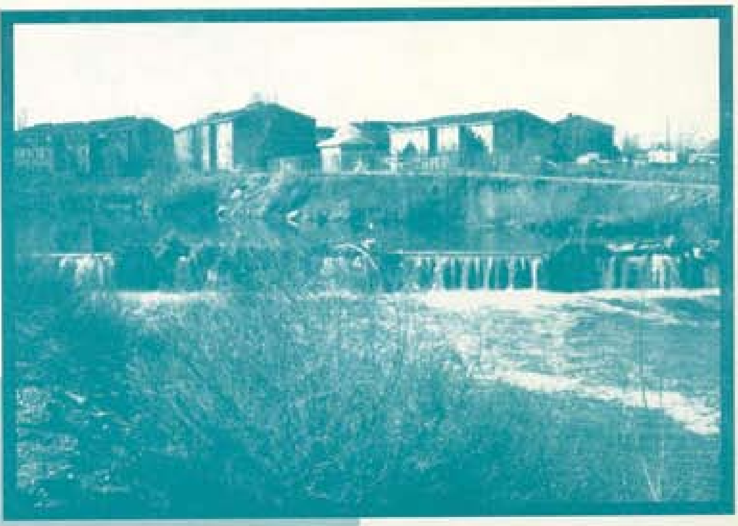
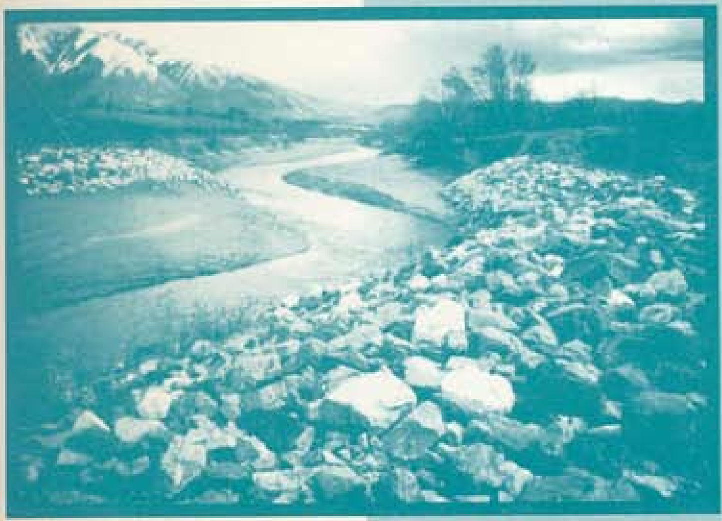
STEVE DENSEN
COMMISSION STAFF

JORDAN RIVER STABILITY STUDY

APPENDIX





Submitted to
SALT LAKE COUNTY

Submitted by
CH2M HILL

Appendix A
Sieve Analyses of Sediment Samples

CONSTRUCTION TESTING AND ENGINEERING, INC.

P.O. Box 520292 • Salt Lake City, Utah 84152 • (801) 972-4001 • FAX: (801) 972-4011

CH²M Hill Engineers
4001 South 700 East, Suite 850
Salt Lake City, Utah 84107

File #: 219-4
Work Order #: 11278
11293, 11306

Attn: Craig Bagley, P.E.

Re: Jordan River Stabilization Study
Location/Aggregate Size Analysis

	Sample/ Location	Coarse Gravel%	Fine Gravel %	Coarse Sand %	Medium Sand %	Fine Sand %	-200 Silt/Clay
	40U Bottom	29	31 60%	20	12	6 38	2.1
R-1	55 Bottom	32	37 70	11	15	4 30	1.0
	55D Bottom	32	37 69	11	15	3 29	1.5
R-2	200U Bank	17	50 65	9	9	6 24	8.7
	295D Bottom	32	32 64	14	15	5 34	1.9
R-3	325D Bank	37	29 66	10	15	6 31	2.5
	345D Bottom	40	32 72	12	11	4 27	1.4
	~~457~~ 475 Bottom	32	39 71	9	12	7 28	1.0
R-4	497 Bank	5	61 66	9	8	15 32	1.8
	561D Bottom	66	1 67	2	5	8 15	18
	565D Bank	1	48 49	21	26	3 50	0.9
R-5	650U Bottom	15	44 59	10	16	15 41	0.2
	750D Bank	30	35 65	11	10	13 34	0.8
R-6	760U Bottom	40	22 62	11	17	9 37	0.6
	835D Bottom	7	63 70	7	6	16 29	0.6
	840U Bank	0	23 23	20	24	32 76	1.0
R-7	925D Bottom	31	31 62	11	13	12 36	1.9
	970D Bank	27	34 61	8	8	22 38	0.7
	975D Bottom	40	29 69	9	7	14 30	0.9
	1030 Bottom	9	50 59	13	23	5 41	0.2
	1097U Bottom	38	34 72	0	2	25 27	1.3
	1130U Bank	0	0	1	14	46 61	39
	1125D Bottom	18	58 76	5	2	16 23	1.0
R-8	1160 Bottom	1	43 44	24	9	23 56	0.5
	1170D Bank	0	0	0	2	45 47	53
	1235D Bottom	0	12 12	7	15	66 88	0.2
	1240 Bottom	0	44 44	31	7	17 55	0.8

CONSTRUCTION TESTING AND ENGINEERING, INC.

P.O. Box 520292 • Salt Lake City, Utah 84152 • (801) 972-4001 • FAX: (801) 972-4011

March 24, 1992, Tuesday

File #: 219-4
Work Order #: 11278
11293, 11306

CH2M Hill
4001 South 700 East, Suite 850
Salt Lake City, Utah 84107

Attn: Craig Bagley, P.E.

Re: Jordan River Stabilization Study

Dear Craig:

Please find attached sieve analysis results of the 27 samples obtained from March 16-19, 1992. All bulk samples were sampled per ASTM D 420-9.1 standards. Sample reduction and sieving/washing were performed per ASTM C 702, Method A and ASTM C 136/C 117, respectively. As per your instructions all plus 3" material, if applicable, was not included in sieve determinations. The largest +3" material in original bulk sample is noted under "remarks" on each separate sieve report.

Below is a listing of sampling dates and locations:

March 16 - Monday	March 18 - Wednesday	March 19 - Thursday
1) 40U	9) 1235D	16) 1030
2) 55	10) 1240	17) 970D
3) 55D	11) 1170D	18) 975D
4) 200U	12) 1160	19) 925D
5) 475	13) 1125D	20) 835D
6) 497	14) 1130U	21) 840U
7) 561D	15) 1097U	22) 760U
8) 565D		23) 750D
		24) 650U
		25) 345D
		26) 325D
		27) 295D

Craig, I appreciate your patronage. If you have any questions or require additional services please call me at 972-4001. I look forward to working with you again.

Sincerely,

CONSTRUCTION TESTING & ENGINEERING, INC.

Thomas M Megeath (es)

T. Mark Megeath
Laboratory Manager

Enclosures

CONSTRUCTION TESTING AND ENGINEERING, INC.
P.O. Box 520292 • Salt Lake City, Utah 84152 • (801) 972-4001 • FAX: (801) 972-4011

SIEVE ANALYSIS TEST REPORT
ASTM C 117 / C 136

March 16, 1992, Monday

File #: 219-4
Work Order #: 11278
Sample #: 40U

CH_2M Hill
4001 South 700 East, Suite 850
Salt Lake City, Utah 84107

Attn: Craig Bagley

Re: Jordan River Stabilization Study
Washed Sieve Analysis - Coarse-Grained Soil

Specification Requirement: NA: Reference/I.D. Testing

SIEVE ANALYSIS RESULTS

Sample #: 40U

Sieve Size	Accumulated % Retained	% Passing
3"	0	100
3/4"	29	71
#4	60	40
#16	87	13
#40	92	8
#200	97.9	2.1

Total weight: 9626 grams

Remarks:

Source of material: Jordan River Bottom

+3" material separated from original bulk sample, per Craig Bagley; maximum cobble size noted in bulk sample = 7"

See related aggregate gradation chart.

CONSTRUCTION TESTING & ENGINEERING, INC.
CERTIFIED TEST REPORT:

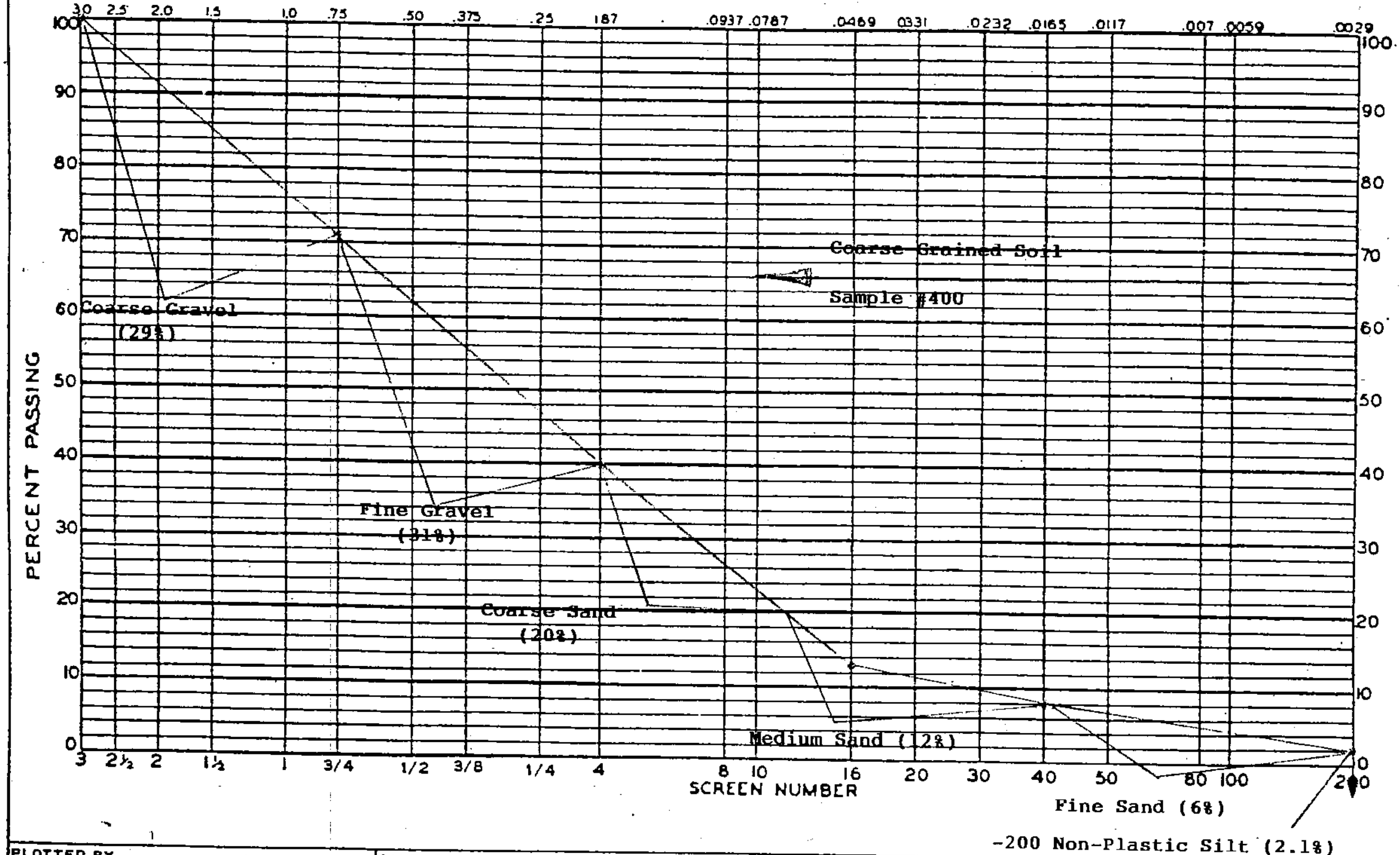
David K. Megeath, Manager

Aggregate Designations Based on ASTM D 2487

CH_2M Hill
Attn: Craig Bagley

File #: 219-4
Work Order #: 11278
March 16, 1992, Monday

AGGREGATE GRADING CHART



PLOTTED BY	SAMPLE IDENTIFICATION
C.T.E., T. Mark Megeath	Jordan River Bottom - Sample #: 40U

WES FORM 886
AUGUST 55

Note: See related sieve analysis test report.

CONSTRUCTION TESTING AND ENGINEERING, INC.

P.O. Box 520292 • Salt Lake City, Utah 84152 • (801) 972-4001 • FAX: (801) 972-4011

SIEVE ANALYSIS TEST REPORT
ASTM C 117 / C 136

March 16, 1992, Monday

File #: 219-4
Work Order #: 11278
Sample #: 55

CH2M Hill
4001 South 700 East, Suite 850
Salt Lake City, Utah 84107

Attn: Craig Bagley

Re: Jordan River Stabilization Study
Washed Sieve Analysis - Coarse-Grained Soil

Specification Requirement: NA: Reference/I.D. Testing

SIEVE ANALYSIS RESULTS

Sample #: 55

Sieve Size	Accumulated % Retained	% Passing
3"	0	100
3/4"	32	68
#4	69	31
#16	87	13
#40	95	5
#200	99.0	1.0

Total weight: 9931 grams

Remarks:

Source of material: Jordan River Bottom

+3" material separated from original bulk sample, per Craig Bagley; maximum cobble size noted in bulk sample = 5"

See related aggregate gradation chart.

CONSTRUCTION TESTING & ENGINEERING, INC.
CERTIFIED TEST REPORT:

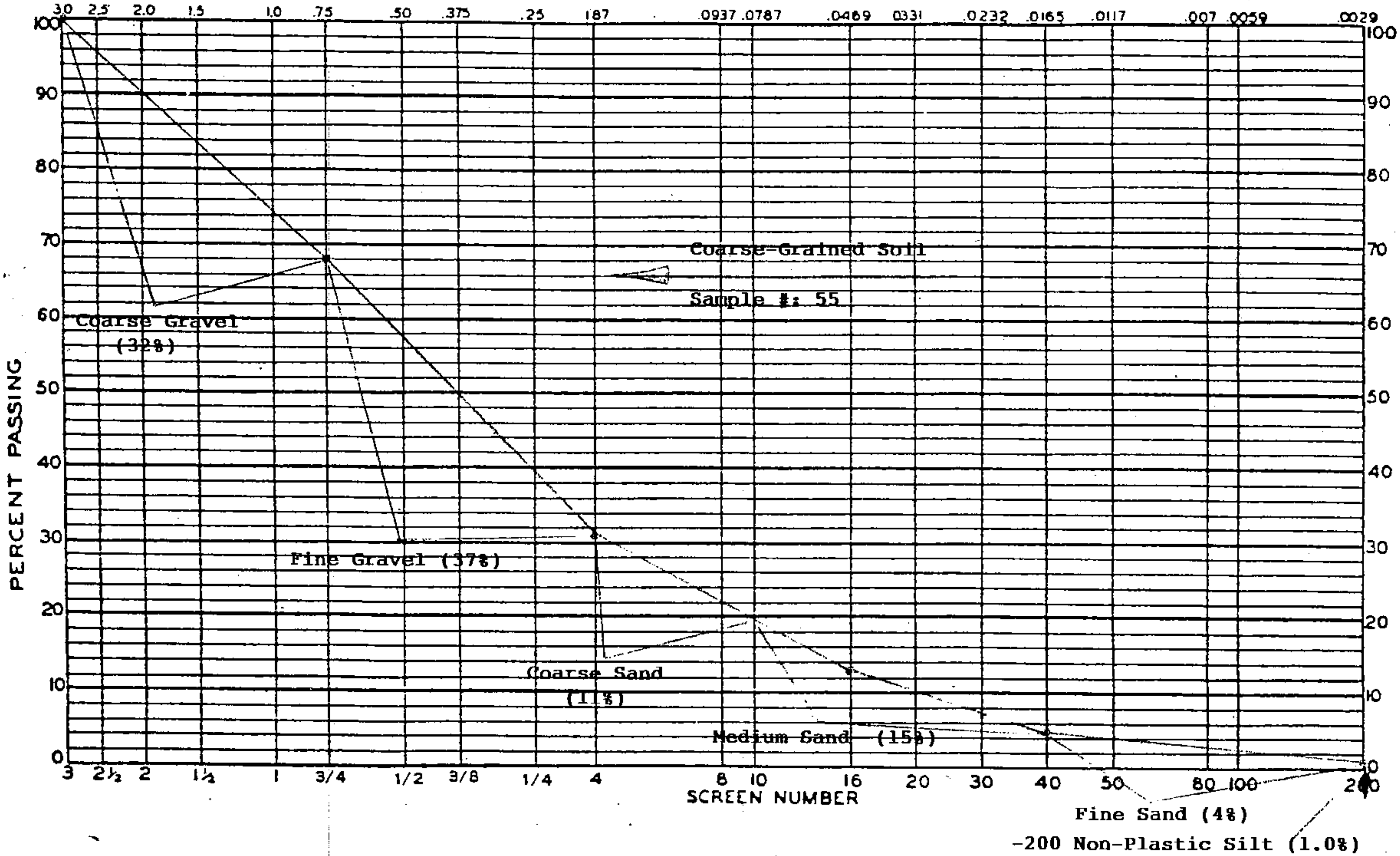
David K. Megeath, Manager

Aggregate Designations Based on ASTM D 2487

CH_2M Hill
Attn: Craig Bagley

File #: 219-4
Work Order #: 11278
March 16, 1992, Monday

AGGREGATE GRADING CHART



PLOTTED BY	SAMPLE IDENTIFICATION
C.T.E., T. Mark Megeath	Jordan River Bottom - Sample #: 55

WES FORM 886
AUGUST 55

Note: See related sieve analysis test report.

CONSTRUCTION TESTING AND ENGINEERING, INC.
P.O. Box 520292 • Salt Lake City, Utah 84152 • (801) 972-4001 • FAX: (801) 972-4011

SIEVE ANALYSIS TEST REPORT
ASTM C 117 / C 136

March 16, 1992, Monday

File #: 219-4
Work Order #: 11278
Sample #: 55D

CH_2M Hill
4001 South 700 East, Suite 850
Salt Lake City, Utah 84107

Attn: Craig Bagley

Re: Jordan River Stabilization Study
Washed Sieve Analysis - Coarse-Grained Soil

Specification Requirement: NA: Reference/I.D. Testing

SIEVE ANALYSIS RESULTS

Sample #: 55D

Sieve Size	Accumulated % Retained	% Passing
3"	0	100
3/4"	32	68
#4	69	31
#16	87	13
#40	95	5
#200	98.5	1.5

Total weight: 11015 grams

Remarks:

Source of material: Jordan River Bottom

+3" material separated from original bulk sample, per Craig Bagley; maximum cobble size noted in bulk sample = 5"

See related aggregate gradation chart.

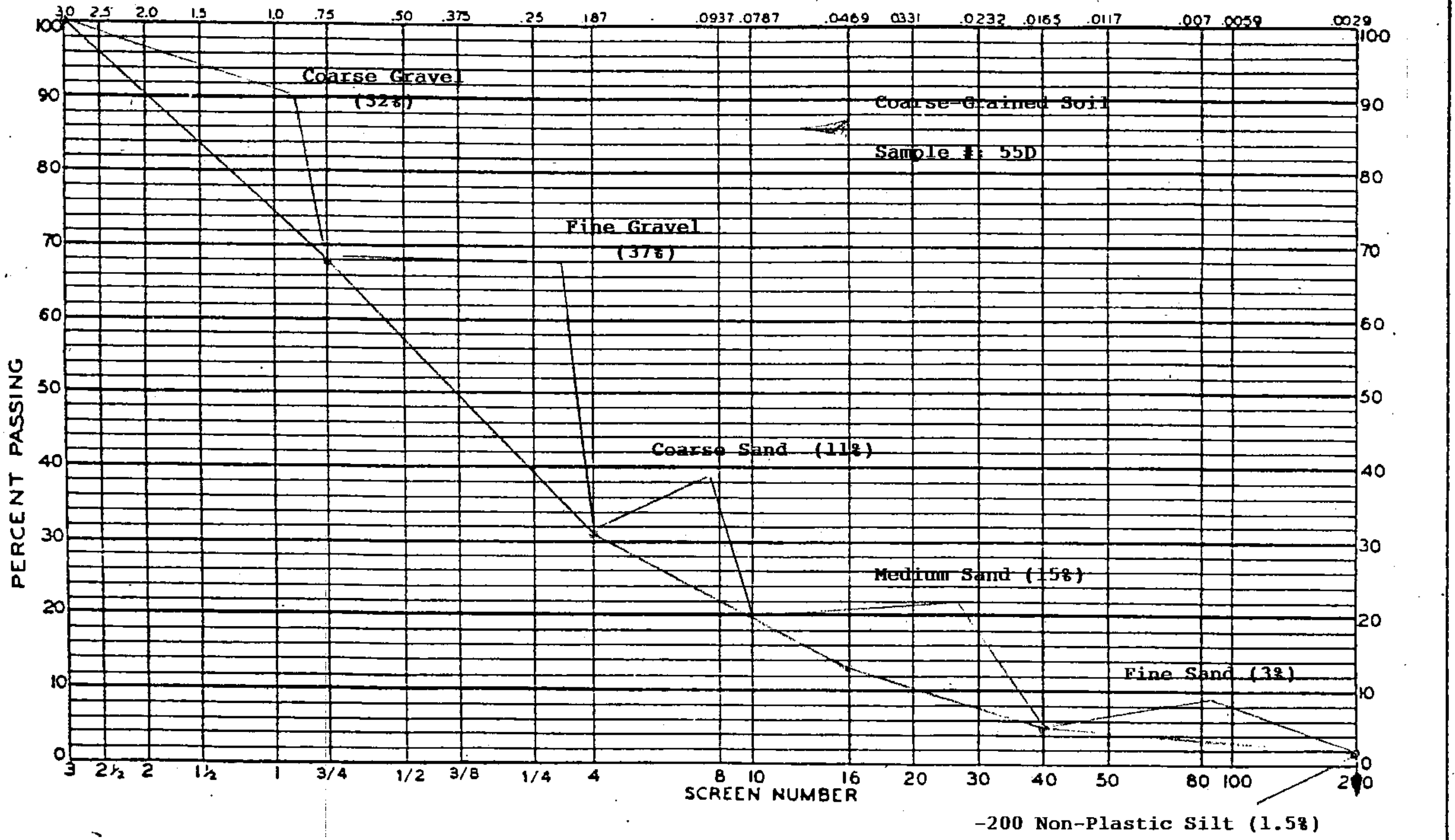
CONSTRUCTION TESTING & ENGINEERING, INC.
CERTIFIED TEST REPORT:

David K. Megeath, Manager

CH$_2$M Hill
Attn: Craig Bagley

File #: 219-4
Work Order #: 11278
March 16, 1992, Monday

AGGREGATE GRADING CHART



PLOTTED BY	SAMPLE IDENTIFICATION
C.T.E., T. Mark Megeath	Jordan River Bottom - Sample #: 55D

WES FORM 886
AUGUST 55

Note: See related sieve analysis test report.

CONSTRUCTION TESTING AND ENGINEERING, INC.
P.O. Box 520292 • Salt Lake City, Utah 84152 • (801) 972-4001 • FAX: (801) 972-4011

SIEVE ANALYSIS TEST REPORT
ASTM C 117 / C 136

March 16, 1992, Monday

File #: 219-4
Work Order #: 11278
Sample #: 200 U

CH_2M Hill
4001 South 700 East, Suite 850
Salt Lake City, Utah 84107

Attn: Craig Bagley

Re: Jordan River Stabilization Study
Washed Sieve Analysis - Coarse-Grained Soil

Specification Requirement: NA: Reference/I.D. Testing

SIEVE ANALYSIS RESULTS

Sample #: 200 U

Sieve Size	Accumulated % Retained	% Passing
3"	0	100
3/4"	17	83
#4	67	33
#16	82	18
#40	85	15
#200	91.3	8.7

Total weight: 6589 grams

Remarks:

Source of material: Jordan River Bank

+3" material separated from original bulk sample, per Craig Bagley; maximum cobble size noted in bulk sample = None.

See related aggregate gradation chart.

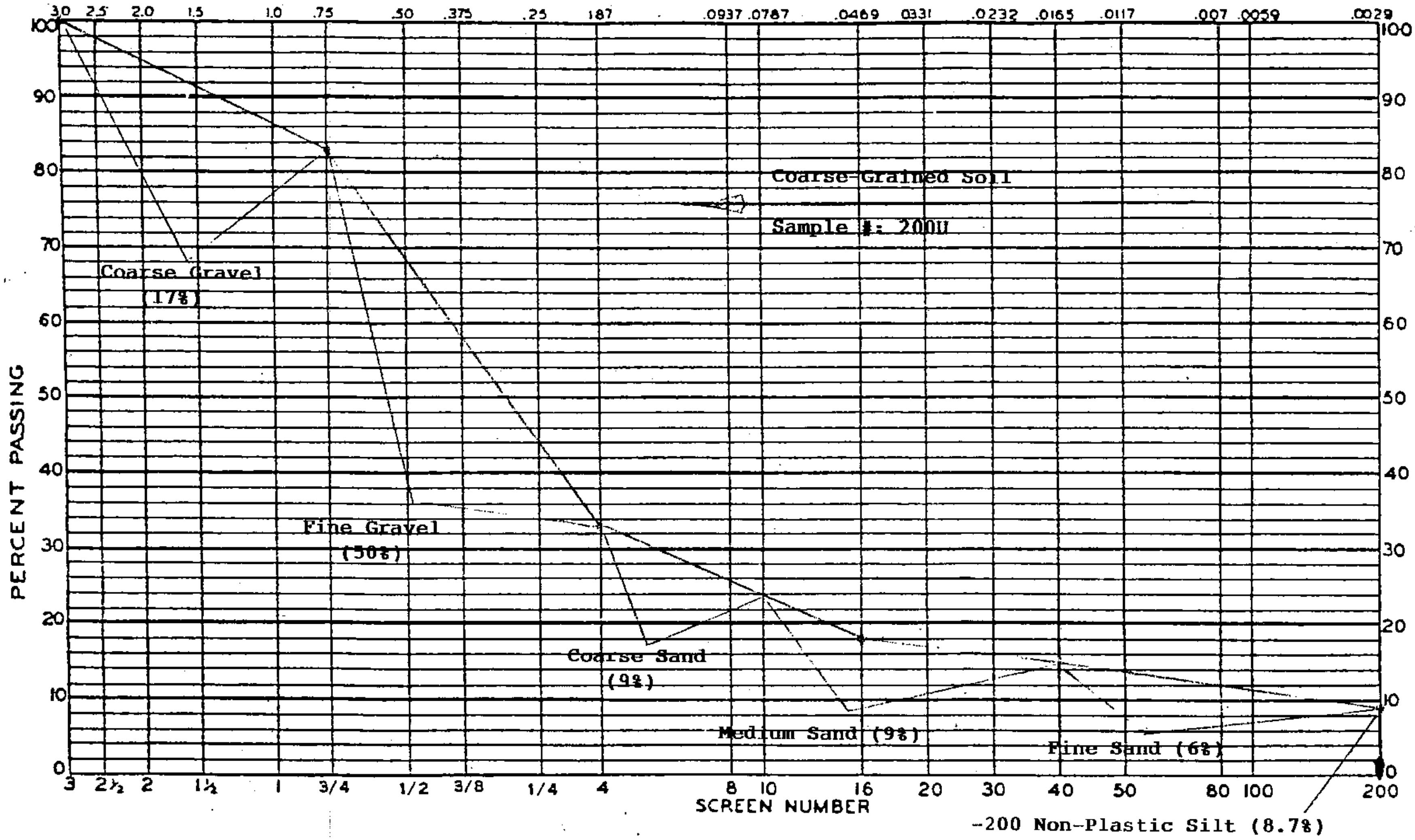
CONSTRUCTION TESTING & ENGINEERING, INC.
CERTIFIED TEST REPORT:

David K. Megeath, Manager

CH$_2$M Hill
Attn: Craig Bagley

AGGREGATE GRADING CHART

File #: 219-4
Work Order #: 11278
March 16, 1992, Monday



PLOTTED BY	SAMPLE IDENTIFICATION
C.T.E., T. Mark Megeath	Jordan River Bank - Sample #: 200U

WES FORM 886
AUGUST 55

Note: See related sieve analysis test report.

CONSTRUCTION TESTING AND ENGINEERING, INC.
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SIEVE ANALYSIS TEST REPORT
ASTM C 117 / C 136

March 19, 1992, Thursday

File #: 219-4
Work Order #: 11306
Sample #: 295D

CH$_2$M Hill
4001 South 700 East, Suite 850
Salt Lake City, Utah 84107

Attn: Craig Bagley

Re: Jordan River Stabilization Study
Washed Sieve Analysis - Coarse-Grained Soil

Specification Requirement: NA: Reference/I.D. Testing

SIEVE ANALYSIS RESULTS

Sample #: 295D

Sieve Size	Accumulated % Retained	% Passing
3"	0	100
3/4"	32	68
#4	64	36
#10	78	22
#40	93	7
#200	98.1	1.9

Total weight: 6134 grams

Remarks:

Source of material: Jordan River Bottom

+3" material separated from ogiginal bulksample per Craig Bagley; maximum cobble size noted in bulk sample = 7"

See related aggregate gradation chart.

CONSTRUCTION TESTING & ENGINEERING, INC.
CERTIFIED TEST REPORT:

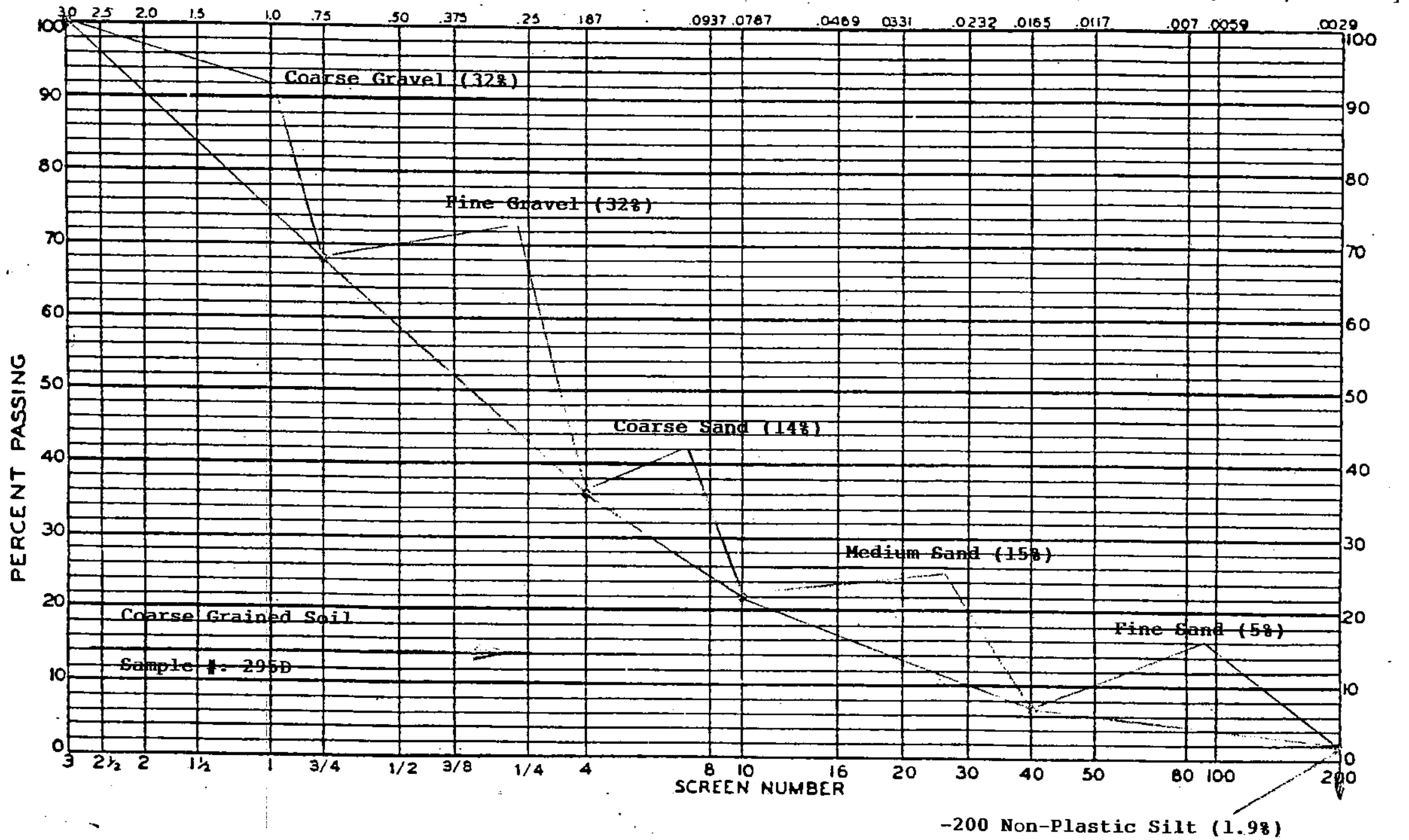
David K. Megeath, Manager

Aggregate Designations Based on ASTM D 2487

CH2M Hill
Attn: Craig Bagley

AGGREGATE GRADING CHART

File #: 219-4
Work Order #: 11306
March 19, 1992, Thursday



PLOTTED BY	SAMPLE IDENTIFICATION
C.T.E., T. Mark Megeath	Jordan River Bottom - Sample #: 295D

WES FORM 886
AUGUST 55

Note: See related sieve analysis test report.

CONSTRUCTION TESTING AND ENGINEERING, INC.
P.O. Box 520292 • Salt Lake City, Utah 84152 • (801) 972-4001 • FAX: (801) 972-4011

SIEVE ANALYSIS TEST REPORT
ASTM C 117 / C 136

March 19, 1992, Thursday

File #: 219-4
Work Order #: 11306
Sample #: 325D

CH_2M Hill
4001 South 700 East, Suite 850
Salt Lake City, Utah 84107

Attn: Craig Bagley

Re: Jordan River Stabilization Study
Washed Sieve Analysis - Coarse-Grained Soil

Specification Requirement: NA: Reference/I.D. Testing

SIEVE ANALYSIS RESULTS

Sample #: 325D

Sieve Size	Accumulated % Retained	% Passing
3"	0	100
3/4"	37	63
#4	66	34
#10	76	24
#40	91	9
#200	97.5	2.5

Total weight: 5856 grams

Remarks:

Source of material: Jordan River Bank

Maximum cobble size noted in bulk sample = none.

See related aggregate gradation chart.

CONSTRUCTION TESTING & ENGINEERING, INC.
CERTIFIED TEST REPORT:

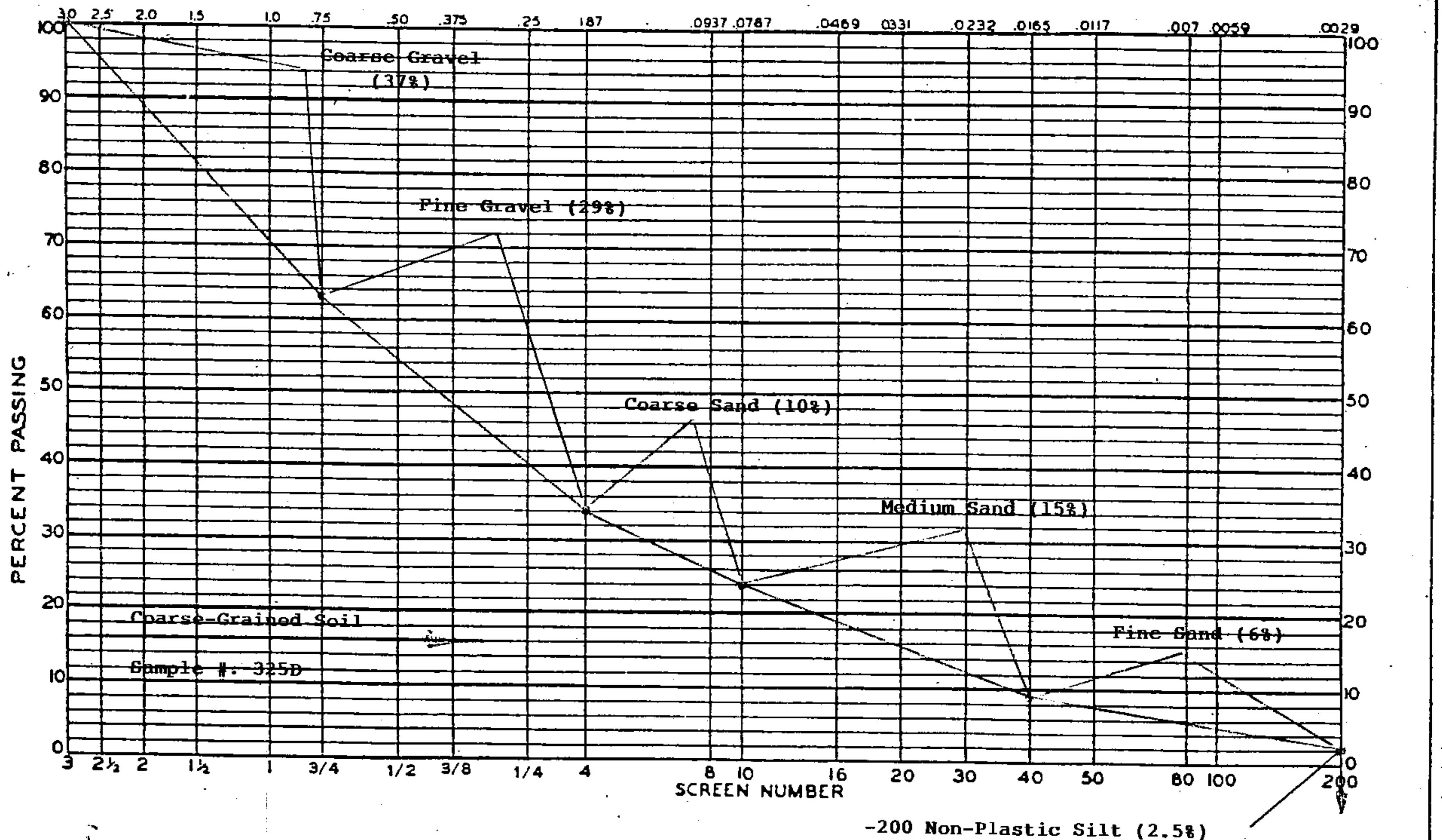
David K. Megeath, Manager

Aggregate Designations Based on ASTM D 2487

CH$_2$M Hill
Attn: Craig Bagley

AGGREGATE GRADING CHART

File #: 219-4
Work Order #: 11306
March 19, 1992, Thursday



PLOTTED BY	SAMPLE IDENTIFICATION
C.T.E., T. Mark Megeath	Jordan River Bank - Sample #: 325D

WES FORM 886
AUGUST 55

Note: See related sieve analysis test report.

CONSTRUCTION TESTING AND ENGINEERING, INC.
P.O. Box 520292 • Salt Lake City, Utah 84152 • (801) 972-4001 • FAX: (801) 972-4011

SIEVE ANALYSIS TEST REPORT
ASTM C 117 / C 136

March 19, 1992, Thursday

File #: 219-4
Work Order #: 11306
Sample #: 345D

CH$_2$M Hill
4001 South 700 East, Suite 850
Salt Lake City, Utah 84107

Attn: Craig Bagley

Re: Jordan River Stabilization Study
Washed Sieve Analysis - Coarse-Grained Soil

Specification Requirement: NA: Reference/I.D. Testing

SIEVE ANALYSIS RESULTS

Sample #: 345D

Sieve Size	Accumulated % Retained	% Passing
2.5"	0	100
3/4"	40	60
#4	72	28
#10	84	16
#40	95	5
#200	98.6	1.4

Total weight: 5394 grams

Remarks:

Source of material: Jordan River Bottom

+3" material separated from original bulk sample per Craig Bagley; maximum cobble size noted in bulk sample = 3.25"

See related aggregate gradation chart.

CONSTRUCTION TESTING & ENGINEERING, INC.
CERTIFIED TEST REPORT:

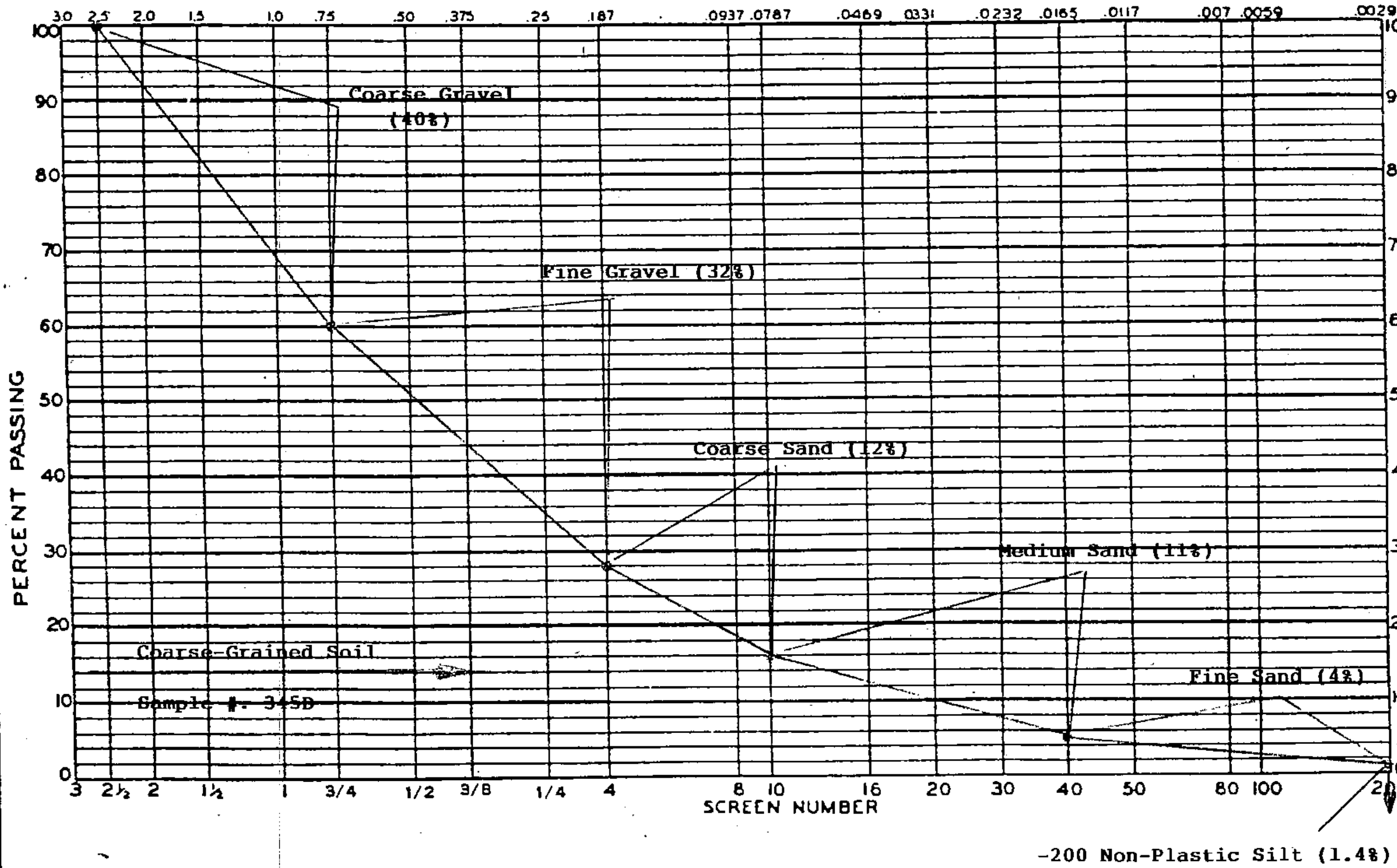
David K. Megeath, Manager

CH$_2$M Hill
Attn: Craig Bagley

File #: 219-4
Work Order #: 11306
March 19, 1992, Thursday

AGGREGATE GRADING CHART

SCREEN OPENING IN INCHES



PLOTTED BY	SAMPLE IDENTIFICATION
C.T.E., T. Mark Megeath	Jordan River Bottom - Sample #: 345D

WES FORM 886
AUGUST 55

Note: See related sieve analysis test report.

CONSTRUCTION TESTING AND ENGINEERING, INC.
P.O. Box 520292 • Salt Lake City, Utah 84152 • (801) 972-4001 • FAX: (801) 972-4011

SIEVE ANALYSIS TEST REPORT
ASTM C 117 / C 136

March 16, 1992, Monday

File #: 219-4
Work Order #: 11278
Sample #: 475

CH_2M Hill
4001 South 700 East, Suite 850
Salt Lake City, Utah 84107

Attn: Craig Bagley

Re: Jordan River Stabilization Study
Washed Sieve Analysis - Coarse-Grained Soil

Specification Requirement: NA: Reference/I.D. Testing

SIEVE ANALYSIS RESULTS

Sample #: 475

Sieve Size	Accumulated % Retained	% Passing
3"	0	100
3/4"	32	68
#4	71	29
#16	85	15
#40	92	8
#200	99.0	1.0

Total weight: 5965 grams

Remarks:

Source of material: Jordan River Bottom

+3" material separated from original bulk sample, per Craig Bagley; maximum cobble size noted in bulk sample: None

See related aggregate gradation chart.

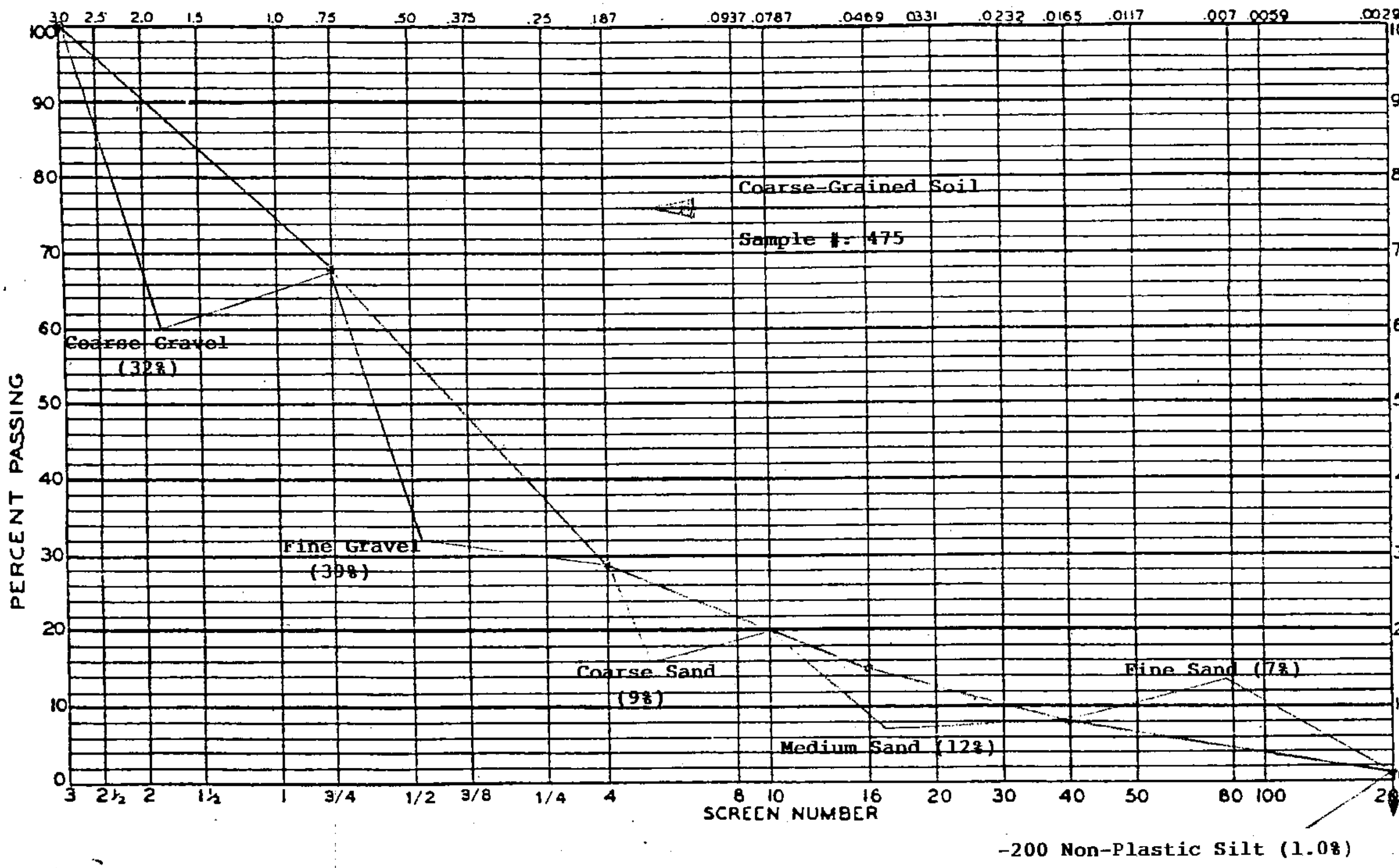
CONSTRUCTION TESTING & ENGINEERING, INC.
CERTIFIED TEST REPORT:

David K. Megeath, Manager

CH2M Hill
Attn: Craig Bagley

AGGREGATE GRADING CHART

File #: 219-4
Work Order #: 11278
March 16, 1992, Monday



PLOTTED BY	SAMPLE IDENTIFICATION
C.T.E., T. Mark Megeath	Jordan River Bottom - Sample #: 475

WFS FORM 886
AUGUST 55

Note: See related sieve analysis test report.

CONSTRUCTION TESTING AND ENGINEERING, INC.
P.O. Box 520292 • Salt Lake City, Utah 84152 • (801) 972-4001 • FAX: (801) 972-4011

SIEVE ANALYSIS TEST REPORT
ASTM C 117 / C 136

March 16, 1992, Monday

File #: 219-4
Work Order #: 11278
Sample #: 497

CH_2M Hill
4001 South 700 East, Suite 850
Salt Lake City, Utah 84107

Attn: Craig Bagley

Re: Jordan River Stabilization Study
Washed Sieve Analysis - Coarse-Grained Soil

Specification Requirement: NA: Reference/I.D. Testing

SIEVE ANALYSIS RESULTS

Sample #: 497

Sieve Size	Accumulated % Retained	% Passing
3"	0	100
3/4"	5	95
#4	66	34
#16	80	20
#40	83	17
#200	98.2	1.8

Total weight: 5790 grams

Remarks:

Source of material: Jordan River Bank

+3" material separated from original bulk sample, per Craig Bagley; maximum cobble size noted in bulk sample = none.

See related aggregate gradation chart.

CONSTRUCTION TESTING & ENGINEERING, INC.
CERTIFIED TEST REPORT:

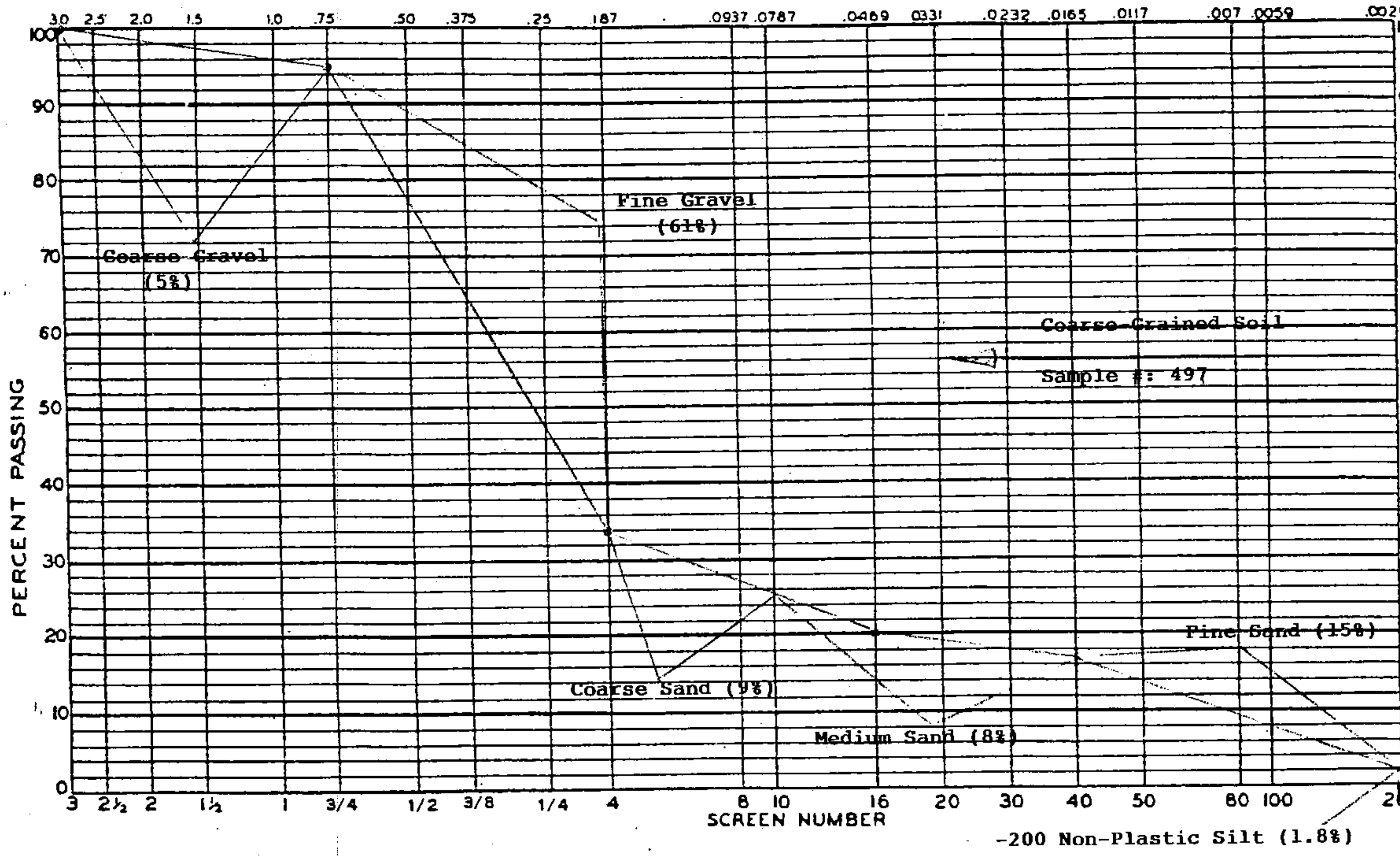
David K. Megeath, Manager

Aggregate Designations Based on ASTM D 2487

CH_2M Hill
Attn: Craig Bagley

AGGREGATE GRADING CHART

File #: 219-4
Work Order #: 11278
March 16, 1992, Monday



PLOTTED BY	SAMPLE IDENTIFICATION
C.T.E., T. Mark Megeath	Jordan River Bank - Sample #: 497

WES FORM 886
AUGUST 55

Note: See related sieve analysis test report.

CONSTRUCTION TESTING AND ENGINEERING, INC.
P.O. Box 520292 • Salt Lake City, Utah 84152 • (801) 972-4001 • FAX: (801) 972-4011

SIEVE ANALYSIS TEST REPORT
ASTM C 117 / C 136

March 16, 1992, Monday

File #: 219-4
Work Order #: 11278
Sample #: 561D

CH_2M Hill
4001 South 700 East, Suite 850
Salt Lake City, Utah 84107

Attn: Craig Bagley

Re: Jordan River Stabilization Study
Washed Sieve Analysis - Coarse-Grained Soil

Specification Requirement: NA: Reference/I.D. Testing

SIEVE ANALYSIS RESULTS

Sample #: 561D

Sieve Size	Accumulated % Retained	% Passing
3"	0	100
3/4"	66	34
#4	67	33
#16	70	30
#40	74	26
#200	82	18

Total weight: 5340 grams

Remarks:

Source of material: Jordan River Bottom

+3" material separated from original bulk sample, per Craig Bagley; maximum cobble size noted in bulk sample = 5"

See related aggregate gradation chart.

CONSTRUCTION TESTING & ENGINEERING, INC.
CERTIFIED TEST REPORT:

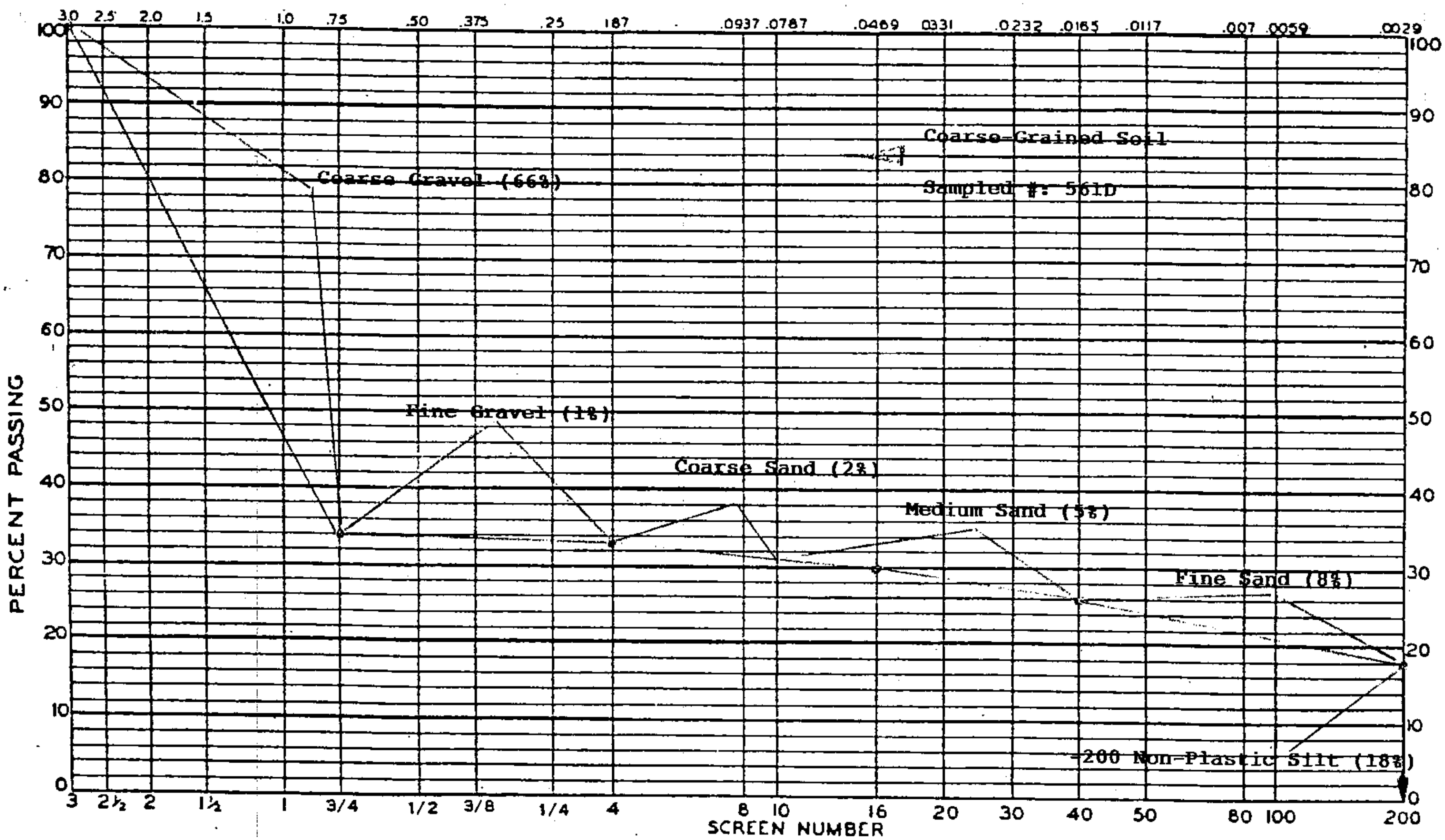
David K. Megeath, Manager

Aggregate Designations Based on ASTM D 2487

CH$_2$M Hill
Attn: Craig Bagley

AGGREGATE GRADING CHART

File #: 219-4
Work Order #: 11278
March16, 1992, Monday



PLOTTED BY	SAMPLE IDENTIFICATION
C.T.E., T. Mark Megeath	Jordan River Bottom - Sample #: 561D

WES FORM 886
AUGUST 55

Note: See related sieve analysis test report.

CONSTRUCTION TESTING AND ENGINEERING, INC.

P.O. Box 520292 • Salt Lake City, Utah 84152 • (801) 972-4001 • FAX: (801) 972-4011

SIEVE ANALYSIS TEST REPORT
ASTM C 117 / C 136

March 16, 1992, Monday

File #: 219-4
Work Order #: 11278
Sample #: 497

CH$_2$M Hill
4001 South 700 East, Suite 850
Salt Lake City, Utah 84107

Attn: Craig Bagley

Re: Jordan River Stabilization Study
Washed Sieve Analysis - Coarse-Grained Soil

Specification Requirement: NA: Reference/I.D. Testing

SIEVE ANALYSIS RESULTS

Sample #: 497

Sieve Size	Accumulated % Retained	% Passing
3"	0	100
3/4"	5	95
#4	66	34
#16	80	20
#40	83	17
#200	98.2	1.8

Total weight: 5790 grams

Remarks:

Source of material: Jordan River Bank

+3" material separated from original bulk sample, per Craig Bagley; maximum cobble size noted in bulk sample = none.

See related aggregate gradation chart.

CONSTRUCTION TESTING & ENGINEERING, INC.
CERTIFIED TEST REPORT:

David K. Megeath, Manager

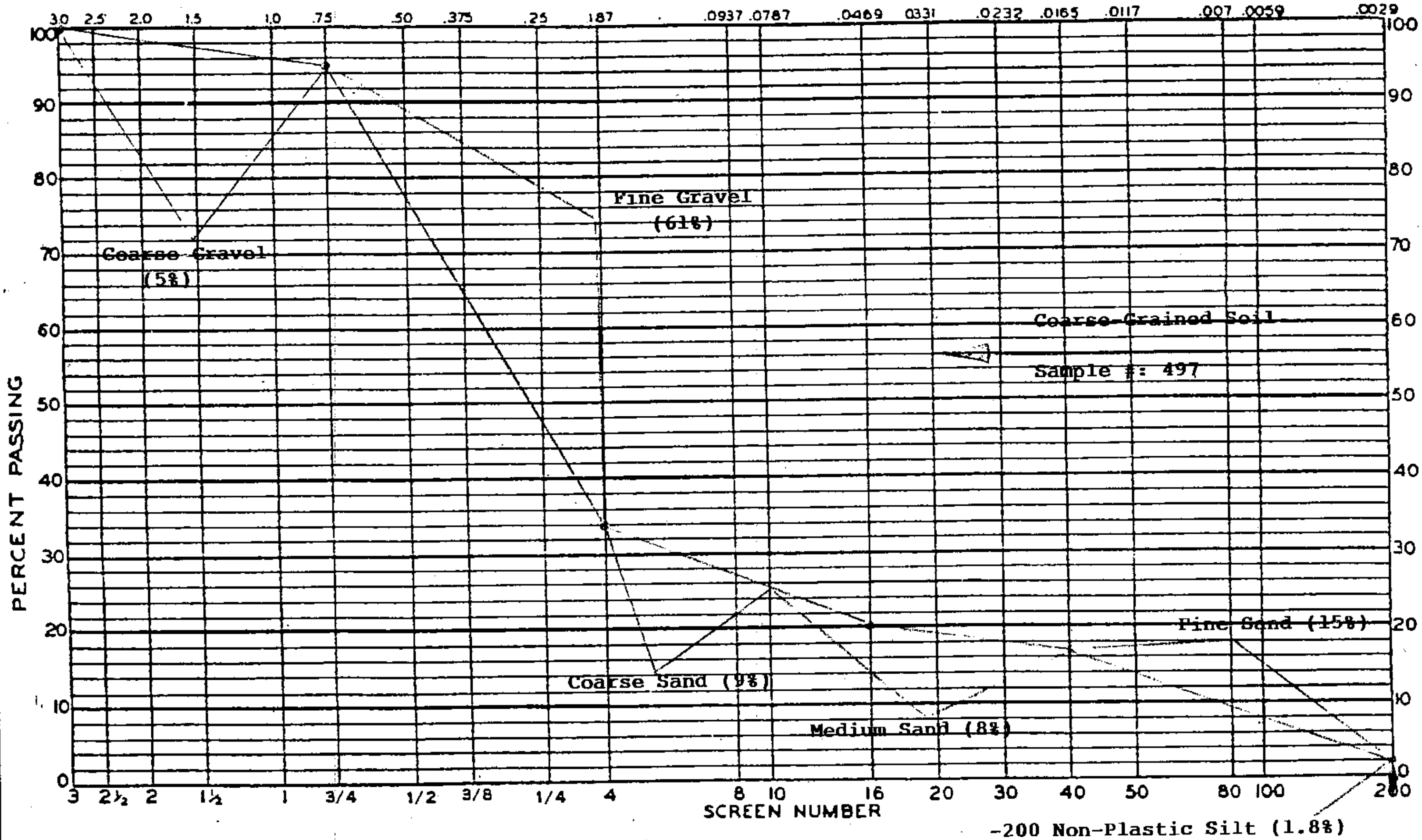
[redacted]

Aggregate Designations Based on ASTM D 2487

CH2M Hill
Attn: Craig Bagley

AGGREGATE GRADING CHART

File #: 219-4
Work Order #: 11278
March 16, 1992, Monday



PLOTTED BY	SAMPLE IDENTIFICATION
C.T.E., T. Mark Megeath	Jordan River Bank - Sample #: 497

WES FORM 886
AUGUST 55

Note: See related sieve analysis test report.

CONSTRUCTION TESTING AND ENGINEERING, INC.
P.O. Box 520292 • Salt Lake City, Utah 84152 • (801) 972-4001 • FAX: (801) 972-4011

SIEVE ANALYSIS TEST REPORT
ASTM C 117 / C 136

March 19, 1992, Thursday

File #: 219-4
Work Order #: 11306
Sample #: 650U

CH_2M Hill
4001 South 700 East, Suite 850
Salt Lake City, Utah 84107

Attn: Craig Bagley

Re: Jordan River Stabilization Study
Washed Sieve Analysis - Coarse-Grained Soil

Specification Requirement: NA: Reference/I.D. Testing

SIEVE ANALYSIS RESULTS

Sample #: 650U

Sieve Size	Accumulated % Retained	% Passing
2"	0	100
3/4"	15	85
#4	59	41
#10	69	31
#40	85	15
#200	99.8	0.2

Total weight: 5737 grams

Remarks:

Source of material: Jordan River Bottom

Maximum cobble size noted in bulk sample = none.

See related aggregate gradation chart.

CONSTRUCTION TESTING & ENGINEERING, INC.
CERTIFIED TEST REPORT:

David K. Megeath, Manager

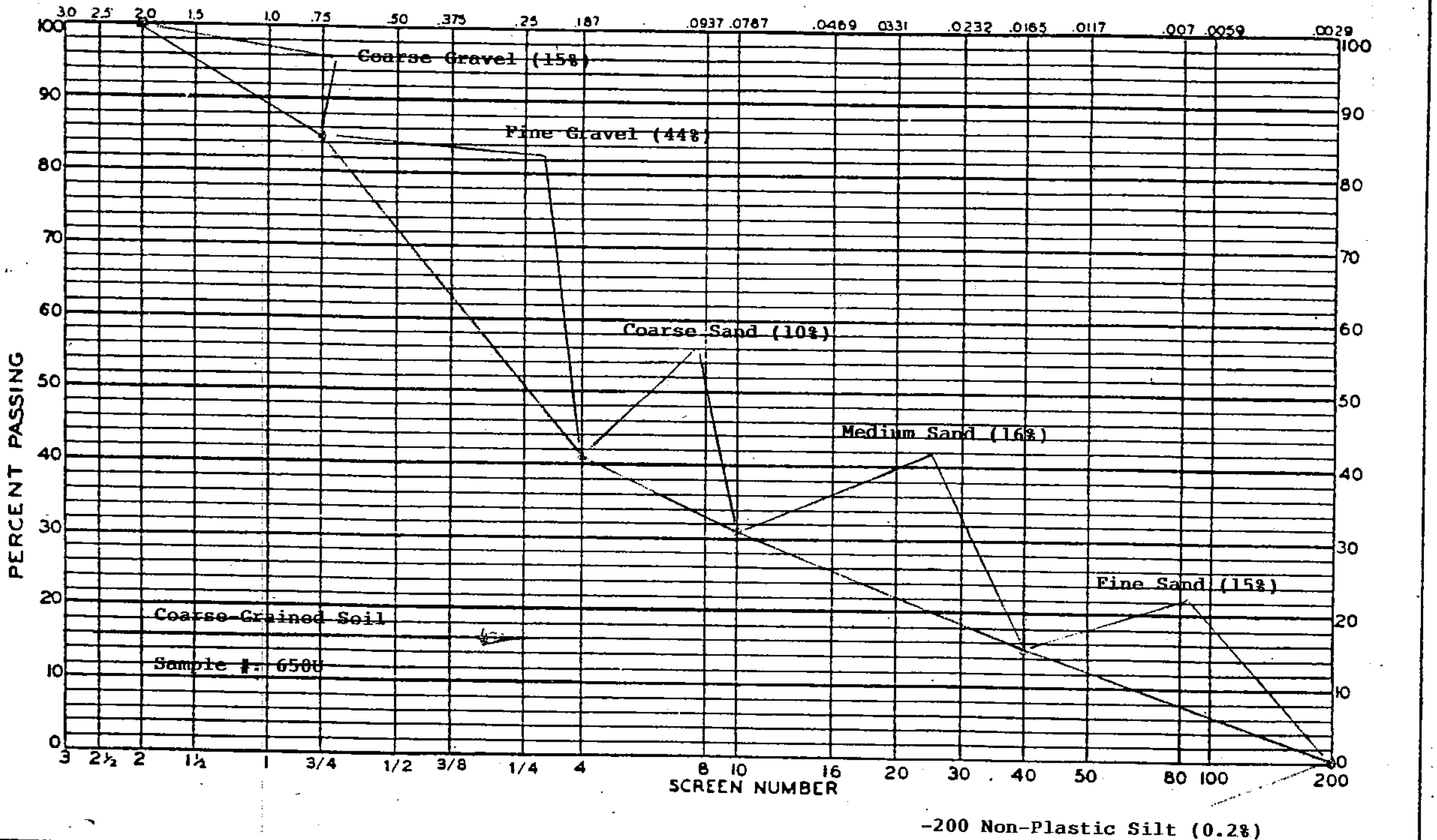
Aggregate Designations Based on ASTM D 2487

CH_2M Hill

Attn: Craig Bagley

AGGREGATE GRADING CHART

File #: 219-4
Work Order #: 11306
March 19, 1992, Thursday



PLOTTED BY	SAMPLE IDENTIFICATION
C.T.E., T. Mark Megeath	Jordan River Bottom - Sample #: 650U

WES FORM 886
AUGUST 55

Note: See related sieve analysis test report.

CONSTRUCTION TESTING AND ENGINEERING, INC.

P.O. Box 520292 • Salt Lake City, Utah 84152 • (801) 972-4001 • FAX: (801) 972-4011

SIEVE ANALYSIS TEST REPORT
ASTM C 117 / C 136

March 19, 1992, Thursday

File #: 219-4
Work Order #: 11306
Sample #: 750D

CH_2M Hill
4001 South 700 East, Suite 850
Salt Lake City, Utah 84107

Attn: Craig Bagley

Re: Jordan River Stabilization Study
Washed Sieve Analysis - Coarse-Grained Soil

Specification Requirement: NA: Reference/I.D. Testing

SIEVE ANALYSIS RESULTS

Sample #: 750D

Sieve Size	Accumulated % Retained	% Passing
1 1/2"	0	100
3/4"	30	70
#4	65	35
#10	76	24
#40	86	14
#200	99.2	0.8

Total weight: 5836 grams

Remarks:

Source of material: Jordan River Bank

Maximum cobble size noted in bulk sample = none.

See related aggregate gradation chart.

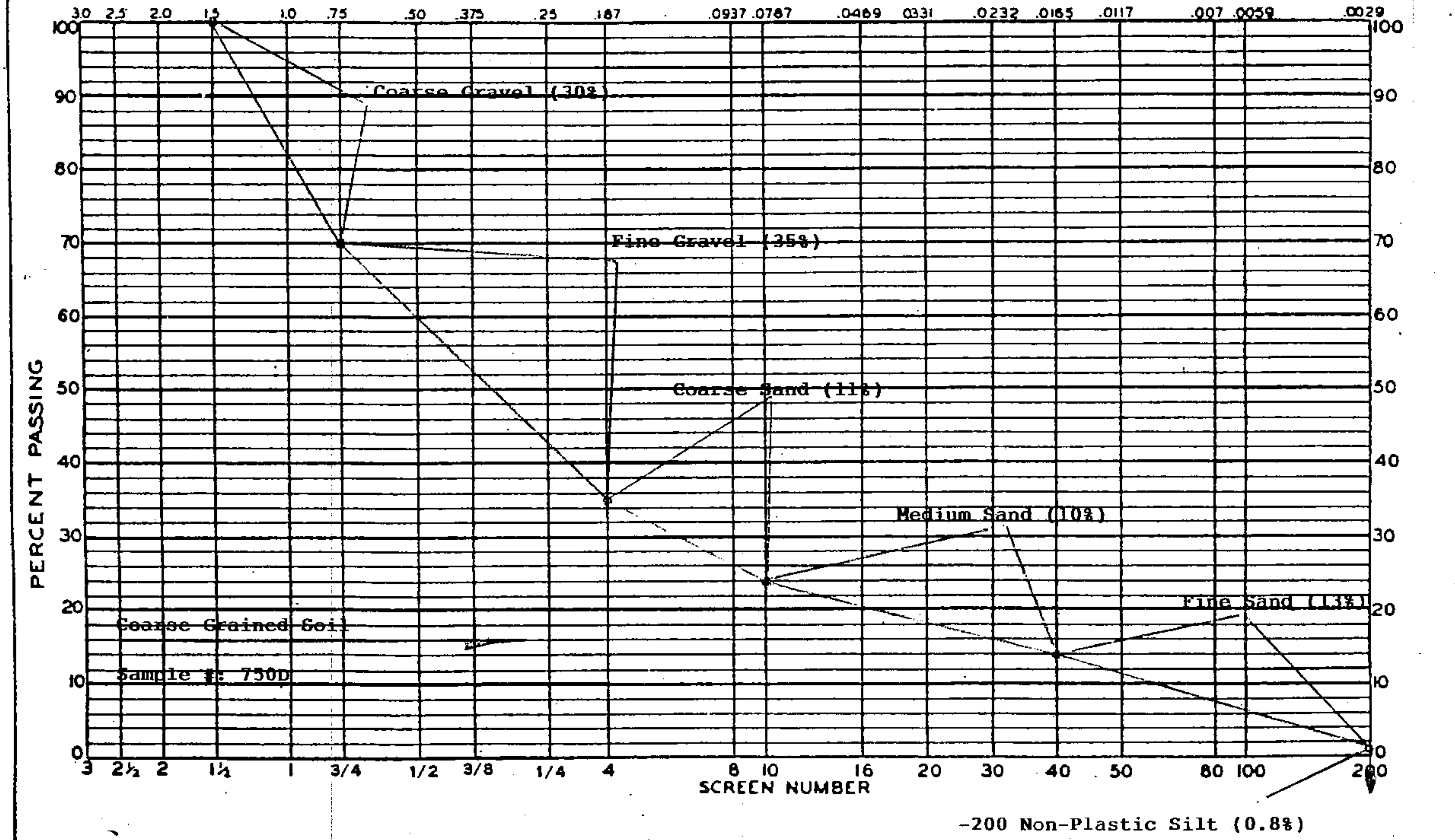
CONSTRUCTION TESTING & ENGINEERING, INC.
CERTIFIED TEST REPORT:

David K. Megeath, Manager

CH2M Hill
Attn: Craig Bagley

File #: 219-4
Work Order #: 11306
March 19, 1992, Thursday

AGGREGATE GRADING CHART



PLOTTED BY	SAMPLE IDENTIFICATION
C.T.E., T. Mark Megeath	Jordan River Bank - Sample #: 750D

WES FORM 886
AUGUST 55

Note: See related sieve analysis test report.

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P.O. Box 520292 • Salt Lake City, Utah 84152 • (801) 972-4001 • FAX: (801) 972-4011

SIEVE ANALYSIS TEST REPORT
ASTM C 117 / C 136

March 19, 1992, Thursday

File #: 219-4
Work Order #: 11306
Sample #: 760U

CH_2M Hill
4001 South 700 East, Suite 850
Salt Lake City, Utah 84107

Attn: Craig Bagley

Re: Jordan River Stabilization Study
Washed Sieve Analysis - Coarse-Grained Soil

Specification Requirement: NA: Reference/I.D. Testing

SIEVE ANALYSIS RESULTS

Sample #: 760U

Sieve Size	Accumulated % Retained	% Passing
3"	0	100
3/4"	40	60
#4	62	38
#10	73	27
#40	90	10
#200	99.4	0.6

Total weight: 5391 grams

Remarks:

Source of material: Jordan River Bottom

+3" material separated from original bulk sample per Craig Bagley; maximum cobble size noted in bulk sample = 3.25"

See related aggregate gradation chart.

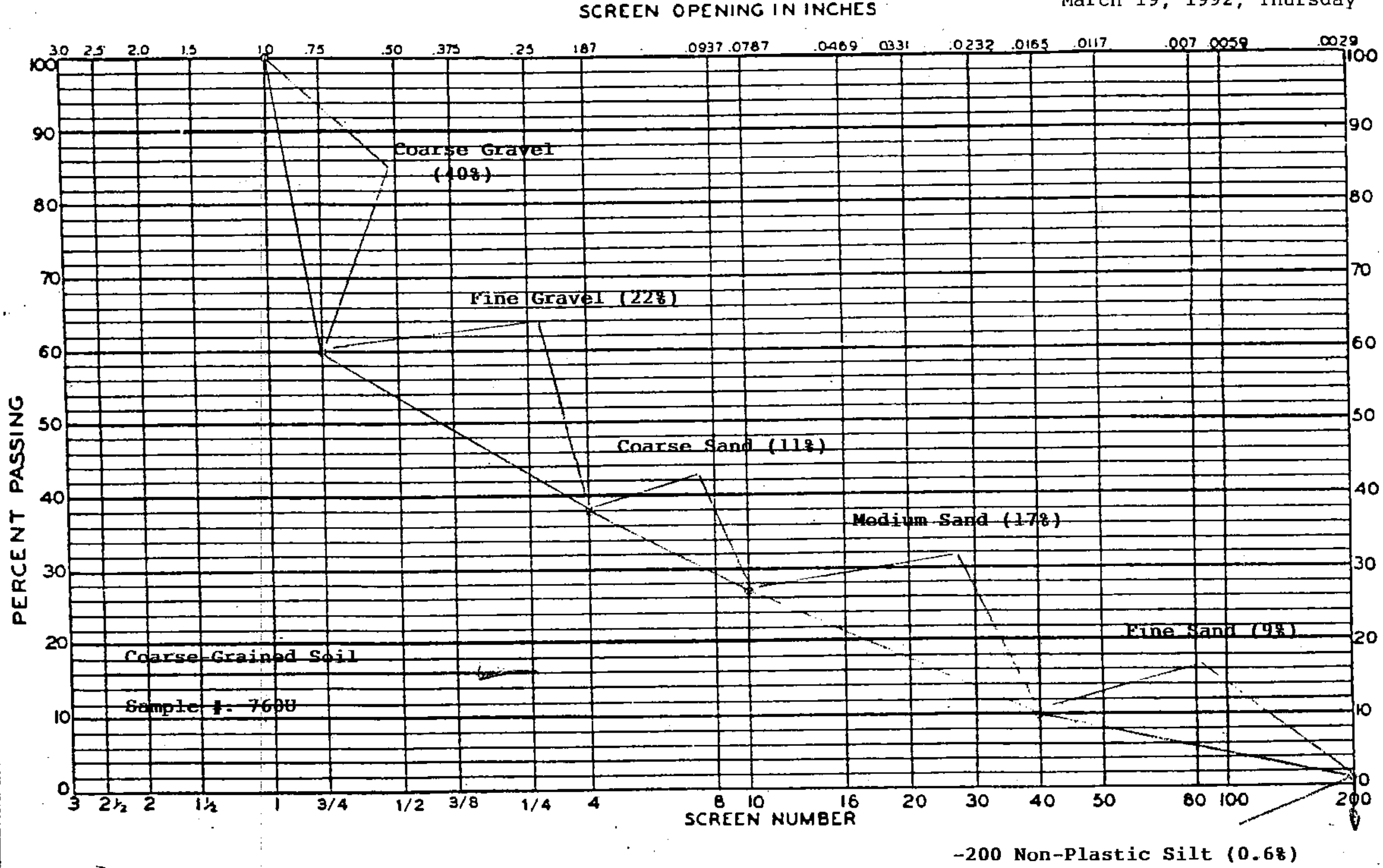
CONSTRUCTION TESTING & ENGINEERING, INC.
CERTIFIED TEST REPORT:

David K. Megeath, Manager

CH_2M Hill
Attn: Craig Bagley

File #: 219-4
Work Order #: 11306
March 19, 1992, Thursday

AGGREGATE GRADING CHART



PLOTTED BY	SAMPLE IDENTIFICATION
C.T.E., T. Mark Megeath	Jordan River Bottom - Sample #: 760U

WES FORM 886
AUGUST 55

Note: See related sieve analysis test report.

CONSTRUCTION TESTING AND ENGINEERING, INC.
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SIEVE ANALYSIS TEST REPORT
ASTM C 117 / C 136

March 19, 1992, Thursday

File #: 219-4
Work Order #: 11306
Sample #: 835D

CH_2M Hill
4001 South 700 East, Suite 850
Salt Lake City, Utah 84107

Attn: Craig Bagley

Re: Jordan River Stabilization Study
Washed Sieve Analysis - Coarse-Grained Soil

Specification Requirement: NA: Reference/I.D. Testing

SIEVE ANALYSIS RESULTS

Sample #: 835D

Sieve Size	Accumulated % Retained	% Passing
1 1/2"	0	100
3/4"	7	93
#4	68	30
#10	77	23
#40	83	17
#200	99.4	0.6

Total weight: 5035 grams

Remarks:

Source of material: Jordan River Bottom

Maximum cobble size noted in bulk sample = none.

See related aggregate gradation chart.

CONSTRUCTION TESTING & ENGINEERING, INC.
CERTIFIED TEST REPORT:

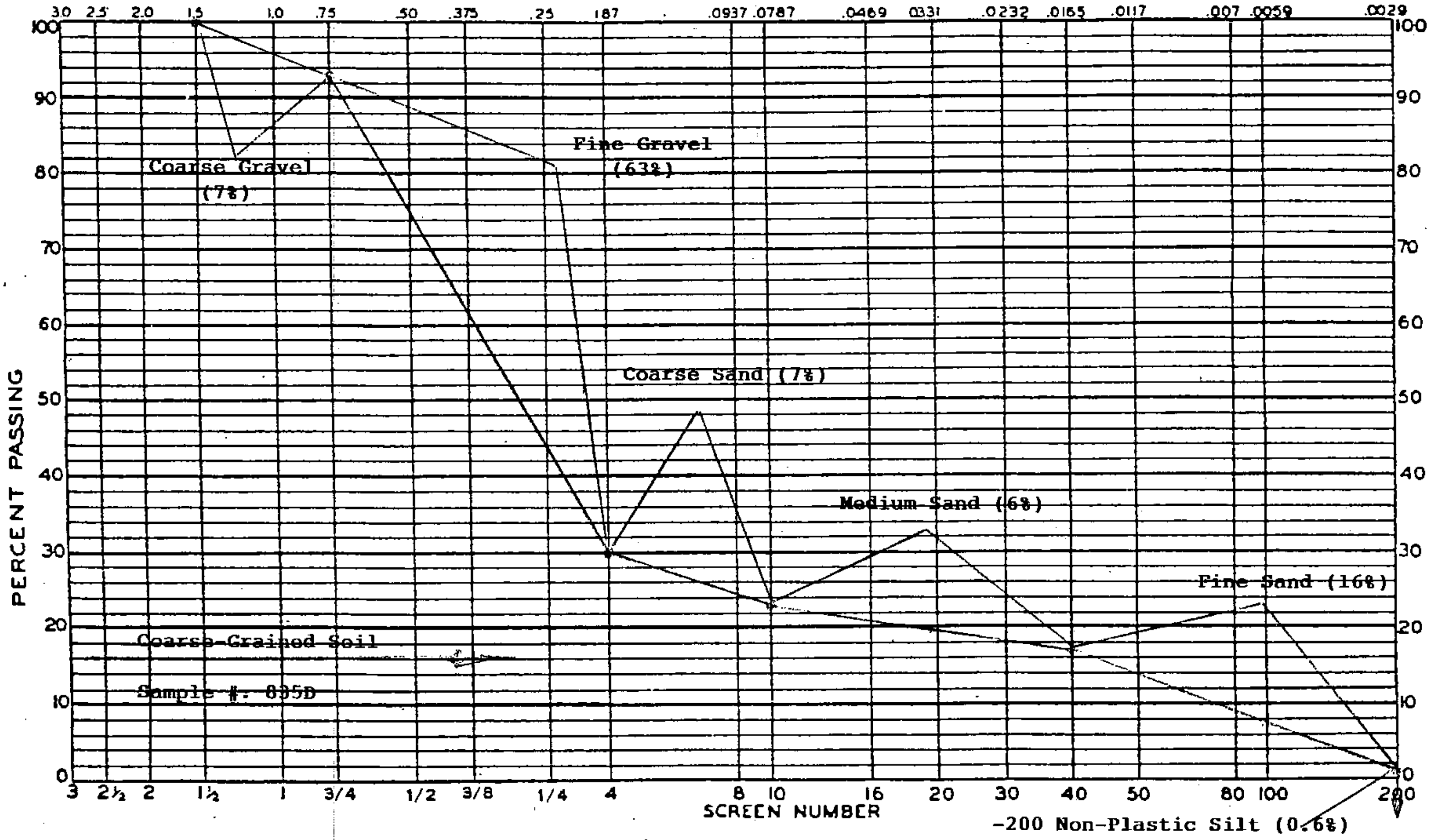
David K. Megeath, Manager

CH2M Hill
Attn: Craig Bagley

AGGREGATE GRADING CHART

SCREEN OPENING IN INCHES

File #: 219-4
Work Order #: 11306
March 19, 1992, Thursday



PLOTTED BY	SAMPLE IDENTIFICATION
C.T.E., T. Mark Megeath	Jordan River Bottom - Sample #: 835D

WES FORM 886
AUGUST 55

Note: See related sieve analysis test report.

CONSTRUCTION TESTING AND ENGINEERING, INC.
P.O. Box 520292 • Salt Lake City, Utah 84152 • (801) 972-4001 • FAX: (801) 972-4011

SIEVE ANALYSIS TEST REPORT
ASTM C 117 / C 136

March 19, 1992, Thursday

File #: 219-4
Work Order #: 11306
Sample #: 840U

CH$_2$M Hill
4001 South 700 East, Suite 850
Salt Lake City, Utah 84107

Attn: Craig Bagley

Re: Jordan River Stabilization Study
Washed Sieve Analysis - Coarse-Grained Soil

Specification Requirement: NA: Reference/I.D. Testing

SIEVE ANALYSIS RESULTS

Sample #: 840U

Sieve Size	Accumulated % Retained	% Passing
3/4"	0	100
#4	23	77
#10	43	57
#40	67	33
#200	99.0	1.0

Total weight: 1682 grams

Remarks:

Source of material: Jordan River Bank

Maximum cobble size noted in bulk sample = none.

See related aggregate gradation chart.

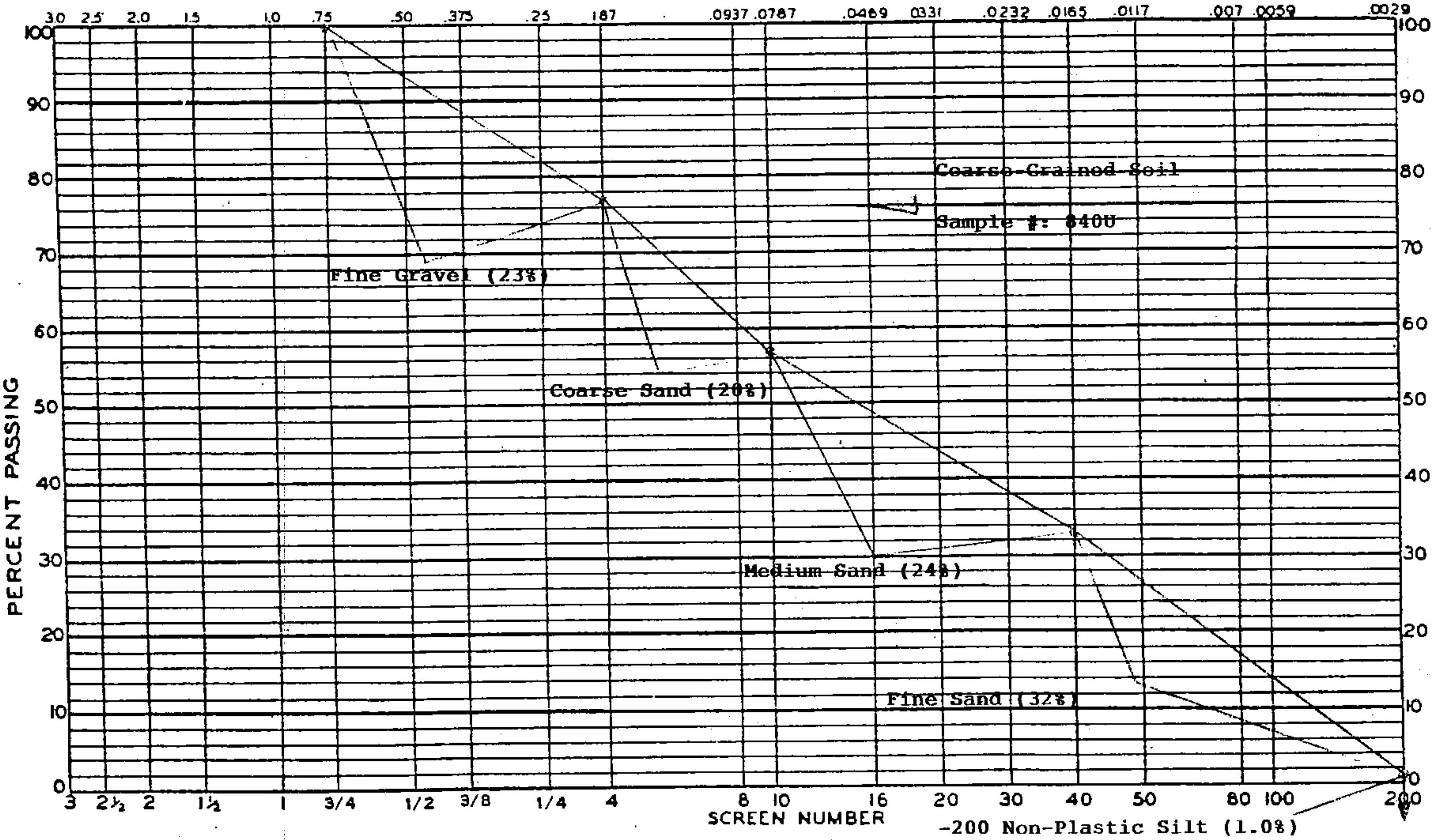
CONSTRUCTION TESTING & ENGINEERING, INC.
CERTIFIED TEST REPORT:

David K. Megeath, Manager

CH$_2$M Hill
Attn: Craig Bagley

File #: 219-4
Work Order #11306
March 19, 1992, Thursday

AGGREGATE GRADING CHART



PLOTTED BY	SAMPLE IDENTIFICATION
C.T.E., T. Mark Megeath	Jordan River Bank - Sample #: 840U

WES FORM 886
AUGUST 55

Note: See related sieve analysis test report.

CONSTRUCTION TESTING AND ENGINEERING, INC.
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SIEVE ANALYSIS TEST REPORT
ASTM C 117 / C 136

March 19, 1992, Thursday

File #: 219-4
Work Order #: 11306
Sample #: 925D

CH_2M Hill
4001 South 700 East, Suite 850
Salt Lake City, Utah 84107

Attn: Craig Bagley

Re: Jordan River Stabilization Study
Washed Sieve Analysis - Coarse-Grained Soil

Specification Requirement: NA: Reference/I.D. Testing

SIEVE ANALYSIS RESULTS

Sample #: 925D

Sieve Size	Accumulated % Retained	% Passing
2"	0	100
3/4"	31	69
#4	62	38
#10	73	27
#40	86	14
#200	98.1	1.9

Total weight: 4990 grams

Remarks:

Source of material: Jordan River Bottom

+3" material separated fromoriginal bulk sample per Craig Bagley; maximum cobble size noted in bulk sample = 3.5"

See related aggregate gradation chart.

CONSTRUCTION TESTING & ENGINEERING, INC.
CERTIFIED TEST REPORT:

David K. Megeath, Manager

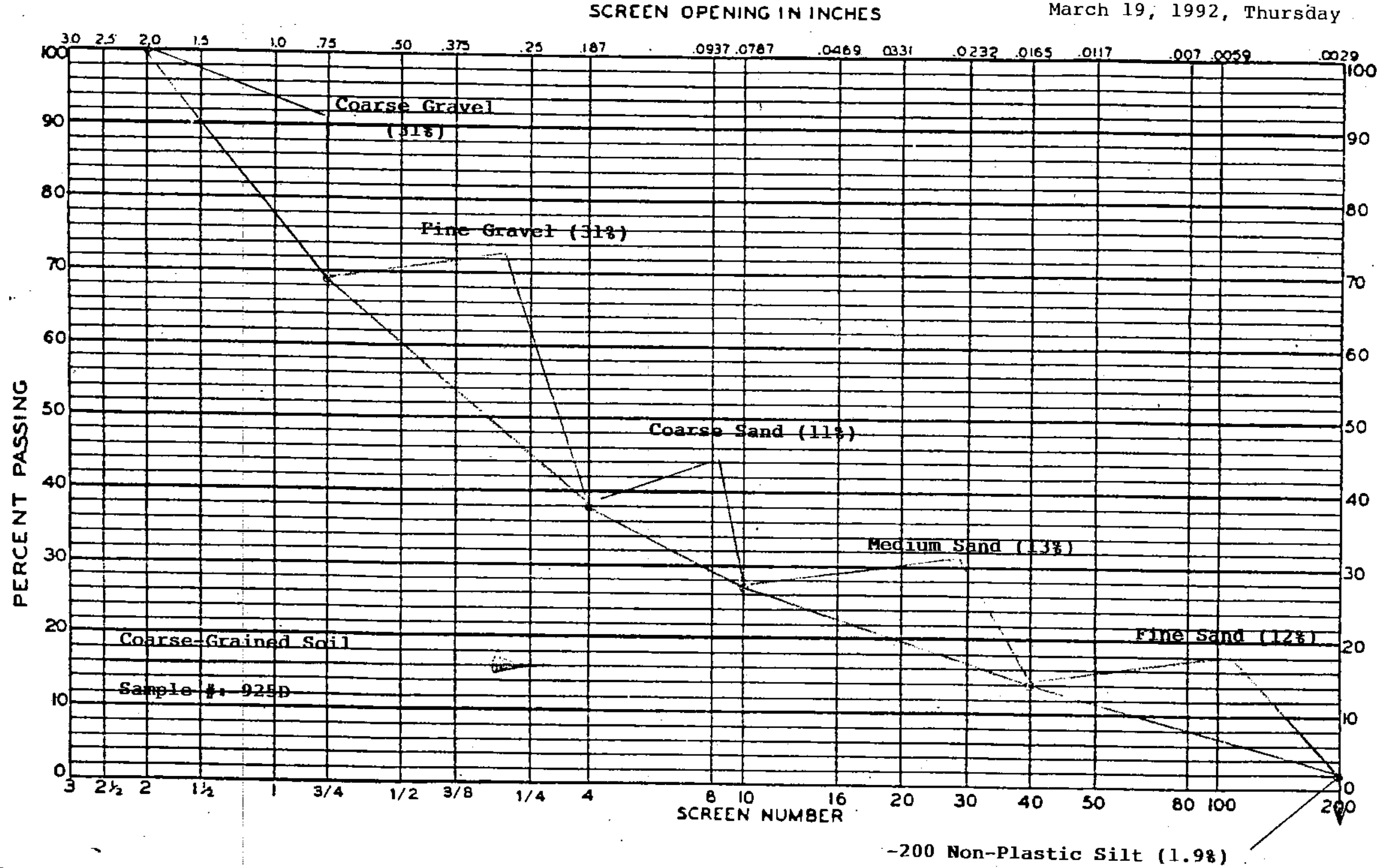
[redacted]

Aggregate Designations Based on ASTM D 2487

CH$_2$M Hill
Attn: Craig Bagley

File #: 219-4
Work Order #: 11306
March 19, 1992, Thursday

AGGREGATE GRADING CHART



PLOTTED BY	SAMPLE IDENTIFICATION
C.T.E., T. Mark Megeath	Jordan River Bottom - Sample #: 925D

WES FORM 886
AUGUST 55

Note: See related sieve analysis test report.

CONSTRUCTION TESTING AND ENGINEERING, INC.
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SIEVE ANALYSIS TEST REPORT
ASTM C 117 / C 136

March 19, 1992, Thursday

File #: 219-4
Work Order #: 11306
Sample #: 970D

CH_2M Hill
4001 South 700 East, Suite 850
Salt Lake City, Utah 84107

Attn: Craig Bagley

Re: Jordan River Stabilization Study
Washed Sieve Analysis - Coarse-Grained Soil

Specification Requirement: NA: Reference/I.D. Testing

SIEVE ANALYSIS RESULTS

Sample #: 970D

Sieve Size	Accumulated % Retained	% Passing
2"	0	100
3/4"	27	73
#4	61	39
#10	69	31
#40	77	23
#200	99.3	0.7

Total weight: 5736 grams

Remarks:

Source of material: Jordan River Bank

Maximum cobble size noted in bulk sample = none.

See related aggregate gradation chart.

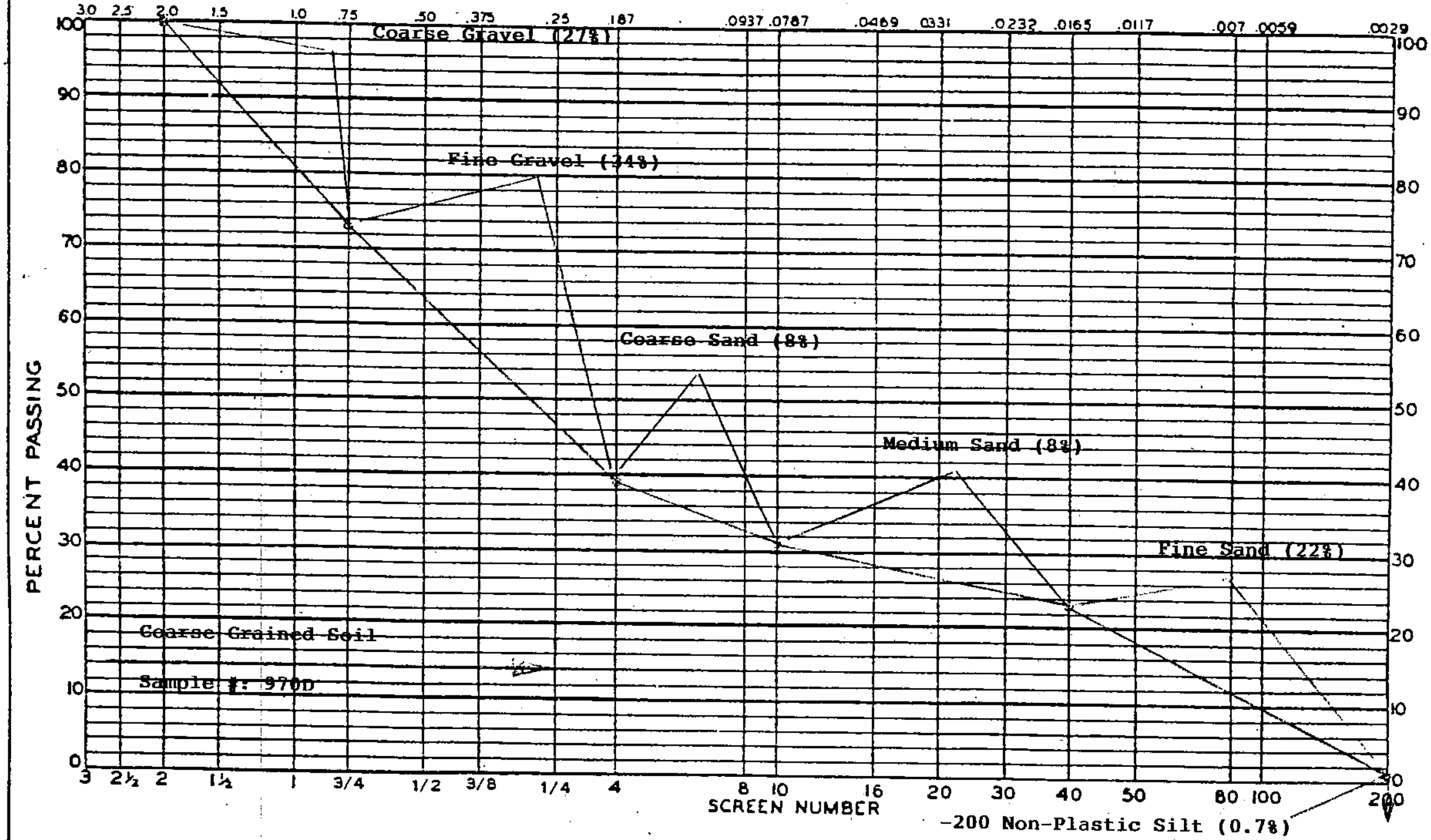
CONSTRUCTION TESTING & ENGINEERING, INC.
CERTIFIED TEST REPORT:

David K. Megeath, Manager

CH2M Hill
Attn: Craig Bagley

File #: 219-4
Work Order #: 11306
March 19, 1992, Thursday

AGGREGATE GRADING CHART



PLOTTED BY C.T.E., T. Mark Megeath.

SAMPLE IDENTIFICATION
Jordan River Bank - Sample #: 970D

WES FORM 886
AUGUST 55

Note: See related sieve analysis test report.

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SIEVE ANALYSIS TEST REPORT
ASTM C 117 / C 136

March 19, 1992, Thursday

File #: 219-4
Work Order #: 11306
Sample #: 975D

CH_2M Hill
4001 South 700 East, Suite 850
Salt Lake City, Utah 84107

Attn: Craig Bagley

Re: Jordan River Stabilization Study
Washed Sieve Analysis - Coarse-Grained Soil

Specification Requirement: NA: Reference/I.D. Testing

SIEVE ANALYSIS RESULTS

Sample #: 975D

Sieve Size	Accumulated % Retained	% Passing
3"	0	100
3/4"	40	60
#4	69	31
#10	78	22
#40	85	15
#200	99.1	0.9

Total weight: 5670 grams

Remarks:

Source of material: Jordan River Bottom

Maximum cobble size noted in bulk sample = none.

See related aggregate gradation chart.

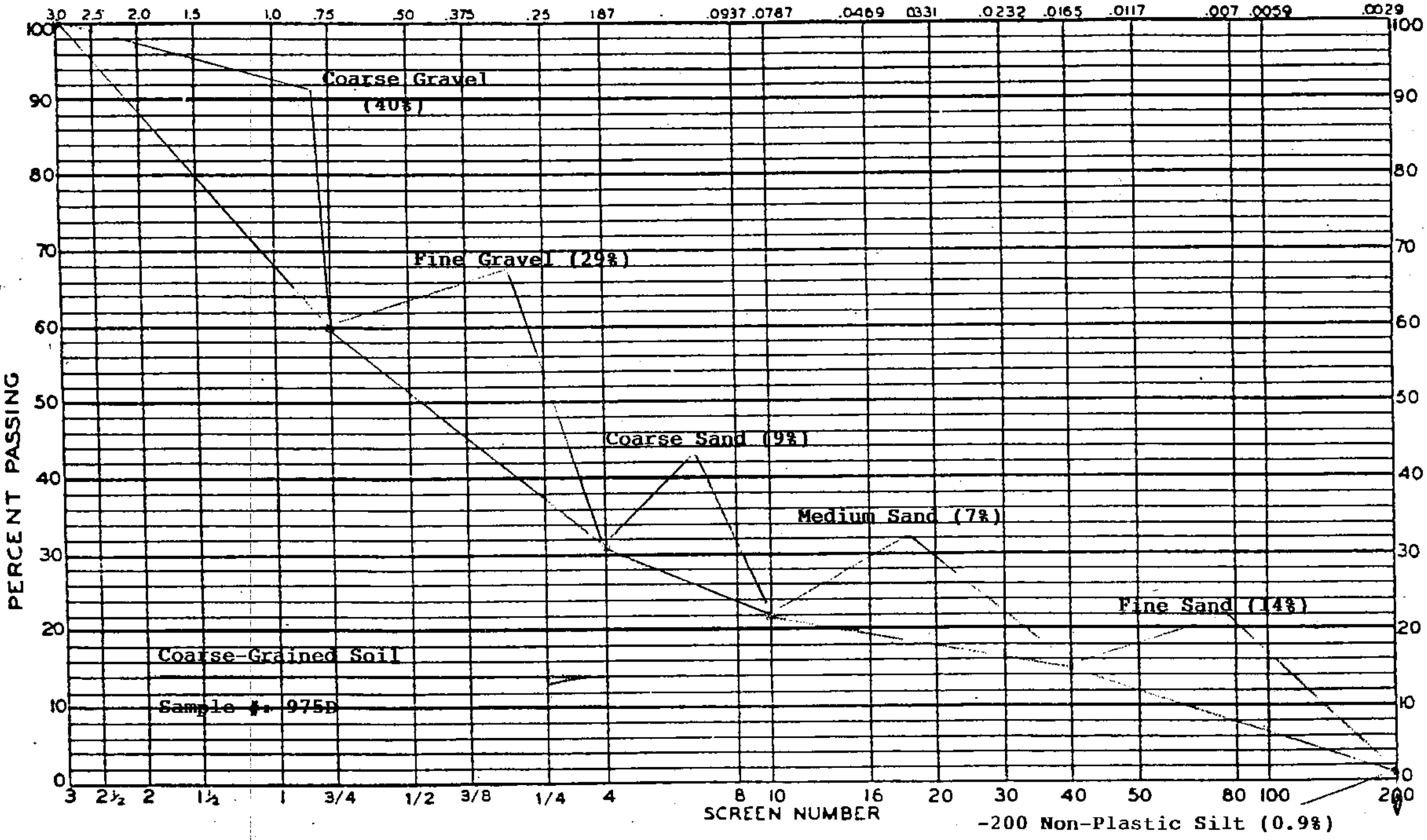
CONSTRUCTION TESTING & ENGINEERING, INC.
CERTIFIED TEST REPORT:

David K. Megeath, Manager

CH$_2$M Hill
Attn: Craig Bagley

AGGREGATE GRADING CHART

File #: 219-4
Work Order #: 11306
March 19, 1992, Thursday



PLOTTED BY	SAMPLE IDENTIFICATION
C.T.E., T. Mark Megeath	Jordan River Bottom - Sample #: 975D

WES FORM 886
AUGUST 55

Note: See related sieve analysis test report.

CONSTRUCTION TESTING AND ENGINEERING, INC.
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SIEVE ANALYSIS TEST REPORT
ASTM C 117 / C 136

March 19, 1992, Thursday

File #: 219-4
Work Order #: 11306
Sample #: 1030

CH_2M Hill
4001 South 700 East, Suite 850
Salt Lake City, Utah 84107

Attn: Craig Bagley

Re: Jordan River Stabilization Study
Washed Sieve Analysis - Coarse-Grained Soil

Specification Requirement: NA: Reference/I.D. Testing

SIEVE ANALYSIS RESULTS

Sample #: 1030

Sieve Size	Accumulated % Retained	% Passing
1 1/2"	0	100
3/4"	9	91
#4	59	41
#10	72	28
#40	95	5
#200	99.8	0.2

Total weight: 6023 grams

Remarks:

Source of material: Jordan River Bottom

Maximum cobble size noted in bulk sample = none.

See related aggregate gradation chart.

CONSTRUCTION TESTING & ENGINEERING, INC.
CERTIFIED TEST REPORT:

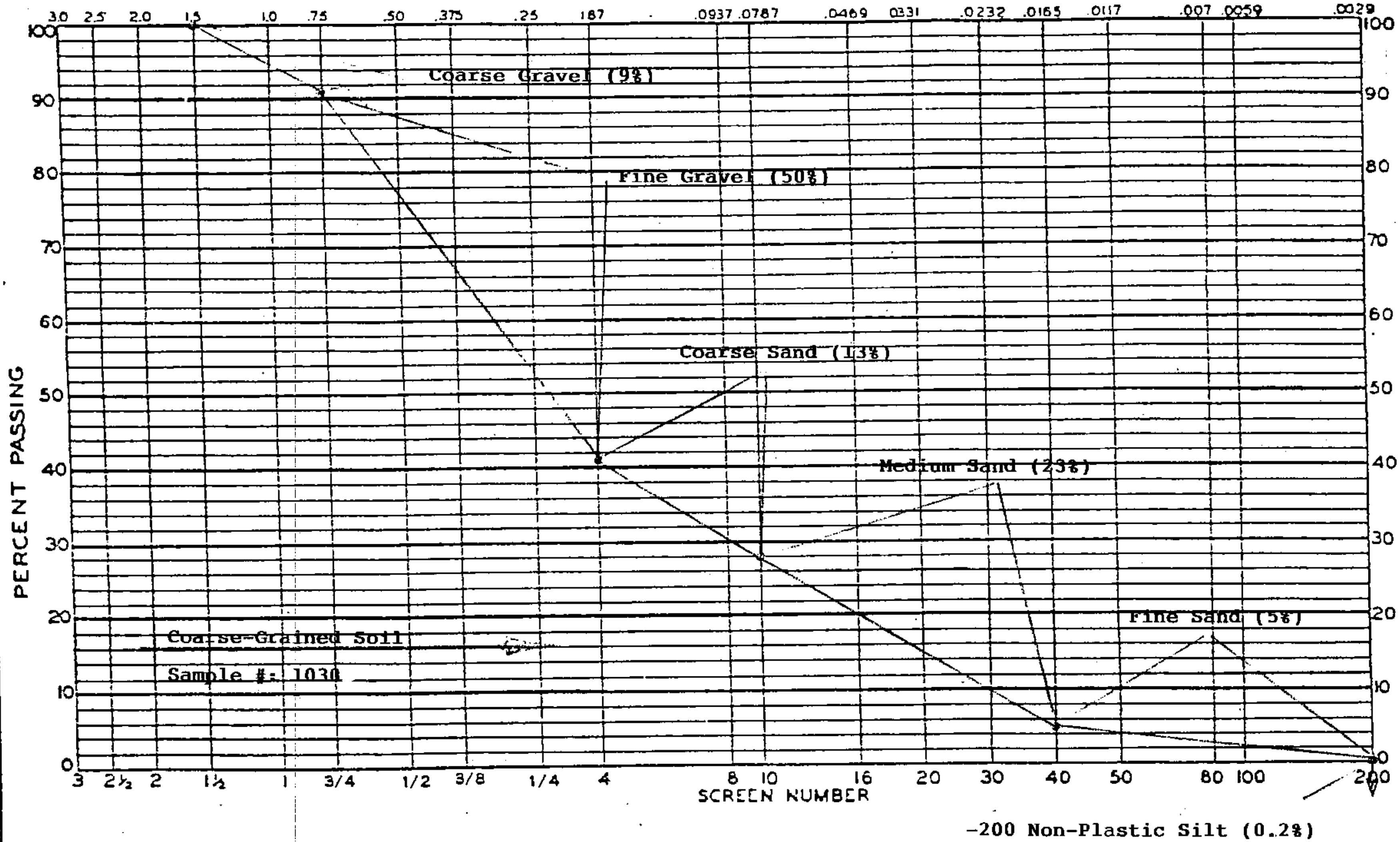
David K. Megeath, Manager

CH$_2$M Hill
Attn: Craig Bagley

File #: 219-4
Work Order #: 11306
March 19, 1992, Thursday

AGGREGATE GRADING CHART

SCREEN OPENING IN INCHES



PLOTTED BY	SAMPLE IDENTIFICATION
C.T.E., T. Mark Megeath	Jordan River Bottom - Sample #: 1030

WES FORM 886
AUGUST 55

Note: See related sieve analysis test report.

CONSTRUCTION TESTING AND ENGINEERING, INC.
P.O. Box 520292 • Salt Lake City, Utah 84152 • (801) 972-4001 • FAX: (801) 972-4011

SIEVE ANALYSIS TEST REPORT
ASTM C 117 / C 136

March 18, 1992, Wednesday

File #: 219-4
Work Order #: 11293
Sample #: 1097U

CH_2M Hill
4001 South 700 East, Suite 850
Salt Lake City, Utah 84107

Attn: Craig Bagley

Re: Jordan River Stabilization Study
Washed Sieve Analysis - Coarse-Grained Soil

Specification Requirement: NA: Reference/I.D. Testing

SIEVE ANALYSIS RESULTS

Sample #: 1097U

Sieve Size	Accumulated % Retained	% Passing
3"	0	100
3/4"	38	62
#4	72	28
#10	72	28
#40	74	26
#200	98.7	1.3

Total weight: 5692 grams

Remarks:

Source of material: Jordan River Bottom

No +3" material noted in original field sample.

See related aggregate gradation chart.

CONSTRUCTION TESTING & ENGINEERING, INC.
CERTIFIED TEST REPORT:

David K. Megeath, Manager

SU[illegible]TED [illegible]CONS[illegible]CTI[illegible]ESTI[illegible] & ENGINEERING, INC.

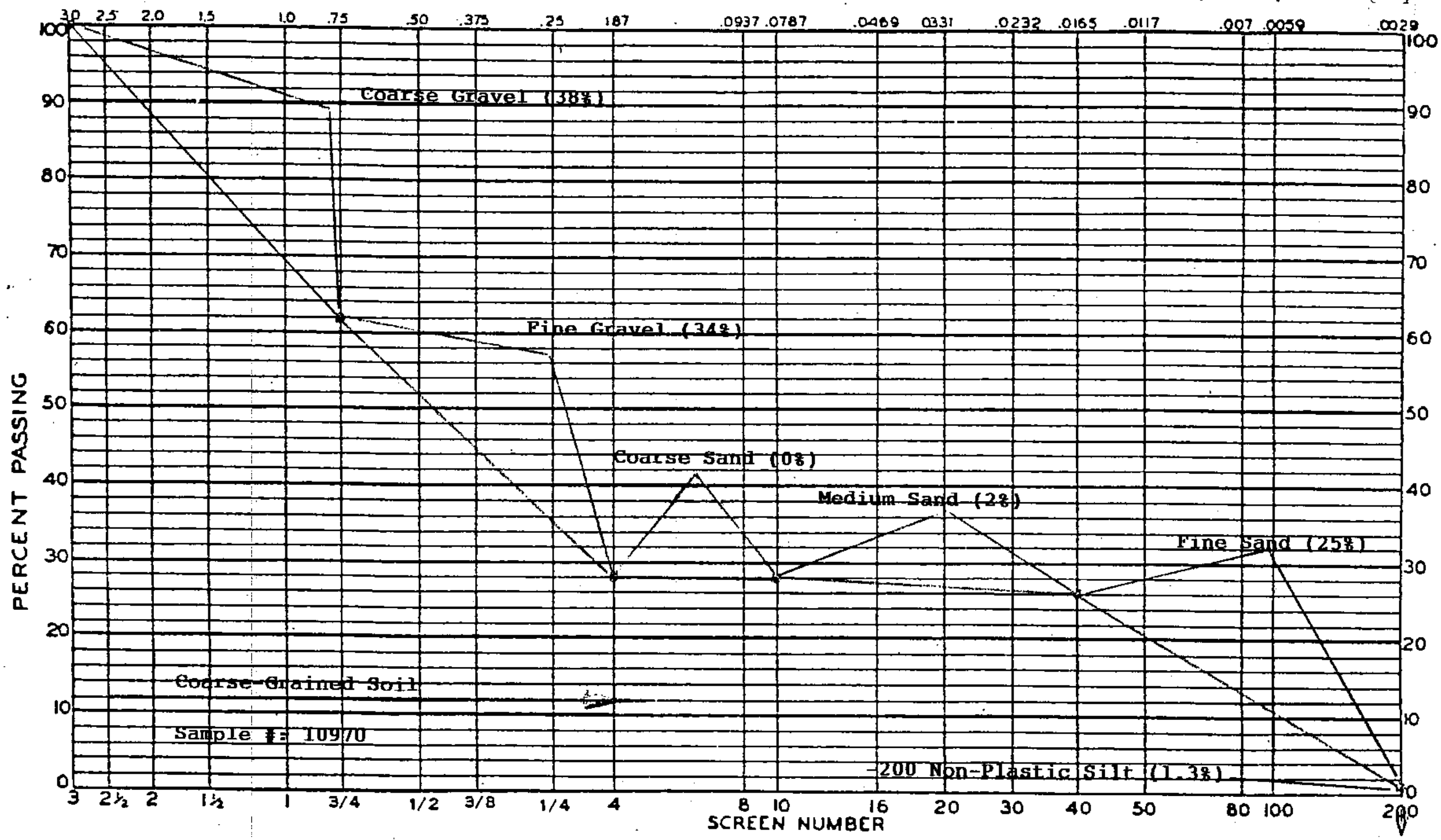
Aggregate Designations Based on ASTM D 2487

CH2M Hill
Attn: Craig Bagley

File #: 219-4
Work Order #: 11293
March 18, 1992, Wednesday

AGGREGATE GRADING CHART

SCREEN OPENING IN INCHES



PLOTTED BY
C.T.E., T. Mark Megeath

SAMPLE IDENTIFICATION
Jordan River Bottom - Sample #: 1097U

WES FORM 886
AUGUST 55

Note: See related sieve analysis test report.

CONSTRUCTION TESTING AND ENGINEERING, INC.
P.O. Box 520292 • Salt Lake City, Utah 84152 • (801) 972-4001 • FAX: (801) 972-4011

SIEVE ANALYSIS TEST REPORT
ASTM C 117 / C 136

March 18, 1992, Wednesday

File #: 219-4
Work Order #: 11293
Sample #: 1125D

CH_2M Hill
4001 South 700 East, Suite 850
Salt Lake City, Utah 84107

Attn: Craig Bagley

Re: Jordan River Stabilization Study
Washed Sieve Analysis - Coarse-Grained Soil

Specification Requirement: NA: Reference/I.D. Testing

SIEVE ANALYSIS RESULTS

Sample #: 1125D

Sieve Size	Accumulated % Retained	% Passing
3"	0	100
3/4"	18	82
#4	76	24
#10	81	19
#40	83	17
#200	99.0	1.0

Total weight: 5093 grams

Remarks:

Source of material: Jordan River Bottom

No +3" material noted in original field sample.

See related aggregate gradation chart.

CONSTRUCTION TESTING & ENGINEERING, INC.
CERTIFIED TEST REPORT:

David K. Megeath, Manager

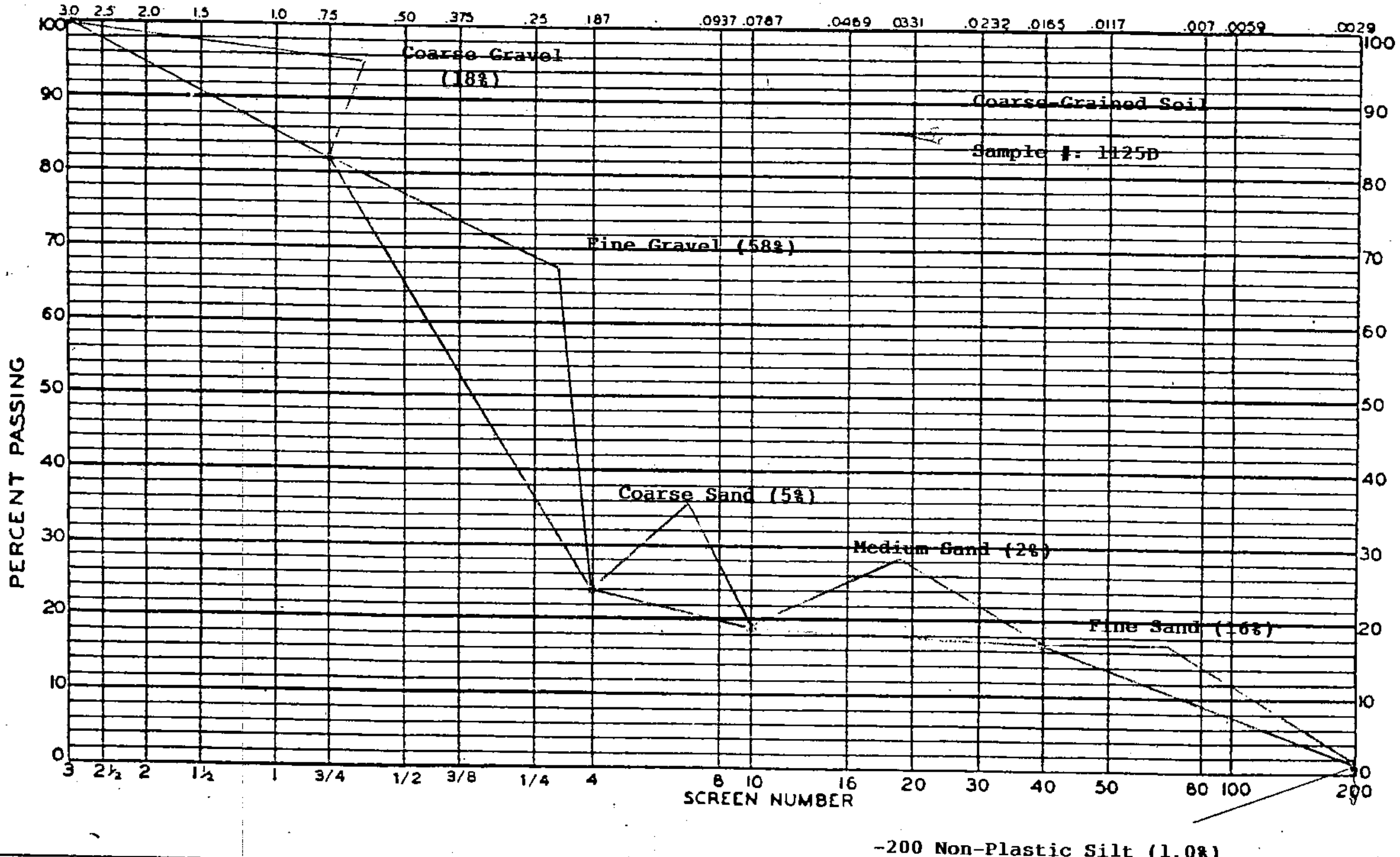
Aggregate Designations Based on ASTM D 2487

CH_2M Hill
Attn: Craig Bagley

File #: 219-4
Work Order #: 11293
March 18, 1992, Wednesday

AGGREGATE GRADING CHART

SCREEN OPENING IN INCHES



PLOTTED BY	SAMPLE IDENTIFICATION
C.T.E., T. Mark Megeath	Jordan River Bottom - Sample #: 1125D

WES FORM 886
AUGUST 55

Note: See related sieve analysis test report.

CONSTRUCTION TESTING AND ENGINEERING, INC.
P.O. Box 520292 • Salt Lake City, Utah 84152 • (801) 972-4001 • FAX: (801) 972-4011

SIEVE ANALYSIS TEST REPORT
ASTM C 117 / C 136

March 18, 1992, Wednesday

File #: 219-4
Work Order #: 11293
Sample #: 1130U

CH_2M Hill
4001 South 700 East, Suite 850
Salt Lake City, Utah 84107

Attn: Craig Bagley

Re: Jordan River Stabilization Study
Washed Sieve Analysis - Coarse-Grained Soil

Specification Requirement: NA: Reference/I.D. Testing

SIEVE ANALYSIS RESULTS

Sample #: 1130U

Sieve Size	Accumulated % Retained	% Passing
3/8"	0	100
#4	0	100
#10	1	99
#50	18	82
#100	35	65
#200	61	39

Total weight: 401 grams

Remarks:

Source of material: Jordan River Bank

No +3" material noted in original field sample.

See related aggregate gradation chart.

CONSTRUCTION TESTING & ENGINEERING, INC.
CERTIFIED TEST REPORT:

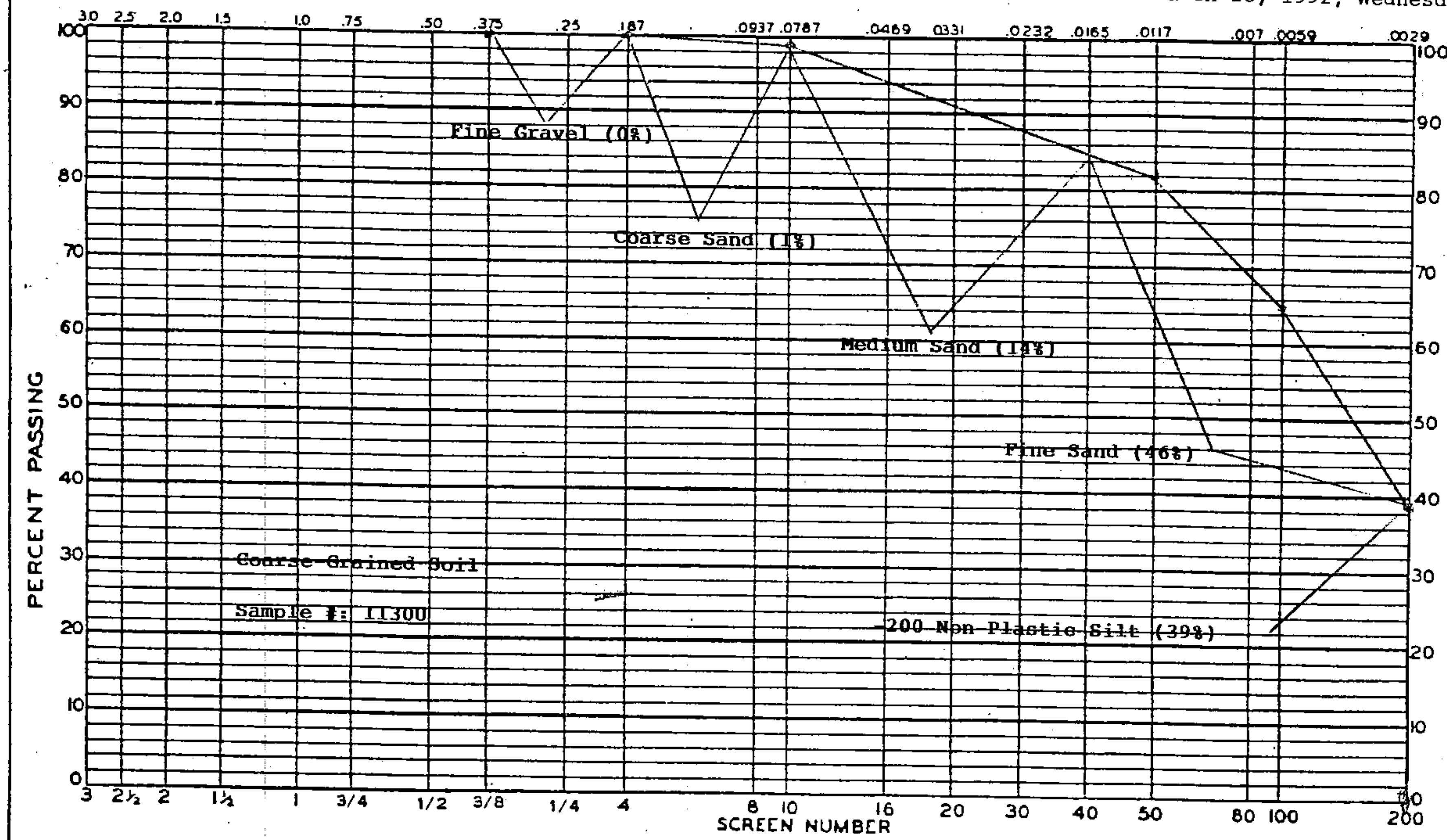
David K. Megeath, Manager

Aggregate Designations Based on ASTM D 2487

CH2M Hill
Attn: Craig Bagley

File #: 219-4
Work Order #: 11293
March 18, 1992, Wednesday

AGGREGATE GRADING CHART



PLOTTED BY	SAMPLE IDENTIFICATION
C.T.E., T. Mark Megeath	Jordan River Bank - Sample #: 1130U

WES FORM 886
AUGUST 55

Note: See related sieve analysis test report.

CONSTRUCTION TESTING AND ENGINEERING, INC.
P.O. Box 520292 • Salt Lake City, Utah 84152 • (801) 972-4001 • FAX: (801) 972-4011

SIEVE ANALYSIS TEST REPORT
ASTM C 117 / C 136

March 18, 1992, Wednesday

File #: 219-4
Work Order #: 11293
Sample #: 1160

CH_2M Hill
4001 South 700 East, Suite 850
Salt Lake City, Utah 84107

Attn: Craig Bagley

Re: Jordan River Stabilization Study
Washed Sieve Analysis - Coarse-Grained Soil

Specification Requirement: NA: Reference/I.D. Testing

SIEVE ANALYSIS RESULTS

Sample #: 1160

Sieve Size	Accumulated % Retained	% Passing
1 1/2"	0	100
1"	0	100
3/4"	1	99
#4	44	56
#10	68	32
#40	77	23
#200	99.5	0.5

Total weight: 2853 grams

Remarks:

Source of material: Jordan River Bottom

No +3" material noted in original field sample.

See related aggregate gradation chart.

CONSTRUCTION TESTING & ENGINEERING, INC.
CERTIFIED TEST REPORT:

David K. Megeath, Manager

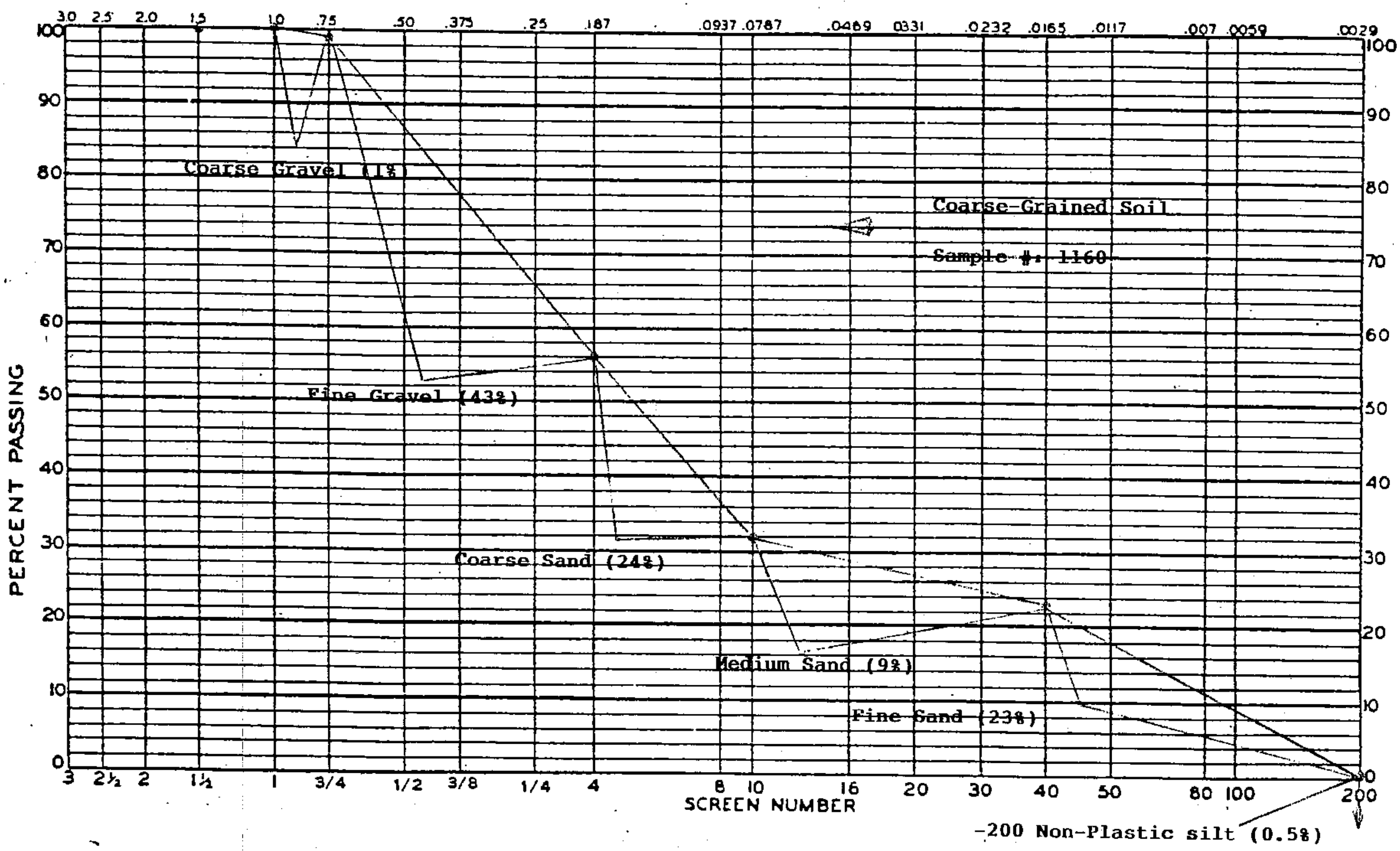
[redacted], INC.

Aggregate Designations Based on ASTM D 2487

CH2M Hill
Attn: Craig Bagley

File #: 219-4
Work Order #: 11293
March 18, 1992, Wednesday

AGGREGATE GRADING CHART



PLOTTED BY	SAMPLE IDENTIFICATION
C.T.E., T. Mark Megeath	Jordan River Bottom - Sample #: 1160

WES FORM 886
AUGUST 55

Note: See related sieve analysis test report.

CONSTRUCTION TESTING AND ENGINEERING, INC.
P.O. Box 520292 • Salt Lake City, Utah 84152 • (801) 972-4001 • FAX: (801) 972-4011

SIEVE ANALYSIS TEST REPORT
ASTM C 117 / C 136

March 18, 1992, Wednesday

File #: 219-4
Work Order #: 11293
Sample #: 1170D

CH2M Hill
4001 South 700 East, Suite 850
Salt Lake City, Utah 84107

Attn: Craig Bagley

Re: Jordan River Stabilization Study
Washed Sieve Analysis - Fine-Grained Soil

Specification Requirement: NA: Reference/I.D. Testing

SIEVE ANALYSIS RESULTS

Sample #: 1170D

Sieve Size	Accumulated % Retained	% Passing
#4	0	100
#10	0	100
#50	2	98
#100	7	93
#200	37	63

Total weight: 143 grams

Remarks:

Source of material: Jordan River Bank

No +3" material noted in original field sample.

See related aggregate gradation chart.

CONSTRUCTION TESTING & ENGINEERING, INC.
CERTIFIED TEST REPORT:

David K. Megeath, Manager

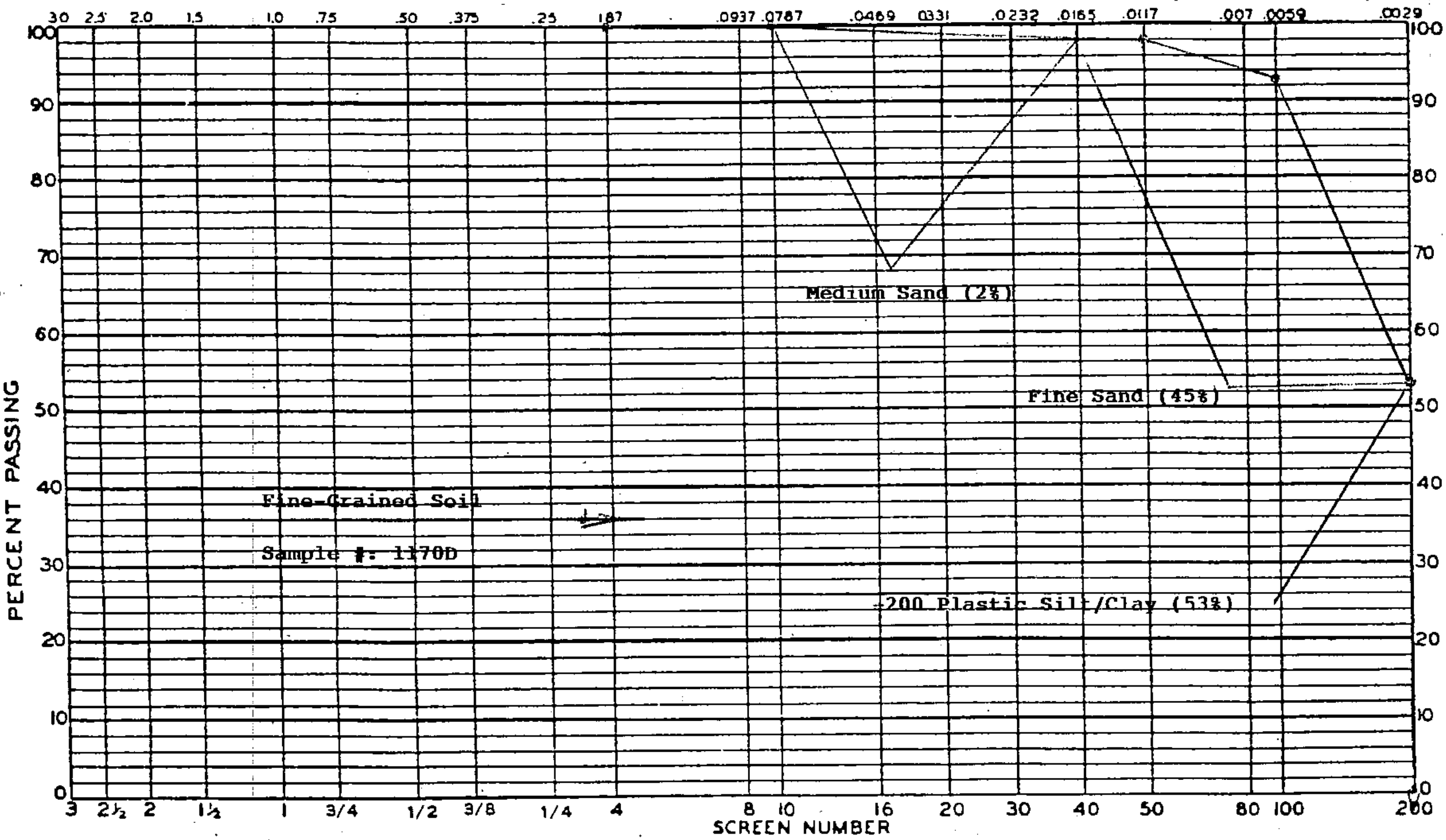
SUBMITTED BY CONSTRUCTION TESTING & ENGINEERING, INC.

Aggregate Designations Based on ASTM D 2487

CH2M Hill
Attn: Craig Bagley

File #: 219-4
Work Order #: 11293.
March 18, 1992, Wednesday

AGGREGATE GRADING CHART



PLOTTED BY	SAMPLE IDENTIFICATION
C.T.E., T. Mark Megeath	Jordan River Bank - Sample #: 1170D

WES FORM 886
AUGUST 55

Note: See related sieve analysis test report.

CONSTRUCTION TESTING AND ENGINEERING, INC.
P.O. Box 520292 • Salt Lake City, Utah 84152 • (801) 972-4001 • FAX: (801) 972-4011

SIEVE ANALYSIS TEST REPORT
ASTM C 117 / C 136

March 18, 1992, Wednesday

File #: 219-4
Work Order #: 11293
Sample #: 1235D

CH_2M Hill
4001 South 700 East, Suite 850
Salt Lake City, Utah 84107

Attn: Craig Bagley

Re: Jordan River Stabilization Study
Washed Sieve Analysis - Coarse-Grained Soil

Specification Requirement: NA: Reference/I.D. Testing

SIEVE ANALYSIS RESULTS

Sample #: 1235D

Sieve Size	Accumulated % Retained	% Passing
1"	0	100
3/4"	0	100
#4	12	88
#10	19	81
#40	34	66
#200	99.8	0.2

Total weight: 2550 grams

Remarks:

Source of material: Jordan River Bottom

No +3" material noted in original field sample.

See related aggregate gradation chart.

CONSTRUCTION TESTING & ENGINEERING, INC.
CERTIFIED TEST REPORT:

David K. Megeath, Manager

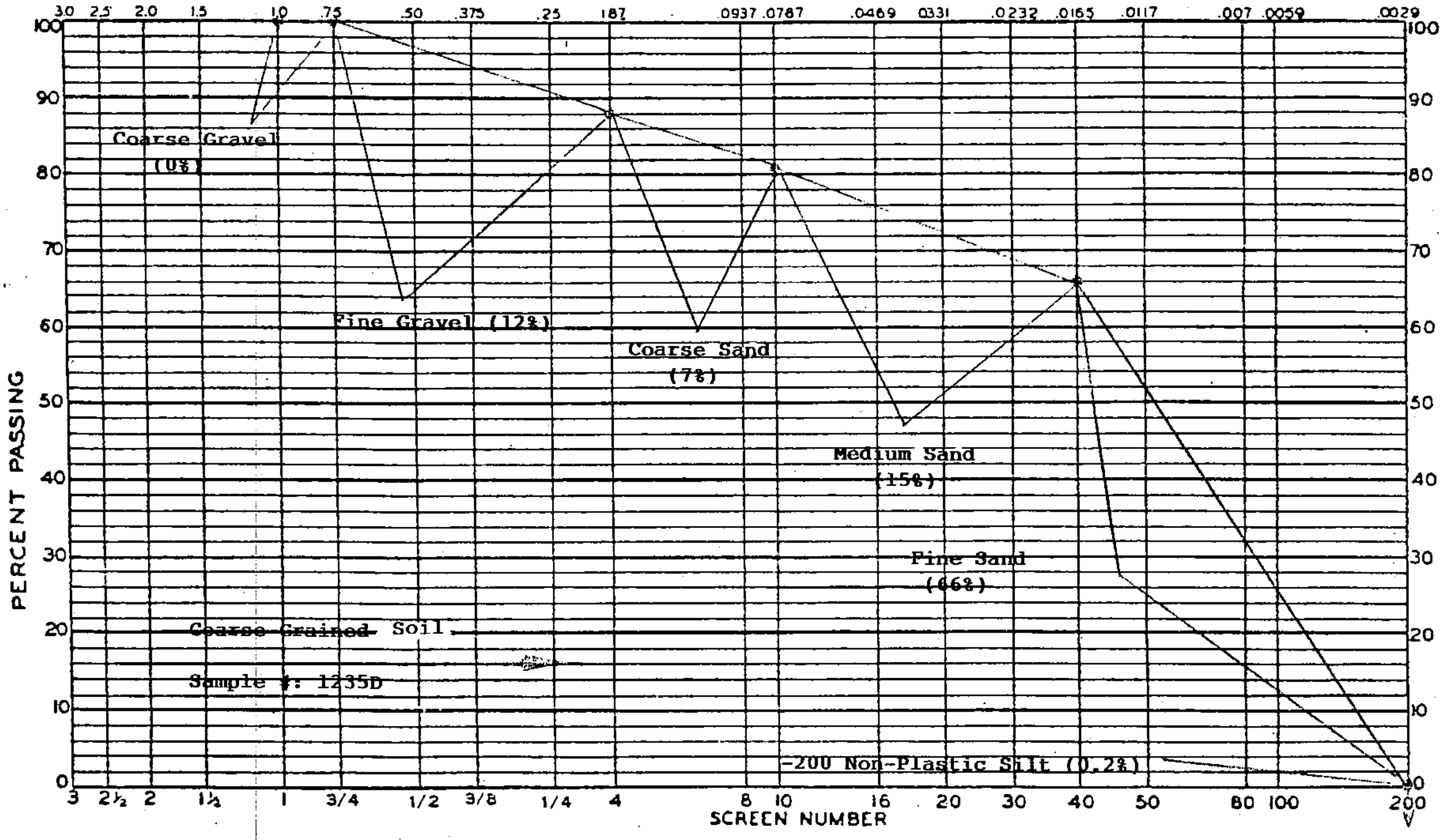
Aggregate Designations Based on ASTM D 2487

CH_2M Hill
Attn: Craig Bagley

File #: 219-4
Work Order #: 11293
March 18, 1992, Wednesday

AGGREGATE GRADING CHART

SCREEN OPENING IN INCHES



PLOTTED BY
C.T.E., T. Mark Megeath

SAMPLE IDENTIFICATION
Jordan River Bottm - Sample #: 1235D

WES FORM 886
AUGUST 55

Note: See related sieve analysis test report.

CONSTRUCTION TESTING AND ENGINEERING, INC.
P.O. Box 520292 • Salt Lake City, Utah 84152 • (801) 972-4001 • FAX: (801) 972-4011

SIEVE ANALYSIS TEST REPORT
ASTM C 117 / C 136

March 18, 1992, Wednesday

File #: 219-4
Work Order #: 11293
Sample #: 1240

CH_2M Hill
4001 South 700 East, Suite 850
Salt Lake City, Utah 84107

Attn: Craig Bagley

Re: Jordan River Stabilization Study
Washed Sieve Analysis - Coarse-Grained Soil

Specification Requirement: NA: Reference/I.D. Testing

SIEVE ANALYSIS RESULTS

Sample #: 1240

Sieve Size	Accumulated % Retained	% Passing
1/2"	0	100
#4	44	56
#10	75	25
#40	82	18
#200	99.2	0.8

Total weight: 2378 grams

Remarks:

Source of material: Jordan River Bottom

No +3" material noted in original field sample.

See related aggregate gradation chart.

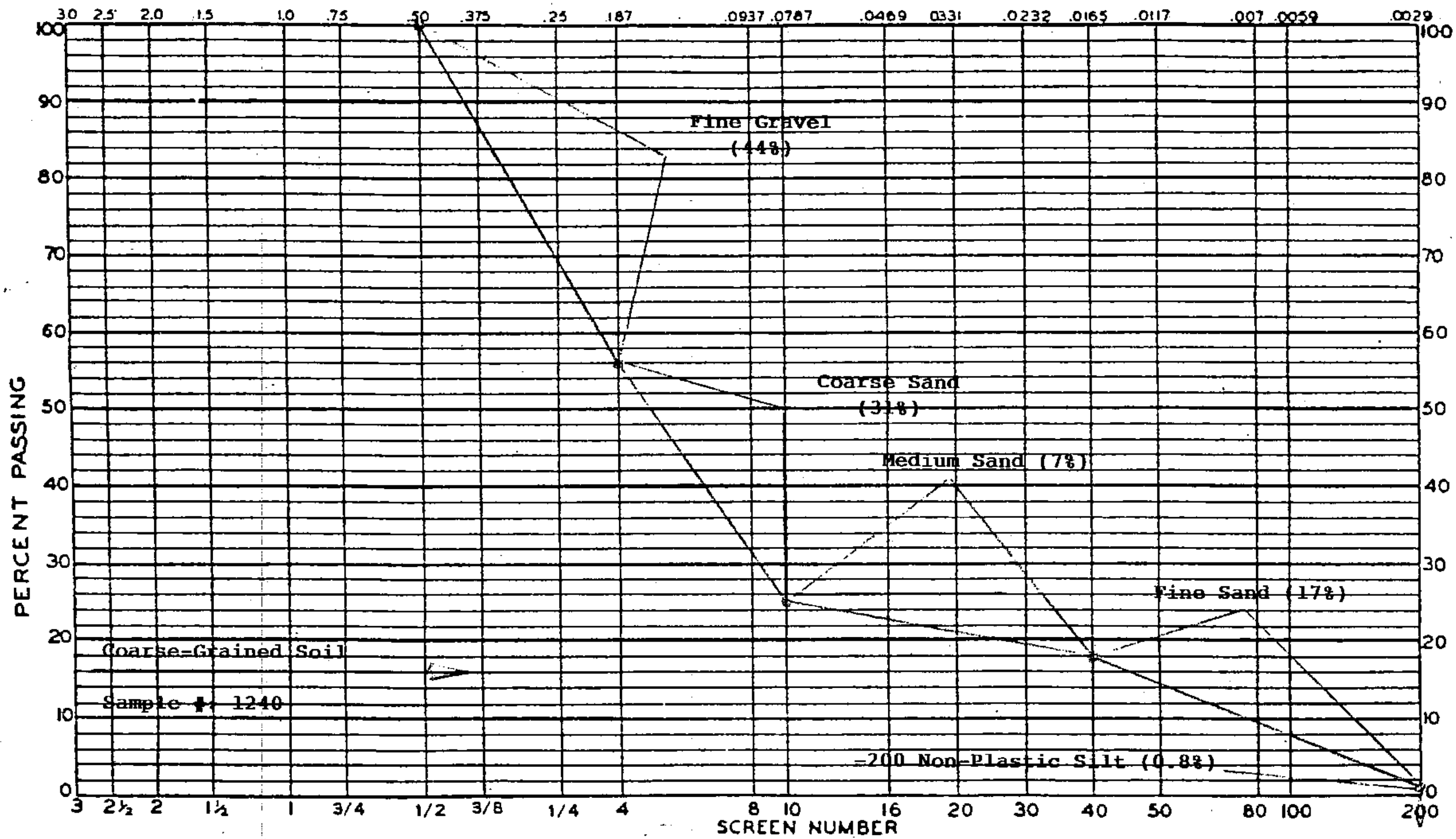
CONSTRUCTION TESTING & ENGINEERING, INC.
CERTIFIED TEST REPORT:

David K. Megeath, Manager

CH$_2$M Hill
Attn: Craig Bagley

AGGREGATE GRADING CHART

File #: 219-4
Work Order #: 11293
March 18, 1992, Wednesday



PLOTTED BY	SAMPLE IDENTIFICATION
C.T.E., T. Mark Megeath	Jordan River Bottom - Sample #: 1240

WES FORM 886
AUGUST 55

Note: See related sieve analysis test report.

Appendix B
Neils Curves

STABILITY OF FLOOD CONTROL CHANNELS

Draft document prepared for the Waterways Experiment Station and the Committee on Channel Stabilization of the U.S. Army Corps of Engineers.

Prepared by Northwest Hydraulic Consultants Inc., Kent, Washington, in collaboration with an Editorial Board from the Committee on Channel Stabilization.

January 1990

Principal editor: Charles R. Neill (Northwest Hydraulic Consultants)

Associate editor: Thomas E. Munsey (OCE)

Collaborators:

Larry E. Banks (LMK)
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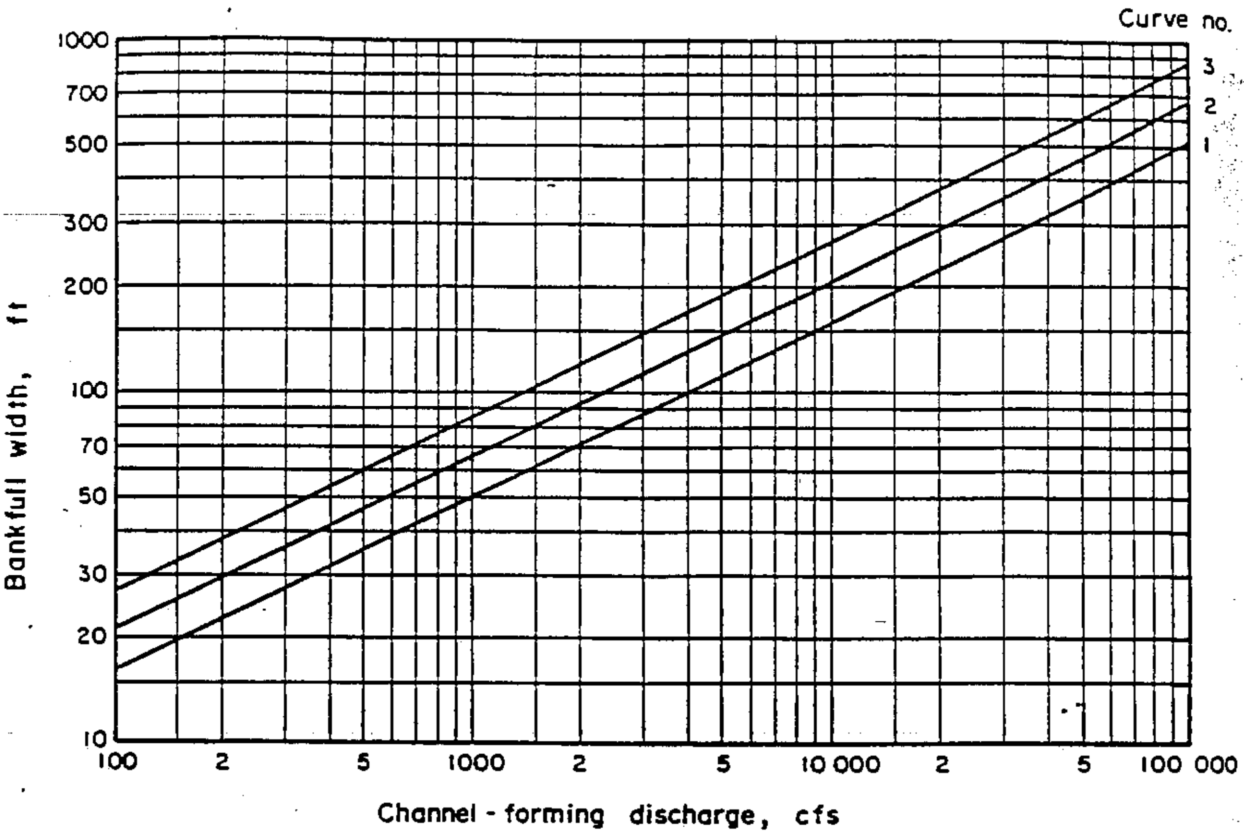
Samuel B. Powell (OCE, chairman CCS)
Richard P. Regan (NPS, retired)
Michael F. Spoor (ORH)



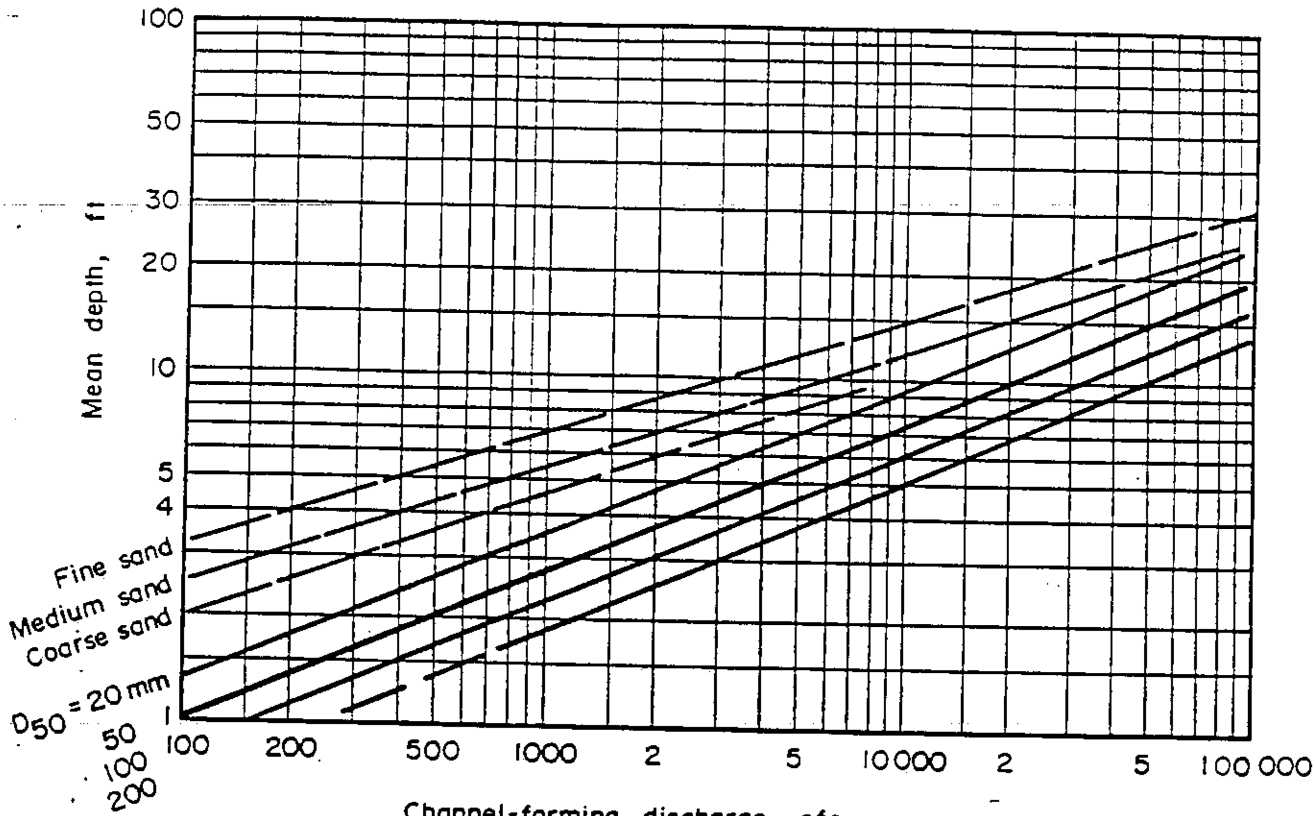
Tentative guidance: Curve 1 : stiff cohesive or very coarse granular banks.
Curve 2: average cohesive or coarse granular banks.
Curve 3: sandy alluvial banks.

See section 5.3.3 of text for limitations.

Formula: $W = CQ^{0.5}$ with C = 1.6, 2.1, 2.7

ENTER WIDTH, COMPARE Q TO Q_2 OR $Q_{BANKFUL}$

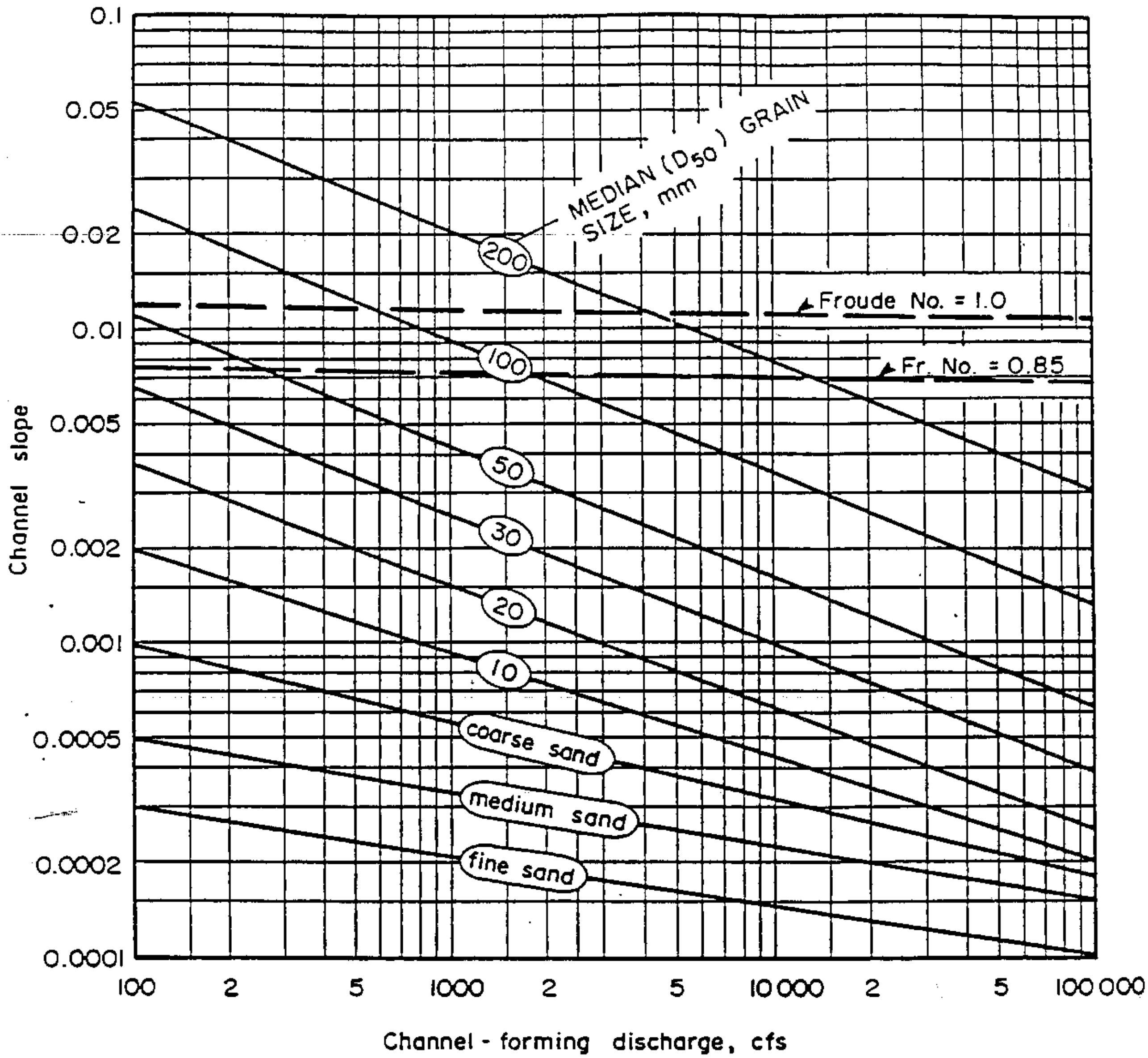
Figure 5.3.5 Hydraulic geometry: bankfull width versus channel-forming discharge.



Note : for very approximate guidance only; depths should be checked by uniform - flow calculation using selected width and slope (Figures 5.3.4 and 5.3.5) and estimated roughness (see Section 4.5.5).

Applies basically to channels with low bed - sediment transport.

Figure 5.3.6 Hydraulic geometry: mean depth versus channel-forming discharge.



Note: for limitations see Section 5.3.3 of text. Curves are basically for single channels with fully alluvial bed but low bed - sediment transport. Slopes may be much higher with high sediment transport, especially with sand beds.

D_{50} REFERS TO BED MATERIAL

Figure 5.3.7 Hydraulic geometry: slope versus channel-forming discharge.

Appendix C
HEC-6 Output

SIMULATED 10-YR
OR
1952-TYPE EVEN

```
*****************************************************    **********************************
*  SCOUR AND DEPOSITION IN RIVERS AND RESERVOIRS  *    *  U.S. ARMY CORPS OF ENGINEERS  *
*       Version: 4.0.6  -  June 1991               *    *  HYDROLOGIC ENGINEERING CENTER *
*  INPUT FILE:  JR52.H6                            *    *  609 SECOND STREET             *
*  OUTPUT FILE: JR52.OUT                           *    *  DAVIS, CALIFORNIA 95616-4687  *
*  RUN DATE:        RUN TIME:          *    *  (916) 756-1104                *
*****************************************************    **********************************


                     X     X  XXXXXXX   XXXXX          XXXXX
                     X     X  X         X     X        X     X
                     X     X  X         X              X
                     XXXXXXX  XXXX      X        XXXXX XXXXXX
                     X     X  X         X              X     X
                     X     X  X         X     X        X     X
                     X     X  XXXXXXX   XXXXX          XXXXX


          ************************************************************************
          *  MAXIMUM LIMITS FOR THIS VERSION ARE:                                *
          *        10  Stream Segments (Main Stem + Tributaries)                 *
          *       300  Cross Sections                                            *
          *       100  Elevation/Station Points per Cross Section                *
          *        15  Grain Sizes                                               *
          *        10  Control Points                                            *
          ************************************************************************


T1      JORDAN RIVER SEDIMENT TRANSPORT STUDY SALT LAKE COUNTY
T2      17TH SOUTH TO D/S OF TURNER DAM
T3      GENENERAL SCOUR WITHOUT BRIDGES   FILE:J2.H6

NC 0.0750  0.0750  0.0470  0.3000  0.5000

SECTION NO.  1 RIVER MILE=   1310.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

SECTION NO.  2 RIVER MILE=   1310.100
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

SECTION NO.  3 RIVER MILE=   1310.400
...Add     0.20 (ft) to each Elevation(Y)
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

SECTION NO.  4 RIVER MILE=   1305.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

SECTION NO.  5 RIVER MILE=   1300.100
...Add    -0.50 (ft) to each Elevation(Y)
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

SECTION NO.  6 RIVER MILE=   1300.400
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0750  0.0750  0.0470  0.0000  0.0000

SECTION NO.  7 RIVER MILE=   1300.000
...Add     0.50 (ft) to each Elevation(Y)
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00
```

```
NC 0.0750  0.0750  0.0260  0.0000  0.0000

SECTION NO.  8 RIVER MILE=   1295.000
...Set the Depth (ft) of the Bed Sediment Reservoir to     8.00

SECTION NO.  9 RIVER MILE=   1290.000
...Set the Depth (ft) of the Bed Sediment Reservoir to     8.00

SECTION NO. 10 RIVER MILE=   1280.000
...Set the Depth (ft) of the Bed Sediment Reservoir to     8.00

NC 0.0750  0.0750  0.0300  0.0000  0.0000

SECTION NO. 11 RIVER MILE=   1270.000
...Set the Depth (ft) of the Bed Sediment Reservoir to     8.00

NC 0.0750  0.0750  0.0280  0.0000  0.0000

SECTION NO. 12 RIVER MILE=   1265.000
...Set the Depth (ft) of the Bed Sediment Reservoir to     8.00

SECTION NO. 13 RIVER MILE=   1260.000
...Set the Depth (ft) of the Bed Sediment Reservoir to     8.00

NC 0.1000  0.1000  0.0320  0.0000  0.0000

SECTION NO. 14 RIVER MILE=   1250.000
...Set the Depth (ft) of the Bed Sediment Reservoir to     8.00

Local Inflow Point  1 occurs just downstream from X-Section No.   15

NC 0.1000  0.1000  0.0400  0.0000  0.0000

SECTION NO. 15 RIVER MILE=   1240.000
...Set the Depth (ft) of the Bed Sediment Reservoir to     8.00

NC 0.1000  0.1000  0.0320  0.0000  0.0000

SECTION NO. 16 RIVER MILE=   1235.000
...Set the Depth (ft) of the Bed Sediment Reservoir to     8.00

SECTION NO. 17 RIVER MILE=   1230.000
...Set the Depth (ft) of the Bed Sediment Reservoir to     8.00

SECTION NO. 18 RIVER MILE=   1220.000
...Set the Depth (ft) of the Bed Sediment Reservoir to     8.00

NC 0.0750  0.0750  0.0280  0.0000  0.0000

SECTION NO. 19 RIVER MILE=   1210.000
...Add    -0.50 (ft) to each Elevation(Y)
...Set the Depth (ft) of the Bed Sediment Reservoir to     8.00

SECTION NO. 20 RIVER MILE=   1207.100
...Add     5.60 (ft) to each Elevation(Y)
...Set the Depth (ft) of the Bed Sediment Reservoir to     8.00

NC 0.1000  0.1000  0.0320  0.0000  0.0000

SECTION NO. 21 RIVER MILE=   1205.000
```

...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO. 22 RIVER MILE= 1200.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.1000 0.1000 0.0410 0.0000 0.0000

SECTION NO. 23 RIVER MILE= 1190.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.1000 0.1000 0.0350 0.0000 0.0000

SECTION NO. 24 RIVER MILE= 1185.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO. 25 RIVER MILE= 1180.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.1000 0.1000 0.0360 0.0000 0.0000

SECTION NO. 26 RIVER MILE= 1170.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0750 0.0750 0.0450 0.0000 0.0000

SECTION NO. 27 RIVER MILE= 1165.000
...Multiply all Stations(X) by 0.97
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO. 28 RIVER MILE= 1160.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0750 0.0750 0.0500 0.0000 0.0000

SECTION NO. 29 RIVER MILE= 1150.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.1250 D.1250 0.0400 0.0000 0.0000

SECTION NO. 30 RIVER MILE= 1145.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO. 31 RIVER MILE= 1140.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.1000 0.1000 0.0390 0.0000 0.0000

SECTION NO. 32 RIVER MILE= 1130.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.1000 0.1000 0.0410 0.0000 0.0000

SECTION NO. 33 RIVER MILE= 1125.000
...Multiply all Stations(X) by 0.91
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO. 34 RIVER MILE= 1120.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

Local Inflow Point 2 occurs just downstream from X-Section No. 35

```
NC 0.1000  0.1000  0.0360  0.0000  0.0000

SECTION NO. 35 RIVER MILE=   1110.000
...Set the Depth (ft) of the Bed Sediment Reservoir to     8.00

NC 0.0750  0.0750  0.0400  0.0000  0.0000

SECTION NO. 36 RIVER MILE=   1107.000
...Set the Depth (ft) of the Bed Sediment Reservoir to     8.00

NC 0.0750  0.0750  0.0420  0.0000  0.0000

SECTION NO. 37 RIVER MILE=   1097.000
...Set the Depth (ft) of the Bed Sediment Reservoir to     8.00

SECTION NO. 38 RIVER MILE=   1095.100
...Set the Depth (ft) of the Bed Sediment Reservoir to     8.00

NC 0.1000  0.1000  0.0460  0.0000  0.0000

SECTION NO. 39 RIVER MILE=   1090.000
...Set the Depth (ft) of the Bed Sediment Reservoir to     8.00

NC 0.1000  0.1000  0.0280  0.0000  0.0000

SECTION NO. 40 RIVER MILE=   1087.000
...Set the Depth (ft) of the Bed Sediment Reservoir to     8.00

SECTION NO. 41 RIVER MILE=   1087.200
...Add     0.20 (ft) to each Elevation(Y)
...Set the Depth (ft) of the Bed Sediment Reservoir to     8.00

NC 0.0000  0.0000  0.0150  0.0000  0.0000

SECTION NO. 42 RIVER MILE=   1085.000
...Hydraulic Control Point #  1
   Water Surface Elevation will be read from R-RECORD..Field  2
   Head Loss Criteria =     0.00
...Set the Depth (ft) of the Bed Sediment Reservoir to     0.00

NC 0.0000  0.0000  0.0300  0.0000  0.0000

SECTION NO. 43 RIVER MILE=   1083.200
...Set the Depth (ft) of the Bed Sediment Reservoir to     5.00

NC 0.0000  0.0000  0.0280  0.0000  0.0000

SECTION NO. 44 RIVER MILE=   1077.000
...Set the Depth (ft) of the Bed Sediment Reservoir to     8.00

SECTION NO. 45 RIVER MILE=   1075.000
...Add    -1.00 (ft) to each Elevation(Y)
...Set the Depth (ft) of the Bed Sediment Reservoir to     8.00

SECTION NO. 46 RIVER MILE=   1070.000
...Add     1.00 (ft) to each Elevation(Y)
...Set the Depth (ft) of the Bed Sediment Reservoir to     8.00

NC 0.1000  0.1000  0.0300  0.0000  0.0000
```

SECTION NO. 47 RIVER MILE= 1060.000
...Add 1.00 (ft) to each Elevation(Y)
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

Local Inflow Point 3 occurs just downstream from X-Section No. 48

NC 0.1000 0.1000 0.0250 0.0000 0.0000

SECTION NO. 48 RIVER MILE= 1055.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 2.00

SECTION NO. 49 RIVER MILE= 1050.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 2.00

NC 0.1000 0.1000 0.0250 0.0000 0.0000

SECTION NO. 50 RIVER MILE= 1040.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.1000 0.1000 0.0250 0.0000 0.0000

SECTION NO. 51 RIVER MILE= 1035.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO. 52 RIVER MILE= 1030.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.1000 0.1000 0.0290 0.0000 0.0000

SECTION NO. 53 RIVER MILE= 1020.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.1000 0.1000 0.0280 0.0000 0.0000

SECTION NO. 54 RIVER MILE= 1010.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0750 0.0750 0.0350 0.0000 0.0000

SECTION NO. 55 RIVER MILE= 1005.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO. 56 RIVER MILE= 1000.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.1000 0.1000 0.0480 0.3000 0.5000

SECTION NO. 57 RIVER MILE= 995.100
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.1000 0.1000 0.0400 0.0000 0.0000

SECTION NO. 58 RIVER MILE= 990.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.1000 0.1000 0.0350 0.0000 0.0000

SECTION NO. 59 RIVER MILE= 985.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

```
SECTION NO. 60 RIVER MILE=    980.000
...Set the Depth (ft) of the Bed Sediment Reservoir to     8.00

NC 0.1000  0.1000  0.0440  0.0000  0.0000

SECTION NO. 61 RIVER MILE=    975.000
...Set the Depth (ft) of the Bed Sediment Reservoir to     8.00

SECTION NO. 62 RIVER MILE=    970.000
...Set the Depth (ft) of the Bed Sediment Reservoir to     8.00

NC 0.1000  0.1000  0.0400  0.0000  0.0000

SECTION NO. 63 RIVER MILE=    965.000
...Set the Depth (ft) of the Bed Sediment Reservoir to     8.00

SECTION NO. 64 RIVER MILE=    960.000
...Set the Depth (ft) of the Bed Sediment Reservoir to     8.00

NC 0.0000  0.0000  0.0350  0.0000  0.0000

SECTION NO. 65 RIVER MILE=    957.100
...Add     1.00 (ft) to each Elevation(Y)
...Set the Depth (ft) of the Bed Sediment Reservoir to     4.00

NC 0.1000  0.1000  0.0380  0.0000  0.0000

SECTION NO. 66 RIVER MILE=    955.000
...Multiply all Stations(X) by     0.88
...Set the Depth (ft) of the Bed Sediment Reservoir to     8.00

NC 0.0000  0.0000  0.0330  0.0000  0.0000

SECTION NO. 67 RIVER MILE=    950.000
...Set the Depth (ft) of the Bed Sediment Reservoir to     8.00

NC 0.1000  0.1000  0.0290  0.0000  0.0000

SECTION NO. 68 RIVER MILE=    940.000
...Set the Depth (ft) of the Bed Sediment Reservoir to     8.00

NC 0.1000  0.1000  0.0400  0.0000  0.0000

SECTION NO. 69 RIVER MILE=    940.100
...Add    -0.30 (ft) to each Elevation(Y)
...Set the Depth (ft) of the Bed Sediment Reservoir to     8.00

SECTION NO. 70 RIVER MILE=    935.000
...Set the Depth (ft) of the Bed Sediment Reservoir to     8.00

SECTION NO. 71 RIVER MILE=    930.000
...Set the Depth (ft) of the Bed Sediment Reservoir to     8.00

NC 0.1000  0.1000  0.0320  0.0000  0.0000

SECTION NO. 72 RIVER MILE=    925.000
...Set the Depth (ft) of the Bed Sediment Reservoir to     8.00

SECTION NO. 73 RIVER MILE=    923.000
```

...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.1000 0.1000 0.0380 0.0000 0.0000

SECTION NO. 74 RIVER MILE= 913.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO. 75 RIVER MILE= 912.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO. 76 RIVER MILE= 905.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0500 0.0500 0.0200 0.0000 0.0000

SECTION NO. 77 RIVER MILE= 904.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 0.00

SECTION NO. 78 RIVER MILE= 903.100
...Set the Depth (ft) of the Bed Sediment Reservoir to 2.00

NC 0.1000 0.1000 0.0300 0.0000 0.0000

SECTION NO. 79 RIVER MILE= 900.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.1000 0.1000 0.0400 0.0000 0.0000

SECTION NO. 80 RIVER MILE= 890.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.1000 0.1000 0.0500 0.0000 0.0000

SECTION NO. 81 RIVER MILE= 880.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.1000 0.1000 0.0480 0.0000 0.0000

SECTION NO. 82 RIVER MILE= 870.000
...Add -1.00 (ft) to each Elevation(Y)
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.1000 0.1000 0.0310 0.0000 0.0000

SECTION NO. 83 RIVER MILE= 860.000
...Add -2.00 (ft) to each Elevation(Y)
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.1000 0.1000 0.0450 0.0000 0.0000

SECTION NO. 84 RIVER MILE= 850.000
...Add 1.00 (ft) to each Elevation(Y)
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO. 85 RIVER MILE= 845.100
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.1000 0.1000 0.0450 0.0000 0.0000

SECTION NO. 86 RIVER MILE= 840.000

```
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.1000  0.1000  0.0380  0.0000  0.0000

SECTION NO. 87 RIVER MILE=    835.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.1000  0.1000  0.0500  0.0000  0.0000

SECTION NO. 88 RIVER MILE=    820.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

SECTION NO. 89 RIVER MILE=    815.000
...Add    -1.70 (ft) to each Elevation(Y)
...Set the Depth (ft) of the Bed Sediment Reservoir to      4.00

NC 0.0000  0.0000  0.0450  0.0000  0.0000

SECTION NO. 90 RIVER MILE=    810.000
...Add     2.00 (ft) to each Elevation(Y)
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0000  0.0000  0.0400  0.0000  0.0000

SECTION NO. 91 RIVER MILE=    805.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

SECTION NO. 92 RIVER MILE=    800.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0000  0.0000  0.0370  0.0000  0.0000

SECTION NO. 93 RIVER MILE=    790.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0000  0.0000  0.0560  0.0000  0.0000

SECTION NO. 94 RIVER MILE=    780.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0000  0.0000  0.0420  0.0000  0.0000

SECTION NO. 95 RIVER MILE=    770.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0000  0.0000  0.0300  0.0000  0.0000

SECTION NO. 96 RIVER MILE=    760.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

SECTION NO. 97 RIVER MILE=    750.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0000  0.0000  0.0360  0.0000  0.0000

SECTION NO. 98 RIVER MILE=    745.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

SECTION NO. 99 RIVER MILE=    740.000
...Add    -1.50 (ft) to each Elevation(Y)
```

...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0340 0.0000 0.0000

SECTION NO.100 RIVER MILE= 735.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO.101 RIVER MILE= 730.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0300 0.0000 0.0000

SECTION NO.102 RIVER MILE= 725.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0280 0.0000 0.0000

SECTION NO.103 RIVER MILE= 720.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO.104 RIVER MILE= 715.000
...Add -0.30 (ft) to each Elevation(Y)
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO.105 RIVER MILE= 710.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0420 0.3000 0.5000

SECTION NO.106 RIVER MILE= 705.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0330 0.0000 0.0000

SECTION NO.107 RIVER MILE= 700.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0350 0.0000 0.0000

SECTION NO.108 RIVER MILE= 695.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO.109 RIVER MILE= 690.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0320 0.0000 0.0000

SECTION NO.110 RIVER MILE= 685.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.1000 0.1000 0.0280 0.1000 0.3000

Local Inflow Point 4 occurs just downstream from X-Section No. 111

SECTION NO.111 RIVER MILE= 676.000
...Hydraulic Control Point # 2
Water Surface Elevation will be read from R-RECORD..Field 3
Head Loss Criteria = 0.00
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO.112 RIVER MILE= 673.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO.113 RIVER MILE= 670.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0350 0.0000 0.0000

SECTION NO.114 RIVER MILE= 660.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0300 0.0000 0.0000

SECTION NO.115 RIVER MILE= 655.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO.116 RIVER MILE= 650.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0240 0.0000 0.0000

SECTION NO.117 RIVER MILE= 640.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0250 0.0000 0.0000

SECTION NO.118 RIVER MILE= 630.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0350 0.0000 0.0000

SECTION NO.119 RIVER MILE= 625.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO.120 RIVER MILE= 621.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.D000 0.0000 0.0380 0.0000 0.0000

SECTION NO.121 RIVER MILE= 615.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0400 0.0D00 0.0000

SECTION NO.122 RIVER MILE= 610.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.2000 0.0450 0.3000 0.5000

SECTION NO.123 RIVER MILE= 600.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.1250 0.0350 0.0000 0.0000

SECTION NO.124 RIVER MILE= 595.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0300 0.0000 0.0000

SECTION NO.125 RIVER MILE= 590.000

...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0380 0.0000 0.0000

SECTION NO.126 RIVER MILE= 575.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0400 0.0000 0.0000

SECTION NO.127 RIVER MILE= 565.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO.128 RIVER MILE= 561.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0440 0.0000 0.0000

SECTION NO.129 RIVER MILE= 555.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO.130 RIVER MILE= 550.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO.131 RIVER MILE= 540.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0300 0.0000 0.0000

SECTION NO.132 RIVER MILE= 535.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0340 0.0000 0.0000

SECTION NO.133 RIVER MILE= 515.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO.134 RIVER MILE= 510.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0300 0.0000 0.0000

SECTION NO.135 RIVER MILE= 505.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO.136 RIVER MILE= 497.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0240 0.0000 0.0000

SECTION NO.137 RIVER MILE= 495.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0240 0.0000 0.0000

SECTION NO.138 RIVER MILE= 485.000
...Add -3.00 (ft) to each Elevation(Y)
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0280 0.8000 1.0000

SECTION NO.139 RIVER MILE= 480.100
...Ineffective Flow Area Requested by X3-RECORD. Left Overbank Right Overbank

	Left Overbank	Right Overbank
Station #	5	14
Ineffective Elevation	4335.10	4334.90

...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0400 0.5000 0.8000

SECTION NO.140 RIVER MILE= 480.000
...Add 0.80 (ft) to each Elevation(Y)
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0380 0.0000 0.0000

SECTION NO.141 RIVER MILE= 475.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0350 0.0000 0.0000

SECTION NO.142 RIVER MILE= 470.000
...Add -1.00 (ft) to each Elevation(Y)
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0320 0.2000 0.4000

SECTION NO.143 RIVER MILE= 455.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO.144 RIVER MILE= 453.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO.145 RIVER MILE= 445.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO.146 RIVER MILE= 437.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO.147 RIVER MILE= 435.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO.148 RIVER MILE= 425.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0280 0.0000 0.0000

SECTION NO.149 RIVER MILE= 420.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO.150 RIVER MILE= 415.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0250 0.0000 0.0000

SECTION NO.151 RIVER MILE= 410.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0350 0.0000 0.0000

SECTION NO.152 RIVER MILE= 400.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0300 0.0000 0.0000

SECTION NO.153 RIVER MILE= 390.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0300 0.0000 0.0000

SECTION NO.154 RIVER MILE= 380.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0270 0.0000 0.0000

SECTION NO.155 RIVER MILE= 370.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0300 0.0000 0.0000

SECTION NO.156 RIVER MILE= 365.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO.157 RIVER MILE= 360.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0240 0.0000 0.0000

SECTION NO.158 RIVER MILE= 355.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0280 0.0000 0.0000

SECTION NO.159 RIVER MILE= 345.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO.160 RIVER MILE= 335.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO.161 RIVER MILE= 333.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0250 0.0000 0.0000

SECTION NO.162 RIVER MILE= 325.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO.163 RIVER MILE= 320.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.2000 0.2000 0.0480 0.0000 0.0000

SECTION NO.164 RIVER MILE= 315.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO.165 RIVER MILE= 310.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0410 0.3000 0.5000

SECTION NO.166 RIVER MILE= 305.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 6.00

SECTION NO.167 RIVER MILE= 300.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0480 0.0000 0.0000

SECTION NO.168 RIVER MILE= 295.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO.169 RIVER MILE= 290.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0500 0.0000 0.0000

SECTION NO.170 RIVER MILE= 280.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0350 0.0000 0.0000

SECTION NO.171 RIVER MILE= 270.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO.172 RIVER MILE= 260.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0400 0.0000 0.0000

SECTION NO.173 RIVER MILE= 255.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO.174 RIVER MILE= 250.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0550 0.0000 0.0000

SECTION NO.175 RIVER MILE= 240.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0360 0.0000 0.0000

SECTION NO.176 RIVER MILE= 235.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO.177 RIVER MILE= 230.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0450 0.0000 0.0000

SECTION NO.178 RIVER MILE= 225.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0300 0.0000 0.0000

SECTION NO.179 RIVER MILE= 220.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0280 0.0000 0.0000

SECTION NO.180 RIVER MILE= 210.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

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NC 0.0000  0.0000  0.0500  0.0000  0.0000

SECTION NO.181 RIVER MILE=    205.000
...Set the Depth (ft) of the Bed Sediment Reservoir to       8.00

SECTION NO.182 RIVER MILE=    200.000
...Set the Depth (ft) of the Bed Sediment Reservoir to       8.00

SECTION NO.183 RIVER MILE=    190.000
...Set the Depth (ft) of the Bed Sediment Reservoir to       8.00

SECTION NO.184 RIVER MILE=    110.000
...Set the Depth (ft) of the Bed Sediment Reservoir to       5.00

SECTION NO.185 RIVER MILE=     90.000
...Set the Depth (ft) of the Bed Sediment Reservoir to       5.00

NC 0.0000  0.0000  0.0400  0.0000  0.0000

SECTION NO.186 RIVER MILE=     85.000
...Add    -1.00 (ft) to each Elevation(Y)
...Set the Depth (ft) of the Bed Sediment Reservoir to       8.00

NC 0.0160  0.0160  0.0160  0.3000  0.5000

SECTION NO.187 RIVER MILE=     80.100
...Ineffective Flow Area Requested by X3-RECORD. Left Overbank  Right Overbank
                                         Station #              2            11
                             Ineffective Elevation        4440.00       4440.00
...Set the Depth (ft) of the Bed Sediment Reservoir to       3.00

SECTION NO.188 RIVER MILE=     80.400
...Add     0.20 (ft) to each Elevation(Y)
...Hydraulic Control Point #  3
   Water Surface Elevation will be read from R-RECORD..Field  4
   Head Loss Criteria =     0.00
...Set the Depth (ft) of the Bed Sediment Reservoir to       0.00

NC 0.0000  0.0000  0.0350  0.1000  0.3000

SECTION NO.189 RIVER MILE=     75.000
...Add    -2.00 (ft) to each Elevation(Y)
...Set the Depth (ft) of the Bed Sediment Reservoir to       6.00

SECTION NO.190 RIVER MILE=     70.000
...Set the Depth (ft) of the Bed Sediment Reservoir to       6.00

NC 0.0000  0.0000  0.0350  0.0000  0.0000

SECTION NO.191 RIVER MILE=     60.000
...Set the Depth (ft) of the Bed Sediment Reservoir to       6.00

NC 0.0000  0.0000  0.0550  0.0000  0.0000

SECTION NO.192 RIVER MILE=     55.000
...Set the Depth (ft) of the Bed Sediment Reservoir to       6.00

NC 0.0000  0.0000  0.0720  0.000D  0.0000
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SECTION NO.193 RIVER MILE=     50.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      6.00

NC 0.0000  0.0000  0.0290  0.0000  0.0000

SECTION NO.194 RIVER MILE=     45.000
...Multiply all Stations(X) by      0.71
...Set the Depth (ft) of the Bed Sediment Reservoir to      6.00

SECTION NO.195 RIVER MILE=     40.000
...Add    -0.50 (ft) to each Elevation(Y)
...Set the Depth (ft) of the Bed Sediment Reservoir to      6.00

SECTION NO.196 RIVER MILE=     35.000
...Add     0.50 (ft) to each Elevation(Y)
...Set the Depth (ft) of the Bed Sediment Reservoir to      6.00

NC 0.0000  0.0000  0.0700  0.0000  0.0000

SECTION NO.197 RIVER MILE=     30.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      6.00

NC 0.0000  0.0000  0.0700  0.0000  0.0000

SECTION NO.198 RIVER MILE=     25.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      6.00

SECTION NO.199 RIVER MILE=     15.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NO. OF CROSS SECTIONS IN STREAM SEGMENT=199
NO. OF INPUT DATA MESSAGES =    0

TOTAL NO. OF CROSS SECTIONS IN THE NETWORK = 199
TOTAL NO. OF STREAM SEGMENTS IN THE NETWORK=    1
END OF GEOMETRIC DATA

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T4     JORDAN RIVER SEDIMENT TRANSPORT ANALYSIS
T5     GEOMETERIC DATA FROM JORDAN RIVER FIS
T6     BED GRADATIONS DERIVED FROM FIELD SAMPLES
T7     SEDIMENT TRANSPORT BY M-P-M
T8
JORDAN RIVER SEDIMENT TRANSPORT STUDY SALT LAKE COUNTY
17TH SOUTH TO D/S OF TURNER DAM
GENENERAL SCOUR WITHOUT BRIDGES   FILE:J2.H6

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

SEDIMENT PROPERITES AND PARAMETERS

       SPI     IBG     MNQ      SPGF     ACGR      NFALL    IBSHER
I1     5.       0       1      1.000    32.174       2          1

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

SAND AND/OR GRAVEL ARE PRESENT

       MTC     IASA     LASA     SPGS      GSF      BSAE      PSI      UWDLB
```

14 10 1 10 2.650 0.667 0.500 30.000 93.000

USING TRANSPORT CAPACITY RELATIONSHIP # 10, MPM(1948)

FOLLOWING GRAIN SIZES UTILIZED (MM)

SAND:	0.0880	0.1770	0.3540	0.7070	1.4140
	2.8280	5.6570	11.3140	22.6270	45.2550

- -

SEDIMENT LOAD TABLE FOR STREAM SEGMENT # 1

LOAD BY GRAIN SIZE CLASS (tons/day)

L		1.00000	2000.00	4200.00
L	VFS	0.100000E-01	10.0000	90.0000
L	FS	0.350000E-01	15.0000	60.0000
L	MS	0.550000E-01	12.5000	45.0000
L	CS	0.100000E-19	7.50000	30.0000
L	VCS	0.100000E-19	2.50000	30.0000
L	VFG	0.100000E-19	1.50000	15.0000
L	FG	0.100000E-19	1.00000	15.0000
L	MG	0.100000E-19	0.100000E-19	9.00000
L	CG	0.100000E-19	0.100000E-19	6.00000
L	VCG	0.100000E-19	0.100000E-19	0.100000E-19
	TOTAL	0.100000	50.0000	300.000

REACH GEOMETRY FOR STREAM SEGMENT 1

CROSS SECTION ID. NO.	REACH LENGTH (ft)	MOVABLE BED WIDTH	INITIAL BED-ELEVATIONS LEFT SIDE (ft)	THALWEG (ft)	RIGHT SIDE (ft)	ACCUMULATED CHANNEL DISTANCE FROM DOWNSTREAM (ft)	(miles)
	150.00						
1310.000		85.00	4218.10	4218.10	4219.60	0.00	0.00
	165.00						
1310.100		85.00	4218.10	4218.10	4219.60	165.00	0.03
	93.00						
1310.400		85.00	4218.30	4218.30	4219.80	258.00	0.05
	267.00						
1305.000		129.75	4223.30	4220.40	4222.30	525.00	0.10
	360.00						
1300.100		125.00	4223.80	4219.80	4221.80	885.00	0.17
	106.00						
1300.400		125.00	4224.30	4220.30	4222.30	991.00	0.19
	200.00						
1300.000		125.00	4224.80	4220.80	4222.80	1191.00	0.23
	640.00						
1295.000		123.10	4224.60	4220.90	4223.60	1831.00	0.35
	390.00						
1290.000		122.50	4224.30	4218.30	4225.30	2221.00	0.42
	1415.00						
1280.000		131.50	4224.60	4219.60	4224.60	3636.00	0.69
	670.00						
1270.000		109.00	4221.30	4218.30	4221.80	4306.00	0.82
	1010.00						
1265.000		131.50	4225.80	4223.00	4225.70	5316.00	1.01
	190.00						
1260.000		128.00	4223.50	4221.00	4225.00	5506.00	1.04

1250.000	1150.00	124.00	4229.20	4221.20	4224.20	6656.00	1.26
1240.000	2450.00	78.50	4223.00	4217.00	4223.00	9106.00	1.72
1235.000	760.00	62.50	4220.30	4218.50	4226.50	9866.00	1.87
1230.000	700.00	62.00	4223.60	4221.60	4225.60	10566.00	2.00
1220.000	1590.00	84.00	4226.20	4223.70	4224.70	12156.00	2.30
1210.000	860.00	103.00	4228.50	4224.50	4226.00	13016.00	2.47
1207.100	150.00	152.00	4231.90	4224.40	4232.40	13166.00	2.49
1205.000	320.00	83.60	4226.80	4223.80	4224.20	13486.00	2.55
1200.000	445.00	72.50	4226.50	4221.50	4222.50	13931.00	2.64
1190.000	1270.00	102.00	4229.30	4223.80	4229.30	15201.00	2.88
1185.000	240.00	85.20	4227.80	4223.10	4227.70	15441.00	2.92
1180.000	850.00	69.50	4229.60	4221.60	4228.10	16291.00	3.09
1170.000	1640.00	100.50	4230.90	4225.40	4230.40	17931.00	3.40
1165.000	1290.00	119.07	4231.50	4224.80	4230.80	19221.00	3.64
1160.000	440.00	133.50	4232.00	4229.00	4234.20	19661.00	3.72
1150.000	166.00	82.00	4228.90	4221.90	4231.90	19827.00	3.76
1145.000	170.00	27.00	4229.90	4229.90	4231.50	19997.00	3.79
1140.000	1060.00	79.50	4233.40	4222.90	4234.20	21057.00	3.99
1130.000	1100.00	95.00	4233.70	4227.70	4233.20	22157.00	4.20
1125.000	1080.00	72.07	4233.50	4226.80	4234.70	23237.00	4.40
1120.000	315.00	72.00	4231.90	4230.90	4233.40	23552.00	4.46
1110.000	1195.00	144.50	4236.80	4234.80	4238.80	24747.00	4.69
1107.000	530.00	92.00	4235.90	4231.40	4235.90	25277.00	4.79
1097.000	990.00	103.05	4237.90	4233.50	4236.00	26267.00	4.97
1095.100	250.00	105.15	4244.90	4234.40	4250.00	26517.00	5.02
1090.000	295.00	63.00	4235.00	4235.00	4237.00	26812.00	5.08
1087.000	600.00	93.60	4237.50	4234.00	4237.50	27412.00	5.19
1087.200	84.00	93.60	4237.70	4234.20	4237.70	27496.00	5.21
1085.000	5.00	106.50	4242.00	4242.00	4242.00	27501.00	5.21
1083.200	50.00	94.40	4243.10	4237.60	4243.00	27551.00	5.22

1077.000	510.00	85.50	4240.80	4239.20	4243.00	28061.00	5.31
1075.000	560.00	58.35	4239.80	4239.00	4243.60	28621.00	5.42
1070.000	560.00	60.00	4234.30	4234.30	4242.50	29181.00	5.53
1060.000	447.00	48.00	4240.10	4236.10	4239.60	29628.00	5.61
1055.000	710.00	96.00	4243.70	4242.10	4243.80	30338.00	5.75
1050.000	350.00	59.00	4243.70	4238.70	4243.20	30688.00	5.81
1040.000	1340.00	101.50	4246.10	4244.60	4246.10	32028.00	6.07
1035.000	335.00	63.90	4246.10	4243.40	4246.00	32363.00	6.13
1030.000	600.00	75.00	4245.00	4243.00	4246.00	32963.00	6.24
1020.000	1040.00	93.00	4248.00	4245.00	4248.00	34003.00	6.44
1010.000	1330.00	88.00	4249.20	4245.70	4248.20	35333.00	6.69
1005.000	490.00	91.00	4250.10	4247.90	4250.00	35823.00	6.78
1000.000	780.00	99.50	4250.20	4249.20	4251.20	36603.00	6.93
995.100	100.00	90.00	4258.50	4244.90	4257.50	36703.00	6.95
990.000	184.00	57.00	4250.40	4245.90	4249.90	36887.00	6.99
985.000	590.00	118.60	4253.20	4249.10	4252.30	37477.00	7.10
980.000	510.00	93.50	4249.00	4248.30	4252.30	37987.00	7.19
975.000	650.00	113.70	4254.10	4252.10	4253.70	38637.00	7.32
970.000	450.00	60.50	4254.00	4251.50	4254.50	39087.00	7.40
965.000	520.00	76.30	4255.10	4252.80	4255.10	39607.00	7.50
960.000	370.00	96.00	4256.30	4251.80	4256.30	39977.00	7.57
957.100	120.00	63.75	4248.00	4248.00	4248.00	40097.00	7.59
955.000	510.00	85.31	4257.30	4254.20	4257.50	40607.00	7.69
950.000	770.00	89.50	4258.80	4256.30	4260.80	41377.00	7.84
940.000	910.00	96.50	4261.10	4259.10	4260.60	42287.00	8.01
940.100	290.00	96.50	4260.80	4258.80	4260.30	42577.00	8.06
935.000	325.00	68.60	4259.30	4257.60	4259.30	42902.00	8.13
930.000	150.00	76.00	4261.50	4258.50	4262.00	43052.00	8.15
925.000	500.00	110.55	4270.70	4259.10	4260.80	43552.00	8.25
923.000	480.00	102.00	4263.30	4259.70	4266.20	44032.00	8.34

	590.00						
913.000		95.30	4267.60	4260.40	4263.00	44622.00	8.45
	800.00						
912.000		89.80	4263.80	4261.60	4264.20	45422.00	8.60
	350.00						
905.000		79.95	4266.30	4257.60	4265.10	45772.00	8.67
	80.00						
904.000		70.20	4260.00	4260.00	4260.00	45852.00	8.68
	30.00						
903.100		91.15	4268.20	4268.20	4268.20	45882.00	8.69
	180.00						
900.000		63.00	4267.20	4264.50	4267.50	46062.00	8.72
	730.00						
890.000		49.00	4267.90	4264.40	4269.10	46792.00	8.86
	1300.00						
880.000		66.50	4269.50	4266.50	4269.00	48092.00	9.11
	1220.00						
870.000		58.00	4269.10	4267.10	4271.70	49312.00	9.34
	1410.00						
860.000		73.50	4273.70	4269.70	4273.20	50722.00	9.61
	900.00						
850.000		60.00	4278.10	4270.10	4279.80	51622.00	9.78
	150.00						
845.100		51.50	4272.50	4270.50	4272.50	51772.00	9.81
	91.00						
840.000		51.00	4277.90	4269.90	4275.40	51863.00	9.82
	715.00						
835.000		78.50	4275.70	4273.00	4275.90	52578.00	9.96
	1250.00						
820.000		61.00	4279.90	4274.40	4278.70	53828.00	10.19
	70.00						
815.000		64.95	4278.80	4275.80	4279.80	53898.00	10.21
	140.00						
810.000		61.00	4284.80	4277.60	4282.10	54038.00	10.23
	460.00						
805.000		120.00	4281.60	4278.10	4279.50	54498.00	10.32
	500.00						
800.000		55.95	4281.20	4275.20	4283.20	54998.00	10.42
	1150.00						
790.000		54.50	4281.50	4276.50	4280.50	56148.00	10.63
	1000.00						
780.000		53.00	4283.30	4277.80	4279.80	57148.00	10.82
	1190.00						
770.000		84.50	4284.10	4282.10	4288.60	58338.00	11.05
	1050.00						
760.000		62.50	4286.10	4282.60	4286.30	59388.00	11.25
	1020.00						
750.000		515.50	4296.80	4285.20	4289.00	60408.00	11.44
	420.00						
745.000		95.50	4287.70	4286.50	4288.70	60828.00	11.52
	200.00						
740.000		84.50	4288.50	4286.00	4290.50	61028.00	11.56
	370.00						
735.000		77.30	4288.60	4286.20	4288.70	61398.00	11.63
	880.00						
730.000		87.50	4293.30	4286.30	4292.30	62278.00	11.80
	610.00						
725.000		81.00	4290.30	4287.80	4291.70	62888.00	11.91
	540.00						
720.000		125.00	4293.40	4288.40	4294.90	63428.00	12.01

715.000	170.00	66.45	4292.60	4285.50	4292.30	63598.00	12.05
710.000	245.00	61.00	4293.30	4287.80	4291.30	63843.00	12.09
705.000	390.00	85.20	4291.90	4288.30	4290.90	64233.00	12.17
700.000	610.00	50.00	4295.20	4287.20	4292.20	64843.00	12.28
695.000	750.00	80.50	4293.90	4290.80	4293.20	65593.00	12.42
690.000	340.00	81.50	4293.30	4291.30	4294.30	65933.00	12.49
685.000	920.00	66.80	4294.10	4292.10	4293.90	66853.00	12.66
676.000	450.00	68.50	4295.20	4293.60	4296.10	67303.00	12.75
673.000	660.00	69.95	4296.70	4293.30	4302.10	67963.00	12.87
670.000	710.00	69.00	4297.00	4292.00	4296.00	68673.00	13.01
660.000	1200.00	64.50	4298.00	4295.00	4298.00	69873.00	13.23
655.000	300.00	75.50	4299.00	4298.50	4298.50	70173.00	13.29
650.000	890.00	63.50	4302.70	4298.90	4301.30	71063.00	13.46
640.000	1250.00	86.50	4304.30	4302.80	4306.30	72313.00	13.70
630.000	1310.00	95.50	4310.20	4306.20	4306.20	73623.00	13.94
625.000	530.00	79.50	4304.00	4301.40	4304.10	74153.00	14.04
621.000	780.00	89.50	4305.50	4303.10	4307.00	74933.00	14.19
615.000	360.00	79.00	4305.10	4303.40	4305.00	75293.00	14.26
610.000	790.00	70.45	4308.90	4299.90	4309.70	76083.00	14.41
600.000	480.00	75.00	4305.80	4305.80	4309.30	76563.00	14.50
595.000	290.00	135.00	4307.40	4306.00	4307.60	76853.00	14.56
590.000	910.00	104.00	4310.50	4309.50	4311.60	77763.00	14.73
575.000	1110.00	99.60	4309.90	4308.20	4311.00	78873.00	14.94
565.000	1250.00	116.05	4311.30	4309.80	4311.80	80123.00	15.17
561.000	1130.00	120.50	4311.90	4310.10	4310.10	81253.00	15.39
555.000	470.00	81.00	4314.30	4311.40	4313.10	81723.00	15.48
550.000	390.00	85.95	4316.50	4312.50	4317.10	82113.00	15.55
540.000	1065.00	101.50	4317.80	4314.80	4317.80	83178.00	15.75
535.000	810.00	61.00	4316.50	4313.30	4316.70	83988.00	15.91
515.000	1820.00	181.00	4321.50	4318.10	4320.20	85808.00	16.25

510.000	1140.00	191.00	4320.80	4320.30	4320.30	86948.00	16.47
505.000	290.00	93.95	4321.00	4319.00	4323.70	87238.00	16.52
497.000	750.00	103.00	4323.10	4322.00	4323.00	87988.00	16.66
495.000	1060.00	95.50	4323.80	4320.10	4324.40	89048.00	16.87
485.000	770.00	122.50	4322.50	4321.40	4323.30	89818.00	17.01
480.100	690.00	63.00	4326.10	4322.10	4326.10	90508.00	17.14
480.000	385.00	63.00	4326.90	4322.90	4326.90	90893.00	17.21
475.000	490.00	115.50	4326.60	4324.50	4327.80	91383.00	17.31
470.000	620.00	65.55	4334.30	4325.20	4333.00	92003.00	17.42
455.000	565.00	187.00	4329.80	4328.30	4333.60	92568.00	17.53
453.000	600.00	153.95	4334.00	4329.60	4330.70	93168.00	17.65
445.000	910.00	67.00	4332.70	4329.30	4334.60	94078.00	17.82
437.000	1320.00	121.00	4335.80	4331.90	4338.30	95398.00	18.07
435.000	460.00	116.50	4335.90	4332.60	4335.10	95858.00	18.15
425.000	540.00	82.00	4336.70	4335.60	4337.20	96398.00	18.26
420.000	1000.00	90.50	4338.50	4334.50	4334.50	97398.00	18.45
415.000	520.00	105.50	4339.20	4338.10	4339.60	97918.00	18.55
410.000	630.00	56.00	4339.40	4336.40	4336.90	98548.00	18.66
400.000	1120.00	52.50	4338.10	4336.60	4341.60	99668.00	18.88
390.000	860.00	84.00	4343.90	4343.90	4345.40	100528.00	19.04
380.000	1350.00	155.00	4349.70	4347.70	4348.70	101878.00	19.30
370.000	1550.00	107.50	4347.40	4347.40	4351.90	103428.00	19.59
365.000	1050.00	115.50	4351.90	4350.70	4354.90	104478.00	19.79
360.000	650.00	77.50	4350.40	4349.90	4351.90	105128.00	19.91
355.000	1480.00	179.00	4355.90	4355.90	4357.70	106608.00	20.19
345.000	900.00	74.00	4360.40	4356.40	4358.70	107508.00	20.36
335.000	510.00	253.00	4360.50	4359.20	4360.50	108018.00	20.46
333.000	1040.00	166.55	4365.90	4361.90	4363.10	109058.00	20.65
325.000	1250.00	178.50	4369.30	4366.50	4368.10	110308.00	20.89
320.000	1420.00	152.00	4374.30	4371.80	4373.30	111728.00	21.16

315.000	220.00	54.50	4372.40	4370.30	4372.20	111948.00	21.20
310.000	660.00	87.50	4379.50	4377.00	4379.50	112608.00	21.33
305.000	243.00	77.80	4378.20	4376.00	4380.30	112851.00	21.37
300.000	70.00	89.50	4380.60	4375.60	4384.60	112921.00	21.39
295.000	620.00	73.50	4382.00	4379.80	4381.00	113541.00	21.50
290.000	390.00	80.65	4384.00	4379.50	4382.50	113931.00	21.58
280.000	725.00	66.50	4386.20	4383.70	4384.70	114656.00	21.72
270.000	980.00	60.00	4389.80	4387.30	4390.80	115636.00	21.90
260.000	685.00	79.00	4393.60	4390.60	4392.10	116321.00	22.03
255.000	300.00	181.30	4394.90	4393.20	4393.40	116621.00	22.09
250.000	380.00	73.50	4396.30	4393.30	4396.80	117001.00	22.16
240.000	600.00	89.00	4397.20	4394.70	4398.20	117601.00	22.27
235.000	280.00	63.25	4399.40	4395.30	4399.30	117881.00	22.33
230.000	320.00	71.50	4400.80	4398.30	4398.30	118201.00	22.39
225.000	260.00	99.95	4400.50	4399.70	4402.90	118461.00	22.44
220.000	390.00	67.50	4402.90	4398.90	4402.40	118851.00	22.51
210.000	1180.00	60.50	4401.00	4401.00	4403.50	120031.00	22.73
205.000	590.00	39.30	4404.90	4402.50	4402.70	120621.00	22.84
200.000	780.00	52.45	4407.00	4406.00	4412.50	121401.00	22.99
190.000	1040.00	50.50	4414.90	4413.90	4418.40	122441.00	23.19
110.000	880.00	78.90	4435.30	4418.70	4446.10	123321.00	23.36
90.000	430.00	185.40	4429.20	4424.20	4427.10	123751.00	23.44
85.000	530.00	85.50	4425.00	4425.00	4425.00	124281.00	23.54
80.100	120.00	54.60	4426.00	4426.00	4426.00	124401.00	23.56
80.400	139.00	54.60	4426.20	4426.20	4426.20	124540.00	23.59
75.000	300.00	190.50	4431.50	4427.50	4431.50	124840.00	23.64
70.000	520.00	382.00	4433.90	4427.90	4436.00	125360.00	23.74
60.000	400.00	248.45	4433.70	4431.20	4433.60	125760.00	23.82
55.000	680.00	79.15	4440.20	4430.80	4441.00	126440.00	23.95
50.000	880.00	411.75	4446.60	4436.80	4445.40	127320.00	24.11

	890.00						
45.000		79.31	4449.60	4439.10	4448.50	128210.00	24.28
	660.00						
40.000		274.60	4449.60	4448.10	4452.60	128870.00	24.41
	500.00						
35.000		274.60	4450.10	4448.60	4453.10	129370.00	24.50
	1550.00						
30.000		39.45	4451.20	4451.20	4454.20	130920.00	24.80
	1580.00						
25.000		267.40	4467.40	4466.80	4469.60	132500.00	25.09
	730.00						
15.000		156.05	4471.90	4469.50	4470.50	133230.00	25.23

BED MATERIAL GRADATION (as computed from PF-records)

SECID	SAE (%)	DMAX (ft)	DXPI (ft)	XPI	TOTAL BED	BED MATERIAL FRACTIONS per grain size, fine - coarse.				
N 1310.000	1.000	0.052	0.052	1.000	1.000	0.060	0.060	0.060	0.030	0.030
						0.220	0.310	0.220	0.000	0.000
N 1310.100	1.000	0.053	0.053	1.000	0.990	0.060	0.060	0.060	0.030	0.030
						0.220	0.309	0.220	0.001	0.000
N 1310.400	1.000	0.053	0.053	1.000	0.990	0.060	0.060	0.060	0.030	0.030
						0.219	0.309	0.220	0.001	0.000
N 1305.000	1.000	0.054	0.054	1.000	0.990	0.060	0.061	0.061	0.030	0.030
						0.219	0.308	0.220	0.002	0.000
N 1300.100	1.000	0.055	0.055	1.000	0.990	0.060	0.061	0.061	0.030	0.030
						0.218	0.306	0.220	0.003	0.000
N 1300.400	1.000	0.055	0.055	1.000	0.991	0.061	0.061	0.062	0.031	0.031
						0.218	0.306	0.219	0.003	0.000
N 1300.000	1.000	0.056	0.056	1.000	0.991	0.061	0.061	0.062	0.031	0.031
						0.218	0.305	0.219	0.004	0.000
N 1295.000	1.000	0.057	0.057	1.000	0.991	0.061	0.062	0.063	0.031	0.031
						0.216	0.303	0.219	0.006	0.000
N 1290.000	1.000	0.058	0.058	1.000	0.991	0.061	0.062	0.063	0.031	0.031
						0.215	0.301	0.219	0.007	0.000
N 1280.000	1.000	0.062	0.062	1.000	0.992	0.062	0.064	0.066	0.032	0.032
						0.213	0.295	0.218	0.011	0.000
N 1270.000	1.000	0.064	0.064	1.000	0.992	0.062	0.064	0.067	0.032	0.032
						0.211	0.292	0.218	0.013	0.000
N 1265.000	1.000	0.067	0.067	1.000	0.993	0.063	0.065	0.068	0.033	0.033
						0.209	0.288	0.217	0.016	0.000
N 1260.000	1.000	0.067	0.067	1.000	0.993	0.063	0.066	0.068	0.033	0.033
						0.209	0.288	0.217	0.017	0.000
N 1250.000	1.000	0.070	0.070	1.000	0.993	0.063	0.067	0.070	0.033	0.033
						0.206	0.283	0.217	0.020	0.000
N 1240.000	1.000	0.077	0.077	1.000	0.995	0.065	0.069	0.074	0.035	0.035

						0.201	0.273	0.215	0.028	0.000
N 1235.000	1.000	0.079	0.079	1.000	0.995	0.065	0.070	0.075	0.035	0.035
						0.200	0.270	0.215	0.030	0.000
N 1230.000	1.000	0.081	0.081	1.000	0.995	0.065	0.071	0.076	0.035	0.035
						0.199	0.267	0.215	0.032	0.000
N 1220.000	1.000	0.085	0.085	1.000	0.996	0.066	0.072	0.079	0.036	0.036
						0.195	0.261	0.214	0.037	0.000
N 1210.000	1.000	0.087	0.087	1.000	0.997	0.067	0.073	0.080	0.037	0.037
						0.194	0.257	0.213	0.040	0.000
N 1207.100	1.000	0.088	0.088	1.000	0.997	0.067	0.073	0.080	0.037	0.037
						0.193	0.256	0.213	0.040	0.000
N 1205.000	1.000	0.088	0.088	1.000	0.997	0.067	0.074	0.081	0.037	0.037
						0.193	0.255	0.213	0.041	0.000
N 1200.000	1.000	0.090	0.090	1.000	0.997	0.067	0.074	0.081	0.037	0.037
						0.192	0.253	0.213	0.043	0.000
N 1190.000	1.000	0.093	0.093	1.000	0.998	0.068	0.075	0.083	0.038	0.038
						0.189	0.248	0.212	0.046	0.000
N 1185.000	1.000	0.094	0.094	1.000	0.998	0.068	0.076	0.084	0.038	0.038
						0.189	0.247	0.212	0.047	0.000
N 1180.000	1.000	0.096	0.096	1.000	0.998	0.068	0.077	0.085	0.038	0.038
						0.187	0.244	0.212	0.050	0.000
N 1170.000	1.000	0.100	0.100	1.000	0.999	0.069	0.078	0.087	0.039	0.039
						0.184	0.237	0.211	0.055	0.000
N 1165.000	1.000	0.104	0.104	1.000	1.000	0.070	0.080	0.089	0.040	0.040
						0.181	0.232	0.210	0.059	0.000
N 1160.000	1.000	0.105	0.105	1.000	1.000	0.070	0.080	0.090	0.040	0.040
						0.180	0.230	0.210	0.060	0.000
N 1150.000	1.000	0.110	0.110	1.000	1.000	0.069	0.079	0.088	0.039	0.039
						0.174	0.230	0.214	0.068	0.001
N 1145.000	1.000	0.115	0.115	1.000	0.999	0.068	0.078	0.086	0.037	0.037
						0.167	0.229	0.218	0.076	0.003
N 1140.000	1.000	0.146	0.146	1.000	0.996	0.062	0.072	0.074	0.028	0.028
						0.125	0.226	0.241	0.126	0.012
N 1130.000	1.000	0.178	0.178	1.000	0.993	0.056	0.066	0.062	0.019	0.019
						0.082	0.223	0.266	0.179	0.021
N 1125.000	1.000	0.210	0.210	1.000	1.000	0.050	0.060	0.050	0.010	0.010
						0.040	0.220	0.290	0.230	0.030
N 1120.000	1.000	0.210	0.210	1.000	0.990	0.052	0.064	0.051	0.011	0.011
						0.038	0.208	0.278	0.226	0.052
N 1110.000	1.000	0.210	0.210	1.000	0.990	0.060	0.080	0.055	0.015	0.015

						0.030	0.160	0.230	0.210	0.135
N 1107.000	1.000	0.210	0.210	1.000	0.990	0.063	0.087	0.057	0.017	0.017
						0.027	0.139	0.209	0.203	0.171
N 1097.000	1.000	0.210	0.210	1.000	1.000	0.070	0.100	0.060	0.020	0.020
						0.020	0.100	0.170	0.190	0.240
N 1095.100	1.000	0.210	0.210	1.000	0.990	0.068	0.097	0.060	0.023	0.023
						0.023	0.104	0.173	0.188	0.232
N 1090.000	1.000	0.210	0.210	1.000	0.991	0.066	0.094	0.059	0.027	0.027
						0.027	0.108	0.176	0.185	0.223
N 1087.000	1.000	0.210	0.210	1.000	0.992	0.061	0.088	0.058	0.034	0.034
						0.034	0.117	0.182	0.180	0.204
N 1087.200	1.000	0.210	0.210	1.000	0.992	0.061	0.087	0.058	0.035	0.035
						0.035	0.118	0.183	0.179	0.201
N 1085.000	1.000	0.210	0.210	1.000	0.992	0.061	0.087	0.058	0.035	0.035
						0.035	0.118	0.183	0.179	0.201
N 1083.200	1.000	0.210	0.210	1.000	0.992	0.060	0.087	0.058	0.035	0.035
						0.035	0.119	0.183	0.178	0.200
N 1077.000	1.000	0.210	0.210	1.000	0.993	0.057	0.081	0.057	0.041	0.041
						0.041	0.127	0.189	0.174	0.184
N 1075.000	1.000	0.210	0.210	1.000	0.994	0.052	0.075	0.056	0.048	0.048
						0.048	0.135	0.195	0.169	0.166
N 1070.000	1.000	0.210	0.210	1.000	0.994	0.048	0.070	0.056	0.055	0.055
						0.055	0.144	0.200	0.164	0.149
N 1060.000	1.000	0.210	0.210	1.000	0.995	0.045	0.065	0.055	0.060	0.060
						0.060	0.150	0.205	0.160	0.135
N 1055.000	1.000	0.210	0.210	1.000	0.996	0.040	0.057	0.054	0.069	0.069
						0.069	0.161	0.213	0.154	0.112
N 1050.000	1.000	0.210	0.210	1.000	0.997	0.037	0.054	0.053	0.073	0.073
						0.073	0.166	0.216	0.150	0.101
N 1040.000	1.000	0.210	0.210	1.000	0.999	0.027	0.040	0.051	0.089	0.089
						0.089	0.186	0.230	0.138	0.059
N 1035.000	1.000	0.210	0.210	1.000	0.999	0.024	0.036	0.051	0.093	0.093
						0.093	0.191	0.234	0.135	0.049
N 1030.000	1.000	0.210	0.210	1.000	1.000	0.020	0.030	0.050	0.100	0.100
						0.100	0.200	0.240	0.130	0.030
N 1020.000	1.000	0.210	0.210	1.000	0.998	0.022	0.031	0.050	0.096	0.096
						0.098	0.194	0.232	0.136	0.043
N 1010.000	1.000	0.210	0.210	1.000	0.996	0.024	0.032	0.050	0.091	0.091
						0.096	0.187	0.222	0.143	0.059
N 1005.000	1.000	0.210	0.210	1.000	0.995	0.025	0.033	0.050	0.089	0.089

						0.095	0.184	0.218	0.146	0.065
N 1000.000	1.000	0.210	0.210	1.000	0.993	0.027	0.033	0.050	0.086	0.086
						0.093	0.179	0.212	0.151	0.075
N 995.100	1.000	0.210	0.210	1.000	0.993	0.027	0.034	0.050	0.086	0.086
						0.093	0.179	0.212	0.151	0.076
N 990.000	1.000	0.210	0.210	1.000	0.993	0.027	0.034	0.050	0.085	0.085
						0.093	0.178	0.210	0.152	0.078
N 985.000	1.000	0.210	0.210	1.000	0.991	0.029	0.034	0.050	0.083	0.083
						0.091	0.174	0.206	0.156	0.085
N 980.000	1.000	0.210	0.210	1.000	0.991	0.029	0.035	0.050	0.081	0.081
						0.091	0.172	0.202	0.158	0.092
N 975.000	1.000	0.210	0.210	1.000	0.989	0.031	0.035	0.050	0.079	0.079
						0.089	0.168	0.197	0.162	0.100
N 970.000	1.000	0.210	0.210	1.000	0.988	0.032	0.036	0.050	0.077	0.077
						0.088	0.165	0.194	0.165	0.105
N 965.000	1.000	0.210	0.210	1.000	0.987	0.033	0.036	0.050	0.075	0.075
						0.087	0.162	0.190	0.168	0.112
N 960.000	1.000	0.210	0.210	1.000	0.987	0.033	0.037	0.050	0.074	0.074
						0.087	0.160	0.187	0.170	0.116
N 957.100	1.000	0.210	0.210	1.000	0.987	0.033	0.037	0.050	0.073	0.073
						0.087	0.160	0.186	0.170	0.118
N 955.000	1.000	0.210	0.210	1.000	0.986	0.034	0.037	0.050	0.071	0.071
						0.086	0.157	0.182	0.173	0.124
N 950.000	1.000	0.210	0.210	1.000	0.984	0.036	0.038	0.050	0.068	0.068
						0.084	0.152	0.176	0.178	0.133
N 940.000	1.000	0.210	0.210	1.000	0.982	0.038	0.039	0.050	0.065	0.065
						0.082	0.147	0.170	0.183	0.144
N 940.100	1.000	0.210	0.210	1.000	0.982	0.038	0.039	0.050	0.064	0.064
						0.082	0.146	0.167	0.184	0.148
N 935.000	1.000	0.210	0.210	1.000	0.981	0.039	0.039	0.050	0.062	0.062
						0.081	0.144	0.165	0.186	0.152
N 930.000	1.000	0.210	0.210	1.000	0.981	0.039	0.040	0.050	0.062	0.062
						0.081	0.143	0.164	0.187	0.154
N 925.000	1.000	0.210	0.210	1.000	1.000	0.040	0.040	0.050	0.060	0.060
						0.080	0.140	0.160	0.190	0.160
N 923.000	1.000	0.210	0.210	1.000	0.980	0.040	0.041	0.050	0.060	0.060
						0.080	0.141	0.161	0.189	0.159
N 913.000	1.000	0.210	0.210	1.000	0.981	0.040	0.041	0.050	0.060	0.060
						0.080	0.142	0.162	0.188	0.157
N 912.000	1.000	0.210	0.210	1.000	0.981	0.040	0.042	0.051	0.061	0.061

							0.079	0.143	0.164	0.187	0.155
N	905.000	1.000	0.210	0.210	1.000	0.982	0.040	0.042	0.051	0.061	0.061
							0.079	0.143	0.165	0.186	0.154
N	904.000	1.000	0.210	0.210	1.000	0.982	0.040	0.043	0.051	0.061	0.061
							0.079	0.143	0.165	0.186	0.153
N	903.100	1.000	0.210	0.210	1.000	0.982	0.040	0.043	0.051	0.061	0.061
							0.079	0.143	0.165	0.186	0.153
N	900.000	1.000	0.210	0.210	1.000	0.982	0.040	0.043	0.051	0.061	0.061
							0.079	0.144	0.165	0.185	0.153
N	890.000	1.000	0.210	0.210	1.000	0.982	0.040	0.044	0.051	0.061	0.061
							0.079	0.145	0.167	0.184	0.151
N	880.000	1.000	0.210	0.210	1.000	0.983	0.040	0.045	0.052	0.062	0.062
							0.078	0.147	0.170	0.182	0.147
N	870.000	1.000	0.210	0.210	1.000	0.984	0.040	0.046	0.052	0.062	0.062
							0.078	0.148	0.173	0.180	0.143
N	860.000	1.000	0.210	0.210	1.000	0.985	0.040	0.048	0.053	0.063	0.063
							0.077	0.150	0.176	0.177	0.139
N	850.000	1.000	0.210	0.210	1.000	0.986	0.040	0.049	0.053	0.063	0.063
							0.077	0.152	0.178	0.175	0.137
N	845.100	1.000	0.210	0.210	1.000	0.986	0.040	0.049	0.053	0.063	0.063
							0.077	0.152	0.178	0.175	0.136
N	840.000	1.000	0.210	0.210	1.000	0.986	0.040	0.049	0.053	0.063	0.063
							0.077	0.152	0.178	0.175	0.136
N	835.000	1.000	0.210	0.210	1.000	0.987	0.040	0.050	0.053	0.063	0.063
							0.077	0.153	0.180	0.174	0.134
N	820.000	1.000	0.210	0.210	1.000	0.987	0.040	0.051	0.054	0.064	0.064
							0.076	0.155	0.182	0.171	0.130
N	815.000	1.000	0.210	0.210	1.000	0.988	0.040	0.051	0.054	0.064	0.064
							0.076	0.155	0.183	0.171	0.130
N	810.000	1.000	0.210	0.210	1.000	0.988	0.040	0.051	0.054	0.064	0.064
							0.076	0.155	0.183	0.171	0.130
N	805.000	1.000	0.210	0.210	1.000	0.988	0.040	0.052	0.054	0.064	0.064
							0.076	0.156	0.184	0.170	0.128
N	800.000	1.000	0.210	0.210	1.000	0.988	0.040	0.052	0.054	0.064	0.064
							0.076	0.157	0.185	0.169	0.127
N	790.000	1.000	0.210	0.210	1.000	0.989	0.040	0.054	0.055	0.065	0.065
							0.075	0.158	0.187	0.167	0.123
N	780.000	1.000	0.210	0.210	1.000	0.990	0.040	0.055	0.055	0.065	0.065
							0.075	0.160	0.190	0.165	0.120
N	770.000	1.000	0.210	0.210	1.000	0.991	0.040	0.056	0.055	0.065	0.065

							0.075	0.161	0.192	0.163	0.117
N	760.000	1.000	0.210	0.210	1.000	0.992	0.040	0.057	0.056	0.066	0.066
							0.074	0.163	0.195	0.161	0.114
N	750.000	1.000	0.210	0.210	1.000	0.992	0.040	0.058	0.056	0.066	0.066
							0.074	0.165	0.197	0.159	0.111
N	745.000	1.000	0.210	0.210	1.000	0.993	0.040	0.059	0.056	0.066	0.066
							0.074	0.165	0.198	0.159	0.110
N	740.000	1.000	0.210	0.210	1.000	0.993	0.040	0.059	0.056	0.066	0.066
							0.074	0.165	0.198	0.158	0.109
N	735.000	1.000	0.210	0.210	1.000	0.993	0.040	0.059	0.056	0.066	0.066
							0.074	0.166	0.199	0.158	0.108
N	730.000	1.000	0.210	0.210	1.000	0.994	0.040	0.060	0.057	0.067	0.067
							0.073	0.167	0.201	0.156	0.106
N	725.000	1.000	0.210	0.210	1.000	0.994	0.040	0.061	0.057	0.067	0.067
							0.073	0.168	0.202	0.155	0.104
N	720.000	1.000	0.210	0.210	1.000	0.994	0.040	0.062	0.057	0.067	0.067
							0.073	0.169	0.203	0.154	0.102
N	715.000	1.000	0.210	0.210	1.000	0.995	0.040	0.062	0.057	0.067	0.067
							0.073	0.169	0.204	0.154	0.102
N	710.000	1.000	0.210	0.210	1.000	0.995	0.040	0.062	0.057	0.067	0.067
							0.073	0.170	0.204	0.153	0.101
N	705.000	1.000	0.210	0.210	1.000	0.995	0.040	0.063	0.058	0.068	0.068
							0.072	0.170	0.205	0.152	0.100
N	700.000	1.000	0.210	0.210	1.000	0.995	0.040	0.063	0.058	0.068	0.068
							0.072	0.171	0.206	0.151	0.098
N	695.000	1.000	0.210	0.210	1.000	0.996	0.040	0.064	0.058	0.068	0.068
							0.072	0.172	0.208	0.150	0.096
N	690.000	1.000	0.210	0.210	1.000	0.996	0.040	0.064	0.058	0.068	0.068
							0.072	0.173	0.209	0.149	0.095
N	685.000	1.000	0.210	0.210	1.000	0.997	0.040	0.065	0.058	0.068	0.068
							0.072	0.174	0.211	0.148	0.092
N	676.000	1.000	0.210	0.210	1.000	0.997	0.040	0.066	0.059	0.069	0.069
							0.071	0.175	0.212	0.147	0.091
N	673.000	1.000	0.210	0.210	1.000	0.998	0.040	0.067	0.059	0.069	0.069
							0.071	0.175	0.213	0.146	0.089
N	670.000	1.000	0.210	0.210	1.000	0.998	0.040	0.067	0.059	0.069	0.069
							0.071	0.177	0.215	0.144	0.087
N	660.000	1.000	0.210	0.210	1.000	0.999	0.040	0.069	0.060	0.070	0.070
							0.070	0.178	0.217	0.142	0.083
N	655.000	1.000	0.210	0.210	1.000	0.999	0.040	0.069	0.060	0.070	0.070

							0.070	0.179	0.218	0.142	0.083
N	650.000	1.000	0.210	0.210	1.000	1.000	0.040	0.070	0.060	0.070	0.070
							0.070	0.180	0.220	0.140	0.080
N	640.000	1.000	0.223	0.210	0.995	0.995	0.038	0.068	0.058	0.069	0.069
							0.071	0.178	0.216	0.142	0.087
N	630.000	1.000	0.236	0.210	0.990	0.990	0.035	0.065	0.056	0.069	0.069
							0.071	0.175	0.212	0.144	0.094
N	625.000	1.000	0.242	0.210	0.988	0.988	0.034	0.064	0.055	0.068	0.068
							0.072	0.174	0.211	0.145	0.097
N	621.000	1.000	0.250	0.210	0.985	0.985	0.032	0.062	0.054	0.068	0.068
							0.072	0.172	0.209	0.146	0.101
N	615.000	1.000	0.254	0.210	0.983	0.983	0.032	0.062	0.054	0.068	0.068
							0.072	0.172	0.208	0.146	0.103
N	610.000	1.000	0.262	0.210	0.980	0.980	0.030	0.060	0.053	0.068	0.068
							0.072	0.170	0.205	0.147	0.107
N	600.000	1.000	0.267	0.210	0.978	0.978	0.029	0.059	0.052	0.067	0.067
							0.073	0.169	0.204	0.148	0.110
N	595.000	1.000	0.270	0.210	0.977	0.977	0.029	0.059	0.051	0.067	0.067
							0.073	0.169	0.203	0.149	0.111
N	590.000	1.000	0.279	0.210	0.974	0.974	0.027	0.057	0.050	0.067	0.067
							0.073	0.167	0.200	0.150	0.116
N	575.000	1.000	0.291	0.210	0.969	0.969	0.025	0.055	0.048	0.066	0.066
							0.074	0.165	0.197	0.152	0.122
N	565.000	1.000	0.304	0.210	0.964	0.964	0.022	0.052	0.047	0.066	0.066
							0.074	0.162	0.193	0.153	0.129
N	561.000	1.000	0.315	0.210	0.960	0.960	0.020	0.050	0.045	0.065	0.065
							0.075	0.160	0.190	0.155	0.135
N	555.000	1.000	0.320	0.210	0.958	0.958	0.019	0.049	0.044	0.065	0.065
							0.075	0.159	0.189	0.156	0.138
N	550.000	1.000	0.324	0.210	0.956	0.956	0.018	0.048	0.044	0.065	0.065
							0.075	0.158	0.187	0.156	0.140
N	540.000	1.000	0.335	0.210	0.952	0.952	0.016	0.046	0.042	0.064	0.064
							0.076	0.156	0.184	0.158	0.146
N	535.000	1.000	0.344	0.210	0.949	0.949	0.015	0.045	0.041	0.064	0.064
							0.076	0.155	0.182	0.159	0.150
N	515.000	1.000	0.362	0.210	0.942	0.942	0.011	0.041	0.038	0.063	0.063
							0.077	0.151	0.176	0.162	0.160
N	510.000	1.000	0.374	0.210	0.937	0.937	0.009	0.039	0.037	0.062	0.062
							0.078	0.149	0.173	0.163	0.166
N	505.000	1.000	0.377	0.210	0.936	0.936	0.008	0.038	0.036	0.062	0.062

						0.078	0.148	0.172	0.164	0.168
N	497.000	1.000	0.385	0.210	0.933	0.933	0.007	0.037	0.035	0.062	0.062
							0.078	0.147	0.170	0.165	0.172
N	495.000	1.000	0.396	0.210	0.929	0.929	0.005	0.035	0.033	0.061	0.061
							0.079	0.145	0.167	0.167	0.177
N	485.000	1.000	0.404	0.210	0.926	0.926	0.003	0.033	0.032	0.061	0.061
							0.079	0.143	0.165	0.168	0.182
N	480.100	1.000	0.411	0.210	0.923	0.923	0.002	0.032	0.031	0.060	0.060
							0.080	0.142	0.163	0.169	0.185
N	480.000	1.000	0.415	0.210	0.922	0.922	0.001	0.031	0.031	0.060	0.060
							0.080	0.141	0.161	0.169	0.187
N	475.000	1.000	0.420	0.210	0.920	0.920	0.000	0.030	0.030	0.060	0.060
							0.080	0.140	0.160	0.170	0.190
N	470.000	1.000	0.420	0.210	0.919	0.919	0.000	0.029	0.030	0.060	0.060
							0.081	0.139	0.160	0.168	0.193
N	455.000	1.000	0.420	0.210	0.919	0.919	0.000	0.029	0.031	0.059	0.059
							0.081	0.138	0.159	0.166	0.196
N	453.000	1.000	0.420	0.210	0.918	0.918	0.000	0.028	0.031	0.059	0.059
							0.082	0.137	0.159	0.164	0.199
N	445.000	1.000	0.420	0.210	0.918	0.918	0.000	0.028	0.031	0.059	0.059
							0.082	0.135	0.159	0.161	0.203
N	437.000	1.000	0.420	0.210	0.916	0.916	0.000	0.026	0.032	0.058	0.058
							0.084	0.133	0.158	0.157	0.210
N	435.000	1.000	0.420	0.210	0.916	0.916	0.000	0.026	0.032	0.058	0.058
							0.084	0.132	0.158	0.156	0.212
N	425.000	1.000	0.420	0.210	0.915	0.915	0.000	0.025	0.032	0.058	0.058
							0.085	0.131	0.158	0.154	0.215
N	420.000	1.000	0.420	0.210	0.915	0.915	0.000	0.025	0.033	0.057	0.057
							0.085	0.129	0.157	0.151	0.220
N	415.000	1.000	0.420	0.210	0.914	0.914	0.000	0.024	0.033	0.057	0.057
							0.086	0.128	0.157	0.149	0.222
N	410.000	1.000	0.420	0.210	0.914	0.914	0.000	0.024	0.033	0.057	0.057
							0.086	0.127	0.157	0.147	0.226
N	400.000	1.000	0.420	0.210	0.913	0.913	0.000	0.023	0.034	0.056	0.056
							0.087	0.125	0.156	0.144	0.231
N	390.000	1.000	0.420	0.210	0.912	0.912	0.000	0.022	0.034	0.056	0.056
							0.088	0.123	0.156	0.141	0.235
N	380.000	1.000	0.420	0.210	0.911	0.911	0.000	0.021	0.035	0.055	0.055
							0.089	0.121	0.155	0.137	0.242
N	370.000	1.000	0.420	0.210	0.909	0.909	0.000	0.019	0.035	0.055	0.055

							0.091	0.118	0.155	0.132	0.250
N	365.000	1.000	0.420	0.210	0.908	0.908	0.000	0.018	0.036	0.054	0.054
							0.092	0.116	0.154	0.129	0.255
N	360.000	1.000	0.420	0.210	0.908	0.908	0.000	0.018	0.036	0.054	0.054
							0.092	0.115	0.154	0.127	0.258
N	355.000	1.000	0.420	0.210	0.906	0.906	0.000	0.016	0.037	0.053	0.053
							0.094	0.113	0.153	0.122	0.266
N	345.000	1.000	0.420	0.210	0.905	0.905	0.000	0.015	0.037	0.053	0.053
							0.095	0.111	0.153	0.119	0.270
N	335.000	1.000	0.420	0.210	0.905	0.905	0.000	0.015	0.038	0.052	0.052
							0.095	0.110	0.152	0.117	0.273
N	333.000	1.000	0.420	0.210	0.904	0.904	0.000	0.014	0.038	0.052	0.052
							0.096	0.108	0.152	0.114	0.278
N	325.000	1.000	0.420	0.210	0.903	0.903	0.000	0.013	0.039	0.051	0.051
							0.097	0.106	0.151	0.110	0.284
N	320.000	1.000	0.420	0.210	0.902	0.902	0.000	0.012	0.039	0.051	0.051
							0.098	0.103	0.151	0.106	0.291
N	315.000	1.000	0.420	0.210	0.901	0.901	0.000	0.011	0.039	0.051	0.051
							0.099	0.103	0.151	0.105	0.292
N	310.000	1.000	0.420	0.210	0.901	0.901	0.000	0.011	0.040	0.050	0.050
							0.099	0.102	0.150	0.103	0.295
N	305.000	1.000	0.420	0.210	0.901	0.901	0.000	0.011	0.040	0.050	0.050
							0.099	0.101	0.150	0.102	0.297
N	300.000	1.000	0.420	0.210	0.901	0.901	0.000	0.011	0.040	0.050	0.050
							0.099	0.101	0.150	0.102	0.297
N	295.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	290.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	280.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	270.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	260.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	255.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	250.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	240.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050

							0.100	0.100	0.150	0.100	0.300
N	235.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	230.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	225.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	220.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	210.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	205.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	200.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	190.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	110.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	90.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	85.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	80.100	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	80.400	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	75.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	70.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	60.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	55.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	50.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	45.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	40.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050

							0.100	0.100	0.150	0.100	0.300
N	35.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	30.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	25.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	15.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300

..LOCAL INFLOW DATA...

SEDIMENT LOAD TABLE FOR STREAM SEGMENT # 1
AT LOCAL INFLOW POINT # 1
LOAD BY GRAIN SIZE CLASS (tons/day)

L L		1.00000	1000.00
L L	VFS	0.600000E-01	5.00000
L L	FS	0.400000E-01	3.00000
L L	MS	0.100000E-19	2.00000
L L	CS	0.100000E-19	0.100000E-19
L L	VCS	0.100000E-19	0.100000E-19
L L	VFG	0.100000E-19	0.100000E-19
L L	FG	0.100000E-19	0.100000E-19
L L	MG	0.100000E-19	0.100000E-19
L L	CG	0.100000E-19	0.100000E-19
L L	VCG	0.100000E-19	0.100000E-19
	TOTAL	0.100000	10.0000

..LOCAL INFLOW DATA...

SEDIMENT LOAD TABLE FOR STREAM SEGMENT # 1
AT LOCAL INFLOW POINT # 2
LOAD BY GRAIN SIZE CLASS (tons/day)

L L		1.00000	1000.00
L L	VFS	0.500000E-01	80.0000
L L	FS	0.400000E-01	60.0000
L L	MS	0.100000E-01	40.0000
L L	CS	0.100000E-19	20.0000
L L	VCS	0.100000E-19	0.100000E-19
L L	VFG	0.100000E-19	0.100000E-19
L L	FG	0.100000E-19	0.100000E-19
L L	MG	0.100000E-19	0.100000E-19
L L	CG	0.100000E-19	0.100000E-19
L L	VCG	0.100000E-19	0.100000E-19
	TOTAL	0.100000	200.000

..LOCAL INFLOW DATA...

SEDIMENT LOAD TABLE FOR STREAM SEGMENT # 1
AT LOCAL INFLOW POINT # 3

LOAD BY GRAIN SIZE CLASS (tons/day)

L L	1.00000	1000.00
L L VFS	0.500000E-01	4.00000
L L FS	0.400000E-01	3.00000
L L MS	0.100000E-01	2.00000
L L CS	0.100000E-19	1.00000
L L VCS	0.100000E-19	0.100000E-19
L L VFG	0.100000E-19	0.100000E-19
L L FG	0.100000E-19	0.100000E-19
L L MG	0.100000E-19	0.100000E-19
L L CG	0.100000E-19	0.100000E-19
L L VCG	0.100000E-19	0.100000E-19
TOTAL	0.100000	10.0000

..LOCAL INFLOW DATA...

SEDIMENT LOAD TABLE FOR STREAM SEGMENT # 1
AT LOCAL INFLOW POINT # 4

LOAD BY GRAIN SIZE CLASS (tons/day)

L L	1.00000	400.000
L L VFS	0.600000E-01	4.00000
L L FS	0.400000E-01	3.00000
L L MS	0.100000E-19	2.00000
L L CS	0.100000E-19	1.00000
L L VCS	0.100000E-19	0.100000E-19
L L VFG	0.100000E-19	0.100000E-19
L L FG	0.100000E-19	0.100000E-19
L L MG	0.100000E-19	0.100000E-19
L L CG	0.100000E-19	0.100000E-19
L L VCG	0.100000E-19	0.100000E-19
TOTAL	0.100000	10.0000

STREAM SEGMENT # 1: JORDAN RIVER SEDIMENT TRANSPORT STUDY SALT LAKE COUNTY

BED SEDIMENT CONTROL VOLUMES

SECTION NUMBER	LENGTH (ft)	MAX. WIDTH (ft)	DEPTH (ft)	VOLUME (cu.ft)	VOLUME (cu.yd)
1310.000	82.50	85.00	8.00	56100.0	2077.78
1310.100	129.00	85.00	8.00	87720.0	3248.89
1310.400	180.00	96.06	8.00	138331.	5123.37
1305.000	313.50	122.49	8.00	307202.	11377.9
1300.100	233.00	126.22	8.00	235280.	8714.07
1300.400	153.00	125.00	8.00	153000.	5666.67
1300.000	420.00	124.52	8.00	418379.	15495.5
1295.000	515.00	123.42	8.00	508481.	18832.6
1290.000	902.50	124.90	8.00	901742.	33397.9
1280.000	1042.50	127.05	8.00	0.105963E+07	39245.6
1270.000	840.00	116.50	8.00	782880.	28995.6

1265.000	600.00	125.00	8.00	600013.	22222.7
1260.000	670.00	127.02	8.00	680833.	25216.0
1250.000	1800.00	114.10	8.00	0.164310E+07	60855.6
1240.000	1605.00	88.81	8.00	0.114036E+07	42235.6
1235.000	730.00	65.20	8.00	380747.	14101.7
1230.000	1145.00	67.14	8.00	615027.	22778.8
1220.000	1225.00	81.46	8.00	798347.	29568.4
1210.000	505.00	100.03	8.00	404133.	14967.9
1207.100	235.00	131.26	8.00	246776.	9139.85
1205.000	382.50	90.98	8.00	278414.	10311.6
1200.000	857.50	80.74	8.00	553889.	20514.4
1190.000	755.00	92.84	8.00	560751.	20768.5
1185.000	545.00	82.35	8.00	359055.	13298.3
1180.000	1245.00	78.09	8.00	777800.	28807.4
1170.000	1465.00	97.44	8.00	0.114201E+07	42296.6
1165.000	865.00	115.68	8.00	800478.	29647.3
1160.000	303.00	125.30	8.00	303738.	11249.6
1150.000	168.00	81.21	8.00	109140.	4042.22
1145.000	615.00	44.62	8.00	219507.	8129.88
1140.000	1080.00	73.54	8.00	635413.	23533.8
1130.000	1090.00	88.61	8.00	772646.	28616.5
1125.000	697.50	77.98	8.00	435136.	16116.2
1120.000	755.00	91.13	8.00	550426.	20386.1
1110.000	862.50	122.38	8.00	844433.	31275.3
1107.000	760.00	100.50	8.00	611046.	22631.3
1097.000	620.00	100.25	8.00	497242.	18416.4
1095.100	272.50	97.22	8.00	211948.	7849.93
1090.000	447.50	74.47	8.00	266599.	9874.04
1087.000	342.00	84.65	8.00	231610.	8578.13
1087.200	42.00	93.60	8.00	31449.6	1164.80
1085.000	25.00	102.47	0.00	0.000000	0.000000
1083.200	280.00	92.06	5.00	128882.	4773.39
1077.000	535.00	82.18	8.00	351720.	13026.7
1075.000	560.00	63.15	8.00	282912.	10478.2
1070.000	503.50	57.92	8.00	233296.	8640.59
1060.000	578.50	59.36	8.00	274736.	10175.4
1055.000	530.00	81.21	2.00	86083.3	3188.27
1050.000	845.00	72.79	2.00	123010.	4555.93
1040.000	837.50	87.66	8.00	587322.	21752.7
1035.000	467.50	70.76	8.00	264661.	9802.25
1030.000	820.00	77.45	8.00	508080.	18817.8
1020.000	1185.00	89.43	8.00	847813.	31400.5
1010.000	910.00	89.49	8.00	651467.	24128.4
1005.000	635.00	92.35	8.00	469160.	17376.3
1000.000	440.00	96.63	8.00	340133.	12597.5
995.100	142.00	83.99	8.00	95410.7	3533.73
990.000	387.00	75.27	8.00	233027.	8630.62
985.000	550.00	103.71	8.00	456313.	16900.5
980.000	580.00	100.95	8.00	468415.	17348.7
975.000	550.00	102.47	8.00	450853.	16698.3
970.000	485.00	71.55	8.00	277615.	10282.0
965.000	445.00	75.95	8.00	270392.	10014.5
960.000	245.00	88.41	8.00	173281.	6417.83
957.100	315.00	71.62	4.00	90236.3	3342.08
955.000	640.00	83.29	8.00	426437.	15794.0
950.000	840.00	90.12	8.00	605634.	22430.9
940.000	600.00	94.73	8.00	454707.	16841.0
940.100	307.50	91.59	8.00	225300.	8344.44
935.000	237.50	75.74	8.00	143910.	5330.00
930.000	325.00	84.29	8.00	219153.	8116.79

925.000	490.00	103.28	8.00	404851.	14994.5
923.000	535.00	102.05	8.00	436761.	16176.3
913.000	695.00	95.19	8.00	529272.	19602.7
912.000	575.00	90.08	8.00	414350.	15346.3
905.000	215.00	82.02	8.00	141071.	5224.84
904.000	55.00	74.47	0.00	0.000000	0.000000
903.100	105.00	82.11	2.00	17243.0	638.630
900.000	455.00	61.11	8.00	222449.	8238.86
890.000	1015.00	54.41	8.00	441840.	16364.4
880.000	1260.00	62.12	8.00	626160.	23191.1
870.000	1315.00	62.08	8.00	653127.	24189.9
860.000	1155.00	68.59	8.00	633800.	23474.1
850.000	525.00	63.45	8.00	266500.	9870.37
845.100	120.50	53.20	8.00	51285.3	1899.46
840.000	403.00	59.15	8.00	190701.	7063.01
835.000	982.50	71.45	8.00	561627.	20801.0
820.000	660.00	66.59	8.00	351615.	13022.8
815.000	105.00	63.63	4.00	26726.0	989.852
810.000	300.00	76.39	8.00	183324.	6789.78
805.000	480.00	99.46	8.00	381913.	14144.9
800.000	825.00	62.08	8.00	409747.	15175.8
790.000	1075.00	54.53	8.00	468923.	17367.5
780.000	1095.00	58.93	8.00	516260.	19120.7
770.000	1120.00	75.48	8.00	676340.	25049.6
760.000	1035.00	140.63	8.00	0.116438E+07	43125.2
750.000	720.00	367.71	8.00	0.211800E+07	78444.4
745.000	310.00	189.16	8.00	469107.	17374.3
740.000	285.00	84.23	8.00	192041.	7112.64
735.000	625.00	80.40	8.00	402020.	14889.6
730.000	745.00	84.60	8.00	504245.	18675.8
725.000	575.00	89.04	8.00	409567.	15169.1
720.000	355.00	109.17	8.00	310049.	11483.3
715.000	207.50	73.37	8.00	121798.	4511.04
710.000	317.50	66.66	8.00	169304.	6270.53
705.000	500.00	74.90	8.00	299587.	11095.8
700.000	680.00	60.87	8.00	331129.	12264.0
695.000	545.00	73.61	8.00	320933.	11886.4
690.000	630.00	77.83	8.00	392275.	14528.7
685.000	685.00	70.28	8.00	385116.	14263.6
676.000	555.00	68.56	8.00	304396.	11273.9
673.000	685.00	69.55	8.00	381151.	14116.7
670.000	955.00	68.18	8.00	520859.	19291.1
660.000	750.00	66.43	8.00	398600.	14763.0
655.000	595.00	71.58	8.00	340740.	12620.0
650.000	1070.00	69.64	8.00	596133.	22079.0
640.000	1280.00	84.29	8.00	863147.	31968.4
630.000	920.00	91.83	8.00	675853.	25031.6
625.000	655.00	83.64	8.00	438287.	16232.8
621.000	570.00	86.11	8.00	392680.	14543.7
615.000	575.00	78.14	8.00	359434.	13312.4
610.000	635.00	72.80	8.00	369804.	13696.4
600.000	385.00	81.59	8.00	251288.	9306.96
595.000	600.00	122.33	8.00	587187.	21747.7
590.000	1010.00	107.85	8.00	871421.	32274.9
575.000	1180.00	103.19	8.00	974153.	36079.7
565.000	1190.00	113.87	8.00	0.108408E+07	40151.3
561.000	800.00	115.58	8.00	739742.	27397.9
555.000	430.00	88.94	8.00	305967.	11332.1
550.000	727.50	89.30	8.00	519736.	19249.5
540.000	937.50	92.72	8.00	695429.	25756.6

535.000	1315.00	92.84	8.00	976660.	36172.6
515.000	1480.00	157.69	8.00	0.186704E+07	69149.6
510.000	715.00	181.78	8.00	0.103979E+07	38510.9
505.000	520.00	105.15	8.00	437408.	16200.3
497.000	905.00	100.29	8.00	726070.	26891.5
495.000	915.00	100.73	8.00	737380.	27310.4
485.000	730.00	108.38	8.00	632940.	23442.2
480.100	537.50	75.73	8.00	325640.	12060.7
480.000	437.50	72.80	8.00	254800.	9437.04
475.000	555.00	98.47	8.00	437228.	16193.6
470.000	592.50	93.56	8.00	443491.	16425.6
455.000	582.50	161.69	8.00	753488.	27907.0
453.000	755.00	140.86	8.00	850799.	31511.1
445.000	1115.00	89.48	8.00	798179.	29562.2
437.000	890.00	107.26	8.00	763720.	28285.9
435.000	500.00	110.98	8.00	443920.	16441.5
425.000	770.00	87.87	8.00	541293.	20047.9
420.000	760.00	90.35	8.00	549307.	20344.7
415.000	575.00	94.20	8.00	433320.	16048.9
410.000	875.00	61.19	8.00	428353.	15864.9
400.000	990.00	57.72	8.00	457147.	16931.4
390.000	1105.00	94.37	8.00	834240.	30897.8
380.000	1450.00	135.52	8.00	0.157203E+07	58223.5
370.000	1300.00	118.02	8.00	0.122737E+07	45458.0
365.000	850.00	109.01	8.00	741267.	27454.3
360.000	1065.00	104.87	8.00	893527.	33093.6
355.000	1190.00	144.73	8.00	0.137779E+07	51029.1
345.000	705.00	117.92	8.00	665080.	24632.6
335.000	775.00	214.03	8.00	0.132700E+07	49148.2
333.000	1145.00	181.81	8.00	0.166539E+07	61681.2
325.000	1335.00	171.94	8.00	0.183629E+07	68010.7
320.000	820.00	155.29	8.00	0.101869E+07	37729.4
315.000	440.00	70.88	8.00	249480.	9240.00
310.000	451.50	78.59	8.00	283867.	10513.6
305.000	156.50	81.18	6.00	76230.3	2823.34
300.000	345.00	84.31	8.00	232701.	8618.57
295.000	505.00	77.69	8.00	313885.	11625.4
290.000	557.50	76.75	8.00	342303.	12677.9
280.000	852.50	67.26	8.00	458715.	16989.4
270.000	832.50	63.88	8.00	425447.	15757.3
260.000	492.50	84.98	8.00	334827.	12401.0
255.000	340.00	146.18	8.00	397597.	14725.8
250.000	490.00	90.60	8.00	355139.	13153.3
240.000	440.00	82.75	8.00	291267.	10787.7
235.000	300.00	68.72	8.00	164933.	6108.64
230.000	290.00	74.23	8.00	172223.	6378.62
225.000	325.00	89.67	8.00	233133.	8634.57
220.000	785.00	68.43	8.00	429761.	15917.1
210.000	885.00	59.70	8.00	422676.	15654.7
205.000	685.00	44.84	8.00	245717.	9100.64
200.000	910.00	50.20	8.00	365456.	13535.4
190.000	960.00	55.19	8.00	423867.	15698.8
110.000	655.00	84.19	5.00	275733.	10212.3
90.000	480.00	151.11	5.00	362675.	13432.4
85.000	325.00	110.75	8.00	287952.	10664.9
80.100	129.50	59.37	3.00	23066.1	854.300
80.400	219.50	85.56	0.00	0.000000	0.000000
75.000	410.00	214.41	6.00	527440.	19534.8
70.000	460.00	326.57	6.00	901320.	33382.2
60.000	540.00	229.41	6.00	743274.	27528.7

55.000	780.00	166.29	6.00	778234.	28823.5
50.000	885.00	300.91	6.00	0.159783E+07	59178.9
45.000	775.00	170.65	6.00	793545.	29390.6
40.000	580.00	237.56	6.00	826715.	30619.1
35.000	1025.00	215.33	6.00	0.132431E+07	49048.4
30.000	1565.00	116.62	6.00	0.109508E+07	40558.5
25.000	1155.00	203.70	6.00	0.141164E+07	52282.8
15.000	365.00	193.17	8.00	564047.	20890.6

NO. OF INPUT DATA MESSAGES= 0
END OF SEDIMENT DATA

==

BEGIN COMPUTATIONS.
$HYD

....

$GR
...BED CHANGE OPTION 1

....

$RATING
...DOWNSTREAM BOUNDARY CONDITION SPECIFIED BY A RATING CURVE

ELEVATION OF GAGE ZERO 0.00
DISCHARGE CORRESPONDING TO LOWEST ELEVATION IN TABLE 0.0
DISCHARGE INTERVAL 1000.0
NO. OF POINTS IN RATING TABLE 7
ELEVATIONS
4222.00 4223.90 4226.00 4228.20 4230.60 4232.40 4233.50

==

* B FLOW 1=1000

BOUNDARY CONDITION DATA, CONTROL POINT NO. 1
TIME STEP NO. 1
WATER DISCHARGE= 1000.00
ELEVATION= 4223.900
TEMPERATURE= 50.000
FLOW DURATION(DAYS) 15.00
** Q BELOW TABLE ** **INL
WATER DISCHARGE, WATER-SEDIMENT LOAD TABLE ENDPOINT 0.00 1.00 0.060000

TABLE SA-1. TRAP EFFICIENCY ON STREAM SEGMENT # 1
JORDAN RIVER SEDIMENT TRANSPORT STUDY SALT LAKE COUNTY
ACCUMULATED AC-FT ENTERING AND LEAVING THIS STREAM SEGMENT

TIME DAYS	ENTRY POINT	INFLOW	SAND OUTFLOW	TRAP EFF
15.00	15.000	0.15		
TOTAL=	80.400	0.15	1.58	-9.70

TIME	ENTRY		SAND	

15.00	80.400 *	1.58			*
TOTAL=	676.000 *	1.58	0.20	0.87	*
	*				*

****

TIME	ENTRY *		SAND		*
15.00	676.000 *	0.20			*
	685.000 *	0.00			*
	1060.000 *	0.01			*
TOTAL=	1085.000 *	0.21	0.78	-2.66	*
	*				*

****

TIME	ENTRY *		SAND		*
15.00	1085.000 *	0.78			*
	1120.000 *	0.05			*
	1250.000 *	0.01			*
TOTAL=	1310.000 *	0.83	0.57	0.32	*
	*				*

****

TABLE SB-1.	TOTAL	LOAD BY GRAIN SIZE (TONS/DAY)				
		VF	F	M	C	VC
SEDIMENT INFLOW						
SANDS & GRAVELS	19.93	4.84	7.94	7.07	0.05	0.02
		0.01	0.01	0.00	0.00	0.00
SEDIMENT OUTFLOW						
SANDS & GRAVELS	76.90	23.83	21.91	18.56	7.51	4.80
		0.29	0.00	0.00	0.00	0.00

SECTION ID NO	BED CHANGE FEET	WS ELEV FEET	THALWEG EL FEET	Q CFS	SEDIMENT LOAD (TONS/DAY) SAND
15.000	-0.10	4473.81	4469.40	900.	39.
25.000	-0.10	4469.13	4466.70	900.	93.
30.000	-0.53	4455.97	4450.67	900.	354.
35.000	0.44	4451.13	4449.04	900.	70.
40.000	-0.10	4450.47	4448.00	900.	110.
45.000	-5.31	4445.44	4433.79	900.	1027.
50.000	2.36	4442.02	4439.16	900.	610.
55.000	1.55	4437.65	4432.35	900.	373.
60.000	-0.72	4434.59	4430.48	900.	505.
70.000	0.58	4433.77	4428.48	900.	354.
75.000	-0.65	4431.46	4426.85	900.	461.
80.400	7.12	4430.80	4433.32	900.	213.
80.100	0.62	4430.25	4426.62	900.	206.
85.000	0.19	4430.30	4425.19	900.	189.
90.000	-0.70	4428.60	4423.50	900.	285.
110.000	0.12	4424.96	4418.82	900.	272.
190.000	-0.14	4417.98	4413.76	900.	292.
200.000	0.26	4411.68	4406.26	900.	257.
205.000	0.12	4409.02	4402.62	900.	246.
210.000	-0.13	4405.38	4400.87	900.	267.
220.000	0.45	4403.61	4399.35	900.	196.
225.000	0.18	4403.14	4399.88	900.	181.
230.000	0.24	4402.02	4398.54	900.	166.
235.000	-0.34	4400.41	4394.96	900.	184.
240.000	0.18	4400.10	4394.88	900.	165.
250.000	-0.12	4398.51	4393.18	900.	180.
255.000	-0.57	4396.31	4392.63	900.	230.
260.000	0.03	4393.85	4390.63	900.	227.
270.000	-0.04	4391.29	4387.26	900.	234.

280.000	-0.39	4387.13	4383.31	900.	303.
290.000	0.74	4384.77	4380.24	900.	208.
295.000	0.05	4383.73	4379.85	900.	201.
300.000	0.14	4380.85	4375.74	900.	189.
305.000	0.07	4380.79	4376.07	900.	187.
310.000	-0.22	4379.14	4376.78	900.	207.
315.000	0.11	4376.58	4370.41	900.	199.
320.000	-0.50	4375.45	4371.30	900.	339.
325.000	-0.79	4369.71	4365.71	900.	704.
333.000	-0.46	4364.63	4361.44	900.	851.
335.000	1.30	4362.19	4360.50	900.	475.
345.000	0.03	4361.34	4356.43	900.	469.
355.000	-0.83	4358.00	4355.07	900.	909.
360.000	1.12	4355.42	4351.02	900.	536.
365.000	-0.61	4353.63	4350.09	900.	667.
370.000	0.83	4351.95	4348.23	900.	303.
380.000	-0.11	4350.73	4347.59	900.	371.
390.000	-1.07	4346.15	4342.83	900.	717.
400.000	0.57	4343.30	4337.17	900.	614.
410.000	0.98	4341.65	4337.38	900.	445.
415.000	-0.11	4341.10	4337.99	900.	464.
420.000	0.39	4340.63	4334.89	900.	380.
425.000	-0.01	4338.89	4335.59	900.	381.
435.000	0.39	4338.03	4332.99	900.	314.
437.000	-0.08	4337.47	4331.82	900.	338.
445.000	-0.08	4335.49	4329.22	900.	365.
453.000	-0.12	4334.02	4329.48	900.	401.
455.000	-1.21	4331.43	4327.09	900.	608.
470.000	0.54	4330.22	4325.74	900.	533.
475.000	1.22	4329.53	4325.72	900.	308.
480.000	0.26	4328.50	4323.16	900.	281.
480.100	0.04	4326.94	4322.14	900.	276.
485.000	0.80	4326.63	4322.20	900.	86.
495.000	-0.12	4326.27	4319.98	900.	120.
497.000	-0.34	4325.09	4321.66	900.	200.
505.000	0.02	4323.94	4319.02	900.	198.
510.000	-0.01	4323.66	4320.29	900.	201.
515.000	-0.13	4321.53	4317.97	900.	298.
535.000	0.37	4319.97	4313.67	900.	155.
540.000	-0.14	4319.52	4314.66	900.	193.
550.000	-0.37	4316.82	4312.13	900.	265.
555.000	0.17	4316.09	4311.57	900.	244.
561.000	0.29	4315.64	4310.39	900.	165.
565.000	0.04	4314.85	4309.84	900.	149.
575.000	0.13	4314.23	4308.33	900.	106.
590.000	-0.68	4311.91	4308.82	900.	328.
595.000	0.92	4310.87	4306.92	900.	120.
600.000	-0.15	4310.37	4305.65	900.	135.
610.000	0.17	4309.89	4300.07	900.	111.
615.000	0.25	4309.62	4303.65	900.	77.
621.000	0.20	4309.55	4303.30	900.	47.
625.000	0.05	4309.42	4301.45	900.	39.
630.000	-0.16	4309.13	4306.04	900.	78.
640.000	-0.66	4306.30	4302.14	900.	294.
650.000	-0.09	4303.37	4298.81	900.	314.
655.000	0.57	4302.27	4299.07	900.	236.
660.000	0.87	4302.18	4295.87	900.	103.
670.000	0.43	4302.05	4292.43	900.	20.
673.000	-0.10	4301.89	4293.20	900.	32.
676.000	0.09	4301.80	4293.69	900.	27.

685.000	-0.11	4296.99	4291.99	850.	37.
690.000	-0.16	4295.62	4291.14	850.	60.
695.000	-0.12	4295.18	4290.68	850.	75.
700.000	-0.16	4294.47	4287.04	850.	93.
705.000	0.03	4294.13	4288.33	850.	89.
710.000	-0.16	4293.48	4287.64	850.	99.
715.000	0.08	4293.43	4285.58	850.	96.
720.000	-0.16	4293.09	4288.24	850.	110.
725.000	-0.10	4292.68	4287.70	850.	125.
730.000	-0.16	4291.99	4286.14	850.	153.
735.000	-0.10	4291.07	4286.10	850.	167.
740.000	-0.16	4290.55	4285.84	850.	179.
745.000	-0.16	4290.16	4286.34	850.	193.
750.000	-0.13	4289.47	4285.07	850.	225.
760.000	-0.16	4288.16	4282.44	850.	261.
770.000	-0.26	4286.44	4281.84	850.	325.
780.000	0.89	4285.32	4278.69	850.	153.
790.000	-0.14	4284.09	4276.36	850.	178.
800.000	0.15	4283.26	4275.35	850.	155.
805.000	-0.06	4282.92	4278.04	850.	162.
810.000	-0.04	4281.79	4277.56	850.	164.
815.000	0.50	4281.40	4276.30	850.	155.
820.000	-0.45	4281.10	4273.95	850.	212.
835.000	0.01	4278.27	4273.01	850.	210.
840.000	-0.44	4277.22	4269.46	850.	235.
845.100	0.59	4277.15	4271.09	850.	224.
850.000	-0.15	4276.86	4269.95	850.	237.
860.000	-0.16	4274.59	4269.54	850.	275.
870.000	0.41	4273.66	4267.51	850.	170.
880.000	0.11	4272.77	4266.61	850.	144.
890.000	-0.11	4271.49	4264.29	850.	163.
900.000	-0.14	4270.95	4264.36	850.	174.
903.100	-0.93	4269.91	4267.27	850.	197.
904.000	3.69	4266.78	4263.69	850.	152.
905.000	0.39	4266.68	4257.99	850.	132.
912.000	-0.14	4266.20	4261.46	850.	152.
913.000	-0.14	4265.06	4260.26	850.	176.
923.000	-0.12	4264.30	4259.58	850.	192.
925.000	0.13	4263.96	4259.23	850.	175.
930.000	-0.15	4263.29	4258.35	850.	186.
935.000	-0.12	4263.12	4257.48	850.	193.
940.100	-0.14	4262.82	4258.66	850.	205.
940.000	-0.37	4262.10	4258.73	850.	266.
950.000	-0.43	4259.99	4255.87	850.	362.
955.000	0.16	4258.43	4254.36	850.	336.
957.100	1.57	4258.05	4249.57	850.	227.
960.000	0.83	4258.05	4252.63	850.	174.
965.000	-0.12	4257.68	4252.68	850.	186.
970.000	-0.15	4256.95	4251.35	850.	202.
975.000	-0.16	4255.66	4251.94	850.	230.
980.000	-0.12	4254.39	4248.18	850.	251.
985.000	-0.16	4253.69	4248.94	850.	277.
990.000	-0.09	4252.79	4245.81	850.	284.
995.100	1.07	4252.61	4245.97	850.	256.
1000.000	-0.03	4252.47	4249.17	850.	260.
1005.000	-0.16	4251.27	4247.74	850.	288.
1010.000	-0.10	4250.50	4245.60	850.	314.
1020.000	-0.05	4249.13	4244.95	850.	331.
1030.000	0.34	4248.22	4243.34	850.	267.
1035.000	-0.54	4247.48	4242.86	850.	320.

1040.000	-0.11	4247.09	4244.49	850.	344.
1050.000	-0.12	4245.58	4238.58	850.	367.
1055.000	0.07	4245.34	4242.17	850.	358.
1060.000	1.93	4245.14	4238.03	925.	171.
1070.000	0.83	4245.08	4235.13	925.	99.
1075.000	-0.08	4244.88	4238.92	925.	107.
1077.000	-0.02	4244.71	4239.18	925.	109.
1083.200	-0.06	4244.57	4237.54	925.	113.
1085.000	1.09	4244.30	4243.09	925.	105.
1087.200	0.22	4240.76	4234.42	925.	102.
1087.000	-0.01	4240.74	4233.99	925.	103.
1090.000	-0.12	4240.34	4234.88	925.	115.
1095.100	-0.17	4239.88	4234.23	925.	127.
1097.000	0.01	4239.69	4233.51	925.	126.
1107.000	0.07	4239.25	4231.47	925.	110.
1110.000	-0.32	4238.10	4234.48	925.	201.
1120.000	0.34	4236.13	4231.24	975.	142.
1125.000	0.09	4235.88	4226.89	975.	127.
1130.000	-0.01	4234.99	4227.69	975.	131.
1140.000	0.23	4234.51	4223.13	975.	78.
1145.000	-0.21	4233.70	4229.69	975.	94.
1150.000	0.21	4233.67	4222.11	975.	85.
1160.000	-0.25	4233.39	4228.75	975.	115.
1165.000	0.05	4232.84	4224.85	975.	100.
1170.000	-0.06	4231.74	4225.34	975.	124.
1180.000	0.19	4231.09	4221.79	975.	69.
1185.000	-0.06	4230.82	4223.04	975.	77.
1190.000	-0.15	4230.61	4223.65	975.	110.
1200.000	0.19	4229.78	4221.69	975.	67.
1205.000	-0.04	4229.62	4223.76	975.	72.
1207.100	0.00	4229.52	4224.40	975.	72.
1210.000	-0.14	4229.37	4224.36	975.	94.
1220.000	-0.07	4228.93	4223.63	975.	115.
1230.000	-0.07	4227.95	4221.53	975.	132.
1235.000	0.27	4227.62	4218.77	975.	92.
1240.000	0.12	4227.49	4217.12	975.	39.
1250.000	-0.03	4226.68	4221.17	1000.	61.
1260.000	0.03	4226.36	4221.03	1000.	52.
1265.000	-0.14	4226.19	4222.86	1000.	84.
1270.000	0.17	4226.01	4218.47	1000.	33.
1280.000	-0.05	4225.83	4219.55	1000.	53.
1290.000	0.03	4225.50	4218.33	1000.	44.
1295.000	-0.07	4225.36	4220.83	1000.	58.
1300.000	-0.09	4225.14	4220.71	1000.	72.
1300.400	0.00	4224.97	4220.30	1000.	72.
1300.100	0.01	4224.90	4219.81	1000.	71.
1305.000	-0.14	4224.40	4220.26	1000.	88.
1310.400	0.02	4224.08	4218.32	1000.	86.
1310.100	0.22	4224.02	4218.32	1000.	78.
1310.000	0.06	4223.90	4218.16	1000.	77.

==

*   A   FLOW 2=1200

COMPUTING FROM TIME=   15.000000 DAYS TO TIME=   5.000000 DAYS IN   0 COMPUTATION STEPS

** Q BELOW TABLE **   **INL

WATER DISCHARGE, WATER-SEDIMENT LOAD TABLE ENDPOINT   0.00   1.00   0.060000

TABLE SA-1. TRAP EFFICIENCY ON STREAM SEGMENT # 1
JORDAN RIVER SEDIMENT TRANSPORT STUDY SALT LAKE COUNTY
ACCUMULATED AC-FT ENTERING AND LEAVING THIS STREAM SEGMENT

TIME DAYS	ENTRY POINT	INFLOW	SAND OUTFLOW	TRAP EFF
30.00	15.000	0.32		
TOTAL=	80.400	0.32	2.61	-7.12

TIME	ENTRY		SAND	
30.00	80.400	2.61		
TOTAL=	676.000	2.61	0.72	0.73

TIME	ENTRY		SAND	
30.00	676.000	0.72		
	685.000	0.00		
	1060.000	0.03		
TOTAL=	1085.000	0.74	1.61	-1.16

TIME	ENTRY		SAND	
30.00	1085.000	1.61		
	1120.000	0.13		
	1250.000	0.01		
TOTAL=	1310.000	1.75	1.18	0.32

==

* A FLOW 3=1500

COMPUTING FROM TIME= 30.000000 DAYS TO TIME= 5.000000 DAYS IN -2 COMPUTATION STEPS

** Q BELOW TABLE **
WATER DISCHARGE, WATER-SEDIMENT LOAD TABLE ENDPOINT 0.00 1.00 0.060000

TABLE SA-1. TRAP EFFICIENCY ON STREAM SEGMENT # 1
JORDAN RIVER SEDIMENT TRANSPORT STUDY SALT LAKE COUNTY
ACCUMULATED AC-FT ENTERING AND LEAVING THIS STREAM SEGMENT

TIME DAYS	ENTRY POINT	INFLOW	SAND OUTFLOW	TRAP EFF
40.00	15.000	0.45		
TOTAL=	80.400	0.45	4.20	-8.37

TIME	ENTRY		SAND	
40.00	80.400	4.20		
TOTAL=	676.000	4.20	1.19	0.72

TIME	ENTRY		SAND	
40.00	676.000	1.19		

	685.000 *	0.00			*
	1060.000 *	0.04			*
TOTAL=	1085.000 *	1.23	2.90	-1.36	*
	*				*

****

TIME	ENTRY *		SAND		*
40.00	1085.000 *	2.90			*
	1120.000 *	0.24			*
	1250.000 *	0.02			*
TOTAL=	1310.000 *	3.15	1.67	0.47	*
	*				*

****

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* B   FLOW 4=1800

COMPUTING FROM TIME=   40.000000 DAYS TO TIME=   2.500000 DAYS IN   -7 COMPUTATION STEPS

BOUNDARY CONDITION DATA, CONTROL POINT NO. 1
TIME STEP NO.   4
WATER   DISCHARGE=   1800.00
ELEVATION= 4225.580
TEMPERATURE=   73.000
FLOW DURATION(DAYS) 5.000
** Q BELOW TABLE **
WATER DISCHARGE, WATER-SEDIMENT LOAD TABLE ENDPOINT   0.00   1.00   0.060000   **INL

TABLE SA-1. TRAP EFFICIENCY ON STREAM SEGMENT # 1
JORDAN RIVER SEDIMENT TRANSPORT STUDY SALT LAKE COUNTY
ACCUMULATED AC-FT ENTERING AND LEAVING THIS STREAM SEGMENT

****

TIME DAYS	ENTRY POINT *	INFLOW	SAND OUTFLOW	TRAP EFF	*
45.00	15.000 *	0.52			*
TOTAL=	80.400 *	0.52	4.80	-8.21	*
	*				*

****

TIME	ENTRY *		SAND		*
45.00	80.400 *	4.80			*
TOTAL=	676.000 *	4.80	1.64	0.66	*
	*				*

****

TIME	ENTRY *		SAND		*
45.00	676.000 *	1.64			*
	685.000 *	0.00			*
	1060.000 *	0.05			*
TOTAL=	1085.000 *	1.69	3.39	-1.00	*
	*				*

****

TIME	ENTRY *		SAND		*
45.00	1085.000 *	3.39			*
	1120.000 *	0.32			*
	1250.000 *	0.02			*
TOTAL=	1310.000 *	3.73	1.98	0.47	*
	*				*

****

TABLE SB-1.	TOTAL	LOAD BY GRAIN SIZE (TONS/DAY)				
		VF	F	M	C	VC
SEDIMENT INFLOW						
SANDS & GRAVELS	29.56	7.23	11.29	9.69	0.79	0.28
		0.17	0.12	0.00	0.00	0.00
SEDIMENT OUTFLOW						
SANDS & GRAVELS	123.78	30.63	25.85	24.65	9.10	5.43
		28.11	0.00	0.00	0.00	0.00

SECTION ID NO	BED CHANGE FEET	WS ELEV FEET	THALWEG EL FEET	Q CFS	SEDIMENT LOAD (TONS/DAY) SAND
15.000	-0.10	4474.52	4469.40	1400.	30.
25.000	-0.46	4469.20	4466.34	1400.	304.
30.000	-1.05	4457.47	4450.15	1400.	625.
35.000	-1.02	4450.67	4447.58	1400.	397.
40.000	-2.26	4449.72	4445.84	1400.	581.
45.000	0.99	4446.70	4440.09	1400.	43.
50.000	2.33	4444.15	4439.13	1400.	136.
55.000	-0.02	4437.58	4430.78	1400.	485.
60.000	-0.01	4435.44	4431.19	1400.	106.
70.000	1.07	4434.94	4428.97	1400.	340.
75.000	-0.76	4432.57	4426.74	1400.	890.
80.400	4.70	4431.60	4430.90	1400.	244.
80.100	-1.75	4431.32	4424.25	1400.	398.
85.000	0.26	4430.83	4425.26	1400.	476.
90.000	-1.21	4428.76	4422.99	1400.	558.
110.000	-1.12	4424.98	4417.58	1400.	614.
190.000	-1.00	4418.75	4412.90	1400.	724.
200.000	0.07	4413.03	4406.07	1400.	792.
205.000	-0.56	4409.49	4401.94	1400.	817.
210.000	-1.00	4406.35	4400.00	1400.	940.
220.000	0.99	4405.00	4399.89	1400.	595.
225.000	-0.40	4404.03	4399.30	1400.	936.
230.000	-0.51	4402.94	4397.79	1400.	906.
235.000	-0.90	4402.00	4394.40	1400.	990.
240.000	2.62	4401.57	4397.32	1400.	647.
250.000	-0.45	4398.86	4392.85	1400.	777.
255.000	-1.08	4396.45	4392.12	1400.	869.
260.000	-0.76	4394.46	4389.84	1400.	1021.
270.000	-0.79	4391.28	4386.51	1400.	1156.
280.000	-0.31	4388.41	4383.39	1400.	1026.
290.000	0.80	4385.70	4380.30	1400.	1072.
295.000	-0.48	4384.18	4379.32	1400.	1092.
300.000	-0.94	4381.40	4374.66	1400.	1182.
305.000	2.29	4381.37	4378.29	1400.	844.
310.000	-1.26	4380.74	4375.74	1400.	1134.
315.000	-0.66	4376.14	4369.64	1400.	1551.
320.000	-3.09	4373.82	4368.71	1400.	1692.
325.000	-1.83	4369.19	4364.67	1400.	1581.
333.000	0.57	4366.38	4362.47	1400.	1578.
335.000	1.01	4363.25	4360.21	1400.	1873.
345.000	-1.01	4360.33	4355.39	1400.	2152.
355.000	0.09	4359.17	4355.99	1400.	598.
360.000	0.38	4356.59	4350.28	1400.	2225.
365.000	1.52	4355.42	4352.22	1400.	1047.
370.000	2.14	4353.52	4349.54	1400.	862.
380.000	-0.56	4350.34	4347.14	1400.	1220.
390.000	-1.05	4346.78	4342.85	1400.	1121.

400.000	1.68	4345.35	4338.28	1400.	777.
410.000	0.71	4342.65	4337.11	1400.	1101.
415.000	0.40	4341.91	4338.50	1400.	909.
420.000	0.35	4341.24	4334.85	1400.	842.
425.000	-0.36	4340.14	4335.24	1400.	741.
435.000	0.82	4339.08	4333.42	1400.	931.
437.000	0.04	4338.35	4331.94	1400.	848.
445.000	-0.11	4336.23	4329.19	1400.	866.
453.000	-0.49	4334.19	4329.11	1400.	1158.
455.000	-1.02	4332.91	4327.28	1400.	1130.
470.000	1.19	4332.05	4326.39	1400.	1007.
475.000	1.63	4330.69	4326.13	1400.	1129.
480.000	-0.44	4329.30	4322.46	1400.	1125.
480.100	-0.54	4328.28	4321.56	1400.	1199.
485.000	3.03	4327.50	4324.43	1400.	700.
495.000	-0.01	4326.74	4320.09	1400.	644.
497.000	-0.77	4325.55	4321.23	1400.	709.
505.000	-0.18	4324.42	4318.82	1400.	717.
510.000	0.13	4324.11	4320.43	1400.	562.
515.000	0.01	4322.43	4318.11	1400.	464.
535.000	0.64	4320.69	4313.94	1400.	338.
540.000	-0.13	4320.11	4314.67	1400.	329.
550.000	-0.50	4317.80	4312.00	1400.	365.
555.000	0.14	4317.16	4311.54	1400.	346.
561.000	0.45	4316.60	4310.55	1400.	307.
565.000	0.04	4315.55	4309.84	1400.	305.
575.000	0.18	4314.50	4308.38	1400.	302.
590.000	-1.17	4312.84	4308.33	1400.	432.
595.000	1.47	4311.95	4307.47	1400.	350.
600.000	-0.62	4311.42	4305.18	1400.	391.
610.000	0.72	4310.65	4300.62	1400.	376.
615.000	0.43	4310.01	4303.83	1400.	365.
621.000	0.84	4309.77	4303.94	1400.	321.
625.000	0.25	4309.41	4301.65	1400.	294.
630.000	-0.59	4308.36	4305.61	1400.	294.
640.000	-2.47	4306.28	4300.33	1400.	459.
650.000	0.61	4305.13	4299.51	1400.	350.
655.000	0.46	4303.38	4298.96	1400.	678.
660.000	2.15	4303.08	4297.15	1400.	418.
670.000	2.71	4302.43	4294.71	1400.	206.
673.000	-0.16	4302.03	4293.14	1400.	218.
676.000	0.33	4301.80	4293.93	1400.	185.
685.000	-0.16	4297.67	4291.94	1300.	184.
690.000	-0.63	4296.61	4290.67	1300.	258.
695.000	-0.11	4296.28	4290.69	1300.	257.
700.000	-0.26	4295.40	4286.94	1300.	293.
705.000	-0.11	4294.98	4288.19	1300.	281.
710.000	-0.85	4294.27	4286.95	1300.	352.
715.000	1.21	4294.08	4286.71	1300.	341.
720.000	-0.65	4293.87	4287.75	1300.	364.
725.000	0.05	4293.46	4287.85	1300.	311.
730.000	-0.54	4292.76	4285.76	1300.	426.
735.000	0.00	4291.67	4286.20	1300.	388.
740.000	-0.42	4291.22	4285.58	1300.	388.
745.000	-0.14	4290.83	4286.36	1300.	394.
750.000	-0.11	4290.23	4285.09	1300.	358.
760.000	-0.52	4289.04	4282.08	1300.	492.
770.000	-0.18	4288.14	4281.92	1300.	398.
780.000	1.34	4286.97	4279.14	1300.	262.
790.000	-0.20	4285.23	4276.30	1300.	292.

800.000	-0.08	4284.19	4275.12	1300.	272.
805.000	0.00	4283.75	4278.10	1300.	291.
810.000	-1.06	4282.62	4276.54	1300.	348.
815.000	-0.92	4282.19	4274.88	1300.	407.
820.000	-0.75	4281.98	4273.65	1300.	426.
835.000	0.20	4279.39	4273.20	1300.	356.
840.000	-0.67	4278.30	4269.23	1300.	366.
845.100	0.83	4278.18	4271.33	1300.	340.
850.000	-0.62	4277.85	4269.48	1300.	423.
860.000	-0.11	4276.09	4269.59	1300.	411.
870.000	0.70	4275.15	4267.80	1300.	323.
880.000	0.16	4273.96	4266.66	1300.	278.
890.000	-0.23	4272.18	4264.17	1300.	311.
900.000	-0.39	4271.24	4264.11	1300.	387.
903.100	-1.96	4269.89	4266.24	1300.	451.
904.000	0.63	4267.69	4260.63	1300.	495.
905.000	1.55	4267.59	4259.15	1300.	323.
912.000	-0.44	4267.07	4261.16	1300.	376.
913.000	-0.07	4265.92	4260.33	1300.	364.
923.000	-0.14	4265.08	4259.56	1300.	366.
925.000	-0.01	4264.65	4259.09	1300.	390.
930.000	-0.53	4263.83	4257.97	1300.	447.
935.000	-0.17	4263.55	4257.43	1300.	482.
940.100	-0.04	4263.03	4258.76	1300.	462.
940.000	-0.92	4262.15	4258.18	1300.	550.
950.000	-0.49	4260.79	4255.81	1300.	531.
955.000	0.49	4259.55	4254.69	1300.	489.
957.100	0.36	4258.82	4248.36	1300.	513.
960.000	1.06	4258.86	4252.86	1300.	351.
965.000	-0.15	4258.32	4252.65	1300.	374.
970.000	-0.70	4257.42	4250.80	1300.	412.
975.000	-0.50	4256.59	4251.60	1300.	402.
980.000	0.16	4255.27	4248.46	1300.	526.
985.000	-0.12	4254.62	4248.98	1300.	506.
990.000	-0.30	4253.73	4245.60	1300.	543.
995.100	0.17	4253.35	4245.07	1300.	583.
1000.000	-0.03	4253.20	4249.17	1300.	542.
1005.000	-0.19	4252.03	4247.71	1300.	555.
1010.000	-0.02	4251.33	4245.68	1300.	494.
1020.000	0.01	4250.25	4245.01	1300.	396.
1030.000	0.44	4249.45	4243.44	1300.	301.
1035.000	-0.88	4249.08	4242.52	1300.	371.
1040.000	0.33	4248.99	4244.93	1300.	202.
1050.000	-0.07	4248.50	4238.63	1300.	179.
1055.000	0.84	4248.46	4242.94	1300.	99.
1060.000	1.59	4248.17	4237.69	1550.	193.
1070.000	3.16	4247.97	4237.46	1550.	250.
1075.000	0.12	4247.86	4239.12	1550.	188.
1077.000	0.28	4247.78	4239.48	1550.	112.
1083.200	-0.12	4247.72	4237.48	1550.	142.
1085.000	0.01	4246.52	4242.01	1550.	200.
1087.200	-0.12	4241.98	4234.08	1550.	252.
1087.000	-0.03	4242.00	4233.97	1550.	277.
1090.000	-0.45	4241.47	4234.55	1550.	340.
1095.100	0.14	4240.97	4234.54	1550.	302.
1097.000	0.03	4240.72	4233.53	1550.	282.
1107.000	0.10	4240.00	4231.50	1550.	259.
1110.000	-0.72	4239.34	4234.08	1550.	340.
1120.000	0.61	4238.14	4231.51	1750.	329.
1125.000	0.13	4237.84	4226.93	1750.	346.

1130.000	0.20	4236.95	4227.90	1750.	269.
1140.000	0.38	4236.31	4223.28	1750.	269.
1145.000	-0.21	4235.26	4229.69	1750.	269.
1150.000	0.26	4235.19	4222.16	1750.	271.
1160.000	-0.43	4235.04	4228.57	1750.	278.
1165.000	0.19	4234.65	4224.99	1750.	237.
1170.000	-0.05	4233.71	4225.35	1750.	211.
1180.000	0.28	4232.91	4221.88	1750.	225.
1185.000	-0.01	4232.56	4223.09	1750.	216.
1190.000	-0.13	4232.42	4223.67	1750.	210.
1200.000	0.25	4231.53	4221.75	1750.	211.
1205.000	0.01	4231.36	4223.81	1750.	202.
1207.100	0.36	4231.26	4224.76	1750.	173.
1210.000	-0.13	4231.13	4224.37	1750.	170.
1220.000	-0.12	4230.74	4223.58	1750.	166.
1230.000	-0.13	4229.85	4221.47	1750.	166.
1235.000	-0.01	4229.51	4218.49	1750.	203.
1240.000	0.41	4229.31	4217.41	1750.	150.
1250.000	-0.02	4228.26	4221.18	1800.	136.
1260.000	0.07	4227.91	4221.07	1800.	120.
1265.000	-0.14	4227.76	4222.86	1800.	120.
1270.000	0.27	4227.54	4218.57	1800.	110.
1280.000	-0.04	4227.33	4219.56	1800.	107.
1290.000	0.02	4226.98	4218.32	1800.	100.
1295.000	-0.10	4226.86	4220.80	1800.	107.
1300.000	-0.14	4226.67	4220.66	1800.	107.
1300.400	-0.14	4226.51	4220.16	1800.	107.
1300.100	0.02	4226.44	4219.82	1800.	122.
1305.000	-0.14	4226.02	4220.26	1800.	122.
1310.400	-0.14	4225.77	4218.16	1800.	122.
1310.100	-0.09	4225.70	4218.01	1800.	123.
1310.000	-0.11	4225.58	4217.99	1800.	124.

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* A FLOW 3=1500

COMPUTING FROM TIME= 45.000000 DAYS TO TIME= 5.000000 DAYS IN -3 COMPUTATION STEPS

** Q BELOW TABLE ** **INL(

WATER DISCHARGE, WATER-SEDIMENT LOAD TABLE ENDPOINT 0.00 1.00 0.060000

TABLE SA-1. TRAP EFFICIENCY ON STREAM SEGMENT # 1

JORDAN RIVER SEDIMENT TRANSPORT STUDY SALT LAKE COUNTY

ACCUMULATED AC-FT ENTERING AND LEAVING THIS STREAM SEGMENT

TIME DAYS	ENTRY POINT	INFLOW	SAND OUTFLOW	TRAP EFF
55.00	15.000	0.65		
TOTAL=	80.400	0.65	6.48	-9.03

TIME	ENTRY		SAND	
55.00	80.400	6.48		
TOTAL=	676.000	6.48	2.26	0.65

TIME	ENTRY		SAND	

```
   55.00    676.000 *      2.26                        *
            685.000 *      0.00                        *
           1060.000 *      0.07                        *
  TOTAL=   1085.000 *      2.33       4.07     -0.75   *
                    *                                  *
*******************************************************
   TIME       ENTRY *             SAND                 *
   55.00   1085.000 *      4.07                        *
           1120.000 *      0.43                        *
           1250.000 *      0.03                        *
  TOTAL=   1310.000 *      4.53       2.45      0.46   *
                    *                                  *
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*    A    FLOW 2=1200

COMPUTING FROM TIME=    55.000000 DAYS TO TIME=     5.000000 DAYS IN        -3 COMPUTATION STEPS

** Q BELOW TABLE **
**WATER DISCHARGE, WATER-SEDIMENT LOAD TABLE ENDPOINT**          0.00           1.00          0.060000

TABLE SA-1. TRAP EFFICIENCY ON STREAM SEGMENT #  1
            JORDAN RIVER SEDIMENT TRANSPORT STUDY SALT LAKE COUNTY
            ACCUMULATED AC-FT ENTERING AND LEAVING THIS STREAM SEGMENT
*******************************************************
                    *                                  *
   TIME       ENTRY *             SAND                 *
   DAYS       POINT *    INFLOW   OUTFLOW   TRAP EFF   *
                    *                                  *
   70.00     15.000 *      0.82                        *
  TOTAL=     80.400 *      0.82       6.48     -6.90   *
                    *                                  *
*******************************************************
   TIME       ENTRY *             SAND                 *
   70.00     80.400 *      6.48                        *
  TOTAL=    676.000 *      6.48       3.09      0.52   *
                    *                                  *
*******************************************************
   TIME       ENTRY *             SAND                 *
   70.00    676.000 *      3.09                        *
            685.000 *     -0.01                        *
           1060.000 *      0.08                        *
  TOTAL=   1085.000 *      3.17       4.24     -0.34   *
                    *                                  *
*******************************************************
   TIME       ENTRY *             SAND                 *
   70.00   1085.000 *      4.24                        *
           1120.000 *      0.51                        *
           1250.000 *      0.03                        *
  TOTAL=   1310.000 *      4.78       2.92      0.39   *
                    *                                  *
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*    B    FLOW 1=900

BOUNDARY CONDITION DATA, CONTROL POINT NO.  1
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 TIME STEP NO.      7
WATER    DISCHARGE=     900.00
         ELEVATION=   4223.710
       TEMPERATURE=     68.000
FLOW DURATION(DAYS)  15.00
** Q BELOW TABLE **
**WATER DISCHARGE, WATER-SEDIMENT LOAD TABLE ENDPOINT**          0.00          1.00          0.060000                    **INL
```

TABLE SA-1. TRAP EFFICIENCY ON STREAM SEGMENT # 1
JORDAN RIVER SEDIMENT TRANSPORT STUDY SALT LAKE COUNTY
ACCUMULATED AC-FT ENTERING AND LEAVING THIS STREAM SEGMENT

TIME DAYS	ENTRY POINT	INFLOW	SAND OUTFLOW	TRAP EFF
85.00	15.000	0.96		
TOTAL=	80.400	0.96	6.48	-5.79

TIME	ENTRY		SAND	
85.00	80.400	6.48		
TOTAL=	676.000	6.48	3.39	0.48

TIME	ENTRY		SAND	
85.00	676.000	3.39		
	685.000	-0.D1		
	1060.000	0.09		
TOTAL=	1085.000	3.48	4.78	-0.37

TIME	ENTRY		SAND	
85.00	1085.00D	4.78		
	1120.000	0.56		
	1250.000	0.04		
TOTAL=	1310.000	5.38	3.23	0.40

TABLE SB-1.	TOTAL	LOAD BY GRAIN SIZE (TONS/DAY)				
		VF	F	M	C	VC
SEDIMENT INFLOW						
SANDS & GRAVELS	18.11	4.35	7.22	6.50	0.02	0.01
		0.01	0.00	0.00	0.00	0.00
SEDIMENT OUTFLOW						
SANDS & GRAVELS	41.37	14.49	12.37	10.69	3.22	0.60
		0.00	0.00	0.00	0.00	0.00

SECTION ID NO	BED CHANGE FEET	WS ELEV FEET	THALWEG EL FEET	Q CFS	SEDIMENT LOAD (TONS/DAY) SAND
15.000	-0.10	4473.73	4469.40	800.	18.
25.000	-0.86	4468.04	4465.94	800.	69.
30.000	-1.35	4457.18	4449.85	800.	95.
35.000	-1.65	4450.15	4446.95	800.	363.
40.000	-3.96	4447.17	4444.14	800.	92.
45.000	-0.34	4446.08	4438.76	800.	133.
50.000	2.84	4444.48	4439.64	800.	303.
55.000	0.31	4437.56	4431.11	800.	619.

60.000	3.09	4436.36	4434.29	800.	51.
70.000	2.14	4436.40	4430.04	800.	1.
75.000	-0.51	4436.40	4426.99	800.	0.
80.400	0.00	4436.36	4426.20	800.	0.
80.100	-2.70	4436.36	4423.30	800.	136.
85.000	0.25	4429.34	4425.25	800.	136.
90.000	-1.68	4427.00	4422.52	800.	156.
110.000	-1.94	4422.60	4416.76	800.	172.
190.000	-1.86	4416.67	4412.04	800.	203.
200.000	-0.06	4410.95	4405.94	800.	192.
205.000	-0.82	4407.66	4401.68	800.	190.
210.000	-1.01	4404.90	4399.99	800.	190.
220.000	0.45	4403.16	4399.35	800.	163.
225.000	-0.42	4402.52	4399.28	800.	175.
230.000	-0.65	4401.54	4397.65	800.	183.
235.000	-0.56	4401.09	4394.74	800.	159.
240.000	2.38	4400.61	4397.08	800.	130.
250.000	-0.74	4397.31	4392.56	800.	155.
255.000	-1.78	4394.63	4391.42	800.	171.
260.000	-1.60	4392.20	4389.00	800.	190.
270.000	-1.61	4389.73	4385.69	800.	223.
280.000	-0.29	4387.50	4383.41	800.	212.
290.000	0.85	4384.50	4380.35	800.	261.
295.000	-0.52	4383.26	4379.28	800.	239.
300.000	-0.92	4379.11	4374.68	800.	265.
305.000	-0.95	4379.04	4375.05	800.	265.
310.000	-1.69	4378.20	4375.31	800.	268.
315.000	-0.84	4374.35	4369.46	800.	309.
320.000	-3.48	4373.05	4368.32	800.	360.
325.000	-1.90	4367.65	4364.60	800.	379.
333.000	0.01	4365.36	4361.91	800.	309.
335.000	-0.43	4362.21	4358.77	800.	798.
345.000	0.33	4360.51	4356.73	800.	405.
355.000	-1.00	4357.79	4354.90	800.	921.
360.000	2.56	4356.57	4352.46	800.	84.
365.000	2.21	4355.86	4352.91	800.	279.
370.000	1.86	4352.84	4349.26	800.	303.
380.000	-0.92	4349.12	4346.78	800.	408.
390.000	-0.73	4346.60	4343.17	800.	284.
400.000	-0.84	4343.79	4335.76	800.	792.
410.000	3.74	4342.60	4340.14	800.	136.
415.000	-0.17	4341.76	4337.93	800.	424.
420.000	1.56	4340.68	4336.06	800.	283.
425.000	-0.45	4338.76	4335.15	800.	327.
435.000	0.77	4337.79	4333.37	800.	237.
437.000	-0.21	4337.11	4331.69	800.	299.
445.000	-0.25	4334.99	4329.05	800.	321.
453.000	-0.57	4332.95	4329.03	800.	363.
455.000	-1.08	4331.82	4327.22	800.	374.
470.000	1.17	4331.11	4326.37	800.	372.
475.000	0.80	4329.51	4325.30	800.	473.
480.000	-0.41	4328.11	4322.49	800.	470.
480.100	-0.03	4327.44	4322.07	800.	428.
485.000	3.34	4326.68	4324.74	800.	317.
495.000	-0.04	4325.74	4320.06	800.	321.
497.000	-0.83	4324.80	4321.17	800.	355.
505.000	0.49	4324.11	4319.49	800.	294.
510.000	0.56	4323.81	4320.86	800.	276.
515.000	0.20	4321.89	4318.30	800.	289.
535.000	1.53	4319.74	4314.83	800.	226.

540.000	-0.14	4318.90	4314.66	800.	231.
550.000	-0.57	4316.72	4311.93	800.	226.
555.000	0.49	4316.22	4311.89	800.	197.
561.000	0.90	4315.62	4311.00	800.	164.
565.000	-0.03	4314.45	4309.77	800.	170.
575.000	0.22	4313.32	4308.42	800.	171.
590.000	-1.45	4311.81	4308.05	800.	197.
595.000	1.09	4310.49	4307.09	800.	280.
600.000	-0.82	4309.87	4304.98	800.	297.
610.000	1.98	4309.21	4301.88	800.	152.
615.000	0.63	4308.64	4304.03	800.	155.
621.000	1.12	4308.36	4304.22	800.	159.
625.000	0.56	4307.98	4301.96	800.	134.
630.000	-1.34	4306.96	4304.86	800.	192.
640.000	-2.61	4305.03	4300.19	800.	187.
650.000	0.50	4303.86	4299.40	800.	194.
655.000	1.18	4302.83	4299.68	800.	150.
660.000	2.33	4302.62	4297.33	800.	135.
670.000	4.30	4302.08	4296.30	800.	67.
673.000	-0.08	4301.91	4293.22	800.	62.
676.000	1.42	4301.80	4295.02	800.	41.
685.000	-0.16	4296.18	4291.94	750.	41.
690.000	-1.13	4294.93	4290.17	750.	62.
695.000	-0.11	4294.48	4290.69	750.	62.
700.000	-0.61	4293.74	4286.59	750.	85.
705.000	-0.07	4293.32	4288.23	750.	81.
710.000	-1.13	4292.82	4286.67	750.	92.
715.000	1.07	4292.69	4286.57	750.	86.
720.000	-0.98	4292.51	4287.42	750.	108.
725.000	-0.07	4292.08	4287.73	750.	107.
730.000	-0.54	4291.43	4285.76	750.	107.
735.000	-0.04	4290.42	4286.16	750.	109.
740.000	-0.91	4290.06	4285.09	750.	109.
745.000	-0.14	4289.72	4286.36	750.	109.
750.000	-0.15	4288.85	4285.05	750.	109.
760.000	-0.52	4287.60	4282.08	750.	109.
770.000	-0.29	4286.52	4281.81	750.	117.
780.000	1.61	4285.02	4279.41	750.	112.
790.000	-0.52	4283.34	4275.98	750.	137.
800.000	0.00	4282.42	4275.20	750.	132.
805.000	-0.15	4281.88	4277.95	750.	132.
810.000	-1.69	4280.93	4275.91	750.	142.
815.000	-0.47	4280.66	4275.33	750.	138.
820.000	-0.95	4280.49	4273.45	750.	145.
835.000	0.09	4277.70	4273.09	750.	149.
840.000	-0.89	4276.73	4269.01	750.	152.
845.100	0.28	4276.40	4270.78	750.	172.
850.000	-0.81	4276.17	4269.29	750.	166.
860.000	-0.10	4274.57	4269.60	750.	166.
870.000	0.98	4273.44	4268.08	750.	145.
880.000	0.21	4272.08	4266.71	750.	150.
890.000	-0.43	4270.43	4263.97	750.	161.
900.000	-0.80	4269.79	4263.70	750.	174.
903.100	-0.81	4268.75	4267.39	750.	146.
904.000	2.34	4266.48	4262.34	750.	127.
905.000	0.72	4266.22	4258.32	750.	168.
912.000	-0.75	4265.69	4260.85	750.	204.
913.000	-0.05	4264.56	4260.35	750.	204.
923.000	-0.14	4263.62	4259.56	750.	203.
925.000	-0.02	4263.18	4259.08	750.	190.

930.000	-1.05	4262.52	4257.45	750.	221.
935.000	-0.17	4262.33	4257.43	750.	213.
940.100	-0.10	4261.78	4258.70	750.	213.
940.000	-1.40	4261.04	4257.70	750.	233.
950.000	-0.46	4259.81	4255.84	750.	232.
955.000	0.42	4258.22	4254.62	750.	240.
957.100	1.94	4257.77	4249.94	750.	147.
960.000	0.77	4257.64	4252.57	750.	190.
965.000	-0.13	4256.98	4252.67	750.	188.
970.000	-0.82	4256.38	4250.68	750.	191.
975.000	-0.49	4255.52	4251.61	750.	234.
980.000	0.47	4254.36	4248.77	750.	235.
985.000	-0.14	4253.59	4248.96	750.	279.
990.000	0.08	4252.89	4245.98	750.	256.
995.100	1.00	4252.68	4245.90	750.	250.
1000.000	0.25	4252.56	4249.45	750.	242.
1005.000	0.11	4251.99	4248.01	750.	195.
1010.000	0.54	4251.78	4246.24	750.	76.
1020.000	0.18	4251.59	4245.18	750.	19.
1030.000	0.30	4251.51	4243.30	750.	8.
1035.000	-0.84	4251.48	4242.56	750.	7.
1040.000	0.30	4251.48	4244.90	750.	1.
1050.000	-0.02	4251.46	4238.68	750.	1.
1055.000	1.07	4251.46	4243.17	750.	0.
1060.000	2.06	4251.40	4238.16	825.	4.
1070.000	2.41	4251.39	4236.71	825.	3.
1075.000	0.03	4251.38	4239.03	825.	2.
1077.000	0.51	4251.38	4239.71	825.	1.
1083.200	-0.01	4251.37	4237.59	825.	5.
1085.000	0.00	4248.96	4226.57	825.	73.
1087.200	0.77	4240.10	4234.97	825.	63.
1087.000	0.07	4240.08	4234.07	825.	50.
1090.000	-0.81	4239.76	4234.19	825.	57.
1095.100	0.09	4239.26	4234.49	825.	54.
1097.000	-0.02	4239.02	4233.48	825.	44.
1107.000	0.05	4238.41	4231.45	825.	35.
1110.000	-1.06	4237.57	4233.74	825.	70.
1120.000	0.47	4235.94	4231.37	875.	69.
1125.000	0.04	4235.69	4226.84	875.	73.
1130.000	0.19	4234.77	4227.89	875.	91.
1140.000	0.61	4234.22	4223.51	875.	77.
1145.000	-0.21	4233.36	4229.69	875.	77.
1150.000	0.25	4233.32	4222.15	875.	77.
1160.000	-0.62	4233.13	4228.38	875.	85.
1165.000	0.16	4232.62	4224.96	875.	96.
1170.000	-0.08	4231.47	4225.32	875.	109.
1180.000	0.61	4230.80	4222.21	875.	73.
1185.000	-0.05	4230.54	4223.05	875.	74.
1190.000	-0.15	4230.33	4223.65	875.	76.
1200.000	0.35	4229.45	4221.85	875.	69.
1205.000	-0.08	4229.30	4223.72	875.	72.
1207.100	0.40	4229.14	4224.80	875.	79.
1210.000	-0.14	4229.01	4224.36	875.	79.
1220.000	-0.13	4228.58	4223.57	875.	81.
1230.000	-0.12	4227.69	4221.48	875.	81.
1235.000	0.06	4227.39	4218.56	875.	75.
1240.000	0.63	4227.24	4217.63	875.	45.
1250.000	-0.04	4226.39	4221.16	900.	53.
1260.000	0.10	4226.05	4221.10	900.	53.
1265.000	-0.14	4225.89	4222.86	900.	53.

1270.000	0.42	4225.69	4218.72	900.	37.
1280.000	-0.07	4225.51	4219.53	900.	41.
1290.000	0.04	4225.17	4218.34	900.	41.
1295.000	-0.13	4225.04	4220.77	900.	42.
1300.000	-0.14	4224.83	4220.66	900.	42.
1300.400	-0.14	4224.67	4220.16	900.	42.
1300.100	-0.03	4224.61	4219.77	900.	42.
1305.000	-0.14	4224.14	4220.26	900.	42.
1310.400	-0.14	4223.87	4218.16	900.	42.
1310.100	-0.12	4223.81	4217.98	900.	41.
1310.000	-0.13	4223.71	4217.97	900.	41.

....

$$END

0 DATA ERRORS DETECTED.

TOTAL NO. OF TIME STEPS READ = 7
TOTAL NO. OF WS PROFILES = 7
ITERATIONS IN EXNER EQ = 6965.
END OF JOB

JOB COMPLETED
RUN TIME = 0 HOURS, 4 MINUTES & 47.76 SECONDS

SIMULATED 100-YR FLOOD OR 1984-TYPE EVENT

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*****************************************************    ************************************
* SCOUR AND DEPOSITION IN RIVERS AND RESERVOIRS  *        * U.S. ARMY CORPS OF ENGINEERS     *
*      Version: 4.0.6  -  June 1991              *        * HYDROLOGIC ENGINEERING CENTER    *
* INPUT FILE:  j2x                               *        * 609 SECOND STREET                *
* OUTPUT FILE: j2x.out                           *        * DAVIS, CALIFORNIA 95616-4687     *
* RUN DATE:       RUN TIME:        *     *  (916) 756-1104                  *
*****************************************************    ************************************

                    X     X  XXXXXXX   XXXXX          XXXXX
                    X     X  X         X    X        X     X
                    X     X  X         X             X
                    XXXXXXX  XXXX      X       XXXXX  XXXXXX
                    X     X  X         X             X     X
                    X     X  X         X    X        X     X
                    X     X  XXXXXXX   XXXXX          XXXXX

     ***********************************************************************
     * MAXIMUM LIMITS FOR THIS VERSION ARE:                                *
     *       10  Stream Segments (Main Stem + Tributaries)                 *
     *      300  Cross Sections                                            *
     *      100  Elevation/Station Points per Cross Section                *
     *       15  Grain Sizes                                               *
     *       10  Control Points                                            *
     ***********************************************************************
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T1 JORDAN RIVER SEDIMENT TRANSPORT STUDY SALT LAKE COUNTY
T2 17TH SOUTH TO D/S OF TURNER DAM
T3 GENENERAL SCOUR WITHOUT BRIDGES FILE:J2.H6

NC 0.0750 0.0750 0.0470 0.3000 0.5000

SECTION NO. 1 RIVER MILE= 1310.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO. 2 RIVER MILE= 1310.100
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO. 3 RIVER MILE= 1310.400
...Add 0.20 (ft) to each Elevation(Y)
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO. 4 RIVER MILE= 1305.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO. 5 RIVER MILE= 1300.100
...Add -0.50 (ft) to each Elevation(Y)
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO. 6 RIVER MILE= 1300.400
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0750 0.0750 0.0470 0.0000 0.0000

SECTION NO. 7 RIVER MILE= 1300.000
...Add 0.50 (ft) to each Elevation(Y)
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0750 0.0750 0.0260 0.0000 0.0000

SECTION NO. 8 RIVER MILE= 1295.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO. 9 RIVER MILE= 1290.000

...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO. 10 RIVER MILE= 1280.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0750 0.0750 0.0300 0.0000 0.0000

SECTION NO. 11 RIVER MILE= 1270.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0750 0.0750 0.0280 0.0000 0.0000

SECTION NO. 12 RIVER MILE= 1265.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO. 13 RIVER MILE= 1260.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.1000 0.1000 0.0320 0.0000 0.0000

SECTION NO. 14 RIVER MILE= 1250.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

Local Inflow Point 1 occurs just downstream from X-Section No. 15

NC 0.1000 0.1000 0.0400 0.0000 0.0000

SECTION NO. 15 RIVER MILE= 1240.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.1000 0.1000 0.0320 0.0000 0.0000

SECTION NO. 16 RIVER MILE= 1235.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO. 17 RIVER MILE= 1230.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO. 18 RIVER MILE= 1220.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0750 0.0750 0.0280 0.0000 0.0000

SECTION NO. 19 RIVER MILE= 1210.000
...Add -0.50 (ft) to each Elevation(Y)
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO. 20 RIVER MILE= 1207.100
...Add 5.60 (ft) to each Elevation(Y)
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.1000 0.1000 0.0320 0.0000 0.0000

SECTION NO. 21 RIVER MILE= 1205.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO. 22 RIVER MILE= 1200.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.1000 0.1000 0.0410 0.0000 0.0000

SECTION NO. 23 RIVER MILE= 1190.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.1000 0.1000 0.0350 0.0000 0.0000

SECTION NO. 24 RIVER MILE= 1185.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO. 25 RIVER MILE= 1180.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

```
NC 0.1000  0.1000  0.0360  0.0000  0.0000

SECTION NO. 26 RIVER MILE=   1170.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0750  0.0750  0.0450  0.0000  0.0000

SECTION NO. 27 RIVER MILE=   1165.000
...Multiply all Stations(X) by      0.97
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

SECTION NO. 28 RIVER MILE=   1160.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0750  0.0750  0.0500  0.0000  0.0000

SECTION NO. 29 RIVER MILE=   1150.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.1250  0.1250  0.0400  0.0000  0.0000

SECTION NO. 30 RIVER MILE=   1145.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

SECTION NO. 31 RIVER MILE=   1140.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.1000  0.1000  0.0390  0.0000  0.0000

SECTION NO. 32 RIVER MILE=   1130.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.1000  0.1000  0.0410  0.0000  0.0000

SECTION NO. 33 RIVER MILE=   1125.000
...Multiply all Stations(X) by      0.91
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

SECTION NO. 34 RIVER MILE=   1120.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

Local Inflow Point  2 occurs just downstream from X-Section No.    35

NC 0.1000  0.1000  0.0360  0.0000  0.0000

SECTION NO. 35 RIVER MILE=   1110.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0750  0.0750  0.0400  0.0000  0.0000

SECTION NO. 36 RIVER MILE=   1107.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0750  0.0750  0.0420  0.0000  0.0000

SECTION NO. 37 RIVER MILE=   1097.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

SECTION NO. 38 RIVER MILE=   1095.100
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.1000  0.1000  0.0460  0.0000  0.0000

SECTION NO. 39 RIVER MILE=   1090.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.1000  0.1000  0.0280  0.0000  0.0000

SECTION NO. 40 RIVER MILE=   1087.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

SECTION NO. 41 RIVER MILE=   1087.200
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...Add     0.20 (ft) to each Elevation(Y)
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0000  0.0000  0.0150  0.0000  0.0000

SECTION NO. 42 RIVER MILE=   1085.000
...Hydraulic Control Point #  1
   Water Surface Elevation will be read from R-RECORD..Field  2
   Head Loss Criteria =     0.00
...Set the Depth (ft) of the Bed Sediment Reservoir to      0.00

NC 0.0000  0.0000  0.0300  0.0000  0.0000

SECTION NO. 43 RIVER MILE=   1083.200
...Set the Depth (ft) of the Bed Sediment Reservoir to      5.00

NC 0.0000  0.0000  0.0280  0.0000  0.0000

SECTION NO. 44 RIVER MILE=   1077.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

SECTION NO. 45 RIVER MILE=   1075.000
...Add    -1.00 (ft) to each Elevation(Y)
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

SECTION NO. 46 RIVER MILE=   1070.000
...Add     1.00 (ft) to each Elevation(Y)
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.1000  0.1000  0.0300  0.0000  0.0000

SECTION NO. 47 RIVER MILE=   1060.000
...Add     1.00 (ft) to each Elevation(Y)
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

Local Inflow Point  3 occurs just downstream from X-Section No.    48

NC 0.1000  0.1000  0.0250  0.0000  0.0000

SECTION NO. 48 RIVER MILE=   1055.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      2.00

SECTION NO. 49 RIVER MILE=   1050.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      2.00

NC 0.1000  0.1000  0.0250  0.0000  0.0000

SECTION NO. 50 RIVER MILE=   1040.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.1000  0.1000  0.0250  0.0000  0.0000

SECTION NO. 51 RIVER MILE=   1035.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

SECTION NO. 52 RIVER MILE=   1030.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.1000  0.1000  0.0290  0.0000  0.0000

SECTION NO. 53 RIVER MILE=   1020.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.1000  0.1000  0.0280  0.0000  0.0000

SECTION NO. 54 RIVER MILE=   1010.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0750  0.0750  0.0350  0.0000  0.0000

SECTION NO. 55 RIVER MILE=   1005.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00
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SECTION NO. 56 RIVER MILE=   1000.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.1000  0.1000  0.0480  0.3000  0.5000

SECTION NO. 57 RIVER MILE=    995.100
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.1000  0.1000  0.0400  0.0000  0.0000

SECTION NO. 58 RIVER MILE=    990.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.1000  0.1000  0.0350  0.0000  0.0000

SECTION NO. 59 RIVER MILE=    985.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

SECTION NO. 60 RIVER MILE=    980.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.1000  0.1000  0.0440  0.0000  0.0000

SECTION NO. 61 RIVER MILE=    975.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

SECTION NO. 62 RIVER MILE=    970.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.1000  0.1000  0.0400  0.0000  0.0000

SECTION NO. 63 RIVER MILE=    965.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

SECTION NO. 64 RIVER MILE=    960.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0000  0.0000  0.0350  0.0000  0.0000

SECTION NO. 65 RIVER MILE=    957.100
...Add     1.00 (ft) to each Elevation(Y)
...Set the Depth (ft) of the Bed Sediment Reservoir to      4.00

NC 0.1000  0.1000  0.0380  0.0000  0.0000

SECTION NO. 66 RIVER MILE=    955.000
...Multiply all Stations(X) by     0.88
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0000  0.0000  0.0330  0.0000  0.0000

SECTION NO. 67 RIVER MILE=    950.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.1000  0.1000  0.0290  0.0000  0.0000

SECTION NO. 68 RIVER MILE=    940.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.1000  0.1000  0.0400  0.0000  0.0000

SECTION NO. 69 RIVER MILE=    940.100
...Add    -0.30 (ft) to each Elevation(Y)
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

SECTION NO. 70 RIVER MILE=    935.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

SECTION NO. 71 RIVER MILE=    930.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00
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NC 0.1000  0.1000  0.0320  0.0000  0.0000

SECTION NO. 72 RIVER MILE=    925.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

SECTION NO. 73 RIVER MILE=    923.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.1000  0.1000  0.0380  0.0000  0.0000

SECTION NO. 74 RIVER MILE=    913.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

SECTION NO. 75 RIVER MILE=    912.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

SECTION NO. 76 RIVER MILE=    905.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0500  0.0500  0.0200  0.0000  0.0000

SECTION NO. 77 RIVER MILE=    904.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      0.00

SECTION NO. 78 RIVER MILE=    903.100
...Set the Depth (ft) of the Bed Sediment Reservoir to      2.00

NC 0.1000  0.1000  0.0300  0.0000  0.0000

SECTION NO. 79 RIVER MILE=    900.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.1000  0.1000  0.0400  0.0000  0.0000

SECTION NO. 80 RIVER MILE=    890.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.1000  0.1000  0.0500  0.0000  0.0000

SECTION NO. 81 RIVER MILE=    880.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.1000  0.1000  0.0480  0.0000  0.0000

SECTION NO. 82 RIVER MILE=    870.000
...Add    -1.00 (ft) to each Elevation(Y)
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.1000  0.1000  0.0310  0.0000  0.0000

SECTION NO. 83 RIVER MILE=    860.000
...Add    -2.00 (ft) to each Elevation(Y)
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.1000  0.1000  0.0450  0.0000  0.0000

SECTION NO. 84 RIVER MILE=    850.000
...Add     1.00 (ft) to each Elevation(Y)
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

SECTION NO. 85 RIVER MILE=    845.100
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.1000  0.1000  0.0450  0.0000  0.0000

SECTION NO. 86 RIVER MILE=    840.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.1000  0.1000  0.0380  0.0000  0.0000

SECTION NO. 87 RIVER MILE=    835.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00
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NC 0.1000  0.1000  0.0500  0.0000  0.0000

SECTION NO. 88 RIVER MILE=    820.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

SECTION NO. 89 RIVER MILE=    815.000
...Add    -1.70 (ft) to each Elevation(Y)
...Set the Depth (ft) of the Bed Sediment Reservoir to      4.00

NC 0.0000  0.0000  0.0450  0.0000  0.0000

SECTION NO. 90 RIVER MILE=    810.000
...Add     2.00 (ft) to each Elevation(Y)
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0000  0.0000  0.0400  0.0000  0.0000

SECTION NO. 91 RIVER MILE=    805.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

SECTION NO. 92 RIVER MILE=    800.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0000  0.0000  0.0370  0.0000  0.0000

SECTION NO. 93 RIVER MILE=    790.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0000  0.0000  0.0560  0.0000  0.0000

SECTION NO. 94 RIVER MILE=    780.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0000  0.0000  0.0420  0.0000  0.0000

SECTION NO. 95 RIVER MILE=    770.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0000  0.0000  0.0300  0.0000  0.0000

SECTION NO. 96 RIVER MILE=    760.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

SECTION NO. 97 RIVER MILE=    750.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0000  0.0000  0.0360  0.0000  0.0000

SECTION NO. 98 RIVER MILE=    745.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

SECTION NO. 99 RIVER MILE=    740.000
...Add    -1.50 (ft) to each Elevation(Y)
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0000  0.0000  0.0340  0.0000  0.0000

SECTION NO.100 RIVER MILE=    735.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

SECTION NO.101 RIVER MILE=    730.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0000  0.0000  0.0300  0.0000  0.0000

SECTION NO.102 RIVER MILE=    725.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0000  0.0000  0.0280  0.0000  0.0000

SECTION NO.103 RIVER MILE=    720.000
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...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

SECTION NO.104 RIVER MILE=    715.000
...Add    -0.30 (ft) to each Elevation(Y)
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

SECTION NO.105 RIVER MILE=    710.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0000  0.0000  0.0420  0.3000  0.5000

SECTION NO.106 RIVER MILE=    705.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0000  0.0000  0.0330  0.0000  0.0000

SECTION NO.107 RIVER MILE=    700.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0000  0.0000  0.0350  0.0000  0.0000

SECTION NO.108 RIVER MILE=    695.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

SECTION NO.109 RIVER MILE=    690.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0000  0.0000  0.0320  0.0000  0.0000

SECTION NO.110 RIVER MILE=    685.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.1000  0.1000  0.0280  0.1000  0.3000

Local Inflow Point  4 occurs just downstream from X-Section No.  111

SECTION NO.111 RIVER MILE=    676.000
...Hydraulic Control Point #  2
   Water Surface Elevation will be read from R-RECORD..Field  3
   Head Loss Criteria =     0.00
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

SECTION NO.112 RIVER MILE=    673.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

SECTION NO.113 RIVER MILE=    670.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0000  0.0000  0.0350  0.0000  0.0000

SECTION NO.114 RIVER MILE=    660.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0000  0.0000  0.0300  0.0000  0.0000

SECTION NO.115 RIVER MILE=    655.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

SECTION NO.116 RIVER MILE=    650.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0000  0.0000  0.0240  0.0000  0.0000

SECTION NO.117 RIVER MILE=    640.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0000  0.0000  0.0250  0.0000  0.0000

SECTION NO.118 RIVER MILE=    630.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0000  0.0000  0.0350  0.0000  0.0000
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SECTION NO.119 RIVER MILE= 625.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO.120 RIVER MILE= 621.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0380 0.0000 0.0000

SECTION NO.121 RIVER MILE= 615.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0400 0.0000 0.0000

SECTION NO.122 RIVER MILE= 610.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.2000 0.0450 0.3000 0.5000

SECTION NO.123 RIVER MILE= 600.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.1250 0.0350 0.0000 0.0000

SECTION NO.124 RIVER MILE= 595.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0300 0.0000 0.0000

SECTION NO.125 RIVER MILE= 590.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0380 0.0000 0.0000

SECTION NO.126 RIVER MILE= 575.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0400 0.0000 0.0000

SECTION NO.127 RIVER MILE= 565.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO.128 RIVER MILE= 561.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0440 0.0000 0.0000

SECTION NO.129 RIVER MILE= 555.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO.130 RIVER MILE= 550.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO.131 RIVER MILE= 540.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0300 0.0000 0.0000

SECTION NO.132 RIVER MILE= 535.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0340 0.0000 0.0000

SECTION NO.133 RIVER MILE= 515.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO.134 RIVER MILE= 510.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0300 0.0000 0.0000

SECTION NO.135 RIVER MILE= 505.000

```
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

SECTION NO.136 RIVER MILE=     497.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0000  0.0000  0.0240  0.0000  0.0000

SECTION NO.137 RIVER MILE=     495.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0000  0.0000  0.0240  0.0000  0.0000

SECTION NO.138 RIVER MILE=     485.000
...Add     -3.00 (ft) to each Elevation(Y)
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0000  0.0000  0.0280  0.8000  1.0000

SECTION NO.139 RIVER MILE=     480.100
...Ineffective Flow Area Requested by X3-RECORD. Left Overbank  Right Overbank
                                          Station #           5              14
                                 Ineffective Elevation     4335.10        4334.90
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0000  0.0000  0.0400  0.5000  0.8000

SECTION NO.140 RIVER MILE=     480.000
...Add      0.80 (ft) to each Elevation(Y)
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0000  0.0000  0.0380  0.0000  0.0000

SECTION NO.141 RIVER MILE=     475.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0000  0.0000  0.0350  0.0000  0.0000

SECTION NO.142 RIVER MILE=     470.000
...Add     -1.00 (ft) to each Elevation(Y)
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0000  0.0000  0.0320  0.2000  0.4000

SECTION NO.143 RIVER MILE=     455.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

SECTION NO.144 RIVER MILE=     453.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

SECTION NO.145 RIVER MILE=     445.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

SECTION NO.146 RIVER MILE=     437.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

SECTION NO.147 RIVER MILE=     435.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

SECTION NO.148 RIVER MILE=     425.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0000  0.0000  0.0280  0.0000  0.0000

SECTION NO.149 RIVER MILE=     420.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

SECTION NO.150 RIVER MILE=     415.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0000  0.0000  0.0250  0.0000  0.0000

SECTION NO.151 RIVER MILE=     410.000
```

...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0350 0.0000 0.0000

SECTION NO.152 RIVER MILE= 400.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0300 0.0000 0.0000

SECTION NO.153 RIVER MILE= 390.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0300 0.0000 0.0000

SECTION NO.154 RIVER MILE= 380.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0270 0.0000 0.0000

SECTION NO.155 RIVER MILE= 370.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0300 0.0000 0.0000

SECTION NO.156 RIVER MILE= 365.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO.157 RIVER MILE= 360.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0240 0.0000 0.0000

SECTION NO.158 RIVER MILE= 355.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0280 0.0000 0.0000

SECTION NO.159 RIVER MILE= 345.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO.160 RIVER MILE= 335.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO.161 RIVER MILE= 333.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0250 0.0000 0.0000

SECTION NO.162 RIVER MILE= 325.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO.163 RIVER MILE= 320.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.2000 0.2000 0.0480 0.0000 0.0000

SECTION NO.164 RIVER MILE= 315.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

SECTION NO.165 RIVER MILE= 310.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0410 0.3000 0.5000

SECTION NO.166 RIVER MILE= 305.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 6.00

SECTION NO.167 RIVER MILE= 300.000
...Set the Depth (ft) of the Bed Sediment Reservoir to 8.00

NC 0.0000 0.0000 0.0480 0.0000 0.0000

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SECTION NO.168 RIVER MILE=    295.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

SECTION NO.169 RIVER MILE=    290.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0000  0.0000  0.0500  0.0000  0.0000

SECTION NO.170 RIVER MILE=    280.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0000  0.0000  0.0350  0.0000  0.0000

SECTION NO.171 RIVER MILE=    270.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

SECTION NO.172 RIVER MILE=    260.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0000  0.0000  0.0400  0.0000  0.0000

SECTION NO.173 RIVER MILE=    255.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

SECTION NO.174 RIVER MILE=    250.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0000  0.0000  0.0550  0.0000  0.0000

SECTION NO.175 RIVER MILE=    240.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0000  0.0000  0.0360  0.0000  0.0000

SECTION NO.176 RIVER MILE=    235.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

SECTION NO.177 RIVER MILE=    230.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0000  0.0000  0.0450  0.0000  0.0000

SECTION NO.178 RIVER MILE=    225.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0000  0.0000  0.0300  0.0000  0.0000

SECTION NO.179 RIVER MILE=    220.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0000  0.0000  0.0280  0.0000  0.0000

SECTION NO.180 RIVER MILE=    210.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0000  0.0000  0.0500  0.0000  0.0000

SECTION NO.181 RIVER MILE=    205.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

SECTION NO.182 RIVER MILE=    200.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

SECTION NO.183 RIVER MILE=    190.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

SECTION NO.184 RIVER MILE=    110.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      5.00

SECTION NO.185 RIVER MILE=     90.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      5.00
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NC 0.0000  0.0000  0.0400  0.0000  0.0000

SECTION NO.186 RIVER MILE=      85.000
...Add     -1.00 (ft) to each Elevation(Y)
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00

NC 0.0160  0.0160  0.0160  0.3000  0.5000

SECTION NO.187 RIVER MILE=      80.100
...Ineffective Flow Area Requested by X3-RECORD. Left Overbank  Right Overbank
                                         Station #             2              11
                           Ineffective Elevation        4440.00         4440.00
...Set the Depth (ft) of the Bed Sediment Reservoir to      3.00

SECTION NO.188 RIVER MILE=      80.400
...Add      0.20 (ft) to each Elevation(Y)
...Hydraulic Control Point #  3
   Water Surface Elevation will be read from R-RECORD..Field  4
   Head Loss Criteria =     0.00
...Set the Depth (ft) of the Bed Sediment Reservoir to      0.00

NC 0.0000  0.0000  0.0350  0.1000  0.3000

SECTION NO.189 RIVER MILE=      75.000
...Add     -2.00 (ft) to each Elevation(Y)
...Set the Depth (ft) of the Bed Sediment Reservoir to      6.00

SECTION NO.190 RIVER MILE=      70.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      6.00

NC 0.0000  0.0000  0.0350  0.0000  0.0000

SECTION NO.191 RIVER MILE=      60.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      6.00

NC 0.0000  0.0000  0.0550  0.0000  0.0000

SECTION NO.192 RIVER MILE=      55.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      6.00

NC 0.0000  0.0000  0.0720  0.0000  0.0000

SECTION NO.193 RIVER MILE=      50.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      6.00

NC 0.0000  0.0000  0.0290  0.0000  0.0000

SECTION NO.194 RIVER MILE=      45.000
...Multiply all Stations(X) by     0.71
...Set the Depth (ft) of the Bed Sediment Reservoir to      6.00

SECTION NO.195 RIVER MILE=      40.000
...Add     -0.50 (ft) to each Elevation(Y)
...Set the Depth (ft) of the Bed Sediment Reservoir to      6.00

SECTION NO.196 RIVER MILE=      35.000
...Add      0.50 (ft) to each Elevation(Y)
...Set the Depth (ft) of the Bed Sediment Reservoir to      6.00

NC 0.0000  0.0000  0.0700  0.0000  0.0000

SECTION NO.197 RIVER MILE=      30.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      6.00

NC 0.0000  0.0000  0.0700  0.0000  0.0000

SECTION NO.198 RIVER MILE=      25.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      6.00

SECTION NO.199 RIVER MILE=      15.000
...Set the Depth (ft) of the Bed Sediment Reservoir to      8.00
```

NO. OF CROSS SECTIONS IN STREAM SEGMENT=199
NO. OF INPUT DATA MESSAGES = 0

TOTAL NO. OF CROSS SECTIONS IN THE NETWORK = 199
TOTAL NO. OF STREAM SEGMENTS IN THE NETWORK= 1
END OF GEOMETRIC DATA

===

T4 JORDAN RIVER SEDIMENT TRANSPORT ANALYSIS
T5 GEOMETERIC DATA FROM JORDAN RIVER FIS
T6 BED GRADATIONS DERIVED FROM FIELD SAMPLES
T7 SEDIMENT TRANSPORT BY M-P-M
T8
JORDAN RIVER SEDIMENT TRANSPORT STUDY SALT LAKE COUNTY
17TH SOUTH TO D/S OF TURNER DAM
GENENERAL SCOUR WITHOUT BRIDGES FILE:J2.H6

- -

SEDIMENT PROPERITES AND PARAMETERS

	SPI	IBG	MNQ	SPGF	ACGR	NFALL	IBSHER
I1	5.	0	1	1.000	32.174	2	1

- -

SAND AND/OR GRAVEL ARE PRESENT

	MTC	IASA	LASA	SPGS	GSF	BSAE	PSI	UWDLB
I4	10	1	10	2.650	0.667	0.500	30.000	93.000

USING TRANSPORT CAPACITY RELATIONSHIP # 10, MPM(1948)

FOLLOWING GRAIN SIZES UTILIZED (MM)

SAND:	0.0880	0.1770	0.3540	0.7070	1.4140
	2.8280	5.6570	11.3140	22.6270	45.2550

- -

SEDIMENT LOAD TABLE FOR STREAM SEGMENT # 1
LOAD BY GRAIN SIZE CLASS (tons/day)

L		1.00000	2000.00	4200.00
L	VFS	0.100000E-01	10.0000	90.0000
L	FS	0.350000E-01	15.0000	60.0000
L	MS	0.550000E-01	12.5000	45.0000
L	CS	0.100000E-19	7.50000	30.0000
L	VCS	0.100000E-19	2.50000	30.0000
L	VFG	0.100000E-19	1.50000	15.0000
L	FG	0.100000E-19	1.00000	15.0000
L	MG	0.100000E-19	0.100000E-19	9.00000
L	CG	0.100000E-19	0.100000E-19	6.00000
L	VCG	0.100000E-19	0.100000E-19	0.100000E-19
	TOTAL	0.100000	50.0000	300.000

REACH GEOMETRY FOR STREAM SEGMENT 1

CROSS SECTION ID. NO.	REACH LENGTH (ft)	MOVABLE BED WIDTH	INITIAL BED-ELEVATIONS LEFT SIDE (ft)	THALWEG (ft)	RIGHT SIDE (ft)	ACCUMULATED CHANNEL DISTANCE FROM DOWNSTREAM (ft)	(miles)
	150.00						
1310.000		85.00	4218.10	4218.10	4219.60	0.00	0.00
	165.00						
1310.100		85.00	4218.10	4218.10	4219.60	165.00	0.03
	93.00						
1310.400		85.00	4218.30	4218.30	4219.80	258.00	0.05
	267.00						
1305.D00		129.75	4223.30	4220.40	4222.30	525.00	0.10

1300.100	360.00	125.00	4223.80	4219.80	4221.80	885.00	0.17
1300.400	106.00	125.00	4224.30	4220.30	4222.30	991.00	0.19
1300.000	200.00	125.00	4224.80	4220.80	4222.80	1191.00	0.23
1295.000	640.00	123.10	4224.60	4220.90	4223.60	1831.00	0.35
1290.000	390.00	122.50	4224.30	4218.30	4225.30	2221.00	0.42
1280.000	1415.00	131.50	4224.60	4219.60	4224.60	3636.00	0.69
1270.000	670.00	109.00	4221.30	4218.30	4221.80	4306.00	0.82
1265.000	1010.00	131.50	4225.80	4223.00	4225.70	5316.00	1.01
1260.000	190.00	128.00	4223.50	4221.00	4225.00	5506.00	1.04
1250.000	1150.00	124.00	4229.20	4221.20	4224.20	6656.00	1.26
1240.000	2450.00	78.50	4223.00	4217.00	4223.00	9106.00	1.72
1235.000	760.00	62.50	4220.30	4218.50	4226.50	9866.00	1.87
1230.000	700.00	62.00	4223.60	4221.60	4225.60	10566.00	2.00
1220.000	1590.00	84.00	4226.20	4223.70	4224.70	12156.00	2.30
1210.000	860.00	103.00	4228.50	4224.50	4226.00	13016.00	2.47
1207.100	150.00	152.00	4231.90	4224.40	4232.40	13166.00	2.49
1205.000	320.00	83.60	4226.80	4223.80	4224.20	13486.00	2.55
1200.000	445.00	72.50	4226.50	4221.50	4222.50	13931.00	2.64
1190.000	1270.00	102.00	4229.30	4223.80	4229.30	15201.00	2.88
1185.000	240.00	85.20	4227.80	4223.10	4227.70	15441.00	2.92
1180.000	850.00	69.50	4229.60	4221.60	4228.10	16291.00	3.09
1170.000	1640.00	100.50	4230.90	4225.40	4230.40	17931.00	3.40
1165.000	1290.00	119.07	4231.50	4224.80	4230.80	19221.00	3.64
1160.000	440.00	133.50	4232.00	4229.00	4234.20	19661.00	3.72
1150.000	166.00	82.00	4228.90	4221.90	4231.90	19827.00	3.76
1145.000	170.00	27.00	4229.90	4229.90	4231.50	19997.00	3.79
1140.000	1060.00	79.50	4233.40	4222.90	4234.20	21057.00	3.99
1130.000	1100.00	95.00	4233.70	4227.70	4233.20	22157.00	4.20
1125.000	1080.00	72.07	4233.50	4226.80	4234.70	23237.00	4.40
1120.000	315.00	72.00	4231.90	4230.90	4233.40	23552.00	4.46
1110.000	1195.00	144.50	4236.80	4234.80	4238.80	24747.00	4.69
1107.000	530.00	92.00	4235.90	4231.40	4235.90	25277.00	4.79
1097.000	990.00	103.05	4237.90	4233.50	4236.00	26267.00	4.97
1095.100	250.00	105.15	4244.90	4234.40	4250.00	26517.00	5.02
1090.000	295.00	63.00	4235.00	4235.00	4237.00	26812.00	5.08
1087.000	600.00	93.60	4237.50	4234.00	4237.50	27412.00	5.19

1087.200	84.00	93.60	4237.70	4234.20	4237.70	27496.00	5.21
1085.000	5.00	106.50	4242.00	4242.00	4242.00	27501.00	5.21
1083.200	50.00	94.40	4243.10	4237.60	4243.00	27551.00	5.22
1077.000	510.00	85.50	4240.80	4239.20	4243.00	28061.00	5.31
1075.000	560.00	58.35	4239.80	4239.00	4243.60	28621.00	5.42
1070.000	560.00	60.00	4234.30	4234.30	4242.50	29181.00	5.53
1060.000	447.00	48.00	4240.10	4236.10	4239.60	29628.00	5.61
1055.000	710.00	96.00	4243.70	4242.10	4243.80	30338.00	5.75
1050.000	350.00	59.00	4243.70	4238.70	4243.20	30688.00	5.81
1040.000	1340.00	101.50	4246.10	4244.60	4246.10	32028.00	6.07
1035.000	335.00	63.90	4246.10	4243.40	4246.00	32363.00	6.13
1030.000	600.00	75.00	4245.00	4243.00	4246.00	32963.00	6.24
1020.000	1040.00	93.00	4248.00	4245.00	4248.00	34003.00	6.44
1010.000	1330.00	88.00	4249.20	4245.70	4248.20	35333.00	6.69
1005.000	490.00	91.00	4250.10	4247.90	4250.00	35823.00	6.78
1000.000	780.00	99.50	4250.20	4249.20	4251.20	36603.00	6.93
995.100	100.00	90.00	4258.50	4244.90	4257.50	36703.00	6.95
990.000	184.00	57.00	4250.40	4245.90	4249.90	36887.00	6.99
985.000	590.00	118.60	4253.20	4249.10	4252.30	37477.00	7.10
980.000	510.00	93.50	4249.00	4248.30	4252.30	37987.00	7.19
975.000	650.00	113.70	4254.10	4252.10	4253.70	38637.00	7.32
970.000	450.00	60.50	4254.00	4251.50	4254.50	39087.00	7.40
965.000	520.00	76.30	4255.10	4252.80	4255.10	39607.00	7.50
960.000	370.00	96.00	4256.30	4251.80	4256.30	39977.00	7.57
957.100	120.00	63.75	4248.00	4248.00	4248.00	40097.00	7.59
955.000	510.00	85.31	4257.30	4254.20	4257.50	40607.00	7.69
950.000	770.00	89.50	4258.80	4256.30	4260.80	41377.00	7.84
940.000	910.00	96.50	4261.10	4259.10	4260.60	42287.00	8.01
940.100	290.00	96.50	4260.80	4258.80	4260.30	42577.00	8.06
935.000	325.00	68.60	4259.30	4257.60	4259.30	42902.00	8.13
930.000	150.00	76.00	4261.50	4258.50	4262.00	43052.00	8.15
925.000	500.00	110.55	4270.70	4259.10	4260.80	43552.00	8.25
923.000	480.00	102.00	4263.30	4259.70	4266.20	44032.00	8.34
913.000	590.00	95.30	4267.60	4260.40	4263.00	44622.00	8.45
912.000	800.00	89.80	4263.80	4261.60	4264.20	45422.00	8.60
905.000	350.00	79.95	4266.30	4257.60	4265.10	45772.00	8.67

3374' / 2.6 .0007

2760' / 4.7 .0017

904.000	80.00	70.20	4260.00	4260.00	4260.00	45852.00	8.68
903.100	30.00	91.15	4268.20	4268.20	4268.20	45882.00	8.69
900.000	180.00	63.00	4267.20	4264.50	4267.50	46062.00	8.72
890.000	730.00	49.00	4267.90	4264.40	4269.10	46792.00	8.86
880.000	1300.00	66.50	4269.50	4266.50	4269.00	48092.00	9.11
870.000	1220.00	58.00	4269.10	4267.10	4271.70	49312.00	9.34
860.000	1410.00	73.50	4273.70	4269.70	4273.20	50722.00	9.61
850.000	900.00	60.00	4278.10	4270.10	4279.80	51622.00	9.78
845.100	150.00	51.50	4272.50	4270.50	4272.50	51772.00	9.81
840.000	91.00	51.00	4277.90	4269.90	4275.40	51863.00	9.82
835.000	715.00	78.50	4275.70	4273.00	4275.90	52578.00	9.96
820.000	1250.00	61.00	4279.90	4274.40	4278.70	53828.00	10.19
815.000	70.00	64.95	4278.80	4275.80	4279.80	53898.00	10.21
810.000	140.00	61.00	4284.80	4277.60	4282.10	54038.00	10.23
805.000	460.00	120.00	4281.60	4278.10	4279.50	54498.00	10.32
800.000	500.00	55.95	4281.20	4275.20	4283.20	54998.00	10.42
790.000	1150.00	54.50	4281.50	4276.50	4280.50	56148.00	10.63
780.000	1000.00	53.00	4283.30	4277.80	4279.80	57148.00	10.82
770.000	1190.00	84.50	4284.10	4282.10	4288.60	58338.00	11.05
760.000	1050.00	62.50	4286.10	4282.60	4286.30	59388.00	11.25
750.000	1020.00	515.50	4296.80	4285.20	4289.00	60408.00	11.44
745.000	420.00	95.50	4287.70	4286.50	4288.70	60828.00	11.52
740.000	200.00	84.50	4288.50	4286.00	4290.50	61028.00	11.56
735.000	370.00	77.30	4288.60	4286.20	4288.70	61398.00	11.63
730.000	880.00	87.50	4293.30	4286.30	4292.30	62278.00	11.80
725.000	610.00	81.00	4290.30	4287.80	4291.70	62888.00	11.91
720.000	540.00	125.00	4293.40	4288.40	4294.90	63428.00	12.01
715.000	170.00	66.45	4292.60	4285.50	4292.30	63598.00	12.05
710.000	245.00	61.00	4293.30	4287.80	4291.30	63843.00	12.09
705.000	390.00	85.20	4291.90	4288.30	4290.90	64233.00	12.17
700.000	610.00	50.00	4295.20	4287.20	4292.20	64843.00	12.28
695.000	750.00	80.50	4293.90	4290.80	4293.20	65593.00	12.42
690.000	340.00	81.50	4293.30	4291.30	4294.30	65933.00	12.49
685.000	920.00	66.80	4294.10	4292.10	4293.90	66853.00	12.66
676.000	450.00	68.50	4295.20	4293.60	4296.10	67303.00	12.75
673.000	660.00	69.95	4296.70	4293.30	4302.10	67963.00	12.87

10358' / 13.4 = .0012

3880' / 9 =

3080' / 1.2 = .0003

670.000	710.00	69.00	4297.00	4292.00	4296.00	68673.00	13.01	6260/11
660.000	1200.00	64.50	4298.00	4295.00	4298.00	69873.00	13.23	
655.000	300.00	75.50	4299.00	4298.50	4298.50	70173.00	13.29	
650.000	890.00	63.50	4302.70	4298.90	4301.30	71063.00	13.46	
640.000	1250.00	86.50	4304.30	4302.80	4306.30	72313.00	13.70	
630.000	1310.00	95.50	4310.20	4306.20	4306.20	73623.00	13.94	
625.000	530.00	79.50	4304.00	4301.40	4304.10	74153.00	14.04	
621.000	780.00	89.50	4305.50	4303.10	4307.00	74933.00	14.19	
615.000	360.00	79.00	4305.10	4303.40	4305.00	75293.00	14.26	
610.000	790.00	70.45	4308.90	4299.90	4309.70	76083.00	14.41	
600.000	480.00	75.00	4305.80	4305.80	4309.30	76563.00	14.50	
595.000	290.00	135.00	4307.40	4306.00	4307.60	76853.00	14.56	
590.000	910.00	104.00	4310.50	4309.50	4311.60	77763.00	14.73	
575.000	1110.00	99.60	4309.90	4308.20	4311.00	78873.00	14.94	2380/19
565.000	1250.00	116.05	4311.30	4309.80	4311.80	80123.00	15.17	= .001
561.000	1130.00	120.50	4311.90	4310.10	4310.10	81253.00	15.39	8565/11
555.000	470.00	81.00	4314.30	4311.40	4313.10	81723.00	15.48	
550.000	390.00	85.95	4316.50	4312.50	4317.10	82113.00	15.55	
540.000	1065.00	101.50	4317.80	4314.80	4317.80	83178.00	15.75	
535.000	810.00	61.00	4316.50	4313.30	4316.70	83988.00	15.91	
515.000	1820.00	181.00	4321.50	4318.10	4320.20	85808.00	16.25	
510.000	1140.00	191.00	4320.80	4320.30	4320.30	86948.00	16.47	
505.000	290.00	93.95	4321.00	4319.00	4323.70	87238.00	16.52	
497.000	750.00	103.00	4323.10	4322.00	4323.00	87988.00	16.66	
495.000	1060.00	95.50	4323.80	4320.10	4324.40	89048.00	16.87	
485.000	770.00	122.50	4322.50	4321.40	4323.30	89818.00	17.01	2185/3.8
480.100	690.00	63.00	4326.10	4322.10	4326.10	90508.00	17.14	
480.000	385.00	63.00	4326.90	4322.90	4326.90	90893.00	17.21	
475.000	490.00	115.50	4326.60	4324.50	4327.80	91383.00	17.31	
470.000	620.00	65.55	4334.30	4325.20	4333.00	92003.00	17.42	14605'/34' = .002
455.000	565.00	187.00	4329.80	4328.30	4333.60	92568.00	17.53	
453.000	600.00	153.95	4334.00	4329.60	4330.70	93168.00	17.65	
445.000	910.00	67.00	4332.70	4329.30	4334.60	94078.00	17.82	
437.000	1320.00	121.00	4335.80	4331.90	4338.30	95398.00	18.07	
435.000	460.00	116.50	4335.90	4332.60	4335.10	95858.00	18.15	
425.000	540.00	82.00	4336.70	4335.60	4337.20	96398.00	18.26	

420.000	1000.00	90.50	4338.50	4334.50	4334.50	97398.00	18.45
415.000	520.00	105.50	4339.20	4338.10	4339.60	97918.00	18.55
410.000	630.00	56.00	4339.40	4336.40	4336.90	98548.00	18.66
400.000	1120.00	52.50	4338.10	4336.60	4341.60	99668.00	18.88
390.000	860.00	84.00	4343.90	4343.90	4345.40	100528.00	19.04
380.000	1350.00	155.00	4349.70	4347.70	4348.70	101878.00	19.30
370.000	1550.00	107.50	4347.40	4347.40	4351.90	103428.00	19.59
365.000	1050.00	115.50	4351.90	4350.70	4354.90	104478.00	19.79
360.000	650.00	77.50	4350.40	4349.90	4351.90	105128.00	19.91
355.000	1480.00	179.00	4355.90	4355.90	4357.70	106608.00	20.19
345.000	900.00	74.00	4360.40	4356.40	4358.70	107508.00	20.36
335.000	510.00	253.00	4360.50	4359.20	4360.50	108018.00	20.46
333.000	1040.00	166.55	4365.90	4361.90	4363.10	109058.00	20.65
325.000	1250.00	178.50	4369.30	4366.50	4368.10	110308.00	20.89
320.000	1420.00	152.00	4374.30	4371.80	4373.30	111728.00	21.16
315.000	220.00	54.50	4372.40	4370.30	4372.20	111948.00	21.20
310.000	660.00	87.50	4379.50	4377.00	4379.50	112608.00	21.33
305.000	243.00	77.80	4378.20	4376.00	4380.30	112851.00	21.37
300.000	70.00	89.50	4380.60	4375.60	4384.60	112921.00	21.39
295.000	620.00	73.50	4382.00	4379.80	4381.00	113541.00	21.50
290.000	390.00	80.65	4384.00	4379.50	4382.50	113931.00	21.58
280.000	725.00	66.50	4386.20	4383.70	4384.70	114656.00	21.72
270.000	980.00	60.00	4389.80	4387.30	4390.80	115636.00	21.90
260.000	685.00	79.00	4393.60	4390.60	4392.10	116321.00	22.03
255.000	300.00	181.30	4394.90	4393.20	4393.40	116621.00	22.09
250.000	380.00	73.50	4396.30	4393.30	4396.80	117001.00	22.16
240.000	600.00	89.00	4397.20	4394.70	4398.20	117601.00	22.27
235.000	280.00	63.25	4399.40	4395.30	4399.30	117881.00	22.33
230.000	320.00	71.50	4400.80	4398.30	4398.30	118201.00	22.39
225.000	260.00	99.95	4400.50	4399.70	4402.90	118461.00	22.44
220.000	390.00	67.50	4402.90	4398.90	4402.40	118851.00	22.51
210.000	1180.00	60.50	4401.00	4401.00	4403.50	120031.00	22.73
205.000	590.00	39.30	4404.90	4402.50	4402.70	120621.00	22.84
200.000	780.00	52.45	4407.00	4406.00	4412.50	121401.00	22.99
190.000	1040.00	50.50	4414.90	4413.90	4418.40	122441.00	23.19
110.000	880.00	78.90	4435.30	4418.70	4446.10	123321.00	23.36

5120/16 = .003

2203'/10 = .003

AV. CHANNEL SLOPE (%)

11673'/48' = .004%

2150'/6 = .002

5729' (60-210) ELEV. 30- .005 %

REACH N

	430.00						
90.000		185.40	4429.20	4424.20	4427.10	123751.00	23.44
	530.00						
85.000		85.50	4425.00	4425.00	4425.00	124281.00	23.54
	120.00						
80.100		54.60	4426.00	4426.00	4426.00	124401.00	23.56
	139.00						
80.400		54.60	4426.20	4426.20	4426.20	124540.00	23.59
	300.00						
75.000		190.50	4431.50	4427.50	4431.50	124840.00	23.64
	520.00						
70.000		382.00	4433.90	4427.90	4436.00	125360.00	23.74
	400.00						
60.000		248.45	4433.70	4431.20	4433.60	125760.00	23.82
	680.00						
55.000		79.15	4440.20	4430.80	4441.00	126440.00	23.95
	880.00						
50.000		411.75	4446.60	4436.80	4445.40	127320.00	24.11
	890.00						
45.000		79.31	4449.60	4439.10	4448.50	128210.00	24.28
	660.00						
40.000		274.60	4449.60	4448.10	4452.60	128870.00	24.41
	500.00						
35.000		274.60	4450.10	4448.60	4453.10	129370.00	24.50
	1550.00						
30.000		39.45	4451.20	4451.20	4454.20	130920.00	24.80
	1580.00						
25.000		267.40	4467.40	4466.80	4469.60	132500.00	25.09
	730.00						
15.000		156.05	4471.90	4469.50	4470.50	133230.00	25.23

BED MATERIAL GRADATION (as computed from PF-records)

SECID	SAE (%)	DMAX (ft)	DXPI (ft)	XPI	TOTAL BED	BED MATERIAL FRACTIONS per grain size, fine - coarse.				
N 1310.000	1.000	0.052	0.052	1.000	1.000	0.060	0.060	0.060	0.030	0.030
						0.220	0.310	0.220	0.000	0.000
N 1310.100	1.000	0.053	0.053	1.000	0.990	0.060	0.060	0.060	0.030	0.030
						0.220	0.309	0.220	0.001	0.000
N 1310.400	1.000	0.053	0.053	1.000	0.990	0.060	0.060	0.060	0.030	0.030
						0.219	0.309	0.220	0.001	0.000
N 1305.000	1.000	0.054	0.054	1.000	0.990	0.060	0.061	0.061	0.030	0.030
						0.219	0.308	0.220	0.002	0.000
N 1300.100	1.000	0.055	0.055	1.000	0.990	0.060	0.061	0.061	0.030	0.030
						0.218	0.306	0.220	0.003	0.000
N 1300.400	1.000	0.055	0.055	1.000	0.991	0.061	0.061	0.062	0.031	0.031
						0.218	0.306	0.219	0.003	0.000
N 1300.000	1.000	0.056	0.056	1.000	0.991	0.061	0.061	0.062	0.031	0.031
						0.218	0.305	0.219	0.004	0.000
N 1295.000	1.000	0.057	0.057	1.000	0.991	0.061	0.062	0.063	0.031	0.031
						0.216	0.303	0.219	0.006	0.000
N 1290.000	1.000	0.058	0.058	1.000	0.991	0.061	0.062	0.063	0.031	0.031
						0.215	0.301	0.219	0.007	0.000
N 1280.000	1.000	0.062	0.062	1.000	0.992	0.062	0.064	0.066	0.032	0.032
						0.213	0.295	0.218	0.011	0.000
N 1270.000	1.000	0.064	0.064	1.000	0.992	0.062	0.064	0.067	0.032	0.032
						0.211	0.292	0.218	0.013	0.000
N 1265.000	1.000	0.067	0.067	1.000	0.993	0.063	0.065	0.068	0.033	0.033
						0.209	0.288	0.217	0.016	0.000
N 1260.000	1.000	0.067	0.067	1.000	0.993	0.063	0.066	0.068	0.033	0.033

						0.209	0.288	0.217	0.017	0.000
N 1250.000	1.000	0.070	0.070	1.000	0.993	0.063	0.067	0.070	0.033	0.033
						0.206	0.283	0.217	0.020	0.000
N 1240.000	1.000	0.077	0.077	1.000	0.995	0.065	0.069	0.074	0.035	0.035
						0.201	0.273	0.215	0.028	0.000
N 1235.000	1.000	0.079	0.079	1.000	0.995	0.065	0.070	0.075	0.035	0.035
						0.200	0.270	0.215	0.030	0.000
N 1230.000	1.000	0.081	0.081	1.000	0.995	0.065	0.071	0.076	0.035	0.035
						0.199	0.267	0.215	0.032	0.000
N 1220.000	1.000	0.085	0.085	1.000	0.996	0.066	0.072	0.079	0.036	0.036
						0.195	0.261	0.214	0.037	0.000
N 1210.000	1.000	0.087	0.087	1.000	0.997	0.067	0.073	0.080	0.037	0.037
						0.194	0.257	0.213	0.040	0.000
N 1207.100	1.000	0.088	0.088	1.000	0.997	0.067	0.073	0.080	0.037	0.037
						0.193	0.256	0.213	0.040	0.000
N 1205.000	1.000	0.088	0.088	1.000	0.997	0.067	0.074	0.081	0.037	0.037
						0.193	0.255	0.213	0.041	0.000
N 1200.000	1.000	0.090	0.090	1.000	0.997	0.067	0.074	0.081	0.037	0.037
						0.192	0.253	0.213	0.043	0.000
N 1190.000	1.000	0.093	0.093	1.000	0.998	0.068	0.075	0.083	0.038	0.038
						0.189	0.248	0.212	0.046	0.000
N 1185.000	1.000	0.094	0.094	1.000	0.998	0.068	0.076	0.084	0.038	0.038
						0.189	0.247	0.212	0.047	0.000
N 1180.000	1.000	0.096	0.096	1.000	0.998	0.068	0.077	0.085	0.038	0.038
						0.187	0.244	0.212	0.050	0.000
N 1170.000	1.000	0.100	0.100	1.000	0.999	0.069	0.078	0.087	0.039	0.039
						0.184	0.237	0.211	0.055	0.000
N 1165.000	1.000	0.104	0.104	1.000	1.000	0.070	0.080	0.089	0.040	0.040
						0.181	0.232	0.210	0.059	0.000
N 1160.000	1.000	0.105	0.105	1.000	1.000	0.070	0.080	0.090	0.040	0.040
						0.180	0.230	0.210	0.060	0.000
N 1150.000	1.000	0.110	0.110	1.000	1.000	0.069	0.079	0.088	0.039	0.039
						0.174	0.230	0.214	0.068	0.001
N 1145.000	1.000	0.115	0.115	1.000	0.999	0.068	0.078	0.086	0.037	0.037
						0.167	0.229	0.218	0.076	0.003
N 1140.000	1.000	0.146	0.146	1.000	0.996	0.062	0.072	0.074	0.028	0.028
						0.125	0.226	0.241	0.126	0.012
N 1130.000	1.000	0.178	0.178	1.000	0.993	0.056	0.066	0.062	0.019	0.019
						0.082	0.223	0.266	0.179	0.021
N 1125.000	1.000	0.210	0.210	1.000	1.000	0.050	0.060	0.050	0.010	0.010
						0.040	0.220	0.290	0.230	0.030
N 1120.000	1.000	0.210	0.210	1.000	0.990	0.052	0.064	0.051	0.011	0.011
						0.038	0.208	0.278	0.226	0.052
N 1110.000	1.000	0.210	0.210	1.000	0.990	0.060	0.080	0.055	0.015	0.015
						0.030	0.160	0.230	0.210	0.135
N 1107.000	1.000	0.210	0.210	1.000	0.990	0.063	0.087	0.057	0.017	0.017
						0.027	0.139	0.209	0.203	0.171
N 1097.000	1.000	0.210	0.210	1.000	1.000	0.070	0.100	0.060	0.020	0.020

REACH 1

LENGTH = 1.69 mi. (8925' 8944

GRADE = .005

(ELEV. DROP) 45 ft.

8949

						0.020	0.100	0.170	0.190	0.240
N 1095.100	1.000	0.210	0.210	1.000	0.990	0.068	0.097	0.060	0.023	0.023
						0.023	0.104	0.173	0.188	0.232
N 1090.000	1.000	0.210	0.210	1.000	0.991	0.066	0.094	0.059	0.027	0.027
						0.027	0.108	0.176	0.185	0.223
N 1087.000	1.000	0.210	0.210	1.000	0.992	0.061	0.088	0.058	0.034	0.034
						0.034	0.117	0.182	0.180	0.204
N 1087.200	1.000	0.210	0.210	1.000	0.992	0.061	0.087	0.058	0.035	0.035
						0.035	0.118	0.183	0.179	0.201
N 1085.000	1.000	0.210	0.210	1.000	0.992	0.061	0.087	0.058	0.035	0.035
						0.035	0.118	0.183	0.179	0.201
N 1083.200	1.000	0.210	0.210	1.000	0.992	0.060	0.087	0.058	0.035	0.035
						0.035	0.119	0.183	0.178	0.200
N 1077.000	1.000	0.210	0.210	1.000	0.993	0.057	0.081	0.057	0.041	0.041
						0.041	0.127	0.189	0.174	0.184
N 1075.000	1.000	0.210	0.210	1.000	0.994	0.052	0.075	0.056	0.048	0.048
						0.048	0.135	0.195	0.169	0.166
N 1070.000	1.000	0.210	0.210	1.000	0.994	0.048	0.070	0.056	0.055	0.055
						0.055	0.144	0.200	0.164	0.149
N 1060.000	1.000	0.210	0.210	1.000	0.995	0.045	0.065	0.055	0.060	0.060
						0.060	0.150	0.205	0.160	0.135
N 1055.000	1.000	0.210	0.210	1.000	0.996	0.040	0.057	0.054	0.069	0.069
						0.069	0.161	0.213	0.154	0.112
N 1050.000	1.000	0.210	0.210	1.000	0.997	0.037	0.054	0.053	0.073	0.073
						0.073	0.166	0.216	0.150	0.101
N 1040.000	1.000	0.210	0.210	1.000	0.999	0.027	0.040	0.051	0.089	0.089
						0.089	0.186	0.230	0.138	0.059
N 1035.000	1.000	0.210	0.210	1.000	0.999	0.024	0.036	0.051	0.093	0.093
						0.093	0.191	0.234	0.135	0.049
N 1030.000	1.000	0.210	0.210	1.000	1.000	0.020	0.030	0.050	0.100	0.100
						0.100	0.200	0.240	0.130	0.030
N 1020.000	1.000	0.210	0.210	1.000	0.998	0.022	0.031	0.050	0.096	0.096
						0.098	0.194	0.232	0.136	0.043
N 1010.000	1.000	0.210	0.210	1.000	0.996	0.024	0.032	0.050	0.091	0.091
						0.096	0.187	0.222	0.143	0.059
N 1005.000	1.000	0.210	0.210	1.000	0.995	0.025	0.033	0.050	0.089	0.089
						0.095	0.184	0.218	0.146	0.065
N 1000.000	1.000	0.210	0.210	1.000	0.993	0.027	0.033	0.050	0.086	0.086
						0.093	0.179	0.212	0.151	0.075
N 995.100	1.000	0.210	0.210	1.000	0.993	0.027	0.034	0.050	0.086	0.086
						0.093	0.179	0.212	0.151	0.076
N 990.000	1.000	0.210	0.210	1.000	0.993	0.027	0.034	0.050	0.085	0.085
						0.093	0.178	0.210	0.152	0.078
N 985.000	1.000	0.210	0.210	1.000	0.991	0.029	0.034	0.050	0.083	0.083
						0.091	0.174	0.206	0.156	0.085
N 980.000	1.000	0.210	0.210	1.000	0.991	0.029	0.035	0.050	0.081	0.081
						0.091	0.172	0.202	0.158	0.092
N 975.000	1.000	0.210	0.210	1.000	0.989	0.031	0.035	0.050	0.079	0.079

							0.089	0.168	0.197	0.162	0.100
N	970.000	1.000	0.210	0.210	1.000	0.988	0.032	0.036	0.050	0.077	0.077
							0.088	0.165	0.194	0.165	0.105
N	965.000	1.000	0.210	0.210	1.000	0.987	0.033	0.036	0.050	0.075	0.075
							0.087	0.162	0.190	0.168	0.112
N	960.000	1.000	0.210	0.210	1.000	0.987	0.033	0.037	0.050	0.074	0.074
							0.087	0.160	0.187	0.170	0.116
N	957.100	1.000	0.210	0.210	1.000	0.987	0.033	0.037	0.050	0.073	0.073
							0.087	0.160	0.186	0.170	0.118
N	955.000	1.000	0.210	0.210	1.000	0.986	0.034	0.037	0.050	0.071	0.071
							0.086	0.157	0.182	0.173	0.124
N	950.000	1.000	0.210	0.210	1.000	0.984	0.036	0.038	0.050	0.068	0.068
							0.084	0.152	0.176	0.178	0.133
N	940.000	1.000	0.210	0.210	1.000	0.982	0.038	0.039	0.050	0.065	0.065
							0.082	0.147	0.170	0.183	0.144
N	940.100	1.000	0.210	0.210	1.000	0.982	0.038	0.039	0.050	0.064	0.064
							0.082	0.146	0.167	0.184	0.148
N	935.000	1.000	0.210	0.210	1.000	0.981	0.039	0.039	0.050	0.062	0.062
							0.081	0.144	0.165	0.186	0.152
N	930.000	1.000	0.210	0.210	1.000	0.981	0.039	0.040	0.050	0.062	0.062
							0.081	0.143	0.164	0.187	0.154
N	925.000	1.000	0.210	0.210	1.000	1.000	0.040	0.040	0.050	0.060	0.060
							0.080	0.140	0.160	0.190	0.160
N	923.000	1.000	0.210	0.210	1.000	0.980	0.040	0.041	0.050	0.060	0.060
							0.080	0.141	0.161	0.189	0.159
N	913.000	1.000	0.210	0.210	1.000	0.981	0.040	0.041	0.050	0.060	0.060
							0.080	0.142	0.162	0.188	0.157
N	912.000	1.000	0.210	0.210	1.000	0.981	0.040	0.042	0.051	0.061	0.061
							0.079	0.143	0.164	0.187	0.155
N	905.000	1.000	0.210	0.210	1.000	0.982	0.040	0.042	0.051	0.061	0.061
							0.079	0.143	0.165	0.186	0.154
N	904.000	1.000	0.210	0.210	1.000	0.982	0.040	0.043	0.051	0.061	0.061
							0.079	0.143	0.165	0.186	0.153
N	903.100	1.000	0.210	0.210	1.000	0.982	0.040	0.043	0.051	0.061	0.061
							0.079	0.143	0.165	0.186	0.153
N	900.000	1.000	0.210	0.210	1.000	0.982	0.040	0.043	0.051	0.061	0.061
							0.079	0.144	0.165	0.185	0.153
N	890.000	1.000	0.210	0.210	1.000	0.982	0.040	0.044	0.051	0.061	0.061
							0.079	0.145	0.167	0.184	0.151
N	880.000	1.000	0.210	0.210	1.000	0.983	0.040	0.045	0.052	0.062	0.062
							0.078	0.147	0.170	0.182	0.147
N	870.000	1.000	0.210	0.210	1.000	0.984	0.040	0.046	0.052	0.062	0.062
							0.078	0.148	0.173	0.180	0.143
N	860.000	1.000	0.210	0.210	1.000	0.985	0.040	0.048	0.053	0.063	0.063
							0.077	0.150	0.176	0.177	0.139
N	850.000	1.000	0.210	0.210	1.000	0.986	0.040	0.049	0.053	0.063	0.063
							0.077	0.152	0.178	0.175	0.137
N	845.100	1.000	0.210	0.210	1.000	0.986	0.040	0.049	0.053	0.063	0.063

							0.077	0.152	0.178	0.175	0.136
N	840.000	1.000	0.210	0.210	1.000	0.986	0.040	0.049	0.053	0.063	0.063
							0.077	0.152	0.178	0.175	0.136
N	835.000	1.000	0.210	0.210	1.000	0.987	0.040	0.050	0.053	0.063	0.063
							0.077	0.153	0.180	0.174	0.134
N	820.000	1.000	0.210	0.210	1.000	0.987	0.040	0.051	0.054	0.064	0.064
							0.076	0.155	0.182	0.171	0.130
N	815.000	1.000	0.210	0.210	1.000	0.988	0.040	0.051	0.054	0.064	0.064
							0.076	0.155	0.183	0.171	0.130
N	810.000	1.000	0.210	0.210	1.000	0.988	0.040	0.051	0.054	0.064	0.064
							0.076	0.155	0.183	0.171	0.130
N	805.000	1.000	0.210	0.210	1.000	0.988	0.040	0.052	0.054	0.064	0.064
							0.076	0.156	0.184	0.170	0.128
N	800.000	1.000	0.210	0.210	1.000	0.988	0.040	0.052	0.054	0.064	0.064
							0.076	0.157	0.185	0.169	0.127
N	790.000	1.000	0.210	0.210	1.000	0.989	0.040	0.054	0.055	0.065	0.065
							0.075	0.158	0.187	0.167	0.123
N	780.000	1.000	0.210	0.210	1.000	0.990	0.040	0.055	0.055	0.065	0.065
							0.075	0.160	0.190	0.165	0.120
N	770.000	1.000	0.210	0.210	1.000	0.991	0.040	0.056	0.055	0.065	0.065
							0.075	0.161	0.192	0.163	0.117
N	760.000	1.000	0.210	0.210	1.000	0.992	0.040	0.057	0.056	0.066	0.066
							0.074	0.163	0.195	0.161	0.114
N	750.000	1.000	0.210	0.210	1.000	0.992	0.040	0.058	0.056	0.066	0.066
							0.074	0.165	0.197	0.159	0.111
N	745.000	1.000	0.210	0.210	1.000	0.993	0.040	0.059	0.056	0.066	0.066
							0.074	0.165	0.198	0.159	0.110
N	740.000	1.000	0.210	0.210	1.000	0.993	0.040	0.059	0.056	0.066	0.066
							0.074	0.165	0.198	0.158	0.109
N	735.000	1.000	0.210	0.210	1.000	0.993	0.040	0.059	0.056	0.066	0.066
							0.074	0.166	0.199	0.158	0.108
N	730.000	1.000	0.210	0.210	1.000	0.994	0.040	0.060	0.057	0.067	0.067
							0.073	0.167	0.201	0.156	0.106
N	725.000	1.000	0.210	0.210	1.000	0.994	0.040	0.061	0.057	0.067	0.067
							0.073	0.168	0.202	0.155	0.104
N	720.000	1.000	0.210	0.210	1.000	0.994	0.040	0.062	0.057	0.067	0.067
							0.073	0.169	0.203	0.154	0.102
N	715.000	1.000	0.210	0.210	1.000	0.995	0.040	0.062	0.057	0.067	0.067
							0.073	0.169	0.204	0.154	0.102
N	710.000	1.000	0.210	0.210	1.000	0.995	0.040	0.062	0.057	0.067	0.067
							0.073	0.170	0.204	0.153	0.101
N	705.000	1.000	0.210	0.210	1.000	0.995	0.040	0.063	0.058	0.068	0.068
							0.072	0.170	0.205	0.152	0.100
N	700.000	1.000	0.210	0.210	1.000	0.995	0.040	0.063	0.058	0.068	0.068
							0.072	0.171	0.206	0.151	0.098
N	695.000	1.000	0.210	0.210	1.000	0.996	0.040	0.064	0.058	0.068	0.068
							0.072	0.172	0.208	0.150	0.096
N	690.000	1.000	0.210	0.210	1.000	0.996	0.040	0.064	0.058	0.068	0.068

							0.072	0.173	0.209	0.149	0.095
N	685.000	1.000	0.210	0.210	1.000	0.997	0.040	0.065	0.058	0.068	0.068
							0.072	0.174	0.211	0.148	0.092
N	676.000	1.000	0.210	0.210	1.000	0.997	0.040	0.066	0.059	0.069	0.069
							0.071	0.175	0.212	0.147	0.091
N	673.000	1.000	0.210	0.210	1.000	0.998	0.040	0.067	0.059	0.069	0.069
							0.071	0.175	0.213	0.146	0.089
N	670.000	1.000	0.210	0.210	1.000	0.998	0.040	0.067	0.059	0.069	0.069
							0.071	0.177	0.215	0.144	0.087
N	660.000	1.000	0.210	0.210	1.000	0.999	0.040	0.069	0.060	0.070	0.070
							0.070	0.178	0.217	0.142	0.083
N	655.000	1.000	0.210	0.210	1.000	0.999	0.040	0.069	0.060	0.070	0.070
							0.070	0.179	0.218	0.142	0.083
N	650.000	1.000	0.210	0.210	1.000	1.000	0.040	0.070	0.060	0.070	0.070
							0.070	0.180	0.220	0.140	0.080
N	640.000	1.000	0.223	0.210	0.995	0.995	0.038	0.068	0.058	0.069	0.069
							0.071	0.178	0.216	0.142	0.087
N	630.000	1.000	0.236	0.210	0.990	0.990	0.035	0.065	0.056	0.069	0.069
							0.071	0.175	0.212	0.144	0.094
N	625.000	1.000	0.242	0.210	0.988	0.988	0.034	0.064	0.055	0.068	0.068
							0.072	0.174	0.211	0.145	0.097
N	621.000	1.000	0.250	0.210	0.985	0.985	0.032	0.062	0.054	0.068	0.068
							0.072	0.172	0.209	0.146	0.101
N	615.000	1.000	0.254	0.210	0.983	0.983	0.032	0.062	0.054	0.068	0.068
							0.072	0.172	0.208	0.146	0.103
N	610.000	1.000	0.262	0.210	0.980	0.980	0.030	0.060	0.053	0.068	0.068
							0.072	0.170	0.205	0.147	0.107
N	600.000	1.000	0.267	0.210	0.978	0.978	0.029	0.059	0.052	0.067	0.067
							0.073	0.169	0.204	0.148	0.110
N	595.000	1.000	0.270	0.210	0.977	0.977	0.029	0.059	0.051	0.067	0.067
							0.073	0.169	0.203	0.149	0.111
N	590.000	1.000	0.279	0.210	0.974	0.974	0.027	0.057	0.050	0.067	0.067
							0.073	0.167	0.200	0.150	0.116
N	575.000	1.000	0.291	0.210	0.969	0.969	0.025	0.055	0.048	0.066	0.066
							0.074	0.165	0.197	0.152	0.122
N	565.000	1.000	0.304	0.210	0.964	0.964	0.022	0.052	0.047	0.066	0.066
							0.074	0.162	0.193	0.153	0.129
N	561.000	1.000	0.315	0.210	0.960	0.960	0.020	0.050	0.045	0.065	0.065
							0.075	0.160	0.190	0.155	0.135
N	555.000	1.000	0.320	0.210	0.958	0.958	0.019	0.049	0.044	0.065	0.065
							0.075	0.159	0.189	0.156	0.138
N	550.000	1.000	0.324	0.210	0.956	0.956	0.018	0.048	0.044	0.065	0.065
							0.075	0.158	0.187	0.156	0.140
N	540.000	1.000	0.335	0.210	0.952	0.952	0.016	0.046	0.042	0.064	0.064
							0.076	0.156	0.184	0.158	0.146
N	535.000	1.000	0.344	0.210	0.949	0.949	0.015	0.045	0.041	0.064	0.064
							0.076	0.155	0.182	0.159	0.150
N	515.000	1.000	0.362	0.210	0.942	0.942	0.011	0.041	0.038	0.063	0.063

							0.077	0.151	0.176	0.162	0.160
N	510.000	1.000	0.374	0.210	0.937	0.937	0.009	0.039	0.037	0.062	0.062
							0.078	0.149	0.173	0.163	0.166
N	505.000	1.000	0.377	0.210	0.936	0.936	0.008	0.038	0.036	0.062	0.062
							0.078	0.148	0.172	0.164	0.168
N	497.000	1.000	0.385	0.210	0.933	0.933	0.007	0.037	0.035	0.062	0.062
							0.078	0.147	0.170	0.165	0.172
N	495.000	1.000	0.396	0.210	0.929	0.929	0.005	0.035	0.033	0.061	0.061
							0.079	0.145	0.167	0.167	0.177
N	485.000	1.000	0.404	0.210	0.926	0.926	0.003	0.033	0.032	0.061	0.061
							0.079	0.143	0.165	0.168	0.182
N	480.100	1.000	0.411	0.210	0.923	0.923	0.002	0.032	0.031	0.060	0.060
							0.080	0.142	0.163	0.169	0.185
N	480.000	1.000	0.415	0.210	0.922	0.922	0.001	0.031	0.031	0.060	0.060
							0.080	0.141	0.161	0.169	0.187
N	475.000	1.000	0.420	0.210	0.920	0.920	0.000	0.030	0.030	0.060	0.060
							0.080	0.140	0.160	0.170	0.190
N	470.000	1.000	0.420	0.210	0.919	0.919	0.000	0.029	0.030	0.060	0.060
							0.081	0.139	0.160	0.168	0.193
N	455.000	1.000	0.420	0.210	0.919	0.919	0.000	0.029	0.031	0.059	0.059
							0.081	0.138	0.159	0.166	0.196
N	453.000	1.000	0.420	0.210	0.918	0.918	0.000	0.028	0.031	0.059	0.059
							0.082	0.137	0.159	0.164	0.199
N	445.000	1.000	0.420	0.210	0.918	0.918	0.000	0.028	0.031	0.059	0.059
							0.082	0.135	0.159	0.161	0.203
N	437.000	1.000	0.420	0.210	0.916	0.916	0.000	0.026	0.032	0.058	0.058
							0.084	0.133	0.158	0.157	0.210
N	435.000	1.000	0.420	0.210	0.916	0.916	0.000	0.026	0.032	0.058	0.058
							0.084	0.132	0.158	0.156	0.212
N	425.000	1.000	0.420	0.210	0.915	0.915	0.000	0.025	0.032	0.058	0.058
							0.085	0.131	0.158	0.154	0.215
N	420.000	1.000	0.420	0.210	0.915	0.915	0.000	0.025	0.033	0.057	0.057
							0.085	0.129	0.157	0.151	0.220
N	415.000	1.000	0.420	0.210	0.914	0.914	0.000	0.024	0.033	0.057	0.057
							0.086	0.128	0.157	0.149	0.222
N	410.000	1.000	0.420	0.210	0.914	0.914	0.000	0.024	0.033	0.057	0.057
							0.086	0.127	0.157	0.147	0.226
N	400.000	1.000	0.420	0.210	0.913	0.913	0.000	0.023	0.034	0.056	0.056
							0.087	0.125	0.156	0.144	0.231
N	390.000	1.000	0.420	0.210	0.912	0.912	0.000	0.022	0.034	0.056	0.056
							0.088	0.123	0.156	0.141	0.235
N	380.000	1.000	0.420	0.210	0.911	0.911	0.000	0.021	0.035	0.055	0.055
							0.089	0.121	0.155	0.137	0.242
N	370.000	1.000	0.420	0.210	0.909	0.909	0.000	0.019	0.035	0.055	0.055
							0.091	0.118	0.155	0.132	0.250
N	365.000	1.000	0.420	0.210	0.908	0.908	0.000	0.018	0.036	0.054	0.054
							0.092	0.116	0.154	0.129	0.255
N	360.000	1.000	0.420	0.210	0.908	0.908	0.000	0.018	0.036	0.054	0.054

							0.092	0.115	0.154	0.127	0.258
N	355.000	1.000	0.420	0.210	0.906	0.906	0.000	0.016	0.037	0.053	0.053
							0.094	0.113	0.153	0.122	0.266
N	345.000	1.000	0.420	0.210	0.905	0.905	0.000	0.015	0.037	0.053	0.053
							0.095	0.111	0.153	0.119	0.270
N	335.000	1.000	0.420	0.210	0.905	0.905	0.000	0.015	0.038	0.052	0.052
							0.095	0.110	0.152	0.117	0.273
N	333.000	1.000	0.420	0.210	0.904	0.904	0.000	0.014	0.038	0.052	0.052
							0.096	0.108	0.152	0.114	0.278
N	325.000	1.000	0.420	0.210	0.903	0.903	0.000	0.013	0.039	0.051	0.051
							0.097	0.106	0.151	0.110	0.284
N	320.000	1.000	0.420	0.210	0.902	0.902	0.000	0.012	0.039	0.051	0.051
							0.098	0.103	0.151	0.106	0.291
N	315.000	1.000	0.420	0.210	0.901	0.901	0.000	0.011	0.039	0.051	0.051
							0.099	0.103	0.151	0.105	0.292
N	310.000	1.000	0.420	0.210	0.901	0.901	0.000	0.011	0.040	0.050	0.050
							0.099	0.102	0.150	0.103	0.295
N	305.000	1.000	0.420	0.210	0.901	0.901	0.000	0.011	0.040	0.050	0.050
							0.099	0.101	0.150	0.102	0.297
N	300.000	1.000	0.420	0.210	0.901	0.901	0.000	0.011	0.040	0.050	0.050
							0.099	0.101	0.150	0.102	0.297
N	295.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	290.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	280.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	270.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	260.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	255.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	250.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	240.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	235.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	230.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	225.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	220.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	210.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	205.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050

							0.100	0.100	0.150	0.100	0.300
N	200.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	190.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	110.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	90.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	85.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	80.100	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	80.400	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	75.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	70.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	60.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	55.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	50.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	45.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	40.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	35.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	30.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	25.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300
N	15.000	1.000	0.420	0.210	0.900	0.900	0.000	0.010	0.040	0.050	0.050
							0.100	0.100	0.150	0.100	0.300

..LOCAL INFLOW DATA...

SEDIMENT LOAD TABLE FOR STREAM SEGMENT # 1
AT LOCAL INFLOW POINT # 1
LOAD BY GRAIN SIZE CLASS (tons/day)

L L		1.00000	1000.00
L L	VFS	0.600000E-01	5.00000
L L	FS	0.400000E-01	3.00000
L L	MS	0.100000E-19	2.00000
L L	CS	0.100000E-19	0.100000E-19
L L	VCS	0.100000E-19	0.100000E-19
L L	VFG	0.100000E-19	0.100000E-19
L L	FG	0.100000E-19	0.100000E-19

L L	MG	0.100000E-19	0.100000E-19
L L	CG	0.100000E-19	0.100000E-19
L L	VCG	0.100000E-19	0.100000E-19
	TOTAL	0.100000	10.0000

..LOCAL INFLOW DATA...

SEDIMENT LOAD TABLE FOR STREAM SEGMENT # 1
AT LOCAL INFLOW POINT # 2
LOAD BY GRAIN SIZE CLASS (tons/day)

L L		1.00000	1000.00
L L	VFS	0.500000E-01	80.0000
L L	FS	0.400000E-01	60.0000
L L	MS	0.100000E-01	40.0000
L L	CS	0.100000E-19	20.0000
L L	VCS	0.100000E-19	0.100000E-19
L L	VFG	0.100000E-19	0.100000E-19
L L	FG	0.100000E-19	0.100000E-19
L L	MG	0.100000E-19	0.100000E-19
L L	CG	0.100000E-19	0.100000E-19
L L	VCG	0.100000E-19	0.100000E-19
	TOTAL	0.100000	200.000

..LOCAL INFLOW DATA...

SEDIMENT LOAD TABLE FOR STREAM SEGMENT # 1
AT LOCAL INFLOW POINT # 3
LOAD BY GRAIN SIZE CLASS (tons/day)

L L		1.00000	1000.00
L L	VFS	0.500000E-01	4.00000
L L	FS	0.400000E-01	3.00000
L L	MS	0.100000E-01	2.00000
L L	CS	0.100000E-19	1.00000
L L	VCS	0.100000E-19	0.100000E-19
L L	VFG	0.100000E-19	0.100000E-19
L L	FG	0.100000E-19	0.100000E-19
L L	MG	0.100000E-19	0.100000E-19
L L	CG	0.100000E-19	0.100000E-19
L L	VCG	0.100000E-19	0.100000E-19
	TOTAL	0.100000	10.0000

..LOCAL INFLOW DATA...

SEDIMENT LOAD TABLE FOR STREAM SEGMENT # 1
AT LOCAL INFLOW POINT # 4
LOAD BY GRAIN SIZE CLASS (tons/day)

L L		1.00000	400.000
L L	VFS	0.600000E-01	4.00000
L L	FS	0.400000E-01	3.00000
L L	MS	0.100000E-19	2.00000
L L	CS	0.100000E-19	1.00000
L L	VCS	0.100000E-19	0.100000E-19
L L	VFG	0.100000E-19	0.100000E-19
L L	FG	0.100000E-19	0.100000E-19
L L	MG	0.100000E-19	0.100000E-19
L L	CG	0.100000E-19	0.100000E-19
L L	VCG	0.100000E-19	0.100000E-19
	TOTAL	0.100000	10.0000

STREAM SEGMENT # 1: JORDAN RIVER SEDIMENT TRANSPORT STUDY SALT LAKE COUNTY

BED SEDIMENT CONTROL VOLUMES

SECTION NUMBER	LENGTH (ft)	MAX. WIDTH (ft)	DEPTH (ft)	VOLUME (cu.ft)	(cu.yd)
1310.000	82.50	85.00	8.00	56100.0	2077.78
1310.100	129.00	85.00	8.00	87720.0	3248.89
1310.400	180.00	96.06	8.00	138331.	5123.37
1305.000	313.50	122.49	8.00	307202.	11377.9
1300.100	233.00	126.22	8.00	235280.	8714.07
1300.400	153.00	125.00	8.00	153000.	5666.67
1300.000	420.00	124.52	8.00	418379.	15495.5
1295.000	515.00	123.42	8.00	508481.	18832.6
1290.000	902.50	124.90	8.00	901742.	33397.9
1280.000	1042.50	127.05	8.00	0.105963E+07	39245.6
1270.000	840.00	116.50	8.00	782880.	28995.6
1265.000	600.00	125.00	8.00	600013.	22222.7
1260.000	670.00	127.02	8.00	680833.	25216.0
1250.000	1800.00	114.10	8.00	0.164310E+07	60855.6
1240.000	1605.00	88.81	8.00	0.114036E+07	42235.6
1235.000	730.00	65.20	8.00	380747.	14101.7
1230.000	1145.00	67.14	8.00	615027.	22778.8
1220.000	1225.00	81.46	8.00	798347.	29568.4
1210.000	505.00	100.03	8.00	404133.	14967.9
1207.100	235.00	131.26	8.00	246776.	9139.85
1205.000	382.50	90.98	8.00	278414.	10311.6
1200.000	857.50	80.74	8.00	553889.	20514.4
1190.000	755.00	92.84	8.00	560751.	20768.5
1185.000	545.00	82.35	8.00	359055.	13298.3
1180.000	1245.00	78.09	8.00	777800.	28807.4
1170.000	1465.00	97.44	8.00	0.114201E+07	42296.6
1165.000	865.00	115.68	8.00	800478.	29647.3
1160.000	303.00	125.30	8.00	303738.	11249.6
1150.000	168.00	81.21	8.00	109140.	4042.22
1145.000	615.00	44.62	8.00	219507.	8129.88
1140.000	1080.00	73.54	8.00	635413.	23533.8
1130.000	1090.00	88.61	8.00	772646.	28616.5
1125.000	697.50	77.98	8.00	435136.	16116.2
1120.000	755.00	91.13	8.00	550426.	20386.1
1110.000	862.50	122.38	8.00	844433.	31275.3
1107.000	760.00	100.50	8.00	611046.	22631.3
1097.000	620.00	100.25	8.00	497242.	18416.4
1095.100	272.50	97.22	8.00	211948.	7849.93
1090.000	447.50	74.47	8.00	266599.	9874.04
1087.000	342.00	84.65	8.00	231610.	8578.13
1087.200	42.00	93.60	8.00	31449.6	1164.80
1085.000	25.00	102.47	0.00	0.000000	0.000000
1083.200	280.00	92.06	5.00	128882.	4773.39
1077.000	535.00	82.18	8.00	351720.	13026.7
1075.000	560.00	63.15	8.00	282912.	10478.2
1070.000	503.50	57.92	8.00	233296.	8640.59
1060.000	578.50	59.36	8.00	274736.	10175.4
1055.000	530.00	81.21	2.00	86083.3	3188.27
1050.000	845.00	72.79	2.00	123010.	4555.93
1040.000	837.50	87.66	8.00	587322.	21752.7
1035.000	467.50	70.76	8.00	264661.	9802.25
1030.000	820.00	77.45	8.00	508080.	18817.8
1020.000	1185.00	89.43	8.00	847813.	31400.5
1010.000	910.00	89.49	8.00	651467.	24128.4
1005.000	635.00	92.35	8.00	469160.	17376.3
1000.000	440.00	96.63	8.00	340133.	12597.5
995.100	142.00	83.99	8.00	95410.7	3533.73
990.000	387.00	75.27	8.00	233027.	8630.62
985.000	550.00	103.71	8.00	456313.	16900.5
980.000	580.00	100.95	8.00	468415.	17348.7
975.000	550.00	102.47	8.00	450853.	16698.3
970.000	485.00	71.55	8.00	277615.	10282.0
965.000	445.00	75.95	8.00	270392.	10014.5
960.000	245.00	88.41	8.00	173281.	6417.83
957.100	315.00	71.62	4.00	90236.3	3342.08

955.000	640.00	83.29	8.00	426437.	15794.0
950.000	840.00	90.12	8.00	605634.	22430.9
940.000	600.00	94.73	8.00	454707.	16841.0
940.100	307.50	91.59	8.00	225300.	8344.44
935.000	237.50	75.74	8.00	143910.	5330.00
930.000	325.00	84.29	8.00	219153.	8116.79
925.000	490.00	103.28	8.00	404851.	14994.5
923.000	535.00	102.05	8.00	436761.	16176.3
913.000	695.00	95.19	8.00	529272.	19602.7
912.000	575.00	90.08	8.00	414350.	15346.3
905.000	215.00	82.02	8.00	141071.	5224.84
904.000	55.00	74.47	0.00	0.000000	0.000000
903.100	105.00	82.11	2.00	17243.0	638.630
900.000	455.00	61.11	8.00	222449.	8238.86
890.000	1015.00	54.41	8.00	441840.	16364.4
880.000	1260.00	62.12	8.00	626160.	23191.1
870.000	1315.00	62.08	8.00	653127.	24189.9
860.000	1155.00	68.59	8.00	633800.	23474.1
850.000	525.00	63.45	8.00	266500.	9870.37
845.100	120.50	53.20	8.00	51285.3	1899.46
840.000	403.00	59.15	8.00	190701.	7063.01
835.000	982.50	71.45	8.00	561627.	20801.0
820.000	660.00	66.59	8.00	351615.	13022.8
815.000	105.00	63.63	4.00	26726.0	989.852
810.000	300.00	76.39	8.00	183324.	6789.78
805.000	480.00	99.46	8.00	381913.	14144.9
800.000	825.00	62.08	8.00	409747.	15175.8
790.000	1075.00	54.53	8.00	468923.	17367.5
780.000	1095.00	58.93	8.00	516260.	19120.7
770.000	1120.00	75.48	8.00	676340.	25049.6
760.000	1035.00	140.63	8.00	0.116438E+07	43125.2
750.000	720.00	367.71	8.00	0.211800E+07	78444.4
745.000	310.00	189.16	8.00	469107.	17374.3
740.000	285.00	84.23	8.00	192041.	7112.64
735.000	625.00	80.40	8.00	402020.	14889.6
730.000	745.00	84.60	8.00	504245.	18675.8
725.000	575.00	89.04	8.00	409567.	15169.1
720.000	355.00	109.17	8.00	310049.	11483.3
715.000	207.50	73.37	8.00	121798.	4511.04
710.000	317.50	66.66	8.00	169304.	6270.53
705.000	500.00	74.90	8.00	299587.	11095.8
700.000	680.00	60.87	8.00	331129.	12264.0
695.000	545.00	73.61	8.00	320933.	11886.4
690.000	630.00	77.83	8.00	392275.	14528.7
685.000	685.00	70.28	8.00	385116.	14263.6
676.000	555.00	68.56	8.00	304396.	11273.9
673.000	685.00	69.55	8.00	381151.	14116.7
670.000	955.00	68.18	8.00	520859.	19291.1
660.000	750.00	66.43	8.00	398600.	14763.0
655.000	595.00	71.58	8.00	340740.	12620.0
650.000	1070.00	69.64	8.00	596133.	22079.0
640.000	1280.00	84.29	8.00	863147.	31968.4
630.000	920.00	91.83	8.00	675853.	25031.6
625.000	655.00	83.64	8.00	438287.	16232.8
621.000	570.00	86.11	8.00	392680.	14543.7
615.000	575.00	78.14	8.00	359434.	13312.4
610.000	635.00	72.80	8.00	369804.	13696.4
600.000	385.00	81.59	8.00	251288.	9306.96
595.000	600.00	122.33	8.00	587187.	21747.7
590.000	1010.00	107.85	8.00	871421.	32274.9
575.000	1180.00	103.19	8.00	974153.	36079.7
565.000	1190.00	113.87	8.00	0.108408E+07	40151.3
561.000	800.00	115.58	8.00	739742.	27397.9
555.000	430.00	88.94	8.00	305967.	11332.1
550.000	727.50	89.30	8.00	519736.	19249.5
540.000	937.50	92.72	8.00	695429.	25756.6
535.000	1315.00	92.84	8.00	976660.	36172.6
515.000	1480.00	157.69	8.00	0.186704E+07	69149.6
510.000	715.00	181.78	8.00	0.103979E+07	38510.9
505.000	520.00	105.15	8.00	437408.	16200.3
497.000	905.00	100.29	8.00	726070.	26891.5
495.000	915.00	100.73	8.00	737380.	27310.4

485.000	730.00	108.38	8.00	632940.	23442.2
480.100	537.50	75.73	8.00	325640.	12060.7
480.000	437.50	72.80	8.00	254800.	9437.04
475.000	555.00	98.47	8.00	437228.	16193.6
470.000	592.50	93.56	8.00	443491.	16425.6
455.000	582.50	161.69	8.00	753488.	27907.0
453.000	755.00	140.86	8.00	850799.	31511.1
445.000	1115.00	89.48	8.00	798179.	29562.2
437.000	890.00	107.26	8.00	763720.	28285.9
435.000	500.00	110.98	8.00	443920.	16441.5
425.000	770.00	87.87	8.00	541293.	20047.9
420.000	760.00	90.35	8.00	549307.	20344.7
415.000	575.00	94.20	8.00	433320.	16048.9
410.000	875.00	61.19	8.00	428353.	15864.9
400.000	990.00	57.72	8.00	457147.	16931.4
390.000	1105.00	94.37	8.00	834240.	30897.8
380.000	1450.00	135.52	8.00	0.157203E+07	58223.5
370.000	1300.00	118.02	8.00	0.122737E+07	45458.0
365.000	850.00	109.01	8.00	741267.	27454.3
360.000	1065.00	104.87	8.00	893527.	33093.6
355.000	1190.00	144.73	8.00	0.137779E+07	51029.1
345.000	705.00	117.92	8.00	665080.	24632.6
335.000	775.00	214.03	8.00	0.132700E+07	49148.2
333.000	1145.00	181.81	8.00	0.166539E+07	61681.2
325.000	1335.00	171.94	8.00	0.183629E+07	68010.7
320.000	820.00	155.29	8.00	0.101869E+07	37729.4
315.000	440.00	70.88	8.00	249480.	9240.00
310.000	451.50	78.59	8.00	283867.	10513.6
305.000	156.50	81.18	6.00	76230.3	2823.34
300.000	345.00	84.31	8.00	232701.	8618.57
295.000	505.00	77.69	8.00	313885.	11625.4
290.000	557.50	76.75	8.00	342303.	12677.9
280.000	852.50	67.26	8.00	458715.	16989.4
270.000	832.50	63.88	8.00	425447.	15757.3
260.000	492.50	84.98	8.00	334827.	12401.0
255.000	340.00	146.18	8.00	397597.	14725.8
250.000	490.00	90.60	8.00	355139.	13153.3
240.000	440.00	82.75	8.00	291267.	10787.7
235.000	300.00	68.72	8.00	164933.	6108.64
230.000	290.00	74.23	8.00	172223.	6378.62
225.000	325.00	89.67	8.00	233133.	8634.57
220.000	785.00	68.43	8.00	429761.	15917.1
210.000	885.00	59.70	8.00	422676.	15654.7
205.000	685.00	44.84	8.00	245717.	9100.64
200.000	910.00	50.20	8.00	365456.	13535.4
190.000	960.00	55.19	8.00	423867.	15698.8
110.000	655.00	84.19	5.00	275733.	10212.3
90.000	480.00	151.11	5.00	362675.	13432.4
85.000	325.00	110.75	8.00	287952.	10664.9
80.100	129.50	59.37	3.00	23066.1	854.300
80.400	219.50	85.56	0.00	0.000000	0.000000
75.000	410.00	214.41	6.00	527440.	19534.8
70.000	460.00	326.57	6.00	901320.	33382.2
60.000	540.00	229.41	6.00	743274.	27528.7
55.000	780.00	166.29	6.00	778234.	28823.5
50.000	885.00	300.91	6.00	0.159783E+07	59178.9
45.000	775.00	170.65	6.00	793545.	29390.6
40.000	580.00	237.56	6.00	826715.	30619.1
35.000	1025.00	215.33	6.00	0.132431E+07	49048.4
30.000	1565.00	116.62	6.00	0.109508E+07	40558.5
25.000	1155.00	203.70	6.00	0.141164E+07	52282.8
15.000	365.00	193.17	8.00	564047.	20890.6

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 NO. OF INPUT DATA MESSAGES=     0
END OF SEDIMENT DATA

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BEGIN COMPUTATIONS.
 $HYD

 ..........................................................................................
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$GR
...BED CHANGE OPTION 1

....

$RATING
...DOWNSTREAM BOUNDARY CONDITION SPECIFIED BY A RATING CURVE

ELEVATION OF GAGE ZERO	0.00
DISCHARGE CORRESPONDING TO LOWEST ELEVATION IN TABLE	0.0
DISCHARGE INTERVAL	1000.0
NO. OF POINTS IN RATING TABLE	7

ELEVATIONS

4222.00 4223.90 4226.00 4228.20 4230.60 4232.40 4233.50

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* AB FLOW 1=2200

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JORDAN RIVER SEDIMENT TRANSPORT STUDY SALT LAKE COUNTY

BOUNDARY CONDITION DATA, CONTROL POINT NO. 1

SEGMENT INFLOW Q IN CFS...
1 2200.0 50.0 80.0 120.0 -50.0
TIME STEP NO. 1
WATER DISCHARGE= 2200.00
ELEVATION= 4226.440
TEMPERATURE= 50.000
FLOW DURATION(DAYS) 15.00

**** N	DISCHARGE (CFS)	WATER SURFACE	ENERGY LINE	VELOCITY HEAD	ALPHA	TOP WIDTH	AVG BED	AVG VEL (by subsection) 1	2	3
SEC NO. 1310.000										
**** 1	2200.0	4226.44	4226.58	0.14	1.03	115.52	4219.63	0.70	3.03	0.54
					FLOW DISTRIBUTION (%) =			0.4	99.5	0.1
SEC NO. 1310.100										
**** 1	2200.0	4226.56	4226.70	0.14	1.03	115.81	4219.65	0.70	2.99	0.54
					FLOW DISTRIBUTION (%) =			0.4	99.5	0.1
SEC NO. 1310.400										
**** 1	2200.0	4226.63	4226.77	0.14	1.03	115.44	4219.84	0.70	3.04	0.54
					FLOW DISTRIBUTION (%) =			0.3	99.6	0.1
SEC NO. 1305.000										
**** 1	2200.0	4226.88	4227.05	0.17	1.00	135.38	4221.96	0.22	3.34	0.29
					FLOW DISTRIBUTION (%) =			0.0	100.0	0.0
SEC NO. 1300.100										
**** 1	2200.0	4227.28	4227.39	0.11	1.03	140.14	4220.77	0.62	2.65	0.39
					FLOW DISTRIBUTION (%) =			0.3	99.6	0.1
SEC NO. 1300.400										
**** 1	2200.0	4227.34	4227.47	0.13	1.02	137.07	4221.29	0.64	2.85	0.34
					FLOW DISTRIBUTION (%) =			0.2	99.7	0.0
SEC NO. 1300.000										
**** 1	2200.0	4227.50	4227.64	0.14	1.01	134.64	4221.80	0.65	3.04	0.29
					FLOW DISTRIBUTION (%) =			0.2	99.8	0.0
SEC NO. 1295.000										
**** 1	2200.0	4227.68	4227.83	0.15	1.02	132.41	4222.11	0.30	3.11	0.36
					FLOW DISTRIBUTION (%) =			0.0	99.9	0.1
SEC NO. 1290.000										
**** 1	2200.0	4227.80	4227.94	0.13	1.10	134.20	4221.16	0.49	2.93	0.24
					FLOW DISTRIBUTION (%) =			1.0	99.0	0.0

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SEC NO.  1280.000
****  1    2200.0   4228.14   4228.28    0.14    1.02    132.26   4222.38   0.38  3.00   0.28
                                                  FLOW DISTRIBUTION (%) =   0.1  99.9    0.0

SEC NO.  1270.000
****  1    2200.0   4228.34   4228.45    0.11    1.18    127.67   4219.77   0.54  2.64   0.50
                                                  FLOW DISTRIBUTION (%) =   1.2  97.6    1.2

SEC NO.  1265.000
****  1    2200.0   4228.55   4228.74    0.18    1.03    135.73   4223.54   0.43  3.45   0.45
                                                  FLOW DISTRIBUTION (%) =   0.1  99.8    0.1

SEC NO.  1260.000
****  1    2200.0   4228.71   4228.82    0.11    1.07    136.77   4221.99   0.53  2.66   0.39
                                                  FLOW DISTRIBUTION (%) =   0.8  99.1    0.2

SEC NO.  1250.000
****  1    2200.0   4229.05   4229.18    0.13    1.02    127.99   4222.88   0.00  2.92   0.27
                                                  FLOW DISTRIBUTION (%) =   0.0  99.9    0.1

....LOCAL INFLOW POINT NO.  1,  Q=      50.00
...CONTINUING ON SEGMENT NO   1
       TEMPERATURE=      50.233

SEC NO.  1240.000
****  1    2150.0   4230.09   4230.23    0.15    1.35    127.49   4220.31   0.48  3.13   0.44
                                                  FLOW DISTRIBUTION (%) =   2.9  96.7    0.3

SEC NO.  1235.000
****  1    2150.0   4230.29   4230.52    0.23    1.45    128.96   4222.05   0.61  3.92   0.36
                                                  FLOW DISTRIBUTION (%) =   3.5  96.1    0.4

SEC NO.  1230.000
****  1    2150.0   4230.64   4230.89    0.24    1.07     94.42   4223.80   0.42  3.96   0.35
                                                  FLOW DISTRIBUTION (%) =   0.4  99.6    0.1

SEC NO.  1220.000
****  1    2150.0   4231.59   4231.80    0.21    1.00     90.14   4225.05   0.10  3.67   0.00
                                                  FLOW DISTRIBUTION (%) =   0.0 100.0    0.0

SEC NO.  1210.000
****  1    2150.0   4231.99   4232.17    0.19    1.09    125.72   4226.15   0.65  3.47   0.45
                                                  FLOW DISTRIBUTION (%) =   0.8  99.0    0.2

SEC NO.  1207.100
****  1    2150.0   4232.14   4232.24    0.10    1.00    147.95   4226.51   0.00  2.58   0.00
                                                  FLOW DISTRIBUTION (%) =   0.0 100.0    0.0

SEC NO.  1205.000
****  1    2150.0   4232.22   4232.39    0.18    1.14    111.32   4225.29   0.49  3.38   0.56
                                                  FLOW DISTRIBUTION (%) =   0.5  98.6    0.9

SEC NO.  1200.000
****  1    2150.0   4232.38   4232.55    0.17    1.10     84.25   4223.34   0.56  3.36   0.20
                                                  FLOW DISTRIBUTION (%) =   1.0  98.9    0.0

SEC NO.  1190.000
****  1    2150.0   4233.26   4233.45    0.19    1.10    126.98   4227.69   0.75  3.53   0.70
                                                  FLOW DISTRIBUTION (%) =   0.5  98.6    0.9

SEC NO.  1185.000
****  1    2150.0   4233.39   4233.59    0.20    1.42    125.94   4225.23   0.27  3.68   0.61
                                                  FLOW DISTRIBUTION (%) =   0.1  95.8    4.2

SEC NO.  1180.000
****  1    2150.0   4233.75   4233.96    0.20    1.14     80.40   4224.20   0.53  3.64   0.47
                                                  FLOW DISTRIBUTION (%) =   0.9  98.7    0.4

SEC NO.  1170.000
****  1    2150.0   4234.54   4234.68    0.14    2.07    281.52   4227.61   0.57  3.21   0.23
                                                  FLOW DISTRIBUTION (%) =  10.7  89.1    0.2
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SEC NO.  1165.000
****  1    2150.0   4235.40   4235.53    0.13     1.05     123.91   4228.79  0.76  2.93  0.34
                                                  FLOW DISTRIBUTION (%) =    0.9  99.1   0.0

SEC NO.  1160.000
****  1    2150.0   4235.79   4235.99    0.20     1.05     140.39   4231.10  1.32  3.57  0.61
                                                  FLOW DISTRIBUTION (%) =    1.7  98.2   0.1

SEC NO.  1150.000
****  1    2150.0   4235.97   4236.16    0.19     1.41     110.99   4225.30  1.16  3.72  1.14
                                                  FLOW DISTRIBUTION (%) =    2.4  88.7   8.9

SEC NO.  1145.000
****  1    2150.0   4236.04   4236.38    0.34     1.15      94.94   4230.05  0.73  4.73  0.72
                                                  FLOW DISTRIBUTION (%) =    0.9  98.5   0.6

SEC NO.  1140.000
****  1    2150.0   4237.10   4237.30    0.20     1.33     107.96   4226.93  0.45  3.62  0.30
                                                  FLOW DISTRIBUTION (%) =    2.2  97.7   0.1

SEC NO.  1130.000
****  1    2150.0   4237.73   4237.92    0.20     1.06     100.66   4231.04  0.50  3.55  0.56
                                                  FLOW DISTRIBUTION (%) =    0.2  99.5   0.3

SEC NO.  1125.000
****  1    2150.0   4238.58   4238.85    0.27     1.13      79.01   4230.54  0.87  4.22  0.62
                                                  FLOW DISTRIBUTION (%) =    1.3  98.3   0.4

SEC NO.  1120.000
****  1    2150.0   4238.91   4239.13    0.23     1.32     144.92   4231.39  0.53  3.87  0.31
                                                  FLOW DISTRIBUTION (%) =    2.4  97.5   0.1

....LOCAL INFLOW POINT NO.  2,  Q=      80.00
...CONTINUING ON SEGMENT NO   1
       TEMPERATURE=      50.628

SEC NO.  1110.000
****  1    2070.0   4240.12   4240.37    0.25     2.10     444.31   4236.87  0.74  4.20  0.57
                                                  FLOW DISTRIBUTION (%) =    9.2  89.2   1.6

SEC NO.  1107.000
****  1    2070.0   4240.83   4241.01    0.18     1.13     147.78   4233.98  0.84  3.43  0.35
                                                  FLOW DISTRIBUTION (%) =    0.8  98.7   0.5

SEC NO.  1097.000
****  1    2070.0   4241.62   4241.82    0.20     1.21     118.94   4235.09  1.21  3.68  1.08
                                                  FLOW DISTRIBUTION (%) =    3.6  94.0   2.4

SEC NO.  1095.100
****  1    2070.0   4241.89   4242.15    0.27     1.00      97.17   4236.73  0.00  4.13  0.03
                                                  FLOW DISTRIBUTION (%) =    0.0 100.0   0.0

SEC NO.  1090.000
****  1    2070.0   4242.41   4242.88    0.46     1.22     109.43   4236.05  0.57  5.51  1.14
                                                  FLOW DISTRIBUTION (%) =    0.9  98.3   0.8

SEC NO.  1087.000
****  1    2070.0   4243.07   4243.28    0.21     1.14      93.89   4235.75  0.49  3.67  0.49
                                                  FLOW DISTRIBUTION (%) =    0.6  98.8   0.6

SEC NO.  1087.200
****  1    2070.0   4243.09   4243.31    0.22     1.14      93.25   4235.98  0.50  3.77  0.50
                                                  FLOW DISTRIBUTION (%) =    0.6  98.9   0.5

SEC NO.  1085.000
OPERATION RULE SPECIFIED
UPPER POOL ELEVATION (UPE) =  4245.10   HEAD LOSS =      0.00
****  1    2070.0   4245.10   4245.81    0.71     1.00     105.10   4242.19  0.00  6.78  0.00
                                                  FLOW DISTRIBUTION (%) =    0.0 100.0   0.0

SEC NO.  1083.200
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**** 1   2070.0   4245.75   4246.02   0.27    1.04    90.35  4239.80  0.40  4.19  0.42
                                               FLOW DISTRIBUTION (%) =  0.1  99.8   0.1

SEC NO.  1077.000
**** 1   2070.0   4246.05   4246.34   0.28    1.06    92.77  4240.11  0.46  4.28  0.45
                                               FLOW DISTRIBUTION (%) =  0.2  99.6   0.2

SEC NO.  1075.000
**** 1   2070.0   4246.39   4246.81   0.43    1.06    71.16  4239.96  0.51  5.26  0.49
                                               FLOW DISTRIBUTION (%) =  0.2  99.7   0.1

SEC NO.  1070.000
**** 1   2070.0   4246.86   4247.13   0.28    1.51    69.29  4236.52  0.74  4.32  0.65
                                               FLOW DISTRIBUTION (%) =  3.1  94.9   2.0

SEC NO.  1060.000
**** 1   2070.0   4246.99   4247.40   0.40    1.50    68.10  4237.92  0.49  5.25  1.00
                                               FLOW DISTRIBUTION (%) =  0.3  94.3   5.4

....LOCAL INFLOW POINT NO.  3,  Q=    120.00
...CONTINUING ON SEGMENT NO   1
      TEMPERATURE=      51.282

SEC NO.  1055.000
**** 1   1950.0   4247.46   4247.77   0.31    1.09   103.19  4242.59  0.47  4.47  0.55
                                               FLOW DISTRIBUTION (%) =  0.2  99.4   0.4

SEC NO.  1050.000
**** 1   1950.0   4247.57   4248.25   0.69    2.02   165.89  4241.31  0.55  6.80  0.61
                                               FLOW DISTRIBUTION (%) =  3.5  96.0   0.6

SEC NO.  1040.000
**** 1   1950.0   4249.26   4249.52   0.26    1.70   186.91  4244.81  0.64  4.20  0.37
                                               FLOW DISTRIBUTION (%) =  6.0  93.9   0.1

SEC NO.  1035.000
**** 1   1950.0   4249.37   4250.03   0.65    1.66   105.57  4244.22  0.93  6.66  0.64
                                               FLOW DISTRIBUTION (%) =  5.0  94.8   0.2

SEC NO.  1030.000
**** 1   1950.0   4250.34   4250.65   0.31    1.48   121.87  4244.50  0.56  4.55  0.52
                                               FLOW DISTRIBUTION (%) =  3.0  96.7   0.4

SEC NO.  1020.000
**** 1   1950.0   4251.22   4251.53   0.32    1.03    94.86  4246.42  0.54  4.51  0.25
                                               FLOW DISTRIBUTION (%) =  0.2  99.8   0.0

SEC NO.  1010.000
**** 1   1950.0   4252.40   4252.71   0.31    1.32   147.05  4247.42  0.35  4.52  0.49
                                               FLOW DISTRIBUTION (%) =  0.1  98.1   1.9

SEC NO.  1005.000
**** 1   1950.0   4253.12   4253.53   0.41    1.08    94.91  4248.44  1.02  5.14  0.99
                                               FLOW DISTRIBUTION (%) =  0.8  98.9   0.3

SEC NO.  1000.000
**** 1   1950.0   4254.42   4254.66   0.25    1.06   110.77  4249.45  0.98  4.01  0.52
                                               FLOW DISTRIBUTION (%) =  0.9  99.0   0.1

SEC NO.   995.100
**** 1   1950.0   4254.55   4254.97   0.42    1.00    56.17  4247.86  0.00  5.19  0.00
                                               FLOW DISTRIBUTION (%) =  0.0 100.0   0.0

SEC NO.   990.000
**** 1   1950.0   4254.85   4255.34   0.49    1.12    63.48  4248.29  1.00  5.64  0.88
                                               FLOW DISTRIBUTION (%) =  0.8  98.7   0.5

SEC NO.   985.000
**** 1   1950.0   4255.93   4256.22   0.29    1.05   111.20  4251.49  0.63  4.31  0.72
                                               FLOW DISTRIBUTION (%) =  0.2  99.4   0.3

SEC NO.   980.000
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**** 1	1950.0	4256.50	4256.88	0.38	2.01	98.83	4248.96	0.87	5.39	1.31
					FLOW DISTRIBUTION (%) =			1.0	83.3	15.7
SEC NO.	975.000									
**** 1	1950.0	4257.81	4258.08	0.27	1.09	121.53	4253.55	0.95	4.23	1.12
					FLOW DISTRIBUTION (%) =			0.5	98.3	1.2
SEC NO.	970.000									
**** 1	1950.0	4258.78	4259.28	0.51	1.09	66.09	4252.89	1.17	5.74	0.96
					FLOW DISTRIBUTION (%) =			0.8	98.8	0.4
SEC NO.	965.000									
**** 1	1950.0	4259.90	4260.22	0.32	1.18	84.80	4253.50	0.88	4.58	1.01
					FLOW DISTRIBUTION (%) =			0.9	97.4	1.7
SEC NO.	960.000									
**** 1	1950.0	4260.43	4260.60	0.18	1.07	101.32	4253.90	0.59	3.37	0.50
					FLOW DISTRIBUTION (%) =			0.6	99.2	0.2
SEC NO.	957.100									
**** 1	1950.0	4260.31	4260.86	0.55	3.09	68.47	4247.97	1.62	7.21	1.70
					FLOW DISTRIBUTION (%) =			15.6	66.1	18.3
SEC NO.	955.000									
**** 1	1950.0	4261.17	4261.44	0.27	1.06	88.28	4255.37	0.49	4.15	0.73
					FLOW DISTRIBUTION (%) =			0.1	99.4	0.5
SEC NO.	950.000									
**** 1	1950.0	4262.05	4262.48	0.43	1.04	92.38	4257.77	0.90	5.27	0.36
					FLOW DISTRIBUTION (%) =			0.5	99.5	0.0
SEC NO.	940.000									
**** 1	1950.0	4263.62	4264.12	0.49	1.09	103.18	4259.78	0.72	5.65	0.83
					FLOW DISTRIBUTION (%) =			0.3	99.2	0.5
SEC NO.	940.100									
**** 1	1950.0	4264.57	4264.84	0.27	1.13	109.26	4259.46	0.82	4.20	0.91
					FLOW DISTRIBUTION (%) =			0.8	98.1	1.1
SEC NO.	935.000									
**** 1	1950.0	4264.99	4265.37	0.38	1.21	76.79	4258.36	1.06	5.01	0.85
					FLOW DISTRIBUTION (%) =			2.2	97.2	0.6
SEC NO.	930.000									
**** 1	1950.0	4265.24	4265.69	0.45	1.16	89.39	4260.28	1.32	5.46	0.88
					FLOW DISTRIBUTION (%) =			2.5	97.2	0.3
SEC NO.	925.000									
**** 1	1950.0	4266.07	4266.29	0.23	1.00	93.01	4260.59	0.00	3.83	0.00
					FLOW DISTRIBUTION (%) =			0.0	100.0	0.0
SEC NO.	923.000									
**** 1	1950.0	4266.46	4266.72	0.27	1.00	100.41	4261.62	0.24	4.15	0.00
					FLOW DISTRIBUTION (%) =			0.0	100.0	0.0
SEC NO.	913.000									
**** 1	1950.0	4267.28	4267.60	0.32	1.07	89.85	4261.97	0.00	4.52	0.89
					FLOW DISTRIBUTION (%) =			0.0	99.1	0.9
SEC NO.	912.000									
**** 1	1950.0	4268.49	4268.90	0.41	1.26	89.28	4262.53	1.05	5.21	0.88
					FLOW DISTRIBUTION (%) =			2.9	96.6	0.6
SEC NO.	905.000									
**** 1	1950.0	4269.09	4269.35	0.27	1.06	75.57	4261.86	0.51	4.16	0.57
					FLOW DISTRIBUTION (%) =			0.2	99.5	0.3
SEC NO.	904.000									
**** 1	1950.0	4269.26	4269.40	0.14	1.01	73.92	4260.05	0.18	3.01	0.19
					FLOW DISTRIBUTION (%) =			0.0	100.0	0.0
SEC NO.	903.100									

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SUPERCRITICAL
SEC NO. 903.100 TIME =   15.00 DAYS.
TRIAL    TRIAL        COMPUTED      CRITICAL
 NO.      WS            WS            WS
 0.     4271.00       4268.62
 1.     4271.09       4268.66       4271.04
**** 1      1950.0    4271.09    4272.45    1.36     1.10     80.51   4268.20   2.11  9.44  2.21
                                                     FLOW DISTRIBUTION (%) =   0.7  98.4   1.0

SEC NO.   900.000
**** 1      1950.0    4272.70    4273.13    0.43     1.25     70.32   4265.55   0.82  5.33  0.65
                                                     FLOW DISTRIBUTION (%) =   1.7  97.8   0.5

SEC NO.   890.000
**** 1      1950.0    4273.73    4274.17    0.44     1.10     55.25   4265.67   0.61  5.33  0.79
                                                     FLOW DISTRIBUTION (%) =   0.2  99.1   0.6

SEC NO.   880.000
**** 1      1950.0    4275.73    4275.94    0.20     1.08     71.05   4267.32   0.59  3.64  0.78
                                                     FLOW DISTRIBUTION (%) =   0.3  98.9   0.8

SEC NO.   870.000
**** 1      1950.0    4276.81    4277.07    0.27     1.17     74.00   4268.03   0.56  4.19  0.87
                                                     FLOW DISTRIBUTION (%) =   0.7  98.1   1.2

SEC NO.   860.000
**** 1      1950.0    4277.61    4277.94    0.33     1.10     81.96   4271.63   0.67  4.62  0.50
                                                     FLOW DISTRIBUTION (%) =   0.6  99.2   0.2

SEC NO.   850.000
**** 1      1950.0    4279.39    4279.82    0.43     1.00     57.76   4272.84   0.42  5.28  0.00
                                                     FLOW DISTRIBUTION (%) =   0.0 100.0   0.0

SEC NO.   845.100
**** 1      1950.0    4279.82    4280.14    0.32     1.00     61.18   4272.79   0.00  4.53  0.00
                                                     FLOW DISTRIBUTION (%) =   0.0 100.0   0.0

SEC NO.   840.000
**** 1      1950.0    4279.88    4280.44    0.55     1.08     58.81   4273.01   0.88  5.99  0.74
                                                     FLOW DISTRIBUTION (%) =   0.5  99.3   0.2

SEC NO.   835.000
**** 1      1950.0    4281.13    4281.39    0.26     1.16     85.29   4274.06   0.76  4.09  0.72
                                                     FLOW DISTRIBUTION (%) =   1.1  98.0   0.8

SEC NO.   820.000
**** 1      1950.0    4283.64    4284.12    0.48     1.07     64.46   4277.48   1.07  5.60  1.19
                                                     FLOW DISTRIBUTION (%) =   0.4  98.9   0.6

SEC NO.   815.000
**** 1      1950.0    4284.04    4284.37    0.34     1.00     79.91   4278.81   0.02  4.67  0.01
                                                     FLOW DISTRIBUTION (%) =   0.0 100.0   0.0

SEC NO.   810.000
**** 1      1950.0    4284.29    4284.99    0.70     1.02     55.90   4278.77   0.00  6.70  0.95
                                                     FLOW DISTRIBUTION (%) =   0.0  99.8   0.2

SEC NO.   805.000
**** 1      1950.0    4285.60    4285.77    0.17     1.11    105.61   4279.08   0.55  3.31  0.72
                                                     FLOW DISTRIBUTION (%) =   0.4  98.5   1.1

SEC NO.   800.000
**** 1      1950.0    4285.95    4286.25    0.30     1.00     57.56   4278.20   0.00  4.42  0.21
                                                     FLOW DISTRIBUTION (%) =   0.0 100.0   0.0

SEC NO.   790.000
**** 1      1950.0    4287.05    4287.46    0.41     1.36     59.12   4278.33   1.37  5.33  0.34
                                                     FLOW DISTRIBUTION (%) =   7.1  92.9   0.0

SEC NO.   780.000
**** 1      1950.0    4288.75    4288.99    0.23     1.13     56.36   4278.20   1.08  3.92  0.32
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                                                FLOW DISTRIBUTION (%) =   2.4  97.5   0.1

SEC NO.   770.000
**** 1     1950.0   4289.76   4290.06    0.30   1.08     94.70  4283.92  0.00  4.41  0.62
                                                FLOW DISTRIBUTION (%) =   0.0  99.3   0.7

SEC NO.   760.000
**** 1     1950.0   4290.66   4291.10    0.44   1.02     63.25  4284.64  0.39  5.31  0.25
                                                FLOW DISTRIBUTION (%) =   0.1  99.9   0.0

SEC NO.   750.000
**** 1     1950.0   4291.79   4291.97    0.17   1.22    156.76  4287.18  0.64  3.40  0.64
                                                FLOW DISTRIBUTION (%) =   0.7  97.2   2.1

SEC NO.   745.000
**** 1     1950.0   4292.18   4292.50    0.31   1.09     98.57  4287.22  0.80  4.52  0.76
                                                FLOW DISTRIBUTION (%) =   0.5  99.0   0.5

SEC NO.   740.000
**** 1     1950.0   4292.63   4292.86    0.24   1.53    187.81  4289.16  1.02  4.22  1.43
                                                FLOW DISTRIBUTION (%) =   1.1  83.2  15.7

SEC NO.   735.000
**** 1     1950.0   4293.07   4293.42    0,35   1.14     78.75  4286.64  0.73  4.78  0.74
                                                FLOW DISTRIBUTION (%) =   0.6  98.7   0.7

SEC NO.   730.000
**** 1     1950.0   4294.17   4294.57    0.40   1.12     87.43  4289.13  0.33  5.13  1.14
                                                FLOW DISTRIBUTION (%) =   0.0  98.1   1.9

SEC NO.   725.000
**** 1     1950.0   4294.88   4295.17    0.28   1.06     81.98  4288.77  0.60  4.29  0.16
                                                FLOW DISTRIBUTION (%) =   0.5  99.5   0.0

SEC NO.   720.000
**** 1     1950.0   4295.28   4295.71    0.43   1.30    118.20  4290.38  0.44  5.33  0.68
                                                FLOW DISTRIBUTION (%) =   0.1  97.8   2.1

SEC NO.   715.000
**** 1     1950.0   4295.66   4295.90    0.24   1.00     74.93  4289.03  0.02  3.93  0.00
                                                FLOW DISTRIBUTION (%) =   0.0 100.0   0.0

SEC NO.   710.000
**** 1     1950.0   4295.69   4296.21    0.52   1.10     62.60  4289.48  0.82  5.81  0.00
                                                FLOW DISTRIBUTION (%) =   0.9  99.1   0.0

SEC NO.   705.000
**** 1     1950.0   4296.64   4296.89    0.25   1.17     89.03  4289.69  0.79  4.06  0.87
                                                FLOW DISTRIBUTION (%) =   1.1  97.6   1.3

SEC NO.   700.000
**** 1     1950.0   4297.02   4297.50    0.48   1.12     58.13  4289.15  0.64  5.58  0.66
                                                FLOW DISTRIBUTION (%) =   0.5  99.2   0.3

SEC NO.   695.000
**** 1     1950.0   4298.01   4298.24    0.24   1.04     83.41  4291.43  0.44  3.89  0.32
                                                FLOW DISTRIBUTION (%) =   0.1  99.8   0.1

SEC NO.   690.000
**** 1     1950.0   4298.29   4298.63    0.34   1.05     86.55  4293.11  0.00  4.70  0.81
                                                FLOW DISTRIBUTION (%) =   0.0  99.4   0.6

SEC NO.   685.000
**** 1     1950.0   4299.27   4299.47    0.20   1.13    119.97  4293.89  0.50  3.61  0.69
                                                FLOW DISTRIBUTION (%) =   0.4  98.5   1.2

....LOCAL INFLOW POINT NO.  4,  Q=      -50.00
...CONTINUING ON SEGMENT NO   1
      TEMPERATURE=       51.125

SEC NO.   676.000
OPERATION RULE SPECIFIED
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UPPER POOL ELEVATION (UPE) = 4301.80 HEAD LOSS = 0.00

****	1	2000.0	4301.80	4302.08	0.28	1.00	77.87	4295.70	0.00	4.21	0.00
						FLOW DISTRIBUTION (%) =			0.0	100.0	0.0
SEC NO.	673.000										
****	1	2000.0	4302.23	4302.72	0.49	1.00	68.92	4296.99	0.12	5.62	0.08
						FLOW DISTRIBUTION (%) =			0.0	100.0	0.0
SEC NO.	670.000										
****	1	2000.0	4302.89	4303.04	0.15	1.08	74.81	4293.15	0.30	3.14	0.28
						FLOW DISTRIBUTION (%) =			0.2	99.6	0.2
SEC NO.	660.000										
****	1	2000.0	4303.33	4303.65	0.31	1.42	123.34	4296.35	0.64	4.55	0.58
						FLOW DISTRIBUTION (%) =			0.4	96.9	2.7
SEC NO.	655.000										
****	1	2000.0	4303.53	4303.99	0.47	1.02	85.30	4299.04	0.49	5.50	0.55
						FLOW DISTRIBUTION (%) =			0.1	99.9	0.1
SEC NO.	650.000										
****	1	2000.0	4305.14	4305.65	0.51	1.97	209.19	4300.50	0.76	5.93	0.00
						FLOW DISTRIBUTION (%) =			6.6	93.4	0.0
SEC NO.	640.000										
****	1	2000.0	4307.66	4308.25	0.59	4.39	779.95	4304.79	0.24	6.81	0.96
						FLOW DISTRIBUTION (%) =			0.8	81.1	18.1
SEC NO.	630.000										
****	1	2000.0	4310.21	4310.43	0.21	5.34	1166.39	4306.53	0.16	4.27	0.63
						FLOW DISTRIBUTION (%) =			1.0	74.8	24.2
SEC NO.	625.000										
****	1	2000.0	4310.70	4310.88	0.18	1.24	667.98	4303.01	0.33	3.36	0.07
						FLOW DISTRIBUTION (%) =			0.1	99.7	0.2
SEC NO.	621.000										
****	1	2000.0	4311.06	4311.19	0.13	2.98	724.38	4303.60	0.23	3.02	0.28
						FLOW DISTRIBUTION (%) =			2.6	92.5	5.0
SEC NO.	615.000										
****	1	2000.0	4311.18	4311.39	0.21	1.10	86.61	4303.93	0.55	3.69	0.60
						FLOW DISTRIBUTION (%) =			0.5	99.0	0.5
SEC NO.	610.000										
****	1	2000.0	4311.79	4312.00	0.21	1.00	74.63	4304.56	0.00	3.71	0.00
						FLOW DISTRIBUTION (%) =			0.0	100.0	0.0
SEC NO.	600.000										
****	1	2000.0	4312.56	4312.93	0.37	1.00	93.30	4308.18	0.00	4.89	0.00
						FLOW DISTRIBUTION (%) =			0.0	100.0	0.0
SEC NO.	595.000										
****	1	2000.0	4313.14	4313.22	0.08	2.14	700.79	4307.43	0.00	2.35	0.18
						FLOW DISTRIBUTION (%) =			0.0	95.8	4.2
SEC NO.	590.000										
****	1	2000.0	4313.53	4314.07	0.54	1.59	244.67	4310.57	0.74	6.02	0.65
						FLOW DISTRIBUTION (%) =			3.9	96.0	0.1
SEC NO.	575.000										
****	1	2000.0	4315.72	4315.83	0.11	1.86	246.29	4310.25	0.80	2.87	0.49
						FLOW DISTRIBUTION (%) =			17.2	81.9	0.9
SEC NO.	565.000										
****	1	2000.0	4316.58	4316.73	0.15	3.42	474.18	4310.83	0.75	3.41	0.51
						FLOW DISTRIBUTION (%) =			0.9	81.3	17.7
SEC NO.	561.000										
****	1	2000.0	4317.47	4317.61	0.14	1.14	152.18	4312.43	0.84	3.02	0.56
						FLOW DISTRIBUTION (%) =			1.9	97.4	0.6

SEC NO.	555.000									
**** 1	2000.0	4317.95	4318.22	0.27	1.03	90.72	4312.37	0.64	4.16	0.39
					FLOW DISTRIBUTION (%) =			0.2	99.8	0.1
SEC NO.	550.000									
**** 1	2000.0	4318.73	4319.15	0.41	1.02	146.79	4314.26	0.09	5.15	0.09
					FLOW DISTRIBUTION (%) =			0.0	100.0	0.0
SEC NO.	540.000									
**** 1	2000.0	4321.36	4321.52	0.17	2.07	282.16	4316.32	1.08	3.61	0.61
					FLOW DISTRIBUTION (%) =			15.0	80.1	5.0
SEC NO.	535.000									
**** 1	2000.0	4321.81	4321.98	0.18	3.01	255.69	4315.21	0.65	3.70	0.57
					FLOW DISTRIBUTION (%) =			10.7	81.9	7.4
SEC NO.	515.000									
**** 1	2000.0	4323.22	4323.38	0.16	1.13	244.65	4319.90	0.42	3.27	0.00
					FLOW DISTRIBUTION (%) =			1.0	99.0	0.0
SEC NO.	510.000									
**** 1	2000.0	4324.72	4324.90	0.18	1.02	210.72	4321.89	0.71	3.44	0.30
					FLOW DISTRIBUTION (%) =			0.3	99.7	0.0
SEC NO.	505.000									
**** 1	2000.0	4325.02	4325.43	0.41	3.01	305.08	4320.92	0.50	5.49	0.70
					FLOW DISTRIBUTION (%) =			0.1	87.7	12.3
SEC NO.	497.000									
**** 1	2000.0	4326.51	4327.05	0.53	1.66	149.43	4322.41	0.96	6.01	0.80
					FLOW DISTRIBUTION (%) =			0.7	94.9	4.4
SEC NO.	495.000									
**** 1	2000.0	4327.93	4328.22	0.29	1.33	168.17	4323.73	0.00	4.37	0.40
					FLOW DISTRIBUTION (%) =			0.0	98.4	1.6
SEC NO.	485.000									
**** 1	2000.0	4328.41	4328.53	0.12	1.51	362.40	4322.20	0.23	2.75	0.09
					FLOW DISTRIBUTION (%) =			1.4	98.3	0.3
SEC NO.	480.100									
**** 1	2000.0	4328.83	4329.57	0.74	1.00	63.47	4324.27	0.00	6.91	0.00
					FLOW DISTRIBUTION (%) =			0.0	100.0	0.0
SEC NO.	480.000									
**** 1	2000.0	4330.56	4331.06	0.50	1.00	65.39	4325.18	0.00	5.69	0.00
					FLOW DISTRIBUTION (%) =			0.0	100.0	0.0
SEC NO.	475.000									
**** 1	2000.0	4331.70	4331.81	0.11	1.05	188.31	4327.40	0.43	2.72	0.26
					FLOW DISTRIBUTION (%) =			0.4	99.5	0.0
SEC NO.	470.000									
**** 1	2000.0	4332.18	4332.71	0.52	1.01	61.36	4326.44	0.32	5.81	0.23
					FLOW DISTRIBUTION (%) =			0.0	100.0	0.0
SEC NO.	455.000									
**** 1	2000.0	4333.38	4334.44	1.07	2.19	153.92	4329.07	1.38	8.60	1.01
					FLOW DISTRIBUTION (%) =			0.7	92.7	6.6
SEC NO.	453.000									
**** 1	2000.0	4335.69	4335.88	0.19	1.46	459.23	4332.81	0.37	3.50	0.00
					FLOW DISTRIBUTION (%) =			2.7	97.3	0.0
SEC NO.	445.000									
**** 1	2000.0	4336.99	4337.34	0.35	3.75	675.45	4332.67	0.00	4.96	0.41
					FLOW DISTRIBUTION (%) =			0.0	90.6	9.4
SEC NO.	437.000									
**** 1	2000.0	4339.15	4339.45	0.30	4.11	661.30	4334.11	0.61	4.77	0.27
					FLOW DISTRIBUTION (%) =			14.5	84.2	1.3

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SEC NO.   435.000
**** 1     2000.0    4339.74    4339.95     0.21      1.25     306.95   4335.06  0.21  3.72  0.19
                                                      FLOW DISTRIBUTION (%) =    0.7  99.3   0.0

SEC NO.   425.000
**** 1     2000.0    4340.44    4340.86     0.42      1.23     217.98   4337.67  0.61  5.23  0.55
                                                      FLOW DISTRIBUTION (%) =    1.5  98.5   0.1

SEC NO.   420.000
**** 1     2000.0    4342.05    4342.39     0.35      1.81     243.80   4337.11  0.74  4.84  0.31
                                                      FLOW DISTRIBUTION (%) =    3.1  95.5   1.4

SEC NO.   415.000
**** 1     2000.0    4342.67    4343.05     0.37      1.24     264.11   4338.93  0.27  4.91  0.21
                                                      FLOW DISTRIBUTION (%) =    0.6  99.3   0.1

SEC NO.   410.000
**** 1     2000.0    4343.28    4343.72     0.44      1.76     155.02   4337.58  0.60  5.43  0.00
                                                      FLOW DISTRIBUTION (%) =    4.5  95.5   0.0

SEC NO.   400.000
**** 1     2000.0    4345.37    4345.84     0.47      1.62     150.91   4340.17  1.00  5.64  0.64
                                                      FLOW DISTRIBUTION (%) =    1.9  95.3   2.8

SEC NO.   390.000
**** 1     2000.0    4347.54    4348.07     0.53      2.95     345.91   4344.92  0.37  6.36  1.03
                                                      FLOW DISTRIBUTION (%) =    0.1  83.3  16.6

SEC NO.   380.000
**** 1     2000.0    4351.74    4352.06     0.32      1.44     284.49   4348.53  0.95  4.61  0.31
                                                      FLOW DISTRIBUTION (%) =    2.3  96.8   1.0

SEC NO.   370.000
**** 1     2000.0    4353.44    4353.70     0.26      1.62     274.70   4348.90  0.39  4.12  0.35
                                                      FLOW DISTRIBUTION (%) =    2.8  97.0   0.3

SEC NO.   365.000
**** 1     2000.0    4355.23    4355.86     0.63      1.74     208.38   4352.40  0.71  6.55  0.96
                                                      FLOW DISTRIBUTION (%) =    0.5  94.0   5.5

SEC NO.   360.000
**** 1     2000.0    4356.84    4357.48     0.64      1.84      85.25   4350.82  1.17  6.73  1.18
                                                      FLOW DISTRIBUTION (%) =    1.7  91.1   7.2

SEC NO.   355.000
**** 1     2000.0    4359.51    4359.97     0.46      2.33     304.75   4357.16  1.63  5.97  0.54
                                                      FLOW DISTRIBUTION (%) =   16.0  81.5   2.5

SEC NO.   345.000
**** 1     2000.0    4362.13    4363.20     1.07      2.04     189.48   4357.33  0.73  8.48  0.88
                                                      FLOW DISTRIBUTION (%) =    4.0  95.6   0.5

SEC NO.   335.000
**** 1     2000.0    4363.91    4364.05     0.15      1.15     355.95   4361.34  0.00  3.10  0.23
                                                      FLOW DISTRIBUTION (%) =    0.0  99.4   0.6

SEC NO.   333.000

SUPERCRITICAL
SEC NO. 333.000 TIME =    15.00 DAYS.
TRIAL    TRIAL        COMPUTED      CRITICAL
 NO.      WS             WS            WS
  0.    4365.45       4365.20
  1.    4365.54       4365.18       4365.49
**** 1     2000.0    4365.54    4366.95     1.41      1.11      89.41   4362.42  0.82  9.54  0.61
                                                      FLOW DISTRIBUTION (%) =    0.5  99.5   0.0

SEC NO.   325.000
**** 1     2000.0    4371.42    4372.40     0.98      5.00     344.72   4367.19  0.98  8.77  0.68
                                                      FLOW DISTRIBUTION (%) =   18.2  81.6   0.1

SEC NO.   320.000
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**** 1	2000.0	4376.54	4377.56	1.01	1.69	154.70	4373.52	1.09	8.28	0.69
					FLOW DISTRIBUTION (%) =			4.8	95.1	0.1
SEC NO.	315.000									
**** 1	2000.0	4378.42	4378.86	0.44	1.75	105.46	4371.45	0.68	5.45	0.70
					FLOW DISTRIBUTION (%) =			4.0	94.8	1.2
SEC NO.	310.000									
**** 1	2000.0	4381.09	4381.82	0.72	1.02	87.64	4377.60	0.55	6.81	0.40
					FLOW DISTRIBUTION (%) =			0.1	99.9	0.0
SEC NO.	305.000									
**** 1	2000.0	4382.35	4382.79	0.44	1.09	76.79	4376.67	0.52	5.34	0.32
					FLOW DISTRIBUTION (%) =			0.4	99.5	0.1
SEC NO.	300.000									
**** 1	2000.0	4382.39	4383.20	0.80	1.37	88.58	4377.58	0.77	7.27	0.52
					FLOW DISTRIBUTION (%) =			2.0	97.9	0.1
SEC NO.	295.000									
**** 1	2000.0	4385.79	4386.21	0.42	1.26	131.30	4380.74	0.34	5.22	0.42
					FLOW DISTRIBUTION (%) =			0.1	98.9	1.0
SEC NO.	290.000									
**** 1	2000.0	4386.88	4387.17	0.29	1.10	90.20	4380.74	0.35	4.32	0.44
					FLOW DISTRIBUTION (%) =			0.1	99.5	0.4
SEC NO.	280.000									
**** 1	2000.0	4389.14	4389.83	0.69	1.46	141.58	4384.59	0.58	6.72	0.48
					FLOW DISTRIBUTION (%) =			2.0	97.9	0.0
SEC NO.	270.000									
**** 1	2000.0	4392.79	4393.64	0.85	1.19	84.76	4388.34	0.53	7.43	0.44
					FLOW DISTRIBUTION (%) =			0.7	99.3	0.1
SEC NO.	260.000									
**** 1	2000.0	4395.76	4396.29	0.53	1.03	97.92	4392.07	0.44	5.86	0.00
					FLOW DISTRIBUTION (%) =			0.1	99.9	0.0
SEC NO.	255.000									
**** 1	2000.0	4397.75	4398.42	0.67	1.03	150.91	4395.66	0.31	6.57	0.79
					FLOW DISTRIBUTION (%) =			0.0	99.8	0.2
SEC NO.	250.000									
**** 1	2000.0	4399.92	4400.29	0.37	1.65	151.27	4395.23	0.58	4.98	0.31
					FLOW DISTRIBUTION (%) =			4.0	95.9	0.0
SEC NO.	240.000									
**** 1	2000.0	4401.99	4402.24	0.25	1.39	167.62	4396.60	0.44	4.07	0.42
					FLOW DISTRIBUTION (%) =			2.2	97.7	0.2
SEC NO.	235.000									
**** 1	2000.0	4402.13	4403.33	1.20	1.50	72.59	4397.39	1.00	8.91	0.64
					FLOW DISTRIBUTION (%) =			2.8	97.0	0.2
SEC NO.	230.000									
**** 1	2000.0	4404.15	4404.66	0.51	1.63	124.74	4398.88	0.59	5.84	0.34
					FLOW DISTRIBUTION (%) =			2.8	96.9	0.3
SEC NO.	225.000									
**** 1	2000.0	4405.16	4405.50	0.34	1.08	111.11	4400.58	0.00	4.65	0.41
					FLOW DISTRIBUTION (%) =			0.0	99.6	0.4
SEC NO.	220.000									
**** 1	2000.0	4405.56	4406.04	0.49	1.18	93.68	4399.83	0.30	5.60	0.26
					FLOW DISTRIBUTION (%) =			0.1	99.6	0.3
SEC NO.	210.000									
**** 1	2000.0	4407.33	4408.27	0.95	1.49	71.90	4402.50	0.89	7.91	0.54
					FLOW DISTRIBUTION (%) =			2.4	97.2	0.3
SEC NO.	205.000									

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****  1    2000.0   4411.41   4412.00    0.59      1.00     54.77  4405.51  0.00  6.19  0.00
                                                  FLOW DISTRIBUTION (%) =   0.0 100.0   0.0

SEC NO.   200.000
****  1    2000.0   4414.47   4415.08    0.60      1.30     62.85  4407.09  0.58  6.30  0.92
                                                  FLOW DISTRIBUTION (%) =   0.4  97.7   1.9

SEC NO.   190.000
****  1    2000.0   4420.24   4421.26    1.02      1.00     54.86  4415.72  0.00  8.10  0.16
                                                  FLOW DISTRIBUTION (%) =   0.0 100.0   0.0

SEC NO.   110.000
****  1    2000.0   4427.26   4428.06    0.80      1.01     47.05  4421.19  0.37  7.17  0.00
                                                  FLOW DISTRIBUTION (%) =   0.0 100.0   0.0

SEC NO.    90.000
****  1    2000.0   4430.55   4431.11    0.56      2.08    195.49  4426.91  0.58  6.31  1.15
                                                  FLOW DISTRIBUTION (%) =   1.2  89.8   9.1

SEC NO.    85.000
****  1    2000.0   4432.13   4432.35    0.22      1.00     88.44  4426.14  0.00  3.77  0.00
                                                  FLOW DISTRIBUTION (%) =   0.0 100.0   0.0

SEC NO.    80.100
****  1    2000.0   4431.99   4432.56    0.58      1.00     54.59  4425.97  0.00  6.09  0.00
                                                  FLOW DISTRIBUTION (%) =   0.0 100.0   0.0

SEC NO.    80.400
OPERATION RULE SPECIFIED
UPPER POOL ELEVATION (UPE) =  4432.80   HEAD LOSS =    0.00
****  1    2000.0   4432.80   4433.28    0.48      1.00     54.59  4426.21  0.00  5.56  0.00
                                                  FLOW DISTRIBUTION (%) =   0.0 100.0   0.0

SEC NO.    75.000
****  1    2000.0   4433.62   4433.76    0.14      1.01    343.23  4431.43  1.88  3.06  1.49
                                                  FLOW DISTRIBUTION (%) =   0.1  99.2   0.8

SEC NO.    70.000
****  1    2000.0   4434.44   4434.66    0.22      1.00    299.27  4430.96  3.63  3.70  3.89
                                                  FLOW DISTRIBUTION (%) =   8.9  53.2  37.8

SEC NO.    60.000

SUPERCRITICAL
SEC NO.  60.000 TIME =    15.00 DAYS.
TRIAL    TRIAL        COMPUTED      CRITICAL
 NO.      WS             WS            WS
  0.    4436.12       4434.89
  1.    4436.21       4434.96       4436.16
****  1    2000.0   4436.21   4436.84    0.63      1.18    152.40  4433.43  5.61  4.60  7.52
                                                  FLOW DISTRIBUTION (%) =   2.0  43.8  54.2

SEC NO.    55.000
****  1    2000.0   4438.97   4439.60    0.63      1.13     55.88  4432.00  2.40  5.67  9.93
                                                  FLOW DISTRIBUTION (%) =   0.1  87.0  12.9

SEC NO.    50.000
****  1    2000.0   4443.77   4444.21    0.44      1.05    241.13  4438.76  0.00  4.72  6.07
                                                  FLOW DISTRIBUTION (%) =   0.0  58.1  41.9

SEC NO.    45.000

SUPERCRITICAL
SEC NO.  45.000 TIME =    15.00 DAYS.
TRIAL    TRIAL        COMPUTED      CRITICAL
 NO.      WS             WS            WS
  0.    4447.43       4445.87
  1.    4447.53       4445.83       4447.48
****  1    2000.0   4447.53   4449.39    1.86      1.02     49.78  4443.03  6.52 11.01  4.55
                                                  FLOW DISTRIBUTION (%) =   0.9  98.4   0.8

SEC NO.    40.000
```

**** 1	2000.0	4451.12	4451.27	0.15	1.02	581.33	4449.20	3.16	2.58	0.00
					FLOW DISTRIBUTION (%) =			85.1	14.9	0.0
SEC NO.	35.000									
**** 1	2000.0	4451.65	4451.79	0.14	1.02	584.73	4449.68	3.04	2.45	0.00
					FLOW DISTRIBUTION (%) =			85.4	14.6	0.0
SEC NO.	30.000									
**** 1	2000.0	4457.03	4458.69	1.67	1.02	49.00	4451.97	11.04	10.09	15.40
					FLOW DISTRIBUTION (%) =			5.2	91.7	3.1
SEC NO.	25.000									
**** 1	2000.0	4470.19	4470.84	0.65	3.01	243.69	4467.86	9.15	2.23	8.00
					FLOW DISTRIBUTION (%) =			22.6	45.5	31.9
SEC NO.	15.000									
**** 1	2000.0	4474.91	4475.12	0.21	1.00	152.94	4471.38	0.18	3.71	0.00
					FLOW DISTRIBUTION (%) =			0.0	100.0	0.0

**INLO

** Q BELOW TABLE **

WATER DISCHARGE, WATER-SEDIMENT LOAD TABLE ENDPOINT 0.00 1.00 0.060000

TABLE SA-1. TRAP EFFICIENCY ON STREAM SEGMENT # 1

JORDAN RIVER SEDIMENT TRANSPORT STUDY SALT LAKE COUNTY

ACCUMULATED AC-FT ENTERING AND LEAVING THIS STREAM SEGMENT

TIME DAYS	ENTRY POINT	INFLOW	SAND OUTFLOW	TRAP EFF
15.00	15.000	0.37		
TOTAL=	80.400	0.37	4.33	-10.70
TIME	ENTRY		SAND	
15.00	80.400	4.33		
TOTAL=	676.000	4.33	2.12	0.51
TIME	ENTRY		SAND	
15.00	676.000	2.12		
	685.000	0.00		
	1060.000	0.02		
TOTAL=	1085.000	2.14	3.44	-0.61
TIME	ENTRY		SAND	
15.00	1085.000	3.44		
	1120.000	0.08		
	1250.000	0.01		
TOTAL=	1310.000	3.53	1.54	0.56

TABLE SB-1.	TOTAL	LOAD BY GRAIN SIZE (TONS/DAY)				
		VF	F	M	C	VC
SEDIMENT INFLOW						
SANDS & GRAVELS	50.00	10.00	15.00	12.50	7.50	2.50
		1.50	1.00	0.00	0.00	0.00
SEDIMENT OUTFLOW						
SANDS & GRAVELS	208.57	50.38	43.02	43.95	18.49	13.80
		38.94	0.00	0.00	0.00	0.00

SECTION ID NO	BED CHANGE FEET	WS ELEV FEET	THALWEG EL FEET	Q CFS	SEDIMENT LOAD (TONS/DAY) SAND
15.000	-0.26	4474.91	4469.24	2000.	106.
25.000	-0.08	4470.19	4466.72	2000.	162.
30.000	-5.35	4457.03	4445.85	2000.	3085.
35.000	4.48	4451.65	4453.08	2000.	173.
40.000	0.00	4451.12	4448.10	2000.	172.
45.000	-5.40	4447.53	4433.70	2000.	1661.
50.000	1.71	4443.77	4438.51	2000.	855.

55.000	-0.40	4438.97	4430.40	2000.	956.
60.000	-0.93	4436.21	4430.27	2000.	1204.
70.000	1.07	4434.44	4428.97	2000.	814.
75.000	0.49	4433.62	4427.99	2000.	691.
-80.400	2.27	4432.80	4428.47	2000.	585.
80.100	7.89	4431.99	4433.89	2000.	490.
85.000	0.17	4432.13	4425.17	2000.	470.
90.000	-0.70	4430.55	4423.50	2000.	623.
110.000	0.48	4427.26	4419.18	2000.	564.
190.000	-2.84	4420.24	4411.06	2000.	992.
200.000	0.70	4414.47	4406.70	2000.	892.
205.000	0.73	4411.41	4403.23	2000.	823.
210.000	0.23	4407.33	4401.23	2000.	787.
220.000	0.55	4405.56	4399.45	2000.	699.
225.000	1.00	4405.16	4400.70	2000.	617.
230.000	0.68	4404.15	4398.98	2000.	573.
235.000	-5.53	4402.13	4389.77	2000.	867.
240.000	1.85	4401.99	4396.55	2000.	666.
250.000	0.48	4399.92	4393.78	2000.	604.
255.000	0.27	4397.75	4393.47	2000.	571.
260.000	0.19	4395.76	4390.79	2000.	547.
270.000	-0.09	4392.79	4387.21	2000.	561.
280.000	-0.27	4389.14	4383.43	2000.	610.
290.000	0.41	4386.88	4379.91	2000.	557.
295.000	0.33	4385.79	4380.13	2000.	517.
300.000	-0.14	4382.39	4375.46	2000.	529.
305.000	0.78	4382.35	4376.78	2000.	500.
310.000	0.21	4381.09	4377.21	2000.	478.
315.000	0.19	4378.42	4370.49	2000.	462.
320.000	-2.22	4376.54	4369.58	2000.	1327.
325.000	-1.17	4371.42	4365.33	2000.	2092.
333.000	-4.57	4365.54	4357.33	2000.	4204.
335.000	7.41	4363.91	4366.61	2000.	820.
345.000	-0.54	4362.13	4355.86	2000.	955.
355.000	-0.71	4359.51	4355.19	2000.	1339.
360.000	-0.18	4356.84	4349.72	2000.	1402.
365.000	0.25	4355.23	4350.95	2000.	1339.
370.000	1.07	4353.44	4348.47	2000.	854.
380.000	-0.05	4351.74	4347.65	2000.	884.
390.000	-0.46	4347.54	4343.44	2000.	1048.
400.000	0.24	4345.37	4336.84	2000.	1000.
410.000	-0.01	4343.28	4336.39	2000.	1001.
415.000	-0.12	4342.67	4337.98	2000.	1022.
420.000	-0.06	4342.05	4334.44	2000.	1036.
425.000	0.35	4340.44	4335.95	2000.	952.
435.000	1.40	4339.74	4334.00	2000.	708.
437.000	-0.24	4339.15	4331.66	2000.	779.
445.000	-0.14	4336.99	4329.16	2000.	826.
453.000	0.19	4335.69	4329.79	2000.	763.
455.000	-1.29	4333.38	4327.01	2000.	1082.
470.000	0.51	4332.18	4325.71	2000.	1001.
475.000	2.76	4331.70	4327.26	2000.	490.
480.000	-0.61	4330.56	4322.29	2000.	553.
480.100	-0.90	4328.83	4321.20	2000.	665.
485.000	1.17	4328.41	4322.57	2000.	380.
495.000	-0.14	4327.93	4319.96	2000.	420.
497.000	-0.05	4326.51	4321.95	2000.	433.
505.000	0.23	4325.02	4319.23	2000.	402.
510.000	-0.02	4324.72	4320.28	2000.	411.
515.000	-0.11	4323.22	4317.99	2000.	493.
535.000	0.21	4321.81	4313.51	2000.	410.
540.000	-0.13	4321.36	4314.67	2000.	447.
550.000	-0.52	4318.73	4311.98	2000.	554.
555.000	-0.15	4317.95	4311.25	2000.	573.
561.000	0.46	4317.47	4310.56	2000.	445.
565.000	0.07	4316.58	4309.87	2000.	420.
575.000	0.15	4315.72	4308.35	2000.	370.
590.000	-0.44	4313.53	4309.06	2000.	515.
595.000	1.06	4313.14	4307.06	2000.	266.
600.000	-0.64	4312.56	4305.16	2000.	336.
610.000	0.00	4311.79	4299.90	2000.	336.
615.000	-0.08	4311.18	4303.32	2000.	347.

621.000	0.55	4311.06	4303.65	2000.	266.
625.000	-0.11	4310.70	4301.29	2000.	284.
630.000	-0.29	4310.21	4305.91	2000.	360.
640.000	-1.20	4307.66	4301.60	2000.	759.
650.000	-0.05	4305.14	4298.85	2000.	770.
655.000	-0.50	4303.53	4298.00	2000.	838.
660.000	1.72	4303.33	4296.72	2000.	577.
670.000	1.58	4302.89	4293.58	2000.	266.
673.000	-0.32	4302.23	4292.98	2000.	310.
676.000	0.35	4301.80	4293.95	2000.	287.
685.000	-0.16	4299.27	4291.94	1950.	301.
690.000	-0.40	4298.29	4290.90	1950.	358.
695.000	-0.06	4298.01	4290.74	1950.	365.
700.000	-0.60	4297.02	4286.60	1950.	438.
705.000	0.14	4296.64	4288.44	1950.	423.
710.000	0.34	4295.69	4288.14	1950.	401.
715.000	0.24	4295.66	4285.74	1950.	389.
720.000	-0.63	4295.28	4287.77	1950.	465.
725.000	-0.01	4294.88	4287.79	1950.	467.
730.000	-0.55	4294.17	4285.75	1950.	573.
735.000	-0.41	4293.07	4285.79	1950.	634.
740.000	0.58	4292.63	4286.58	1950.	590.
745.000	-0.26	4292.18	4286.24	1950.	616.
750.000	0.35	4291.79	4285.55	1950.	516.
760.000	-0.48	4290.66	4282.12	1950.	644.
770.000	0.05	4289.76	4282.15	1950.	630.
780.000	0.41	4288.75	4278.21	1950.	547.
790.000	-0.16	4287.05	4276.34	1950.	576.
800.000	0.11	4285.95	4275.31	1950.	559.
805.000	0.24	4285.60	4278.34	1950.	529.
810.000	-0.62	4284.29	4276.98	1950.	566.
815.000	1.01	4284.04	4276.81	1950.	544.
820.000	0.14	4283.64	4274.54	1950.	526.
835.000	0.00	4281.13	4273.00	1950.	526.
840.000	0.45	4279.88	4270.35	1950.	493.
845.100	2.36	4279.82	4272.86	1950.	445.
850.000	-0.49	4279.39	4269.61	1950.	492.
860.000	-0.19	4277.61	4269.51	1950.	536.
870.000	0.29	4276.81	4267.39	1950.	464.
880.000	0.04	4275.73	4266.54	1950.	456.
890.000	-0.03	4273.73	4264.37	1950.	460.
900.000	0.34	4272.70	4264.84	1950.	433.
903.100	-1.96	4271.09	4266.24	1950.	480.
904.000	5.50	4269.26	4265.50	1950.	412.
905.000	0.67	4269.09	4258.27	1950.	379.
912.000	-0.04	4268.49	4261.56	1950.	385.
913.000	-0.13	4267.28	4260.27	1950.	408.
923.000	0.04	4266.46	4259.74	1950.	402.
925.000	-0.09	4266.07	4259.01	1950.	414.
930.000	0.21	4265.24	4258.71	1950.	397.
935.000	0.43	4264.99	4258.03	1950.	374.
940.100	0.11	4264.57	4258.91	1950.	365.
940.000	-0.27	4263.62	4258.83	1950.	411.
950.000	-0.18	4262.05	4256.12	1950.	451.
955.000	0.34	4261.17	4254.54	1950.	397.
957.100	-2.75	4260.31	4245.25	1950.	587.
960.000	1.93	4260.43	4253.73	1950.	461.
965.000	0.15	4259.90	4252.95	1950.	447.
970.000	-0.03	4258.78	4251.47	1950.	450.
975.000	-0.24	4257.81	4251.86	1950.	491.
980.000	-0.60	4256.50	4247.70	1950.	598.
985.000	0.27	4255.93	4249.37	1950.	554.
990.000	0.34	4254.85	4246.24	1950.	526.
995.100	1.87	4254.55	4246.77	1950.	477.
1000.000	-0.01	4254.42	4249.19	1950.	479.
1005.000	-0.63	4253.12	4247.27	1950.	589.
1010.000	-0.02	4252.40	4245.68	1950.	593.
1020.000	-0.10	4251.22	4244.90	1950.	625.
1030.000	-0.07	4250.34	4242.93	1950.	637.
1035.000	-1.12	4249.37	4242.28	1950.	748.
1040.000	0.11	4249.26	4244.71	1950.	724.
1050.000	-0.84	4247.57	4237.86	1950.	878.

1055.000	0.61	4247.46	4242.71	1950.	802.
1060.000	0.45	4246.99	4236.55	2070.	760.
1070.000	1.93	4246.86	4236.23	2070.	591.
1075.000	0.03	4246.39	4239.03	2070.	588.
1077.000	0.23	4246.05	4239.43	2070.	559.
1083.200	0.49	4245.75	4238.09	2070.	522.
1085.000	7.47	4245.10	4249.47	2070.	464.
1087.200	4.20	4243.09	4238.40	2070.	418.
1087.000	0.28	4243.07	4234.28	2070.	395.
1090.000	0.12	4242.41	4235.12	2070.	384.
1095.100	0.12	4241.89	4234.52	2070.	374.
1097.000	0.02	4241.62	4233.52	2070.	371.
1107.000	-0.02	4240.83	4231.38	2070.	376.
1110.000	-0.12	4240.12	4234.68	2070.	414.
1120.000	0.01	4238.91	4230.91	2150.	424.
1125.000	0.01	4238.58	4226.81	2150.	422.
1130.000	0.19	4237.73	4227.89	2150.	366.
1140.000	0.17	4237.10	4223.07	2150.	327.
1145.000	-0.21	4236.04	4229.69	2150.	343.
1150.000	-0.12	4235.97	4221.78	2150.	349.
1160.000	-0.20	4235.79	4228.80	2150.	372.
1165.000	0.21	4235.40	4225.01	2150.	309.
1170.000	0.07	4234.54	4225.47	2150.	277.
1180.000	0.04	4233.75	4221.64	2150.	267.
1185.000	-0.09	4233.39	4223.01	2150.	278.
1190.000	-0.13	4233.26	4223.67	2150.	307.
1200.000	0.17	4232.38	4221.67	2150.	269.
1205.000	0.04	4232.22	4223.84	2150.	265.
1207.100	0.51	4232.14	4224.91	2150.	217.
1210.000	-0.13	4231.99	4224.37	2150.	238.
1220.000	-0.12	4231.59	4223.58	2150.	277.
1230.000	-0.20	4230.64	4221.40	2150.	326.
1235.000	0.17	4230.29	4218.67	2150.	300.
1240.000	0.26	4230.09	4217.26	2150.	192.
1250.000	0.01	4229.05	4221.21	2200.	189.
1260.000	0.11	4228.71	4221.11	2200.	159.
1265.000	-0.14	4228.55	4222.86	2200.	190.
1270.000	0.21	4228.34	4218.51	2200.	130.
1280.000	-0.05	4228.14	4219.55	2200.	151.
1290.000	0.04	4227.80	4218.34	2200.	138.
1295.000	-0.10	4227.68	4220.80	2200.	158.
1300.000	-0.13	4227.50	4220.67	2200.	180.
1300.400	-0.12	4227.34	4220.18	2200.	187.
1300.100	0.00	4227.28	4219.80	2200.	188.
1305.000	-0.18	4226.88	4220.22	2200.	209.
1310.400	0.00	4226.63	4218.30	2200.	209.
1310.100	-0.02	4226.56	4218.08	2200.	210.
1310.000	0.05	4226.44	4218.15	2200.	209.

==

*   FLOW 2=2800

COMPUTING FROM TIME=   15.000000 DAYS TO TIME=   5.000000 DAYS IN   0 COMPUTATION STEPS

** Q BELOW TABLE **
WATER DISCHARGE, WATER-SEDIMENT LOAD TABLE ENDPOINT   0.00   1.00   0.060000

==

* A   FLOW 3=3550

COMPUTING FROM TIME=   30.000000 DAYS TO TIME=   5.000000 DAYS IN   -2 COMPUTATION STEPS

** Q BELOW TABLE **
WATER DISCHARGE, WATER-SEDIMENT LOAD TABLE ENDPOINT   0.00   1.00   0.060000

TABLE SA-1. TRAP EFFICIENCY ON STREAM SEGMENT # 1
JORDAN RIVER SEDIMENT TRANSPORT STUDY SALT LAKE COUNTY
ACCUMULATED AC-FT ENTERING AND LEAVING THIS STREAM SEGMENT
****
*   *

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   TIME       ENTRY *              SAND              *
   DAYS       POINT *    INFLOW   OUTFLOW  TRAP EFF *
                    *                                *
  40.00      15.000 *      1.39                      *
 .TOTAL=     80.400 *      1.39      5.26     -2.78 *
                    *                                *
*****************************************************
   TIME       ENTRY *              SAND              *
  40.00      80.400 *      5.26                      *
  TOTAL=    676.000 *      5.26     12.89     -1.45 *
                    *                                *
*****************************************************
   TIME       ENTRY *              SAND              *
  40.00     676.000 *     12.89                      *
            685.000 *      0.00                      *
           1060.000 *      0.07                      *
  TOTAL=   1085.000 *     12.95      5.08      0.61 *
                    *                                *
*****************************************************
   TIME       ENTRY *              SAND              *
  40.00    1085.000 *      5.08                      *
           1120.000 *      0.61                      *
           1250.000 *      0.03                      *
  TOTAL=   1310.000 *      5.71      4.08      0.29 *
                    *                                *
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*    B    FLOW 4=4150

COMPUTING FROM TIME=    40.000000 DAYS TO TIME=      2.500000 DAYS IN          -7 COMPUTATION STEPS


BOUNDARY CONDITION DATA, CONTROL POINT NO.  1
  TIME STEP NO.       4
WATER    DISCHARGE=    4150.00
         ELEVATION=   4230.870
       TEMPERATURE=     73.000
FLOW DURATION(DAYS)  5.000
** Q BELOW TABLE **                                                                                        **INLC
**WATER DISCHARGE, WATER-SEDIMENT LOAD TABLE ENDPOINT**          0.00           1.00        0.060000

TABLE SA-1. TRAP EFFICIENCY ON STREAM SEGMENT #  1
            JORDAN RIVER SEDIMENT TRANSPORT STUDY SALT LAKE COUNTY
            ACCUMULATED AC-FT ENTERING AND LEAVING THIS STREAM SEGMENT
*****************************************************
                    *                                *
   TIME       ENTRY *              SAND              *
   DAYS       POINT *    INFLOW   OUTFLOW  TRAP EFF *
                    *                                *
  45.00      15.000 *      1.70                      *
  TOTAL=     80.400 *      1.70      6.04     -2.55 *
                    *                                *
*****************************************************
   TIME       ENTRY *              SAND              *
  45.00      80.400 *      6.04                      *
  TOTAL=    676.000 *      6.04     15.97     -1.64 *
                    *                                *
*****************************************************
   TIME       ENTRY *              SAND              *
  45.00     676.000 *     15.97                      *
            685.000 *      0.00                      *
           1060.000 *      0.09                      *
  TOTAL=   1085.000 *     16.05      5.42      0.66 *
                    *                                *
*****************************************************
   TIME       ENTRY *              SAND              *
  45.00    1085.000 *      5.42                      *
           1120.000 *      0.82                      *
           1250.000 *      0.03                      *
  TOTAL=   1310.000 *      6.27      4.61      0.26 *
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TABLE SB-1.	TOTAL	LOAD BY GRAIN SIZE (TONS/DAY)				
		VF	F	M	C	VC
SEDIMENT INFLOW						
SANDS & GRAVELS	125.79	33.23	32.00	25.17	16.00	9.72
		5.28	4.39	0.00	0.00	0.00
SEDIMENT OUTFLOW						
SANDS & GRAVELS	213.92	68.69	52.80	44.88	17.35	11.56
		18.63	0.00	0.00	0.00	0.00

SECTION ID NO	BED CHANGE FEET	WS ELEV FEET	THALWEG EL FEET	Q CFS	SEDIMENT LOAD (TONS/DAY) SAND
15.000	-0.72	4475.60	4468.78	3000.	224.
25.000	-0.83	4469.83	4465.97	3000.	650.
30.000	-5.25	4459.17	4445.95	3000.	771.
35.000	3.99	4451.54	4448.48	3000.	1432.
40.000	-2.21	4449.56	4445.89	3000.	552.
45.000	-3.71	4447.06	4435.39	3000.	1032.
50.000	1.98	4445.46	4438.78	3000.	324.
55.000	-1.83	4438.40	4428.97	3000.	1482.
60.000	0.74	4437.87	4431.94	3000.	177.
70.000	1.77	4437.03	4429.67	3000.	1679.
75.000	4.22	4435.96	4431.72	3000.	226.
80.400	0.01	4435.00	4426.21	3000.	318.
80.100	-1.58	4430.96	4424.42	3000.	388.
85.000	-0.75	4431.61	4424.25	3000.	413.
90.000	-1.66	4430.29	4422.54	3000.	37.
110.000	-3.36	4428.32	4415.34	3000.	460.
190.000	2.17	4422.67	4416.07	3000.	30.
200.000	0.36	4416.40	4406.36	3000.	62.
205.000	-0.02	4412.40	4402.48	3000.	43.
210.000	-1.30	4409.73	4399.70	3000.	223.
220.000	0.81	4408.76	4399.71	3000.	311.
225.000	0.44	4408.66	4400.14	3000.	304.
230.000	-5.44	4408.60	4392.86	3000.	266.
235.000	-7.20	4406.61	4388.10	3000.	402.
240.000	1.64	4403.25	4396.34	3000.	465.
250.000	-1.12	4400.32	4392.18	3000.	511.
255.000	-0.97	4398.36	4392.23	3000.	825.
260.000	-1.01	4396.28	4389.59	3000.	1009.
270.000	-1.35	4393.12	4385.95	3000.	1159.
280.000	-0.53	4391.00	4383.17	3000.	1000.
290.000	-0.18	4387.96	4379.32	3000.	1665.
295.000	-0.04	4386.60	4379.76	3000.	1393.
300.000	-0.91	4384.57	4374.69	3000.	1432.
305.000	-1.12	4383.04	4374.88	3000.	1782.
310.000	-1.41	4382.22	4375.59	3000.	1887.
315.000	-7.21	4374.72	4363.09	3000.	3315.
320.000	-6.01	4373.40	4365.79	3000.	2200.
325.000	-2.65	4372.52	4363.85	3000.	821.
333.000	3.55	4371.41	4365.45	3000.	1204.
335.000	-7.03	4366.66	4351.26	3000.	4133.
345.000	-3.91	4361.90	4352.49	3000.	4308.
355.000	1.01	4360.29	4356.91	3000.	2698.
360.000	-0.86	4357.63	4349.04	3000.	2723.
365.000	0.59	4356.54	4351.29	3000.	2295.
370.000	1.33	4354.45	4348.73	3000.	1650.
380.000	-0.70	4351.54	4347.00	3000.	2102.
390.000	-0.90	4348.55	4343.00	3000.	1921.
400.000	0.58	4346.89	4337.18	3000.	1961.
410.000	-0.23	4344.32	4336.17	3000.	2131.
415.000	0.53	4343.77	4338.63	3000.	1918.
420.000	0.13	4343.02	4334.63	3000.	1901.
425.000	0.62	4342.22	4336.22	3000.	1286.
435.000	0.59	4341.01	4333.19	3000.	2424.
437.000	0.51	4340.02	4332.41	3000.	2165.
445.000	0.09	4337.81	4329.39	3000.	1774.
453.000	0.81	4336.46	4330.41	3000.	1156.
455.000	-1.81	4335.52	4326.49	3000.	1292.

470.000	0.21	4334.67	4325.41	3000.	1358.
475.000	0.69	4333.33	4325.19	3000.	3488.
480.000	-0.49	4331.34	4322.41	3000.	3424.
480.100	-0.68	4330.20	4321.42	3000.	3293.
485.000	4.18	4329.80	4325.58	3000.	531.
495.000	-0.20	4328.99	4319.90	3000.	1358.
497.000	-1.12	4327.47	4320.88	3000.	1905.
505.000	0.12	4326.42	4319.12	3000.	1773.
510.000	1.22	4326.09	4321.52	3000.	1325.
515.000	0.48	4324.55	4318.58	3000.	1136.
535.000	0.62	4322.73	4313.92	3000.	1012.
540.000	-0.30	4322.08	4314.50	3000.	1111.
550.000	-0.78	4320.28	4311.72	3000.	1109.
555.000	-0.44	4319.66	4310.96	3000.	1236.
561.000	1.44	4319.00	4311.54	3000.	1101.
565.000	0.46	4317.71	4310.26	3000.	827.
575.000	0.05	4316.42	4308.25	3000.	831.
590.000	-1.04	4315.02	4308.46	3000.	940.
595.000	2.68	4314.22	4308.68	3000.	776.
600.000	-1.03	4313.57	4304.77	3000.	823.
610.000	-0.28	4312.59	4299.62	3000.	940.
615.000	-0.36	4311.39	4303.04	3000.	1105.
621.000	0.73	4311.01	4303.83	3000.	1094.
625.000	-0.23	4310.03	4301.17	3000.	1122.
630.000	-3.14	4309.34	4303.06	3000.	1171.
640.000	-2.40	4308.35	4300.40	3000.	1045.
650.000	0.07	4307.04	4298.97	3000.	1543.
655.000	1.97	4306.08	4300.47	3000.	952.
660.000	1.04	4305.52	4296.04	3000.	1605.
670.000	3.18	4304.63	4295.18	3000.	604.
673.000	-1.31	4304.01	4291.99	3000.	813.
676.000	-0.65	4303.30	4292.95	3000.	1249.
685.000	0.89	4300.88	4292.99	2900.	2167.
690.000	0.26	4299.72	4291.56	2900.	1758.
695.000	1.97	4299.37	4292.77	2900.	1192.
700.000	-1.17	4298.26	4286.03	2900.	1251.
705.000	-0.24	4297.84	4288.06	2900.	1283.
710.000	-1.28	4296.77	4286.52	2900.	1437.
715.000	0.81	4296.70	4286.31	2900.	1329.
720.000	-0.69	4296.50	4287.71	2900.	1383.
725.000	0.32	4296.05	4288.12	2900.	1300.
730.000	-0.71	4295.53	4285.59	2900.	1287.
735.000	-0.52	4294.69	4285.68	2900.	1266.
740.000	1.37	4294.25	4287.37	2900.	1280.
745.000	-0.23	4293.94	4286.27	2900.	1294.
750.000	1.27	4293.51	4286.47	2900.	1049.
760.000	-0.64	4292.46	4281.96	2900.	1043.
770.000	0.37	4291.75	4282.47	2900.	903.
780.000	-0.13	4290.62	4277.67	2900.	956.
790.000	-0.92	4288.69	4275.58	2900.	1075.
800.000	-0.27	4287.47	4274.93	2900.	1116.
805.000	1.41	4286.90	4279.51	2900.	997.
810.000	-2.07	4285.88	4275.53	2900.	1025.
815.000	-0.50	4285.49	4275.30	2900.	1131.
820.000	-0.83	4285.21	4273.57	2900.	1356.
835.000	0.03	4282.98	4273.03	2900.	1221.
840.000	-0.96	4281.89	4268.94	2900.	1273.
845.100	-0.39	4281.32	4270.11	2900.	1461.
850.000	-0.56	4281.02	4269.54	2900.	1444.
860.000	0.18	4279.60	4269.88	2900.	1246.
870.000	2.80	4278.74	4269.90	2900.	693.
880.000	-0.25	4277.11	4266.25	2900.	798.
890.000	-1.28	4274.20	4263.12	2900.	1121.
900.000	-1.70	4272.85	4262.80	2900.	1190.
903.100	1.37	4271.93	4269.57	2900.	955.
904.000	3.57	4271.02	4263.57	2900.	1088.
905.000	-0.37	4270.46	4257.23	2900.	1188.
912.000	-0.11	4269.85	4261.49	2900.	1134.
913.000	-0.43	4268.79	4259.97	2900.	1149.
923.000	0.23	4267.74	4259.93	2900.	1292.
925.000	0.67	4267.11	4259.77	2900.	1218.
930.000	-0.41	4266.20	4258.09	2900.	1195.

935.000	-0.53	4265.90	4257.07	2900.	1213.
940.100	-0.58	4265.49	4258.22	2900.	1255.
940.000	-0.98	4264.75	4258.12	2900.	1476.
950.000	-0.43	4263.86	4255.87	2900.	1463.
955.000	1.31	4263.16	4255.51	2900.	1025.
957.100	-2.33	4262.40	4245.67	2900.	1073.
960.000	0.57	4262.34	4252.37	2900.	1569.
965.000	0.66	4261.84	4253.46	2900.	1277.
970.000	-0.99	4261.09	4250.51	2900.	1369.
975.000	0.68	4260.78	4252.78	2900.	851.
980.000	-0.41	4260.23	4247.89	2900.	678.
985.000	0.21	4260.11	4249.31	2900.	475.
990.000	-0.60	4259.70	4245.30	2900.	502.
995.100	0.45	4259.40	4245.35	2900.	768.
1000.000	1.74	4259.47	4250.94	2900.	300.
1005.000	0.47	4259.31	4248.37	2900.	145.
1010.000	1.19	4259.29	4246.89	2900.	48.
1020.000	0.93	4259.24	4245.93	2900.	22.
1030.000	0.54	4259.17	4243.54	2900.	27.
1035.000	-0.65	4259.16	4242.75	2900.	28.
1040.000	1.34	4259.16	4245.94	2900.	13.
1050.000	-0.39	4259.14	4238.31	2900.	8.
1055.000	1.10	4259.14	4243.20	2900.	5.
1060.000	-0.40	4259.05	4235.70	3500.	22.
1070.000	1.00	4258.99	4235.30	3500.	19.
1075.000	-0.12	4258.96	4238.88	3500.	28.
1077.000	0.62	4258.95	4239.82	3500.	24.
1083.200	-0.57	4258.93	4237.03	3500.	65.
1085.000	11.18	4257.17	4253.18	3500.	140.
1087.200	-1.54	4245.16	4232.66	3500.	135.
1087.000	-0.50	4245.05	4233.50	3500.	158.
1090.000	-0.92	4244.43	4234.08	3500.	232.
1095.100	-0.59	4244.04	4233.81	3500.	295.
1097.000	0.12	4243.77	4233.62	3500.	319.
1107.000	-0.01	4242.95	4231.39	3500.	254.
1110.000	-0.04	4242.68	4234.76	3500.	216.
1120.000	-0.10	4242.01	4230.80	4000.	311.
1125.000	-0.63	4241.45	4226.17	4000.	437.
1130.000	0.07	4240.78	4227.77	4000.	379.
1140.000	-0.17	4240.08	4222.73	4000.	430.
1145.000	-1.71	4239.04	4228.19	4000.	505.
1150.000	-0.01	4238.94	4221.89	4000.	549.
1160.000	0.15	4238.81	4229.15	4000.	553.
1165.000	0.84	4238.42	4225.64	4000.	436.
1170.000	0.14	4237.75	4225.54	4000.	355.
1180.000	-0.26	4236.77	4221.34	4000.	385.
1185.000	-0.31	4236.42	4222.79	4000.	399.
1190.000	-0.25	4236.33	4223.55	4000.	420.
1200.000	-0.21	4235.36	4221.29	4000.	536.
1205.000	0.12	4235.18	4223.92	4000.	578.
1207.100	1.53	4235.08	4225.93	4000.	521.
1210.000	-0.13	4235.00	4224.37	4000.	503.
1220.000	-0.20	4234.65	4223.50	4000.	498.
1230.000	0.20	4234.19	4221.80	4000.	312.
1235.000	-0.27	4233.71	4218.23	4000.	347.
1240.000	0.58	4233.54	4217.58	4000.	345.
1250.000	0.08	4232.60	4221.28	4150.	335.
1260.000	0.38	4232.30	4221.38	4150.	316.
1265.000	-0.09	4232.21	4222.91	4150.	312.
1270.000	0.44	4232.02	4218.74	4150.	280.
1280.000	0.01	4231.88	4219.61	4150.	260.
1290.000	0.10	4231.64	4218.40	4150.	247.
1295.000	-0.03	4231.58	4220.87	4150.	237.
1300.000	-0.08	4231.48	4220.72	4150.	227.
1300.400	-0.09	4231.40	4220.21	4150.	225.
1300.100	-0.06	4231.37	4219.74	4150.	216.
1305.000	-0.17	4231.15	4220.23	4150.	215.
1310.400	-0.01	4230.99	4218.29	4150.	213.
1310.100	-0.10	4230.95	4218.00	4150.	212.
1310.000	-0.11	4230.87	4217.99	4150.	214.

==

*   A   FLOW 3=3550

COMPUTING FROM TIME=   45.000000 DAYS TO TIME=   5.000000 DAYS IN   -3 COMPUTATION STEPS

** Q BELOW TABLE **   **INLO
WATER DISCHARGE, WATER-SEDIMENT LOAD TABLE ENDPOINT   0.00   1.00   0.060000

TABLE SA-1. TRAP EFFICIENCY ON STREAM SEGMENT # 1
JORDAN RIVER SEDIMENT TRANSPORT STUDY SALT LAKE COUNTY
ACCUMULATED AC-FT ENTERING AND LEAVING THIS STREAM SEGMENT

TIME DAYS	ENTRY POINT	SAND INFLOW	SAND OUTFLOW	TRAP EFF
55.00	15.000	2.17		
TOTAL=	80.400	2.17	9.42	-3.34
TIME	ENTRY	SAND		
55.00	80.400	9.42		
TOTAL=	676.000	9.42	21.15	-1.25
TIME	ENTRY	SAND		
55.00	676.000	21.15		
	685.000	-0.01		
	1060.000	0.11		
TOTAL=	1085.000	21.26	6.30	0.70
TIME	ENTRY	SAND		
55.00	1085.000	6.30		
	1120.000	1.15		
	1250.000	0.04		
TOTAL=	1310.000	7.49	5.75	0.23

==

*   FLOW 2=2800

COMPUTING FROM TIME=   55.000000 DAYS TO TIME=   5.000000 DAYS IN   -3 COMPUTATION STEPS

** Q BELOW TABLE **   **INLO
WATER DISCHARGE, WATER-SEDIMENT LOAD TABLE ENDPOINT   0.00   1.00   0.060000

==

*   B   FLOW 1=2200

BOUNDARY CONDITION DATA, CONTROL POINT NO. 1
TIME STEP NO.   7
WATER   DISCHARGE=   2200.00
ELEVATION=   4226.440
TEMPERATURE=   68.000
FLOW DURATION(DAYS)   15.00
** Q BELOW TABLE **   **INLO
WATER DISCHARGE, WATER-SEDIMENT LOAD TABLE ENDPOINT   0.00   1.00   0.060000

TABLE SA-1. TRAP EFFICIENCY ON STREAM SEGMENT # 1
JORDAN RIVER SEDIMENT TRANSPORT STUDY SALT LAKE COUNTY
ACCUMULATED AC-FT ENTERING AND LEAVING THIS STREAM SEGMENT

TIME DAYS	ENTRY POINT	SAND INFLOW	SAND OUTFLOW	TRAP EFF
85.00	15.000	3.09		
TOTAL=	80.400	3.09	12.85	-3.15

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                         *                             *
*******************************************************
   TIME       ENTRY *              SAND                *
   85.00      80.400 *     12.85                       *
   TOTAL=    676.000 *     12.85      31.54      -1.45 *
                     *                                 *
*******************************************************
   TIME       ENTRY *              SAND                *
   85.00     676.000 *     31.54                       *
             685.000 *     -0.01                       *
            1060.000 *      0.16                       *
   TOTAL=   1085.000 *     31.69      14.75       0.53 *
                     *                                 *
*******************************************************
   TIME       ENTRY *              SAND                *
   85.00    1085.000 *     14.75                       *
            1120.000 *      1.43                       *
            1250.000 *      0.06                       *
   TOTAL=   1310.000 *     16.24       8.97       0.45 *
                     *                                 *
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TABLE SB-1.	TOTAL	LOAD BY GRAIN SIZE (TONS/DAY)				
		VF	F	M	C	VC
SEDIMENT INFLOW						
SANDS & GRAVELS	50.00	10.00	15.00	12.50	7.50	2.50
		1.50	1.00	0.00	0.00	0.00
SEDIMENT OUTFLOW						
SANDS & GRAVELS	192.50	58.00	55.35	35.80	22.02	10.02
		11.31	0.00	0.00	0.00	0.00

SECTION ID NO	BED CHANGE FEET	WS ELEV FEET	THALWEG EL FEET	Q CFS	SEDIMENT LOAD (TONS/DAY) SAND
15.000	-1.12	4474.25	4468.38	2000.	78.
25.000	-1.25	4468.77	4465.55	2000.	170.
30.000	-5.35	4457.87	4445.85	2000.	166.
35.000	3.40	4450.49	4447.89	2000.	312.
40.000	-3.95	4448.10	4444.15	2000.	623.
45.000	-3.36	4446.47	4435.74	2000.	517.
50.000	1.15	4444.63	4437.95	2000.	654.
55.000	-0.53	4440.98	4430.27	2000.	243.
60.000	-3.41	4439.10	4427.79	2000.	1617.
70.000	5.38	4435.91	4433.28	2000.	242.
75.000	5.08	4434.61	4432.58	2000.	1287.
80.400	14.91	4432.80	4441.11	2000.	188.
80.100	-2.03	4430.12	4423.97	2000.	208.
85.000	-1.10	4430.43	4423.90	2000.	233.
90.000	-2.91	4427.19	4421.29	2000.	341.
110.000	-3.89	4423.64	4414.81	2000.	268.
190.000	-1.91	4420.03	4411.99	2000.	276.
200.000	1.49	4415.01	4407.49	2000.	273.
205.000	-0.01	4411.15	4402.49	2000.	274.
210.000	-1.16	4409.79	4399.84	2000.	290.
220.000	2.08	4409.42	4400.98	2000.	169.
225.000	3.89	4408.98	4403.59	2000.	237.
230.000	3.76	4408.26	4402.06	2000.	267.
235.000	-0.72	4405.36	4394.58	2000.	61.
240.000	1.64	4401.82	4396.34	2000.	61.
250.000	-1.90	4398.80	4391.40	2000.	106.
255.000	-1.64	4396.42	4391.56	2000.	150.
260.000	-1.67	4394.03	4388.93	2000.	180.
270.000	-2.47	4391.68	4384.83	2000.	287.
280.000	-0.60	4388.83	4383.10	2000.	286.
290.000	0.11	4385.79	4379.61	2000.	253.
295.000	-1.51	4384.58	4378.29	2000.	262.
300.000	-2.37	4380.04	4373.23	2000.	332.
305.000	-1.56	4379.86	4374.44	2000.	333.
310.000	-3.78	4379.25	4373.22	2000.	379.
315.000	-6.63	4373.74	4363.67	2000.	777.
320.000	-6.43	4371.60	4365.37	2000.	793.
325.000	-3.44	4370.42	4363.06	2000.	440.

333.000	2.27	4368.80	4364.17	2000.	526.
335.000	-6.78	4362.80	4351.51	2000.	534.
345.000	-4.41	4361.11	4351.99	2000.	488.
355.000	0.15	4359.28	4356.05	2000.	545.
360.000	-0.64	4357.15	4349.26	2000.	505.
365.000	0.93	4356.08	4351.63	2000.	530.
370.000	0.30	4353.13	4347.70	2000.	777.
380.000	-1.10	4350.49	4346.60	2000.	759.
390.000	-1.04	4347.67	4342.86	2000.	819.
400.000	0.62	4346.09	4337.22	2000.	893.
410.000	2.17	4344.23	4338.57	2000.	658.
415.000	1.96	4343.92	4340.06	2000.	427.
420.000	1.30	4343.45	4335.80	2000.	484.
425.000	-0.52	4340.69	4335.08	2000.	1089.
435.000	2.97	4340.17	4335.57	2000.	426.
437.000	1.01	4339.59	4332.91	2000.	625.
445.000	-0.28	4337.10	4329.02	2000.	640.
453.000	-0.47	4334.96	4329.13	2000.	845.
455.000	-1.86	4333.70	4326.44	2000.	947.
470.000	0.52	4332.94	4325.72	2000.	907.
475.000	2.44	4332.66	4326.94	2000.	260.
480.000	-0.93	4331.35	4321.97	2000.	507.
480.100	-1.07	4330.48	4321.03	2000.	586.
485.000	4.02	4328.99	4325.42	2000.	851.
495.000	-0.12	4327.50	4319.98	2000.	912.
497.000	-0.48	4326.55	4321.52	2000.	756.
505.000	1.49	4326.00	4320.49	2000.	473.
510.000	1.27	4325.73	4321.57	2000.	472.
515.000	0.81	4323.83	4318.91	2000.	546.
535.000	1.04	4321.57	4314.34	2000.	570.
540.000	-0.36	4320.89	4314.44	2000.	582.
550.000	-0.83	4318.98	4311.67	2000.	596.
555.000	0.01	4318.52	4311.41	2000.	568.
561.000	1.51	4317.94	4311.61	2000.	530.
565.000	0.79	4316.58	4310.59	2000.	503.
575.000	0.41	4315.32	4308.61	2000.	452.
590.000	-1.39	4313.85	4308.11	2000.	536.
595.000	0.31	4312.33	4306.31	2000.	971.
600.000	-0.70	4311.69	4305.10	2000.	909.
610.000	0.44	4310.82	4300.34	2000.	795.
615.000	-0.06	4309.92	4303.34	2000.	764.
621.000	0.31	4309.60	4303.41	2000.	704.
625.000	0.37	4308.78	4301.77	2000.	655.
630.000	-3.27	4308.04	4302.93	2000.	662.
640.000	-2.63	4306.78	4300.17	2000.	633.
650.000	0.15	4305.74	4299.05	2000.	574.
655.000	-1.55	4304.28	4296.95	2000.	922.
660.000	1.93	4304.25	4296.93	2000.	579.
670.000	4.00	4302.81	4296.00	2000.	743.
673.000	-0.69	4302.24	4292.61	2000.	650.
676.000	0.62	4301.80	4294.22	2000.	624.
685.000	0.71	4299.48	4292.81	1950.	482.
690.000	-0.23	4298.54	4291.07	1950.	583.
695.000	-0.80	4297.79	4290.00	1950.	884.
700.000	-0.49	4296.82	4286.71	1950.	824.
705.000	1.44	4296.31	4289.74	1950.	737.
710.000	-0.79	4295.59	4287.01	1950.	727.
715.000	1.97	4295.55	4287.47	1950.	602.
720.000	-0.57	4295.28	4287.83	1950.	603.
725.000	0.42	4294.71	4288.22	1950.	643.
730.000	-0.79	4294.13	4285.51	1950.	676.
735.000	-0.45	4293.30	4285.75	1950.	698.
740.000	0.57	4292.83	4286.57	1950.	712.
745.000	-0.22	4292.51	4286.28	1950.	697.
750.000	0.89	4291.76	4286.09	1950.	783.
760.000	-0.60	4290.59	4282.00	1950.	759.
770.000	0.49	4289.67	4282.59	1950.	723.
780.000	0.88	4288.45	4278.68	1950.	597.
790.000	-1.08	4286.89	4275.42	1950.	629.
800.000	-0.17	4285.88	4275.03	1950.	648.
805.000	-0.36	4284.87	4277.74	1950.	914.
810.000	-1.72	4283.92	4275.88	1950.	869.

815.000	4.34	4283.76	4280.14	1950.	754.
820.000	-0.86	4283.42	4273.54	1950.	752.
835.000	0.69	4281.08	4273.69	1950.	645.
840.000	-0.90	4279.99	4269.00	1950.	677.
845.100	2.34	4279.79	4272.84	1950.	656.
850.000	-0.34	4279.51	4269.76	1950.	642.
860.000	0.16	4278.15	4269.86	1950.	607.
870.000	0.45	4277.57	4267.55	1950.	448.
880.000	1.75	4276.42	4268.25	1950.	437.
890.000	-1.50	4275.10	4262.90	1950.	472.
900.000	-1.55	4274.78	4262.95	1950.	489.
903.100	1.28	4273.15	4269.48	1950.	560.
904.000	14.52	4272.46	4274.52	1950.	501.
905.000	0.33	4268.85	4257.93	1950.	529.
912.000	0.11	4268.19	4261.71	1950.	494.
913.000	-0.58	4267.02	4259.82	1950.	517.
923.000	0.02	4266.18	4259.72	1950.	490.
925.000	0.29	4265.49	4259.39	1950.	526.
930.000	-0.81	4264.75	4257.69	1950.	517.
935.000	-0.67	4264.53	4256.93	1950.	515.
940.100	-0.60	4264.08	4258.20	1950.	541.
940.000	-1.32	4263.30	4257.78	1950.	647.
950.000	-0.52	4262.21	4255.78	1950.	686.
955.000	0.46	4260.88	4254.66	1950.	781.
957.100	-0.41	4260.43	4247.59	1950.	629.
960.000	3.36	4260.45	4255.16	1950.	436.
965.000	-0.53	4259.97	4252.27	1950.	476.
970.000	-1.14	4259.29	4250.36	1950.	504.
975.000	-0.28	4258.22	4251.82	1950.	744.
980.000	0.38	4257.15	4248.68	1950.	591.
985.000	-0.10	4256.28	4249.00	1950.	827.
990.000	-0.25	4255.39	4245.65	1950.	815.
995.100	3.79	4255.34	4248.69	1950.	649.
1000.000	1.22	4255.00	4250.42	1950.	668.
1005.000	-0.14	4254.36	4247.76	1950.	526.
1010.000	1.59	4254.01	4247.29	1950.	382.
1020.000	1.14	4253.45	4246.14	1950.	291.
1030.000	2.15	4252.89	4245.15	1950.	324.
1035.000	0.57	4252.81	4243.97	1950.	183.
1040.000	0.84	4252.81	4245.44	1950.	54.
1050.000	-0.16	4252.74	4238.54	1950.	19.
1055.000	1.05	4252.74	4243.15	1950.	12.
1060.000	0.04	4252.52	4236.14	2070.	123.
1070.000	5.29	4252.31	4239.59	2070.	151.
1075.000	0.17	4252.29	4239.17	2070.	149.
1077.000	0.90	4252.27	4240.10	2070.	67.
1083.200	-0.56	4252.25	4237.04	2070.	133.
1085.000	7.13	4251.00	4249.13	2070.	134.
1087.200	12.23	4250.86	4246.43	2070.	154.
1087.000	-0.60	4242.85	4233.40	2070.	242.
1090.000	-1.03	4242.36	4233.97	2070.	258.
1095.100	-0.58	4241.99	4233.82	2070.	274.
1097.000	0.26	4241.71	4233.76	2070.	303.
1107.000	0.12	4240.80	4231.52	2070.	322.
1110.000	-0.12	4240.10	4234.68	2070.	341.
1120.000	-0.07	4238.91	4230.83	2150.	375.
1125.000	-0.49	4238.64	4226.31	2150.	378.
1130.000	0.43	4237.80	4228.13	2150.	355.
1140.000	0.12	4237.17	4223.02	2150.	312.
1145.000	-2.29	4236.37	4227.61	2150.	326.
1150.000	0.53	4236.28	4222.43	2150.	328.
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1165.000	1.32	4235.58	4226.12	2150.	302.
1170.000	0.21	4234.42	4225.61	2150.	292.
1180.000	-0.20	4233.63	4221.40	2150.	271.
1185.000	-0.39	4233.30	4222.71	2150.	269.
1190.000	-0.32	4233.19	4223.48	2150.	269.
1200.000	-0.12	4232.40	4221.38	2150.	249.
1205.000	0.03	4232.23	4223.83	2150.	244.
1207.100	1.30	4232.04	4225.70	2150.	259.
1210.000	-0.22	4231.98	4224.28	2150.	260.
1220.000	-0.23	4231.63	4223.47	2150.	257.

1230.000	-0.24	4230.83	4221.36	2150.	259.
1235.000	-0.15	4230.52	4218.35	2150.	267.
1240.000	1.04	4230.28	4218.04	2150.	224.
1250.000	0.09	4229.10	4221.29	2200.	224.
1260.000	0.64	4228.69	4221.64	2200.	207.
1265.000	-0.12	4228.57	4222.88	2200.	211.
1270.000	0.83	4228.32	4219.13	2200.	170.
1280.000	-0.06	4228.11	4219.54	2200.	189.
1290.000	0.15	4227.75	4218.45	2200.	187.
1295.000	-0.07	4227.63	4220.83	2200.	193.
1300.000	-0.10	4227.46	4220.70	2200.	194.
1300.400	-0.06	4227.30	4220.24	2200.	192.
1300.100	-0.09	4227.24	4219.71	2200.	197.
1305.000	-0.18	4226.87	4220.22	2200.	198.
1310.400	0.09	4226.63	4218.39	2200.	193.
1310.100	-0.01	4226.56	4218.09	2200.	192.
1310.000	-0.02	4226.44	4218.08	2200.	192.

....

$SEND

0 DATA ERRORS DETECTED.

TOTAL NO. OF TIME STEPS READ = 7
TOTAL NO. OF WS PROFILES = 7
ITERATIONS IN EXNER EQ = 6965.
END OF JOB

JOB COMPLETED
RUN TIME = 0 HOURS, 4 MINUTES & 59.95 SECONDS

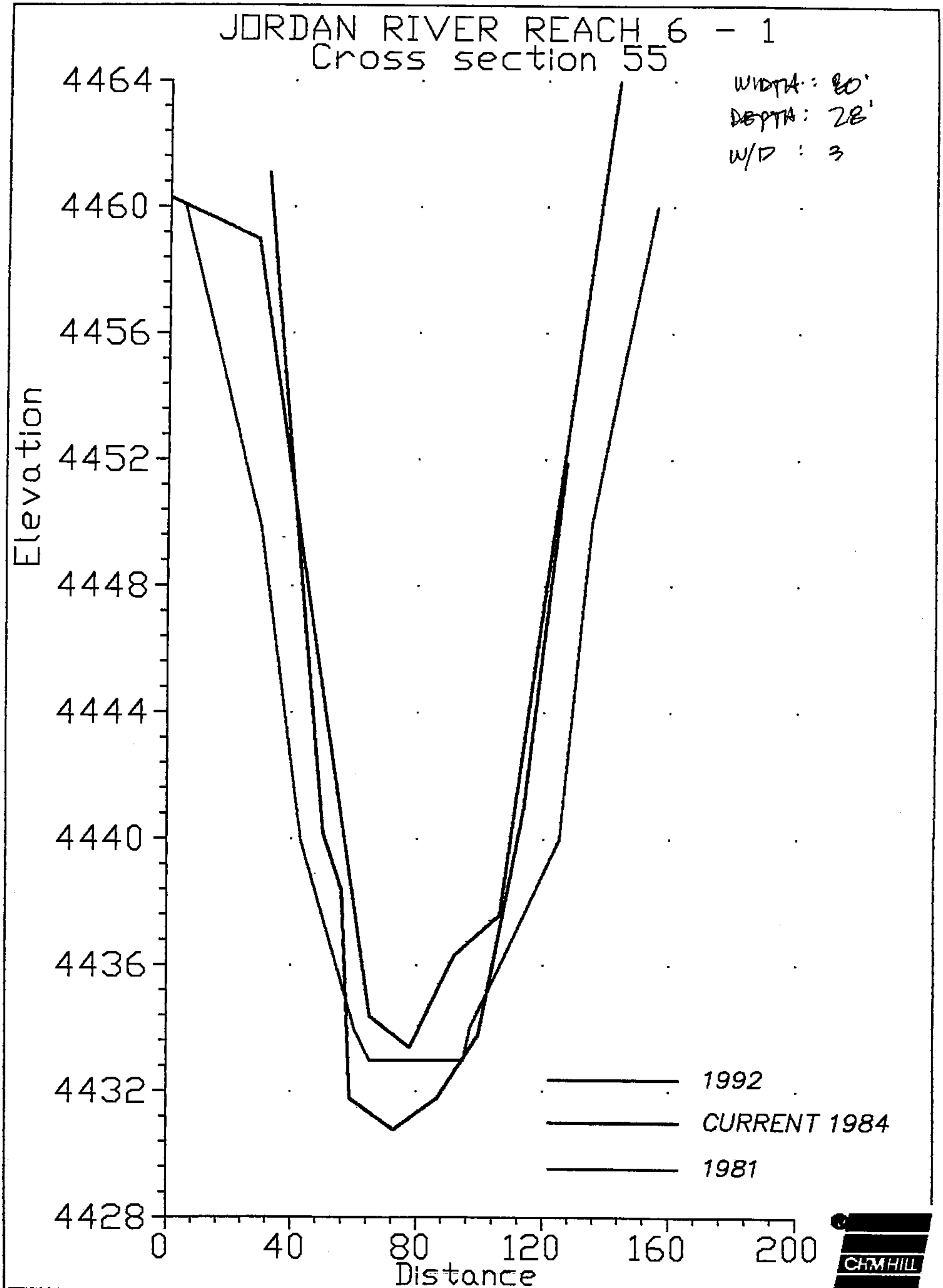
Appendix D

Historical Cross Section Data

Note: Current 1984 = Cross Section data contained in existing FEMA FIS HEC-2 Model.

Old 1984 = Cross Section data not contained in existing FEMA FIS, HEC-2 Model because of significant geomorphic changes. Data were obtained from HEC-2 model developed for Utah Lake/Jordan River Flood Management Program.

06-04-92



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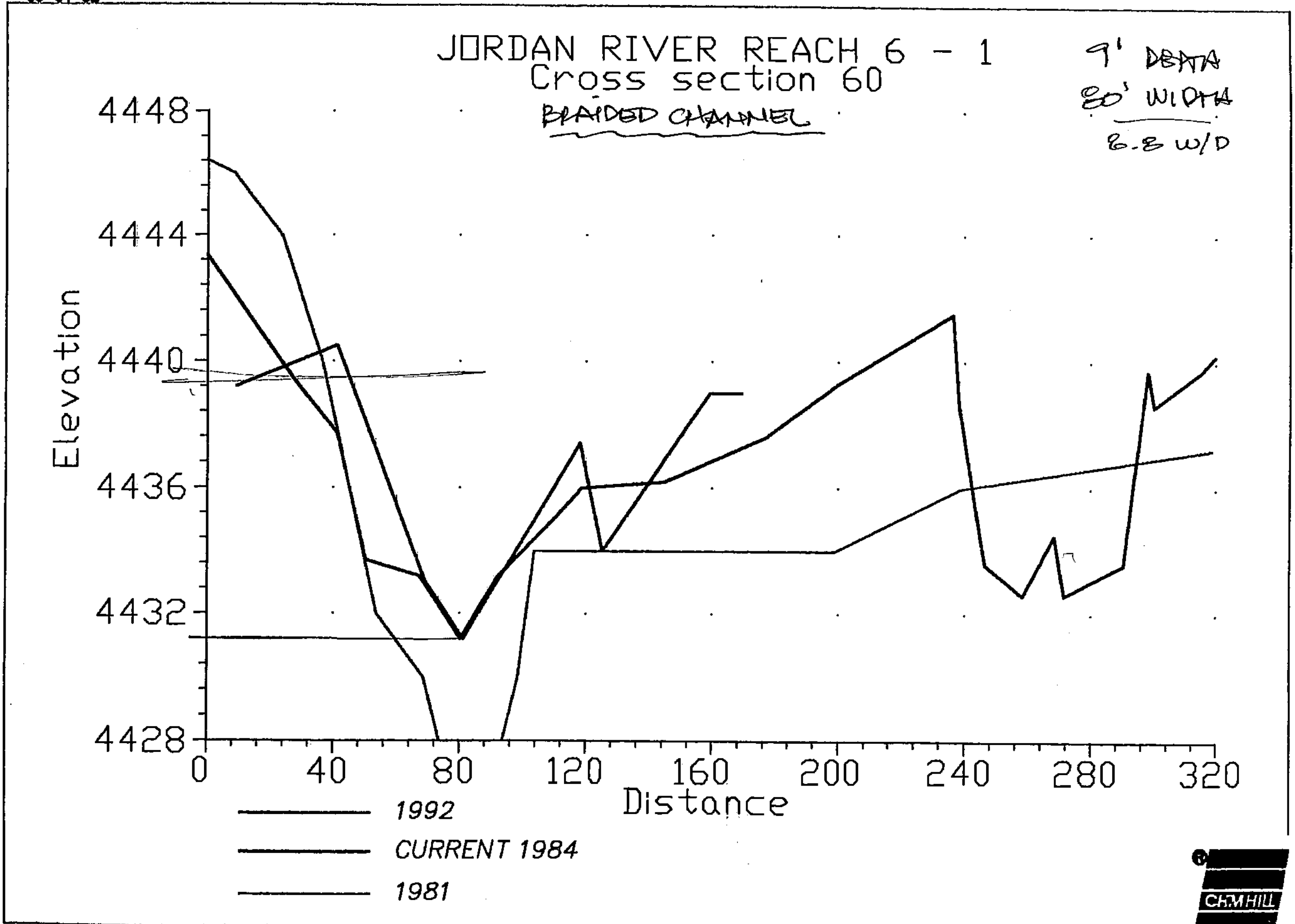

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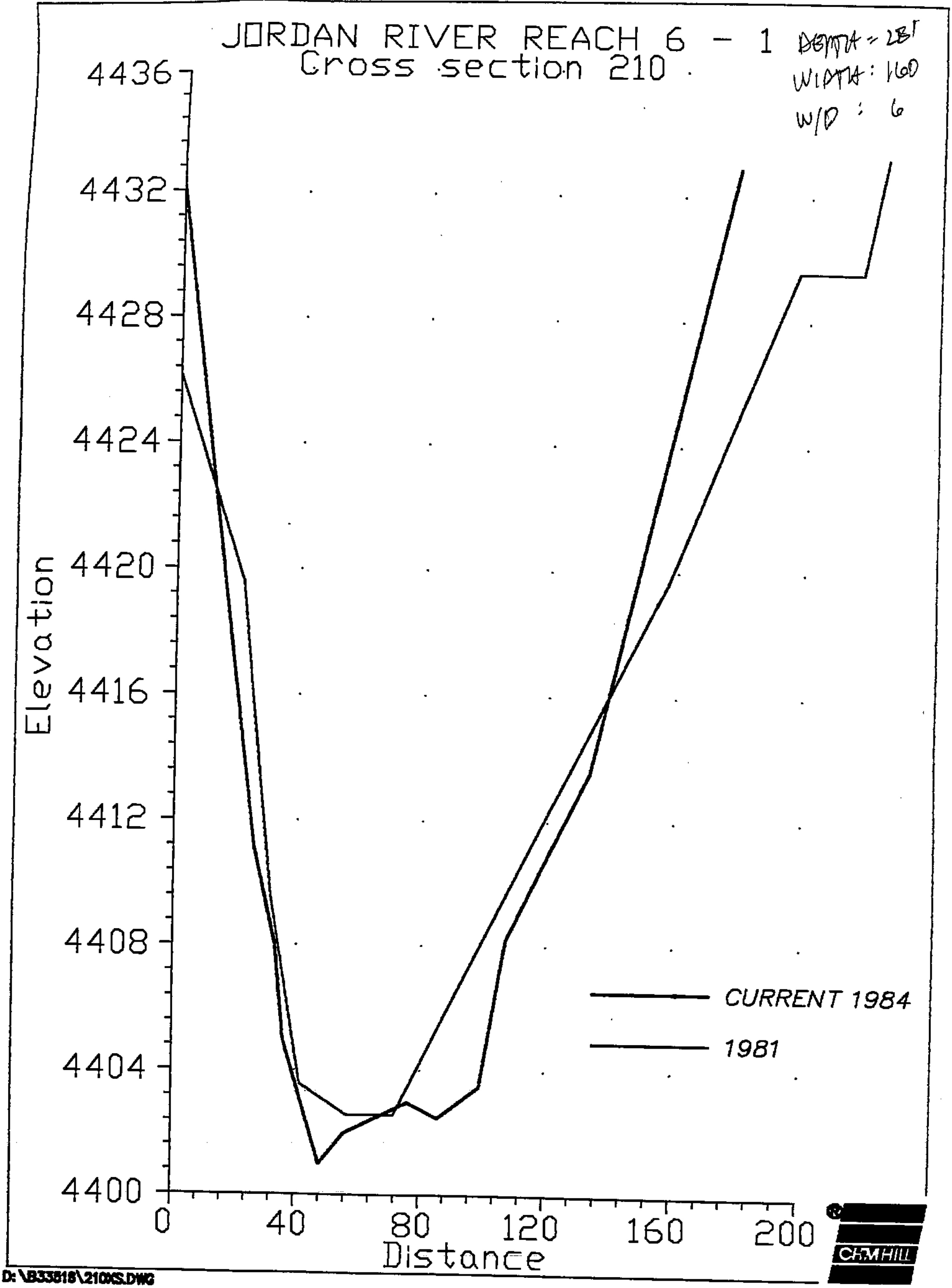

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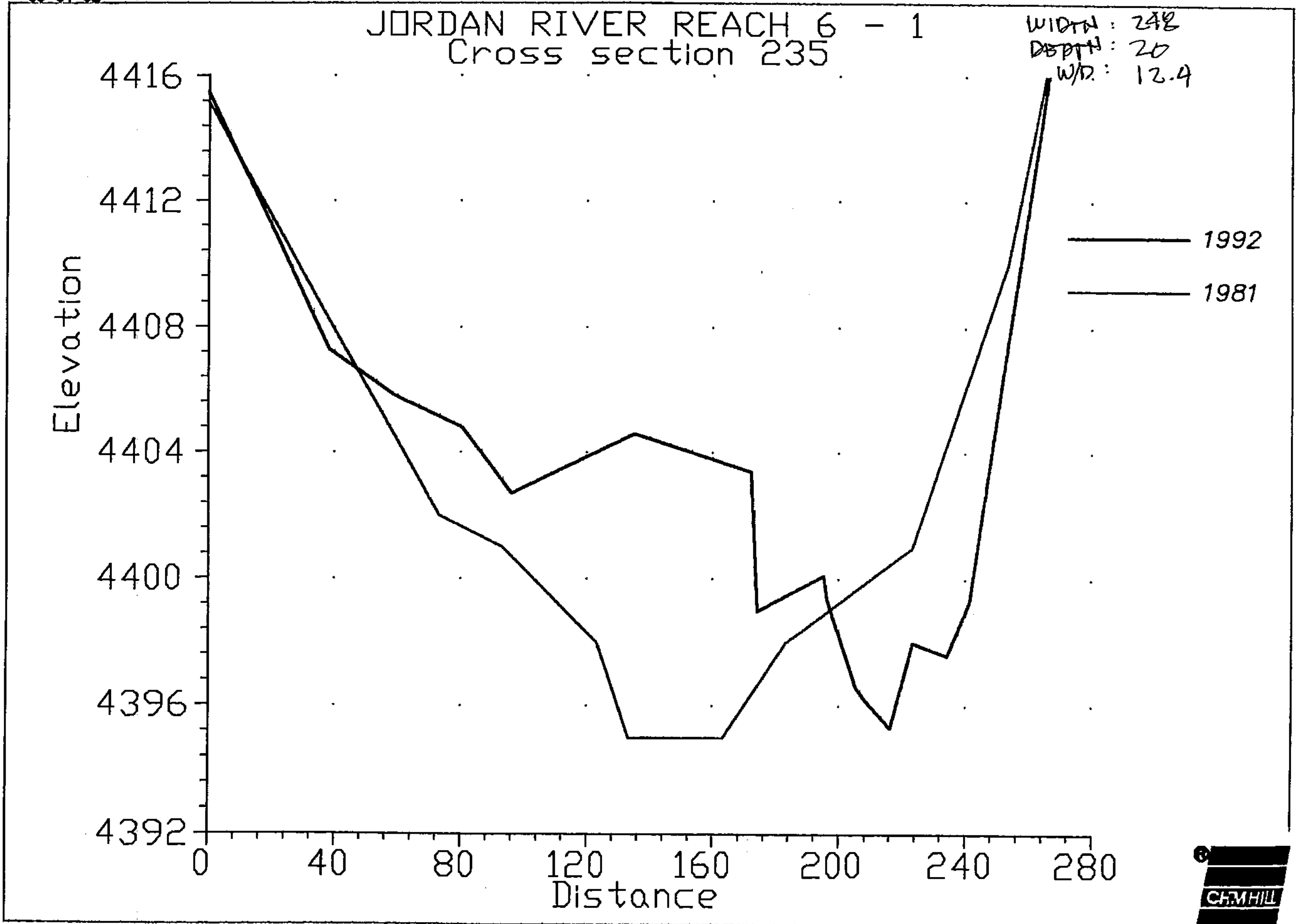

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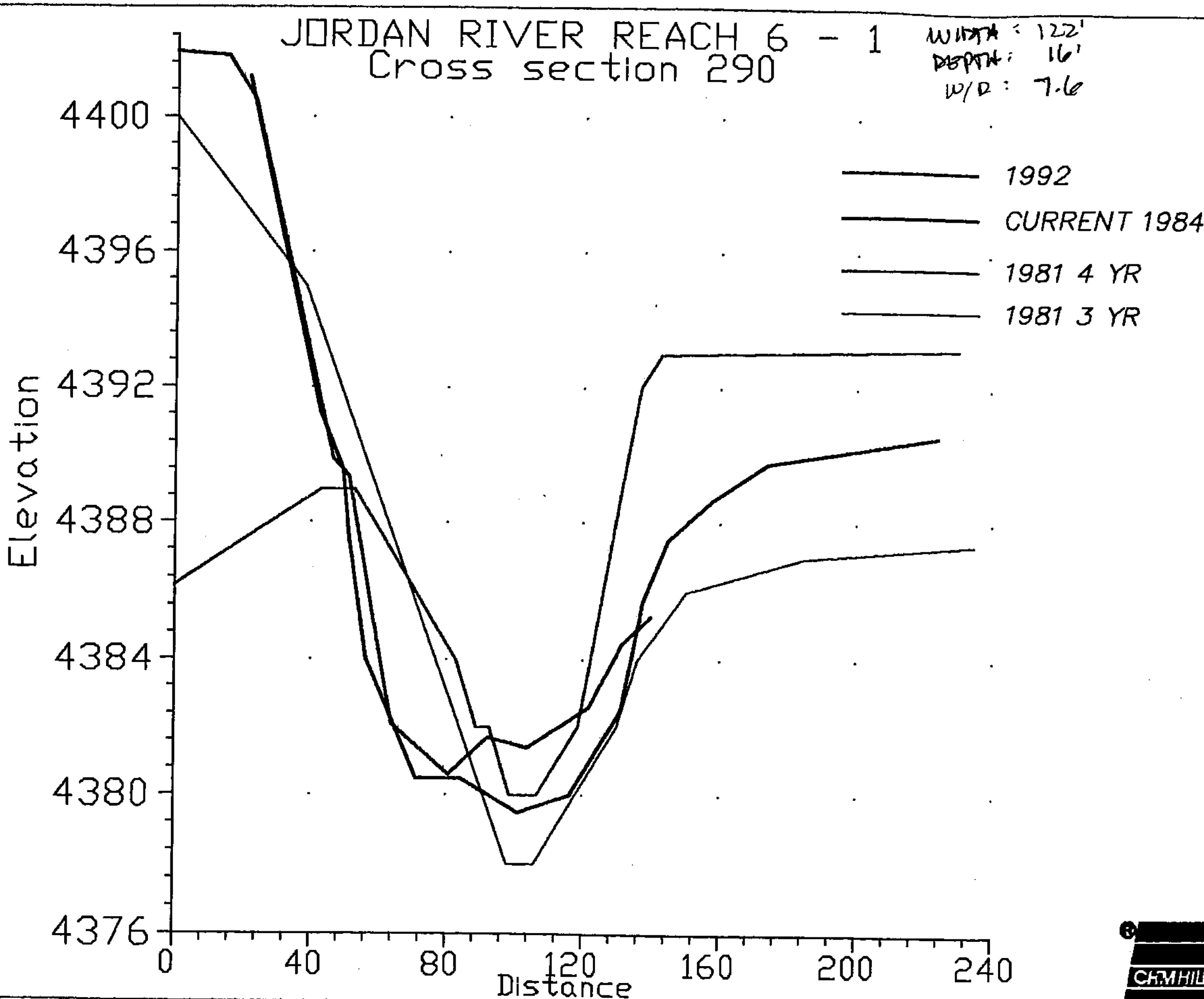

CH2M HILL

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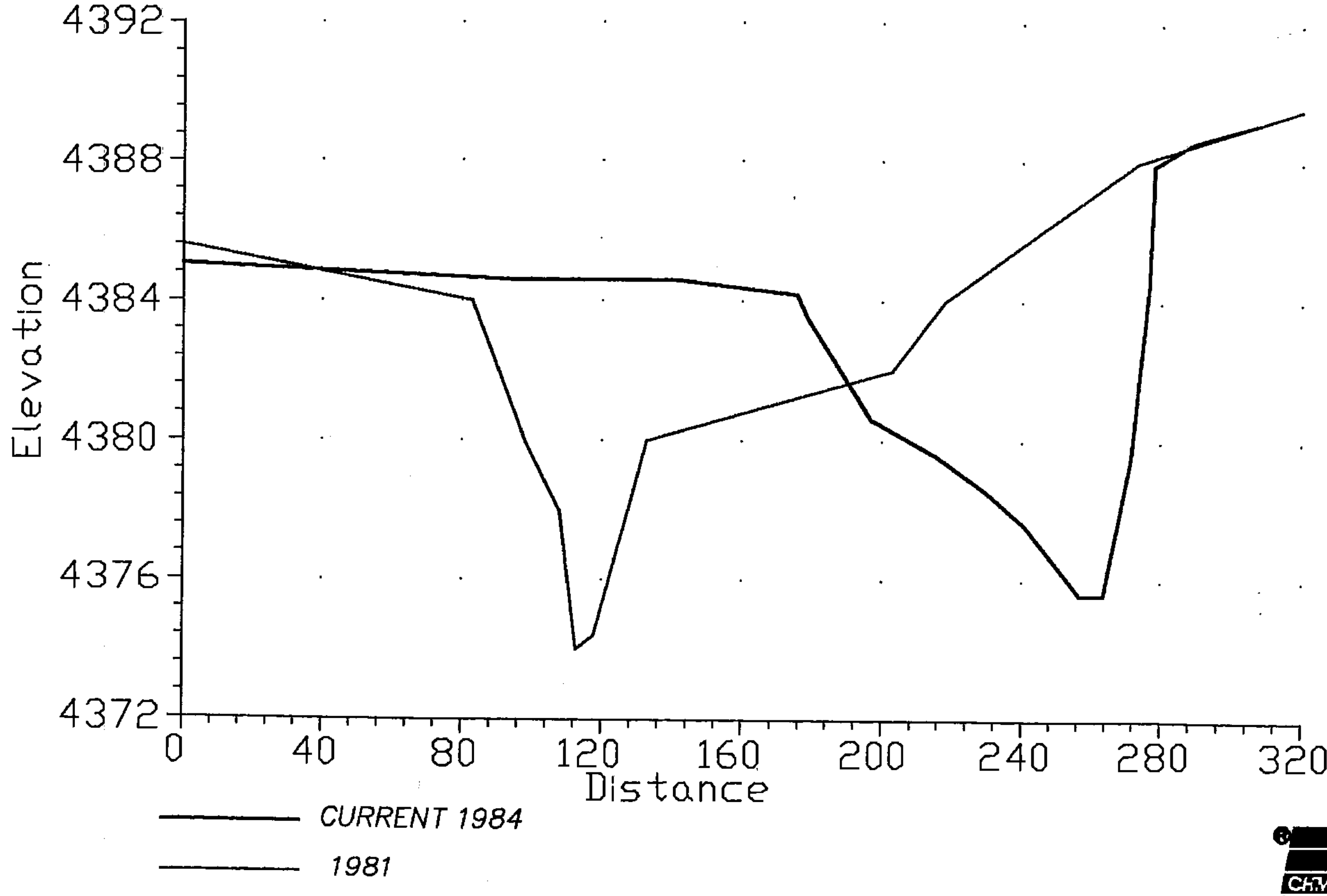
06-04-92

JORDAN RIVER REACH 6 - 1
Cross section 300



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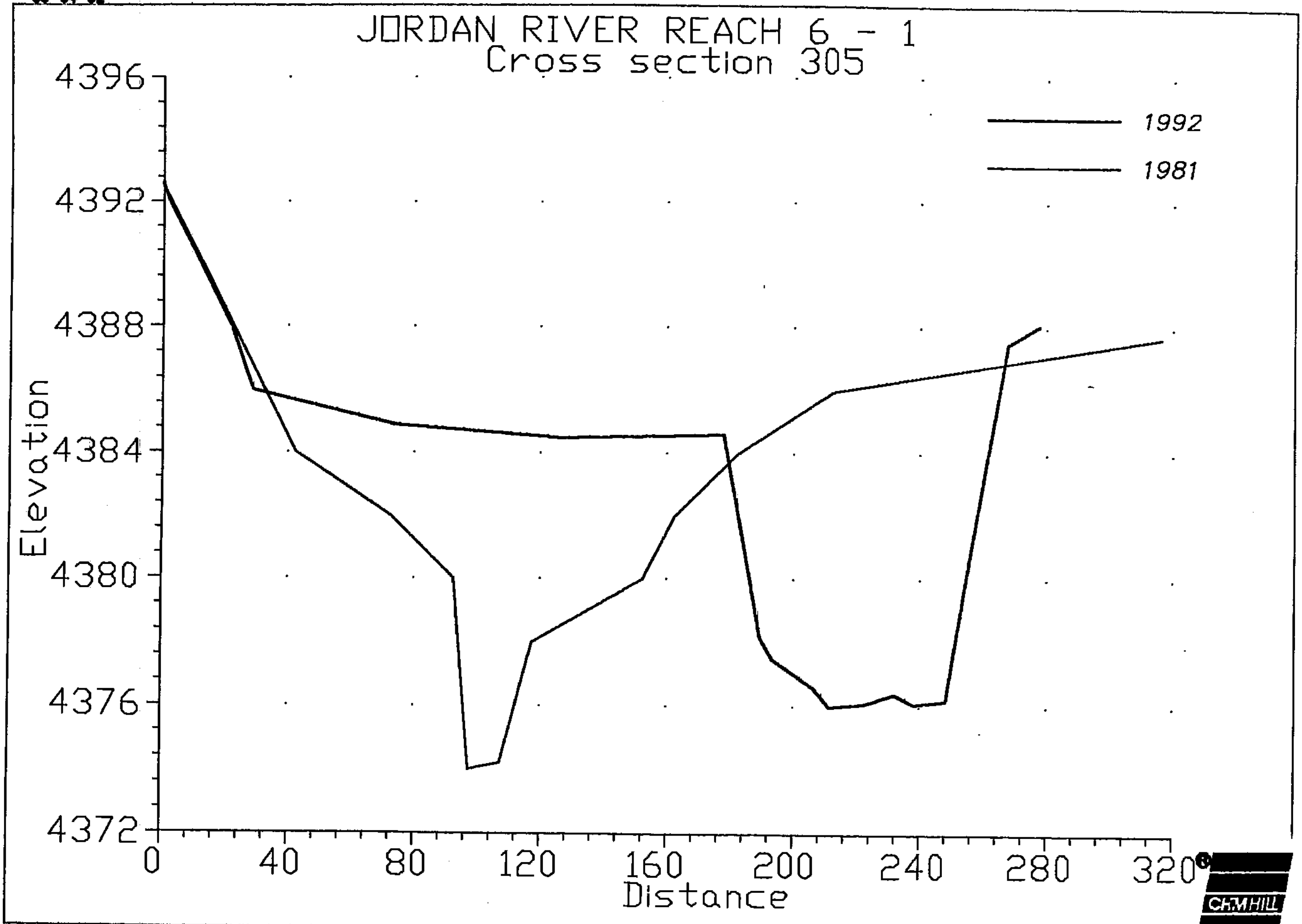

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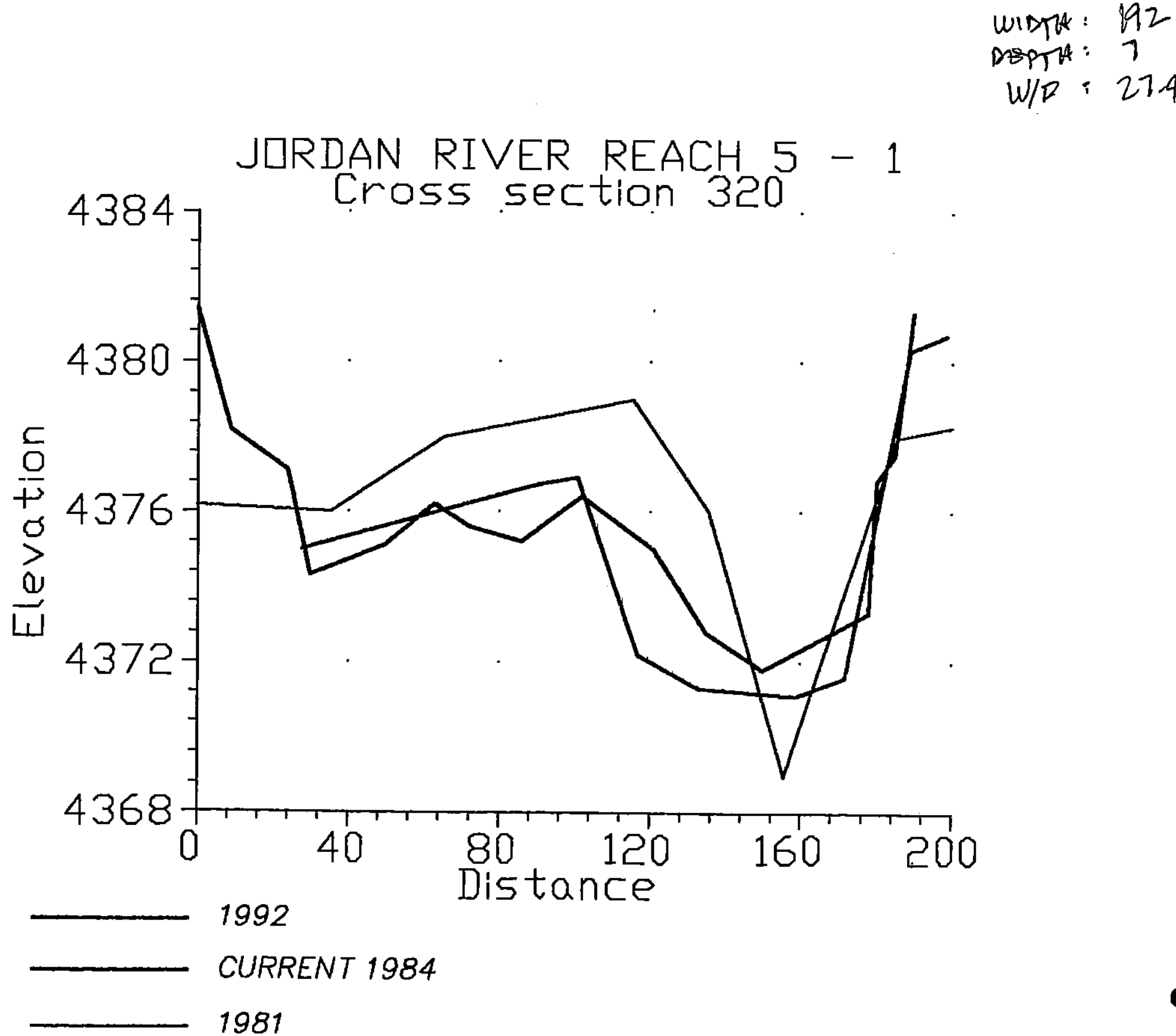

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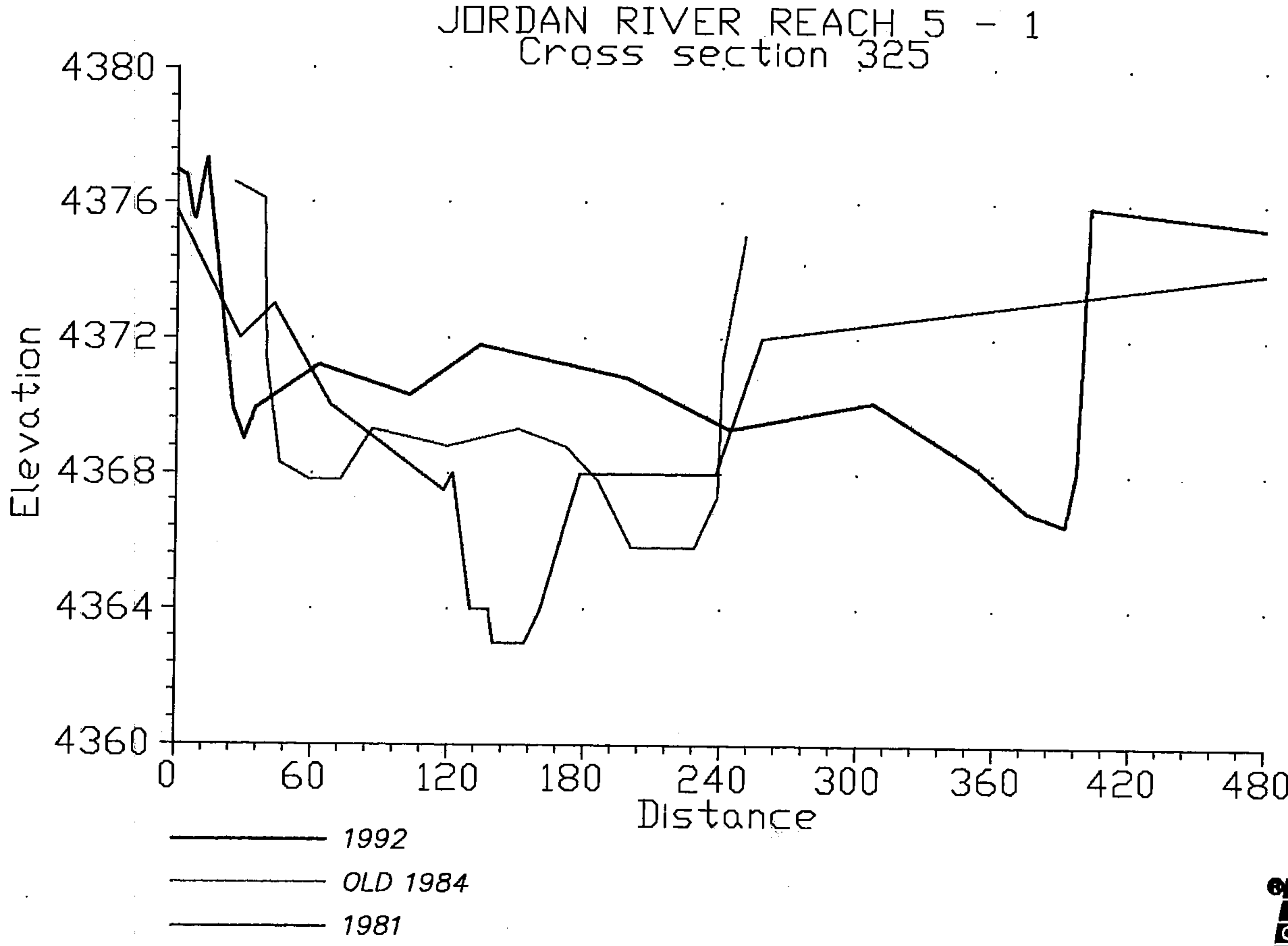

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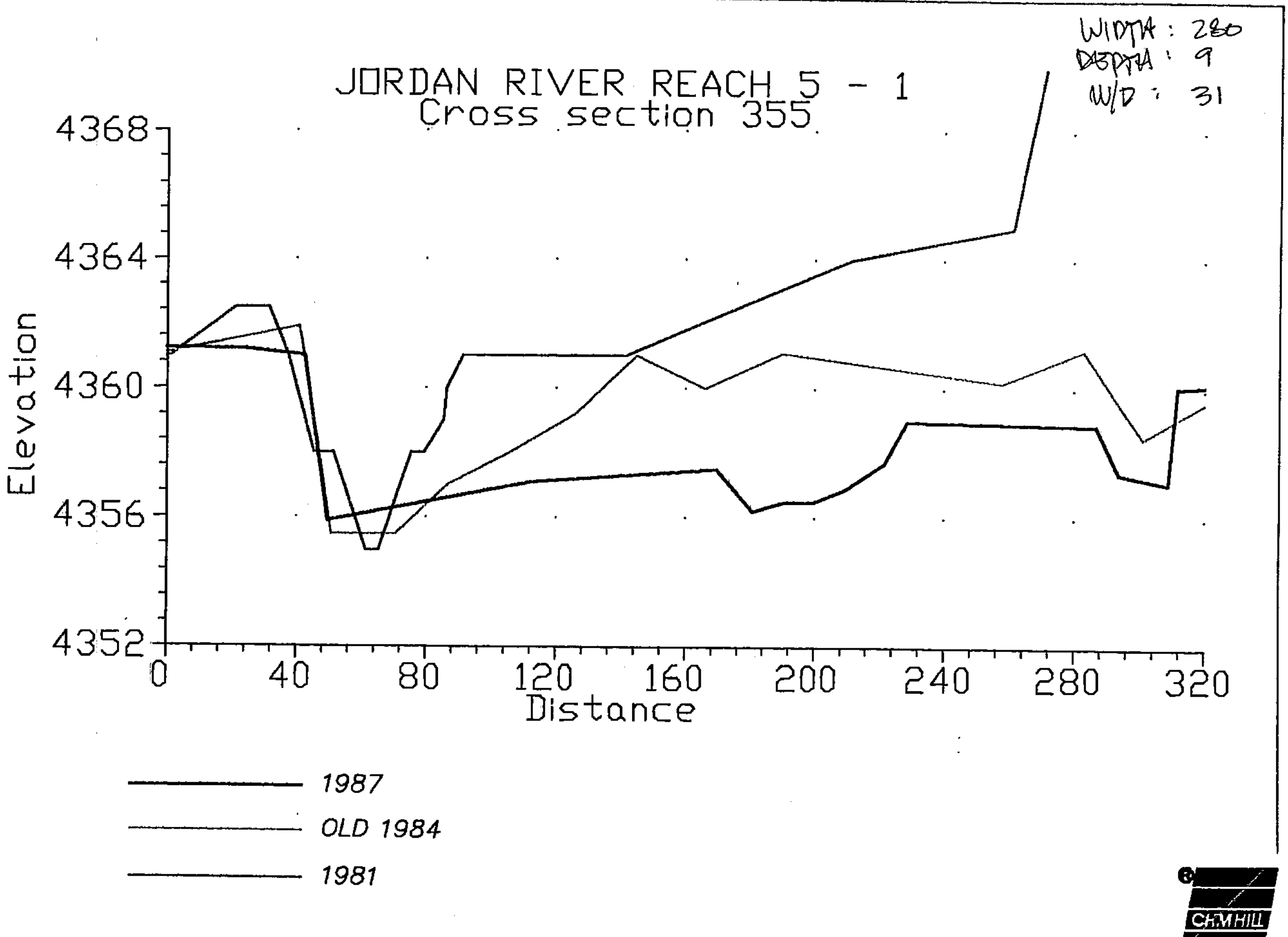

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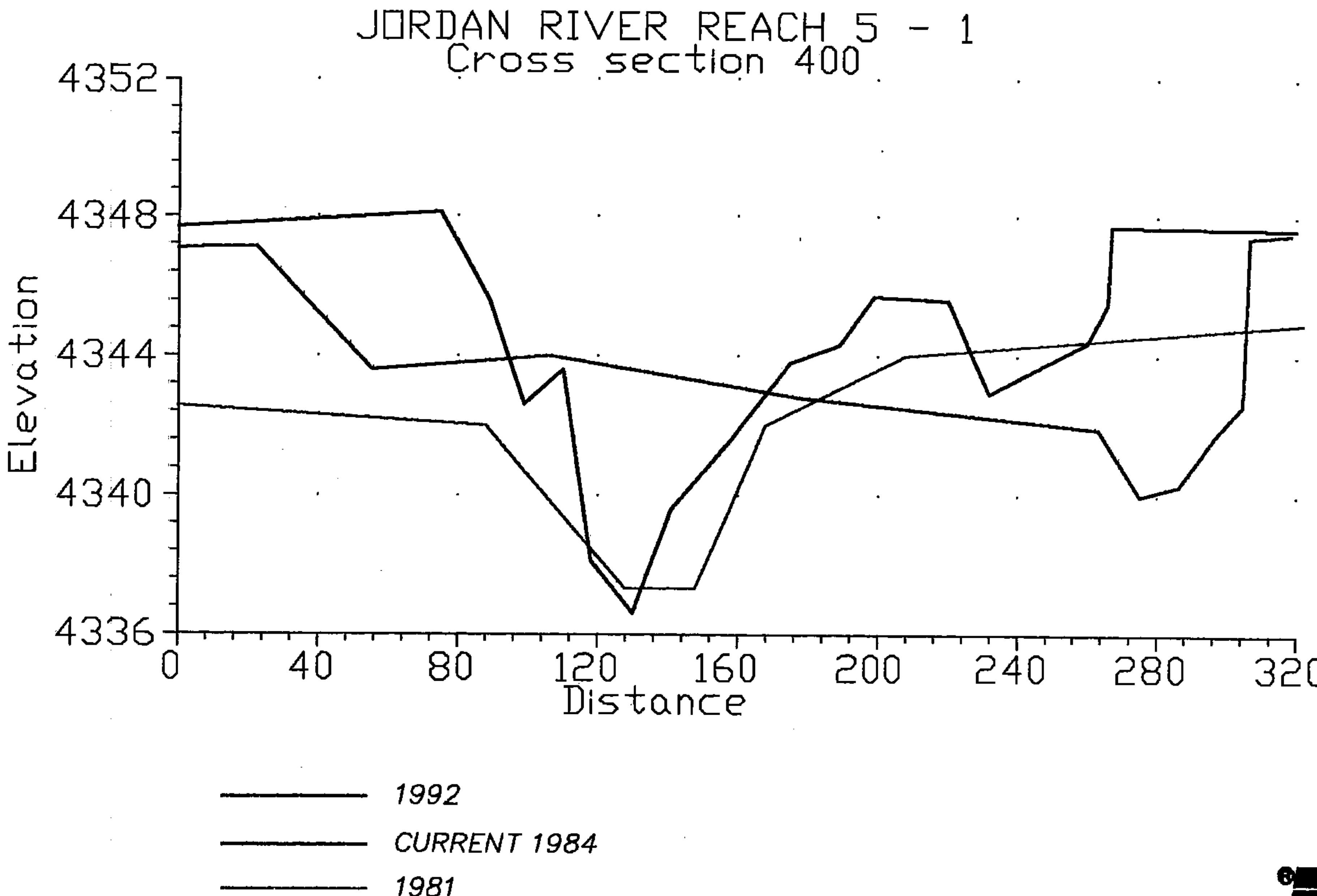

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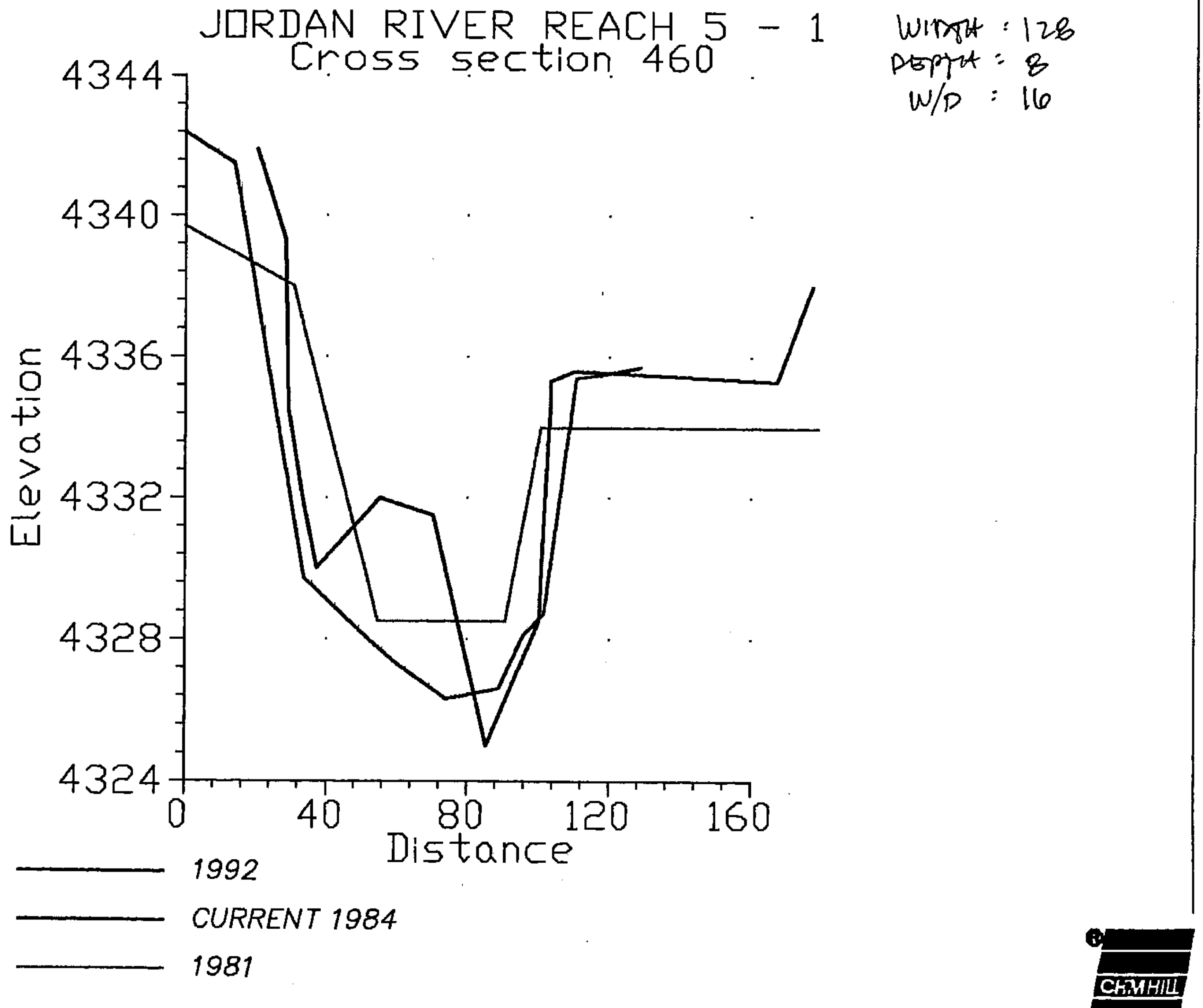

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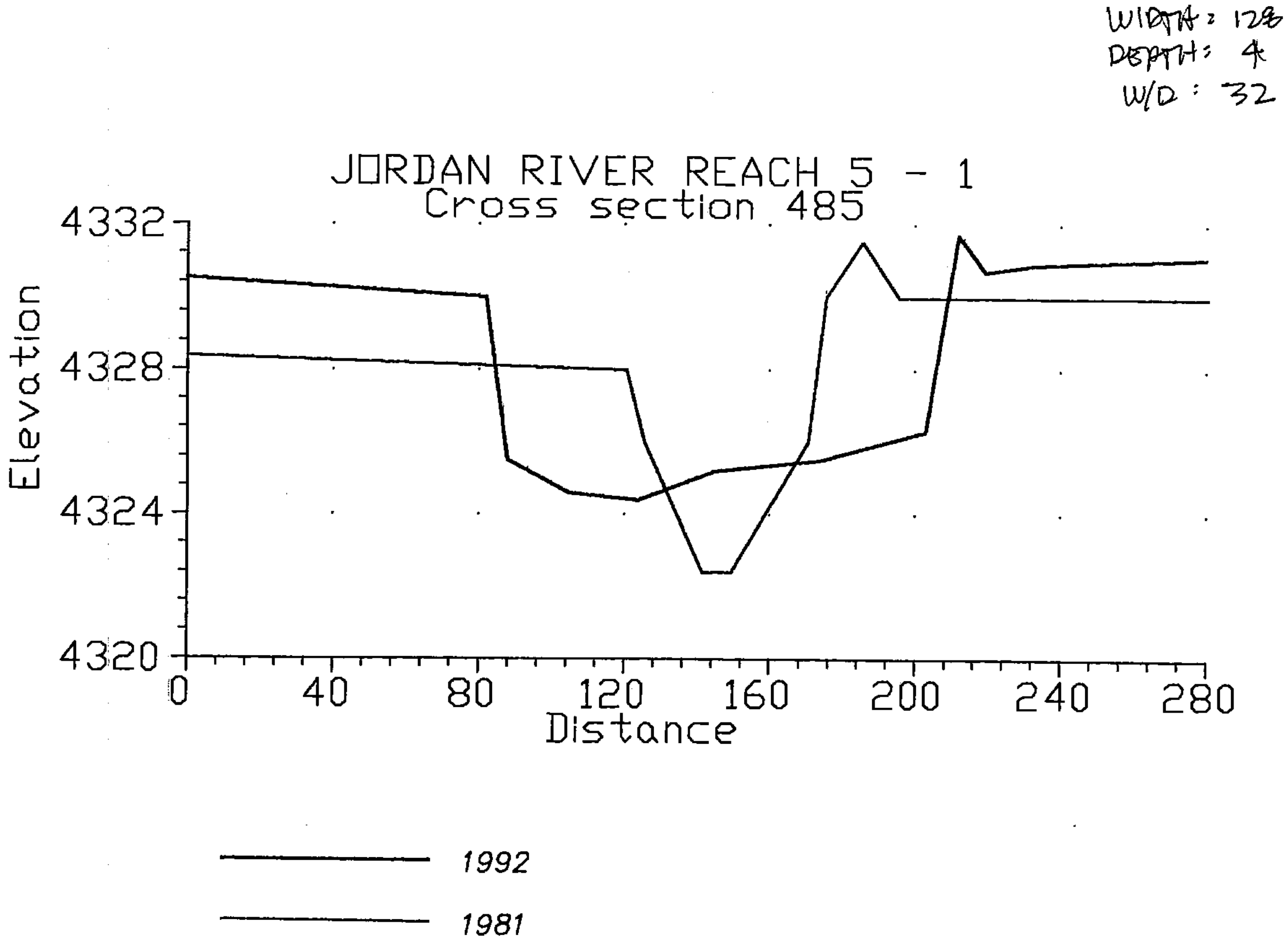

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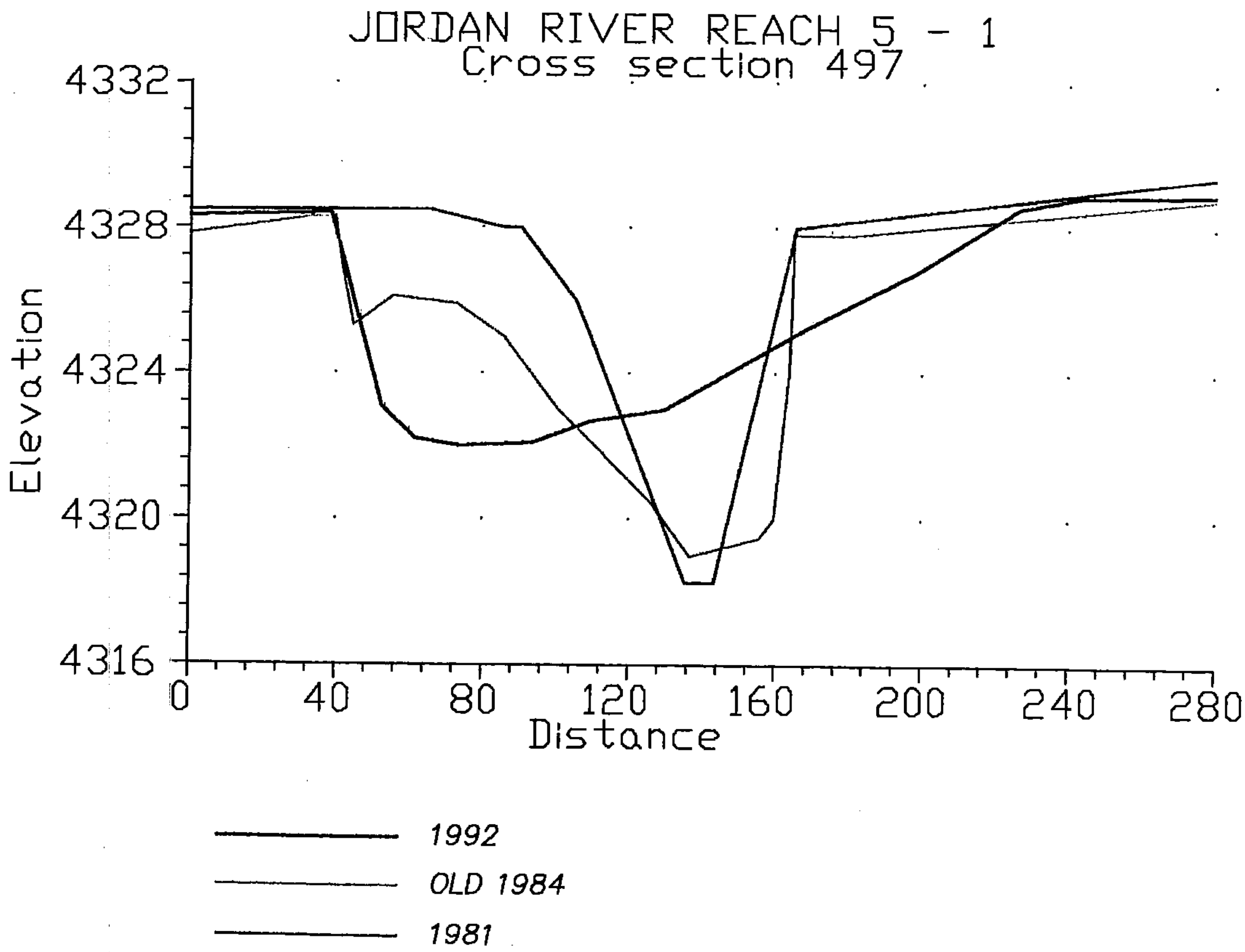

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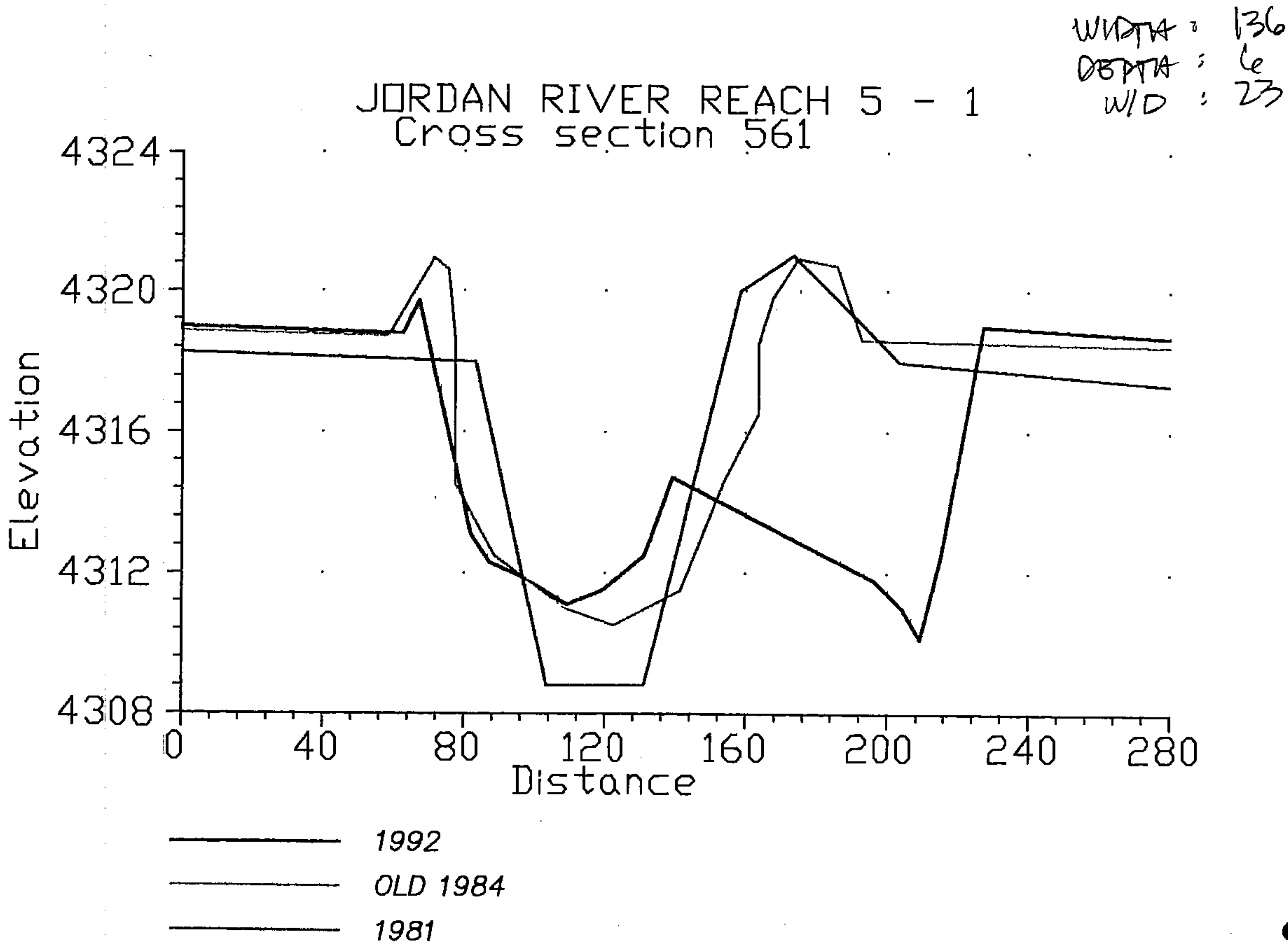

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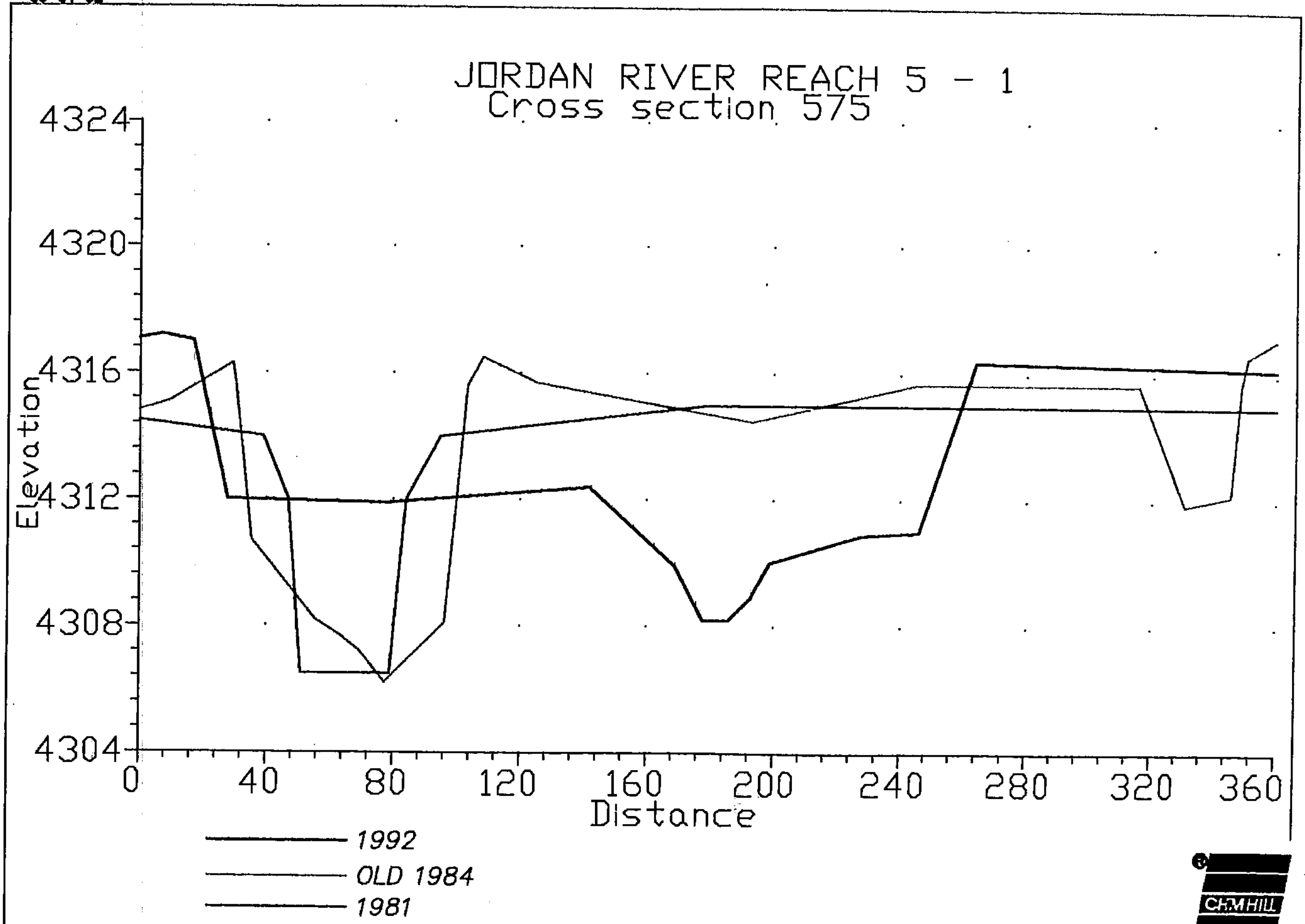

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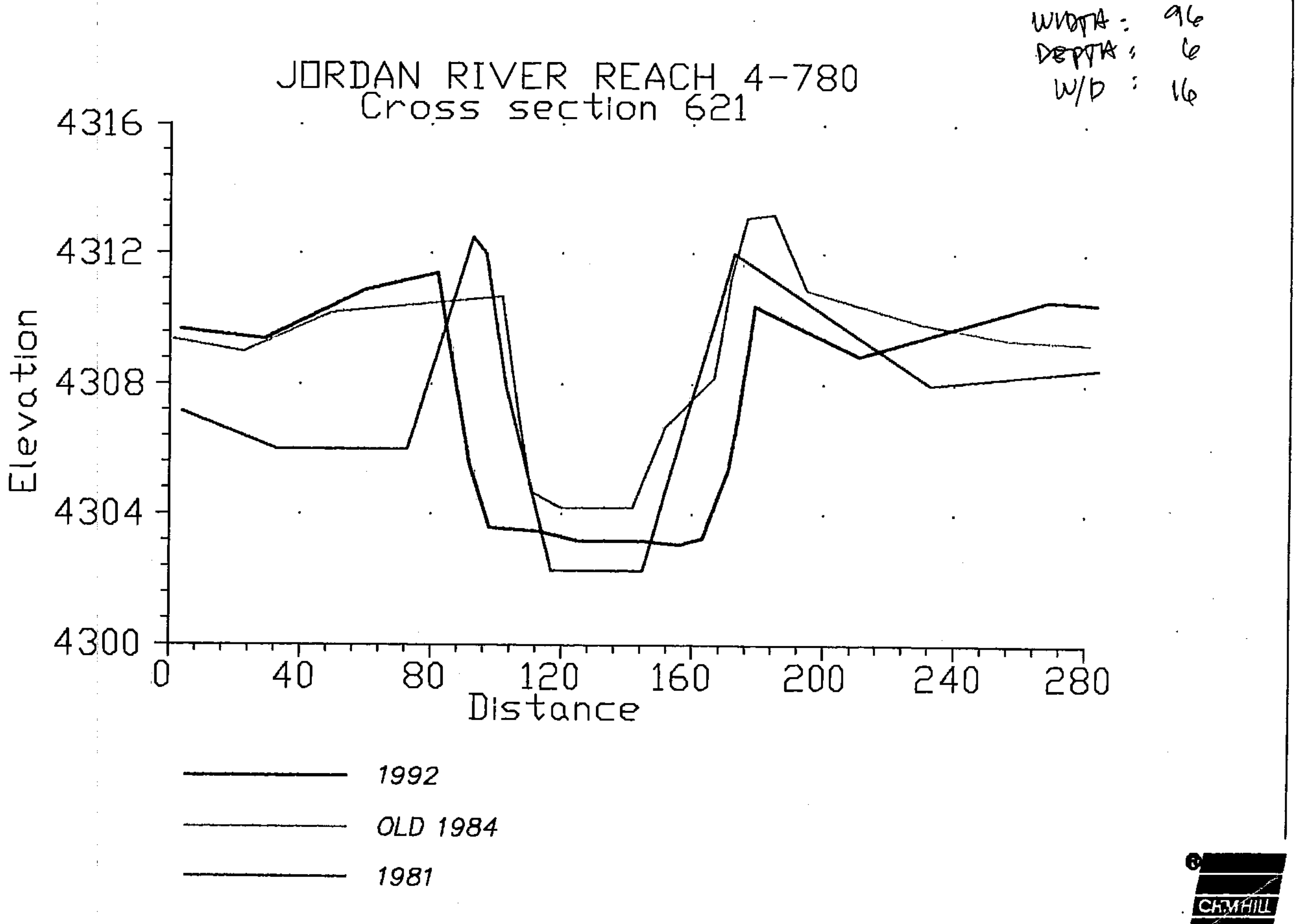

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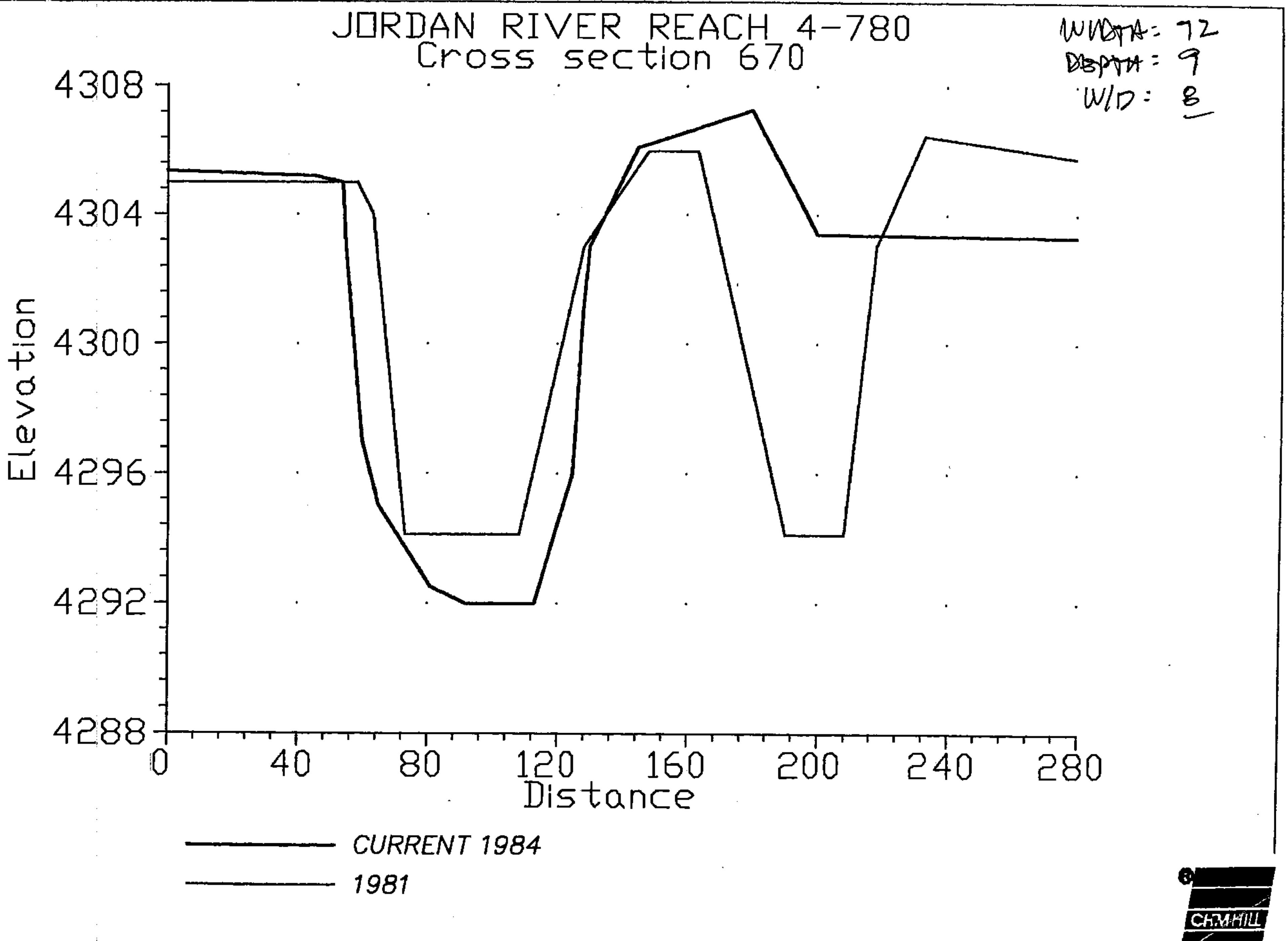

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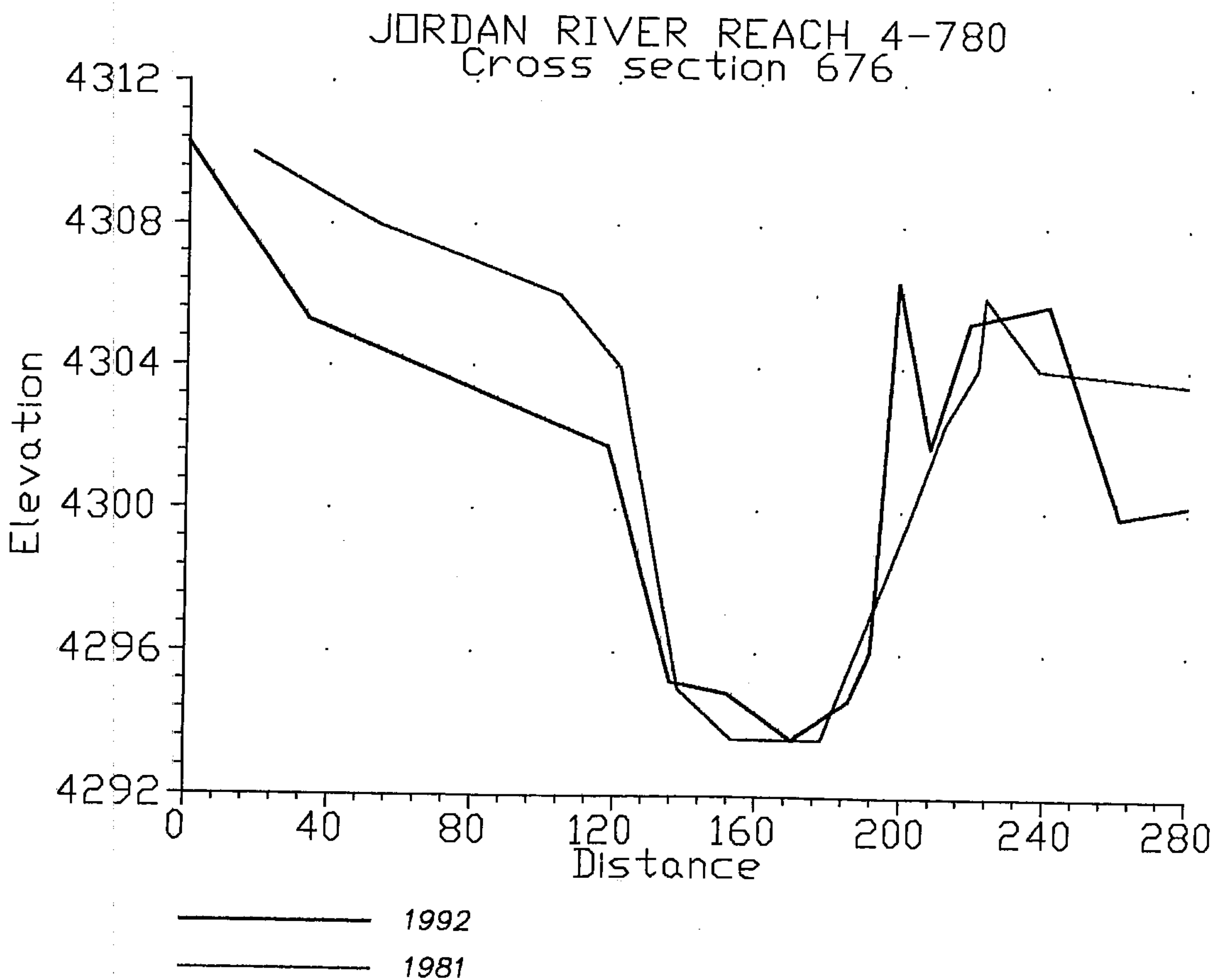

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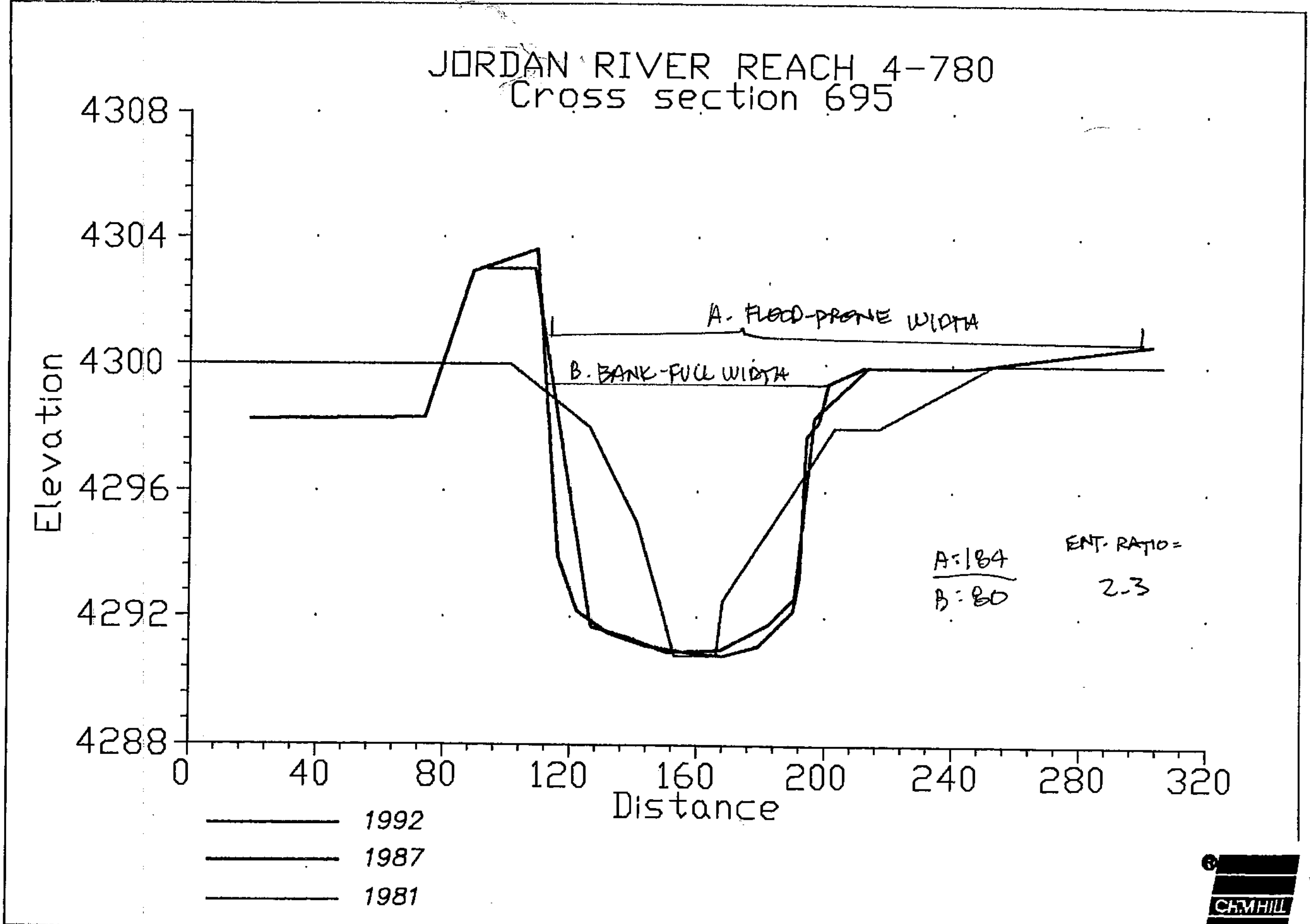

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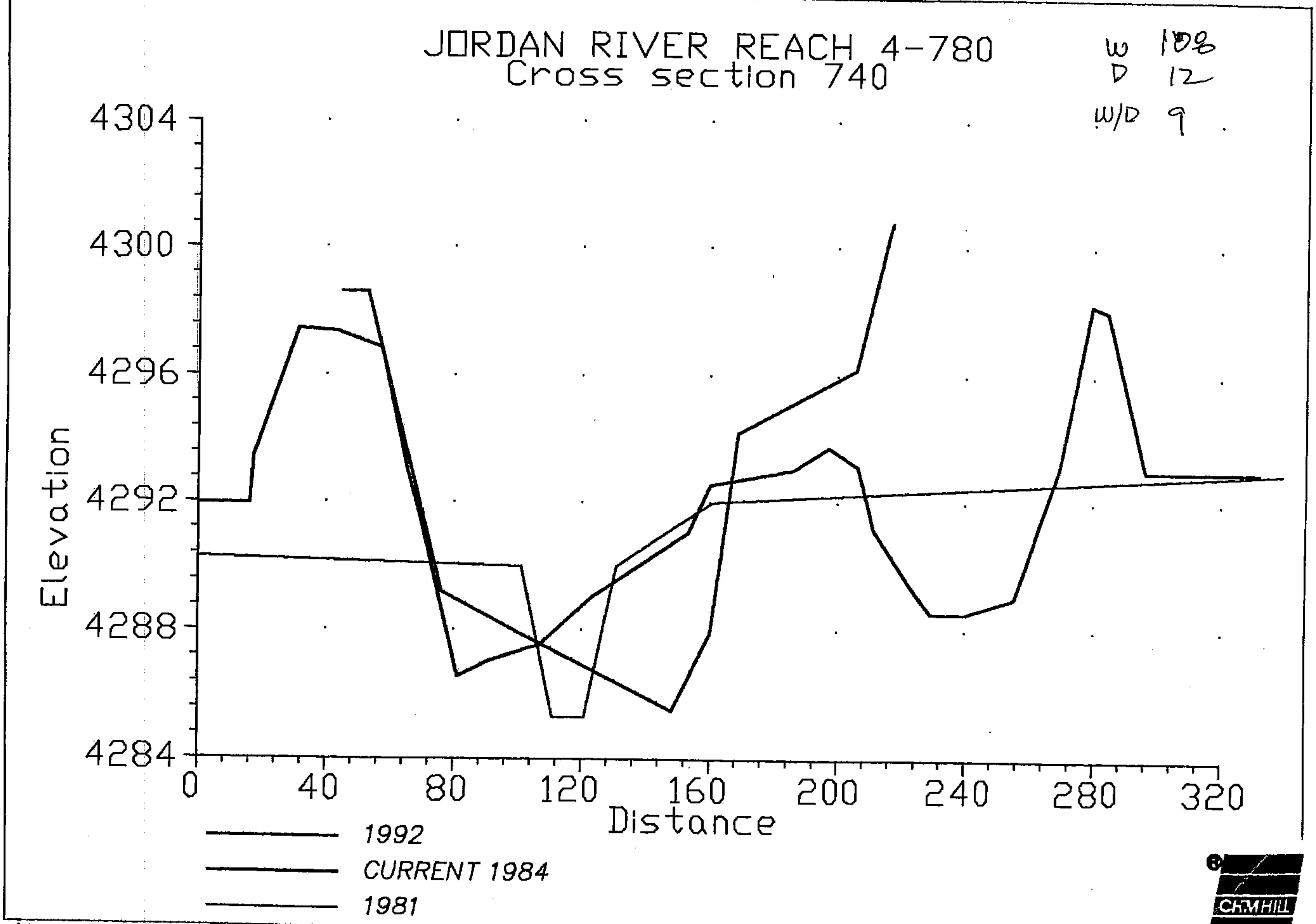

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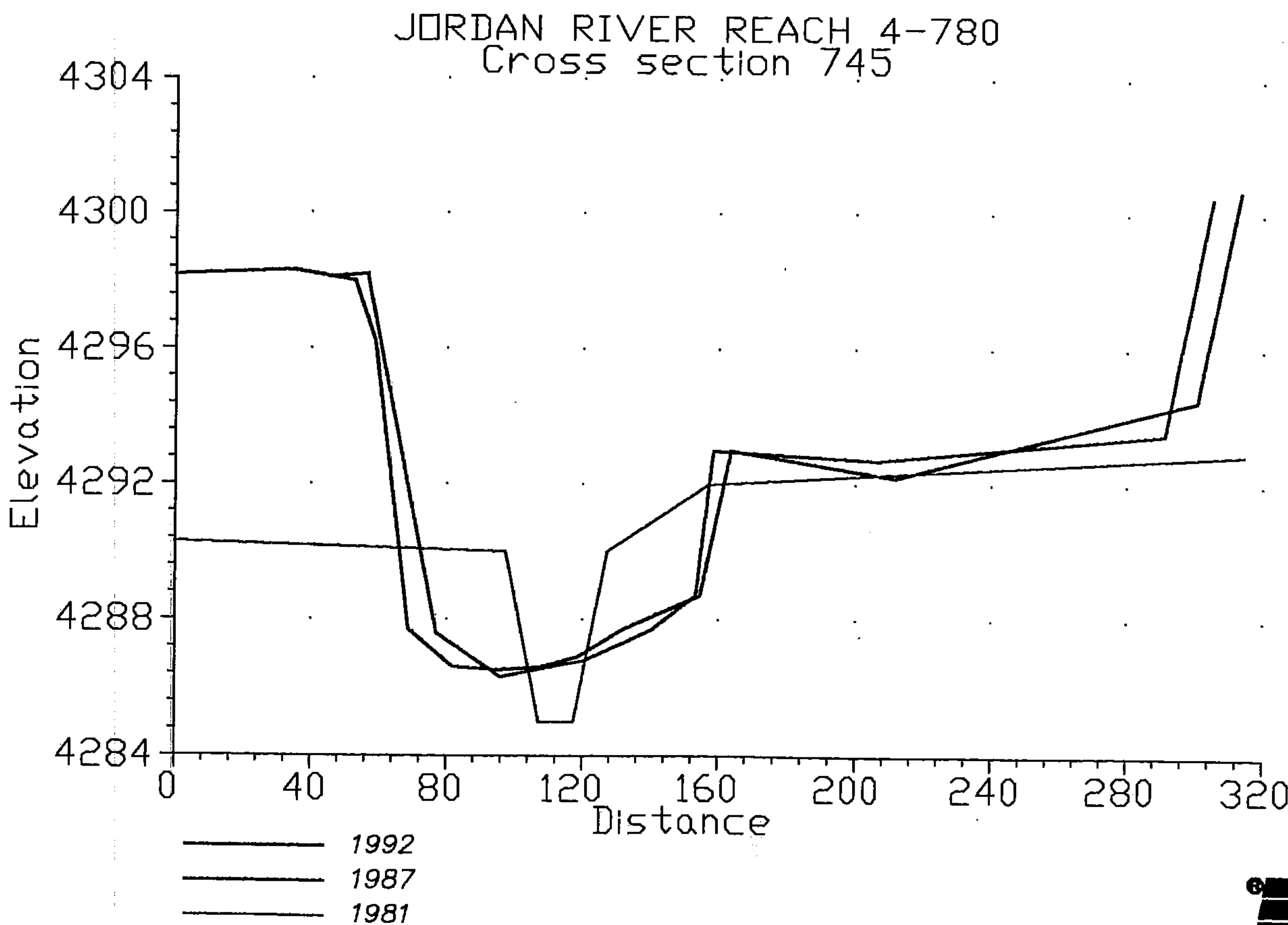

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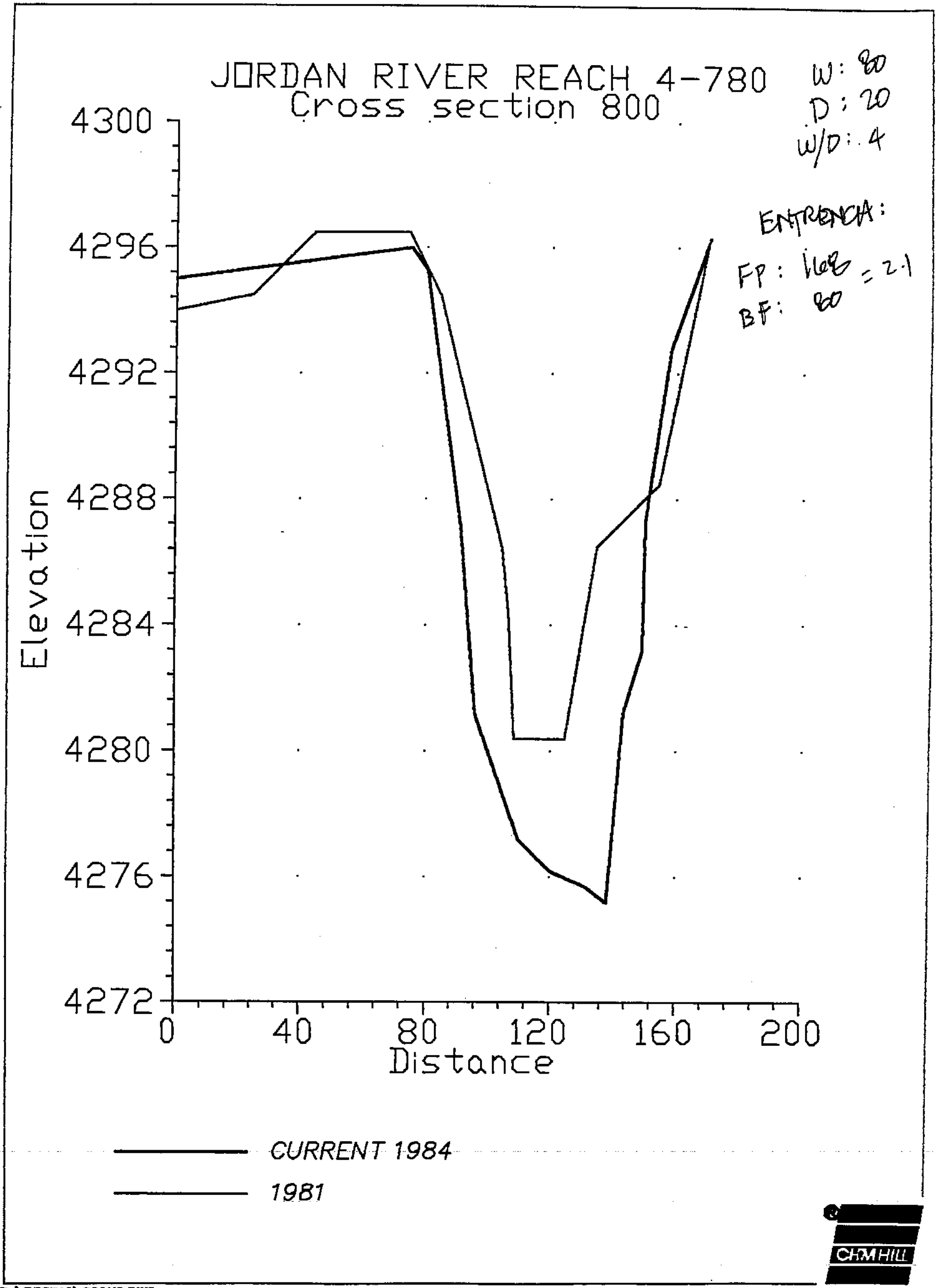
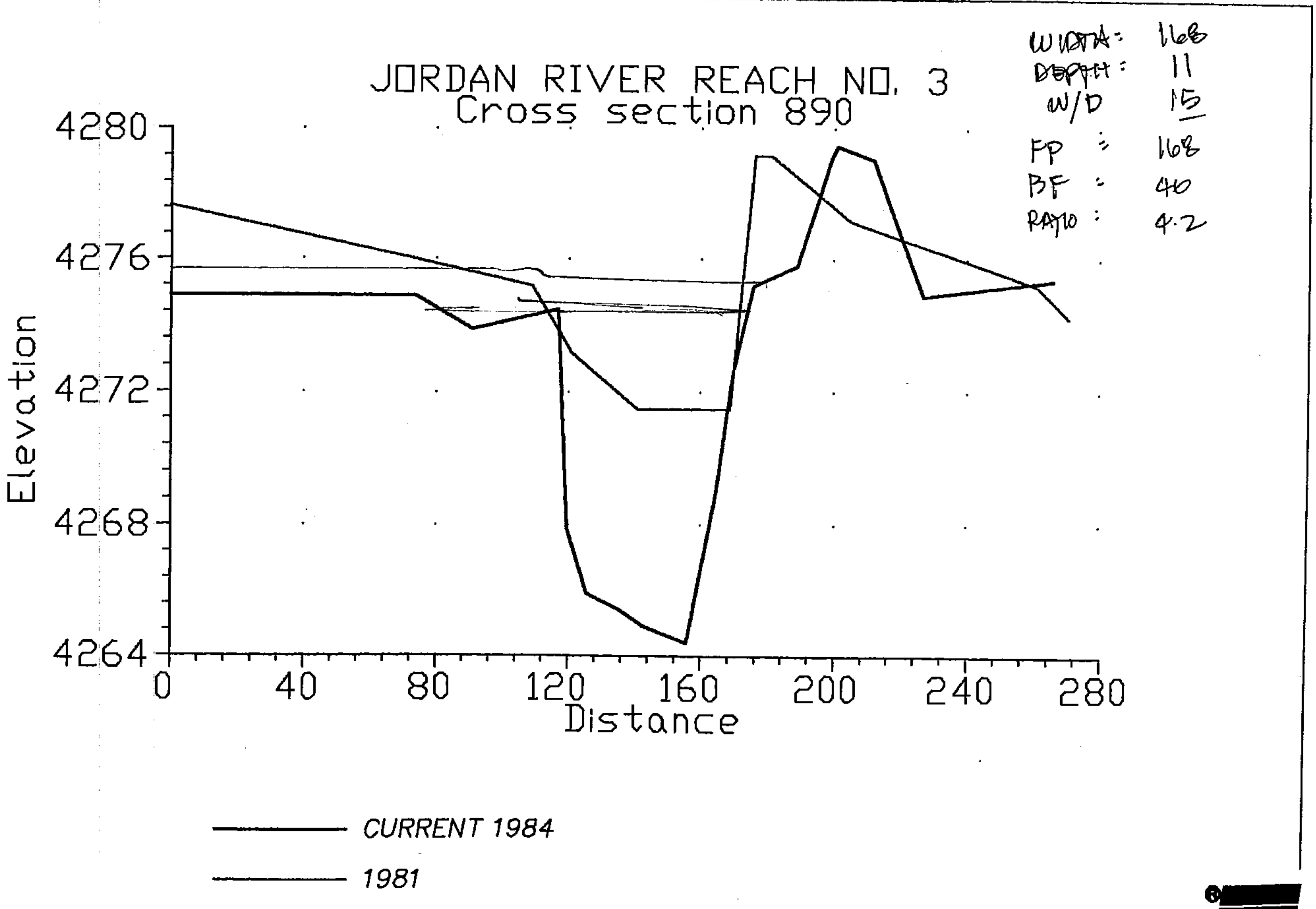

JORDAN RIVER REACH 4-780
Cross section 800
W: 80
D: 20
W/D: 4
ENTRENCH:
FP: 168
BF: 80
= 2.1
4300
4296
4292
4288
4284
4280
4276
4272
Elevation
0
40
80
120
160
200
Distance
CURRENT 1984
1981
CH2M HILL

06-04-92



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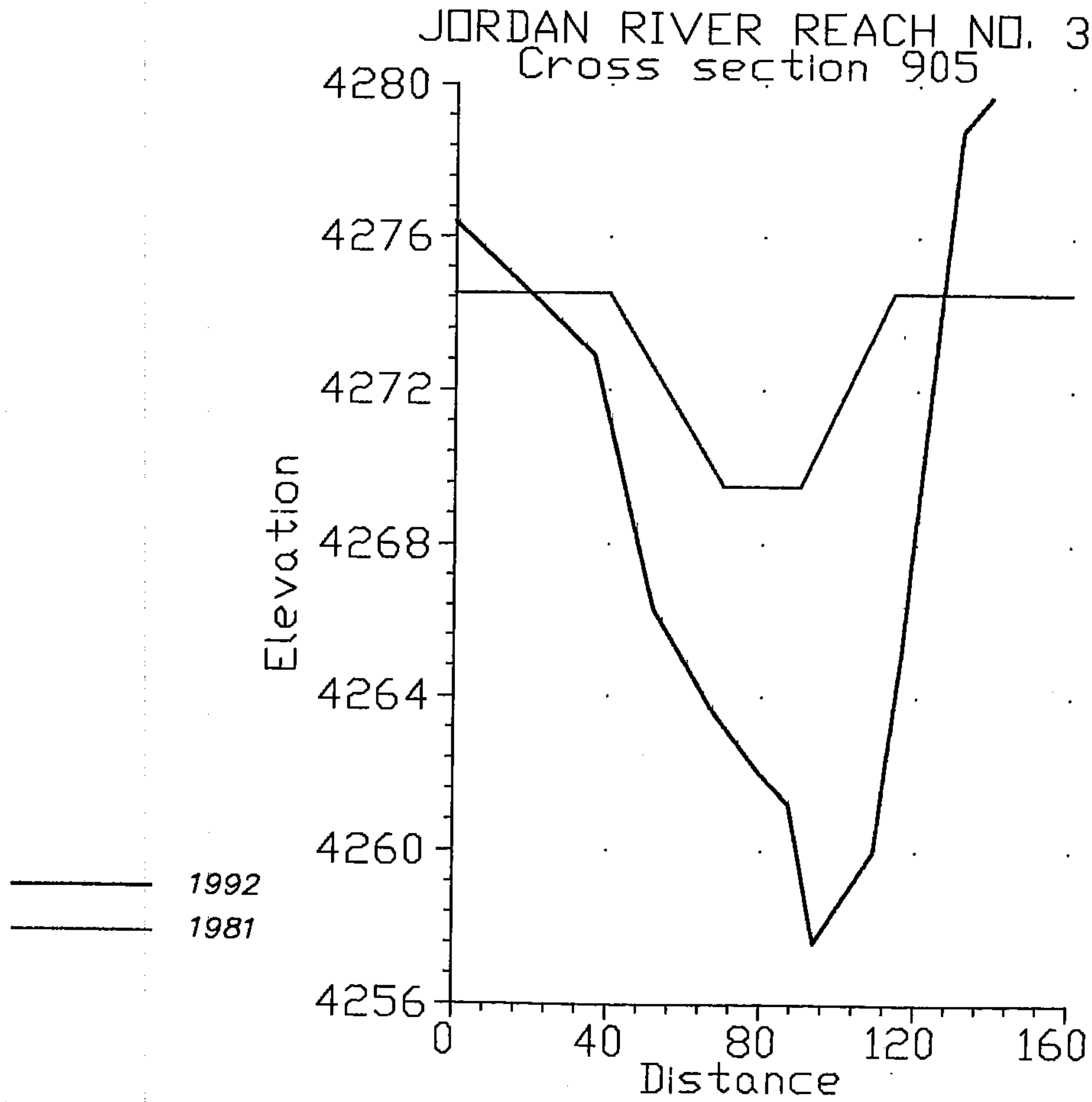

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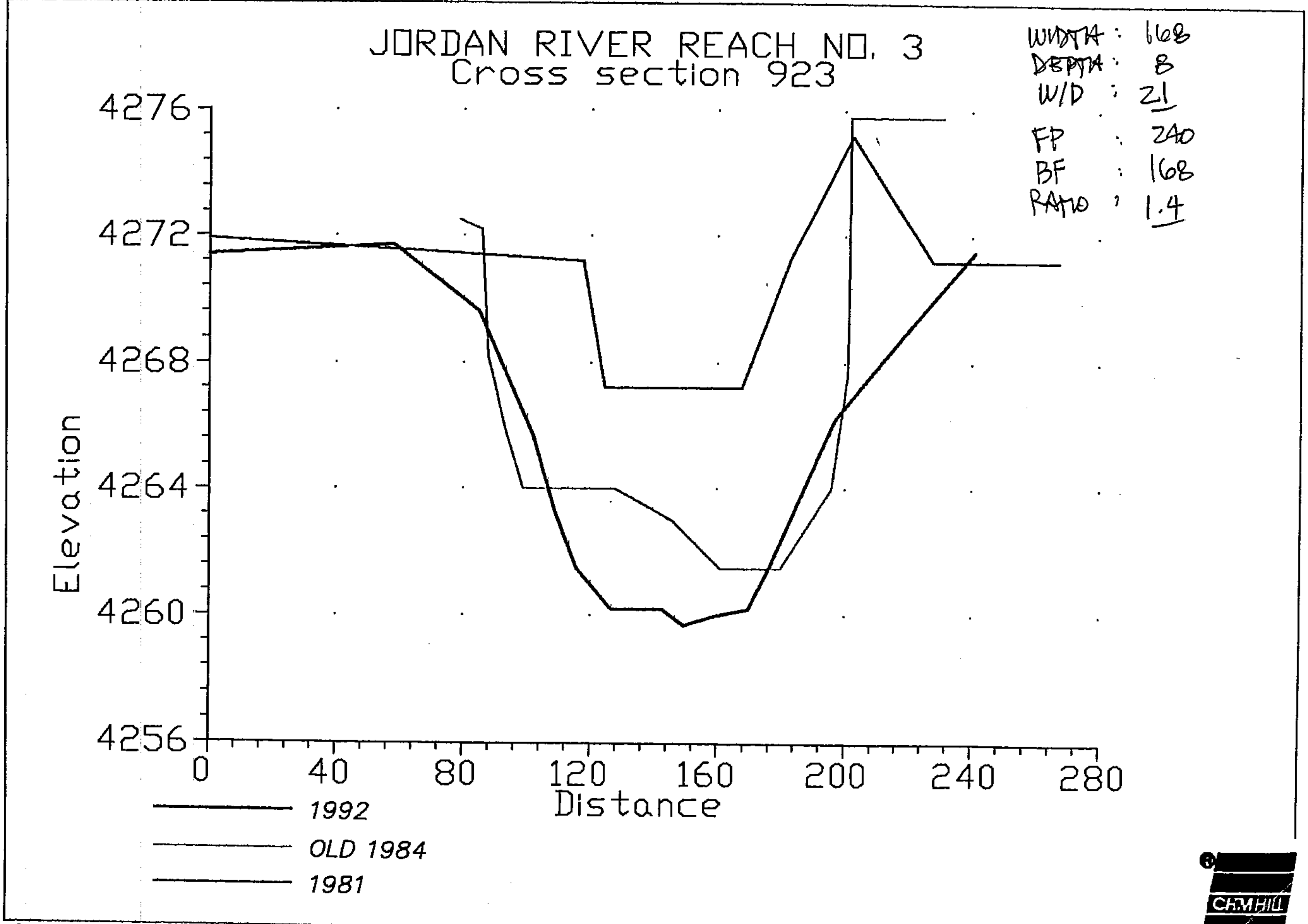

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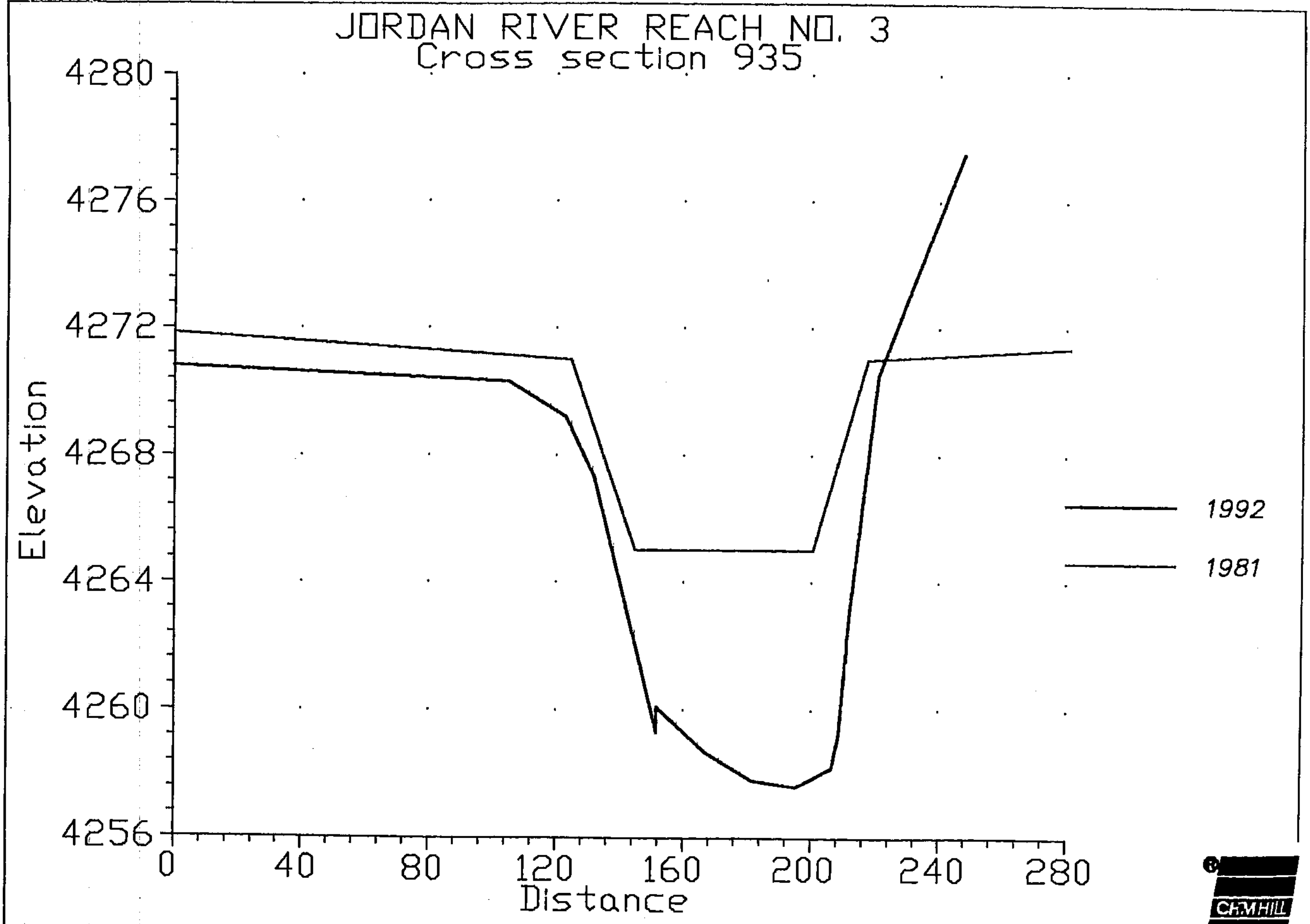

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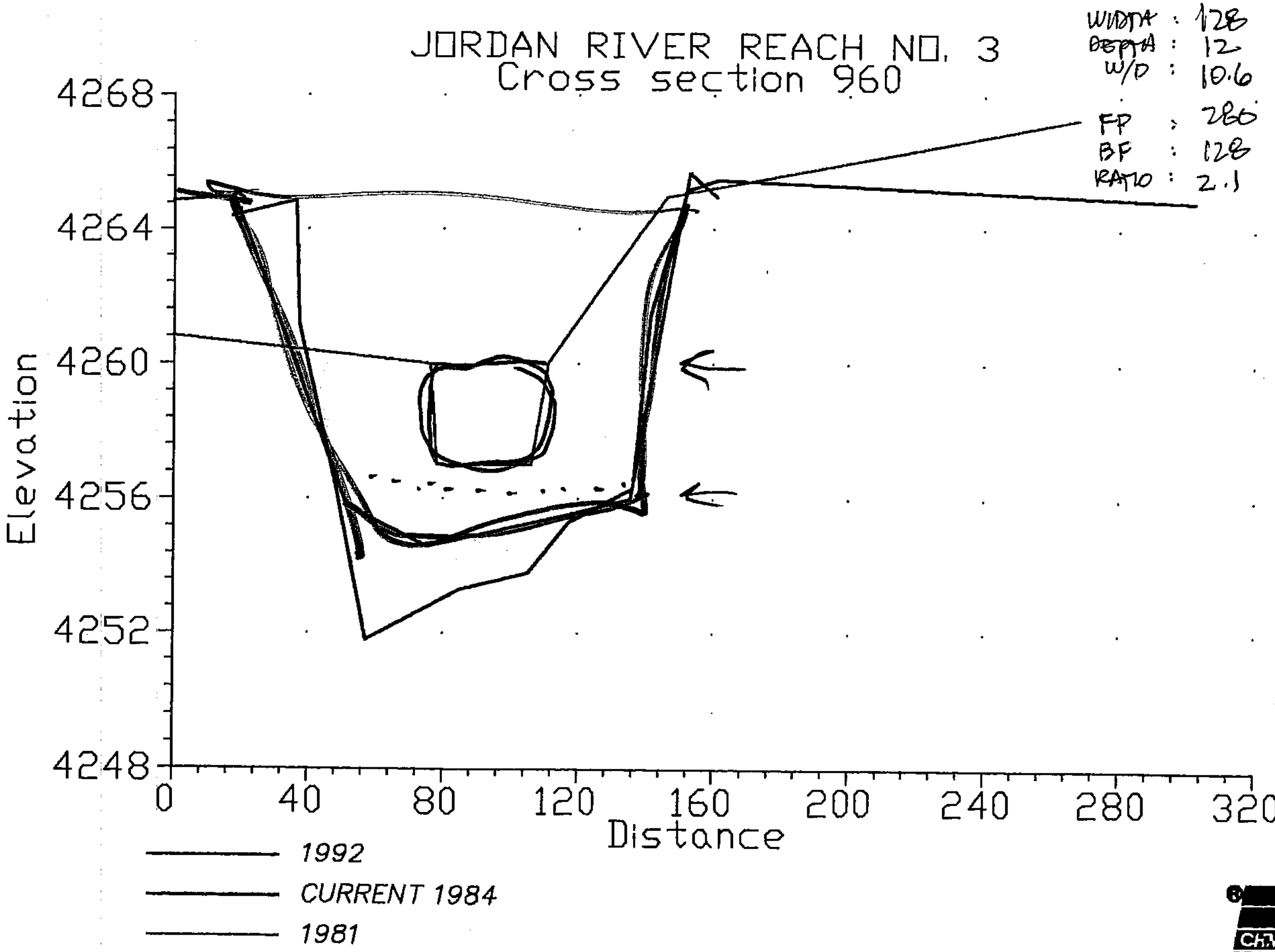

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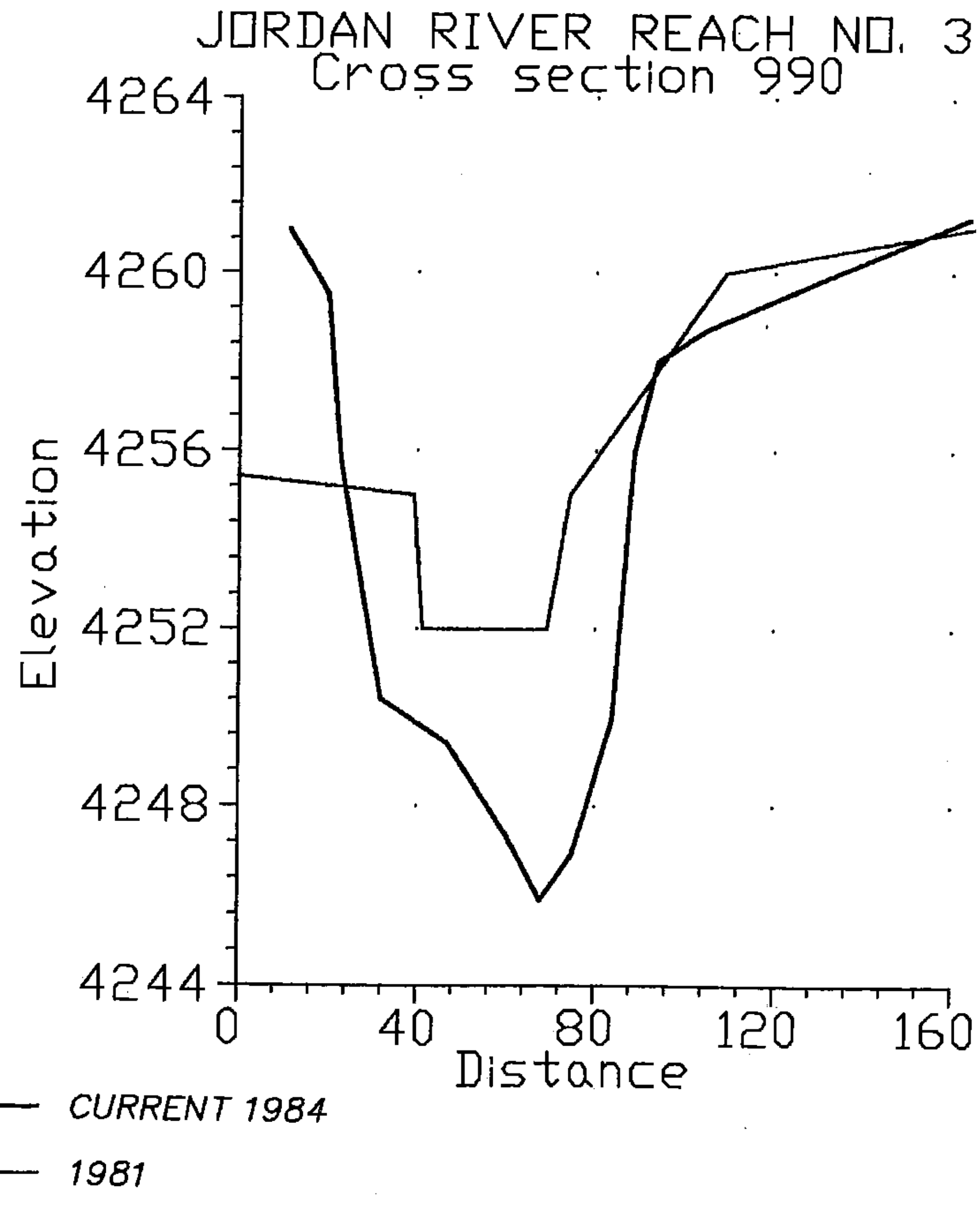

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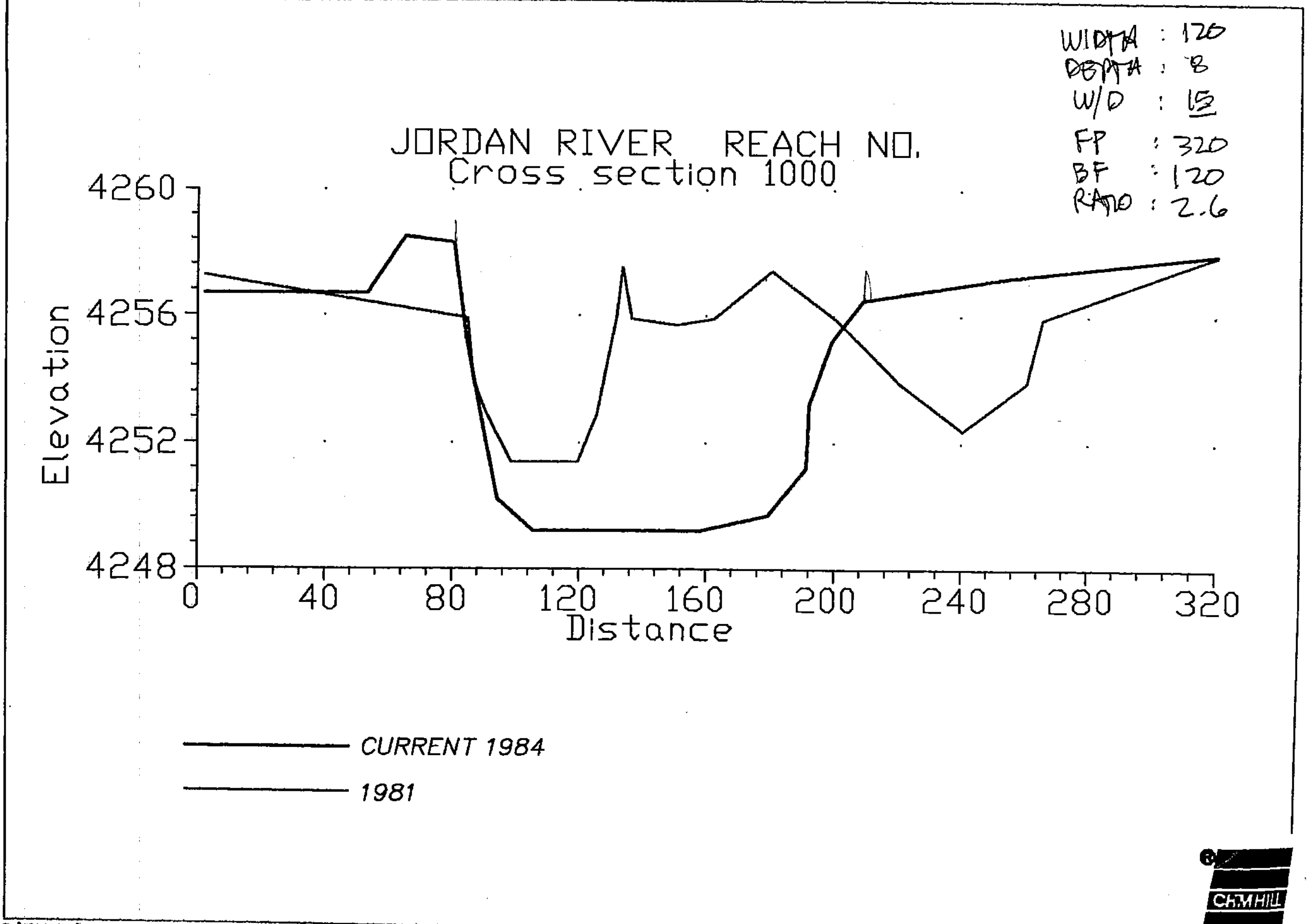

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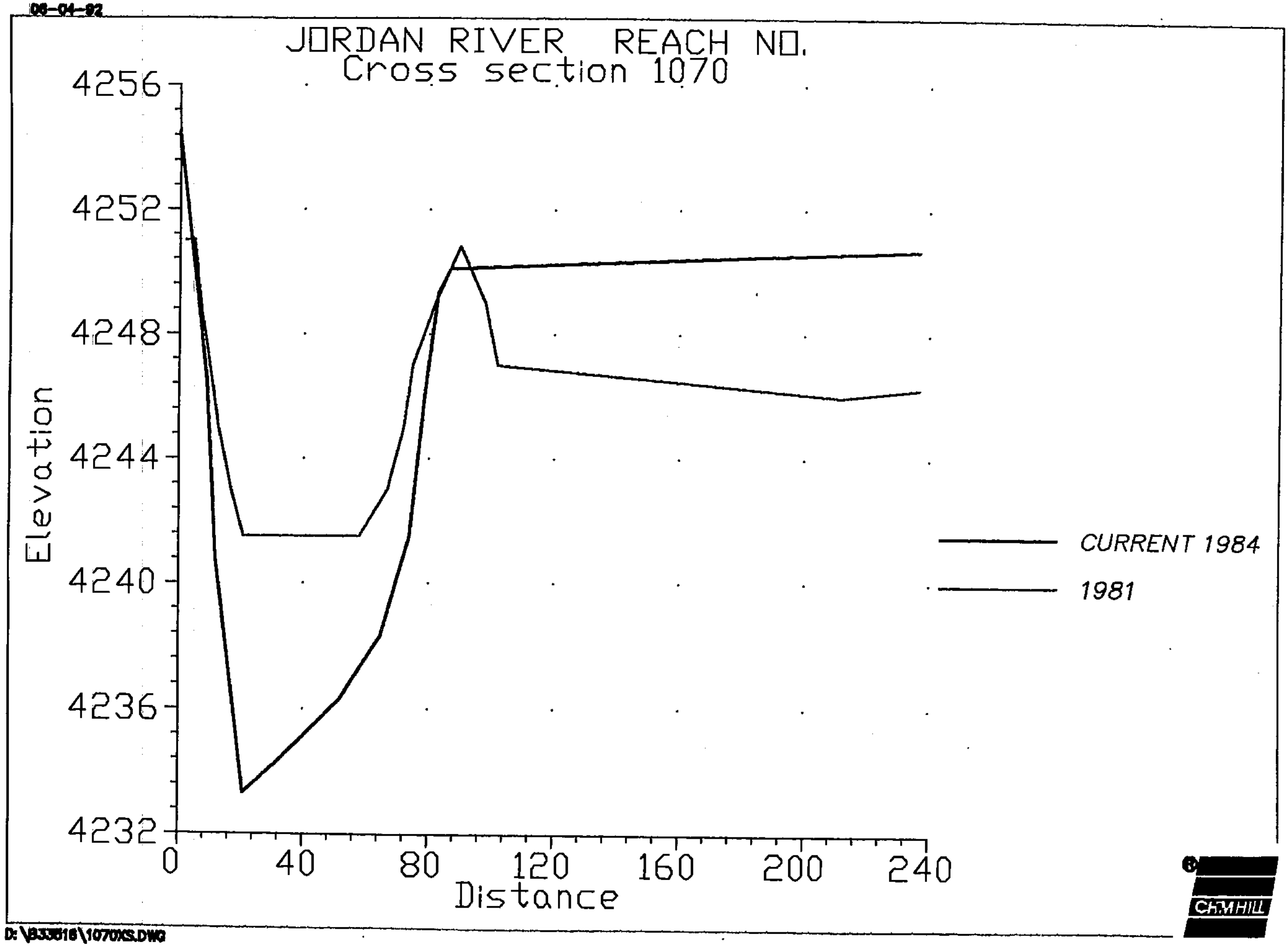
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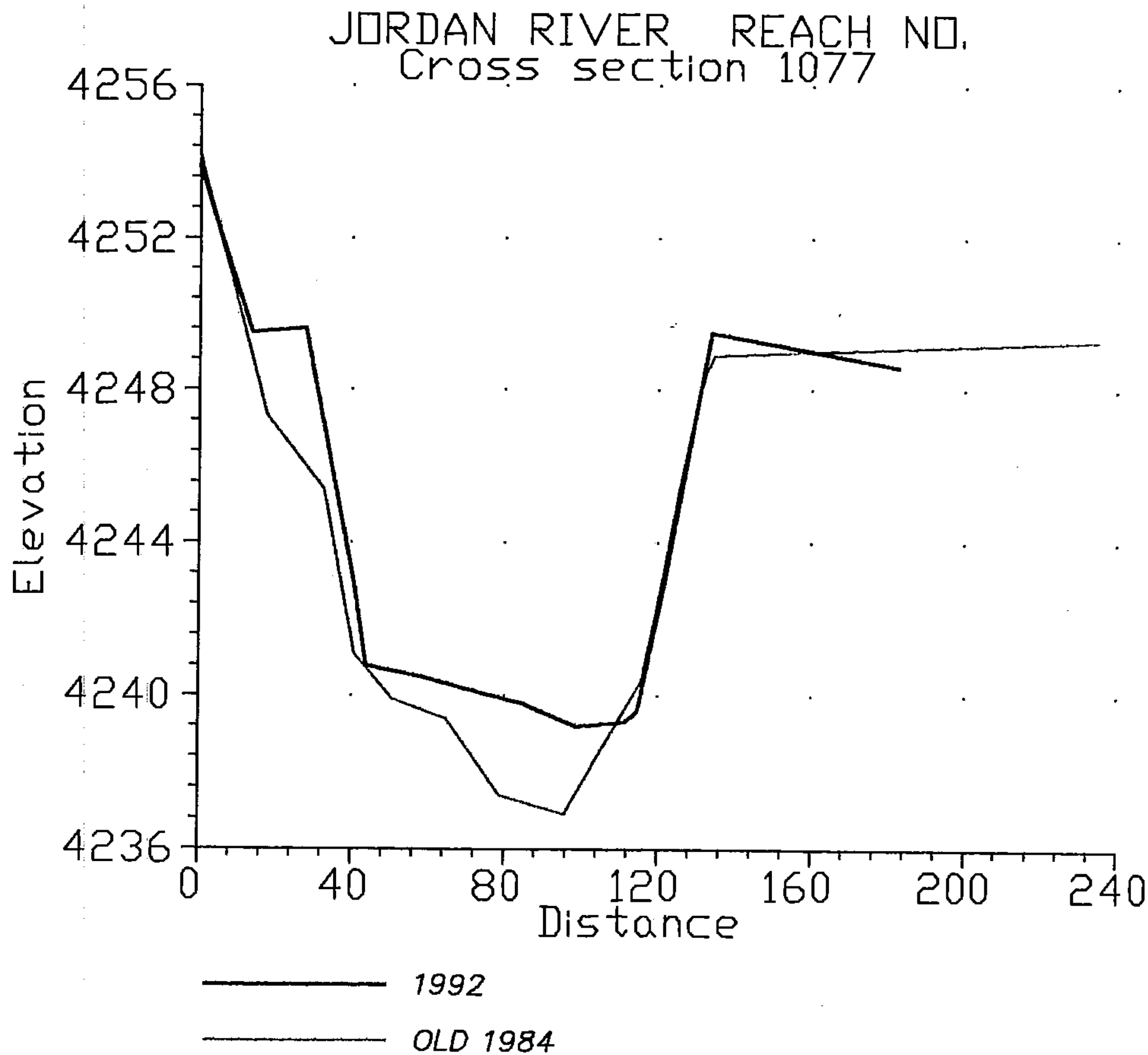
JORDAN RIVER REACH NO.
Cross section 1070
Elevation
4256
4252
4248
4244
4240
4236
4232
0
40
80
120
160
200
240
Distance
CURRENT 1984
1981
CH2M HILL
D:\B33516\1070XS.DWG

06-04-92



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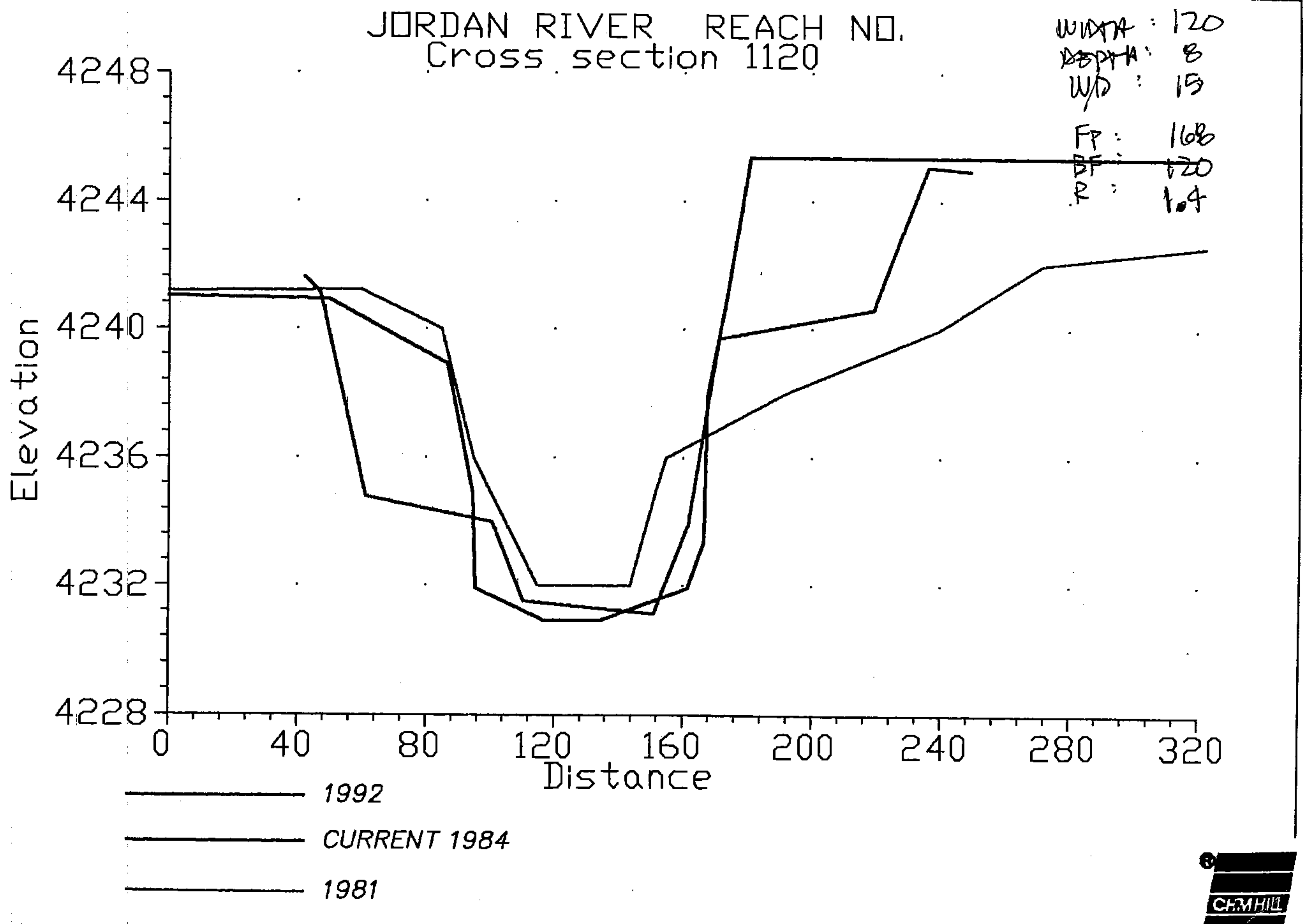

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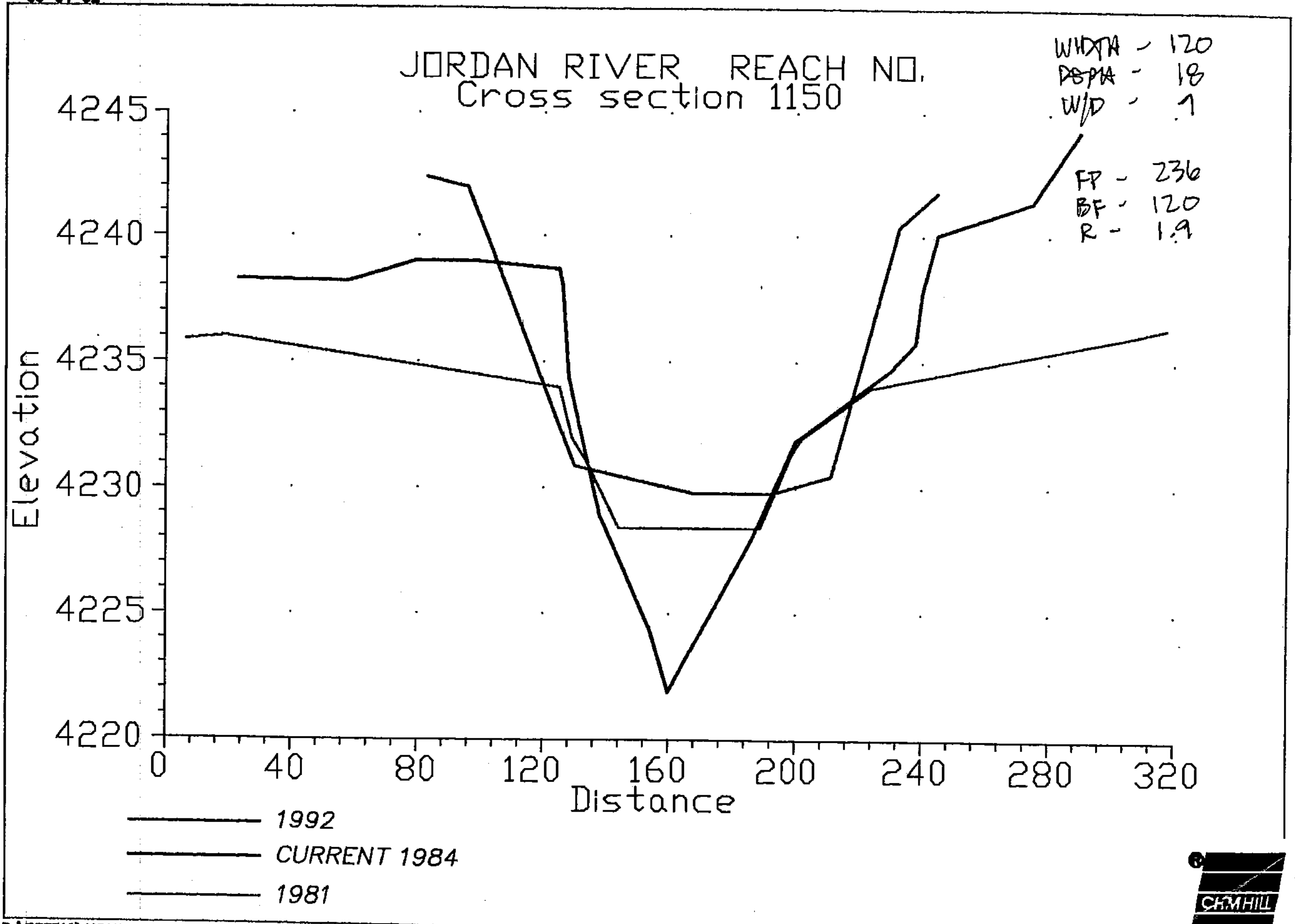

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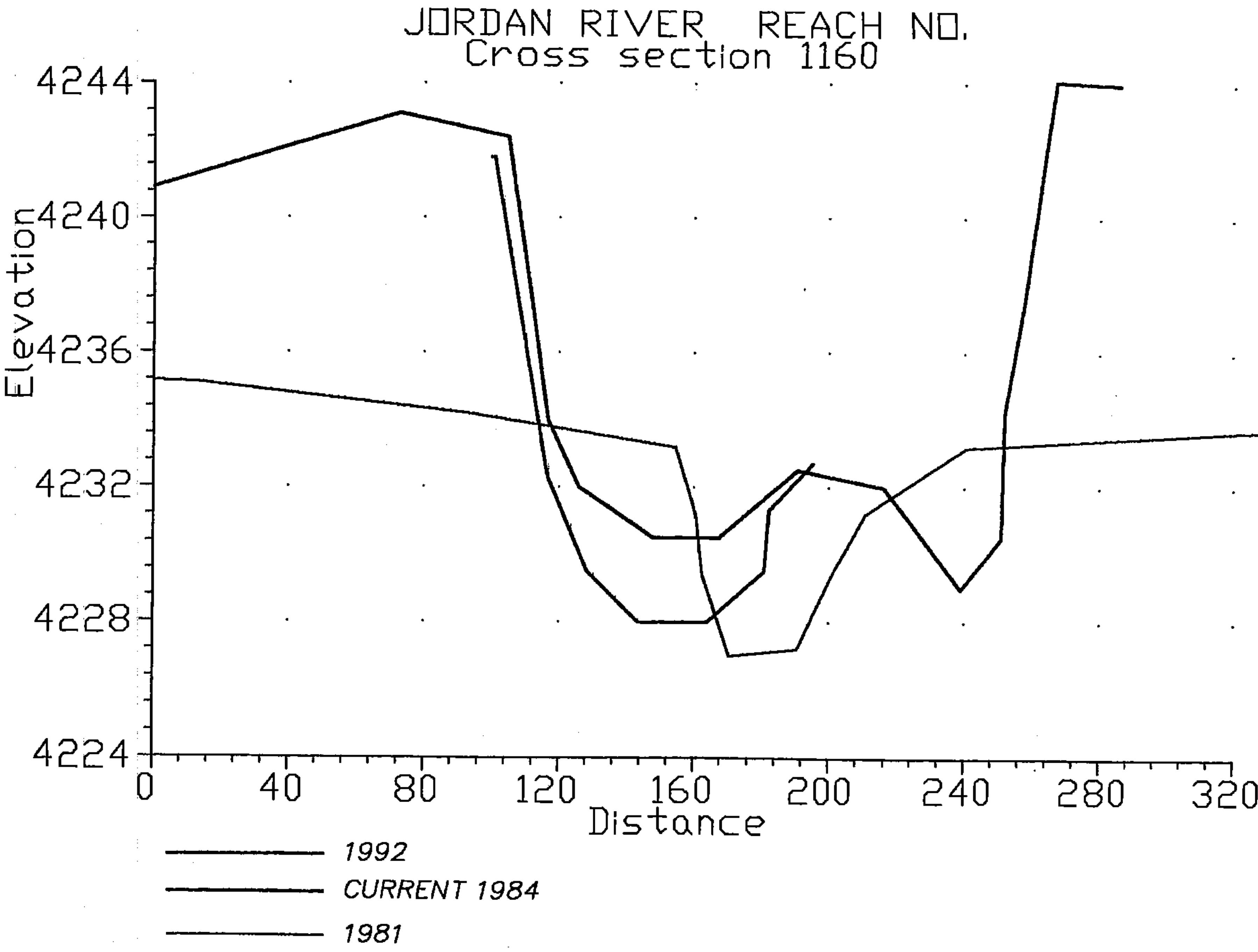

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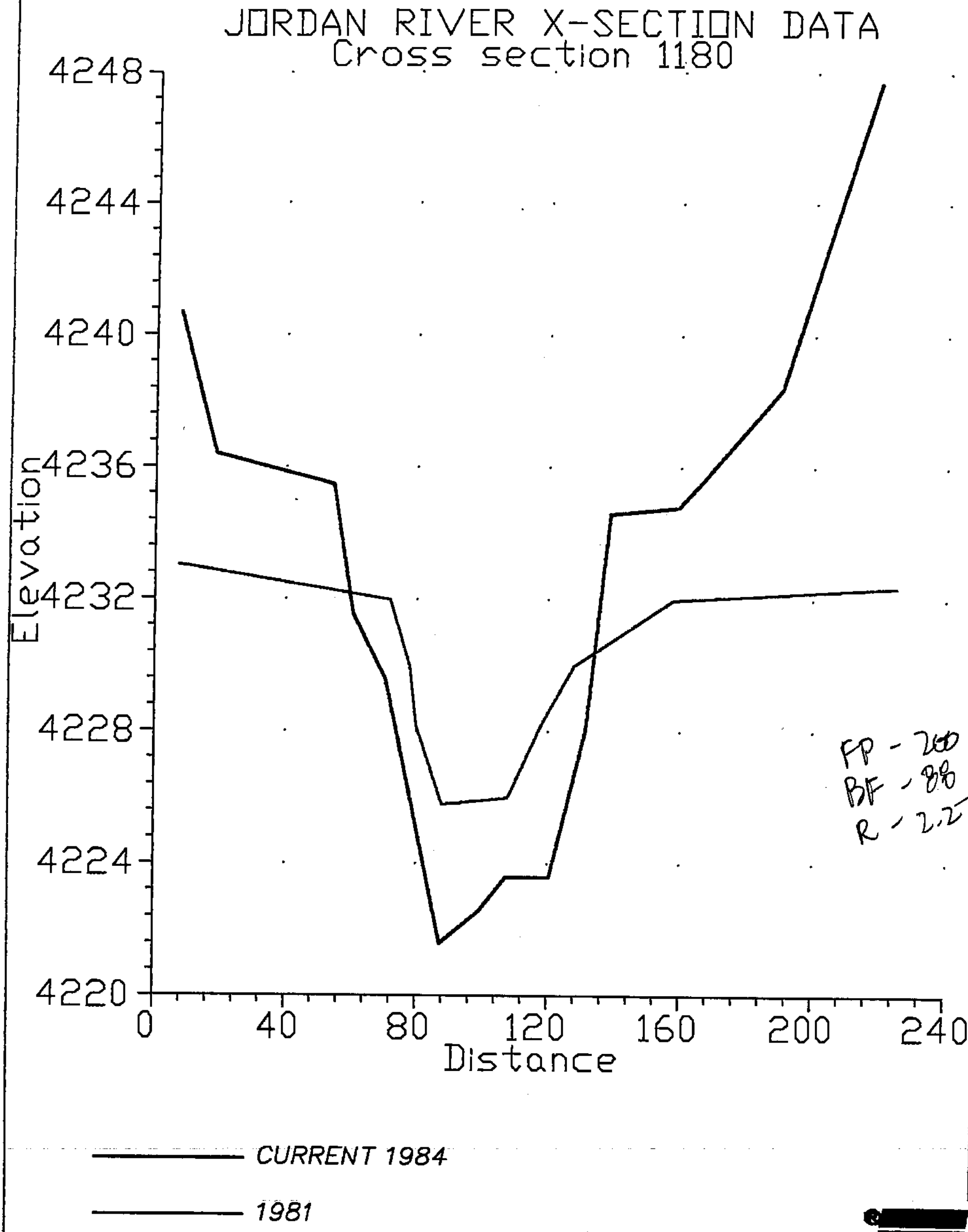
06-04-92

REACH 8



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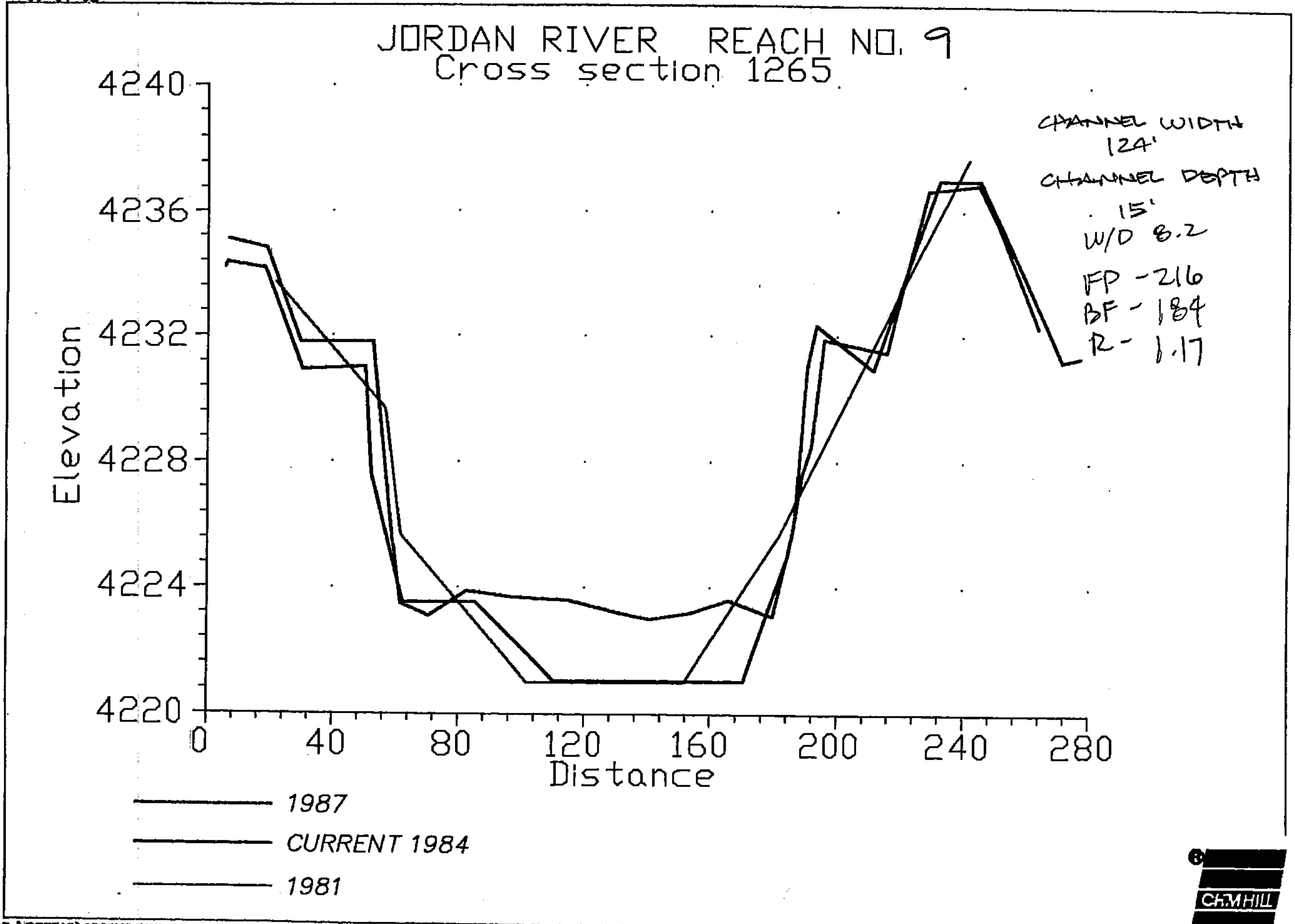

D: \B33618\1260XS.DWG

Appendix E

Sample Erosion Hazard Management Ordinance

FLOODPLAIN AND EROSION HAZARD MANAGEMENT ORDINANCE NO. 1988–FC2

FOR PIMA COUNTY, ARIZONA

PASSED AND ADOPTED BY THE BOARD OF SUPERVISORS

SITTING AS THE BOARD OF DIRECTORS OF THE

PIMA COUNTY FLOOD CONTROL DISTRICT

DECEMBER 6, 1988

DEPARTMENT OF TRANSPORTATION AND FLOOD CONTROL DISTRICT

1313 S. MISSION ROAD

TUCSON, ARIZONA 85713

WILLIAM T. HOWELLS

DIRECTOR AND COUNTY ENGINEER

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8435 2365

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TABLE OF CONTENTS

PIMA COUNTY ORDINANCE NO. 1988-FC2

TITLE: An Ordinance for Pima County, Arizona, adopting regulations for the subdivision of land, construction of dwelling units and commercial and industrial structures, or uses which may divert, retard or obstruct flood water and threaten public health, safety or the general welfare; adopting maps and criteria outlining regulatory floodplain and floodway areas; providing for the coordination by the Floodplain Management Board with all other interested and affected political subdivisions and State agencies; establishing appeals; providing for the adjustment, amendment, and enforcement of said Ordinance; and prescribing penalties for the violation thereof. Replacing Ordinance No. 1988-FC1 adopted by the Board of Supervisors on April 12, 1988 replacing Ordinance No. 1985-FC1 adopted by the Board of Supervisors on May 7, 1985 replacing Ordinance No. 1983-FC1 adopted by the Board of Supervisors on July 12, 1983 which replaced Ordinance No. 1974-86 adopted by the Board of Supervisors on December 16, 1974.

ARTICLE I

SHORT TITLE: This Ordinance may be referred to as the Floodplain and Erosion Hazard Management Ordinance.

ARTICLE II

STATEMENT OF PURPOSE: INTERPRETATION; APPLICATION AND AREA OF JURISDICTION

A. This Ordinance shall apply only within regulatory floodplain and erosion hazard areas.

B. This Ordinance is one aspect of land and resource management planning for Pima County. Floodplain management must be seen in perspective, not only as flood hazard minimization; but as one element of an integrated program of natural resource management and flood and erosion hazard reduction.

The Floodplain Management Board recognizes that it is both necessary and desirable to maintain a balanced and cooperative relationship between human communities and the land and resources which sustain them. Maintaining the stability, health, diversity and natural flora and fauna of the environment is essential.

It is the intent of the Floodplain Management Board that:

1. The highest and best use of regulatory floodplains in Pima County be for maintenance of hydrologic and hydraulic processes, with consideration for groundwater recharge, aesthetics, natural open space, recreation areas and wildlife habitat.

2. Any human habitation or structural developments which limit natural processes within floodprone or erosion hazard areas be discouraged and limited to the extent allowable by law.

3. The county acquire, by appropriate means, lands within the regulatory floodplain and erosion hazard areas, and that these lands be managed by the Pima County Flood Control District to preserve or enhance natural values and expressed resource management goals.

4. Regulatory land use control for floodplain management emphasize overall watershed management, and that floodplain management be used to prevent unwise human occupation or encroachment into regulatory floodplain and erosion hazard areas.

5. Natural floodprone areas, streams, washes, arroyos, rivers, and drainage courses, whenever possible, be preserved in their natural riverine condition and that any land use proposal which utilizes this approach be considered superior to all others.

C. The purpose of this Ordinance is to protect the public health, safety, and general welfare of the citizens of Pima County by adopting regulations designed:

1. To minimize flood and erosion damages;

2. To meet or exceed state and federal requirements relating to floodplain management, thereby enabling Pima County residents to purchase low cost flood insurance, receive disaster relief should the need arise, and to seek residential and commercial real estate loans;

3. To establish minimum flood protection elevations and damage prevention requirements for structures and other types of development which may be vulnerable to flood and erosion damage;

4. To regulate encroachment and building development within areas subject to flooding or erosion, and to assure that the flood carrying capacity within the altered and/or relocated portion of any watercourse is maintained;

5. To encourage the most effective expenditures of public money for flood control projects;

6. To minimize the need for rescue and relief efforts associated with flooding and erosion generally undertaken at the expense of the general public;

7. To minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets and ridges located in regulatory floodplain and erosion hazard areas;

8. To help maintain a stable tax base by providing for the protection of regulatory floodplain and erosion hazard areas;

9. To inform the public when property is in a regulatory floodplain or erosion hazard area;

10. To insure that those who occupy the areas within a regulatory floodplain and erosion hazard area assume the responsibility for their actions;

11. To protect, preserve and enhance groundwater recharge;

12. To encourage the preservation of natural washes and enhance the riverine environment.

D. In the interpretation and application of this Ordinance, all provisions shall be:

1. Considered as minimum requirements;

2. Liberally construed in favor of the governing body; and

3. Deemed neither to limit nor repeal any other powers granted to Pima County under any state statute. Where this Ordinance conflicts with or overlaps any other ordinance or regulation, whichever imposes the more stringent restrictions for the health, safety and welfare of the public shall prevail.

E. This Ordinance shall be applicable and enforceable in the incorporated as well as the unincorporated areas of Pima County, including public lands, but excluding Indian and military reservations and those incorporated areas of cities or towns which have elected to assume separate floodplain management powers and duties pursuant to Section 48-3610 of the Arizona Revised Statutes.

F. The performance requirements as specified in this Ordinance are minimum standards and address general floodplain management requirements. Specific projects may warrant additional requirements. The Floodplain Management Board and the County Engineer have the authority to establish standards and/or policies as necessary to carry out the provisions of this Ordinance. All drainage design standards, river and basin management plans, or other land use plans approved by the Board of Supervisors or Floodplain Management Board are hereby incorporated into this Ordinance.

ARTICLE III

WARNING AND DISCLAIMER OF LIABILITY

The degree of flood protection required by this Ordinance is considered reasonable for regulatory purposes and is based on engineering and scientific methods of study. Larger floods may occur on occasion or the flood height may be increased by man-made or natural causes, such as bridge openings restricted by debris. This Ordinance does not imply that areas outside floodways and floodway fringe areas, or land uses permitted within such areas, will be free from flooding or flood damage. This Ordinance shall not create liability on the part of Pima County, the Pima County Flood Control District, the Pima County Floodplain Management Board, or any officer or employee thereof for any flood damages that may result from reliance on this Ordinance or any administrative decision based upon this ordinance.

ARTICLE IV

DEFINITIONS

The following definitions shall apply to words and phrases used in this Ordinance.

Balanced Drainage Basin: A drainage basin or watershed which contains floodwater channels, natural or man-made, and/or flood control structures that are adequate to contain existing runoff from the base flood produced by the basin or watershed; but in which additional runoff may not be safely contained by said channels or structures.

Base Flood: The base flood (Q_{100}) shall mean the peak discharge of a 100-year flood. The base flood has a one percent probability of being equalled or exceeded in any given year. Said flood shall be determined from an analysis of floods on a particular watercourse and other watercourses in the same general region in accordance with the criteria established by the Director of the Arizona Department of Water Resources, or the Pima County Flood Control District Board, which criteria is hereby incorporated by reference and made a part of this Ordinance.

Base Flood Elevation: The calculated water-surface elevation of the base flood.

County Engineer: An official of Pima County whose duties are set forth in Arizona Revised Statutes 11-562 and 48-3603. Also, the Director of the Pima County Department of Transportation and Chief Engineer of the Pima County Flood Control District.

Critical Drainage Basin: A drainage basin or watershed which contains floodwater channels, natural or man-made, and/or flood control structures that cannot contain existing runoff produced by the base flood within the basin or watershed, and which has a documented history of severe flooding hazards.

Critical or Balanced Drainage Basin Management Plan: A site specific plan for a balanced/critical basin or watershed which has been prepared for and approved by Pima County and provides a conceptual plan for orderly development of flood control/floodplain management measures within the basin or watershed.

Detention System: A type of flood control system which delays the downstream progress of flood waters in a controlled manner, generally through the combined use of a temporary storage area and a metered outlet device which causes a lengthening of the duration of flow and thereby reduces downstream flood peaks.

Development: Any man-made change to improved or unimproved real estate, including but not limited to buildings or other structures, mining, dredging, filling, grading, paving, fencing, excavating or drilling.

Drainage Area: The contributing area to a single point of drainage concentration, expressed in units of area. Also called catchment area, watershed, and river basin.

Dry Well: A deep hole, covered and designed in such a manner so as to hold drainage water until it infiltrates into the ground.

Dwelling Unit: A place of residence which may be located in a single or multiple dwelling building or a manufactured home.

Encroachment, Equal Degree of: Encroachment is the advancement or infringement of uses, fill, or structures into any regulatory floodplain in a manner that impedes the flow capacity of the channel and regulatory floodplain of a watercourse. An equal degree of encroachment is a standard applied to the evaluation of the effects of the encroachment on increases in flood heights. It assumes that an encroachment, if permitted,may confer on all property owners on both sides of the watercourse an equal right to encroach to the same degree within that reach. Since the factors affecting hydraulic efficiency are usually not uniform within a reach, this standard may not result in equal measured distances between floodway limit lines and the regulatory floodplain boundaries of the watercourse.

Erosion Hazard Area: Land adjoining a watercourse regulated by this ordinance which is deemed by the County Engineer to be subject to flood-related erosion losses.

Flood or Floodwaters: A temporary rise in water level, including groundwater or overflow of water onto lands not normally covered by water.

Floodplain Management: The operation of an integrated natural resource management program, encompassing corrective and preventive measures for reducing flood and erosion damage, including but not limited to emergency preparedness planning, flood control works and floodplain management regulations.

Floodplain Management Board: The Board of Supervisors of Pima County sitting as the Board of Directors of the Pima County Flood Control District.

Floodplain Management Regulations: The codes, ordinances and other regulations relating to the use of land and construction within the regulatory floodplain, including zoning ordinances, subdivision regulations, building codes, housing codes, setback requirements, open area regulations and similar methods of control affecting the use and development of these areas.

Floodplain Use Permit: An official document which authorizes specific activity within a regulatory floodplain or erosion hazard area.

Flood Proofing: Provisions, changes, or adjustments primarily used for the reduction or elimination of flood damages to property and improvements subject to flooding.

Floodway Area: The channel of a watercourse and the adjacent land areas necessary in order to discharge the base flood without cumulatively increasing the water surface more than one foot above the base flood elevation and without creating hazardous velocities of flood waters. (See Exhibit 1 on following page).

Floodway Fringe Area: Land outside the floodway but within the regulatory floodplain and below the base flood elevation.

Geologic Floodplain: That portion of the land that has, in the geologic past, been subject to fluvial processes. The geologic floodplain may be different than the regulatory floodplain.

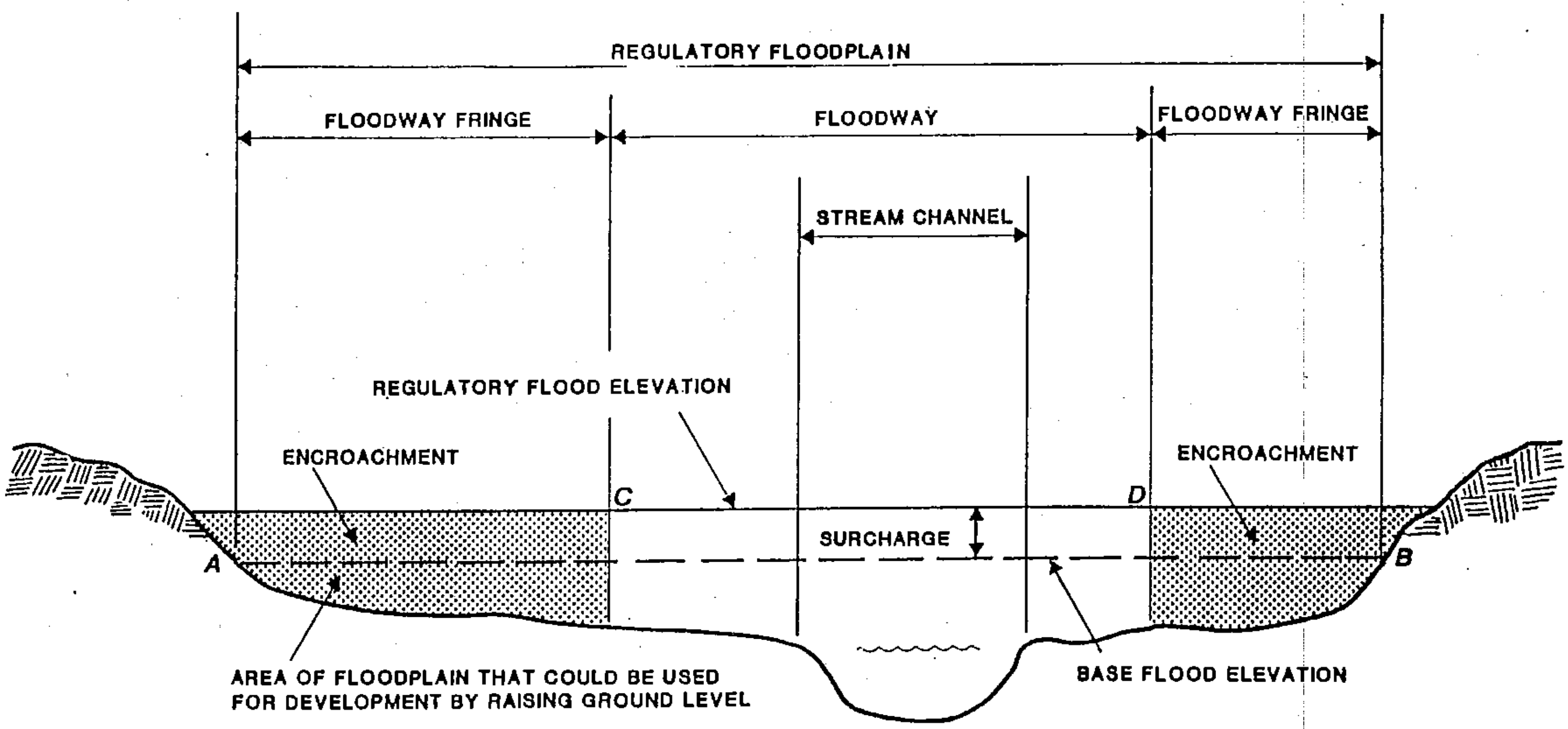
Levee: A man-made structure, usually an earthen embankment, designed and constructed in accordance with sound engineering practices to contain, control, or divert the flow of water so as to provide protection from temporary flooding.

Lowest Floor: The floor of the lowest enclosed area of any development.

Manufactured Home: A structure transportable in one or more sections which is built on a permanent chassis and designed to be used with or without a permanent foundation when connected to the required utilities. For floodplain management purposes, the term manufactured home also includes park trailers, travel trailers and other similar vehicles placed on a site for greater than 180 consecutive days.

Manufactured Home Park or Subdivision: A parcel (or contiguous parcels) of land divided into four or more manufactured home lots for sale or rent.

Mean Sea Level: For purposes of the National Flood Insurance Program, the National Geodetic Vertical Datum (NGVD) of 1929 or other datum, to which base flood elevations shown on a community's Flood Insurance Rate Map are referenced.



LINE *AB* IS THE BASE FLOOD ELEVATION (100 YEAR FLOOD)

LINE *CD* IS THE REGULATORY FLOOD ELEVATION (1.0 FOOT ABOVE BASE FLOOD ELEVATION.)

SURCHARGE IS NOT TO EXCEED 1.0 FOOT (FEMA REQUIREMENT), OR LESS IF SPECIFIED BY COUNTY

EXHIBIT 1

Obstruction: Any physical alteration in, to, along, across, or projecting into any watercourse which may impede, retard or change the direction of the flow of water, either in itself or by catching or collecting debris carried by such water, or that is placed where a flow of water might carry the same downstream. Examples include, but are not limited to, the following: any dam, wall, embankment, levee, dike, pile, abutment, projection, excavation, channel rectification, bridge, conduit, culvert, building, wire, fence, rock, gravel, refuse, fill, structure or vegetation.

Person: Any individual or his agent, firm, partnership, association, corporation, or agent of the aforementioned groups, or the State or any agency or political subdivision thereof.

Reach: A hydraulic engineering term used to describe longitudinal segments of a stream or watercourse. In an urban area an example of a reach would be the segment of a watercourse between two consecutive bridge crossings.

Reclamation Plan: A plan for sand and gravel operations which defines hydrologic and hydraulic constraints; outlines methods of extraction, operation and site development, and provides for backfilling procedures and final site reclamation.

Regulatory Flood Elevation: The elevation which is one foot above the calculated water-surface elevation of the base flood.

Regulatory Floodplain or Floodprone Area: That portion of the geologic floodplain associated with a watercourse or that area where drainage is or may be restricted by man-made structures and that would be inundated by the base flood where the peak discharge of the flow is one-hundred cubic feet per second (cfs) or greater, or those areas which are subject to sheet flooding, or those areas mapped as being floodprone on existing recorded subdivision plats (See Exhibit 1).

Retention System: A type of flood control system which stops the downstream progress of flood waters by employing methods of total containment.

Setback: The minimum horizontal distance between a structure and a watercourse. On each side of a watercourse, the setback is measured from the top edge of the highest channel bank or edge of the base flood water-surface elevation, whichever is closer to the channel centerline.

Sheet Flooding: Those areas which are subject to flooding with depths of one-half foot or greater during the base flood where a clearly defined channel does not exist and the path of the flooding is often unpredictable and indeterminate.

Structure: Anything constructed or erected, the use of which requires location on the ground or attachment to some foundation having a location on the ground.

Variance: A grant of relief from the requirements of this ordinance which permits construction in a manner that would otherwise be prohibited by his ordinance.

Violation: The failure of a structure or other development to be fully compliant with this ordinance.

Watercourse: Any lake, river, stream, creek, wash, arroyo, or other body of water or channel having banks and bed through which waters flow at least periodically.

Watershed: The drainage area above a point on a watercourse.

ARTICLE V

STATUTORY EXEMPTIONS: NON-CONFORMING USES

A. As specified in Arizona Revised Statute (A.R.S.) §48-3609, the provisions of this Ordinance shall not affect or prohibit:

   1. Existing legal uses of property or the right to continuation of such legal use. However, if a non-conforming use of land, or a building or structure is discontinued for twelve consecutive months or destroyed to the extent of fifty percent

of its value, as determined by a competent appraiser, any further use shall comply with this Ordinance.

2. Reasonable repair or alteration of property for the purposes for which the property was legally used on December 16, 1974 except that any alteration, addition or repair to a non-conforming building or structure which would result in increasing its flood damage potential by fifty percent or more shall be either flood-proofed or elevated to, at, or above the regulatory flood elevation.

3. Reasonable repair of structures constructed with the written authorization required by A.R.S. §48-3613 and Article V, Section B of this Ordinance.

4. Facilities constructed or installed pursuant to a certificate of environmental compatability issued pursuant to Title 40, Chapter 2, Article 6.2 of A.R.S. §40-360 *et seq.*

B. As specified in A.R.S. §48-3613, before construction of the following may begin, plans for the construction must be submitted to the Floodplain Management Board for review and comment; however, the following shall not be prohibited and shall not require a Floodplain Use Permit or other written authorization:

1. The construction of bridges, culverts, dikes and other structures necessary for the construction of public highways, roads and streets intersecting or crossing a watercourse.

2. The construction of storage dams for watering livestock or wildlife and structures on banks of a watercourse to prevent erosion of or damage to adjoining land if the structure will not divert, retard or obstruct the natural channel of the watercourse or dams for the conservation of floodwaters as permitted by Title 45, Chapter 6 of A.R.S. §45-1201 *et seq.*

3. Construction of tailing dams and waste disposal areas used in connection with mining and metallurgical operations. This paragragh does not exempt those sand and gravel operations which will divert, retard or obstruct the flow of

waters in a watercourse from complying with and acquiring authorization from the Floodplain Management Board pursuant to the regulations adopted by the Floodplain Management Board under this Ordinance.

4. Other construction, if it is determined by the Floodplain Management Board that written authorization is unnecessary.

5. Construction by any flood control district, county, city, town or other political subdivision exercising powers granted to it under Title 48, Chapter 21, Article 1 of A.R.S. §48-3601 *et seq.*

6. The construction of streams, waterways, lakes and other auxiliary facilities in conjunction with development of public parks and recreation facilities by a public agency or political subdivision.

7. The construction and erection of poles, towers, foundations, support structures, guy wires, and other facilities related to power transmission as constructed by any utility, whether a public service corporation or a political subdivision.

C. This article shall not exempt any person from obtaining a Floodplain Use Permit as set forth in this Ordinance for any use which diverts, retards or obstructs the flow of water and creates a danger or hazard to life or property in the area.

D. These exemptions do not preclude any person from liability if that person's actions increase flood hazards to any other person or property.

E. Non-Conforming Uses.

1. Improvements to or reconstruction of existing non-conforming uses.

    a. Any structure which is repaired, reconstructed, or substantially improved at a cost equal to or exceeding fifty percent of the value of the structure as shown on the latest assessment rolls of the Pima County Assessor either (a) before the improvement or repair is started; or (b) if the structure has been damaged and is being restored, before the damage occurred, shall conform to the provisions of this Ordinance. For the purpose of determining the value of any such construction, repair or alteration, the normal retail value of the materials and the reasonable value of the labor performed shall be used. No person shall repair or alter property in a piecemeal manner so as to avoid the provisions of this section.

b. For the purpose of this article substantial improvement is considered to occur when the first alteration of any wall, ceiling, floor, or other structural part of the building commences, whether or not that alteration affects the external dimension of the structure. The term does not, however, include any project for improvement of a structure to comply with existing State or local health, sanitary or safety code specifications which are solely necessary to assure safe living conditions.

2. Discontinuance of Non-Conforming Use. In the event that the use of a non-conforming use is discontinued for a period of twelve consecutive months, any further use thereof shall be in conformity with the provisions of this Ordinance.

ARTICLE VI

FLOODPLAIN MAPS AND BOUNDARIES

A. The boundaries of the regulatory floodplains and the floodways for which adequate hydrologic and hydraulic data is available for their delineation on maps shall be shown on maps maintained by the Pima County Engineer.

1. The Federal Emergency Management Agency (FEMA) has identified certain flood hazard areas in an engineering report entitled "The Flood Insurance Study for the Unincorporated Areas of Pima County, Arizona", hereinafter referred to as The Flood Insurance Study, dated February 15, 1983, with accompanying Flood Insurance Rate Maps and Flood Boundary and Floodway Maps, as well as Flood Insurance Studies, Flood Insurance Rate Maps and Flood Hazard Boundary Maps for the incorporated cities within Pima County, all of which are hereby incorporated by reference and declared to be a part of this Ordinance. The delineation of the regulatory floodplains and the floodways shown on these

maps shall be the regulatory floodplains and floodways governed by this Ordinance for those watercourses studied with the exception of the Santa Cruz River and Rillito Creek. The Flood Insurance Study and the accompanying maps are on file in the offices of the Pima County Department of Transportation and Flood Control District. Amendments by FEMA to the Flood Insurance Study and its accompanying maps shall be incorporated in the floodplain maps maintained by the County Engineer.

2. Due to continuously and episodically changing hydrologic and hydraulic conditions on the watercourses within Pima County, base flood peak discharges, flow volumes, and associated regulatory floodplain and erosion hazard areas are continuously subject to revision. At a minimum, base flood values will meet or exceed the current values established by the FEMA, and reflect historic flood information and general, current, watershed conditions. Current regulatory floodplain and erosion hazard area maps will be maintained by the County Engineer for the Santa Cruz River and Rillito Creek.

   a. The regulatory floodplains and floodways for the Santa Cruz River and Rillito Creek shall be based upon the historic flood limit or flood hazard boundary maps prepared by Pima County, whichever is more restrictive, where no flood control improvements exist. As flood repair and flood control improvements are constructed, the County Engineer will prepare revised floodplain maps for the purpose of regulation.

   b. All watersheds which generate flood peak discharges exceeding 5,000 cfs for the base flood discharge shall have their flood peak discharges listed by the County Engineer and adopted by the Board of Directors of the Flood Control District (See Appendix 1 of this Ordinance). These discharges will be amended, if necessary, as revised base flood discharge estimates become available.

3. In those areas where the regulatory regulatory floodplain and erosion hazard areas are not delineated pursuant to paragraphs 1 and 2 of this article, and upon request for a county permit the County Engineer may require the land owner to establish the regulatory floodplain and floodway limits through a hydrologic and hydraulic study prepared by an Arizona Registered Professional Civil Engineer.

4. In those areas where a hydrologic and hydraulic study has been prepared by an Arizona Registered Professional Civil Engineer which delineates the regulatory floodplains, floodways, and erosion hazard areas and has been approved by the County Engineer, the delineation of those boundaries shown within the study shall be the regulatory floodplain, floodway, and erosion hazard areas governed by this Ordinance.

5. Prior to the release of assurances for subdivisions or certificate of occupancy for development plans, construction of any improvement which changes the configuration of the delineated floodplain contained in the Flood Insurance Study, whether upstream of, downstream from or adjacent to the development, the owner shall provide to Pima County a new delineation of all regulatory floodplains affected by the improvement. The new delineations and reports shall be prepared in conformance with the requirements of FEMA, the Director of Water Resources and this ordinance. Pima County will submit the required flood insurance study information to FEMA within 15 days of receipt.

6. Engineering studies showing the regulatory floodplain and erosion hazard areas may be prepared under the direction of the County Engineer. Upon approval by the County Engineer, these maps shall be the regulatory floodplain and erosion hazard areas governed by this Ordinance.

7. Where a question arises as to the location of any regulatory floodplain, floodway or erosion hazard area, the question shall be decided by the County Engineer,whose decision shall be final except as provided for in Article XV of this Ordinance. Any person contesting the location of any boundary shall be given a reasonable opportunity to present technical evidence if so desired.

8. Where presently platted or mapped regulatory floodplain and erosion hazard areas are different than previously approved regulatory floodplain and erosion hazard areas, the most recent information shall apply.

ARTICLE VII

PERMITS; PENALTY

A. Floodplain Use Permit Required

1. From the effective date of this Ordinance it shall be unlawful to cause or allow any development to occur on any land within the regulatory floodplain as described in Articles VIII and IX of this ordinance, or within erosion hazard areas as described in Article XII of this Ordinance, without first applying for and obtaining a Floodplain Use Permit from the County Engineer, and thereafter complying with each and every written term of the permit. However, no such Floodplain Use Permit shall be required for any repairs or alterations for which the value of the materials and labor thereon does not exceed $1500.00 except for those improvements which obstruct the flow of flood water. For the purpose of determining the value of any such repairs or alterations, the normal retail value of materials and the reasonable value of the labor performed shall be used. Although no Floodplain Use Permit is required, all other provisions of this Ordinance shall be observed in the performance of said repairs or alterations. Repairs or alterations shall not be done in a piecemeal fashion for the purpose of avoiding applying for a permit when the total cost of said work is in excess of $1500.00.

2. Every new structure, building, fill, excavation or development located or maintained within any regulatory floodplain or erosion hazard area in violation of this Ordinance and without written authorization from the Floodplain Management Board is a public nuisance per se and may be abated, prevented or restrained by action of the State or any political subdivision of the State.

3. In addition to other penalties or remedies otherwise provided by law, the State of Arizona, any political subdivision thereof, or any person who may be damaged as a result of the diversion, retardation or obstruction of water within

the regulatory floodplain, shall have the right to commence, maintain and prosecute any appropriate action or pursue any remedy to enjoin, abate or otherwise prevent any person from violating or continuing to violate any provision of this Ordinance. If any person is found to be in violation of any provision of this Ordinance, the court shall require the violator to comply with this Ordinance or remove the obstruction and restore the floodplain to its original condition.

4. As a further remedy, Pima County may withhold the issuance of building permits or Floodplain Use Permits for any development or improvement on the same parcel, or on a contiguous parcel of land under the same ownership, where any improvement or development on the property is not in compliance with this Ordinance or any other provision of law relating to that development.

B. Issuance of Permits

1. It shall be the duty of the County Engineer through the Floodplain Management Section of the Pima County Department of Transportation and Flood Control District to issue the Floodplain Use Permits required by this article. The County Engineer may request and shall receive, so far as may be necessary in the discharge of his duties, the assistance and cooperation of all departments, agencies, officials and public employees of Pima County in the enforcement of this Ordinance. No license, permit or other similar approval for any development which would be in conflict with the provisions of this Ordinance shall be issued by any department, official or employee of Pima County; and any such license, permit or approval, if issued in conflict with the provisions of this Ordinance, shall be null and void.

2. The District shall advise any city or town which has assumed jurisdiction over its regulatory floodplains in accordance with Arizona Revised Statute No. §48-3610 in writing and provide a copy of any development plan or any application which has been filed with the County for a Floodplain Use Permit or variance to develop land in a regulatory floodplain, floodway or erosion hazard area within one mile of the boundary between the District's area of jurisdiction and the jurisdiction of that city or town. The District shall also advise any city or town in writing and provide a copy of any development plan

of any major development proposed within a regulatory floodplain, floodway or erosion hazard area which could affect regulatory floodplains, floodways, erosion hazard areas or watercourses within that city's or town's area of jurisdiction. Written notice and a copy of the plan of development shall be sent to any adjacent jurisdiction no later than three working days after having been received by the District.

C. Permit Procedures

1. Upon receiving an application for a Floodplain Use Permit, the County Engineer may require, where applicable, the applicant to submit the following:

   a. Plans in triplicate, drawn to scale showing the nature, location, dimensions and elevation of the lot, existing or proposed structure, fill, storage of materials, flood proofing measures and the relationship of the above to the location of the channel, regulatory floodplain, floodway and erosion hazard area boundaries and the regulatory flood elevation. All elevations or vertical distances must reference an established datum or base elevation.

2. Where special circumstances necessitate more detailed information, the applicant must furnish any or all of the following as is deemed necessary by the County Engineer for the evaluation of the effects of the proposed use upon flood flows and other factors necessary to render a decision on the suitability of the proposed use:

   a. One or more cross-sections showing the existing channel of the stream, elevation of land areas adjoining each side of the channel, cross-sectional areas to be occupied by the proposed development, and high water information (if available).

   b. Plan (surface view) showing elevations or contours of the ground; pertinent structures, fill, or storage elevations; size, location and spatial arrangement of all proposed and existing structures and channel banks on the site; location and elevation of streets, water supply, sanitary facilities; photographs showing existing land uses and vegetation upstream and downstream, soil types, and other pertinent information.

3. The proposed water supply and sanitation systems of any development and the ability of these systems to prevent disease, contamination and unsanitary conditions if they should become flooded or eroded.

4. The susceptibility of the proposed development or its contents to flood or erosion damage and the effect of such damage on the individual owners.

5. The availability of alternative locations for the proposed use on the same property which are not subject to flooding or erosion.

6. The compatibility of the proposed use with existing regulatory floodplain uses and with floodplain management programs anticipated in the foreseeable future.

7. The relationship of the proposed use to any comprehensive plan and floodplain management program for the area.

8. The access to the property line in times of flood for conventional and emergency vehicles.

9. The expected heights, velocity, duration, rate of rise and sediment transport of the flood waters expected at the site under both existing and proposed conditions.

10. Documentation that all necesary permits have been obtained from State and Federal agencies.

11. Such other factors which are relevant to the purposes of this Ordinance.

E. Conditions

Any Floodplain Use Permit may be subject to conditions or restrictions designed to reduce or mitigate the potential danger or hazard to life or property resulting from development within the regulatory floodplain, floodway or erosion hazard areas. The applicant may be required to execute deed restrictions running with the land or be required to post performance bonds, assurances or such other security as may be appropriate and necessary to assure the performance of the conditions or restrictions that may be imposed. Examples of conditions that may be imposed include, but are not limited to, the following:

1. Modification of waste disposal and water supply facilities.

2. Limitations on periods of use and hours of operation.

3. Institution of operation controls.

4. Requirements for construction of channel modifications, dikes, levees and other protective measures.

5. Indemnification agreements whereby the applicant agrees to hold Pima County, the Pima County Flood Control District, and the Floodplain Management Board and their officers, employees and agents, harmless and defend them from any and all claims for damages now and in the future relating to the use of the property sought to be developed by reason of flooding, flowage, erosion or damage caused by water whether surface, flood or rainfall.

6. Flood proofing measures for non-residential structures, such as the following, which shall be designed to be consistent with the regulatory flood elevation for the particular area, flood velocities, durations, rate of rise, hydrostatic and hydrodynamic forces, and other factors associated with the base flood. The Floodplain Management Board may require that the applicant submit a plan or document certified by an Arizona Registered Professional Civil Engineer that the flood proofing measures are consistent with the regulatory flood elevation and associated flood factors for the particular area. Examples of flood proofing measures that may be required include, but are not limited to:

    a. Anchorage to resist flotation and lateral movement.

    b. Installation of watertight doors, bulkheads, and shutters.

    c. Reinforcement of walls to resist water pressures.

d. Use of paints, membrane, or mortars to reduce seepage of water through walls.

e. Addition of mass or weight to structures to resist flotation.

f. Installation of pumps to lower water levels in structures.

g. Construction of water supply and waste treatment systems so as to prevent the entrance of flood waters.

h. Pumping facilities for subsurface external foundation wall and basement floor pressures.

i. Construction designed to resist rupture or collapse caused by water pressure or floating debris.

j. Cut-off valves on sewer lines or the elimination of gravity flow basement drains.

k. Elevation of structures or uses.

l. Bank protection or armor platting on any proposed fill.

F. Penalty

Any person who fails to obtain the permit required by this article or who fails to comply with the terms and conditions of said permit shall be guilty of a Class 2 misdemeanor.

G. Revocation of Permit

For failure to comply with the terms of the Floodplain Use Permit, Pima County shall be entitled to revoke the Floodplain Use Permit upon written notice by registered mail or personal delivery to the applicant citing the reasons for revocation. The person holding the Floodplain Use Permit may request a hearing before the County Engineer, where the merits of and reasons for revoking the permit are heard, within ten working days from the receipt of notice or personal delivery. After considering the issues and facts presented during the hearing the County Engineer may revoke a previously issued Floodplain Use Permit. If no request for a hearing is made within ten working days from the receipt of notice or personal delivery, the permit shall be considered revoked. The applicant or any affected party may appeal the decision of the County Engineer by requesting a hearing before the Floodplain Management Board in accordance with Article XVI of this Ordinance.

H. Removal of Violation

Upon written notice, the County Engineer may cause any structure, encroachment or work constructed without a Floodplain Use Permit, or which is in violation with the terms of a permit, to be removed immediately at the expense of the person who caused the structure, encroachment or work if said structure, encroachment or work will cause an immediate danger to life and property.

I. Recovery of Costs

Pima County shall be entitled to recover all costs, administrative, engineering and legal, as well as actual costs to remove or modify the structure, encroachment and any other work in violation of this Ordinance.

J. Certification

Prior to either the pouring of the first slab or the finished floor inspection, the applicant shall submit to the County Engineer certification of elevation in compliance with the provisions of the Floodplain Use Permit prepared by an Arizona Registered Land Surveyor. Such certification shall be maintained in the Floodplain Management Section of the Pima County Department of Transportation and Flood Control District.

ARTICLE VIII

FLOODWAY REQUIREMENTS

A. Uses Allowed

Except as provided for in this article, no other use shall be allowed in any floodway. The following open space uses shall be permitted within a floodway to the extent that they are not prohibited by any provision of this Ordinance or any other ordinance, law or regulation, and provided they do not require fill, excavation, or the storage of materials or equipment:

1. Agricultural uses, including general farming, pasture, grazing, outdoor plant nurseries, horticulture, truck farming, sod farming, and wild crop harvesting.

2. Industrial-commercial uses such as loading areas, airport landing strips, parking areas.

3. Private and public recreational uses, including golf courses, tennis courts, driving ranges, archery ranges, picnic grounds, parks, wildlife and nature preserves, game farms, shooting preserves, target ranges, trap and skeet ranges, hunting and fishing areas, hiking and horseback riding trails.

4. Accessory residential uses, including lawns, gardens, parking areas and play areas.

B. Excavations; Including Sand and Gravel Operations

Sand and gravel excavations, including proposed operations and existing operations subject to permit renewal, are subject to the following:

1. Extraction of sand, gravel, and other materials is allowed within a floodway provided that excavations are not so located nor of such depth, or width, or length, or combination of depth-width-length as to present a hazard to

structures (including but not limited to roads, bridges, culverts, and utilities), to the banks of watercourses, to other property, or which adversely affect groundwater recharge.

2. Within a floodway there shall be no stockpiling of materials or tailings that may obstruct, divert, or retard the flow of floodwaters except as reviewed and approved by the Pima County Engineer on an individual Floodplain Use Permit basis.

3. Excavations may be allowed only in those reaches of watercourses which have, at a minimum, a balanced sediment system, i.e. the sediment coming into the reach is equal to or greater than the sediment leaving the reach and the long term sediment balance for the entire river system indicates that the stream channel will aggrade.

4. Due to the rapidly changing hydraulic characteristics of watercourses in Pima County, and the effects excavations have on these characteristics, Floodplain Use Permits for excavations shall only be issued for a limited time period, not to exceed one year, subject to annual renewal upon review by the County Engineer.

5. In addition to those conditions provided for elsewhere, Floodplain Use Permits for excavations may impose conditions regarding the area and location in which excavations are allowed, the maximum amount of material to be excavated, and other reasonable restraints on the methods of operating, including time restraints.

6. Any extraction of sand and gravel or related materials in a floodway shall be allowed after the effective date of this Ordinance only if a reclamation plan is also provided for the extraction operation. The reclamation plan shall show in sufficient detail the actions which are proposed to reclaim the excavated areas so that all adverse effects of extraction are mitigated. The plan shall also contain a timetable and financial assurances for accomplishing reclamation.

7. The County Engineer may require bonds or other financial assurances appropriate for the sand and gravel extraction operation.

8. The County Engineer may require hydrologic, hydraulic and geomorphic analyses addressing the existing conditions as well as the impacts under the proposed method of operation.

9. The Floodplain Management Board may grant variances as provided by Article XVII of this Ordinance.

C. Limitations

No use shall be allowed which:

1. Acting alone or in combination with existing or future uses creates danger or hazard to life or property. In determining whether a use creates a danger or hazard to life or property, the County Engineer may require a certification by an Arizona Registered Professional Civil Engineer that the proposed use will not result in any increase in the floodway elevations during the occurrence of the base flood, nor will the proposed use divert, retard or obstruct the flow of flood waters.

2. Increases the floodway elevations.

3. Adversely affects groundwater recharge.

4. Increases erosion potential upstream and/or downstream.

5. Places a waste disposal system wholly or partially in a floodway.

D. Flood Control Structures

Flood control structures designed to protect life or property from the dangers or hazards of floodwaters are permitted provided all other provisions of this Ordinance are met.

ARTICLE IX

FLOODWAY FRINGE AREA REQUIREMENTS

A. Uses allowed

Any use to the extent not prohibited by this Ordinance or any other ordinance or law is allowed within the floodway fringe area.

B. General conditions

The following general conditions shall apply to all uses within the floodway fringe area. No development, storage of materials or equipment, or other uses shall be permitted which, acting alone or in combination with existing or future uses, create a danger or hazard to life or property. Consideration of the effects of a proposed use or development shall be based on the assumption that there will be an equal degree of encroachment extending for a significant reach on both sides of the watercourse.

1. Fill

a. Any fill proposed to be deposited in the floodway fringe must be shown to have some beneficial purpose and the amount thereof not greater than is necessary to achieve that purpose, as demonstrated by a plan submitted by the owner showing the uses to which the filled land will be put and the final dimensions of the proposed fill or other materials.

b. Such fill or other materials shall be protected against erosion by riprap, vegetative cover, bulk-heading, or other approved methods.

2. Structures

a. Structures shall be constructed so as to offer the minimum obstruction to the flow of flood waters. Wherever possible, structures shall be constructed with the same alignment as the direction of flood flow and so far as practicable shall be placed approximately on the same alignment as those of adjoining structures.

b. All structures shall be firmly anchored to prevent their flotation, which might otherwise result in damage to other structures or restriction of bridge openings and other narrow sections of the watercourse.

c. Service facilities such as electrical and heating equipment shall be constructed at or above the regulatory flood elevation for the particular area or be adequately flood proofed.

d. Any structure designed or utilized for human habitation, whether full or part time, shall have the lowest floor elevated at or above the regulatory flood elevation. Prior to the pouring of the first slab or finish floor inspection the applicant shall submit to the County Engineer certification by an Arizona Registered Land Surveyor that the elevation of the lowest floor is in compliance with the Floodplain Use Permit.

e. Enclosed areas within the regulatory floodplain and below the regulatory flood elevation shall be designed to equalize hydrostatic flood forces on exterior walls by allowing for the entry and exit of floodwaters.

f. If fill is used to elevate any structure, the minimum elevation of the fill shall be at or above the base flood elevation and shall extend at such elevation for a distance of at least twenty-five feet beyond the outside limit of the structure unless a study/analysis prepared by an Arizona Registered Professional Civil Engineer demonstrates that a lesser distance is acceptable.

g. Structures designed or utilized for human habitation, whether full or part time, shall only be permitted where the product of the flow depth d, in feet, times the square of the flow velocity v, in feet per second, of the surrounding floodwaters of the base flood does not exceed the numerical value of eighteen ($dv^2 \leq 18$)for a period in excess of thirty minutes, and the surrounding floodwaters of the base flood do not exceed three feet in depth .

3. Storage of Materials and Equipment

a. The storage and/or processing of materials that are buoyant, flammable, explosive or that could be injurious to human, animal or plant life in time of flooding is prohibited.

b. Storage of other material or equipment may be allowed if it is not subject to major damage by floods and is firmly anchored to prevent flotation or is readily removable from the area within the limited time available after flood warning.

4. Utilities

a. Water supply, water treatment, and sewage collection and disposal systems built in a regulatory floodplain shall be designed to prevent or minimize infiltration of floodwaters into these systems and discharge of materials from these systems into flood waters.

b. On-site sanitary waste disposal systems shall be located to avoid impairment to them or contamination from them during flooding.

5. Excavations; Including Sand and Gravel Operations

a. Extraction of sand, gravel, and other materials is allowed within the floodway fringe and erosion hazard areas provided that excavations are not so located nor of such depth, or width, or length, or combination of depth-width-length as to present a hazard to structures (including but not limited to roads, bridges, culverts, and utilities), to banks or watercourses, to other property, or which adversely affect groundwater recharge.

b. There shall be no stockpiling of material or tailings within the floodway fringe areas that may obstruct, divert, or retard the flow of floodwaters except as reviewed and approved by the Pima County Engineer on an individual Floodplain Use Permit basis.

c. Due to the rapidly changing hydraulic characteristics of watercourses in Pima County, and the effects excavations have on these characteristics, Floodplain Use Permits for excavations shall only be issued for a limited time period, not to exceed one year, subject to annual renewal upon review by the County Engineer.

d. In addition to those conditions provided for elsewhere, Floodplain Use Permits for excavations may impose conditions regarding the area and location in which excavations are allowed, the maximum amount of material to be excavated, and other reasonable restraints on the methods of operation, including time restraints.

e. Any extraction of sand and gravel or related materials in the floodway fringe or erosion hazard areas shall be allowed after the effective date of this Ordinance only if a reclamation plan is also provided for the extraction operation. The reclamation plan shall show in sufficient detail the actions which are proposed to reclaim the excavated areas so that all adverse effects of extraction are mitigated. The plan shall also contain a timetable and financial assurances for accomplishing reclamation.

f. The County Engineer may require bonds or other financial assurances appropriate for the sand and gravel extraction operation.

g. The County Engineer may require hydrologic, hydraulic and geomorphic analyses addressing the existing conditions as well as the impacts under the proposed method of operation.

h. The Floodplain Management Board may grant variances as provided by Article XVII of this Ordinance.

ARTICLE X

STANDARDS FOR MANUFACTURED HOMES AND MANUFACTURED HOME PARKS AND SUBDIVISIONS

A. Permit Required

From the effective date of this ordinance it shall be unlawful to place a manufactured home within a regulatory floodplain, as described in Articles VIII and IX of this Ordinance, or erosion hazard areas as described in Article XII of this Ordinance, for more than 180 consecutive days without first applying for and obtaining a Floodplain Use Permit from the County Engineer, and thereafter complying with each and every written term of the permit. However, no such Floodplain Use Permit shall be required for any repairs or alterations for which the value of the materials and labor thereon does not exceed $1500.00 except for those improvements which obstruct the flow of floodwaters. For the purpose of determining the value of any such repairs or alterations, the normal retail value of materials and the reasonable value of labor performed shall be used. Although no Floodplain Use Permit is required, all other provisions of this Ordinance shall be observed in the performance of said repairs or alterations. Repairs or alterations shall not be done in a piecemeal fashion for the purpose of avoiding applying for a permit when the total cost of said work is in excess of $1500.00.

B. General Provisions

All manufactured homes and additions to manufactured homes located within a regulatory floodplain or erosion hazard area shall be anchored to resist flotation, collapse, or lateral movement by one of the following methods:

1. By providing an anchoring system designed to withstand horizontal forces of 25 pounds per square foot and uplift forces of 15 pounds per square foot; or

2. By providing over-the-top and frame ties to ground anchors. Specifically:

a. Over-the-top ties be provided at each of the four corners of the manufactured home, with two additional ties per side at intermediate locations, except that manufactured homes less than fifty feet long require only one additional tie per side; and

b. Frame ties be provided at each corner of the home with five additional ties per side at intermediate points, except that manufactured homes less than fifty feet long require only four additional ties per side; and

c. All components of the anchoring system be capable of carrying a force of 4,800 pounds.

C. <u>Application and Requirements</u>:

<u>Where:</u>

(a) manufactured homes not placed in manufactured home parks or subdivisions,
(b) new manufactured home parks or subdivisions,
(c) expansions to existing manufactured home parks or subdivisions and,
(d) repair, reconstruction, or improvements to existing manufactured home parks or subdivisions that equal or exceed fifty percent of the value of the streets, utilities and pads before the repair, reconstruction or improvement commenced,are located within a regulatory floodplain or erosion hazard area, the following standards shall apply:

1. Adequate surface drainage and access for a hauler shall be provided.

2. All manufactured homes shall be placed on pads or lots elevated on compacted fill which shall be, at a minimum, at or above the base flood elevation or on a stem wall or on pilings so that the bottom of the structural frame or the lowest point of any attached appliances, whichever is lower, is at or above the regulatory flood elevation. If elevated on pilings:

   a. The lots shall be large enough to permit steps;

b. The pilings shall be placed in stable soil no more than ten feet apart and,

c. Structures designed or utilized for human habitation, whether full or part time, shall only be permitted where the product of the flow depth d, in feet, times the square of the flow velocity v, in feet per second, of the surrounding floodwaters of the base flood does not exceed the numerical value of eighteen ($dv^2 \leq 18$) for a period in excess of thirty minutes, and the surrounding floodwaters of the base flood do not exceed three feet in depth.

D. Certification

Certification that the installation of a manufactured home meets all of the requirements of this section is required. Such certification shall be provided by the person installing the manufactured home, the owner, the developer of the manufactured home park or subdivision, or an agency regulating manufactured home placement,
whichever is deemed appropriate by the County Engineer. Certification of elevations listed on the Floodplain Use Permit shall be prepared by an Arizona Registered Land Surveyor and provided to the County Engineer prior to habitation of the structure.

ARTICLE XI

SUBDIVISION AND DEVELOPMENT REQUIREMENTS

A. Suitability of Land

Land may not be parceled or subdivided in such a manner as to create lots unsuitable for development because of flood or erosion hazards.

B. Delineation on Plats and Development Plans of Areas Subject to Flooding and Erosion

1. All tentative plats and development plans submitted shall show location by survey, or photographic methods, of streams, watercourses, canals, irrigation laterals, private ditches, culverts, lakes and other water features, including those areas subject to flooding or erosion. The plats/plans shall also include the direction of any flow and drainage area, as well as water surface elevations and the limits of inundation for the base flood if such a flood has a peak flow rate equal to or greater than 100 cfs.

2. All tentative plats and development plans shall show proposed grading and improvements for areas which are subject to flooding or which have drainage problems, and shall also show a description and location of all facilities proposed to alleviate flooding or drainage problems within or outside the boundaries of the subdivision or development.

3. All development plans and tentative plats must be accompanied by conceptual grading plans and conceptual drainage improvement plans as necessary to demonstrate:

   a. The methods for flood proofing and/or drainage control for the development including sufficient lot grading information to demonstrate adequate finished pad elevations and/or drainage slopes to protect building foundations.

   b. That improvements are compatible with the existing upstream and downstream drainage conditions and that any proposed grading and/or grade change will not have an adverse impact on surrounding property.

   c. The methods of erosion and sediment control.

   d. The methods of mitigating increased urban peak and volumetric flood water runoff or discharge on downstream properties created as a result of the development.

4. Prior to commencement of any site improvements or grading, a grading plan must be submitted to the Pima County Department of Transportation and Flood

Control District for review and approval. Detailed improvement plans for storm drains or channel improvements must also be submitted to the same Department for review and approval.

5. All final plats and development plans shall indicate the limits of the regulatory floodplains, erosion hazard boundaries and the limits of the federally established regulatory floodplains and floodways (if applicable), and be delineated in a surveyable manner and certified by an Arizona Registered Land Surveyor.

6. All final plats shall indicate both the drainage areas and their respective base flood peak discharges, with a note contained on the final plat that the drainage areas and base flood peak discharges are provided by the owner only for information purposes.

7. The District shall advise any city or town which has assumed jurisdiction over its regulatory floodplains in accordance with Arizona Revised Statute 48-3610 in writing and provide a copy of any development plan or any application which has been filed with the County for a Floodplain Use Permit or variance to develop land in a regulatory floodplain or floodway within one mile of the boundary between the District's area of jurisdiction and the jurisdiction of that city or town. The District shall also advise any city or town in writing and provide a copy of any development plan of any major development proposed within a regulatory floodplain or floodway which could affect floodprone areas or watercourses within that city's or town's area of jurisdiction. Written notice of a copy of the plan of development shall be sent to any adjacent jurisdiction no later than three working days after having been received by the District.

C. Street Elevations

Streets required for paved permanent access shall be designed and constructed so that the flow depths over them do not exceed one foot in depth during the base flood. At least one paved permanent access shall be provided to each lot over terrain which can be traversed by conventional motor vehicles in times of flooding. In specific instances at drainage crossings where it can be demonstrated that this requirement is either impractical, based upon low hazard to life and property, or where construction of a drainage crossing may create problems which override the corresponding benefits; this requirement may be waived by the County Engineer. Fill may be used for streets in areas subject to flooding provided such fill does not unduly increase flood heights. The developers may be required to provide profiles and elevations of streets for areas subject to flooding.

D. Building Sites

Land which contains areas within a regulatory floodplain or erosion hazard area shall not be platted for residential occupancy or building sites unless each lot contains a building site, either natural or man-made, which is not subject to flooding or erosion by the base flood.

1. It is preferred that building sites be located outside of the regulatory floodplain.

2. In regulatory floodplain areas where fill is to be used to raise the elevation of the building site, the building shall be located not less than twenty-five feet landward from any edge of the fill unless a study/analysis prepared by an Arizona Registered Professional Civil Engineer demonstrates a lesser distance is acceptable. No fill shall be placed in any regulatory floodplain or floodway, nor shall any fill be placed where it diverts, retards or obstructs the flow of water to such an extent that it creates a danger or hazard to life or property.

3. Any dwelling unit built within a regulatory floodplain shall be constructed so as to place the minimum floor elevation of the dwelling unit at or above the regulatory flood elevation.

E. Setbacks from Channels

Along reaches of watercourses where hazards from eroding banks or channel meandering are considered by the County Engineer to be severe, special engineering studies prepared by an Arizona Registered Professional Civil Engineer shall be required of the property owner or developer and requirements for setbacks from banks of watercourses and/or other protection measures shall be established in accordance with those approved studies. Also see Article XII of this Ordinance.

F. Rights-of-Way for Drainage

Whenever a subdivision plat or development plan contains a watercourse which is regulated by this Ordinance, all right-of-way associated with the watercourse shall be designated "Drainageway".

1. If the watercourse is an improved major watercourse, the Drainageway shall include the channel, the channel improvements, and a fifty foot wide area measured outward from the front face of the top of the bank protection for Pima County or for Pima County Flood Control District uses.

2. If the watercourse is an improved minor watercourse, the Drainageway shall include the channel, the channel improvements, and necessary maintenance access.

3. If the watercourse is to remain natural, the Drainageway shall be the boundaries of the regulatory floodplain.

4. Along major watercourses where the peak discharge during the base flood is 10,000 cubic feet per second or greater, the Drainageway shall be dedicated in fee simple to the Pima County Flood Control District.

5. Along other watercourses, the County Engineer shall determine whether it is necessary for Pima County or the Pima County Flood Control District to have control of the Drainageway. If the County Engineer determines that public control is necessary, the owner shall dedicate the Drainageway in fee simple or grant an easement.

G. Detention/Retention Systems

(See Article XIV of this Ordinance.)

H. Fees and Public Cost Recovery for Drainage or Flood Control Improvements

The Floodplain Management Board may establish a cost recovery system or fee system for the improvement or installation of public flood control systems. The purpose of the fee is to provide a method for off-site improvements necessary to mitigate the effect of urbanization and to provide a systematic approach for the construction of public flood control improvements. If such a system is adopted it shall demonstrate that the fee will in some manner benefit the property from which the fee is collected and be applied equitably to all property in proportion to floodwaters generated by urban use of the property. The fees will also be restricted to providing flood control improvements necessary for the allowed use of the properties from which the fee is collected, and the fees shall be reasonably related to the actual cost of providing flood control improvements beneficial to the site or surrounding area. The fees will be reviewed by the Flood Control District Advisory Committee prior to action by the Board of Directors of the Pima County Flood Control District.

ARTICLE XII

EROSION HAZARD AREAS AND BUILDING SETBACK REQUIREMENTS

In erosion hazard areas where watercourses are subject to flow related erosion hazards, building setbacks are required as follows:

A. Major Watercourses

For major watercourses, with base flood peak discharges of 2,000 cfs or greater, the following building setbacks shall be required where approved bank protection is not provided:

1. Along the following major natural watercourses where no unusual conditions exist, a minimum building setback, as indicated below, shall be provided at the time of the development unless an engineering analysis which establishes safe limits is performed by an Arizona Registered Professional Civil Engineer and is approved by the County Engineer. Unusual conditions include, but are not limited to, historical meandering of the watercourse, large excavation pits, poorly defined or poorly consolidated banks, natural channel armoring, proximity to stabilized structures such as bridges or rock outcrops, and changes in the direction, amount and velocity of the flow of waters within the watercourse.

a. The building setback shall be five-hundred feet along the Santa Cruz River, Rillito Creek, Pantano Wash, Tanque Verde Creek and the Canada del Oro Wash downstream of the confluence with Sutherland Wash.

b. The building setback shall be two-hundred and fifty feet along major watercourses with base flood peak discharges greater than 10,000 cfs.

c. The building setback shall be one-hundred feet along all other major watercourses with base flood peak discharges of 10,000 cfs or less, but more than 2,000 cfs.

2. Along major watercourses where unusual conditions do exist, building setbacks shall be established on a case-by-case basis by the County Engineer, unless an engineering study which establishes safe limits is performed by an Arizona Registered Professional Civil Engineer and is approved by the County Engineer. When determining building setback requirements the County Engineer shall consider danger to life and property due to existing flood heights or velocities and historical channel meandering. Unusual conditions include, but are not limited to, historical meandering of the watercourse, large excavation pits, poorly defined or poorly consolidated banks, natural channel armoring, proximity to stabilized structures such as bridges or rock outcrops, and changes in the direction, amount, and velocity of the flow of waters within the watercourse.

B. Minor Washes

For minor washes with a base flood peak discharge of 2,000 cfs or less, the following building setbacks shall be required where approved bank protection is not provided.

1. Along minor watercourses where no unusual conditions exist, a minimum setback of fifty feet shall be provided at the time of development unless an engineering analysis which establishes safe limits is performed by an Arizona Registered Professional Civil Engineer and is approved by the County Engineer. Unusual conditions include, but are not limited to, historical

meandering of the watercourse, large excavation pits, poorly defined or poorly consolidated banks, natural channel armoring, proximity to stabilized structures such as bridges or rock outcrops, and changes in the direction, amount, and velocity of flow of the waters in the watercourse.

2. Along minor washes where unusual conditions do exist, building setbacks shall be established on a case-by-case basis by the County Engineer, unless an engineering study which establishes safe limits is performed by an Arizona Registered Professional Civil Engineer and is approved by the County Engineer. When determining building setback requirements, the County Engineer shall consider danger to life and property due to existing flood heights or velocities and historical channel meandering.

ARTICLE XIII

ACCESS REQUIREMENTS

A. Purpose

It is recognized that private vehicular access may become impassable to ordinary and emergency vehicles during times of flooding. It is the intent of this Article to allocate the responsibility for private vehicular access which crosses a regulatory floodplain.

B. Application of Article

This Article shall apply in all situations where private vehicular access crosses any regulatory floodplain located between the point where the private access leaves a paved, publicly maintained roadway and the end of the private access.

C. Requirements for Private Vehicular Access

In all situations where private vehicular access crosses a regulatory floodplain located between the point where the private access leaves a paved, publicly maintained roadway and the end of the private access, the owner of the property requiring the private vehicular access shall:

1. Construct a private vehicular access in such a manner that it is permanent and is over terrain which can be traversed by conventional motor vehicles during a base flood; or

2. Execute and record a covenant running with the land enforceable by Pima County and the Pima County Flood Control District which contains the following:

   a. An acknowledgement that the private vehicular access may be impassable to conventional motor vehicles and emergency vehicles in times of flooding,

   b. A hold harmless provision, holding Pima County and the Pima County Flood Control District harmless from and against all injuries and damages resulting from traversing or attempting to traverse the private vehicular access during times of flooding, and

   c. A provision which either:

      (1) Requires the covenantor, successors and assigns to erect and maintain a sign(s) in a location(s) and size(s) acceptable to the Pima County Department of Transportation and Flood Control District stating "DO NOT ENTER WHEN FLOODED"; or

      (2) Causes the covenantor, successors and assigns to assume responsibility to notify users of the private vehicular access that it may be impassable in times of flooding and agreeing to indemnify and defend Pima County, the Pima County Flood Control District, their officers, employees, servants and agents, against all claims for injuries to persons or damages to property due to the construction, installation, location, operation, safeguarding, maintenance, repair and condition of the private vehicular access.

ARTICLE XIV

DETENTION/RETENTION SYSTEMS

All proposed residential densities of three or more units per acre and all proposed commercial and industrial developments greater than one acre in size shall provide some method of peak or volumetric runoff reduction. The amount of reduction is stipulated within the Stormwater Detention/Retention Manual. The Stormwater Detention/Retention Manual approved for use by the Board of Supervisors as of the effective date of this ordinance is made a part of this ordinance. Any revisions to the Stormwater Retention/Detention Manual will be reviewed by the Flood Control District Advisory Committee.

A. Balanced and Critical Basins

Balanced and critical drainage basins which have been identified by the County Engineer as unsuitable for added development because of the high probability of increased flooding, or flooding of existing improvements or property not previously flooded, or ponding of flood water, may be developed further only upon the incorporation of adequate detention/retention systems or flood control facilities as reviewed and approved by the County Engineer. Drainage basins which have not been previously identified as unsuitable for additional urban development but upon any study are so identified shall be subject to the provisions of this Article. These detention or retention systems or flood control facilities shall be incorporated into any and all future basin development proposals regardless of size or land use density.

B. Alternative Improvements

Structural flood control measures may be proposed in conjunction with or in place of detention/retention systems if it can be clearly demonstrated that such measures will not alter the water and sediment equilibrium of the affected watercourse and will mitigate environmental impacts.

Appropriate structural flood control measures, such as channelization to a logical conclusion downstream of the proposed development and/or improvements to existing off-site flood control systems within the effected drainage or stream reach, shall be completed in accordance with plans reviewed and approved by the County Engineer.

C. Fees in Lieu of Detention/Retention Requirements

A fee may be utilized in place of a detention/retention system when it can be clearly demonstrated that detention at the site does not provide off-site flood relief due to the parcel size, location within the drainage basin, or other factors. The fees collected will be used to construct public flood control improvements which will mitigate the potential damage of flood waters originating from the property contributing the fees. In balanced and critical basins, and where development is less than three units to the acre, use of a fee system will be encouraged in lieu of a detention system in order to preserve the natural drainage patterns.

D. Balanced and Critical Basin Map

The County Engineer shall prepare and retain for public inspection and use an official map designating balanced and critical basins within Pima County.

ARTICLE XV

SEDIMENT AND EROSION CONTROL

A. Grading

Any grading or alteration of any watercourse regulated by this Ordinance shall be controlled to minimize the loss of soil through erosion from rainfall or storm water flowage. Methods to control erosion and sedimentation must be demonstrated to the satisfaction of the County Engineer prior to the granting of a Floodplain Use Permit for any work in any floodplain. Both temporary and permanent measures for sediment and erosion control must be clearly delineated on plans or other written documents prior to receiving a Floodplain Use Permit. The Grading Design Manual prepared pursuant to Chapter 18.81 of the zoning code shall be used to prepare these plans or documents.

B. Soil Investigations

The County Engineer may require appropriate soil investigation reports for the purpose of determining the erosive properties of areas or lands to be graded or disturbed which may create sediment deposition or erosion in any watershed regulated by this Ordinance.

C. Applicability

Any activity which may have an effect on the flood water carrying capacity of any watercourse regulated by this Ordinance is subject to the provisions of this Article.

ARTICLE XVI

APPEALS

A. Appeals Process

Any property owner appealing any written decision concerning the interpretation or administration of this Ordinance shall first appeal in writing to the County Engineer who shall make a written response within fifteen working days of receipt of the appeal. Within 10 working days of receipt of the written appeal the County Engineer may hold hearings and request such additional information as he deems necessary in order to render his written decision.

Any property owner aggrieved by the written decision of the County Engineer may file with the Clerk of the Board a written appeal which shall be heard by the Floodplain Management Board.

B. Procedures for Public Hearing

1. The Floodplain Management Board shall hold a public hearing concerning the appeal within forty-five days after the written appeal is received by the Clerk of the Board.

2. The appeal shall contain a detailed explanation of all matters in dispute and the Floodplain Management Board, through the County Engineer, may require the submission of such additional information as it deems necessary.

3. The Floodplain Management Board shall render its decision within thirty days of the close of the hearing.

4. The Floodplain Management Board may meet monthly or at such times as it deems necessary for the transaction of business including the hearing of appeals.

5. The Floodplain Management Board may refer matters of a highly technical nature, where an appeal is made to the Floodplain Management Board for interpretation, to a technical review board which shall make findings and recommendations to the Floodplain Management Board for decision. The technical review board shall consist of three Arizona Registered Professional Civil Engineers, one named by the County Engineer, one named by the appellant, and one named by the first two members. This review board shall not be permanent in nature, but shall be formed as required to hear individual appeals.

ARTICLE XVII

VARIANCES

A. Authorization

The Floodplain Management Board shall hear and decide all requests for variances from the requirements of this Ordinance to the extent permitted by A.R.S. §48-3609. A variance is subject to conditions to ensure that the variance does not constitute a grant of special privileges inconsistent with the limitations on similar property in a regulatory floodplain or erosion hazard area.

B. Requirements for a Variance

Variances shall only be issued if the Floodplain Management Board makes the following five determinations:

1. A determination that the variance is the minimum necessary, considering the flood hazards to afford relief;

2. A determining of good and sufficient cause;

3. A determination that failure to grant the variance would result in exceptional hardship to the applicant; and

4. A determination that the granting of the variance will not create a danger or hazard to persons or property in a regulatory floodplain or erosion hazard area in the area of jurisdiction or result in increased flood heights, additional threats to public safety, the creation of a nuisance, the victimization of or fraud on the public, or that the variance is not in conflict with other local laws or ordinances.

5. Special circumstances, such as size, shape, topography, location or surroundings of the property, would cause strict application of the regulations to deprive the property of the privileges enjoyed by similar property in a regulatory floodplain or erosion hazard area. A variance is subject to conditions to ensure that the variance does not constitute a grant of special privileges inconsistent with the limitations on similar property in the regulatory floodplain.

C. Covenants

Upon granting of a variance, permit or waiver for the construction of a dwelling unit or commercial of industrial structure, where the construction of such unit or structure is otherwise contrary to this Ordinance, the Floodplain Management Board shall provide written notice to the grantees of such a variance, permit, or waiver that, if the structure is a dwelling unit or business as defined by A.R.S. §26-321, the land upon which the structure is located is ineligible for exchange of state land pursuant to the flood relocation and land exchange program provided for by Title 26, Chapter 2, Article 2 (A.R.S. §26-321 *et seq.*). A copy of the notice shall be recorded by the Floodplain Management Board in the office of the County Recorder and shall be recorded in manner so that it appears in the chain of title of the affected parcel of land.

D. Notification of Adjacent Jurisdictions

The District shall advise any city or town which has assumed jurisdiction over its regulatory floodplains in accordance with A.R.S. §No. 48-3610 in writing and provide a copy of any development plan or any application which has been filed with the County for a Floodplain Use Permit or variance to develop land in a floodplain or floodway within one mile of the boundary between the District's area of jurisdiction and the jurisdiction of that city or town. The District shall also advise any city or town in writing and provide a copy of any development plan of any major development proposed within a regulatory floodplain or floodway which could affect regulatory floodplains, floodways or watercourses within that city's or town's area of jurisdiction. Written notice and a copy of the plan of development shall be sent to any adjacent jurisdiction no later than three working days after having been received by the District.

ARTICLE XVIII

AMENDMENTS

A. Public Hearing Process

This Ordinance may be amended only after a public hearing at which parties in interest and other citizens have an opportunity to be heard.

B. Petition for Amendments

The County Engineer or any affected person may petition for an amendment to this Ordinance and shall initiate such proceeding by filing with the Floodplain Management Board a proper and complete petition for such change on the form or forms provided by the Floodplain Management Board.

1. Staff Report: Upon receipt of such petition the County Engineer, with the assistance, advice and counsel of the County Zoning Inspector and the County Planning Director, shall make a study and report the findings to the Floodplain Management Board. The report shall be made available to the applicant and other interested parties at least thirty days before the date of any public hearing for the respective petition.

2. Floodplain Management Board Action: Upon receipt of the County Engineer's report and recommendation the Floodplain Management Board shall hold a public hearing thereon at which petitioner and other parties in interest have an opportunity to be heard. At least thirty days prior to the hearing, a notice of the time and place of hearing shall be published in a newspaper of general circulation within the area of jurisdiction of the Floodplain Management Board; or, if no newspaper of general circulation is regularly published within the area of jurisdiction, a newspaper of general circulation regularly published nearest the area of jurisdiction. A notice of any hearing accompanied by a copy of each of the proposed amendments shall be furnished to the Director of the Arizona Department of Water Resources at least thirty days prior to the date of such hearing. A copy of any amendment adopted by the Floodplain Management Board shall within five days thereafter be filed with the Director of the Arizona Department of Water Resources.

ARTICLE XIX

UNLAWFUL ACTS, PENALTY

A. Unlawful Acts

It is unlawful for any person to divert, retard or obstruct the flow of waters in a regulatory floodplain whenever such actions create a hazard to life or property without first securing the permit required by any provision of this Ordinance.

B. Penalty

Any person or entity violating the provisions of this Ordinance shall be guilty of a class 2 misdemeanor.

ARTICLE XX

MISCELLANEOUS

A. Cooperative Agreements and Consultants

The Floodplain Management Board may retain consultants and experts and may enter into cooperative agreements for the delineation of regulatory floodplains, floodways, and erosion hazard areas, or for such other assistance and guidance considered appropriate and necessary.

B. Severability

This Ordinance and the various parts thereof are hereby declared to be severable. Should any section or paragraph of this Ordinance be declared by the court to be unconstitutional or invalid, such decision shall not affect the validity of the Ordinance as a whole, or any portion thereof, other than the section or paragraph declared to be unconstitutional or invalid.

C. Units of Measure

All units of measure contained in this Ordinance, whether expressed or implied, are intended to be in the English system of units.

ARTICLE XXI

EFFECTIVE DATE:

Sec. 2001: This Ordinance shall become effective on December 6, 1988.

PASSED AND ADOPTED by the Board of Supervisors of Pima County, Arizona, this 6th day of December, 1988.

PIMA COUNTY BOARD OF SUPERVISORS

Iris O. Dewhirst
Chairman

ATTEST:

Jane S. Williams
Clerk, Board of Supervisors

APPROVED AS TO FORM:

John R Neubauer
Deputy County Attorney
Civil Division

William Hoswell
Director, Chief Engineer and County Engineer
Pima County Department of Transportation
and Flood Control District

APPENDIX 1

TABLE OF REGULATORY PEAK DISCHARGES

Note: List is not all inclusive; remaining watersheds are also subjected to Pima County Floodplain Management Ordinance Restrictions. Listed discharges are subject to review and revision due to urbanization and improvements; check with Floodplain Management Section staff before their use.

	REGULATORY	DESIGN[1]
Agua Caliente Wash		
@ Tanque Verde Wash	13,000	18,000
@ Soldier Canyon	12,000	17,000
@ Molino Canyon	9,000	14,000
above La Milagrosa Canyon	4,966	
Airport Wash		
@ Santa Cruz River	8,100	13,100
@ Alvernon Road	7,090	
Ajo Wash		
@ .5 miles west of La Cholla and Ajo	2,938	
Alamo Wash		
@ Ft. Lowell	8,235	
Anklam Wash		
@ Anklam Road	3,461	
Attebury Wash		
@ Stella Road	4,168	

[1] Unless otherwise noted, design discharges shall be 20 percent greater than regulatory discharges.

(Appendix 1 continued)

	REGULATORY	DESIGN[1]
Attebury Wash		
@ Stella Road	4,168	
Big Wash		
@ Canada del Oro	18,300	23,300
@ Honey Bee Wash	16,900	21,900
Black Wash		
@ Ajo – Benson Highway	8,872	
@ Valencia	8,430	
Blanco Wash		
@ Los Robles Wash	17,000	22,000
Bowes Wash		
@ Tres Lomas Wash	2,006	
Brawley Wash		
@ Los Robles Wash	35,000	40,000
Caliente Hills Wash		
@ National Forest	2,899	
@ Agua Caliente Wash	2,473	
Camino del Oeste Wash		
@ Santa Cruz River	6,747	
Camino Real Wash		
@ Rillito Creek	2,516	
Campbell Wash		
@ Rillito Creek	2,899	

(Appendix 1 continued)

	REGULATORY	DESIGN[1]
Canada Wash		
@ Mission Road	782	
Canada del Oro Wash		
@ Santa Cruz River	28,000	33,000
@ Big Wash	21,000	26,000
@ Sutherland Wash	17,500	22,500
Canyon del Salto Wash		
@ Tanque Verde Wash	6,190	
Carmack Wash		
@ Hardy Road	5,595	
@ Thornydale Road	4,980	
Casas Adobes Wash	3,252	
Castle Rock Wash		
@ Tanque Verde Road	2,148	
Christmas Wash		
@ Rillito Creek	4,500	
Cienega Creek		
@ Pantano	18,000	28,000
Citrus Wash		
@ Roller Coaster Road	1,562	
Craycroft Wash		
@ Rillito	4,228	
@ Center Village Drive	4,130	

(Appendix 1 continued)

	REGULATORY	DESIGN[1]
Cuprite Wash		
@ Fagan Wash	3,171	
Dakota Wash		
@ Mission Road	4,190	
Davidson Canyon Wash		
@ Vail	19,000	
Deep Well Ranch Wash		
@ Redington Road	770	
Dodge Tank Wash		
@ Canada del Oro Wash	11,004	
Enchanted Hills Wash		
@ Mission Road	4,054	
Esperero Wash		
@ Ventana Canyon Wash	8,440	
@ Sunrise Drive	9,116	
Fagan Wash (includes Cuprite Wash)		
@ Lee Moore Wash	7,817	
Ferreo Wash		
@ Tanque Verde Creek	968	
Finger Rock Wash		
@ Rillito River	5,779	
Flato Wash		
@ Lee Moore Wash	2,652	

(Appendix 1 continued)

	REGULATORY	DESIGN[1]
Flecha Caida Wash		
@ Swan Road	1,604	
Flowing Wells Wash		
@ Ft. Lowell Road	5,698	
Forty-Niners Wash		
@ National Forest Boundary	4,578	
@ Tanque Verde Road	3,500	
Franco Wash		
@ Santa Cruz River	6,388	
Freeman Wash		
@ Tanque Verde Creek	2,467	
@ St. James Road	2,785	
Friendly Village Wash		
@ Rillito River	2,250	
Fuller Wash		
@ Fuller Road	4,162	

(Appendix 1 continued)

GREEN VALLEY DRAINAGEWAYS		REGULATORY Present	DESIGN[1] Future
1	@ Santa Cruz River	732	873
2	"	564	
3	"	2,921	3,686
6	"	2,363	4,169
7	"	1,167	1,794
8	"	672	
9	"	3,043	4,292
10	"	108	
11	"	290	
12	"	117	
14	"	170	
15	"	42	
16	"	271	
17	"	1,718	1,973
18	"	210	
19	"	314	
20	"	440	
22	"	298	
23	"	892	910
24	"	1,160	1,207
25	"	1,150	1,189

(Appendix 1 continued)

	REGULATORY	DESIGN[1]
Garfield Wash		
@ La Cholla Road	1,949	
Geronimo Wash		
@ Orange Grove Road	3,650	
Gibson Arroyo – Ajo, AZ		
@ 2nd Avenue	2,400	
@ Highway 85	3,990	
@ Rasmussen Road	5,100	
Golder Wash		
@ Confluence w/Sutherland	5,200	
Gunnery Range Wash		
@ Lee Moore Wash	5,736	
Hardy Wash		
@ Camino de Oeste Road	4,536	
Hughes Wash		
@ Hughes Access	2,416	
@ Old Nogales Highway	7,946	
@ Santa Cruz River	6,021	
Idle Hour East		
@ Santa Cruz River	9,257	
Idle Hour Wash		
@ Sunset Road	5,743	
Indian Hills Wash		
@ Bear Canyon Road	1,935	
@ Catalina Highway	1,340	

(Appendix I continued)

	REGULATORY	DESIGN[1]
Julian Wash		
@ Ajo Gage	8,500	13,500
@ Wilmot Road	7,500	12,500
King Canyon Wash		
@ Kinney Road	3,902	
La Milagrosa Canyon		
above Agua Caliente Wash	3,892	
Lee Moore Wash		
@ Santa Cruz River	20,866	
Little Brawley Wash		
@ 32° 7' 25"		
111° 19' 45"	13,440	
Los Robles Wash		
@ Blanco Wash	37,000	42,000
Main Interceptor Channel		
@ DMAFB	5,450	
Mescal Arroyo		
@ Pantano Creek	12,000	
Monument Wash		
@ Speedway Road	9,495	
Mountain Wash		
@ Rillito Creek	450	
Nanini Wash		
@ Rillito Creek	3,071	

8435 2427

(Appendix 1 continued)

	REGULATORY	DESIGN[1]
Old Grandad Tank Wash		
@ Redington Road	4,278	
Painted Hills Wash		
@ Ironwood/Greasewood Roads	3,848	
Pantano Creek		
@ Rillito Creek	32,000	37,000
@ Houghton Road	31,000	36,000
@ Rincon Creek	29,000	34,000
@ Vail	30,000	35,000
Pegler Wash		
@ Rillito Creek	4,000	
Petty Ranch Wash		
@ Lee Moore Wash	783	
Picture Rock Wash		
@ Picture Rocks Road	3,479	
Pima Wash		
@ Rillito Creek	5,300	10,300
@ Geronimo Wash	4,250	9,250
Pusch Ridge Wash		
@ Highway 89	2,803	
Race Track Wash		
@ Rillito Creek	2,100	
Rillito Creek		
@ Santa Cruz River	32,000	37,000

	REGULATORY	DESIGN[1]
Rincon Creek		
@ Pantano Creek	21,000	26,000
@ Coyote Wash	18,500	24,000
@ Sentinel	16,000	21,000
Rinconado Wash		
@ Redington Road	949	
Robb Wash		
@ Tanque Verde Creek	3,526	
Roller Coaster Wash		
@ Rillito Creek	2,300	
Rooney Wash		
@ Highway 89	3,960	
Sabino Creek		
@ Tanque Verde Creek	18,000	23,000
@ Bear Creek	12,500	17,500
Santa Cruz River		
@ Continental Road	45,000	55,000
@ Congress Road	60,000	70,000
@ Cortaro Road	70,000	80,000
San Pedro River		
@ Redington Road	50,000	70,000
Soldier Wash		
@ Soldier Trail Road	5,050	

(Appendix 1 continued)

	REGULATORY	DESIGN[1]
Sopori Wash		
@ Highway 89	19,900	24,900
South Interceptor Channel		
@ DMAFB	3,252	
Summit Wash		
@ Lee Moore Wash	874	
Sutherland Wash		
@ National Forest	12,800	
@ Catalina State Park	13,656	
Sycamore Canyon		
@ Lee Moore Wash	7,793	
Sweetwater Wash		
@ Silverbell Road	6,011	
Tanque Verde Wash		
@ Rillito Creek	34,000	39,000
@ Sabino Creek	28,000	33,000
@ Agua Caliente Wash	23,000	28,000
@ Canyon del Salto Wash	16,000	21,000
Tanuri Wash		
@ River Road	2,682	
Tanuri Wash (east branch)		
@ Tanuri Wash	1,131	

	REGULATORY	DESIGN[1]
Tortolita Fan		
@ Canada Agua Canyon @ I-10	5,255	
Cochie Canyon @ I-10	5,779	
Cottonwood Canyon @ I-10	5,439	
Derrio Canyon @ I-10	5,229	
Eastern Limit of Fan @ I-10	4,084	
Guild Canyon @ I-10	4,561	
Ruelas Canyon @ I-10	4,604	
Unnamed Canyon @ I-10	4,340	
Wild Burro @ I-10	5,831	
Tres Lomas Wash		
@ Tanque Verde Wash	4,379	
Twenty-Seven Wash		
@ Sec 3/4 T11 R14	3,796	
Valley View Wash		
@ River Road	3,947	
Ventana Canyon Wash		
@ Tanque Verde Creek	9,371	
Above Esperero Wash	11,082	
Below Esperero Wash	14,775	
@ Sunrise Drive	10,770	
Via Entrada Wash		
@ Rillito Creek	2,500	
West Branch Santa Cruz		
@ Valencia Road	8,100	13,100

(Appendix 1 continued)

	REGULATORY	DESIGN[1]
Wyoming Wash		
@ Mission Road	2,235	

8435 2432

CH2M HILL
Engineers
Planners
Economists
Scientists

December 18, 1992

BOI33516.A0

Mr. Neil Stack
Assistant Director
Salt Lake County Public Works Dept.
2001 South State Street, #N3300
Salt Lake City, Utah 84190-4600

Dear Mr. Stack:

Subject: Jordan River Stability Study-Response to Review Comments, Draft Report

Introduction

CH2M HILL greatly appreciates the time and effort of those who reviewed and commented on the draft report. Numerous excellent suggestions were received. Where possible, comments were incorporated into the draft report. However, some comments could not be integrated into the text. This memorandum summarizes CH2M HILL's responses to comments received from public agencies and local communities that were not directly addressed in the revised draft report. Although most of this memorandum summarizes responses to negative or critical comments, it must be stressed that the overall response to the draft report was **overwhelmingly** positive.

Project Review

The Salt Lake County Public Works Department was the primary reviewer for the Jordan River Stability Study. Review comments were also solicited from numerous public agencies that have jurisdiction along the Jordan River and from local communities which would be impacted by the proposed river management plan. The agencies that reviewed the draft report are listed below.

Federal Agencies:

- U.S. Army Corps of Engineers
- U.S. Fish & Wildlife Service
- U.S. Geological Survey

Federal Emergency Management Agency
Department of Agriculture/Soil Conservation Districts
Federal Emergency Management Agency

State Agencies:
Division of Water Rights/State Engineer
Division of Wildlife Resources
Division of Parks & Recreation
Division of State Lands and Forestry
Department of Transportation
Division of Comprehensive Emergency Management
Department of Agriculture

Local Agencies:
Salt Lake County Public Works Department
Board of Salt Lake County Commissioners
Salt Lake County Parks & Recreation
City of Bluffdale
City of Riverton
City of Draper
City of South Jordan
City of West Jordan
City of Sandy
City of Midvale
City of South Salt Lake
City of Salt Lake
West Valley City
Murray City

Each agency and community listed above was invited to two public meetings held at the Salt Lake County Public Works Department. The project goals, project approach, and preliminary results were discussed at the first meeting, held on May 14, 1992. The recommended management plan, technical evaluation results, and a provisional meander corridor were presented and discussed at the second meeting, held on September 30, 1992. Draft materials were made available for review after each meeting, and formal written comments were requested from all of the attendees. Following the second meeting, copies of the provisional meander corridor limits and the executive summary to the draft report were mailed to each community and agency listed above, with an additional request for comments. After a 2- to 4-week waiting period, CH2M HILL project personnel telephoned each agency and community to obtain additional comments on the draft report.

Summary of Responses

The response to the study was overwhelmingly favorable. Almost unanimously, a non-structural management approach which enhances riparian and natural values was endorsed. Several communities are currently developing parkway plans that will maintain a natural river corridor. Other positive comments were received regarding the technical approach and the recommendations outlined in the report. Most agencies requested the opportunity to be a part of implementing the river management plan.

Some "critical" report comments were also received. These critical comments can be grouped into three general categories. Most of the critical report comments pertained to the implementation of the proposed management plan ("Implementation Comments"). Some reviewers criticized specific recommendations that were detailed in the draft report ("Recommendations Comments"). A few reviewers criticized some of the technical methods used to evaluate the river stability ("Technical Comments"). Responses to comments from each of these categories are presented below.

Scope of Services

Many critical comments can be addressed simply by clarifying the scope of services to be provided by CH2M HILL for the Jordan River Stability Study. The scope of services for this study was limited to:

- Developing a meander corridor that would encompass the expected limits of lateral river migration over the next 100 years.
- Identifying existing river stability problems and recommending solutions for the most significant problems.
- Developing maintenance and management guidelines for the river. The Jordan River Stability Study is intended to be only one part of an overall river management plan.

Many important aspects of what will make the final river management plan successful were not addressed in the draft report, nor will they be addressed in the final report. Some reviewers were probably unaware of this limitation in scope, and thus provided comments more relevant to the next step in the planning process.

Implementation Comments

Implementation comments pertain to various aspects of how the proposed river management plan may be accomplished after being adopted by Salt Lake County. Some key questions raised by the reviewing agencies include:

- How will existing regulatory authority be divided?
- How can river management be centralized?
- What funding sources are available for land acquisition?
- How will the stability plan be integrated with other river management plans, parkway plans, water quality plans, wetlands mapping, etc?
- What are the legal implications of private river ownership, relative to other legislation implying public ownership?
- What are the legal implications of public ownership of river beds on a meandering river channel?
- What permitting will be needed prior to final adoption of a plan?

While these are important questions, they are not within the scope of work of the Jordan River Stability Study. CH2M HILL concurs that these questions, and probably many others, need to be answered prior to implementation of an overall river management plan. Careful consideration of the needs, goals, and plans of each of the communities bordering the river, as well as the numerous agencies which regulate the river is required.

Recommendations Comments

Some reviewers took exception to a few of the recommended management alternatives. While most of these comments will be addressed directly in the final report, some are important enough to be reiterated. At a minimum, these criticisms should be fully discussed prior to implementing the final river management plan. The recommendations that reviewers criticized are summarized below:

- **Allow Erosion.** Allowing natural bank erosion to occur within the meander corridor was the most frequently criticized recommendation. (Other reviewers specifically cited this recommendation as one of the strengths of the proposed management plan.) Some reviewers correctly pointed out that allowing erosion within the corridor assumes that the corridor would be publicly owned. Some communities stated that they felt they had no authority to prevent private landowners from preventing erosion on their property.

CH2M HILL recommended the more passive approach of allowing erosion within the corridor for the reasons summarized below:

- We acknowledged that most of the river corridor will need to be acquired, although for more reasons than the right to protect private property.

- The passive approach lets nature "do for free" the same thing that would cost millions of dollars to engineer. There is little funding currently available to analyze and design stable channel geometries, and no guarantee that such designs would indeed be stable over the 100-year planning period specified in the scope of work.

- The hydrologic analysis indicates that the next period of flooding and significant erosion may be two or more decades away. Therefore, there is time to acquire lands most likely to erode. However, the time to preserve and protect a corridor is now because development pressure on lands near the river has increased significantly in recent years.

- The passive approach does not preclude later efforts toward stable channel design.

- Considering the current regulatory climate, it is unlikely that significant private channelization projects will be approved in the near future.

- **Dredging.** Most reviewers who mentioned dredging were critical of the recommendation to continue dredging at the mouths of Little Cottonwood Creek, Big Cottonwood Creek, and Mill Creek. CH2M HILL recommended continued dredging for several reasons:

  - Salt Lake County indicated that increased flood water surface elevations were an unacceptable alternative. Unless channel deposition is periodically removed, flood levels would increase.

- Bed material samples indicated sediment sizes are too large to be removed by flushing flows. Also, some agencies objected to the idea of using flushing flows.

- The County has an agreement with the Corps of Engineers to periodically dredge the portion of the study reach that lies between the head of the Surplus Canal and the mouth of Mill Creek.

CH2M HILL did recommend placing the following limits on future dredging:

- Dredging should not extend below the surveyed 1990 flowline. The 1990 flowline was chosen because it was the datum used for the FEMA Flood Insurance Study, and it is well documented.

- Dredging should be used only after deposition above the 1990 flowline is established by a channel survey.

- Dredging was only recommended at the mouths of the major canyon tributaries. These areas are located in some of the most disturbed river reaches and the most densely developed areas along the river.

- CH2M HILL did provide an alternative to dredging: offset levees. It is expected that the need to dredge will diminish in the future as development along the tributaries continues to decrease the sediment supply. ? ASSUMPTION? —OFFSET LEVEES MAY CONFLICT W/ WETLAND MANAGEMENT

- **Grade Control.** Several agencies and personnel from Murray City expressed concern that the proposed grade control structures would disturb fish passage and recreational access under bridges. The geomorphic analysis indicated that grade control was an essential element of the management plan. Without grade control, excessive bank erosion will continue to destroy riparian vegetation and threaten existing structures, including bridges. Slope decreases caused by increased meandering would not be sufficient to arrest long-term degradation in Reaches 5 through 9. Therefore, grade control is required to stabilize the river.

It is possible to construct grade control structures that are compatible with fishery and recreation objectives. There are a plethora of possible grade control designs. The sheet pile structures recommended in the draft report reflect only the goals and objectives outlined in the scope of services. Sheet piles are cost-effective and have been successfully used on the Jordan River.

The final selection of drop structure design should consider objectives other than flood control and erosion management. Several agencies offered to supply design drawings of alternative grade control structures.

- **Grazing.** Some agencies were very concerned about grazing impacts, and apparently misunderstood CH2M HILL's conclusions regarding the historical affects of grazing. Some conflicting data exist regarding the impacts of grazing on the Jordan River. Unfortunately, data for the Jordan River are anecdotal and could not be incorporated into the geomorphic analysis. Regionally, overgrazing has been shown to have profound negative impacts on river bank stability. Therefore, overgrazing should be prevented within the river corridor. Acquisition will ensure that no overgrazing occurs. Appropriate recommendations regarding grazing were added to the final report.

- **Corridor Limits.** Several reviewers felt that the corridor limits were too narrow, especially in Reach 6 (from 6400 South to 7800 South). These reviewers felt that the entire 100-year, 500-year, or geologic floodplain should be made part of the corridor. (Of course, a few reviewers felt that the corridor was too wide.) While wider corridor limits may eventually be adopted as part of parkway or wetland preservation plans, the meander corridor limits shown in the draft report reflect the objectives outlined in the scope of work. The proposed corridor limits represent CH2M HILL's best estimate of where bank erosion and channel migration are likely within a 100-year planning period considering the data, methodologies, and assumptions outlined in the study. The limits to be used as part of a final river management plan will probably reflect numerous other objectives, management scenarios, and additional information, and may be somewhat different than the meander limits proposed in the draft report.

Technical Comments

A few agencies provided comments on technical aspects of the geomorphic analysis. Several reviewers challenged the methodologies used to evaluate river stability. Others addressed CH2M HILL's interpretation of data. Rather than address each comment separately, we will try to clarify our approach. We believe that if our approach is fully understood, the majority of the comments will be satisfactorily addressed.

The scope of the study must be understood. The objectives of the geomorphic analysis were to identify areas with stability problems, and to help establish corridor limits. There was no intent to design stable cross sections, predict exact meander geometry, or predict with certainty other equilibrium values for the channel over the next 100 years.

The geomorphic equations and variables that were used must be understood. The equations cited in the draft report were used to establish the direction of expected change, and assess the probable (order of) magnitude of change. We feel that the concerns expressed by commentors regarding specific values for certain river variables cited in the draft report are unwarranted. Note that several predicted values were computed for most variables -- therefore, no one value could be used exclusively. Nowhere, does the report claim to use any one specific value to predict the corridor width.

Geomorphic analysis is extremely complex, even for the most pristine, neatly categorized river. The Jordan River, unfortunately, is neither pristine, nor easily classified. As described in the draft report, its hydrology, geology, and history are very complicated. Because the river is so unique and has been so thoroughly altered, most of the established techniques for evaluating river stability have some weaknesses when applied to the Jordan River. In addition, the independent variables which control river geometry vary significantly within the study area. Thus, no one method would be completely satisfactory for the whole river. Also, there are no undisturbed reaches in the study area from which to extrapolate stable river geometry, and no nearby river is truly analogous. Furthermore, no methodology has been established to explicitly address all of the effects of urbanization.

The use of historical data is very important and must be understood. Historical data represent the best, most applicable source of stability information for the Jordan River. Historical data includes any information which describes river behavior prior to the time of analysis. The final report does not suggest that historical data may be used without consideration of its relevance to existing or future conditions. However, it is CH2M HILL's opinion that historical data from *the same river* is far more likely to describe equilibrium conditions than data from some other river which does not have the same independent variables. Obviously, historical data must be screened to determine if inputs have changed during the period of record. Data from the recent floods of the 1980s can hardly be ignored when trying to identify reaches subject to future erosion. In fact, a recent Corps of Engineer manual suggests that if an equation predicts river behavior which does not agree with historical data, the historical data should be used. For these reasons, historical data were used to temper information obtained from more traditional analytical approaches.

Analysis of Reach 6 (between 6400 South and 7800 South) is a good example of how stability was assessed. Several reviewers stated that the corridor limits in Reach 6 were too narrow. The analytical approach indicated certain values for meander amplitude, radius of curvature, and other variables which could have been simply used to draw the corridor limits. However, analysis of historical photographs, topographic data, and field reports indicated that no measurable channel migration has occurred through most of the reach since the river was channelized. In fact, it was recently reported that the banks and riparian habitat were in very good condition. The channel has withstood the 100-year flood, some other floods, and almost 40 years of low flows without significant migration and erosion. Therefore, it seemed logical, given the study objectives of identifying stability problem areas, to narrow the corridor width to reflect the actual, rather than theoretical, stable geometry. The existing grade controls in this reach are the probable cause of the stability that has been experienced.

Some reviewers may be uncomfortable with the level of engineering judgement that the CH2M HILL approach used. However, given the nature of available data, the unique characteristics of the problem, and the stated objectives of the study, we feel it was a prudent methodology. While some reviewers may have objected to certain equations, or the use of historical data, they provided no information that contradicted any of the conclusions or management strategies proposed in the draft report.

Other technical comments were the result of typographical errors, or poor wording by the report authors. CH2M HILL apologizes for any confusion these errors may have caused, and appreciates the effort that each reviewer made to understand the report. Finally, some technical review comments were simply the result of misreading, or failing to completely read, the draft report.

Summary

CH2M HILL recognizes the important contribution made by the numerous reviewers. We have made every attempt to incorporate all of the review comments in to the final report. A complete list of agency and community reviewers, as well as correspondence and telephone logs can be provided upon request.

We would welcome the opportunity to discuss specific comments in more detail. Please call if you have any questions or comments.

Sincerely,

CH2M HILL

Michael Collins, P.E.
Project Manager

ckm/SLC77/038.51

cc: David Lovell/SLCo
Brent Beardall/SLCo
Craig Bagley/SLC
Jon Fuller/PHX

Salt Lake County
BOARD OF COMMISSIONERS

E. James Bradley, Chairman
Randy Horiuchi
D. Michael Stewart

COMMISSION STAFF OFFICE
Anthony W. Mitchell, Ph.D.
Staff Manager

June 24, 1992.

Mr. Craig Bagley
CH2M-Hill Consulting Engineers
4001 South 700 East
Murray, Utah 84107

Re: Comments on Jordan River Meander/Stability Study

Dear Craig,

Pursuant to our telephone discussion yesterday, attached are my comments on the Jordan River meander corridor study. I have also included a few questions that should be addressed by the study at some point.

If you have questions, please call at 468-3630. I look forward to working with you and Brent Beardall in the development of this important study.

Sincerely,

Steven F. Jensen, M.P.A.
Environmental Planning Coordinator

Attachment: Study comments
cc: Brent Beardall, Salt Lake County Public Works
Roy Gunnell, State Division of Water Quality

Salt Lake County Government Center 2001 South State Street, #N3003 Salt Lake City, Utah 84190-1000 (801) 468-3610, FAX (801) 468-3602

COMMENTS ON MEANDER CORRIDOR MANAGEMENT &
JORDAN RIVER STABILITY STUDY BY CH2M-HILL
June 23, 1992
Steven F. Jensen, M.P.A.
Environmental Planning Coordinator

The following comments are submitted for your consideration in the development and design of a meander corridor/stream stability plan for the upper Jordan River:

Wetlands Unsuitable for Issuance of 404 Permits

The Jordan River Wetland Advance Identification Study (WAIDS) identified about 2000 acres of wetlands along the 22 mile river corridor between the Jordan Narrows and 2100 South, which possess sufficient functional values to be designated "presumptively unsuitable" for issuance of discharge permits by the Army Corps of Engineers. In some cases, these wetlands fall within an oxbow which would be part of the proposed meander corridor.

This factor will restrict development alternatives within the meander corridor by any municipality or individual. Uses that are not considered "water dependent" by the Corps will not be considered for permits. This factor lends substantial weight to the position of the county that the river should be "managed" naturally, left alone, or modified to enhance existing resource values (fish habitat, wildlife habitat, recreational values, etc.).

Although the Corps can grant a permit within these wetlands, the 404(b)(1) guidelines may require substantial study of potential short and long-term impacts prior to permitting, and acre-for-acre or greater mitigation would be required. Therefore, any master planning or zoning should take into consideration the permit restriction and not designate the areas for any potential development. If the CUP Reauthorization bill passes, purchase of these areas will become a realistic option, since $ 7 million was specified for acquisition of priority Jordan River wetlands.

Wetlands Providing Significant Flood Storage

The oxbow meanders in the upper Jordan River corridor have been largely cut off by past channelization. Palustrine wetlands outside of the oxbows which lie within the floodplain have also been isolated. Studies conducted over the last twenty years have shown a direct correlation between the occurrence of upstream wetlands and downstream flood damage. Watersheds with a significant upstream wetland community suffer lower levels of flood damage losses downstream. Inversely, watersheds with depleted upstream wetland communities suffer greater downstream damage. The flood storage benefits of oxbow restoration could be considerable.

Modelling Sedimentation Rates and Trade-off Analysis

A major feature of management of the upstream river corridor should be the restoration and re-establishment of these oxbows. Trade-off analysis of "natural" erosion of the oxbow meander pattern compared to downstream effects should be performed.

For example, what are the potential benefits to downstream fishery habitat from increased fluvial sedimentation (pool/run/riffle ratios) compared to increased flood hazard or downstream erosion produced by the sedimentation? Will the rates of upstream oxbow erosion and downstream sedimentation be excessive so as to preclude enhanced benefits? How would outside bank stabilization affect these conditions? How would selective dredging near bridges affect these conditions? (i.e. headcutting).

Hydrology

The Jordan River is not a natural stream course affected only by seasonal snowpack and groundwater fluctuation. It is a managed irrigation facility. The flow regime which interacts with the meander pattern of the river is controlled to some extent by seasonal diversion regimen as well as being impacted by flooding.

The flooding potential of the river due to storage in Jordanelle, water diversion to the Sevier Basin, management of Utah Lake at a lower level, modifications to Utah Lake storage capacity, increased diversions for future dual irrigation system operations, all play a part in future flooding potential. The peak design flood over "X" years may not have any effect on the meander pattern of the Jordan. It may also completely re-establish the pattern. How will peak design flood impacts and possible hydrologic modifications be factored into the selection of the proposed management scenario?

Which flood event will be used to set the standard? If the 1952 event is still in use, it should be abandoned. Since the 1983-84 levels were substantially greater, they should be "adopted" as the baseline frequency for evaluating potential effects, with consideration to future upstream hydrologic modifications.

Ownership and Control of the Jordan River

Based on the policy administered by the State of Utah Division of Lands and Forestry, the Jordan River up to its "normal" high watermark constitute sovereign lands which are owned by the State. The Utah Attorney General should be solicited for an opinion specifically for the Jordan River, and the administration and implementation of the sovereign lands policy thoroughly understood.

Recommended Management Plan

Any management plan for a multi-function river corridor must undergo extensive review, coordination with, and approval by several federal, state, and local agencies.

Under the provisions of authority held by the Board of Salt Lake County Commissioners, Area-Wide Water Quality Planning and other water resource management is currently performed and allowed under State law. This process consitutes a framework for a Jordan River Sub-Basin planning authority. This authority should be further supplemented and constituted through development of an interlocal agreement, and establishment of a management authority board.

The agencies that should be represented on this authority board include at a minimum:

Federal Agencies

U.S. Army Corps of Engineers/Region VIII EPA
U.S. Bureau of Reclamation
U.S. Fish & Wildlife Service

State Agencies

Division of Water Resources/State Engineer
Division of Environmental Quality
Division of Wildlife Resources
Division of Parks & Recreation
Department of Agriculture/Soil Conservation Districts

Local Agencies

Board of Salt Lake County Commissioners
Salt Lake County Public Works
Salt Lake County Parks & Recreation
City of Bluffdale
City of Riverton
City of Draper
City of South Jordan
City of West Jordan
City of Sandy
City of Midvale
City of Murray
City of South Salt Lake
City of Salt Lake

Each of these agencies should be provided the opportunity to review and comment on the draft report.

UTAH ASSOCIATION OF CONSERVATION DISTRICTS

UACD

Zone II, 60 W. Gentile St., Layton, UT 84041

D. Lovell

Mr. Neil D. Stack, P.E. Assistant Director June 18, 1992
Public Works Department
Engineering Division, Salt Lake County
2001 S. State St., N3300
Salt Lake City, UT 84190-4600

Dear Mr. Stack:

Subject: Jordan River Stability Study

We appreciate being invited to participate in the Jordan River Stability Study. We applaud Salt Lake County for this effort to deal with natural resource problems along the Jordan River Corridor.

Soil Conservation Districts (SCD's) are special service districts, legal subdivisions of the state with authority given by statute. One of Utah's 39 such districts is the Salt Lake SCD. Governed by a five-member board of elected supervisors, they are uniquely suited to coordinate the efforts of local, state and federal entities. They are champions of private land rights and of the complete natural environment.

The Salt Lake SCD board meets regularly on the third Wednesday of each month at 6:00 PM at the Salt Lake County Agricultural Service Center at 7235 S. 300 W. in Midvale. These are open meetings and we invite you or your representative to meet with us to discuss common issues. Please call board member Vanae Morris at 943-5436 to get on the meeting agenda. Our next meeting is July 15, 1992.

Our specific comments on the Jordan River Stability Study follow:

1. We believe the concept of a meander corridor is better than a Los Angeles River-style lined channel. We are concerned however that much of a meander corridor is private property and if its use is to be "taken" for the public good the private owner should be properly compensated for the taking. It may be more in the public interest to purchase the development rights or obtain a conservation easement for the public purpose than to have the government entity purchase the property.

2. Some segments of the river corridor already have existing developments in place. An example is the Murray City Parkway project. These should be integrated into the overall plan so as not to loose their value.

3. The study should take into account the impacts on existing irrigation and other soil and water conservation management systems, the impacts on ecosystems, the effects of disruption of natural drainage patterns, and severence of private land units.

Thank you for inviting us to participate in this process. Please keep us informed. If you have specific technical questions I will be happy to discuss them with you or your consultants. Feel free to call me at 544-9144 or write to me at the above address

Sincerely,

Dean Maxwell by KJ

Dean Maxwell, Resource Coordinator

cc Douglas D Bateman, Chairman, SL SCD, West Jordan, UT
Vanae Morris, Secretary, SL SCD, SLC, UT
Gary Briggs, District Conservationist, SCS, Midvale, UT
Jim Christensen, Director, Ag Development & Conservation, UDA, SLC, UT

State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WATER RIGHTS

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June 16, 1992

D. Lovell

Neil D. Stack
Salt Lake County Public Works Dept
2001 South State Street #N3300
Salt Lake City UT 84190-4600

RE: Jordan River Stability Study

Dear Mr. Stack:

We appreciate the opportunity to comment on the Jordan River Stability Study presently underway. We feel that this is one of the most progressive concepts in floodplain management to come along in a long time. Only two types of river management exist in developed areas. The most common is to incrementally armor the banks and beds until the river is nothing more than a heavily armored canal. The other is to allow space for natural stream processes. Natural values can be preserved within a wider corridor. Other progressive cities have developed riparian corridors which provide great benefits to their communities. These benefits include:

1. Recreational opportunities
2. Inexpensive flood control
3. Expanded flood capacity
4. Habitat for a variety of wildlife
5. Education
6. Improved water quality
7. Sediment transport (instead of mechanical removal)

Opportunities for providing such benefits to the public are lost as areas around the Jordan River are developed. To design a stream corridor, the entire system must be considered. If development continues, as in the past, then complete structural control will be inevitable. The cost of construction and maintenance will be enormous and all values will be lost. Though we entirely agree with the meander corridor concept, we have concerns about your consultants approach.

Your consultants did not provide detailed information regarding methods used to derive the preliminary corridor. Simple review of aerial photos will not tell the whole story. Since attempts to coordinate with your consultant have been unsuccessful, it is possible that some of the items listed below have been adequately covered. Our concerns are as follows:

1. The river should be categorized according to geomorphic stream type. The river's geometry should be compared to similar rivers of the same type. Similar rivers are those with approximately the same valley slope, channel slope, soil type, bed load, hydrology, entrenchment, confinement, vegetation, etc. The consultants must determine if the present condition of the river is a result of disturbance to the system, and if another geomorphic type would be "healthier" and more stable. If disturbance has altered the system, then comparison should be made to a system where the "preferred" geomorphic stream type exists. The geomorphic stream type chosen to determine the corridor dimensions can greatly influence the results.

2. The consultants should recognize that rivers are constantly changing. Sometimes rivers will change geomorphic type. This usually occurs as a result of a change in hydrology, a large flood event, or other disturbances. Often this evolutionary trend is a natural response to sediment transport, sediment abundance, aggregation, and/or degradation. The consultants must also understand that rivers have a universal tendency to achieve a state of quasi-equilibrium, where sediment and water transport are balanced in a most efficient state. Episodically, rivers are caused to change geomorphic form. The interim form is usually short lived (geologically speaking) and begins to trend back to its quasi-equilibrium form. These transient forms are usually unstable and undesirable. It would be unfortunate if the river was naively designed to exist as an unstable stream type. Usually, the quasi-equilibrium stream type is the most stable and desirable. Designers must delineate what the quasi-equilibrium type is before they can choose a corridor. In other words, if the optimum stream type will not fit into the chosen corridor, then another (probably less desirable) stream type will have to be used.

3. The most important aspects of selecting a meander corridor is understanding relationships between those factors which influence channel geometry, (in-situ valley fill, entrenchment, confinement, bedload, valley slope, vegetation, and hydrology) and the resultant meander pattern and sinuosity. The presentation given by CH2M Hill did not indicate that these relationships were used.

4. The designers must realize that parameters of stream geometry (i.e. radius of curvature, amplitude, sinuosity, etc.) are not a continuum. In other words, a river which has achieved an equilibrium state can only exist when factors of hydraulic geometry vary within a narrow range. If these factors (such as sinuosity) are minulated beyond this small range, the channel will change geomorphic type. Factors of hydraulic geometry are also related to each other. Changes in one or more factors may initiate changes in all or most of the others. Designers cannot arbitrarily choose factors of hydraulic geometry such as radius of curvature, width-depth ratio, sinuosity, etc. Proper design will require determining the quasi-equilibrium channel type and its related hydraulic geometry. With this information one can size an adequate meander corridor to accommodate this most stable channel form. To reverse the process may require forcing a dysfunctional channel within a chosen corridor. From information presented thus far, this appears to be the case.

5. Achieving the desired channel type may require expanding one area to compensate for restrictions in other areas.

6. Contrary to your consultants claim, land management practice does make a difference. Rivers will continually change, and meanders perpetually migrate, but the rate of migrations, erosion rate, channel condition, and sometime geomorphic channel type are definitely related to land use practices (such as channelizations, recreation and grazing). Impacts to stream channels and the resulting effects are understood by many experts and land managers.

7. Methods used to derive meander corridor dimensions should be made available for review. SEE COMMENTS: MIKE COLLINS (12/18/92)

8. This office suggests that Salt Lake County employ an experienced fluvial geomorphologist for assistance and review.

State regulation requires that anyone desiring to change the beds and/or banks of any natural stream must first obtain written approval from the State Engineer. Included are activities such as:

1. Channel adjustment or relocation
2. Bank stabilization
3. Bridge or utility line crossings
4. Water control structures
5. Dredging
6. Any activity adjacent to the channel which impacts the natural stream environment (such as vegetation removal) and may act to destabilize the channel.
7. Construction of any structure adjacent to or within the channel, which will require bank stabilization, or result in a change of direction, velocity, or capacity of the current during high flows.

Enclosed, please find a copy of our Administrative Rules for Stream Channel Alterations. Section 5.2 outlines items which are considered during our review process.

In places, it is already to late to design a plan for a meander corridor. In other areas, this may be the last change to preserve and plan for a valuable, functional corridor. We support and appreciate your efforts.

Sincerely,

Chad R. Gourley
Stream Alterations

CRG/sh

pc: Mike Schwinn - Corps of Engineers
Terry Green - Parks & Recreation
Mark Holden - Wildlife Resources

State of Utah
DEPARTMENT OF NATURAL RESOURCES
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November 5, 1992

Mr. Brent Beardall
Salt Lake County Public Works Department
Engineering Division
2001 South State Street #N3300
Salt Lake City, Utah 84190-4600

Subject: Jordan River Stability Study Draft Report

Dear Mr. Beardall:

Again, we would like to commend Salt Lake County for their insightful approach towards management of the Jordan River. We apologize for our late response, but we only recently received a copy of the plans. Our comments are as follows:

1. In many areas we feel the channel is entrenched and essentially lacks a flood plain. Your consultant's report states: "The bank erosion currently taking place is the result of newly degraded channel scouring out a floodplain which will form a new terrace." We feel this statement is correct, and also believe that before the stream can achieve a state of "dynamic equilibrium" the floodplain must be expanded. The question that was not answered was how far will the floodplain have to be expanded to reach an equilibrium state.

2. The draft report claims that recent activities such as regulating discharges, river straightening, dredging, channelization, diversions of stream flows, urbanization and agriculture have overwritten much of the natural geologic and geomorphic history of the "Jordan River." We concur with this statement and suggest that this is why historical data concerning the streams location migration and channel pattern should be skeptically reviewed. ? HISTORICAL = BEST AVAIL. DATA ?

3. It is not clear what criteria is used to determine channel geometry. All of the geometry reported appears suspect. Examples included:

   A. Width/Depth - why are existing width and depth measurements significantly different than flow depth/and flow top width reported for the "channel forming" flow (10-year flood, page 4-2).

   B. Given the accepted definition of meander radius of curvature, amplitude and wave length (figure 9A) it is difficult to understand how all but one (which is zero) radii of curvature is larger than the meander wavelength, and are a magnitude larger than the amplitude. This is inconsistent with dozens of researchers who have reported empirical relationships between factors of hydraulic geometry.

RESPONSE BY GA2M ?

4. Not being familiar with Neill's Hydraulic Geometry regression curves makes critical review impossible but we question if differences in geomorphic channel types are considered. In other words, an entrenched channel will have a much different width/depth ratio than a channel with an extensive floodplain. Do these curves recognize the differences? Predictions using Neill's curves seem to differ from those reported. The draft report claims that the curves predict channel width increases and slope decreases. Review of actual width verses predicted width values seems to predict the channel width will decrease. (Page 4-7) We believe the channel could become narrower if a floodplain is allowed to develop and banks are stable.

INTEGRATED FINDINGS?

5. It would suffice to say that Schumm's Silt factor is not broadly applicable. Predicted width/depth ratios range from 24 to 930. Typical values observed in nature range from about 5 in confined mountain streams to possibly 50 in broadly entrenched incised channels.

JORDAN 6% NOT A NATURAL STREAM

Schumm's meander curve is derived from theoretical and flume experiments. The curve relates flume slope (not channel slope) to sinuosity. This curve cannot be generally applied to natural streams. As slopes decrease streams tend to meander more (opposite of the curve's prediction) as slope increases sinuosity is reduced. Mountain streams with a slope of 5 percent have little sinuosity (Typical Sinuosity is 1.2 or less) valley streams with slopes of 1.0 percent or less percent typically have a sinuosity of 2 or greater. The discrepancy is created by factors not represented in the flume studies.

7. Radius of curvature predicted by the Hey Meander equation appear to be fairly reasonable (possibly a little short), but comparison with existing values show an extensive magnitude of change is required for this channel to approach a state of "dynamic equilibrium".

8. Average velocity is not the only factor controlling erosion. Velocity distribution, velocity gradients and many other factors come into play. Entrainment of fine grained sediments tend to be related more to the depth-slope product rather than velocity. Some of the areas of greatest erosion occur in areas where average velocity is low, but where flow is turbulent with reverse current (eddies).

9. Your draft report states that "the corridor represents the valley width required for the channel to re-establish a stable natural channel pattern in dynamic equilibrium." We strongly concur with this approach but question if this has truly been accomplished. The report states that "The Corridor reflects the historic and predicted sinuosity and meander amplitude for each reach". We did not find in the report a predicted equilibrium value for either amplitude or sinuosity. If these have not been determined, this would be a serious error.

10. Riprap bank stabilization was recommended at several locations. The stabilization was intended to protect utility lines and other facilities.

When riprap is placed the river will not be allowed to migrate laterally beyond that point. This act essentially narrows and limits the corridor. Adjustment should be made (where possible) to expand the corridor to preserve the width opposite the riprapped sections. Several benefits will be enjoyed if riprap is not placed along the bank or placed arching around a meander: If riprap is placed as far away from the bank as possible a natural, vegetated bank can be preserved. Minor erosion adjustment will not expose riprap. Riprap placed parallel to meander migration, or placed arching away from the stream will not freeze or meander in place while other meanders are allowed to migrate.

HOW WOULD THIS LOOK?

11. Some sections of the corridor are limited by existing urbanization. To preserve sinuosity, areas upstream and downstream should be conservatively expanded.

12. If possible dredging should be avoided. Areas where sediment deposition may be a problem could be treated by expanding the corridor in anticipation of lateral migration, and constructing off-set training dikes well away from the banks to control over-bank flooding. Armored training dikes may be required at bridges to protect roadways from meander and control flooding.

13. The corridor includes Murray City golf course. Meander migration will not likely be allowed to threaten this facility. To preserve the corridor width, the corridor should be expanded westward. Corridor width is very narrow through this section and the proposed alignment (which includes the golf course) essentially cuts the corridor in half.

14. We believe the corridor width in general is not conservative in most sections, but we also understand their constraints in some sections. In particular reach number 6 is too narrow. The width through this reach is inconsistent with expected meander patterns and sinuosity.

15. In reach number 3 the corridor is going to be narrowed by proposed stabilization and the Riverton Golf Course. The corridor should be expanded to compensate for this narrowing particularly south of, and opposite the golf course.

Sincerely,

Jim Wells for

Chad Gourley
Geologist

State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF PARKS AND RECREATION

Norman H. Bangerter
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Brent B

1 April 1992

Mr. Neil D. Stack, Asst. Director
Salt Lake County Public Works Department
2001 South State, #N3300
Salt Lake City, UT 84109-4600

Re: Proposed study along the Jordan River Parkway, Salt Lake County

Dear Mr. Stack:

Thank you for the notification in your letter of 23 March. We wish to be involved in your study--particularly the scoping aspects; i.e., what are your primary objectives and intent. We are currently performing a similar study along the Provo River in Wasatch County in an attempt to restore some of the values and utility of that channelized and misused resource. Your focus appears to be the management and protection of development along the Jordan River. While the river requires management, management of development near or contiguous to the river seems to be as much of a problem.

Millions of dollars have been wasted in dredging, straightening, rip-rapping and diverting the Jordan river in the past, rather than managing this precious resource under a more enlightened and current river management philosophy. The state has spent some 13 to 15 million dollars in purchasing lands and making improvements along the river. The Legislature has recently established the Riverway Enhancement Program to protect, acquire and improve riverway corridors throughout Utah. Our division has statutory responsibility over all boating waters and the parkway corridor up to 150 feet on either bank of the Jordan River.

The seminal study on the Jordan River, The Jordan River Parkway: An Alternative--From Liability To Asset, (circa 1971, by Urban Technology Associates) provided an outstanding alternative to dredging and structural approaches used on the Los Angeles River and in the east. Rather than deepening and diking the river to accommodate land development--thus encroaching on the natural and functional sinuosity of a river--a broader, meandering and natural flood plain or parkway corridor was established. In concert with wetlands and riparian areas, the river could be restored to an amenity that could cleanse itself, provide fish and wildlife habitat, reduce flood damages and provide a broad range of leisure opportunities along the river.

Right now, the river needs more protection than the encroaching development. Local government (Murray City and Salt Lake County) and the state have been successful in

ND 4/3

maintaining the integrity of a few reaches along the Jordan and Provo Rivers. We have excellent examples to look to. On the Provo River, we are attempting to establish a "belt of land" or corridor in which the river can naturally meander, flood and establish a healthy relationship with its surroundings while becoming an amenity to the community and improving the quality of fishery and water in the river. This too, should be an objective for the Jordan River and other rivers in the state. You may be referring to such an approach when you discuss the "channel meander/bend migration corridor" in your letter. We concur if this is your approach.

We urge you to consider looking at the river corridor as part of critical living system. It is a leisure resource for a broad variety of leisure uses: education, scientific inquiry, outdoor recreation and water reclamation. It is a major segment of the state trail system that extends from Great Salt Lake, along the Jordan to Utah Lake, around Utah Lake up the Provo River to Deer Creek, Jordanelle, to Echo Reservoir and back down the Weber River to Great Salt Lake.

Properly managed, the Jordan River corridor/parkway will mitigate flood damage, improve water quality, protect cultural resources and wildlife/fishery values, improve property values, and provide important outdoor recreational opportunities for our citizens. Public access to the river is critical, and is a major objective and requirement of our State Comprehensive Outdoor Recreation Plan (SCORP) and Jordan River Master Plan (circa, 1979).

Development should conform to the needs of the river corridor, not visa-versa. Dredging and structural management/stabilization of the river should be a rare and last resort. We will want to be involved because of our statutory, ownership and management responsibilities along the river.

Respectfully Submitted,

Harold E. Green, Jr., AICP, Coordinator
Comprehensive Planning and Policy

cc: Milo Barney, Deputy Director, DNR
Chad Gourley, Division of Water Rights

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF PARKS AND RECREATION

Norman H. Bangerter
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D. Loxell

June 8, 1992

Salt Lake County Public Works Department
Engineering Division
Attn: Mr. Neil D. Stack, P.E.
2001 South State Street, #N3300
Salt Lake City, UT 84190-4600

RE: **Jordan River Stability Study--Meander Belt width and degree of sinuosity**

Dear Mr. Stack:

As we noted in your last meeting, we are currently completing a field analysis and sinuosity study of the Provo River between Deer Creek and Jordanelle Reservoirs. The objectives of the study are to improve the fishery, slow velocities and erosion, enhance shoreline vegetation, provide protection from livestock grazing, restore aesthetic values, enhance property values, reduce losses from flood episodes, enhance wildlife habitat, and generally improve water quality along the river. These seem to be worthy objectives for any river or stream--particularly the Jordan River. The objectives are those of the state Comprehensive Outdoor Recreation Plan and those of the Jordan and Provo River Parkway as established by state law in the 70's.

Restoring or accommodating the natural meanders of the river will require the purchase of easements, zoning, Parkway setback enforcement, fee purchase and other means to protect and restore the important functions and aesthetics of the Jordan River. It has been "straightened and spoiled" on several occasions at considerable and unnecessary cost to the citizens of the state. We would like to preserve and rehabilitate a river, not develop a dysfunctional, ugly and armored canal through the center of the county. This corridor also includes precious wetlands--many of which are being, or have been effectively drained by the down-cutting high velocity river flows. These too, must be considered in the river system. Our objective is to use natural approaches and vegetation, and limit structural approaches such as culverts, rip-rap and dredging. We feel this is the enlightened approach to river enhancement and management, and should be adopted by the county. The belt width is a calculated parameter that should probably vary from 500 to 800 feet--and probably increase the length (river miles) by 8% to 12%. Any development along the river should be held back a minium of 150 feet from the bank of the river or more--and include old ox bows, riparian and emergent wetlands when they occur.

We would like to be apprised of your preliminary alignment and recommendations.

Sincerely,

Harold E. Green, Jr., AICP Coordinator
Comprehensive Planning and Policy

cc: Mr. Mark Holden, DWR

State of Utah
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19 October 1992

Mr. Brent Beardall
Salt Lake County Public Works Department
Engineering Division
2001 South State, #N3300
Salt Lake City, Utah 84190-4600

Re: Division response to the **Jordan River Stability Study draft**

Dear Mr. Beardall:

I received a "reminder call" from Mr. John Fuller of CH2M Hill today. I had been ill twice in the last two weeks and had not seen the draft report and meeting notes that had been forwarded to our office. I apologize for the delay. I read through the "meeting notes", Executive Summary, Summary of Prioritized Recommended Management & Maintenance Alternatives and portions of the Jordan River Stability Study: Draft Report. The objective of "improving the river" and restoring, non-structurally for the most part, the river to a more natural condition, is a meritorious objective we support. This is consistent with the 1992 Utah State Comprehensive Outdoor Recreation Plan, and the statutory objectives of the state River Enhancement Act. The study does an efficient job of focusing on the "mechanical and geomorphological" processes and design response to mitigate damaging fluvial erosion. We agree that the river should be allowed to return to a state of dynamic equilibrium: structural intervention should be kept to a minimum.

Our experience has seen private land owners desiring to maximize use of their property by extraordinary means of rip rap and structural containment to the debilitation of other public and private property above and below--or across stream. A corridor should be purchased or dedicated by property owners allowing the river to meander. The same corridor should protect or enhance wetlands, wildlife habitat and fisheries. The 150 foot parkway delimitation helps, but the flood plain is better. **We would recommend several test sections where artificial geometry or straight-a-ways could be reconstructed or reconfigured to demonstrate the efficacy of allowing the river to meander and to accelerate the benefits of restored natural meanders to the river.**

The county has accomplished significant study of contiguous wetland areas that should be preserved or conserved along the river. Recommendations from those studies should be incorporated or overlaid into the meander design where practical. This would allow the wetlands to be used to slow velocities, cleanse the water by capturing sediments and pollutants. There are significant acquisitions of these wetlands that are proposed under the "CUP Completion Act" or subsequent legislation that will be submitted in January, 1993 if the "completion bill" is not signed by the President in the next few days.

Centralized control was the objective of the original "Parkway Authority". This overview has been expanded statewide to all rivers subject to damaging floods near high concentrations of population. The River Enhancement Board focuses primarily on leisure acquisitions and development projects along these river systems. It does not address effectively, the problems associated with land development and conflicting land use proposals. Perhaps your suggested commission or council could speed protection of the corridor in concert with the CUP Completion Act Commission and the River Enhancement Board. So much damage was done to the river by the dredging of the 1950's and again in the early 1980's that could have accomplished what we are now proposing to do at enormous cost. We must keep development away from the river corridor and preserve this precious resource. If we can muster the funds--even utilizing flood control monies--we can demonstrate the advantages of constructing natural meanders and associated wildlife and recreation features along the Jordan River along reach 6 and other sites, in association with private or public development on contiguous lands outside the flood plain.

The state is at a similar juncture on the Provo River corridor in Wasatch County. The objectives are to "restore the quality of the river" while accommodating flows that will not destroy the fishery or cause flood damage. The study is perhaps a better mix of "aesthetics" as well as mechanics and hydrology. Here, most of the river is too rip-rapped and controlled. Costs will be significant to move the river into "natural" but man-made sinuosity channels. Here too, funding will not allow us to do all that should be done to protect and enhance this wonderful river resource. Buying or receiving the belt width necessary is an important and perhaps most critical step. But some improvement..beyond letting the river do it's thing..should be sought and accomplished. Your forthcoming cost estimates will be interesting.

We strongly recommend that drop or control structures be carefully designed to accommodate on-river navigation and mitigate any major boat or rafting hazards. The division also reserves it's statutory right to review the design and location of any structures on or immediate to the river--particularly those affecting navigation on the Jordan River.

Respectfully Submitted,

Harold E. Green, Jr., AICP, Coordinator
Comprehensive Planning and Policy.

cc: Milo Barney, Deputy Director DNR
Utah RDCC
Mr. John Fuller, CH2M Hill

State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WILDLIFE RESOURCES

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June 30, 1992

Mr. Neil D. Stack, P.E.
Salt Lake County Public Works Department
2001 South State Street, #N3300
Salt Lake City, Utah 84190-4600

Subject: Jordan River Meander/Stability Study

Dear Mr. Stack:

We appreciate the opportunity to become involved in the planning process currently underway along the Jordan River corridor. We are pleased to see Salt Lake County initiate a study which will address and define some of the parameters needed to develop, restore and maintain a healthier, more stable and more functional Jordan River floodplain corridor. Too often in the past, flood control and/or zoning efforts have emphasized structural control as the preferred method of accommodating developments along river corridors in the state. Heavily-armored, canal-like rivers have resulted, with enormous attendant initial costs and annual maintenance problems and costs. We would like to see this process come to an end where feasible alternatives exist.

We believe the study being completed now will demonstrate that feasible alternatives do still exist along much of the Jordan River. We encourage Salt Lake County to adopt recommendations that would allow for creation of a meander corridor that could accommodate the needs of the river, provide open space and greenbelt opportunities for compatible recreational and educational uses.

We would like to point out that there may be several different funding sources available to accomplish wildlife, wetland, and fishery mitigation and enhancement projects along Jordan River during the 1990s, pending passage of the Central Utah Project Completion Act currently before a Congressional conference committee. We encourage Salt Lake County to become familiar with the opportunities that would be available if the act passes, because many objectives of the non-structural approach to Jordan River meander corridor management might be compatible with those projects.

We also provide some specific comments regarding the study. Because we have had only cursory opportunity to be involved with the study to this point, the county and consultants may have since considered some of these factors that we are not aware of.

1. Determination of an appropriate meander corridor should involve many disciplines. Perhaps most important is to retain a qualified and experienced fluvial geomorphologist to evaluate the needs of Jordan River. Specifically, relationships between factors which influence channel geometry (including hydrology, in-situ soils, valley slope, past efforts to "control" the river and resultant entrenchments and confinements) must be understood and considered. Other disciplines must be involved to meet additional goals of accommodating recreational and educational uses, wetlands, and fish and wildlife habitat in the corridor. The draft proposed meander corridor did not reflect this broad mix of considerations.

2. We were concerned by statements made at the agency meeting which indicated a lack of appreciation for the importance of regulating land uses along Jordan River, or any river system. Our experience has shown that riparian vegetation is critical to maintaining channel stability. Even in areas with fine-grained soils, vegetation can appreciably reduce erosion. If this effort is to succeed, it will be important to recognize the importance of maintaining and restoring riparian vegetation, and the need to manage adjacent lands to allow for healthy riparian areas.

3. We would appreciate the opportunity to become more involved in the study and hopefully in implementation of a program to manage the Jordan River corridor. We also advise that the Utah Division of State Lands and Forestry administers the bed of the Jordan River and should be involved in this project.

Thank you for the opportunity to comment on the Jordan River Meander/Stability study. Please keep our Division apprised of all future meetings where we can participate or provide assistance.

Sincerely,

Acting Director

Timothy H. Provan
Director

cc: Milo Barney, DNR
Dick Mitchell, Director, SL&F
Terry Green, SP&R
Chad Gourley, Water Rights

State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF WILDLIFE RESOURCES

Norman H. Bangerter
Governor
Dee C. Hansen
Executive Director
Timothy H. Provan
Division Director

1596 West North Temple
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October 26, 1992

Mr. Brent Beardall
Salt Lake County Public Works Department
Engineering Division
2001 South State Street #N3300
Salt Lake City, Utah 84190-4600

Subject: Jordan River Stability Study Draft Report

Dear Mr. Beardall:

We have reviewed the Jordan River Stability Study Draft Report and have the following comments.

First, we appreciate the County's foresight in initiating this study. Development pressures along the Jordan River seem to be increasing. Opportunities for an approach that allows for a naturally functioning river are lost each day a new structure is built. We believe the cost of creating a static, armored, canal-like river is great, both in terms of dollars to maintain it, and in the natural values, including fish and wildlife, that are lost. The Division of Wildlife Resources supports the concept of a meander corridor to allow natural river processes to take place.

We realize the Glossary has not been completed in this draft form. We suggest that all of the characteristics identified in the tables and text be precisely defined. For example, are channel width and channel depth measured from the high water mark?

Both methods used to predict river stability have weaknesses, as described in the draft report. We agree that it is wise to not rely too heavily on any one method or equation. However, we have concerns about the reliability of the models that were used and how the results are interpreted.

The results of several of the analytical equations appear unrealistic in terms of what we see in nature and would expect to see as the Jordan River adjusts. Specific comments are as follows:

1) Is it possible to have a meander radius that is larger than the meander wave length (Table 4.2)?

2) How can the river achieve a width to depth ratio of 930 (Table 4.5)? With a depth of 4 feet, the river would be 3720 feet wide! The proposed meander corridor is not even that wide.

3) A comparison of widths in table 4.3 and 4.4 shows the width of the channel is predicted to decrease, yet the text says Neill's curves predict width increases. Is it possible for all three, width, depth, and slope to decrease as shown in the table? The existing channel is probably over wide; we would expect it to become more narrow as it stabilizes.

?

4) Why does predicted meander wavelength vary by nearly an order of magnitude (Table 4.6)? Most natural systems seem more uniform. WRONG TABLE

5) Table 4.9 has two columns titled "Meander Wave Length." We assume the first column should be "Meander Amplitude." How do you measure a meander on a straightened river and what value does it have for predicting stability?

6) The discussion of Table 4.9 indicates channels are stable when the ratio of meander amplitude to meander wavelength is between 0.5 and 1.5, yet an "unstable" ratio of 0.4 is used to make predictions. Meander amplitude predictions should be carefully evaluated as they may be the most important attribute in determining the width needed for the meander corridor.

SINUOSITY IS RESTRICTED OR CONFINED BY SLOPE.

7) Figure 9B, Schumm's Meander Curve, is confusing. Is the model for channel slope or valley slope? Channel slope is not independent of sinuosity. A stream becomes more sinuous to reduce channel slope. What we see in nature is opposite of the curve. High gradient mountain streams are less sinuous than low gradient meadow streams. How was this curve developed? How is it used in this report?

These results seem to indicate that some of the models used are not appropriate for the Jordan River system, or the inputs to the models are in error. The assumptions of the models are not identified in the text. If the existing, unstable characteristics of the river are used as input to the model, it will skew the resulting predictions. Perhaps input data can be inferred from the more stable historic river characteristics. THIS WAS INCLUDED!

While we question the results of the analytical analysis, we also question whether historical data is indeed the "most reliable gauge of channel stability" as described on page 4-23. Even the pre-1950's channel was surely modified, and watershed conditions have changed significantly. We believe analytical analysis using more appropriate models, input data from a stable Jordan River, and a

SUCH AS?

DOESN'T EXIST

sensitivity to the reasonableness of the results can provide better information.

The process of stream evolution and floodplain development is missing from the "Geomorphic Approach" section. The common and well documented process of rapid downcutting following straightening or other disturbance is addressed. However, the subsequent process of channel widening and formation of a new flood plain is not adequately addressed. It is most important that the readers understand that the channel will continue to erode and be unstable until a new floodplain wide enough for the river to achieve dynamic equilibrium is established. This is the key question that should be addressed by this study--how wide will the new floodplain be? The proposed meander corridor should correspond to the predicted floodplain width. FLOODPLAIN PREDICTION BASED ON MODELS TOO!

The risk of defining the meander corridor too narrowly is that the river would then not be allowed to scour an adequate floodplain. The result will be exactly what you are trying to avoid with this study: perpetually degraded river conditions and costly maintenance activities. Based solely on observation and intuition, the meander corridor seems too narrow in places, particularly in section 4. 106-12600 SOUTH.

In general, we agree with the proposed management strategy. Specifically:

1) We fully support the meander corridor concept. Allowing the river to find a dynamic equilibrium is probably the only way to avoid extensive armoring of the river channel. As discussed above, we think some refinement of the analysis of the meander corridor is needed.

2) In places, riprap will be necessary to protect existing structures. Where riprap is recommended, figure 13 shows it at the rivers edge, well inside the delineated meander corridor. Shouldn't the protection be consistent with the meander corridor line? We recommend the riprap and channel profile design adopted in the Nonpoint Source Management Plan for the Jordan River.

3) As you are aware, there have been some problems in the past with periodic flushing of backwater deposition. The Division is currently working with the County and others on guidelines for the appropriate use of this technique.

4) We agree with the discussion on page 5-11 that grade controls should be designed to minimize impacts to fish passage and river recreation. The State Engineer's Office has a standard drop structure design in its "Administrative Rules for Stream Channel Alterations." Flat, concrete structures that are recommended in the report often cause bank erosion and channel widening upstream of the structure.

Looking toward the future, we recommend a strong education/public information program be initiated, along with aggressive enforcement of permits and zoning requirements, to preserve the meander corridor for the river. In addition, the County should pursue management agreements with the appropriate local, state and federally agencies that will bind everyone to a consistent management philosophy.

We appreciate the opportunity to review and comment on this proposal. Salt Lake County is commended for its willingness to consider this non-traditional approach to floodplain management. It is a sound and realistic management approach.

Sincerely,

Darrell H. Fish

Timothy Provan
Director

cc: Craig Bagley, CH2MHill
Chad Gourley, State Engineer's Office
W.D. Robinson, Department of Agriculture

State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF STATE LANDS AND FORESTRY

Norman H. Bangerter, Governor
Dee C. Hansen, Executive Director
Richard J. Mitchell, Division Director

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801-355-0922 (Fax)

October 16, 1992

Mr. Neil D. Stack, Director
Engineering Division
Salt Lake County Public Works Department
2001 South State Street #N3300
Salt Lake City, Utah 84190-4600

Dear Mr. Stack:

Thank you for the opportunity to respond to the draft Jordan River Stability Study.

The main concerns of this agency relate to the ownership, management and permitting of activities in the Jordan River corridor. The Public Trust Doctrine, under which the beds of all navigable bodies of water are managed, places many responsibilities on the State of Utah. As trustee, the State must assure the river bed - past, present and future - is managed for the good of the public. This project appears to have great merit, and we will be happy to participate in proactive river management strategies.

The State of Utah claims ownership of the lands beneath the river, where it now runs, as well as the ox-bows of the old riverbeds, except as resulted from the river channelization accomplished by the Salt Lake County for flood control. Separate agreements may stipulate state ownership of the present river bed.
We wonder if there are stretches where channelization has brought ownership into question.

The draft also mentions a Jordan River Management Council. As noted in the draft, several political entities have varying degrees of jurisdiction over development near the river. Various boards and agencies of State Government also have specific management charges by statutory and other mandates on the Jordan. These include, among others, the State Engineer, Water Resources, Wildlife Resources, Parks and Recreation, Health, Environmental Quality and State Lands and Forestry. Policies of these agencies need to be taken onto account to assure full cooperation is obtainable as the plan goes forward.

Finally, with respect to coordination of permitting actions, State law requires review by the Resource Development Coordinating Committee (RDCC). This generally involves a 45 day review period. You may want to consider submitting the final study to RDCC for a single 45 day review, thus eliminating the need for each of the permitting agencies running their individual permitting actions through RDCC.

Sincerely,

Scott C. Flandro
SOVEREIGN LANDS COORDINATOR

State of Utah
DEPARTMENT OF PUBLIC SAFETY
DIVISION OF COMPREHENSIVE EMERGENCY MANAGEMENT

Norman H. Bangerter
Governor
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Commissioner
Brant L. Johnson
Deputy Commissioner

State Office Building, Room 1110
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(801) 538-3400
(801) 538-3770 FAX Line

Lorayne Frank
Director

June 23, 1992

Mr. Neil D. Stack, P.E.
Assistant Director
Salt Lake County Public Works Department
2001 South State Street #N3300
Salt Lake City, Utah 84190-4600

Dear Mr. Stack:

The Division of Comprehensive Emergency Management, Flood Loss Reduction Section, would like to submit the following comments on the Jordan River study currently being performed by CH2M Hill. As the administrators of the National Flood Insurance Program (NFIP) for the State of Utah we are committed to assuring that NFIP standards and concerns are adequately addressed by such projects.

The meander corridor mapping of the Jordan River would qualify for mapping credit within the Community Rating System. This credit would be available to Salt Lake County as well as other jurisdictions along the river that participate in the NFIP and make application to the Community Rating System. There are also possibilities for Community Rating System credits if open space preservation is incorporated into the master plan. These types of credits would help all of the participating communities within the project area reduce the cost of flood insurance for policy holders within their communities.

Public Safety is also a prime concern of our Division, therefore we would not be opposed to the limited use of structural mitigation measures, such as gabion structures, where there is no other alternative for protecting areas subject to unique erosion situations. However, this is not to detract from our position that the natural and historical benefits of floodplains should be preserved to the greatest extent possible.

The opportunity to preserve and enhance an urban river corridor such as the Jordan River will provide many benefits to present and future residents of Salt Lake County. I look forward to working with you on this project.

Sincerely,

Fred

Dr. Fred E. May
NFIP Program Manager

FEM/mm
cc:Craig Bagley, CH2M Hill

DEPARTMENT OF THE ARMY
U.S. ARMY ENGINEER DISTRICT, SACRAMENTO
CORPS OF ENGINEERS
1325 J STREET
SACRAMENTO, CALIFORNIA 95814-2922

REPLY TO
ATTENTION OF

October 30, 1992

Utah Regulatory Office (9250293)

Brent Beardall
Salt Lake County Public Works Department
Engineering Division
2001 South State #N3300
Salt Lake City, Utah 84190-4600

Dear Mr. Beardall:

We have reviewed the Executive Summary of the Jordan River Stability Study. In general, we are pleased with the approach being taken to establish a corridor in which the river will be allowed to meander and that consideration is being given to installing grade control structures as a means to arrest bed degradation.

Some of the corridor widths are very narrow and we would like to know what criteria were used to establish those widths. It is obvious that in areas of existing development the river must be confined. However, we note in some undeveloped areas the corridor width is quite narrow and would like to know the reason for this (i.e., is there some geologic control that would limit the channel's ability to meander in these areas thereby allowing closer encroachment by development to the channel). For example, Reach 6 has a meander corridor that, in some areas, is much narrower than the extent of the floodplain. The recommendation would be to restrict development within the identified, narrow corridor but allow development in the rest of the floodplain. Efforts should be made to preserve the floodplain in its entirety where it currently remains an integral part of the river. Encouraging development in portions of active floodplain may set up conditions to protect such investments in the future as the river continues to migrate and meander. From our standpoint, we cannot guarantee that a Department of the Army Permit would be issued to protect facilities that have been built in a flood prone area.

Some treatments proposed in the stability study would allow the river to continue its pattern of erosion and channel change as a means of letting the river seek its own meander pattern and stable slope. Such a passive approach may not be suitable for some sections and the river may not reach a point of equilibrium without a more aggressive program. The plan should consider the following as a means of assisting in the healing process:

1. Re-stucturing channel sinuosity, geometry and slope to approximate representative reaches that are still in a fairly natural state;

2. Re-sloping eroding, vertical banks to a more stable slope and aggressively revegetating the sites;

3. Restricting grazing. Grazing has not been addressed and this, in our opinion, is a major oversite. Grazing has had, and continues to have, a significant effect on the river's ability to become stabilized. Several reaches identified in the stability study are grazed and the effect of unrestricted grazing is most evident in the condition of the riparian community and the condition of the banks. Without attention being given to the establishment of a healthy riparian community and the role grazing plays in impeding that establishment, the river will not likely heal on its own.

We appreciate the opportunity to review and comment on the proposal. Some of the treatments described may require a Department of the Army Permit. Mr. Michael Schwinn, of my staff, is available to address any questions you might have in regards to our comments or the permitting process. He can be reached at 1403 South, 600 West, Suite A, Bountiful, Utah 84010 or telephone (801)295-8380.

Sincerely,

B Carter

Brooks Carter
Chief, Utah Regulatory Office

State of Utah
DEPARTMENT OF AGRICULTURE
GOVERNOR'S CABINET

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October 26, 1992

Brent Beardall
Salt Lake County Engineering Division
2001 South State Street
Salt Lake City, UT 84190

RE: Jordan River Stability Study

Dear Brent,

I am enthused about the concepts and understanding that the County has shown in developing the Jordan River Stability Study. I have several comments (Please understand that these are suggestions, and that they in no way should be taken as criticism or as reason to delay the implementation of these very important precepts and management approaches for the Jordan River):

- First paragraph of the Executive Summary: I would place the words "to guide" into the second sentence: "...to manage and protect the river, as well as *to guide* development along the river."

- Fourth paragraph of the Executive Summary, fourth "bulleted" subparagraph: I would revise the last sentence in the following manner: "Many of the channel changes experienced during the 1980s floods *and many others that are currently ongoing are* the result of the channel re-establishing its *most efficient sediment transport configuration.*"

- Fifth paragraph with recommended management alternatives summary, "entire study area":

• Monitoring programs should specify why they are being monitored, i.e. bridge protection and stability.

• After the sentence "Restrict development within meander corridor.", I would add: *"In some areas, a wider corridor would be appropriate and would gain stream stability and other benefits. The wider configurations are not specified because existing data is not sufficient to support zoning restrictions. This option should still be made available to the land owner or land management decision maker."*

• I would modify this second sentence and make it third in priority: "Allow bank erosion to occur within *the* meander corridor until *appropriate* sinuosity is re-established.

• I would modify the third sentence and make it second in priority: *Vegetation establishment and management should be pursued along the entire river. Wherever meander corridor boundaries will eventually be threatened, begin to grow bands of appropriate vegetation to act as new streambanks. Regrade channel banks only where the stream corridor is confined in a width that is less than the calculated stabile meander width.*

• What are the "objectives of the meander corridor" referred to in the last sentence? From reading the executive summary, I would say they are:

- river wide management and protection
- river stability to protect present and future development
- cost effectiveness
- multi-value management and protection

I would make a guess at what these additional values are:

- water quality
- flood control
- fisheries and wildlife
- recreation
- aesthetics

I feel it is critical that a coordinated approach is made to develop a parkway management plan for the entire river. This study is an invaluable first step in the process. Perhaps it would be appropriate here to identify the urgent need to consolidate efforts such as what the Salt Lake County Council of Governments is pursuing. In this process, additional aspects of the corridor could be addressed such as FEMA floodplain management input and wetland protection.

- Recommended management alternatives summary, Reach 3:

• I would rewrite the alternatives in order to show strictly what needs to be accomplished, not a defined alternative. For most of the treatments, there are a variety of approaches that may successfully provide what is needed. For example, "Protect sewer line in overbank area upstream of 12600 South *or* relocate the sewer line." I wouldn't specify riprap. There may be another method preferred by the landowner or by others involved in making the decision. These methods may include "bio-engineering" or simply aggressive vegetation establishment and management.

• Another example: "Stabilize bridge approach section at 12600 South." Alternatives may be the same as above, but the preferred alternative should be selected by the land owner or land management decision maker.

- Recommended management alternatives summary, Reach 4:

• Another example: "Prevent headcut migration at 10600 South." The preferable alternative is most likely a grade control structure downstream of the bridge. Various aspects of grade control location and configuration should be considered. This would immediately protect the bridge and halt the headcut. However, if the philosophy of meander system re-establishment is extremely successful (we hope it will be), the grade change may be more than that accounted for by the meander re-establishment (this would occur in a long term depositional regime with at least one complete cycle of the stream meandering back and forth within its corridor). If so, the river may eventually "drown out" or lessen the grade change at the grade control structure. These characteristics of the dynamics of the river should be considered.

- Recommended management alternatives summary, Reach 7:

• Bank protection on the west side of the stream south of 5400 South appears to be very appropriate in order to protect residential property. However, the upper or southern end of the protection precisely follows the existing bank. I would suggest that the protection be continued in a bend to the southwest (not turned to the south along the existing bank) in order to accommodate future adjustments of the stream into its proposed meander corridor. This same concern is applicable for the bank protection proposed for the power substation in Reach 8. The protection here should probably be continued straight west or perhaps along the upper bank contour.

- Recommended management alternatives summary, Reach 8:

• Dredging at the Big Cottonwood Creek confluence would be inappropriate and ill-advised! A substantial width of corridor is available for the river to react to the sediment influx. As point bars develop from this material, lateral adjustments of the river will create and accelerate meanders both downstream and upstream. This is essentially the entire purpose of the corridor and its management scheme. To dredge these depositions appear to me to be contrary to the objectives. The better approach would be to monitor the speed and extent of the meander development and prepare for bank stabilization at either the corridor boundaries or at locations outside the boundary agreed upon by the land owner or land management decision maker.

- Is there active headcutting at each bridge? If so, grade control treatments may be very appropriate. This is very well demonstrated at 6400 South. However, at 3900 South, a very sinuous system is evident below the bridge, and immediately below, a point bar is developing. This does not occur in headcutting situations. I feel that bridge integrity at this location would more likely be compromised by reductions in flow capacity and by erosion on the opposite bank of the point bar. I feel this particular place would definitely benefit from bank stabilization to ensure that undercutting the bridge will not occur, and would possibly benefit from dredging (only immediately downstream along the point bar) to maintain flow capacity. To put in grade control would aggravate meander pressure upstream of the bridge.

- Page 5-6 of the Draft Report dated September 1992: I would rename "non-structural methods" and call them "Development Management methods.

- Page 5-7: I would describe a "vegetation introduction and management" alternative that may also replace "dredging and installation of piece-meal bank protection". The advantages are very similar to the "do-nothing" alternative ("dormant stock planting" of willows and cottonwood, broadcast seeding, and grazing management are very low cost), and the disadvantages are similar (however, well established lines of vegetation at the corridor boundaries would slow "bank erosion and long-term degradation").

"Meander re-establishment" should be one of the "engineered improvements" listed as a structural method.

I don't understand why re-vegetation is a structural method, unless materials are used in a "bio-engineering" approach (i.e. "wattling").

- Page 5-8: I would rewrite the second paragraph: ... Straightening *can be a long term solution, but* it requires *inordinately* high capital investment. It *also* may cause bank erosion *upstream and downstream,* increased flood peaks, decreased water quality, and destruction of...for the Jordan River.

I would rewrite the first sentence of the fourth paragraph: "Dredging may be required to maintain *engineered* channel geometry and *capacities at bridge approaches (mostly due to deposition above grade control structures or flow restrictions)* and in *other* reaches where changes are unacceptable."

As I indicated above, dredging would only be appropriate in areas confined by development or by bank stabilization.

- Page 5-9: I would recommend construction of offset levees only at the outside borders of the meander corridor (or beyond as is determined appropriate by the landowner or decision-maker). This would allow maximum use of the corridor for flood retention and capacity, wetland protection, and related benefits. If lateral migration of the channel threatens these levees, then bank stabilization would be warranted. If long term aggradation threatens to overtop these levees, then two options would be (1) to raise the levees, or (2) to constrict the river only until it downcuts slightly, thereby preserving its own flood capacity. WETLAND CONFLICTS?

- Page 5-10: I am not familiar with "meander vanes" that are a "series of jetties constructed on the outside of meander bends (that) are aligned slightly in the downstream direction". I am very familiar with what I suppose are very similar jetties that are aligned slightly in the upstream direction. They are constructed to slope downward as they enter the stream so that flow which runs over them is "pulled" back toward the middle of the channel. They have proven very effective on the Weber River. My understanding is that "construction labor intensity" is not much more for these types of jetties than for riprap placement. As I indicated above, bank regrading should be utilized only in confined areas. On Chalk Creek, the steep banks where the series of jetties were placed regraded themselves and re-vegetation efforts were very successful. I highly recommend "upstream pointed" meander vanes constructed in this fashion as an alternative for stability management on the outside bends of the Jordan River, especially in three situations: (1) where development is threatened, (2) where lateral adjustments are extensive enough to provide an appropriate meander sinuosity, (3) where the meander corridor boundary is threatened and further adjustment is undesirable.

- Page 5-11: Two overall benefits are provided by a well functioning, vegetated meandering stream system: (1) The stream maintains a well functioning, single channel conveyance for the water it carries (especially during floods); (2) available sediment and bedload are reduced but more importantly can travel through the system. Lower flood flow velocities caused by vegetation on the upper banks is inconsequential in comparison to the benefits provided.

There are a full range of costs associated with vegetation introduction and management. "Dormant stock planting or simple broadcast seeding are very inexpensive where a riparian "wildflower carpet" with a sprinkling system may exemplify the other extreme.

Grade control should only be considered where other approaches will not work. If riprapped or otherwise stabilized banks are threatened, either the bank stabilization should be improved to where it will halt the lateral migration or the meander corridor should be widened. If neither option is available, then grade control is a possibility. In a stream like the Jordan River, "sill" types of grade control structures should be avoided. At the minimum, a "V-notch" structure (with the center "pointing" upstream) should be used.

- Page 5-12: The meander corridor boundaries do not appear to me to be wide enough to allow the river to "re-establish its pre-channelization sinuosity and meander amplitude" or a stabile meander configuration. This appears especially so in Reach 6. As I indicated above, the option of widening should be made available to the landowner or decision-maker. Flood capacity, wetland issues, and other concerns should be incorporated. I feel that every option to increase this width should be pursued, in spite of the fact that the river is entrenched and may not redevelop and occupy its full corridor for a while (according to the model, over 100 years).

- Page 5-13: I'm not sure how 1990 was determined as the flowline elevation to dredge to. If stream dynamics and flood function allow, higher elevations should be allowed.

- I am the coordinator of a group called the "STREAM Team". One effort of this group is to develop a methodology which determines a ranked list of "Best Management Practices" to treat identified stream and riparian non-point source water quality problems based upon geomorphic stream type. I would be happy to show you this methodology.

I very much appreciate this opportunity for comment. I feel that this study is a tremendous improvement over past approaches to manage the Jordan River. I look forward to my continued participation. If you have any questions, my phone number is 538-7173.

Sincerely,

W.D. Robinson, Environmental Quality Specialist
Development and Conservation Division

cc: Craig Bagley, CH2M Hill
Steve Jensen, Salt Lake County Commission Staff

West Valley City

PUBLIC WORKS

June 17, 1992

Neil D. Stack, P.E., Assistant Director
Salt Lake County Public Works Department
Engineering Division
2001 S. State #N3300
SLC, UT 84190-4600

SUBJECT: JORDAN RIVER STABILITY STUDY

Dear Mr. Stack:

In response to your request for information, I have enclosed a copy of both the zoning and master plan maps for the West Valley City area, along with copies of our flood plain management ordinances and regulations. You have also requested our written comments regarding the concept of using the Meander Corridor as a boundary for river management and maintenance, and how we would like to see it implemented along the Jordan River. Due to the short time frame and lack of detailed information, this plan was not presented to our Planning Commission or City Council. However, it was presented to our Staff Technical Advisory Committee, which produced the following comments:

1) Our staff feels that the proposed Meander Study should be incorporated in the City's plans for future development along the Jordan River.

2) As much as possible, maintenance and stabilization of the river should remain within its natural channel.

3) Any development within the Meander floodway should be restricted to those developments which would have little or no impact during the flood event. These type of developments should be restricted to low impact parkways and trailheads.

4) As the Staff Technical Committee we would encourage the Planning Commission and City Council to further restrict and define additional flood plain management ordinances and regulations as we anticipate will be suggested in the final draft of the Jordan River Stability Study.

I hope this information will be beneficial in aiding you to complete this study. We thank you for including us with your request for comments. If you need any additional information, or have any other concerns, please feel free to contact me.

Sincerely,

G. Trace Robinson, P.E.
Assistant City Engineer

GTR/kmd

Enclosures

cc: John Patterson, City Manager
Russ Willardson, Public Works Director
Joe Moore, Community Development Director
John Janson, Assistant Community Development Director
Craig Bagley, CHM2HILL
File

West Valley City

PUBLIC WORKS

October 14, 1992

Brent Beardall
Salt Lake County Public Works Department
Engineering Division
2001 S. State #N3300
SLC, UT 84190-4600

Dear Brent:

I have reviewed a copy of the executive summary, and the copy of the draft report sent to me by Craig Bagley of CH2MHILL regarding the Jordan River Stability Study. After reviewing the items which pertained to West Valley City, I have no comments to be included in the final report.

I greatly appreciate the amount of work which has been done by both you and your consultant to the complete a project of this magnitude. I would also like to thank you for allowing us to be involved throughout the various stages of this study.

Sincerely,

G. Trace Robinson, P.E.
Deputy City Engineer

cc: Neil Stack, Salt Lake County Engineering
Craig Bagley, CH2MHILL
File

3600 Constitution Blvd. West Valley City, Utah 84119-3720 Phone: (801) 966-3600 FAX: (801) 966-8455

West Valley City

PUBLIC WORKS

BB

October 14, 1992

Brent Beardall
Salt Lake County Public Works Department
Engineering Division
2001 S. State #N3300
SLC, UT 84190-4600

Dear Brent:

I have reviewed a copy of the executive summary, and the copy of the draft report sent to me by Craig Bagley of CH2MHILL regarding the Jordan River Stability Study. After reviewing the items which pertained to West Valley City, I have no comments to be included in the final report.

I greatly appreciate the amount of work which has been done by both you and your consultant to the complete a project of this magnitude. I would also like to thank you for allowing us to be involved throughout the various stages of this study.

Sincerely,

G. Trace Rob

G. Trace Robinson, P.E.
Deputy City Engineer

cc: Neil Stack, Salt Lake County Engineering
Craig Bagley, CH2MHILL
File

3600 Constitution Blvd. West Valley City, Utah 84119-3720 Phone: (801) 966-3600 FAX: (801) 966-8455

THE HUB OF SALT LAKE COUNTY — MURRAY CITY

MURRAY CITY CORPORATION

Charles D. Clay, P.E.
City Engineer
Director of Public Works
264-2607

October 19, 1992

Mr. Neil Stack
Engineering Director
SALT LAKE COUNTY
Public Works Department
2001 South State
Salt Lake City, UT 84190-1300

Dear Mr. Stack:

In regards to the Jordan River meander line proposal, Murray City has several concerns:

First, elevation control structures are proposed at I-215, 5400 South, 4800 South, and 4500 South. This causes two concerns:

A. Murray City plans to use the additional height to provide a trail under the structures. If the control is placed too high there will not be the head room necessary to allow pedestrian traffic and riderless horses under the structure.

B. Canoes are at present being launched north of Winchester and are allowed north to 5400 South. With control structures canoes could not be floated the entire distance.

Secondly, Reach No. 7 shows allowable erosion the entire length. Murray City is, at the present time, investing heavily in the Jordan River Parkway. Since Murray City will spend about one million dollars in federal, state, and local money on the parkway. It is not prudent to let the river meander anywhere it pleases. Murray is protecting the old existing Oxbows, and it would be possible to reestablish old existing channels; a more definitive meander line should be established.

Thank you for your consideration of these matters.

Yours Truly,

MURRAY CITY CORPORATION

Charles D. Clay, P.E.
Director of Public Works

MURRAY CITY PARKS AND RECREATION

November 23, 1992

Neal Stack
Salt Lake County Flood Control
2001 S State St
Salt Lake City Ut 84115

Dear Mr. Stack,

The Murray City Parks and Recreation Advisory Board recently reviewed the Jordan River Stability Study/Draft Report submitted to Salt Lake County in September 1992. As you know, the recommendations in this report have a direct impact on Murray City's Jordan River Parkway Master Plan and future development.

The Parkway Master Plan was adopted by the Parks and Recreation Advisory Board and the City Council in November 1990. The goal of the Jordan River Parkway project in Murray is to provide present and future residents a unique opportunity for recreational, educational and environmental experiences along the Jordan River in Murray. In addition, a trail system will travel the Parkway from 6400 South to Murray's north boundary. To date, the City has purchased approximately 135 acres and spent over $400,000 developing 40 of those acres. Development has included two asphalt parking lots, asphalt trails, equestrian trails, canoe launches and several bridge structures crossing the river and its adjacent wetlands. Future development will include additional trail systems, ballfields, boardwalks, pavilions, restrooms and play areas.

Considering the above information, we have two concerns about the Jordan River Stability Study. First, potential damage to existing trails, parking lots and structures along the Jordan River Parkway will take place if the Jordan River be allowed to meander. Second, the construction of grade control structures at I-215, 5400 South and 4800 South will prevent a safe, continuous trail system along the Jordan River. It would in effect, preclude much of the contemplated beneficial use of the trail system.

P.O. Box 57520 • 330 East Vine Street • Murray, Utah 84157-7520 • (801) 264-2614

Therefore, we are asking that you consider the following recommendations:

.... reconsider whether control grade structures are required in the area of Jordan River Parkway development.

.... if a control grade structure is required, design it in such a way that pedestrians, bicyclists and horses can cross under major roadways on the control structure. In addition, those canoeing down the river should have access through the control structure by means of a "canoe chute" or similar alternative.

Thank you for sharing this study with us and allowing us the opportunity to comment. We understand the complexities that are involved in controlling the Jordan River. Our desire is to provide opportunities for others to enjoy the river.

Sincerely yours,

Murray City Parks and
Recreation Advisory Board
Richard Hutchison, Chairman
Karen Edwards
Richard Evans
Mike Carlston
John Riches

cc: Commissioner Randy Horiuchi
Commissioner James Bradley
Commissioner Michael Stewart

enclosure: Murray City Jordan River Parkway Master Plan

BINGHAM ENGINEERING 5160 Wiley Post Way, Salt Lake City, Utah 84116 801 532-2520, 801 328-3381 FAX

June 18, 1992

Neil D. Stack, PE, Assistant Director
Public Works Department
2001 South State N#3300
Salt Lake City, Utah 84190-4600

Dear Mr. Stack:

SUBJECT: Jordan River Stability Study

This letter and enclosed drawings is in response to your request for information of development along the Jordan River corridor. Bingham Engineering is working with South Jordan on a Parkway Master Plan. We feel that a comprehensive management and maintenance program is essential for the overall project success and would like to see the implementation of the following comments and planning.

A. <u>River Management/Maintenance Options</u>

It would seem appropriate to establish a clear definition of management and maintenance duties of the existing state, county and city departments for the corridor. Also, each of these departments could elect a representative to sit on a "Board" or "Review Committee". This "Board" or "Committee" should elect a chairperson and meet on a regular basis to resolve design or land development issues.

Optional division of department management and maintenance responsibilities may include:

1. City Parks and Recreation Department

   Maintenance of existing formal parks along the Jordan River to include (name of existing parks). . . . This responsibility includes all regular maintenance practices, but does not include the maintenance of the trail or path through them.

2. Open Space Department (???)

   Maintenance of "natural", environmentally sensitive and revegetated areas on open space land and easements along the Jordan River. This responsibility includes trash collection, tree and shrub care, revegetation of damaged areas, repair and replacement of benches, signs, tables, trash containers, and similar amenities. Also, insect and disease control if required.

3. Flood Control Department

Maintenance of entire Jordan River corridor, including removal of large obstructions in the river, maintenance of stream habitat structures, and river bank erosion problems. Extreme care must be taken when maintaining the river channel so as not to disturb the bank vegetation, fish and aquatic habitat, and the general riparian ecology. Vegetation removal in such areas will be mutual agreement of the managing agency and the flood control department.

4. Wildlife Resources

A fish management plan should be developed between the Cities and the Division of Wildlife Resources. Administration of fish regulations will be the responsibility of Division of Wildlife Resources.

5. Local Police Departments/County Sheriff

Responsible for criminal actions that may occur along the river.

6. Establish a Corridor Ranger Program

Duties may include not only coordination of the corridor activities, observation and advising "Board" or "Committee" but also maintenance of good public relations.

7. Establish a checklist of basic design criteria for all improvements including but not limited to:

- appropriateness and excellence of design
- environmental fit
- functional quality
- aesthetic sensitivity
- consistency and continuation of design
- durability and strength
- ease of maintenance
- resistance to vandalism
- availability/replaceabilty
- handicap access

B. Facilities Master Plan

We have developed the following plans for South Jordan and would like to see a continuity of quality and theme throughout the corridor:

- City/County Map
- Flood Plains, Vegetation and Photo Reference (photos not included)

- Property Ownership
- Site Map and Recreation Areas
- Jordan River Parkway - South Jordan Master Plan
- Jordan River Park - Midas Creek Park Development Master Plan
- Jordan River Park Bank Stabilization and Habitat Improvement - Earthwork and Vegetation Plan
- Jordan River Park Bank Stabilization and Habitat Improvement - Earthwork and Vegetation Details
- South Point Golf Course Feasibility Study - Concept B
- South Point Golf Course Feasibility Study - Concept C

The enclosed plans indicate where bank stabilization, meanders and planned recreation uses are to occur. This information is not intended to be comprehensive but our thoughts to date regarding development. Please contact us if you have any questions concerning this information. We appreciate the opportunity to have input and would appreciate being kept abreast of your study and planning for the Jordan River corridor.

Sincerely,

BINGHAM ENGINEERING

Bruce

Bruce L. Maw, ASLA

cc: Craig Bagley, CH2M Hill
Judd Lawrence, City Engineer
Alden Winters, Public Works Director

Note: South Jordan Zoning Map sent to Craig Bagley

Appendix F
Agency and Community Comments