	.64	.50	.62	.64	.73	3.0	11	2.4	1.0	.66
5	.47	.57	.60	.50	.62	.64	.73	3.9	11	2.4	1.0	.64
6	.46	.57	.55	.50	.62	.67	.78	4.6	11	2.3	1.0	.65
7	.46	.60	.52	.50	.59	.73	.84	4.4	9.8	2.4	.91	.67
8	.46	.60	.50	.49	.59	.73	.87	4.1	9.4	2.3	.95	.60
9	.45	.54	.50	.49	.59	.62	.87	3.7	8.8	2.1	.90	.69
10	.45	.54	.50	.51	.59	.59	.84	3.4	8.1	2.1	.86	.75
11	.45	.72	.50	.51	.59	.67	.81	3.1	7.6	2.0	.84	.61
12	.44	.71	.50	.51	.59	.70	.87	3.0	7.2	2.0	1.0	.54
13	.43	.62	.50	.54	.59	.76	.81	3.3	6.9	1.9	1.3	.58
14	.44	.62	.50	.46	.59	.76	.87	4.0	6.7	1.8	1.1	.56
15	.42	.62	.50	.59	.59	.76	.97	4.9	6.2	1.7	1.0	.56
16	.42	.62	.50	.59	.56	.76	1.1	6.1	5.9	1.7	1.0	.51
17	.41	.62	.50	.59	.59	.73	1.4	8.0	5.6	1.8	1.1	.46
18	.41	.62	.54	.59	.54	.64	1.7	10	5.3	1.8	1.1	.45
19	.42	.64	.54	.56	.54	.67	1.6	12	5.1	1.6	1.4	.44
20	.40	.59	.54	.56	.54	.73	1.4	14	4.7	1.6	1.2	.54
21	.48	.59	.54	.56	.54	.78	1.6	14	4.5	1.6	1.1	.56
22	.42	.59	.54	.56	.54	.73	1.8	16	4.2	1.7	.92	.49
23	.43	.62	.54	.56	.54	.67	1.9	17	4.0	1.6	.81	.49
24	.45	.62	.54	.56	.54	.70	2.0	18	3.8	1.5	.75	.44
25	.43	.64	.54	.56	.59	.73	1.8	20	3.6	1.3	.74	.46
26	.44	.67	.54	.56	.62	.73	1.8	21	3.4	1.2	.74	.44
27	.44	.64	.52	.56	.62	.73	1.9	21	3.4	1.2	.69	.49
28	.44	.62	.52	.56	.59	.76	2.3	20	3.2	1.1	.65	.49
29	.44	.62	.52	.56	---	.76	2.5	18	3.0	1.1	.63	.51
30	.47	.62	.52	.56	---	.76	2.7	16	2.9	1.0	.61	.54
31	.47	---	.51	.56	---	.73	---	13	---	1.0	.62	---
TOTAL	13.76	18.50	16.68	16.65	16.38	21.72	39.45	298.1	202.3	56.2	28.92	16.79
MEAN	.44	.62	.54	.54	.59	.70	1.32	9.62	6.74	1.81	.93	.56
MAX	.48	.77	.64	.59	.62	.78	2.7	21	13	2.8	1.4	.75
MIN	.40	.48	.50	.46	.54	.56	.62	2.7	2.9	1.0	.61	.44
AC-FT	27	37	33	33	32	43	78	591	401	111	57	33

WTR YR 1979 TOTAL 745.45 MEAN 2.04 MAX 21 MIN .40 AC-FT 1480

09317920 TIE FORK CANYON NEAR HUNTINGTON, UT--Continued

PERIOD OF RECORD.--October 1978 to September 1979.

SEDIMENT DATA: November 1978, August 1979.

WATER QUALITY DATA, WATER YEAR OCTOBER 1978 TO SEPTEMBER 1979

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH (UNITS)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)	HARD-NESS (MG/L AS CACO3)	HARD-NESS, NONCAR-BONATE (MG/L CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)
OCT											
23...	1300	.42	420	8.5	3.0	10.2	--	--	280	31	61
NOV											
18...	1445	.75	530	8.5	.0	11.0	K3	28	310	47	68
JUN											
14...	1130	6.6	470	7.9	9.5	--	--	--	--	--	--
JUL											
17...	1245	1.7	450	8.6	13.0	8.4	--	--	230	17	51
AUG											
06...	1100	.96	470	8.4	11.0	8.5	K13	460	270	45	57
SEP											
16...	1100	.57	510	8.5	3.0	10.4	--	--	280	44	58

DATE	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	SODIUM+ POTAS-SIUM DIS-SOLVED (MG/L AS NA)	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	BICAR-BONATE (MG/L AS HCO3)	CAR-BONATE (MG/L AS CO3)	ALKA-LINITY (MG/L AS CACO3)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)
OCT											
23...	32	4.5	3	.1	--	1.9	280	14	250	1.6	37
NOV											
18...	33	3.9	3	.1	--	1.8	300	10	263	1.6	39
JUN											
14...	--	--	--	--	--	--	--	--	--	--	--
JUL											
17...	25	3.3	3	.1	5.4	2.1	240	10	210	1.0	28
AUG											
06...	30	4.2	6	.1	8.8	4.6	270	2	225	1.7	31
SEP											
16...	32	4.1	3	.1	5.9	1.8	280	4	236	1.5	39

DATE	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	SOLIDS, DIS-SOLVED (TONS PER DAY)	NITRO-GEN, NITRATE DIS-SOLVED (MG/L AS N)	NITRO-GEN, NITRITE DIS-SOLVED (MG/L AS NO2)	NITRO-GEN, NO2+NO3 DIS-SOLVED (MG/L AS N)	NITRO-GEN, AMMONIA DIS-SOLVED (MG/L AS N)	NITRO-GEN, ORGANIC DIS-SOLVED (MG/L AS N)
OCT											
23...	5.0	--	6.8	300	.41	.34	--	--	--	--	--
NOV											
18...	4.9	.1	6.4	316	.43	.64	--	.03	.10	.02	.17
JUN											
14...	--	--	--	--	--	--	--	--	--	--	--
JUL											
17...	3.9	--	6.0	248	.34	1.15	--	--	--	--	--
AUG											
06...	4.6	.1	6.4	274	.37	.71	.19	.03	.20	.00	.12
SEP											
16...	4.0	--	6.4	287	.39	.44	--	--	--	--	--

DATE	NITRO-GEN, AM-MONIA + ORGANIC TOTAL (MG/L AS N)	NITRO-GEN, NH4 + ORG. SUSP. TOTAL (MG/L AS N)	NITRO-GEN, AM-MONIA + ORGANIC DIS. (MG/L AS N)	PHOS-PHORUS, TOTAL (MG/L AS P)	PHOS-PHORUS, ORTHO, DIS-SOLVED (MG/L AS P)	PHOS-PHATE, ORTHO, DIS-SOLVED (MG/L AS PO4)	BORON, DIS-SOLVED (UG/L AS B)	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C)	PHENOLS (UG/L)	OIL AND GREASE, TOTAL RECOV. GRAVI-METRIC (MG/L)
OCT											
23...	--	--	--	--	--	--	--	--	--	--	--
NOV											
18...	.30	.11	.19	.000	.01	.03	40	7.9	.6	1	0
JUN											
14...	--	--	--	--	--	--	--	--	--	--	--
JUL											
17...	--	--	--	--	--	--	--	--	--	--	--
AUG											
06...	.10	.00	.12	.010	.00	.00	30	1.2	.1	2	0
SEP											
16...	--	--	--	--	--	--	--	--	--	--	--

K Results based on colony count outside the acceptable range (non-ideal colony count).

09317920 TIE FORK CANYON NEAR HUNTINGTON, UT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1978 TO SEPTEMBER 1979

DATE	TIME	ARSENIC DIS- SOLVED (UG/L AS AS)	CHRO- MIUM, DIS- SOLVED (UG/L AS CR)	IRON, DIS- SOLVED (UG/L AS FE)	LEAD, DIS- SOLVED (UG/L AS PB)	LITHIUM DIS- SOLVED (UG/L AS LI)	MANGA- NESE, DIS- SOLVED (UG/L AS MN)	SELE- NIUM, DIS- SOLVED (UG/L AS SE)	STRON- TIUM, DIS- SOLVED (UG/L AS SR)	ZINC, DIS- SOLVED (UG/L AS ZN)
NOV										
18...	1445	0	0	10	19	9	2	1	210	4
AUG										
06...	1100	1	0	40	0	6	<1	0	240	50

BENTHIC INVERTEBRATE ANALYSES, OCTOBER 1978 TO AUGUST 1979

DATE	NOV 18,78	AUG 6,79
TIME	1445	1100
TOTAL COUNT	972	504
DIVERSITY: PHYLUM	0.2	0.1
.CLASS	0.4	0.2
..ORDER	1.8	1.8
...FAMILY	0.0	0.0
....GENUS	0.0	0.0
....GENUS-INSECTA	0.0	0.0
ORGANISM	COUNT	COUNT
ANNELIDA		
.OLIGOCHAETA		
..UNKNOWN ORDER	--	3
...UNKNOWN FAMILY	23	--
ARTHROPODA (ARTHROPODS)		
.ARACHNIDA		
..ACARINA	17	11
.INSECTA		
..COLEOPTERA		
...ELMIDAE	5	13
..DIPTERA		
...CHIRONOMIDAE	254	77
...EMPIDIDAE	19	--
...EPHYDRIDAE	3	--
...PSYCHODIDAE	4	--
...SIMULIIDAE	90	13
...TIPULIDAE	56	7
..EPHEMEROPTERA	381	295
..MEGALOPTERA	--	1
..PLECOPTERA	76	50
..TRICHOPTERA	38	34
MOLLUSCA (MOLLUSCS)		
.BIVALVIA		
..NUCULOIDEA		
...SPHAERIIDAE	2	--
NEMATODA (NEMATODES)		
.UNKNOWN CLASS		
..UNKNOWN ORDER		
...UNKNOWN FAMILY	2	--
PLATYHELMINTHES (FLATWORMS)		
.TURBELLARIA		
..TRICLADIDA		
...UNKNOWN FAMILY	2	--

09317920 TIE FORK CANYON NEAR HUNTINGTON, UT--Continued

SUSPENDED SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1978 TO SEPTEMBER 1979

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT DIS-CHARGE, SUS-PENDED (T/DAY)
NOV				
18...	1445	.75	57	.12
AUG				
06...	1100	.96	66	.17

PARTICLE-SIZE DISTRIBUTION OF SURFACE BED MATERIAL, WATER YEAR OCTOBER 1978 TO SEPTEMBER 1979

DATE	TIME	BED MAT. FALL DIAM. % FINER THAN .062 MM	BED MAT. FALL DIAM. % FINER THAN .125 MM	BED MAT. FALL DIAM. % FINER THAN .250 MM	BED MAT. FALL DIAM. % FINER THAN .500 MM	BED MAT. SIEVE DIAM. % FINER THAN 1.00 MM	BED MAT. SIEVE DIAM. % FINER THAN 2.00 MM	BED MAT. SIEVE DIAM. % FINER THAN 4.00 MM	BED MAT. SIEVE DIAM. % FINER THAN 8.00 MM	BED MAT. SIEVE DIAM. % FINER THAN 16.0 MM	BED MAT. SIEVE DIAM. % FINER THAN 32.0 MM
NOV											
18...	1445	5	8	18	35	42	52	64	71	82	100
AUG											
06...	1100	1	2	7	21	30	39	52	72	96	100

09317920 TIE FORK CANYON NEAR HUNTINGTON, UTAH

LOCATION.--Lat 39°27'31", long 111°08'11", in NE1/4SE1/4 sec.4, T.16 S., R.7 E., Emery County, Hydrologic Unit 14060009, on right bank 0.4 mi (0.6 km) upstream from mouth, 0.4 mi (0.6 km) from Highway 31, 15 mi (24.1 km) northwest of Huntington.

DRAINAGE AREA.--11.7 mi^2 (30.3 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1978 to current year (seasonal record).

GAGE.--Water-stage recorder. Altitude of gage is 7,400 ft (2,260 m) from topographic map.

REMARKS.--Records good except those above 6 ft^3/s (0.170 m^3/s), and November, which are poor.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 29 ft^3/s (0.821 m^3/s) May 30, 31, June 7-9, 1980; minimum, 0.17 ft^3/s (0.005 m^3/s) Mar. 10, 1979.

EXTREMES FOR CURRENT YEAR.--Maximum daily discharge, 29 ft^3/s (0.821 m^3/s) May 30, 31, June 7-9; minimum daily, 0.40 ft^3/s (0.011 m^3/s) Nov. 23, 24, 29, 30 (may have been lower during period of non-operation).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.54	.51	.61				---	5.1	26	8.0	1.9	1.1
2	.52	.52	.57				---	5.0	25	7.4	1.9	1.0
3	.52	.52	.56				---	5.5	26	6.6	1.8	1.0
4	.54	.52	---				---	6.5	26	6.0	1.7	.98
5	.57	.51	---				---	8.3	26	5.5	1.7	.95
6	.57	.51	---				---	12	26	5.1	1.6	.96
7	.57	.49	---				---	13	29	5.0	1.5	1.4
8	.57	.49	---				---	14	29	5.1	1.4	1.5
9	.54	.49	---				---	14	29	4.6	1.4	1.5
10	.54	.50	---				---	14	27	4.2	1.4	2.0
11	.52	.54	---				---	13	26	4.0	1.4	1.5
12	.52	.58	---				---	12	24	3.8	1.3	1.2
13	.52	.54	---				---	11	22	3.6	1.5	1.2
14	.52	.52	---				---	11	21	3.4	1.9	1.1
15	.54	.50	---				---	10	20	3.3	1.9	1.1
16	.57	.49	---				---	11	19	3.1	1.5	.99
17	.54	.49	---				---	11	18	3.0	1.4	.95
18	.60	.49	---				---	12	17	2.9	1.3	.93
19	.54	.46	---				---	14	16	2.8	1.3	.91
20	.60	.46	---				---	18	14	2.7	1.3	.91
21	.60	.42	---				---	24	13	2.6	1.3	.90
22	.54	.41	---				---	28	12	2.6	1.2	.91
23	.54	.40	---				---	27	12	2.6	1.3	.89
24	.52	.40	---				---	26	11	2.6	1.4	.88
25	.52	.41	---				---	26	10	2.4	1.6	.86
26	.52	.42	---				---	27	10	2.2	1.4	.86
27	.52	.41	---				---	26	8.8	2.2	1.3	.89
28	.52	.41	---				---	26	8.3	2.1	1.2	.88
29	.54	.40	---				7.1	28	7.6	2.1	1.1	.87
30	.54	.40	---				5.5	29	7.6	2.0	1.1	.84
31	.53	---	---				---	29	---	2.0	1.1	---
TOTAL	16.84	14.21	---				---	516.4	566.3	115.5	45.1	31.96
MEAN	.54	.47	---				---	16.7	18.9	3.73	1.45	1.07
MAX	.60	.58	---				---	29	29	8.0	1.9	2.0
MIN	.52	.40	---				---	5.0	7.6	2.0	1.1	.84
AC-FT	33	28	---				---	1020	1120	229	89	63

09317920 TIE FORK CANYON NEAR HUNTINGTON, UT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1978 to current year.

SEDIMENT DATA: November 1978 to current year, monthly.

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (MICRO-MHOS)	PH FIELD (UNITS)	TEMPER-ATURE, AIR (DEG C)	TEMPER-ATURE, WATER (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	NITRO-GEN, DIS-SOLVED (MG/L AS N)	COLI-FORM, FECAL, 0.7 UM-MF (COLS./ 100 ML)	STREP-TOCOCCI FECAL, KF AGAR (COLS. PER 100 ML)
OCT										
14...	1015	.53	520	8.5	11.5	6.0	9.8	--	--	--
NOV										
12...	1415	.97	580	8.2	3.0	.0	11.1	.60	K2	K44
MAY										
25...	1500	26	455	8.5	9.5	4.0	10.0	2.0	K5	K14
JUN										
28...	1200	8.7	440	8.5	23.5	10.5	8.7	--	--	--
JUL										
13...	1515	3.5	425	8.7	15.0	12.0	8.4	--	--	--
AUG										
17...	1645	1.5	455	8.6	19.5	12.5	7.9	.68	68	140
SEP										
20...	1445	.96	475	8.5	15.0	11.0	8.5	--	--	--

DATE	HARD-NESS (MG/L AS CACO3)	HARD-NESS, NONCAR-BONATE (MG/L CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	SODIUM PERCENT	SODIUM AD-SORP-TION RATIO	SODIUM+ POTAS-SIUM DIS-SOLVED (MG/L AS NA)	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	BICAR-BONATE (MG/L AS HCO3)
OCT										
14...	290	31	61	33	5.3	4	.1	7.3	2.0	300
NOV										
12...	310	39	65	36	4.9	6	.1	6.7	1.8	330
MAY										
25...	250	17	70	18	3.0	3	.1	--	1.2	280
JUN										
28...	240	5	59	22	3.4	3	.1	--	1.0	270
JUL										
13...	220	10	49	24	3.5	3	.1	--	1.2	240
AUG										
17...	240	25	51	27	3.8	3	.1	--	1.4	230
SEP										
20...	250	35	52	28	3.7	3	.1	--	1.3	270

DATE	CAR-BONATE (MG/L AS CO3)	ALKA-LINITY (MG/L AS CACO3)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	SOLIDS, DIS-SOLVED (TONS PER DAY)
OCT										
14...	8	260	1.6	41	5.0	--	6.7	310	.42	.45
NOV										
12...	0	270	3.3	40	7.7	.1	7.0	326	.44	.85
MAY										
25...	2	230	1.4	26	3.6	.2	5.7	274	.37	19.2
JUN										
28...	8	230	1.4	19	3.7	--	5.6	255	.35	5.99
JUL										
13...	8	210	.8	18	3.8	--	5.8	232	.32	2.19
AUG										
17...	16	220	1.1	25	4.3	.2	6.0	250	.34	1.01
SEP										
20...	6	230	1.3	31	4.6	--	5.6	252	.34	.65

K Results based on colony count outside the acceptable range (non-ideal colony count).

09317920 TIE FORK CANYON NEAR HUNTINGTON, UT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	NITROGEN, NITRATE DISSOLVED (MG/L AS N)	NITROGEN, NITRATE DISSOLVED (MG/L AS NO3)	NITROGEN, NITRITE DISSOLVED (MG/L AS N)	NITROGEN, NITRITE DISSOLVED (MG/L AS NO2)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA DISSOLVED (MG/L AS NH4)	NITROGEN, ORGANIC DISSOLVED (MG/L AS N)	NITROGEN, AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN, NH4 + ORG. SUSP. TOTAL (MG/L AS N)
OCT										
14...	--	--	--	--	--	--	--	--	--	--
NOV										
12...	.15	.66	.000	.00	.15	.000	.00	.45	.55	.10
MAY										
25...	1.4	<6.2	.000	.00	1.4	.040	.05	.52	1.0	.44
JUN										
28...	--	--	--	--	--	--	--	--	--	--
JUL										
13...	--	--	--	--	--	--	--	--	--	--
AUG										
17...	.26	<1.2	.000	.00	.26	.060	.08	.36	.43	.01
SEP										
20...	--	--	--	--	--	--	--	--	--	--

DATE	NITROGEN, AMMONIA + ORGANIC DIS. (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS, TOTAL (MG/L AS PO4)	PHOSPHORUS, ORTHOPHOSPHATE DISSOL. (MG/L AS P)	PHOSPHORUS, ORTHOPHOSPHATE DISSOL. (MG/L AS PO4)
NOV					
12...	.45	.010	.03	.000	.00
MAY					
25...	.56	.160	.49	.040	.12
AUG					
17...	.42	.020	.06	.000	.00

DATE	TIME	ARSENIC DISSOLVED (UG/L AS AS)	BORON, DISSOLVED (UG/L AS B)	IRON, DISSOLVED (UG/L AS FE)	LEAD, DISSOLVED (UG/L AS PB)	LITHIUM DISSOLVED (UG/L AS LI)	MANGANESE, DISSOLVED (UG/L AS MN)	SELENIUM, DISSOLVED (UG/L AS SE)	STRONTIUM, DISSOLVED (UG/L AS SR)	ZINC, DISSOLVED (UG/L AS ZN)
NOV										
12...	1415	2	20	10	0	30	3	0	260	<3
MAY										
25...	1500	0	30	20	0	10	0	1	200	10
AUG										
17...	1645	1	60	<10	2	9	2	0	220	4

09317920 TIE FORK CANYON NEAR HUNTINGTON, UT--Continued

BENTHIC INVERTEBRATE ANALYSES, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

Date:	Nov. 12, 1979	Aug. 17, 1980
Time:	1530	1645
Total Count	556	180
Diversity Phylum		
.Class		
..Order	1.4	0.0
...Family	0.0	3.3
Organism		
Annelida		
.Oligochaeta		
..Plesiopora		
...Enchytraeidae	-	2
Arthropoda		
.Arachnoidea		
..Hydracarina		
...Lebertiidae	-	1
...Sperchonidae	-	1
.Insecta		
..Coleoptera		
...Elmidae	-	1
..Diptera		
...Chironomidae	12	26
...Culicidae	4	-
...Psychodidae	4	-
...Simuliidae	-	5
...Tipulidae	12	7
..Ephemeroptera	384	-
...Baetidae	-	56
...Ephemeridae	-	1
...Heptageniidae	-	11
...Leptophlebiidae	-	2
..Plecoptera	44	-
...Capniidae	-	16
...Nemouridae	-	8
...Perlodidae	-	7
...Pteronarcyidae	-	14
..Trichoptera	96	
...Hydropsychidae	-	19
...Rhyacophilidae	-	1
Mollusca		
.Pelecypoda		
..Heterondonta		
...Sphaeriidae	-	1
Platyhelminthes		
.Turbellaria		
..Tricladida		
...Planariidae	-	1

PARTICLE-SIZE DISTRIBUTION OF SUSPENDED SEDIMENT, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE, WATER (DEG C)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT DIS-CHARGE, SUS-PENDED (T/DAY)	SED. SUSP. FALL DIAM. % FINER THAN .002 MM	SED. SUSP. FALL DIAM. % FINER THAN .004 MM
NOV							
12...	1415	.97	.0	143	.37	--	--
APR							
29...	1720	4.6	3.5	227	2.8	56	58
MAY							
25...	1500	26	4.0	648	45	14	16
AUG							
17...	1645	1.5	12.5	7	.03	--	--

DATE	SED. SUSP. FALL DIAM. % FINER THAN .016 MM	SED. SUSP. FALL DIAM. % FINER THAN .062 MM	SED. SUSP. FALL DIAM. % FINER THAN .125 MM	SED. SUSP. FALL DIAM. % FINER THAN .250 MM	SED. SUSP. FALL DIAM. % FINER THAN .500 MM	SED. SUSP. FALL DIAM. % FINER THAN 1.00 MM
NOV						
12...	--	--	--	--	--	--
APR						
29...	70	92	96	98	100	--
MAY						
25...	27	44	63	87	98	100
AUG						
17...	--	--	--	--	--	--

09317920 TIE FORK CANYON NEAR HUNTINGTON, UT--Continued

PARTICLE-SIZE DISTRIBUTION OF SURFACE BED MATERIAL, WATER YEAR OCTOBER 1979 TO SEPTEMBER 1980

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE, WATER (DEG C)	BED MAT. FALL DIAM. % FINER THAN .062 MM	BED MAT. FALL DIAM. % FINER THAN .125 MM	BED MAT. FALL DIAM. % FINER THAN .250 MM	BED MAT. FALL DIAM. % FINER THAN .500 MM
NOV							
12...	1415	.97	.0	1	1	6	20

DATE	BED MAT. SIEVE DIAM. % FINER THAN 1.00 MM	BED MAT. SIEVE DIAM. % FINER THAN 2.00 MM	BED MAT. SIEVE DIAM. % FINER THAN 4.00 MM	BED MAT. SIEVE DIAM. % FINER THAN 8.00 MM	BED MAT. SIEVE DIAM. % FINER THAN 16.0 MM	BED MAT. SIEVE DIAM. % FINER THAN 32.0 MM
NOV						
12...	33	42	54	72	93	100

09317920 TIE FORK CANYON NEAR HUNTINGTON, UTAH

LOCATION.--Lat 39°27'31", long 111°08'11", inNE¼SE¼ sec.4, T.16 S., R.7 E., Emery County, Hydrologic Unit 14060009, on right bank 0.4 mi (0.6 km) upstream from mouth, 0.4 mi (0.6 km) from Highway 31, 15 mi (24.1 km) northwest of Huntington.

DRAINAGE AREA.--11.7 mi^2 (30.3 km^2).

WATER-DISCHARGE RECORDS

PERIOD OF RECORD.--October 1978 to September 1981 (discontinued) (seasonal).

GAGE.--Water-stage recorder. Altitude of gage is 7,400 ft (2,260 m) from topographic map.

REMARKS.--Records good.

EXTREMES FOR PERIOD OF RECORD.--Maximum daily discharge, 29 ft^3/s (0.821 m^3/s) May 30, 31, June 7-9, 1980; minimum, 0.17 ft^3/s (0.005 m^3/s) Mar. 10, 1979.

EXTREMES FOR CURRENT YEAR.--Maximum discharge, 4.8 ft^3/s (0.136 m^3/s) Apr. 30, gage height, 1.40 ft (0.427 m); minimum observed, 0.41 ft^3/s (0.012 m^3/s) Nov. 18 (may have been lower during period of non-operation).

DISCHARGE, IN CUBIC FEET PER SECOND, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981
MEAN VALUES

DAY	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
1	.82	.79						2.0	1.2	.66	.47	.60
2	.82	.79						1.9	1.3	.72	.48	.60
3	.82	.81						1.9	1.3	.65	.49	.59
4	.81	.83						1.4	1.1	.60	.46	.58
5	.79	.80						1.2	1.0	.61	.46	.83
6	.80	.83						1.2	1.0	.59	.45	.70
7	.81	.82						1.0	1.0	.61	.48	.66
8	.79	.82						1.1	.96	.60	.48	.74
9	.78	.82						.98	.91	.57	.48	.88
10	.82	.83						1.0	.90	.62	.62	.79
11	.83	.87						1.0	.88	.68	.65	.68
12	1.1	.88						.94	.85	.70	.63	.68
13	.99	.87						.91	.85	.69	.62	.66
14	1.1	.77						.91	.94	.59	.61	.63
15	1.2	.65						.97	.92	.50	.60	.60
16	1.1	.55						1.0	.88	.49	.60	.60
17	1.0	.49						.94	.84	.50	.59	.60
18	1.0	.47						.88	.83	.49	.56	.60
19	.97	.46						.88	.82	.47	.56	.57
20	.93	.45						1.0	.80	.45	.54	.57
21	.90	.46						1.1	.75	.45	.54	.57
22	.88	.45						1.1	.72	.45	.62	.60
23	.80	.45						1.0	.69	.47	.58	.60
24	.75	.45						.92	.72	.49	.59	.57
25	.76	.45						.82	.70	.51	.56	.54
26	.81	.45						.88	.69	.47	.58	.54
27	.80	.45						1.3	.68	.46	.59	.54
28	.77	.45						1.7	.69	.46	.62	.54
29	.79	.45						1.6	.67	.47	.61	.52
30	.83	.45						1.5	.65	.48	.63	.49
31	.82	---						1.4	---	.46	.64	---
TOTAL	27.19	19.11						36.43	26.24	16.96	17.39	18.67
MEAN	.88	.64						1.18	.87	.55	.56	.62
MAX	1.2	.88						2.0	1.3	.72	.65	.88
MIN	.75	.45						.82	.65	.45	.45	.49
AC-FT	54	38						72	52	34	34	37

09317920 TIE FORK CANYON NEAR HUNTINGTON, UT--Continued

WATER-QUALITY RECORDS

PERIOD OF RECORD.--October 1978 to September 1981 (discontinued).
SEDIMENT DATA: November 1978 to September 1981 (discontinued).

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	SPE-CIFIC CON-DUCT-ANCE (UMHOS)	PH (UNITS)	TEMPER-ATURE, AIR (DEG C)	TEMPER-ATURE (DEG C)	OXYGEN, DIS-SOLVED (MG/L)	OXYGEN, DIS-SOLVED (PER-CENT SATUR-ATION)	NITRO-GEN DIS-SOLVED (MG/L AS N)	HARD-NESS (MG/L AS CACO3)	HARD-NESS, NONCAR-BONATE (MG/L CACO3)
OCT											
20...	1300	.86	510	8.4	4.0	2.0	10.1	99	--	290	37
NOV											
18...	1130	.41	580	8.4	1.0	.0	11.4	101	.55	290	42
MAY											
22...	1245	1.1	480	8.5	11.0	9.0	9.3	104	.55	260	42
JUN											
25...	1130	.70	490	8.5	27.0	14.0	8.0	100	--	260	30
26...	1130	.70	490	8.5	27.0	14.0	8.0	100	--	--	--
JUL											
14...	1400	.64	475	8.4	28.0	14.0	8.2	102	--	250	40
AUG											
13...	0945	.62	500	8.2	13.0	9.0	9.2	102	.46	270	49
SEP											
03...	1100	.38	470	8.6	21.0	9.5	8.4	--	--	270	--
06...	1315	.67	495	8.5	14.0	10.0	8.8	100	--	260	40

DATE	HARD-NESS NONCAR-BONATE (MG/L AS CACO3)	CALCIUM DIS-SOLVED (MG/L AS CA)	MAGNE-SIUM, DIS-SOLVED (MG/L AS MG)	SODIUM, DIS-SOLVED (MG/L AS NA)	PERCENT SODIUM	SODIUM AD-SORP-TION RATIO	POTAS-SIUM, DIS-SOLVED (MG/L AS K)	BICAR-BONATE FET-FLD (MG/L AS HCO3)	CAR-BONATE FET-FLD (MG/L AS CO3)	ALKA-LINITY FIELD (MG/L AS CACO3)
OCT										
20...	--	63	32	4.4	3	.1	1.6	300	4	250
NOV										
18...	--	64	32	4.4	3	.1	1.8	340	4	280
MAY										
22...	32	57	29	4.8	4	.1	1.4	260	6	220
JUN										
25...	60	53	31	4.4	4	.1	1.2	270	6	230
26...	--	--	--	--	--	--	--	270	6	230
JUL										
14...	--	50	31	4.9	4	.1	1.7	250	3	210
AUG										
13...	--	54	32	4.5	4	.1	1.6	270	0	220
SEP										
03...	--	52	33	4.2	3	.1	1.7	--	--	--
06...	--	53	31	4.1	3	.1	1.8	250	9	220

DATE	ALKA-LINITY LAB (MG/L AS CACO3)	CARBON DIOXIDE DIS-SOLVED (MG/L AS CO2)	SULFATE DIS-SOLVED (MG/L AS SO4)	CHLO-RIDE, DIS-SOLVED (MG/L AS CL)	FLUO-RIDE, DIS-SOLVED (MG/L AS F)	SILICA, DIS-SOLVED (MG/L AS SIO2)	SOLIDS, RESIDUE AT 180 DEG. C DIS-SOLVED (MG/L)	SOLIDS, SUM OF CONSTI-TUENTS, DIS-SOLVED (MG/L)	SOLIDS, DIS-SOLVED (TONS PER AC-FT)	SOLIDS, DIS-SOLVED (TONS PER DAY)
OCT										
20...	220	2.0	34	4.9	.1	6.0	252	298	.34	.59
NOV										
18...	250	1.9	30	5.1	.2	6.5	224	296	.30	.25
MAY										
22...	230	1.4	34	4.9	.1	4.8	251	275	.34	.75
JUN										
25...	200	1.2	39	4.5	.1	5.2	259	259	.35	.49
26...	--	1.4	--	--	--	--	--	--	--	--
JUL										
14...	--	1.6	40	4.5	.1	6.0	248	264	.34	.43
AUG										
13...	--	2.7	40	4.7	.1	6.4	264	277	.36	.44
SEP										
03...	--	--	41	9.8	.1	6.4	261	--	.35	.27
06...	--	1.4	40	4.5	.1	6.9	266	274	.36	.48

09317920 TIE FORK CANYON NEAR HUNTINGTON, UT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	NITROGEN, AMMONIA TOTAL (MG/L AS N)	NITROGEN, AMMONIA TOTAL (MG/L AS NH4)	NITROGEN, ORGANIC TOTAL (MG/L AS N)	NITROGEN,AMMONIA + ORGANIC TOTAL (MG/L AS N)	NITROGEN,NH4 + ORG. SUSP. TOTAL (MG/L AS N)	NITROGEN,AMMONIA + ORGANIC DIS. (MG/L AS N)	NITROGEN, NO2+NO3 DISSOLVED (MG/L AS N)	PHOSPHORUS, TOTAL (MG/L AS P)	PHOSPHORUS TOTAL (MG/L AS PO4)	PHOSPHORUS, DISSOLVED (MG/L AS P)	POTASSIUM 40 DISSOLVED (PCI/L AS K40)
NOV											
18...	.010	.01	.38	.39	.05	.34	.21	.010	.03	.020	--
MAY											
22...	.090	--	.40	.49	.03	.46	.09	.010	.03	.010	1.0
JUN											
25...	--	--	--	--	--	--	--	--	--	--	.90
JUL											
14...	--	--	--	--	--	--	--	--	--	--	1.3
AUG											
13...	.030	--	.51	.54	.23	.31	.15	.050	.15	.020	--

DATE	TIME	ARSENIC TOTAL (UG/L AS AS)	ARSENIC SUSPENDED TOTAL (UG/L AS AS)	ARSENIC DISSOLVED (UG/L AS AS)	BARIUM, TOTAL RECOVERABLE (UG/L AS BA)	BARIUM, SUSPENDED RECOVERABLE (UG/L AS BA)	BARIUM, DISSOLVED (UG/L AS BA)	BERYLLIUM, TOTAL RECOVERABLE (UG/L AS BE)	BERYLLIUM, SUSPENDED RECOV. (UG/L AS BE)	BERYLLIUM, DISSOLVED (UG/L AS BE)	BORON, DISSOLVED (UG/L AS B)	CADMIUM TOTAL RECOVERABLE (UG/L AS CD)
OCT												
20...	1300	--	--	--	--	--	--	--	--	--	8	--
NOV												
18...	1130	1	--	2	100	20	80	10	--	<1	30	8
MAY												
22...	1245	1	1	0	0	0	60	0	--	<1	0	0
JUN												
25...	1130	--	--	--	--	--	--	--	--	--	10	--
JUL												
14...	1400	--	--	--	--	--	--	--	--	--	10	--
AUG												
13...	0945	0	0	0	--	--	--	0	0	1	20	0
SEP												
03...	1100	--	--	--	--	--	--	--	--	--	10	--
06...	1315	--	--	--	--	--	--	--	--	--	20	--

DATE	CADMIUM DISSOLVED (UG/L AS CD)	CHROMIUM, TOTAL RECOVERABLE (UG/L AS CR)	CHROMIUM, SUSPENDED RECOV. (UG/L AS CR)	CHROMIUM, DISSOLVED (UG/L AS CR)	COPPER, TOTAL RECOVERABLE (UG/L AS CU)	COPPER, SUSPENDED RECOVERABLE (UG/L AS CU)	COPPER, DISSOLVED (UG/L AS CU)	IRON, TOTAL RECOVERABLE (UG/L AS FE)	IRON, SUSPENDED RECOVERABLE (UG/L AS FE)	IRON, DISSOLVED (UG/L AS FE)	LEAD, TOTAL RECOVERABLE (UG/L AS PB)	LEAD, SUSPENDED RECOVERABLE (UG/L AS PB)
OCT												
20...	--	--	--	--	--	--	--	80	--	<10	--	--
NOV												
18...	<1	10	--	0	1	--	2	140	--	<10	5	--
MAY												
22...	<1	0	0	0	4	2	2	70	--	<10	0	0
JUN												
25...	--	--	--	--	--	--	--	60	40	20	--	--
JUL												
14...	--	--	--	--	--	--	--	40	30	10	--	--
AUG												
13...	<1	10	10	0	37	37	0	50	--	<10	5	4
SEP												
03...	--	--	--	--	--	--	--	10	--	<10	--	--
06...	--	--	--	--	--	--	--	260	--	<10	--	--

09317920 TIE FORK CANYON NEAR HUNTINGTON, UT--Continued

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	LEAD, DIS-SOLVED (UG/L AS PB)	LITHIUM TOTAL RECOV-ERABLE (UG/L AS LI)	LITHIUM SUS-PENDED RECOV-ERABLE (UG/L AS LI)	LITHIUM DIS-SOLVED (UG/L AS LI)	MANGA-NESE, TOTAL RECOV-ERABLE (UG/L AS MN)	MANGA-NESE, SUS-PENDED RECOV. (UG/L AS MN)	MANGA-NESE, DIS-SOLVED (UG/L AS MN)	MERCURY TOTAL RECOV-ERABLE (UG/L AS HG)	MERCURY SUS-PENDED RECOV-ERABLE (UG/L AS HG)	MERCURY DIS-SOLVED (UG/L AS HG)	NICKEL, TOTAL RECOV-ERABLE (UG/L AS NI)
OCT											
20...	--	--	--	--	10	7	3	--	--	--	--
NOV											
18...	0	10	0	10	10	7	3	.0	--	.0	2
MAY											
22...	10	10	0	30	10	8	2	.1	.0	.1	1
JUN											
25...	--	--	--	--	0	0	2	--	--	--	--
JUL											
14...	--	--	--	--	10	9	1	--	--	--	--
AUG											
13...	1	--	--	--	10	--	<1	.1	.1	.0	23
SEP											
03...	--	--	--	--	0	0	2	--	--	--	--
06...	--	--	--	--	30	30	1	--	--	--	--

DATE	NICKEL, SUS-PENDED RECOV-ERABLE (UG/L AS NI)	NICKEL, DIS-SOLVED (UG/L AS NI)	SELE-NIUM, TOTAL (UG/L AS SE)	SELE-NIUM, SUS-PENDED TOTAL (UG/L AS SE)	SELE-NIUM, DIS-SOLVED (UG/L AS SE)	STRON-TIUM, TOTAL RECOV-ERABLE (UG/L AS SR)	STRON-TIUM, SUS-PENDED RECOV. (UG/L AS SR)	STRON-TIUM, DIS-SOLVED (UG/L AS SR)	ZINC, TOTAL RECOV-ERABLE (UG/L AS ZN)	ZINC, SUS-PENDED RECOV-ERABLE (UG/L AS ZN)	ZINC, DIS-SOLVED (UG/L AS ZN)
OCT											
20...	--	--	--	--	--	--	--	--	--	--	--
NOV											
18...	--	0	0	--	0	230	0	250	10	--	<3
MAY											
22...	1	0	0	0	0	270	50	220	0	0	9
JUN											
25...	--	--	--	--	--	--	--	--	--	--	--
JUL											
14...	--	--	--	--	--	--	--	--	--	--	--
AUG											
13...	23	0	0	0	0	--	--	--	30	--	<3
SEP											
03...	--	--	--	--	--	--	--	--	--	--	--
06...	--	--	--	--	--	--	--	--	--	--	--

DATE	TIME	CARBON, ORGANIC DIS-SOLVED (MG/L AS C)	CARBON, ORGANIC SUS-PENDED TOTAL (MG/L AS C)	CYANIDE TOTAL (MG/L AS CN)	PHENOLS (UG/L)
NOV					
18...	1130	21	.3	.00	39
MAY					
22...	1245	15	.5	.00	4
AUG					
13...	0945	5.0	.2	.00	35

DATE	TIME	GROSS ALPHA, DIS-SOLVED (UG/L AS U-NAT)	GROSS ALPHA, SUSP. TOTAL (UG/L AS U-NAT)	GROSS BETA, DIS-SOLVED (PCI/L AS CS-137)	GROSS BETA, SUSP. TOTAL (PCI/L AS CS-137)	GROSS BETA, DIS-SOLVED (PCI/L AS SR/YT-90)	GROSS BETA, SUSP. TOTAL (PCI/L AS SR/YT-90)
AUG							
13...	0945	<8.4	<.4	<6.2	<.4	<5.8	<.4

09317920 TIE FORK CANYON NEAR HUNTINGTON, UT--Continued

PHYTOPLANKTON ANALYSES, OCTOBER 1980 TO SEPTEMBER 1981

DATE	OCT 20,80	JUN 26,81	JUL 14,81	AUG 13,81	SEP 6,81
TIME	1300	1130	1400	0945	1315
TOTAL CELLS/ML	13	270	100	70	72
DIVERSITY: DIVISION	0.0	1.5	0.0	0.0	0.0
.CLASS	0.0	1.5	0.0	0.0	0.0
..ORDER	0.0	1.7	0.5	0.0	0.0
...FAMILY	0.0	2.7	1.5	1.5	1.0
....GENUS	0.0	2.7	1.5	1.5	1.4

ORGANISM	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT	CELLS /ML	PER-CENT
CHLOROPHYTA (GREEN ALGAE)										
.CHLOROPHYCEAE										
..CHLOROCOCCALES										
...SCENEDESMACEAE										
....SCENEDESMUS	--	-	51a	19	--	-	--	-	--	
CHRYSOPHYTA										
.BACILLARIOPHYCEAE										
..CENTRALES										
...COSCINODISCACEAE										
....CYCLOTELLA	--	-	13	5	13	13	--	-	--	
..PENNALES										
...ACHNANTHACEAE										
....ACHNANTHES	--	-	13	5	13	13	28a	40	14a	20
....COCCONEIS	--	-	--	-	--	-	--	-	14a	20
...CYMBELLACEAE										
....CYMBELLA	--	-	13	5	64a	63	--	-	--	-
...FRAGILARIACEAE										
....SYNEDRA	--	-	51a	19	--	-	--	-	--	-
...NAVICULACEAE										
....NAVICULA	--	-	26	10	--	-	28a	40	43a	60
...NITZSCHIACEAE										
....NITZSCHIA	--	-	26	10	13	13	14a	20	--	
CYANOPHYTA (BLUE-GREEN ALGAE)										
.CYANOPHYCEAE										
..CHROOCOCCALES										
...CHROOCOCCACEAE										
....ANACYSTIS	13a	100	77a	29	--	-	--	-	--	

NOTE.--(a) Dominant organism: Equal to or greater than 15 percent.
(b) Observed organism, may not have been counted: Less than 1/2 percent.

WATER QUALITY DATA, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	PERI-PHYTON BIOMASS TOTAL DRY WEIGHT G/SQ M	PERI-PHYTON BIOMASS ASH WEIGHT G/SQ M	CHLOR-A PERI-PHYTON CHROMO-GRAPHIC FLUOROM (MG/M2)	CHLOR-B PERI-PHYTON CHROMO-GRAPHIC FLUOROM (MG/M2)	BIOMASS CHLORO-PHYLL RATIO PERI-PHYTON (UNITS)
AUG 13...	0945	39.8	35.4	12.7	.640	346
SEP 06...	1315	20.2	19.2	6.20	.260	161

SUSPENDED-SEDIMENT DISCHARGE, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)	SEDI-MENT, SUS-PENDED (MG/L)	SEDI-MENT, DIS-CHARGE, SUS-PENDED (T/DAY)	COAL IN BOTTOM MATE-RIAL (GM/KG)
OCT 20...	1300	.86	2.0	5	.01	5.00
NOV 18...	1130	.41	.0	45	.05	--
MAY 22...	1245	1.1	9.0	40	.12	--
JUN 26...	1130	.70	14.0	2	.00	--
JUL 14...	1400	.64	14.0	4	.01	--
AUG 13...	0945	.62	9.0	74	.12	--
SEP 06...	1315	.67	10.0	46	.08	--

09317920 TIE FORK CANYON NEAR HUNTINGTON, UT--Continued

PARTICLE-SIZE DISTRIBUTION OF SURFACE-BED MATERIAL, WATER YEAR OCTOBER 1980 TO SEPTEMBER 1981

DATE	TIME	STREAM-FLOW, INSTAN-TANEOUS (CFS)	TEMPER-ATURE (DEG C)	BED MAT. SIEVE DIAM. % FINER THAN .062 MM	BED MAT. SIEVE DIAM. % FINER THAN .125 MM	BED MAT. SIEVE DIAM. % FINER THAN .250 MM	BED MAT. SIEVE DIAM. % FINER THAN .500 MM
MAY							
22...	1245	1.1	9.0	2	4	9	18

DATE	BED MAT. SIEVE DIAM. % FINER THAN 1.00 MM	BED MAT. SIEVE DIAM. % FINER THAN 2.00 MM	BED MAT. SIEVE DIAM. % FINER THAN 4.00 MM	BED MAT. SIEVE DIAM. % FINER THAN 8.00 MM	BED MAT. SIEVE DIAM. % FINER THAN 16.0 MM	BED MAT. SIEVE DIAM. % FINER THAN 32.0 MM
MAY						
22...	24	33	43	57	75	100

EXHIBIT 6

LABORATORY METHODS USED FOR SAMPLE ANALYSIS

Field Methods Used for the Analysis of Water Quality Samples

Parameter	Units	Instrument
Flow	cfs	Marsh-McBirney current meter, float measurement, volumetric measurement, or weir gage
Temperature	°C	Thermometer
pH	Standard Units	Beckman Model 1009 pH Meter
Conductivity	micromhos /cm at 25°C	Hydrolab TC-2 Conductivity Meter

Laboratory Methods Used for the Analysis of Water Quality Samples, With Standard Reference Page Numbers

Parameter	Unit	Method	1974 EPA Methods Page No.	14th Ed. Standard Methods Page No.
Acidity, as $CaCO_3$	mg/l	Titration	1	273
Alkalinity, as $CaCO_3$	mg/l	Manual or automated electrometric titration to pH 4.5, or automated method	3 5	278 ---
Ammonia, as N	mg/l	Manual distillation (at pH 9.5) followed by nesslerization, titration, electrode, automated phenolate	--- 159 165 168	410 412 --- ---
Arsenic	mg/l	Digestion followed by silver diethyldithiocarbamate, or atomic absorption	--- 9 95	285 283 159
BOD, 5-day	mg/l	Winkler (azide modification) or electrode method	--	543
Barium	mg/l	Digestion followed by atomic absorption or colorimetric	97	152
Bicarbonate	mg/l	Titration	278	--
Boron	mg/l	Colorimetric (Curcumin)	13	287
Cadmium	mg/l	Digestion followed by atomic absorption or colorimetric	101 ---	148 182
Calcium	mg/l	Digestion followed by atomic absorption or titration	103 ---	148 182

Parameter	Unit	Method	1974 EPA Methods Page No.	14th Ed. Standard Methods Page No.
Chloride	mg/l	Silver nitrate, mercuric nitrate, or automated colorimetric	--- 29	303 304
Chromium, VI	mg/l	Extration and atomic absorption, colorimetric	89 105	--- 192
Copper	mg/l	Digestion followed by atomic absorption or colorimetric	108	148 196
Cyanide	mg/l	Distillation followed by silver nitrate titration or pyridine pyrazolone (or barbituric acid) colorimetric	40	361
Fluoride	mg/l	Distillation followed by ion electrode, or SPANDS, or automated complexone	--- 65	389 391
Gross Alpha Radioactivity	pCi/l	Scintillation counter	--	641
Gross Beta Radioactivity	pCi/l	Scintillation counter	--	642
Iron	mg/l	Digestion followed by atomic absorption or colorimetric	110	148 208
Lead	mg/l	Digestion followed by atomic absorption or colorimetric	112 ---	148 215

Parameters	Unit	Method	1974 EPA Methods Page No.	14th Ed. Standard Methods Page No.
MPN Fecal Coliform	MPN/100 ml	MPN procedure	--	922
MPN Total Coliform	MPN/100 ml	MPN procedure	--	922
Magnesium	mg/l	Digestion followed by atomic absorption or gravimetric	114 ---	148 221
Manganese	mg/l	Digestion followed by atomic absorption or colorimetric	116 ---	148 225
Mercury	mg/l	Flameless atomic absorption	118	156
Nitrate, as N	mg/l	Cadmium reduction, brucine sulfate, automated cadmium or hydrazine reduction	201 197 207	423 427 620
Oil & Grease	mg/l	Liquid extraction with freongravimetric	229	515
Phenol	mg/l	Colorimetric (4-AAP)	241	582
Phosphate, as P	mg/l	Manual or automated ascorbic acid reduction	249 256	481 624
Potassium	mg/l	Digestion followed by atomic absorption, colorimetric or flame photometric	143 ---	235 234
Selenium	mg/l	Digestion followed by atomic absorption	145	159
Silver	mg/l	Digestion followed by atomic absorption or colorimetric	146	148

Parameter	Unit	Method	1974 EPA Methods Page No.	14th Ed. Standard Methods Page No.
Sodium	mg/l	Digestion followed by atomic absorption, flame photometric	147 ---	--- 250
Sulfate	mg/l	Gravimetric, turbidimetric, or automated colorimetric	--- 277, 279	493 496
Suspended Solids	mg/l	Glass fiber filtration, 105°C	268	94
Total Suspended Solids	mg/l	Glass fiber filtration, 180°C	266	92
Total Organic Carbon	mg/l	Combustion - infrared	236	532
Turbidity	NTU	Nephelometric	295	132
Zinc	mg/l	Digestion followed by atomic absorption or colorimetric	155 ---	148 265