

20 0 20
SCALE IN METERS



URANIUM (pCi/g U) AND THORIUM (pCi/g Th).
CIMARRON GAMMA SPEC SOIL COUNTER.
SITE SOIL BACKGROUND OF APPROX. 4.0 pCi/g U
AND 1.5 pCi/g Th, NOT SUBTRACTED.
SAMPLES TAKEN ON 5 METER X 5 METER GRID.

LEGEND

6+ URANIUM
1 - 29 pCi/g U
58+ URANIUM
30 - 89 pCi/g U
129+ URANIUM
> 90 pCi/g U
+2 THORIUM
1 - 5 pCi/g Th

REV.	DESCRIPTION	DRWN BY:	CHKD BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JK	5/15/96
DRWN BY	DATE	CHKD BY	DATE	APP'D BY	SCALE
JE	4/24/96				AS SHOWN



CIMARRON CORPORATION

CIMARRON FACILITY
PHASE III, SUB-AREA L
BURIAL AREA #2 - OVERBURDEN
POST-REMEDIATION SOIL SAMPLE RESULTS (1995)
SOIL SAMPLE ALIQUOT: 1'-2'

CLIENT DRAWING NO.

JOB NO.

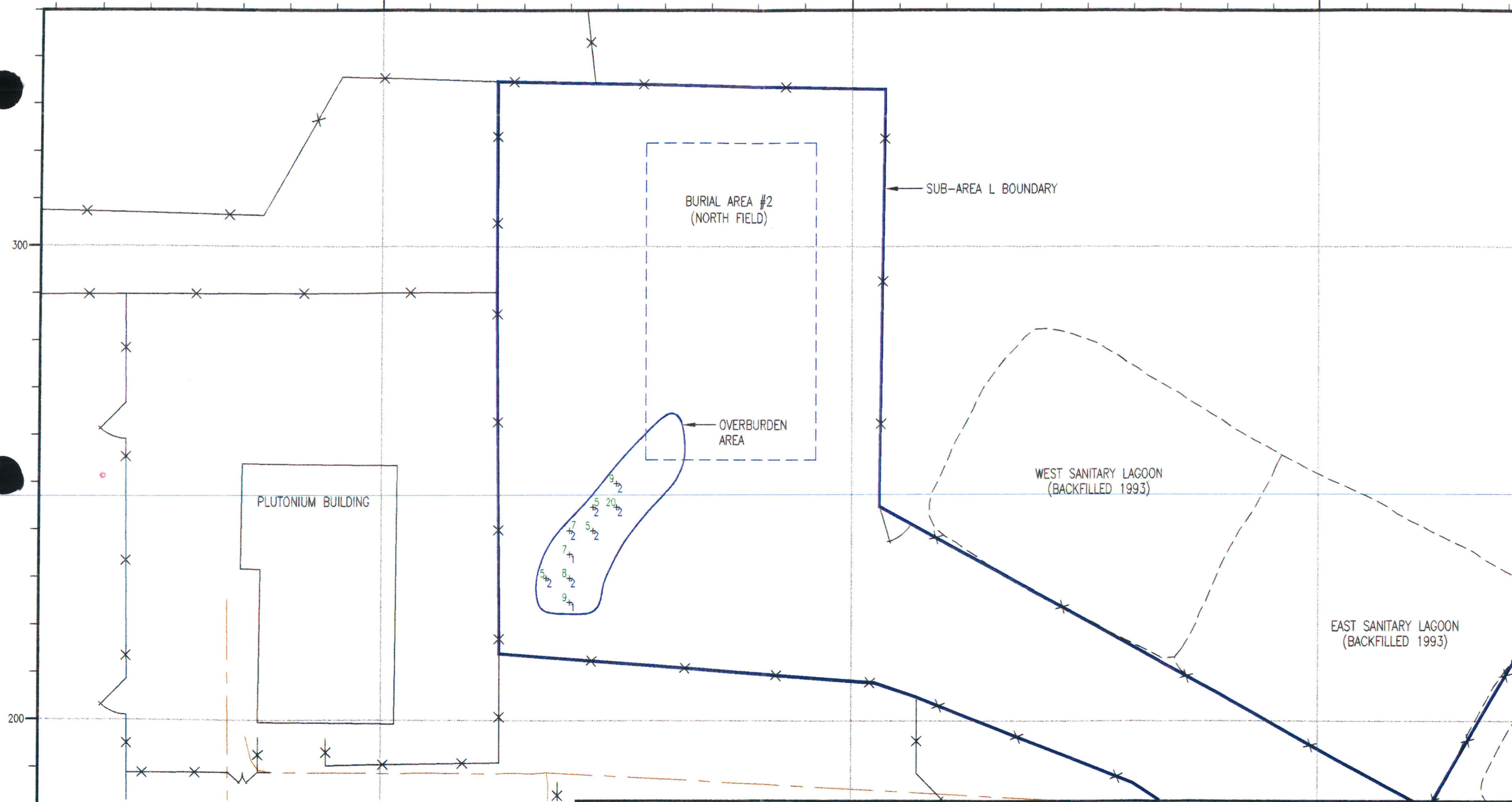
DRAWING NO.

953L20SS-2

REV.

0

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20 0 20
SCALE IN METERS



URANIUM (pCi/g U) AND THORIUM (pCi/g Th).

CIMARRON GAMMA SPEC SOIL COUNTER.

SITE SOIL BACKGROUND OF APPROX. 4.0 pCi/g U AND 1.5 pCi/g Th, NOT SUBTRACTED.

SAMPLES TAKEN ON 5 METER X 5 METER GRID.

LEGEND

6+ URANIUM
1 - 29 pCi/g U

58+ URANIUM
30 - 89 pCi/g U

129+ URANIUM
> 90 pCi/g U

+2 THORIUM
1 - 5 pCi/g Th

REV.	DESCRIPTION	DRWN BY:	CHKD BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JK	5/15/96

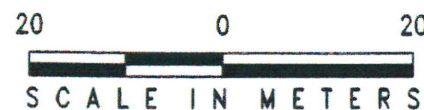
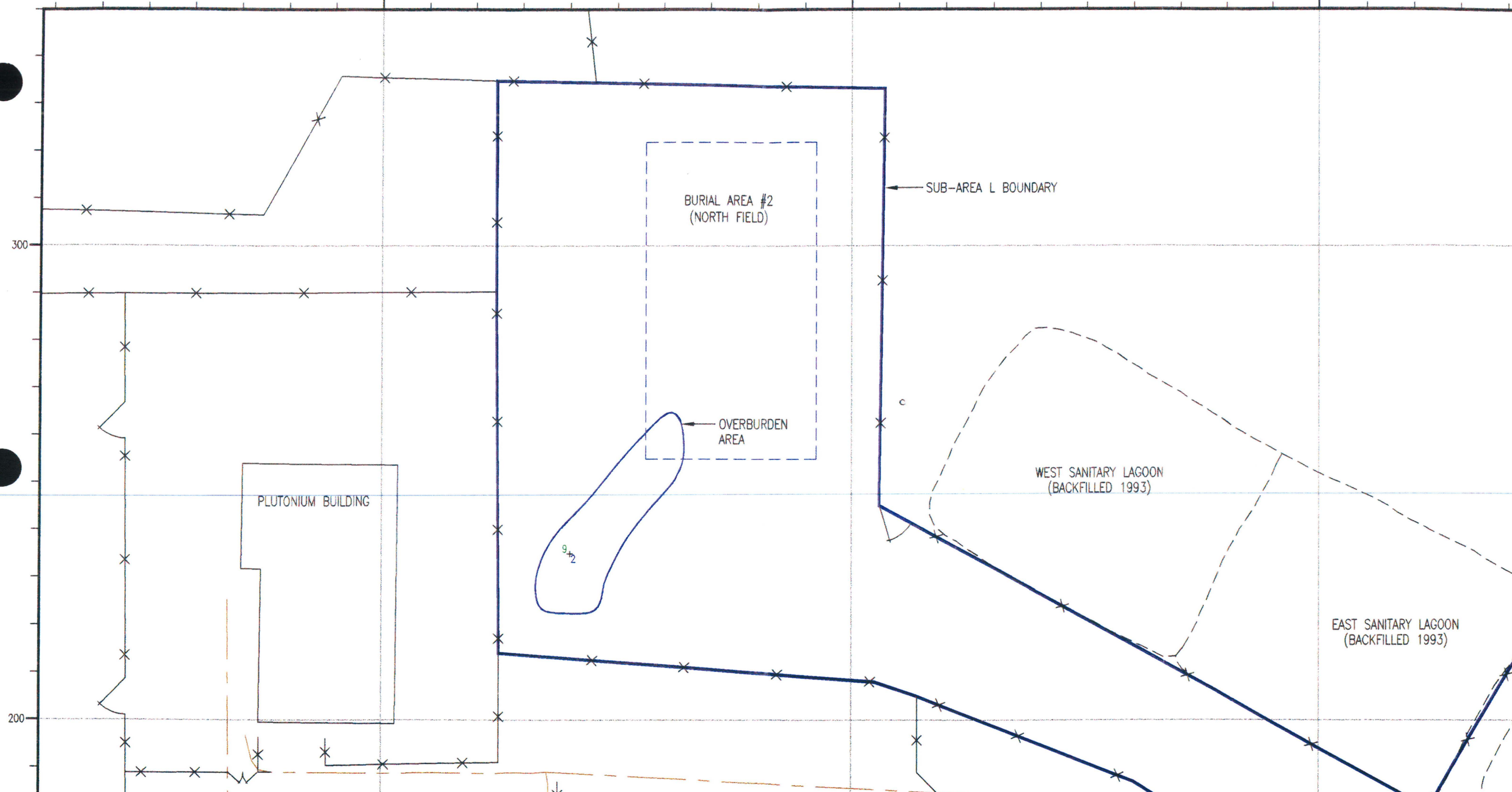
DRWN. BY	DATE	CHKD. BY	DATE	APP'D. BY	SCALE
JE	4/24/96				AS SHOWN

CIMARRON CORPORATION

CIMARRON FACILITY
PHASE III, SUB-AREA L
BURIAL AREA #2 - OVERBURDEN
POST-REMEDIATION SOIL SAMPLE RESULTS (1995)
SOIL SAMPLE ALIQUOT: 2'-3'

CLIENT DRAWING NO.

JOB NO.	DRAWING NO.	REV.
	953L20SS-3	0



URANIUM (pCi/g U) AND THORIUM (pCi/g Th).

CIMARRON GAMMA SPEC SOIL COUNTER.

SITE SOIL BACKGROUND OF APPROX. 4.0 pCi/g U AND 1.5 pCi/g Th, NOT SUBTRACTED.

SAMPLES TAKEN ON 5 METER X 5 METER GRID.

LEGEND

6+ URANIUM 1 - 29 pCi/g U

58+ URANIUM 30 - 89 pCi/g U

129+ URANIUM > 90 pCi/g U

+2 THORIUM 1 - 5 pCi/g Th

REV.	DESCRIPTION	DRWN BY:	CHK'D BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JK	5/15/96

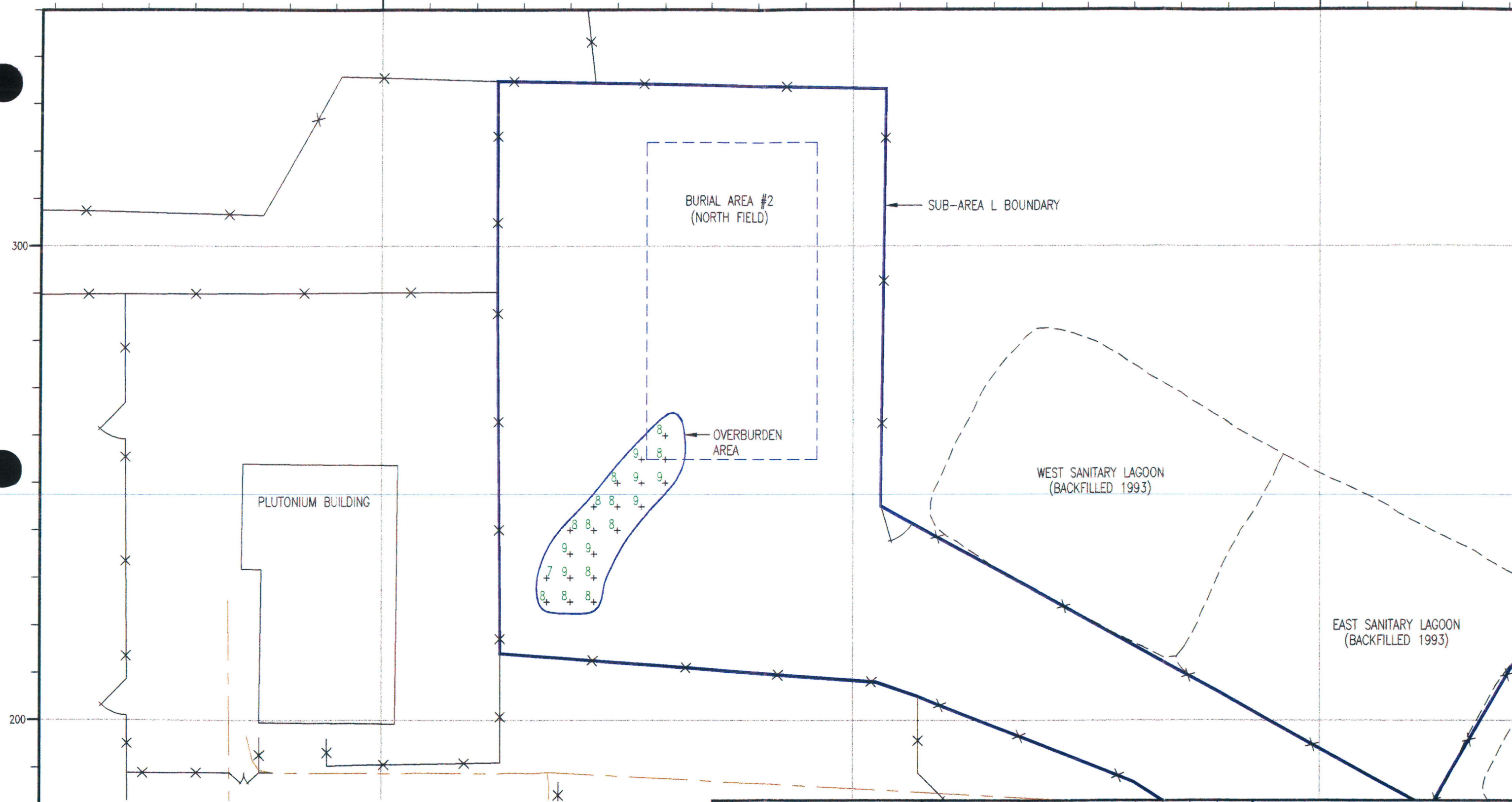
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JE	4/24/96				AS SHOWN

CIMARRON CORPORATION

CIMARRON FACILITY
PHASE III, SUB-AREA L
BURIAL AREA #2 - OVERBURDEN
POST-REMEDIATION SOIL SAMPLE RESULTS (1995)
SOIL SAMPLE ALIQUOT: 3'-4'

CLIENT DRAWING NO.

JOB NO.	DRAWING NO.	REV.
	953L20SS-4	0



READINGS ARE IN MICRO-R/HR (μ R/HR)

INSTRUMENT: LUDLUM MICRO-R METER
SERIAL NO: 111299
BACKGROUND: 7 μ R/HR.

READINGS TAKEN ON 5 METER X 5 METER GRID.

REV.	DESCRIPTION	DRWN BY	CHKD BY	APP'D BY	DATE
0	DRAWING ISSUED.	JE	WR	JK	5/15/96

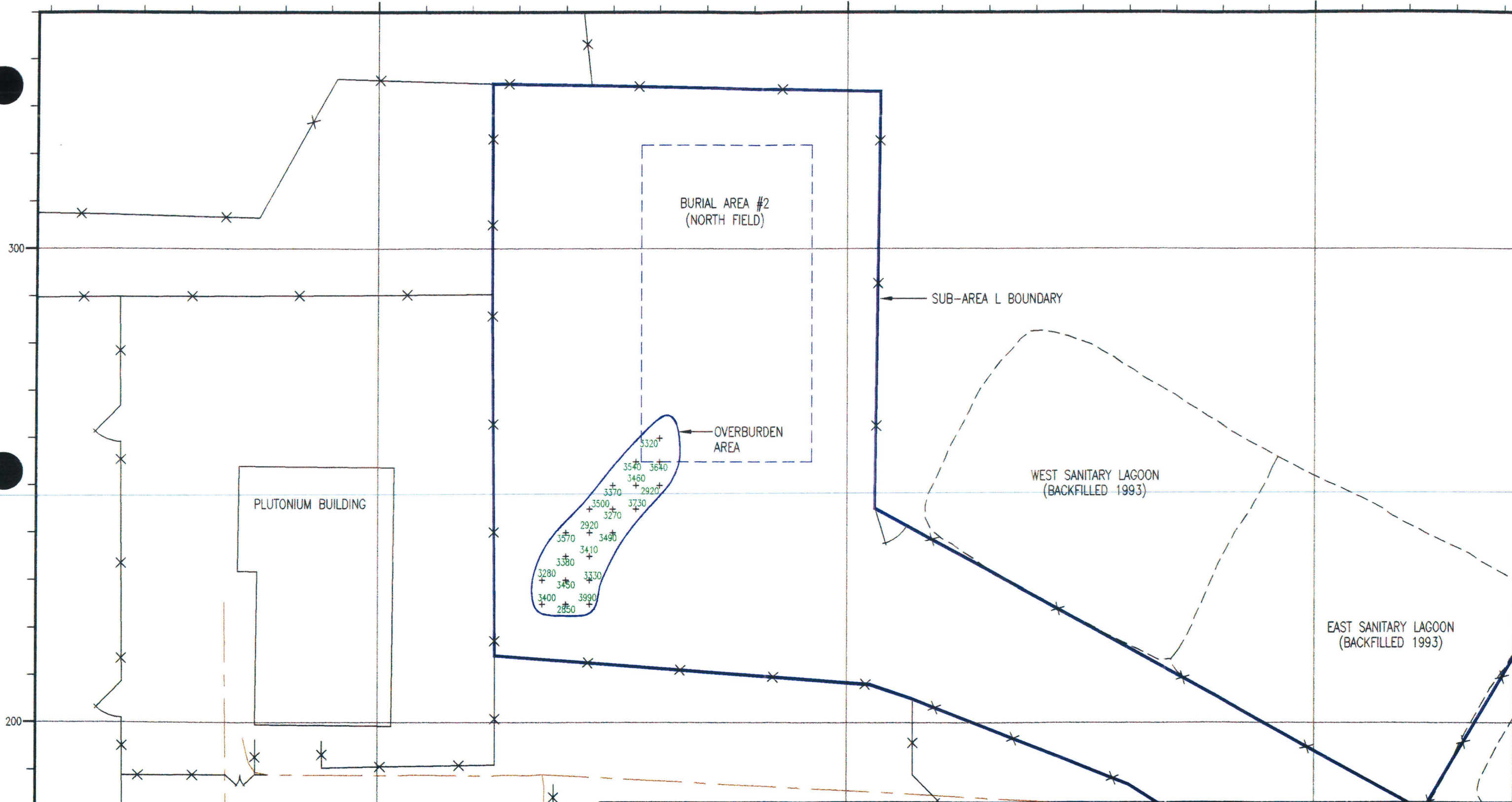
DRWN BY	DATE	CHKD BY	DATE	APP'D BY	SCALE
JE	4/24/96				AS SHOWN

CIMARRON CORPORATION

CIMARRON FACILITY
PHASE III, SUB-AREA L
BURIAL AREA #2 - OVERBURDEN
POST-REMEDIATION MICRO-R SURVEY (1995)
AT ONE METER ABOVE SURFACE

CLIENT DRAWING NO.

JOB NO. DRAWING NO. 953L20UR-1 REV. 0




INSTRUMENT: LUDLUM 2220, S/N 50057,
LEAD-SHIELDED 3" X 1/2"
NaI DETECTOR.

BACKGROUND: 3100 CPM

READINGS TAKEN ON 5 METER X 5 METER GRID.

LEGEND
3560 < 6200 CPM

REV.	DESCRIPTION	DRWN BY	CHKD BY	APP'D BY	DATE
0	DRAWING ISSUED.	JE	WR	JK	5/15/96
DRWN. BY	DATE	CHKD. BY	DATE	APP'D. BY	SCALE
JE	4/24/96				AS SHOWN

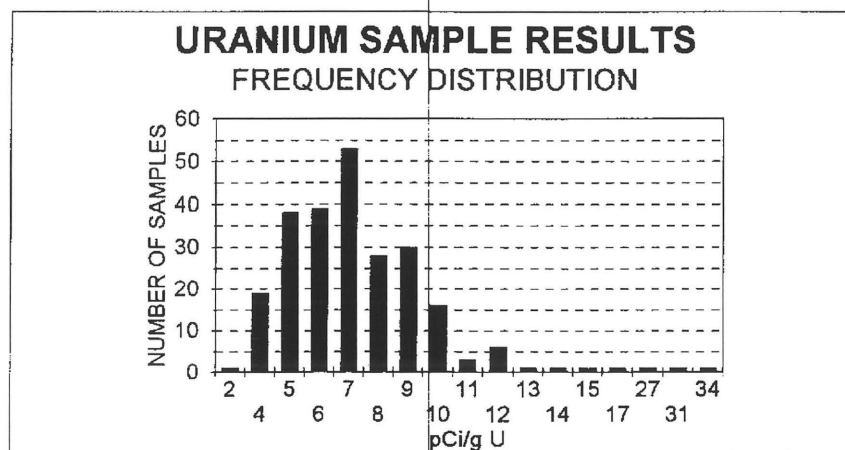
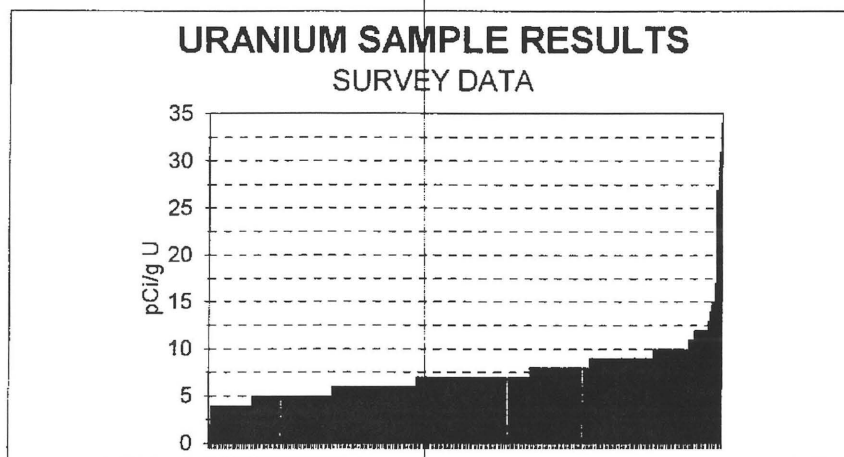
 **CIMARRON CORPORATION**

CIMARRON FACILITY
PHASE III, SUB-AREA L
BURIAL AREA #2 - OVERBURDEN
POST-REMEDIATION GAMMA SURVEY (1995)
READING IN CPM (3" DET.) AT SURFACE

CLIENT DRAWING NO.

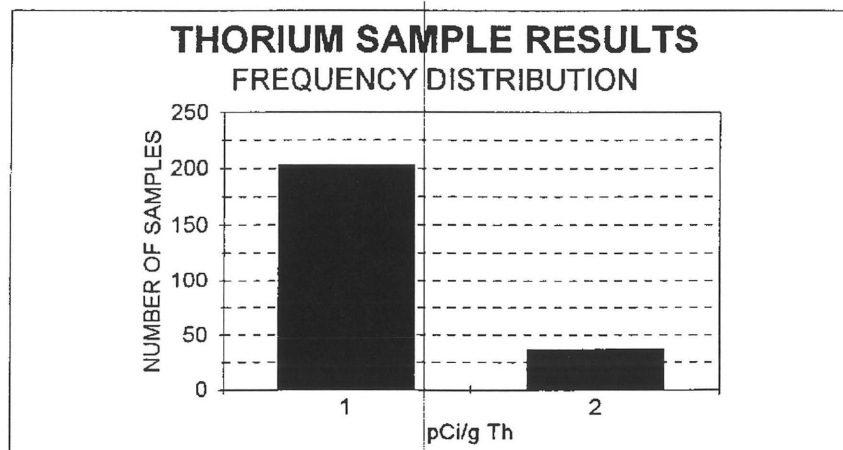
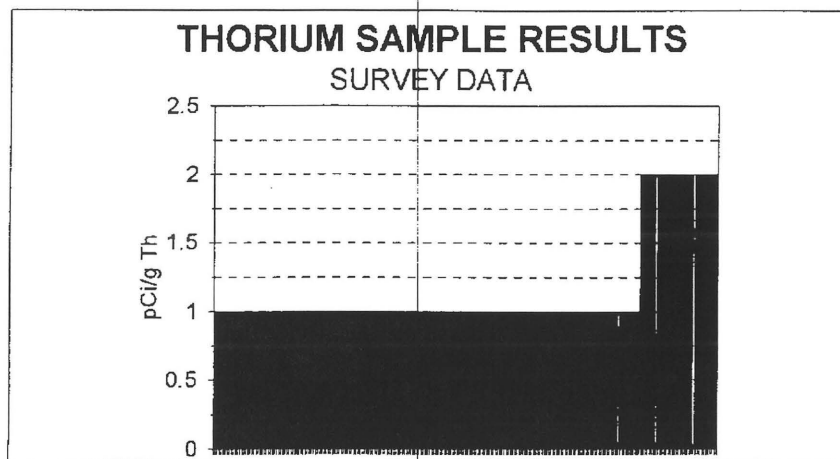
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PHASE III - AREA L
LINED SANITARY LAGOON
CIMARRON SOIL COUNTER
TOTAL URANIUM SOIL SAMPLE RESULTS
SITE BACKGROUND OF 4 pCi/g NOT SUBTRACTED
NOVEMBER 1995



NUMBER OF SAMPLES	240
AVERAGE SAMPLE	7
MINIMUM SAMPLE	2
MAXIMUM SAMPLE	34
STANDARD DEVIATION	3

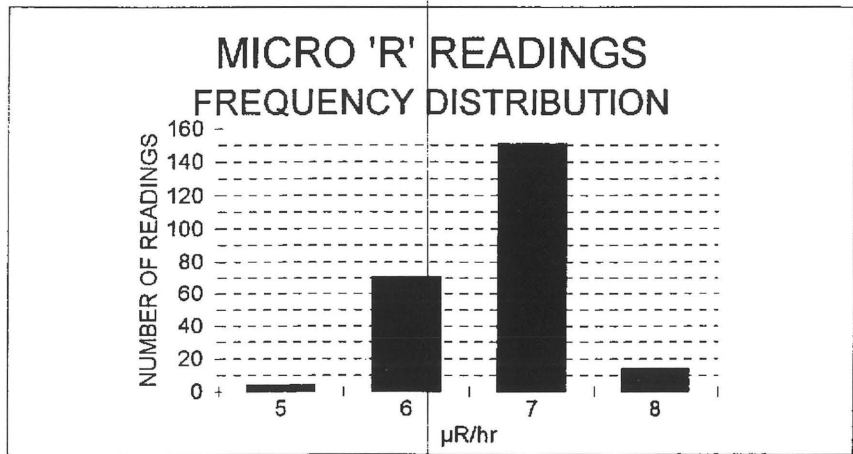
PHASE III - AREA L
LINED SANITARY LAGOON
CIMARRON SOIL COUNTER
THORIUM (NAT) SOIL SAMPLE RESULTS
SITE BACKGROUND OF 1.5 pCi/g NOT SUBTRACTED
NOVEMBER 1995



NUMBER OF SAMPLES	240
AVERAGE SAMPLE	1
MINIMUM SAMPLE	1
MAXIMUM SAMPLE	2
STANDARD DEVIATION	0

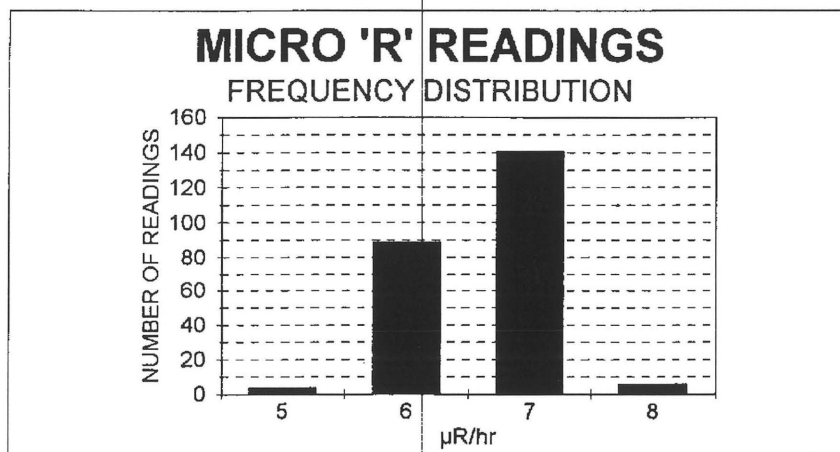
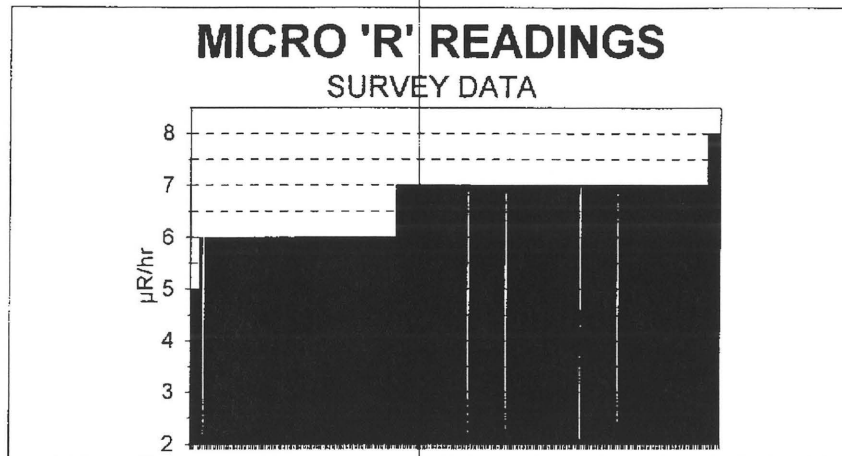
MICRO 'R' READINGS
SURVEY DATA

Reading Number	Reading Value ($\mu\text{R/hr}$)
1	5.8
2	6.0
3	7.0
4	8.0



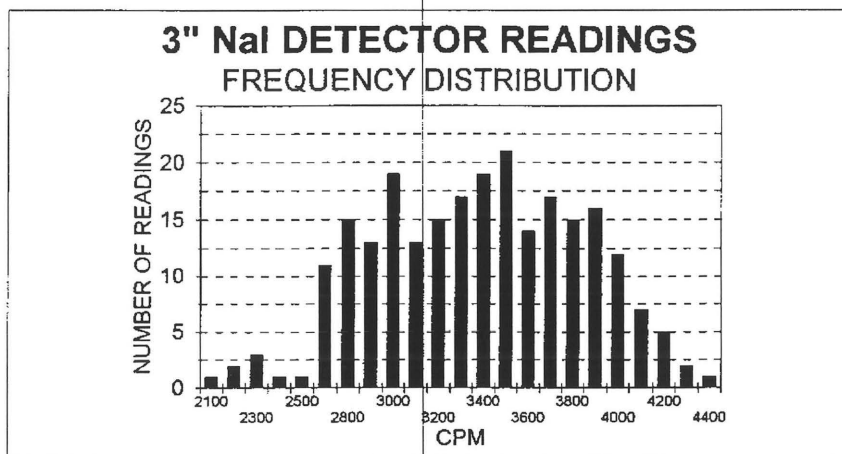
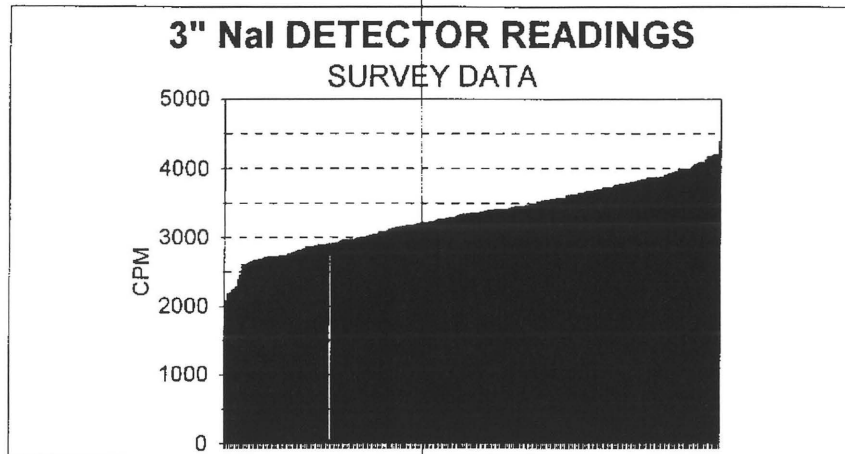
NUMBER OF READINGS	240
AVERAGE READING	7
MINIMUM READING	5
MAXIMUM READING	8
STANDARD DEVIATION	1

PHASE III - AREA L
LINED SANITARY LAGOON
MICRO-R METER READINGS AT ONE METER ABOVE SURFACE
LUDLUM MODEL 19 S/N 111299
RESULTS IN $\mu\text{R/hr}$
NOVEMBER 1995



NUMBER OF READINGS	240
AVERAGE READING	7
MINIMUM READING	5
MAXIMUM READING	8
STANDARD DEVIATION	1

**PHASE III - AREA L
LINED SANITARY LAGOON
GROSS GAMMA READINGS IN CPM
LUDLUM MODEL 2220 S/N 48395
BACKGROUND OF 3100 CPM
NOVEMBER 1995**



NUMBER OF READINGS	240
AVERAGE READING	3334
MINIMUM READING	2084
MAXIMUM READING	4390
STANDARD DEVIATION	464

CIMARRON CORPORATION - CIMARRON FACILITY
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE (PHASE III - AREA-L)

n = pCi/g TOTAL U

Number	n	(n-N)	(n-N) ²
1	31	23.6	555.6
2	7	-0.4	0.2
3	9	1.6	2.5
4	9	1.6	2.5
5	4	-3.4	11.8
6	5	-2.4	5.9
7	5	-2.4	5.9
8	15	7.6	57.3
9	11	3.6	12.8
10	34	26.6	706.0
11	27	19.6	383.0
12	4	-3.4	11.8
13	10	2.6	6.6
14	7	-0.4	0.2
15	8	0.6	0.3
16	5	-2.4	5.9
17	8	0.6	0.3
18	6	-1.4	2.0
19	6	-1.4	2.0
20	8	0.6	0.3
21	9	1.6	2.5
22	7	-0.4	0.2
23	10	2.6	6.6
24	17	9.6	91.6
25	9	1.6	2.5
26	9	1.6	2.5
27	8	0.6	0.3
28	7	-0.4	0.2
29	8	0.6	0.3
30	8	0.6	0.3
31	8	0.6	0.3
32	6	-1.4	2.0
33	7	-0.4	0.2
34	7	-0.4	0.2
35	4	-3.4	11.8
36	7	-0.4	0.2
37	6	-1.4	2.0
38	9	1.6	2.5
39	7	-0.4	0.2
40	12	4.6	20.9
41	9	1.6	2.5
42	6	-1.4	2.0
43	5	-2.4	5.9
44	12	4.6	20.9
45	12	4.6	20.9
46	7	-0.4	0.2
47	8	0.6	0.3
48	7	-0.4	0.2
49	8	0.6	0.3
50	5	-2.4	5.9
352		225.492535	
343		248.217535	
352		209.492535	
273		124.375694	
1783		2786.796	
Sum(n)		Sum(n-N) ²	

No. of Samples (x) : 240

COUNT TIME: 5 MINUTES

Sample Mean (N) = Sum(n) / (x)

Sample Mean (N) : 7.4

Standard Deviation (Sd) = SQRT [(n-N)² / (x - 1)]

Standard Deviation: 3.4

2 Std Deviations: 6.8

Degree of Freedom(df) = (x) - 1 Data listed on Table B-1

(df) = 1.654

Area's Average Level (A_u) = (N) + (df) x [(Sd)/(x)]

(A_u) = 7.8

pCi/gU TOTAL U

GUIDELINE VALUE: 30

pCi/gU TOTAL U

Acceptable Level: 34

pCi/gU TOTAL U

(30 PLUS BACKGROUND)

TABLE B - 1

Factors for Comparison of Survey Data with Guidelines					
(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:

Interpolate between the listed values.

(df) high value(Z)	400	is (B)	1.649	95%
(df) low value(Y)	120	is (A)	1.658	95%

Desired value(df) (X) 239 is calculated as follow:

EXP[(Ln(B)-Ln(A)) + (Z-Y) / (X-Y) + Ln(A)]

The (df) value for (X) 239 1.654 95%

PERFORMED BY: Ch Powell

DATE: 5-6-96

REVIEWED BY: W-A. Rogers

DATE: 5-6-96

CIMARRON CORPORATION - CIMARRON FACILITY

LINED SANITARY LAGOON

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE (PHASE III - AREA-L)

n = pCi/g TOTAL U

Number	n	(n-N)	(n-N) ²
51	5	-2.4	5.9
52	5	-2.4	5.9
53	10	2.6	6.6
54	7	-0.4	0.2
55	13	5.6	31.0
56	8	0.6	0.3
57	8	0.6	0.3
58	4	-3.4	11.8
59	6	-1.4	2.0
60	6	-1.4	2.0
61	7	-0.4	0.2
62	8	0.6	0.3
63	5	-2.4	5.9
64	4	-3.4	11.8
65	8	0.6	0.3
66	10	2.6	6.6
67	5	-2.4	5.9
68	5	-2.4	5.9
69	7	-0.4	0.2
70	5	-2.4	5.9
71	9	1.6	2.5
72	9	1.6	2.5
73	10	2.6	6.6
74	9	1.6	2.5
75	8	0.6	0.3
76	12	4.6	20.9
77	6	-1.4	2.0
78	7	-0.4	0.2
79	6	-1.4	2.0
80	10	2.6	6.6
81	10	2.6	6.6
82	5	-2.4	5.9
83	8	0.6	0.3
84	7	-0.4	0.2
85	6	-1.4	2.0
86	7	-0.4	0.2
87	4	-3.4	11.8
88	7	-0.4	0.2
89	4	-3.4	11.8
90	6	-1.4	2.0
91	4	-3.4	11.8
92	7	-0.4	0.2
93	7	-0.4	0.2
94	8	0.6	0.3
95	7	-0.4	0.2
96	7	-0.4	0.2
97	4	-3.4	11.8
98	7	-0.4	0.2
99	6	-1.4	2.0
100	9	1.6	2.5
	352		225.5
	Sum(n)		Sum(n-N) ²

n = pCi/g TOTAL U

Number	n	(n-N)	(n-N) ²
101	5	-2.4	5.9
102	10	2.6	6.6
103	8	0.6	0.3
104	6	-1.4	2.0
105	8	0.6	0.3
106	6	-1.4	2.0
107	6	-1.4	2.0
108	9	1.6	2.5
109	8	0.6	0.3
110	5	-2.4	5.9
111	2	-5.4	29.5
112	4	-3.4	11.8
113	7	-0.4	0.2
114	9	1.6	2.5
115	4	-3.4	11.8
116	9	1.6	2.5
117	7	-0.4	0.2
118	6	-1.4	2.0
119	9	1.6	2.5
120	6	-1.4	2.0
121	7	-0.4	0.2
122	14	6.6	43.2
123	7	-0.4	0.2
124	7	-0.4	0.2
125	6	-1.4	2.0
126	7	-0.4	0.2
127	5	-2.4	5.9
128	7	-0.4	0.2
129	9	1.6	2.5
130	9	1.6	2.5
131	10	2.6	6.6
132	9	1.6	2.5
133	7	-0.4	0.2
134	4	-3.4	11.8
135	5	-2.4	5.9
136	7	-0.4	0.2
137	5	-2.4	5.9
138	7	-0.4	0.2
139	5	-2.4	5.9
140	10	2.6	6.6
141	5	-2.4	5.9
142	5	-2.4	5.9
143	4	-3.4	11.8
144	5	-2.4	5.9
145	7	-0.4	0.2
146	7	-0.4	0.2
147	6	-1.4	2.0
148	10	2.6	6.6
149	9	1.6	2.5
150	4	-3.4	11.8
	343		248.2175
	Sum(n)		Sum(n-N) ²

CIMARRON CORPORATION - CIMARRON FACILITY

LINED SANITARY LAGOON

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE (PHASE III - AREA-L)

n = pCi/g TOTAL U			
Number	n	(n-N)	(n-N) ²
151	6	-1.4	2.0
152	7	-0.4	0.2
153	9	1.6	2.5
154	5	-2.4	5.9
155	6	-1.4	2.0
156	5	-2.4	5.9
157	5	-2.4	5.9
158	6	-1.4	2.0
159	9	1.6	2.5
160	6	-1.4	2.0
161	6	-1.4	2.0
162	10	2.6	6.6
163	12	4.6	20.9
164	5	-2.4	5.9
165	7	-0.4	0.2
166	7	-0.4	0.2
167	7	-0.4	0.2
168	9	1.6	2.5
169	9	1.6	2.5
170	6	-1.4	2.0
171	6	-1.4	2.0
172	4	-3.4	11.8
173	10	2.6	6.6
174	4	-3.4	11.8
175	5	-2.4	5.9
176	8	0.6	0.3
177	8	0.6	0.3
178	8	0.6	0.3
179	7	-0.4	0.2
180	4	-3.4	11.8
181	5	-2.4	5.9
182	6	-1.4	2.0
183	12	4.6	20.9
184	8	0.6	0.3
185	11	3.6	12.8
186	6	-1.4	2.0
187	9	1.6	2.5
188	10	2.6	6.6
189	6	-1.4	2.0
190	5	-2.4	5.9
191	6	-1.4	2.0
192	6	-1.4	2.0
193	5	-2.4	5.9
194	7	-0.4	0.2
195	7	-0.4	0.2
196	6	-1.4	2.0
197	9	1.6	2.5
198	5	-2.4	5.9
199	8	0.6	0.3
200	9	1.6	2.5
	352		209.49253
	Sum(n)		Sum(n-N) ²

n = pCi/g TOTAL U			
Number	n	(n-N)	(n-N) ²
201	6	-1.4	2.0
202	9	1.6	2.5
203	5	-2.4	5.9
204	10	2.6	6.6
205	6	-1.4	2.0
206	7	-0.4	0.2
207	6	-1.4	2.0
208	5	-2.4	5.9
209	5	-2.4	5.9
210	5	-2.4	5.9
211	5	-2.4	5.9
212	8	0.6	0.3
213	4	-3.4	11.8
214	9	1.6	2.5
215	7	-0.4	0.2
216	7	-0.4	0.2
217	8	0.6	0.3
218	7	-0.4	0.2
219	11	3.6	12.8
220	9	1.6	2.5
221	7	-0.4	0.2
222	7	-0.4	0.2
223	5	-2.4	5.9
224	4	-3.4	11.8
225	7	-0.4	0.2
226	10	2.6	6.6
227	7	-0.4	0.2
228	7	-0.4	0.2
229	6	-1.4	2.0
230	6	-1.4	2.0
231	7	-0.4	0.2
232	9	1.6	2.5
233	5	-2.4	5.9
234	6	-1.4	2.0
235	8	0.6	0.3
236	6	-1.4	2.0
237	7	-0.4	0.2
238	7	-0.4	0.2
239	8	0.6	0.3
240	5	-2.4	5.9
241		0.0	0.0
242		0.0	0.0
243		0.0	0.0
244		0.0	0.0
245		0.0	0.0
246		0.0	0.0
247		0.0	0.0
248		0.0	0.0
249		0.0	0.0
250		0.0	0.0
	273		124.3757
	Sum(n)		Sum(n-N) ²

CIMARRON CORPORATION - CIMARRON FACILITY
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE (PHASE III - AREA-L)

n = pCi/g Th (NAT)

Number	n	(n-N)	(n-N) ²
1	1	-0.15	0.02
2	1	-0.15	0.02
3	1	-0.15	0.02
4	1	-0.15	0.02
5	1	-0.15	0.02
6	1	-0.15	0.02
7	1	-0.15	0.02
8	1	-0.15	0.02
9	2	0.85	0.72
10	2	0.85	0.72
11	1	-0.15	0.02
12	1	-0.15	0.02
13	1	-0.15	0.02
14	1	-0.15	0.02
15	1	-0.15	0.02
16	2	0.85	0.72
17	2	0.85	0.72
18	1	-0.15	0.02
19	1	-0.15	0.02
20	1	-0.15	0.02
21	1	-0.15	0.02
22	1	-0.15	0.02
23	1	-0.15	0.02
24	1	-0.15	0.02
25	1	-0.15	0.02
26	1	-0.15	0.02
27	1	-0.15	0.02
28	1	-0.15	0.02
29	1	-0.15	0.02
30	1	-0.15	0.02
31	2	0.85	0.72
32	1	-0.15	0.02
33	1	-0.15	0.02
34	2	0.85	0.72
35	1	-0.15	0.02
36	1	-0.15	0.02
37	2	0.85	0.72
38	1	-0.15	0.02
39	1	-0.15	0.02
40	1	-0.15	0.02
41	1	-0.15	0.02
42	1	-0.15	0.02
43	1	-0.15	0.02
44	1	-0.15	0.02
45	1	-0.15	0.02
46	2	0.85	0.72
47	1	-0.15	0.02
48	1	-0.15	0.02
49	1	-0.15	0.02
50	2	0.85	0.72
58			6.7217014
59			7.4133681
53			3.2633681
48			6.4840278
277			31.295833
Sum(n)			Sum(n-N) ²

No. of Samples (x) : 240

COUNT TIME: 5 MINUTES

Sample Mean (N) = Sum(n) + (x)

Sample Mean (N) : 1.15

Standard Deviation (Sd) = SQRT [(n-N)² + (x - 1)]

Standard Deviation: 0.36

2 Std Deviations: 0.72

Degree of Freedom(df) = (x) - 1 Data listed on Table B-1

(df) = 1.654

Area's Average Level (Aμ) = (N) + (df) x [(Sd)/(x)]

(Aμ) = 1.19 pCi/gTh (NAT)

GUIDELINE VALUE: 10 pCi/gTh (NAT)

Acceptable Level: 4.0 pCi/gTh (NAT)

(25% OF GUIDELINE PLUS BACKGROUND)

TABLE B - 1

Factors for Comparison of Survey Data with Guidelines					
(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:
Interpolate between the listed values.

(df) high value(Z)	400	is (B)	1.649	95%
(df) low value(Y)	120	is (A)	1.658	95%

Desired value(df) (X) 239 is calculated as follow:

EXP[(Ln(B)-Ln(A)) + (Z-Y) / (X-Y) + Ln(A)]

The (df) value for (X) 239 1.654 95%

PERFORMED BY: C. Powell

DATE: 5-6-96

REVIEWED BY: W. A. Ayers

DATE: 5-6-96

CIMARRON CORPORATION - CIMARRON FACILITY

LINED SANITARY LAGOON

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE (PHASE III - AREA-L)

n = pCi/g Th (NAT)

Number	n	(n-N)	(n-N) ²
51	1	-0.15	0.02
52	1	-0.15	0.02
53	1	-0.15	0.02
54	1	-0.15	0.02
55	1	-0.15	0.02
56	1	-0.15	0.02
57	1	-0.15	0.02
58	1	-0.15	0.02
59	1	-0.15	0.02
60	2	0.85	0.72
61	1	-0.15	0.02
62	1	-0.15	0.02
63	1	-0.15	0.02
64	1	-0.15	0.02
65	1	-0.15	0.02
66	1	-0.15	0.02
67	2	0.85	0.72
68	1	-0.15	0.02
69	1	-0.15	0.02
70	1	-0.15	0.02
71	2	0.85	0.72
72	1	-0.15	0.02
73	2	0.85	0.72
74	1	-0.15	0.02
75	1	-0.15	0.02
76	1	-0.15	0.02
77	1	-0.15	0.02
78	1	-0.15	0.02
79	2	0.85	0.72
80	1	-0.15	0.02
81	1	-0.15	0.02
82	2	0.85	0.72
83	1	-0.15	0.02
84	1	-0.15	0.02
85	1	-0.15	0.02
86	1	-0.15	0.02
87	1	-0.15	0.02
88	1	-0.15	0.02
89	1	-0.15	0.02
90	1	-0.15	0.02
91	1	-0.15	0.02
92	2	0.85	0.72
93	1	-0.15	0.02
94	1	-0.15	0.02
95	1	-0.15	0.02
96	1	-0.15	0.02
97	1	-0.15	0.02
98	2	0.85	0.72
99	1	-0.15	0.02
100	1	-0.15	0.02
	58		6.7
	Sum(n)		Sum(n-N) ²

n = pCi/g Th (NAT)

Number	n	(n-N)	(n-N) ²
101	1	-0.15	0.02
102	1	-0.15	0.02
103	2	0.85	0.72
104	1	-0.15	0.02
105	1	-0.15	0.02
106	2	0.85	0.72
107	1	-0.15	0.02
108	1	-0.15	0.02
109	1	-0.15	0.02
110	2	0.85	0.72
111	1	-0.15	0.02
112	1	-0.15	0.02
113	1	-0.15	0.02
114	1	-0.15	0.02
115	2	0.85	0.72
116	1	-0.15	0.02
117	1	-0.15	0.02
118	1	-0.15	0.02
119	2	0.85	0.72
120	1	-0.15	0.02
121	1	-0.15	0.02
122	1	-0.15	0.02
123	2	0.85	0.72
124	1	-0.15	0.02
125	1	-0.15	0.02
126	1	-0.15	0.02
127	1	-0.15	0.02
128	1	-0.15	0.02
129	2	0.85	0.72
130	1	-0.15	0.02
131	2	0.85	0.72
132	1	-0.15	0.02
133	1	-0.15	0.02
134	1	-0.15	0.02
135	1	-0.15	0.02
136	1	-0.15	0.02
137	1	-0.15	0.02
138	1	-0.15	0.02
139	1	-0.15	0.02
140	1	-0.15	0.02
141	1	-0.15	0.02
142	1	-0.15	0.02
143	1	-0.15	0.02
144	2	0.85	0.72
145	1	-0.15	0.02
146	1	-0.15	0.02
147	1	-0.15	0.02
148	1	-0.15	0.02
149	1	-0.15	0.02
150	1	-0.15	0.02
	59		7.413368
	Sum(n)		Sum(n-N)

CIMARRON CORPORATION - CIMARRON FACILITY

LINED SANITARY LAGOON

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE (PHASE III - AREA-L)

$n = \text{pCi/g Th (NAT)}$

Number	n	(n-N)	(n-N) ²
151	1	-0.15	0.02
152	1	-0.15	0.02
153	1	-0.15	0.02
154	1	-0.15	0.02
155	1	-0.15	0.02
156	1	-0.15	0.02
157	1	-0.15	0.02
158	1	-0.15	0.02
159	1	-0.15	0.02
160	2	0.85	0.72
161	1	-0.15	0.02
162	1	-0.15	0.02
163	1	-0.15	0.02
164	1	-0.15	0.02
165	1	-0.15	0.02
166	1	-0.15	0.02
167	1	-0.15	0.02
168	1	-0.15	0.02
169	1	-0.15	0.02
170	1	-0.15	0.02
171	1	-0.15	0.02
172	1	-0.15	0.02
173	2	0.85	0.72
174	1	-0.15	0.02
175	2	0.85	0.72
176	1	-0.15	0.02
177	1	-0.15	0.02
178	1	-0.15	0.02
179	1	-0.15	0.02
180	1	-0.15	0.02
181	1	-0.15	0.02
182	1	-0.15	0.02
183	1	-0.15	0.02
184	1	-0.15	0.02
185	1	-0.15	0.02
186	1	-0.15	0.02
187	1	-0.15	0.02
188	1	-0.15	0.02
189	1	-0.15	0.02
190	1	-0.15	0.02
191	1	-0.15	0.02
192	1	-0.15	0.02
193	1	-0.15	0.02
194	1	-0.15	0.02
195	1	-0.15	0.02
196	1	-0.15	0.02
197	1	-0.15	0.02
198	1	-0.15	0.02
199	1	-0.15	0.02
200	1	-0.15	0.02
	53		3.2633681
			Sum(n-N) ²

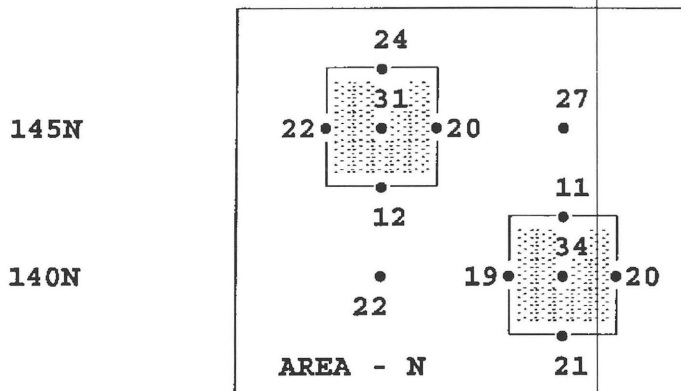
$n = \text{pCi/g Th (NAT)}$

Number	n	(n-N)	(n-N) ²
201	1	-0.15	0.02
202	1	-0.15	0.02
203	1	-0.15	0.02
204	1	-0.15	0.02
205	2	0.85	0.72
206	1	-0.15	0.02
207	2	0.85	0.72
208	1	-0.15	0.02
209	1	-0.15	0.02
210	1	-0.15	0.02
211	1	-0.15	0.02
212	1	-0.15	0.02
213	2	0.85	0.72
214	2	0.85	0.72
215	2	0.85	0.72
216	1	-0.15	0.02
217	1	-0.15	0.02
218	1	-0.15	0.02
219	1	-0.15	0.02
220	1	-0.15	0.02
221	1	-0.15	0.02
222	2	0.85	0.72
223	1	-0.15	0.02
224	1	-0.15	0.02
225	1	-0.15	0.02
226	1	-0.15	0.02
227	1	-0.15	0.02
228	1	-0.15	0.02
229	1	-0.15	0.02
230	1	-0.15	0.02
231	1	-0.15	0.02
232	2	0.85	0.72
233	1	-0.15	0.02
234	1	-0.15	0.02
235	2	0.85	0.72
236	1	-0.15	0.02
237	1	-0.15	0.02
238	1	-0.15	0.02
239	1	-0.15	0.02
240	1	-0.15	0.02
241		0.00	0.00
242		0.00	0.00
243		0.00	0.00
244		0.00	0.00
245		0.00	0.00
246		0.00	0.00
247		0.00	0.00
248		0.00	0.00
249		0.00	0.00
250		0.00	0.00
	48		6.484028
			Sum(n-N)

CIMARRON CORPORATION
 CIMARRON FACILITY
 PHASE III - AREA L - SANITARY LAGOON
 HOT SPOT AVERAGING (10 METER X 10 METER GRID)

(HOT SPOT) LOCATIONS: 230E-140N (34 pCi/gU) & 225E-145N (31 pCi/gU)

155N	4	9	10	9
	•	•	•	•
			AREA - L	
150N	7	7	4	17
	•	•	•	•



LOCATION pCi/gU

230E-140N	34
225E-145N	31

TOTAL pCi/gU: 65
 AVERAGE: 32.5 pCi/gU

"HOT SPOT" AREA
 EQUALS 2 SQUARE METERS

135N					
	220E	225E	230E	235E	240E

<u>LOCATION</u>	<u>pCi/gU</u>	<u>LOCATION</u>	<u>pCi/gU</u>
224E-145N	22	229E-140N	19
225E-140N	22	230E-139N	21
225E-144N	12	230E-141N	11
225E-146N	24	230E-145N	27
226E-145N	20	231E-140N	20

TOTAL pCi/gU: 198 pCi/gU AVERAGE: 19.8 pCi/gU

$$X_w = 19.8 [1 - 2/100] + 32.5 [2/100]$$

$$X_w = 19.8 [.98] + [32.5 \times .02]$$

$$X_w = 19.404 + 0.65 = 20.054$$

$$X_w = 20.054 \text{ pCi/gU OR } 20 \text{ pCi/gU}$$

CIMARRON CORPORATION
CIMARRON FACILITY
PHASE III - AREA L - LINED SANITARY LAGOON
POST-REMEDATION SURVEY

DATE: 11/9/95

LN #	GRID NUMBER	3" DETECT C.P.M.	MICRO R' METER	MICRO R' SURF.	pCi/g	
					0 - 6" Sample	
					Total-U	Th (Nat)
1	225E - 145N	3444	8	8	31	1
2	225E - 150N	4210	7	7	7	1
3	225E - 155N	2820	6	7	9	1
4	225E - 160N	3290	5	5	9	1
5	225E - 165N	3340	7	6	4	1
6	225E - 170N	2860	6	6	5	1
7	225E - 175N	3170	6	6	5	1
8	225E - 180N	4020	7	7	15	1
9	225E - 185N	4170	7	7	11	2

INSTRUMENTS:

LUDLUM MICRO 'R' METER - MODEL 19, S/N 111299

RESULTS IN

μR/hr

BKG

7

MDA

7

LUDLUM 2220, LEAD SHIELDED 3" X 1/2" DET.-S/N 49395

CPM

3100

N/A

CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR

pCi/g
pCi/g

4.0 TOTAL U
1.5 Th (Nat)

TOTAL U - 10
Th (Nat) - 1

GROUND NOT SUBTRACTED

REVIEWED BY: *W.A. Rogers*

DATE: 5-3-96

FILE: PO3LLS95

CIMARRON CORPORATION
CIMARRON FACILITY
PHASE III - AREA L - LINED SANITARY LAGOON
POST-REMEDIATION SURVEY

DATE: 11/9/95

LN #	GRID NUMBER	3" DETECT C.P.M.	MICRO R' 1 METER	MICRO R' SURF.	pCi/g	
					0 - 6" Sample	
					Total-U	Th (Nat)
1	230E - 140N	3868	7	7	34	2
2	230E - 145N	3782	7	7	27	1
3	230E - 150N	2656	7	7	4	1
4	230E - 155N	2930	7	7	10	1
5	230E - 160N	3000	6	6	7	1
6	230E - 165N	3470	6	6	8	1
7	230E - 170N	3850	7	7	5	2
8	230E - 175N	4200	6	6	8	2
9	230E - 180N	3300	6	6	6	1
10	230E - 185N	3520	6	6	6	1
	230E - 190N	4090	7	8	8	1

INSTRUMENTS:

LUDLUM MICRO 'R' METER - MODEL 19, S/N 111299

RESULTS IN

BKG

MDA

μR/hr

7

7

LUDLUM 2220, LEAD SHIELDED 3" X 1/2" DET.-S/N 49395

CPM

3100

N/A

CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR

pCi/g

4.0 TOTAL U

TOTAL U - 10

pCi/g

1.5 Th (Nat)

Th (Nat) - 1

BACKGROUND NOT SUBTRACTED

REVIEWED BY:

W. G. Poyer

DATE: 5-3-96

FILE: PO3LLS95

CIMARRON CORPORATION
CIMARRON FACILITY
PHASE III - AREA L - LINED SANITARY LAGOON
POST-REMEDIATION SURVEY

DATE: 11/9/95

LN #	GRID NUMBER	3" DETECT C.P.M.	MICRO R' 1 METER	MICRO R' SURF.	pCi/g	
					0 - 6" Sample	
					Total-U	Th (Nat)
1	235E - 135N	2930	7	7	9	1
2	235E - 140N	2828	7	7	7	1
3	235E - 145N	2672	7	7	10	1
4	235E - 150N	3690	7	8	17	1
5	235E - 155N	3370	6	8	9	1
6	235E - 160N	3230	6	6	9	1
7	235E - 165N	2950	7	7	8	1
8	235E - 170N	3400	6	6	7	1
9	235E - 175N	3540	7	7	8	1
10	235E - 180N	3800	7	7	8	1
	235E - 185N	3670	7	8	8	2
	235E - 190N	4130	7	7	6	1
13	235E - 195N	4180	7	7	7	1
14	235E - 200N	4100	7	7	7	2

INSTRUMENTS:

LUDLUM MICRO 'R' METER - MODEL 19, S/N 111299

RESULTS IN

BKG

MDA

μR/hr

7

7

LUDLUM 2220, LEAD SHIELDED 3" X 1/2" DET.-S/N 49395

CPM

3100

N/A

CIMARRON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR

pCi/g

4.0 TOTAL U

TOTAL U - 10

pCi/g

1.5 Th (Nat)

Th (Nat) - 1

GROUND NOT SUBTRACTED

REVIEWED BY:

W. A. Rogers

DATE:

5-3-96

FILE: PO3LLS95

CIMARRON CORPORATION
CIMARRON FACILITY
PHASE III - AREA L - LINED SANITARY LAGOON
POST-REMEDIATION SURVEY

DATE: 11/9/95

LN #	GRID NUMBER	3" DETECT C.P.M.	MICRO R' 1 METER	MICRO R' SURF.	pCi/g	
					0 - 6" Sample	
					Total-U	Th (Nat)
1	240E - 135N	2782	7	7	4	1
2	240E - 140N	3006	7	7	7	1
3	240E - 145N	3210	7	7	6	2
4	240E - 150N	2460	6	6	9	1
5	240E - 155N	3940	7	7	7	1
6	240E - 160N	2390	6	5	12	1
7	240E - 165N	3040	6	7	9	1
8	240E - 170N	3420	6	6	6	1
9	240E - 175N	4040	6	7	5	1
10	240E - 180N	2990	6	6	12	1
11	240E - 185N	3570	7	8	12	1
12	240E - 190N	3880	7	7	7	2
13	240E - 195N	3700	7	7	8	1
14	240E - 200N	3790	7	7	7	1
15	240E - 205N	4210	6	6	8	1
16	240E - 210N	2980	7	7	5	2

INSTRUMENTS:

LUDLUM MICRO 'R' METER - MODEL 19, S/N 111299

LUDLUM 2220, LEAD SHIELDED 3" X 1/2" DET.-S/N 49395

CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR

RESULTS IN

BKG

MDA

μR/hr

7

7

CPM

3100

N/A

pCi/g

4.0 TOTAL U

pCi/g

1.5 Th (Nat) TOTAL U - 10
Th (Nat) - 1

BACKGROUND NOT SUBTRACTED

FILE: PO3LLS95

REVIEWED BY:

W.G. Ryer

DATE: 5-3-96

CIMARRON CORPORATION
CIMARRON FACILITY
PHASE III - AREA L - LINED SANITARY LAGOON
POST-REMEDIATION SURVEY

DATE: 11/9/95

LN #	GRID NUMBER	3" DETECT C.P.M.	MICRO R' METER	MICRO R' SURF.	pCi/g	
					0 - 6" Sample	
					Total-U	Th (Nat)
1	245E - 130N	2862	7	7	5	1
2	245E - 135N	2812	7	7	5	1
3	245E - 140N	3790	5	6	10	1
4	245E - 145N	2980	7	7	7	1
5	245E - 150N	3400	6	6	13	1
6	245E - 155N	3230	6	7	8	1
7	245E - 160N	3270	6	7	8	1
8	245E - 165N	3410	7	7	4	1
9	245E - 170N	3450	7	7	6	1
10	245E - 175N	3420	7	7	6	2
	245E - 180N	2930	6	6	7	1
	245E - 185N	3880	7	7	8	1
13	245E - 190N	3650	6	7	5	1
14	245E - 195N	3910	6	6	4	1
15	245E - 200N	3720	7	7	8	1
16	245E - 205N	3810	7	7	10	1
17	245E - 210N	3730	7	7	5	2
18	245E - 215N	3360	6	6	5	1

INSTRUMENTS:

LUDLUM MICRO 'R' METER - MODEL 19, S/N 111299

LUDLUM 2220, LEAD SHIELDED 3" X 1/2" DET.-S/N 49395

CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR

RESULTS IN

BKG

MDA

μR/hr

7

7

CPM

3100

N/A

pCi/g

4.0 TOTAL U

TOTAL U - 10

pCi/g

1.5 Th (Nat)

Th (Nat) - 1

GROUND NOT SUBTRACTED

REVIEWED BY:

W.A. Rogers

DATE: 5-3-96

FILE: PO3LLS95

CIMARRON CORPORATION
CIMARRON FACILITY
PHASE III - AREA L - LINED SANITARY LAGOON
POST-REMEDIATION SURVEY

DATE: 11/9/95

LN #	GRID NUMBER	3" DETECT C.P.M.	MICRO R' METER	MICRO R' SURF.	pCi/g	
					0 - 6" Sample	
					Total-U	Th (Nat)
1	250E - 130N	2758	7	7	7	1
2	250E - 135N	2676	7	7	5	1
3	250E - 140N	3540	6	6	9	2
4	250E - 145N	2920	6	6	9	1
5	250E - 150N	3220	6	7	10	2
6	250E - 155N	3090	6	7	9	1
7	250E - 160N	3200	7	7	8	1
8	250E - 165N	3220	6	7	12	1
9	250E - 170N	3300	6	6	6	1
10	250E - 175N	3830	7	7	7	1
	250E - 180N	3410	7	7	6	2
	250E - 185N	3570	7	7	10	1
13	250E - 190N	3290	7	7	10	1
14	250E - 195N	3990	7	7	5	2
15	250E - 200N	3050	7	7	8	1
16	250E - 205N	3560	7	7	7	1
17	250E - 210N	3930	8	8	6	1
18	250E - 215N	3490	7	7	7	1
19	250E - 220N	3180	6	6	4	1
20	250E - 225N	3150	7	7	7	1

INSTRUMENTS:

LUDLUM MICRO 'R' METER - MODEL 19, S/N 111299

RESULTS IN

BKG

MDA

μR/hr

7

7

LUDLUM 2220, LEAD SHIELDED 3" X 1/2" DET.-S/N 49395

CPM

3100

N/A

CIMARRON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR

pCi/g

4.0 TOTAL U

TOTAL U - 10

pCi/g

1.5 Th (Nat)

Th (Nat) - 1

BACKGROUND NOT SUBTRACTED

REVIEWED BY: *W.A. Rogers*

DATE: 5-3-96

FILE: PO3LLS95

CIMARRON CORPORATION
CIMARRON FACILITY
PHASE III - AREA L - LINED SANITARY LAGOON
POST-REMEDIATION SURVEY

DATE: 11/9/95

LN #	GRID NUMBER	3" DETECT C.P.M.	MICRO R' 1 METER	MICRO R' SURF.	pCi/g	
					0 - 6" Sample	
					Total-U	Th (Nat)
1	255E - 125N	3340	7	7	4	1
2	255E - 130N	2706	6	6	6	1
3	255E - 135N	3042	6	6	4	1
4	255E - 140N	3100	6	6	7	2
5	255E - 145N	3050	7	7	7	1
6	255E - 150N	3450	6	6	8	1
7	255E - 155N	2920	6	7	7	1
8	255E - 160N	2910	6	6	7	1
9	255E - 165N	3560	7	7	4	1
10	255E - 170N	4000	6	6	7	2
	255E - 175N	3700	6	6	6	1
	255E - 180N	3720	7	7	9	1
13	255E - 185N	3230	6	7	5	1
14	255E - 190N	3840	6	7	10	1
15	255E - 195N	3630	7	7	8	2
16	255E - 200N	3850	6	7	6	1
17	255E - 205N	4060	7	7	8	1
18	255E - 210N	3620	7	7	6	2
19	255E - 215N	3470	6	6	6	1
20	255E - 220N	3370	7	7	9	1
21	255E - 225N	3330	6	7	8	1

INSTRUMENTS:

LUDLUM MICRO 'R' METER - MODEL 19, S/N 111299

LUDLUM 2220, LEAD SHIELDED 3" X 1/2" DET.-S/N 49395

ARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR

BACKGROUND NOT SUBTRACTED

FILE: PO3LLS95

RESULTS IN

BKG

MDA

µR/hr

7

7

CPM

3100

N/A

pCi/g

4.0 TOTAL U

TOTAL U - 10

pCi/g

1.5 Th (Nat)

Th (Nat) - 1

REVIEWED BY:

W-a. Rogers

DATE: 5-3-96

**CIMARRON CORPORATION
CIMARRON FACILITY
PHASE III - AREA L - LINED SANITARY LAGOON
POST-REMEDIATION SURVEY**

DATE: 11/9/95

LN #	GRID NUMBER	3" DETECT C.P.M.	MICRO R' METER	MICRO R' SURF.	pCi/g	
					0 - 6" Sample	
					Total-U	Th (Nat)
1	260E - 120N	3578	8	8	5	2
2	260E - 125N	3136	7	7	2	1
3	260E - 130N	2084	7	7	4	1
4	260E - 135N	2978	7	7	7	1
5	260E - 140N	3520	6	7	9	1
6	260E - 145N	3420	7	8	4	2
7	260E - 150N	3160	6	6	9	1
8	260E - 155N	3150	6	6	7	1
9	260E - 160N	2880	5	5	6	1
10	260E - 165N	3180	6	6	9	2
	260E - 170N	3500	7	6	6	1
	260E - 175N	3950	7	7	7	1
13	260E - 180N	3390	7	7	14	1
14	260E - 185N	3730	6	6	7	2
15	260E - 190N	4190	7	7	7	1
16	260E - 195N	3560	7	7	6	1
17	260E - 200N	3770	6	6	7	1
18	260E - 205N	3550	7	8	5	1
19	260E - 210N	3680	6	6	7	1
20	260E - 215N	3990	7	7	9	2
21	260E - 220N	3400	7	7	9	1
22	260E - 225N	3770	8	8	10	2

INSTRUMENTS:

LUDLUM MICRO 'R' METER - MODEL 19, S/N 111299

RESULTS IN

BKG

MDA

μR/hr

7

7

LUDLUM 2220, LEAD SHIELDED 3" X 1/2" DET.-S/N 49395

CPM

3100

N/A

ARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR

pCi/g

4.0 TOTAL U

TOTAL U - 10

pCi/g

1.5 Th (Nat)

Th (Nat) - 1

BACKGROUND NOT SUBTRACTED

REVIEWED BY: *W. a. Boyer*

DATE: *5-3-96*

FILE: PO3LLS95

**CIMARRON CORPORATION
CIMARRON FACILITY
PHASE III - AREA L - LINED SANITARY LAGOON
POST-REMEDIATION SURVEY**

DATE: 11/9/95

LN #	GRID NUMBER	3" DETECT C.P.M.	MICRO R' 1 METER	MICRO R' SURF.	pCi/g	
					0 - 6" Sample	
					Total-U	Th (Nat)
1	265E - 120N	3576	8	8	9	1
2	265E - 125N	2862	7	7	7	1
3	265E - 130N	2196	6	6	4	1
4	265E - 135N	2732	6	6	5	1
5	265E - 140N	2880	6	6	7	1
6	265E - 145N	3190	7	7	5	1
7	265E - 150N	3870	7	7	7	1
8	265E - 155N	3180	6	7	5	1
9	265E - 160N	3220	6	6	10	1
10	265E - 165N	3030	7	7	5	1
11	265E - 170N	3190	6	6	5	1
12	265E - 175N	3310	7	7	4	1
13	265E - 180N	3280	7	7	5	2
14	265E - 185N	3650	6	7	7	1
15	265E - 190N	3450	7	7	7	1
16	265E - 195N	3750	7	7	6	1
17	265E - 200N	4390	7	7	10	1
18	265E - 205N	3880	7	7	9	1
19	265E - 210N	3900	7	7	4	1
20	265E - 215N	3780	7	7	6	1
21	265E - 220N	3380	7	7	7	1
22	265E - 225N	3610	7	7	9	1

INSTRUMENTS:

RESULTS IN BKG MDA

LUDLUM MICRO 'R' METER - MODEL 19, S/N 111299

μR/hr 7 7

LUDLUM 2220, LEAD SHIELDED 3" X 1/2" DET.-S/N 49395

CPM 3100 N/A

CIMARRON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR

**pCi/g 4.0 TOTAL U TOTAL U - 10
pCi/g 1.5 Th (Nat) Th (Nat) - 1**

BACKGROUND NOT SUBTRACTED

REVIEWED BY: *W.A. Rogers*

DATE: *5-3-96*

FILE: PO3LLS95

**CIMARRON CORPORATION
CIMARRON FACILITY
PHASE III - AREA L - LINED SANITARY LAGOON
POST-REMEDIATION SURVEY**

DATE: 11/9/95

LN #	GRID NUMBER	3" DETECT C.P.M.	MICRO R' 1 METER	MICRO R' SURF.	pCi/g	
					0 - 6" Sample	
					Total-U	Th (Nat)
1	270E - 115N	3362	7	7	5	1
2	270E - 120N	2902	7	7	6	1
3	270E - 125N	2896	6	6	5	1
4	270E - 130N	2256	6	6	5	1
5	270E - 135N	2184	6	6	6	1
6	270E - 140N	3160	6	6	9	1
7	270E - 145N	3090	6	7	6	2
8	270E - 150N	3320	6	6	6	1
9	270E - 155N	3630	7	7	10	1
10	270E - 160N	3780	6	6	12	1
11	270E - 165N	3420	7	6	5	1
12	270E - 170N	3670	7	7	7	1
13	270E - 175N	3540	7	6	7	1
14	270E - 180N	3630	7	7	7	1
15	270E - 185N	3270	7	7	9	1
16	270E - 190N	3490	6	6	9	1
17	270E - 195N	3680	7	7	6	1
18	270E - 200N	3870	7	7	6	1
19	270E - 205N	3570	7	7	4	1
20	270E - 210N	3980	6	6	10	2
21	270E - 215N	3450	7	7	4	1
22	270E - 220N	3820	7	7	5	2
23	270E - 225N	4100	7	7	8	1

INSTRUMENTS:

LUDLUM MICRO 'R' METER - MODEL 19, S/N 111299

RESULTS IN

BKG

MDA

μR/hr

7

7

LUDLUM 2220, LEAD SHIELDED 3" X 1/2" DET.-S/N 49395

CPM

3100

N/A

CIMARRON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR

pCi/g

4.0 TOTAL U

TOTAL U - 10

pCi/g

1.5 Th (Nat)

Th (Nat) - 1

BACKGROUND NOT SUBTRACTED

REVIEWED BY: *W.A. Ryan*

DATE: *5-3-96*

FILE: PO3LLS95

**CIMARRON CORPORATION
CIMARRON FACILITY
PHASE III - AREA L - LINED SANITARY LAGOON
POST-REMEDIATION SURVEY**

DATE: 11/9/95

LN #	GRID NUMBER	3" DETECT C.P.M.	MICRO R' METER	MICRO R' SURF.	pCi/g	
					0 - 6" Sample	
					Total-U	Th (Nat)
1	275E - 110N	3340	7	7	8	1
2	275E - 115N	2972	7	7	8	1
3	275E - 120N	2744	6	6	7	1
4	275E - 125N	2612	6	6	4	1
5	275E - 130N	2742	7	7	5	1
6	275E - 135N	2974	6	6	6	1
7	275E - 140N	2650	6	5	12	1
8	275E - 145N	3260	6	7	8	1
9	275E - 150N	3020	6	6	11	1
10	275E - 155N	3500	6	6	6	1
11	275E - 160N	3440	5	6	9	1
12	275E - 165N	3250	7	6	10	1
13	275E - 170N	3730	6	6	6	1
14	275E - 175N	3660	7	7	5	1
15	275E - 180N	3990	7	7	6	1
16	275E - 185N	3870	7	7	6	1
17	275E - 190N	3990	6	6	5	1
18	275E - 195N	3970	7	8	7	1
19	275E - 200N	3710	7	7	7	1
20	275E - 205N	3850	7	7	6	1
21	275E - 210N	3620	6	7	9	1
22	275E - 215N	3960	7	7	5	1
23	275E - 220N	3450	7	7	8	1

INSTRUMENTS:

LUDLUM MICRO 'R' METER - MODEL 19, S/N 111299

RESULTS IN

BKG

MDA

μR/hr

7

7

LUDLUM 2220, LEAD SHIELDED 3" X 1/2" DET.-S/N 49395

CPM

3100

N/A

CIMARRON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR

pCi/g

4.0 TOTAL U

TOTAL U - 10

pCi/g

1.5 Th (Nat)

Th (Nat) - 1

BACKGROUND NOT SUBTRACTED

REVIEWED BY:

W. A. Rogers

DATE:

5-3-96

FILE: PO3LLS95

**CIMARRON CORPORATION
CIMARRON FACILITY
PHASE III - AREA L - LINED SANITARY LAGOON
POST-REMEDIATION SURVEY**

DATE: 11/9/95

LN #	GRID NUMBER	3" DETECT C.P.M.	MICRO R' 1 METER	MICRO R' SURF.	pCi/g	
					0 - 6" Sample	
					Total-U	Th (Nat)
1	280E - 120N	2684	7	7	9	1
2	280E - 125N	2778	7	7	6	1
3	280E - 130N	2636	7	7	9	1
4	280E - 135N	2720	6	7	5	1
5	280E - 140N	2700	7	7	10	1
6	280E - 145N	3126	7	7	6	2
7	280E - 150N	3086	7	7	7	1
8	280E - 175N	3430	7	7	6	2
9	280E - 180N	3890	7	7	5	1
	280E - 185N	3380	7	7	5	1
	280E - 190N	3420	6	6	5	1
12	280E - 195N	3650	7	7	5	1
13	280E - 200N	3390	6	6	8	1
14	280E - 205N	3350	7	7	4	2
15	280E - 210N	4080	6	6	9	2

INSTRUMENTS:

RESULTS IN BKG MDA

LUDLUM MICRO 'R' METER - MODEL 19, S/N 111299

μR/hr 7 7

LUDLUM 2220, LEAD SHIELDED 3" X 1/2" DET.-S/N 49395

CPM 3100 N/A

CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR

**pCi/g 4.0 TOTAL U TOTAL U - 10
pCi/g 1.5 Th (Nat) Th (Nat) - 1**

GROUND NOT SUBTRACTED

PO3LLS95

REVIEWED BY: *W. A. Rogers*

DATE: 5-3-96

CIMARRON CORPORATION
CIMARRON FACILITY
PHASE III - AREA L - LINED SANITARY LAGOON
POST-REMEDIATION SURVEY

DATE: 11/9/95

LN #	GRID NUMBER	3" DETECT C.P.M.	MICRO R' 1 METER	MICRO R' SURF.	pCi/g	
					0 - 6" Sample	
					Total-U	Th (Nat)
1	285E - 125N	2626	7	7	7	2
2	285E - 130N	3272	7	7	7	1
3	285E - 135N	3144	8	8	8	1
4	285E - 140N	2972	7	7	7	1
5	285E - 145N	2904	7	7	11	1
6	285E - 150N	3174	7	7	9	1
7	290E - 130N	2238	7	7	7	1
8	290E - 135N	2990	7	7	7	2
	290E - 140N	3012	7	7	5	1
	290E - 145N	2872	7	7	4	1
	290E - 150N	3356	7	7	7	1
12	295E - 135N	2760	7	7	10	1
13	295E - 140N	2724	7	7	7	1
14	295E - 145N	2726	7	7	7	1
15	295E - 150N	2610	7	7	6	1

INSTRUMENTS:

LUDLUM MICRO 'R' METER - MODEL 19, S/N 111299

RESULTS IN

BKG

MDA

μR/hr

7

7

LUDLUM 2220, LEAD SHIELDED 3" X 1/2" DET.-S/N 49395

CPM

3100

N/A

CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR

pCi/g

4.0 TOTAL U

TOTAL U - 10

pCi/g

1.5 Th (Nat)

Th (Nat) - 1

GROUND NOT SUBTRACTED

REVIEWED BY: *W. A. Ryan*

DATE: 5-3-96

FILE: PO3LLS95

CIMARRON CORPORATION
CIMARRON FACILITY
PHASE III - AREA L - LINED SANITARY LAGOON
POST-REMEDIATION SURVEY

DATE: 11/9/95

LN #	GRID NUMBER	3" DETECT C.P.M.	MICRO R' 1 METER	MICRO R' SURF.	pCi/g	
					0 - 6" Sample	
					Total-U	Th (Nat)
1	300E - 135N	2738	6	6	6	1
2	300E - 140N	2690	7	7	7	1
3	300E - 145N	2742	6	6	9	2
4	300E - 150N	2968	6	6	5	1
5	305E - 140N	2896	6	6	6	1
6	305E - 145N	3078	7	7	8	2
7	305E - 150N	2286	6	6	6	1
8	310E - 140N	2722	6	7	7	1
9	310E - 145N	2834	7	7	7	1
10	310E - 150N	2728	6	6	8	1
11	315E - 150N	2806	7	7	5	1

INSTRUMENTS:

LUDLUM MICRO 'R' METER - MODEL 19, S/N 111299

LUDLUM 2220, LEAD SHIELDED 3" X 1/2" DET.-S/N 49395

CIMMARON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR

RESULTS IN BKG MDA

μR/hr 7 7

CPM 3100 N/A

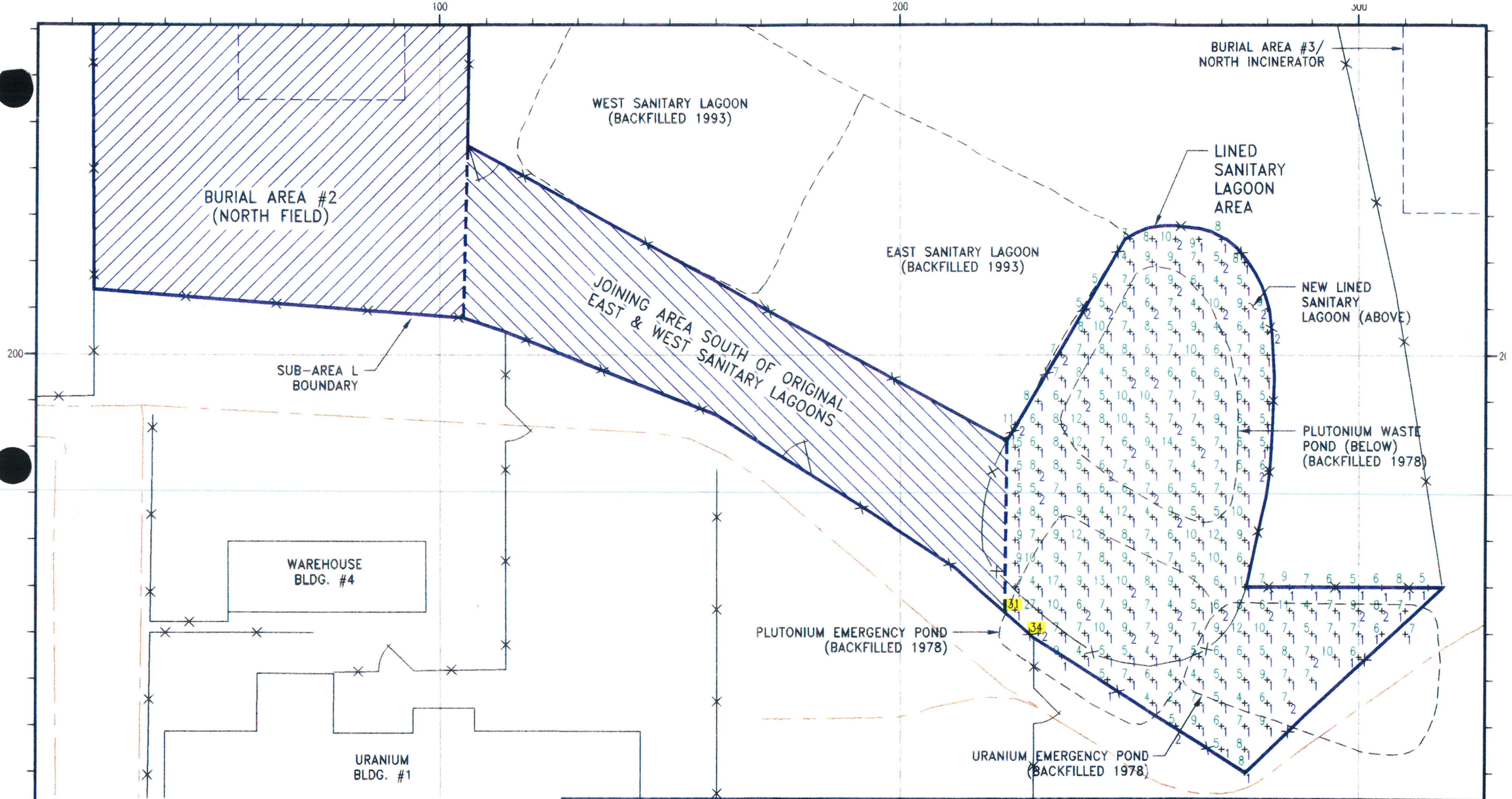
pCi/g 4.0 TOTAL U TOTAL U - 10
pCi/g 1.5 Th (Nat) Th (Nat) - 1

GROUND NOT SUBTRACTED

PO3LLS95

REVIEWED BY: *W.A. Royle*

DATE: 5-3-96




20 0 20
SCALE IN METERS



URANIUM (pCi/g U) AND THORIUM (pCi/g Th).
CIMARRON GAMMA SPEC SOIL COUNTER.
SITE SOIL BACKGROUND OF APPROX. 4.0 pCi/g U
AND 1.5 pCi/g Th, NOT SUBTRACTED.
SAMPLES TAKEN ON 5 METER X 5 METER GRID.

LEGEND
+ URANIUM
1 - 29 pCi/g U
58+ URANIUM
30 - 89 pCi/g U
129+ URANIUM
> 90 pCi/g U
+2 THORIUM
1 - 5 pCi/g Th

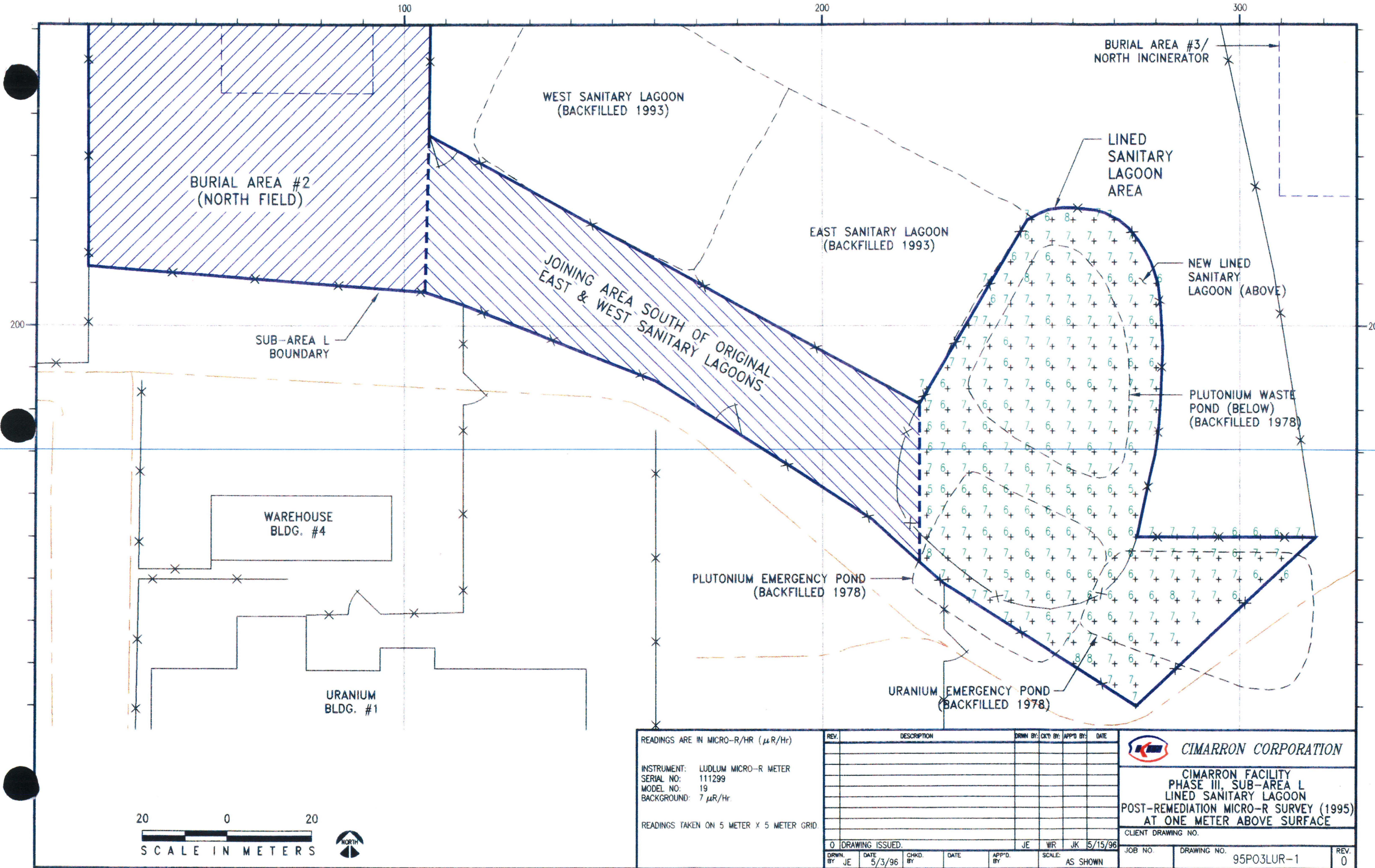
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DRWN BY:	DATE	CHKD BY:	DATE	APP'D BY:	SCALE:
JE	4/24/96				AS SHOWN

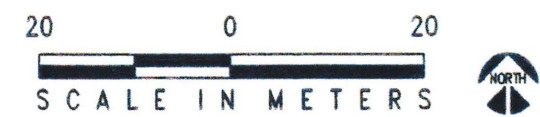
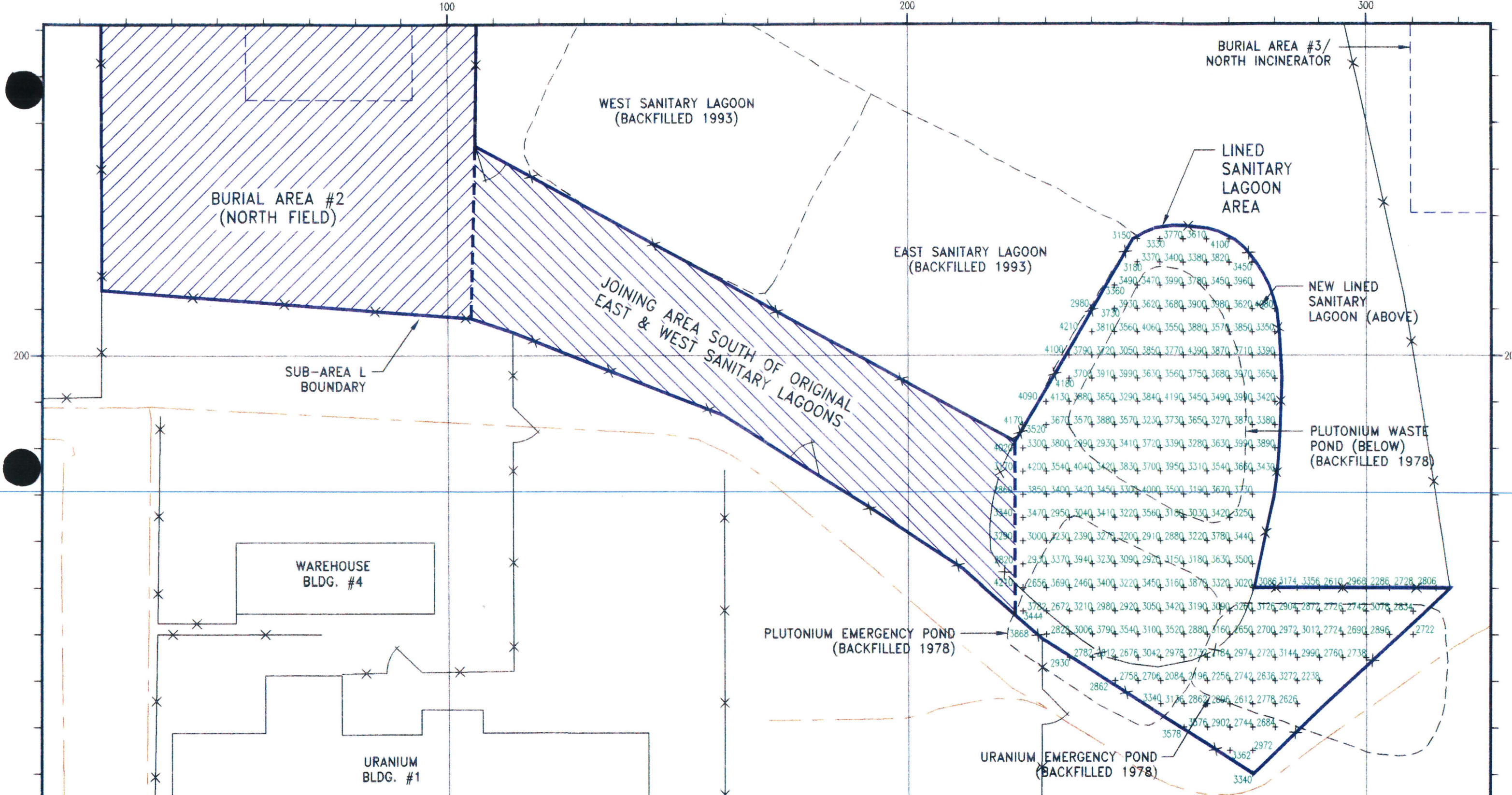
**CIMARRON CORPORATION**

**CIMARRON FACILITY
PHASE III, SUB-AREA L
LINED SANITARY LAGOON
POST-REMEDIATION SOIL SAMPLE RESULTS (1995)
SOIL SAMPLE ALIQUOT: SURFACE**

CLIENT DRAWING NO.

JOB NO. DRAWING NO. 95P03LSS-0 REV. 0






INSTRUMENT: LUDLUM 2220, S/N 48395,
LEAD-SHIELDED 3" X 1/2"
NaI DETECTOR.

BACKGROUND: 3100 CPM

READINGS TAKEN ON 5 METER X 5 METER GRID

LEGEND
3560 < 6200 CPM

REV.	DESCRIPTION	DRWN BY:	CHK'D BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JK	5/15/96
DRWN BY:	JE	DATE:	5/3/96	CHK'D BY:	DATE:
APP'D BY:		SCALE:	AS SHOWN		


CIMARRON CORPORATION

**CIMARRON FACILITY
PHASE III, SUB-AREA L
LINED SANITARY LAGOON
POST-REMEDATION GAMMA SURVEY (1995)
READING IN CPM (3" DET.) AT SURFACE**

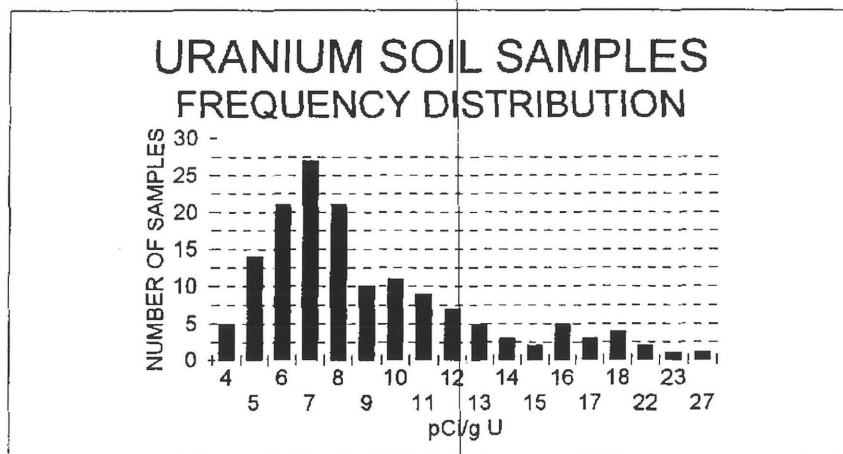
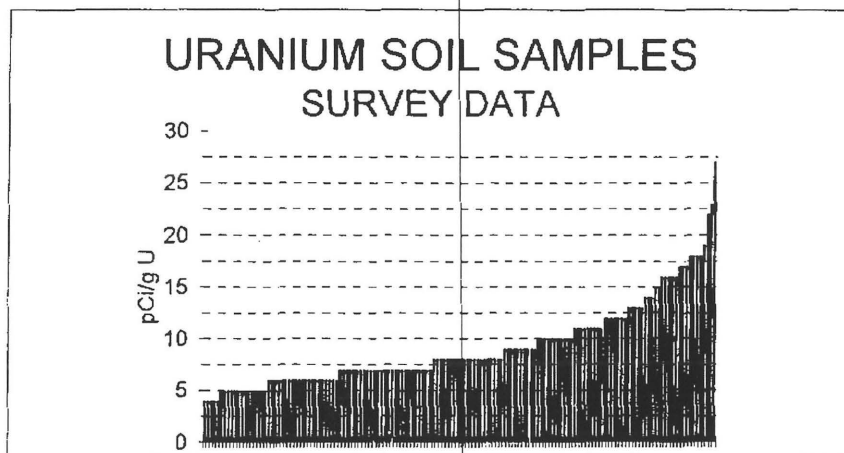
CLIENT DRAWING NO.

JOB NO.

DRAWING NO. 95P03L3D-0

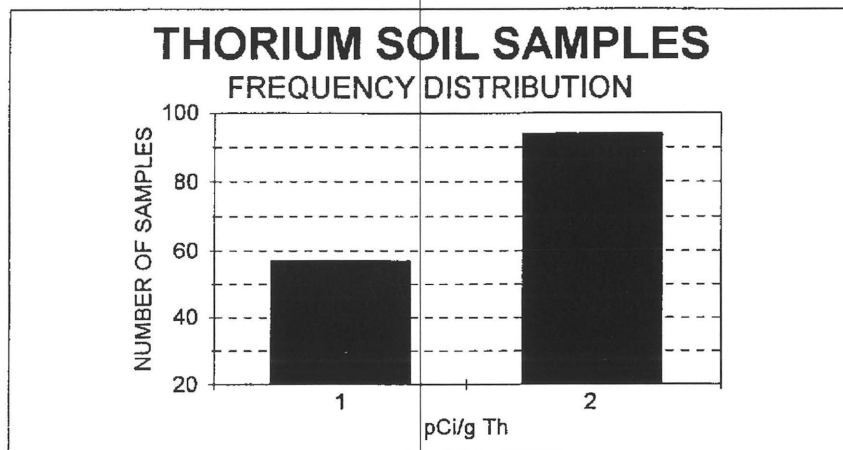
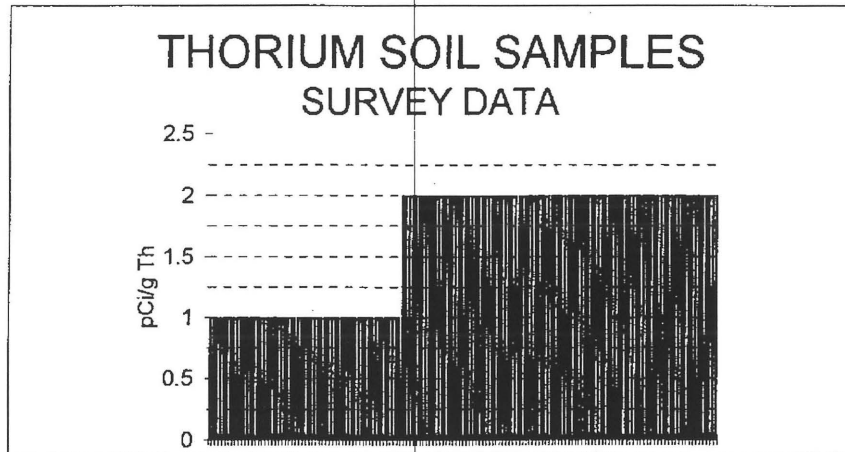
REV. 0

PHASE III - AREA L
SOUTH OF ORIGINAL EAST & WEST SANITARY LAGOON
CIMARRON SOIL COUNTER
TOTAL URANIUM SOIL SAMPLE RESULTS
SITE BACKGROUND OF 4 pCi/g NOT SUBTRACTED



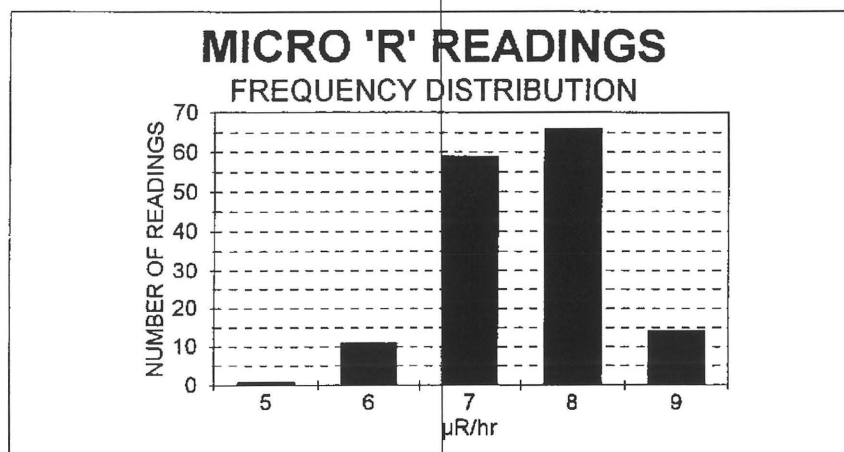
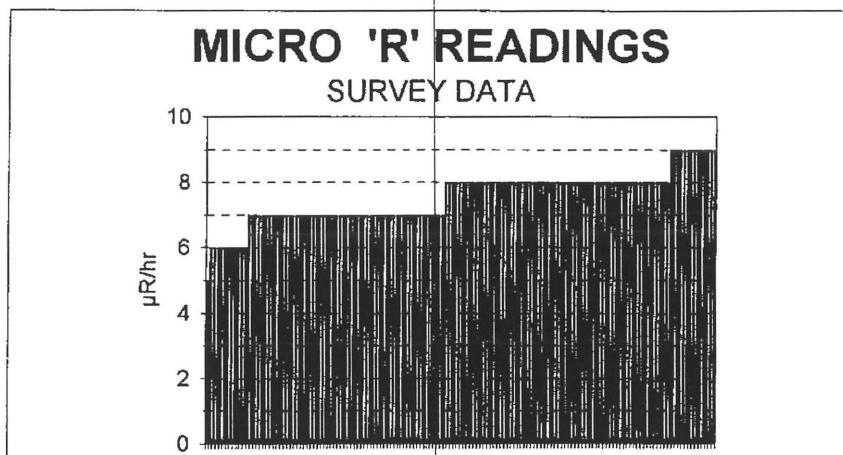
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AVERAGE SAMPLE	9
MINIMUM SAMPLE	4
MAXIMUM SAMPLE	27
STANDARD DEVIATION	4

PHASE III - AREA L
SOUTH OF ORIGINAL EAST & WEST SANITARY LAGOON
CIMARRON SOIL COUNTER
THORIUM (NAT) SOIL SAMPLE RESULTS
SITE BACKGROUND OF 1.5 pCi/g NOT SUBTRACTED
MAY 1995



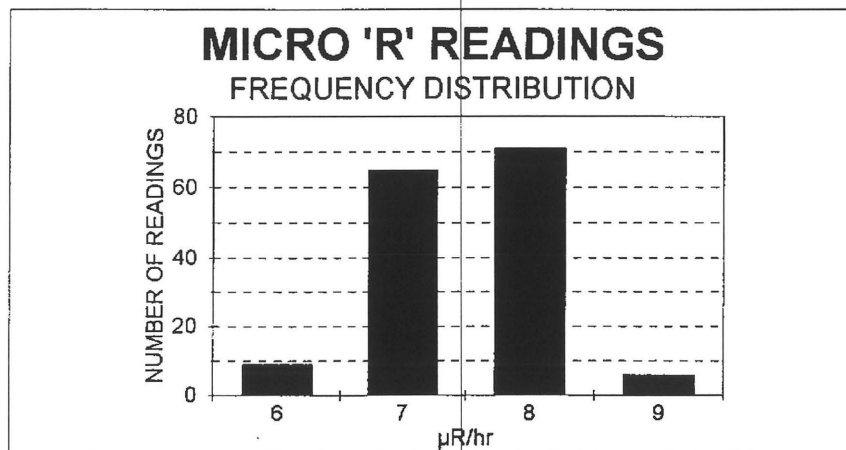
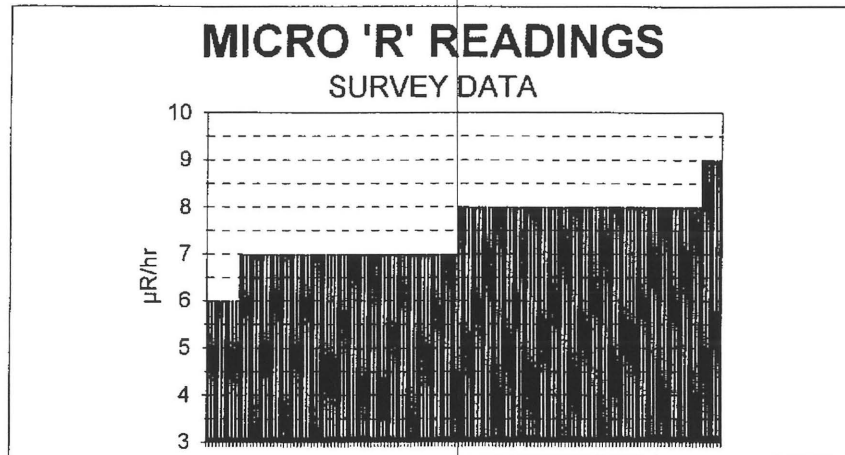
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AVERAGE SAMPLE	2
MINIMUM SAMPLE	1
MAXIMUM SAMPLE	2
STANDARD DEVIATION	0

PHASE III - AREA L
SOUTH OF ORIGINAL EAST & WEST SANITARY LAGOON
MICRO-R METER READINGS AT SURFACE
LUDLUM MODEL 19 S/N 111299
RESULTS IN $\mu\text{R/hr}$
MAY 1995



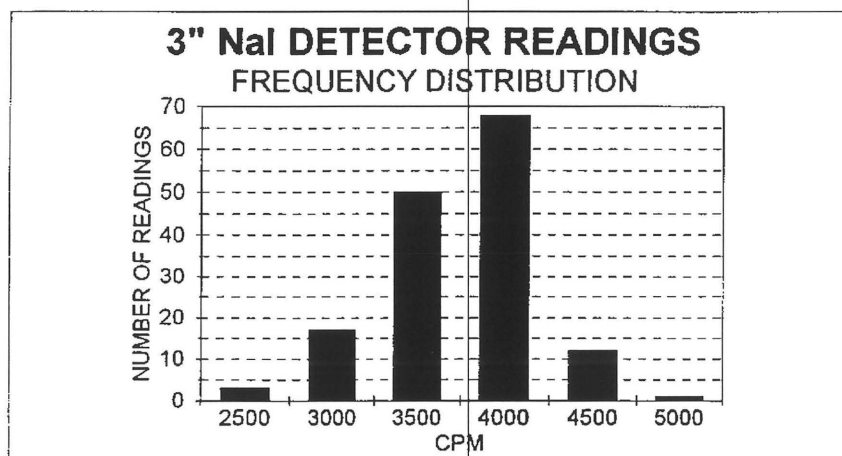
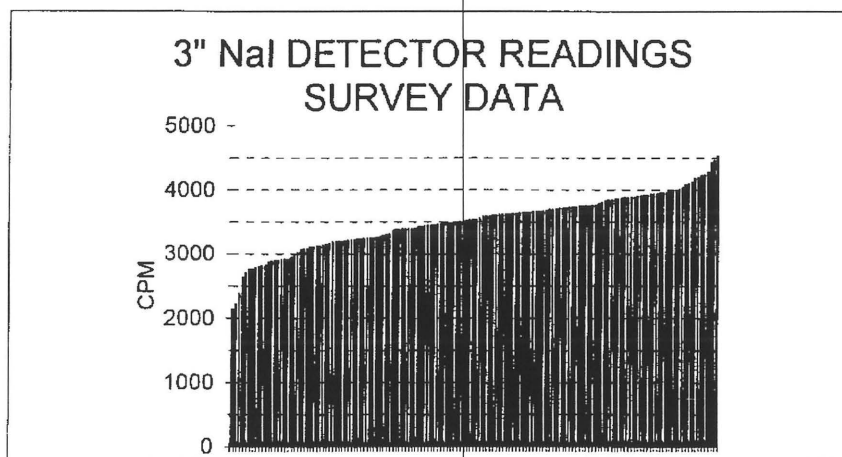
NUMBER OF READINGS	151
AVERAGE READING	8
MINIMUM READING	5
MAXIMUM READING	9
STANDARD DEVIATION	1

PHASE III - AREA L
SOUTH OF ORIGINAL EAST & WEST SANITARY LAGOON
MICRO-R METER READINGS AT ONE METER ABOVE SURFACE
LUDLUM MODEL 19 S/N 111299
RESULTS IN $\mu\text{R/hr}$
MAY 1995



NUMBER OF READINGS	151
AVERAGE READING	7
MINIMUM READING	6
MAXIMUM READING	9
STANDARD DEVIATION	1

PHASE III - AREA L
SOUTH OF ORIGINAL EAST & WEST SANITARY LAGOON
GROSS GAMMA READINGS IN CPM
LUDLUM MODEL 2220 S/N 48395
BACKGROUND AVERAGE: 3100
MAY 1995



NUMBER OF READINGS	151
AVERAGE READING	3508
MINIMUM READING	2140
MAXIMUM READING	4538
STANDARD DEVIATION	432

CIMARRON CORPORATION - CIMARRON FACILITY

(ORIGINAL EAST AND WEST LAGOONS)

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

(PHASE III - AREA-L - SANITARY LAGOON)

$n = \text{pCi/g TOTAL U}$

Number	n	(n-N)	(n-N) ²
1	7	-2.19	4.78
2	7	-2.19	4.78
3	5	-4.19	17.52
4	23	13.81	190.84
5	10	0.81	0.66
6	7	-2.19	4.78
7	7	-2.19	4.78
8	8	-1.19	1.41
9	11	1.81	3.29
10	13	3.81	14.55
11	8	-1.19	1.41
12	7	-2.19	4.78
13	6	-3.19	10.15
14	8	-1.19	1.41
15	6	-3.19	10.15
16	8	-1.19	1.41
17	7	-2.19	4.78
18	7	-2.19	4.78
19	7	-2.19	4.78
20	13	3.81	14.55
21	5	-4.19	17.52
22	8	-1.19	1.41
23	11	1.81	3.29
24	9	-0.19	0.03
25	7	-2.19	4.78
26	9	-0.19	0.03
27	9	-0.19	0.03
28	5	-4.19	17.52
29	4	-5.19	26.89
30	13	3.81	14.55
31	12	2.81	7.92
32	16	6.81	46.44
33	7	-2.19	4.78
34	8	-1.19	1.41
35	11	1.81	3.29
36	8	-1.19	1.41
37	6	-3.19	10.15
38	9	-0.19	0.03
39	22	12.81	164.21
40	7	-2.19	4.78
41	7	-2.19	4.78
42	12	2.81	7.92
43	8	-1.19	1.41
44	9	-0.19	0.03
45	10	0.81	0.66
46	8	-1.19	1.41
47	5	-4.19	17.52
48	10	0.81	0.66
49	8	-1.19	1.41
50	16	6.81	46.44
	515		886.61326
	418		943.95891
	1387		2548.8079
	Sum(n)		Sum(n-N) ²

No. of Samples (x) : 151

COUNT TIME: 5 MINUTES

Sample Mean (N) = Sum(n) ÷ (x)

Sample Mean (N) : 9.2

Standard Deviation (Sd) = SQRT [(n-N)² ÷ (x - 1)]

Standard Deviation: 4.1

2 Std Deviations: 8.2

Degree of Freedom(df) = (x) - 1

Data listed on Table B-1

(df) = 1.657

Area's Average Level (Aμ) = (N) + (df) × [(Sd)/(x)]

(Aμ) = 9.7

pCi/gU TOTAL U

GUIDELINE VALUE: 30.0

pCi/gU TOTAL U

Acceptable Level: 34.0

pCi/gU TOTAL U

(30 PLUS BACKGROUND)

TABLE B - 1

Factors for Comparison of Survey Data with Guidelines					
(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:

Interpolate between the listed values.

(df) high value(Z)	400	is (B)	1.649	95%
(df) low value(Y)	120	is (A)	1.658	95%

Desired value(df) (X) 150 is calculated as follow:

EXP[(Ln(B) - Ln(A)) ÷ (Z - Y)] (X - Y) + Ln(A)

The (df) value for (X) 150 1.657 95%

PERFORMED BY: C. Powell

DATE: 5-6-96

REVIEWED BY: W. C. Rogers

DATE: 5-6-96

CIMARRON CORPORATION - CIMARRON FACILITY

(ORIGINAL EAST AND WEST LAGOONS)

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

(PHASE III - AREA-L - SANITARY LAGOON)

n = pCi/g TOTAL U

n = pCi/g TOTAL U

Number	n	(n-N)	(n-N) ²
51	6	-3.19	10.15
52	16	6.81	46.44
53	5	-4.19	17.52
54	8	-1.19	1.41
55	9	-0.19	0.03
56	17	7.81	61.07
57	12	2.81	7.92
58	5	-4.19	17.52
59	18	8.81	77.70
60	6	-3.19	10.15
61	10	0.81	0.66
62	8	-1.19	1.41
63	18	8.81	77.70
64	15	5.81	33.81
65	10	0.81	0.66
66	14	4.81	23.18
67	11	1.81	3.29
68	4	-5.19	26.89
69	11	1.81	3.29
70	6	-3.19	10.15
71	8	-1.19	1.41
72	6	-3.19	10.15
73	7	-2.19	4.78
74	12	2.81	7.92
75	16	6.81	46.44
76	10	0.81	0.66
77	11	1.81	3.29
78	12	2.81	7.92
79	7	-2.19	4.78
80	10	0.81	0.66
81	12	2.81	7.92
82	8	-1.19	1.41
83	7	-2.19	4.78
84	14	4.81	23.18
85	5	-4.19	17.52
86	15	5.81	33.81
87	6	-3.19	10.15
88	7	-2.19	4.78
89	14	4.81	23.18
90	5	-4.19	17.52
91	9	-0.19	0.03
92	10	0.81	0.66
93	11	1.81	3.29
94	17	7.81	61.07
95	17	7.81	61.07
96	6	-3.19	10.15
97	18	8.81	77.70
98	11	1.81	3.29
99	8	-1.19	1.41
100	7	-2.19	4.78
515			886.6
Sum(n)			Sum(n-N) ²

Number	n	(n-N)	(n-N) ²
101	18	8.81	77.70
102	11	1.81	3.29
103	12	2.81	7.92
104	5	-4.19	17.52
105	9	-0.19	0.03
106	13	3.81	14.55
107	5	-4.19	17.52
108	6	-3.19	10.15
109	8	-1.19	1.41
110	10	0.81	0.66
111	6	-3.19	10.15
112	19	9.81	96.33
113	6	-3.19	10.15
114	4	-5.19	26.89
115	10	0.81	0.66
116	6	-3.19	10.15
117	7	-2.19	4.78
118	5	-4.19	17.52
119	7	-2.19	4.78
120	6	-3.19	10.15
121	7	-2.19	4.78
122	4	-5.19	26.89
123	6	-3.19	10.15
124	8	-1.19	1.41
125	8	-1.19	1.41
126	10	0.81	0.66
127	5	-4.19	17.52
128	8	-1.19	1.41
129	7	-2.19	4.78
130	13	3.81	14.55
131	16	6.81	46.44
132	27	17.81	317.36
133	7	-2.19	4.78
134	5	-4.19	17.52
135	8	-1.19	1.41
136	7	-2.19	4.78
137	6	-3.19	10.15
138	9	-0.19	0.03
139	6	-3.19	10.15
140	5	-4.19	17.52
141	6	-3.19	10.15
142	7	-2.19	4.78
143	8	-1.19	1.41
144	6	-3.19	10.15
145	7	-2.19	4.78
146	4	-5.19	26.89
147	6	-3.19	10.15
148	7	-2.19	4.78
149	7	-2.19	4.78
150	6	-3.19	10.15
151	9	-0.19	0.03
418			943.96
Sum(n)			Sum(n-N) ²

CIMARRON CORPORATION - CIMARRON FACILITY
TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

(ORIGINAL EAST AND WEST LAGOONS)
 (PHASE III - AREA-L - SANITARY LAGOON)

$n = \text{pCi/g Th (NAT)}$

Order	n	(n-N)	(n-N) ²
1	2	0.38	0.14
2	2	0.38	0.14
3	2	0.38	0.14
4	2	0.38	0.14
5	1	-0.62	0.39
6	1	-0.62	0.39
7	2	0.38	0.14
8	2	0.38	0.14
9	2	0.38	0.14
10	2	0.38	0.14
11	1	-0.62	0.39
12	2	0.38	0.14
13	2	0.38	0.14
14	2	0.38	0.14
15	2	0.38	0.14
16	2	0.38	0.14
17	2	0.38	0.14
18	2	0.38	0.14
19	2	0.38	0.14
20	2	0.38	0.14
21	1	-0.62	0.39
22	2	0.38	0.14
23	1	-0.62	0.39
24	2	0.38	0.14
25	1	-0.62	0.39
26	2	0.38	0.14
27	2	0.38	0.14
28	2	0.38	0.14
29	1	-0.62	0.39
30	2	0.38	0.14
31	1	-0.62	0.39
32	1	-0.62	0.39
33	2	0.38	0.14
34	1	-0.62	0.39
35	2	0.38	0.14
36	2	0.38	0.14
37	2	0.38	0.14
38	2	0.38	0.14
39	2	0.38	0.14
40	2	0.38	0.14
41	2	0.38	0.14
42	1	-0.62	0.39
43	2	0.38	0.14
44	2	0.38	0.14
45	2	0.38	0.14
46	2	0.38	0.14
47	1	-0.62	0.39
48	1	-0.62	0.39
49	2	0.38	0.14
50	1	-0.62	0.39
85			10.800184
74			14.128108
245			35.483444
Sum(n)			Sum(n-N) ²

No. of Samples (x) : 151

COUNT TIME: 5 MINUTES

Sample Mean (N) = $\text{Sum}(n) \div (x)$

Sample Mean (N) : 1.62

Standard Deviation (Sd) = $\text{SQRT} [(n-N)^2 \div (x - 1)]$

Standard Deviation: 0.5

2 Std Deviations: 1.0

Degree of Freedom (df) = (x) - 1 Data listed on Table B-1

(df) = 1.657

Area's Average Level (μ) = (N) + (df) x [(Sd)/(x)]

(μ) = 1.7 pCi/g Th (NAT)

GUIDELINE VALUE: 10 pCi/g Th (NAT)

Acceptable Level: 4.0 pCi/g Th (NAT)

(25% OF GUIDELINE PLUS BACKGROUND)

TABLE B - 1

Factors for Comparison of Survey Data with Guidelines					
(df)	95%	97.5%	(df)	95%	97.5%
1	6.314	12.706	19	1.729	2.093
2	2.92	4.303	20	1.725	2.086
3	2.353	3.182	21	1.721	2.08
4	2.132	2.776	22	1.717	2.074
5	2.015	2.571	23	1.714	2.069
6	1.943	2.447	24	1.711	2.064
7	1.895	2.365	25	1.708	2.06
8	1.86	2.306	26	1.706	2.056
9	1.833	2.262	27	1.703	2.052
10	1.812	2.228	28	1.701	2.048
11	1.796	2.201	29	1.699	2.045
12	1.782	2.179	30	1.697	2.042
13	1.771	2.16	40	1.684	2.021
14	1.761	2.145	60	1.671	2
15	1.753	2.131	120	1.658	1.98
16	1.746	2.12	400	1.649	1.966
17	1.74	2.11	Infinite	1.645	1.96
18	1.734	2.101			

For values of Degrees of Freedom not listed:

Interpolate between the listed values.

(df) high value(Z) 400 is (B) 1.649 95%

(df) low value(Y) 120 is (A) 1.658 95%

Desired value(df) (X) 150 is calculated as follow:

$\text{EXP}[(\text{Ln}(B) - \text{Ln}(A)) \div (Z - Y)] \times (X - Y) + \text{Ln}(A)$

The (df) value for (X) 150 1.657 95%

PERFORMED BY: C. Powell

DATE: 5-6-96

REVIEWED BY: W. A. Rogers

DATE: 5-6-96

CIMARRON CORPORATION - CIMARRON FACILITY

TRUE MEAN ACTIVITY VS. GUIDELINE VALUE AT 95% CONFIDENCE

(ORIGINAL EAST AND WEST LAGOONS)

(PHASE III - AREA-L - SANITARY LAGOON)

$n = \text{pCi/g Th (NAT)}$

Number	n	(n-N)	(n-N) ²
51	1	-0.62	0.39
52	2	0.38	0.14
53	2	0.38	0.14
54	1	-0.62	0.39
55	2	0.38	0.14
56	2	0.38	0.14
57	2	0.38	0.14
58	2	0.38	0.14
59	2	0.38	0.14
60	1	-0.62	0.39
61	1	-0.62	0.39
62	1	-0.62	0.39
63	2	0.38	0.14
64	2	0.38	0.14
65	1	-0.62	0.39
66	2	0.38	0.14
67	1	-0.62	0.39
68	2	0.38	0.14
69	2	0.38	0.14
70	2	0.38	0.14
71	2	0.38	0.14
72	2	0.38	0.14
73	2	0.38	0.14
74	2	0.38	0.14
75	2	0.38	0.14
76	2	0.38	0.14
77	2	0.38	0.14
78	1	-0.62	0.39
79	2	0.38	0.14
80	1	-0.62	0.39
81	1	-0.62	0.39
82	2	0.38	0.14
83	2	0.38	0.14
84	2	0.38	0.14
85	2	0.38	0.14
86	1	-0.62	0.39
87	2	0.38	0.14
88	1	-0.62	0.39
89	2	0.38	0.14
90	2	0.38	0.14
91	2	0.38	0.14
92	2	0.38	0.14
93	2	0.38	0.14
94	2	0.38	0.14
95	1	-0.62	0.39
96	1	-0.62	0.39
97	2	0.38	0.14
98	2	0.38	0.14
99	1	-0.62	0.39
100	2	0.38	0.14
	85		10.8
	Sum(n)		Sum(n-N) ²

Number	n	(n-N)	(n-N) ²
101	2	0.38	0.14
102	2	0.38	0.14
103	2	0.38	0.14
104	2	0.38	0.14
105	2	0.38	0.14
106	2	0.38	0.14
107	1	-0.62	0.39
108	2	0.38	0.14
109	1	-0.62	0.39
110	1	-0.62	0.39
111	2	0.38	0.14
112	1	-0.62	0.39
113	1	-0.62	0.39
114	1	-0.62	0.39
115	2	0.38	0.14
116	2	0.38	0.14
117	2	0.38	0.14
118	1	-0.62	0.39
119	1	-0.62	0.39
120	1	-0.62	0.39
121	1	-0.62	0.39
122	2	0.38	0.14
123	2	0.38	0.14
124	1	-0.62	0.39
125	2	0.38	0.14
126	1	-0.62	0.39
127	1	-0.62	0.39
128	2	0.38	0.14
129	1	-0.62	0.39
130	1	-0.62	0.39
131	1	-0.62	0.39
132	2	0.38	0.14
133	1	-0.62	0.39
134	1	-0.62	0.39
135	1	-0.62	0.39
136	2	0.38	0.14
137	1	-0.62	0.39
138	2	0.38	0.14
139	2	0.38	0.14
140	1	-0.62	0.39
141	2	0.38	0.14
142	1	-0.62	0.39
143	2	0.38	0.14
144	1	-0.62	0.39
145	2	0.38	0.14
146	1	-0.62	0.39
147	1	-0.62	0.39
148	1	-0.62	0.39
149	1	-0.62	0.39
150	1	-0.62	0.39
151	2	0.38	0.14
	0		0
	0		0
	74		14.12811
	Sum(n)		Sum(n-N)

**CIMARRON CORPORATION
CIMARRON FACILITY
PHASE III - AREA L - SOUTH OF ORIGINAL EAST & WEST SANITARY LAGOONS
POST REMEDIATION SURVEY**

DATE: 5/11/95 - 5/15/95

LN #	GRID NUMBER	3" DETECT C.P.M.	MICRO 'R' 1 METER	MICRO 'R' SURF.	pCi/g 0-6" Sample	
					Total-U	Th (Nat)
1	110E - 210N	3493	8	8	7	2
2	110E - 215N	3506	8	8	7	2
3	110E - 220N	3764	7	7	5	2
4	110E - 225N	3664	7	8	23	2
5	110E - 230N	3912	7	8	10	1
6	110E - 235N	3462	7	7	7	1
7	110E - 240N	3400	8	7	7	2
8	115E - 205N	3900	8	8	8	2
9	115E - 210N	3394	7	7	11	2
10	115E - 215N	3248	7	7	13	2
11	115E - 220N	3202	7	7	8	1
12	115E - 225N	2920	7	7	7	2
13	115E - 230N	3528	7	8	6	2
14	115E - 235N	3408	8	7	8	2
15	115E - 240N	3316	8	7	6	2
16	120E - 205N	3476	7	7	8	2
17	120E - 210N	3398	7	7	7	2
18	120E - 215N	3278	8	7	7	2
19	120E - 220N	3242	7	7	7	2
20	120E - 225N	3222	7	8	13	2
21	120E - 230N	3518	8	8	5	1
22	120E - 235N	3880	8	8	8	2

INSTRUMENTS:

LUDLUM MICRO 'R' METER - MODEL 19 S/N 111299

LUDLUM 2220, UNSHIELDED 3" X 1/2" NaI DETECTOR-S/N 48395

CIMARRON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR

RESULTS IN

BKG

MDA

µr/hr

7

7

CPM

3100

N/A

pCi/g

TOTAL U - 4.0
Th (Nat) - 1.5

TOTAL U - 10
Th (Nat) - 1

BACKGROUND NOT SUBTRACTED

REVIEWED BY: *W.A. Rogers*

5-3-96

FILE: PO3LSL95

**CIMARRON FACILITY
PHASE III - AREA L - SOUTH OF ORIGINAL EAST & WEST SANITARY LAGOONS
POST REMEDIATION SURVEY**

DATE: 5/11/95 - 5/15/95

LN #	GRID NUMBER	3" DETECT C.P.M.	MICRO 'R' 1 METER	MICRO 'R' SURF.	pCi/g 0-6" Sample	
					Total-U	Th (Nat)
1	125E - 200N	3205	7	7	11	1
2	125E - 205N	3976	8	8	9	2
3	125E - 210N	3248	8	8	7	1
4	125E - 215N	3810	8	8	9	2
5	125E - 220N	3178	7	7	9	2
6	125E - 225N	3084	7	7	5	2
7	125E - 230N	3208	7	8	4	1
8	130E - 200N	3856	8	8	13	2
9	130E - 205N	3920	8	8	12	1
10	130E - 210N	3990	8	8	16	1
11	130E - 215N	3398	7	7	7	2
12	130E - 220N	2790	7	7	8	1
13	130E - 225N	3158	7	7	11	2
14	130E - 230N	3490	8	8	8	2
15	135E - 200N	3796	7	8	6	2
16	135E - 205N	3950	7	8	9	2
17	135E - 210N	4204	8	7	22	2
18	135E - 215N	3124	7	8	7	2
19	135E - 220N	3222	8	8	7	2
20	135E - 225N	3634	7	7	12	1

INSTRUMENTS:

LUDLUM MICRO 'R' METER - MODEL 19 S/N 111299

LUDLUM 2220, UNSHIELDED 3" X 1/2" NaI DETECTOR-S/N-48395

CIMARRON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR

RESULTS IN BKG MDA

µr/hr 7 7

CPM 3100 N/A

pCi/g TOTAL U - 4.0 TOTAL U - 10
Th (Nat) - 1.5 Th (Nat) - 1

BACKGROUND NOT SUBTRACTED

FILE: PO3LSL95

REVIEWED BY: W.G. Rogers 5-3-96

**CIMARRON CORPORATION
CIMARRON FACILITY
PHASE III - AREA L - SOUTH OF ORIGINAL EAST & WEST SANITARY LAGOONS
POST REMEDIATION SURVEY**

DATE: 5/11/95 - 5/15/95

LN #	GRID NUMBER	3" DETECT C.P.M.	MICRO 'R' 1 METER	MICRO 'R' SURF.	pCi/g 0-6" Sample	
					Total-U	Th (Nat)
1	140E - 195N	4282	8	9	8	2
2	140E - 200N	3958	8	8	9	2
3	140E - 205N	3550	8	8	10	2
4	140E - 210N	3758	8	9	8	2
5	140E - 215N	3072	7	7	5	1
6	140E - 220N	3320	8	8	10	1
7	140E - 225N	3766	7	8	8	2
8	145E - 195N	4100	9	8	16	1
9	145E - 200N	3740	9	8	6	1
10	145E - 205N	3638	8	8	16	2
11	145E - 210N	3738	8	8	5	2
12	145E - 215N	3702	8	7	8	1
13	145E - 220N	3864	7	7	9	2
14	150E - 190N	4238	8	9	17	2
15	150E - 195N	3928	8	8	12	2
16	150E - 200N	3426	7	7	5	2
17	150E - 205N	3750	7	8	18	2
18	150E - 210N	3932	8	8	6	1
19	150E - 215N	3448	7	7	10	1
20	150E - 220N	3866	7	9	8	1

INSTRUMENTS:

LUDLUM MICRO 'R' METER - MODEL 19 S/N 111299

LUDLUM 2220, UNSHIELDED 3" X 1/2" NaI DETECTOR-S/N-48395

CIMARRON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR

RESULTS IN BKG MDA

µr/hr 7 7

CPM 3100 N/A

pCi/g TOTAL U - 4.0 TOTAL U - 10
Th (Nat) - 1.5 Th (Nat) - 1

BACKGROUND NOT SUBTRACTED

FILE: PO3LSL95

REVIEWED BY:

W.A. Rogers

5-3-96

**CIMARRON CORPORATION
CIMARRON FACILITY
PHASE III - AREA L - SOUTH OF ORIGINAL EAST & WEST SANITARY LAGOONS
POST REMEDIATION SURVEY**

DATE: 5/11/95 - 5/15/95

LN #	GRID NUMBER	3" DETECT C.P.M.	MICRO 'R' 1 METER	MICRO 'R' SURF.	pCi/g 0-6" Sample	
					Total-U	Th (Nat)
1	155E - 190N	4470	8	9	18	2
2	155E - 195N	3728	8	8	15	2
3	155E - 200N	4022	8	8	10	1
4	155E - 205N	3764	7	8	14	2
5	155E - 210N	2926	8	8	11	1
6	155E - 215N	3632	8	8	4	2
7	160E - 190N	3996	8	8	11	2
8	160E - 195N	2140	8	9	6	2
9	160E - 200N	3238	7	7	8	2
10	160E - 205N	3848	8	8	6	2
11	160E - 210N	3732	8	8	7	2
12	160E - 215N	3660	8	8	12	2
13	165E - 185N	4434	8	8	16	2
14	165E - 190N	3976	8	9	10	2
15	165E - 195N	2768	8	8	11	2
16	165E - 200N	3594	8	7	12	1
17	165E - 205N	3460	8	8	7	2
18	165E - 210N	3888	9	9	10	1

INSTRUMENTS:

LUDDLUM MICRO 'R' METER - MODEL 19 S/N 111299

LUDDLUM 2220, UNSHIELDED 3" X 1/2" NaI DETECTOR-S/N-48395

CIMARRON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR

RESULTS IN

BKG

MDA

µr/hr

7

7

CPM

3100

N/A

pCi/g

TOTAL U - 4.0
Th (Nat) - 1.5

TOTAL U - 10
Th (Nat) - 1

BACKGROUND NOT SUBTRACTED

FILE # 03LSL95

REVIEWED BY:

W.A. Rogers

5-3-96

**CIMARRON CORPORATION
CIMARRON FACILITY
PHASE III - AREA L - SOUTH OF ORIGINAL EAST & WEST SANITARY LAGOONS
POST REMEDIATION SURVEY**

DATE: 5/11/95 - 5/15/95

LN #	GRID NUMBER	3" DETECT C.P.M.	MICRO 'R' 1 METER	MICRO 'R' SURF.	pCi/g 0-6" Sample	
					Total-U	Th (Nat)
1	170E - 180N	3534	8	8	12	1
2	170E - 185N	4250	8	8	8	2
3	170E - 190N	3472	8	7	7	2
4	170E - 195N	3684	8	8	14	2
5	170E - 200N	3606	7	7	5	2
6	170E - 205N	3722	8	8	15	1
7	175E - 180N	4192	8	9	6	2
8	175E - 185N	3678	8	8	7	1
9	175E - 190N	3708	8	7	14	2
10	175E - 195N	3774	9	8	5	2
11	175E - 200N	3562	8	8	9	2
12	175E - 205N	3548	7	7	10	2
13	180E - 170N	4000	8	9	11	2
14	180E - 175N	4538	9	9	17	2
15	180E - 180N	3888	8	8	17	1
16	180E - 185N	3464	8	7	6	1
17	180E - 190N	3608	7	8	18	2
18	180E - 195N	3638	8	7	11	2
19	180E - 200N	3856	7	8	8	1

INSTRUMENTS:

LUDLUM MICRO 'R' METER - MODEL 19 S/N 111299

RESULTS IN

BKG

MDA

µr/hr

7

7

LUDLUM 2220, UNSHIELDED 3" X 1/2" NaI DETECTOR-S/N-48395

CPM

3100

N/A

CIMARRON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR

pCi/g

TOTAL U - 4.0
Th (Nat) - 1.5

TOTAL U - 10
Th (Nat) - 1

BACKGROUND NOT SUBTRACTED

REVIEWED BY:

W.A. Rogers

5-3-96

FILE: PO3LSL95

**CIMARRON CORPORATION
CIMARRON FACILITY
PHASE III - AREA L - SOUTH OF ORIGINAL EAST & WEST SANITARY LAGOONS
POST REMEDIATION SURVEY**

DATE: 5/11/95 - 5/15/95

LN #	GRID NUMBER	3" DETECT C.P.M.	MICRO 'R' 1 METER	MICRO 'R' SURF.	pCi/g 0-6" Sample	
					Total-U	Th (Nat)
1	185E - 175N	4106	9	8	7	2
2	185E - 180N	3666	8	9	18	2
3	185E - 185N	3662	8	9	11	2
4	185E - 190N	3502	7	8	12	2
5	185E - 195N	3964	8	8	5	2
6	185E - 200N	3718	7	8	9	2
7	190E - 170N	3036	7	7	13	2
8	190E - 175N	2802	7	6	5	1
9	190E - 180N	3266	7	7	6	2
10	190E - 185N	3202	8	7	8	1
11	190E - 190N	3392	7	7	10	1
12	190E - 195N	3944	8	8	6	2
13	195E - 165N	4050	7	8	19	1
14	195E - 170N	3138	7	7	6	1
15	195E - 175N	3624	8	7	4	1
16	195E - 180N	3250	7	7	10	2
17	195E - 185N	3298	7	7	6	2
18	195E - 190N	3624	8	8	7	2
19	195E - 195N	3608	8	7	5	1

INSTRUMENTS:

LUDLUM MICRO 'R' METER - MODEL 19 S/N 111299

RESULTS IN

µr/hr

BKG

7

MDA

7

LUDLUM 2220, UNSHIELDED 3" X 1/2" NaI DETECTOR-S/N-48395

CPM

3100

N/A

CIMARRON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR

pCi/g

TOTAL U - 4.0
Th (Nat) - 1.5

TOTAL U - 10
Th (Nat) - 1

BACKGROUND NOT SUBTRACTED

REVIEWED BY:

W.A. Ryan

5-3-96

FILE: PO3LSL95

**CIMARRON CORPORATION
CIMARRON FACILITY
PHASE III - AREA L - SOUTH OF ORIGINAL EAST & WEST SANITARY LAGOONS
POST REMEDIATION SURVEY**

DATE: 5/11/95 - 5/15/95

LN #	GRID NUMBER	3" DETECT C.P.M.	MICRO 'R' 1 METER	MICRO 'R' SURF.	pCi/g 0-6" Sample	
					Total-U	Th (Nat)
1	200E - 160N	3744	7	9	7	1
2	200E - 165N	2760	7	6	6	1
3	200E - 170N	3120	7	7	7	1
4	200E - 175N	3662	8	7	4	2
5	200E - 180N	3494	7	7	6	2
6	200E - 185N	3232	8	7	8	1
7	200E - 190N	3438	7	8	8	2
8	205E - 160N	3654	7	7	10	1
9	205E - 165N	4134	8	8	5	1
10	205E - 170N	2950	7	8	8	2
11	205E - 175N	3196	7	7	7	1
12	205E - 180N	3390	7	7	13	1
13	205E - 185N	3368	8	7	16	1
14	210E - 155N	3900	8	8	27	2
15	210E - 160N	2826	6	6	7	1
16	210E - 165N	2380	6	5	5	1
17	210E - 170N	2700	6	6	8	1
18	210E - 175N	3124	7	7	7	2
19	210E - 180N	2970	7	7	6	1
20	210E - 185N	3690	8	7	9	2

INSTRUMENTS:

LUDLUM MICRO 'R' METER - MODEL 19 S/N 111299

LUDLUM 2220, UNSHIELDED 3" X 1/2" NaI DETECTOR-S/N-48395

CIMARRON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR

BACKGROUND NOT SUBTRACTED

FILE: PO3LSL95

RESULTS IN

BKG

MDA

µr/hr

7

7

CPM

3100

N/A

pCi/g

TOTAL U - 4.0
Th (Nat) - 1.5

TOTAL U - 10
Th (Nat) - 1

REVIEWED BY:

W.A. Rees

5-3-96

**CIMARRON CORPORATION
CIMARRON FACILITY
PHASE III - AREA L - SOUTH OF ORIGINAL EAST & WEST SANITARY LAGOONS
POST REMEDIATION SURVEY**

DATE: 5/11/95 - 5/15/95

LN #	GRID NUMBER	3" DETECT C.P.M.	MICRO 'R' 1 METER	MICRO 'R' SURF.	pCi/g 0-6" Sample	
					Total-U	Th (Nat)
1	215E - 155N	3480	7	6	6	2
2	215E - 160N	2876	6	7	5	1
3	215E - 165N	2888	6	6	6	2
4	215E - 170N	2914	7	6	7	1
5	215E - 175N	3116	7	7	8	2
6	215E - 180N	3090	7	7	6	1
7	220E - 150N	3594	7	8	7	2
8	220E - 155N	2220	6	6	4	1
9	220E - 160N	2906	7	6	6	1
10	220E - 165N	2820	6	7	7	1
11	220E - 170N	2630	6	6	7	1
12	220E - 175N	2908	6	6	6	1
13	220E - 180N	3262	7	7	9	2

INSTRUMENTS:

LUDLUM MICRO 'R' METER - MODEL 19 S/N 111299

RESULTS IN

BKG

MDA

µr/hr

7

7

LUDLUM 2220, UNSHIELDED 3" X 1/2" NaI DETECTOR-S/N-48395

CPM

3100

N/A

CIMARRON SOIL COUNTER 4" X 4" X 16" NaI DETECTOR

pCi/g

TOTAL U - 4.0
Th (Nat) - 1.5

TOTAL U - 10
Th (Nat) - 1

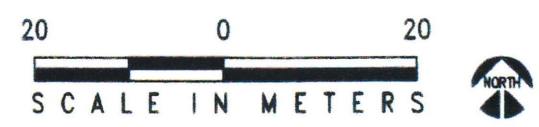
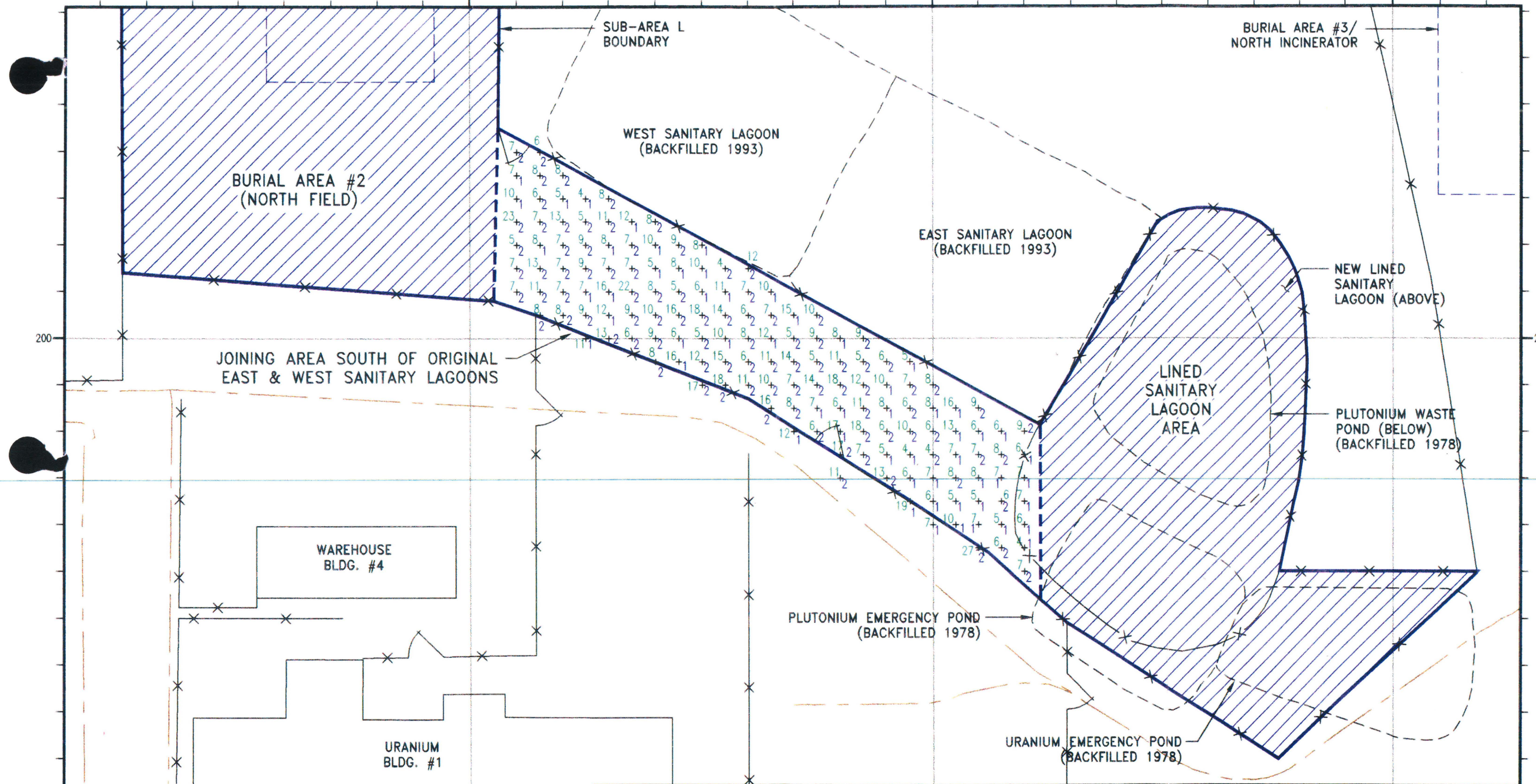
BACKGROUND NOT SUBTRACTED

REVIEWED BY:

W-a. Rogers

5-3-96

FILE: PO3LSL95



URANIUM (pCi/g U) AND THORIUM (pCi/g Th).
CIMARRON GAMMA SPEC SOIL COUNTER.
SITE SOIL BACKGROUND OF APPROX. 4.0 pCi/g U AND 1.5 pCi/g Th, NOT SUBTRACTED.
SAMPLES TAKEN ON 5 METER X 5 METER GRID.

LEGEND

6	URANIUM
1 - 29	pCi/g U
58	URANIUM
30 - 89	pCi/g U
129	URANIUM
> 90	pCi/g U
+2	THORIUM
1 - 5	pCi/g Th

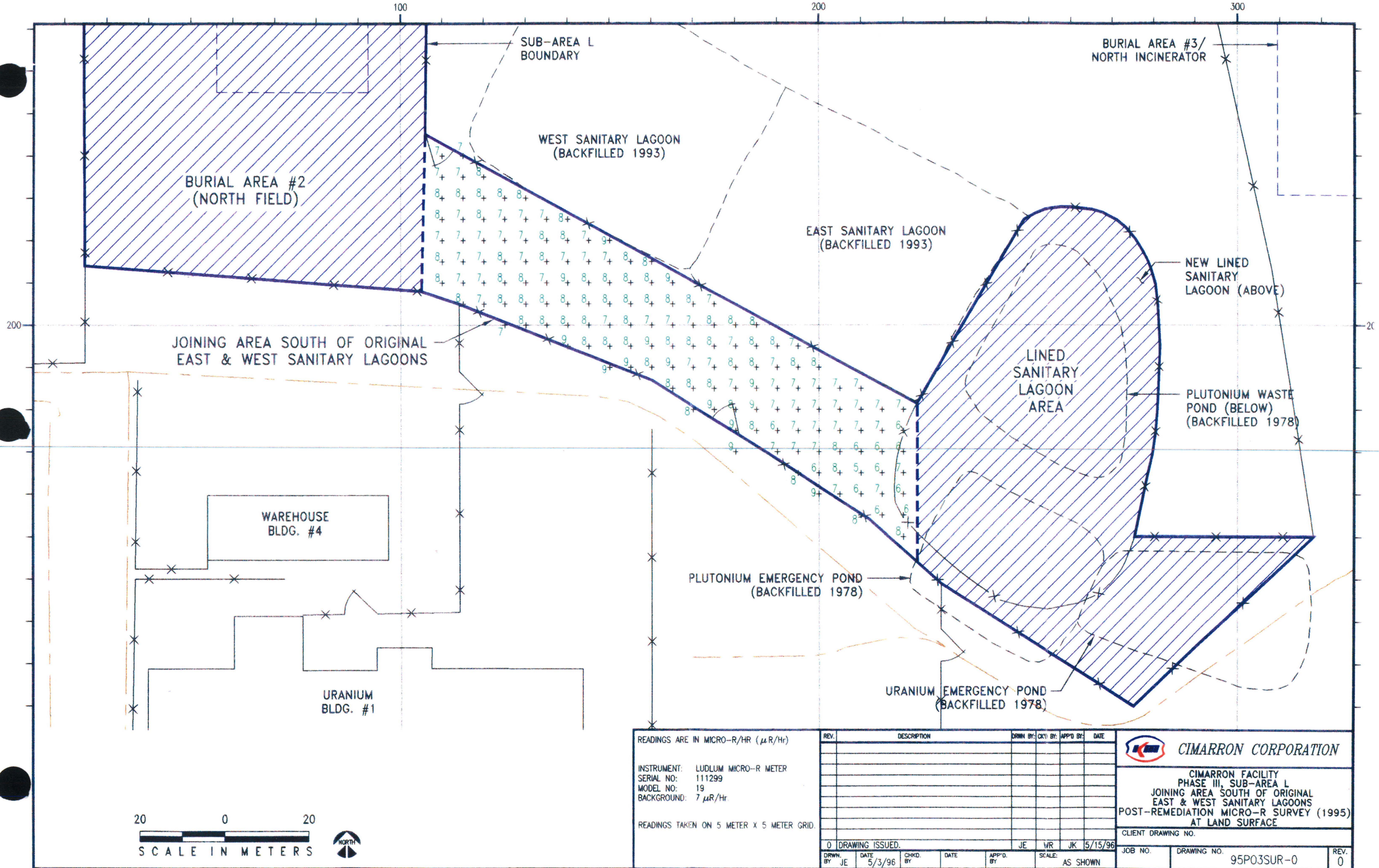
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0	DRAWING ISSUED.	JE	WR	JK	5/15/96
DRWN BY	DATE	CHKD BY	DATE	APP'D BY	SCALE
JE	4/24/96				AS SHOWN

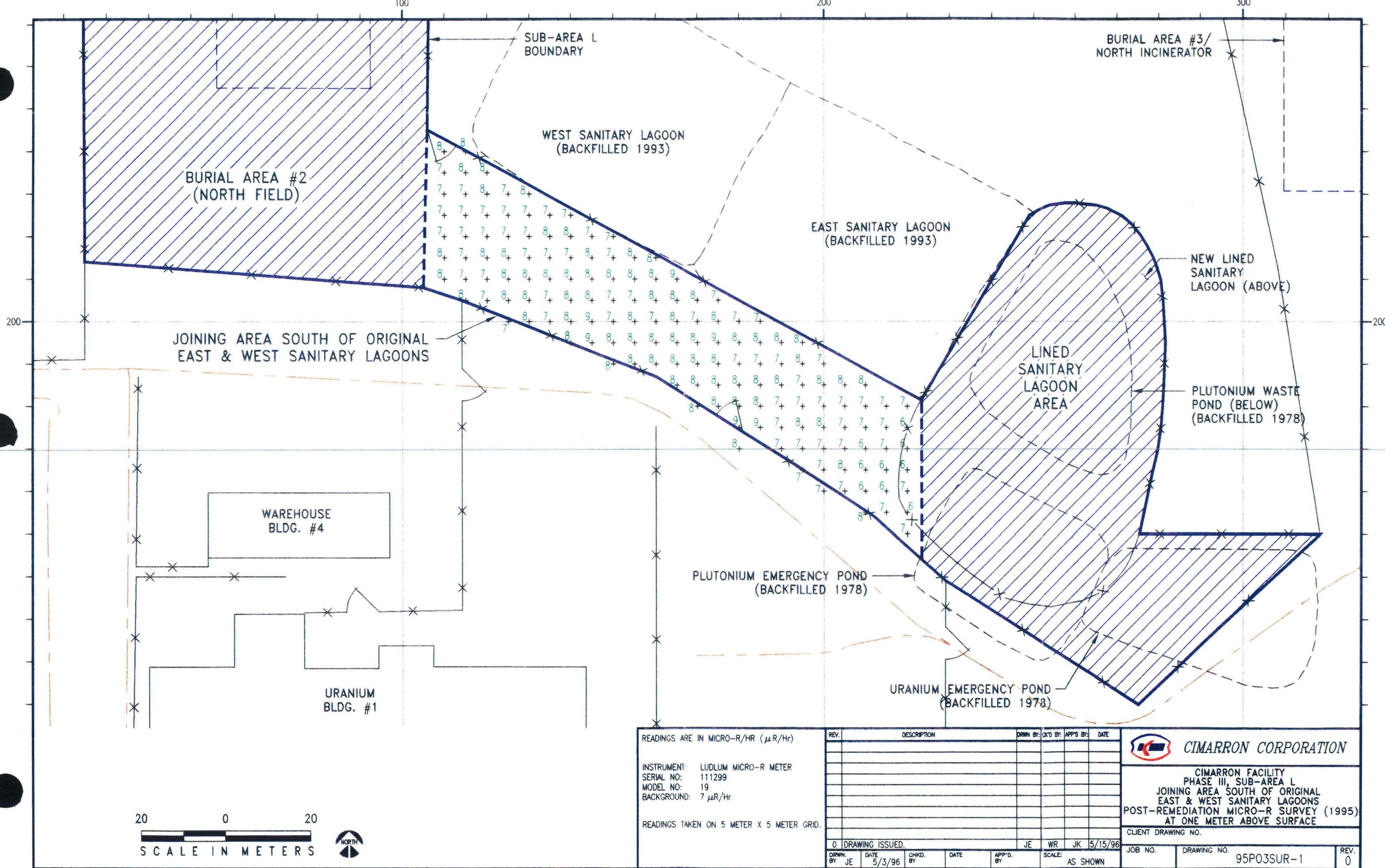
CIMARRON CORPORATION

CIMARRON FACILITY
PHASE III, SUB-AREA L
JOINING AREA SOUTH OF ORIGINAL
EAST & WEST SANITARY LAGOONS
POST-REMEDIATION SOIL SAMPLE RESULTS (1995)
SOIL SAMPLE ALIQUOT: SURFACE

CLIENT DRAWING NO.

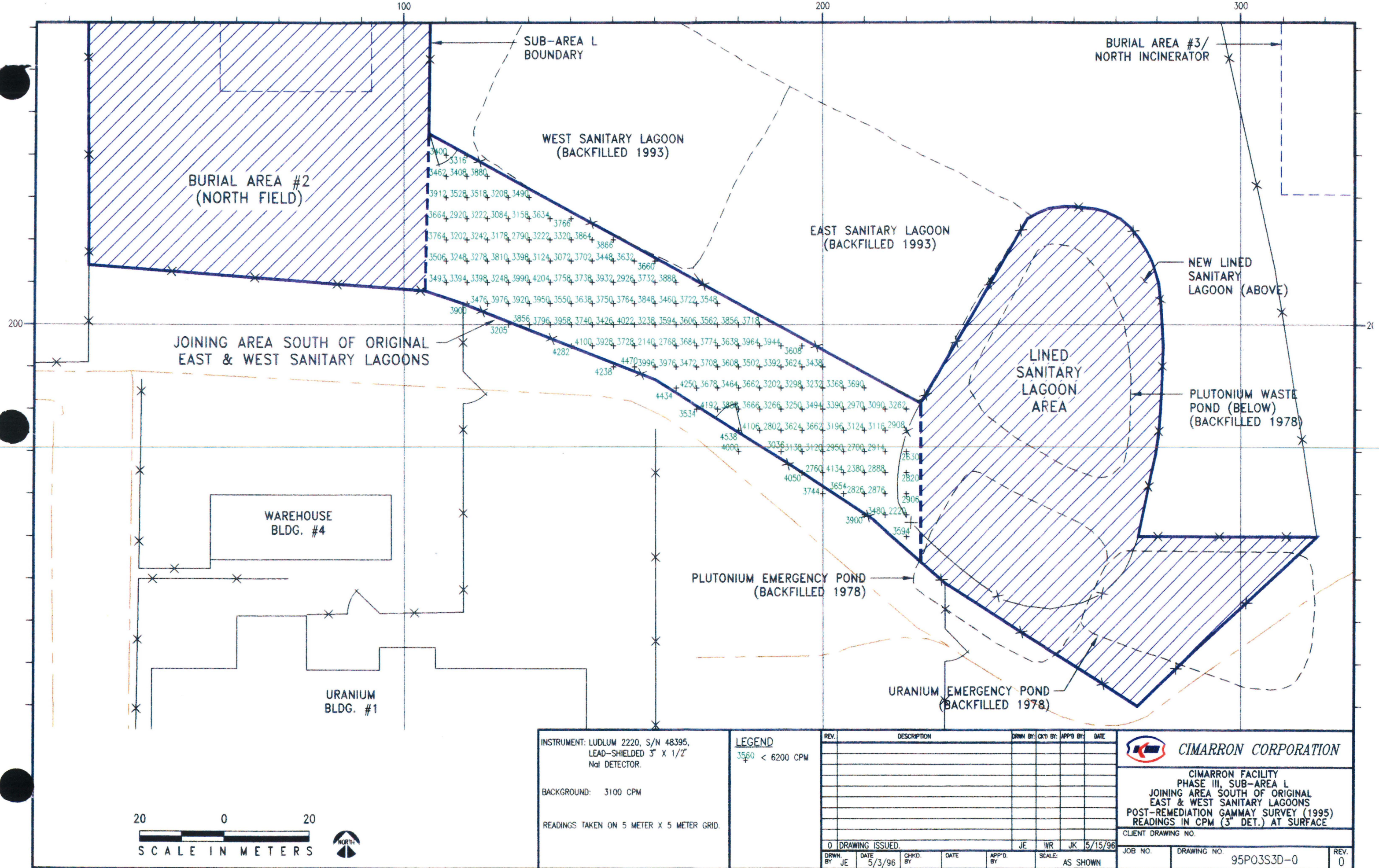
JOB NO. DRAWING NO. 95P03SSS-0 REV. 0





READINGS ARE IN MICRO-R/HR (μ R/Hr)		REV.		DESCRIPTION		DRWN BY:	CHKD BY:	APP'D BY:	DATE
INSTRUMENT: LUDLUM MICRO-R METER									
SERIAL NO: 111299									
MODEL NO: 19									
BACKGROUND: 7 μ R/Hr.									
READINGS TAKEN ON 5 METER X 5 METER GRID.									
		0		DRAWING ISSUED.		JE	WR	JK	5/15/96
DRWN BY:	DATE	CHKD BY:	DATE	APP'D BY:	SCALE:	AS SHOWN			
JE	5/3/96								
						JOB NO.		DRAWING NO.	
								95P03SUR-1	
						REV.		0	

M:\CIMARRON\SUBAREAL\95P03SUR



INSTRUMENT: LUDLUM 2220, S/N 48395,
LEAD-SHIELDED 3" X 1/2"
NaI DETECTOR.

BACKGROUND: 3100 CPM

READINGS TAKEN ON 5 METER X 5 METER GRID.

LEGEND
3560 < 6200 CPM

REV.	DESCRIPTION	DRWN BY:	CHKD BY:	APP'D BY:	DATE
0	DRAWING ISSUED.	JE	WR	JK	5/15/96
BY: JE	DATE: 5/3/96	CHKD. BY:	DATE:	APP'D. BY:	SCALE: AS SHOWN

CIMARRON CORPORATION

CIMARRON FACILITY
PHASE III, SUB-AREA L
JOINING AREA SOUTH OF ORIGINAL
EAST & WEST SANITARY LAGOONS
POST-REMEDIATION GAMMA SURVEY (1995)
READINGS IN CPM (3" DET.) AT SURFACE

CLIENT DRAWING NO.

JOB NO. DRAWING NO. 95P03S3D-0 REV. 0