

CROW BUTTE RESOURCES, INC.

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November 7, 2001

U.S. Nuclear Regulatory Commission
Attention: Mr. Philip Ting, Chief
Fuel Cycle Licensing Branch
Division of Fuel Cycle Safety and Safeguards
c/o Document Control Desk
Washington, D.C. 20555

Re: License No. SUA-1534
Docket No. 40-8943
Annual Pond Inspection Report

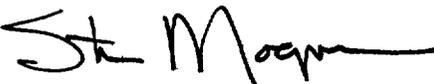
Dear Mr. Ting:

Enclosed is a copy of the Crow Butte Mine, 2001 Pond Inspection Report as required by NRC license condition no. 11.4 of SUA-1534. The pond inspection report contains a technical evaluation of the hydraulic capacities and structural stability of the pond embankments.

The annual inspection was conducted in accordance with the Evaporation Pond Inspection Program dated December 1992 (Revised February 26, 1993, August 30, 1993 and February 5, 1996).

If you have any questions regarding the inspection report, please contact me.

Sincerely,



Steven D. Magnuson, P.E.
Vice President / Manager of Operations
Nebraska P.E., E-6759

NMSSO1FO101

CROW BUTTE RESOURCES, INC.

**CROW BUTTE MINE
DAWES COUNTY, NEBRASKA**

2001 POND INSPECTION REPORT

**By: Steven D. Magnuson, P.E.
Nebraska P.E., E-6749**

November 7, 2001

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1.0 GENERAL

An annual inspection of the Crow Butte ISL Mine pond system is required by the Evaporation Pond Onsite Inspection Program dated December 1992 (Revised February 26, 1993, August 30, 1993 and February 5, 1996) and by reference under license condition no.11.4 of SUA-1534. The inspection program provides for systematic inspections and an annual technical evaluation and inspection report which compares field inspection data with engineering design reports to assess structural stability and hydraulic and hydrologic capacities.

The 2001 annual report covers the time period of November 1, 2000 through November 1, 2001. During that period five evaporation ponds were in use, two R&D ponds (Cells 1 and 2) and three commercial ponds (Ponds 1, 3 and 4).

The R&D pond design report was prepared by Klohn Leonoff Consulting Engineers in 1983 and construction of R&D cells 1 and 2 was completed in 1985. The R&D ponds have two to one horizontal to vertical (2H:1V) interior and exterior embankment slopes with a 34 mil interior hypalon liner placed on top of six inches of sand. The underdrain leak detection system piping is located beneath the pond liner and reports to two six inch monitor stand pipes. The overall depth of the R&D ponds is 15 feet and the maximum operating level is 12 feet which provides three feet of freeboard.

The commercial evaporation pond design report was prepared by Western Water Consultants, Inc. in 1988. Construction of ponds 3 and 4 was completed in 1990 and construction of pond 1 was completed in 1992. The exterior slopes of these ponds are 2.5H:1V and the interior slopes are 2H:1V. Ponds 3 and 4 have a 20 mil PVC bottom liner, an intermediate geonet and a 60 mil high density polyethylene (HDPE) top liner. In pond 1, a 30 mil very low density polyethylene (VLDPE) bottom liner was installed with an intermediate geonet and 60 mil HDPE top liner. Each pond has a leak detection system consisting of six separate perforated four inch pipes which report to leak detection standpipes located on the interior slopes.

The overall depth of Pond 1 is 17 feet from crest to pond bottom and the maximum operating level is 12 feet which provides five feet of freeboard. The overall depth of Ponds 3 and 4 is 17.5 feet with a maximum operating level of 12.5 feet which once again provides five feet of freeboard.

2.0 REVIEW OF INSPECTION DATA

The Evaporation Pond Onsite Inspection Program dated December 1992 (revised February 26, 1993, August 30, 1993 and February 5, 1996) calls for systematic inspections on a daily, weekly, monthly and quarterly basis. Data from the inspection reports are shown on Charts 1 through 5 including the pond depths and underdrain measurements.

Two groundwater monitor wells are installed in the uppermost aquifer in the commercial pond area and one groundwater monitor well in the R&D pond area. The wells are sampled quarterly for indications of leaks in the ponds that may have bypassed the pond leak detection systems. A review of the assay data was done and all parameters were near baseline conditions.

During September, gravel was placed on the top of the commercial pond embankments as recommended in last years engineering report. The gravel raised the elevation of the embankments that had been eroded due to wind and rain. The gravel will also act to prevent future wind and rain erosion.

One elevated underdrain conductivity level was detected during the year. The southwest underdrain of Commercial Pond 1 had elevated indicator parameters on April 26, 2001. The elevated level was determined to not be due to an upper liner leak and a final report explaining this was sent to the NRC on September 26, 2001.

3.0 TECHNICAL EVALUATION

The technical evaluation of the Crow Butte Mine ponds utilizes data from the systematic inspection reports, results of the annual survey and a visual inspection of the ponds to assess the hydraulic capacities and structural stability of the ponds.

A review of the daily inspection data was performed. Maintenance items such as filling in rills on embankments, poisoning gophers and repairing ditches were reported. Nothing was found during the review to indicate stability problems with the ponds.

The annual survey was done in October and compared with previous annual survey data. No problems were indicated from a review of the survey information. Results of the annual survey are included in Attachment 1.

Pictures of the ponds were taken for comparison with previous years pictures. No problems in embankment alignment or sloughing were detected.

Attachment 2 contains calculations of ditch flow capacities for the commercial ponds. A USBR one-hour thunderstorm, zone 3 was used as the design storm. Two types of ditches are installed in the pond area, trapezoidal ditches and v-ditches. Attachment 2 and Figures 1 and 2 shows the ditch locations, type of ditch and flow depth during the design storm. The installed ditches are capable of containing the design storm flow with adequate freeboard.

As of November 1, 2001 the pond system contained 77.9 acre-feet (AF) of stored water. The allowable storage capacity of the five ponds is 122.4 AF which provides for transfer of any one pond to the pond system in the event of an emergency.

4.0 CONCLUSIONS

Review of the available inspection reports and data and a visual inspection of the Crow Butte evaporation ponds indicate the ponds are operating as per the engineering design reports.

Nothing was detected during the annual inspection and review that would indicate slope stability problems. The calculated minimum safety factors of 1.7 for dynamic conditions and 1.9 for static conditions as detailed in the commercial pond engineering report are still valid. The 1.7 static safety factor in the R&D pond is likewise still valid.

The pond system is operating within its designed storage capacity. Adequate freeboard existed in each pond throughout the year and capacity was available in the system to transfer the contents of any one pond to the pond system.

Diversion ditches in the pond areas are capable of containing the design flood. Routine maintenance of the embankments and ditches was performed during the year.

The suggestion of additional protection, i.e. gravel, on portions of the tops of the dikes of the commercial ponds made in the 2000 consulting engineer report was done this year.

CHART 1

Commercial Pond 1 - 2001

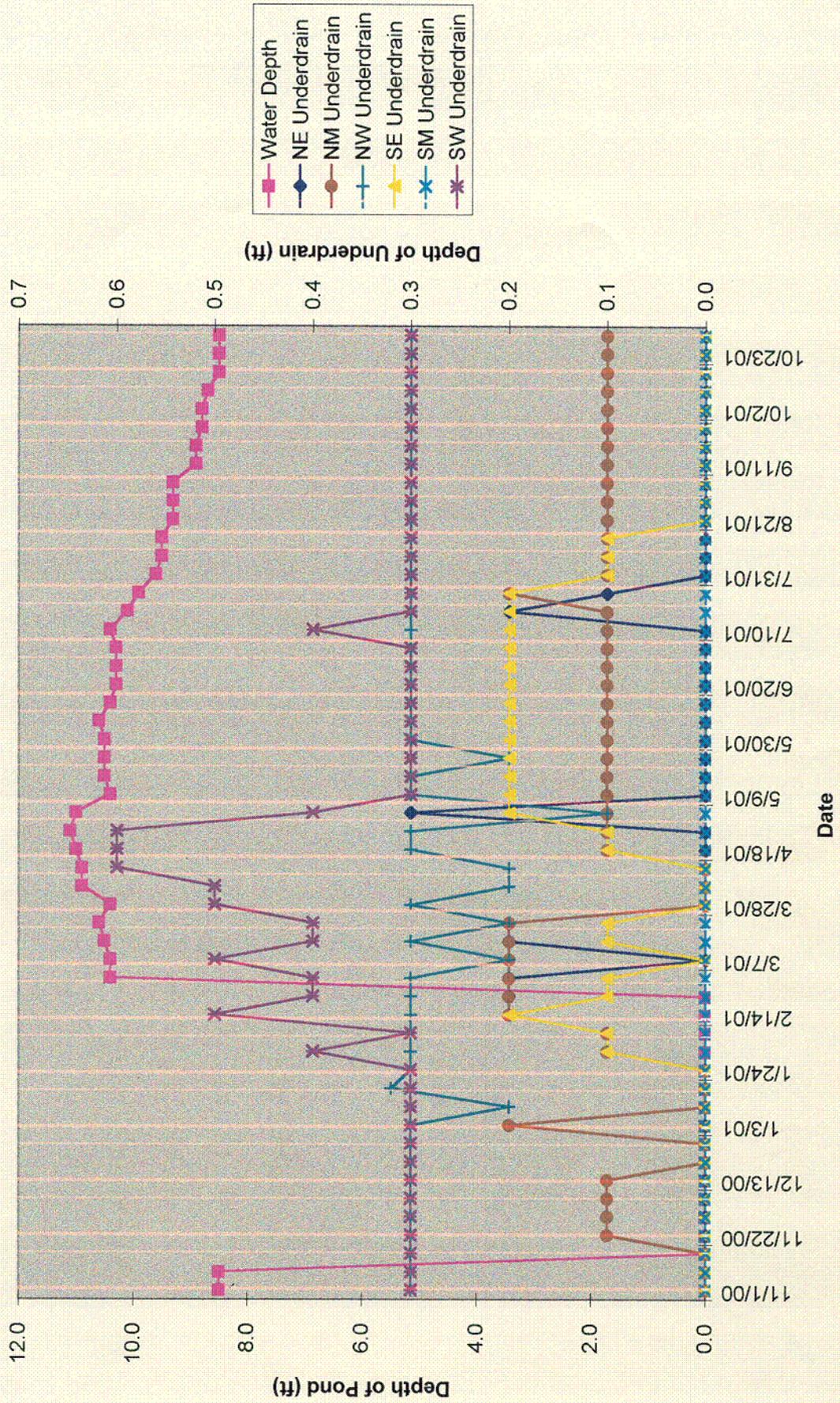


CHART 2

Commercial Pond 3 - 2001

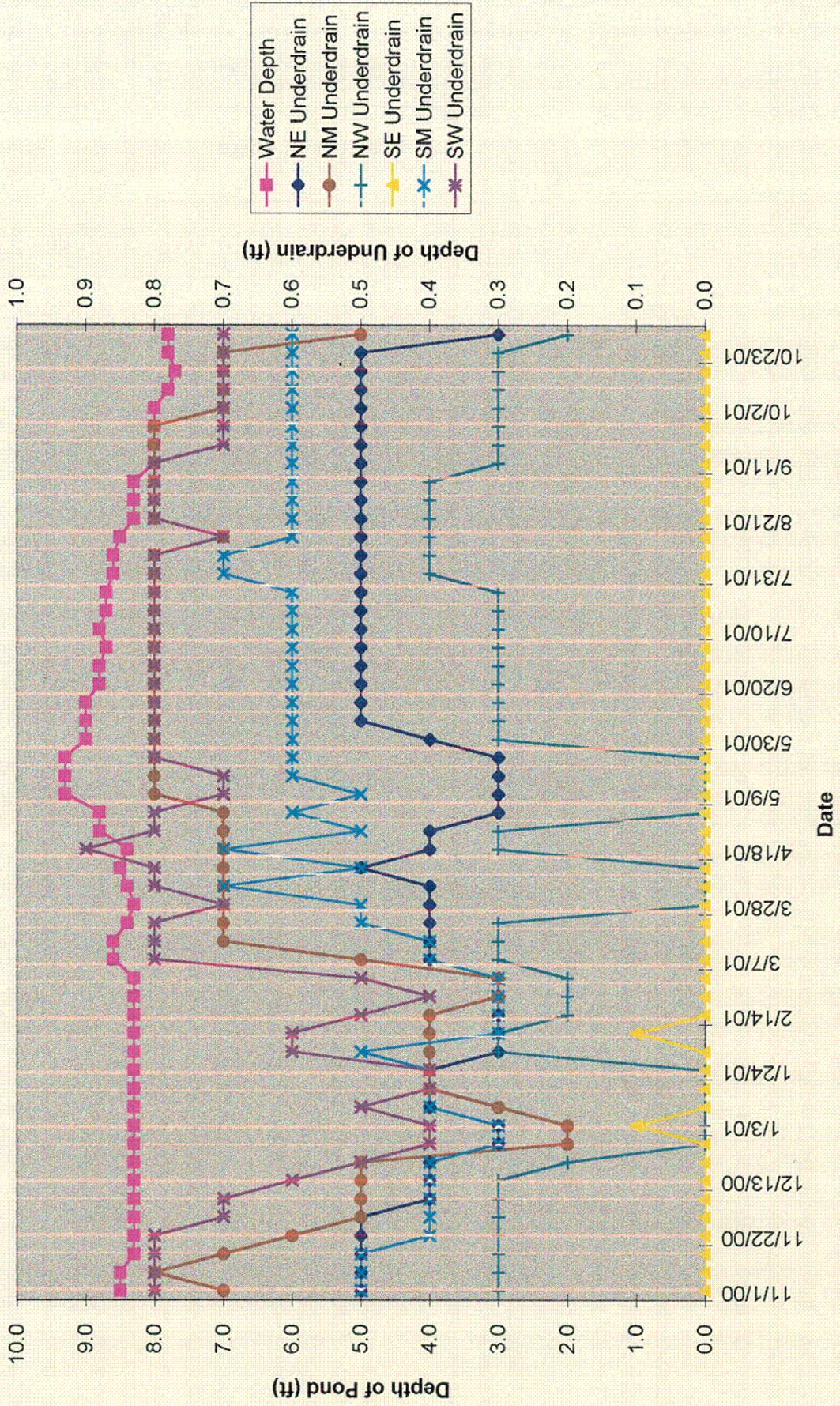


CHART 3

Commercial Pond 4 - 2001

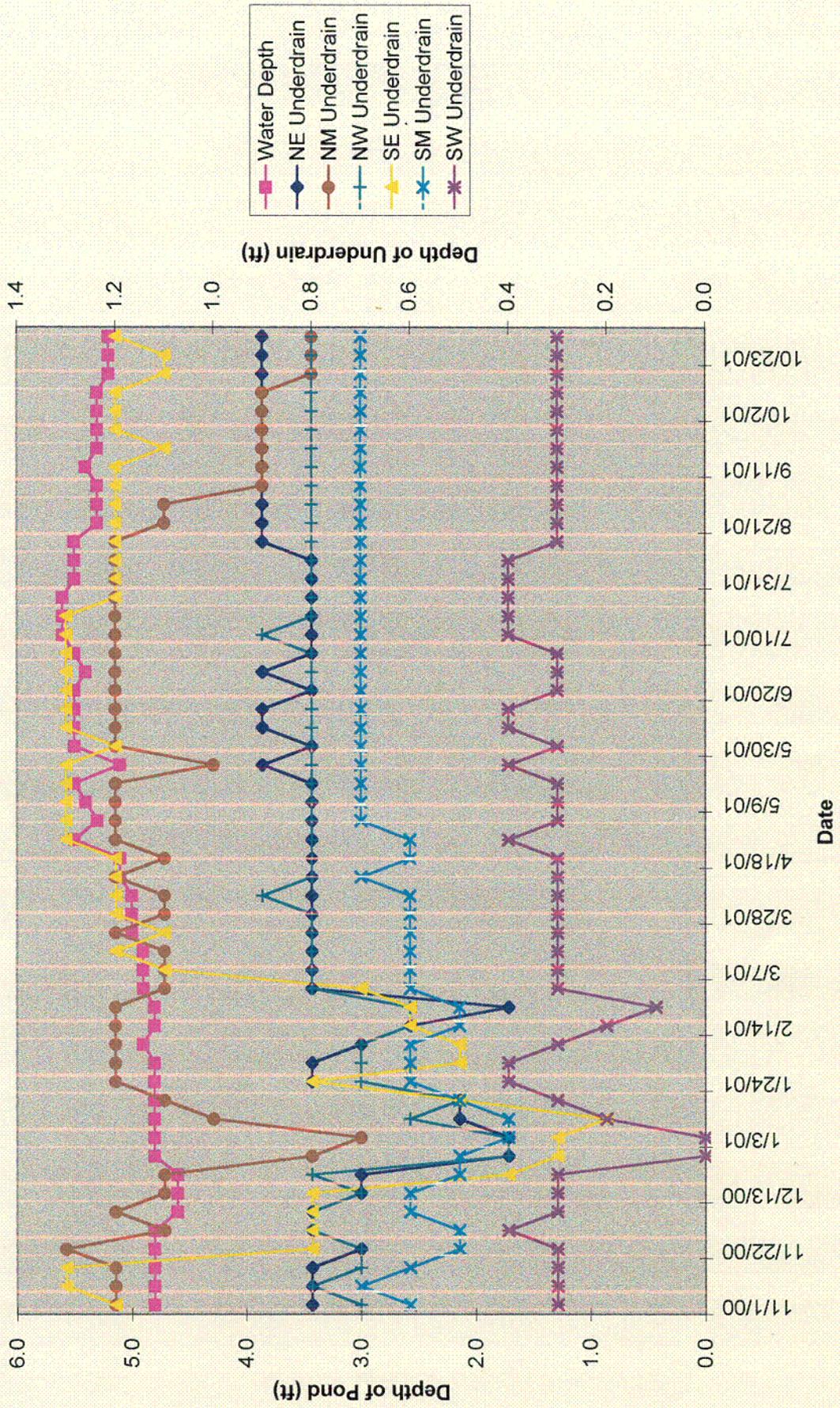
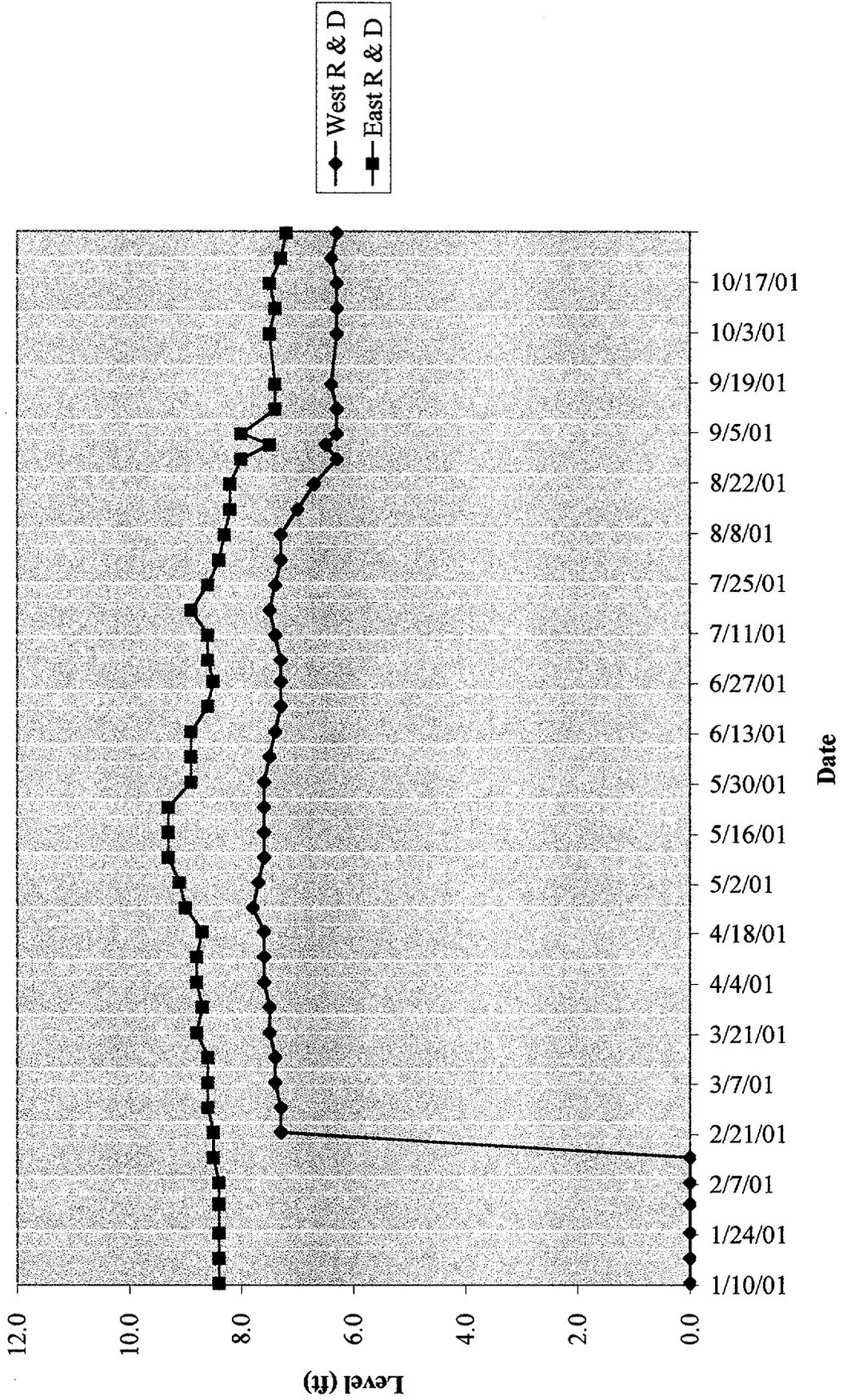


CHART 4

R & D Pond Levels - 2001



ATTACHMENT 1

2001 ANNUAL POND SURVEY

BY

: PINE RIDGE SURVEYS

CROW BUTTE RESOURCES, INC.
RANGE ONE
CROSS SECTIONS FOR PONDS
STATION 0+00
October 25, 2001

LEFT OF BASELINE	SEA LEVEL ELEVATION	DESCRIPTION	SHOT TAKEN ON
0.00	3851.73	0+00 B.L.	REBAR&CAP
89.07	3850.92	FENCE	GROUND
118.10	3852.64	GROUND	HUB
132.37	3854.32	TOE OF SLOPE	TOE
162.37	3866.70	MIDPOINT SLOPE/DIRT	GROUND
195.67	3879.88	OUTSIDE OF BERM	GROUND
356.77	3880.75	MIDPOINT POND ON BERM	REBAR
531.57	3880.98	OUTSIDE EDGE BERM	GROUND
538.17	3878.82	"V" OF DITCH	GROUND
548.37	3882.97	TOP OF SLOPE	GROUND
553.87	3883.12	FENCE	GROUND
564.67	3884.36	WEST EDGE OF ROAD	GROUND
576.11	3884.21	EAST EDGE OF ROAD	GROUND
585.47	3882.63	"V" OF DITCH	GROUND
594.17	3884.97	TOP OF DITCH	GROUND
639.72	3888.49	0+00 E.B.	REBAR&CAP

CROW BUTTE RESOURCES, INC.
RANGE TWO
CROSS SECTIONS FOR PONDS
STATION 5+00
October 25, 2001

LEFT OF BASELINE	SEA LEVEL ELEVATION	DESCRIPTION	SHOT TAKEN ON
0.00	3862.17	5+00 B.L.	REBAR&CAP
92.29	3860.89	FENCE	GROUND
144.08	3862.30	HUB	HUB
151.09	3863.18	TOE OF SLOPE	GROUND
173.39	3871.26	MIDPOINT OF SLOPE	GROUND
194.24	3880.26	OUTSIDE EDGE BERM/DIRT	GROUND
gone		POINT ON BERM/REBAR	REBAR
205.29	3881.46	INSIDE EDGE BERM/LINER	LINER
521.69	3880.55	INSIDE EDGE BERM/LINER	LINER
528.05	3880.45	OUTSIDE EDGE BERM/REBAR	REBAR
537.74	3878.68	"V" OF DITCH	GROUND
563.79	3882.89	WEST EDGE OF ROAD	GROUND
577.09	3882.95	EDGE ROAD	GROUND
609.19	3894.18	MIDPOINT OF SLOPE	GROUND
633.89	3904.57	OUTSIDE EDGE BERM	GROUND
636.82	3905.05	PREV. OUTSIDE EDGE BERM	REBAR
645.99	3905.22	INSIDE EDGE BERM	LINER
907.29	3905.08	EDGE BERM	LINER
909.69	3905.13	INSIDE EDGE BERM	LINER
915.34	3904.95	CENTER OF BERM	REBAR
918.74	3905.02	OUTSIDE EDGE BERM	GROUND
934.39	3899.84	W. EDGE FLAT BOTTOM DITCH	GROUND
945.04	3899.90	E. EDGE FLAT BOTTOM DITCH	GROUND
970.24	3908.63	TOP OF SLOPE	GROUND
992.69	3910.16	FENCE	GROUND
999.19	3910.65	TOE OF SLOPE	GROUND
1004.99	3913.86	W. TOP DITCH/TRAIL	GROUND
1018.49	3914.48	BOTTOM OF DITCH/TRAIL	GROUND
1022.39	3916.13	E. TOP OF DITCH/TRAIL	GROUND
1033.39	3919.44	MIDPOINT OF SLOPE	GROUND
1077.19	3928.89	TOP OF SLOPE	GROUND
1094.53	3929.59	5+00 E.B.	REBAR&CAP

CROW BUTTE RESOURCES, INC.
RANGE THREE
CROSS SECTIONS FOR PONDS
STATION 10+00
October 25, 2001

LEFT OF BASELINE	SEA LEVEL ELEVATION	DESCRIPTION	SHOT TAKEN ON
0.00	3874.30	10+00 B.L.	REBAR&CAP
96.0	3868.94	FENCE	GROUND
122.07	3870.25	TOE OF SLOPE	HUB
148.75	3879.95	MIDPOINT SLOPE	GROUND
174.22	3890.13	OUTSIDE EDGE BERM	REBAR
185.75	3890.80	INSIDE EDGE BERM	LINER
500.35	3890.82	INSIDE EDGE BERM	LINER
509.90	3889.80	OUTSIDE EDGE BERM	REBAR
537.20	3887.98	WEST EDGE ROAD	GROUND
546.00	3888.16	EAST EDGE ROAD	GROUND
552.90	3887.02	W. EDGE FLAT BOTTOM DITCH	GROUND
560.70	3886.85	E. EDGE FLAT BOTTOM DITCH	GROUND
569.60	3889.40	TOP OF DITCH	GROUND
598.90	3890.92	TOE OF SLOPE	HUB
618.10	3898.30	MIDPOINT OF SLOPE	GROUND
634.60	3904.96	OUTSIDE EDGE BERM	REBAR
644.05	3905.39	INSIDE EDGE BERM	LINER
908.90	3905.00	INSIDE EDGE BERM	LINER
918.90	3904.95	OUTSIDE EDGE BERM	REBAR
932.10	3900.22	W. EDGE FLT. BTM. DITCH/TRAIL	GROUND
942.50	3900.25	E. EDGE FLT. BTM. DITCH/TRAIL	GROUND
974.50	3910.82	TOP OF DITCH	GROUND
989.90	3912.08	FENCE	GROUND
1006.2	3912.85	TOE OF SLOPE	GROUND
1014.30	3914.92	TOP OF DITCH	GROUND
1020.60	3913.08	"V" OF DITCH	GROUND
1024.45	3915.01	TOP OF DITCH	GROUND
1038.20	3917.80	MIDPOINT OF SLOPE	GROUND
1066.50	3920.47	TOP OF SLOPE	GROUND
1087.00	3919.90	LOW POINT	GROUND
1148.50	3924.85	10+00 E.B.	REBAR&CAP

CROW BUTTE RESOURCES, INC.
RANGE FOUR
CROSS SECTIONS FOR PONDS
STATION 15+00
October 25, 2001

LEFT OF BASELINE	SEA LEVEL ELEVATION	DESCRIPTION	SHOT TAKEN ON
0.00	3883.65	15+00 B.L.	REBAR&CAP
99.34	3875.54	FENCE	GROUND
136.75	3876.08	TOE OF SLOPE	HUB
156.24	3883.63	MIDPOINT OF SLOPE	GROUND
gone		OUTSIDE EDGE BERM	REBAR
173.24	3890.24	OUTSIDE EDGE BERM	GROUND
185.89	3891.09	INSIDE EDGE BERM	LINER
499.04	3890.81	INSIDE EDGE BERM	LINER
508.79	3890.99	OUTSIDE EDGE BERM	GROUND
515.56	3889.55	"V" OF DITCH	GROUND
524.84	3892.21	TOP OF DITCH	GROUND
535.84	3892.59	FENCE	GROUND
554.34	3892.95	TOE OF SLOPE	GROUND
559.44	3894.56	TOP OF SLOPE	GROUND
697.04	3903.47	HIGH POINT	GROUND
790.94	3904.81	LOW POINT	GROUND
985.60	3915.07	15+00 E.B.	REBAR&CAP

ATTACHMENT 2

DITCH SIZING CALCULATIONS

BY:

TERRA AQUA CONSULTANTS, INC.

(See Figure 1 for ditch locations)

BASIN CHARACTERISTICS

DRAINAGE AREA (SQ. MI.)	=	0.008
STREAM LENGTH (MI.)	=	0.189
ELEVATION DIFFERENCE (FT.)	=	33.500
RUNOFF CURVE NUMBER, CN	=	87.000
MINIMUM INFILTRATION-LOSS (IN./HR.)	=	0.000

PRECIPITATION FOR SELECTED STORM

ADJUSTED PRECIPITATION FOR SELECTED STORM (IN.) = 16.60

UNIT HYDROGRAPH PARAMETERS

UNADJUSTED TIME OF CONCENTRATION (HR.)	=	0.10
ADJUSTED TIME OF CONCENTRATION (HR.)	=	0.10
DURATION OF EXCESS RAINFALL, D (HR.)	=	0.01
TIME TO PEAK (HR.)	=	0.07
BASE TIME (HR.)	=	0.17
QPEAK (PEAK FLOW IN CFS FOR UNIT HYDROGRAPH)	=	59.2

RESULTANT HYDROGRAPH VALUES

PEAK DISCHARGE (CFS)	=	162.88
RUNOFF VOLUME (ACRE-FEET)	=	8.77
TIME TO PEAK DISCHARGE (HR.)	=	1.00

USED USBR 1-HK THUNDERSTORM, ZONE III

AS-BUILT DITCH ANALYSIS - AQUA TERRA CONSULTANTS

8-24-93

Ferret Ditch No. 2

BASIN CHARACTERISTICS

DRAINAGE AREA (SQ. MI.)	=	0.011
STREAM LENGTH (MI.)	=	0.320
ELEVATION DIFFERENCE (FT.)	=	46.500
RUNOFF CURVE NUMBER, CN	=	67.000
MINIMUM INFILTRATION LOSS (IN./HR.)	=	0.000

PRECIPITATION FOR SELECTED STORM

ADJUSTED PRECIPITATION FOR SELECTED STORM (IN.)	=	16.60
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UNIT HYDROGRAPH PARAMETERS

UNADJUSTED TIME OF CONCENTRATION (HR.)	=	0.16
ADJUSTED TIME OF CONCENTRATION (HR.)	=	0.16
DURATION OF EXCESS RAINFALL, D (HR.)	=	0.02
TIME TO PEAK (HR.)	=	0.11
BASE TIME (HR.)	=	0.28
QPEAK (PEAK FLOW IN CFS FOR UNIT HYDROGRAPH)	=	50.3

RESULTANT HYDROGRAPH VALUES

PEAK DISCHARGE (CFS)	=	221.16
RUNOFF VOLUME (ACRE-FEET)	=	12.05
TIME TO PEAK DISCHARGE (HR.)	=	1.01

USED USBR 1-HR THUNDERSTORM, ZONE III

Ferret Ditch No. 2A

BASIN CHARACTERISTICS

DRAINAGE AREA (SQ. MI.)	=	0.001
STREAM LENGTH (MI.)	=	0.100
ELEVATION DIFFERENCE (FT.)	=	3.000
RUNOFF CURVE NUMBER, CN	=	87.000
MINIMUM INFILTRATION LOSS (IN./HR.)	=	0.000

PRECIPITATION FOR SELECTED STORM

ADJUSTED PRECIPITATION FOR SELECTED STORM (IN.)	=	16.60
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UNIT HYDROGRAPH PARAMETERS

UNADJUSTED TIME OF CONCENTRATION (HR.)	=	0.12
ADJUSTED TIME OF CONCENTRATION (HR.)	=	0.12
DURATION OF EXCESS RAINFALL, D (HR.)	=	0.02
TIME TO PEAK (HR.)	=	0.08
BASE TIME (HR.)	=	0.21
QPEAK (PEAK FLOW IN CFS FOR UNIT HYDROGRAPH)	=	6.1

RESULTANT HYDROGRAPH VALUES

PEAK DISCHARGE (CFS)	=	20.35
RUNOFF VOLUME (ACRE-FEET)	=	1.10
TIME TO PEAK DISCHARGE (HR.)	=	1.01

USED USBR 1-HR THUNDERSTORM, ZONE III

Ferret Ditch No. 3

BASIN CHARACTERISTICS

DRAINAGE AREA (SQ. MI.)	. . . . .	=	0.003
STREAM LENGTH (MI.)	. . . . .	=	0.142
ELEVATION DIFFERENCE (FT.)	. . . . .	=	18.900
RUNOFF CURVE NUMBER, CN	. . . . .	=	87.000
MINIMUM INFILTRATION LOSS (IN./HR.)	. . . . .	=	0.000

PRECIPITATION FOR SELECTED STORM

ADJUSTED PRECIPITATION FOR SELECTED STORM (IN.) . = 16.60

UNIT HYDROGRAPH PARAMETERS

UNADJUSTED TIME OF CONCENTRATION (HR.)	. . . . .	=	0.09
ADJUSTED TIME OF CONCENTRATION (HR.)	. . . . .	=	0.09
DURATION OF EXCESS RAINFALL, D (HR.)	. . . . .	=	0.01
TIME TO PEAK (HR.)	. . . . .	=	0.06
BASE TIME (HR.)	. . . . .	=	0.16
QPEAK (PEAK FLOW IN CFS FOR UNIT HYDROGRAPH)	. . . . .	=	24.8

RESULTANT HYDROGRAPH VALUES

PEAK DISCHARGE (CFS)	. . . . .	=	61.11
RUNOFF VOLUME (ACRE-FEET)	. . . . .	=	3.29
TIME TO PEAK DISCHARGE (HR.)	. . . . .	=	1.00

USED USBR 1-HR THUNDERSTORM, ZONE III

Ferret Ditch No. 4

BASIN CHARACTERISTICS

DRAINAGE AREA (SQ. MI.)	=	0.003
STREAM LENGTH (MI.)	=	0.098
ELEVATION DIFFERENCE (FT.)	=	25.000
RUNOFF CURVE NUMBER, CN	=	87.000
MINIMUM INFILTRATION LOSS (IN./HR.)	=	0.000

PRECIPITATION FOR SELECTED STORM

ADJUSTED PRECIPITATION FOR SELECTED STORM (IN.) = 16.60

UNIT HYDROGRAPH PARAMETERS

UNADJUSTED TIME OF CONCENTRATION (HR.)	=	0.05
ADJUSTED TIME OF CONCENTRATION (HR.)	=	0.05
DURATION OF EXCESS RAINFALL, D (HR.)	=	0.01
TIME TO PEAK (HR.)	=	0.03
BASE TIME (HR.)	=	0.09
QPEAK (PEAK FLOW IN CFS FOR UNIT HYDROGRAPH)	=	42.4

RESULTANT HYDROGRAPH VALUES

PEAK DISCHARGE (CFS)	=	61.18
RUNOFF VOLUME (ACRE-FEET)	=	3.29
TIME TO PEAK DISCHARGE (HR.)	=	1.00

USED USBK 1-HR THUNDERSTORM, ZONE III

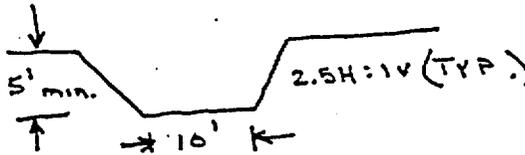
08-24-1993 12:11:44

FERRET DITCH NO. 1

TRAPEZOIDAL CHANNEL

DISCHARGE	=	162.88	cfs
AREA OF FLOW	=	38.44267	sq. feet
HYDR. RADIUS	=	1.676169	feet
WETTED PERIMETER	=	22.93484	feet
VR - GRASS CHANNELS	=	7.10186	
VELOCITY	=	4.236959	fps
MANNING'S N	=	.035	
SLOPE	=	.005	ft/ft
SIDESLOPES	=	2.5	ft/ft
BOTTOM WIDTH	=	10	feet
DEPTH OF FLOW	=	2.401939	feet
THE FROUDE NUMBER IS:		.5649716	

*** SUBCRITICAL FLOW ***



DITCH X-SECTION

08-24-1993 12:14:20

FERRET DITCH NO. 2 UPPER SECTION S=0.005

TRAPEZOIDAL CHANNEL

DISCHARGE	=	221.16	cfs
AREA OF FLOW	=	47.92113	sq. feet
HYDR. RADIUS	=	1.905381	feet
WETTED PERIMETER	=	25.15042	feet
VR - GRASS CHANNELS	=	6.793493	
VELOCITY	=	4.615084	fps
MANNING'S N	=	.035	
SLOPE	=	.005	ft/ft
SIDESLOPES	=	2.5	ft/ft
BOTTOM WIDTH	=	10	feet
DEPTH OF FLOW	=	2.813362	feet
THE FROUDE NUMBER IS:		.5763647	
*** SUBCRITICAL FLOW ***			

SAME X-SECTION AS DITCH 1

08-24-1993 12:18:09

FERRET DITCH NO. Z UPPER SECTION S=0.01

TRAPEZOIDAL CHANNEL

DISCHARGE	=	221.16	cfs
AREA OF FLOW	=	37.33664	sq. feet
HYDR. RADIUS	=	1.647496	feet
WETTED PERIMETER	=	22.66266	feet
VR - GRASS CHANNELS	-	9.758784	
VELOCITY	=	5.923405	fps
MANNING'S N	-	.035	
SLOPE	=	.01	ft/ft
SIDESLOPES	=	2.5	ft/ft
BOTTOM WIDTH	=	10	feet
DEPTH OF FLOW	=	2.351397	feet
THE FROUDE NUMBER IS:		.7968475	

*** SUBCRITICAL FLOW ***

08-24-1993 12:21:58

FERRET DITCH NO. 2 UPPER SECTION S=0.02

TRAPEZOIDAL CHANNEL

DISCHARGE	=	221.16	cfs
AREA OF FLOW	=	29.15911	sq. feet
HYDR. RADIUS	=	1.419438	feet
WETTED PERIMETER	=	20.54271	feet
VR - GRASS CHANNELS	=	10.76586	
VELOCITY	=	7.584593	fps
MANNING'S N	-	.035	
SLOPE	=	.02	ft/ft
SIDESLOPES	=	2.5	ft/ft
BOTTOM WIDTH	=	10	feet
DEPTH OF FLOW	=	1.957732	feet
THE FROUDE NUMBER IS:		1.101097	

*** SUPERCRITICAL FLOW ***

08-24-1993

12:19:41

FERRET DITCH NO. 2 LOWER SECTION S=0.01

TRAPEZOIDAL CHANNEL

DISCHARGE	=	241.51	cfs
AREA OF FLOW	=	39.77111	sq. feet
HYDR. RADIUS	=	1.710021	feet
WETTED PERIMETER	=	23.25767	feet
VR - GRASS CHANNELS	=	10.3841	
VELOCITY	=	6.072497	fps
MANNING'S N	=	.035	
SLOPE	=	.01	ft/ft
SIDESLOPES	=	2.5	ft/ft
BOTTOM WIDTH	=	10	feet
DEPTH OF FLOW	=	2.461888	feet
THE FROUDE NUMBER IS:		.8014932	

*** SUBCRITICAL FLOW ***

SAME X-SECTION AS DITCH 1

08-24-1993

12:16:32

FERRET DITCH NO. 2 LOWER SECTION S=0.005

TRAPEZOIDAL CHANNEL

DISCHARGE	=	241.51	cfs
AREA OF FLOW	=	51.07439	sq. feet
HYDR. RADIUS	=	1.976056	feet
WETTED PERIMETER	=	25.84664	feet
VR - GRASS CHANNELS	=	9.343963	
VELOCITY	=	4.728593	fps
MANNING'S N	-	.035	
SLOPE	=	.005	ft/ft
SIDESLOPES	=	2.5	ft/ft
BOTTOM WIDTH	=	10	feet
DEPTH OF FLOW	=	2.942647	feet
THE FROUDE NUMBER IS:		.5796518	

*** SUBCRITICAL FLOW ***

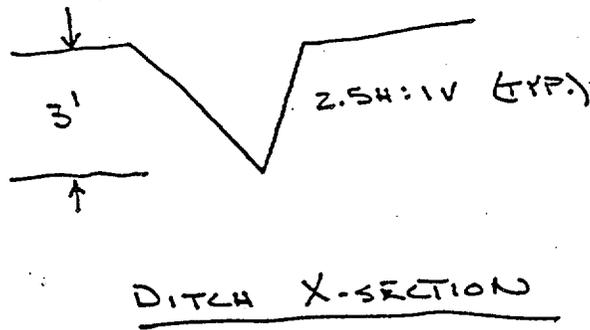
08-24-1993 12:24:55

FERRET DITCH NO. 2A

TRIANGULAR CHANNEL

DISCHARGE	=	20.35	cfs
AREA OF FLOW	=	7.753137	sq. feet
HYDR. RADIUS	=	.8175414	feet
WETTED PERIMETER	=	9.483479	feet
VR - GRASS CHANNELS	=	2.145837	
VELOCITY	=	2.624744	fps
MANNING'S N	=	.035	
SLOPE	=	.005	ft/ft
SIDESLOPES	=	2.5	ft/ft
DEPTH OF FLOW	=	1.761038	feet
THE FROUDE NUMBER IS:		.492935	

*** SUBCRITICAL FLOW ***



08-24-1993 12:26:19

FERRET DITCH NO. 3

TRIANGULAR CHANNEL

DISCHARGE	=	61.11	cfs
AREA OF FLOW	=	17.68502	sq. feet
HYDR. RADIUS	=	1.234735	feet
WETTED PERIMETER	=	14.32293	feet
VR - GRASS CHANNELS	=	4.266586	
VELOCITY	=	3.455467	fps
MANNING'S N	=	.035	
SLOPE	=	.005	ft/ft
SIDESLOPES	=	2.5	ft/ft
DEPTH OF FLOW	=	2.659701	feet
THE FROUDE NUMBER IS:		.5280527	

*** SUBCRITICAL FLOW ***

SAME DITCH X-SECTION AS ZA

08-24-1993 12:28:25

FERRET DITCH NO. 4

TRIANGULAR CHANNEL

DISCHARGE	=	61.18	cfs
AREA OF FLOW	=	17.70022	sq. feet
HYDR. RADIUS	=	1.235265	feet
WETTED PERIMETER	=	14.32908	feet
VR - GRASS CHANNELS	=	4.269639	
VELOCITY	=	3.456455	fps
MANNING'S N	=	.035	
SLOPE	=	.005	ft/ft
SIDESLOPES	=	2.5	ft/ft
DEPTH OF FLOW	=	2.660843	feet
THE FROUDE NUMBER IS:		.5280904	

*** SUBCRITICAL FLOW ***

SAME DITCH X-SECTION AS ZA

08-24-1993 12:23:24

FERRET DITCH NO. 2 LOWER SECTION S=0.02

TRAPEZOIDAL CHANNEL

DISCHARGE	=	241.51	cfs
AREA OF FLOW	=	31.04136	sq. feet
HYDR. RADIUS	=	1.474725	feet
WETTED PERIMETER	=	21.04892	feet
VR - GRASS CHANNELS	=	11.47375	
VELOCITY	=	7.780263	fps
MANNING'S N	=	.035	
SLOPE	=	.02	ft/ft
SIDESLOPES	=	2.5	ft/ft
BOTTOM WIDTH	=	10	feet
DEPTH OF FLOW	=	2.051734	feet
THE FROUDE NUMBER IS:		1.107647	

*** SUPERCRITICAL FLOW ***