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GENERAL SURVEY NOTES

1. TOPOGRAPHIC AND HYDROGRAPHIC SURVEYS WERE COMPLETED BY BOWEN ENGINEERING AND SURVEYING, INC. ON THE DATES AS SHOWN IN ACCORDANCE WITH THE QUALITY MANAGEMENT PLAN AND QUALITY CONTROL PROCEDURES.

2. HORIZONTAL PROJECT DATUM - NAD 1983 (CONUS)
   COORDINATE SYSTEM - US STATE PLANE 1983
   ZONE - MISSOURI CENTRAL (2402)

HORIZONTAL POSITIONING OF TOPOGRAPHIC FEATURES WAS DETERMINED BY HANDHELD GPS OBSERVATIONS ON CONTROL POINTS AND SHOULD BE CONSIDERED APPROXIMATE.

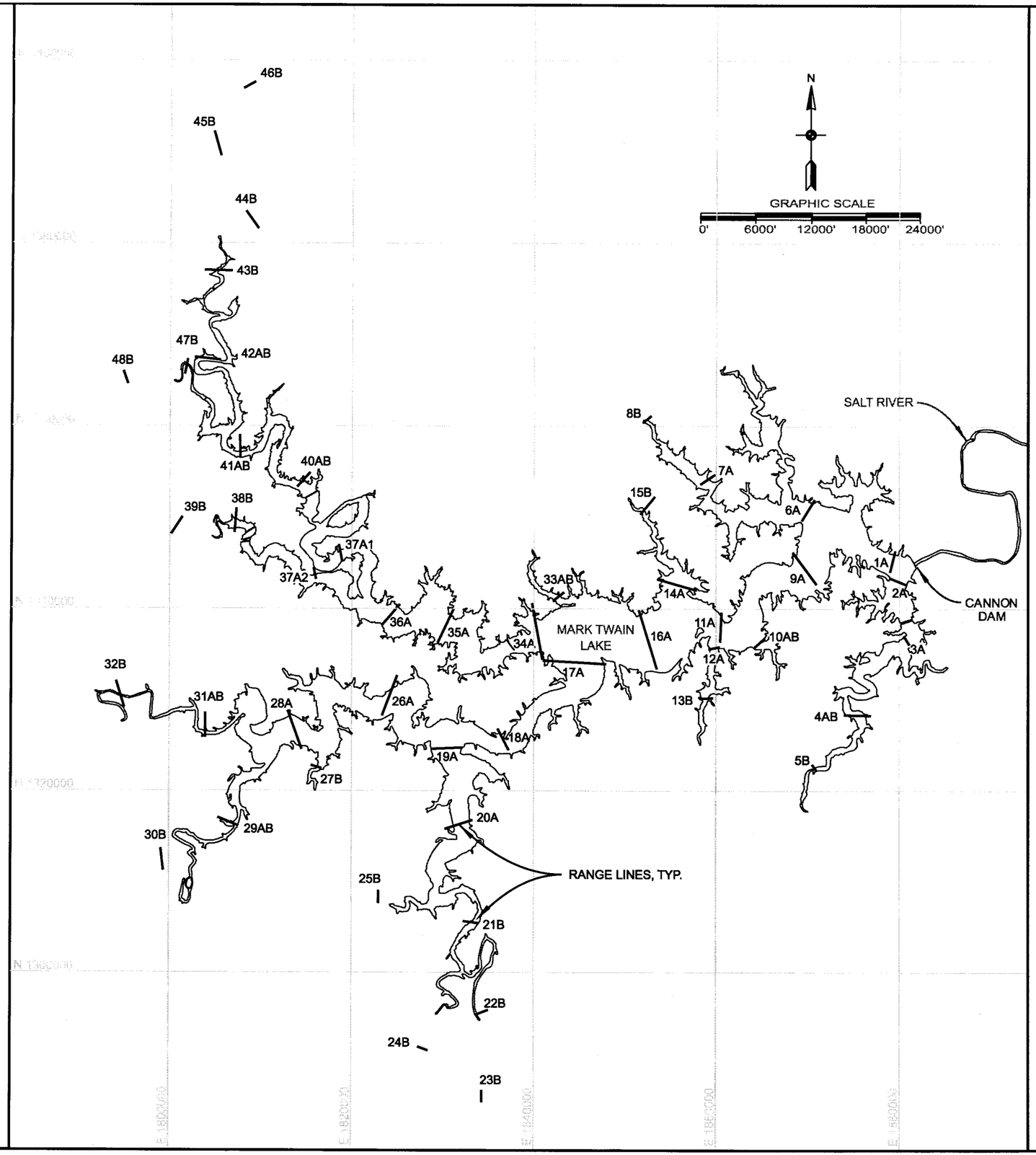
MARK TWAIN LAKE IS LOCATED IN BOTH MISSOURI EAST STATE PLANE (2401) AND MISSOURI CENTRAL STATE PLANE (2402) ZONES. ALL RANGE LINES SURVEYED ARE SHOWN IN THE MISSOURI CENTRAL STATE PLANE COORDINATE SYSTEM, AS DIRECTED BY USACE PERSONNEL.

3. VERTICAL PROJECT DATUM IS THE NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88) AND IS BASED ON TIES TO THE MARK TWAIN LAKE WATER SURFACE AT THE TIME OF EACH SURVEY. WATER SURFACE ELEVATIONS ARE BASED ON MARK TWAIN LAKE POOL GAGE READINGS AND WERE CONVERTED FROM NGVD29 ELEVATIONS TO NAVD88 ELEVATIONS. CONVERSIONS WERE ESTABLISHED BY OPUS OBSERVATIONS AT THE GAGE.

FOR RANGE LINES WHERE THE WATER SURFACE WAS NOT IN A POOLED CONDITION, IT WAS NOT POSSIBLE TO ESTABLISH THE VERTICAL DATUM BY TYING TO THE WATER SURFACE. THE VERTICAL DATUM OF THESE LINES WAS ESTABLISHED BY MAKING OBSERVATIONS ON RANGE LINE CONTROL POINTS USING A REAL TIME GPS ROVER AND THE MODOT REAL TIME NETWORK.

RECORD NGVD29 ELEVATIONS SHOWN FOR RECOVERED MONUMENTS WERE TAKEN FROM "CLARENCE CANNON DAM AND MARK TWAIN RESERVOIR MONUMENTATION OF THE SEDIMENTATION RANGES" DATED 1982 THROUGH 1983 BY KENNETH BALK AND ASSOCIATES PROVIDED BY USACE PERSONNEL.

4. THE ACCURACY OF THE HORIZONTAL AND VERTICAL TOPOGRAPHIC FEATURES DEPICTED HEREON WERE DERIVED BY SURVEY METHODS THAT EXCEED THE ACCURACY OF THE PLOTTED DOCUMENT AS DEFINED BY THE MAP SCALE. THE USE OF THIS SURVEY INFORMATION IN A DIGITAL ENVIRONMENT, CADD OR GIS SHALL NOT BE RELIED UPON TO AN ACCURACY GREATER THAN THAT OF THE MAP SCALE.



US Army Corps of Engineers®
St. Louis District

Symbol	Description	Date	Appr.
	Revisions		

SURVEYED BY: BOWEN, SWRC & SURV
DATE: MAY 6, 2010
DRAWN BY: TWN
CHD BY: CRT
SOLICITATION NO.:
SUBMITTED BY:
CONTRACT NO.: W912P7-07-D-0016, TASK 02
PLOT SCALE: 1" = 24000'
PLOT DATE: 5/10/2010
FILE NUMBER:
SIZE: 36
FILE NAME:

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Bowen ENGINEERING & SURVEYING
1515 Hampton, MO 63135
Cape Girardeau, MO 63703

SEDIMENTATION RANGE
LINE SURVEYS
MARK TWAIN LAKE
COVER SHEET

SHEET
V-001

Mark Twain Lake Water Surface Information

Date	Gage	Time	Gage Reading	Gage Zero	NGVD29 WS Elev	Datum Adjust.	NAVD88 WS Elev
20090520	M T Lake (Pool)	14:00	38.09	580.00	618.09	-0.232	617.86
20090520	M T Lake (Pool)	15:00	38.06	580.00	618.06	-0.232	617.83
20090520	M T Lake (Pool)	16:00	38.03	580.00	618.03	-0.232	617.80
20090520	M T Lake (Pool)	17:00	38.00	580.00	618.00	-0.232	617.77
20090520	M T Lake (Pool)	18:00	37.98	580.00	617.98	-0.232	617.75
20090521	M T Lake (Pool)	8:00	37.61	580.00	617.61	-0.232	617.38
20090521	M T Lake (Pool)	9:00	37.57	580.00	617.57	-0.232	617.34
20090521	M T Lake (Pool)	10:00	37.53	580.00	617.53	-0.232	617.30
20090521	M T Lake (Pool)	11:00	37.52	580.00	617.52	-0.232	617.29
20090521	M T Lake (Pool)	12:00	37.48	580.00	617.48	-0.232	617.25
20090521	M T Lake (Pool)	13:00	37.44	580.00	617.44	-0.232	617.21
20090521	M T Lake (Pool)	14:00	37.41	580.00	617.41	-0.232	617.18
20090521	M T Lake (Pool)	15:00	37.39	580.00	617.39	-0.232	617.16
20090521	M T Lake (Pool)	16:00	37.36	580.00	617.36	-0.232	617.13
20090521	M T Lake (Pool)	17:00	37.33	580.00	617.33	-0.232	617.10
20090521	M T Lake (Pool)	18:00	37.30	580.00	617.30	-0.232	617.07
20090522	M T Lake (Pool)	9:00	36.84	580.00	616.84	-0.232	616.61
20090522	M T Lake (Pool)	10:00	36.81	580.00	616.81	-0.232	616.58
20090522	M T Lake (Pool)	11:00	36.78	580.00	616.78	-0.232	616.55
20090527	M T Lake (Pool)	11:00	34.86	580.00	614.86	-0.232	614.63
20090527	M T Lake (Pool)	12:00	34.85	580.00	614.85	-0.232	614.62
20090527	M T Lake (Pool)	13:00	34.83	580.00	614.83	-0.232	614.60
20090527	M T Lake (Pool)	14:00	34.82	580.00	614.82	-0.232	614.59
20090527	M T Lake (Pool)	15:00	34.80	580.00	614.80	-0.232	614.57
20090527	M T Lake (Pool)	16:00	34.79	580.00	614.79	-0.232	614.56
20090527	M T Lake (Pool)	17:00	34.77	580.00	614.77	-0.232	614.54
20090528	M T Lake (Pool)	8:00	34.75	580.00	614.75	-0.232	614.52
20090528	M T Lake (Pool)	9:00	34.76	580.00	614.76	-0.232	614.53
20090528	M T Lake (Pool)	10:00	34.73	580.00	614.73	-0.232	614.50
20090528	M T Lake (Pool)	11:00	34.69	580.00	614.69	-0.232	614.46
20090528	M T Lake (Pool)	12:00	34.69	580.00	614.69	-0.232	614.46
20090528	M T Lake (Pool)	13:00	34.65	580.00	614.65	-0.232	614.42
20090528	M T Lake (Pool)	14:00	34.61	580.00	614.61	-0.232	614.38
20090528	M T Lake (Pool)	15:00	34.59	580.00	614.59	-0.232	614.36
20090528	M T Lake (Pool)	16:00	34.56	580.00	614.56	-0.232	614.33
20090529	M T Lake (Pool)	8:00	34.41	580.00	614.41	-0.232	614.18
20090529	M T Lake (Pool)	9:00	34.37	580.00	614.37	-0.232	614.14
20090529	M T Lake (Pool)	10:00	34.38	580.00	614.38	-0.232	614.15
20090529	M T Lake (Pool)	11:00	34.36	580.00	614.36	-0.232	614.13
20090623	M T Lake (Pool)	11:00	33.87	580.00	613.87	-0.232	613.64
20090623	M T Lake (Pool)	12:00	33.84	580.00	613.84	-0.232	613.61
20090623	M T Lake (Pool)	13:00	33.79	580.00	613.79	-0.232	613.56
20090623	M T Lake (Pool)	14:00	33.77	580.00	613.77	-0.232	613.54
20090624	M T Lake (Pool)	8:00	33.58	580.00	613.58	-0.232	613.35
20090624	M T Lake (Pool)	9:00	33.56	580.00	613.56	-0.232	613.33
20090624	M T Lake (Pool)	10:00	33.53	580.00	613.53	-0.232	613.30
20090624	M T Lake (Pool)	11:00	33.53	580.00	613.53	-0.232	613.30
20090624	M T Lake (Pool)	12:00	33.50	580.00	613.50	-0.232	613.27
20090624	M T Lake (Pool)	13:00	33.45	580.00	613.45	-0.232	613.22
20090624	M T Lake (Pool)	14:00	33.42	580.00	613.42	-0.232	613.19
20090624	M T Lake (Pool)	15:00	33.38	580.00	613.38	-0.232	613.15
20090624	M T Lake (Pool)	16:00	33.33	580.00	613.33	-0.232	613.10
20090624	M T Lake (Pool)	17:00	33.32	580.00	613.32	-0.232	613.09
20090624	M T Lake (Pool)	18:00	33.29	580.00	613.29	-0.232	613.06

Mark Twain Lake Water Surface Information (Cont.)

Date	Gage	Time	Gage Reading	Gage Zero	NGVD29 WS Elev	Datum Adjust.	NAVD88 WS Elev
20090625	M T Lake (Pool)	10:00	33.17	580.00	613.17	-0.232	612.94
20090625	M T Lake (Pool)	11:00	33.11	580.00	613.11	-0.232	612.88
20090625	M T Lake (Pool)	12:00	33.12	580.00	613.12	-0.232	612.89
20090625	M T Lake (Pool)	13:00	33.06	580.00	613.06	-0.232	612.83
20090625	M T Lake (Pool)	14:00	33.03	580.00	613.03	-0.232	612.80
20090625	M T Lake (Pool)	15:00	33.02	580.00	613.02	-0.232	612.79
20090625	M T Lake (Pool)	16:00	32.97	580.00	612.97	-0.232	612.74
20090625	M T Lake (Pool)	17:00	32.94	580.00	612.94	-0.232	612.71
20090702	M T Lake (Pool)	10:00	31.41	580.00	611.41	-0.232	611.18
20090702	M T Lake (Pool)	11:00	31.33	580.00	611.33	-0.232	611.10
20090702	M T Lake (Pool)	12:00	31.29	580.00	611.29	-0.232	611.06
20090722	M T Lake (Pool)	10:00	26.98	580.00	606.98	-0.232	606.75
20090722	M T Lake (Pool)	11:00	26.96	580.00	606.96	-0.232	606.73
20090722	M T Lake (Pool)	12:00	26.93	580.00	606.93	-0.232	606.70
20090722	M T Lake (Pool)	13:00	26.89	580.00	606.89	-0.232	606.66
20090722	M T Lake (Pool)	14:00	26.88	580.00	606.88	-0.232	606.65
20090722	M T Lake (Pool)	15:00	26.85	580.00	606.85	-0.232	606.62
20090722	M T Lake (Pool)	16:00	26.83	580.00	606.83	-0.232	606.60
20090727	M T Lake (Pool)	13:00	26.83	580.00	606.83	-0.232	606.60
20090727	M T Lake (Pool)	14:00	26.83	580.00	606.83	-0.232	606.60
20090727	M T Lake (Pool)	15:00	26.83	580.00	606.83	-0.232	606.60
20090727	M T Lake (Pool)	16:00	26.82	580.00	606.82	-0.232	606.59
20090727	M T Lake (Pool)	17:00	26.82	580.00	606.82	-0.232	606.59
20090727	M T Lake (Pool)	18:00	26.82	580.00	606.82	-0.232	606.59
20090728	M T Lake (Pool)	9:00	26.83	580.00	606.83	-0.232	606.60
20090728	M T Lake (Pool)	10:00	26.83	580.00	606.83	-0.232	606.60
20090728	M T Lake (Pool)	11:00	26.84	580.00	606.84	-0.232	606.61
20090728	M T Lake (Pool)	12:00	26.83	580.00	606.83	-0.232	606.60
20090728	M T Lake (Pool)	13:00	26.83	580.00	606.83	-0.232	606.60
20090728	M T Lake (Pool)	14:00	26.81	580.00	606.81	-0.232	606.58
20090728	M T Lake (Pool)	15:00	26.76	580.00	606.76	-0.232	606.53
20090729	M T Lake (Pool)	10:00	26.67	580.00	606.67	-0.232	606.44
20090729	M T Lake (Pool)	11:00	26.66	580.00	606.66	-0.232	606.43
20090729	M T Lake (Pool)	12:00	26.66	580.00	606.66	-0.232	606.43
20090729	M T Lake (Pool)	13:00	26.66	580.00	606.66	-0.232	606.43
20090729	M T Lake (Pool)	14:00	26.66	580.00	606.66	-0.232	606.43
20090729	M T Lake (Pool)	15:00	26.66	580.00	606.66	-0.232	606.43
20090729	M T Lake (Pool)	16:00	26.65	580.00	606.65	-0.232	606.42
20090729	M T Lake (Pool)	17:00	26.66	580.00	606.66	-0.232	606.43
20090730	M T Lake (Pool)	9:00	26.67	580.00	606.67	-0.232	606.44
20090730	M T Lake (Pool)	10:00	26.67	580.00	606.67	-0.232	606.44
20090730	M T Lake (Pool)	11:00	26.67	580.00	606.67	-0.232	606.44
20090805	M T Lake (Pool)	8:00	25.96	580.00	605.96	-0.232	605.73
20090805	M T Lake (Pool)	9:00	25.97	580.00	605.97	-0.232	605.74
20090805	M T Lake (Pool)	10:00	25.97	580.00	605.97	-0.232	605.74
20090805	M T Lake (Pool)	11:00	25.98	580.00	605.98	-0.232	605.75
20090805	M T Lake (Pool)	12:00	25.97	580.00	605.97	-0.232	605.74
20090805	M T Lake (Pool)	13:00	25.93	580.00	605.93	-0.232	605.70
20090805	M T Lake (Pool)	14:00	25.87	580.00	605.87	-0.232	605.64
20090811	M T Lake (Pool)	8:00	25.66	580.00	605.66	-0.232	605.43
20090811	M T Lake (Pool)	9:00	25.65	580.00	605.65	-0.232	605.42
20090811	M T Lake (Pool)	10:00	25.65	580.00	605.65	-0.232	605.42
20090811	M T Lake (Pool)	11:00	25.65	580.00	605.65	-0.232	605.42
20090811	M T Lake (Pool)	12:00	25.65	580.00	605.65	-0.232	605.42

Mark Twain Lake Water Surface Information (Cont.)

Date	Gage	Time	Gage Reading	Gage Zero	NGVD29 WS Elev	Datum Adjust.	NAVD88 WS Elev
20100426	M T Lake (Pool)	12:00	35.77	580.00	615.77	-0.232	615.54
20100426	M T Lake (Pool)	13:00	35.89	580.00	615.89	-0.232	615.66
20100426	M T Lake (Pool)	14:00	35.98	580.00	615.98	-0.232	615.75
20100427	M T Lake (Pool)	10:00	37.66	580.00	617.66	-0.232	617.43
20100427	M T Lake (Pool)	11:00	37.72	580.00	617.72	-0.232	617.49
20100427	M T Lake (Pool)	12:00	37.79	580.00	617.79	-0.232	617.56
20100427	M T Lake (Pool)	13:00	37.85	580.00	617.85	-0.232	617.62
20100427	M T Lake (Pool)	14:00	37.90	580.00	617.90	-0.232	617.67
20100427	M T Lake (Pool)	15:00	37.97	580.00	617.97	-0.232	617.74
20100427	M T Lake (Pool)	16:00	38.03	580.00	618.03	-0.232	617.80
20100427	M T Lake (Pool)	17:00	38.07	580.00	618.07	-0.232	617.84
20100429	M T Lake (Pool)	9:00	38.38	580.00	618.38	-0.232	618.15
20100429	M T Lake (Pool)	10:00	38.36	580.00	618.36	-0.232	618.13
20100429	M T Lake (Pool)	11:00	38.37	580.00	618.37	-0.232	618.14
20100429	M T Lake (Pool)	12:00	38.37	580.00	618.37	-0.232	618.14
20100429	M T Lake (Pool)	13:00	38.37	580.00	618.37	-0.232	618.14
20100429	M T Lake (Pool)	14:00	38.35	580.00	618.35	-0.232	618.12
20100429	M T Lake (Pool)	15:00	38.33	580.00	618.33	-0.232	618.10
20100429	M T Lake (Pool)	16:00	38.32	580.00	618.32	-0.232	618.09
20100429	M T Lake (Pool)	17:00	38.31	580.00	618.31	-0.232	618.08
20100430	M T Lake (Pool)	8:00	38.11	580.00	618.11	-0.232	617.88
20100430	M T Lake (Pool)	9:00	38.13	580.00	618.13	-0.232	617.90
20100430	M T Lake (Pool)	10:00	38.12	580.00	618.12	-0.232	617.89
20100503	M T Lake (Pool)	14:00	38.65	580.00	618.65	-0.232	618.42
20100503	M T Lake (Pool)	15:00	38.65	580.00	618.65	-0.232	618.42
20100503	M T Lake (Pool)v	16:00	38.66	580.00	618.66	-0.232	618.43
20100504	M T Lake (Pool)	12:00	38.61	580.00	618.61	-0.232	618.38
20100504	M T Lake (Pool)	13:00	38.60	580.00	618.60	-0.232	618.37
20100504	M T Lake (Pool)	14:00	38.58	580.00	618.58	-0.232	618.35
20100504	M T Lake (Pool)	15:00	38.56	580.00	618.56	-0.232	618.33
20100504	M T Lake (Pool)	16:00	38.52	580.00	618.52	-0.232	618.29
20100505	M T Lake (Pool)	9:00	38.14	580.00	618.14	-0.232	617.91
20100505	M T Lake (Pool)	10:00	38.14	580.00	618.14	-0.232	617.91
20100505	M T Lake (Pool)	11:00	38.11	580.00	618.11	-0.232	617.88
20100505	M T Lake (Pool)	12:00	38.08	580.00	618.08	-0.232	617.85
20100505	M T Lake (Pool)	13:00	38.06	580.00	618.06	-0.232	617.83
20100505	M T Lake (Pool)	14:00	38.03	580.00	618.03	-0.232	617.80
20100507	M T Lake (Pool)	10:00	36.77	580.00	616.77	-0.232	616.54
20100507	M T Lake (Pool)	11:00	36.75	580.00	616.75	-0.232	616.52

US Army Corps of Engineers®
St. Louis District

Symbol	Description	Date	Appr.
	Revisions		

DATE: MAY 18, 2010
SOLICITATION NO.:
CONTRACT NO.: W912P-17-D-0056, TASK 22
FILE NUMBER:
SURVEYED BY: BOWEN ENGR. & SURV.
DWN BY: DAN SAYER
CKD BY:
SUBMITTED BY:
PLOT DATE: 5/18/2010
PLOT SCALE: 1" = 1000'
SIZE: B
FILE NAME:

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Bowen ENGINEERING & SURVEYING
1019 Wesselow Lake Drive
Cape Girardeau, MO 63701

SEDIMENTATION RANGE
LINE SURVEYS
MARK TWAIN LAKE
WATER SURFACE INFORMATION

SHEET
V-002

Water Surface Elevation Ties Used to Establish Range Line Vertical Datum

Date	Sedimentation Range No.	Time	NAVD88 WSE from Gage Readings
5/20/2009	LINE 2A	14:58	617.83
		15:25	617.82
5/20/2009	LINE 1A	16:29	617.79
		16:54	617.77
5/21/2009	LINE 3A	8:39	617.35
		8:45	617.35
5/21/2009	LINE 5B	13:40	617.19
		13:45	617.19
5/21/2009	LINE 6A	15:20	617.15
		15:37	617.14
5/21/2009	LINE 7A	17:08	617.10
		17:30	617.08
5/22/2009	LINE 8B	9:23	616.60
		9:30	616.59
5/27/2009	LINE 9A	11:46	614.62
		11:53	614.62
5/27/2009	LINE 11A	13:28	614.60
		13:35	614.59
5/27/2009	LINE 12A	15:45	614.56
		15:50	614.56
5/28/2009	LINE 10AB	8:38	614.53
		8:44	614.53
5/28/2009	LINE 13B	11:00	614.46
		11:10	614.46
		11:26	614.46
5/28/2009	LINE 14A	13:50	614.39
		14:22	614.37
		14:30	614.37
		14:40	614.37
5/29/2009	LINE 15B	8:05	614.18
		8:15	614.17
		9:27	614.14
6/23/2009	LINE 16A	11:45	613.62
		12:13	613.60
6/24/2009	LINE 34A	8:49	613.33
		10:44	613.30
6/24/2009	LINE 17A	14:40	613.16
		14:55	613.15
		16:00	613.10
		16:57	613.09
6/25/2009	LINE 33AB	10:43	612.89
		11:04	612.88
6/25/2009	LINE 36A	14:50	612.79
		15:50	612.75
7/2/2009	LINE 18A	10:20	611.15
		10:40	611.13
7/22/2009	LINE 35A	10:00	606.75
		10:37	606.74
7/22/2009	LINE 37A-2	13:14	606.66
		13:43	606.65
7/27/2009	LINE 37A-1	13:12	606.60
		13:45	606.60
7/27/2009	LINE 40AB	15:36	606.59
		15:45	606.59
7/28/2009	LINE 19A	9:04	606.60
		9:15	606.60
7/28/2009	LINE 26A	10:13	606.60
		11:16	606.61
7/28/2009	LINE 27B	13:42	606.58
		13:48	606.58
7/29/2009	LINE 28A	10:30	606.43
		10:57	606.43

Water Surface Elevation Ties Used to Establish Range Line Vertical Datum (Cont.)

Date	Sedimentation Range No.	Time	NAVD88 WSE from Gage Readings
7/30/2009	LINE 21B	9:30	606.44
		9:33	606.44
8/11/2009	LINE 29AB	8:30	605.42
		11:15	605.42
4/27/2010	LINE 42AB	16:30	617.82
4/29/2010	LINE 38B	9:00	618.15
		9:15	618.15
4/29/2010	LINE 25B	14:15	618.11
		14:45	618.11
4/29/2010	LINE 24B	16:20	618.09
		16:30	618.09
4/30/2010	LINE 23B	8:30	617.89
4/30/2010	LINE 22B	8:50	617.90
5/03/2010	LINE 47B	14:55	618.42
		15:20	618.42
5/04/2010	LINE 30B	12:00	618.38
		12:45	618.37
5/04/2010	LINE 31AB	15:00	618.33
		15:15	618.32
5/05/2010	LINE 32B	9:00	617.91
		9:30	617.91
5/05/2010	LINE 41AB	13:00	617.83
		13:45	617.81
5/05/2010	LINE 20A	11:30	617.87
		11:45	617.86
5/07/2010	LINE 4AB	10:30	616.53
		10:40	616.53

Note:
For Sedimentation Range Lines 39B, 43B, 44B, 45B, 46B and 48B, the water surface was not in a pooled condition at the time of the survey. Therefore the vertical datum at these lines could not be established by using the Mark Twain Lake Pool gage reading. The vertical datum was established by making observations on range line control points using a Real Time GPS rover and the MoDOT Real Time GPS Network.

Hydrographic Survey Information

Date	Sedimentation Range No.	Hypack Line	NAVD88 WSE
5/20/2009	LINE 2A	001_1429	617.85
5/20/2009	LINE 1A	002_1558	617.80
5/21/2009	LINE 3A	003_854	617.34
5/21/2009	LINE 4AB	004_1217	617.24
5/21/2009	LINE 5B	005_1358	617.18
5/21/2009	LINE 6A	006_1548	617.14
5/21/2009	LINE 7A	007_1739	617.08
5/22/2009	LINE 8B	008_1027	616.57
5/27/2009	LINE 9A	009_1230	614.61
5/27/2009	LINE 11A	010_1420	614.58
5/27/2009	LINE 12A	011_1619	614.55
5/28/2009	LINE 10AB	012_907	614.53
5/28/2009	LINE 13B	013_1151	614.46
		013_1154	614.46
5/28/2009	LINE 14A	014_1504	614.36
		014_1509	614.36
5/29/2009	LINE 15B	015_1036	614.14
6/23/2009	LINE 16A	16A	613.56
6/24/2009	LINE 34A	34A	613.23
6/24/2009	LINE 17A	018_1714	613.08
		018_1726	613.08
6/25/2009	LINE 33AB	017_1139	612.89
6/25/2009	LINE 36A	016_1610	612.74
7/2/2009	LINE 18A	019_1103	611.10
7/22/2009	LINE 35A	020_1116	606.72
7/22/2009	LINE 37A-2	021_1519	606.61
7/27/2009	LINE 37A-1	022_1437	606.60
7/27/2009	LINE 40AB	023_1705	606.59
7/28/2009	LINE 19A	024_925	606.60
7/28/2009	LINE 26A	025_1212	606.60
7/28/2009	LINE 27B	026_1427	606.56
7/29/2009	LINE 28A	027A1217	606.43
7/30/2009	LINE 21B	029_1012	606.44
4/26/2010	LINE 23B	021_1218	624.17*

Hydrographic Survey Information (Cont.)

Date	Sedimentation Range No.	Hypack Line	NAVD88 WSE
4/26/2010	LINE 22B	010_1348	616.45 *
4/27/2010	LINE 46B	034_1050	634.12 *
		034_1056	634.12 *
		034_1058	634.12 *
4/27/2010	LINE 45B	022_1229	628.51 *
4/27/2010	LINE 44B	011_1548	623.66 *
4/27/2010	LINE 43B	048_1602	620.46 *
4/27/2010	LINE 42AB	039_1619	617.80
4/29/2010	LINE 38B	024_0946	618.13
4/30/2010	LINE 24B	033_0926	617.90
4/30/2010	LINE 25B	044_0956	617.89
5/3/2010	LINE 47B	045_1534	618.43
5/4/2010	LINE 30B	000_1252	618.37
5/4/2010	LINE 29AB	001_1329	618.36
5/4/2010	LINE 31AB	030_1523	618.31
5/5/2010	LINE 32A	001_0951	617.91
5/5/2010	LINE 20A	028_1118	617.87
		000_1125	617.87
5/5/2010	LINE 41AB	001_1349	617.81

Notes:
1) An asterisk (*) denotes that the water surface elevation used to process hydrographic data was not based on Mark Twain Lake Pool gage readings at the time of sounding. Range Lines 22B, 23B, 43B, 44B, 45B and 46B were sounded while the water was not in a pooled condition. To process the hydrographic data, the water surface elevations at the time of sounding were established by leveling from known control points previously established vertically from a pooled water surface or established by making observations using a Real Time GPS rover and the MoDOT Real Time GPS Network.

2) No hydrographic data was obtained for Range Lines 39B and 48B. Due to low water levels, these lines were surveyed completely by land.

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Symbol	Description	Date	Appr.
	Revisions		

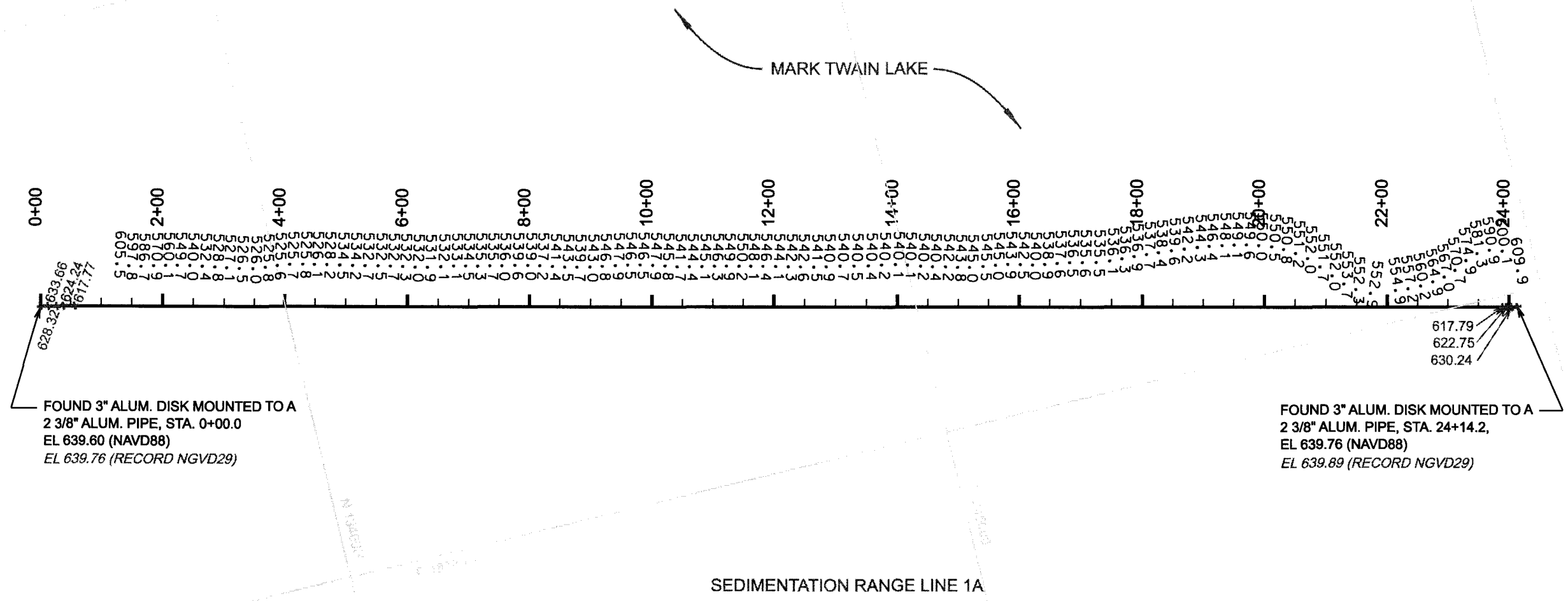
SURVEYED BY: BOWEN ENGR. & SURV.
DATE: MAY 18, 2010
DWN BY: MGH
CKD BY: CSH
SOLICITATION NO.:
SUBMITTED BY:
CONTRACT NO.: W912P7-09-C-0006, T.O.No. 22
PLOT SCALE: 1" = 250000'
PLOT DATE: 5/24/2010
FILE NUMBER:
SIZE: B
FILE NAME:

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

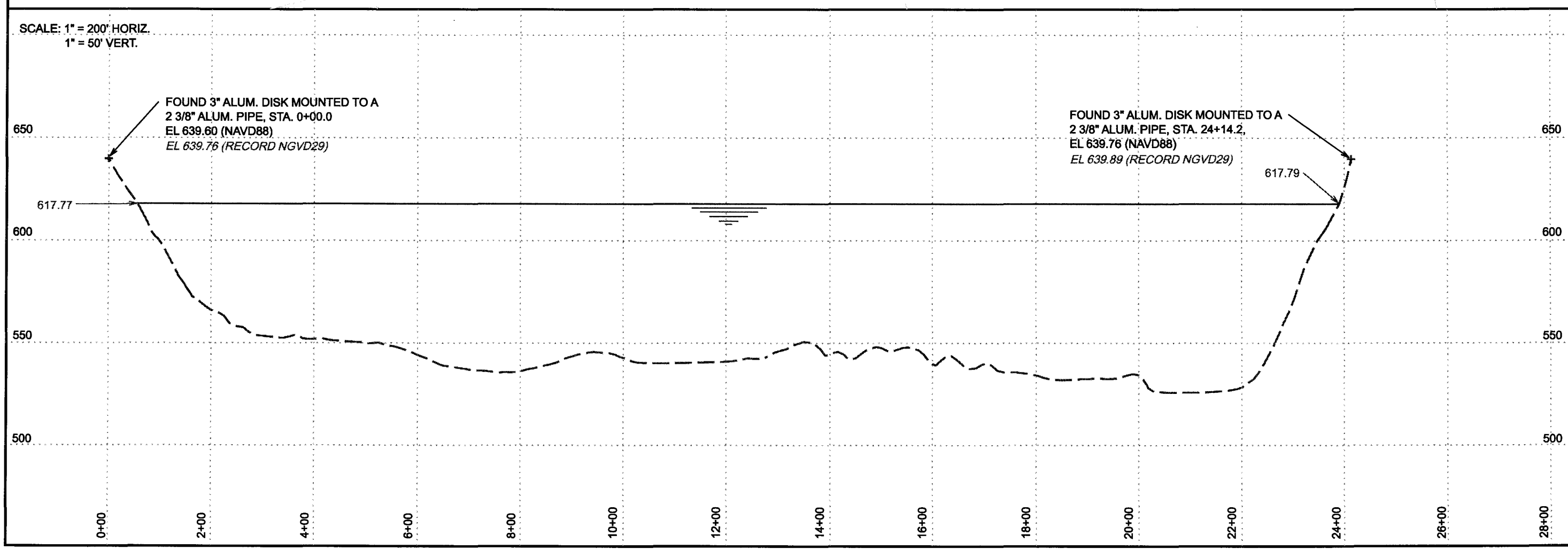
Bowen ENGINEERING & SURVEYING
Cape Girardeau, MO 63701

SEDIMENTATION RANGE
LINE SURVEYS
MARK TWAIN LAKE
WATER SURFACE INFORMATION

SHEET
V-003



SEDIMENTATION RANGE LINE 1A



US Army Corps of Engineers®
St. Louis District

Symbol	Description / Revisions	Date	Appr.

DATE: MAY 18, 2010
SOLICITATION NO.:
CONTRACT NO.: W912P7-11-C-0006, TASK 22
FILE NUMBER:
SURVEYED BY: BOWEN ENGR. & SURV.
DWN BY: MGH
CKD BY: CGH
SUBMITTED BY:
PLOT SCALE: 1"=200'
PLOT DATE: 5/10/2011
SIZE: B
FILE NAME:

U.S. ARMY ENGINEER DIVISION
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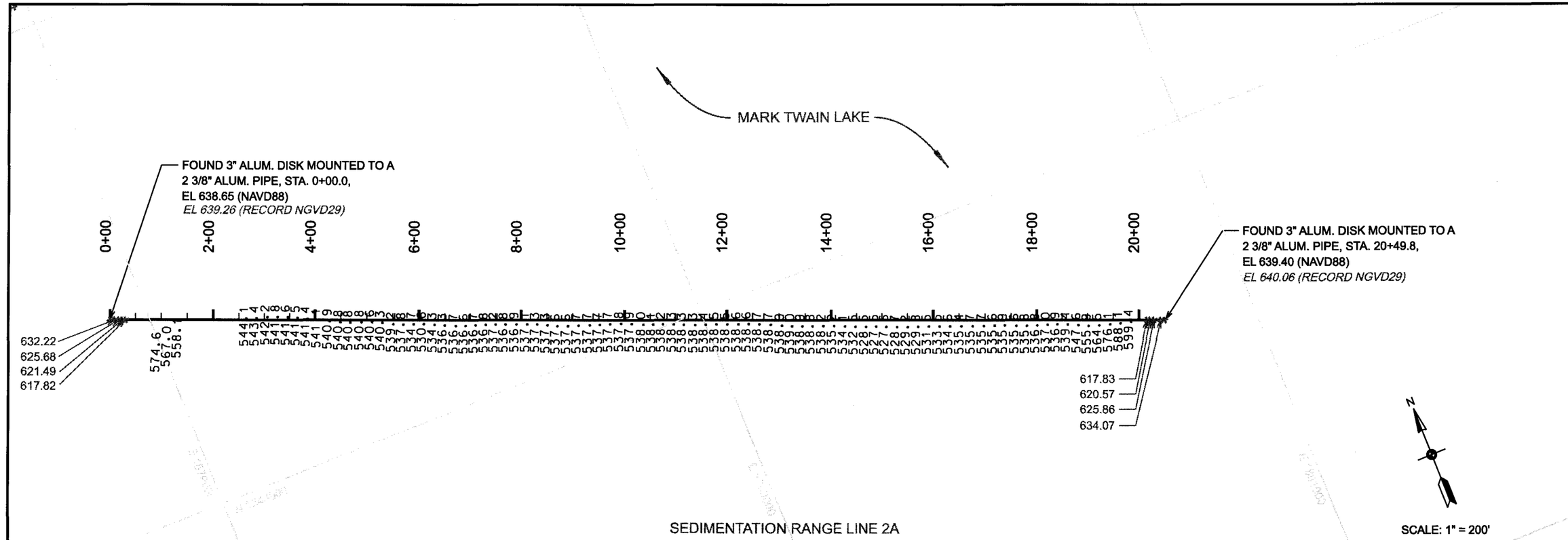
Bowen ENGINEERING & SURVEYING
8101 Perryville Road, Suite J
Cape Girardeau, MO 63701

SEDIMENTATION RANGE
LINE SURVEYS
MARK TWAIN LAKE
RANGE LINE 1A

SHEET
V-101



SEDIMENTATION RANGE LINE 2A

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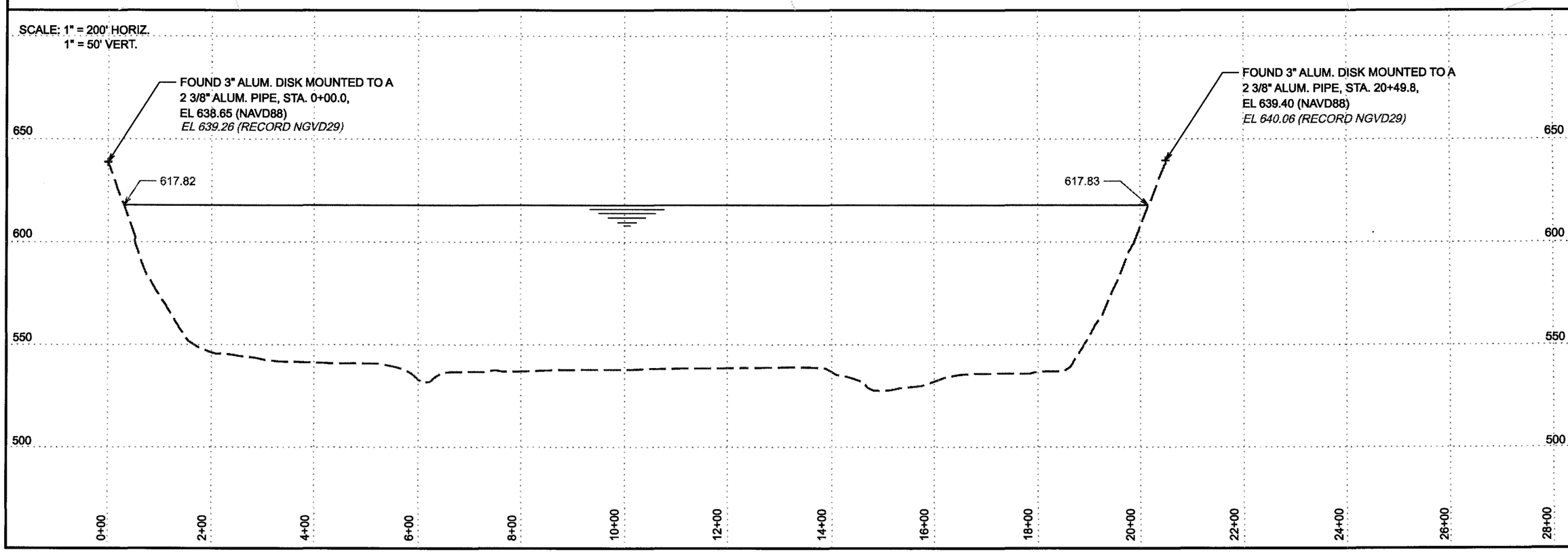

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	Revisions		

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DWN BY: MGH
CKD BY: CGH
SUBMITTED BY:
PLOT SCALE: 1" = 200'
PLOT DATE: 5/18/2010
SIZE: B
FILE NAME:
DATE: MAY 18, 2010
SOLICITATION NO.:
CONTRACT NO.: W912P7-09-D-0056, TASK 22
FILE NUMBER:

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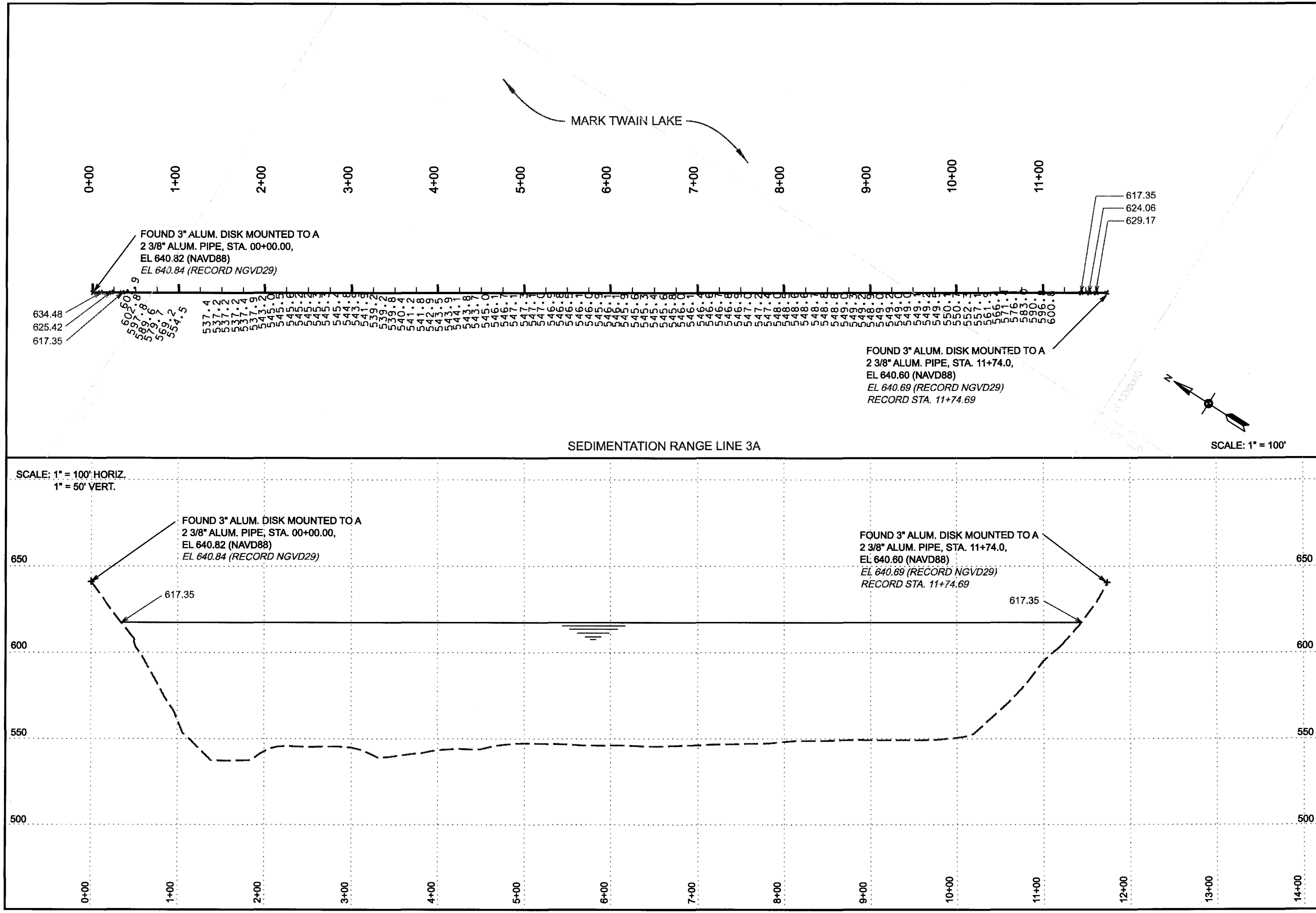
ST. LOUIS, MISSOURI

Bowen ENGINEERING & SURVEYING
1500 N. Mansfield, P.O. Box 1
Cape Girardeau, MO 63701

SEDIMENTATION RANGE
LINE SURVEYS
MARK TWAIN LAKE
RANGE LINE 2A

SHEET
V-102



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	Revisions		

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CONTRACT NO.: W912P7-21-D-0058, TASK 23
FILE NUMBER:
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DWN BY: MGH
CKD BY: CGH
SUBMITTED BY:
PLOT DATE: 11-10-2021
PLOT SCALE: 1" = 100'
SIZE: 6
FILE NAME:

U.S. ARMY ENGINEER DIVISION
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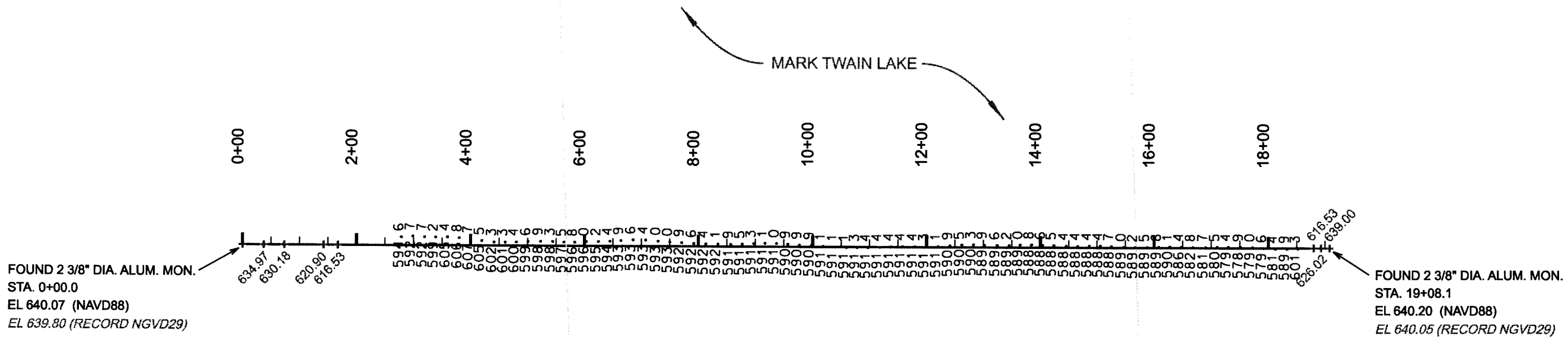
Bowen ENGINEERING & SURVEYING
Date Generated: Nov 1, 2021

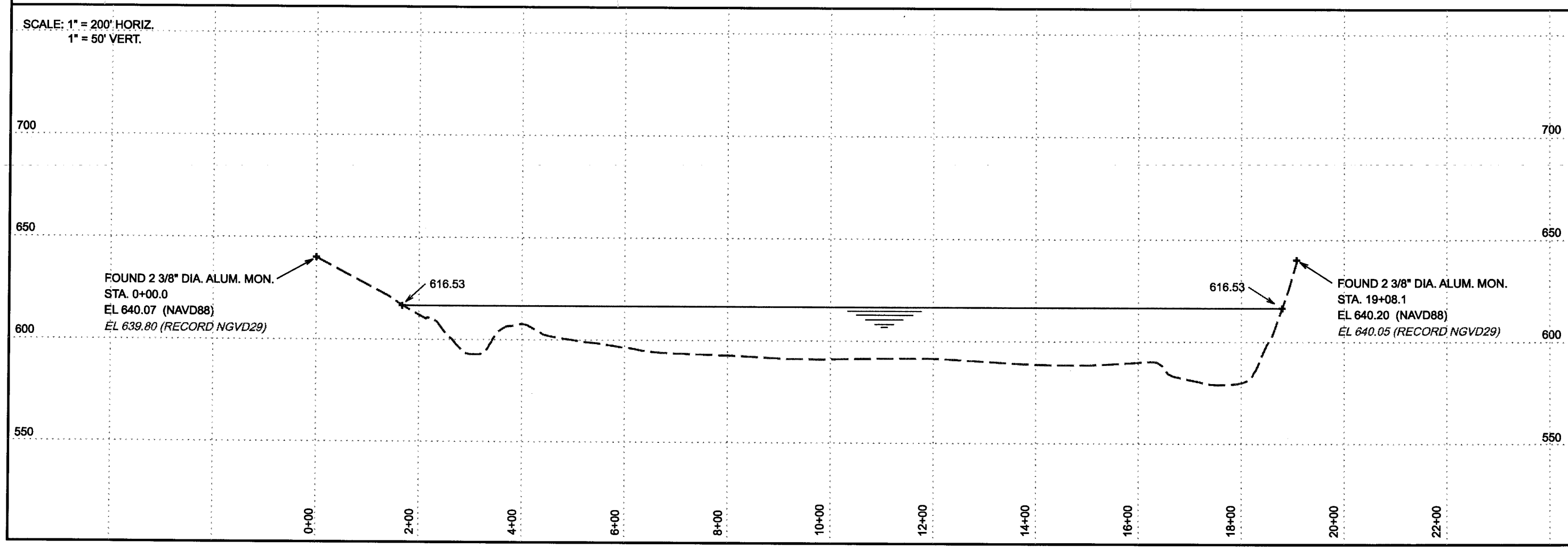
SEDIMENTATION RANGE
LINE SURVEYS
MARK TWAIN LAKE
RANGE LINE 3A

SHEET
V-103



SEDIMENTATION RANGE LINE 4AB

SCALE: 1" = 200'



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	Revisions		

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CKD BY: CGH
SUBMITTED BY:
PLOT SCALE: 1" = 200'
PLOT DATE: 5/18/2016
SIZE: B
FILE NAME:
DATE: MAY 18, 2010
SOLICITATION NO.:
CONTRACT NO.: W912P8-09-C-0066, 71.8K.22
FILE NUMBER:

U.S. ARMY ENGINEER DIVISION
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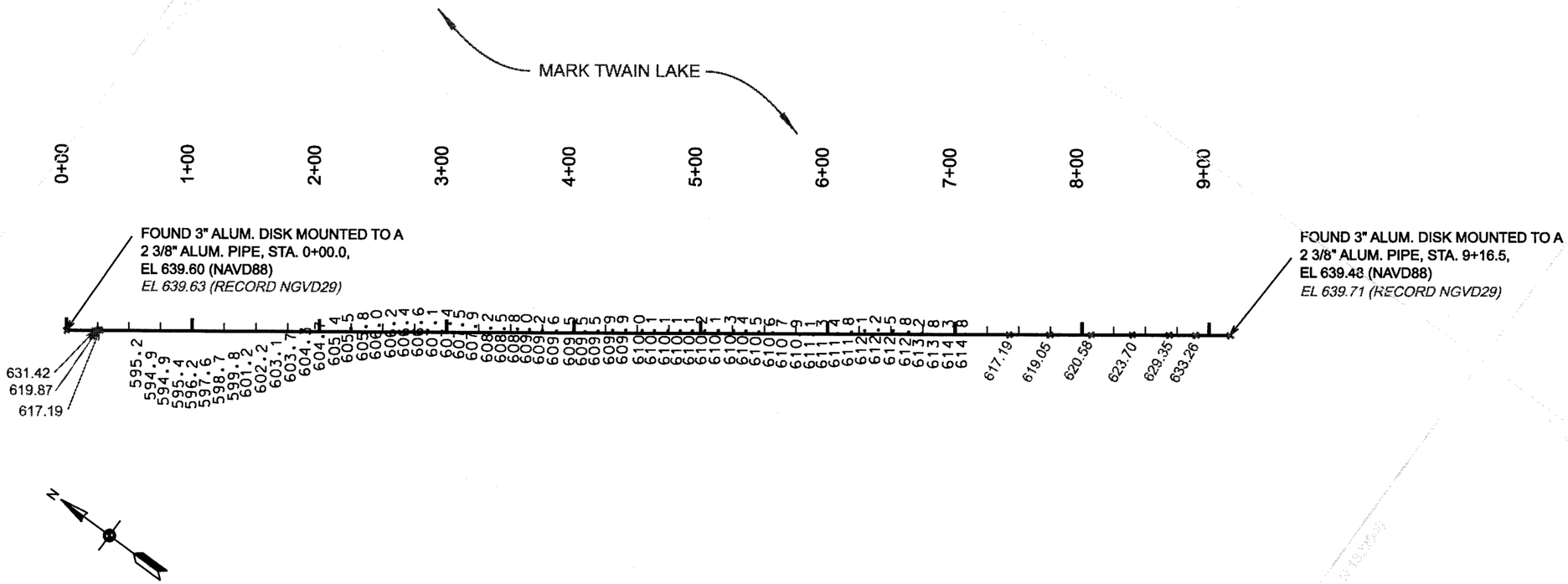
ST. LOUIS, MISSOURI

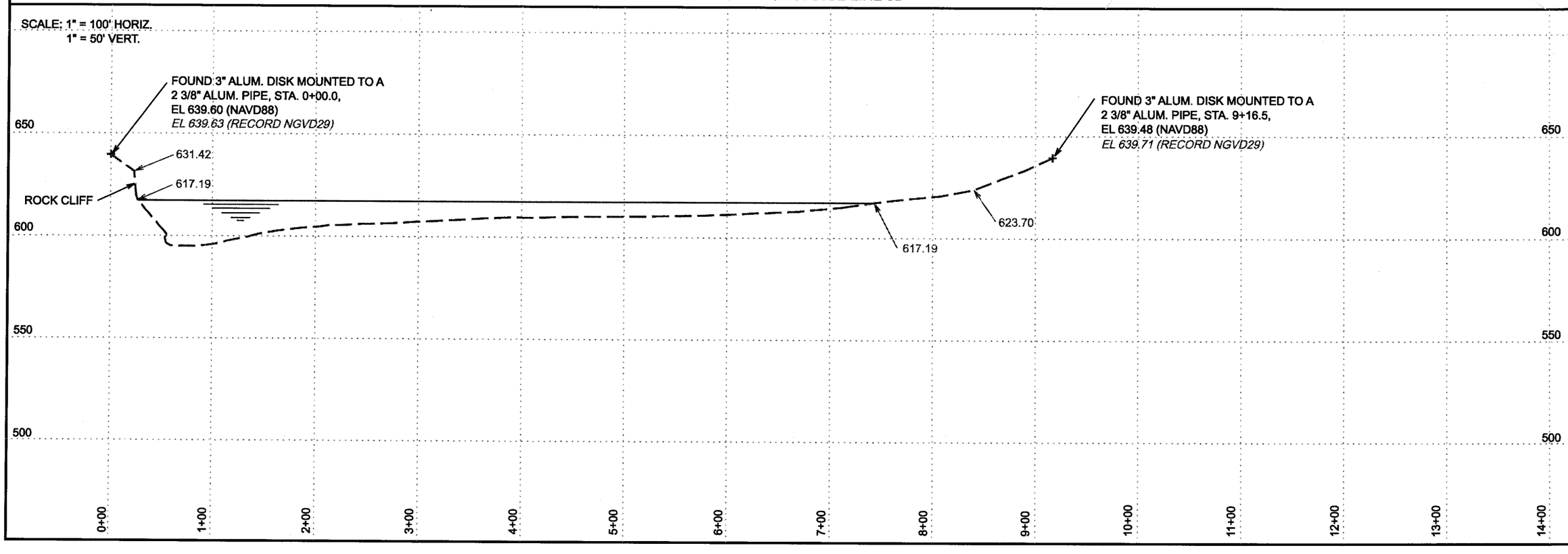
Bowen ENGINEERING & SURVEYING
1019 Broadway, Ste. J
Cape Girardeau, MO 63701

SEDIMENTATION RANGE
LINE SURVEYS
MARK TWAIN LAKE
RANGE LINE 4AB

SHEET
V-104



SEDIMENTATION RANGE LINE 5B



US Army Corps of Engineers®
St. Louis District

Symbol	Description Revisions	Date	Appr.

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DATE: MAY 18, 2010
DWN BY: MGH
CKD BY: CJH
SOLICITATION NO.:
SUBMITTED BY:
CONTRACT NO.: W912P3-10-D-0095 TASK 22
PLOT SCALE: 1" = 100'
PLOT DATE: 5/18/2010
FILE NUMBER:
SIZE: 8
FILE NAME:

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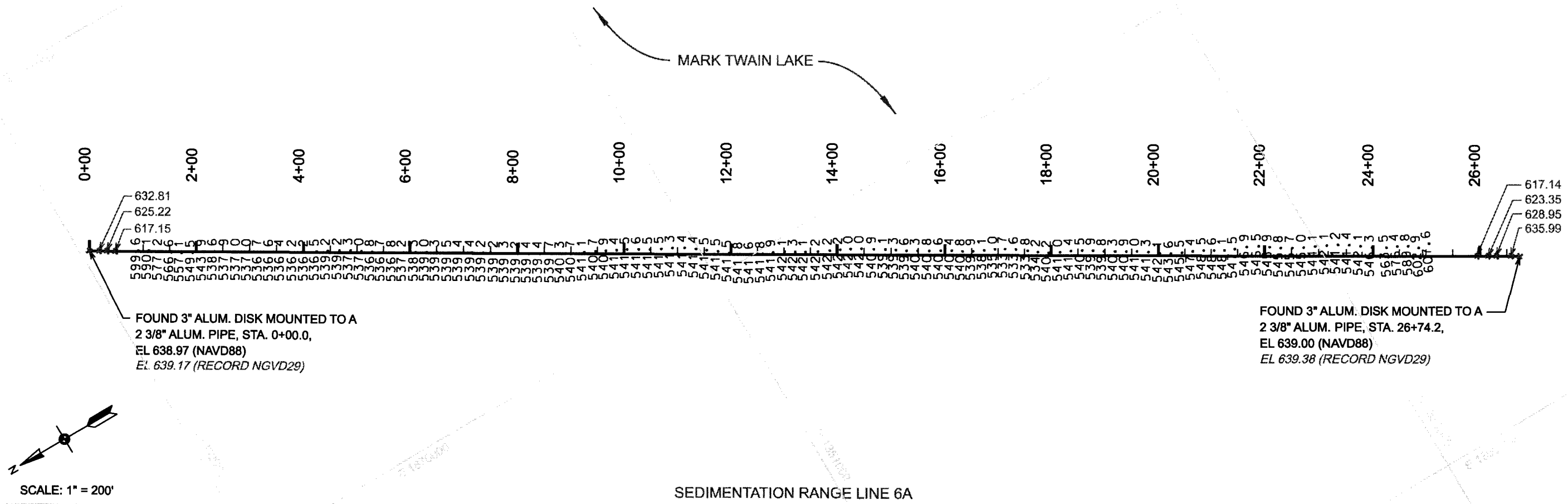
ST. LOUIS, MISSOURI

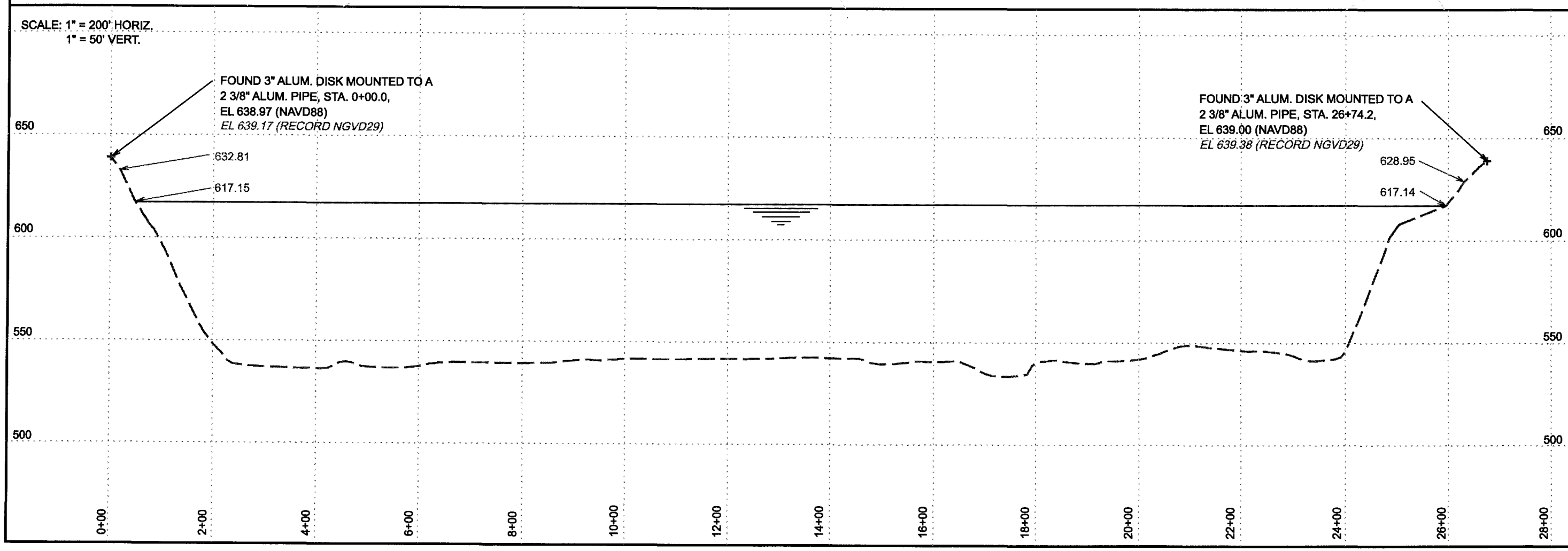
Bowen ENGINEERING & SURVEYING
Bowen Engineering & Surveying, Inc.
Cape Girardeau, MO 63701

SEDIMENTATION RANGE
LINE SURVEYS
MARK TWAIN LAKE
RANGE LINE 5B

SHEET
V-105



SEDIMENTATION RANGE LINE 6A



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St. Louis District

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	Revisions		

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DWN BY: MEGH
CKD BY: TGM
SUBMITTED BY:
PLOT SCALE: 1" = 200'
PLOT DATE: 5/15/2010
SIZE: B
FILE NAME:
DATE: MAY 15, 2010
SOLICITATION NO.:
CONTRACT NO.: W912P4-11-D-0001, TA SK 22
FILE NUMBER:

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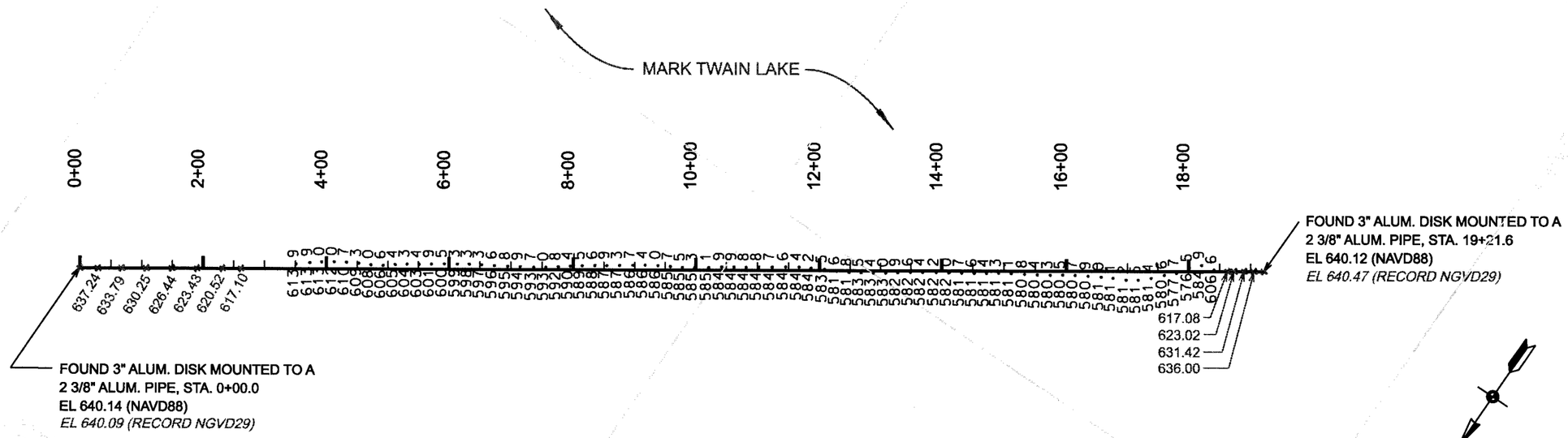
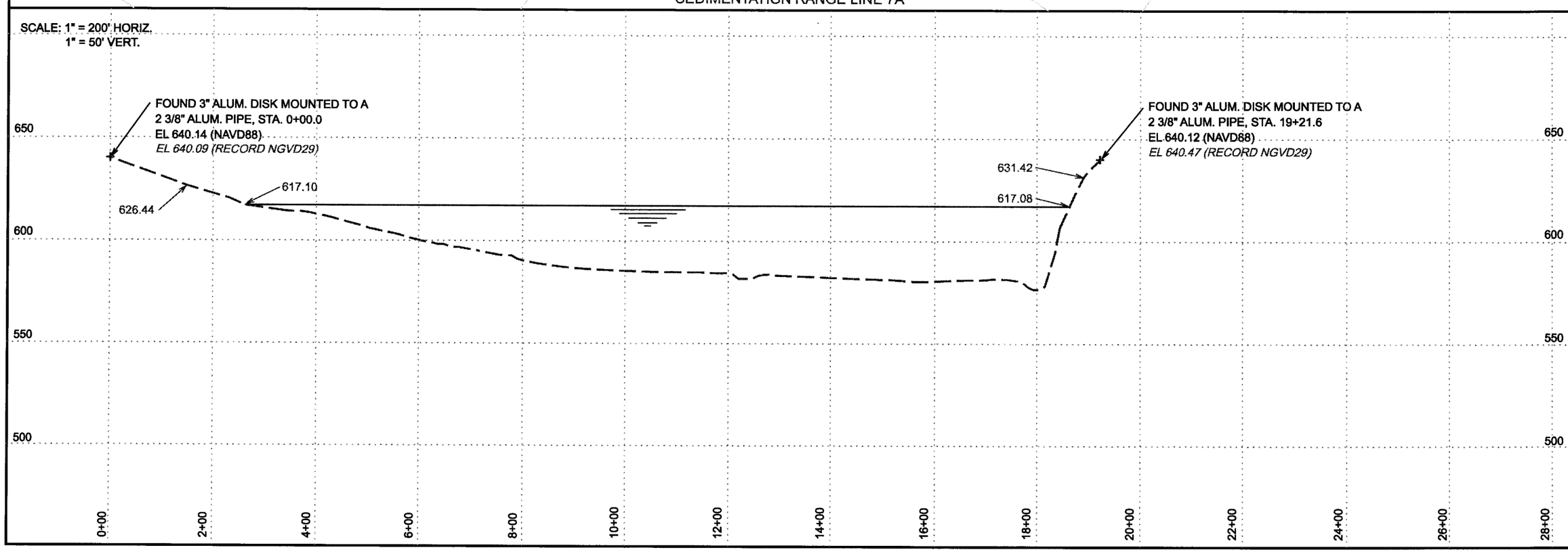
Bowen ENGINEERING & SURVEYING, INC.
1019 Maryville Ctr. Drive
Cape Girardeau, MO 63701

SEDIMENTATION RANGE
LINE SURVEYS
MARK TWAIN LAKE
RANGE LINE 6A

SHEET
V-106



SEDIMENTATION RANGE LINE 7A



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St. Louis District

Symbol	Description	Date	Appr.
	Revisions		

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DWN BY: MGH
CKD BY: CGH
SUBMITTED BY:
PLOT SCALE: 1" = 200'
PLOT DATE: 8/19/2010
SIZE:
FILE NAME:
DATE: MAY 18, 2010
SOLICITATION NO.:
CONTRACT NO.: W912P7-10-B-0086, TASK 22
FILE NUMBER:

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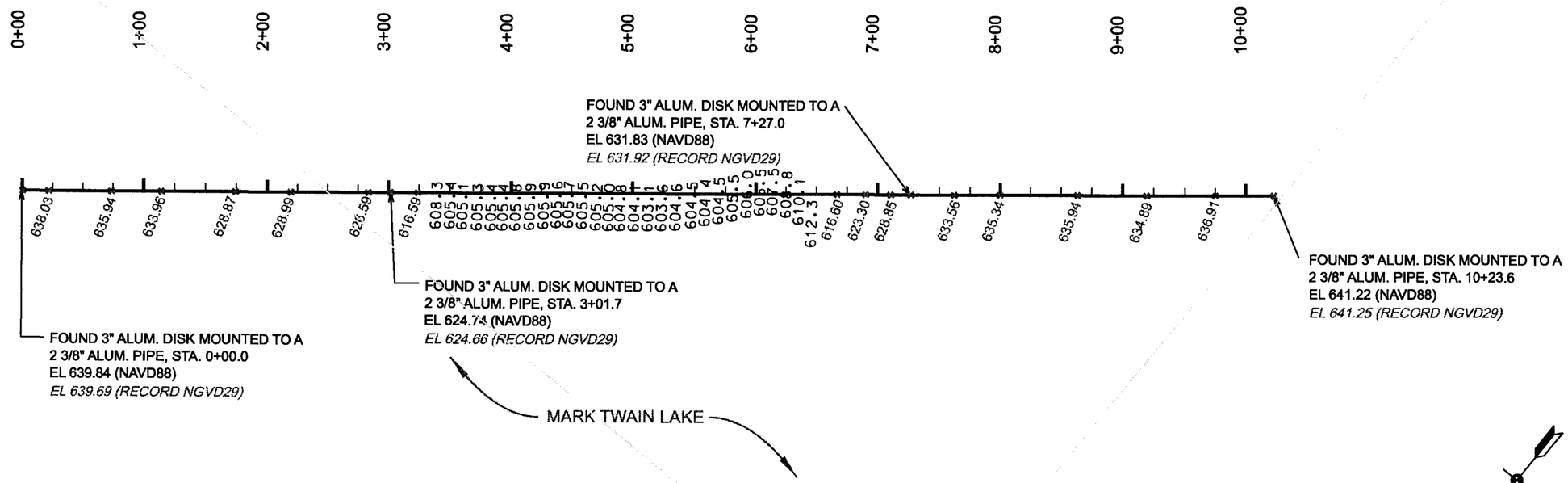
Cape Girardeau, MO 63701

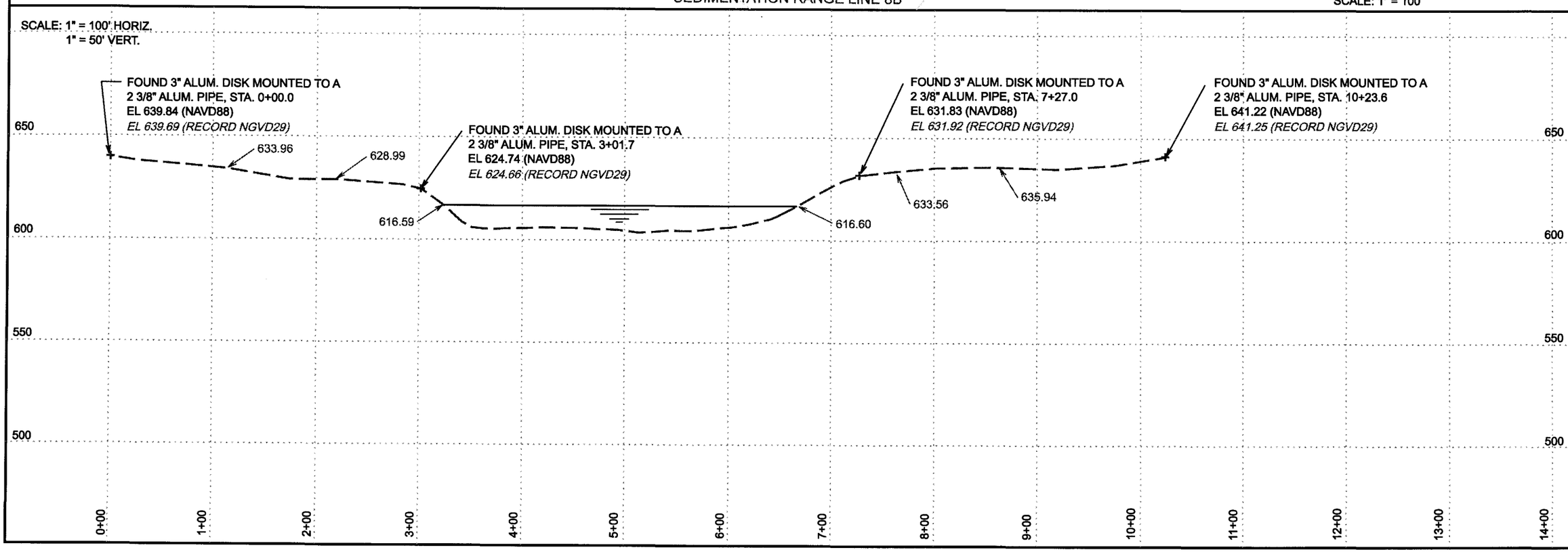
SEDIMENTATION RANGE
LINE SURVEYS
MARK TWAIN LAKE
RANGE LINE 7A

SHEET
V-107



SEDIMENTATION RANGE LINE 8B

SCALE: 1" = 100'



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St. Louis District

Symbol	Description Revisions	Date	Appr.

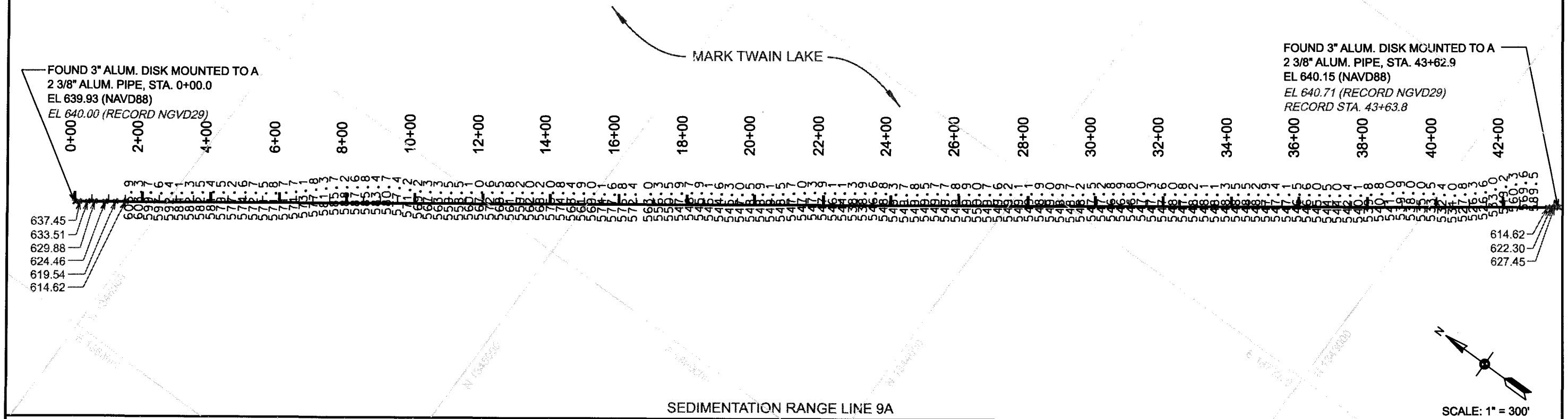
SURVEYED BY: BOWEN ENGR. & SURV.
DWN BY: MGH
CKD BY: CGH
SUBMITTED BY:
DATE: MAY 18, 2010
SOLICITATION NO.:
CONTRACT NO.: W912P4-11-D-0035, TASK 22
PLOT SCALE: 1" = 100'
PLOT DATE: 6/18/2010
SIZE: B
FILE NAME:
FILE NUMBER:

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

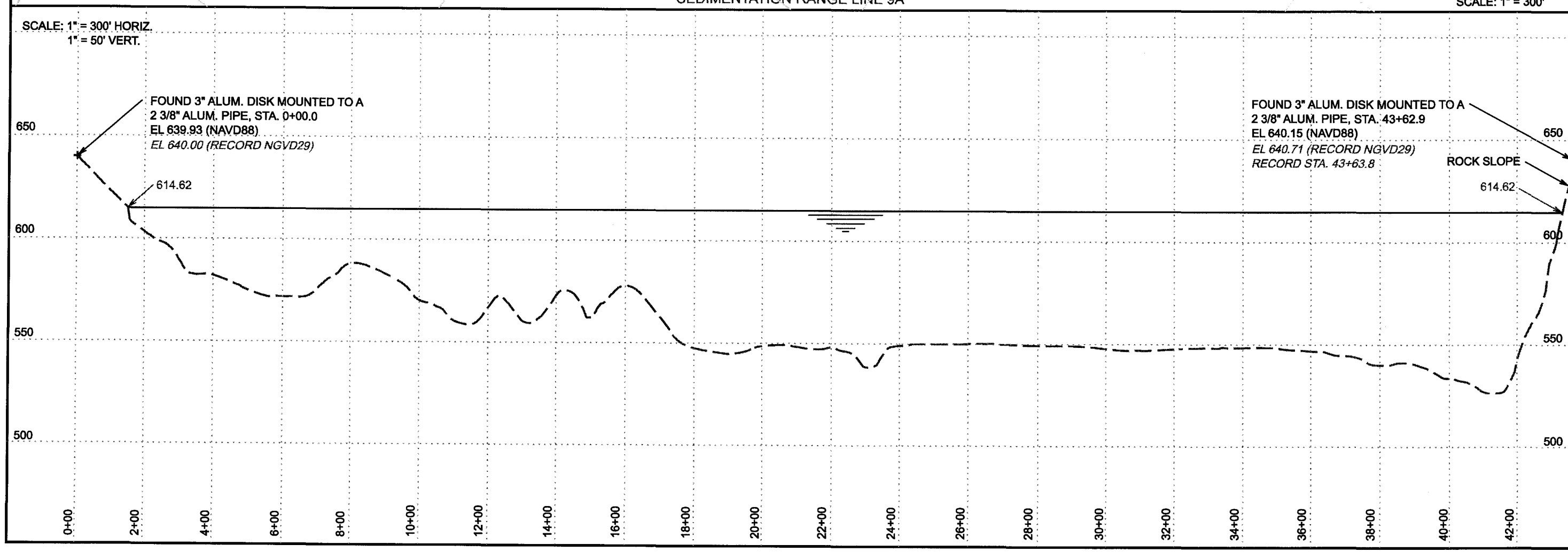
Bowen ENGINEERING & SURVEYING
1000 Broadway, Suite 1
Cape Girardeau, MO 63701

SEDIMENTATION RANGE
LINE SURVEYS
MARK TWAIN LAKE
RANGE LINE 8B

SHEET
V-108



SEDIMENTATION RANGE LINE 9A



US Army Corps of Engineers®
St. Louis District

Symbol	Description Revisions	Date	Appr.

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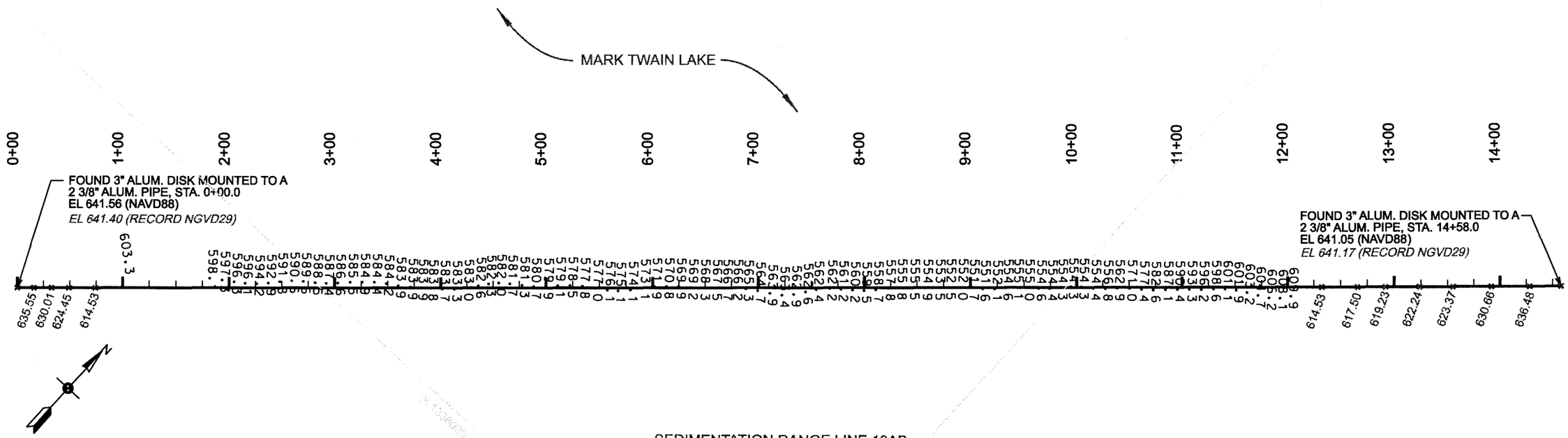
SOLICITATION NO.:
CONTRACT NO.: W912P4-13-D-0006, TO 0K-22
FILE NUMBER:
SURVEYED BY: BOWEN ENGR. & SURV.
DWN BY: MGH
CKD BY: CGH
SUBMITTED BY:
PLOT DATE: 5/16/2012
PLOT SCALE: 1" = 300'
SIZE: 8
FILE NAME:

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Bowen ENGINEERING & SURVEYING
1010 Commerce Drive / Cape Girardeau, MO 63701

SEDIMENTATION RANGE
LINE SURVEYS
MARK TWAIN LAKE
RANGE LINE 9A

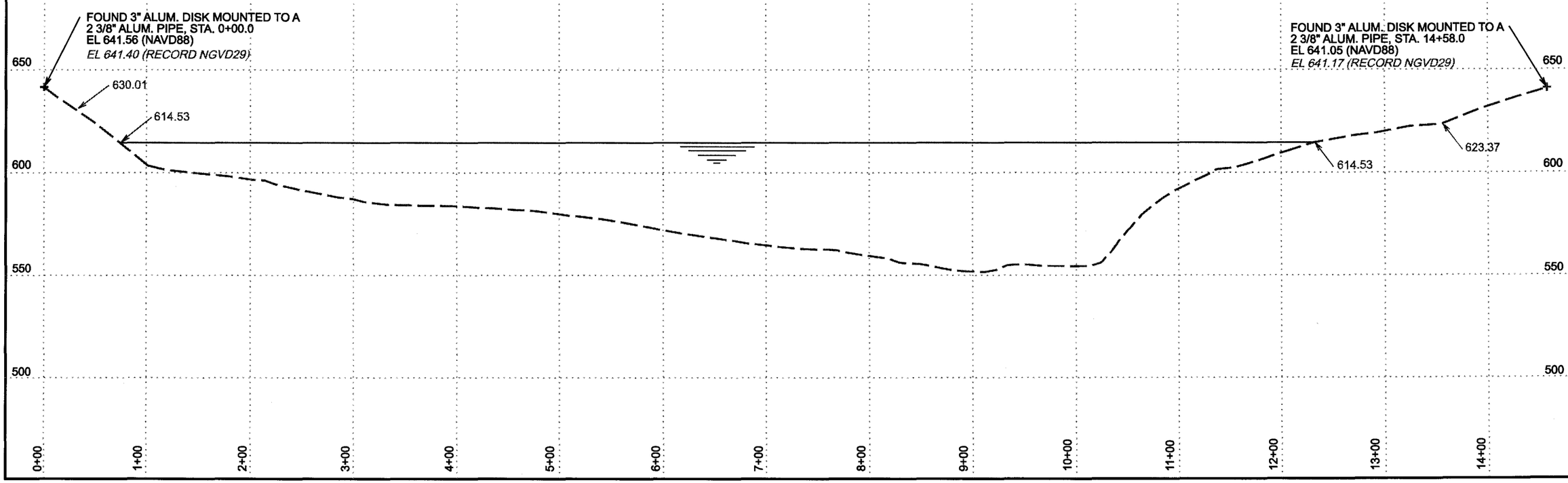
SHEET
V-109



SCALE: 1" = 100'

SEDIMENTATION RANGE LINE 10AB

SCALE: 1" = 100' HORIZ.
1" = 50' VERT.



US Army Corps of Engineers®
St. Louis District

Symbol	Description	Date	Appr.
	Revisions		

SURVEYED BY: BOWEN ENGR. & SURVY.
DATE: MAY 18, 2010
DWN BY: MGH
CKD BY: CGH
SOLICITATION NO.:
SUBMITTED BY:
CONTRACT NO.: W912P8-10-D-0004, TASK 22
PLOT SCALE: 1" = 100'
PLOT DATE: 07/02/2010
SIZE: B
FILE NAME:
FILE NUMBER:

U.S. ARMY ENGINEER DIVISION
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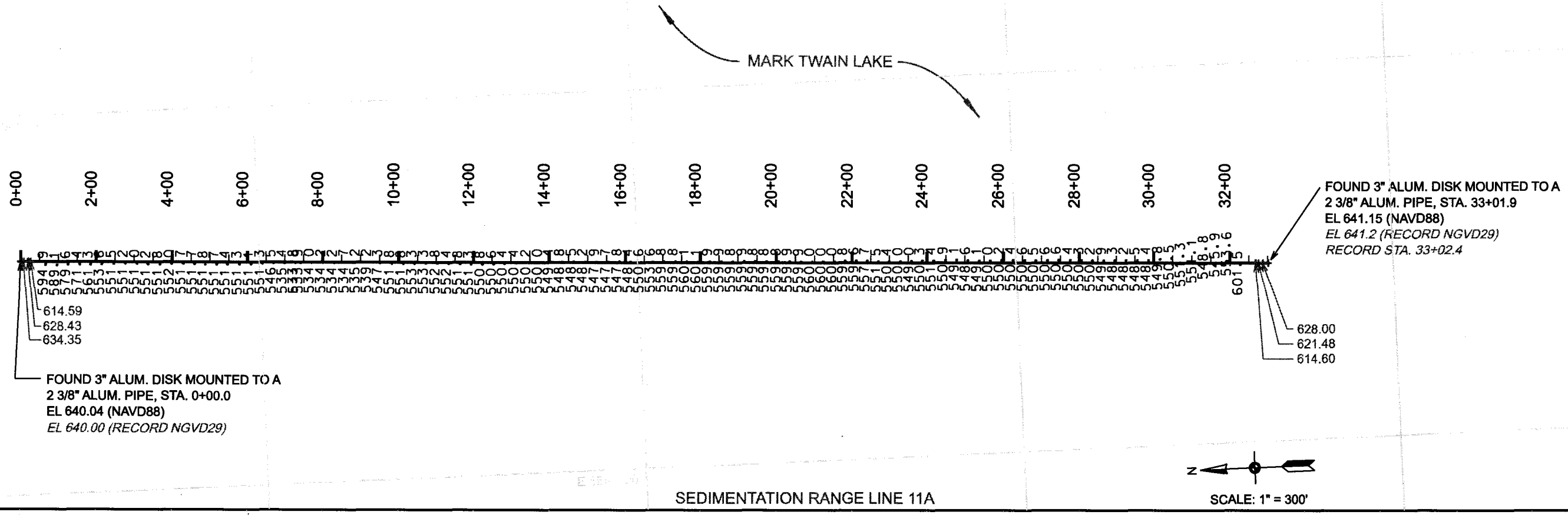
ST. LOUIS, MISSOURI

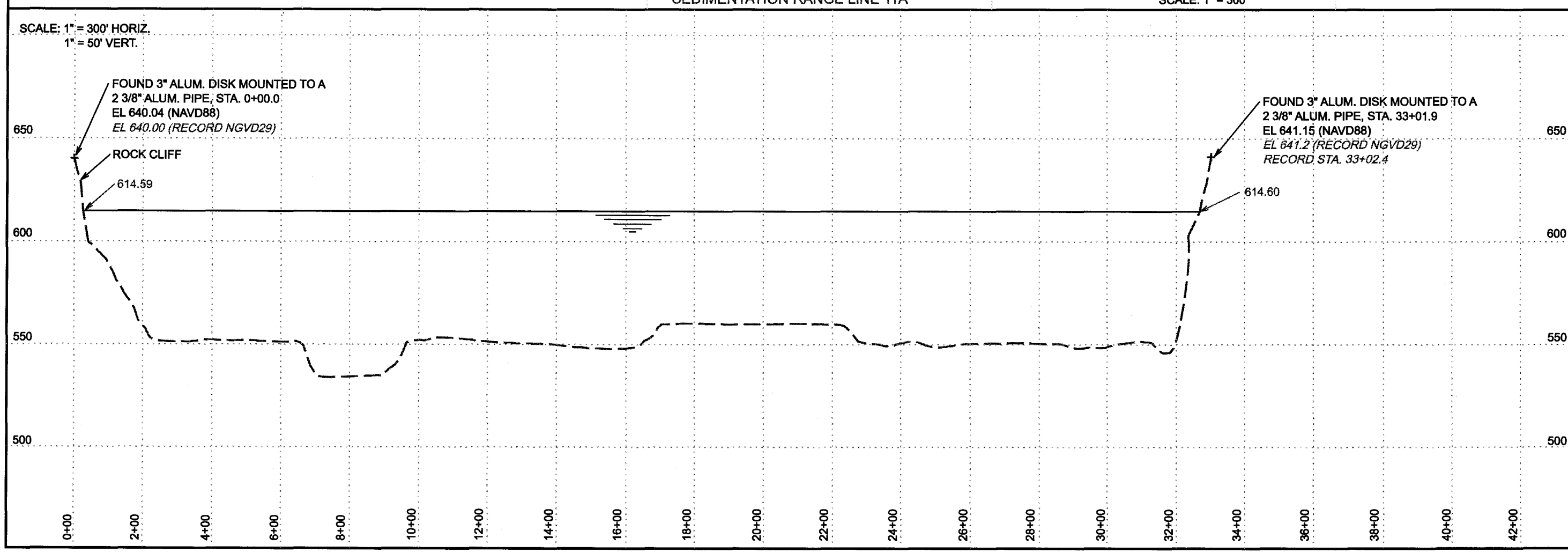
Bowen ENGINEERING & SURVEYING
1010 Wayne, Ste. 1000
Cape Girardeau, MO 63701

SEDIMENTATION RANGE
LINE SURVEYS
MARK TWAIN LAKE
RANGE LINE 10AB

SHEET
V-110



SEDIMENTATION RANGE LINE 11A



US Army Corps of Engineers®
St. Louis District

Symbol	Description Revisions	Date	Appr.

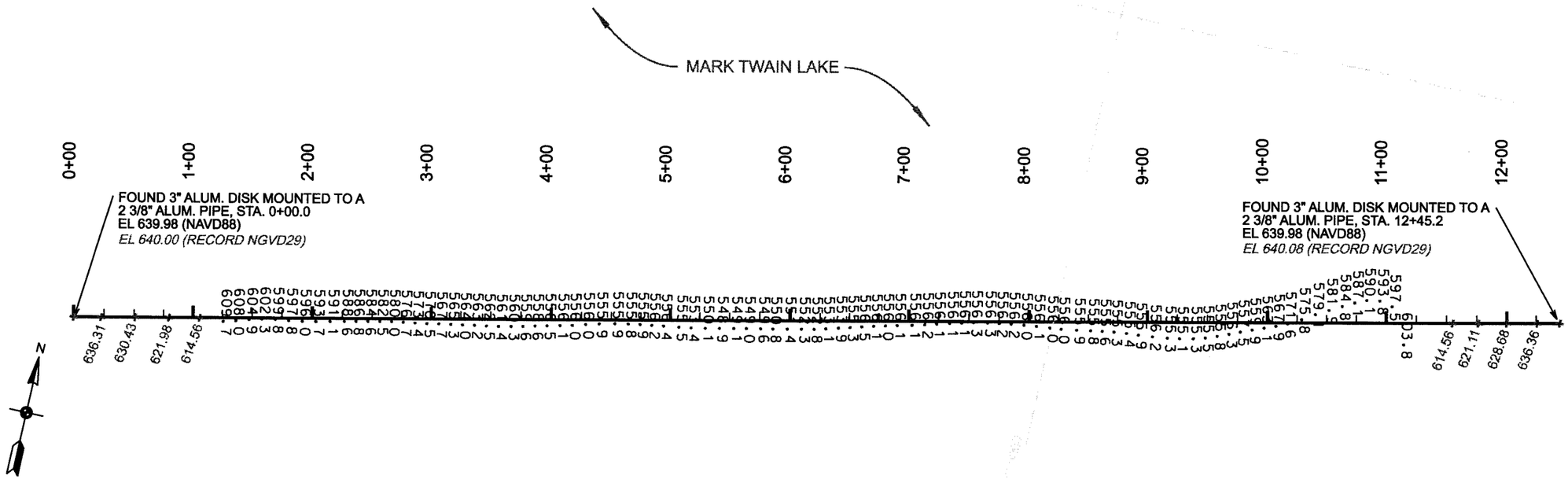
DATE: MAY 18, 2010
SOLICITATION NO.:
CONTRACT NO.: W912P7-10-C-0086, TASK 22
FILE NUMBER
SURVEYED BY: BOWEN ENGR. & SURV.
DWN BY: MGH
CKD BY: CGH
SUBMITTED BY:
PLOT SCALE: 1" = 300'
PLOT DATE: 5/18/2010
SIZE: B
FILE NAME:

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Bowen ENGINEERING & SURVEYING
SURVEYORS • ENGINEERS • PLANNERS
Cape Girardeau, MO 63701

SEDIMENTATION RANGE
LINE SURVEYS
MARK TWAIN LAKE
RANGE LINE 11A

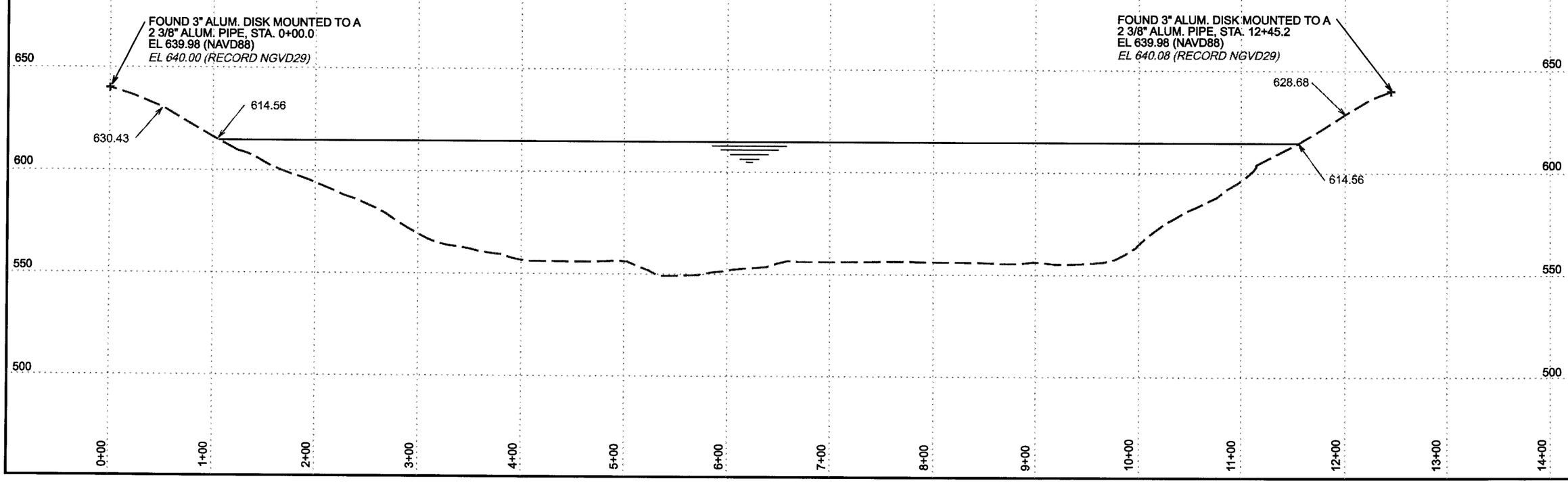
SHEET
V-111



SCALE: 1" = 100'

SEDIMENTATION RANGE LINE 12A

SCALE: 1" = 100' HORIZ.
1" = 50' VERT.



US Army Corps of Engineers®
St. Louis District

Symbol	Description Revisions	Date	Appr.

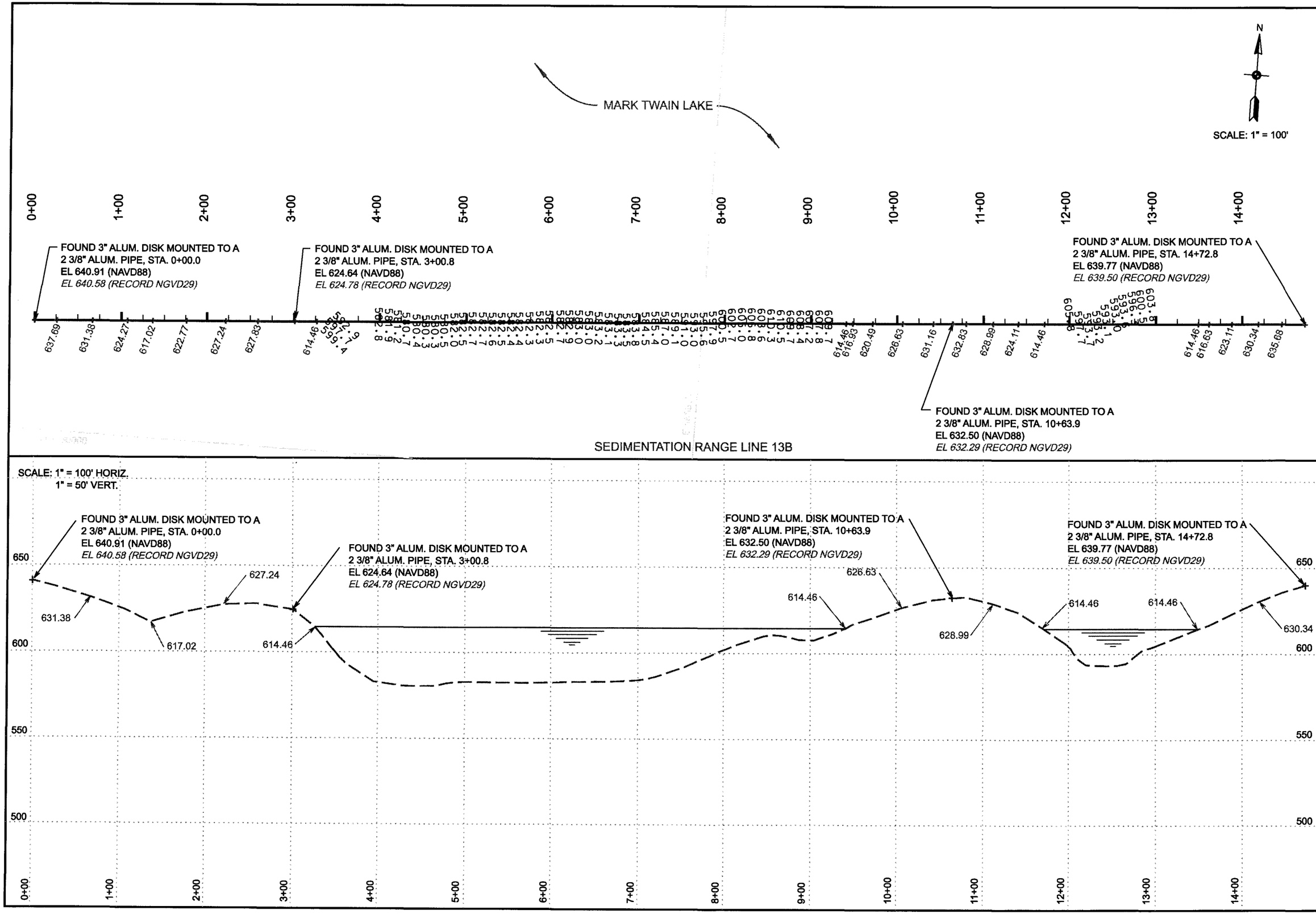
DATE: MAY 18, 2010
SOLICITATION NO.:
CONTRACT NO.: W912P7-12-C-0036, TASK 23
FILE NUMBER:
SURVEYED BY: BOWEN ENGR. & SURV.
DWN BY: MGK
CKD BY: CGH
SUBMITTED BY:
PLOT SCALE: 1" = 100'
PLOT DATE: 5/18/2010
SIZE: B
FILE NAME:

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Bowen ENGINEERING & SURVEYING
1000 Maplewood Drive
Cape Girardeau, MO 63701

SEDIMENTATION RANGE
LINE SURVEYS
MARK TWAIN LAKE
RANGE LINE 12A

SHEET
V-112



US Army Corps of Engineers®
St. Louis District

Symbol	Description	Date	Appr.
	Revisions		

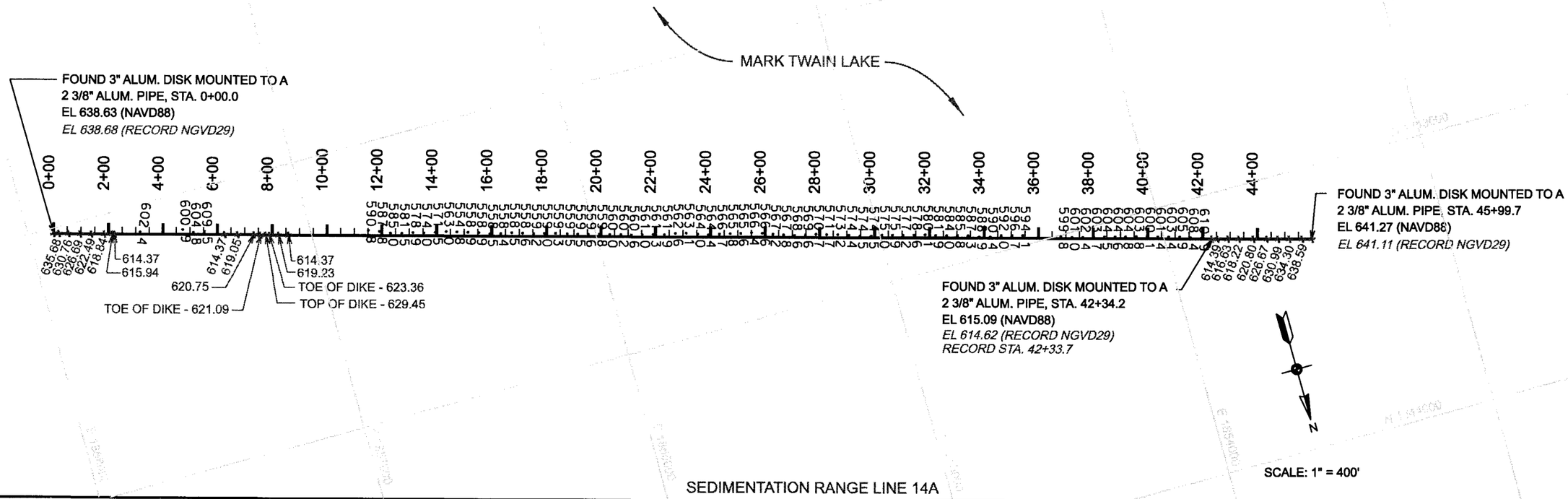
DATE: MAY 18, 2010
SOLICITATION NO.:
CONTRACT NO.: W912GP-09-D-0086, TASK 22
FILE NUMBER:
SURVEYED BY: BOWEN ENGR. & SRVY.
DWN BY: MGH
CKD BY: CGH
SUBMITTED BY:
PLOT SCALE: 1" = 100'
PLOT DATE: 5/18/2010
SIZE: B
FILE NAME:

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

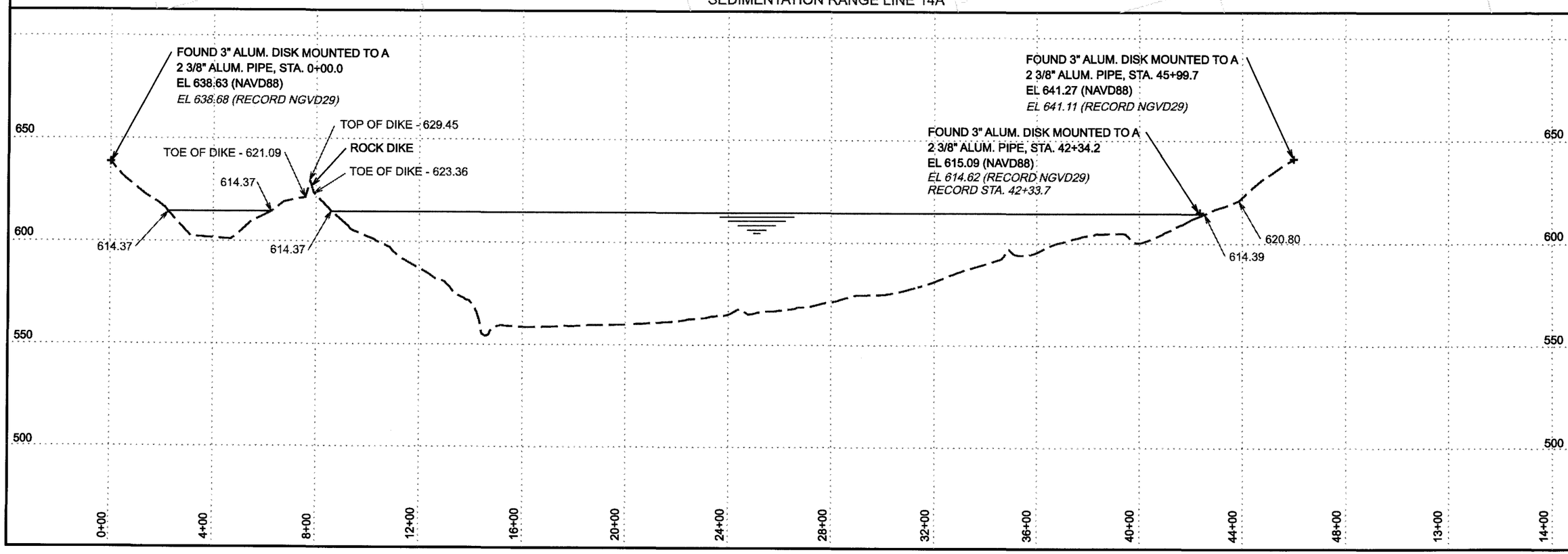
Bowen ENGINEERING & SURVEYING
1019 Rive Drive, Suite J
Cape Girardeau, MO 63701

SEDIMENTATION RANGE
LINE SURVEYS
MARK TWAIN LAKE
RANGE LINE 13B

SHEET
V-113



SEDIMENTATION RANGE LINE 14A



US Army Corps of Engineers®
St. Louis District

Symbol	Description	Date	Appr.
	Revisions		

DATE: MAY 18, 2010
SOLICITATION NO.:
CONTRACT NO.: W912P7-10-C-0006
FILE NUMBER:

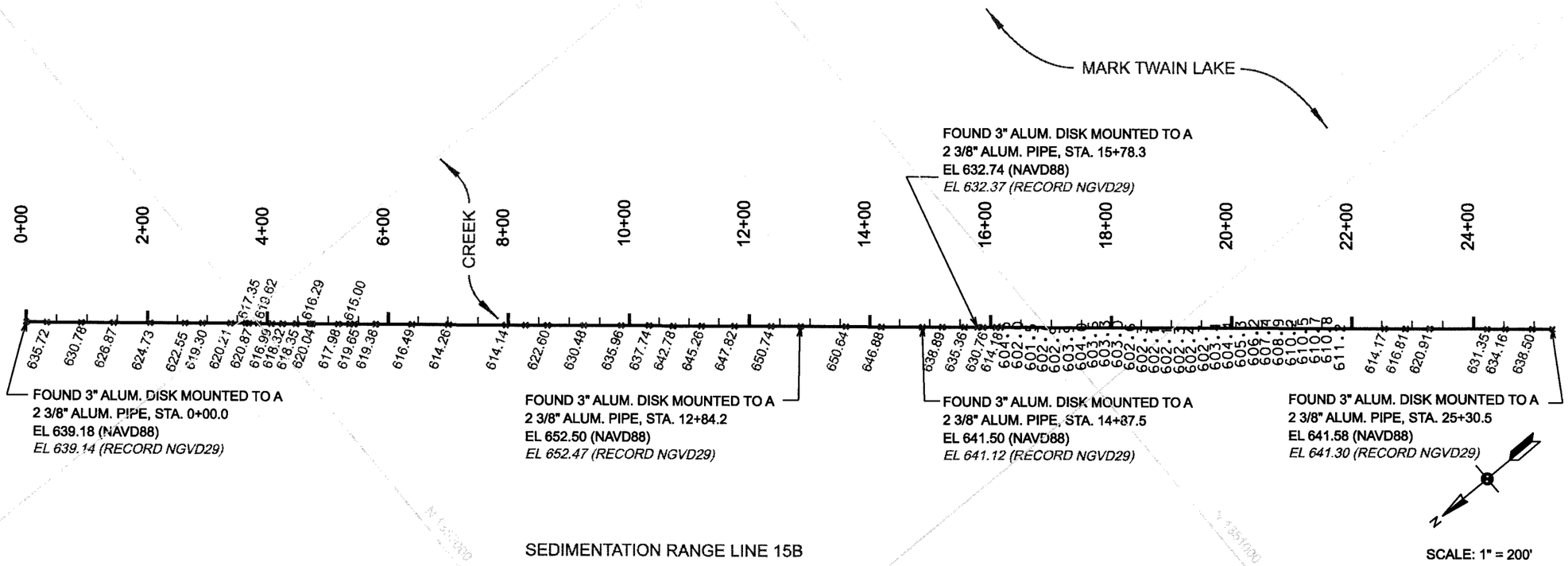
SURVEYED BY: BOWEN ENGR. & SURV.
DWN BY: MGR
CKD BY: CGH
SUBMITTED BY:
PLOT SCALE: 1" = 400'
PLOT DATE: 5/13/2010
SIZE: B
FILE NAME:

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

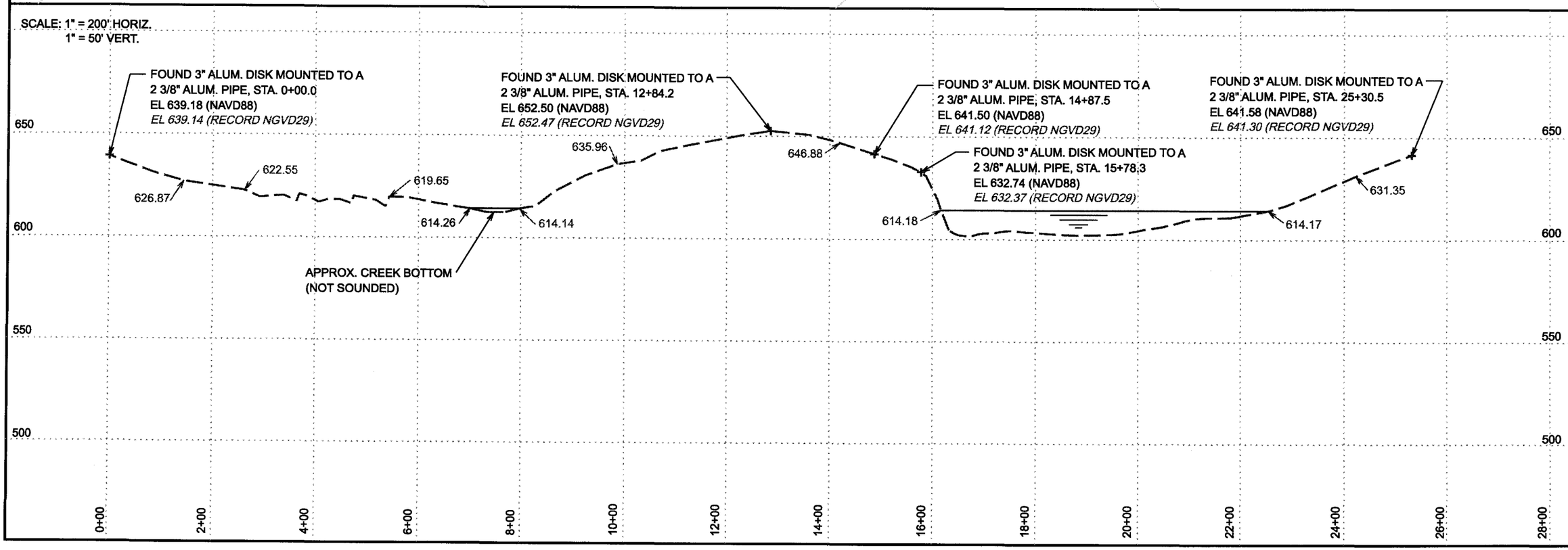
Bowen ENGINEERING & SURVEYING
1010 Pershing, Suite J
Cape Girardeau, MO 63701

SEDIMENTATION RANGE
LINE SURVEYS
MARK TWAIN LAKE
RANGE LINE 14A

SHEET
V-114



SEDIMENTATION RANGE LINE 15B



US Army Corps of Engineers®
St. Louis District

Symbol	Description Revisions	Date	Appr.

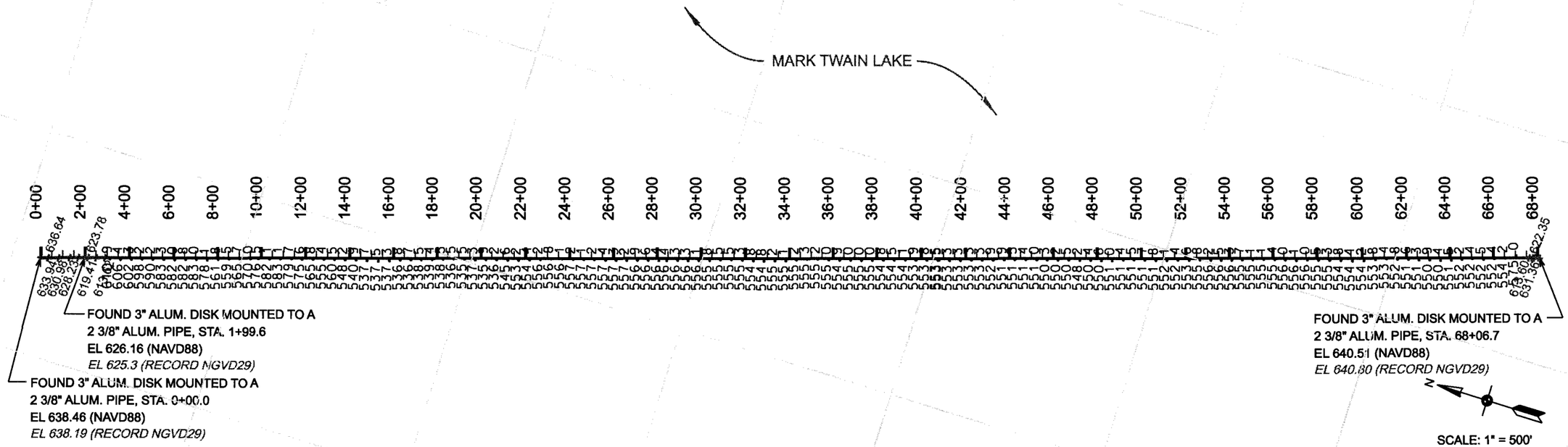
DATE: MAY 18, 2010
SOLICITATION NO.:
CONTRACT NO.: W912P8-09-C-0006, TASK 23
FILE NUMBER:
SURVEYED BY: BOWSER ENGR. & SURV.
DWN BY: MGH
CKD BY: CGH
SUBMITTED BY:
PLOT SCALE: 1" = 200'
PLOT DATE: 5/18/2010
SIZE: B
FILE NAME:

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

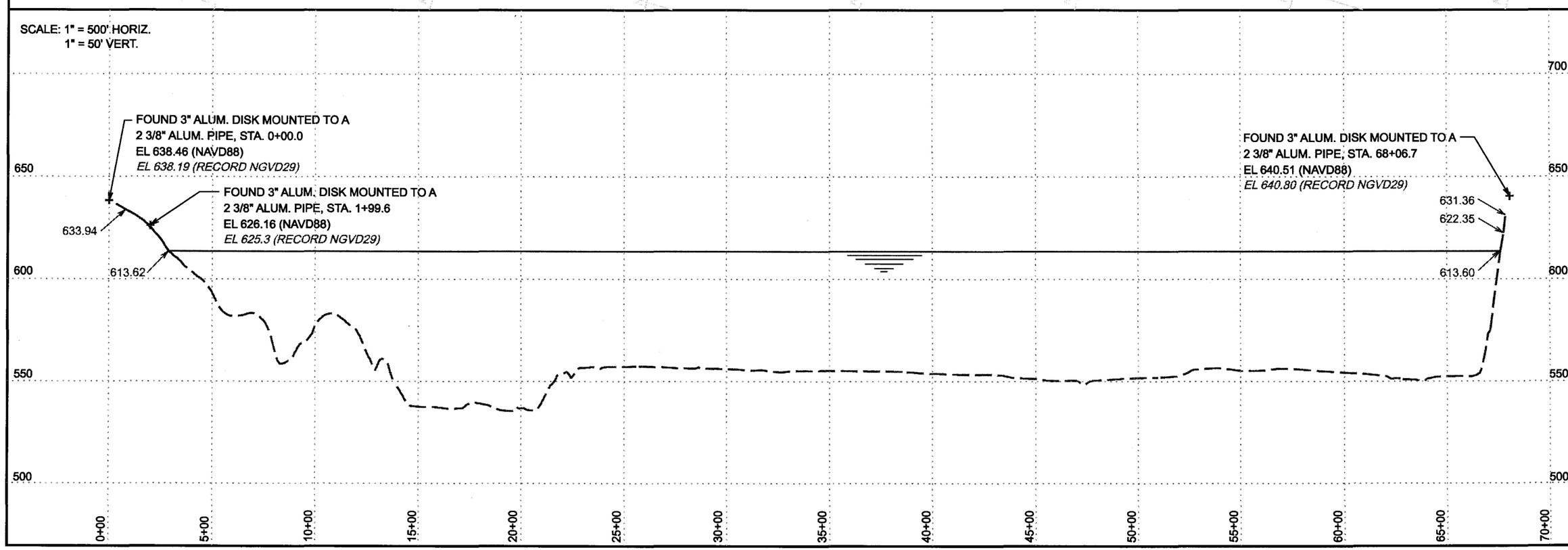
Bowen ENGINEERING & SURVEYING
1919 Rockford Road, Suite J
Cape Girardeau, MO 63701

SEDIMENTATION RANGE
LINE SURVEYS
MARK TWAIN LAKE
RANGE LINE 15B

SHEET
V-115



SEDIMENTATION RANGE LINE 16A



US Army Corps of Engineers®
St. Louis District

Symbol	Description	Date	Appr.
	Revisions		

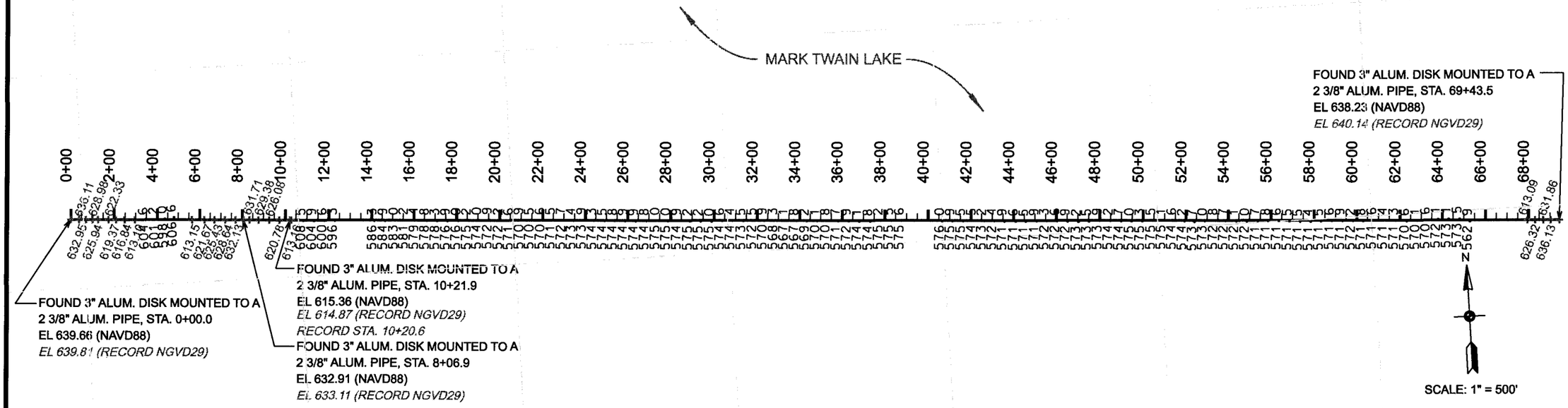
DATE: MAY 18, 2010
SOLICITATION NO.:
CONTRACT NO.: W912P8-09-D-0004, TASK 32
FILE NUMBER:
SURVEYED BY: BOWEN ENGR. & SURV.
DWN BY: MGH
CKD BY: CSH
SUBMITTED BY:
PLOT DATE: 5/18/2010
PLOT SCALE: 1" = 500'
SIZE: B
FILE NAME:

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

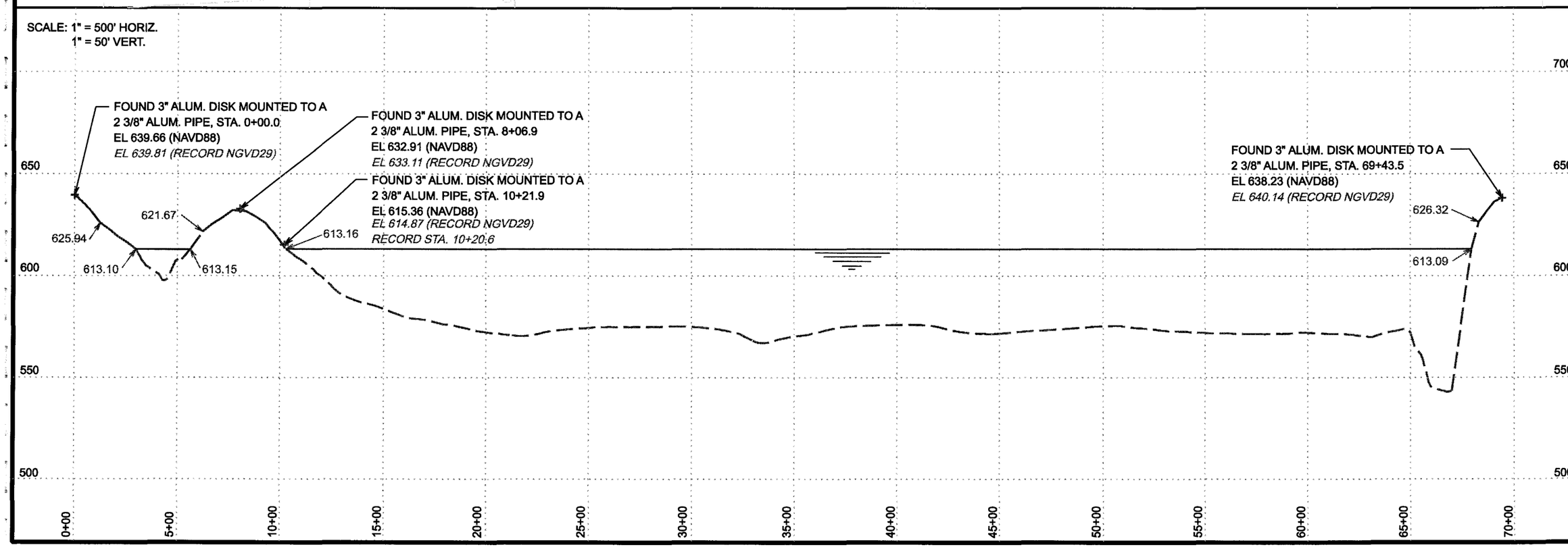
Bowen ENGINEERING & SURVEYING
1010 Washington Street, Suite J
Cape Girardeau, MO 63701

SEDIMENTATION RANGE
LINE SURVEYS
MARK TWAIN LAKE
RANGE LINE 16A

SHEET
V-116



SEDIMENTATION RANGE LINE 17A



US Army Corps of Engineers®
St. Louis District

Symbol	Description	Date	Appr.
	Revisions		

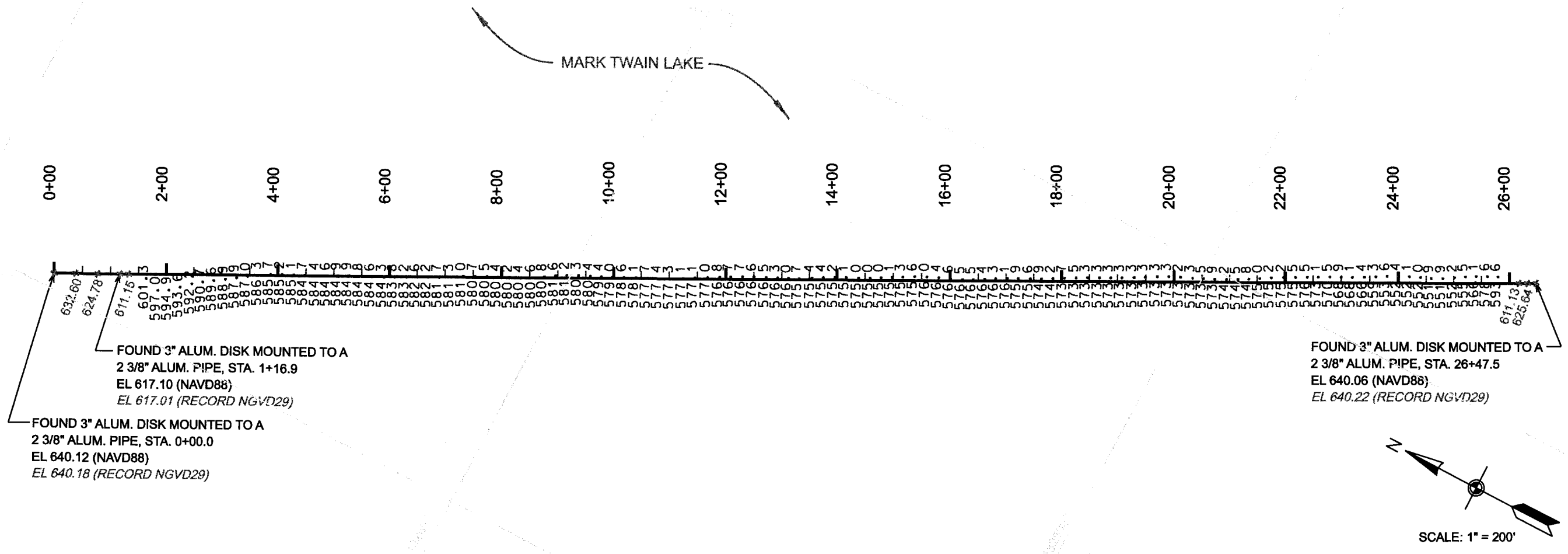
DATE: MAY 18, 2010
SOLICITATION NO.:
CONTRACT NO.: W912P4-07-D-0506, TASK 22
FILE NUMBER:
SURVEYED BY: BOWEN ENGR. & SURV.
DWN BY: MAC
CKD BY: CZN
SUBMITTED BY:
PLOT DATE: 5/18/2010
PLOT SCALE: 1" = 50'
FILE NAME:
SIZE: B

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

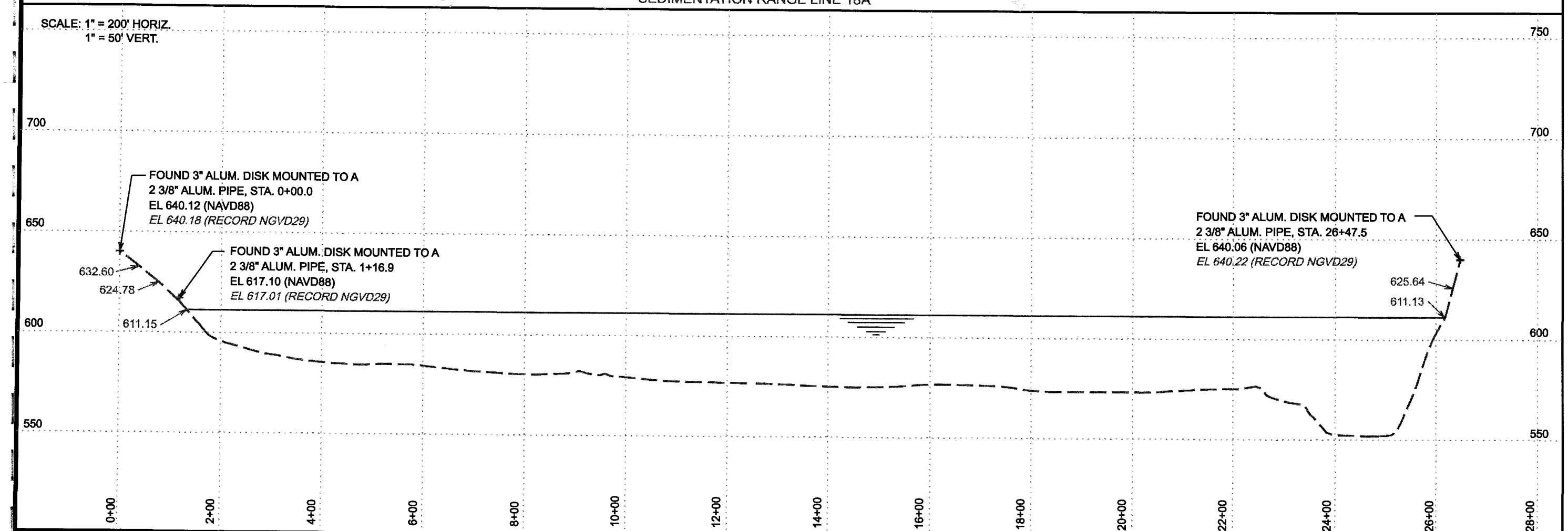
Bowen ENGINEERING & SURVEYING
1016 Nicholas Lane, Suite J
Cape Girardeau, MO 63701

SEDIMENTATION RANGE
LINE SURVEYS
MARK TWAIN LAKE
RANGE LINE 17A

SHEET
V-117



SEDIMENTATION RANGE LINE 18A



US Army Corps of Engineers®
St. Louis District

Symbol	Description Revisions	Date	Appr.

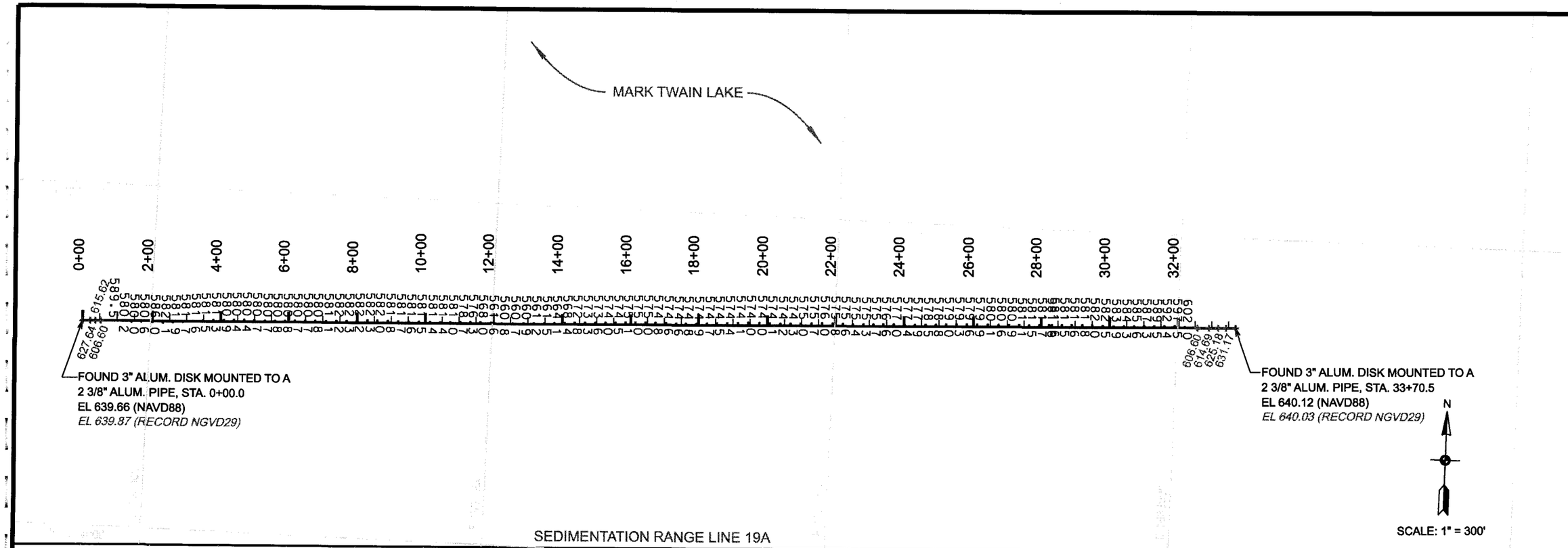
DATE: MAY 16, 2014
SOLICITATION NO.:
CONTRACT NO.: W912P4-07-D-0500, TASK 22
FILE NUMBER:
PLOT DATE: 5/16/2014
FILE NAME:
SURVEYED BY: BOWEN ENGINEERING & SURV.
DWN BY: DAN
CKD BY: DAN
SUBMITTED BY:
PLOT SCALE: 1" = 200'
SIZE: B

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

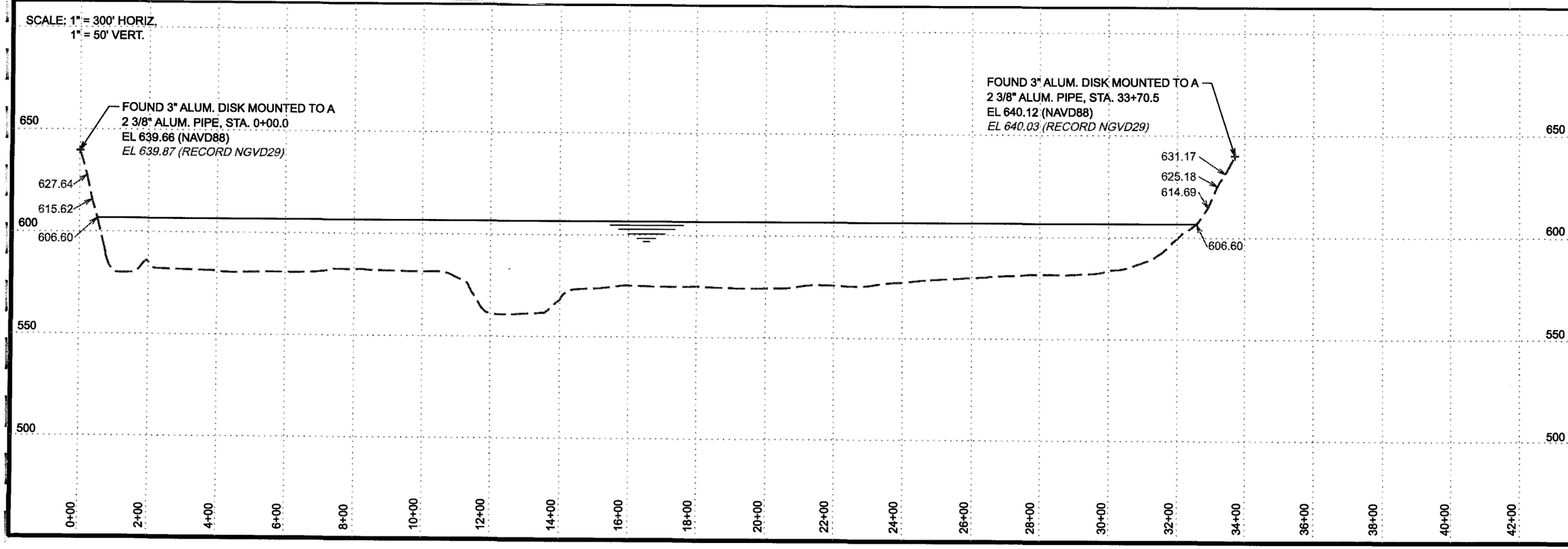
Bowen ENGINEERING & SURVEYING
1018 Waterfront Park Drive
Cape Girardeau, MO 63701

SEDIMENTATION RANGE
LINE SURVEYS
MARK TWAIN LAKE
RANGE LINE 18A

SHEET
V-118



SEDIMENTATION RANGE LINE 19A



US Army Corps of Engineers®
St. Louis District

Symbol	Description / Revisions	Date	Appr.

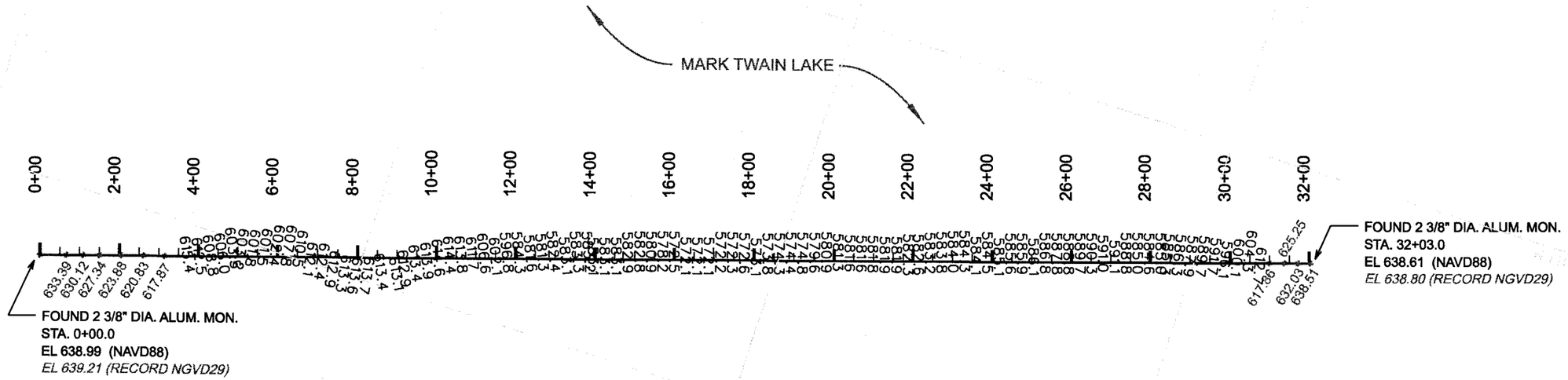
DATE: MAY 16, 2013
SOLICITATION NO.:
CONTRACT NO.: W912P-07-D-0505, TASK 22
FILE NUMBER:
SURVEYED BY: R. BOWEN/ BOWEN & SURV.
DWN BY: MARK
CKD BY:
SUBMITTED BY:
PLOT DATE: 01/05/2015
PLOT SCALE: 1" = 300'
SIZE: 15
FILE NAME:

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Bowen ENGINEERING & SURVEYING
1215 Washington Ave. 63301
1215 Washington Ave. 63301

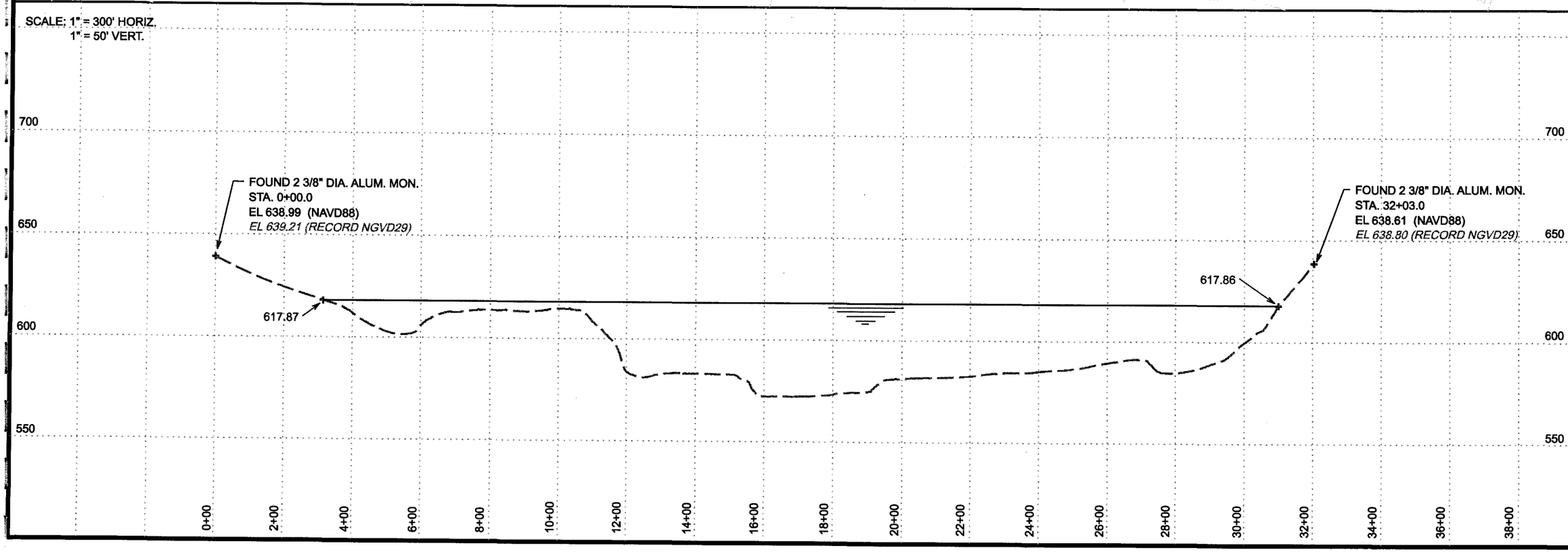
SEDIMENTATION RANGE
LINE SURVEYS
MARK TWAIN LAKE
RANGE LINE 19A

SHEET
V-119



SEDIMENTATION RANGE LINE 20A

SCALE: 1" = 300'



US Army Corps of Engineers®
St. Louis District

Symbol	Description	Date	Appr.
	Revisions		

DATE: January 18, 2018
SOLICITATION NO.:
CONTRACT NO.: W912EP-07-D-0508, TASK 22
FILE NUMBER:
SURVEYED BY: Bowen Engineering & Surveying
DWN BY: Kevin Kaiser
CKD BY: Chris Bowen
SUBMITTED BY:
PLOT DATE: 2/16/2018
PLOT SCALE: 1" = 300'
SIZE: B
FILE NAME:

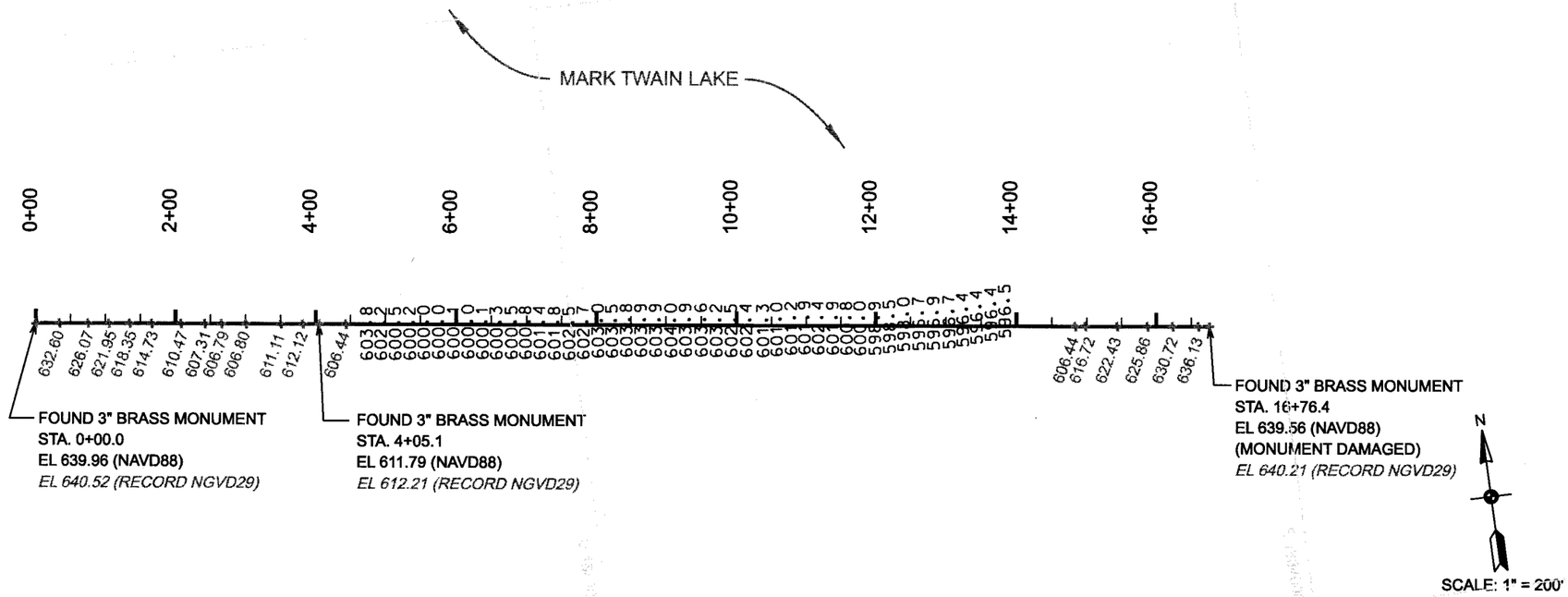
U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Bowen ENGINEERING & SURVEYING
1009 Wolverton Lane, Suite A
Lake Winnebago, MO 64071

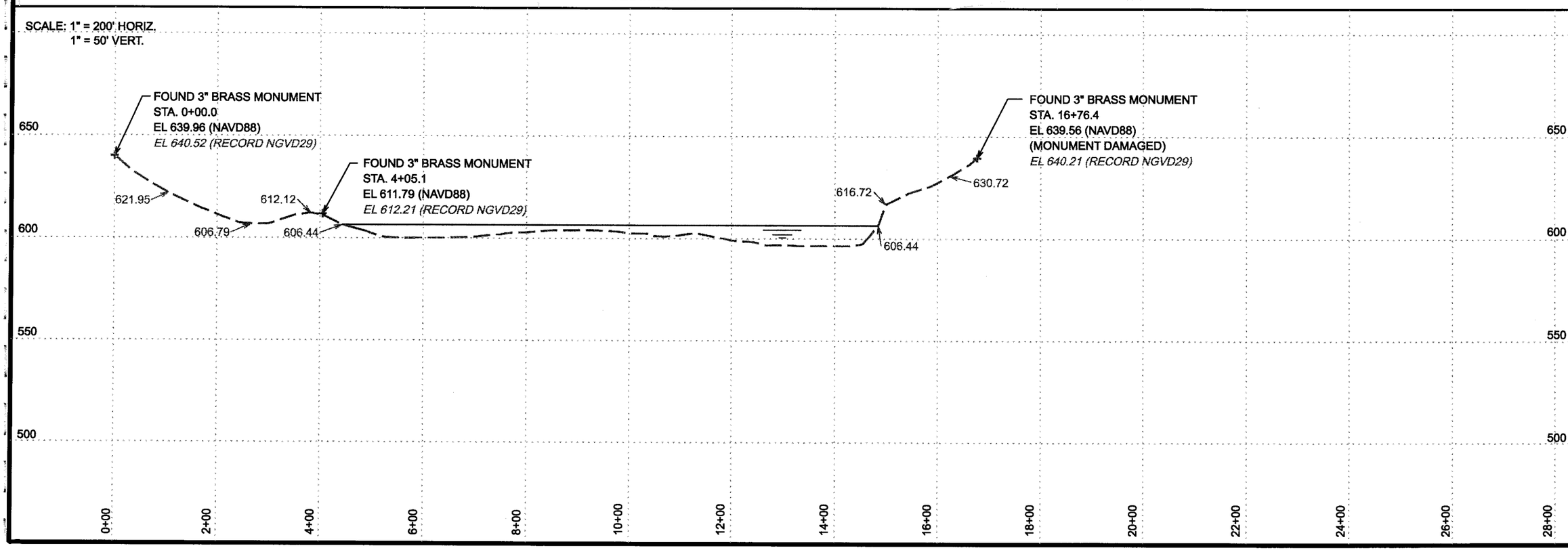
SEDIMENTATION RANGE
LINE SURVEYS
MARK TWAIN LAKE

RANGE LINE 20A

SHEET
V-120



SEDIMENTATION RANGE LINE 21B



US Army Corps of Engineers®
St. Louis District

Symbol	Description Revisions	Date	Appr.

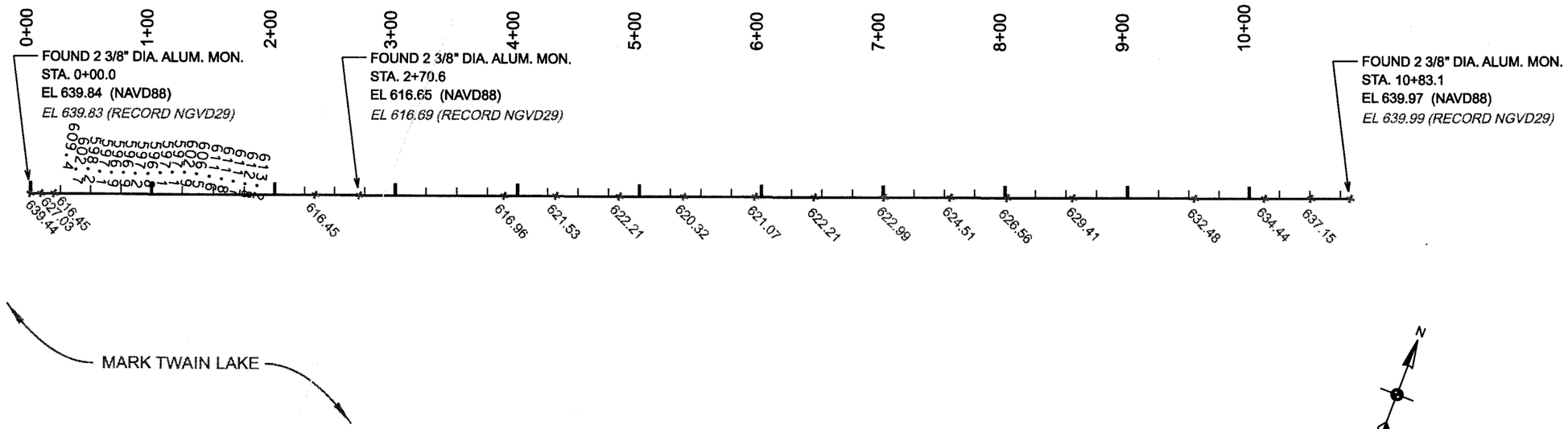
SURVEYED BY: BOWEN ENGR. & SURV.
DATE: MAY 18, 2010
DWN BY: WEM
CKD BY: CDR
SOLICITATION NO.:
SUBMITTED BY:
CONTRACT NO.: W912P4-10-D-0059, TASK 22
PLOT SCALE: 1" = 200'
PLOT DATE: 5/24/2010
SIZE: B
FILE NUMBER:
FILE NAME:

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Bowen ENGINEERING & SURVEYING
1015 Waterfront Drive, Suite J
Cape Girardeau, MO 63701

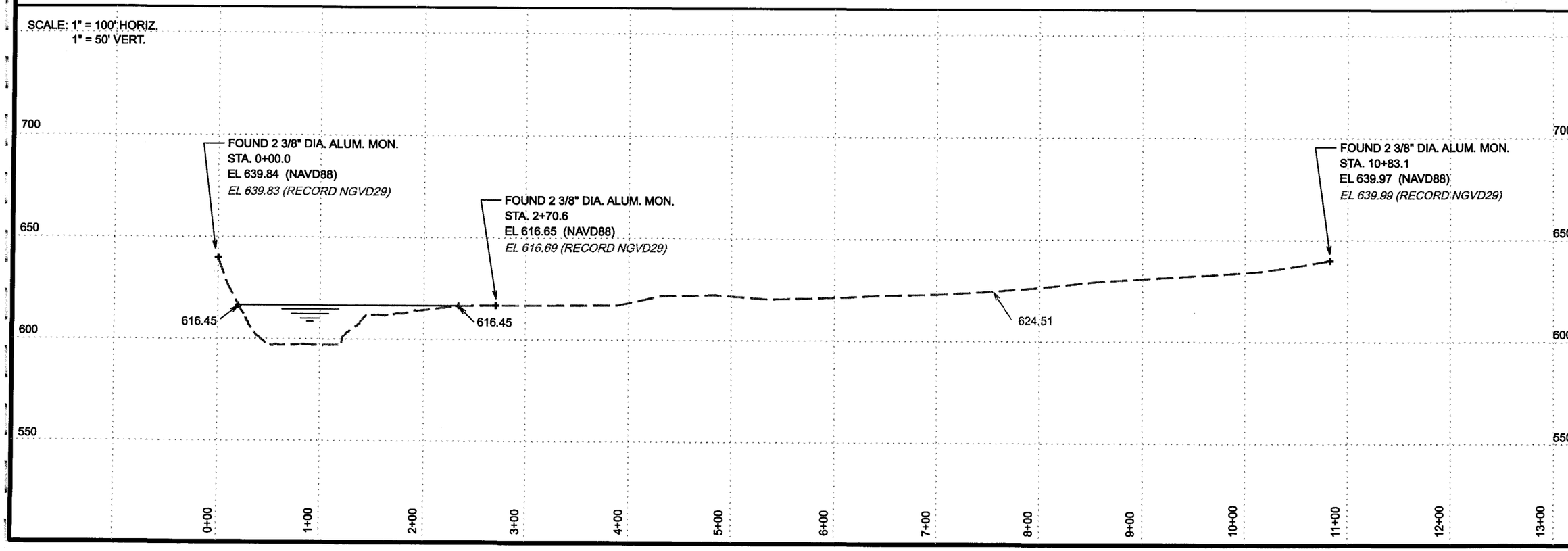
SEDIMENTATION RANGE
LINE SURVEYS
MARK TWAIN LAKE
RANGE LINE 21B

SHEET
V-121



SEDIMENTATION RANGE LINE 22B

SCALE: 1" = 100'



US Army Corps of Engineers® St. Louis District

Symbol	Description Revisions	Date	Appr.

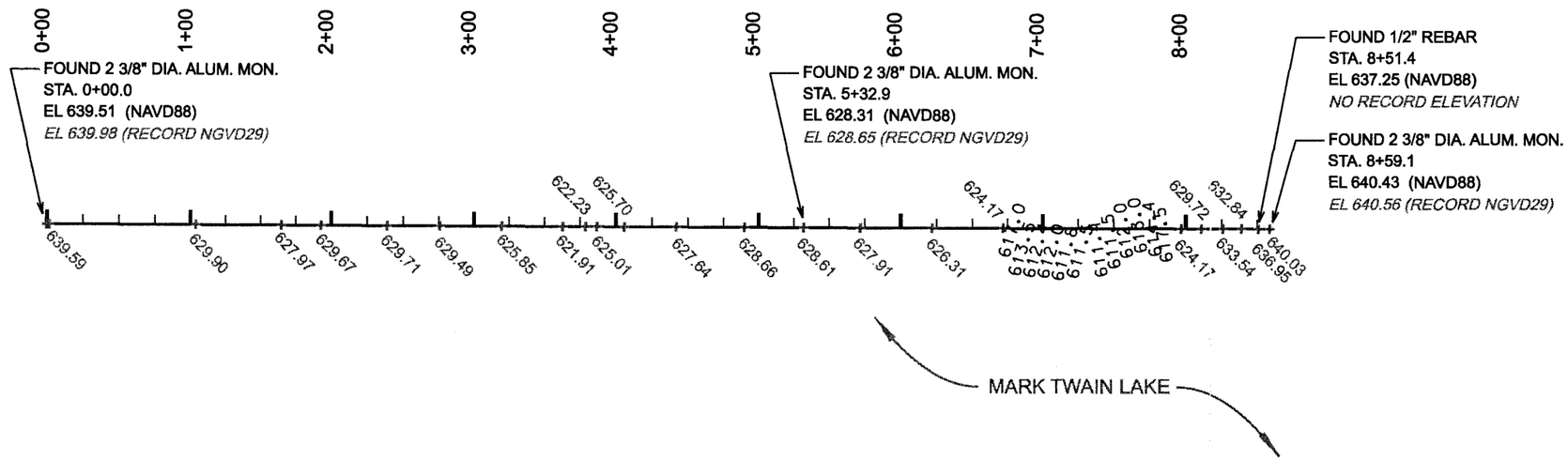
SURVEYED BY: Bowen Engr. & Surv.
DWN BY: M. Wolf
CKD BY: CDR
SUBMITTED BY:
PLOT SCALE: 1" = 100'
PLOT DATE: 5/18/2010
SIZE: B
FILE NAME:
DATE: MAY 16, 2012
SOLICITATION NO.:
CONTRACT NO.: W912P7-12-D-0005, TASK 22
FILE NUMBER:

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Bowen ENGINEERING & SURVEYING
1055 Wheeler Lake Road
Lake Wheeler, NC 27571

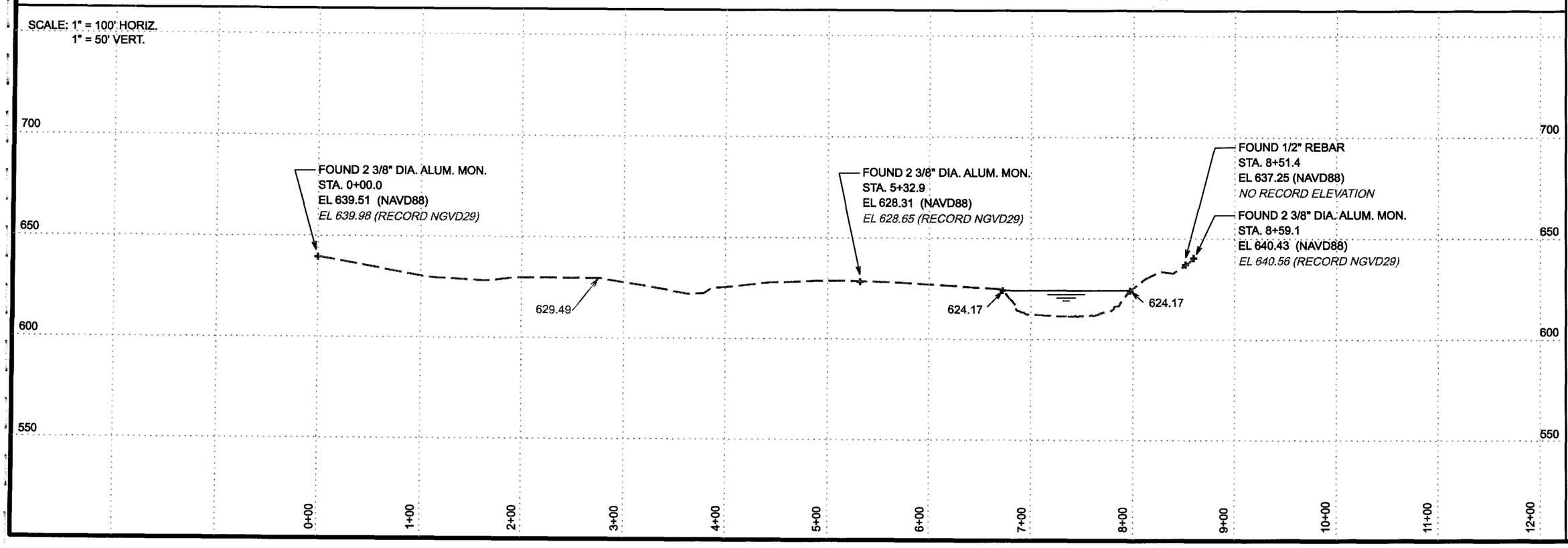
SEDIMENTATION RANGE LINE SURVEYS
MARK TWAIN LAKE
RANGE LINE 22B

SHEET
V-122



SEDIMENTATION RANGE LINE 23B

SCALE: 1" = 100'



US Army Corps of Engineers®
St. Louis District

Symbol	Description	Date	Appr.
	Revisions		

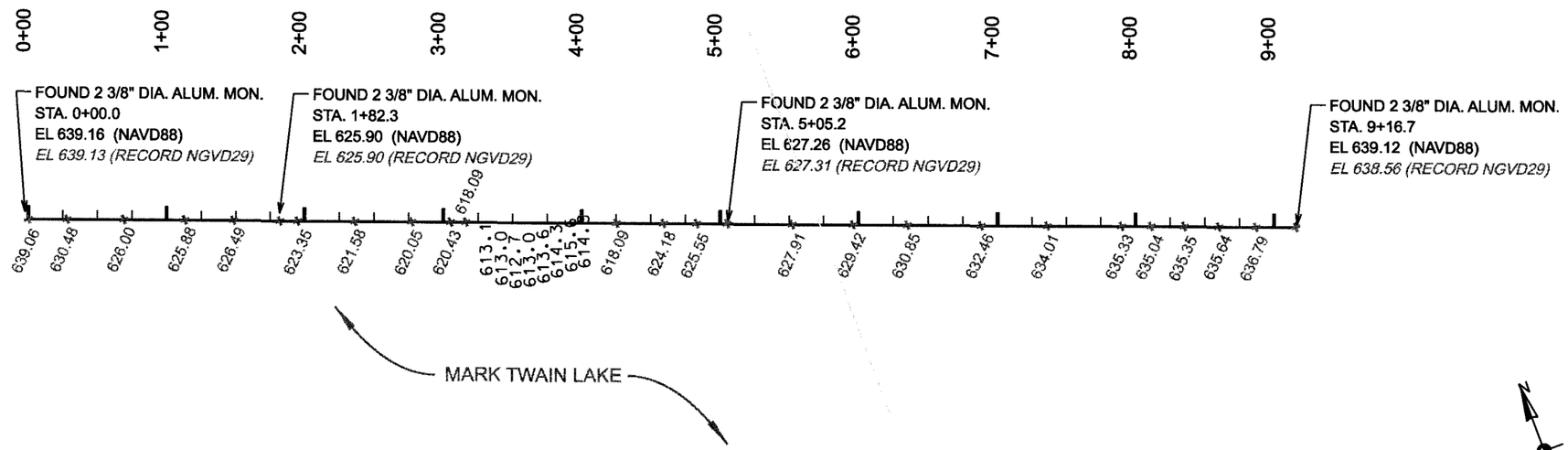
DATE: MAY 18, 2010
SOLICITATION NO.:
CONTRACT NO.: W912P7-10-D-0009, TASK 22
FILE NUMBER:
SURVEYED BY: BOWEN ENGR. & SURV
DWN BY: MSH
CKD BY: EDH
SUBMITTED BY:
PLOT SCALE: 1" = 100'
PLOT DATE: 5/18/2010
SIZE: B
FILE NAME:

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Bowen ENGINEERING & SURVEYING, INC.
1015 Nevada Ave. Suite J
Cape Girardeau, MO 63701

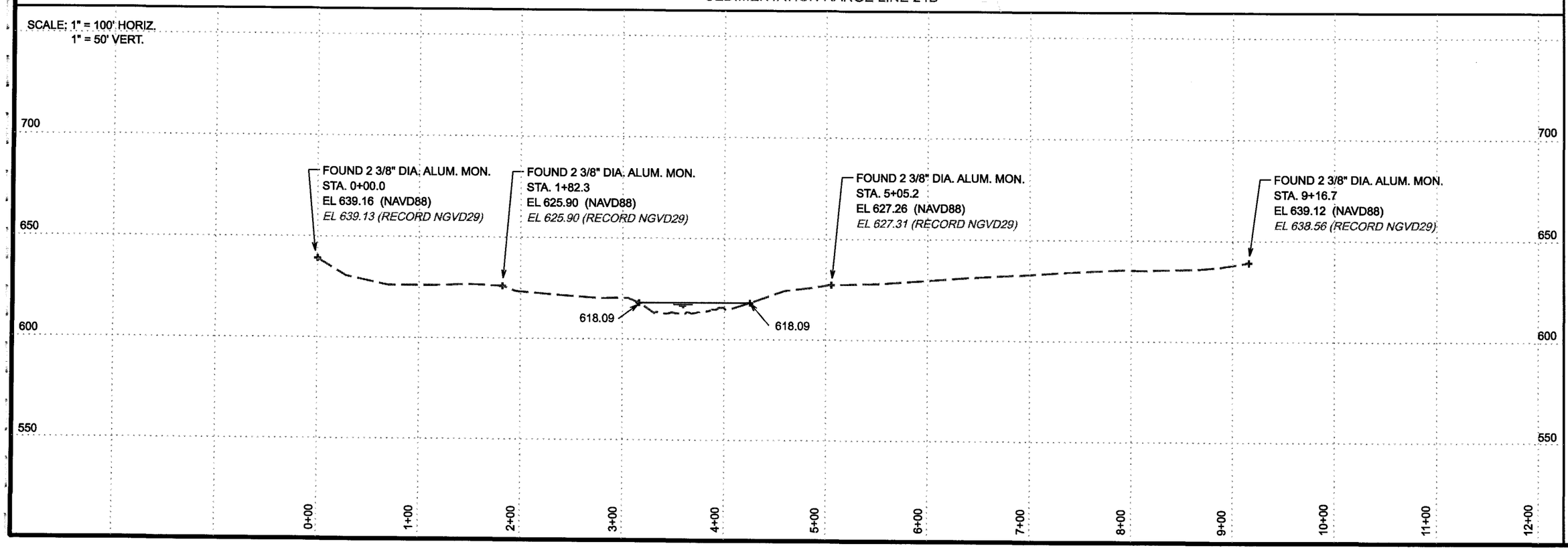
SEDIMENTATION RANGE LINE SURVEYS
MARK TWAIN LAKE
RANGE LINE 23B

SHEET
V-123



SEDIMENTATION RANGE LINE 24B

SCALE: 1" = 100'



US Army Corps of Engineers®
St. Louis District

Symbol	Description Revisions	Date	Appr.

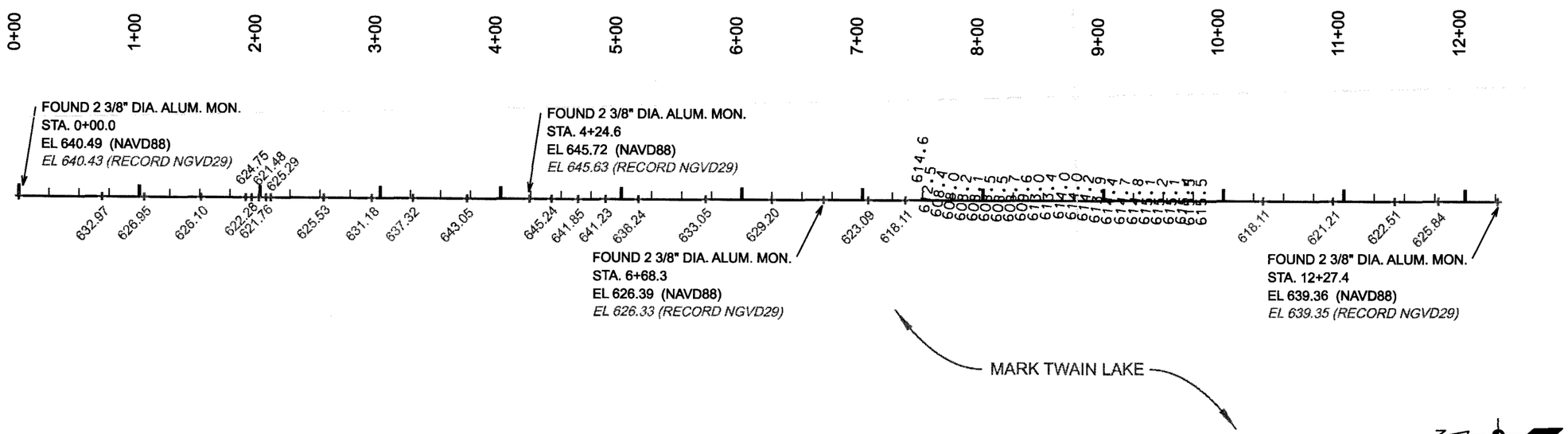
DATE: MAY 16, 2010
SOLICITATION NO.:
CONTRACT NO.: W912P4-10-D-0016, TASK 22
FILE NUMBER:
SURVEYED BY: BOWEN ENGR. & SURV.
DWN BY: MAK
CKD BY: CRT
SUBMITTED BY:
PLOT SCALE: 1" = 100'
PLOT DATE: 5/18/2010
SIZE: B
FILE NAME:

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Bowen ENGINEERING & SURVEYING
1025 Waterloo Ind. Blvd.
Cape Girardeau, MO 63701

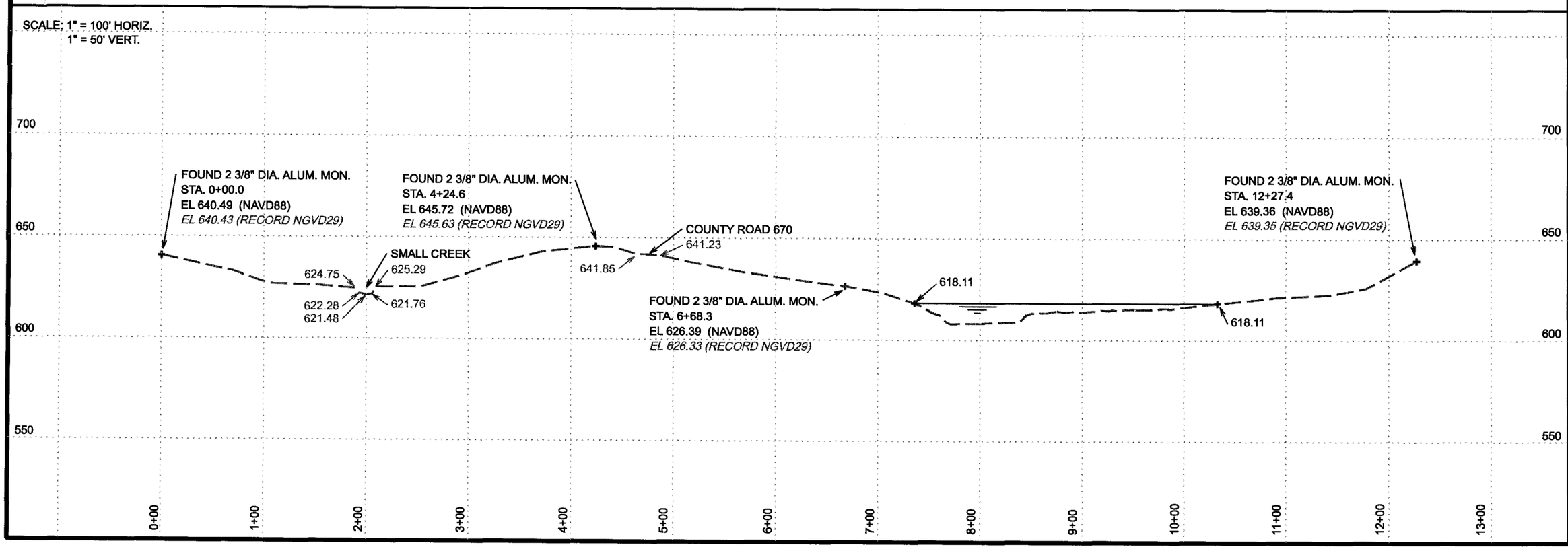
SEDIMENTATION RANGE
LINE SURVEYS
MARK TWAIN LAKE
RANGE LINE 24B

SHEET
V-124



SEDIMENTATION RANGE LINE 25B

SCALE: 1" = 100'



US Army Corps of Engineers®
St. Louis District

Symbol	Description	Date	Appr.
	Revisions		

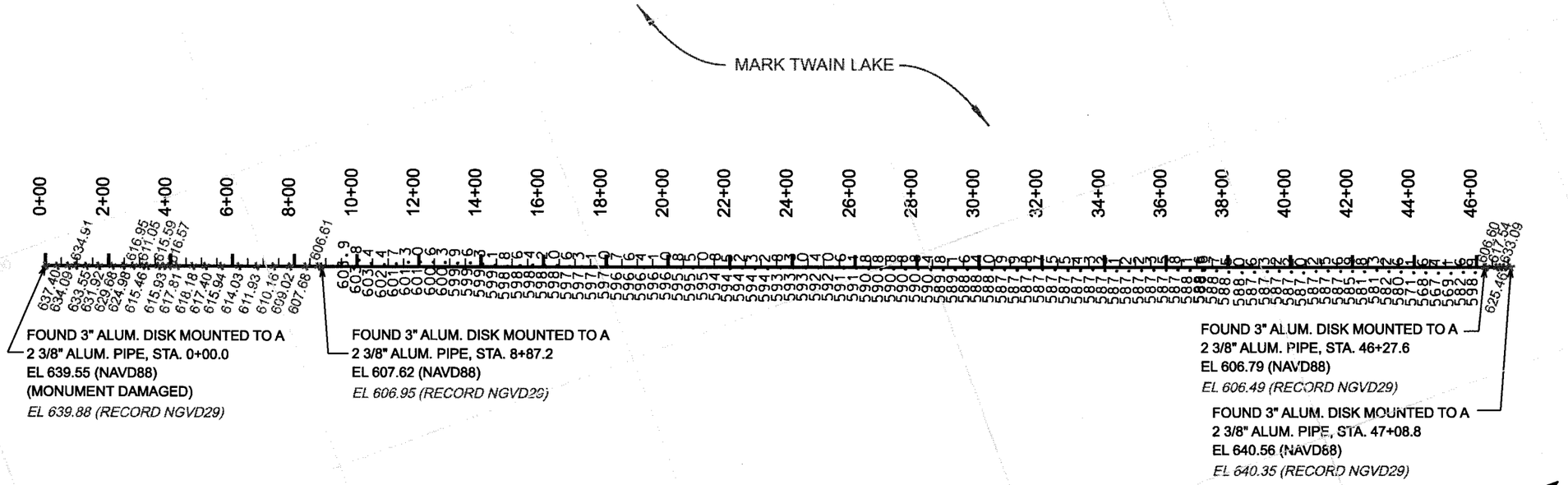
SURVEYED BY: BOWEN ENGR. & SURV.
DATE: MAY 18, 2010
DWN BY: MGH
CKD BY: CSH
SOLICITATION NO.:
SUBMITTED BY:
CONTRACT NO.: W912P-07-D-0806, TASK 22
FILE NUMBER:
PLOT SCALE: 1" = 100'
PLOT DATE: 8/18/2010
SIZE: B
FILE NAME:

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

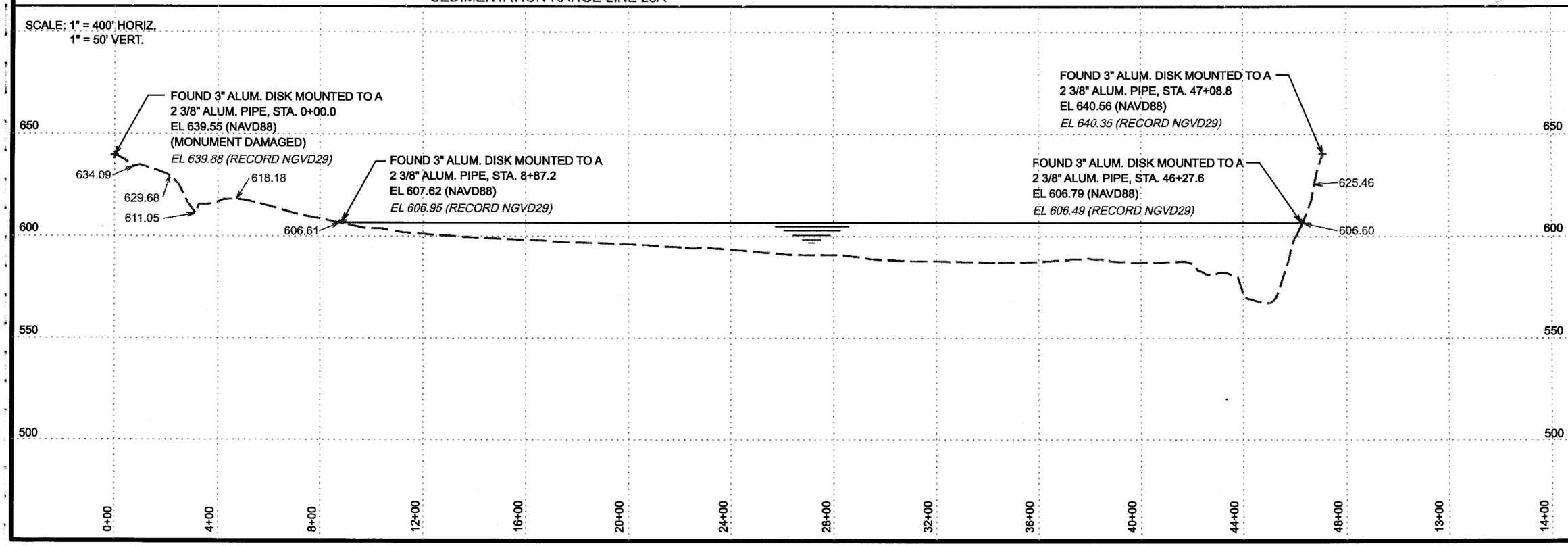
Bowen ENGINEERING & SURVEYING
Cape Girardeau, MO 63701

SEDIMENTATION RANGE LINE SURVEYS
MARK TWAIN LAKE
RANGE LINE 25B

SHEET
V-125



SEDIMENTATION RANGE LINE 26A



US Army Corps of Engineers®
St. Louis District

Symbol	Description	Date	Appr.

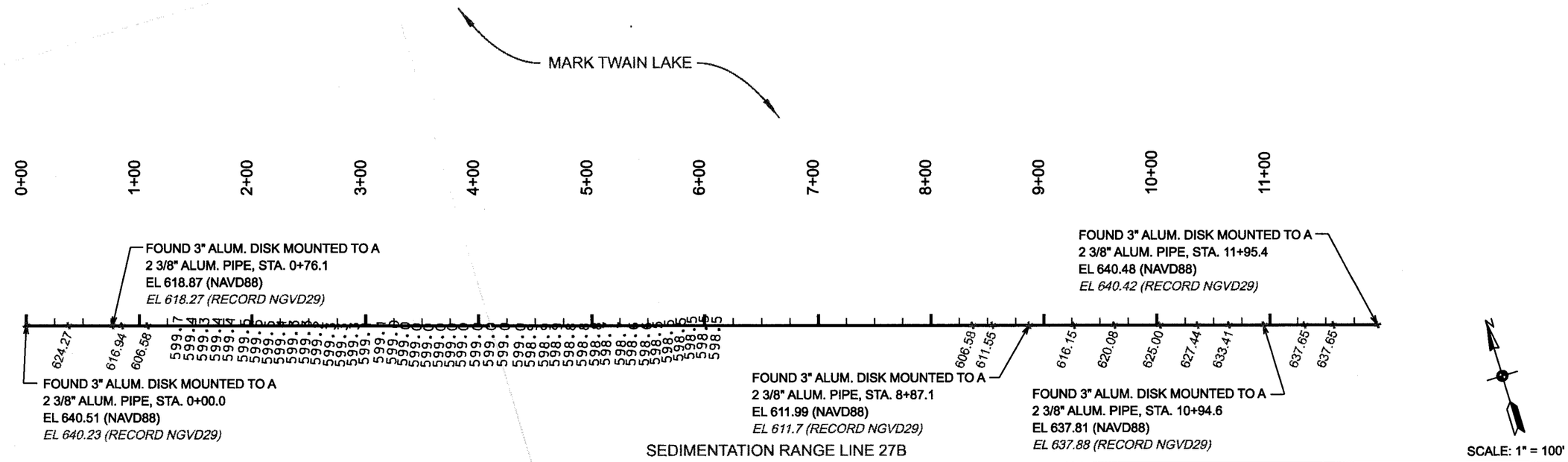
SURVEYED BY: BOWEN ENGG. & SURV
DWN BY: MAW
CKD BY: CRT
SUBMITTED BY:
DATE: MAY 18, 2010
SOLICITATION NO.:
CONTRACT NO.: W912P4-07-D-0500, TASK 22
FILE NUMBER:
PLOT SCALE: 1" = 400'
PLOT DATE: 5/18/2010
SIZE: B
FILE NAME:

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

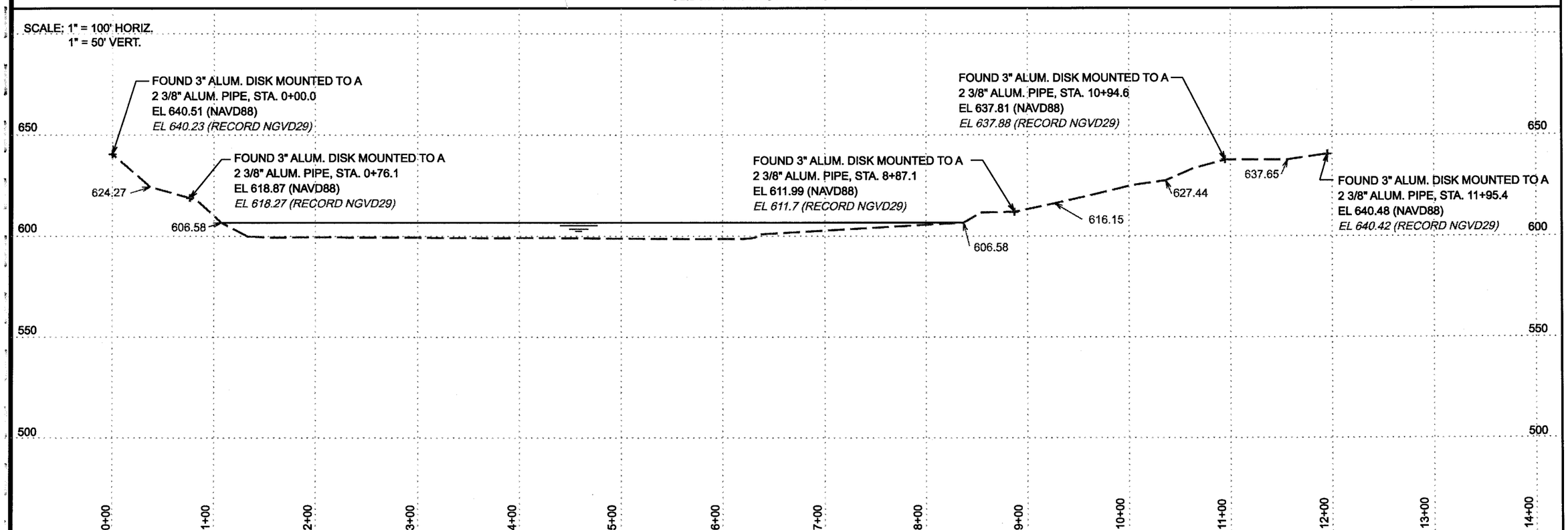
Bowen ENGINEERING & SURVEYING
1015 Wickes Lake Rd.
Cape Girardeau, MO 63701

SEDIMENTATION RANGE
LINE SURVEYS
MARK TWAIN LAKE
RANGE LINE 26A

SHEET
V-126



SEDIMENTATION RANGE LINE 27B



US Army Corps of Engineers®
St. Louis District

Symbol	Description/Revisions	Date	Appr.

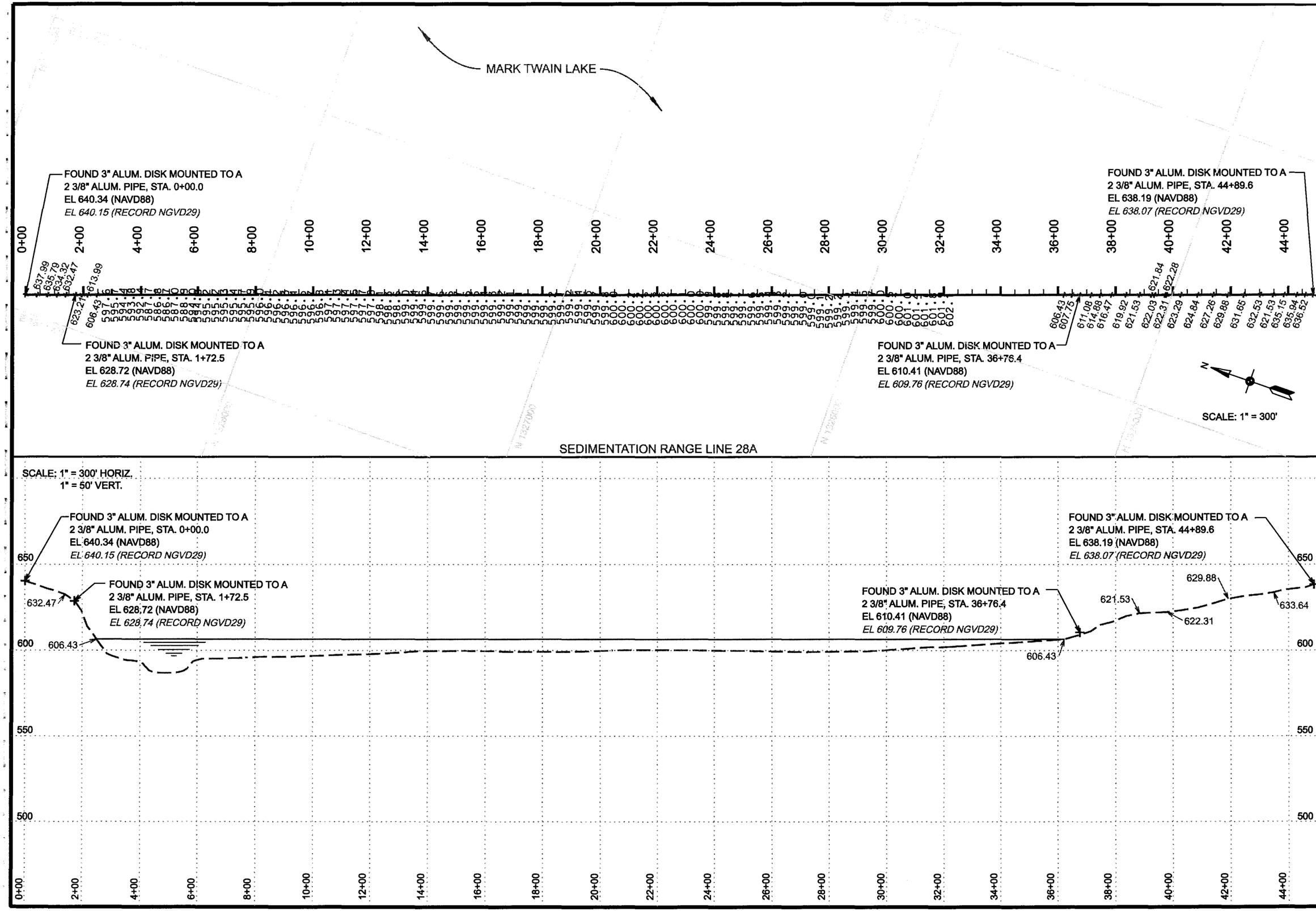
SURVEYED BY: BOWEN ENGR. & SURV.
DATE: MAY 19, 2010
DWN BY: KSH
CKD BY: CZR
SOLICITATION NO.:
SUBMITTED BY:
CONTRACT NO.: W912P4-07-D-0059, TASK 22
PLOT SCALE: 1" = 100'
PLOT DATE: 8/18/2010
SIZE: B
FILE NAME:
FILE NUMBER:

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Bowen ENGINEERING & SURVEYING
1019 Wolverine Valley Drive / Cave Junction, OR 97523

SEDIMENTATION RANGE
LINE SURVEYS
MARK TWAIN LAKE
RANGE LINE 27B

SHEET
V-127



US Army Corps of Engineers®
St. Louis District

Symbol	Description	Date	Appr.
	Revisions		

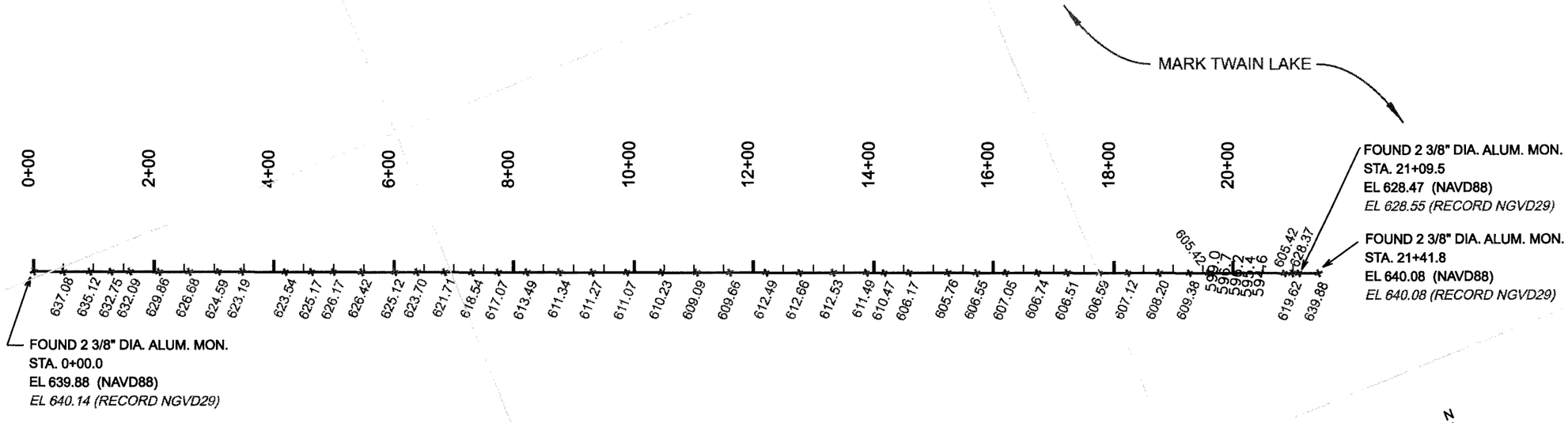
SURVEYED BY: BOWEN ENGR. & SURV.
DATE: MAY 16, 2010
DWN BY: WGH
CKD BY: CDR
SOLICITATION NO.:
SUBMITTED BY:
CONTRACT NO.: W912P4-11-D-0003, TASK 22
PLOT SCALE: 1" = 300'
PLOT DATE: 5/16/2011
SIZE: B
FILE NUMBER:
FILE NAME:

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

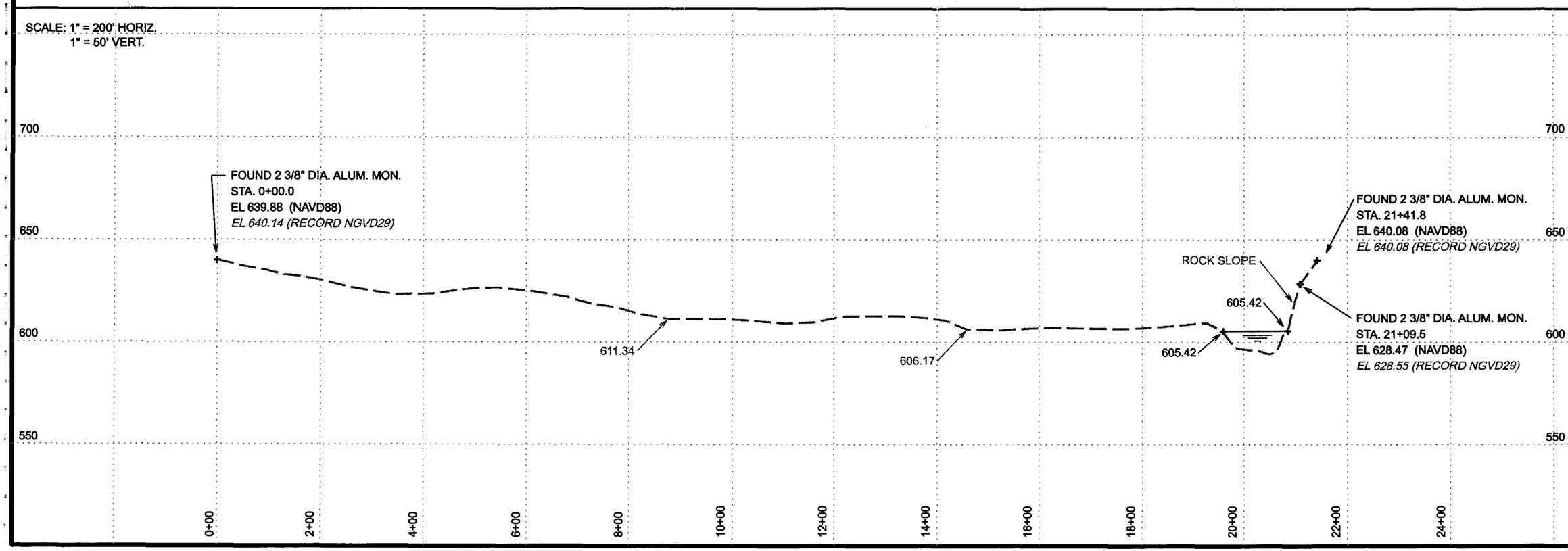
Bowen ENGINEERING & SURVEYING
1018 Wolverine Lane, Suite J
Cape Girardeau, MO 63701

SEDIMENTATION RANGE LINE SURVEYS
MARK TWAIN LAKE
RANGE LINE 28A

SHEET
V-128



SEDIMENTATION RANGE LINE 29AB



US Army Corps of Engineers®
St. Louis District

Symbol	Description / Revisions	Date	Appr.

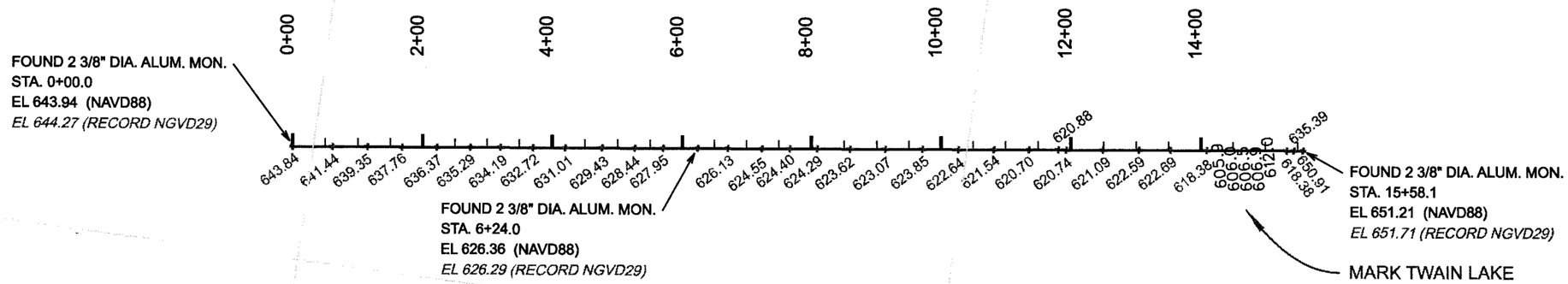
DATE: MAY 18, 2010
SOLICITATION NO.:
CONTRACT NO.: W912P7-07-D-0006, TASK 23
FILE NUMBER:
SURVEYED BY: BOWEN ENGR. & SRVY
DWN BY: MARK
CKD BY: CHRT
SUBMITTED BY:
PLOT DATE: 5/18/2010
PLOT SCALE: 1" = 200'
SIZE: B
FILE NAME:

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Bowen ENGINEERING & SURVEYING
1203 Schaeffer Rd. Suite J
East Alton, IL 62024

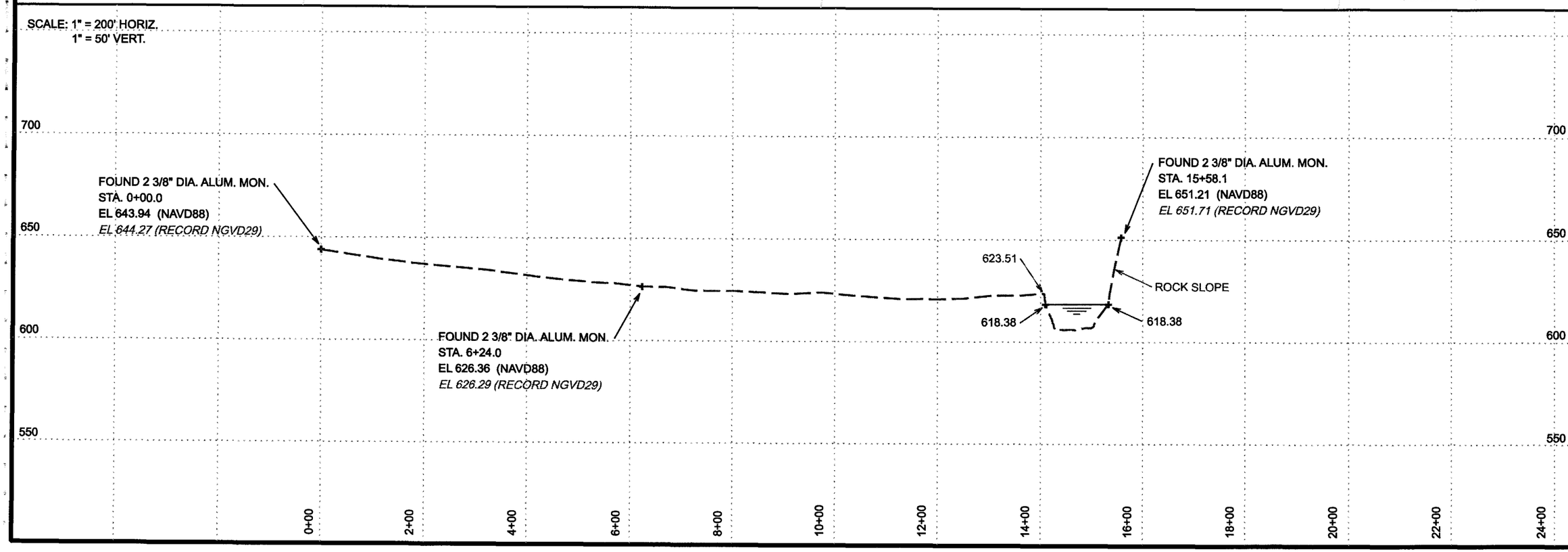
SEDIMENTATION RANGE
LINE SURVEYS
MARK TWAIN LAKE
RANGE LINE 29AB

SHEET
V-129



SEDIMENTATION RANGE LINE 30B

SCALE: 1" = 200'



US Army Corps of Engineers®
St. Louis District

Symbol	Description Revisions	Date	Appr.

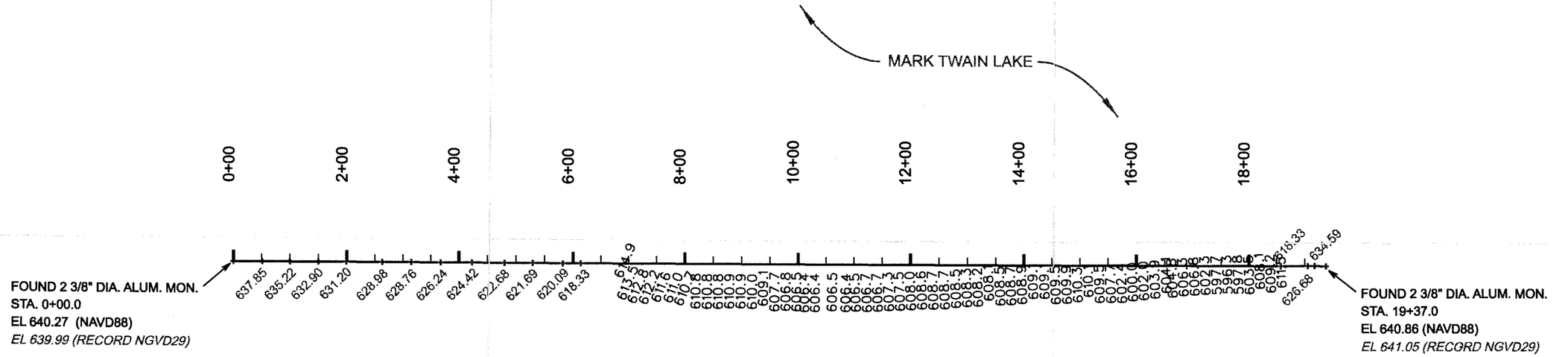
DATE: MAY 18, 2010
SOLICITATION NO.:
CONTRACT NO.: W912P4-07-D-0500, TASK 22
FILE NUMBER:
SURVEYED BY: BOWEN ENGR. & SURV.
DWN BY: MCM
CKD BY: CSR
SUBMITTED BY:
PLOT DATE: 5/18/2010
PLOT SCALE: 1" = 200'
SIZE: B
FILE NAME:

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Bowen ENGINEERING & SURVEYING CO.
1016 Waterfront Lake Drive
Cape Girardeau, MO 63701

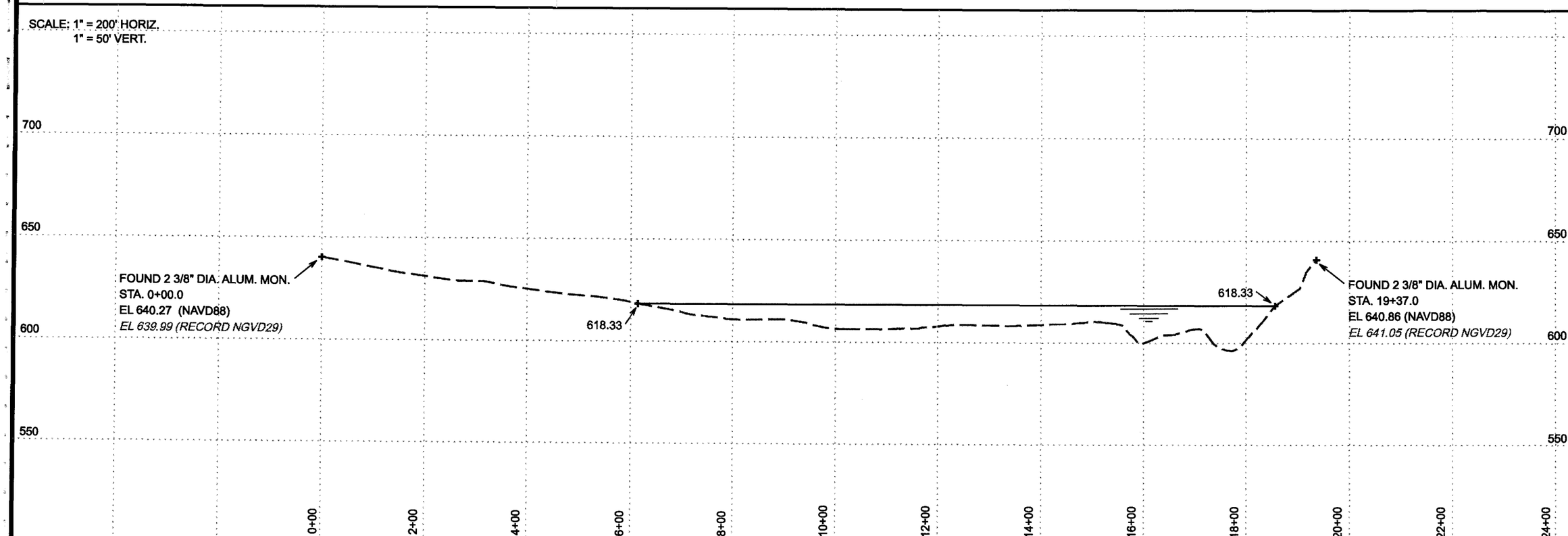
SEDIMENTATION RANGE
LINE SURVEYS
MARK TWAIN LAKE
RANGE LINE 30B

SHEET
V-130



SEDIMENTATION RANGE LINE 31AB

SCALE: 1" = 200'



US Army Corps of Engineers®
St. Louis District

Symbol	Description	Date	Appr.
	Revisions		

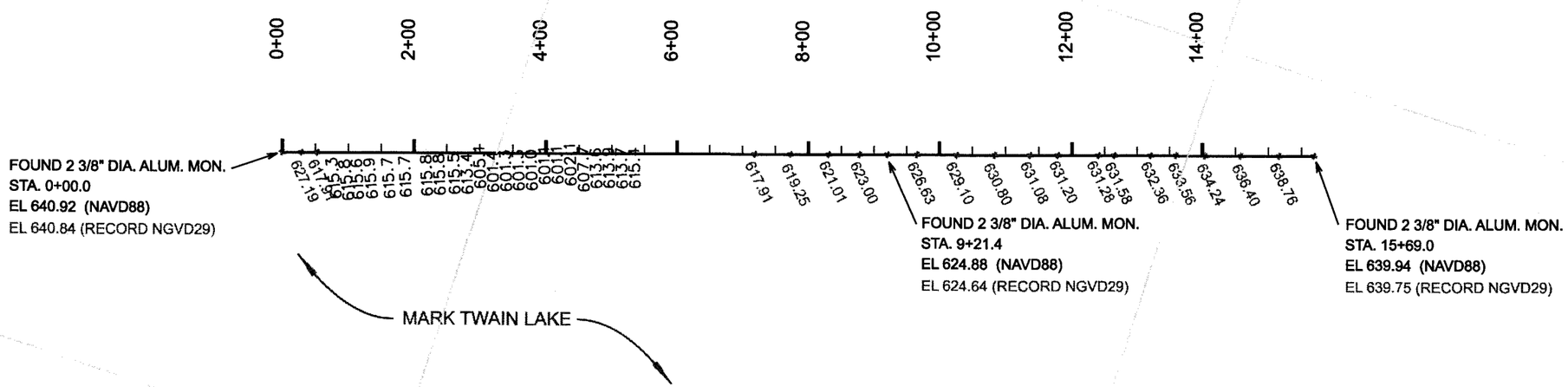
DATE: MAY 18, 2010
SOLICITATION NO.:
CONTRACT NO.: W912P8-09-D-0003, TASK 22
FILE NUMBER:
SURVEYED BY: BOWEN ENGR. & SURV.
DWN BY: MGH
CKD BY: CSH
SUBMITTED BY:
PLOT DATE: 5/19/2010
PLOT SCALE: 1" = 200'
SIZE: B
FILE NAME:

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Bowen ENGINEERING & SURVEYING
1019 Nicholson Lane, Suite J
Cape Girardeau, MO 63701

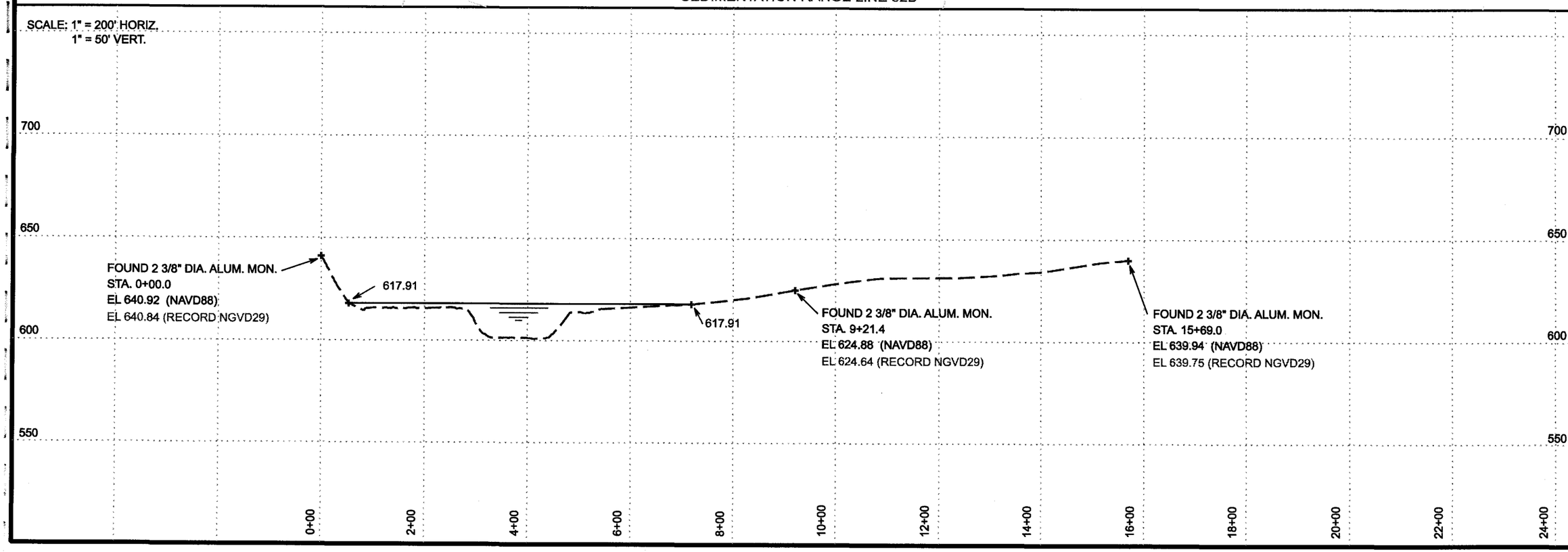
SEDIMENTATION RANGE LINE SURVEYS
MARK TWAIN LAKE
RANGE LINE 31AB

SHEET
V-131



SEDIMENTATION RANGE LINE 32B

SCALE: 1" = 200'



US Army Corps of Engineers®
St. Louis District

Symbol	Description	Date	Appr.
	Revisions		

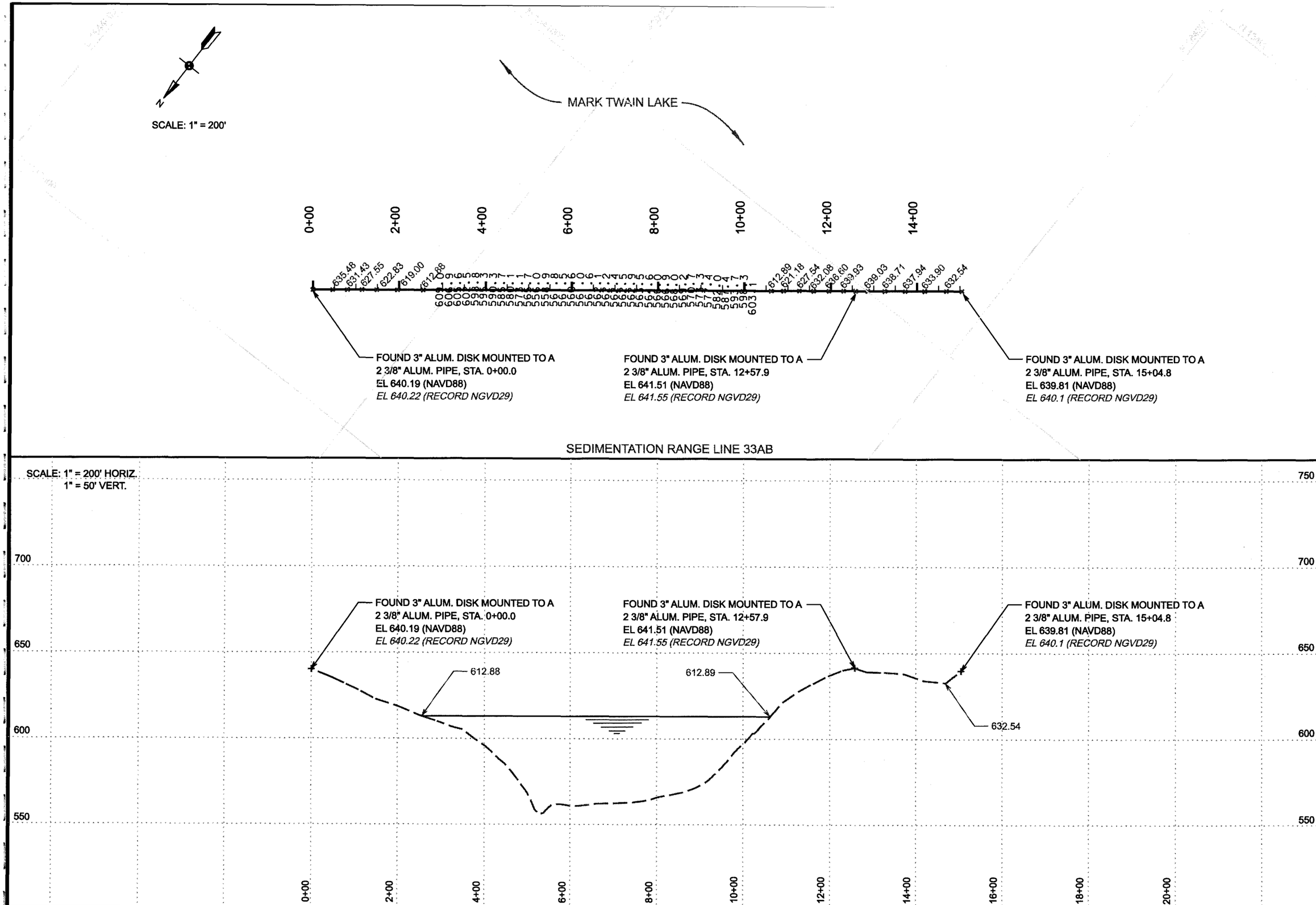
DATE: MAR 18, 2010
SOLICITATION NO.:
CONTRACT NO.: W912P7-09-D-0060, TASK 22
FILE NUMBER:
SURVEYED BY: SURVEY CREW & SURV. ENGR.
DWN BY: MARK
CKD BY: CRS
SUBMITTED BY:
PLOT DATE: 3/18/2010
PLOT SCALE: 1" = 200'
SIZE: E
FILE NAME:

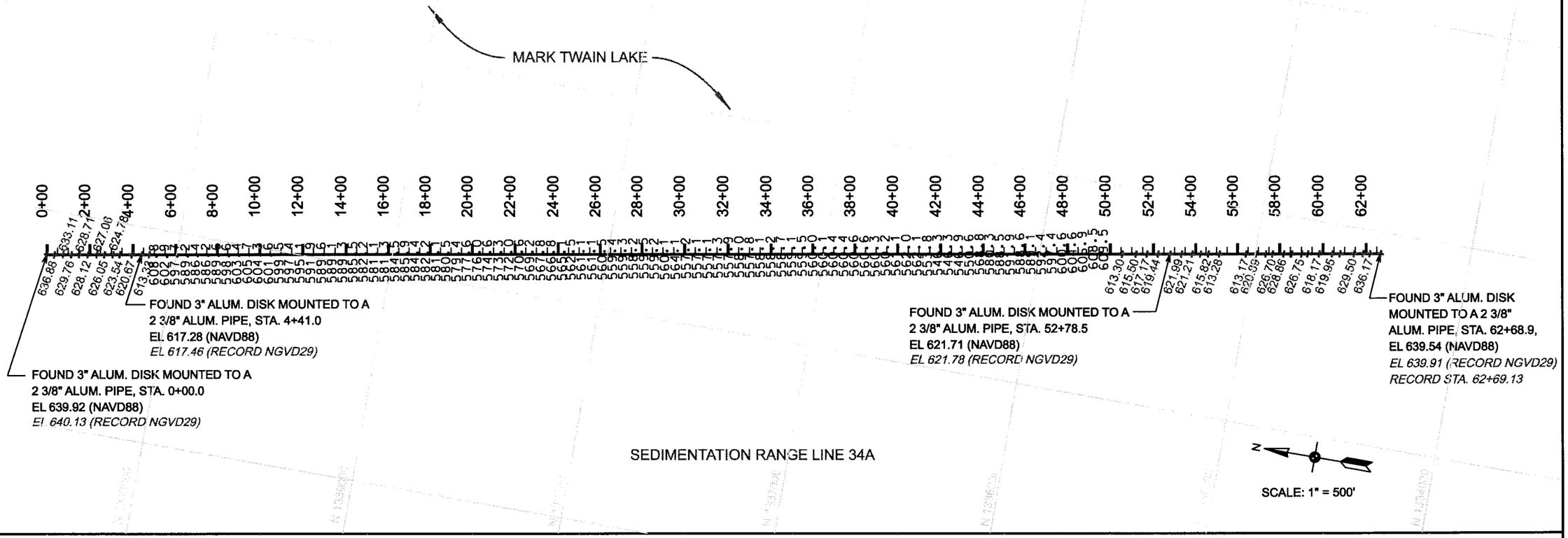
U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

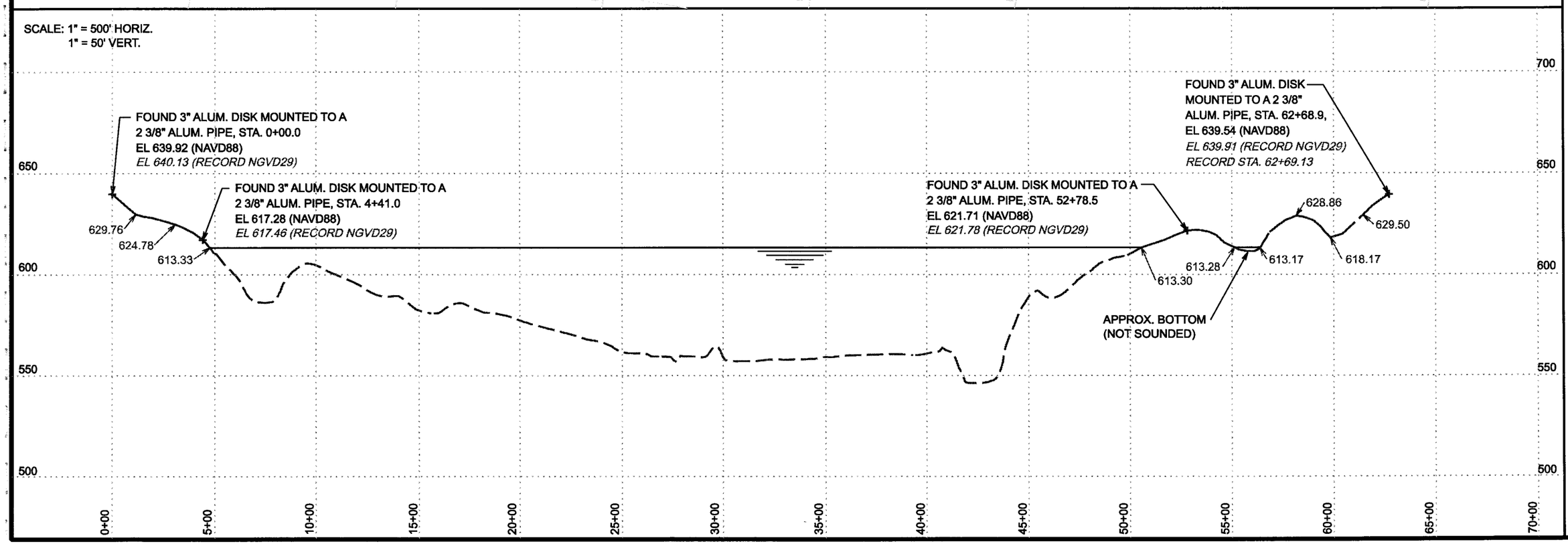
Bowen ENGINEERING & SURVEYING
1011 Wehrenberg Lane, Suite 1
Lake Ozark, MO 65049
Lake Wentzville, MO 63367

SEDIMENTATION RANGE
LINE SURVEYS
MARK TWAIN LAKE
RANGE LINE 32B

SHEET
V-132


N
SCALE: 1" = 200'
MARK TWAIN LAKE
0+00
2+00
4+00
6+00
8+00
10+00
12+00
14+00
635.46
631.43
627.55
622.83
619.00
612.89
621.18
627.54
632.08
636.60
639.93
639.03
638.71
637.94
633.90
632.54
FOUND 3" ALUM. DISK MOUNTED TO A
2 3/8" ALUM. PIPE, STA. 0+00.0
EL 640.19 (NAVD88)
EL 640.22 (RECORD NGVD29)
FOUND 3" ALUM. DISK MOUNTED TO A
2 3/8" ALUM. PIPE, STA. 12+57.9
EL 641.51 (NAVD88)
EL 641.55 (RECORD NGVD29)
FOUND 3" ALUM. DISK MOUNTED TO A
2 3/8" ALUM. PIPE, STA. 15+04.8
EL 639.81 (NAVD88)
EL 640.1 (RECORD NGVD29)
SEDIMENTATION RANGE LINE 33AB
SCALE: 1" = 200' HORIZ.
1" = 50' VERT.
750
700
650
600
550
612.88
612.89
632.54
16+00
18+00
20+00
US Army Corps of Engineers®
St. Louis District
Symbol
Description
Revisions
Date
Appr.
DATE: MAY 16, 2012
SOLICITATION NO.:
SURVEYED BY: BOWEN ENGR & SURVY.
DWN BY: WBSI
CKD BY: LGR
SUBMITTED BY:
CONTRACT NO.: W912P7-12-D-0006, TASK 22
FILE NUMBER:
PLOT SCALE: 1" = 200'
PLOT DATE: 5/16/2012
SIZE: E
FILE NAME:
U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI
Bowen ENGINEERING & SURVEYING
1919 Waterfront Park Drive / Cape Girardeau, MO 63701
SEDIMENTATION RANGE LINE SURVEYS
MARK TWAIN LAKE
RANGE LINE 33AB
SHEET
V-133





US Army Corps of Engineers®
St. Louis District

Symbol	Description Revisions	Date	Appr.

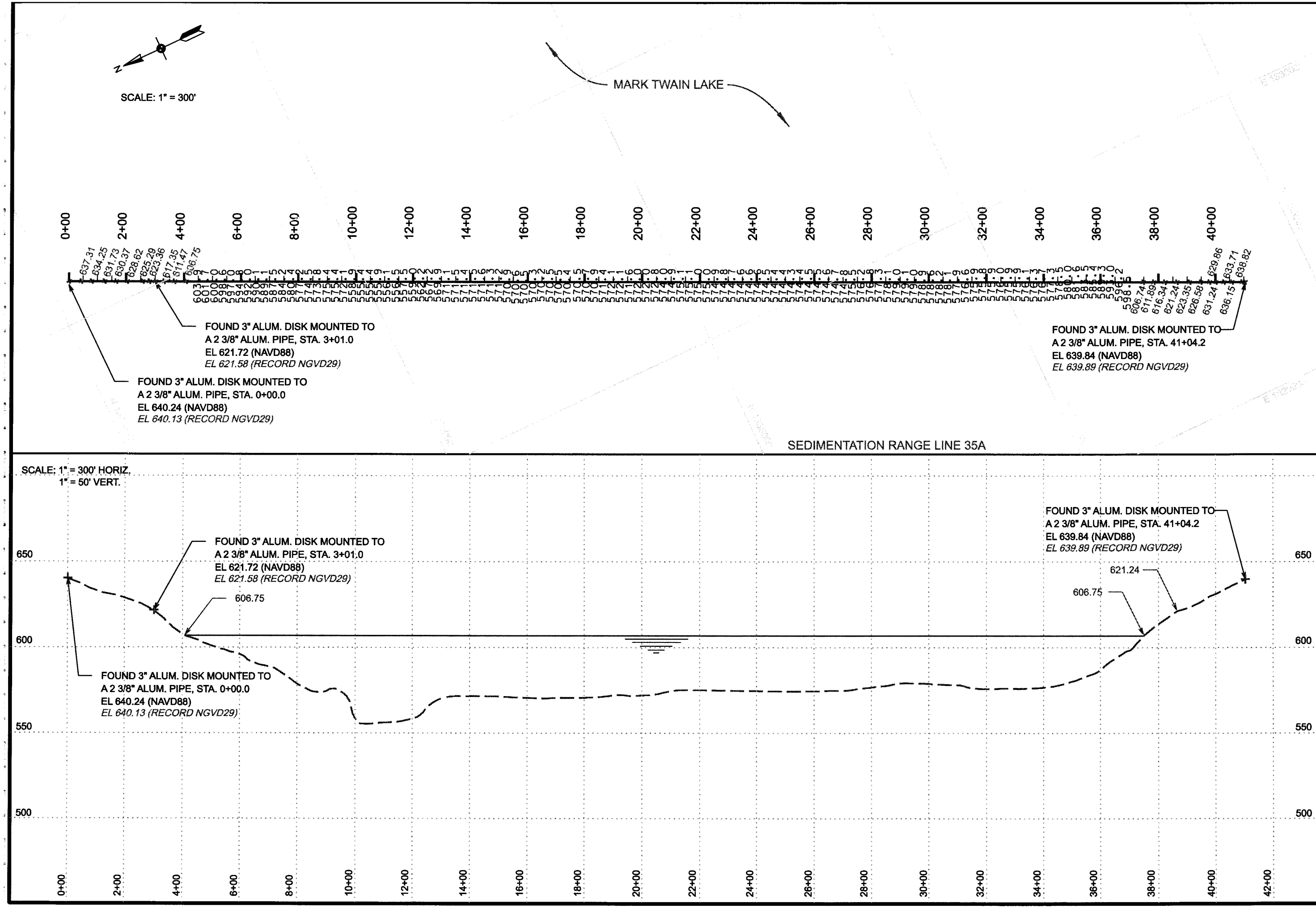
SURVEYED BY: BOWEN ENGR. & SURV.
DWN BY: WBR
CKD BY: EDR
SUBMITTED BY:
PLOT SCALE: 1" = 500'
PLOT DATE: 5/16/2012
SIZE: B
FILE NAME:
DATE: MAY 8, 2012
SOLICITATION NO.:
CONTRACT NO.: W912P4-07-D-0004, TASK 22
FILE NUMBER:

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Bowen ENGINEERING & SURVEYING
1018 Westwood Blvd., Suite J
Cape Girardeau, MO 63701

SEDIMENTATION RANGE LINE SURVEYS
MARK TWAIN LAKE
RANGE LINE 34A

SHEET
V-134



US Army Corps of Engineers®
St. Louis District

Symbol	Description/ Revisions	Date	Appr.

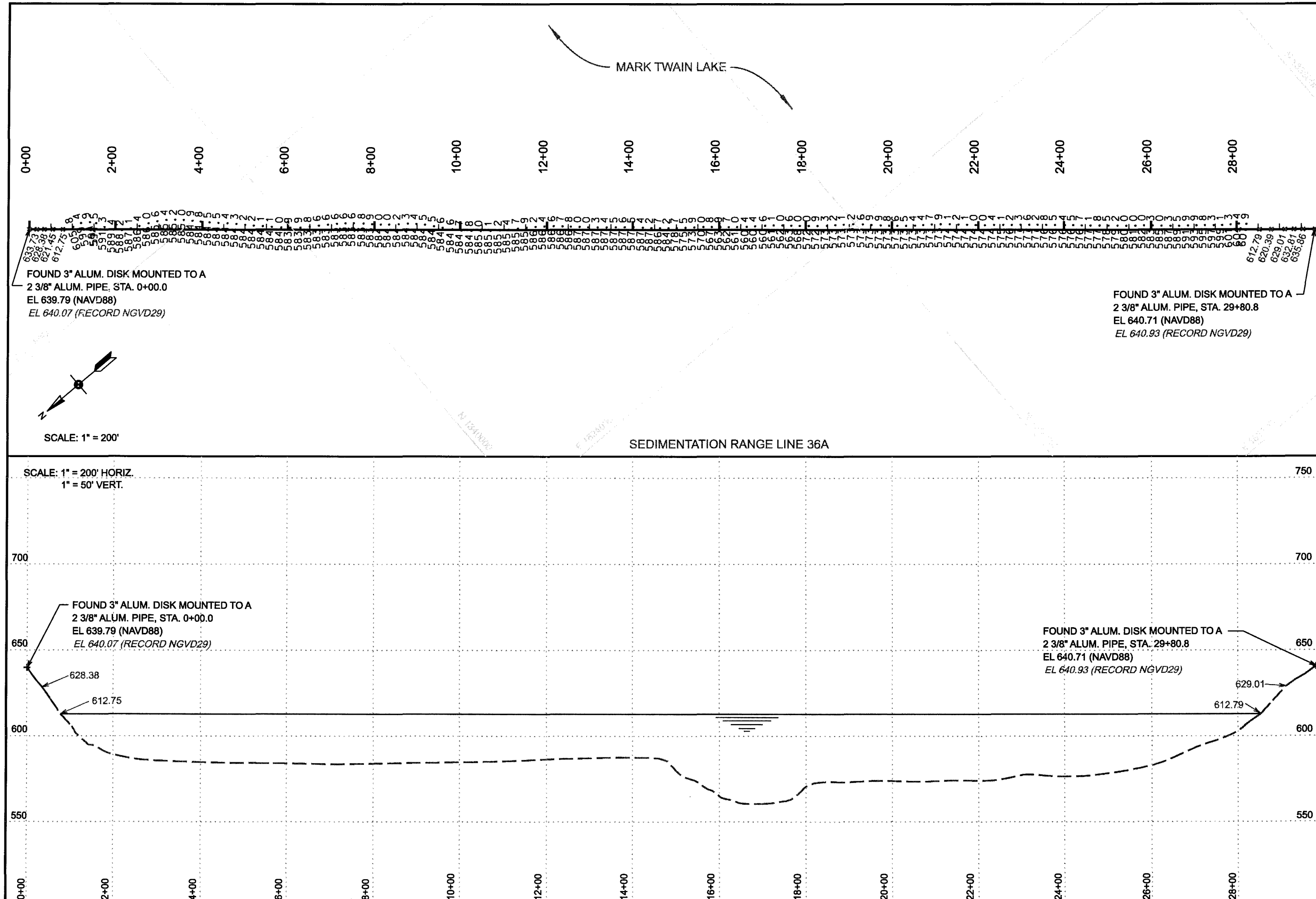
DATE: MAY 18, 2010
SOLICITATION NO.:
CONTRACT NO.: W912P4-07-D-0009, TASK 23
FILE NUMBER:
SURVEYED BY: BOWEN GROUP, & SMJV
DWN BY: MOSI
CKD BY: CJR1
SUBMITTED BY:
PLOT SCALE: 1" = 300'
PLOT DATE: 5/18/2010
SIZE: B
FILE NAME:

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Bowen ENGINEERING & SERVICES, INC.
1015 Waterfront Lake Drive / Cape Girardeau, MO 63701

SEDIMENTATION RANGE
LINE SURVEYS
MARK TWAIN LAKE
RANGE LINE 35A

SHEET
V-135



US Army Corps of Engineers®
St. Louis District

Symbol	Description Revisions	Date	Appr.

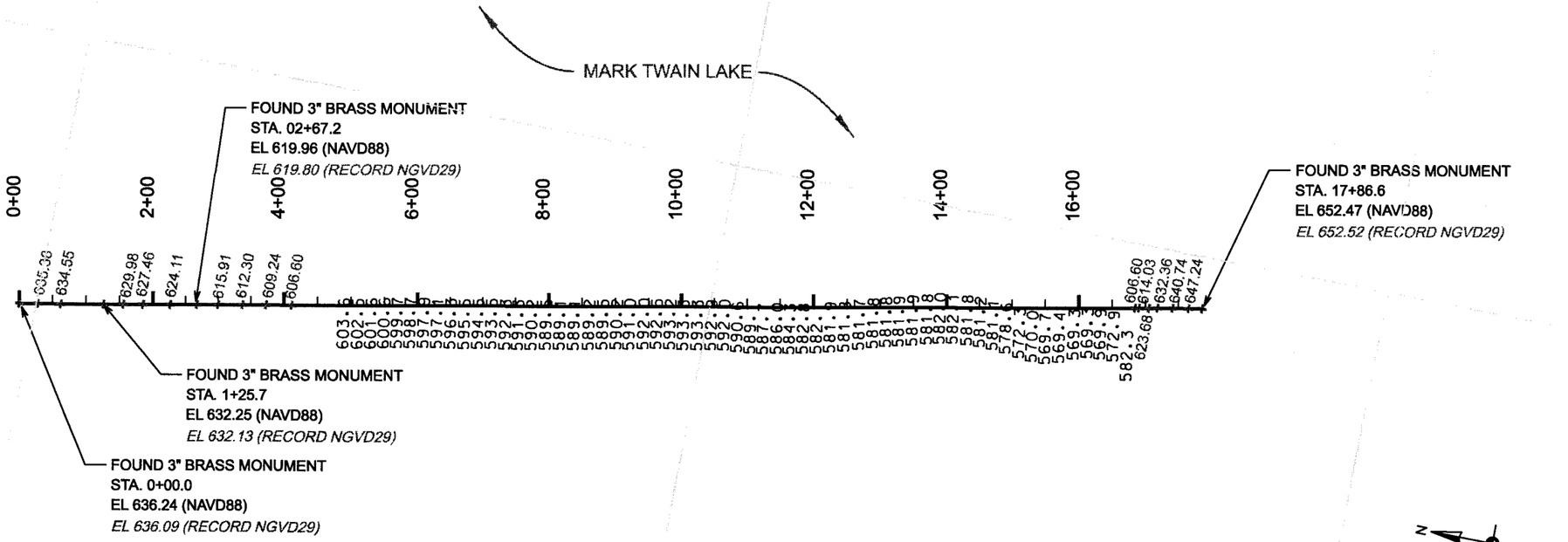
SURVEYED BY: BOWEN ENGR. & SURV.
DATE: MAY 18, 2010
DWN BY: MGH
CKD BY: CGH
SOLICITATION NO.:
SUBMITTED BY:
CONTRACT NO.: W912P7-09-D-0006, TASK 22
PLOT SCALE: 1" = 200'
PLOT DATE: 5/18/2010
FILE NUMBER:
SIZE: B
FILE NAME:

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

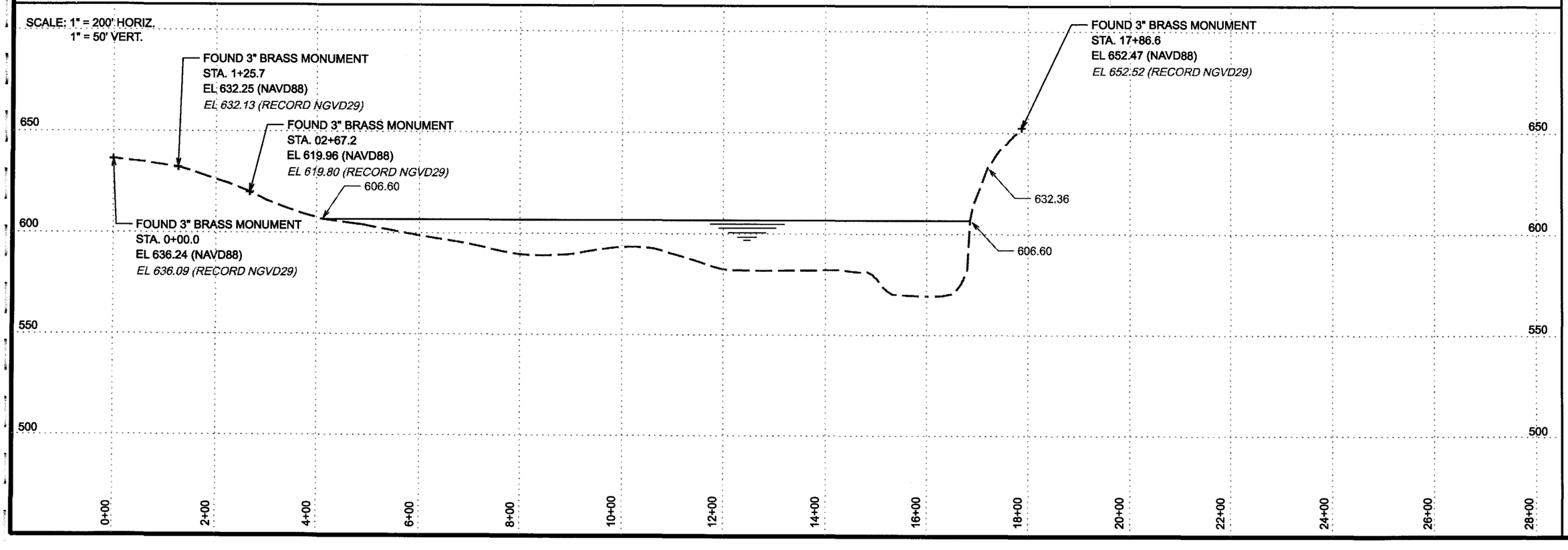
Bowen ENGINEERING & SURVEYING
5510 Pegasus Court, Suite J
Dale Blumeier, MO 63701

SEDIMENTATION RANGE
LINE SURVEYS
MARK TWAIN LAKE
RANGE LINE 36A

SHEET
V-136



SEDIMENTATION RANGE LINE 37A1



US Army Corps of Engineers®
St. Louis District

Symbol	Description	Date	Appr.
	Revisions		

DATE: MAY 18, 2010
SOLICITATION NO.:
CONTRACT NO.: W912P8-09-C-0016, TASK 23
FILE NUMBER:

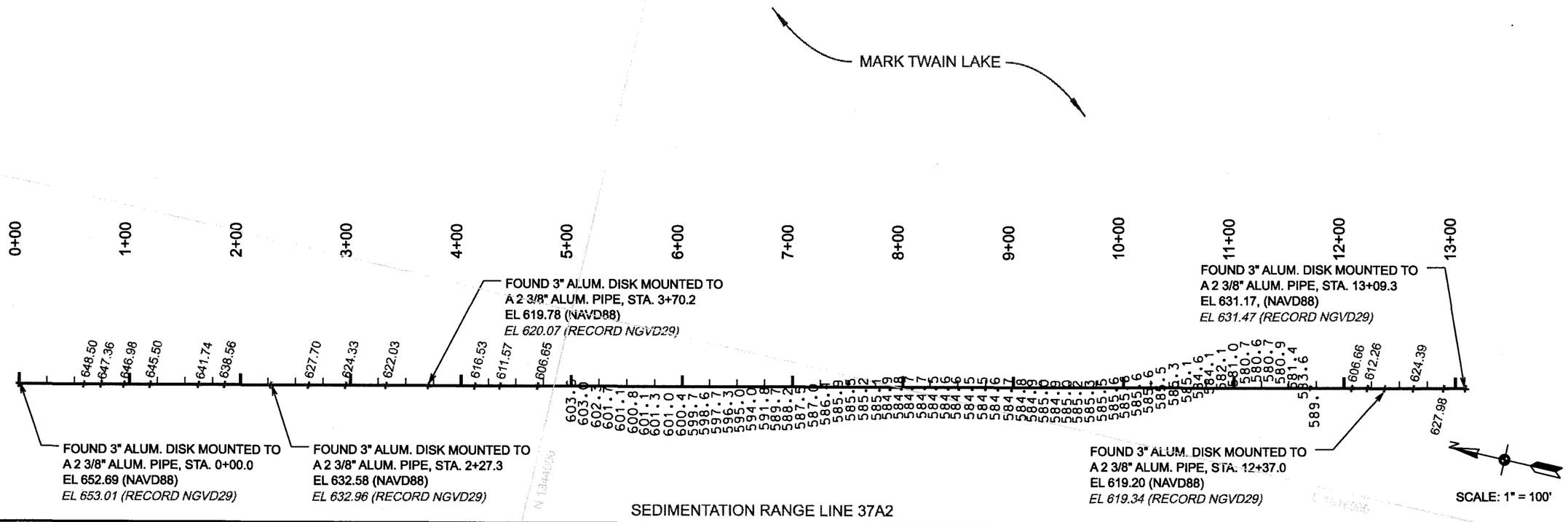
SURVEYED BY: BOWEN ENGR. & SURV.
DWN BY: MGH
CKD BY: EGR
SUBMITTED BY:
PLOT DATE: 5/10/2010
PLOT SCALE: 1" = 200'
SIZE: B
FILE NAME:

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

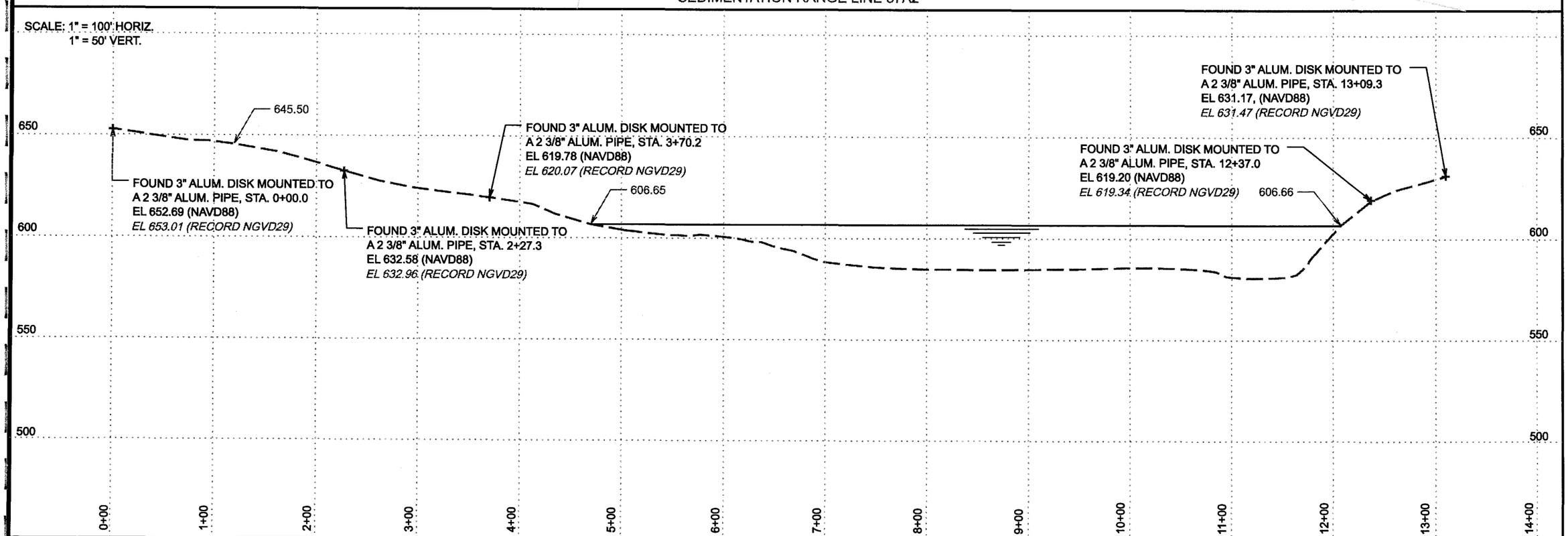
Bowen ENGINEERING & SURVEYING
1914 Broadway Lake Drive
Cape Girardeau, MO 63701

SEDIMENTATION RANGE LINE SURVEYS
MARK TWAIN LAKE
RANGE LINE 37A1

SHEET
V-137-1



SEDIMENTATION RANGE LINE 37A2



US Army Corps of Engineers®
St. Louis District

Symbol	Description	Date	Appr.

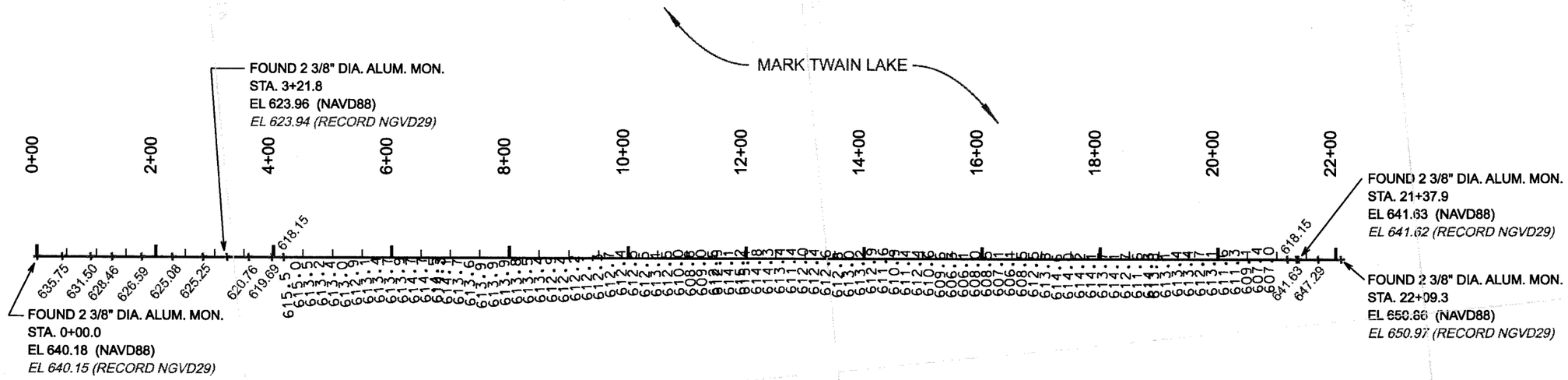
DATE: MAY 18, 2010
SOLICITATION NO.:
CONTRACT NO.: W912EP-07-D-0809, TASK 22
FILE NUMBER:
SURVEYED BY: SOWER ENGR. & SURV.
DWN BY: DAN
CKD BY: CSR
SUBMITTED BY:
PLOT DATE: 5/18/2010
PLOT SCALE: 1" = 100'
SIZE: B
FILE NAME:

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Bowen ENGINEERING & SURVEYING
1015 Washington, MO 63090
Jefferson City, MO 65101

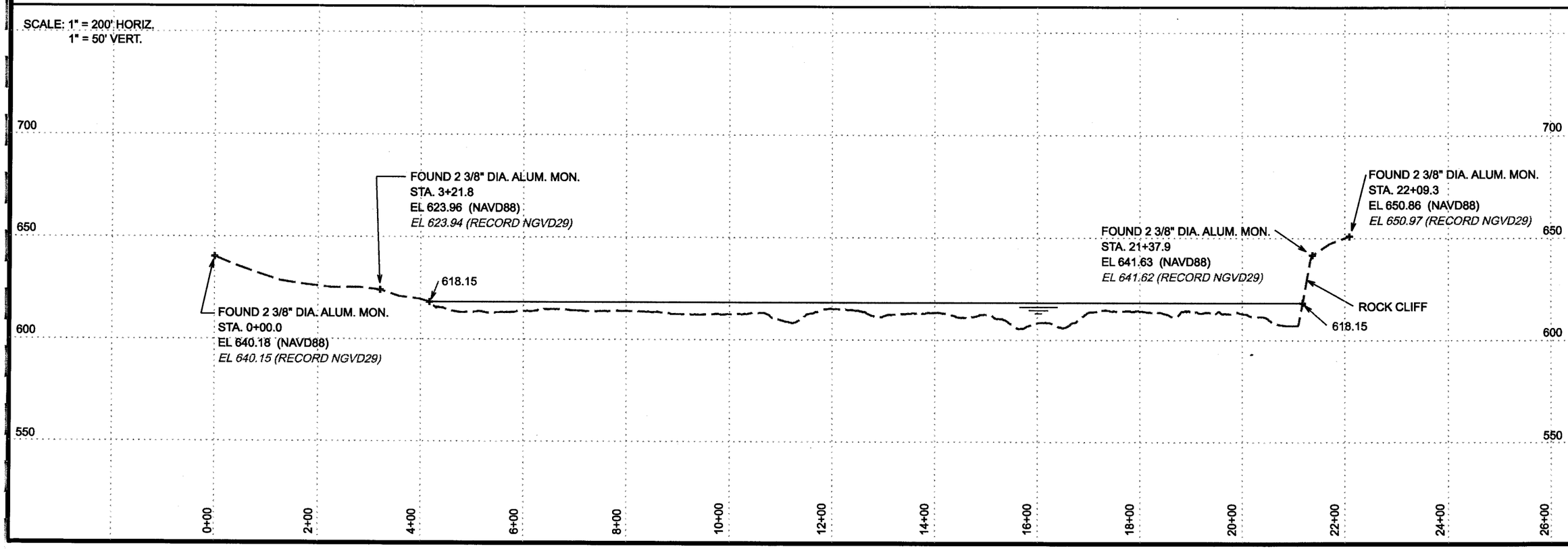
SEDIMENTATION RANGE LINE SURVEYS
MARK TWAIN LAKE
RANGE LINE 37A2

SHEET
V-137-2



SCALE: 1" = 200'

SEDIMENTATION RANGE LINE 38B



US Army Corps of Engineers®
St. Louis District

Symbol	Description/Revisions	Date	Appr.

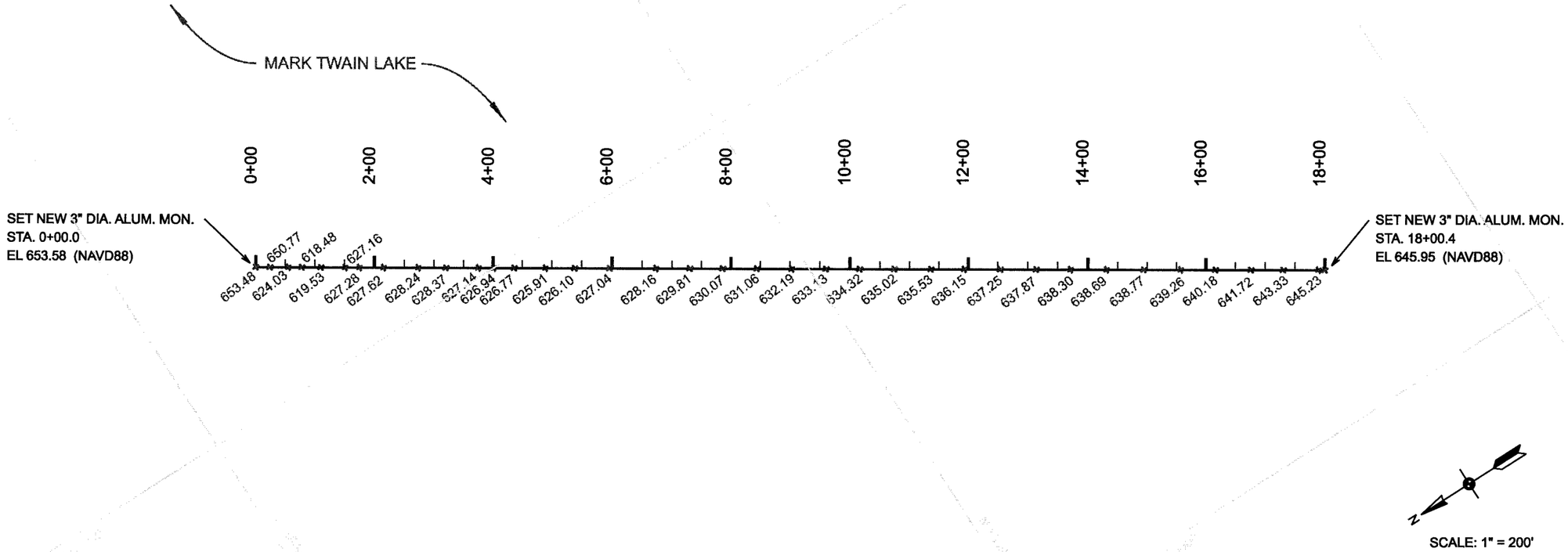
DATE: MAY 18, 2010
SOLICITATION NO.:
CONTRACT NO.: W912P4-07-D-0005, TASK 22
FILE NUMBER:
SURVEYED BY: BOWEN DIST. & SURV.
DWN BY: MAK
CKD BY: CSH
SUBMITTED BY:
PLOT SCALE: 1" = 200'
PLOT DATE: 5/18/2010
SIZE: B
FILE NAME:

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

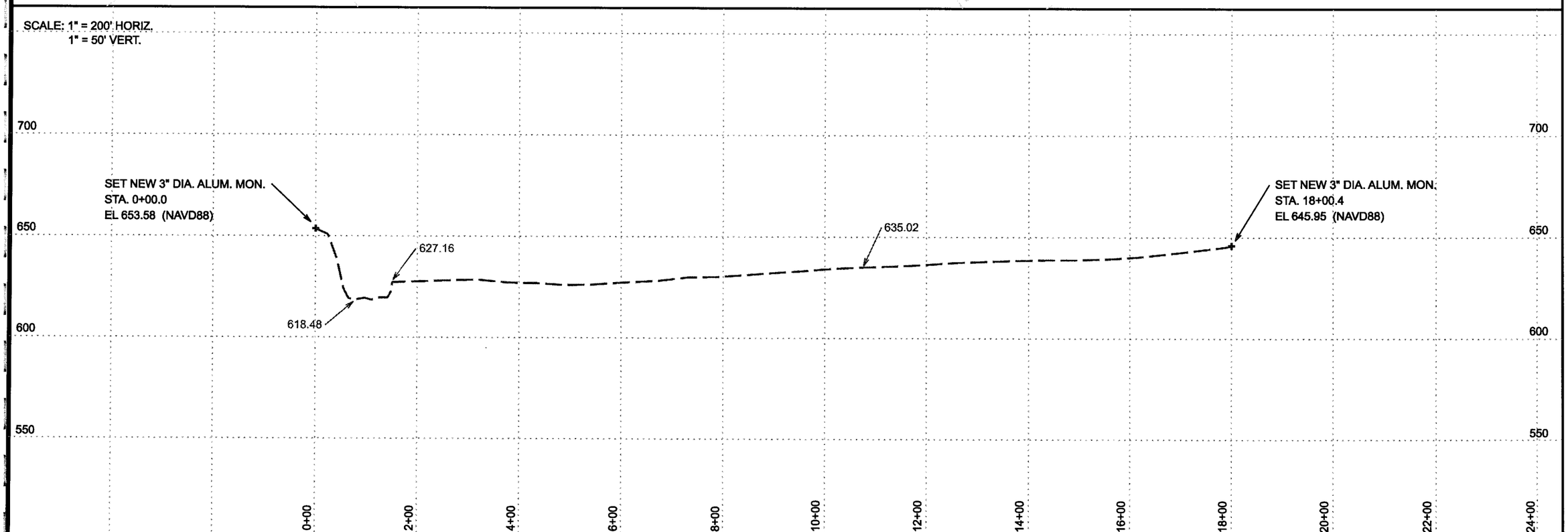
Bowen
ENGINEERING & SURVEYING
1018 Waterloo Lake Drive
Lake Waterloo, MO 63079

SEDIMENTATION RANGE
LINE SURVEYS
MARK TWAIN LAKE
RANGE LINE 38B

SHEET
V-138



SEDIMENTATION RANGE LINE 39B



US Army Corps of Engineers®
St. Louis District

Symbol	Description Revisions	Date	Appr.

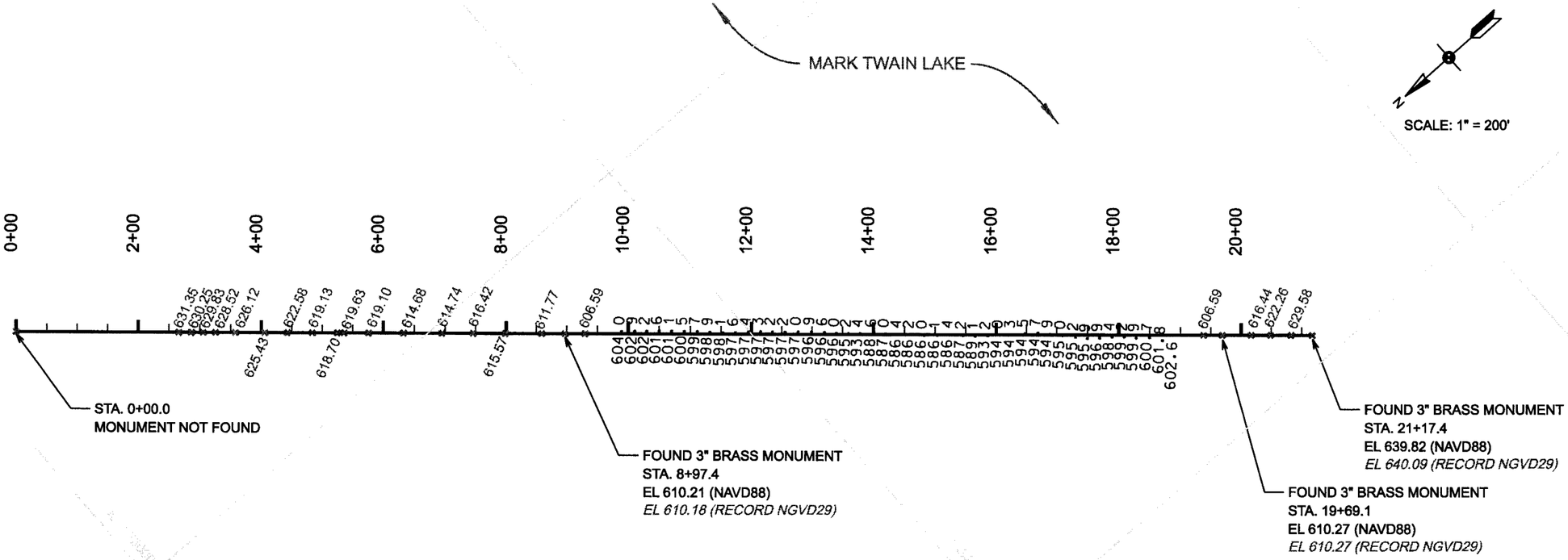
DATE: MAY 18, 2010
SOLICITATION NO.:
CONTRACT NO.: W912P-07-D-0600, TASK 22
FILE NUMBER:
SURVEYED BY: BOWEN ENGR. & SURV.
DWN BY: MARK
CKD BY: DSR
SUBMITTED BY:
PLOT DATE: 5/18/2010
PLOT SCALE: 1" = 200'
FILE NAME:
SIZE: B

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

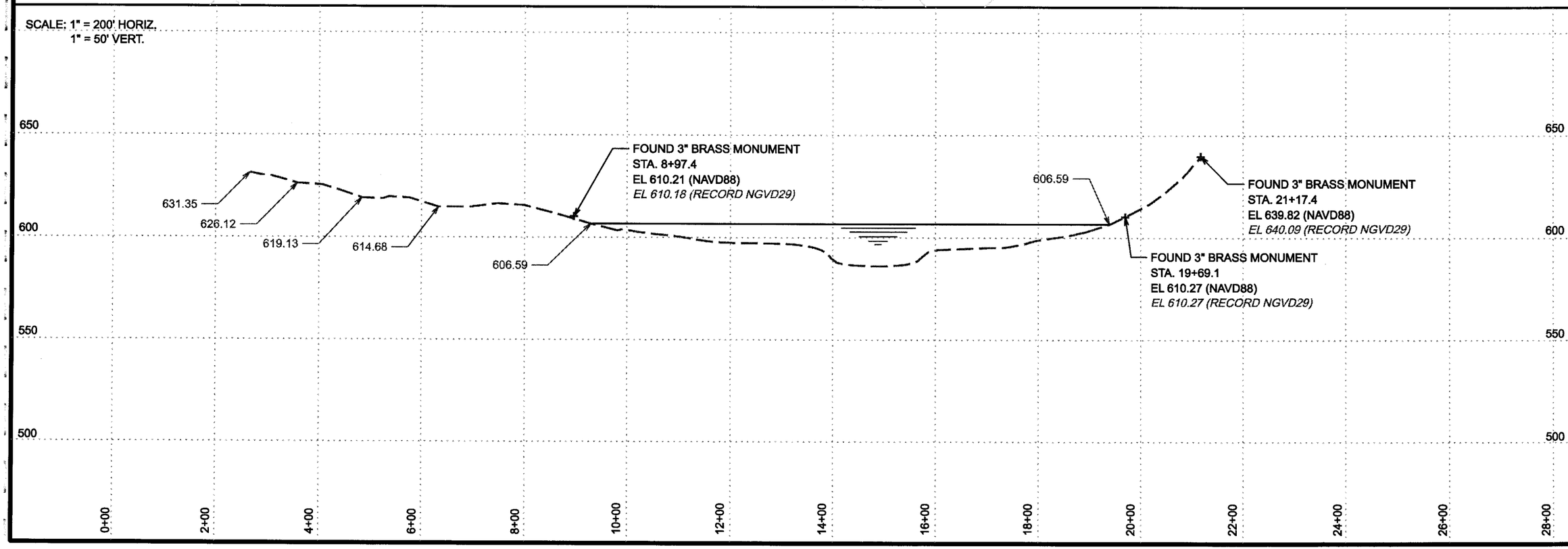
Bowen ENGINEERING & SURVEYING
1016 Wyandotte Lake, Suite J
Cape Girardeau, MO 63701

SEDIMENTATION RANGE
LINE SURVEYS
MARK TWAIN LAKE
RANGE LINE 39B

SHEET
V-139



SEDIMENTATION RANGE LINE 40AB



US Army Corps of Engineers®
St. Louis District

Symbol	Description Revisions	Date	Appr.

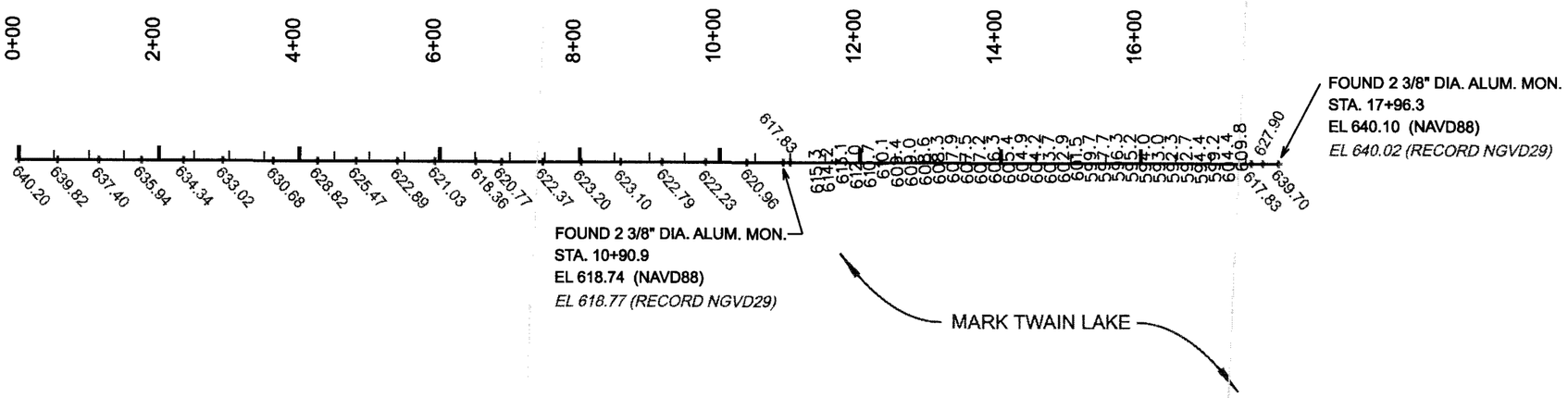
SURVEYED BY: BOWEN ENGR. & SURV.
DWN BY: WGH
CKD BY: CJH
SUBMITTED BY:
DATE: MAR. 16, 2010
SOLICITATION NO.:
CONTRACT NO.: W912P5-07-D-0600, TASK 22
PLOT SCALE: 1" = 200'
PLOT DATE: 5/18/2010
SIZE: B
FILE NAME:
FILE NUMBER:

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Bowen ENGINEERING & SURVEYING CO.
1018 Schwartz Lake Road
Cape Girardeau, MO 63701

SEDIMENTATION RANGE LINE SURVEYS
MARK TWAIN LAKE
RANGE LINE 40AB

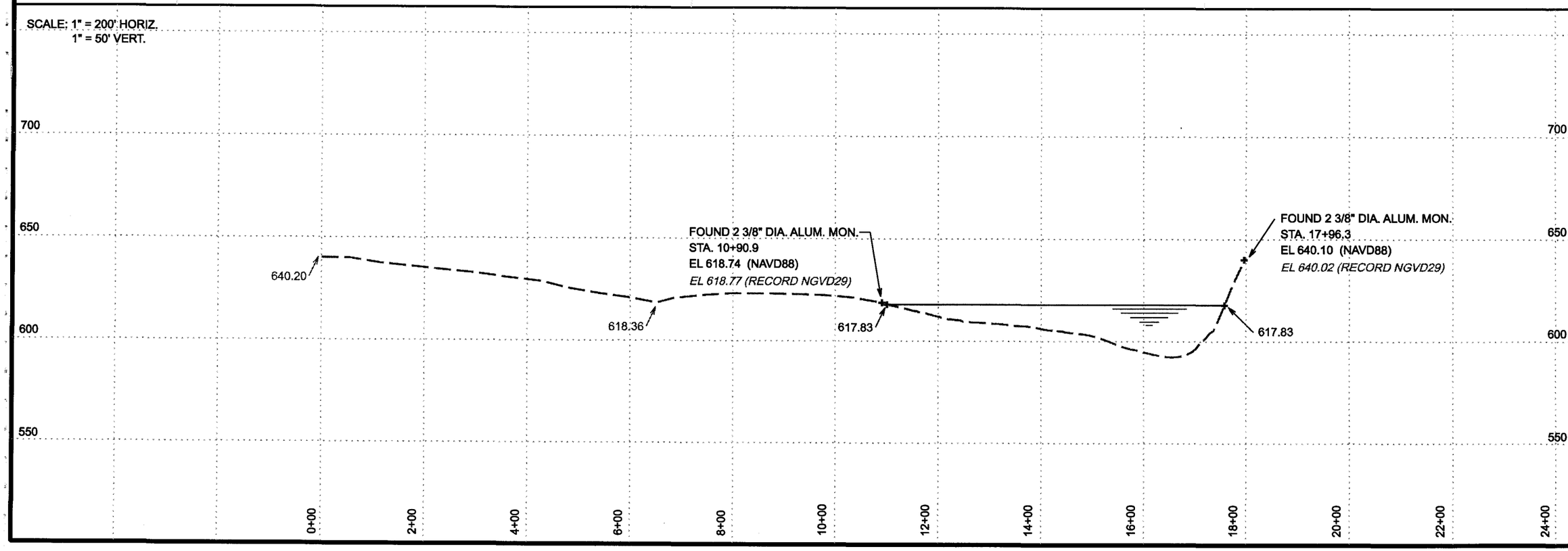
SHEET
V-140



SEDIMENTATION RANGE LINE 41AB

N

SCALE: 1" = 200'



US Army Corps of Engineers®
St. Louis District

Symbol	Description	Date	Appr.
	Revisions		

DATE: MAY 18, 2010
SOLICITATION NO.:
CONTRACT NO.: W912P8-09-D-0001, TASK 22
FILE NUMBER:

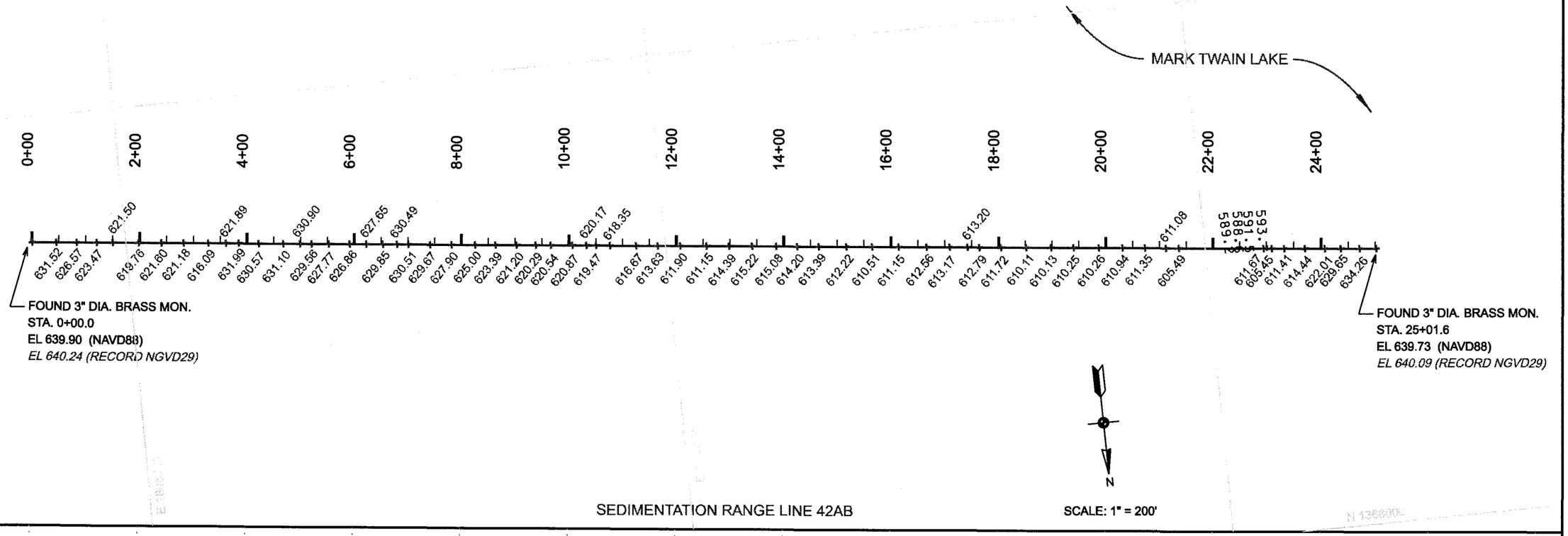
SURVEYED BY: BOWEN ENGR. & SURV.
DWN BY: MGH
CKD BY: CSH
SUBMITTED BY:
PLOT SCALE: 1" = 200'
PLOT DATE: 5/10/2010
SIZE: B
FILE NAME:

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Bowen ENGINEERING & SURVEYING
5914 Waterloo Lake Drive / Cape Girardeau, MO 63701

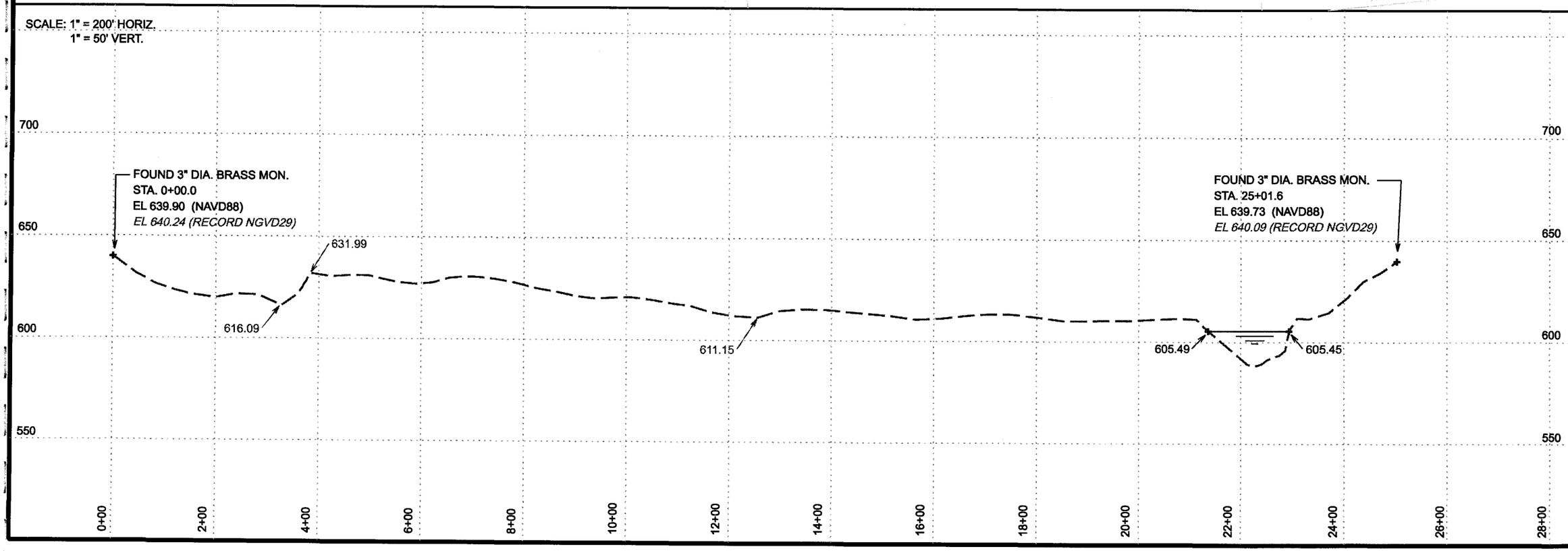
SEDIMENTATION RANGE
LINE SURVEYS
MARK TWAIN LAKE
RANGE LINE 41AB

SHEET
V-141



SEDIMENTATION RANGE LINE 42AB

SCALE: 1" = 200'



US Army Corps of Engineers®
St. Louis District

Symbol	Description Revisions	Date	Appr.

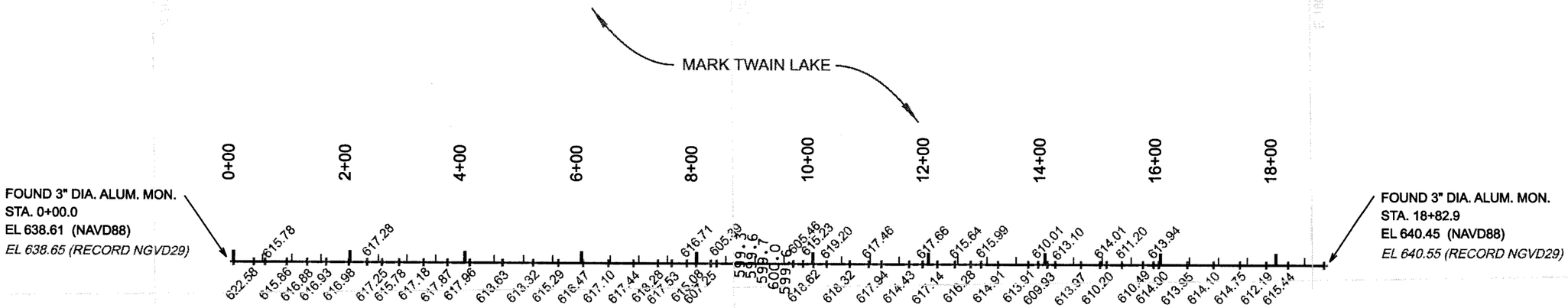
DATE: MAY 18, 2010
SOLICITATION NO.:
CONTRACT NO.: W912P4-07-D-0500, TASK 22
FILE NUMBER:
SURVEYED BY: BOWEN ENGR. & SURV.
DWN BY: WWB
CKD BY: CAH
SUBMITTED BY:
DATE:
PLOT SCALE: 1" = 200'
PLOT DATE: 5/18/2010
SIZE: B
FILE NAME:

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

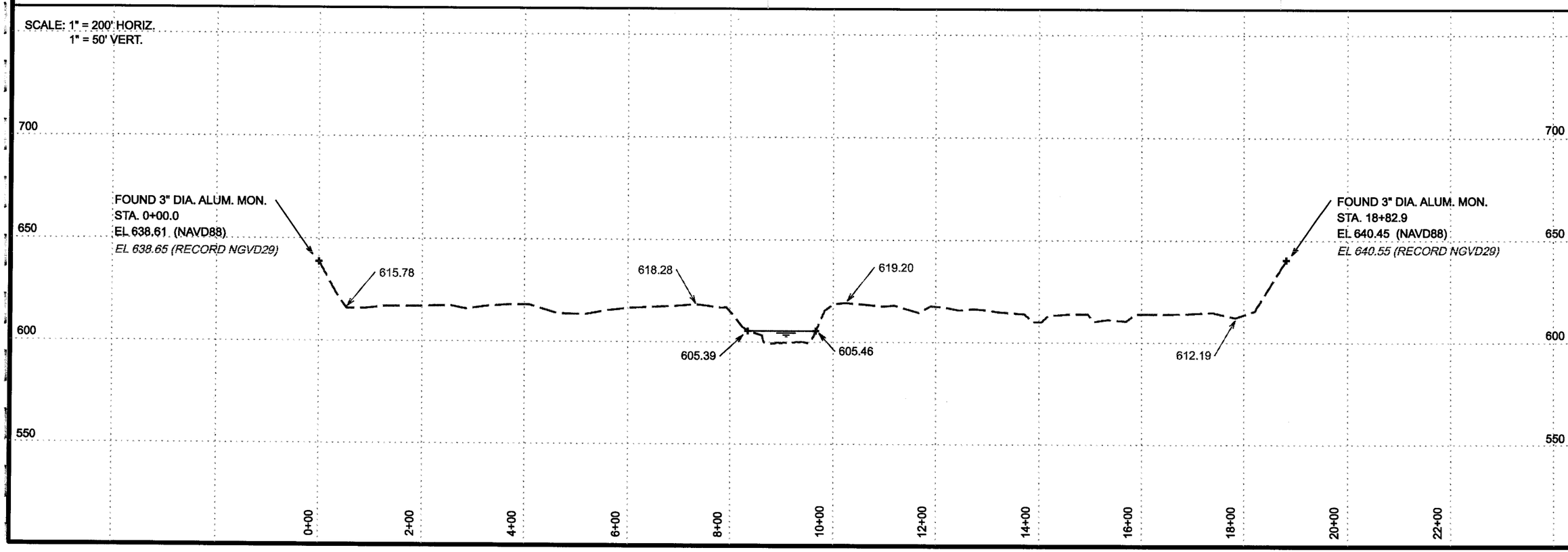
Bowen ENGINEERING & SURVEYING
1009 Wayne Ave. Suite 1
Lake Geneva, WI 53147

SEDIMENTATION RANGE LINE SURVEYS
MARK TWAIN LAKE
RANGE LINE 42AB

SHEET
V-142



SEDIMENTATION RANGE LINE 43B



US Army Corps of Engineers®
St. Louis District

Symbol	Description/ Revisions	Date	Appr.

SURVEYED BY: Bowen Engineering & Surv.
DATE: MAY 18, 2010
DRAWN BY: USACE
CADD BY: CWR
SOLICITATION NO.:
SUBMITTED BY:
CONTRACT NO.: W912P-07-D-0604, TASK 22
PLOT DATE: 07/02/2010
PLOT SCALE: 1" = 200'
FILE NUMBER:
SIZE: E
FILE NAME:

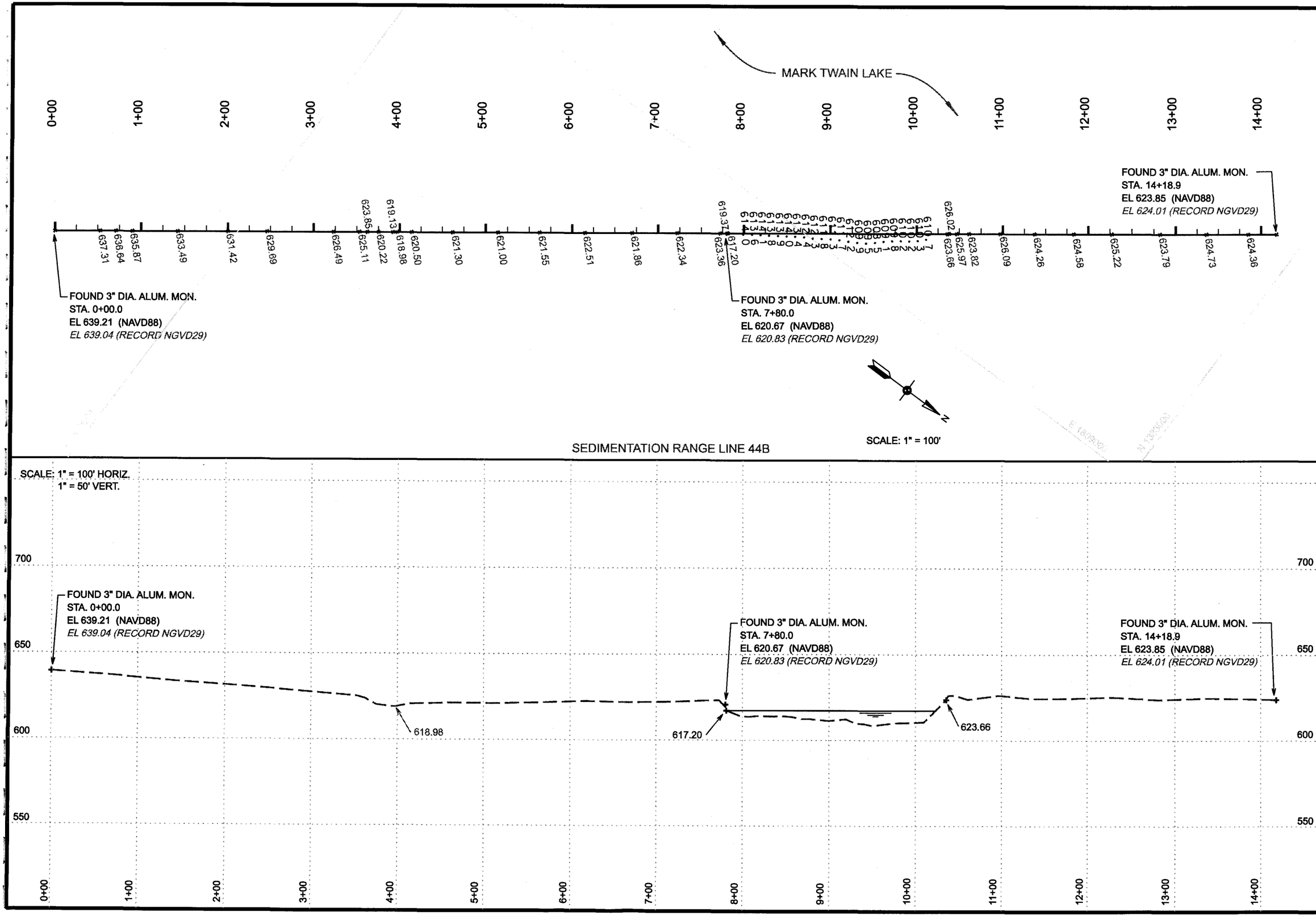
U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Bowen ENGINEERING & SURVEYING
1000 Wentzville Parkway
Suite 1
Wentzville, MO 63385

SEDIMENTATION RANGE
LINE SURVEYS
MARK TWAIN LAKE

RANGE LINE 43B

SHEET
V-143



US Army Corps of Engineers®
St. Louis District

Symbol	Description	Date	Appv.

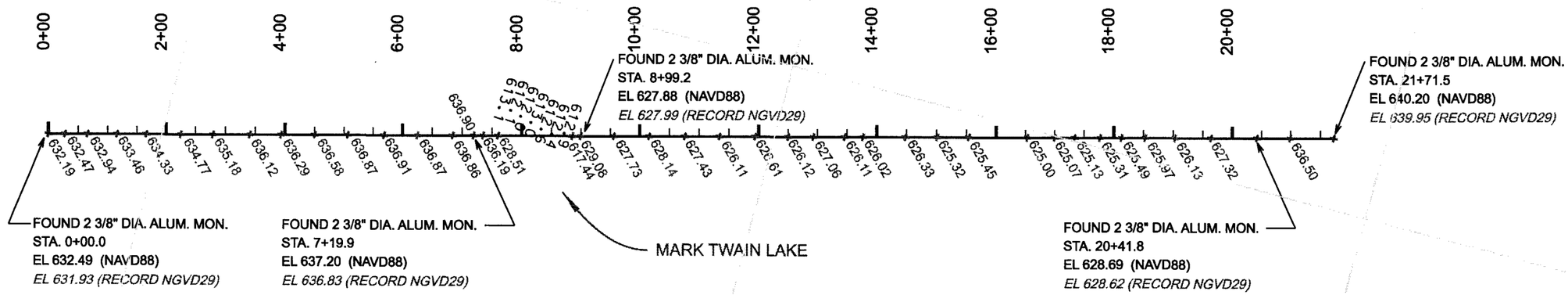
DATE: MAY 18, 2010
SOLICITATION NO.:
CONTRACT NO.: W912P-07-D-0030, TASK 22
FILE NUMBER:
SURVEYED BY: BOWEN ENGR. & SURV.
DWN BY: CAD
CKD BY: CAD
SUBMITTED BY:
PLOT DATE: 5/18/2010
PLOT SCALE: 1" = 100'
SIZE: B
FILE NAME:

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Bowen ENGINEERING & SURVEYING
1015 Westview, Ste. 200
Oak Brook, IL 60523

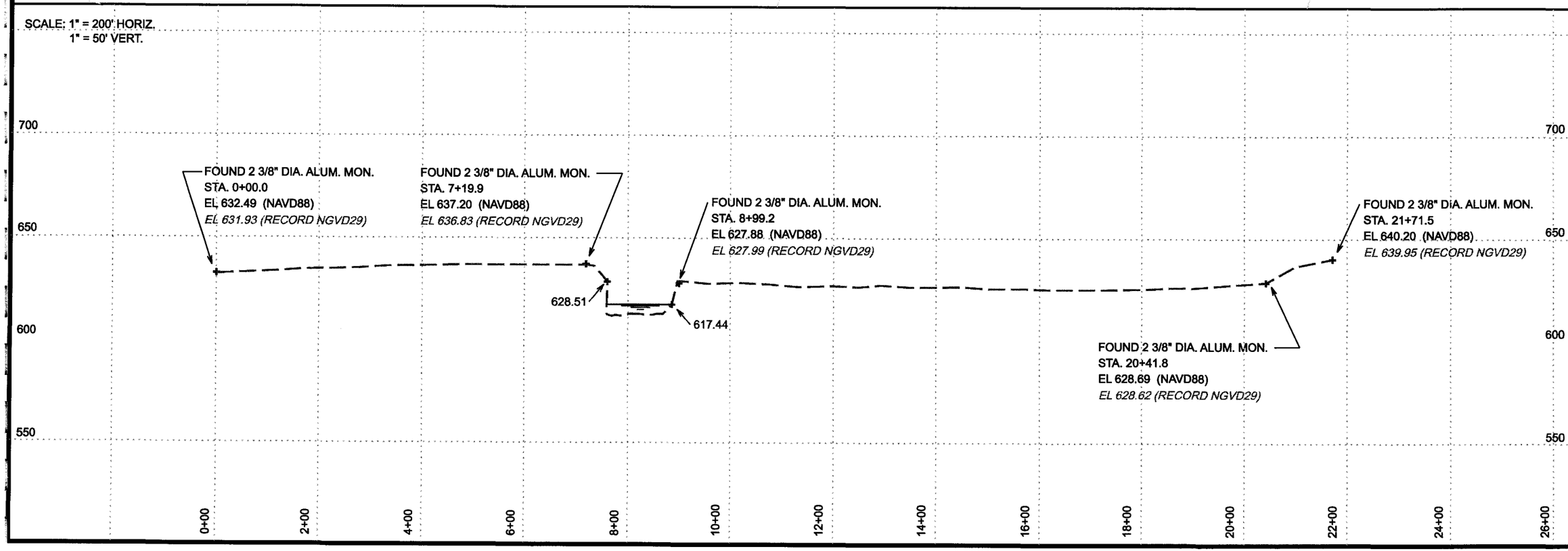
SEDIMENTATION RANGE LINE SURVEYS
MARK TWAIN LAKE
RANGE LINE 44B

SHEET
V-144



SEDIMENTATION RANGE LINE 45B

SCALE: 1" = 200'



US Army Corps of Engineers®
St. Louis District

Symbol	Description Revisions	Date	Appr.

DATE: MAY 18, 2010
SOLICITATION NO.:
CONTRACT NO.: W912P4-07-D-0506, TASK 22
FILE NUMBER:

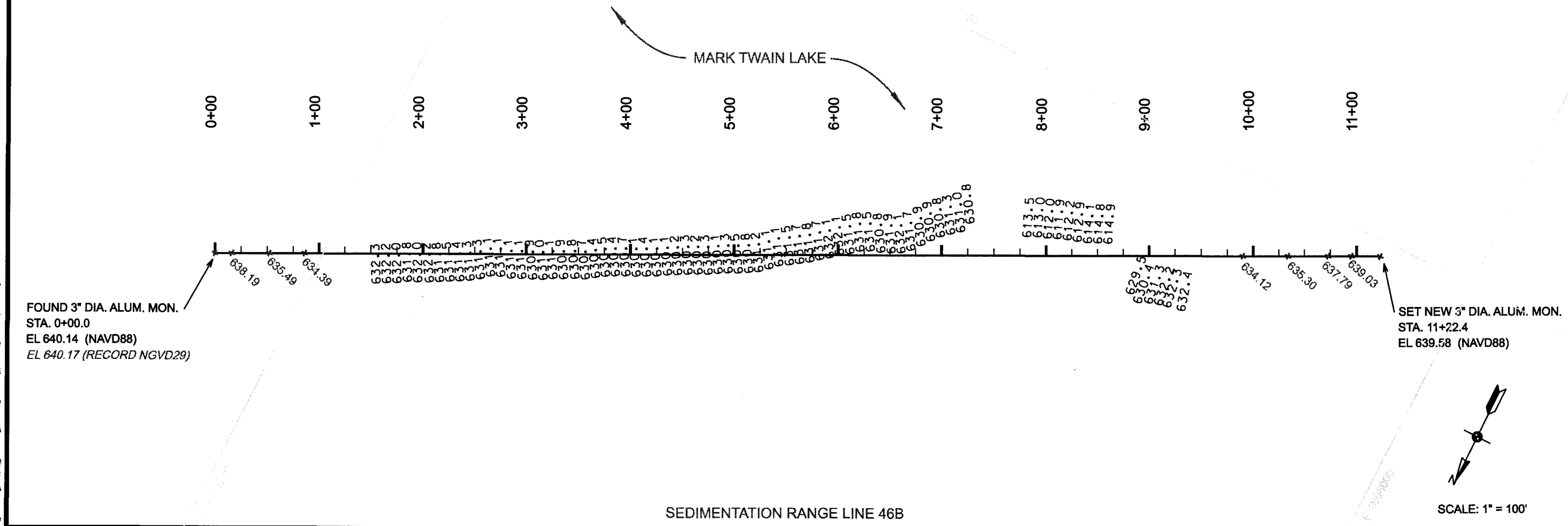
SURVEYED BY: BOWEN ENGR. & SURV.
DWN BY: MARY
CKD BY: DRH
SUBMITTED BY:
PLOT SCALE: 1" = 200'
PLOT DATE: 5/18/2010
SIZE: B
FILE NAME:

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

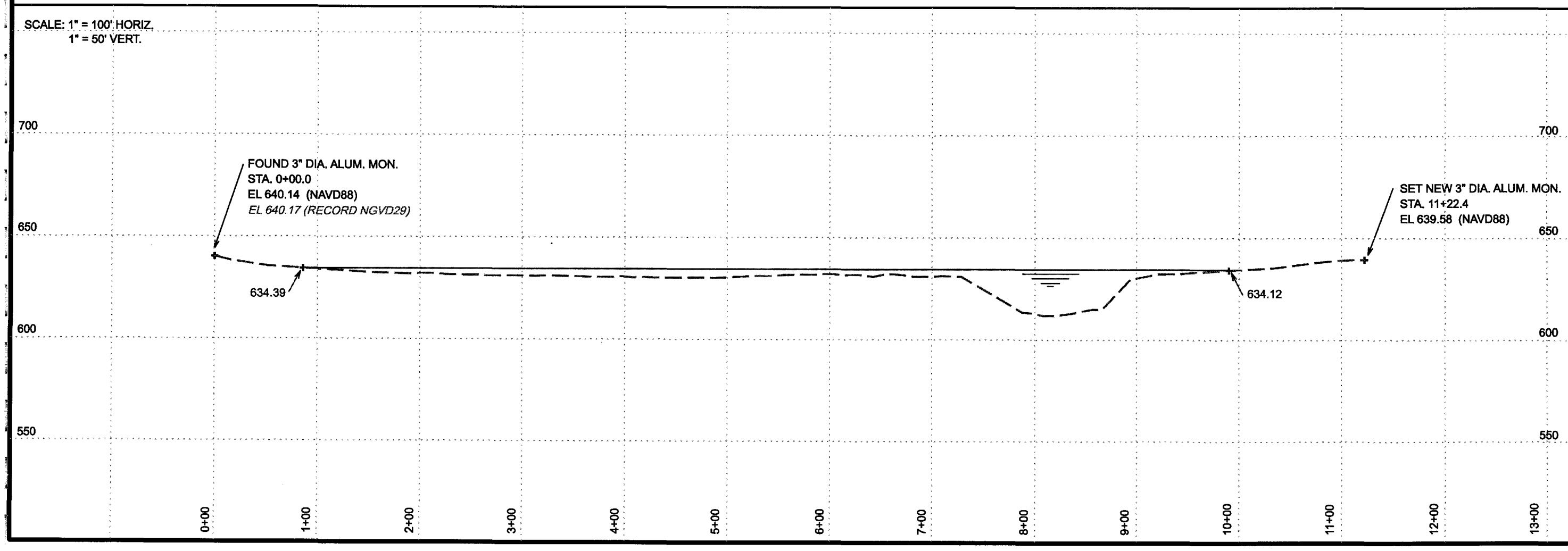
Bowen ENGINEERING & SURVEYING
1079 Nicholas Blvd. Suite J
Elk Grove Village, IL 60007

SEDIMENTATION RANGE LINE SURVEYS
MARK TWAIN LAKE
RANGE LINE 45B

SHEET
V-145



SEDIMENTATION RANGE LINE 46B



US Army Corps of Engineers®
St. Louis District

Symbol	Description / Signature	Date	Appr.

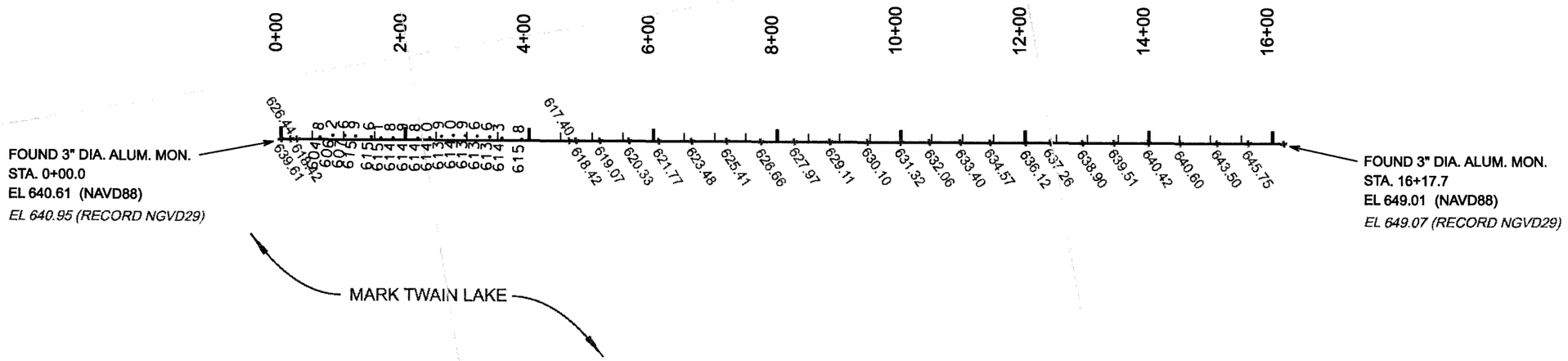
DATE: MAY 18, 2010
SOLICITATION NO.:
CONTRACT NO.: W912P8-09-D-0010, TASK 23
FILE NUMBER:
SURVEYED BY: BOWEN ENGR. & SURV.
DWN BY: MGH
CKD BY: CSH
SUBMITTED BY:
PLOT DATE: 5/18/2010
PLOT SCALE: 1" = 100'
SIZE: B
FILE NAME:

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Bowen ENGINEERING & SURVEYING
1018 Broadway, Ste. 200a
Cape Girardeau, MO 63701

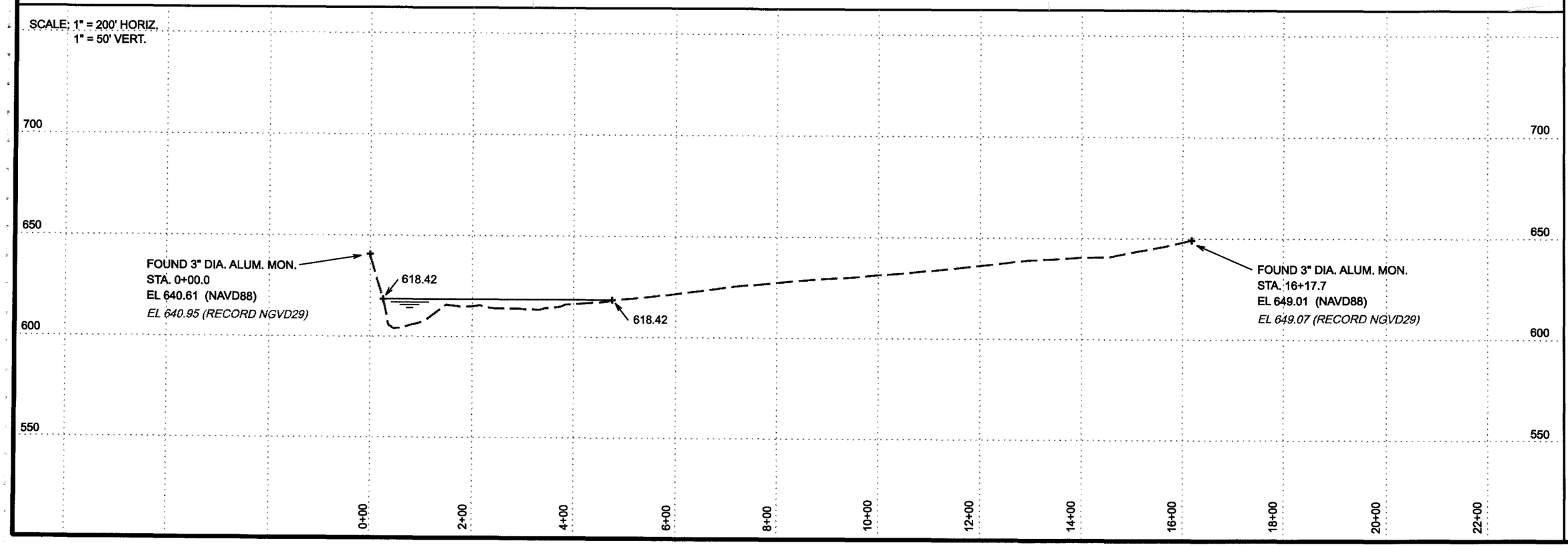
SEDIMENTATION RANGE LINE SURVEYS
MARK TWAIN LAKE
RANGE LINE 46B

SHEET
V-146



SEDIMENTATION RANGE LINE 47B

SCALE: 1" = 200'



US Army Corps of Engineers®
St. Louis District

Symbol	Description / Revisions	Date	Appr.

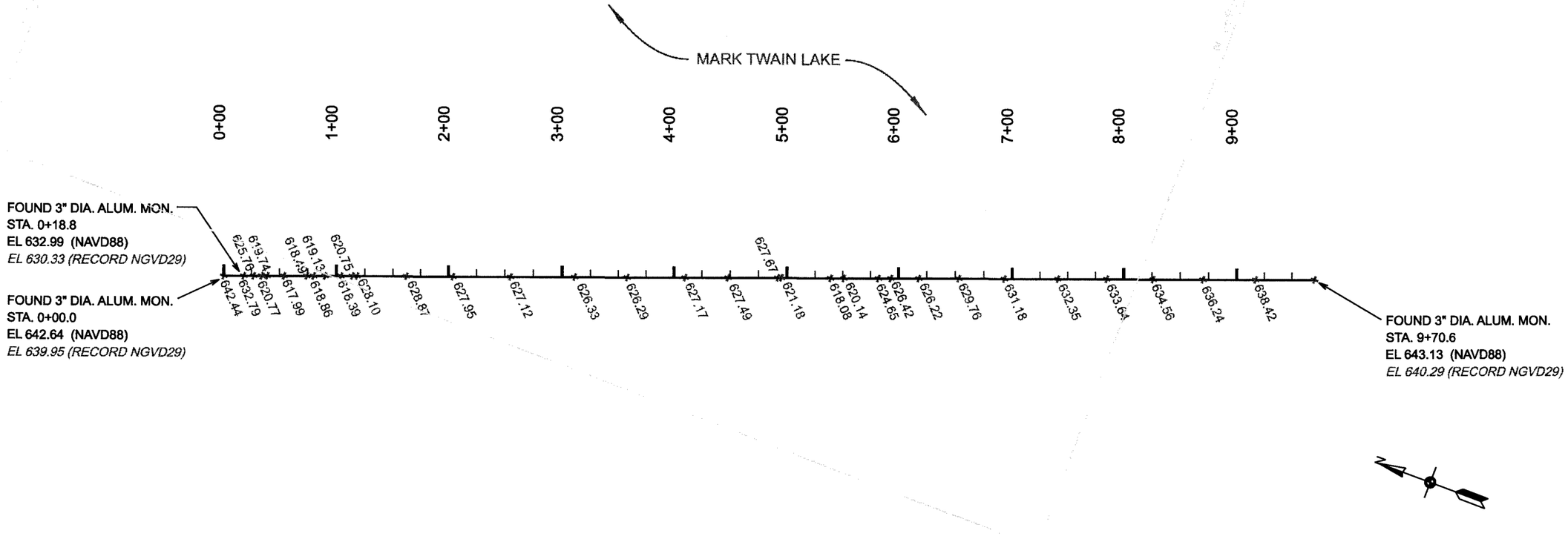
SURVEYED BY: BOWEN ENGR. & SURV.
DWN BY: MGH
CKD BY: CGH
SUBMITTED BY:
PLOT SCALE: 1" = 200'
PLOT DATE: 5/19/2010
SIZE: B
FILE NAME:
DATE: MAY 18, 2010
SOLICITATION NO.:
CONTRACT NO.: W912P7-07-D-0006, TASK 23
FILE NUMBER:

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

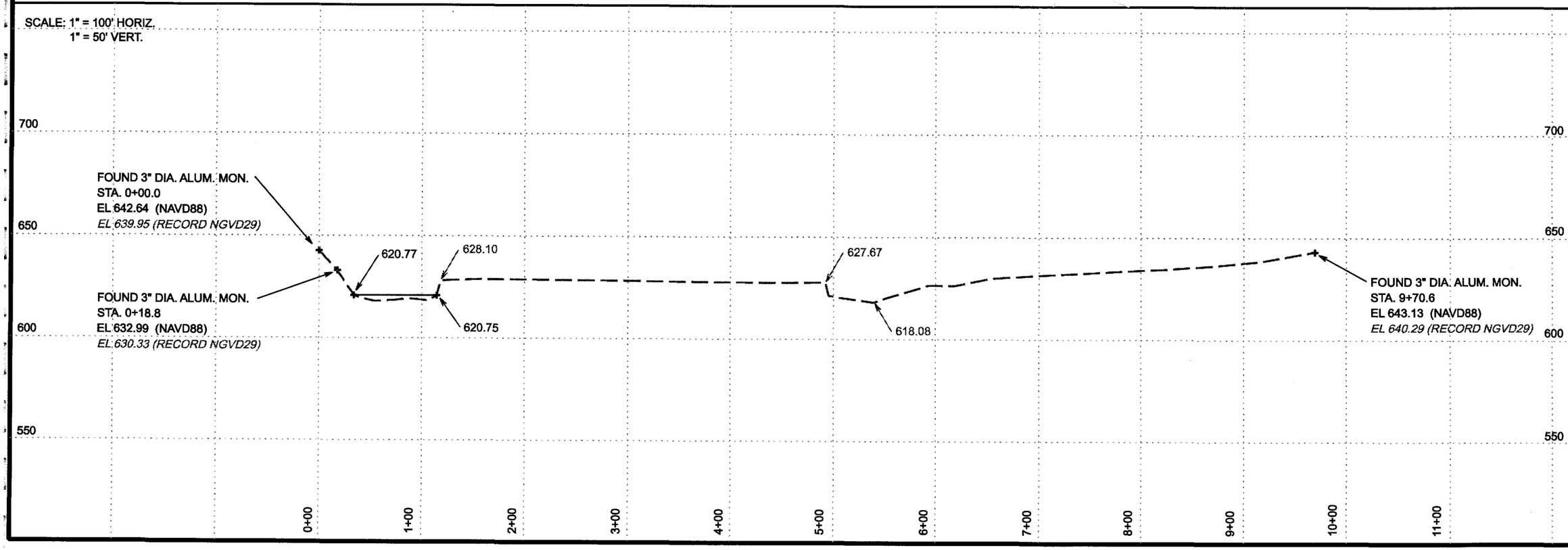
Bowen ENGINEERING & SURVEYING
Cape Girardeau, MO 63701

SEDIMENTATION RANGE
LINE SURVEYS
MARK TWAIN LAKE
RANGE LINE 47B

SHEET
V-147



SEDIMENTATION RANGE LINE 48B



US Army Corps of Engineers®
St. Louis District

Symbol	Description/ Revisions	Date	Appr.

SURVEYED BY: BOWEN ENGR. & SURV.
DWN BY: MGH
CKD BY: CDR
SUBMITTED BY:
PLOT SCALE: 1" = 100'
PLOT DATE: 6/18/2010
SIZE: B
FILE NAME:
DATE: MAY 18, 2010
SOLICITATION NO.:
CONTRACT NO.: W912P7-09-D-0009, TASK 22
FILE NUMBER:

U.S. ARMY ENGINEER DIVISION
CORPS OF ENGINEERS
ST. LOUIS, MISSOURI

Bowen ENGINEERING & SURVEYING CO.
1015 Wellington Lane, Suite J
Cape Girardeau, MO 63701

SEDIMENTATION RANGE
LINE SURVEYS
MARK TWAIN LAKE
RANGE LINE 48B

SHEET
V-148