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ARCS II

Contract No. 68-W9-0051

LI TUNGSTEN
Glen Cove, New York
Work Assignment No. 025-2L4L

Draft Final
Remedial Investigation (RI) Report
Volume II of IV (Tables, Figures, Plates)

Remedial Planning Activities at Selected
Uncontrolled Hazardous Substance Disposal Sites
USEPA Region II (NY, NJ, PR, VI)

Malcolm Pirnie, Inc.
104 Corporate Park Drive
White Plains, NY 10602

May 1998

MALCOLM PIRNIE

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CONTRACT NO. 68-W9-0051

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DRAFT FINAL
REMEDIAL INVESTIGATION (RI) REPORT
VOLUME II OF IV (TABLES, FIGURES, PLATES)

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TABLE 1-1
CHRONOLOGY OF SITE HISTORY AND INVESTIGATIONS, INTERNAL REMEDIAL ACTIONS AND REMOVAL ACTIONS
Li Tungsten Site
Glen Cove, New York

DATE	EVENT
1940	National Reconditioning Corporation formed by K. C. Li, sharing common ownership and management with Wah Chang Trading Corporation, to act as Wah Chang's "operating affiliate" in purifying through smelting, refining, or other treatment, off-grade tungsten ores under tolling agreements with the U.S. Government (throughout lifetime of operations at Site, ores processed primarily through tolling ageeements with U.S. Government entities and/or private sector companies).
1942	Facility becomes operational in October 1942 on land acquired by the Defense Plant Corporation (a World War II-era agency of the U.S. Government) from Wah Chang Trading Corporation in August 1942. Operation initially consists of processing raw ore and scrap tungsten concentrates to produce ammonium p-aratungstate (APT) and subsequently formulating APT to metal tungsten powder and tungsten carbide powder. Other specialty products including tungsten carbide powder plus cobalt and other material for plasma spraying; tungsten titanium carbide powder; tantalum carbide powder; tungsten spray powder; crystalline tungsten powder; and molybdenum spray powder are also produced over the lifetime of the Site facility.
1945	Facility's capacity expanded through the efforts of the Defene Plant Corporation to provide for processing of antimony (sulphide) ore concentrates into pure antimony metal.
1948	National Reconditioning Corporation changes its name to Wah Chang Smelting and Refining Corporation (WCSRC).
1948 - 1964	Site operated by WCSRC.

TABLE 1-1 (continued)
CHRONOLOGY OF EVENTS AND SITE INVESTIGATIONS
Li Tungsten Site
Glen Cove, New York

DATE	EVENT
1964	WCSRC leases Site equipment/real property to the Wah Chang Corporation (WCC) (formerly Wah Chang Trading Corporation), which continued to operate the facility.
April 1967 - 1972	Teledyne, Inc., acquires the stock of WCC and WCC eventually merges into Teledyne. Operations at the Site continued by Teledyne (through lease arrangement with WCSRC) under the name of Teledyne Wah Chang Glen Cove Tungsten Chemicals & Reduction Plant until termination of lease with WCSRC.
1972	WCSRC forms a wholly-owned subsidiary (Li Tungsten Corporation) which continues to operate the Site facility after lease of Site to Teledyne is terminated.
1984	Site property acquired by Glen Cove Development Company (GCDC), which in turn leases the Site back to Li Tungsten Corporation.
June 1985	Li Tungsten Corporation files for Chapter 11 bankruptcy. Manufacturing operations at the facility cease.
May 1988	RTP Environmental Associates, Inc., (Westbury, NY) completes Site Investigation Report for Campon Reality Corporation (RTP, 1988). Site investigation undertaken to evaluate environmental conditions prior to residential development. Geraghty and Miller was subcontracted to perform the hydrogeology investigation.
March 29, 1989	New York State Department of Environmental Conservation (NYSDEC) performs site inspection.

TABLE 1-1 (continued)
CHRONOLOGY OF EVENTS AND SITE INVESTIGATIONS
Li Tungsten Site
Glen Cove, New York

DATE	EVENT
April 14-16, 1989	USEPA assumes lead enforcement role on response actions at the site. USEPA FIT2 contractor (NUS) initiates Preliminary Assessment.
July 21, 1989	Administrative Order On Consent (ACO) issued by USEPA to Glen Cove Development Corporation which specified nine (9) interim remedial actions.
September 18, 1989	USEPA FIT2 contractor (NUS) issues Preliminary Assessment Report (NUS, 1989).
April 4, 1990	Interim remedial actions completed and final report submitted (HART, 1990).
September 28, 1990	USEPA FIT2 contractor (NUS) issues Site Inspection Report (NUS, 1990).
July 1991	Li Tungsten site proposed for inclusion on the National Priorities List (NPL).
February 12, 1992	Special Notice letters were sent by USEPA to five PRPs (Teledyne, Inc.; Li Tungsten Inc.; the Glen Cove Development Corporation; and Mr. John Li (son of Mr. K. C. Li). These letters gave the PRPs until April 14, 1992 to submit a good faith proposal to finance or undertake an RI/FS. A good faith proposal was received, but subsequent negotiations have not resulted in a settlement.
August 26, 1992	Malcolm Pirnie receives work assignment to prepare RI/FS Work Plan.

TABLE 1-1 (continued)
CHRONOLOGY OF EVENTS AND SITE INVESTIGATIONS
Li Tungsten Site
Glen Cove, New York

DATE	EVENT
August 1995 - April 1996	Malcolm Pirnie completes the second set of interim remedial actions (Phase I and Phase II).
January 4, 1996	NaOH tank leaks.
April 1996	USEPA RAB reponds to acid tank leak.
October 1996- present	USEPA RAB conducts removal actions.
June 1997	Malcolm Pirnie submits Draft Work Plan for Focussed Feasibility Study at the Captain's Cove Site.

TABLE 2-1
SUMMARY OF RADIOLOGICAL FIELD SCREENING MEASUREMENTS AT SURFACE SOIL SAMPLE LOCATIONS
LI TUNGSTEN SITE
GLEN COVE, NY

Sample I.D.	Location	Surface Exposure Rate (µR/hr)	Material Desc./Sample Depth	GM Pancake Detector Scan (cpm)
LT-SS-1	4-inches north of fence on Herb Hill Road on Parcel A	150	Dark brown. topsoil and medium sand (0-12-inches)	2,000
LT-SS-2	15 feet north of the fence on Herb Hill Road on Parcel A	10	Lt. brown fine-medium sand w/ trace gravel (0-6-inches)	100
LT-SS-3	1.5 feet south (inside) of the fence on Parcel A	150	Dark brown organics, moist	500-1,000
LT-SS-4	75 feet west of the fence on Parcel C in the area of the "scarred vegetation" at mound of ore residue.	800 increasing to 1.2 mR/hr at 2-inches depth and decreasing to 900 µR/hr at 5-inches depth	Dark black ore/slag and medium sand w/ trace gravel and organics	3,000
LT-SS-5	At bulkhead on Parcel A	100-150	medium-coarse sand (0-4 inches)	1,000
LT-SS-5A	Same as above	2.5 mR/hr	Rocks located in sample	2,500
LT-SS-6	49 feet north of the fence on lower Parcel B; 62 feet east of GM-8	110	medium sand	300-400

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TABLE 2-1 (cont.)
SUMMARY OF RADIOLOGICAL FIELD SCREENING MEASUREMENTS
AT SURFACE SOIL SAMPLING LOCATIONS
LI TUNGSTEN SITE
GLEN COVE, NY

Sample I.D.	Location	Surface Exposure Rate (µR/hr)	Material Desc./Sample Depth	GM Pancake Detector Scan (cpm)
LT-SS-7	At bulkhead on Parcel A	60-100	medium sand (0-3 inches)	300-500
LT-SS-8	5-feet outside the fence on Parcel B	13-15	medium sand (0-3 inches)	50
LT-SS-9	At bulkhead on Parcel A	13-15	medium-coarse sand	40-50
LT-SS-10	Berm around aboveground fuel oil tank on Lower Parcel C	12-13	fine-medium sand	30-40
LT-SS-11	Lower Parcel C, Mud Pond	15 increasing to 25 at 6 inches depth	Clayey medium sand (0-6 inches)	60-80
LT-SS-12	Parcel C; near BenBow Building.	80 at surface; 420 at 7 inches; 380 at 9 inches.	medium-coarse sand/topsoil (0-9 inches)	800-1000
LT-SS-13	Opposite #48 The Place, north of Parcel B	8	medium-coarse sand/topsoil	20-30
LT-SS-14	0.5 mile east of Site; opposite #30 Herb Hill Road	7	medium-fine sand/topsoil	20-30
LT-SS-15	0.8 mile from Site; adjacent to public school on McLouglin Street	8	medium-coarse sand/topsoil	20-30

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TABLE 2-1 (cont.)
SUMMARY OF RADIOLOGICAL FIELD SCREENING MEASUREMENTS
AT SURFACE SOIL SAMPLING LOCATIONS
LI TUNGSTEN SITE
GLEN COVE, NY

LT-SS-16	West end of Gavies Point Road near Harbor; opposite Captain's Cove Site	8	medium-fine sand/topsoil	20-30
LT-SS-17	Intersection of Glen Cove Road and Charles St.; 0.5 mile southeast of main gate to Site on HerbHill Road	8	medium-fine sand/topsoil	20-30
LT-SS-18	Morris Ave; adjacent to soccer baseball field #5	8	medium-coarse sand/toposil	20-30

TABLE 2-2 RATIONALE FOR NEW MONITORING WELL PLACEMENT	
WELL I.D.	RATIONALE
MP-2D	Deep well coupling for existing well GM-2
MP-4	Replaces existing well GM-4 as a groundwater sample collection point
MP-5	Replaces abandoned well GM-5
MP-6	Replaces missing well GM-6
MP-11D	Deep well coupling for existing well GM-11
MP-16	Replaces missing well GM-16
MP-16D	Deep well coupling for new well MP-16
MP-17	Replaces abandoned well GM-17
MP-18	Upgradient well to existing wells GM-14A and GM-14B
MP-18D	Deep well coupling for new well MP-18
MP-19D	Provides groundwater information from the deeper zone downgradient from the soil/slug piles and disposal areas in Parcel B
MP-20	Provides groundwater information downgradient from the former dry cleaners location, in the vicinity where elevated volatile organic contamination was detected during the soil vapor/HydroPunch survey
MP-21D	Provides groundwater information from the deeper zone in the vicinity of the center of Parcel A
MP-22	Replaces abandoned EMW-3 and EMW-5
MP-22D	Deep well coupling for new well MP-22

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T/ E 2-3
LI TUNGSTEN SUPERFUND SITE
Glen Cove, New York
Monitoring Well Details

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December 1996

LOCATION	WELL	WELL INSTALLATION	DATE OF INSTALLATION	GROUND ELEV.	WELL DEPTH	WELL DEPTH ELEV.	SCREEN INTERVAL (B.G.)		SCREEN INTERVAL ELEV.		SCREEN LENGTH	MEASURING POINT	STEEL CASING ELEV.	DEPTH TO GW 1st Round 11/18/96	GW ELEV. 1st Round	DEPTH TO GW 2nd Round 1/15/97	GW ELEV. 2nd Round
							TOP	BOT.	TOP	BOT.							
Parcel A	GM-1	PI	4/9/87	17.888	14.80	3.09	4.80	14.80	13.09	3.09	10	19.838	20.296	8.16	11.678	8.21	11.628
Parcel B	EMW-1	PI	N/A	16.190	14.10	2.09	4.10	14.10	12.09	2.09	10	17.106	17.798	3.95	13.156	3.99	13.116
Parcel A	MP-2D	MPI	9/27/96	7.094	25.00	-17.91	14.00	24.00	-6.91	-16.91	10	6.927	7.094	7.22	-0.293	7.99	-1.063
Parcel A	GM-2	PI	4/14/87	7.061	16.00	-8.94	2.40	12.40	4.66	-5.34	10	6.978	7.061	1.18	5.798	1.90	5.078
Parcel C	EMW-4	PI	N/A	11.676	18.60	-6.92	8.60	18.60	3.08	-6.92	10	13.676	13.901	5.66	8.016	5.86	7.816
Parcel C	MP-4	MPI	10/10/96	26.859	14.00	12.86	3.00	13.00	23.86	13.86	10	26.651	26.859	1.40	25.251	1.40	25.251
Parcel B	MP-5	MPI	10/22/96	59.664	28.00	31.66	16.00	26.00	43.66	33.66	10	61.231	61.489	19.20	42.031	19.01	42.221
Parcel A	MP-6	MPI	9/27/96	14.561	13.00	1.56	2.00	12.00	12.56	2.56	10	17.561	18.803	6.26	11.301	6.29	11.271
Parcel B	GM-7	PI	4/1/88	18.866	12.90	5.97	2.90	12.90	15.97	5.97	10	21.857	22.274	7.76	14.097	6.64	15.217
Parcel B	GM-8	PI	4/4/88	16.489	12.90	3.59	2.90	12.90	13.59	3.59	10	18.805	19.097	6.47	12.335	6.54	12.265
Parcel C'	MW-8S	PI	12/14/89	57.575	49.50	8.08	N/A	N/A	N/A	N/A	10	58.466	59.133	46.02	12.446	45.80	12.666
Parcel C'	MW-8D	PI	12/14/89	56.814	61.00	-4.19	N/A	N/A	N/A	N/A	10	58.522	58.714	46.02	12.502	45.82	12.702
Parcel B	GM-9	PI	4/4/88	18.803	12.10	6.70	2.10	12.10	16.70	6.70	10	20.886	11.053	3.90	16.986	3.85	17.036
Parcel C'	MW-10	PI	8/5/85	65.376	65.00	0.38	N/A	N/A	N/A	N/A	15	66.751	66.826	55.00	11.751	54.79	11.961
Parcel C'	GM-10	PI	4/7/88	57.687	54.10	3.59	44.10	54.10	13.59	3.59	10	59.921	60.229	47.11	12.811	46.95	12.971
Parcel C'	GM-11	PI	4/8/88	65.717	14.20	51.52	4.20	14.20	61.52	51.52	10	67.684	67.959	8.50	59.184	6.98	60.704
Parcel C'	MP-11D	MPI	10/23/96	65.636	112.00	-46.36	102.00	112.00	-36.36	-46.36	10	68.311	68.528	19.58	48.731	18.30	50.011
Parcel C'	GM-12	PI	4/11/88	47.772	15.00	32.77	4.00	14.00	43.77	33.77	10	50.081	50.389	6.01	44.071	5.79	44.291
Parcel B	GM-13	PI	4/11/88	42.302	16.80	25.50	6.80	16.80	35.50	25.50	10	44.419	44.594	13.46	30.959	12.88	31.539
Parcel C	GM-14A	PI	4/12/88	15.415	17.80	-2.39	7.80	17.80	7.62	-2.39	10	16.440	16.648	2.16	14.280	N/A	N/A
Parcel C	GM-14B	PI	4/14/88	15.117	11.30	3.82	1.30	11.30	13.82	3.82	10	17.567	17.925	6.64	10.927	6.05	11.517
Parcel C	GM-15	PI	4/13/87	18.069	14.30	3.77	4.30	14.30	13.77	3.77	10	17.777	18.069	6.38	11.397	6.48	11.297
Parcel C	MP-16S	MPI	10/16/96	35.563	23.00	12.56	12.00	22.00	23.56	13.56	10	38.405	38.630	1.65	36.755	1.12	37.285
Parcel C	MP-16D	MPI	10/16/96	35.970	53.00	-17.03	43.00	53.00	-7.03	-17.03	10	38.361	38.578	3.56	34.801	3.55	34.811
Parcel A	MP-17	MPI	10/21/96	7.404	14.00	-6.60	3.00	13.00	4.40	-5.60	10	7.208	7.404	1.55	5.658	1.45	5.758
Parcel C	MP-18S	MPI	9/3/96	15.547	12.00	3.55	2.00	12.00	13.55	3.55	10	16.514	N/A	4.36	12.154	N/A	N/A
Parcel C	MP-18D	MPI	9/13/96	15.497	48.00	-32.50	37.00	47.00	-21.50	-31.50	10	18.072	N/A	6.80	11.272	7.28	10.792
Parcel B	MP-19D	MPI	10/22/96	30.100	38.00	-7.90	23.00	33.00	7.10	-2.90	10	32.083	32.400	7.99	24.093	7.82	24.263
Parcel A	MP-20	MPI	9/9/96	15.116	13.00	2.12	2.00	12.00	13.12	3.12	10	16.483	16.691	4.50	11.983	4.56	11.923
Parcel A	MP-21D	MPI	9/26/96	10.799	57.00	-46.20	45.00	55.00	-34.20	-44.20	10	10.632	10.799	1.39	9.242	1.47	9.162
Parcel A	MP-22S	MPI	8/21/96	9.849	13.00	-3.15	2.00	12.00	7.85	-2.15	10	11.140	11.482	5.24	5.900	5.48	5.660
Parcel A	MP-22D	MPI	8/21/96	9.966	47.00	-37.03	36.00	46.00	-26.03	-36.03	10	11.624	12.099	8.68	2.944	9.9	1.724

NOTES:

PI = Well installed as part of a Previous Investigation

MPI = Well installed as part of the Malcolm Pirnie, Inc. Investigation

N/A = Information is not available

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T 2-4.

GAMMA LOGGING RESULTS - AREA 1
LI TUNGSTEN SITE
GLEN COVE, NY

Depth (ft)	GAMMA LOGGING MEASUREMENTS (30 second counts)				
	RT-11	RT-12	RT-13	RT-14	RT-15
0	90903	108278	219230	5451	23106
0.5	108943	119433	250607	6437	18906
1	69331	93015	214583	6892	12623
1.5	40224	57168	132220	7088	8808
2	37335	32053	72943	7343	7603
2.5	41682	20689	40110	7612	7425
3	28531	15744	20346	7650	7224
3.5	15851	12367	13336	7774	7544
4	11020	10178	10881	7994	8119
4.5	9040	8730	10561	7892	9088
5	8367	8385	11724	7784	9563
5.5	8046	7715	10294	7454	8585
6	7741	7815	9162	7146	8609
6.5	7405	8443	8398	7543	8514
7	7282	9050	7882	8382	8178
7.5	7535	9498	8636	8661	8322
8	7694	10425	8344	8024	8498
8.5	7635	10501	7623	8093	8341
9	7224	10168	7081	8023	7918
9.5	6897	8996	8768	8880	7744
10	6335	7391	14122	9732	7585
10.5	6216	5819	14513	9823	7275
11	6219	5755	8832	9487	6811
11.5	6320	6632	6667	8418	6572
12	6247	9509	6942	7936	6662
12.5	5585	5904	5866	8059	6932
13	4792	4693	4557	8785	7271
13.5	4384	4429	4102	8987	7439
14	4321	4367	3731	9412	7623
14.5	B.O.H. = 14'	4994	3623	9874	7991
15		8839	4214	9263	8159
Surface Exposure Rate (uR/h)	250 - 1000	300 - 400	72.5	12	700
Adjusted Surface Exposure Rate (uR/h)	225 - 900	270 - 360	65.25	10.8	630

NOTES: B.O.H. = Bottom of hole

Adjusted Surface Exposure (uR/h) = 0.9 x Surface Exposure (uR/h). The 0.9 adjustment factor is based on a comparison of the NaI readings to readings taken with a pressurized ion chamber.

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GAMMA LOGGIN . RESULTS - AREA 2
LI TUNGSTEN SITE
GLEN COVE, NY

Depth (ft)	GAMMA LOGGING MEASUREMENTS (30 second counts)		
	RT-18	RT-19	RT-20
0	4513	44196	6250
0.5	4187	85202	7405
1	3812	62995	7542
1.5	3387	30533	7837
2	3146	17299	7936
2.5	3311	12404	6857
3	4068	10826	5793
3.5	5702	10594	5172
4	6670	11397	5137
4.5	6823	15538	5957
5	6571	21336	6592
5.5	6605	16502	6212
6	6488	18699	5791
6.5	5888	22457	5865
7	5493	17397	5571
7.5	5140	14389	5539
8	5004	13211	5154
8.5	5123	14093	5242
9	5449	15796	5549
9.5	5693	10871	6399
10	5600	9640	6526
10.5	5535	8155	6546
11	5662	6892	6391
11.5	5719	5926	6350
12	5853	6443	6458
12.5	6108	12493	B.O.H. = 12'
13	5949	6047	
13.5	6532	4462	
14	6686	4111	
14.5	B.O.H. = 14'	B.O.H. = 14'	
15			
Surface Exposure Rate (uR/h)	12	150	13
Adjusted Surface Exposure Rate (uR/h)	10.8	135	11.7

NOTES: B.O.H. = Bottom of hole

Adjusted Surface Exposure (uR/h) = 0.9 x Surface Exposure (uR/h).

The 0.9 adjustment factor is based on a comparison of the NaI readings to readings taken with a pressurized ion chamber.

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T 2-6.

GAMMA LOGGING RESULTS - AREA 3
LI TUNGSTEN SITE
GLEN COVE, NY

Depth (ft)	GAMMA LOGGING MEASUREMENTS (30 second counts)											
	RT-1	RT-2	RT-3	RT-4	RT-5	RT-6	RT-7	RT-8	RT-9	RT-10	RT-16	RT-17
0	32142	24606	91153	5818	92059	13497	145361	21463	4699	5872	4272	4088
0.5	36545	37853	145244	6742	88097	12860	202303	19689	6289	7235	4629	4930
1	39200	34797	197324	7504	97835	10773	220131	19304	6793	8060	4905	5559
1.5	37335	25035	202321	8057	25151	9877	165903	19462	6622	8210	5101	5629
2	30434	17046	153395	8212	16160	9057	96103	19469	5681	7848	4775	4965
2.5	28807	11485	78715	7736	11739	8058	63947	19701	4529	6928	4463	4211
3	20290	9547	35564	6894	10455	7395	46679	19203	4068	6137	4155	3399
3.5	13570	8921	22628	6395	10376	7141	39068	16703	4056	5697	4033	3348
4	10374	8859	16921	6653	10539	6495	37738	13220	4067	5719	4062	3312
4.5	9959	8817	13077	6402	10498	5918	39949	B.O.H. = 4'	4197	5525	4193	3093
5	10409	8167	10289	6782	9486	6025	32617		4640	5458	4887	2852
5.5	9067	7618	9625	7393	7757	5953	19213		5040	5823	5056	2849
6	7670	7098	9387	7332	7068	5403	13737		5358	6265	4462	2584
6.5	7348	7169	8612	6927	6753	5105	11982		5197	5983	4612	2522
7	6689	7506	8146	6739	6106	5462	10963		4842	5224	4846	2542
7.5	7338	7986	7819	6768	5563	5703	9497		4663	5076	4821	2455
8	7651	7941	7770	6511	5157	5735	11038		4831	4803	4704	2370
8.5	6188	7825	7380	6376	4793	4947	17918		5193	4577	4842	2362
9	5399	7738	7323	6855	4043	4594	37924		5196	4247	4579	2288
9.5	5495	7436	7152	7646	3561	4688	35409		5014	3907	4583	2957
10	6080	6689	6744	8377	3584	4361	25110		5396	3862	4636	2367
10.5	6835	6163	6921	8985	3201	4013	38835		5217	3538	B.O.H.=10'	B.O.H.=10'
11	7335	5981	7686	9154	2791	3738	42584		5411	3786		
11.5	7048	5958	7532	9756	2359	3560	35548		6309	4110		
12	6408	6162	6892	9965	2218	3568	23188		6862	4190		
12.5	5763	6810	6684	10075	2040	3475	11900		7539	4041		
13	6097	7948	B.O.H. = 12.5'	10229	2090	3205	7155		8494	3936		
13.5	6566	8989		9626	2827	3238	5961		8978	3937		
14	4986	8550		9411	B.O.H. = 13.5'	B.O.H. = 13.5'	5999		9124	B.O.H.=13.5'		
14.5	4895	7429		9041			6287		9290			
15	4928	6909		8584			B.O.H. = 14.5'		9247			
Surface Exposure Rate (uR/h)	200 - 250	100	150 - 200	11	700	50	250	80 - 100	10	14	12	11
Adjusted Surface Exposure Rate (uR/h)	180 - 225	90	135 - 180	9.9	630	45	250	72 - 90	9	12.6	10.8	9.9

NOTES: B.O.H. = Bottom of hole

Adjusted Surface Exposure (uR/h) = 0.9 x Surface Exposure (uR/h). The 0.9 adjustment factor is based on a comparison of the NaI readings to readings taken with a pressurized ion chamber.

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Table 2-7
BUILDING MATERIALS RADIONUCLIDES SAMPLING
LI TUNGSTEN SUPERFUND SITE
GLEN COVE, NEW YORK

Sample ID No.	Units	LT-BM-01	LT-BM-02	LT-BM-03	LT-BM-04	LT-BM-05	LT-BM-06
Lab Number		962258-0001	962258-0002	962258-0003	962258-0004	962258-0005	962258-0006
Matrix		building material	building material	building material	building material	building material	building material
Radium-226	pCi/g	1.4 +/- 0.23	2.2 +/- 0.31	2.1 +/- 0.30	2.3 +/- 0.30	1.3 +/- 0.31	1.0 +/- 0.33
Thorium-232	pCi/g	0.82 +/- 0.29	23 +/- 9.7	7.4 +/- 2.3	2.5 +/- 0.94	2.2 +/- 0.85	0.48 +/- 0.28
Gamma exposure rate*	µR/h	30 - 40	200 - 300	200 - 300	10 - 15	10 - 15	8
Surface alpha total *	CPM	0	100 - 700	0	50	50 - 70	0

Sample ID No.	Units	LT-BM-07	LT-BM-08	LT-BM-09	LT-BM-10	LT-BM-DUP
Lab Number		962258-0007	962258-0008	962258-0009	962258-0010	962258-0011
Matrix		building material	building material	building material	building material	building material
Radium-226	pCi/g	2.0 +/- 0.33	3.0 +/- 0.42	3.8 +/- 0.64	1.1 +/- 0.19	2.3 +/- 0.36
Thorium-232	pCi/g	0.67 +/- 0.27	6.9 +/- 2.0	1.9 +/- 0.65	0.36 +/- 0.18	6.0 +/- 1.9
Gamma exposure rate*	µR/h	18	80 - 100	20	8	see LT-BM-3
Surface alpha total *	CPM	0	20 - 100	0	0	see LT-BM-3

NOTES:

* = measurements taken at time of sample collection with ZnS detector.

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TABLE 2-8

TOTAL POPULATION WITHIN 3-MILES OF THE SITE
LI TUNGSTEN SITE
GLEN COVE, NY

Distance Ring	Total Population
0-¼ miles	876
¼-½ miles	2,414
½-1 miles	5,633
1-2 miles	20,065
2-3 miles	14,835
Total Population Within 3-Miles of the Site:	**43,823**

Source:
1990 US Bureau of Census STF-1A and TIGER/Line files, prepared by Frost Associates.

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Table 2-9

LAND USE CLASSIFICATION
LI TUNGSTEN SITE
GLEN COVE, NY

Land Use Category	**Percentage of Total Area**
Common Residential (R1)	34
Estate Residential (R4)	6
Metropolitan Natural (A1)	--
Agricultural Rural (A2)	--
Undeveloped (A3 & A4)	--
Water Surfaces (A5)	30
Total Rural Land Use	**70%**
Heavy Industrial (I1)	1
Light-moderate Industrial (I2)	3
Commercial (C1)	5
Compact Residential (R2 & R3)	--
Total Urban Land Use	**9%**

Note:
21% of the area could not be classified as rural or urban due to insufficient data.

TABLE 3-1

MINEOLA, NY 1951 - 1973 40° 44' N 73° 38' W 128 FT

MONTH	TEMPERATURE (°F) MEANS: DAILY MAXIMUM	DAILY MINIMUM	MONTHLY	EXTREMES: RECORD HIGHEST	YEAR	DAY	RECORD LOWEST	YEAR	DAY	MEAN NUMBER OF DAYS MAX: 90° AND ABOVE	32° AND BELOW	MIN: 32° AND BELOW	0° AND BELOW	PRECIPITATION TOTALS (INCHES): MEAN	GREATEST MONTHLY	YEAR	GREATEST DAILY	YEAR	DAY	SNOW, SLEET: MEAN	MAXIMUM MONTHLY	YEAR	GREATEST DEPTH	YEAR	DAY	MEAN NUMBER OF DAYS: 1.0 or MORE	5.0 or MORE	1.00 or MORE
JAN	37.6	26.0	31.8	69	67	24	2	57	16	0	9	24	0	2.60	9.06	52	1.75	62	6	6.0	20.7	63	13.0	61	27	8	2	0
FEB	39.3	26.8	33.0	67	56	15	-1	61	2	0	6	21	0	3.01	9.40	56	2.22	66	13	8.0	28.0	67	29.0	61	5	6	3	1
MAR	49.9	33.0	39.5	76	68	25	9	67	19	0	1	14	0	4.30	9.06	53	2.40	55	13	3.8	24.5	67	17.0	60	5	8	3	1
APR	58.1	42.0	50.1	89	68	25	25	72	8	0	0	1	0	4.08	8.26	73	2.25	59	6	.5	4.0	56	2.0	65	2	7	3	1
MAY	68.4	51.3	59.9	90	62	19	36	67	17	0	0	0	0	3.28	6.82	58	2.58	68	29	.0						6	2	1
JUN	78.1	61.1	69.6	101	52	26	47	72	11	2	0	0	0	2.70	7.24	73	2.05	52	1	.0						6	2	1
JULY	83.3	67.0	75.2	103	66	31	53	62	20	5	0	0	0	3.33	9.26	69	3.15	69	20	.0						6	2	1
AUG	81.9	66.0	73.8	101	73	30	51	65	29	3	0	0	0	3.89	15.00	55	6.20	55	12	.0						6	2	1
SEPT	76.9	59.6	67.2	97	53	2	-1	36	21	1	0	0	0	3.30	9.64	60	4.90	60	12	.0						5	2	1
OCT	66.8	49.3	57.1	88	67	3	29	69	26	0	0	0	0	3.26	7.27	58	4.90	72	7	.1	1.0	62	1.0	62	26	5	2	1
NOV	52.5	39.9	46.2	74	65	2	19	55	29	0	0	4	0	4.10	10.09	72	3.63	72	6	.5	4.0	53	4.0	67	30	7	3	1
DEC	41.4	30.2	35.9	66	63	1	4	62	31	0	5	19	0	3.96	8.99	73	2.35	73	21	6.9	16.0	60	15.0	60	15	7	3	1
YEAR	60.5	46.0	53.3	109	JUL 66	3	-1	DEC 61	2	11	21	93	0	42.49	15.00	AUG 55	6.20	AUG 55	12	20.4	28.0	DEC 67	29.0	DEC 61	9	79	29	11

* ALSO ON EARLIER DATES

Source: National Climatic Data Center, Asheville, NC.

TABLE 3-2

Summary of Geology and Water-Bearing Properties of Deposits Underlying the Northern Part of Town of Oyster Bay, Nassau County, New York *

Series	Geologic Unit	Hydrogeologic Unit	Approximate Range in Thickness (ft)	Character of deposits forming geologic unit *(modified from Swarzenski, 1963, and Isbister, 1966)	Water Bearing Properties
QUATERNARY					
Holocene	Undifferentiated artificial fill, salt-march and swamp deposits, stream alluvium, and shore deposits		0 to 50	Sand, gravel, silt, and clay, organic mud, peat, loam, and shells Colors are gray, green, black, and brown	Highly permeable zones near the shore and in stream valleys may yield small quantities of fresh or brackish water at shallow depths Clay and silt beneath the north-shore harbors retard saltwater encroachment and confine underlying aquifers
Pleistocene	Upper Pleistocene deposits	Upper Glacial Aquifer	10 to 380	Till, composed of unsorted clay, sand, gravel, and boulders Outwash deposits of stratified brown sand and gravel May also contains some lucustrine and marine deposits consisting of clay, silt, and sand, locally fossiliferous	Till, relatively low permeability, may cause local conditions of perched water and impede downward percolation of precipitation Outwash deposits of sand and gravel are highly permeable Wells screened in glacial outwash deposits yield as much as 1,750 gal/min Specific capacities of large-capacity wells range from 14 to 175 (gal/min)/ft of drawdown Water is generally fresh and unconfined but may locally contain saltwater near shores
CRETACEOUS - QUATERNARY					
Upper Cretaceous, Pleistocene, and Holocene	Deposits of Holocene and Pleistocene age, undifferentiated May locally include eroded remnants of the clay member of the Raritan Formation	Port Washington Confining Unit	0 to 360	Clay, solid and silty, gray, gray-green, white, red, mottled, and brown, containing lenses or layers of sand or sand and gravel May locally contain lignite, shells, foraminifera, and other microfossils	Relatively low permeability throughout much of the area May be moderately to highly permeable in areas adjacent to inferred limit of Magothy aquifer where sand and sand and gravel content may be large Confines water in underlying Port Washington and Lloyd aquifers but does not prevent movement of water between upper glacial aquifer and Port Washington aquifer Lenses of sand and sand and gravel provide sources of water with adjacent formations One large capacity well had a reported yield of 2,000 gal/min with a specific capacity of 43 (gal/min)/ft of drawdown Coarser deposits may locally contain saltwater near shores
	Deposits of Pleistocene age, undifferentiated, and/or local errosal remnants of the Lloyd sand member of the Raritan Formation	Port Washington Aquifer	0 to 170	Sand, fine to coarse, white, yellow, gray, and brown, or gray and gravel with interbedded clay, silt and sandy clay	Moderately to highly permeable One large capacity well had a reported yield of 1,100 gal/min with a specific capacity of 11 (gal/min)/ft of drawdown Water is under artesian pressure Generally contains freshwater but may have high iron content
CRETACEOUS					
Upper Cretaceous	Matawan Group Magothy Formation Undifferentiated	Magothy Aquifer	0 to 610	Clay, silt, sand, and sand, fine to medium, clayey, white, gray, yellow, pink, and multicolored, in lenticular beds May contain lenticular beds of coarse sand and gravel in lower part of unit Lignite, pyrite and iron oxide concretions may occur throughout the unit	Moderately to highly permeable Wells screened in lower part of aquifer yield as much as 1,400 gal/min Specific capacities of large capacity wells commonly range from 10 to 50 (gal/min)/ft of drawdown but may be as high as 80 (gal/min)/ft Aquifer is principal source for public supply Water is generally of excellent quality Degree of confinement under artesian pressure is variable, however, artesian conditions increase with depth Hydraulic continuity may exist between the Magothy aquifer and continuous Pleistocene aquifers
	Clay Member (Raritan Formation)	Raritan Clay Confining Unit	0 to 185	Clay, solid and silty, gray, white, red and mottled May contain lenses or layers of fine to medium sand which may locally contain gravel Sand layers frequently occur near top of unit Lignite and pyrite are common	Relatively low permeability Confines water in underlying Lloyd aquifer but does not prevent movement of water between Magothy and Lloyd aquifers
	Lloyd Sand Member (Raritan Formation)	Lloyd Aquifer	0 to 195	Sand, fine to coarse, white, yellow, or gray, and gravel, commonly in a clayey matrix Contains lenses and layers of solid or silty clay Beds are usually lenticular and frequently show great lateral changes in composition	Moderately permeable Large-capacity wells may yield as much as 1,600 gal/min, specific capacities commonly range from 10 to 19 (gal/min)/ft of drawdown Water is confined under artesian pressure, some wells flow Water is generally of excellent quality but may have high iron content
PRECAMBRIAN					
	Crystalline Rocks	Bedrock	Not Known	Metamorphic and igneous rocks, muscovite-biotite schist, gneiss, and granite May have weathered zone at top	Relatively low permeability Contains some water in fractures but impracticable to develop owing to low permeability

TABLE 3-3
LI TUNGSTEN SUPERFUND SITE
Glen Cove, New York
Geologic Log of Water Supply Well N1917

Material	Thickness (feet)	Depth (feet)
Fill	2	2
Gravel, sand, and clay, brownish-gray	6	8
Clay, gray, plastic with pebbles	49	57
Gravel, light yellow, clean	14	71
Sand, coarse, and gravel, light yellow, clean	2	73
Gravel, fine and coarse sand	22	95
Clay, gray	47	150
Clay, gray, with some gravel	15	165
Silt, fine sand, clean, light brick red	25	190
Clay, dark gray, plastic, very little silt	25	215
Sand, fine, and silt light gray	77	292
Sand, medium to fine, white, some clay	3	295
Sand, coarse, and gravel, white, clean	16	311
Casing: 8 inch to 6 inch		
Screen: 10 feet of 6 inch with bottom at 306 feet		

NOTES:

1. Supply Well N1917. Wah Chang Trading Corp., 63 Herb Hill Road, Glen Cove, NY. Drilled by C.W. Lauman and Company, Inc., May 1943. Altitude about 10 feet above sea level. Log begins at log surface. Log based on examination of samples by W. DeLaguna (US Geol. Survey).

2. Publication NYSDEC Water Power and Control Commission, Record of Wells in Nassau County, NY, Supplement 1. Prepared by the USGS in cooperation with Water Power and Control Commission, and the Nassau County Department of Public Works. Bulletin GW-10 Albany, 1946, page 145.

G:\8001202\FINALRI\TABLE3-3.WPD

TABLE 3-4
LI TUNGSTEN SUPERFUND SITE
Glen Cove, New York
Summary of Hydraulic Conductivity Results

Well I.D.	Location	Test Type	Hydraulic Conductivity(cm/s)
GM-1	Parcel A	Rising Head	7.0E-04
GM-2	Parcel A	Rising Head	5.5E-05
MP-4	Parcel C	Rising Head	1.4E-04
MP-5	Parcel B	Falling Head	7.9E-04
MP-5	Parcel B	Rising Head	2.2E-04
MP-6	Parcel A	Rising Head	6.0E-03
GM-7	Parcel B	Rising Head	3.3E-05
GM-9	Parcel B	Rising Head	1.1E-03
GM-12	Parcel C'	Rising Head	5.4E-05
GM-14A	Parcel C	Rising Head	1.2E-03
GM-15	Parcel C	Rising Head	2.6E-04
MP-16D	Parcel C	Falling Head	9.9E-06
MP-18S	Parcel C	Rising Head	1.8E-04
MP-18D	Parcel C	Falling Head	3.4E-05
MP-19D	Parcel B	Falling Head	2.2E-02
MP-19D	Parcel B	Rising Head	2.0E-02
MP-20	Parcel A	Rising Head	9.5E-04
MP-21D	Parcel A	Rising Head	2.5E-04

TABLE 3-5

VEGETATION INVENTORY
SEPTEMBER - NOVEMBER, 1996
LI TUNGSTEN SITE

Scientific Name	Common Name
Trees and Shrubs	
Acer negundo	Box Elder
Acer rubrum	Red Maple
Acer saccharinum	Silver Maple
Ailanthus altissima	Tree-of-Heaven
Albizia julibrissin	Mimosa-tree
Betula populifolia	Gray Birch
Carya sp.	Hickory
Cornus florida	Flowering Dogwood
Fraxinus spp.	Ash
Lindera benzoin	Spicebush
Liriodendron tulipifera	Tulip Tree
Morus sp.	Mulberry
Nyssa sylvatica	Black Gum
Paulownia tomentosa	Royal Paulownia
Pinus strobus	White Pine
Populus tremuloides	Quaking Aspen
Prunus serotina	Black Cherry
Quercus alba	White Oak
Quercus rubra	Red Oak
Quercus palustris	Pin Oak
Quercus velutina	Black Oak
Rhus glabra	Smooth Sumac
Robinia pseudoacacia	Black Locust
Salix babylonica	Weeping Willow
Salix discolor	Pussy Willow
Sassafras albidum	Sassafras
Ulmus fulva	Slippery Elm
Viburnum recognitum	Northern Arrow-wood
Herbaceous, Vines	
Ambrosia artemisiifolia	Common Ragweed
Andropogon scoparius	Little Blue Stem
Andropogon virginicus	Broomsedge
Artemisia vulgaris	Common Mugwort
Ascarum shuttleworthii	Wild Ginger
Aster spp.	Aster
Carex sp.	Sedge
Carex scoparia	Sedge
Carex stricta	Tussock Sedge

TABLE 3-5 (Continued)

VEGETATION INVENTORY
SEPTEMBER - NOVEMBER, 1996
LI TUNGSTEN SITE

Scientific Name	Common Name
Herbaceous, Vines (Continued)	
Celastrus orbiculatus	Asiatic Bittersweet
Chimaphila maculata	Striped Wintergreen
Daucus carota	Queen Anne's Lace
Fragaria virginiana	Common Strawberry
Glechoma hederacea	Ground Ivy
Hedera helix	English Ivy
Impatiens sp.	Jewelweed
Impatiens capensis	Jewelweed
Lonicera japonica	Japanese Honeysuckle
Oenothera biennis	Evening Primrose
Osmunda regalis	Royal Fern
Parthenocissus quinquefolia	Virginia Creeper
Phragmites australis	Giant Reed
Plantago major	Common Plantain
Poa sp.	Grass
Polygonum biflorum	Smooth Solomon's Seal
Rosa multiflora	Multiflora Rose
Scirpus cyperinus	Wool Grass
Smilacina racemosa	False Solomon's Seal
Smilax glauca	Greenbriar
Smilax rotundifolia	Greenbriar
Solidago spp.	Goldenrod
Symplocarpus foetidus	Skunk Cabbage
Toxicodendron radicans	Poison Ivy
Viola sp.	Violet
Vitis aestivalis	Fox Grape

TABLE 3-6

WILDLIFE INVENTORY
SEPTEMBER - NOVEMBER 1996
LI TUNGSTEN SITE

Scientific Name	Common Name	Number of Individuals Observed	Species Activity	Vegetative Stratum	Notes
Birds					
Botaurus lentiginosus	American Bittern	1	foraging	mud flats	Mosquito Creek
Carduelis tristis	American Goldfinch	2	roosting	tree canopy	
Charadrius vociferus	Killdeer	1	flying	ground cover	Heard; not seen
Colaptes auratus	Common Flicker	1	flying, roosting	tree canopy	
Corvus brachyrhynchos	American Crow	10	flying, roosting	tree canopy	
Cyanocitta cristata	Blue Jay	6	flying	tree canopy	
Dumetella carolinensis	Gray Catbird	1	roosting, foraging	tree canopy	
Larus spp.	Gulls	25	flying, foraging	mud flats	Mosquito Creek
Mimus polyglottos	Northern Mockingbird	2	roosting, flying	tree canopy	
Pandion haliaetus	Osprey	1	roosting, flying	tree canopy	near edge of Mosquito Creek
Parus bicolor	Tufted Titmouse	4	roosting, foraging	tree canopy	
Sitta sp.	Nuthatch	1	roosting, foraging	tree canopy	
Turdus migratorius	American Robin	3	foraging, flying	ground cover	
Zenaida macroura	Mourning Dove	5	foraging, flying	ground cover	
Mammals					
Felis domestica	Feral Cat	1	foraging	ground cover	
Mus musculus	House Mouse	2	foraging	ground cover	one dead
Procyon lotor	Raccoon	1		ground cover	only tracks observed
Rattus norvegicus	Norway Rat	2	foraging	ground cover	one dead
Vulpes vulpes	Red Fox	1	foraging	ground cover	unhealthy looking
Reptiles/Amphibians					
Thamnophis sirtalis	Common Garter Snake	1	slithering	ground cover	near tanks

Note: This table includes only those species observed at the time of inventory. Habitat exists for additional species of birds, mammals, reptiles and amphibians.

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TABLE 3-7

POTENTIAL THREATENED AND ENDANGERED SPECIES
LI TUNGSTEN SITE

Species Name	Status	Description
Orange Fringed Orchis (Platanthera ciliaris)	T	This vascular plant has yellow or orange fringed flowers with a spur about 1" long, somewhat longer than the flower. It flowers in late summer and inhabits bogs and sandy woods [a].
Pencil-flower (Stylosanthes biflora)	U	This vascular plant has yellow flowers, 1/2" long, growing singly or in small clusters at the ends of the branches. It flowers in the Summer and inhabits dry woods and fields [a].
Red Milkweed (Asclepias rubra)	U	This vascular plant has purplish-red flowers, with hoods about 1/3" long. The horns are nearly erect and almost as long as the hoods. It flowers in the Summer and inhabits wet pinelands and bogs [a].
Virginia Snakeroot (Aristolochia serpentaria)	U	This vascular plant is a member of the Birthwort family (Aristolochiaceae). It has brownish-purple flowers on 1 - 2" stalks at the base of the plant. It flowers in early summer and inhabits rich woods [a].
White Milkweed (Asclepias variegata)	T	This vascular plant has small white flowers with purplish centers, in dense umbels. It flowers in late spring and early summer, and inhabits dry woods[a].

Notes:

T = Threatened Status in New York
U = Unprotected in New York

[a]Newcomb, 1977.

Source: NYSDEC, 1997

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TABLE 4-1

RADIATION UNITS

Parameter	Historical		International	
	Unit	Abbrev.	Unit	Abbrev.
Quantity	Curie	Ci	Becquerel	Bq
Radionuclide Concentration in Soil or Other Solid Material	picoCurie per gram of Solid	pCi/g	Becquerel per kilogram	Bq/kg
Radionuclide Concentration in Water	picoCurie per liter of Water	pCi/L	---	---
Radon Gas Conc.	picoCurie per liter of Air	pCi/L	Becquerel per cu. meter	Bq/m^3
Radon Progeny Conc.	Working Level	WL	---	---
Exposure Rate	micro-Roentgen per hour	$\mu R/h$	---	---
Dose	Radiation Absorbed Dose	rad	Gray	Gy
Dose Equivalent	Radiation Equivalent Man	rem	Sievert	Sv

Table 5-1

PARAMETER LIST AND ANALYTICAL METHODS

Parameter	Media	Analytical Method
^{238}U	Soil	EPA-600/4-80-032, Prescribed Procedures for Measurement of Radioactivity in Drinking Water, August 1980, Method 908.1
^{226}Ra and ^{228}Ra	Soil	EPA-600/4-80-032, Prescribed Procedures for Measurement of Radioactivity in Drinking Water, August 1980, Method 901.1
^{230}Th and ^{232}Th	Soil	Alpha Spectroscopy, SOP CA-GLR-01.0, Rev. 2
^{238}U	Aqueous	Alpha Spectroscopy, SOP CA-GLR-01.0, Rev. 2
^{226}Ra	Aqueous	EPA-600/4-80-032, Prescribed Procedures for Measurement of Radioactivity in Drinking Water, August 1980, Method 903.0
^{228}Ra	Aqueous	EPA-600/4-80-032, Prescribed Procedures for Measurement of Radioactivity in Drinking Water, August 1980, Method 904.0
^{230}Th and ^{232}Th	Aqueous	Alpha Spectroscopy, SOP CA-GLR-01.0, Rev. 2
TCL Volatiles, Semi-Volatiles, Pesticides/PCBs	Soil and Aqueous	USEPA Contract Laboratory Program (CLP) Statement of Work (SOW) for Organic Analysis, Multi-Media, Multi-Concentration, OLM03.2
TAL Inorganics, including Cyanide	Soil and Aqueous	USEPA CLP SOW for Inorganic Analysis, Multi-Media, Multi-Concentration, ILM04.0
Total Organic Carbon	Soil	Methods of Soil Analysis, Part 2, Chemical and Microbiological Properties American Society of Agronomy, 1965, Method 90-3, Walkley-Black Method
pH	Soil	USEPA 9045A, Test Methods for Evaluating Solid Waste, Laboratory Manual, Physical/Chemical Methods, SW-846
TCLP Volatiles	Soil	USEPA 8240, Test Methods for Evaluating Solid Waste, Laboratory Manual, Physical/Chemical Methods, SW-846
TCLP Semi-Volatiles	Soil	USEPA 8270, Test Methods for Evaluating Solid Waste, Laboratory Manual, Physical/Chemical Methods, SW-846
TCLP Herbicides	Soil	USEPA 8150A, Test Methods for Evaluating Solid Waste, Laboratory Manual, Physical/Chemical Methods, SW-846
TCLP metals	Soil	USEPA 6000 Series, Test Methods for Evaluating Solid Waste, Laboratory Manual, Physical/Chemical Methods, SW-846
Total Dissolved Solids	Aqueous	USEPA 160.2 Methods for Chemical Analysis of Water and Wastes, EPA 600/4/79-020
Hydraulic Conductivity	Soil	ASTM D5084-90, Standards for Construction, Volume 4.08, 1992
Atterberg Limits	Soil	ASTM D4318-84, Standards for Construction, Volume 4.08, 1992
Moisture Content	Soil	ASTM D2216-92, Standards for Construction, Volume 4.08, 1992
Grain Size Distribution	Soil	ASTM D422-63, Standards for Construction, Volume 4.08, 1992
Bulk Density - Maximum Index	Soil	ASTM D4253-94, Standards for Construction, Volume 4.08, 1992.
Bulk Density - Minimum Index	Soil	ASTM D4254-91, Standards for Construction, Volume 4.08, 1992.

Table 5-2.
DETERMINATION OF SITE-SPECIFIC BACKGROUND RADIONUCLIDE CONCENTRATIONS IN GROUNDWATER
LI TUNGSTEN SITE
GLEN COVE, NY

	Round 1		Round 2		Off-Site	Site-Specific
	MP-5	MP-11D	MP-5	MP-11D	Konica-1	Average
RADIONUCLIDE	(pCi/L)	(pCi/L)	(pCi/L)	(pCi/L)	(pCi/L)	(pCi/L)
U-238	0.29	4.1	1.6	<0.46	4.6	<2.2
Th-230	ND	1.2	<0.22	<0.29	<1.4	<0.6
Th-232	<0.50	1.7	0.29	<0.38	<0.99	<0.8
Ra-226	ND	6.4	1.6	<0.35	1	<1.9
Ra-228	<0.94	5.2	1.5	<0.95	4.8	<2.7

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Table 5-3.
DETERMINATION OF SITE-SPECIFIC RADIONUCLIDE BACKGROUND CONCENTRATIONS IN SOILS
LI TUNGSTEN SITE
GLEN COVE, NY

	RADIONUCLIDE				
	U-238	Th-230	Th-232	Ra-226	Ra-228
SAMPLING STATION	(pCi/g)	(pCi/g)	(pCi/g)	(pCi/g)	(pCi/g)
MP-5	0.50	1.1	1.1	1.4	ND
MP-5B	0.4	1.6	1.1	0.75	1.6
MP-11D	<0.30	<0.23	0.34	0.81	0.81
MP-11DB	0.71	0.99	0.58	0.99	0.32
SB-13	0.60	0.8	0.95	1.1	1.4
SB-13B	0.10	0.99	1.1	1.2	1.0
TP-6	1.1	1.3	1.5	1.3	1.7
SS-13	0.85	<0.24	0.61	<0.30	0.95
SS-14	0.76	ND	0.65	0.74	0.76
SS-15	0.85	<0.23	0.49	1	1.1
SS-16	0.9	<0.24	0.66	0.77	0.99
SS-17	0.76	ND	0.44	0.95	1.1
SS-18	0.91	0.92	1.2	0.82	1.2
SITE-SPECIFIC AVERAGE	<0.7	<0.7	0.8	<1.0	1.1
1.5X SITE-SPECIFIC AVERAGE	<1.1	<1.1	1.2	<1.5	1.7

Table 5-4.
DETERMINATION OF SITE-SPECIFIC BACKGROUNG CONCENTRATION OF INORGANICS
LI TUNGSTEN SITE
GLEN COVE, NY

CONSTITUENT	SB-13 (mg/Kg)	SB-13B (mg/Kg)	MP-5 (mg/Kg)	MP-5B (mg/Kg)	MP-11D (mg/Kg)	MP-11DB (mg/Kg)	TP-6 (mg/Kg)	Site-Specific Average (mg/Kg)
Aluminium	11,500	6,890	15,400	3,760	3,930	5,550	20,700	9,676
Antimony	ND	ND	ND	ND	ND	ND	1.6 J	0.3
Arsenic	R	2.4 E	14.9	6.5	4.4	4.5	5.1 E	6.3
Barium	58	87.4	62.8	32.8 J	11.5 J	18.2 J	72.6	49
Beryllium	0.71 J	1.1	ND	ND	ND	0.75 J	0.84 J	0.5
Cadmium	ND	ND	ND	ND	ND	ND	ND	ND
Calcium	555 J	2,120	1,180	681 J	91.1 J	66.1 J	884 J	796
Chromium	20.8	23	21.9	7.7	6.5 E	14	34.4	18.3
Cobalt	8.4 J	7.6 J	15.9	2.6 J	2.2 J	1.6 J	11.6	7.1
Copper	10.1 E	9.6 E	26.9 E	7.5 E	4.1 J	38.6	15.1 E	15.9
Iron	15,500	12,100	36,700	25,400	7,040	12,700	32,000	20,206
Lead	16.1	5.1 E	103	3.9	15.3 E	11.1 E	9.8	23
Magnesium	2,200	2,370	2,250	1,230 J	790 J	1,510	4,510	2,122
Manganese	626	2220 E	541 E	407 E	125 E	55 E	673 E	664
Mercury	0.06 J	ND	0.11	ND	ND	ND	ND	0.03
Nickel	11.1 E	21 E	18.2	8.4 J	4.1 J	6.5 J	19.8	12.7
Potassium	1,260	2,100	1,270	1,140 J	422 J	919 J	2,790	1,414
Selenium	ND	1.9 E	2.7	ND	R	R	1.4 E	0.9
Silver	ND	ND	0.6 J	ND	ND	0.34 J	ND	0.1
Sodium	49.9 J	62.2 J	84.5 J	73.5 J	ND	ND	91.3 J	51.6
Thallium	ND	1.1 J	ND	ND	ND	ND	ND	0.2
Vanadium	27.7	15.9	46.3	15.3	4.7 J	20.6	0.45	18.7
Zinc	42.7 E	62.5 E	81.2	15.9	13.9 E	34 E	57 E	44

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Table 5-5.
AVERAGE CONCENTRATION OF INORGANICS AND RADIONUCLIDES IN ORE RESIDUE SAMPLES
LI TUNGSTEN SITE
GLEN COVE, NY

INORGANIC CONSTITUENT	ORE-1	ORE-2	ORE-3	AVERAGE CONCENTRATION
	(mg/Kg)	(mg/Kg)	(mg/Kg)	(mg/Kg)
Aluminium	12,800	15,800	17,100	15,223
Antimony	R	R	R	R
Arsenic	279	428	495	401
Barium	994	534	506	678
Beryllium	1.6 E	6.2 E	ND	2.6
Cadmium	28.4	11.9	74.6	38.3
Calcium	24,600 E	23,400	12,500	20,167
Chromium	391	328	414	378
Cobalt	10,800	4,580	7,070	7,483
Copper	50,400	12,600	64,400	42,467
Iron	90,700	98,700	93,200	94,200
Lead	1,580 E	4,910	1,300 E	2,597
Magnesium	5,320	14,100	3,980	7,800
Manganese	21,000	9,320	11,600	13,973
Mercury	1.1 E	2.8 E	1.3 E	1.7
Nickel	22,000	13,100	24,600	19,900
Potassium	762 J	367 J	1,140	756
Selenium	55.9	107	60.3	74
Silver	105	106	122	111
Sodium	35,500	30,600	21,400	29,167
Thallium	R	R	R	R
Vanadium	50.5	119	554	241
Zinc	5,460	5,040	5,980	5,493
RADIOLOGICAL CONSTITUENT	(pCi/g)	(pCi/g)	(pCi/g)	(pCi/g)
Uranium-238	54 E	46	8.5	36
Radium-226	20	10	2.7	11
Radium-228	15	11	5.2	10
Thorium-230	35 E	21 E	6.6 E	21
Thorium-232	16	9.6	5.7	10

TABLE 7-1

RADIONUCLIDES OF POTENTIAL CONCERN
LI TUNGSTEN SITE

RADIONUCLIDE	ROPC
URANIUM SERIES	
Uranium-238*	X
Uranium-234	X
Thorium-230*	X
Radium-226*	X
Lead-210	X
THORIUM SERIES	
Thorium-232*	X
Radium-228*	X
Thorium-228	X

X: Selected as a radionuclide of potential concern.
*: Radionuclide analyzed by laboratory.

TABLE 7-2 (Continued)

SUMMARY OF RADIONUCLIDES IN ALL SOILS
LI TUNGSTEN SITE

RADIONUCLIDE	AREA A		AREA B		AREA B&C		AREA C		BACKGROUND	
	Sample Size	Range of Concentrations[1] pCi/g	Sample Size	Range of Concentrations[1] pCi/g	Sample Size	Range of Concentrations[1] pCi/g	Sample Size	Range of Concentrations[1] pCi/g	Sample Size	Range of Concentrations[2] pCi/g
Uranium-238	35	<0.3 - 110	16	<0.2 - 3.7	67	<0.2 - 470	21	0.4 - 27	13	<0.1 - 1.1
Radium-226	34	<0.36 - 41	16	0.41 - 5	67	<0.32 - 250	21	0.97 - 9.7	13	<0.3 - 1.4
Radium-228	34	<0.22 - 530	16	<0.52 - 48	67	<0.31 - 420	21	0.78 - 37	13	<0.32 - 1.7
Thorium-230	34	<0.21 - 58	16	0.41 - 7.8	64	<0.1 - 310	21	0.56 - 13	13	<0.16 - 1.6
Thorium-232	34	0.26 - 93	16	0.66 - 16	64	<0.32 - 220	21	<0.47 - 24	13	0.34 - 1.5

1 = Range of detected concentrations.
2 = Background samples are surface and subsurface combined.

301311

TABLE 7-2

SUMMARY OF RADIONUCLIDES IN SURFACE SOIL
LI TUNGSTEN SITE

RADIONUCLIDE	AREA A		AREA B		AREA B&C		AREA C		BACKGROUND	
	Sample Size	Range of Concentrations[1] pCi/g	Sample Size	Range of Concentrations[1] pCi/g	Sample Size	Range of Concentrations[1] pCi/g	Sample Size	Range of Concentrations[1] pCi/g	Sample Size	Range of Concentrations[2] pCi/g
Uranium-238	23	<0.3 - 110	11	0.3 - 3.7	34	0.2 - 470	11	0.4 - 27	13	<0.1 - 1.1
Radium-226	22	0.58 - 41	11	0.54 - 5.0	34	0.77 - 250	11	1.2 - 9.7	13	<0.3 - 1.4
Radium-228	22	<0.29 - 530	11	<0.52 - 48	34	<0.31 - 420	11	0.91 - 37	13	<0.32 - 1.7
Thorium-230	22	<0.21 - 58	11	0.41 - 7.8	31	<0.21 - 310	11	0.76 - 13	13	<0.16 - 1.6
Thorium-232	22	0.30 - 93	11	0.72 - 16	31	0.36 - 220	11	<0.47 - 24	13	0.34 - 1.5

1 = Range of detected concentrations.
2 = Background samples are surface and subsurface combined.

301312

TABLE 7-3

SUMMARY OF RADIONUCLIDES IN GROUNDWATER
LI TUNGSTEN SITE

RADIONUCLIDE	Li Tungsten Site		Background		USEPA MCLs [2]	NYSDEC WQS[3]
	Sample Size	Range of Concentrations[1] pCi/l	Sample Size	Range of Concentrations[1] pCi/l	pCi/l	Human Health Standards (pCi/L)
Uranium-238	60	<0.23 - 80	5	0.29 - 4.6	NA	NA
Radium-226	60	<0.2 - 11	5	<0.35 - 10	5 [4]	5g [4]
Radium-228	60	<0.94 - 10	5	<0.94 - 5.2	5 [4]	5g [4]
Thorium-230	59	<0.22 - 9.4	5	<0.22 - 1.4	NA	NA
Thorium-232	59	<0.2 - 7	5	0.29 - 1.7	NA	NA

[1] Range of detected concentrations.
[2] USEPA Maximum Contaminant Levels; 40 CFR Part 141
[3] NYSDEC Water Quality Standards and
Guidance Values (NYSDEC, 1993). Standards
and guidance values (designated "g") for Class GA groundwater.
[4] 5 pCi/l MCL is combined for Radium 226 and 228.
NA = Not Available

301313

TABLE 7-4

SUMMARY OF RADIONUCLIDES IN SEDIMENT
LI TUNGSTEN SITE

RADIONUCLIDE	PARCEL B Sample Size	PARCEL B Range of Concentrations[1] pCi/g	PARCEL C Sample Size	PARCEL C Range of Concentrations[1] pCi/g	BACKGROUND Sample Size	BACKGROUND Range of Concentrations[2] pCi/g
Uranium-238	2	0.89 - 0.9	2	0.58 - 1.7	13	<0.1 - 1.1
Radium-226	2	1.0 - 1.1	2	0.94 - 2.2	13	<0.3 - 1.4
Radium-228	2	<0.27 - 1.2	2	0.91 - 1.8	13	<0.32 - 1.7
Thorium-230	2	<0.24 - 0.32	2	0.2 - 1.3	13	<0.16 - 1.6
Thorium-232	2	0.52 - 0.78	2	0.56 - 1.5	13	0.34 - 1.5

1 = Range of detected concentrations.
2 = Background samples are surface and subsurface combined.

301314

TABLE 7-5
SUMMARY OF COMPLETE EXPOSURE PATHWAYS:
RADIOLOGICAL RISK ASSESSMENT
LI TUNGSTEN SITE

Potentially Exposed Population	Exposure Route, Medium, and Exposure Point	Pathway Selected for Evaluation?	Location	Reason for Selection or Exclusion
Current Land Use				
Site Workers	Ingestion of radionuclides in surface soil. External exposure to penetrating radiation.	No	Areas A, B, B&C, C	Site is not currently used.
Trespassers	Ingestion of radionuclides in surface soil. External exposure to penetrating radiation.	No	Area A	Parcel A is currently paved.
Trespassers	Ingestion of radionuclides in surface soil. External exposure to penetrating radiation.	Yes	Areas B, B&C, C	Contaminated surface soil may be encountered by trespassers. Presence of gamma-emitting radionuclides in surface soil is possible.
Trespassers	Ingestion of radionuclides in sediment. External exposure to penetrating radiation.	Yes	Parcels B, C	Contminated sediment may be encountered by trespassers. Presence of gamma-emitting radionuclides in sediment is possible.
Off-Site Residents	Inhalation of radionuclides on respirable particulates.	Yes	Offsite	Contaminated soil particles may became airborne.

301315

TABLE 7-5 (continued)
SUMMARY OF COMPLETE EXPOSURE PATHWAYS:
RADIOLOGICAL RISK ASSESSMENT
LI TUNGSTEN SITE

Potentially Exposed Population	Exposure Route, Medium, and Exposure Point	Pathway Selected for Evaluation?	Location	Reason for Selection or Exclusion
Future Land Use				
Trespassers	Ingestion of radionuclides in surface soil. External penetrating radiation from surface soil.	Yes	Areas A, B, B&C, C	Contaminated surface soil may be encountered by trespassers. Presence of gamma-emitting radionuclides in surface soil is possible.
Trespassers	Ingestion of radionuclides in sediment. External exposure to penetrating radiation.	Yes	Parcels B, C	Contminated sediment may be encountered by trespassers. Presence of gamma-emitting radionuclides in sediment is possible.
Site Workers	Ingestion of radionuclides in surface soil. External penetrating radiation from surface soil.	Yes	Areas A, B, B&C, C	Contaminated surface soil may be encountered by site workers. Presence of gamma-emitting radionuclides in surface soil is possible.
Construction Workers	Ingestion of radionuclides in soil. External penetrating radiation from soil. Inhalation of radionuclides on respirable particulates.	Yes	Areas A, B, B&C, C	Contaminated soil may be encountered by construction workers during construction activities. Presence of gamma-emitting radionuclides is possible. Contaminated soil particles may become airborne if disturbed during construction activities.

301316

TABLE 7-5 (continued)
SUMMARY OF COMPLETE EXPOSURE PATHWAYS:
RADIOLOGICAL RISK ASSESSMENT
LI TUNGSTEN SITE

Potentially Exposed Population	Exposure Route, Medium, and Exposure Point	Pathway Selected for Evaluation?	Location	Reason for Selection or Exclusion
Residents	Ingestion of radionuclides in soil. External penetrating radiation from soil. Ingestion of radionuclides in home-grown produce. Inhalation of radon decay products.	Yes	Areas A, B, B&C , C	Contaminated surface soil may be encountered by residents; presence of gamma-emitting radiation is possible. Radiolonuclides in soil may be incorporated in locally grown produce. Decay of COPCs may lead to elevated levels of indoor radon decay products.
Site Workers	Ingestion of radionuclides in groundwater.	Yes	On or Off Site	The possibility of future potable use of the groundwater exists.
Residents	Ingestion of radionuclides in groundwater.	Yes	On or Off Site	The possibility of future potable use of the groundwater exists.

301317

TABLE 7-6

MATRIX OF POTENTIAL EXPOSURE ROUTES
RADIOLOGICAL RISK ASSESSMENT
LI TUNGSTEN SITE

Exposure Medium/ Exposure Route	Adolescent Trespassers	Site Workers	Construction Workers	Residents
Surface Soil				
Ingestion	T	A	--	--
External Penetrating	T	A	--	--
All Soils				
Ingestion	--	--	A	L,C
External Penetrating	--	--	A	L,C
Respirable Particulates				
Inhalation	--	--	A	L,C
Sediment				
Ingestion	T	--	--	--
External Penetrating	T	--	--	--
Groundwater				
Ingestion	--	A	--	L,C

Notes:
L = Lifetime exposure for adults
A = Exposure to adults in a non-residential scenario
T = Teenaged Adolescents
C = Children

TABLE 7-7

EXPOSURE POINT CONCENTRATIONS
LI TUNGSTEN SITE

Adolescent Trespasser and Site Worker: Ingestion of and External Penetrating Radiation from surface soil at Areas A, B, B&C, C

RADIONUCLIDE	AREA A	AREA B	AREA B&C	AREA C
Uranium-238	8.43E+00 pCi/g UCLlog	2.59E+00 pCi/g UCLlog	3.07E+02 pCi/g UCLlog	2.70E+01 pCi/g MAX
Uranium-234	8.53E+00 pCi/g *	3.63E+00 pCi/g *	3.07E+02 pCi/g *	2.70E+01 pCi/g *
Thorium-230	1.04E+01 pCi/g UCLlog	5.49E+00 pCi/g UCLlog	2.14E+02 pCi/g UCLlog	1.16E+01 pCi/g UCLlog
Radium-226	6.75E+00 pCi/g UCLlog	2.82E+00 pCi/g UCLlog	8.49E+01 pCi/g UCLlog	6.81E+00 pCi/g UCLlog
Lead-210	8.53E+00 pCi/g *	3.63E+00 pCi/g *	8.49E+01 pCi/g *	6.81E+00 pCi/g *
Thorium-232	2.35E+01 pCi/g UCLlog	7.04E+00 pCi/g UCLlog	8.81E+01 pCi/g UCLlog	1.65E+01 pCi/g UCLlog
Radium-228	1.51E+02 pCi/g UCLlog	1.78E+01 pCi/g UCLlog	2.49E+02 pCi/g UCLlog	1.56E+01 pCi/g UCLlog
Thorium-228	1.51E+02 pCi/g **	1.78E+01 pCi/g **	2.49E+02 pCi/g **	1.61E+01 pCi/g **

Adolescent Trespasser: Ingestion of and External Penetrating Radiation from sediment at Parcels B and C

	PARCEL B	PARCEL C
Uranium-238	9.00E-01 pCi/g MAX	1.70E+00 pCi/g MAX
Uranium-234	7.70E-01 pCi/g *	1.75E+00 pCi/g *
Thorium-230	3.20E-01 pCi/g MAX	1.30E+00 pCi/g MAX
Radium-226	1.10E+00 pCi/g MAX	2.20E+00 pCi/g MAX
Lead-210	7.70E-01 pCi/g *	1.75E+00 pCi/g *
Thorium-232	7.80E-01 pCi/g MAX	1.50E+00 pCi/g MAX
Radium-228	1.20E+00 pCi/g MAX	1.80E+00 pCi/g MAX
Thorium-228	9.90E-01 pCi/g **	1.65E+00 pCi/g **

Off-Site Residents: Inhalation of Respirable Particulates from surface soil

Uranium-238	2.80E-03	pCi/m^3
Uranium-234	2.80E-03	pCi/m^3
Thorium-230	1.95E-03	pCi/m^3
Radium-226	7.77E-04	pCi/m^3
Lead-210	7.79E-04	pCi/m^3
Thorium-232	8.28E-04	pCi/m^3
Radium-228	2.29E-03	pCi/m^3
Thorium-228	2.29E-03	pCi/m^3

TABLE 7-7 (Continued)

EXPOSURE POINT CONCENTRATIONS
LI TUNGSTEN SITE

Residents and Construction Workers: Ingestion of and External Penetrating Radiation from all soils at Areas A, B, B&C, C

RADIONUCLIDE	AREA A	AREA B	AREA B&C	AREA C
Uranium-238	3.39E+00 pCi/g UCLlog	2.00E+00 pCi/g UCLlog	3.93E+01 pCi/g UCLlog	7.40E+00 pCi/g UCLlog
Uranium-234	3.79E+00 pCi/g *	2.47E+00 pCi/g *	3.85E+01 pCi/g *	5.21E+00 pCi/g *
Thorium-230	4.08E+00 pCi/g UCLlog	2.95E+00 pCi/g UCLlog	3.77E+01 pCi/g UCLlog	4.41E+00 pCi/g UCLlog
Radium-226	3.89E+00 pCi/g UCLlog	2.47E+00 pCi/g UCLlog	2.00E+01 pCi/g UCLlog	3.83E+00 pCi/g UCLlog
Lead-210	3.79E+00 pCi/g *	2.47E+00 pCi/g *	2.00E+01 pCi/g *	5.21E+00 pCi/g *
Thorium-232	7.40E+00 pCi/g UCLlog	3.85E+00 pCi/g UCLlog	1.92E+01 pCi/g UCLlog	4.09E+00 pCi/g UCLlog
Radium-228	2.59E+01 pCi/g UCLlog	6.89E+00 pCi/g UCLlog	4.33E+01 pCi/g UCLlog	4.91E+00 pCi/g UCLlog
Thorium-228	2.59E+01 pCi/g **	6.89E+00 pCi/g **	4.33E+01 pCi/g **	4.50E+00 pCi/g **

Construction Workers: Inhalation of Respirable Particulates from all soils at Areas A, B, B&C, C

	AREA A	AREA B	AREA B&C	AREA C
Uranium-238	4.54E-03 pCi/g	2.69E-03 pCi/g	5.27E-02 pCi/g	9.91E-03 pCi/g
Uranium-234	5.08E-03 pCi/g	3.31E-03 pCi/g	5.16E-02 pCi/g	6.98E-03 pCi/g
Thorium-230	5.47E-03 pCi/g	3.96E-03 pCi/g	5.06E-02 pCi/g	5.91E-03 pCi/g
Radium-226	5.21E-03 pCi/g	3.31E-03 pCi/g	2.67E-02 pCi/g	5.13E-03 pCi/g
Lead-210	5.08E-03 pCi/g	3.31E-03 pCi/g	2.68E-02 pCi/g	6.98E-03 pCi/g
Thorium-232	9.91E-03 pCi/g	5.15E-03 pCi/g	2.58E-02 pCi/g	5.48E-03 pCi/g
Radium-228	3.47E-02 pCi/g	9.24E-03 pCi/g	5.81E-02 pCi/g	6.58E-03 pCi/g
Thorium-228	3.47E-02 pCi/g	9.24E-03 pCi/g	5.81E-02 pCi/g	6.03E-03 pCi/g

Residents and Site Workers: Ingestion of groundwater

Uranium-238	8.30E+00 pCi/l UCLlog
Uranium-234	4.48E+00 pCi/l *
Thorium-230	1.14E+00 pCi/l UCLlog
Radium-226	4.02E+00 pCi/l UCLlog
Lead-210	4.48E+00 pCi/l *
Thorium-232	9.53E-01 pCi/l UCLlog
Radium-228	2.42E+00 pCi/l UCLlog
Thorium-228	1.68E+00 pCi/l **

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TABLE 7-7 (Continued)

EXPOSURE POINT CONCENTRATIONS
LI TUNGSTEN SITE

Background for soil, groundwater, and respirable particulates.

	Soil		Groundwater		On-Site Respirable Particulates***		Off-Site Respirable Particulates***	
Uranium-238	8.11E-01	pCi/g UCLnorm	2.90E-01	pCi/g MAX	1.09E-03	pCi/m3	1.00E-05	pCi/m^3
Uranium-234	1.11E+00	pCi/g *	2.87E-01	pCi/g *	1.49E-03	pCi/m3	1.37E-05	pCi/m^3
Thorium-230	1.41E+00	pCi/g UCLlog	2.20E-01	pCi/g MAX	1.88E-03	pCi/m3	1.74E-05	pCi/m^3
Radium-226	1.11E+00	pCi/g UCLnorm	3.50E-01	pCi/g MAX	1.49E-03	pCi/m3	1.37E-05	pCi/m^3
Lead-210	1.11E+00	pCi/g *	2.87E-01	pCi/g *	1.49E-03	pCi/m3	1.37E-05	pCi/m^3
Thorium-232	1.03E+00	pCi/g UCLnorm	2.90E-01	pCi/g MAX	1.37E-03	pCi/m3	1.27E-05	pCi/m^3
Radium-228	1.27E+00	pCi/g UCLnorm	9.40E-01	pCi/g MAX	1.70E-03	pCi/m3	1.57E-05	pCi/m^3
Thorium-228	1.15E+00	pCi/g **	6.15E-01	pCi/g **	1.54E-03	pCi/m3	1.42E-05	pCi/m^3

* Where Uranium-238, Thorium-230, and Radium-226 data approximate secular equilibrium, assume Uranium-234 and Lead-210 to be equal to the average of Uranium-228, Thorium-230, and Radium-226. Otherwise assume Uranium-234 is equal to Uranium-238 and Lead-210 is equal to Radium-226.

** Where Thorium-232 and Radium-228 data approximate secular equilibrium, assume Thorium-228 to be equal to the average of Thorium-232 and Radium-226. Otherwise, assume Thorium-228 is equal to Radium-228.

*** Background concentrations for respirable particulates differ due to differences in emissions and dispersion modeling.

TABLE 7-8

GENERIC EQUATION FOR CALCULATING RADIOLOGICAL INTAKES

LI TUNGSTEN SITE

Equation:

$$CDI = C \times CR \times EFD$$

Where:

CDI = Chronic daily intake; the amount of radioactivity at the exchange boundary (pCi)

C = Concentration; the "average" concentration contacted over the exposure period (e.g., pCi/g) (In practice, C is either the 95% upper confidence limit on the average concentration or the maximum concentration.)

CR = Contact rate; the amount of contaminated medium contacted per unit time or event (e.g., g/day)

EFD = Exposure frequency and duration; describes how long and how often expo sure occurs; often calculated using two terms (EF and ED).

EF = exposure frequency (day/year)

ED = exposure duration (years)

TABLE 7-9

PARAMETER VALUES USED IN RESRAD AND RAGS
RADIOLOGICAL RISK ASSESSMENT

LI TUNGSTEN SITE

MEDIUM	EXPOSURE PARAMETER	UNITS	SYMBOL	ADOLESCENT TRESPASSER	OFF-SITE RESIDENT ADULT	OFF-SITE RESIDENT CHILD	SITE WORKER	CONSTRUCTION WORKER	ON-SITE RESIDENT ADULT	ON-SITE RESIDENT CHILD
SOIL - INGESTION AND INHALATION										
	Ingestion Rate	mg/day	IR	100 [1]			50 [1]	480 [1]	100 [1]	200 [1]
	Fraction Ingested	unitless	FI	1.0			1.0	1.0	1.0	1.0
	Inhalation Rate	cu.m/hour	IR_i		0.83 [2]	0.83 [2]		2.3 [1]		
	Exposure Time - Inhalation	hour/day	ET		24 [3]	24 [3]		8 [4]		
	Inhalation Shielding Factor	unitless			1	1		1		
SOIL - EXTERNAL RADIATION										
	Gamma Shielding Factor	unitless		0.8 [2]			0.8 [2]	0.8 [2]	0.8 [2]	0.8 [2]
	Indoor Time Fraction/Outdoor Time Fraction	unitless		*			0.5/0.5	0.25/0.75	0.75/0.25	0.875/0.125
HOME GROWN PRODUCE - INGESTION										
	Ingestion Rate - Lettuce	g/day	IR						17 [5]	4 [5]
	Ingestion Rate - Carrots	g/day	IR						48 [5]	27 [5]
	Ingestion Rate - Tomatoes	g/day	IR						57 [5]	24 [5]
GROUNDWATER - INGESTION										
	Ingestion Rate	l/day	IR				1 [1]		2 [1]	1 [2]

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TABLE 7-9 (Continued)

PARAMETER VALUES USED IN RESRAD AND RAGS
RADIOLOGICAL RISK ASSESSMENT

LI TUNGSTEN SITE

MEDIUM	EXPOSURE PARAMETER	UNITS	SYMBOL	ADOLESCENT TRESPASSER	OFF-SITE RESIDENT ADULT	OFF-SITE RESIDENT CHILD	SITE WORKER	CONSTRUCTION WORKER	ON-SITE RESIDENT ADULT	ON-SITE RESIDENT CHILD
SEDIMENT	INGESTION									
	Ingestion Rate	mg/event	IR	100 [1]						
	Fraction Ingested	unitless	FI	1.0						
OTHER PARAMETERS										
	Exposure Frequency	days/year	EF	120 [4]	365 [1]	365 [1]	250 [1]	60 [4]	350 [1]	350 [1]
	Exposure Duration	years	ED	6 [1]	30 [1]	6 [1]	25 [1]	1 [1]	30 [1]	6 [1]

REFERENCES

[1] USEPA, 1991
[2] USEPA, 1989b
[3] Consistent with the estimation of annual average concentrations of ROPC in air
[4] Professional judgement
[5] USEPA, 1986
* Area-specific: Areas A and B - 0/1, Areas B&C and C - 0.25/0.75

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TABLE 7-10

PARAMETER VALUES USED ONLY IN RESRAD
LI TUNGSTEN SITE

PARAMETER	UNIT	DEFAULT VALUE	SITE-SPECIFIC VALUE	REFERENCE
SOIL BULK DENSITY				
Cover Material	g/cm^3	1.5	1.3	Sample Analysis
Contaminated Zone	g/cm^4	1.5	1.3	Sample Analysis
Unsaturated Zone	g/cm^5	1.5	1.3	Sample Analysis
Saturated Zone	g/cm^6	1.5	1.3	Sample Analysis
TOTAL POROSITY				
Cover Material	–	0.4	0.39	Yu, 1993
Contaminated Zone	–	0.4	0.43	Yu, 1993
Unsaturated Zone	–	0.4	0.43	Yu, 1993
Saturated Zone	–	0.4	0.43	Yu, 1993
EFFECTIVE POROSITY				
Contaminated Zone	–	0.2	0.33	RESRAD Manual
Saturated Zone	–	0.2	0.33	RESRAD Manual
Unsaturated Zone	–	0.2	0.33	RESRAD Manual
HYDRAULIC CONDUCTIVITY				
Contaminated Zone	m/yr	10	95	Slug Test Data/RESRAD Manual
Unsaturated Zone	m/yr	10	95	Slug Test Data/RESRAD Manual
Saturated Zone	m/yr	100	950	Slug Test Data/RESRAD Manual
VOLUMETRIC WATER CONTENT				
Cover Material	–	0.05		
PRECIPITATION RATE	m/yr	1	1.2	1980 Nassau County Data
RUNOFF COEFFICIENT				
Parcel A	–	0.2	0.9	RESRAD MANUAL
Lower Parcel B	–	0.2	0.3	RESRAD MANUAL
Upper Parcel B	–	0.2	0.2	RESRAD MANUAL
Lower Parcel C	–	0.2	0.3	RESRAD MANUAL
Middle Parcel C	–	0.2	0.5	RESRAD MANUAL
Upper Parcel C	–	0.2	0.1	RESRAD MANUAL

TABLE 7-10 (Continued)

PARAMETER VALUES USED ONLY IN RESRAD
LI TUNGSTEN SITE

DISTRIBUTION COEFFICIENTS				
Radium	cm^3/g	36000		RESRAD MANUAL
Thorium	cm^3/g	3,300		RESRAD MANUAL
Uranium	cm^3/g	15		RESRAD MANUAL
EVAPOTRANSPIRATION COEFFICIENT	–	0.5	0.46	Salum, 1979
SOIL-SPECIFIC B PARAMETER				
Contaminated Zone	–	5.3	4.9	RESRAD MANUAL
Unsaturated Zone	–	5.3	4.9	RESRAD MANUAL
Saturated Zone	–	5.3	4.9	RESRAD MANUAL
EROSION RATE				
Cover Material/Contaminated Zone	m/yr	0.001		
Parcel A			0/0	RESRAD MANUAL
Lower Parcel B			1.8E-4/1.8E-4	RESRAD MANUAL
Upper Parcel B			3.0E-4/3.0E-4	RESRAD MANUAL
Lower Parcel C			6.0E-5/6.0E-5	RESRAD MANUAL
Middle Parcel C			6.0E-5/6.0E-5	RESRAD MANUAL
Upper Parcel C			9.0E-4/9.0E-4	RESRAD MANUAL
LENGTH OF CONTAMINATED ZONE PARALLEL TO THE AQUIFER FLOW	m	100	300	Site Measurement
HYDRAULIC GRADIENT	–	0.02	0.04	Site Data
WATERSHED AREA FOR NEARBY STREAM OR POND	m^2	1E+06	2.3E+06	USGS Topographic Map
WATER TABLE DROP RATE	m/yr	0.001		
WELL-PUMP INTAKE DEPTH	m	10	0	No Pumping Wells on Site
THICKNESS OF UNCONTAMINATED UNSATURATED ZONE	m	4		
Parcel A			0.1	Site Data
Lower Parcel B			1	Site Data
Upper Parcel B			3	Site Data
Lower Parcel C			0.1	Site Data
Middle Parcel C			0.5	Site Data
Upper Parcel C			10	Site Data

TABLE 7-10 (Continued)

PARAMETER VALUES USED ONLY IN RESRAD
LI TUNGSTEN SITE

MASS LOADING FOR INHALATION	g/m^3	$2x10^{-4}$		
DEPTH OF ROOTS	m	0.9		
THICKNESS OF CONTAMINATED ZONE	m	2		
DILUTION LENGTH FOR AIRBORNE DUST	m	3		
SHAPE FACTOR, EXTERNAL GAMMA	–	1		
DEPTH OF SOIL MIXING LAYER	m	0.15		
AREA OF CONTAMINATED ZONE	m^2	10,000		
EFFECTIVE RADON DIFFUSION COEFFICIENT				
Cover Material	m^2/s	2.00E-06		
Contaminated Zone	m^2/s	2.00E-06		
Building Foundation Material	m^2/s	3.00E-07		
RADON EMANATION COEFFICIENT				
Rn-222/Rn-220	–	0.25/0.15		
RADON VERTICAL DIMENSION OF MIXING	m	2		
AVERAGE ANNUAL WIND SPEED	m/s	2		
AVERAGE BUILDING AIR EXCHANGE RATE	1/hr	0.5		
BUILDING ROOM HEIGHT	m	2.5		
BUILDING INDOOR AREA FACTOR	–	0		
BUILDING FOUNDATION THICKNESS	m	0.15		
FOUNDATION DEPTH BELOW GROUND SURFACE	m	1		

TABLE 7-11

RADIOLOGICAL RISK ASSESSMENT RESULTS
CURRENT SCENARIO - ADULT OFF-SITE RESIDENT
LI TUNGSTEN SITE

PATHWAY	RESRAD[1] DOSE EQUIVALENT PER YEAR (MREM)	RESRAD[1] TOTAL RISK	USEPA RAGS TOTAL RISK
Particulate Inhalation[2]	64.6	1.9E-04	8E-05
Background	2.2	4.4E-06	5E-07
Total Above Background	62.4	1.9E-04	8E-05

1. RESRAD Version 5.70
2. See Appendix for air dispersion model description for USEPA RAGS analysis

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TABLE 7-12

RADIOLOGICAL RISK ASSESSMENT RESULTS
CURRENT SCENARIO - CHILD OFF-SITE RESIDENT
LI TUNGSTEN SITE

PATHWAY	RESRAD[1] DOSE EQUIVALENT PER YEAR (MREM)	RESRAD[1] TOTAL RISK	USEPA RAGS TOTAL RISK
Particulate Inhalation[2]	55.8	3.3E-05	4E-06
Background	1.9	7.6E-07	3E-08
Total Above Background	53.9	3.2E-05	4E-06

1. RESRAD Version 5.70
2. See Appendix for air dispersion model description for USEPA RAGS analysis

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TABLE 7-13

RADIOLOGICAL RISK ASSESSMENT RESULTS
CURRENT / FUTURE SCENARIO - ADOLESCENT TRESPASSER (SOIL)
LI TUNGSTEN SITE

PATHWAY	RESRAD[1] DOSE EQUIVALENT PER YEAR (MREM)				RESRAD[1] TOTAL RISK				USEPA RAGS TOTAL RISK			
	A[2]	B[3]	B&C[3]	C[3]	A[2]	B[3]	B&C[3]	C[3]	A[2]	B[3]	B&C[3]	C[3]
External Gamma	65.1	8.3	122.8	8.3	2.3E-04	2.9E-05	4.3E-04	2.9E-05	2.4E-04	3.1E-05	4.6E-04	3.1E-05
Soil Ingestion	0.1	2.7E-02	0.5	5.0E-02	1.5E-07	2.4E-08	4.7E-07	3.5E-08	6.1E-06	9.9E-07	2.0E-05	1.5E-06
Total	65.2	8.3	123.3	8.3	2.3E-04	2.9E-05	4.3E-04	2.9E-05	2.5E-04	3.2E-05	4.8E-04	3.2E-05
Background	0.8	0.8	0.8	0.8	2.9E-06	2.9E-06	2.8E-06	2.8E-06	3.3E-06	3.3E-06	3.1E-06	3.1E-06
Total Above Background	64.4	7.5	122.5	7.5	2.3E-04	2.6E-05	4.3E-04	2.6E-05	2.5E-04	2.9E-05	4.8E-04	2.9E-05

1. RESRAD Version 5.70
2. Future Scenario
3. Current Scenario

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TABLE 7-14

RADIOLOGICAL RISK ASSESSMENT RESULTS
CURRENT SCENARIO - ADOLESCENT TRESPASSER (SEDIMENT)
LI TUNGSTEN SITE

PATHWAY	RESRAD[1] DOSE EQUIVALENT PER YEAR (MREM)				RESRAD[1] TOTAL RISK				USEPA RAGS TOTAL RISK			
	A	B	B&C	C	A	B	B&C	C	A	B	B&C	C
External Gamma	--	0.5	--	0.9	--	1.8E-06	--	3.2E-06	--	2.9E-06	--	5.1E-06
Sediment Ingestion	--	2.4E-03	--	4.9E-03	--	2.0E-09	--	4.2E-09	--	1.3E-07	--	2.5E-07
Total	--	0.5	--	0.9	--	1.8E-06	--	3.2E-06	--	3.0E-06	--	5.4E-06
Background	--	0.8	--	0.8	--	2.9E-06	--	2.8E-06	--	3.3E-06	--	3.3E-06
Total Above Background	--	<BKG	--	0.1	--	<BKG	--	4.0E-07	--	<BKG	--	2.1E-06

1. RESRAD Version 5.70

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TABLE 7-15

RADIOLOGICAL RISK ASSESSMENT RESULTS
FUTURE SCENARIO - SITE WORKER
LI TUNGSTEN SITE

PATHWAY	RESRAD[1] DOSE EQUIVALENT PER YEAR (MREM)				RESRAD[1] TOTAL RISK				USEPA RAGS TOTAL RISK			
	A	B	B&C	C	A	B	B&C	C	A	B	B&C	C
External Gamma	487.2	61.9	971.1	65.3	7.2E-03	9.1E-04	1.4E-02	9.6E-04	7.6E-03	9.7E-04	1.5E-02	1.0E-03
Soil Ingestion	1.4	0.3	5.2	0.5	6.1E-06	9.8E-07	2.0E-05	1.5E-06	2.7E-05	4.3E-06	8.5E-05	5.3E-06
Groundwater Ingestion[2]	10.2	10.2	10.2	10.2	4.7E-05	4.7E-05	4.7E-05	4.7E-05	4.7E-05	4.7E-05	4.7E-05	4.7E-05
Total	498.8	72.3	986.4	75.9	7.2E-03	9.6E-04	1.4E-02	1.0E-03	7.6E-03	1.0E-03	1.5E-02	1.1E-03
Background	7.4	7.4	7.4	7.4	9.6E-05	9.6E-05	9.6E-05	9.6E-05	1.0E-04	1.0E-04	1.0E-04	1.0E-04
Total Above Background	491.4	64.9	979	68.5	7.1E-03	8.6E-04	1.4E-02	9.1E-04	7.5E-03	9.2E-04	1.5E-02	9.7E-04

1. RESRAD Version 5.70
2. RESRAD-BASELINE Version 2.2

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TABLE 7-16

RADIOLOGICAL RISK ASSESSMENT RESULTS
FUTURE SCENARIO - CONSTRUCTION WORKER
LI TUNGSTEN SITE

PATHWAY	RESRAD[1] DOSE EQUIVALENT PER YEAR (MREM)				RESRAD[1] TOTAL RISK				USEPA RAGS TOTAL RISK			
	A	B	B&C	C	A	B	B&C	C	A	B	B&C	C
External Gamma	22.7	6.8	45.6	5.9	1.3E-05	4.0E-06	2.7E-05	3.4E-06	1.4E-05	4.3E-06	2.8E-05	3.7E-06
Soil Ingestion	0.2	0.1	0.6	0.1	2.9E-08	1.1E-08	8.4E-08	1.5E-08	5.2E-07	2.0E-07	1.5E-06	2.8E-07
Particulate Inhalation[2]	5.0	2.2	14.7	2.4	6.1E-07	1.9E-07	1.4E-06	1.7E-07	4.2E-06	1.3E-06	9.5E-06	1.2E-06
Total	27.9	9.1	60.9	8.4	1.4E-05	4.2E-06	2.8E-05	3.6E-06	1.9E-05	5.8E-06	4.0E-05	5.1E-06
Background	2.2	2.2	2.2	2.2	9.7E-07	9.7E-07	9.7E-07	9.7E-07	1.3E-06	1.3E-06	1.3E-06	1.3E-06
Total Above Background	25.7	6.9	58.7	6.2	1.3E-05	3.2E-06	2.7E-05	2.7E-06	1.8E-05	4.5E-06	3.8E-05	3.8E-06

1. RESRAD Version 5.70
2. See Appendix for air dispersion model description for USEPA RAGS analysis

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TABLE 7-17

RADIOLOGICAL RISK ASSESSMENT RESULTS
FUTURE SCENARIO - ADULT RESIDENT
LI TUNGSTEN SITE

PATHWAY	RESRAD[1] DOSE EQUIVALENT PER YEAR (MREM)				RESRAD[1] TOTAL RISK				USEPA RAGS TOTAL RISK			
	A	B	B&C	C	A	B	B&C	C	A	B	B&C	C
External Gamma	251.9	75.9	505.9	64.8	4.4E-03	1.3E-03	8.9E-03	1.2E-03	4.7E-03	1.4E-03	9.5E-03	1.2E-03
Soil Ingestion	2.7	1.2	8.7	1.7	1.3E-05	5.0E-06	3.8E-05	6.9E-06	1.9E-05	7.3E-06	5.6E-05	1.0E-05
Produce Ingestion	43.1	15.5	110.3	19.0	2.2E-04	8.0E-05	5.7E-04	9.6E-05	1.6E-05	8.4E-06	3.9E-04	1.6E-05
Radon/Radon Decay Products[2]	187.3	116.6	941.2	179.3	4.4E-04	2.7E-04	2.2E-03	4.2E-04	4.4E-04	2.7E-04	2.2E-03	4.2E-04
Groundwater Ingestion3	28.7	28.7	28.7	28.7	1.6E-04	1.6E-04	1.6E-04	1.6E-04	1.6E-04	1.6E-04	1.6E-04	1.6E-04
Total	513.8	237.9	1595	293.5	5.3E-03	1.9E-03	1.2E-02	1.8E-03	5.3E-03	1.9E-03	1.2E-02	1.8E-03
Background	77.8	77.8	77.8	77.8	4.7E-04	4.7E-04	4.7E-04	4.7E-04	4.7E-04	4.7E-04	4.7E-04	4.7E-04
Total Above Background	436.0	160.1	1517.2	215.7	4.8E-03	1.4E-03	1.1E-02	1.4E-03	4.8E-03	1.4E-03	1.2E-02	1.3E-03

1. RESRAD Version 5.70
2. Risks from Radon/Radon Decay Products calculated by RESRAD are used in the RAGS calculation
3. RESRAD-BASELINE Version 2.2

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TABLE 7-18

RADIOLOGICAL RISK ASSESSMENT RESULTS
FUTURE SCENARIO - CHILD RESIDENT
LI TUNGSTEN SITE

PATHWAY	RESRAD[1] DOSE EQUIVALENT PER YEAR (MREM)				RESRAD[1] TOTAL RISK				USEPA RAGS TOTAL RISK			
	A	B	B&C	C	A	B	B&C	C	A	B	B&C	C
External Gamma	244.5	73.6	491.1	62.9	8.6E-04	2.6E-04	1.7E-03	2.2E-04	9.2E-04	2.8E-04	1.8E-03	2.4E-04
Soil Ingestion	5.5	2.4	17.3	3.4	5.2E-06	2.0E-06	1.5E-05	2.7E-06	7.6E-06	2.9E-06	2.2E-05	4.0E-06
Produce Ingestion	19.4	7.0	49.7	8.6	2.0E-05	7.2E-06	5.2E-05	8.7E-06	1.3E-06	7.1E-07	5.7E-06	1.3E-06
Radon/Radon Decay Products[2]	218.2	136.0	1097	209.1	1.0E-04	6.4E-05	5.1E-04	9.8E-05	1.0E-04	6.4E-05	5.1E-04	9.8E-05
Groundwater Ingestion3	14.3	14.3	14.3	14.3	1.6E-05	1.6E-05	1.6E-05	1.6E-05	1.6E-05	1.6E-05	1.6E-05	1.6E-05
Total	501.9	233.2	1669	298.3	1.0E-03	3.5E-04	2.3E-03	3.5E-04	1.0E-03	3.6E-04	2.4E-03	3.6E-04
Background	82.0	82.0	82.0	82.0	9.2E-05	9.2E-05	9.2E-05	9.2E-05	9.4E-05	9.4E-05	9.4E-05	9.4E-05
Total Above Background	419.9	151.2	1587.0	216.3	9.2E-04	2.6E-04	2.2E-03	2.5E-04	9.5E-04	2.7E-04	2.3E-03	2.6E-04

1. RESRAD Version 5.70
2. Risks from Radon/Radon Decay Products calculated by RESRAD are used in the RAGS risk calculation
3. RESRAD-BASELINE Version 2.2

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tbl7-18.xls

TABLE 7-19

SUMMARY OF CHEMICALS IN SURFACE SOIL
LI TUNGSTEN SITE

CHEMICAL	AREA A Frequency	AREA A Range of Concentrations[1] mg/kg	AREA B Frequency	AREA B Range of Concentrations[1] mg/kg	AREA B&C Frequency	AREA B&C Range of Concentrations[1] mg/kg	AREA C Frequency	AREA C Range of Concentrations[1] mg/kg
VOLATILE ORGANICS								
Acetone	3 / 22	0.055 - 0.19	2 / 9	0.01 - 0.056	1 / 19	0.011	3 / 8	0.033 - 0.05
Benzene	1 / 21	0.001	1 / 9	0.004	0 / 19	ND	1 / 8	0.002
2-Butanone	5 / 21	0.007 - 0.052	2 / 9	0.004 - 0.014	1 / 19	0.003	3 / 8	0.002 - 0.015
Carbon disulfide	2 / 21	0.001 - 0.007	0 / 9	ND	0 / 19	ND	0 / 8	ND
Chlorobenzene	0 / 21	ND	0 / 9	ND	0 / 19	ND	0 / 8	ND
Chloroform	1 / 21	0.003	0 / 9	ND	0 / 19	ND	1 / 8	0.001
1,2-Dichloroethane	1 / 21	0.002	0 / 9	ND	0 / 19	ND	0 / 8	ND
1,2-Dichloroethene (total)	1 / 21	0.004	0 / 9	ND	0 / 19	ND	0 / 8	ND
1,1-Dichloroethene	1 / 21	0.006	0 / 9	ND	0 / 19	ND	0 / 8	ND
1,2-Dichloropropane	0 / 21	ND	0 / 9	ND	0 / 19	ND	1 / 8	0.003
Ethylbenzene	1 / 21	0.008	0 / 9	ND	0 / 19	ND	0 / 8	ND
2-Hexanone	1 / 21	0.007	0 / 9	ND	1 / 19	0.001	2 / 8	0.026 - 0.045
4-Methyl-2-Pentanone	1 / 21	0.003	1 / 9	0.017	0 / 19	ND	4 / 8	0.003 - 0.029
Methylene chloride	8 / 22	0.001 - 0.022	2 / 9	0.003 - 0.016	1 / 19	0.004	2 / 8	0.003 - 0.004
Styrene	0 / 21	ND	0 / 9	ND	0 / 19	ND	0 / 8	ND
1,1,2,2-Tetrachloroethane	0 / 21	ND	0 / 9	ND	0 / 19	ND	0 / 8	ND
Tetrachloroethene	4 / 21	0.001 - 0.039	0 / 9	ND	0 / 19	ND	0 / 8	ND
Toluene	1 / 21	0.005	0 / 9	ND	0 / 19	ND	0 / 8	ND
1,1,1-Trichloroethane	1 / 21	0.006	0 / 9	ND	0 / 19	ND	0 / 8	ND
Trichloroethene	1 / 21	0.003	0 / 9	ND	0 / 19	ND	0 / 8	ND
Xylenes (total)	0 21	ND	0 / 9	ND	0 / 19	ND	0 / 8	ND
SEMI-VOLATILE ORGANICS								
Acenaphthene	6 / 22	0.064 - 0.64	0 / 9	ND	0 / 19	ND	0 / 8	ND
Acenaphthylene	1 / 22	0.05	0 / 9	ND	0 / 19	ND	0 / 8	ND
Anthracene	10 / 22	0.022 - 0.7	0 / 9	ND	4 / 19	0.021 - 0.066	0 / 8	ND
Benzo[a]anthracene	15 / 22	0.068 - 3.1	1 / 9	0.092	7 / 19	0.051 - 0.36	1 / 8	0.029
Benzo[a]pyrene	16 / 22	0.043 - 3.9	1 / 9	0.12	6 / 19	0.075 - 0.39	2 / 8	0.021 - 0.05
Benzo[b]fluoranthene	17 / 22	0.058 - 10	1 / 9	0.5	11 / 19	0.086 - 1	2 / 8	0.062 - 0.15
Benzo[g,h,i]perylene	14 / 22	0.081 - 4.7	1 / 9	0.083	7 / 19	0.042 - 0.31	2 / 8	0.022 - 0.062
Benzo[k]fluoranthene	8 / 22	0.081 - 1.5	1 / 9	0.12	1 / 19	0.37	1 / 8	0.036
bis(2-Ethylhexyl)phthalate	10 / 22	0.051 - 16	1 / 9	0.1	2 / 19	0.12 - 0.14	1 / 8	0.021
Butylbenzylphthalate	0 / 22	ND	1 / 9	0.051	1 / 19	0.1	0 / 8	ND
Carbazole	4 / 22	0.09 - 1	0 / 9	ND	1 / 19	0.021	0 / 8	ND
Chrysene	16 / 22	0.09 - 4	1 / 9	0.19	12 / 19	0.041 - 0.4	2 / 8	0.054 - 0.094
Di-n-butylphthalate	0 / 22	ND	1 / 9	0.017	1 / 19	0.058	0 / 8	ND
Dibenz[a,h]anthracene	7 / 22	0.065 - 1.3	0 / 9	ND	0 / 19	ND	0 / 8	ND
Dibenzofuran	5 / 22	0.046 - 0.83	0 / 9	ND	0 / 19	ND	0 / 8	ND
Diethylphthalate	2 / 22	0.1 - 0.5	0 / 9	ND	0 / 19	ND	0 / 8	ND
Dimethylphthalate	1 / 22	0.036	0 / 9	ND	0 / 19	ND	0 / 8	ND
Fluoranthene	20 / 22	0.048 - 10	2 / 9	0.064 - 0.24	11 / 19	0.074 - 0.59	2 / 8	0.066 - 0.098

TABLE 7-19 (Continued)

SUMMARY OF CHEMICALS IN SURFACE SOIL
LI TUNGSTEN SITE

CHEMICAL	AREA A		AREA B		AREA B&C		AREA C	
	Frequency	Range of Concentrations[1] mg/kg	Frequency	Range of Concentrations[1] mg/kg	Frequency	Range of Concentrations[1] mg/kg	Frequency	Range of Concentrations[1] mg/kg
Fluorene	5 / 22	0.074 - 0.57	0 / 9	ND	1 / 19	0.047	0 / 8	ND
Indeno[1,2,3-cd]pyrene	13 / 22	0.075 - 3.8	1 / 9	0.11	8 / 19	0.049 - 0.25	2 / 8	0.027 - 0.049
2-Methylnaphthalene	5 / 22	0.048 - 0.61	0 / 9	ND	0 / 19	ND	0 / 8	ND
N-nitrosodiphenylamine	0 / 22	ND	0 / 9	ND	0 / 19	ND	2 / 8	5.3 - 10
Naphthalene	2 / 22	0.047 - 0.19	0 / 9	ND	1 / 19	0.045	0 / 8	ND
Pentachlorophenol	1 / 22	3.6	0 / 9	ND	0 / 19	ND	1 / 8	0.08
Phenanthrene	16 / 22	0.071 - 3.8	1 / 9	0.072	8 / 19	0.05 - 0.4	2 / 8	0.041 - 0.064
Pyrene	20 / 22	0.052 - 7.3	2 / 9	0.086 - 0.21	11 / 19	0.067 - 0.82	2 / 8	0.051 - 0.11
PESTICIDES/PCBs								
Endrin	0 / 20	ND	1 / 6	0.0053	2 / 12	0.037 - 0.07	0 / 7	ND
4,4'-DDT	0 / 22	ND	1 / 9	0.01	0 / 16	ND	0 / 7	ND
PCBs (total)	2 / 22	0.34 - 1.02	4 / 9	0.037 - 0.51	10 / 18	0.152 - 15.89	2 / 8	0.873 - 2.891
INORGANICS								
Aluminum	22 / 22	2140 - 16900	9 / 9	3690 - 56600	19 / 19	393 - 27700	8 / 8	1380 - 16200
Antimony	6 / 22	2.3 - 21.9	8 / 9	1.4 - 416	14 / 19	7.1 - 5610	7 / 8	30.7 - 2430
Arsenic	14 / 14	6.4 - 523	9 / 9	10 - 1790	16 / 17	2 - 6300	7 / 7	7.3 - 1440
Barium	22 / 22	11.3 - 6400	9 / 9	22.3 - 313	19 / 19	13.5 - 1820	8 / 8	26.6 - 1350
Beryllium	12 / 22	0.22 - 1.1	5 / 9	0.29 - 0.82	9 / 19	0.59 - 8.5	1 / 8	11
Cadmium	9 / 22	0.86 - 10.2	6 / 9	1.3 - 8	13 / 19	1.4 - 21.9	5 / 8	0.89 - 23.9
Calcium	22 / 22	1040 - 145000	9 / 9	285 - 11200	19 / 19	109 - 47800	8 / 8	506 - 76000
Chromium	21 / 21	7.8 - 109	9 / 9	9.3 - 93.7	19 / 19	9.8 - 1620	8 / 8	12.9 - 434
Cobalt	22 / 22	3.1 - 1560	9 / 9	4.2 - 4660	19 / 19	3.1 - 4620	8 / 8	6.7 - 764
Copper	22 / 22	5.8 - 1630	9 / 9	14.8 - 2160	19 / 19	3 - 4610	8 / 8	9.6 - 2070
Iron	22 / 22	7610 - 124000	9 / 9	16800 - 193000	19 / 19	7920 - 313000	8 / 8	11600 - 74300
Lead	19 / 19	14.6 - 688	9 / 9	30.6 - 3710	15 / 19	4 - 19600	8 / 8	8.3 - 5140
Magnesium	22 / 22	633 - 38200	9 / 9	1400 - 94000	19 / 19	908 - 5480	8 / 8	167 - 24800
Manganese	21 / 21	72.5 - 11600	9 / 9	155 - 5680	18 / 18	57.1 - 90000	8 / 8	106 - 2930
Mercury	20 / 22	0.05 - 3.5	7 / 9	0.17 - 1.8	17 / 19	0.05 - 8.4	8 / 8	0.06 - 6.2
Nickel	22 / 22	5.8 - 1100	9 / 9	6.9 - 28900	19 / 19	5.1 - 22000	8 / 8	14.4 - 304
Potassium	22 / 22	331 - 1340	9 / 9	419 - 1800	19 / 19	354 - 2510	8 / 8	508 - 6780
Selenium	14 / 19	1.5 - 149	9 / 9	1.5 - 33.1	12 / 17	2.2 - 140	7 / 8	7.4 - 262
Silver	9 / 16	0.39 - 34.3	7 / 7	0.69 - 103	13 / 18	0.39 - 114	7 / 8	2.8 - 110
Sodium	22 / 22	35.3 - 3060	8 / 9	35.7 - 36500	18 / 19	25.9 - 16600	8 / 8	198 - 2960
Thallium	0 / 22	ND	0 / 9	ND	3 / 19	3.6 - 22.7	0 / 8	ND
Vanadium	22 / 22	9.9 - 92.5	9 / 9	14.2 - 52.8	17 / 19	12.1 - 165	8 / 8	10.6 - 148
Zinc	22 / 22	17.9 - 816	9 / 9	39.8 - 1270	19 / 19	17.3 - 2900	8 / 8	70.9 - 1960
OTHER								
Cyanide	5 / 22	0.33 - 1.5	2 / 9	0.46 - 0.56	10 / 19	0.31 - 2.3	2 / 8	0.3 - 0.41

1 = Range of detected concentrations.
ND = Not detected

TABLE 7-20

SUMMARY OF CHEMICALS IN ALL SOILS
LI TUNGSTEN SITE

CHEMICAL	AREA A Frequency	AREA A Range of Concentrations[1] mg/kg	AREA B Frequency	AREA B Range of Concentrations[1] mg/kg	AREA B&C Frequency	AREA B&C Range of Concentrations[1] mg/kg	AREA C Frequency	AREA C Range of Concentrations[1] mg/kg
VOLATILE ORGANICS								
Acetone	5 / 34	0.041 - 0.19	2 / 12	0.01 - 0.056	4 / 37	0.011 - 0.05	4 / 14	0.027 - 0.05
Benzene	1 / 34	0.001	1 / 12	0.004	0 / 37	ND	1 / 13	0.002
2-Butanone	9 / 34	0.004 - 0.052	2 / 12	0.004 - 0.014	2 / 37	0.003 - 0.012	5 / 13	0.002 - 0.015
Carbon disulfide	5 / 34	0.001 - 0.007	0 / 12	ND	0 / 37	ND	0 / 13	ND
Chlorobenzene	0 / 34	ND	0 / 12	ND	0 / 37	ND	1 / 13	0.001
Chloroform	1 / 34	0.003	0 / 12	ND	0 / 37	ND	1 / 13	0.001
1,2-Dichloroethane	1 / 34	0.002	0 / 12	ND	0 / 37	ND	0 / 13	ND
1,2-Dichloroethene (total)	3 / 34	0.004 - 0.014	0 / 12	ND	0 / 37	ND	1 / 13	0.005
1,1-Dichloroethene	1 / 34	0.006	0 / 12	ND	0 / 37	ND	0 / 13	ND
1,2-Dichloropropane	0 / 34	ND	0 / 12	ND	0 / 37	ND	1 / 13	0.003 - 0.003
Ethylbenzene	2 / 34	0.008 - 0.01	0 / 12	ND	0 / 37	ND	0 / 13	ND
2-Hexanone	2 / 34	0.007 - 0.008	0 / 12	ND	1 / 37	0.001	3 / 13	0.026 - 0.045
4-Methyl-2-Pentanone	1 / 34	0.003	1 / 12	0.017	0 / 37	ND	6 / 13	0.003 - 0.029
Methylene chloride	9 / 35	0.001 - 0.022	2 / 12	0.003 - 0.016	3 / 37	0.002 - 0.004	2 / 14	0.003 - 0.004
Styrene	0 / 34	ND	0 / 12	ND	0 / 37	ND	2 / 13	0.007 - 0.019
1,1,2,2-Tetrachloroethane	0 / 34	ND	0 / 12	ND	0 / 37	ND	1 / 13	0.004
Tetrachloroethene	5 / 34	0.001 - 0.045	0 / 12	ND	0 / 37	ND	1 / 13	0.002
Toluene	1 / 34	0.005	0 / 12	ND	1 / 37	0.001	1 / 13	0.002
1,1,1-Trichloroethane	2 / 34	0.005 - 0.006	0 / 12	ND	0 / 37	ND	0 / 13	ND
Trichloroethene	1 / 34	0.003	0 / 12	ND	0 / 37	ND	2 / 14	0.002 - 0.005
Xylenes (total)	0 / 34	ND	0 / 12	ND	0 / 37	ND	1 / 13	0.002
SEMI-VOLATILE ORGANICS								
Acenaphthene	11 / 35	0.064 - 3.8	0 / 12	ND	0 / 37	ND	1 / 15	0.17
Acenaphthylene	1 / 35	0.05	0 / 12	ND	0 / 37	ND	0 / 15	ND
Anthracene	15 / 35	0.022 - 2.4	0 / 12	ND	4 / 37	0.021 - 0.066	0 / 15	ND
Benzo[a]anthracene	22 / 35	0.068 - 9.9	2 / 12	0.068 - 0.092	9 / 37	0.043 - 0.36	2 / 15	0.029 - 0.26
Benzo[a]pyrene	26 / 35	0.043 - 3.9	2 / 12	0.077 - 0.12	7 / 37	0.075 - 0.39	3 / 15	0.021 - 0.25
Benzo[b]fluoranthene	28 / 35	0.03 - 14	1 / 12	0.5	14 / 37	0.086 - 1	4 / 15	0.062 - 0.67
Benzo[g,h,i]perylene	23 / 35	0.035 - 6.9	1 / 12	0.083	10 / 37	0.042 - 0.31	3 / 15	0.022 - 0.32
Benzo[k]fluoranthene	11 / 35	0.081 - 1.5	1 / 12	0.12	1 / 37	0.37	2 / 15	0.036 - 0.22
bis(2-Ethylhexyl)phthalate	12 / 35	0.051 - 16	2 / 12	0.1 - 0.31	4 / 37	0.068 - 0.29	2 / 15	0.021 - 0.23
Butylbenzylphthalate	1 / 35	0.38	1 / 12	0.051	1 / 37	0.1	0 / 15	ND
Carbazole	7 / 35	0.058 - 1.0	0 / 12	ND	1 / 37	0.021	0 / 15	ND
Chrysene	27 / 35	0.02 - 11	2 / 12	0.09 - 0.19	15 / 37	0.041 - 0.4	4 / 15	0.054 - 0.31
Di-n-butylphthalate	1 / 35	0.38	1 / 12	0.017	1 / 37	0.058	0 / 15	ND
Di-n-octylphthalate	1 / 35	0.38	0 / 12	ND	0 / 37	ND	0 / 15	ND
Dibenz[a,h]anthracene	10 / 35	0.065 - 1.3	0 / 12	ND	0 / 37	ND	0 / 15	ND
Dibenzofuran	9 / 35	0.046 - 0.83	0 / 12	ND	0 / 37	ND	0 / 15	ND
3,3'-Dichlorobenzidine	1 / 35	0.38	0 / 12	ND	0 / 37	ND	0 / 15	ND
Diethylphthalate	2 / 35	0.1 - 0.5	0 / 12	ND	0 / 37	ND	0 / 15	ND

TABLE 7-20 (Continued)

SUMMARY OF CHEMICALS IN ALL SOILS
LI TUNGSTEN SITE

CHEMICAL	AREA A Frequency	AREA A Range of Concentrations[1] mg/kg	AREA B Frequency	AREA B Range of Concentrations[1] mg/kg	AREA B&C Frequency	AREA B&C Range of Concentrations[1] mg/kg	AREA C Frequency	AREA C Range of Concentrations[1] mg/kg
Dimethylphthalate	1 / 35	0.036	0 / 12	ND	0 / 37	ND	0 / 15	ND
Fluoranthene	32 / 35	0.027 - 26	3 / 12	0.064 - 0.24	15 / 37	0.027 - 0.59	5 / 15	0.063 - 0.53
Fluorene	10 / 35	0.068 - 3.1	0 / 12	ND	1 / 37	0.047	1 / 15	0.38
Indeno[1,2,3-cd]pyrene	21 / 35	0.022 - 6.3	1 / 12	0.11	9 / 37	0.049 - 0.25	3 / 15	0.027 - 0.35
2-Methylnaphthalene	7 / 35	0.048 - 4.6	0 / 12	ND	0 / 37	ND	0 / 15	ND
N-nitrosodiphenylamine	0 / 35	ND	0 / 12	ND	0 / 37	ND	4 / 15	0.53 - 10
Naphthalene	7 / 35	0.047 - 0.74	0 / 12	ND	1 / 37	0.045	0 / 15	ND
Pentachlorophenol	1 / 34	3.6	0 / 12	ND	0 / 36	ND	1 / 15	0.08
Phenanthrene	26 / 35	0.032 - 33	2 / 12	0.072 - 0.086	12 / 37	0.03 - 0.46	3 / 15	0.041 - 0.32
Pyrene	32 / 35	0.034 - 28	3 / 12	0.086 - 0.21	14 / 37	0.064 - 0.82	5 / 15	0.051 - 0.42
PESTICIDES/PCBs								
Endrin	0 / 29	ND	1 / 7	0.0053	2 / 25	0.037 - 0.07	0 / 14	ND
4,4'-DDT	0 / 35	ND	1 / 12	0.01	0 / 32	ND	0 / 14	ND
PCBs (total)	2 / 35	0.34 - 1.02	4 / 12	0.037 - 0.51	12 / 35	0.065 15.89	3 / 15	0.873 - 2.891
INORGANICS								
Aluminum	35 / 35	1050 - 20300	12 / 12	3690 - 56600	37 / 37	393 - 27700	15 / 15	1380 - 16200
Antimony	9 / 35	2.3 - 21.9	10 / 12	1.4 - 416	24 / 37	1.3 - 5610	14 / 15	10.2 - 3490
Arsenic	24 / 24	2.2 - 523	12 / 12	5.5 - 1790	31 / 34	1.4 - 6300	14 / 14	7.3 - 2950
Barium	35 / 35	11.3 - 6400	12 / 12	19.5 - 313	37 / 37	12.8 - 1820	15 / 15	26.6 - 1350
Beryllium	16 / 35	0.22 - 1.1	7 / 12	0.29 - 0.82	14 / 37	0.23 - 8.5	2 / 15	0.82 - 11
Cadmium	15 / 35	0.63 - 10.2	6 / 12	1.3 - 8	18 / 37	0.65 - 179	11 / 15	0.89 - 23.9
Calcium	35 / 35	812 - 145000	12 / 12	285 - 11200	37 / 37	98 - 47800	15 / 15	506 - 76000
Chromium	33 / 33	7.8 - 109	12 / 12	9.3 - 93.7	37 / 37	8.4 - 1620	15 / 15	12.9 - 434
Cobalt	35 / 35	3.1 - 1560	12 / 12	2.5 - 4660	36 / 37	1.7 - 4620	14 / 15	2.9 - 764
Copper	35 / 35	5.8 - 1630	12 / 12	6 - 2160	36 / 36	2 - 4610	15 / 15	9.6 - 6740
Iron	35 / 35	4600 - 124000	12 / 12	16800 - 193000	37 / 37	5730 - 313000	15 / 15	11600 - 144000
Lead	28 / 28	9.2 - 688	12 / 12	2.7 - 3710	29 / 37	3.2 - 19600	15 / 15	8.3 - 5140
Magnesium	35 / 35	633 - 38200	12 / 12	913 - 94000	37 / 37	314 - 6170	15 / 15	167 - 24800
Manganese	34 / 34	46.9 - 11600	12 / 12	155 - 5680	35 / 35	57.1 - 90000	13 / 13	58.1 - 2930
Mercury	30 / 35	0.05 - 3.5	8 / 12	0.09 - 1.8	21 / 37	0.05 - 8.4	15 / 15	0.06 - 29.5
Nickel	35 / 35	5.8 - 1100	12 / 12	5.8 - 28900	37 / 37	3.4 - 22000	15 / 15	7.7 - 311
Potassium	35 / 35	331 - 6070	12 / 12	419 - 1850	37 / 37	156 - 4260	15 / 15	508 - 6780
Selenium	22 / 30	1.1 - 149	10 / 12	1.3 - 33.1	15 / 29	1.1 - 140	13 / 15	3.9 - 262
Silver	11 / 23	0.39 - 34.3	7 / 8	0.69 - 103	22 / 36	0.33 - 114	13 / 15	0.95 - 110
Sodium	35 / 35	32 - 3060	11 / 12	35.7 - 36500	32 / 37	25.9 - 16600	15 / 15	57.6 - 2960
Thallium	0 / 35	ND	0 / 12	ND	4 / 37	1.4 - 22.7	0 / 15	ND
Vanadium	35 / 35	8.1 - 92.5	12 / 12	13.7 - 52.8	32 / 37	5.4 - 165	15 / 15	10.6 - 148
Zinc	35 / 35	14.3 - 816	12 / 12	15.4 - 1270	37 / 37	11.8 - 10400	15 / 15	40.8 - 2870
OTHER								
Cyanide	7 / 35	0.31 - 1.5	2 / 12	0.46 - 0.56	11 / 37	0.25 - 2.3	3 / 15	0.3 - 8

1 = Range of detected concentrations.
ND = Not detected

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TABLE 7-21

SUMMARY OF SITE-SPECIFIC BACKGROUND SOIL DATA
LI TUNGSTEN SITE

CHEMICAL	SITE-SPECIFIC BACKGROUND*			Elemental Composition of Soils **	
	Frequency	Range of Concentrations*** mg/kg	Average Concentration*** mg/kg	Range of Concentrations mg/kg	
INORGANICS					
Aluminum	7 / 7	3760 - 20700	9790	7000 - >100000	(1)
Antimony	1 / 7	1.6	1.60	NA	
Arsenic	6 / 6	2.4 - 14.9	6.30	1.5 - 16	(2)
Barium	7 / 7	11.5 - 87.4	49	200 - 500	(2)
Beryllium	4 / 7	0.71 - 1.1	0.85	ND - 2.0	(2)
Cadmium	0 / 7	ND	ND	ND - 4.0	(1)
Calcium	7 / 7	66.1 - 2470	1070	100 - 280000	(1)
Chromium	7 / 7	6.5 - 34.4	18.33	7.0 - 100	(2)
Cobalt	7 / 7	1.6 - 15.9	7.27	<3.0 - 70	(1)
Copper	7 / 7	4.1 - 38.6	15.99	3.0 - 70	(2)
Iron	7 / 7	7040 - 36700	20591	100 - >100000	(1)
Lead	7 / 7	3.9 - 103	24	ND - 50	(2)
Magnesium	7 / 7	790 - 4510	2147	50 - 5000	(1)
Manganese	7 / 7	55 - 2220	677	<2.0 - 7000	(1)
Mercury	2 / 7	0.06 - 0.11	0.09	0.05 - 0.60	(2)
Nickel	7 / 7	4.1 - 21	13	ND - 30	(2)
Potassium	7 / 7	422 - 2790	1427	50 - 37000	(1)
Selenium	3 / 5	1.4 - 2.7	2.0	<0.1 - 0.6	(2)
Silver	2 / 7	0.34 - 0.6	0.47	ND - 5.0	(3)
Sodium	5 / 7	62.2 - 91.3	74.96	<500 - 100000	(1)
Thallium	1 / 7	1.1	1.1	NA	
Vanadium	7 / 7	4.7 - 46.3	25.20	20 - 150	(2)
Zinc	7 7	13.9 - 81.2	43.89	20 - 120	(2)
OTHER					
Cyanide	1 / 7	0.23	0.23	NA	

ND = Not Detected
NA = Not Available
* Background data set includes LT-SB-MP-5, LT-SB-MP-5B, LT-SB-13, LT-SB-13D, LT-SB-TP-06, LT-SB-MP-11D, and LT-SB-MP-11DB.
** Dragun and Chiasson, 1991.
(1) = Eastern United States
(2) = New York State
(3) = Coterminous United States
*** Range and average of detected concentrations.

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TABLE 7-22

SUMMARY OF CHEMICALS IN GROUNDWATER
LI TUNGSTEN SITE

CHEMICAL	Frequency	Range of Concentrations [1] mg/L	BACKGROUND Frequency	BACKGROUND Range of Concentrations [1] mg/L	USEPA MCLs mg/L [2]	NYS MCLs mg/L [3]	NYSDEC WQS mg/L [4]
VOLATILE ORGANICS							
Acetone	19 / 59	0.004 - 17	3 / 5	0.006 - 0.025	NA	0.05	0.05g
Benzene	8 / 59	0.0009 - 0.54	1 / 5	0.001	0.005	0.005	0.0007g
2-Butanone	8 / 59	0.072 - 1.5	1 / 5	0.12	NA	0.005	0.05g
Carbon disulfide	1 / 59	0.001	0 / 5	ND	NA	0.05	NA
Carbon tetrachloride	2 / 59	0.002 - 0.17	0 / 5	ND	0.005	0.005	0.005g
Chlorobenzene	1 / 59	0.001 - 0.001	0 / 5	ND	0.1	0.005	0.005g
Chloroethane	2 / 59	0.027 - 0.028	0 / 5	ND	NA	0.005	0.005g
Chloroform	3 / 59	0.23 - 4	0 / 5	ND	0.1/0.08*	0.1*	0.007g
Chloromethane	1 / 59	0.0022	0 / 5	ND	NA	0.005	NA
1,1-Dichloroethane	15 / 59	0.001 - 3.6	1 / 5	0.001	NA	0.005	0.005g
1,2-Dichloroethane	5 / 59	0.002 - 0.79	0 / 5	ND	0.005	0.005	0.005g
1,1-Dichloroethene	4 / 59	0.003 - 0.65	0 / 5	ND	0.007	0.005	0.005g
1,2-Dichloroethene (total)	29 / 59	0.002 - 150	0 / 5	ND	0.07/0.1**	0.005	0.005g
Ethylbenzene	8 / 59	0.002 - 7.6	0 / 5	ND	0.7	0.005	0.005g
4-Methyl-2-Pentanone	2 / 59	7.9 - 17	0 / 5	ND	NA	0.005	NA
Methylene chloride	9 / 59	0.0009 - 120	2 / 5	0.001 - 0.17	0.005	0.05	0.005g
1,1,2,2-Tetrachloroethane	2 / 59	0.001 - 0.002	0 / 5	ND	NA	0.005	0.005g
Tetrachloroethene	26 / 59	0.001 - 7.8	0 / 5	ND	0.005	0.005	0.005g
Toluene	12 / 59	0.001 - 90	1 / 5	0.001	1	0.005	0.005g
1,1,1-Trichloroethane	10 / 59	0.003 - 16	0 / 5	ND	0.2	0.005	0.005g
1,1,2-Trichloroethane	4 / 59	0.001 - 0.065	0 / 5	ND	0.005	0.005	0.005g
Trichloroethene	26 / 59	0.001 - 31	0 / 5	ND	0.005	0.005	0.005g
Vinyl chloride	10 / 59	0.001 - 0.096	0 / 5	ND	0.002	0.002	0.002g
Xylenes (total)	9 / 59	0.003 - 36	0 / 5	ND	10	0.005	0.005g
SEMI-VOLATILES ORGANICS							
Acenaphthene	3 / 59	0.00068 - 0.004	0 / 5	ND	NA	NA	0.02g
Fluorene	4 / 59	0.00067 - 0.004	0 / 5	ND	NA	NA	0.05g
Phenanthrene	5 / 59	0.00059 - 0.003	0 / 5	ND	NA	NA	0.05g
bis(2-Ethylhexyl)phthalate	23 / 59	0.00051 - 2.4	0 / 5	ND	0.006	NA	0.05g
Dibenzofuran	3 / 59	0.00051 - 0.005	0 / 5	ND	NA	NA	NA
Di-n-butylphthalate	13 / 59	0.0005 - 0.79	0 / 5	ND	NA	NA	0.05g
Di-n-octylphthalate	1 / 59	0.001	0 / 5	ND	NA	NA	0.05g
1,2-Dichlorobenzene	4 / 59	0.24 - 1.3	0 / 5	ND	0.6	NA	0.047g[d]
1,3-Dichlorobenzene	1 / 59	0.02	0 / 5	ND	NA	NA	0.05g
1,4-Dichlorobenzene	4 / 59	0.02 - 0.1	0 / 5	ND	0.075	NA	0.047g[d]
Diethylphthalate	3 / 59	0.007 - 0.062	0 / 5	ND	NA	NA	0.05g
Dimethylphthalate	1 / 59	0.0013	0 / 5	ND	NA	NA	0.05g
2,4-Dimethylphenol	2 / 59	0.026 - 0.11	0 / 5	ND	NA	NA	NA
Isophorone	5 / 59	0.006 - 0.53	0 / 5	ND	NA	NA	0.05g
2-Methylnaphthalene	10 / 59	0.0005 - 0.12	0 / 5	ND	NA	NA	NA
2-Methylphenol	6 / 59	0.002 - 0.41	0 / 5	ND	NA	NA	NA
4-Methylphenol	11 / 59	0.0021 - 0.42	0 / 5	ND	NA	NA	NA
Naphthalene	11 / 59	0.00054 - 2.3	0 / 5	ND	NA	NA	0.01g
Phenol	9 / 59	0.003 - 0.63	0 / 5	ND	NA	NA	0.01g[a]
PESTICIDES/PCBs							
Aldrin	5 / 56	0.000042 - 0.000066	0 / 5	ND	NA	NA	1.0E-6[c]
alpha-BHC	2 / 56	0.000032 - 0.00005	0 / 5	ND	NA	NA	1E-05g
beta-BHC	1 / 54	0.000048	0 / 5	ND	NA	NA	1E-05g
gamma-BHC (Lindane)	3 / 55	0.000031 - 0.00004	0 / 5	ND	0.0002	0.0002	1E-05g

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TABLE 7-22 (Continued)

SUMMARY OF CHEMICALS IN GROUNDWATER
LI TUNGSTEN SITE

CHEMICAL	Frequency	Range of Concentrations [1] mg/L	BACKGROUND Frequency	BACKGROUND Range of Concentrations [1] mg/L	USEPA MCLs mg/L [2]	NYS MCLs mg/L [3]	NYSDEC WQS mg/L [4]
alpha-Chlordane	1 / 55	0.000038	0 / 5	ND	0.002	0.002	0.0001g
gamma-Chlordane	1 / 55	0.000038	0 / 5	ND	0.002	0.002	0.0001g
4,4'-DDD	1 / 57	0.00023	0 / 5	ND	NA	NA	1E-06g[c]
4,4'-DDE	1 / 55	0.000045	0 / 5	ND	NA	NA	1E-06g
4,4'-DDT	2 / 56	0.000054 - 0.000093	0 / 5	ND	NA	NA	1E-06g
Dieldrin	2 / 56	0.000058 - 0.00032	0 / 5	ND	NA	NA	1E-06g[e]
Endosulfan I	3 / 56	0.00003 - 0.000068	0 / 5	ND	NA	NA	9E-06
Endosulfan II	3 / 57	0.00008 - 0.00019	0 / 5	ND	NA	NA	9E-06
Endosulfan sulfate	1 / 56	0.000081	0 / 5	ND	NA	NA	NA
Endrin	2 / 57	0.00044 - 0.0013	0 / 5	ND	0.002	0.0002	0.2
Endrin aldehyde	1 / 56	0.00016	0 / 5	ND	NA	NA	0.005
Heptachlor	3 / 55	0.000029 - 0.000046	0 / 5	ND	0.0004	0.0004	9E-06
INORGANICS							
Aluminum	60 / 60	0.0654 - 122	5 / 5	0.17 - 134	NA	NA	0.1
Antimony	30 / 60	0.0055 - 11.1	0 / 5	ND	0.006	NA	0.003g
Arsenic	34 / 41	0.0099 - 10.9	2 / 3	0.0093 - 0.152	0.050	0.05	0.025g
Barium	60 / 60	0.0215 - 1.64	5 / 5	0.0239 - 4.18	2	2	1g
Beryllium	34 / 60	0.00032 - 0.0124	3 / 5	0.00029 - 0.0015	0.004	NA	0.003g
Cadmium	56 / 60	0.00043 - 1.16	4 / 5	0.0012 - 0.0216	0.005	0.05	0.01g
Calcium	60 / 60	5.44 - 554	5 / 5	5.35 - 112	NA	NA	NA
Chromium	57 / 59	0.0014 - 0.561	5 / 5	0.0016 - 0.378	0.1	0.1	0.05g
Cobalt	58 / 60	0.0015 - 17.6	4 / 5	0.0162 - 0.127	NA	NA	0.005
Copper	59 / 60	0.0025 - 36.9	5 / 5	0.0037 - 0.312	1.3***	NA	0.2g
Iron	60 / 60	0.15 - 1260	5 / 5	0.788 - 317	NA	0.3/0.5**	0.3g[b]
Lead	51 / 60	0.0014 - 0.836	4 / 5	0.0163 - 0.133	0.015***	NA	0.025g
Magnesium	60 / 60	3.2 - 247	5 / 5	1.38 - 21.8	NA	NA	35g
Manganese	59 / 59	0.164 - 68.3	5 / 5	0.0482 - 93.7	NA	0.3/0.5**	0.3g[b]
Mercury	31 / 57	0.00007 - 0.0148	2 / 5	0.0002 - 0.00097	0.002	0.002	0.002g
Nickel	60 / 60	0.0036 - 110	5 / 5	0.0045 - 1.68	0.1	NA	*
Potassium	57 / 57	2.16 - 236	5 / 5	6.5 - 27.1	NA	NA	NA
Selenium	31 / 58	0.003 - 1.31	2 / 5	0.0027 - 0.0138	0.05	NA	0.01g
Silver	38 / 60	0.001 - 0.352	1 / 5	0.0038	NA	NA	0.05g
Sodium	59 / 59	7.82 - 8400	5 / 5	22.2 - 204	NA	NA	20g
Thallium	35 / 58	0.0041 - 0.0237	2 / 5	0.0098 - 0.156	0.002	NA	0.004g
Vanadium	51 / 59	0.0047 - 0.431	4 / 5	0.0302 - 0.28	NA	NA	0.014g
Zinc	60 / 60	0.0084 - 17.1	5 / 5	0.0066 - 2.52	NA	5	.3g
OTHER							
Cyanide	3 / 60	0.0053 - 0.0063	1 / 5	0.0419	0.2	NA	0.1g

ND = Not Detected
NA = Not Available
[1] Range of Detected Concentrations
[2] USEPA Maximum Contaminant Levels; 40 CFR Part 141
* 0.1 1994 proposed rule for disinfection by-products: 0.08 for total halomethanes
** 0.07 for cis-isomer; 0.1 for trans-isomer
*** action levels
[3] NYS Maximum Contaminant Levels; 10 NYCRR Part 1
* 0.1 1994 proposed rule for disinfection by-products: 0.08 for total halomethanes
** 0.5 mg/L for sum of iron and managanese
[4] NYSDEC Water Quality Standards and Guidance Values (NYSDEC, 1993). Standards and guidance values (designated "g") for Class GA groundwater.
* exp (0.76 [ln (ppm hardness)] +1.06)
a = for phenolic compounds (total phenols)
b = 0.5 mg/L for sum of iron and managanese
c = for the sum of DDD, DDE, and DDT
d = for the sum of 1,2 and 1,4 Dichlorobenzene
e = for the sum of Aldrin and Dieldrin

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TABLE 7-23

SUMMARY OF CHEMICALS IN SURFACE WATER
LI TUNGSTEN SITE

CHEMICAL	PARCEL B SURFACE WATER		PARCEL C SURFACE WATER	
	Frequency	Range of Concentrations[1] mg/l	Frequency	Range of Concentrations[1] mg/l
VOLATILE ORGANICS				
Acetone	1 / 2	0.013	0 / 2	ND
1,1-Dichloroethane	1 / 2	0.002	0 / 2	ND
1,2-Dichloroethene (total)	1 / 2	0.015	0 / 2	ND
Tetrachloroethene	1 / 2	0.006	0 / 2	ND
SEMI-VOLATILE ORGANICS				
bis(2-Ethylhexyl)phthalate	1 / 2	0.001	1 / 2	0.004
Di-n-butylphthalate	0 / 2	ND	1 / 2	0.001
PESTICIDES/PCBs				
4,4'-DDD	1 / 2	0.0091	0 / 2	ND
4,4'-DDE	1 / 2	0.0016	0 / 2	ND
4,4'-DDT	1 / 2	0.0046	0 / 2	ND
INORGANICS				
Aluminum	2 / 2	0.127 - 77	2 / 2	13.2 - 28.0
Antimony	1 / 2	2.26	1 / 2	0.0154
Arsenic	1 / 2	8.09	2 / 2	0.115 - 0.246
Barium	2 / 2	0.101 - 0.463	2 / 2	0.0227 - 0.0271
Beryllium	0 / 2	ND	1 / 2	0.0055
Cadmium	1 / 2	0.846	2 / 2	0.0227 - 0.0792
Calcium	2 / 2	29.8 - 106	2 / 2	40.9 - 47.5
Chromium	1 / 2	0.215	1 / 2	0.012
Cobalt	2 / 2	0.0557 - 42.3	0 / 0	ND
Copper	1 / 2	17.1	2 / 2	0.956 - 4.14
Iron	2 / 2	13 - 722	2 / 2	24.5 - 33.6
Lead	1 / 2	1.18	2 / 2	0.292 - 0.377
Magnesium	2 / 2	9.77 - 30.1	2 / 2	12.2 - 15
Manganese	2 / 2	4.97 - 5.39	2 / 2	3.35 - 3.81
Mercury	1 / 2	0.0036	1 / 2	0.00012
Nickel	2 / 2	0.0177 - 27.9	2 / 2	0.0549 - 0.116
Potassium	2 / 2	4.69 - 18.1	2 / 2	2.62 - 3.76
Selenium	1 / 2	0.2		N/A
Silver	1 / 2	0.256	1 / 2	0.0051
Sodium	2 / 2	47.8 - 296	2 / 2	19.9 - 23.0
Vanadium	1 / 2	0.21	0 / 2	ND
Zinc	1 / 2	91.2	2 / 2	2.04 - 4.89
OTHER				
Cyanide	1 / 2	0.0051	0 / 2	ND

1 Range of Detected Concentrations.
ND = Not Detected
N/A = Not Analyzed

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TABLE 7-24

SUMMARY OF CHEMICALS IN SEDIMENT
LI TUNGSTEN SITE

CHEMICAL	PARCEL B SEDIMENT Frequency	PARCEL B SEDIMENT Range of Concentrations[1] mg/kg	PARCEL C SEDIMENT Frequency	PARCEL C SEDIMENT Range of Concentrations[1] mg/kg
VOLATILE ORGANICS				
Acetone	2 / 2	0.16 - 0.24	0 - 2	ND
Benzene	1 / 2	0.002	0 - 2	ND
2-Butanone	2 / 2	0.027 - 0.067	1 - 2	0.021
1,1-Dichloroethane	1 / 2	0.002	0 - 2	ND
1,2-Dichloroethene (total)	1 / 2	0.002	0 - 2	ND
SEMI-VOLATILE ORGANICS				
Benzo[a]anthracene	0 / 2	ND	1 / 2	0.08
Benzo[a]pyrene	0 / 2	ND	1 / 2	0.075
Benzo[b]fluoranthene				
Benzo[g,h,i]perylene	0 / 2	ND	1 / 2	0.13
Benzo[k]fluoranthene	0 / 2	ND	1 / 2	0.066
Chrysene	0 / 2	ND	1 / 2	0.1
Fluoranthene	1 / 2	0.074	1 / 2	0.16
Indeno[1,2,3-cd]pyrene	0 / 2	ND	1 / 2	0.085
Phenanthrene	1 / 2	0.053	1 / 2	0.099
Pyrene	2 / 2	0.052 - 0.059	1 / 2	0.13
PESTICIDES/PCBs				
4,4'-DDD	1 / 2	0.116	0 / 2	ND
4,4'-DDE	1 / 2	0.056	0 / 2	ND
PCBs (total)	1 / 2	1.806	0 / 2	ND

TABLE 7-24 (Continued)

SUMMARY OF CHEMICALS IN SEDIMENT
LI TUNGSTEN SITE

CHEMICAL	PARCEL B SEDIMENT Frequency	PARCEL B SEDIMENT Range of Concentrations[1] mg/kg	PARCEL C SEDIMENT Frequency	PARCEL C SEDIMENT Range of Concentrations[1] mg/kg
INORGANICS				
Aluminum	2 / 2	5260 - 5860	2 / 2	1060 - 6890
Antimony	2 / 2	3.8 - 5	2 / 2	35.2 - 87.8
Arsenic	2 / 2	11.8 - 25.6	2 / 2	1610 - 2080
Barium	2 / 2	67.6 - 82.1	2 / 2	38.9 - 71.7
Beryllium	0 / 2	ND	0 / 2	ND
Cadmium	0 / 2	ND	2 / 2	4.9 - 5.1
Calcium	2 / 2	1190 - 1360	2 / 2	477 - 962
Chromium	2 / 2	15.1 - 18.2	2 / 2	9 - 37.5
Cobalt	2 / 2	47.8 - 77.2	2 / 2	7.9 - 8.7
Copper	2 / 2	34.2 - 191	2 / 2	239 - 418
Iron	2 / 2	23100 - 33000	2 / 2	52900 - 54400
Lead	2 / 2	22.1 - 94.2	2 / 2	1950 - 2840
Magnesium	2 / 2	1610 - 1650	2 / 2	346 - 1640
Manganese	2 / 2	372 - 543	2 / 2	137 - 354
Mercury	2 / 2	0.08 - 0.18	2 / 2	0.17 - 2.1
Nickel	2 / 2	37.5 - 43.4	2 / 2	6.5 - 15.5
Potassium	2 / 2	871 - 1090	2 / 2	1340 - 1860
Selenium	2 / 2	2.7 - 3.6	2 / 2	9.8 - 15.8
Silver	2 / 2	0.65 - 3	2 / 2	19.8 - 63.3
Sodium	2 / 2	51.5 - 53.7	2 / 2	75.6 - 182
Vanadium	2 / 2	23 - 31.5	2 / 2	8.5 - 20.6
Zinc	2 / 2	60.4 - 87.2	2 / 2	435 - 466
OTHER				
Cyanide	0 / 2	ND	1 / 2	0.53

1 Range of Detected Concentrations
ND = Not Detected

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TABLE 7-25

CHEMICALS OF POTENTIAL CONCERN
LI TUNGSTEN SITE

CHEMICAL	SURFACE SOIL				ALL SOILS				GROUNDWATER	SURFACE WATER		SEDIMENT	
	Area A	Area B	Area B&C	Area C	AREA A	AREA B	AREA B&C	AREA C		PARCEL B	PARCEL C	PARCELB	PARCEL C
VOLATILE ORGANICS													
Benzene	X	X	ND	X	X	X	ND	X	X	ND	ND	X	ND
1,1-Dichloroethene	•	ND	ND	ND	•	ND	ND	ND	X	•	ND	•	ND
1,2-Dichloroethene (total)	•	ND	ND	ND	•	ND	ND	•	X	•	ND	•	ND
Methylene chloride	•	•	•	•	•	•	•	•	X	ND	ND	ND	ND
Tetrachloroethene	•	ND	ND	ND	•	ND	ND	•	X	•	ND	ND	ND
1,1,1-Trichloroethane	•	ND	ND	ND	•	ND	ND	ND	X	ND	ND	ND	ND
Trichloroethene	•	ND	ND	ND	•	ND	ND	•	X	ND	ND	ND	ND
Vinyl chloride	ND	ND	ND	ND	ND	ND	ND	ND	X	ND	ND	ND	ND
SEMI -VOLATILE ORGANICS													
Benzo[a]anthracene	•	•	•	•	X	•	•	•	ND	ND	ND	ND	•
Benzo[a]pyrene	X	•	•	•	X	•	•	•	ND	ND	ND	ND	•
Benzo[b]fluoranthene	•	•	•	•	X	•	•	•	ND	ND	ND	•	•
Dibenz[a,h]anthracene	X	ND	ND	ND	X	ND	ND	ND	ND	ND	ND	ND	ND
Benzo[g,h,i]perylene	X	X	X	X	X	X	X	X	ND	ND	ND	ND	•
Indeno[1,2,3-cd]pyrene	•	•	•	•	X	•	•	•	ND	ND	ND	ND	•
Phenanthrene	X	X	X	X	X	X	X	X	X	ND	ND	•	•
PESTICIDES/PCBs													
PCBs (total)	X	•	X	X	X	•	X	X	ND	ND	ND	X	ND

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TABLE 7-25 (Continued)

CHEMICALS OF POTENTIAL CONCERN
LI TUNGSTEN SITE

CHEMICAL	SURFACE SOIL				ALL SOILS					SURFACE WATER		SEDIMENT	
	Area A	Area B	Area B&C	Area C	AREA A	AREA B	AREA B&C	AREA C	GROUNDWATER	PARCEL B	PARCEL C	PARCELB	PARCEL C
INORGANICS													
Aluminum	•	•	•	•	•	•	•	•	•	X	X	•	•
Antimony	X	X	X	X	X	X	X	X	X	X	X	X	X
Arsenic	X	X	X	X	X	X	X	X	X	X	X	X	X
Barium	X	•	•	X	X	•	•	X	•	•	•	•	•
Beryllium	•	•	•	X	•	•	•	X	•	ND	X	ND	ND
Cadmium	•	•	•	•	•	•	•	•	X	X	X	ND	•
Calcium	•	•	•	•	•	•	•	•	X	•	•	•	•
Cobalt	X	X	X	X	X	X	X	X	•	X	ND	•	•
Copper	X	X	X	X	X	X	X	X	X	X	X	X	X
Iron	•	X	X	•	•	•	X	X	•	X	X	•	•
Lead	X	X	X	X	X	X	X	X	X	X	X	X	X
Magnesium	•	•	•	•	•	•	•	•	X	•	•	•	•
Manganese	•	X	X	X	•	X	X	X	•	X	X	•	•
Mercury	X	X	X	X	X	X	X	X	X	•	•	•	X
Nickel	X	X	X	•	X	X	X	•	X	X	•	X	•
Selenium	X	•	•	•	X	•	•	•	•	•	ND	•	•
Silver	X	X	X	X	X	X	X	X	•	•	•	•	•
Sodium	•	•	•	•	•	•	•	•	X	•	•	•	•
Thallium	ND	ND	X	ND	ND	ND	•	ND	•	ND	ND	ND	ND
Zinc	•	•	•	•	•	•	•	•	•	X	X	•	•

X: Selected as a chemical of potential concern
ND: Not Detected
• : Detected but not selected as a chemical of potential concern

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TABLE 7-26

SUMMARY OF COMPLETE EXPOSURE PATHWAYS:
CHEMICAL RISK ASSESSMENT
LI TUNGSTEN SITE

Potentially Exposed Population	Exposure Route, Medium, and Exposure Point	Pathway Selected for Evaluation?	Location	Reason for Selection or Exclusion
Current Land Use				
Site Workers	Ingestion of chemicals in surface soil. Dermal contact with chemicals in surface soil.	No	Areas A, B, B&C, C	Site is not currently used.
Trespassers	Ingestion of chemicals in surface soil. Dermal contact with chemicals in surface soil.	No	Area A	Parcel A is currently paved.
Trespassers	Ingestion of chemicals in surface soil. Dermal contact with chemicals in surface soil.	Yes	Areas B, B&C, C	Contaminated surface soil may be encountered by trespassers.
Trespassers	Dermal contact with chemicals in surface water.	Yes	Parcels B, C	Contaminated surface water may be encountered by trespassers.
Trespassers	Ingestion of chemicals in sediment. Dermal contact with chemicals in sediment.	Yes	Parcels B, C	Contaminated sediment may be encountered by trespassers.
Off-Site Residents	Inhalation of chemicals on respirable particulate.	Yes	Off-site	Contaminated soil particles may become airborne.

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TABLE 7-26 (Continued)

SUMMARY OF COMPLETE EXPOSURE PATHWAYS:
CHEMICAL RISK ASSESSMENT
LI TUNGSTEN SITE

Potentially Exposed Population	Exposure Route, Medium, and Exposure Point	Pathway Selected for Evaluation?	Location	Reason for Selection or Exclusion
Future Land Use				
Trespassers	Ingestion of chemicals in surface soil. Dermal contact with chemicals in surface soil.	Yes	Aeas A, B, B&C, C	Contaminated surface soil may be encountered by trespassers.
Trespassers	Dermal contact with chemicals in surface water.	Yes	Parcel B, C	Contaminated surface water may be encountered by trespassers.
Trespassers	Ingestion of chemicals in sediment. Dermal contact with chemicals in sediment.	Yes	Parcel B, C	Contaminated sediment may be encountered by trespassers.
Site Workers	Ingestion of chemicals in surface soil. Dermal contact with chemicals in surface soil.	Yes	Areas A, B, B&C, C	Contaminated surface soil may be encountered by site workers.
Construction Workers	Ingestion of chemicals in soil. Dermal contact with chemicals in soil. Inhalation of chemicals on respirable particulates.	Yes	Areas A, B, B&C, C	Contaminated soil may be encountered by construction workers during construction activities. Contaminated soil particles may become airborne if disturbed during construction activities.

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TABLE 7-26 (Continued)

SUMMARY OF COMPLETE EXPOSURE PATHWAYS:
CHEMICAL RISK ASSESSMENT
LI TUNGSTEN SITE

Potentially Exposed Population	Exposure Route, Medium, and Exposure Point	Pathway Selected for Evaluation?	Location	Reason for Selection or Exclusion
On-Site Residents	Ingestion of chemicals in soil. Dermal contact with chemicals in soil.	Yes	Areas A,. B, B&C, C	Contaminated surface soil may be encountered by residents.
On-Site Residents	Ingestion of chemicals in groundwater. Dermal contact with chemicals in groundwater. Inhalation of chemicals volatilized from groundwater.	Yes		The possibility of future potable use of the groundwater exists.
Site Workers	Ingestion of chemicals in groundwater. Dermal contact with chemicals in groundwater.	Yes		The possibility of future potable use of the groundwater exists.

TABLE 7-27

MATRIX OF POTENTIAL EXPOSURE ROUTES
CHEMICAL RISK ASSESSMENT
LI TUNGSTEN SITE

Exposure Medium/ Exposure Route	Adolescent Trespassers	Site Workers	Construction Workers	Residents
Surface Soil				
Ingestion	T	A	--	--
Dermal Contact	T	A	--	--
All Soils				
Ingestion	--	--	A	L,C
Dermal Contact	--	--	A	L,C
Respirable Particulates				
Inhalation	--	--	A	L,C
Surface Water				
Dermal Contact	T	--	--	--
Sediment				
Ingestion	T	--	--	--
Dermal Contact	T	--	--	--
Groundwater				
Ingestion	--	A	--	L,C
Dermal Contact	--	A	--	L,C
Inhalation	--	--	--	L,C

Notes:
L = Lifetime exposure for adults
A = Exposure to adults in a non-residential scenario
T = Teenaged Adolescents
C = Children

TABLE 7-28

EXPOSURE POINT CONCENTRATIONS
LI TUNGSTEN SITE

Off-Site Residents: Inhalation of Chemicals on Respirable Particulates from Areas B, B&C, C			
Benzo[g,h,i]perylene	2.22E-09		mg/m^3
Phenanthrene	2.45E-09		mg/m^3
PCBs (total)	8.84E-08		mg/m^3
Antimony	4.31E-05		mg/m^3
Arsenic	6.21E-05		mg/m^3
Barium	2.06E-06		mg/m^3
Beryllium	1.68E-08		mg/m^3
Cobalt	5.20E-05		mg/m^3
Copper	4.86E-05		mg/m^3
Iron	2.15E-03		mg/m^3
Lead	1.90E-04		mg/m^3
Manganese	8.24E-04		mg/m^3
Mercury	8.59E-08		mg/m^3
Nickel	2.56E-04		mg/m^3
Silver	1.38E-06		mg/m^3
Thallium	4.44E-08		mg/m^3
Adolescent Trepasser and Site Worker: Ingestion of and Contact with Chemicals in Surface Soil from Area A			
Benzene	1.00E-03	MAX	mg/kg
Benzo[a]pyrene	1.27E+00	UCLlog	mg/kg
Benzo[g,h,i]perylene	8.84E-01	UCLlog	mg/kg
Dibenz[a,h]anthracene	4.35E-01	UCLlog	mg/kg
Phenanthrene	2.00E+00	UCLlog	mg/kg
PCBs (total)	1.71E-01	UCLlog	mg/kg
Aluminum	7.92E+03	UCLlog	mg/kg
Antimony	8.55E+00	UCLlog	mg/kg
Arsenic	3.68E+02	UCLlog	mg/kg
Barium	4.41E+02	UCLlog	mg/kg
Beryllium	4.93E-01	UCLlog	mg/kg
Cobalt	6.63E+02	UCLlog	mg/kg
Copper	8.65E+02	UCLlog	mg/kg
Iron	3.22E+04	UCLlog	mg/kg
Lead	3.14E+02	UCLlog	mg/kg
Manganese	1.67E+03	UCLlog	mg/kg
Mercury	1.69E+00	UCLlog	mg/kg
Nickel	3.90E+02	UCLlog	mg/kg
Selenium	3.08E+01	UCLlog	mg/kg
Silver	3.43E+01	MAX	mg/kg

TABLE 7-28 (Continued)

EXPOSURE POINT CONCENTRATIONS
LI TUNGSTEN SITE

Adolescent Trepasser and Site Worker: Ingestion of and Contact with Chemicals in Surface Soil from Area B			
Benzene	4.00E-03	MAX	mg/kg
Benzo[g,h,i]perylene	8.30E-02	MAX	mg/kg
Phenanthrene	7.20E-02	MAX	mg/kg
Aluminum	5.66E+04	MAX	mg/kg
Antimony	4.16E+02	MAX	mg/kg
Arsenic	1.79E+03	MAX	mg/kg
Cobalt	4.66E+03	MAX	mg/kg
Copper	2.16E+03	MAX	mg/kg
Iron	1.93E+05	MAX	mg/kg
Lead	3.71E+03	MAX	mg/kg
Manganese	5.68E+03	MAX	mg/kg
Mercury	1.80E+00	MAX	mg/kg
Nickel	2.89E+04	MAX	mg/kg
Silver	1.03E+02	MAX	mg/kg
Adolescent Trepasser and Site Worker: Ingestion of and Contact with Chemicals in Surface Soil from Area B&C			
Benzo[g,h,i]perylene	2.19E-01	UCLnorm	mg/kg
Phenanthrene	2.47E-01	UCLnorm	mg/kg
PCBs (total)	9.42E+00	UCLlog	mg/kg
Antimony	4.34E+03	UCLlog	mg/kg
Arsenic	6.30E+03	MAX	mg/kg
Cobalt	4.62E+03	MAX	mg/kg
Copper	4.61E+03	MAX	mg/kg
Iron	1.85E+05	UCLlog	mg/kg
Lead	1.96E+04	MAX	mg/kg
Manganese	9.00E+04	MAX	mg/kg
Mercury	8.23E+00	UCLlog	mg/kg
Nickel	2.20E+04	MAX	mg/kg
Silver	1.14E+02	MAX	mg/kg
Thallium	4.94E+00	UCLlog	mg/kg
Adolescent Trepasser and Site Worker: Ingestion of and Contact with Chemicals in Surface Soil from Area C			
Benzene	2.00E-03	MAX	mg/kg
Benzo[g,h,i]perylene	6.20E-02	MAX	mg/kg
Phenanthrene	6.40E-02	MAX	mg/kg
PCBs (total)	2.89E+00	MAX	mg/kg
Antimony	2.43E+03	MAX	mg/kg
Arsenic	1.44E+03	MAX	mg/kg
Barium	1.35E+03	MAX	mg/kg
Beryllium	1.10E+01	MAX	mg/kg
Cobalt	7.64E+02	MAX	mg/kg
Copper	2.07E+03	MAX	mg/kg
Iron	7.43E+04	MAX	mg/kg
Lead	5.14E+03	MAX	mg/kg
Manganese	2.93E+03	MAX	mg/kg
Mercury	6.20E+00	MAX	mg/kg
Silver	1.10E+02	MAX	mg/kg

TABLE 7-28 (Continued)

EXPOSURE POINT CONCENTRATIONS
LI TUNGSTEN SITE

Adolescent Trepasser: Contact with Chemicals in Surface Water from Parcel B			
Antimony	2.26E+00	MAX	mg/L
Arsenic	8.09E+00	MAX	mg/L
Cadmium	8.46E-01	MAX	mg/L
Cobalt	4.23E+01	MAX	mg/L
Copper	1.71E+01	MAX	mg/L
Iron	7.22E+02	MAX	mg/L
Lead	1.18E+00	MAX	mg/L
Manganese	5.39E+00	MAX	mg/L
Nickel	2.79E+01	MAX	mg/L
Zinc	9.12E+01	MAX	mg/L
Adolescent Trepasser: Contact with Chemicals in Surface Water from Parcel C			
Aluminum	2.80E+01	MAX	mg/L
Antimony	1.54E-02	MAX	mg/L
Arsenic	2.46E-01	MAX	mg/L
Beryllium	5.50E-03	MAX	mg/L
Cadmium	7.92E-02	MAX	mg/L
Copper	4.14E+00	MAX	mg/L
Iron	3.36E+01	MAX	mg/L
Lead	3.77E-01	MAX	mg/L
Manganese	3.81E+00	MAX	mg/L
Zinc	4.89E+00	MAX	mg/L
Adolescent Trepasser: Inadvertent Ingestion of and Contact with Chemicals in Sediment from Parcel B			
Benzene	2.00E-03	MAX	mg/kg
PCBs (total)	1.81E+00	MAX	mg/kg
Antimony	5.00E+00	MAX	mg/kg
Arsenic	2.56E+01	MAX	mg/kg
Copper	1.91E+02	MAX	mg/kg
Mercury	1.80E-01	MAX	mg/kg
Nickel	4.34E+01	MAX	mg/kg
Adolescent Trepasser: Inadvertent Ingestion of and Contact with Chemicals in Sediment from Parcel C			
Antimony	8.78E+01	MAX	mg/kg
Arsenic	2.08E+03	MAX	mg/kg
Copper	4.18E+02	MAX	mg/kg
Lead	2.84E+03	MAX	mg/kg
Mercury	2.10E+00	MAX	mg/kg

TABLE 7-28 (Continued)

EXPOSURE POINT CONCENTRATIONS
LI TUNGSTEN SITE

Construction Worker and Residents: Ingestion of and Contact with Chemicals in All Soils from Area A			
Benzene	1.00E-03	MAX	mg/kg
Benzo[a]anthracene	7.65E-01	UCLlog	mg/kg
Benzo[a]pyrene	1.02E+00	UCLlog	mg/kg
Benzo[b]fluoranthene	2.38E+00	UCLlog	mg/kg
Benzo[g,h,i]perylene	8.69E-01	UCLlog	mg/kg
Dibenz[a,h]anthracene	4.40E-01	UCLlog	mg/kg
Indeno[1,2,3-cd]pyrene	8.78E-01	UCLlog	mg/kg
Phenanthrene	2.63E+00	UCLlog	mg/kg
PCBs (total)	9.51E-02	UCLlog	mg/kg
Aluminum	7.47E+03	UCLlog	mg/kg
Antimony	5.85E+00	UCLlog	mg/kg
Arsenic	1.68E+02	UCLlog	mg/kg
Barium	2.03E+02	UCLlog	mg/kg
Beryllium	4.43E-01	UCLlog	mg/kg
Cobalt	1.58E+02	UCLlog	mg/kg
Copper	2.88E+02	UCLlog	mg/kg
Iron	2.33E+04	UCLlog	mg/kg
Lead	2.34E+02	UCLlog	mg/kg
Manganese	7.61E+02	UCLlog	mg/kg
Mercury	7.79E-01	UCLlog	mg/kg
Nickel	1.41E+02	UCLlog	mg/kg
Selenium	1.61E+01	UCLlog	mg/kg
Silver	2.02E+01	UCLlog	mg/kg
Construction Worker: Inhalation of Chemicals on Respirable Particulates from Area A			
Benzo[a]anthracene	1.02E-06		mg/m^3
Benzo[a]pyrene	1.37E-06		mg/m^3
Benzo[b]fluoranthene	3.19E-06		mg/m^3
Benzo[g,h,i]perylene	1.16E-06		mg/m^3
Dibenz[a,h]anthracene	5.90E-07		mg/m^3
Indeno[1,2,3-cd]pyrene	1.18E-06		mg/m^3
Phenanthrene	3.53E-06		mg/m^3
PCBs (total)	1.27E-07		mg/m^3
Antimony	7.83E-06		mg/m^3
Arsenic	2.26E-04		mg/m^3
Barium	2.72E-04		mg/m^3
Cobalt	2.11E-04		mg/m^3
Copper	3.86E-04		mg/m^3
Lead	3.14E-04		mg/m^3
Mercury	1.04E-06		mg/m^3
Nickel	1.89E-04		mg/m^3
Selenium	2.16E-05		mg/m^3
Silver	2.71E-05		mg/m^3

TABLE 7-28 (Continued)

EXPOSURE POINT CONCENTRATIONS
LI TUNGSTEN SITE

Construction Worker and Residents: Ingestion of and Contact with Chemicals in All Soils from Area B			
Benzene	4.00E-03	MAX	mg/kg
Benzo[g,h,i]perylene	8.30E-02	MAX	mg/kg
Phenanthrene	8.60E-02	MAX	mg/kg
Antimony	4.16E+02	MAX	mg/kg
Arsenic	1.79E+03	MAX	mg/kg
Cobalt	4.66E+03	MAX	mg/kg
Copper	2.16E+03	MAX	mg/kg
Lead	3.71E+03	MAX	mg/kg
Manganese	2.25E+03	UCLlog	mg/kg
Mercury	1.80E+00	MAX	mg/kg
Nickel	2.89E+04	MAX	mg/kg
Silver	1.03E+02	MAX	mg/kg
Construction Worker: Inhalation of Chemicals on Respirable Particulates from Area B			
Benzo[g,h,i]perylene	1.11E-07		mg/m^3
Phenanthrene	1.15E-07		mg/m^3
Antimony	5.57E-04		mg/m^3
Arsenic	2.40E-03		mg/m^3
Cobalt	6.24E-03		mg/m^3
Copper	2.89E-03		mg/m^3
Lead	4.97E-03		mg/m^3
Manganese	3.02E-03		mg/m^3
Mercury	2.41E-06		mg/m^3
Nickel	3.87E-02		mg/m^3
Silver	1.38E-04		mg/m^3
Construction Worker and Residents: Ingestion of and Contact with Chemicals in All Soils from Area B&C			
Benzo[g,h,i]perylene	2.66E-01	UCLlog	mg/kg
Phenanthrene	3.00E-01	UCLlog	mg/kg
PCBs (total)	1.26E+00	UCLlog	mg/kg
Antimony	1.12E+03	UCLlog	mg/kg
Arsenic	6.30E+03	MAX	mg/kg
Cobalt	1.05E+03	UCLlog	mg/kg
Copper	4.61E+03	MAX	mg/kg
Iron	8.33E+04	UCLlog	mg/kg
Lead	1.96E+04	MAX	mg/kg
Manganese	1.99E+04	UCLlog	mg/kg
Mercury	2.98E+00	UCLlog	mg/kg
Nickel	1.57E+03	UCLlog	mg/kg
Silver	1.14E+02	MAX	mg/kg

TABLE 7-28 (Continued)

EXPOSURE POINT CONCENTRATIONS
LI TUNGSTEN SITE

Construction Worker: Inhalation of Chemicals on Respirable Particulates from Area B&C			
Benzo[g,h,i]perylene	3.57E-07		mg/m^3
Phenanthrene	4.02E-07		mg/m^3
PCBs (total)	1.69E-06		mg/m^3
Antimony	1.50E-03		mg/m^3
Arsenic	8.44E-03		mg/m^3
Cobalt	1.41E-03		mg/m^3
Copper	6.18E-03		mg/m^3
Iron	1.12E-01		mg/m^3
Lead	2.63E-02		mg/m^3
Manganese	2.67E-02		mg/m^3
Mercury	3.99E-06		mg/m^3
Nickel	2.11E-03		mg/m^3
Silver	1.53E-04		mg/m^3
Construction Worker and Residents: Ingestion of and Contact with Chemicals in All Soils from Area C			
Benzene	2.00E-03	MAX	mg/kg
Benzo[g,h,i]perylene	3.20E-01	MAX	mg/kg
Phenanthrene	3.20E-01	MAX	mg/kg
PCBs (total)	1.12E+00	UCLlog	mg/kg
Antimony	3.49E+03	MAX	mg/kg
Arsenic	2.95E+03	MAX	mg/kg
Barium	8.52E+02	UCLlog	mg/kg
Beryllium	1.33E+00	UCLlog	mg/kg
Cobalt	7.64E+02	MAX	mg/kg
Copper	6.74E+03	MAX	mg/kg
Iron	6.93E+04	UCLnorm	mg/kg
Lead	5.14E+03	MAX	mg/kg
Manganese	2.79E+03	UCLlog	mg/kg
Mercury	2.95E+01	MAX	mg/kg
Silver	1.10E+02	MAX	mg/kg
Construction Worker: Inhalation of Chemicals on Respirable Particulates from Area C			
Benzo[g,h,i]perylene	4.29E-07		mg/m^3
Phenanthrene	4.29E-07		mg/m^3
PCBs (total)	1.50E-06		mg/m^3
Antimony	4.68E-03		mg/m^3
Arsenic	3.95E-03		mg/m^3
Barium	1.14E-03		mg/m^3
Beryllium	1.78E-06		mg/m^3
Cobalt	1.02E-03		mg/m^3
Copper	9.03E-03		mg/m^3
Iron	9.29E-02		mg/m^3
Lead	6.89E-03		mg/m^3
Manganese	3.74E-03		mg/m^3
Mercury	3.95E-05		mg/m^3
Silver	1.47E-04		mg/m^3

TABLE 7-28 (Continued)

EXPOSURE POINT CONCENTRATIONS
LI TUNGSTEN SITE

Site Worker and Residents: Ingestion of and Contact with Chemicals in Groundwater			
Benzene	9.39E-02	UCLlog	mg/L
1,1 Dichloroethene	9.27E-02	UCLlog	mg/L
1,2 Dichloroethene (total)	1.86E+01	UCLlog	mg/L
Methylene chloride	6.92E-01	UCLlog	mg/L
1,1,1 Trichloroethane	9.08E-01	UCLlog	mg/L
Trichloroethene	3.08E+00	UCLlog	mg/L
Tetrachloroethene	1.45E+00	UCLlog	mg/L
Vinyl chloride	1.21E-01	UCLlog	mg/L
Phenanthrene	1.08E-02	UCLlog	mg/L
Antimony	3.89E-01	UCLlog	mg/L
Arsenic	4.95E-01	UCLlog	mg/L
Cadmium	5.08E-02	UCLlog	mg/L
Calcium	1.72E+02	UCLlog	mg/L
Copper	3.47E+00	UCLlog	mg/L
Iron	4.52E+02	UCLlog	mg/L
Lead	5.07E-01	UCLlog	mg/L
Magnesium	4.19E+01	UCLlog	mg/L
Manganese	1.43E+01	UCLlog	mg/L
Mercury	1.02E-03	UCLlog	mg/L
Nickel	1.87E+00	UCLlog	mg/L
Sodium	3.58E+02	UCLlog	mg/L
Residents: Inhalation of Chemicals Volatilized from Groundwater			
Benzene	2.77E-01		mg/m^3
1,1 Dichloroethene	2.85E-01		mg/m^3
1,2 Dichloroethene (total)	6.02E+01		mg/m^3
Methylene chloride	2.29E+00		mg/m^3
1,1,1 Trichloroethane	2.50E+00		mg/m^3
Trichloroethene	8.67E+00		mg/m^3
Tetrachloroethene	3.80E+00		mg/m^3
Vinyl chloride	8.89E-02		mg/m^3

TABLE 7-29

GENERIC EQUATION FOR CALCULATING CHEMICAL INTAKES
LI TUNGSTEN SITE

$$CDI = \frac{C \times CR \times EFD}{BW} \times \frac{1}{AT}$$

Where:

CDI	=	Chronic Daily Intake; the amount of chemical at the exchange boundary (mg/kg body weight-day)
C	=	Chemical concentration; the "average" concentration contacted over the exposure period (e.g., mg/liters water) (In practice, C is either the 95% upper confidence limit on the average concentration or the maximum concentration.)
CR	=	Contact Rate; the amount of contaminated medium contacted per unit time or event (e.g. liters/day)
EFD	=	Exposure frequency and duration; describes how long and how often exposure occurs; often calculated using two terms (EF and ED) EF = exposure frequency (days/year) ED = exposure duration (years)
BW	=	Body Weight; the average body weight over the exposure period (kg)
AT	=	Averaging Time; time period over which exposure is averaged (days)

TABLE 7-30

SUMMARY OF EXPOSURE PARAMETERS
CHEMICAL RISK ASSESSMENT

LI TUNGSTEN SITE

MEDIUM	EXPOSURE PARAMETER	UNITS	SYMBOL	ADOLESCENT TRESPASSER	OFF-SITE RESIDENT ADULT	OFF-SITE RESIDENT CHILD	SITE WORKER	CONSTRUCTION WORKER	ON-SITE RESIDENT ADULT	ON-SITE RESIDENT CHILD
SOIL - INGESTION, DERMAL CONTACT AND INHALATION										
	Ingestion Rate	mg/day	IR	100 [1]			50 [1]	480 [1]	100 [1]	200 [1]
	Fraction Ingested	unitless	FI	1.0			1.0	1.0	1.0	1.0
	Inhalation Rate	cu.m/hour	IR_i		0.83 [2]	0.83 [2]		2.3 [1]		
	Exposure Time - Inhalation	hour/day	ET		24 [3]	24 [3]		8 [4]		
	Skin Surface Area	cm^2	SA	1970 [5]			2570 [5]	2570 [5]	2425 [5]	872.5 [5]
	Soil-to-Skin Adherence Factor	mg/cm^2	AF	1.0 [5]			1.0 [5]	1.0 [5]	1.0 [5]	1.0 [5]
	Skin Absorption Factor	unitless	ABS	Chemical Specific			Chemical Specific	Chemical Specific	Chemical Specific	Chemical Specific
GROUNDWATER - INGESTION, DERMAL CONTACT AND INHALATION										
	Ingestion Rate	l/day	IR				1 [1]		2 [1]	1 [1]
	Skin Surface Area	cm^2	SA				2570 [4]		19400 [5]	6980 [5]
	Exposure Time - Dermal Contact	hours/day	ET				0.2 [2]		0.2 [2]	0.2 [2]
	Exposure Time - Inhalation	hours/day	ET						0.2 [2]	0.2 [2]
	Inhalation Rate	cu.m/hour	IR						0.83 [2]	0.83 [2]
	Permeability Coefficient	cm/hour	PC				Chemical Specific		Chemical Specific	Chemical Specific
SURFACE WATER - DERMAL CONTACT										
	Skin Surface Area	cm^2	SA	1970 [5]						
	Exposure Time	hours/day	ET	2 [2]						
	Permeability Coefficient	cm/hour	PC	Chemical Specific						

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TABLE 7-30 (Continued)

SUMMARY OF EXPOSURE PARAMETERS
CHEMICAL RISK ASSESSMENT

LI TUNGSTEN SITE

MEDIUM	EXPOSURE PARAMETER	UNITS	SYMBOL	ADOLESCENT TRESPASSER	OFF-SITE RESIDENT ADULT	OFF-SITE RESIDENT CHILD	SITE WORKER	CONSTRUCTION WORKER	ON-SITE RESIDENT ADULT	ON-SITE RESIDENT CHILD
SEDIMENT - INGESTION AND DERMAL CONTACT										
	Ingestion Rate	mg/event	IR	100 [1]						
	Fraction Ingested	unitless	FI	1.0						
	Skin Surface Area	cm^2/event	SA	1970 [5]						
	Soil-to-Skin Adherence Factor	mg/cm^2	AF	1 [5]						
	Skin Absorption Factor	unitless	ABS	Chemical Specific						
OTHER PARAMETERS										
	Exposure Frequency	days/year	EF	120 [4]	365 [3]	365 [3]	250 [1]	60 [4]	350 [1]	350 [1]
	Exposure Duration	years	ED	6 [2]	30 [1]	6 [1]	25 [1]	1 [2]	30 [1,6]	6 [1]
	Body Weight	kg	BW	57.7 [2]	70 [1]	15 [1]	70 [1]	70 [1]	70 [1]	15 [1]
	Averaging Time for Non-Carcinogenic Effects	days x years	AT_{NC}	2190	10950	2190	9125	365	10950	2190
	Averaging Time for Carcinogenic Effects	days x years	AT_C	25550	25550	25550	25550	25550	25550	25550

REFERENCES

[1] USEPA, 1991
[2] USEPA, 1989a
[3] Constistent with the estimation of annual average concentrations of COPC in air
[4] Professional judgement
[5] USEPA, 1992a
[6] For cancer risk assessment for ingesttion of and dermal contact with soil, 6 years child exposure plus 24 years adult exposure.

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TABLE 7-31

PERMEABILITY COEFFICIENTS
LI TUNGSTEN SITE

CHEMICAL	PERMEABILITY COEFFICIENT (cm/hr)
Benzene	2.1E-02
1,1-Dichloroethane	1.6E-02
1,2-Dichloroethene	1.0E-02
Methylene chloride	4.5E-03
Tetrachloroethene	4.8E-02
1,1,1-Trichloroethane	1.7E-02
Trichloroethene	1.6E-02
Vinyl chloride	7.3E-03
Phenanthrene	2.7E-01
Antimony	1.0E-03
Arsenic	1.0E-03
Cadmium	1.0E-03
Calcium	1.0E-03
Copper	1.0E-03
Lead	1.0E-03
Magnesium	1.0E-03
Mercury	1.0E-03
Nickel	1.0E-03
Sodium	1.0E-03

USEPA, 1992a

TABLE 7-32

TOXICITY VALUES: POTENTIAL NONCARCINOGENIC EFFECTS
ORAL EXPOSURE

LI TUNGSTEN SITE

Chemical	Chronic RfD (mg/kg-day)	Critical Effect	RfD Basis	Confidence Level	Uncertainty Factor	Modifying Factor	RfD Source
VOLATILE ORGANICS							
Benzene	3E-03	Hematotoxicity and immunotoxicity	Oral	Medium	3000 for H,A,S,C,O	1	NCEA
1,1-Dichloroethene	9E-03	Hepatic lesions	Oral	Medium	1000	1	IRIS
1,2-Dichloroethene(total)	9.00E-03	Liver lesions	Water	--	1000	--	HEAST
Methylene chloride	6E-02	Liver toxicity	Oral	Medium	100 for H,A	1	IRIS
Tetrachloroethene	1E-02	--	--	--	--	--	IRIS
1,1,1-Trichloroethane	2E-02	CNS effects	Inhalation	Medium to Low	3000 for H,A, C,O	1	NCEA
Trichloroethene	6.00E-03	Liver and kidney	Oral, diet	Low	3000 for H,A,C,O	--	NCEA
Vinyl chloride	--	--	--	--	--	--	IRIS; HEAST
SEMI-VOLATILE ORGANICS							
Benzo[a]anthracene	--	--	--	--	--	--	IRIS; HEAST
Benzo[a]pyrene	--	--	--	--	--	--	IRIS; HEAST
Benzo[b]fluoranthene	--	--	--	--	--	--	IRIS; HEAST
Dibenz[a,h]anthracene	--	--	--	--	--	--	IRIS; HEAST
Benzo[g,h,i]perylene	--	--	--	--	--	--	IRIS; HEAST
Indeno[1,2,3-cd]pyrene	--	--	--	--	--	--	IRIS; HEAST
Phenanthrene	--	--	--	--	--	--	IRIS; HEAST
PCBs							
Polychlorinated biphenyls	--	--	--	--	--	--	IRIS; HEAST
Aroclor 1016	7.00E-05	Reduced birth weights	Oral	Medium	100 for H,A,C,O	1	IRIS
Aroclor 1248	--	--	--	--	--	--	IRIS; HEAST
Aroclor 1254	2.00E-05	Ocular exudate, inflamed Meibomian glands, distorted nail growth, decreased antibody response.	Oral	Medium	300 for H,A,O	1	IRIS

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TABLE 7-32 (continued)

TOXICITY VALUES: POTENTIAL NONCARCINOGENIC EFFECTS
ORAL EXPOSURE

LI TUNGSTEN SITE

Chemical	Chronic RfD (mg/kg-day)	Critical Effect	RfD Basis	Confidence Level	Uncertainty Factor	Modifying Factor	RfD Source
INORGANICS							
Aluminum	1E+00	Minimal neurotoxicity	Diet	Low	100 for H,A,S	1	NCEA
Antimony	4.00E-04	Longevity, blood glucose, and cholesterol	Oral	Low	1000	1	IRIS
Arsenic	3.00E-04	Hyperpigmentation, keratosis and possible vascular complications	Oral	Medium	3 for O	1	IRIS
Barium	7E-02	Increased blood pressure	Oral	Medium	3 for H,O	1	IRIS
Beryllium	5.00E-03	No adverse effects	Oral	Low	100 for H,A	1	IRIS
Cadmium (water)	5.00E-04	Significant proteinuria	Oral	High	10 for H	1	IRIS
Calcium	--	--	--	--	--	--	IRIS; HEAST
Cobalt	6.00E-02	--	--	--	--	--	NCEA
Copper	3.7E-02	Gastrointestinal irritation	Oral	--	--	--	HEAST
Iron	3.00E-01	--	Oral	Medium	1 for O	1	NCEA
Lead	--	--	--	--	--	--	IRIS; HEAST
Manganese	2.30E-02	CNS effects	Oral	Medium	1 for O	1(3 nondiet)	IRIS
Magnesium	--	--	--	--	--	--	IRIS; HEAST
Mercury(elemental)	--	--	--	--	--	--	IRIS; HEAST
Nickel (soluble salts)	2E-02	Decreased body and organ weights	Oral	Medium	300 H,A,O	1	IRIS
Selenium	5.00E-03	Clinical selenosis	Epidemiology study	High	3	1	IRIS
Silver	5E-03	Argyria	Oral	Low	3 for O	1	IRIS; HEAST
Sodium	--	--	--	--	--	--	IRIS; HEAST
Thallium(I)sulfate	8.00E-05	No observed adverse effects	Oral	Low	3,000 for H,A,C,O	1	IRIS
Zinc	3.00E-01	Decrease in erythrocyte superoxide	Diet	Medium	3 for O	1	IRIS

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TABLE 7-32 (continued)

TOXICITY VALUES: POTENTIAL NONCARCINOGENIC EFFECTS
INHALATION EXPOSURE

LI TUNGSTEN SITE

Chemical	Chronic RfC (mg/m3)	Chronic RfD (mg/kg-day)	Critical Effect	RfD Basis	Confidence Level	Uncertainty Factor	Modifying Factor	RfD Source
VOLATILE ORGANICS								
Benzene	6E-03	2E-03	Damage to hematopoietic cells	Inhalation	Medium	1000 for H,A,S,C	1	NCEA
1,1-Dichloroethene	--	--	--	--	--	--	--	IRIS; HEAST
1,2-Dichloroethene(total)	--	--						IRIS; HEAST
Methylene chloride	3.00E+00	8.6E-01	Liver toxicity	Inhalation	--	100 for H,A,O	--	HEAST
Tetrachloroethene	--	--	Hepatotoxicity	Inhalation	Low	3000 for H,A,S	1	IRIS; HEAST
1,1,1-Trichloroethane	1E+00	2.9E-01	CNS effects	Inhalation	Medium	300 for H,A,C	1	NCEA
Trichloroethene	--	--	--	--	--	--	--	IRIS; HEAST
Vinyl chloride	--	--	--	--	--	--	--	IRIS; HEAST
SEMI-VOLATILE ORGANICS								
Benzo[a]anthracene	--	--	--	--	--	--	--	IRIS; HEAST
Benzo[a]pyrene	--	--	--	--	--	--	--	IRIS; HEAST
Benzo[b]fluoranthene	--	--	--	--	--	--	--	IRIS; HEAST
Dibenz[a,h]anthracene	--	--	--	--	--	--	--	IRIS; HEAST
Benzo[g,h,i]perylene	--	--	--	--	--	--	--	IRIS; HEAST
Indeno[1,2,3-cd]pyrene	--	--	--	--	--	--	--	IRIS; HEAST
Phenanthrene	--	--	--	--	--	--	--	IRIS; HEAST
PCBs								
Polychlorinated biphenyls	--	--	--	--	--	--	--	IRIS; HEAST
Aroclor 1016	--	--	--	--	--	--	--	IRIS; HEAST
Aroclor 1248	--	--	--	--	--	--	--	IRIS; HEAST
Aroclor 1254	--	--	--	--	--	--	--	IRIS; HEAST

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TABLE 7-32 (continued)

TOXICITY VALUES: POTENTIAL NONCARCINOGENIC EFFECTS
INHALATION EXPSOSURE

LI TUNGSTEN SITE

Chemical	Chronic RfD (mg/kg-day)	Critical Effect	RfD Basis	Confidenc Level	Uncertainty Factor	Modifying Factor	RfD Source	
INORGANICS								
Aluminum	--	--	--	--	--	--	--	IRIS; HEAST
Antimony	--	--	--	--	--	--	--	IRIS; HEAST
Arsenic	--	--	--	--	--	--	--	IRIS; HEAST
Barium	5.00E-04	1.0E-04	Fetotoxicity	Inhalation	--	1000	--	HEAST
Beryllium	--	--	--	--	--	--	--	IRIS; HEAST
Cadmium	--	--	--	--	--	--	--	IRIS; HEAST
Calcium	--	--	--	--	--	--	--	IRIS; HEAST
Cobalt	2.00E-05	5.7E-06	--	--	--	--	--	NCEA
Copper	--	--	--	--	--	--	--	IRIS; HEAST
Iron	--	--	--	--	--	--	--	IRIS; HEAST
Lead	--	--	--	--	--	--	--	IRIS; HEAST
Manganese	5.00E-05	1.4E-05	Impairment of neurobehavioral function	Inhalation	Medium	1000 for H,S,O	1	IRIS
Magnesium	--	--	--	--	--	--	--	IRIS; HEAST
Mercury(elemental)	3.00E-04	8.6E-05	Neurotoxicity	Inhalation	Medium	30	1	HEAST
Nickel (soluble salts)	--	--	--	--	--	--	--	IRIS; HEAST
Selenium	--	--	--	--	--	--	--	IRIS; HEAST
Silver	1.00E-05	2.9E-06	Argyrosis	Inhalation	Low	1000 for H,S,C,O	1	NCEA
Sodium	--	--	--	--	--	--	--	IRIS; HEAST
Thallium(I)sulfate	ND	--	--	--	--	--	--	IRIS; HEAST
Zinc	--	--	--	--	--	--	--	IRIS; HEAST

Notes:

-- = Not Available
HEAST = Health Effects Assessment Summary Tables (USEPA, 1995).
IRIS = Integrated Risk Information System (USEPA, 1997a).
NCEA = National Center for Environmental Assessment (USEPA, 1997b).
* = Uncertainty Factor, to account for inter- and intraspecies extrapolation and extrapolation from subchronic to chronic exposures.
** = Modifying Factor, to account for uncertainty in the test program.
H = Variation in Human Sensitivity
A = Animal to Human Extrapolation
S = Extrapolation from Lowest Observed Adverse Effect Level (LOAEL) to No Observed Adverse Effect Level (NOAEL
C = Extrapolation from Subochronic Studies to Chronic
O = Other factors

TABLE 7-33

ORAL ABSORPTION FACTORS
LI TUNGSTEN SITE

CHEMICAL	ORAL ABSORPTION	SOURCE
Organics	1.0	default
Antimony	0.1	ATSDR, 1991
Arsenic	0.8	ATSDR, 1993a
Cadmium	0.05	Carson et al., 1986
Calcium	1.0	default
Copper	0.5	Carson et al., 1986
Magnesium	1.0	default
Mercury	0.02	ATSDR, 1989
Nickel	0.1	Carson et al., 1986
Sodium	1	default

TABLE 7-34

TOXICITY VALUES: POTENTIAL CARCINOGENIC EFFECTS ORAL EXPOSURE

LI TUNGSTEN SITE

Chemical	Slope Factor (SF) (mg/kg-day)-1	SF Basis	Weight-of-Evidence Classification	SF Source
VOLATILE ORGANICS				
Benzene	2.9E-02	Inhalation	A	IRIS
1,1-Dichloroethene	6E-01	Oral	C	IRIS
1,2-Dichloroethene(total)	–		–	IRIS; HEAST
Methylene chloride	7.5E-03	Inhalation	B2	IRIS
Tetrachloroethene	5.20E-02	–	B2/C	NCEA
1,1,1-Trichloroethane	–	–	D	NCEA
Trichloroethene	1.10E-02	–	B2/C	NCEA
Vinyl chloride	1.90E+00	Diet	A	HEAST
SEMI-VOLATILE ORGANICS				
Benzo[a]anthracene	7.30E-01	–	B2	USEPA
Benzo[a]pyrene	7.30E+00	Oral, diet	B2	IRIS
Benzo[b]fluoranthene	7.30E-01	–	B2	USEPA
Benzo[k]fluoranthene	7.30E-02	–	B2	USEPA
Dibenz[a,h]anthracene	7.30E+00	–	B2	USEPA
Benzo[g,h,i]perylene	–	–	D	IRIS
Indeno[1,2,3-cd]pyrene	7.30E-01	–	B2	USEPA
Phenanthrene	–	–	D	IRIS
PCBs				
Polychlorinated biphenyls	2.00E+00	Oral,diet	B2	IRIS
Aroclor 1016	–	–	–	IRIS; HEAST
Aroclor 1248	–	–	–	IRIS; HEAST
Aroclor 1254	–	–	–	IRIS; HEAST

TABLE 7-34 (continued)

TOXICITY VALUES: POTENTIAL CARCINOGENIC EFFECTS ORAL EXPOSURE

LI TUNGSTEN SITE

Chemical	Slope Factor (SF) (mg/kg-day)-1	SF Basis	Weight-of-Evidence Classification	SF Source
INORGANICS				
Aluminum	–	–	–	IRIS; HEAST
Antimony	–	–	–	IRIS; HEAST
Arsenic	1.50E+00	Oral	A	IRIS
Barium	–	–	–	IRIS; HEAST
Beryllium	4.30E+00	Oral	B2	IRIS
Cadmium (water)	–	–	B1	IRIS; HEAST
Calcium	–	–	–	IRIS; HEAST
Cobalt	–	–	ND	IRIS; HEAST
Copper	–	–	D	IRIS; HEAST
Iron	–	–	–	IRIS; HEAST
Lead	–	–	B2	IRIS; HEAST
Manganese	–	–	D	IRIS; HEAST
Magnesium	–	–	–	IRIS; HEAST
Mercury(elemental)	–	–	D	IRIS; HEAST
Nickel (soluble salts)	–	–	–	IRIS; HEAST
Selenium	–	–	D	IRIS; HEAST
Silver	–	–	D	NCEA
Sodium	–	–	–	IRIS; HEAST
Thallium(I)sulfate	–	–	D	IRIS; HEAST
Zinc	–	–	D	IRIS

TABLE 7-34 (continued)

TOXICITY VALUES: POTENTIAL CARCINOGENIC EFFECTS
INHALATION EXPOSURE

LI TUNGSTEN SITE

Chemical	Slope Factor (SF) (mg/kg-day)-1	SF Basis	Weight-of-Evidence Classification	SF Source
VOLATILE ORGANICS				
Benzene	2.9E-02	Inhalation	A	IRIS
1,1-Dichloroethene	1.20E+00	Inhalation	C	IRIS
1,2-Dichloroethene(total)	–		–	IRIS; HEAST
Methylene chloride	1.6E-03	Inhalation	B2	IRIS
Tetrachloroethene	2.00E-03	–	B2/C	NCEA
1,1,1-Trichloroethane	–	–	D	NCEA
Trichloroethene	6.00E-03	–	B2/C	NCEA
Vinyl chloride	3.00E-01	Inhalation	A	HEAST
SEMI-VOLATILE ORGANICS				
Benzo[a]anthracene	–	–	B2	IRIS; HEAST
Benzo[a]pyrene	–	Inhalation	B2	IRIS
Benzo[b]fluoranthene	–	–	B2	IRIS; HEAST
Benzo[k]fluoranthene	–	–	B2	IRIS; HEAST
Dibenz[a,h]anthracene	–	–	B2	IRIS; HEAST
Benzo[g,h,i]perylene	–	–	D	IRIS
Indeno[1,2,3-cd]pyrene	–	–	B2	IRIS; HEAST
Phenanthrene	–	–	D	IRIS
PCBs				
Polychlorinated biphenyls	–	–	B2	IRIS; HEAST
Aroclor 1016	–	–	–	IRIS; HEAST
Aroclor 1248	–	–	–	IRIS; HEAST
Aroclor 1254	–	–	–	IRIS; HEAST

TABLE 7-34 (continued)

TOXICITY VALUES: POTENTIAL CARCINOGENIC EFFECTS
INHALATION EXPOSURE

LI TUNGSTEN SITE

Chemical	Slope Factor (SF) (mg/kg-day)-1	SF Basis	Weight-of-Evidence Classification	SF Source
INORGANICS				
Aluminum	–	–	–	IRIS; HEAST
Antimony	–	–	–	IRIS; HEAST
Arsenic	1.5E+01	Inhalation	A	IRIS
Barium	–	–	–	IRIS; HEAST
Beryllium	8.40E+00	Inhalation	B2	HEAST
Cadmium (water)	6.30E+00	Inhalation	B1	IRIS
Calcium	–	–	–	IRIS; HEAST
Cobalt	–	–	ND	IRIS; HEAST
Copper	–	–	D	IRIS; HEAST
Iron	–	–	–	IRIS; HEAST
Lead	–	–	B2	IRIS; HEAST
Manganese	–	–	D	IRIS; HEAST
Magnesium	–	–	–	IRIS; HEAST
Mercury(elemental)	–	–	D	IRIS; HEAST
Nickel (soluble salts)	–	–	–	IRIS; HEAST
Selenium	–	–	D	IRIS; HEAST
Silver	–	–	D	NCEA
Sodium	–	–	–	IRIS; HEAST
Thallium(I)sulfate	–	–	D	IRIS; HEAST
Zinc	–	–	D	IRIS

Notes:

– = Not Available
HEAST = Health Effects Assessment Summary Tables (USEPA, 1995).
IRIS = Integrated Risk Information System (USEPA, 1997a).
NCEA = National Center for Environmental Assessment (USEPA, 1997b).
USEPA = Provisional Guidance for Quantitative Risk Assessment of Polycylic Aromatic Hydrocarbons (USEPA, 1993b).
A = Human Carcinogen (sufficient evidence of carcinogenicity in humans)
B1 = Probable Human Carcinogen (limited evidence of carcinogenicity in humans)
B2 = Probable Human Carcinogen (sufficient evidence of carcinogenicity in animal with inadequate or lack of evidence in humans)
C = Possible Human Carcinogen (limited evidence of carcinogenicity in animals and inadequate or lack of human data)
D = Not classifiable as to human carcinogenicity (inadequate or no evidence)
ND = Not determined

TABLE 7-35

SUMMARY OF HAZARD INDICES AND CANCER RISKS
LI TUNGSTEN SITE

EXPOSURE POPULATION AND PATHWAY	HAZARD INDEX	PREDOMINANT CONTRIBUTORS	CANCER RISK	PREDOMINANT CONTRIBUTORS
CURRENT SCENARIO				
OFF-SITE ADULT RESIDENT				
Inhalation of Respirable Particulates	2E+01	Mn	1E-04	As
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**2E+01**		**1E-04**	
OFF-SITE CHILD RESIDENT				
Inhalation of Respirable Particulates	9E+01	Mn, Co	1E-04	As
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**9E+01**		**1E-04**	
CURRENT AND FUTURE SCENARIOS				
ADOLESCENT TRESPASSERS				
Ingestion of Surface Soil from Area B	5E+00	As	1E-04	
Dermal Contact with Surface Soil from Area B	3E+00	As	1E-04	
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**8E+00**		**2E-04**	
Ingestion of Surface Soil from Area B&C	2E+01	Sb, As, Mn	5E-04	As
Dermal Contact with Surface Soil from Area B&C	9E+00	As	3E-04	As
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**3E+01**		**8E-04**	
Ingestion of Surface Soil from Area C	6E+00	Sb, As	1E-04	
Dermal Contact of Surface Soil from Area C	2E+00	As	8E-05	
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**9E+00**		**2E-04**	
Dermal Contact with Surface Water from Parcel B	4E+00	Sb,Cd,As,Al,Ni	3E-05	
Ingestion of Sediment from Parcel B	1E-01		2E-06	
Dermal Contact with Sediment from Parcel B	2E-01		2E-06	
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**4E+00**		**3E-05**	
Dermal Contact with Surface Water from Parcel C	3E-01		5E-06	
Ingestion of Sediment from Parcel C	4E+00	As	2E-04	
Dermal Contact with Sediment from Parcel C	3E+00	As	1E-04	
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**7E+00**		**3E-04**	

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TABLE 7-35 (Continued)

SUMMARY OF HAZARD INDICES AND CANCER RISKS
LI TUNGSTEN SITE

EXPOSURE POPULATION AND PATHWAY	HAZARD INDEX	PREDOMINANT CONTRIBUTORS	CANCER RISK	PREDOMINANT CONTRIBUTORS
FUTURE SCENARIO				
ADOLESCENT TRESSPASSER				
Ingestion of Surface Soil from Area A	8E-01		3E-05	
Dermal Contact with Surface Soil from Area A	5E-01		2E-05	
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**1E+00**		**5E-05**	
SITE WORKERS				
Ingestion of Surface Soil from Area A	7E-01	As	1E-04	
Dermal Contact with Surface Soil from Area A	1E+00	As	2E-04	
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**2E+00**		**3E-04**	
Ingestion of Surface Soil from Area B	5E+00	As	5E-04	As
Dermal Contact with Surface Soil from Area B	6E+00	As	9E-04	As
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**1E+01**		**1E-03**	
Ingestion of Surface Soil from Area B&C	2E+01	As,Sb,Mn	2E-03	As
Dermal Contact with Surface Soil from Area B&C	2E+01	As	3E-03	As
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**4E+01**		**5E-03**	
Ingestion of Surface Soil from Area C	6E+00	As,Sb	4E-04	As
Dermal Contact with Surface Soil from Area C	5E+00	As	7E-04	As
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**1E+01**		**1E-03**	
CONSTRUCTION WORKER				
Ingestion of All Soils from Area A	7E-01		4E-06	
Dermal Contact with All Soils from Area A	1E-01		8E-07	
Inhalation of Respirable Particulates at Area A	2E+00	Co	2E-06	
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**3E+00**		**7E-06**	
Ingestion of All Soils from Area B	1E+01	As	4E-05	
Dermal Contact with All Soils from Area B	1E+00		9E-06	
Inhalation of Respirable Particulates at Area B	6E+01	Co,Mn	2E-05	
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**7E+01**		**7E-05**	
Ingestion of All Soils from Area B&C	3E+01	As	2E-04	As
Dermal Contact with All Soils from Area B&C	5E+00		3E-05	
Inhalation of Respirable Particulates at Area B&C	9E+01	Mn,Co	8E-05	As
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**1E+02**		**3E-04**	

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TABLE 7-35 (Continued)

SUMMARY OF HAZARD INDICES AND CANCER RISKS
LI TUNGSTEN SITE

EXPOSURE POPULATION AND PATHWAY	HAZARD INDEX	PREDOMINANT CONTRIBUTORS	CANCER RISK	PREDOMINANT CONTRIBUTORS
Ingestion of All Soils from Area C	2E+01	Sb,As	7E-05	
Dermal Contact with All Soils from Area C	2E+00		1E-05	
Inhalation of Respirable Particulates at Area C	2E+01	Co,Mn	4E-05	
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**5E+01**		**1E-04**	
ADULT RESIDENT				
Ingestion of All Soils from Area A	8E-01	As	4E-04	As *
Dermal Contact with All Soils from Area A	7E-01	As	2E-04	As *
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**2E+00**		**6E-04**	
Ingestion of All Soils from Area B	1E+01	As,Ni	4E-03	As *
Dermal Contact with All Soils from Area B	7E+00	As	2E-03	As *
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**2E+01**		**6E-03**	
Ingestion of All Soils from Area B&C	3E+01	As	1E-02	As *
Dermal Contact with All Soils from Area B&C	3E+01	As	6E-03	As *
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**6E+01**		**2E-02**	
Ingestion of All Soils from Area C	3E+01	Sb,As	7E-03	As *
Dermal Contact with All Soils from Area C	1E+01	As	3E-03	As *
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**4E+01**		**1E-02**	
CHILD RESIDENT				
Ingestion of All Soils from Area A	8E+00	As	3E-04	
Dermal Contact with All Soils from Area A	1E+00	As	5E-05	
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**9E+00**		**3E-04**	
Ingestion of All Soils from Area B	1E+02	Sb,As, Ni	3E-03	As
Dermal Contact with All Soils from Area B	1E+01	As	5E-04	
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**1E+02**		**3E-03**	
Ingestion of All Soils from Area B&C	3E+02	Sb,As	1E-02	As
Dermal Contact with All Soils from Area B&C	4E+01	As	2E-03	
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**4E+02**		**1E-02**	

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TABLE 7-35 (Continued)

SUMMARY OF HAZARD INDICES AND CANCER RISKS
LI TUNGSTEN SITE

EXPOSURE POPULATION AND PATHWAY	HAZARD INDEX	PREDOMINANT CONTRIBUTORS	CANCER RISK	PREDOMINANT CONTRIBUTORS
Ingestion of All Soils from Area C	2E+02	Sb,As	5E-03	As
Dermal Contact with All Soils from Area C	2E+01	As	8E-04	
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**3E+02**		**6E-03**	
SITE WORKERS				
Ingestion of Groundwater	6E+01	As,1,2-DCE,Sb,TCE,Cd,PCE	4E-03	As,Vc
Dermal Contact with Groundwater	2E-01		9E-06	
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**6E+01**		**4E-03**	
ADULT RESIDENT				
Ingestion of Groundwater	2E+02	1,2-DCE,TCE,PCE,Sb,As	1E-02	Vc,As
Dermal Contact with Groundwater	2E+00		1E-04	
Inhalation of Chemicals Volatilized from Groundwater	4E-01		4E-04	
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**2E+02**		**1E-02**	
CHILD RESIDENT				
Ingestion of Groundwater	4E+02	1,2-DCE,TCE,PCE,Sb,As	6E-03	As,Vc
Dermal Contact with Groundwater	3E+00		4E-05	
Inhalation of Chemicals Volatilized from Groundwater	2E+00		4E-04	
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**4E+02**		**7E-03**	

* Based on 30 year exposure, 6 year child exposure plus 24 year adult exposure.
Al: Aluminum
As: Arsenic
Cd: Cadmium
Co: Cobalt
1,2-DCE: 1,2-Dichloroethene (total)
Mn: Manganese
Ni: Nickel
PCE: Tetrachloroethene
Sb: Antimony
TCE: Trichloroethene
Vc: Vinyl chloride

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TABLE 7-36

SUMMARY OF SPECIFIC HAZARD INDICIES
LI TUNGSTEN SITE

EXPOSURE POPULATION AND AREA	CHEMICAL	TARGET/ HAZARD INDEX	CHEMICAL SPECIFIC HAZARD INDEX	TOXIC ENDPOINT-SPECIFIC HAZARD INDEX
CURRENT SCENARIO				
OFF-SITE ADULT RESIDENT				
Inhalation of Respirable Particulates	Manganese	CNS	2E+01	
	Mercury		3E-04	2E+01
	Barium	Circulatory	6E-03	6E-03
	Barium	Development	6E-03	6E-03
	Silver	Skin	1E-01	1E-01
OFF-SITE CHILD RESIDENT				
Inhalation of Respirable Particulates	Barium	Circulatory	3E-02	3E-02
	Manganese	CNS	8E+01	
	Mercury		1E-03	8E+01
	Barium	Development	3E-02	3E-02
	Silver	Skin	6E-01	6E-01
CURRENT AND FUTURE SCENARIOS				
ADOLESCENT TRESPASSERS				
Surface Soil from Area B	Benzene	Circulatory	8E-07	
	Antimony		6E-01	6E-01
	Manganese	CNS	1E-01	1E-01
	Nickel	Development	8E-01	8E-01
	Arsenic	Skin	6E+00	
	Silver		1E-02	6E+00
Surface Soil from Area B&C	Antimony	Circulatory	6E+00	6E+00
	Manganese	CNS	2E+00	2E+00
	PCBs	Development	1E+00	
	Nickel		6E-01	2E+00
	PCBs	Immune	1E+00	1E+00
	Arsenic	Skin	2E+01	
	Silver		1E-02	2E+01
Surface Soil from Area C	Benzene	Circulatory	4E-07	
	Antimony		3E+00	
	Barium		1E-02	3E+00
	Manganese	CNS	7E-02	7E-02
	PCBs	Development	3E-01	
	Barium		1E-02	3E-01
	PCBs	Immune	3E-01	3E-01
	Arsenic	Skin	5E+00	
	Silver		1E-02	5E+00
Surface Water and Sediment from Parcel B	Benzene	Circulatory	4E-07	
	Antimony		1E+00	
	Zinc		2E-02	1E+00
	Aluminum	CNS	3E-01	
	Manganese		1E-01	4E-01

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TABLE 7-36 (Continued)

SUMMARY OF SPECIFIC HAZARD INDICIES
LI TUNGSTEN SITE

EXPOSURE POPULATION AND AREA	CHEMICAL	TARGET/ HAZARD INDEX	CHEMICAL SPECIFIC HAZARD INDEX	TOXIC ENDPOINT-SPECIFIC HAZARD INDEX
	PCBs	Development	2E-01	
	Nickel		3E-01	5E-01
	PCBs	Immune	2E-01	2E-01
	Arsenic	Skin	9E-01	9E-01
	Cadmium	Kidney	8E-01	8E-01
Surface Water and Sediment from Parcel C	Antimony	Circulatory	1E-01	
	Zinc		9E-04	1E-01
	Aluminum	CNS	1E-01	
	Manganese		7E-02	2E-01
	Arsenic	Skin	7E+00	7E+00
FUTURE SCENARIO				
ADOLESCENT TRESPASSERS				
Surface Soil from Area A	Selenium	CNS	4E-03	4E-03
	Benzene	Circulatory	2E-07	
	Antimony		1E-02	
	Barium		4E-03	1E-02
	PCBs	Development	2E-02	
	Barium		4E-03	
	Nickel		1E-02	3E-02
	PCBs	Immune	2E-02	2E-02
	Arsenic	Skin	1E+00	
	Silver		4E-03	1E+00
SITE WORKERS				
Surface Soil from Area A	Benzene	Circulatory	2E-07	
	Antimony		1E-02	
	Barium		3E-03	1E-02
	Selenium	CNS	3E-03	3E-03
	PCBs	Development	3E-02	
	Nickel		1E-02	
	Barium		3E-03	5E-02
	PCBs	Immune	3E-02	3E-02
	Arsenic	Skin	2E+00	
	Silver		3E-03	2E+00
Surface Soil from Area B	Benzene	Circulatory	7E-07	
	Antimony		5E-01	5E-01
	Manganese	CNS	1E-01	1E-01
	Nickel	Development	7E-01	7E-01
	Arsenic	Skin	9E+00	
	Silver		1E-02	9E+00
Surface Soil from Area B&C	Antimony	Circulatory	5E+00	5E+00
	Manganese	CNS	2E+00	2E+00
	PCBs	Development	2E+00	
	Nickel		5E-01	3E+00
	PCBs	Immune	2E+00	2E+00

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TABLE 7-36 (Continued)

SUMMARY OF SPECIFIC HAZARD INDICIES
LI TUNGSTEN SITE

EXPOSURE POPULATION AND AREA	CHEMICAL	TARGET/ HAZARD INDEX	CHEMICAL SPECIFIC HAZARD INDEX	TOXIC ENDPOINT-SPECIFIC HAZARD INDEX
	Arsenic	Skin	3E+01	
	Silver		1E-02	3E+01
Surface Soil from Area C	Benzene	Circulatory	3E-07	
	Antimony		3E+00	
	Barium		9E-03	3E+00
	Manganese	CNS	6E-02	6E-02
	PCBs	Developmenatal	6E-01	
	Barium		9E-03	6E-01
	PCBs	Immune	6E-01	6E-01
	Arsenic	Skin	7E+00	
	Silver		1E-02	7E+00
CONSTRUCTION WORKERS				
All Soils Area A	Benzene	Circulatory	4E-07	
	Antimony		2E-02	
	Barium		1E-01	1E-01
	Mercury	CNS	5E-04	
	Selenium		4E-03	5E-03
	PCBs	Development	9E-03	
	Nickel		8E-03	
	Barium		1E-01	1E-01
	PCBs	Immune	9E-03	9E-03
	Arsenic	Skin	7E-01	
	Silver		4E-01	1E+00
All Soils Area B	Benzene	Circulatory	2E-06	
	Antimony		1E+00	1E+00
	Manganese	CNS	9E+00	
	Mercury		1E-03	9E+00
	Nickel	Development	2E+00	2E+00
	Arsenic	Skin	8E+00	
	Silver		2E+00	1E+01
All Soils Area B&C	Antimony	Circulatory	3E+00	3E+00
	Manganese	CNS	8E+01	
	Mercury		2E-03	8E+01
	PCBs	Development	1E-01	
	Nickel		9E-02	2E-01
	PCBs	Immune	1E-01	1E-01
	Arsenic	Skin	3E+01	
	Silver		2E+00	3E+01
All Soils Area C	Benzene	Circulatory	8E-07	
	Antimony		1E+01	
	Barium		5E-01	1E+01
	Manganese	CNS	1E+01	
	Mercury		2E-02	1E+01
	PCBs	Development	1E-01	
	Barium		5E-01	6E-01

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TABLE 7-36 (Continued)

SUMMARY OF SPECIFIC HAZARD INDICIES
LI TUNGSTEN SITE

EXPOSURE POPULATION AND AREA	CHEMICAL	TARGET/ HAZARD INDEX	CHEMICAL SPECIFIC HAZARD INDEX	TOXIC ENDPOINT-SPECIFIC HAZARD INDEX
	PCBs	Immune	1E-01	1E-01
	Arsenic	Skin	1E+01	
	Silver		2E+00	1E+01
ADULT RESIDENT				
All Soils Area A	Benzene	Circulatory	5E-07	
	Antimony		2E-02	
	Barium		4E-03	2E-02
	Selenium	CNS	4E-03	4E-03
	PCBs	Development	3E-02	
	Nickel		1E-02	
	Barium		4E-03	4E-02
	PCBs	Immune	3E-02	3E-02
	Arsenic	Skin	2E+00	
	Silver		6E-03	2E+00
All Soils Area B	Benzene	Circulatory	2E-06	
	Antimony		1E+00	1E+00
	Manganese	CNS	1E-01	1E-01
	Nickel	Development	2E+00	2E+00
	Arsenic	Skin	2E+01	
	Silver		3E-02	2E+01
All Soils Area B&C	Antimony	Circulatory	4E+00	4E+00
	Manganese	CNS	1E+00	1E+00
	PCBs	Development	4E-01	
	Nickel		1E-01	5E-01
	PCBs	Immune	4E-01	4E-01
	Arsenic	Skin	6E+01	
	Silver		3E-02	6E+01
All Soils Area C	Benzene	Circulatory	9E-07	
	Antimony		1E+01	
	Barium		2E-02	1E+01
	Manganese	CNS	2E-01	2E-01
	PCBs	Development	4E-01	
	Barium		2E-02	4E-01
	PCBs	Immune	4E-01	4E-01
	Arsenic	Skin	2E+01	
	Silver		3E-02	2E+01
CHILD RESIDENT				
All Soil Area A	Benzene	Circulatory	4E-06	
	Antimony		2E-01	
	Barium		4E-02	2E-01
	PCBs	Development	1E-01	
	Nickel		9E-02	
	Barium		4E-02	2E-01

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TABLE 7-36 (Continued)

SUMMARY OF SPECIFIC HAZARD INDICIES
LI TUNGSTEN SITE

EXPOSURE POPULATION AND AREA	CHEMICAL	TARGET/ HAZARD INDEX	CHEMICAL SPECIFIC HAZARD INDEX	TOXIC ENDPOINT-SPECIFIC HAZARD INDEX
	PCBs	Immune	1E-01	1E-01
	Arsenic	Skin	8E+00	
	Silver		5E-02	8E+00
All Soil Area B	Benzene	Circulatory	2E-05	
	Antimony		1E+01	1E+01
	Manganese	CNS	1E+00	1E+00
	Nickel	Development	2E+01	2E+01
	Arsenic	Skin	9E+01	
	Silver		3E-01	9E+01
All Soil Area B&C	Antimony	Circulatory	4E+01	4E+01
	Manganese	CNS	1E+01	1E+01
	PCBs	Development	1E+00	
	Nickel		1E+00	2E+00
	PCBs	Immune	1E+00	1E+00
	Arsenic	Skin	3E+02	
	Silver		3E-01	3E+02
All Soil Area C	Benzene	Circulatory	9E-06	
	Antimony		1E+02	
	Barium		2E-01	1E+02
	Manganese	CNS	2E+00	2E+00
	PCBs	Development	1E+00	
	Barium		2E-01	1E+00
	PCBs	Immune	1E+00	1E+00
	Arsenic	Skin	1E+02	
	Silver		3E-01	1E+02
SITE WORKER				
Groundwater	Benzene	Circulatory	3E-01	
	Antimony		1E+01	1E+01
	1,1-Dichloroethene	Liver	1E-01	
	1,2-Dichloroethene (total)		2E+01	
	Methylene chloride		1E-01	
	Trichloroethene		5E+00	3E+01
	Trichloroethene	Kidney	5E+00	
	Cadmium		1E+00	6E+00
	1,1,1-Trichloroethane	CNS	4E-01	4E-01
	Nickel	Development	9E-01	9E-01
	Arsenic	Skin	2E+01	2E+01
ADULT RESIDENT				
Groundwater	Benzene	Circulatory	1E+00	
	Antimony		3E+01	3E+01
	1,1-Dichloroethene	Liver	3E-01	
	1,2-Dichloroethene (total)		6E+01	
	Methylene chloride		3E-01	
	Trichloroethene		1E+01	7E+01

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TABLE 7-36 (Continued)

SUMMARY OF SPECIFIC HAZARD INDICIES
LI TUNGSTEN SITE

EXPOSURE POPULATION AND AREA	CHEMICAL	TARGET/ HAZARD INDEX	CHEMICAL SPECIFIC HAZARD INDEX	TOXIC ENDPOINT-SPECIFIC HAZARD INDEX
	Trichloroethene	Kidney	1E+01	
	Cadmium		3E+00	1E+01
	1,1,1-Trichloroethane	CNS	1E+00	1E+00
	Nickel	Development	3E+00	3E+00
	Arsenic	Skin	5E+01	5E+01
CHILD RESIDENT				
Groundwater	Benzene	Circulatory	4E+00	
	Antimony		6E+01	6E+01
	1,1-Dichloroethene	Liver	7E-01	
	1,2-Dichloroethene (total)		1E+02	
	Methylene chloride		7E-01	
	Trichloroethene		3E+01	1E+02
	Trichloroethene	Kidney	3E+01	
	Cadmium		6E+00	4E+01
	1,1,1-Trichloroethane	CNS	3E+00	3E+00
	Nickel	Development	6E+00	6E+00
	Arsenic	Skin	1E+02	1E+02

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TABLE 7-37

SUMMARY OF EXPOSURE PARAMETERS
CENTRAL TENDENCY
CHEMICAL RISK ASSESSMENT

LI TUNGSTEN SITE

MEDIUM	EXPOSURE PARAMETER	UNITS	SYMBOL	ADOLESCENT TRESPASSER	OFF-SITE RESIDENT ADULT	OFF-SITE RESIDENT CHILD	SITE WORKER	CONSTRUCTION WORKER	ON-SITE RESIDENT ADULT	ON-SITE RESIDENT CHILD
SOIL - INGESTION, DERMAL CONTACT, AND INHALATION										
	Ingestion Rate	mg/day	IR	100 [1]			50 [1]	480 [1]	100 [1]	200 [1]
	Fraction Ingested	unitless	FI	*0.5*			*0.5*	*0.5*	*0.5*	*0.5*
	Inhalation Rate	cu.m/hour	IR_i		0.83 [2]	0.83 [2]		2.3 [1]		
	Exposure Time - Inhalation	hour/day	ET		17 [2]	17 [2]		8 [3]		
	Skin Surface Area	cm^2	SA	1970 [4]			*2000 [4]*	*2000 [4]*	2425 [4]	872.5 [4]
	Soil-Skin Adherence Factor	mg/cm^2	AR	1.0 [4]			*0.5 [4]*	*0.5 [4]*	*0.5 [4]*	*0.5 [4]*
	Fraction Contacted	unitless	FC	*0.5*			*0.5*	*0.5*	*0.5*	*0.5*
	Skin Absorption Factor	unitless	ABS	Chemical Specific			Chemical Specific	Chemical Specific	Chemical Specific	Chemical Specific
GROUNDWATER - INGESTION, DERMAL CONTACT, AND INHALATION										
	Ingestion Rate	l/day	IR				*0.7 [2]*		*1.4 [2]*	*0.5 [2]*
	Skin Surface Area	cm^2	SA				*2000 [4]*		*18150 [4]*	6980 [4]
	Exposure Time - Dermal Contact	hours/day	ET				0.2 [3]		0.2 [3]	0.2 [3]
	Exposure Time - Inhalation	hours/day	ET						*0.1 [2]*	*0.1 [2]*
	Inhalation Rate	cu.m/hour	IR						*0.6 [2]*	*0.6 [2]*
	Permeability Coefficient	cm/hour	PC				Chemical Specific		Chemical Specific	Chemical Specific
SURFACE WATER - DERMAL CONTACT										
	Skin Surface Area	cm^2	SA	1970 [4]						
	Exposure Time	hours/day	ET	2 [2]						
	Permeability Coefficient	cm/hour	PC	Chemical Specific						

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TABLE 7-37 (Continued)

SUMMARY OF EXPOSURE PARAMETERS
CENTRAL TENDENCY
CHEMICAL RISK ASSESSMENT

LI TUNGSTEN SITE

MEDIUM	EXPOSURE PARAMETER	UNITS	SYMBOL	ADOLESCENT TRESPASSER	OFF-SITE RESIDENT ADULT	OFF-SITE RESIDENT CHILD	SITE WORKER	CONSTRUCTION WORKER	ON-SITE RESIDENT ADULT	ON-SITE RESIDENT CHILD
SEDIMENT - INGESTION AND DERMAL CONTACT										
	Ingestion Rate	mg/event	IR	100 [1]						
	Fraction Ingested	unitless	FI	***0.5***						
	Skin Surface Area	cm^2/event	SA	1970 [4]						
	Soil-Skin Adherence Factor	mg/cm^2	AF	1 [4]						
	Fraction Contacted	unitless	FC	***0.5***						
	Skin Absorption Factor	unitless	ABS	Chemical Specific						
OTHER PARAMETERS										
	Exposure Frequency	days/year	EF	***50 [3]***	350 [1]	350 [1]	250 [1]	***20 [3]***	350 [1]	350 [1]
	Exposure Duration	years	ED	6 [2]	***9 [2]***	6 [1]	***4 [5]***	1 [2]	***9 [1]***	6 [1]
	Body Weight	kg	BW	57.7 [8]	70 [1]	15 [1]	70 [1]	70 [1]	70 [1]	15 [1]
	Averaging Time for Non-Carcinogenic Effects	days x years	AT_{NC}	2190	***3285***	2190	***1460***	365	***3285***	2190
	Averaging Time for Carcinogenic Effects	days x years	AT_C	25550	25550	25550	25550	25550	25550	25550

REFERENCES

[1] USEPA, 1991
[2] USEPA, 1989a
[3] Professional judgement
[4] USEPA, 1992a
[5] Bureau of Labor Statistics, 1987

Central Tendency Value

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TABLE 7-38

SUMMARY OF HAZARD INDICES AND CANCER RISKS
LI TUNGSTEN SITE

EXPOSURE POPULATION AND PATHWAY	RME HAZARD INDEX	CENTRAL TENDENCY HAZARD INDEX	RME CANCER RISK	CENTRAL TENDENCY CANCER RISK
CURRENT SCENARIO				
OFF-SITE ADULT RESIDENT				
Inhalation of Respirable Particulates	2E+01	2E+01	1E-04	3E-05
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**2E+01**	**2E+01**	**1E-04**	**3E-05**
OFF-SITE CHILD RESIDENT				
Inhalation of Respirable Particulates	9E+01	9E+01	1E-04	1E-04
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**9E+01**	**9E+01**	**1E-04**	**1E-04**
CURRENT AND FUTURE SCENARIOS				
ADOLESCENT TRESPASSERS				
Ingestion of Surface Soil from Area B	5E+00	1E+00	1E-04	2E-05
Dermal Contact with Surface Soil from Area B	3E+00	6E-01	1E-04	2E-05
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**8E+00**	**2E+00**	**2E-04**	**4E-05**
Ingestion of Surface Soil from Area B&C	2E+01	4E+00	5E-04	1E-04
Dermal Contact with Surface Soil from Area B&C	9E+00	2E+00	3E-04	6E-05
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**3E+01**	**6E+00**	**8E-04**	**2E-04**
Ingestion of Surface Soil from Area C	6E+00	1E+00	1E-04	2E-05
Dermal Contact of Surface Soil from Area C	2E+00	4E-01	8E-05	2E-05
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**9E+00**	**1E+00**	**2E-04**	**4E-05**
Dermal Contact with Surface Water from Parcel B	4E+00	2E+00	3E-05	2E-05
Ingestion of Sediment from Parcel B	1E-01	2E-02	2E-06	4E-07
Dermal Contact with Sediment from Parcel B	2E-01	2E-02	2E-06	4E-07
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**4E+00**	**2E+00**	**3E-05**	**2E-05**
Dermal Contact with Surface Water from Parcel C	3E-01	2E-01	5E-06	3E-06
Ingestion of Sediment from Parcel C	4E+00	8E-01	2E-04	4E-05
Dermal Contact with Sediment from Parcel C	3E+00	6E-01	1E-04	2E-05
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**7E+00**	**2E+00**	**3E-04**	**6E-05**
FUTURE SCENARIO				
ADOLESCENT TRESSPASSER				
Ingestion of Surface Soil from Area A	8E-01	2E-01	3E-05	6E-06
Dermal Contact with Surface Soil from Area A	5E-01	1E-01	2E-05	4E-06
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**1E+00**	**3E-01**	**5E-05**	**1E-05**
SITE WORKERS				
Ingestion of Surface Soil from Area A	7E-01	4E-01	1E-04	8E-06
Dermal Contact with Surface Soil from Area A	1E+00	3E-01	2E-04	1E-05
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**2E+00**	**7E-01**	**3E-04**	**2E-05**
Ingestion of Surface Soil from Area B	5E+00	3E+00	5E-04	4E-05
Dermal Contact with Surface Soil from Area B	6E+00	2E+00	9E-04	6E-05
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**1E+01**	**5E+00**	**1E-03**	**1E-04**

TABLE 7-38 (Continued)

SUMMARY OF HAZARD INDICES AND CANCER RISKS
LI TUNGSTEN SITE

EXPOSURE POPULATION AND PATHWAY	RME HAZARD INDEX	CENTRAL TENDENCY HAZARD INDEX	RME CANCER RISK	CENTRAL TENDENCY CANCER RISK
Ingestion of Surface Soil from Area B&C	2E+01	1E+01	2E-03	2E-04
Dermal Contact with Surface Soil from Area B&C	2E+01	1E-04	3E-03	2E-04
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**4E+01**	**1E+01**	**5E-03**	**4E-04**
Ingestion of Surface Soil from Area C	6E+00	3E+00	4E-04	3E-05
Dermal Contact with Surface Soil from Area C	5E+00	2E+00	7E-04	4E-05
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**1E+01**	**5E+00**	**1E-03**	**7E-05**
CONSTRUCTION WORKER				
Ingestion of All Soils from Area A	7E-01	1E-01	4E-06	7E-07
Dermal Contact with All Soils from Area A	1E-01	1E-02	8E-07	1E-07
Inhalation of Respirable Particulates at Area A	2E+00	7E-01	2E-06	6E-07
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**3E+00**	**8E-01**	**7E-06**	**1E-06**
Ingestion of All Soils from Area B	1E+01	2E+00	4E-05	7E-06
Dermal Contact with All Soils from Area B	1E+00	1E-01	9E-06	1E-06
Inhalation of Respirable Particulates at Area B	6E+01	2E+01	2E-05	7E-06
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**7E+01**	**2E+01**	**7E-05**	**2E-05**
Ingestion of All Soils from Area B&C	3E+01	5E+00	2E-04	3E-05
Dermal Contact with All Soils from Area B&C	5E+00	6E-01	3E-05	4E-06
Inhalation of Respirable Particulates at Area B&C	9E+01	3E+01	8E-05	3E-05
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**1E+02**	**4E+01**	**3E-04**	**6E-05**
Ingestion of All Soils from Area C	2E+01	3E+00	7E-05	1E-05
Dermal Contact with All Soils from Area C	2E+00	3E-01	1E-05	1E-06
Inhalation of Respirable Particulates at Area C	2E+01	7E+00	4E-05	1E-05
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**5E+01**	**1E+01**	**1E-04**	**2E-05**
ADULT RESIDENT				
Ingestion of All Soils from Area A	8E-01	4E-01	4E-04 *	3E-04 **
Dermal Contact with All Soils from Area A	7E-01	4E-01	2E-04 *	7E-05 **
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**2E+00**	**8E-01**	**6E-04**	**4E-04**
Ingestion of All Soils from Area B	1E+01	5E+00	4E-03 *	3E-03 **
Dermal Contact with All Soils from Area B	7E+00	4E+00	2E-03 *	7E-04 **
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**2E+01**	**9E+00**	**6E-03**	**4E-03**
Ingestion of All Soils from Area B&C	3E+01	2E+01	1E-02 *	7E-03 **
Dermal Contact with All Soils from Area B&C	3E+01	2E+01	6E-03 *	2E-03 **
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**6E+01**	**4E+01**	**2E-02**	**9E-03**
Ingestion of All Soils from Area C	3E+01	2E+01	7E-03 *	4E-03 **
Dermal Contact with All Soils from Area C	1E+01	5E+00	3E-03 *	3E-03 **
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**4E+01**	**3E+01**	**1E-02**	**7E-03**

TABLE 7-38 (Continued)

SUMMARY OF HAZARD INDICES AND CANCER RISKS
LI TUNGSTEN SITE

EXPOSURE POPULATION AND PATHWAY	RME HAZARD INDEX	CENTRAL TENDENCY HAZARD INDEX	RME CANCER RISK	CENTRAL TENDENCY CANCER RISK
CHILD RESIDENT				
Ingestion of All Soils from Area A	8E+00	4E+00	3E-04	2E-04
Dermal Contact with All Soils from Area A	1E+00	5E-01	5E-05	3E-05
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**9E+00**	**5E+00**	**3E-04**	**2E-04**
Ingestion of All Soils from Area B	1E+02	5E+01	3E-03	2E-03
Dermal Contact with All Soils from Area B	1E+01	5E+00	5E-04	3E-04
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**1E+02**	**6E+01**	**3E-03**	**2E-03**
Ingestion of All Soils from Area B&C	3E+02	2E+02	1E-02	5E-03
Dermal Contact with All Soils from Area B&C	4E+01	2E+01	2E-03	1E-03
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**4E+02**	**2E+02**	**1E-02**	**6E-03**
Ingestion of All Soils from Area C	2E+02	1E+02	5E-03	3E-03
Dermal Contact with All Soils from Area C	2E+01	1E+01	8E-04	2E-03
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**3E+02**	**1E+02**	**6E-03**	**5E-03**
SITE WORKERS				
Ingestion of Groundwater	6E+01	6E+01	4E-03	4E-04
Dermal Contact with Groundwater	2E-01	2E-01	9E-06	1E-06
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**6E+01**	**6E+01**	**4E-03**	**4E-04**
ADULT RESIDENT				
Ingestion of Groundwater	2E+02	2E+02	1E-02	2E-03
Dermal Contact with Groundwater	2E+00	2E+00	1E-04	3E-05
Inhalation of Chemicals Volatilized from Groundwater	4E-01	1E-01	4E-04	4E-05
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**2E+02**	**2E+02**	**1E-02**	**2E-03**
CHILD RESIDENT				
Ingestion of Groundwater	4E+02	2E+02	6E-03	3E-03
Dermal Contact with Groundwater	3E+00	3E+00	4E-05	4E-05
Inhalation of Chemicals Volatilized from Groundwater	2E+00	7E-01	4E-04	1E-04
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**4E+02**	**2E+02**	**7E-03**	**3E-03**

* Based on 30 year exposure, 6 year child exposure plus 24 year adult exposure.
** Based on 15 year exposure, 6 year child exposure plus 9 year adult exposure.

TABLE 7- 39

SUMMARY OF CANCER RISKS: CHEMICAL AND RADIOLOGICAL
LI TUNGSTEN CORPORATION SITE

EXPOSURE POPULATION AND PATHWAY	CANCER RISK
CURRENT SCENARIO	
OFF-SITE ADULT RESIDENT	
Inhalation of respirable particulates (chemical)	1E-04
Inhalation of respirable particulates (radiological)	7.6E-05
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**2E-04**
OFF-SITE CHILD RESIDENT	
Inhalation of respirable particulates (chemical)	1E-04
Inhalation of respirable particulates (radiological)	3.9E-06
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**1E-04**
CURRENT AND FUTURE SCENARIOS	
ADOLESCENT TRESPASSERS	
Ingestion of surface soil from Area B (chemical)	1E-04
Dermal contact with surface soil from Area B (chemical)	1E-04
Ingestion of and external gamma from surface soil from Area B (radiological)	2.9E-05
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**3E-04**
Ingestion of surface soil from Area B&C (chemical)	5E-04
Dermal contact with surface soil from Area B&C (chemical)	3E-04
Ingestion of and external gamma from surface soil from Area B&C (radiological)	4.8E-04
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**1E-03**
Ingestion of surface soil from Area C (chemical)	1E-04
Dermal Contact of Surface Soil from Area C (chemical)	8E-05
Ingestion of and external gamma from Surface Soil from Area C (radiological)	2.9E-05
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**2E-04**
Dermal contact with surface water from Parcel B (chemical)	3E-05
Ingestion of sediment from Parcel B (chemical)	2E-06
Dermal contact with sediment from Parcel B (chemical)	2E-06
Ingestion of and external gamma from sediment from Area B (radiological)	<background
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**3E-05**
Dermal contact with surface water from Parcel C (chemical)	5E-06
Ingestion of sediment from Parcel C (chemical)	2E-04
Dermal contact with sediment from Parcel C (chemical)	1E-04
Ingestion of and external gamma from sediment from Area C (radiological)	2.1E-06
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**3E-04**

TABLE 7- 39 (Continued)

SUMMARY OF CANCER RISKS: CHEMICAL AND RADIOLOGICAL
LI TUNGSTEN CORPORATION SITE

EXPOSURE POPULATION AND PATHWAY	CANCER RISK
FUTURE SCENARIO	
ADOLESCENT TRESSPASSER	
Ingestion of surface soil from Area A (chemical)	3E-05
Dermal contact with surface soil from Area A (chemical)	2E-05
Ingestion of and external gamma from surface soil from Area A (radiological)	2.5E-04
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**3E-04**
SITE WORKERS	
Ingestion of surface soil from Area A (chemical)	1E-04
Dermal contact with surface soil from Area A (chemical)	2E-04
Ingestion of groundwater (chemical)	4E-03
Dermal contact with groundwater (chemical)	9E-06
Ingestion of and external gamma from surface soil from Area A (radiological)	7.5E-03
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**1E-02**
Ingestion of surface soil from Area B (chemical)	5E-04
Dermal contact with surface soil from Area B (chemical)	9E-04
Ingestion of groundwater (chemical)	4E-03
Dermal contact with groundwater (chemical)	9E-06
Ingestion of and external gamma from surface soil from Area B (radiological)	9.2E-04
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**6E-03**
Ingestion of surface soil from Area B&C (chemical)	2E-03
Dermal contact with surface soil from Area B&C (chemical)	3E-03
Ingestion of groundwater (chemical)	4E-03
Dermal contact with groundwater (chemical)	9E-06
Ingestion of and external gamma from surface soil from Area B&C (radiological)	1.5E-02
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**2E-02**
Ingestion of surface soil from Area C (chemical)	4E-04
Dermal contact of surface soil from Area C (chemical)	7E-04
Ingestion of groundwater (chemical)	4E-03
Dermal contact with groundwater (chemical)	9E-06
Ingestion of and external gamma from surface soil from Area C (radiological)	9.7E-04
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**6E-03**

TABLE 7- 39 (Continued)

SUMMARY OF CANCER RISKS: CHEMICAL AND RADIOLOGICAL
LI TUNGSTEN CORPORATION SITE

EXPOSURE POPULATION AND PATHWAY	CANCER RISK	
CONSTRUCTION WORKER		
Ingestion of all soils from Area A (chemical)	4E-06	
Dermal contact with all soils from Area A (chemical)	8E-07	
Inhalation of respirable particulates at Area A (chemical)	2E-06	
Ingestion of, external gamma from, and inhalation of respirable particulates from all soils from Area A (radiological)	1.8E-05	
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**2E-05**	
Ingestion of all soils from Area B (chemical)	4E-05	
Dermal contact with all soils from Area B (chemical)	9E-06	
Inhalation of respirable particulates at Area B (chemical)	2E-05	
Ingestion of, external gamma from, and inhalation of respirable particulates from all soils from Area B (radiological)	4.5E-06	
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**8E-05**	
Ingestion of all soils from Area B&C (chemical)	2E-04	
Dermal contact with all soils from Area B&C (chemical)	3E-05	
Inhalation of respirable particulates at Area B&C (chemical)	8E-05	
Ingestion of, external gamma from, and inhalation of respirable particulates from all soils from Area B&C (radiological)	3.8E-05	
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**3E-04**	
Ingestion of all soils from Area C (chemical)	7E-05	
Dermal contact with all soils from Area C (chemical)	1E-05	
Inhalation of respirable particulates at Area C (chemical)	4E-05	
Ingestion of, external gamma from, and inhalation of respirable particulates from all soils from Area C (radiological)	3.8E-06	
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**1E-04**	
ADULT RESIDENT		
Ingestion of all soils from Area A (chemical)	4E-04	*
Dermal contact with all soils from Area A (chemical)	2E-04	*
Ingestion of groundwater (chemical)	1E-02	
Dermal contact with groundwater (chemical)	1E-04	
Inhalation of chemicals volatilized from groundwater (chemical)	4E-04	
Ingestion, external gamma, produce ingestion, radon from soil at Area A and groundwater ingestion (radiological)	4.8E-03	
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**2E-02**	
Ingestion of all soils from Area B (chemical)	4E-03	*
Dermal contact with all soils from Area B (chemical)	2E-03	*
Ingestion of groundwater (chemical)	1E-02	
Dermal contact with groundwater (chemical)	1E-04	
Inhalation of chemicals volatilized from groundwater (chemical)	4E-04	
Ingestion, external gamma, produce ingestion, radon from soil at Area B and groundwater ingestion (radiological)	1.4E-03	
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**2E-02**	
Ingestion of all soils from Area B&C (chemical)	1E-02	*
Dermal contact with all soils from Area B&C (chemical)	6E-03	*
Ingestion of groundwater (chemical)	1E-02	
Dermal contact with groundwater (chemical)	1E-04	
Inhalation of chemicals volatilized from groundwater (chemical)	4E-04	
Ingestion, external gamma, produce ingestion, radon from soil at Area B&C and groundwater ingestion (radiological)	1.2E-02	
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**5E-02**	

TABLE 7- 39 (Continued)

SUMMARY OF CANCER RISKS: CHEMICAL AND RADIOLOGICAL
LI TUNGSTEN CORPORATION SITE

EXPOSURE POPULATION AND PATHWAY	CANCER RISK	
Ingestion of all soils from Area C (chemical)	7E-03	*
Dermal contact with all soils from Area C (chemical)	3E-03	*
Ingestion of groundwater (chemical)	1E-02	
Dermal contact with groundwater (chemical)	1E-04	
Inhalation of chemicals volatilized from groundwater (chemical)	4E-04	
Ingestion, external gamma, produce ingestion, radon from soil at Area C and groundwater ingestion (radiological)	1.3E-03	
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**2E-02**	
CHILD RESIDENT		
Ingestion of all soils from Area A (chemical)	3E-04	
Dermal contact with all soils from Area A (chemical)	5E-05	
Ingestion of groundwater (chemical)	6E-03	
Dermal contact with groundwater (chemical)	4E-05	
Inhalation of chemicals volatilized from groundwater (chemical)	4E-04	
Ingestion, external gamma, produce ingestion, radon from soil at Area A and groundwater ingestion (radiological)	9.5E-04	
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**8E-03**	
Ingestion of all soils from Area B (chemical)	3E-03	
Dermal contact with all soils from Area B (chemical)	5E-04	
Ingestion of groundwater (chemical)	6E-03	
Dermal contact with groundwater (chemical)	4E-05	
Inhalation of chemicals volatilized from groundwater (chemical)	4E-04	
Ingestion, external gamma, produce ingestion, radon from soil at Area B and groundwater ingestion (radiological)	2.7E-04	
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**1E-02**	
Ingestion of all soils from Area B&C (chemical)	1E-02	
Dermal contact with all soils from Area B&C (chemical)	2E-03	
Ingestion of groundwater (chemical)	6E-03	
Dermal contact with groundwater (chemical)	4E-05	
Inhalation of chemicals volatilized from groundwater (chemical)	4E-04	
Ingestion, external gamma, produce ingestion, radon from soil at Area B&C and groundwater ingestion (radiological)	2.3E-03	
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**2E-02**	
Ingestion of all soils from Area C (chemical)	5E-03	
Dermal contact with all soils from Area C (chemical)	8E-04	
Ingestion of groundwater (chemical)	6E-03	
Dermal contact with groundwater (chemical)	4E-05	
Inhalation of chemicals volatilized from groundwater (chemical)	4E-04	
Ingestion, external gamma, produce ingestion, radon from soil at Area C and groundwater ingestion (radiological)	2.6E-04	
TOTAL PATHWAY HAZARD INDEX/CANCER RISK:	**1E-02**	

* Based on 30 year exposure, 6 year child exposure plus 24 year adult exposure.

TABLE 7-40

DATA SUMMARY FOR ECOLOGICAL ASSESSMENT: SURFACE WATER
LI TUNGSTEN SITE

Compound	Frequency	Range	New York State AWQC[1]	USEPA AWQC[2]	Aquatic Toxicity Data[3]
Volatiles (ug/l)					
Acetone	1 / 5	ND - 13	NA	NA	1560[a]
1,1-Dichloroethane	1 / 5	ND - 2	NA	20000[4]	NA
1,2-Dichloroethene (total)	1 / 5	ND - 15	NA	1160[5][6]	NA
Tetrachloroethene	1 / 5	ND - 6	NA	840	NA
Semi-Volatiles (ug/l)					
Di-n-butylphthalate	1 / 5	ND - 1	NA	NA	697[a]
bis(2-ethylhexyl)phthalate	1 / 5	1 - 4	0.6	360[7]	-
Pesticides/PCBs (ug/l)					
4,4'-DDE	1 / 5	ND - 1.6	0.001[8]	105[6]	-
4,4'-DDD	1 / 5	ND - 9.1	0.001[8]	0.06[6]	-
4,4'-DDT	1 / 5	ND - 4.6	0.001[8]	0.001	-
Aroclor 1254	1 / 4	ND - 1	0.001[9]	0.014[9]	-
Radionuclides (pCi/l)					
Uranium-238	-	<MDC - 4.8	NA	NA	0.86[b]
Radium-226	-	<MDC - 4.5	NA	NA	NA
Radium-228	-	<MDC - 2.4	NA	NA	NA
Thorium-230	-	<MDC - 0.64	NA	NA	NA
Thorium-232	-	<MDC - 0.41	NA	NA	NA
Inorganics (ug/l)					
Aluminum	5 / 5	127 - 77000	100	150	-
Antimony	3 / 5	15.4 - 2260	NA	30	-
Arsenic	4 / 5	115 - 8090	190[11]	190[12]	-
Barium	5 / 5	22.7 - 463	NA	NA	7,670
Beryllium	1 / 4	5.5 - 5.5	1,100[13]	5.3	-
Cadmium	3 / 5	22.7 - 846	3.3[14]	3.3[14]	-
Calcium	5 / 5	29800 - 361000	NA	NA	NA
Chromium	3 / 5	10.6 - 215	638[14]	638[14][15]	-
Cobalt	3 / 5	55.7 - 42300	5	NA	-
Copper	4 / 5	222 - 17100	38.2[14]	38.2[14]	-
Iron	5 / 5	7090 - 722000	300	1,000	-
Lead	4 / 5	292 - 1180	18.3[14]	18.3[14]	-
Magnesium	5 / 5	9770 - 58200	NA	NA	200,000
Manganese	5 / 5	1460 - 5390	NA	NA	1,500
Mercury	3 / 5	0.12 - 3.6	NA	0.012	-
Nickel	5 / 5	17.7 - 27900	272[14]	504[14]	-

TABLE 7-40

DATA SUMMARY FOR ECOLOGICAL ASSESSMENT: SURFACE WATER
LI TUNGSTEN SITE

Compound	Frequency	Range	New York State AWQC[1]	USEPA AWQC[2]	Aquatic Toxicity Data[3]
Inorganics (continued)					
Potassium	5 / 5	2620 - 18100	NA	NA	NA
Selenium	2 / 5	24.3 - 200	1[16]	5	-
Silver	3 / 5	5.1 - 256	0.1[17]	0.12	-
Sodium	5 / 5	19900 - 296000	NA	NA	NA
Vanadium	2 / 5	47.2 - 210	14	NA	-
Zinc	4 / 5	173 - 91200	266[14]	339[14]	-
Cyanide	1 / 5	5.1 - 5.1	5.2[18]	5.2	-

Notes:

NA = Not Available

- = Not Applicable

<MDC = less than the minimum detected concentration.

[1]NYSDEC , 1993.

[2]USEPA, 1991. Ambient Water Quality Criteria, Fresh Water, Chronic Effects.

[3]Sources: (a)Suter and Tsao, 1996 (lowest chronic value for daphnids);
[b]Suter and Tsao, 1996 (Secondary Chronic Tier II Value).

[4]Value is for 1,2-Dichloroethane

[5]Value is for total Dichloroethenes

[6]Value represents acute criterion divided by ten.

[7]Proposed criterion

[8]Value applies to sum of DDD, DDE and DDT.

[9]Value is for total PCBs.

[10]Value is for pH between 6.5 and 9.0.

[11]Value is for dissolved arsenic form.

[12]Value is for Arsenic III.

[13]Value applies since hardness is greater than 75 ppm.

[14]Hardness-dependent criterion. Based upon average site water hardness of 395 mg/l.

[15]Value is for Chromium III.

[16]Value applies to acid-soluble form.

[17]Value is for ionic silver.

[18]Value is for free cyanide - the sum of HCN and CN^- expressed as CN.

TABLE 7-41

DATA SUMMARY FOR ECOLOGICAL ASSESSMENT: SEDIMENT
LI TUNGSTEN SITE

Compound	Frequency	Range	New York State Sediment Criteria[1]	NOAA ER-L[2]	NOAA ER-M[3]	Ontario's Provincial Sediment Quality Guidelines[4]
Volatiles (ug/kg)						
Acetone	2 / 5	ND - 240	15[5]	NA	NA	NA
Benzene	1 / 5	ND - 2	278[5]	NA	NA	NA
2-Butanone	3 / 5	21 - 67	464[5]	NA	NA	NA
1,1-Dichloroethane	1 / 5	ND - 2	436[5]	NA	NA	NA
1,2-Dichloroethene (total)	1 / 5	ND - 2	678[5]	NA	NA	NA
Semi-Volatiles (ug/kg)						
Benzo(a)anthracene	1 / 5	ND - 80	187[5]	230	1,600	320
Benzo(b)fluoranthene	4 / 5	54 - 200	307[5][6]	NA	NA	NA
Benzo(k)fluoranthene	1 / 5	ND - 66	307[5][6]	NA	NA	0.24
Benzo(g,h,i)perylene	1 / 5	ND - 130	307[5][6]	NA	NA	0.17
Benzo(a)pyrene	1 / 5	ND - 75	307[5]	400	2,500	370
Chrysene	1 / 5	ND - 100	307[5][6]	400	2,800	340
Fluoranthene	3 / 5	74 - 160	17,340	600	3,600	750
Indeno(1,2,3-cd)pyrene	1 / 5	ND - 85	307[5][6]	NA	NA	0.2
Phenanthrene	2 / 5	53 - 99	2,040	225	1,380	0.56
Pyrene	4 / 5	52 - 130	307[5][6]	350	2,200	0.49
Pesticides/PCBs (ug/kg)						
4,4'-DDE	1 / 5	ND - 56	17[7]	2	15	5
4,4'-DDD	1 / 5	ND - 116	17[7]	2	20	8
Aroclor 1254	1 / 5	ND - 931	328[8]	50[8]	400[8]	70[8]
Aroclor 1260	1 / 5	ND - 875	328[8]	50[8]	400[8]	70[8]

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TABLE 7-41

DATA SUMMARY FOR ECOLOGICAL ASSESSMENT: SEDIMENT
LI TUNGSTEN SITE

Compound	Frequency	Range	New York State Sediment Criteria[1]	NOAA ER-L[2]	NOAA ER-M[3]	Ontario's Provincial Sediment Quality Guidelines[4]
Radionuclides (pCi/g)						
Uranium-238	-	<MDC - 46	NA	NA	NA	NA
Radium-226	-	<MDC - 6.6	NA	NA	NA	NA
Radium-228	-	<MDC - 5	NA	NA	NA	NA
Thorium-230	-	<MDC - 29	NA	NA	NA	NA
Thorium-232	-	<MDC - 5.7	NA	NA	NA	NA
Inorganics (mg/kg)						
Aluminum	5 / 5	1060 - 20600	NA	NA	NA	NA
Antimony	4 / 5	3.8 - 87.8	NA	2	25	NA
Arsenic	5 / 5	11.8 - 2080	6	33	85	6
Barium	5 / 5	38.9 - 271	NA	NA	NA	NA
Beryllium	1 / 5	16.4 - 16.4	NA	NA	NA	NA
Cadmium	3 / 5	4.9 - 10.3	0.6	5	9	0.6
Calcium	5 / 5	477 - 160000	NA	NA	NA	NA
Chromium	5 / 5	9 - 394	26	80	145	26
Cobalt	5 / 5	7.9 - 6900	NA	NA	NA	50
Copper	5 / 5	34.2 - 7320	16	70	390	16
Iron	5 / 5	23100 - 70800	20,000	NA	NA	20,000
Lead	5 / 5	22.1 - 7090	31	35	110	31
Magnesium	5 / 5	346 - 14100	NA	NA	NA	NA
Manganese	5 / 5	137 - 5350	460	NA	NA	460
Mercury	5 / 5	0.08 - 2.1	0.2	0.15	1.3	0.2
Nickel	5 / 5	6.5 - 2640	16	30	50	16

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TABLE 7-41

DATA SUMMARY FOR ECOLOGICAL ASSESSMENT: SEDIMENT
LI TUNGSTEN SITE

Compound	Frequency	Range	New York State Sediment Criteria[1]	NOAA ER-L[2]	NOAA ER-M[3]	Ontario's Provincial Sediment Quality Guidelines[4]
Inorganics (continued)						
Potassium	5 / 5	871 - 5030	NA	NA	NA	NA
Selenium	5 / 5	2.7 - 515	NA	NA	NA	NA
Silver	5 / 5	0.65 - 63.3	NA	1	3.7	NA
Sodium	5 / 5	51.5 - 710	NA	NA	NA	NA
Vanadium	5 / 5	8.5 - 695	NA	NA	NA	NA
Zinc	5 / 5	60.4 - 2650	120	120	270	120
Cyanide	2 / 5	0.53 - 0.95	NA	NA	NA	NA

Notes:

NA = Not Available

- = Not Applicable (since criteria are available)\

<MDC = less than the minimum detected concentration.

[1]NYSDEC, 1994. Calculated based on a site average TOC of 1.7%. TOC values ranged from 0.46 to 2.45%.

[2]National Oceanic and Atmospheric Administration, National Ocean Service, August 1991. ER-L = Effects Range - Low (a concentration at the low end of the range in which effects have been observed).

[3]National Oceanic and Atmospheric Administration, National Ocean Service, August 1991. ER-M = Effects Range - Median (a concentration approximately midway in the range of reported values assoicated with biological effects).

[4]Lowest Effect Level = a level of contamination which has no effect on the majority of the sediment-dwelling organisms (Persaud et al., 1992 and 1993).

[5]Calculated based on Equilibrium Partitioning (EqP) method, based on average site TOC of 1.7%.

[6]Value is for benzo(a)pyrene.

[7]Value is for DDT.

[8]Value is for total PCBs.

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TABLE 7-42

DATA SUMMARY FOR ECOLOGICAL ASSESSMENT: SURFACE SOIL
LI TUNGSTEN SITE

Chemical	Frequency	Range	Maximum Background[1]
Volatiles (mg/kg)			
Acetone	9 / 58	0.011 - 0.19	NA
Benzene	3 / 57	0.001 - 0.004	NA
2-Butanone	11 / 57	0.002 - 0.052	NA
Carbon Disulfide	2 / 57	0.001 - 0.007	NA
Chloroform	2 / 57	0.001 - 0.003	NA
1,2-Dichloroethane	1 / 57	ND - 0.002	NA
1,1-Dichloroethene	1 / 57	ND - 0.006	NA
1,2-Dichloroethene (total)	1 / 57	ND - 0.004	NA
1,2-Dichloropropane	1 / 57	ND - 0.003	NA
Ethylbenzene	1 / 57	ND - 0.008	NA
2-Hexanone	4 / 57	0.001 - 0.045	NA
Methylene Chloride	13 / 58	0.001 - 0.022	NA
4-Methyl-2-Pentanone	6 / 57	0.003 - 0.029	NA
Tetrachloroethene	4 / 57	0.001 - 0.039	NA
Toluene	1 / 57	ND - 0.005	NA
1,1,1-Trichloroethane	1 / 57	ND - 0.006	NA
Trichloroethene	1 / 57	ND - 0.003	NA
Semi-volatiles (mg/kg)			
Acenaphthene	6 / 58	0.064 - 0.64	NA
Acenaphthylene	1 / 58	ND - 0.05	NA
Anthracene	14 / 58	0.021 - 0.7	NA
Benzo(a)anthracene	24 / 58	0.029 - 3.1	NA
Benzo(b)fluoranthene	31 / 58	0.058 - 10	NA
Benzo(k)fluoranthene	11 / 58	0.036 - 1.5	NA
Benzo(g,h,i)perylene	24 / 58	0.022 - 4.7	NA
Benzo(a)pyrene	25 / 58	0.021 - 3.9	NA
bis(2-ethylhexyl)phthalate	14 / 58	0.021 - 16	NA
Butylbenzylphthalate	2 / 58	0.051 - 0.1	NA
Carbazole	5 / 58	0.021 - 1	NA
Chrysene	31 / 58	0.041 - 4	NA
Dibenz(a,h)anthracene	7 / 58	0.065 - 1.3	NA
Dibenzofuran	5 / 58	0.046 - 0.83	NA
Di-n-butylphthalate	2 / 58	0.017 - 0.058	NA
Diethylphthalate	2 / 58	0.1 - 0.5	NA
Dimethylphthalate	1 / 58	ND - 0.036	NA
Fluorene	6 / 58	0.047 - 0.57	NA
Fluoranthene	35 / 58	0.048 - 10	NA
Indeno(1,2,3-cd)pyrene	24 / 58	0.027 - 3.8	NA
2-Methylnaphthalene	5 / 58	0.048 - 0.61	NA
Naphthalene	3 / 58	0.045 - 0.19	NA
N-nitrosodiphenylamine	2 / 58	5.3 - 10	NA
Pentachlorophenol	2 / 58	0.08 - 3.6	NA
Phenanthrene	27 / 58	0.041 - 3.8	NA
Pyrene	35 / 58	0.051 - 7.3	NA

TABLE 7-42

DATA SUMMARY FOR ECOLOGICAL ASSESSMENT: SURFACE SOIL
LI TUNGSTEN SITE

Chemical	Frequency	Range	Maximum Background[1]
Pesticides/PCBs (mg/kg)			
Endrin	3 / 45	0.0053 - 0.07	NA
4,4'-DDT	1 / 54	ND - 0.01	NA
Aroclor-1242	1 / 57	ND - 3.3	NA
Aroclor-1248	9 / 57	0.056 - 11.5	NA
Aroclor-1254	17 / 57	0.037 - 9.1	NA
Aroclor-1260	8 / 57	0.09 - 0.901	NA
Total PCBs	18 / 57	0.037 - 15.89	NA
Radionuclides (pCi/g)			
Uranium-238	-	<MDC - 470	1.1
Radium-226	-	<MDC - 250	1.4
Radium-228	-	<MDC - 530	1.7
Thorium-230	-	<MDC - 310	1.6
Thorium-232	-	<MDC - 220	1.5
Inorganics (mg/kg)			
Aluminum	58 / 58	393 - 56600	20700
Antimony	35 / 58	1.4 - 5610	1.6
Arsenic	46 / 47	2 - 6300	14.9
Barium	58 / 58	11.3 - 6400	87.4
Beryllium	27 / 58	0.22 - 11	1.1
Cadmium	33 / 58	0.86 - 23.9	0
Calcium	58 / 58	109 - 145000	2470
Chromium	57 / 57	7.8 - 1620	34.4
Cobalt	58 / 58	3.1 - 4660	15.9
Copper	58 / 58	3 - 4610	38.6
Iron	58 / 58	7610 - 313000	36700
Lead	51 / 55	4 - 19600	103
Magnesium	58 / 58	167 - 94000	4510
Manganese	56 / 56	57.1 - 90000	2220
Mercury	52 / 58	0.05 - 8.4	0.11
Nickel	58 / 58	5.1 - 28900	21
Potassium	58 / 58	331 - 6780	2790
Selenium	42 / 53	1.5 - 262	2.7
Silver	36 / 49	0.39 - 114	0.6
Sodium	56 / 58	25.9 - 36500	91.3
Thallium	3 / 58	3.6 - 22.7	1.1
Vanadium	56 / 58	9.9 - 165	46.3
Zinc	58 / 58	17.3 - 2900	81.2
Cyanide	19 / 58	0.3 - 2.3	0.23

Notes:

NA = Not Available - = Not Applicable ND = Not Detected

[1]Background for radionuclides represents on-site samples LT-SB-MP-5, -MP-5B, -MP-13, -MP-13B, LT-SB-TP-06, LT-SB-MP-11D, -11DB, LT-SS-13, -14, -15, -16, -17 and -18. Background for inorganics represents on-site samples LT-SB-13, -13B, LT-SB-MP-11D, -5, -5B and LT-TP-06.

TABLE 7-43

CHEMICALS OF POTENTIAL CONCERN: ECOLOGICAL ASSESSMENT
LI TUNGSTEN SITE

Chemical	Surface Water	Sediment	Surface Soil
Volatiles			
Acetone		X	X
Benzene			X
2-Butanone			X
2-Hexanone			X
Methylene Chloride			X
4-Methyl-2-Pentanone			X
Tetrachloroethene			X
Semi-volatiles			
Acenapthene			X
Anthracene			X
Benzo(a)anthracene			X
Benzo(b)fluoranthene			X
Benzo(k)fluoranthene			X
Benzo(g,h,i)perylene			X
Benzo(a)pyrene			X
bis(2-ethylhexyl)phthalate	X		X
Carbazole			X
Chrysene			X
Dibenz(a,h)anthracene			X
Dibenzofuran			X
Fluorene			X
Fluoranthene			X
Indeno(1,2,3-cd)pyrene			X
2-Methylnaphthalene			X
Naphthalene			X
Phenanthrene			X
Pyrene			X
Pesticides/PCBs			
4,4'-DDE	X	X	
4,4'-DDD	X	X	
Endrin			X
Total PCBs	X	X	X

TABLE 7-43

CHEMICALS OF POTENTIAL CONCERN: ECOLOGICAL ASSESSMENT
LI TUNGSTEN SITE

Chemical	Surface Water	Sediment	Surface Soil
Radionuclides			
Uranium-238	X	X	X
Radium-226	X	X	X
Radium-228	X	X	X
Thorium-230	X	X	X
Thorium-232	X	X	X
Inorganics			
Aluminum	X	X	X
Antimony	X	X	X
Arsenic	X	X	X
Barium		X	X
Beryllium	X	X	X
Cadmium	X	X	X
Chromium	X	X	X
Cobalt	X	X	X
Copper	X	X	X
Iron	X	X	X
Lead	X	X	X
Magnesium		X	X
Manganese	X	X	X
Mercury	X	X	X
Nickel	X	X	X
Selenium	X	X	X
Silver	X	X	X
Thallium			X
Vanadium	X	X	X
Zinc	X	X	X
Cyanide		X	X

TABLE 7-44

EXPOSURE POINT CONCENTRATIONS[1] FOR COPC
LI TUNGSTEN SITE

COPC	Surface Water (mg/l)	Sediment (mg/kg)	Surface Soil (mg/kg)
Acetone	-	0.24	0.19
Benzene	-	-	0.004
2-Butanone	-	-	0.052
2-Hexanone	-	-	0.045
Methylene Chloride	-	-	0.022
4-Methyl-2-pentanone	-	-	0.029
Tetrachlorethene	-	-	0.039
Acenaphthene	-	-	0.64
Anthracene	-	-	0.7
Benzo(a)anthracene	-	-	3
Benzo(b)fluoranthene	-	-	10
Benzo(k)fluoranthene	-	-	2
Benzo(g,h,i)perylene	-	-	5
Benzo(a)pyrene	-	-	4
bis(2-ethylhexyl)phthalate	0.004	-	16
Carbazole	-	-	1
Chrysene	-	-	4
Dibenz(a,h)anthracene	-	-	1
Dibenzofuran	-	-	1
Fluorene	-	-	0
Fluoranthene	-	-	10
Indeno(1,2,3-cd)pyrene	-	-	4
2-Methylnaphthalene	-	-	1
Naphthalene	-	-	0
Phenanthrene	-	-	4
Pyrene	-	-	7
4,4'-DDE	0.0016	0.056	-
4,4'-DDD	0.0091	0.116	-
4,4'-DDT	0.0046	-	-
Endrin	-	-	0.07
Total PCBs	0.001	0.875	16
Uranium-238[2]	4.8	46	470
Radium-226[2]	4.5	6.6	250
Radium-228[2]	2.4	5	530
Thorium-230[2]	0.64	29	310
Thorium-232[2]	0.41	5.7	220
Aluminum	77	20,600	56,600
Antimony	2.26	87.8	5,610
Arsenic	8.09	2,080	6,300

TABLE 7-44

EXPOSURE POINT CONCENTRATIONS[1] FOR COPC
LI TUNGSTEN SITE

COPC	Surface Water (mg/l)	Sediment (mg/kg)	Surface Soil (mg/kg)
Barium	-	271	6,400
Beryllium	0.0055	16.4	11
Cadmium	0.846	10.3	23.9
Chromium	0.215	394	1,620
Cobalt	42.3	6,900	4,660
Copper	17.1	7,320	4,610
Iron	722	70,800	313,000
Lead	1.18	7,090	19,600
Magnesium	-	14,100	94,000
Manganese	5.39	5,350	90,000
Mercury	0.0036	2.1	8.4
Nickel	27.9	2,640	28,900
Selenium	0.2	515	262
Silver	0.256	63.3	114
Thallium	-	-	22.7
Vanadium	0.21	695	165
Zinc	91.2	2650	2,900
Cyanide	-	1	2.3

Notes:

- = Not Applicable; chemical not chosen as a COPC for this medium.

[1]Values represent maximum detected concentrations.

[2]Units for radionuclides are as follows: surface water (pCi/l), sediment (pCi/g), surface soil (pCi/g).

TABLE 7-45

EXPOSURE FACTORS FOR ECOLOGICAL RECEPTORS
ENVIRONMENTAL ASSESSMENT
LI TUNGSTEN SITE

Receptor	Exposure Factors[1]					
	NIR_w (g/g-day)	NIR_f (g/g-day)	IR (kg/day) (dw)	Soil/Sediment Ingestion (%)	Body Weight (kg)	Home Range (acres)
Mallard	0.057	0.36[2]	0.07	2	1.3	94
Raccoon	0.083	0.32[2]	0.29	9.4	5.8	566
American Robin	0.14	1.21	0.011	10.4 (woodcock)	0.08	0.84
Deer Mouse	0.19	0.27	0.003	2	0.02	0.15
Red Fox	0.085	0.08	0.24	2.8	4.5	240

Notes:

NIR_w = Ingestion rate of water, normalized to body weight.
NIR_f = Ingestion rate of food, normalized to body weight.
IR = Daily ingestion rate of food.

[1]Reference: USEPA, 1993 unless otherwise noted.
[2]Calculated based on USEPA, 1993.

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TABLE 7-46

PLANT AND EARTHWORM UPTAKE FACTORS
LI TUNGSTEN SITE

COPC	Plant Uptake Factor	Reference	Earthworm Uptake Factor	Reference
Acetone	53.6	(a)	1	(d)
Benzene	2.3	(a)	1	(d)
2-Butanone	26.4	(a)	1	(d)
2-Hexanone	6.2	(a)	1	(d)
Methylene Chloride	7.3	(a)	1	(d)
4-Methyl-2-pentanone	8.1	(a)	1	(d)
Tetrachlorethene	1.1	(a)	1	(d)
Acenaphthene	0.21	(a)	0.24	(e)
Anthracene	0.09	(a)	0.25	(e)
Benzo(a)anthracene	0.02	(a)	0.38	(e)
Benzo(b)fluoranthene	0.012	(a)	0.96	(e)
Benzo(k)fluoranthene	0.012	(a)	0.93	(e)
Benzo(g,h,i)perylene	0.002	(a)	0.44	(e)
Benzo(a)pyrene	0.012	(a)	0.86	(e)
bis(2-ethylhexyl)phthalate	0.002	(a)	1	(d)
Carbazole	0.48	(a)	1	(d)
Chrysene	0.012	(a)	0.37	(e)
Dibenz(a,h)anthracene	0.008	(a)	0.38	(e)
Dibenzofuran	0.16	(a)	1	(d)
Fluoranthene	0.04	(a)	0.32	(e)
Fluorene	0.14	(a)	1	(d)
Indeno(1,2,3-cd)pyrene	0.012	(a)	0.75	(e)
2-Methylnaphthalene	0.19	(a)	1	(d)
Naphthalene	0.44	(a)	1	(d)
Phenanthrene	0.09	(a)	0.29	(e)
Pyrene	0.04	(a)	0.74	(e)
4,4'-DDE	0.064	(b)	5	(e)
4,4'-DDD	0.064	(b)	5	(e)
4,4'-DDT	0.064	(b)	5	(e)
Endrin	0.02	(b)	9	(f)
Total PCBs	0.011	(b)	6	(e)
Uranium-238	0.0085	(c)	1	(d)
Radium-226	0.015	(c)	1	(d)
Radium-228	0.015	(c)	1	(d)
Thorium-230	0.00085	(c)	1	(d)

TABLE 7-46

PLANT AND EARTHWORM UPTAKE FACTORS
LI TUNGSTEN SITE

COPC	Plant Uptake Factor	Reference	Earthworm Uptake Factor	Reference
Thorium-232	0.00085	(c)	1	(d)
Aluminum	0.004	(c)	1	(d)
Antimony	0.2	(c)	1	(d)
Arsenic	0.04	(c)	1	(g)
Barium	0.15	(c)	1	(d)
Beryllium	0.01	(c)	1	(d)
Cadmium	0.55	(c)	3.7	(g)
Chromium	0.0075	(c)	0.1	(h)
Cobalt	0.02	(c)	1	(d)
Copper	0.4	(c)	2	(i)
Iron	0.004	(c)	1	(d)
Lead	0.045	(c)	0.95	(j)
Magnesium	1	(c)	1	(d)
Manganese	0.25	(c)	1	(d)
Mercury	0.9	(c)	1	(d)
Nickel	0.06	(c)	2	(j)
Selenium	0.025	(c)	9.6	(k)
Silver	0.4	(c)	1	(d)
Thallium	0.004	(c)	1	(d)
Vanadium	0.0055	(c)	1	(d)
Zinc	1.5	(c)	5.7	(j)
Cyanide	1	(d)	1	(d)

Notes:

[a]Calculated as PUF = $38.9(K_{ow})^{-0.58}$, from Travis and Hattemer-Frey, 1988.

[b]Jorgensen et al., 1991.

[c]Baes et al., 1984.

[d]Assumed to equal soil/sediment concentration (EUF=1) since earthworm uptake information was not found for this chemical.

[e]Beyer, 1990.

[f]Gish, 1970.

[g]Marquenie et al., 1987

[h]Ma, 1982.

[i]Beyer et al., 1982.

[j]Gish and Christensen, 1973.

[k]Beyer and Cromartie, 1987.

TABLE 7-47

TISSUE CONCENTRATIONS FOR PLANTS AND INVERTEBRATES IN SEDIMENT AND SOIL LI TUNGSTEN SITE

COPC	Sediment		Surface Soil	
	Plants	Invertebrates	Plants	Invertebrates
Acetone	1.29E+01	2.40E-01	1.02E+01	1.90E-01
Benzene	-	-	9.20E-03	4.00E-03
2-Butanone	-	-	1.37E+00	5.20E-02
2-Hexanone	-	-	2.79E-01	4.50E-02
Methylene Chloride	-	-	1.61E-01	2.20E-02
4-Methyl-2-pentanone	-	-	2.35E-01	2.90E-02
Tetrachlorethene	-	-	4.29E-02	3.90E-02
Acenaphthene	-	-	1.34E-01	1.54E-01
Anthracene	-	-	6.30E-02	1.75E-01
Benzo(a)anthracene	-	-	6.20E-02	1.18E+00
Benzo(b)fluoranthene	-	-	1.20E-01	9.60E+00
Benzo(k)fluoranthene	-	-	1.80E-02	1.40E+00
Benzo(g,h,i)perylene	-	-	9.40E-03	1.72E+00
Benzo(a)pyrene	-	-	4.68E-02	3.35E+00
bis(2-ethylhexyl)phthalate	-	-	3.20E-02	1.60E+01
Carbazole	-	-	4.80E-01	1.00E+00
Chrysene	-	-	4.80E-02	1.48E+00
Dibenz(a,h)anthracene	-	-	1.04E-02	4.94E-01
Dibenzofuran	-	-	1.33E-01	8.30E-01
Fluorene	-	-	4.00E-01	3.20E+00
Fluoranthene	-	-	7.98E-02	5.70E-01
Indeno(1,2,3-cd)pyrene	-	-	4.56E-02	2.85E+00
2-Methylnaphthalene	-	-	1.16E-01	6.10E-01
Naphthalene	-	-	8.36E-02	1.90E-01
Phenanthrene	-	-	3.42E-01	1.10E+00
Pyrene	-	-	2.92E-01	5.40E+00
4,4'-DDE	3.58E-03	2.80E-01	1.40E-03	6.30E-01
4,4'-DDD	7.42E-03	5.80E-01	1.75E-01	9.53E+01
4,4'-DDT	-	-	1.21E-02	1.42E+00
Endrin	-	-	3.75E-09	2.50E-07
Total PCBs	5.25E+00	5.25E+00	2.94E-11	1.96E-09
Uranium-238	1.39E-01	1.18E-03	1.28E-08	1.51E-05
Radium-226	6.60E-09	9.90E-11	1.70E-03	2.00E+00
Radium-228	1.85E-11	2.78E-13	2.26E+02	5.66E+04
Thorium-230	1.41E-06	1.20E-09	1.12E+03	5.61E+03
Thorium-232	5.18E-02	4.40E-05	2.52E+02	6.30E+03

TABLE 7-47

TISSUE CONCENTRATIONS FOR PLANTS AND INVERTEBRATES IN SEDIMENT AND SOIL LI TUNGSTEN SITE

COPC	Sediment		Surface Soil	
	Plants	Invertebrates	Plants	Invertebrates
Aluminum	8.24E+01	2.06E+04	9.60E+02	6.40E+03
Antimony	1.76E+01	8.78E+01	1.10E-01	1.10E+01
Arsenic	8.32E+01	2.08E+03	1.31E+01	8.84E+01
Barium	4.07E+01	2.71E+02	1.22E+01	1.62E+02
Beryllium	1.64E-01	1.64E+01	9.32E+01	4.66E+03
Cadmium	5.67E+00	3.81E+01	1.84E+03	9.22E+03
Chromium	2.96E+00	3.94E+01	1.25E+02	3.13E+04
Cobalt	1.38E+02	6.90E+03	8.82E+02	1.86E+04
Copper	2.93E+03	1.46E+04	9.40E+04	9.40E+04
Iron	2.83E+02	7.08E+04	2.25E+04	9.00E+04
Lead	3.19E+02	6.74E+03	7.56E+00	8.40E+00
Magnesium	1.41E+04	1.41E+04	1.73E+03	5.78E+04
Manganese	1.34E+03	5.35E+03	6.55E+00	2.52E+03
Mercury	1.89E+00	2.10E+00	4.56E+01	1.14E+02
Nickel	1.58E+02	5.28E+03	9.08E-02	2.27E+01
Selenium	1.29E+01	4.94E+03	9.08E-01	1.65E+02
Silver	2.53E+01	6.33E+01	4.35E+03	1.65E+04
Thallium	-	-	2.30E+00	2.30E+00
Vanadium	3.82E+00	6.95E+02	4.62E-02	8.40E+00
Zinc	3.98E+03	1.51E+04	4.34E+04	1.65E+05
Cyanide	1.00E+00	1.00E+00	2.62E+02	2.62E+02

Notes:

- = Not Applicable. Chemical not chosen as a COPC for this medium.

Values calculated by multiplying exposure point concentrations in sediment and soil (Table 7.4-5) by PUF or EUF (Table 7.4-7).

TABLE 7-48
ESTIMATED EXPOSURE
MALLARD AND RACCOON
(mg/kg BW-day)

COPC	Mallard				Raccoon			
	EE_{sed}	EE_{water}	EE_{diet}	EE_{total}	EE_{sed}	EE_{water}	EE_{diet}	EE_{total}
Acetone	1.71E-04	NC	8.21E-01	8.21E-01	1.13E-03	0.00E+00	2.10E+00	2.10E+00
4,4'-DDE	3.98E-05	6.02E-05	6.67E-02	6.68E-02	2.63E-04	1.33E-04	4.54E-02	4.58E-02
4,4'-DDD	8.24E-05	3.42E-04	1.38E-01	1.39E-01	5.45E-04	7.55E-04	9.40E-02	9.53E-02
Total PCBs	6.22E-04	3.76E-05	1.56E+00	1.56E+00	4.11E-03	8.30E-05	1.68E+00	1.68E+00
Uranium-238	9.88E-05	5.45E-04	3.31E-02	3.37E-02	6.53E-04	1.20E-03	2.24E-02	2.43E-02
Radium-226	4.69E-12	1.69E-10	1.57E-09	1.75E-09	3.10E-11	3.74E-10	1.07E-09	1.48E-09
Radium-228	1.31E-14	3.34E-13	4.41E-12	4.76E-12	8.70E-14	7.38E-13	3.00E-12	3.83E-12
Thorium-230	1.00E-09	1.17E-09	3.35E-07	3.37E-07	6.63E-09	2.59E-09	2.26E-07	2.35E-07
Thorium-232	3.68E-05	1.40E-04	1.23E-02	1.25E-02	2.43E-04	3.10E-04	8.30E-03	8.85E-03
Aluminum	1.46E+01	2.90E+00	4.90E+03	4.92E+03	9.68E+01	6.39E+00	3.31E+03	3.41E+03
Antimony	6.24E-02	8.50E-02	2.19E+01	2.21E+01	4.13E-01	1.88E-01	1.69E+01	1.75E+01
Arsenic	1.48E+00	3.04E-01	4.99E+02	5.01E+02	9.78E+00	6.71E-01	3.46E+02	3.57E+02
Barium	1.93E-01	NC	6.68E+01	6.70E+01	1.27E+00	0.00E+00	4.99E+01	5.11E+01
Beryllium	1.17E-02	2.07E-04	3.91E+00	3.92E+00	7.71E-02	4.57E-04	2.65E+00	2.73E+00
Cadmium	7.32E-03	3.18E-02	9.39E+00	9.43E+00	4.84E-02	7.02E-02	7.00E+00	7.12E+00
Chromium	2.80E-01	8.09E-03	9.54E+00	9.83E+00	1.85E+00	1.78E-02	6.78E+00	8.65E+00
Cobalt	4.90E+00	1.59E+00	1.65E+03	1.65E+03	3.24E+01	3.51E+00	1.13E+03	1.16E+03
Copper	5.20E+00	6.43E-01	3.65E+03	3.66E+03	3.44E+01	1.42E+00	2.81E+03	2.85E+03
Iron	5.03E+01	2.72E+01	1.68E+04	1.69E+04	3.33E+02	5.99E+01	1.14E+04	1.18E+04
Lead	5.04E+00	4.44E-02	1.62E+03	1.62E+03	3.33E+01	9.79E-02	1.13E+03	1.16E+03
Magnesium	1.00E+01	NC	4.19E+03	4.20E+03	6.63E+01	0.00E+00	4.51E+03	4.58E+03
Manganese	3.80E+00	2.03E-01	1.35E+03	1.35E+03	2.51E+01	4.47E-01	1.07E+03	1.10E+03
Mercury	1.49E-03	1.35E-04	6.11E-01	6.13E-01	9.87E-03	2.99E-04	6.38E-01	6.49E-01
Nickel	1.88E+00	1.05E+00	1.26E+03	1.27E+03	1.24E+01	2.32E+00	8.70E+02	8.85E+02
Selenium	3.66E-01	7.52E-03	1.18E+03	1.18E+03	2.42E+00	1.66E-02	7.93E+02	7.96E+02
Silver	4.50E-02	9.63E-03	1.65E+01	1.66E+01	2.98E-01	2.12E-02	1.42E+01	1.45E+01
Vandium	4.94E-01	7.90E-03	1.65E+02	1.66E+02	3.27E+00	1.74E-02	1.12E+02	1.15E+02
Zinc	1.88E+00	3.43E+00	3.83E+03	3.83E+03	1.25E+01	7.57E+00	3.05E+03	3.07E+03
Cyanide	7.11E-04	NC	2.97E-01	2.98E-01	4.70E-03	0.00E+00	3.20E-01	3.25E-01

Notes:

BW = Body Weight

EE_{sed} = Estimated exposure from sediment ingestion.

EE_{water} = Estimated exposure from water ingestion.

EEdiet = Estimated exposure from food.

EEtotal = Estimated exposure from food, sediment and water.

NC = Not a COPC in this medium, or chemical not detected; values were therefore not calculated.

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TABLE 7-49

ESTIMATED EXPOSURE

AMERICAN ROBIN, DEER MOUSE AND RED FOX

(mg/kg BW-day)

COPC	American Robin				Deer Mouse				Red Fox			
	EE_{soil}	EE_{water}	EE_{diet}	EE_{total}	EE_{soil}	EE_{water}	EE_{diet}	EE_{total}	EE_{soil}	EE_{water}	EE_{diet}	EE_{total}
Acetone	1.79E-03	NC	5.16E+00	5.17E+00	5.70E-04	NC	1.25E+00	1.25E+00	2.84E-04	NC	7.12E-02	7.15E-02
Benzene	3.78E-05	NC	5.80E-03	5.84E-03	1.20E-05	NC	1.70E-03	1.72E-03	5.97E-06	NC	3.49E-04	3.55E-04
2-Butanone	4.91E-04	NC	7.04E-01	7.05E-01	1.56E-04	NC	1.73E-01	1.73E-01	7.77E-05	NC	1.16E-02	1.16E-02
2-Hexanone	4.25E-04	NC	1.53E-01	1.54E-01	1.35E-04	NC	4.02E-02	4.04E-02	6.72E-05	NC	4.91E-03	4.98E-03
Methylene Chloride	2.08E-04	NC	8.71E-02	8.73E-02	6.60E-05	NC	2.26E-02	2.26E-02	3.29E-05	NC	2.54E-03	2.57E-03
4-Methyl-2-pentanone	2.74E-04	NC	1.26E-01	1.27E-01	8.70E-05	NC	3.25E-02	3.26E-02	4.33E-05	NC	3.47E-03	3.52E-03
Tetrachlorethene	3.68E-04	NC	3.31E-02	3.35E-02	1.17E-04	NC	1.10E-02	1.11E-02	5.82E-05	NC	3.14E-03	3.20E-03
Acenaphthene	6.04E-03	NC	1.13E-01	1.19E-01	1.92E-03	NC	3.92E-02	4.11E-02	9.56E-04	NC	1.22E-02	1.31E-02
Anthracene	6.61E-03	NC	8.36E-02	9.02E-02	2.10E-03	NC	3.38E-02	3.59E-02	1.05E-03	NC	1.34E-02	1.44E-02
Benzo(a)anthracene	2.93E-02	NC	3.81E-01	4.10E-01	9.30E-03	NC	1.84E-01	1.93E-01	4.63E-03	NC	8.80E-02	9.26E-02
Benzo(b)fluoranthene	9.44E-02	NC	2.91E+00	3.01E+00	3.00E-02	NC	1.45E+00	1.48E+00	1.49E-02	NC	7.15E-01	7.30E-01
Benzo(k)fluoranthene	1.42E-02	NC	4.23E-01	4.38E-01	4.50E-03	NC	2.11E-01	2.16E-01	2.24E-03	NC	1.04E-01	1.06E-01
Benzo(g,h,i)perylene	4.44E-02	NC	5.14E-01	5.59E-01	1.41E-02	NC	2.59E-01	2.73E-01	7.02E-03	NC	1.28E-01	1.35E-01
Benzo(a)pyrene	3.68E-02	NC	1.02E+00	1.06E+00	1.17E-02	NC	5.09E-01	5.20E-01	5.82E-03	NC	2.50E-01	2.56E-01
bis(2-ethylhexyl)phthalate	1.51E-01	3.70E-04	4.77E+00	4.92E+00	4.80E-02	7.60E-04	2.40E+00	2.45E+00	2.39E-02	3.40E-04	1.19E+00	1.21E+00
Carbazole	9.44E-03	NC	5.38E-01	5.47E-01	3.00E-03	NC	2.08E-01	2.11E-01	1.49E-03	NC	7.71E-02	7.86E-02
Chrysene	3.78E-02	NC	4.64E-01	5.01E-01	1.20E-02	NC	2.28E-01	2.40E-01	5.97E-03	NC	1.10E-01	1.16E-01
Dibenz(a,h)anthracene	1.23E-02	NC	1.52E-01	1.64E-01	3.90E-03	NC	7.53E-02	7.92E-02	1.94E-03	NC	3.68E-02	3.88E-02
Dibenzofuran	7.83E-03	NC	3.13E-01	3.21E-01	2.49E-03	NC	1.40E-01	1.43E-01	1.24E-03	NC	6.25E-02	6.37E-02
Fluoranthene	9.44E-02	NC	1.15E+00	1.25E+00	3.00E-02	NC	5.28E-01	5.58E-01	1.49E-02	NC	2.40E-01	2.55E-01
Fluorene	5.38E-03	NC	2.09E-01	2.15E-01	1.71E-03	NC	9.51E-02	9.68E-02	8.51E-04	NC	4.29E-02	4.37E-02
Indeno(1,2,3-cd)pyrene	3.59E-02	NC	8.69E-01	9.05E-01	1.14E-02	NC	4.33E-01	4.44E-01	5.67E-03	NC	2.12E-01	2.18E-01
2-Methylnaphthalene	5.76E-03	NC	2.39E-01	2.45E-01	1.83E-03	NC	1.05E-01	1.07E-01	9.11E-04	NC	4.60E-02	4.69E-02
Naphthalene	1.79E-03	NC	9.84E-02	1.00E-01	5.70E-04	NC	3.85E-02	3.91E-02	2.84E-04	NC	1.46E-02	1.49E-02
Phenanthrene	3.59E-02	NC	4.99E-01	5.35E-01	1.14E-02	NC	2.06E-01	2.18E-01	5.67E-03	NC	8.39E-02	8.96E-02
Pyrene	6.89E-02	NC	1.75E+00	1.82E+00	2.19E-02	NC	8.45E-01	8.67E-01	1.09E-02	NC	4.04E-01	4.14E-01
Endrin	6.61E-04	NC	1.88E-01	1.88E-01	2.10E-04	NC	9.47E-02	9.49E-02	1.05E-04	NC	4.69E-02	4.70E-02
Total PCBs	1.50E-01	9.24E-05	2.84E+01	2.86E+01	4.77E-02	1.90E-04	1.43E+01	1.44E+01	2.37E-02	8.50E-05	7.09E+00	7.12E+00
Uranium-238	1.34E-02	1.34E-03	4.28E-01	4.43E-01	4.26E-03	2.76E-03	2.14E-01	2.21E-01	2.12E-03	1.23E-03	1.06E-01	1.09E-01
Radium-226	2.36E-09	4.16E-10	7.61E-08	7.89E-08	7.50E-10	8.55E-10	3.80E-08	3.96E-08	3.73E-10	3.83E-10	1.86E-08	1.94E-08
Radium-228	1.85E-11	8.21E-13	5.97E-10	6.16E-10	5.88E-12	1.69E-12	2.98E-10	3.05E-10	2.93E-12	7.56E-13	1.46E-10	1.50E-10

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TABLE 7-49

ESTIMATED EXPOSURE

AMERICAN ROBIN, DEER MOUSE AND RED FOX

(mg/kg BW-day)

COPC	American Robin				Deer Mouse				Red Fox			
	EE_{soil}	EE_{water}	EE_{diet}	EE_{total}	EE_{soil}	EE_{water}	EE_{diet}	EE_{total}	EE_{soil}	EE_{water}	EE_{diet}	EE_{total}
Thorium-230	1.43E-07	2.88E-09	4.49E-06	4.64E-06	4.53E-08	5.93E-09	2.27E-06	2.32E-06	2.25E-08	2.65E-09	1.12E-06	1.15E-06
Thorium-232	1.89E-02	3.45E-04	5.95E-01	6.14E-01	6.00E-03	7.09E-04	3.00E-01	3.07E-01	2.99E-03	3.17E-04	1.49E-01	1.52E-01
Aluminum	5.34E+02	7.11E+00	1.69E+04	1.75E+04	1.70E+02	1.46E+01	8.52E+03	8.70E+03	8.45E+01	6.55E+00	4.21E+03	4.30E+03
Antimony	5.29E+01	2.09E-01	2.23E+03	2.28E+03	1.68E+01	4.29E-01	9.76E+02	9.93E+02	8.38E+00	1.92E-01	4.24E+02	4.32E+02
Arsenic	5.95E+01	7.48E-01	2.00E+03	2.06E+03	1.89E+01	1.54E+00	9.75E+02	9.96E+02	9.41E+00	6.88E-01	4.70E+02	4.80E+02
Barium	6.04E+01	NC	2.38E+03	2.44E+03	1.92E+01	NC	1.08E+03	1.09E+03	9.56E+00	NC	4.82E+02	4.91E+02
Beryllium	1.04E-01	5.08E-04	3.32E+00	3.43E+00	3.30E-02	1.05E-03	1.66E+00	1.70E+00	1.64E-02	4.68E-04	8.19E-01	8.36E-01
Cadmium	2.26E-01	7.82E-02	3.29E+01	3.32E+01	7.17E-02	1.61E-01	1.48E+01	1.51E+01	3.57E-02	7.19E-02	6.65E+00	6.76E+00
Chromium	1.53E+01	1.99E-02	5.42E+01	6.95E+01	4.86E+00	4.09E-02	2.58E+01	3.07E+01	2.42E+00	1.83E-02	1.21E+01	1.46E+01
Cobalt	4.40E+01	3.91E+00	1.43E+03	1.48E+03	1.40E+01	8.04E+00	7.10E+02	7.32E+02	6.96E+00	3.60E+00	3.47E+02	3.58E+02
Copper	4.35E+01	1.58E+00	3.66E+03	3.71E+03	1.38E+01	3.25E+00	1.60E+03	1.62E+03	6.88E+00	1.45E+00	6.96E+02	7.05E+02
Iron	2.95E+02	6.67E+01	9.36E+03	9.72E+03	9.39E+01	1.37E+02	4.71E+03	4.94E+03	4.67E+01	6.14E+01	2.33E+03	2.44E+03
Lead	1.85E+02	1.09E-01	5.97E+03	6.16E+03	5.88E+01	2.24E-01	2.90E+03	2.96E+03	2.93E+01	1.00E-01	1.39E+03	1.42E+03
Magnesium	8.87E+02	NC	7.51E+04	7.60E+04	2.82E+02	NC	2.54E+04	2.57E+04	1.40E+02	NC	7.52E+03	7.66E+03
Manganese	8.49E+02	4.98E-01	3.80E+04	3.89E+04	2.70E+02	1.02E+00	1.62E+04	1.65E+04	1.34E+02	4.58E-01	6.82E+03	6.96E+03
Mercury	7.93E-02	3.33E-04	6.29E+00	6.37E+00	2.52E-02	6.84E-04	2.17E+00	2.19E+00	1.25E-02	3.06E-04	6.67E-01	6.80E-01
Nickel	2.73E+02	2.58E+00	1.80E+04	1.83E+04	8.67E+01	5.30E+00	8.88E+03	8.97E+03	4.32E+01	2.37E+00	4.31E+03	4.36E+03
Selenium	2.47E+00	1.85E-02	7.50E+02	7.53E+02	7.86E-01	3.80E-02	3.78E+02	3.79E+02	3.91E-01	1.70E-02	1.87E+02	1.88E+02
Silver	1.08E+00	2.37E-02	5.67E+01	5.78E+01	3.42E-01	4.86E-02	2.26E+01	2.30E+01	1.70E-01	2.18E-02	8.74E+00	8.93E+00
Thallium	2.14E-01	NC	6.79E+00	7.00E+00	6.81E-02	NC	3.42E+00	3.48E+00	3.39E-02	NC	1.69E+00	1.72E+00
Vandium	1.56E+00	1.94E-02	4.95E+01	5.10E+01	4.95E-01	3.99E-02	2.49E+01	2.54E+01	2.46E-01	1.79E-02	1.23E+01	1.25E+01
Zinc	2.74E+01	8.43E+00	7.09E+03	7.13E+03	8.70E+00	1.73E+01	3.00E+03	3.03E+03	4.33E+00	7.75E+00	1.25E+03	1.27E+03
Cyanide	2.17E-02	0.00E+00	1.84E+00	1.86E+00	6.90E-03	0.00E+00	6.21E-01	6.28E-01	3.43E-03	0.00E+00	1.84E-01	1.87E-01

Notes:

BW = Body Weight

EE_{soil} = Estimated exposure from soil ingestion.

EE_{water} = Estimated exposure from water ingestion.

EE_{diet} = Estimated exposure from food.

EE_{total} = Estimated exposure from food, soil and water.

NC = Not a COPC in this medium, or chemical not detected; values were therefore not calculated.

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TABLE 7-50

TOXICITY REFERENCE VALUES (TRVs) FOR MAMMALS

COPC	TRVs[1] (mg/kg-day)			
	Test Species	Raccoon	Deer Mouse	Red Fox
Acetone	10 (r) [a]	4.29	17.8	4.58
Benzene	26.36 (m) [a]	-	27.9	7.34
2-Butanone	1771 (r) [a]	-	3,149	811
2-Hexanone	2430 (m) [b][2]	-	2,569	676
Methylene Chloride	5.85 (r) [a]	-	10.4	2.68
4-Methyl-2-Pentanone	25 (r) [a]	-	44.5	11.45
Tetrachloroethene	1.4 (m) [a]	-	1.48	0.39
Acenapthene	1 (m) [a][3]	-	1.06	0.28
Anthracene	1 (m) [a][3]	-	1.06	0.28
Benzo(a)anthracene	1 (m) [a][3]	-	1.06	0.28
Benzo(b)fluoranthene	1 (m) [a][3]	-	1.06	0.28
Benzo(k)fluoranthene	1 (m) [a][3]	-	1.06	0.28
Benzo(g,h,i)perylene	1 (m) [a][3]	-	1.06	0.28
Benzo(a)pyrene	1 (m) [a]	-	1.06	0.28
bis(2-ethylhexyl)phthalate	18.3 (m) [a]	-	19.3	5.09
Carbazole	NA	-	NA	NA
Chrysene	1 (m) [a][3]	-	1.06	0.28
Dibenz(a,h)anthracene	1 (m) [a][3]	-	1.06	0.28
Dibenzofuran	NA	-	NA	NA
Fluorene	1 (m) [a][3]	-	1.06	0.28
Fluoranthene	1 (m) [a][3]	-	1.06	0.28
Indeno(1,2,3-cd)pyrene	1 (m) [a][3]	-	1.06	0.28
2-Methylnaphthalene	1 (m) [a][3]	-	1.06	0.28
Naphthalene	1 (m) [a][3]	-	1.06	0.28
Phenanthrene	1 (m) [a][3]	-	1.06	0.28
Pyrene	1 (m) [a][3]	-	1.06	0.28
4,4'-DDE	0.8 (r) [a]	0.34	-	-
4,4'-DDD	0.8 (r) [a]	0.34	-	-
Endrin	0.092 (m) [a]	-	0.10	0.03
Total PCBs	0.004 (mk) [c]	0.0026	0.01	0.0015
Uranium-238	3.07 (m) [a]	0.79	3.25	0.85
Radium-226	NA	NA	NA	NA
Radium-228	NA	NA	NA	NA
Thorium-230	35.2 (m) [b][2]	9.01	37.2	9.80
Thorium-232	35.2 (m) [b][2]	9.01	37.2	9.80
Aluminum	1.93 (m) [a]	0.49	2.04	0.54
Antimony	0.125 (m) [a]	0.03	0.13	0.03
Arsenic	0.126 (m) [a]	0.03	0.13	0.04
Barium	5.06 (r) [a]	2.17	9.0	2.32
Beryllium	0.66 (r) [a]	0.28	1.17	0.30

TABLE 7-50

TOXICITY REFERENCE VALUES (TRVs) FOR MAMMALS

COPC	TRVs[1] (mg/kg-day)			
	Test Species	Raccoon	Deer Mouse	Red Fox
Cadmium	0.1913 (m) [a]	0.05	0.20	0.05
Chromium	2737 (r) [a]	1,175	4,867	1,254
Cobalt	30 (r) [d][2]	12.88	53.3	13.7
Copper	11.71 (mk) [a]	7.54	31.1	4.51
Iron	18 (r) [b][2]	7.73	32.0	8.24
Lead	8 (r) [a]	3.44	14.2	3.66
Magnesium	56 (r) [b][2]	24.0	100	25.6
Manganese	88 (r) [a]	37.8	156	40.3
Mercury	13.2 (m) [a]	3.38	14.0	3.67
Nickel	40 (r) [a]	17.2	71.1	18.3
Selenium	0.075 (m) [a]	0.02	0.08	0.02
Silver	2 (m) [b][2]	0.51	2.11	0.56
Thallium	0.0074 (r) [a]	-	0.013	0.0034
Vanadium	0.21 (r) [a]	0.09	0.37	0.10
Zinc	160 (r) [a]	68.7	285	73.3
Cyanide	68.7 (r) [a]	29.5	122	31.5

Notes:

- = Not Applicable

NA = Not Available

[1]TRVs represent NOAELs for laboratory species converted to receptor species NOAELs as follows (Sample et al., 1996):

$$NOAEL_r = NOAEL_t (bw_t/bw_r)^{1/4}$$

Where: $NOAEL_r$ = receptor NOAEL

$NOAEL_t$ = test species NOAEL

bw_r = receptor body weight

bw_t = test species body weight

Body weights of test species (kg):

rat (r) = 0.2

mouse (m) = 0.025

mink (mk) = 1

[2]Value represents an oral LD_{50} divided by an Uncertainty Factor of 50 (5 for extrapolation from LD_{50} to acute LOAEL (USEPA, 1986) and 10 for extrapolation from acute LOAEL to chronic NOAEL (Newell et al., 1987).

[3]Value is for benzo(a)pyrene.

References:

[a]Sample et al., 1996.

[b]Lewis, 1992.

[c]Heaton, 1992.

[d]Clement Associates, 1985.

TABLE 7-51

TOXICITY REFERENCE VALUES (TRVs) FOR BIRDS

COPC	TRVs[1] (mg/kg-day)		
	Test Species	Mallard	American Robin
Acetone	NA	NA	NA
Benzene	NA	-	NA
2-Butanone	NA	-	NA
2-Hexanone	NA	-	NA
Methylene Chloride	NA	-	NA
4-Methyl-2-Pentanone	NA	-	NA
Tetrachloroethene	NA	-	NA
Acenapthene	NA	-	NA
Anthracene	NA	-	NA
Benzo(a)anthracene	NA	-	NA
Benzo(b)fluoranthene	NA	-	NA
Benzo(k)fluoranthene	NA	-	NA
Benzo(g,h,i)perylene	NA	-	NA
Benzo(a)pyrene	NA	-	NA
bis(2-ethylhexyl)phthalate	NA	-	NA
Carbazole	NA	-	NA
Chrysene	NA	-	NA
Dibenz(a,h)anthracene	NA	-	NA
Dibenzofuran	NA	-	NA
Fluorene	NA	-	NA
Fluoranthene	NA	-	NA
Indeno(1,2,3-cd)pyrene	NA	-	NA
2-Methylnaphthalene	NA	-	NA
Naphthalene	NA	-	NA
Phenanthrene	NA	-	NA
Pyrene	NA	-	NA
4,4'-DDE	0.00028 (pe) [a]	0.00028	-
4,4'-DDD	0.00028 (pe) [a]	0.00028	-
Endrin	0.3 (m) [a]	-	0.3
Total PCBs	0.18 (ph) [a]	0.18	0.18
Uranium-238	16 (bd) [a]	16	16
Radium-226	NA	NA	NA
Radium-228	NA	NA	NA
Thorium-230	NA	NA	NA
Thorium-232	NA	NA	NA

TABLE 7-51

TOXICITY REFERENCE VALUES (TRVs) FOR BIRDS

COPC	TRVs[1] (mg/kg-day)		
	Test Species	Mallard	American Robin
Aluminum	111.4 (rd) [a]	111.4	111.4
Antimony	NA	NA	NA
Arsenic	5.14 (m) [a]	5.14	5.14
Barium	20.86 (c) [a]	20.86	20.86
Beryllium	NA	NA	NA
Cadmium	1.45 (m) [a]	1.45	1.45
Chromium	1 (bd) [a]	1	1
Cobalt	NA	NA	NA
Copper	33.21 (c) [a]	33.21	33.21
Iron	NA	NA	NA
Lead	3.85 (k) [a]	3.85	3.85
Magnesium	NA	NA	NA
Manganese	977 (q) [a]	977	977
Mercury	0.0064 (m) [a]	0.0064	0.0064
Nickel	77.4 (md) [a]	77.4	77.4
Selenium	0.5 (m) [a]	0.5	0.5
Silver	NA	NA	NA
Thallium	NA	-	NA
Vanadium	11.38 (m) [a]	11.38	11.38
Zinc	3 (m) [a]	3	3
Cyanide	NA	NA	NA

Notes:

- = Not Applicable NA = Not Available

[1]TRVs represent NOAELs for laboratory species converted to receptor species NOAELs as follows (Sample et al., 1996):

$$NOAEL_r = NOAEL_t\ (bw_t/bw_r)^0 = NOAEL_r\ (1) = NOAEL_t$$

Where: $NOAEL_r$ = receptor NOAEL

$NOAEL_t$ = test species NOAEL

bw_r = receptor body weight

bw_t = test species body weight

Body weights of test species (kg):

pelican (pe) = 3.5	rock dove = 0.16
mallard (m) = 1.3	chicken (c) = 0.33
pheasant (ph) = 0.8	kestrel (k) = 0.12
black duck (bd) = 1.25	quail (q) = 0.07
	mallard duckling (md) = 0.78

References: (a)Sample et al., 1996.

TABLE 7-52

SURFACE WATER COMPARISON TO TOXICITY REFERENCE VALUES (TRVs)

COPC	Average Site Concentration (ug/l)	Lowest Available TRV (ug/l)	HQ[1]
Bis(2-ethylhexyl)phthalate	2.50E+00	6.00E-01	4.17E+00
4,4'-DDE	1.60E+00	1.00E-03	1.60E+03
4,4'-DDD	9.10E+00	1.00E-03	9.10E+03
4,4'-DDT	4.60E+00	1.00E-03	4.60E+03
Total PCBs	1.00E+00	1.00E-03	1.00E+03
Uranium-238	1.45E+01	2.60E+00	5.59E+00
Radium-226	4.50E-06	NA	NA
Radium-228	8.89E-09	NA	NA
Thorium-230	3.12E-05	NA	NA
Thorium-232	3.73E+00	NA	NA
Aluminum	2.39E+04	1.00E+02	2.39E+02
Antimony	8.53E+02	3.00E+01	2.84E+01
Arsenic	2.16E+03	1.90E+02	1.13E+01
Beryllium	5.50E+00	5.30E+00	1.04E+00
Cadmium	3.16E+02	1.10E+00	2.87E+02
Chromium	7.92E+01	2.10E+02	3.77E-01
Cobalt	1.44E+04	5.00E+00	2.88E+03
Copper	5.60E+03	1.20E+01	4.67E+02
Iron	1.60E+05	3.00E+02	5.33E+02
Lead	5.58E+02	3.20E+00	1.74E+02
Manganese	3.80E+03	1.20E+02	3.16E+01
Mercury	1.39E+00	1.20E-02	1.16E+02
Nickel	5.65E+03	1.60E+02	3.53E+01
Selenium	1.12E+02	1.00E+00	1.12E+02
Silver	9.05E+01	1.00E-01	9.05E+02
Vanadium	1.29E+02	1.40E+01	9.19E+00
Zinc	2.46E+04	1.10E+02	2.23E+02

Notes:

NA = Not Available

[1]HQ = Hazard Quotient = Concentration in Water / TRV

TABLE 7-53

SEDIMENT COMPARISON TO TOXICITY REFERENCE VALUES (TRVs)

COPC	Average Site Concentration (mg/kg)	Lowest Available TRV (mg/kg)	HQ[1]
Acetone	2.00E-01	1.50E-02	1.33E+01
4,4'-DDE	5.60E-02	1.70E-02	3.29E+00
4,4'-DDD	1.16E-01	1.70E-02	6.82E+00
Total PCBs	1.81E+00	2.40E-02	7.54E+01
Uranium-238	1.00E+01	NA	NA
Radium-226	2.37E+00	NA	NA
Radium-228	2.23E+00	NA	NA
Thorium-230	6.21E+00	NA	NA
Thorium-232	1.81E+00	NA	NA
Aluminum	7.93E+03	NA	NA
Antimony	3.30E+01	2.00E+00	1.65E+01
Arsenic	1.01E+03	6.00E+00	1.68E+02
Barium	1.06E+02	NA	NA
Beryllium	1.64E+01	NA	NA
Cadmium	6.77E+00	6.00E-01	1.13E+01
Chromium	9.48E+01	2.60E+01	3.64E+00
Cobalt	1.41E+03	5.00E+01	2.82E+01
Copper	1.64E+03	1.60E+01	1.03E+02
Iron	4.68E+04	2.00E+04	2.34E+00
Lead	2.40E+03	3.10E+01	7.74E+01
Magnesium	3.87E+03	NA	NA
Manganese	1.35E+03	4.60E+02	2.94E+00
Mercury	8.26E-01	1.50E-01	5.51E+00
Nickel	5.49E+02	1.60E+01	3.43E+01
Selenium	1.09E+02	NA	NA
Silver	2.60E+01	NA	NA
Vanadium	2.15E+02	NA	NA
Zinc	7.40E+02	1.20E+02	6.16E+00
Cyanide	7.40E-01	NA	NA

Notes:

NA = Not Available

[1]HQ = Hazard Quotient = Concentration in Sediment / TRV

TABLE 7-54

GLEN COVE CREEK DATA SUMMARY: SURFACE WATER
LI TUNGSTEN SITE

Compound	1990 Sampling Event[1]	1995 Sampling Event[2]	NYS AWQC[3]	USEPA AWQC[4]	Hazard Quotient [5]
Volatiles (ug/l)					
Acetone	ND	ND - 14	NA	NA	NA
2-Butanone (MEK)	ND	ND - 6.5	NA	NA	NA
Bromodichloromethane	0.2 - 1	ND	NA	NA	NA
Chlorobenzene	ND	ND - 0.62	NA	NA	NA
Chloroform	0.6 - 0.7	ND	NA	NA	NA
Dibromochloromethane	0.6 - 1	ND	NA	NA	NA
trans-1,2-Dichloroethene	0.3 - 2	ND	NA	22.4[6]	0.09
2-Hexanone	ND	ND - 0.46	NA	NA	NA
Methylene chloride	ND	1 - 1.8	NA	NA	NA
Tetrachloroethene	1 - 5	ND	NA	0.450	11.1
Trichloroethene	0.3 - 0.6	ND	NA	0.2[6]	3
Semi-volatiles (ug/l)					
Butylbenzyl phthalate	ND	ND - 1.9	NA	NA	NA
Pesticides/PCBs (ug/l)					
gamma-Chlordane	0.5	NS	NA	0.000004[7]	125,000
Inorganics (ug/l)					
Aluminum	205 - 279	180 - 270	NA	NA	NA
Calcium	161,000 - 177,000	140,000 - 310,000	NA	NA	NA
Cobalt	ND	40 - 55	NA	NA	NA
Iron	ND	250 - 430	NA	NA	NA
Magnesium	552,000 - 661,000	420,000 - 960,000	NA	NA	NA
Manganese	74.8 - 110	51 - 75	NA	NA	NA
Mercury	0.23	ND	NA	0.000025	9200
Potassium	191,000 - 210,000	120,000 - 290,000	NA	NA	NA
Silver	ND	65 - 120	NA	0.00092[8]	130,435
Sodium	4,700,000 - 5,530,000	4,000,000 - 7,800,000	NA	NA	NA
Zinc	ND	17 - 52	0.066	0.086	605

ND = Not Detected
NA = Not Available
[1] Range of Detected Concentrations from sampling conducted 12/90 and 1/91 for Mattiace Petrochemical Site.
[2] Range of Detected Concentrations from sampling conducted 6/95 for Mattiace Petrochemical Site.
[3] New York State Ambient Water Quality Criteria (NYCRR Title 6, Chapter 10) for effects in marine waters.
[4] USEPA Ambient Water Quality Criteria. (USEPA, 1991) Chronic effects in marine waters.
[5] Hazard Quotient = Maximum concentration in groundwater divided by lowest AWQC.
[6] Chronic criterion divided by a safety factor of 10.
[7] Value is for chlordane.
[8] Proposed Criterion.

TABLE 7-55

GLEN COVE CREEK DATA SUMMARY: SEDIMENT
LI TUNGSTEN SITE

Compound	1990 Sampling Event[1]	1995 Sampling Event[2]	NYS Sediment Criteria[3]	NOAA ER-L[4]	NOAA ER-M[4]	Ontario's Provincial Sediment Quality Guidelines[5]	Hazard Quotient [6]
Volatiles (ug/kg)							
Acetone	ND	10 - 390	1 [7]	NA	NA	NA	443
2-Butanone (MEK)	ND	14 - 94	27 [7]	NA	NA	NA	3.5
Chlorobenzene	ND	ND - 1.6	1.40	NA	NA	NA	1.1
2-Hexanone	ND	ND - 17	NA	NA	NA	NA	NA
Methylene chloride	ND	2.5 - 74	NA	NA	NA	NA	NA
Semi-volatiles (ug/kg)							
Acenaphthene	ND	ND - 94	96	16	500	NA	5.9
Anthracene	ND	190 - 200	NA	85.3	110	220	2.3
Benzo(a)anthracene	ND	220 - 790	11 [7]	230	1600	320	72
Benzo(a)pyrene	ND	230 - 640	8 [7]	400	2500	370	81
Benzo(b)fluoranthene	ND	230 - 590	8 [7]	NA	NA	NA	75
Benzo(k)fluoranthene	ND	250 - 730	8 [7]	NA	NA	0.24	3042
Bis(2-ethylhexyl)phthalate	ND	280 - 980	31,605 [7]	NA	NA	NA	0.03
Chrysene	ND	250 - 890	8	400	2800	340	113
Dibutyl Phthalate	ND	160 - 420	NA	NA	NA	NA	NA
Fluoranthene	ND	440 - 1600	590	600	3600	750	2.7
Fluorene	ND	98 - 120	NA	NA	NA	190	NA
Indeno(1,2,3-cd)pyrene	ND	ND - 230	8	NA	NA	0.2	1150
4-Methylphenol	ND - 3300	ND	NA	NA	NA	NA	NA
Phenanthrene	ND	190 - 970	70.4	225	1380	0.56	1732
Pyrene	ND	330 - 1400	8	350	2200	0.49	2857
Pesticides/PCBs (ug/kg)							
Aldrin	8.2 - 31	ND	0.34	NA	NA	2	91
alpha-BHC	ND - 15	ND	0.094 [7][8]	NA	NA	6 [8]	160
delta-BHC	190 - 980	ND	0.094 [7][8]	NA	NA	3 [8]	10,426
alpha-Chlordane	21 - 89	ND	0.001 [9]	NA	NA	7 [9]	101,136
gamma-Chlordane	31 - 140	ND - 16	0.001 [9]	NA	NA	7 [9]	159,091
4,4'-DDE	46 - 140	ND	0.44	2	15	5	318
4,4'-DDD	51 - 270	ND	0.44	2	20	8	614
4,4'-DDT	78 - 230	ND	0.44	1.580	46.100	7	523

TABLE 7-55 (Continued)

GLEN COVE CREEK DATA SUMMARY: SEDIMENT
LI TUNGSTEN SITE

Compound	1990 Sampling Event[1]	1995 Sampling Event[2]	NYS Sediment Criteria[3]	NOAA ER-L[4]	NOAA ER-M[4]	Ontario's Provincial Sediment Quality Guidelines[5]	Hazard Quotient [6]
Dieldrin	20 - 36	ND	0.34	NA	NA	2.000	106
Endrin	ND - 18	ND	0.32	NA	NA	3.000	56
Endosulfan I	ND	20 - 57	0.0018 [10]	NA	NA	NA	31,667
Endosulfan sulfate	ND - 480	ND	0.0018 [10]	NA	NA	NA	266,667
Inorganics (mg/kg)							
Aluminum	10700 - 16300	1200 - 14000	NA	NA	NA	NA	NA
Antimony	ND	ND - 16	NA	2	25	NA	8
Arsenic	16.5 - 35.4	0.42 - 18	6	33	85	6	5.9
Barium	60.4 - 91.3	70 - 509	NA	NA	NA	NA	NA
Cadmium	6.9 - 11.3	10 - 14	0.6	5	9	0.6	23
Calcium	6,550 - 38,500	3,100 - 17,000	NA	NA	NA	NA	NA
Chromium	42.5 - 97.3	7 - 94	26	80	145	26	3.7
Cobalt	22.3 - 46.5	2.8 - 30	NA	NA	NA	50	0.93
Copper	377 - 663	20 - 640	16	70	390	16	41
Iron	3010 - 28900	3600 - 30000	20,000	NA	NA	20,000	1.5
Lead	R	39 - 380	31	35	110	31	12
Magnesium	7,780 - 12,300	180 - 12,000	NA	NA	NA	NA	NA
Manganese	218 - 311	ND	460	NA	NA	460	0.68
Mercury	1.7 - 2.5	ND - 1	0.2	0.15	1.3	0.2	12.5
Nickel	31.9 - 98.2	5.6 - 51	16	30	50	16	6.1
Potassium	2,080 - 4,590	1,400 - 4,000	NA	NA	NA	NA	NA
Selenium	ND - 2.6	1 - 2	NA	NA	NA	NA	NA
Silver	ND - 6.6	5.6 - 83	NA	1	3.7	NA	83
Sodium	16,300 - 31,600	3,100 - 26,000	NA	NA	NA	NA	NA
Tungsten	NS	70 - 210	NA	NA	NA	NA	NA
Vanadium	28.1 - 60	6 - 55	NA	NA	NA	NA	NA
Zinc	349 - 533	39 - 480	120	120	270	120	4

301417

TABLE 7-55 (Continued)

GLEN COVE CREEK DATA SUMMARY: SEDIMENT
LI TUNGSTEN SITE

Notes:

ND = Not Detected NS = Not Sampled

NA = Not Available R = Data Rejected

(1) Range of Detected Concentrations from sampling conducted 12/90 and 1/91 for Mattiace Petrochemical Site.

(2) Range of Detected Concentrations from sampling conducted 6/95 for Mattiace Petrochemical Site.

(3) NYSDEC, 1994. Calculated based on a site average TOC of 0.04%.

(4) National Oceanic and Atmospheric Administration, National Ocean Service, August 1991. ER-L = Effects Range - Low (a concentration at the low end of the range in which effects have been observed). ER-M = Effects Range - Median (a concentration approximately midway in the range of reported values assoicated with biological effects).

(5) Lowest Effect Level = a level of contamination which has no effect on the majority of the sediment-dwelling organisms (Persaud et al., 1992 and 1993).

(6) Hazard Quotient = Maximum concentration in sediment divided by lowest sediment criterion.

(7) Calculated based on Equilibrium Partitioning (EqP) method, based on TOC of 0.44%.

(8) Value is for BHC.

(9) Value is for Chlordane

(10) Value is for Endosulfan.

301418

TABLE 7-56

DATA SUMMARY FOR ECOLOGICAL ASSESSMENT: GROUNDWATER
LI TUNGSTEN SITE

Compound	Frequency	Range of Concentrations[1] mg/L	NYS AWQC mg/L [2]	USEPA AWQC mg/L [3]	Hazard Quotient [4]
Volatiles					
Acetone	19 / 59	0.004 - 17	NA	NA	NA
Benzene	8 / 59	0.0009 - 0.54	NA	0.7	0.77
2-Butanone	8 / 59	0.072 - 1.5	NA	NA	NA
Carbon disulfide	1 / 59	0.001	NA	NA	NA
Carbon tetrachloride	2 / 59	0.002 - 0.17	NA	5.0[5]	0.03
Chlorobenzene	1 / 59	0.001 - 0.001	NA	NA	NA
Chloroethane	2 / 59	0.027 - 0.028	NA	NA	NA
Chloroform	3 / 59	0.23 - 4	NA	NA	NA
Chloromethane	1 / 59	0.0022	NA	NA	NA
1,1-Dichloroethane	15 / 59	0.001 - 3.6	NA	NA	NA
1,2-Dichloroethane	5 / 59	0.002 - 0.79	NA	11.3[5]	0.07
1,1-Dichloroethene	4 / 59	0.003 - 0.65	NA	22.4[5]	0.03
1,2-Dichloroethene (total)	29 / 59	0.002 - 150	NA	22.4[5]	6.7
Ethylbenzene	8 / 59	0.002 - 7.6	NA	0.043[5]	177
4-Methyl-2-Pentanone	2 / 59	7.9 - 17	NA	NA	NA
Methylene chloride	9 / 59	0.0009 - 120	NA	NA	NA
1,1,2,2-Tetrachloroethane	2 / 59	0.001 - 0.002	NA	0.9[5]	0.002
Tetrachloroethene	26 / 59	0.001 - 7.8	NA	0.450	17.3
Toluene	12 / 59	0.001 - 90	NA	5.0	18
1,1,1-Trichloroethane	10 / 59	0.003 - 16	NA	3.12[5]	5.13
1,1,2-Trichloroethane	4 / 59	0.001 - 0.065	NA	NA	NA
Trichloroethene	26 / 59	0.001 - 31	NA	0.2[5]	155
Vinyl chloride	10 / 59	0.001 - 0.096	NA	NA	NA
Xylenes (total)	9 / 59	0.003 - 36	NA	NA	NA
Semi-volatiles					
Acenaphthene	3 / 59	0.00068 - 0.004	NA	0.710	0.006
Fluorene	4 / 59	0.00067 - 0.004	NA	NA	NA
Phenanthrene	5 / 59	0.00059 - 0.003	NA	0.0046[6]	0.65
bis(2-Ethylhexyl)phthalate	23 / 59	0.00051 - 2.4	NA	0.360[6]	6.7
Dibenzofuran	3 / 59	0.00051 - 0.005	NA	NA	N
Di-n-butylphthalate	13 / 59	0.0005 - 0.79	NA	NA	N
Di-n-octylphthalate	1 / 59	0.001	NA	NA	N
1,2-Dichlorobenzene	4 / 59	0.24 - 1.3	NA	0.197[5][7]	6.6
1,3-Dichlorobenzene	1 / 59	0.02	NA	0.197[5][7]	0.10
1,4-Dichlorobenzene	4 / 59	0.02 - 0.1	NA	0.197[5][7]	0.51
Diethylphthalate	3 / 59	0.007 - 0.062	NA	NA	NA
Dimethylphthalate	1 / 59	0.0013	NA	NA	NA
2,4-Dimethylphenol	2 / 59	0.026 - 0.11	NA	NA	NA

TABLE 7-56 (Continued)

DATA SUMMARY FOR ECOLOGICAL ASSESSMENT: GROUNDWATER
LI TUNGSTEN SITE

CHEMICAL	Frequency	Range of Concentrations [1] mg/L	NYS AWQC mg/L [2]	USEPA AWQC mg/L [3]	Hazard Quotient [4]
Isophorone	5 / 59	0.006 - 0.53	NA	1.29[5]	0.41
2-Methylnaphthalene	10 / 59	0.0005 - 0.12	NA	NA	NA
2-Methylphenol	6 / 59	0.002 - 0.41	NA	NA	NA
4-Methylphenol	11 / 59	0.0021 - 0.42	NA	NA	NA
Naphthalene	11 / 59	0.00054 - 2.3	NA	0.235[5]	9.8
Phenol	9 / 59	0.003 - 0.63	NA	0.580[5]	1.1
Pesticides / PCBs					
Aldrin	5 / 56	0.000042 - 0.000066	NA	0.00013[5]	0.51
alpha-BHC	2 / 56	0.000032 - 0.00005	NA	0.000034[5][8]	1.5
beta-BHC	1 / 54	0.000048	NA	0.000034[5][8]	1.4
gamma-BHC (Lindane)	3 / 55	0.000031 - 0.00004	NA	0.000034[5][8]	1.2
alpha-Chlordane	1 / 55	0.000038	NA	0.000004[9]	9.5
gamma-Chlordane	1 / 55	0.000038	NA	0.000004[9]	9.5
4,4'-DDD	1 / 57	0.00023	0.000001[10]	0.00036[5]	230
4,4'-DDE	1 / 55	0.000045	0.000001[10]	0.0014[5]	45
4,4'-DDT	2 / 56	0.000054 - 0.000093	0.000001[10]	0.000001	93
Dieldrin	2 / 56	0.000058 - 0.00032	NA	0.0000019	168
Endosulfan I	3 / 56	0.00003 - 0.000068	0.000001[11]	0.0000087[11]	68
Endosulfan II	3 / 57	0.00008 - 0.00019	0.000001[11]	0.0000087[11]	190
Endosulfan sulfate	1 / 56	0.000081	0.000001[11]	NA	81
Endrin	2 / 57	0.00044 - 0.0013	NA	0.0000023	565
Endrin aldehyde	1 / 56	0.00016	NA	NA	NA
Heptachlor	3 / 55	0.000029 - 0.000046	0.000001	0.0000036	46
Inorganics					
Aluminum	60 / 60	0.0654 - 122	NA	NA	NA
Antimony	30 / 60	0.0055 - 11.1	NA	0.5[6]	22.2
Arsenic	34 / 41	0.0099 - 10.9	0.063	0.036	303
Barium	60 / 60	0.0215 - 1.64	NA	NA	NA
Beryllium	34 / 60	0.00032 - 0.0124	NA	NA	NA
Cadmium	56 / 60	0.00043 - 1.16	0.0077	0.0093	151
Calcium	60 / 60	5.44 - 554	NA	NA	NA
Chromium	57 / 59	0.0014 - 0.561	NA	1.03[5]	0.54
Cobalt	58 / 60	0.0015 - 17.6	NA	NA	NA
Copper	59 / 60	0.0025 - 36.9	0.0029	0.00029[5]	127,241
Iron	60 / 60	0.15 - 1260	NA	NA	NA
Lead	51 / 60	0.0014 - 0.836	0.0086	0.0085	98
Magnesium	60 / 60	3.2 - 247	NA	NA	NA
Manganese	59 / 59	0.164 - 68.3	NA	NA	NA

TABLE 7-56 (Continued)

DATA SUMMARY FOR ECOLOGICAL ASSESSMENT: GROUNDWATER
LI TUNGSTEN SITE

CHEMICAL	Frequency	Range of Concentrations [1] mg/L	NYS AWQC mg/L [2]	USEPA AWQC mg/L [3]	Hazard Quotient [4]
Mercury	31 / 57	0.00007 - 0.0148	NA	0.000025	592
Nickel	60 / 60	0.0036 - 110	0.0071	0.0083	15,493
Potassium	57 / 57	2.16 - 236	NA	NA	NA
Selenium	31 / 58	0.003 - 1.31	NA	0.071	18.5
Silver	38 / 60	0.001 - 0.352	NA	0.00092[6]	383
Sodium	59 / 59	7.82 - 8400	NA	NA	NA
Thallium	35 / 58	0.0041 - 0.0237	NA	0.213[5]	0.11
Vanadium	51 / 59	0.0047 - 0.431	NA	NA	NA
Zinc	60 / 60	0.0084 - 17.1	0.066	0.086	259
Cyanide	3 / 60	0.0053 - 0.0063	0.001	0.0001[5]	63

ND = Not Detected
NA = Not Available
[1] Range of Detected Concentrations
[2] New York State Ambient Water Quality Criteria (NYCRR Title 6, Chapter 10) for effects in marine waters.
[3] USEPA Ambient Water Quality Criteria. (USEPA, 1991) Chronic effects in marine waters.
[4] Hazard Quotient = Maximum concentration in groundwater divided by lowest AWQC.
[5] Chronic criterion divided by a safety factor of 10.
[6] Proposed criterion.
[7] Value is for dichlorobenzenes.
[8] Value is for BHC.
[9] Value is for chlordane.
[10] Value is for total DDD, DDE and DDT.
[11] Value is for endosulfan.

TABLE 7-57

SUMMARY OF HAZARD QUOTIENTS FOR MALLARD AND RACCOON

COPC	Mallard			Raccoon		
	EEtotal	TRV	HQ	EEtotal	TRV	HQ
Acetone	8.21E-01	NA	NA	2.10E+00	4.29E+00	4.89E-01
4,4'-DDE	6.68E-02	2.80E-04	2.39E+02	4.58E-02	3.40E-01	1.35E-01
4,4'-DDD	1.39E-01	2.80E-04	4.95E+02	9.53E-02	3.40E-01	2.80E-01
Total PCBs	1.56E+00	1.80E-01	8.67E+00	1.68E+00	2.60E-03	6.48E+02
Uranium-238	3.37E-02	1.60E+01	2.11E-03	2.43E-02	7.90E-01	3.07E-02
Radium-226	1.75E-09	NA	NA	1.48E-09	NA	NA
Radium-228	4.76E-12	NA	NA	3.83E-12	NA	NA
Thorium-230	3.37E-07	NA	NA	2.35E-07	9.01E+00	2.61E-08
Thorium-232	1.25E-02	NA	NA	8.85E-03	9.01E+00	9.82E-04
Aluminum	4.92E+03	1.11E+02	4.41E+01	3.41E+03	4.90E-01	6.96E+03
Antimony	2.21E+01	NA	NA	1.75E+01	3.00E-02	5.82E+02
Arsenic	5.01E+02	5.14E+00	9.75E+01	3.57E+02	3.00E-02	1.19E+04
Barium	6.70E+01	2.09E+01	3.21E+00	5.11E+01	2.17E+00	2.36E+01
Beryllium	3.92E+00	NA	NA	2.73E+00	2.80E-01	9.74E+00
Cadmium	9.43E+00	1.45E+00	6.50E+00	7.12E+00	5.00E-02	1.42E+02
Chromium	9.83E+00	1.00E+00	9.83E+00	8.65E+00	1.18E+03	7.36E-03
Cobalt	1.65E+03	NA	NA	1.16E+03	1.29E+01	9.02E+01
Copper	3.66E+03	3.32E+01	1.10E+02	2.85E+03	7.54E+00	3.78E+02
Iron	1.69E+04	NA	NA	1.18E+04	7.73E+00	1.52E+03
Lead	1.62E+03	3.85E+00	4.22E+02	1.16E+03	3.44E+00	3.38E+02
Magnesium	4.20E+03	NA	NA	4.58E+03	2.40E+01	1.91E+02
Manganese	1.35E+03	9.77E+02	1.39E+00	1.10E+03	3.78E+01	2.90E+01
Mercury	6.13E-01	6.40E-03	9.58E+01	6.49E-01	3.38E+00	1.92E-01
Nickel	1.27E+03	7.74E+01	1.64E+01	8.85E+02	1.72E+01	5.14E+01
Selenium	1.18E+03	5.00E-01	2.35E+03	7.96E+02	2.00E-02	3.98E+04
Silver	1.66E+01	NA	NA	1.45E+01	5.10E-01	2.84E+01
Vandium	1.66E+02	1.14E+01	1.46E+01	1.15E+02	9.00E-02	1.28E+03
Zinc	3.83E+03	3.00E+00	1.28E+03	3.07E+03	6.87E+01	4.47E+01
Cyanide	2.98E-01	NA	NA	3.25E-01	2.95E+01	1.10E-02

Notes:

NA = Not Available

EE_{total} = Total Estimated Exposure (mg/kg BW-day)

TRV = Toxicity Reference Value (mg/kg BW-day) = NOAEL from available literature (see Tables 7.4-11 and 7.4-12).

HQ = Hazard Quotient (EE_{total} / TRV)

p:/8001202/risk/eco/tables/Hq

TABLE 7-58

SURFACE SOIL COMPARISON TO TOXICITY REFERENCE VALUES (TRVs)

COPC	Site Concentration[1] (mg/kg)	Plant TRV (mg/kg)	HQ	Earthworm TRV (mg/kg)	HQ
Acetone	1.90E-01	NA	NA	NA	NA
Benzene	4.00E-03	NA	NA	NA	NA
2-Butanone	5.20E-02	NA	NA	NA	NA
2-Hexanone	4.50E-02	NA	NA	NA	NA
Methylene Chloride	2.20E-02	NA	NA	NA	NA
4-Methyl-2-pentanone	2.90E-02	NA	NA	NA	NA
Tetrachlorethene	3.90E-02	NA	NA	NA	NA
Acenaphthene	6.40E-01	2.00E+01 [2]	3.20E-02	NA	NA
Anthracene	7.00E-01	NA	NA	NA	NA
Benzo(a)anthracene	3.10E+00	NA	NA	NA	NA
Benzo(b)fluoranthene	1.00E+01	NA	NA	NA	NA
Benzo(k)fluoranthene	1.50E+00	NA	NA	NA	NA
Benzo(g,h,i)perylene	4.70E+00	NA	NA	NA	NA
Benzo(a)pyrene	3.90E+00	NA	NA	NA	NA
bis(2-ethylhexyl)phthalate	1.60E+01	NA	NA	NA	NA
Carbazole	1.00E+00	NA	NA	NA	NA
Chrysene	4.00E+00	NA	NA	NA	NA
Dibenz(a,h)anthracene	1.30E+00	NA	NA	NA	NA
Dibenzofuran	8.30E-01	6.00E+02 [2][3]	1.38E-03	NA	NA
Fluorene	5.70E-01	NA	NA	3.00E+01 [4]	1.90E-02
Fluoranthene	1.00E+01	NA	NA	NA	NA
Indeno(1,2,3-cd)pyrene	3.80E+00	NA	NA	NA	NA
2-Methylnaphthalene	6.10E-01	NA	NA	NA	NA
Naphthalene	1.90E-01	NA	NA	NA	NA
Phenanthrene	3.80E+00	NA	NA	NA	NA
Pyrene	7.30E+00	NA	NA	NA	NA
Endrin	7.00E-02	NA	NA	1.00E+01 [5][6]	7.00E-03
Total PCBs	1.59E+01	4.00E+01 [2]	3.97E-01	NA	NA
Uranium-238	2.53E+01	NA	NA	NA	NA
Radium-226	1.41E+01	NA	NA	NA	NA
Radium-228	5.12E+01	NA	NA	NA	NA
Thorium-230	2.13E+01	NA	NA	NA	NA
Thorium-232	1.82E+01	NA	NA	NA	NA

TABLE 7-58

SURFACE SOIL COMPARISON TO TOXICITY REFERENCE VALUES (TRVs)

COPC	Site Concentration[1] (mg/kg)	Plant TRV (mg/kg)	HQ	Earthworm TRV (mg/kg)	HQ
Aluminum	5.66E+04	5.00E+01 [2]	1.13E+03	NA	NA
Antimony	5.61E+03	5.00E+00 [2]	1.12E+03	NA	NA
Arsenic	6.30E+03	1.00E+01 [2]	6.30E+02	6.00E+01 [4]	1.05E+02
Barium	6.40E+03	5.00E+02 [2]	1.28E+01	NA	NA
Beryllium	1.10E+01	1.00E+01 [2]	1.10E+00	NA	NA
Cadmium	2.39E+01	3.00E+00 [2]	7.97E+00	2.00E+01 [4]	1.20E+00
Chromium	1.62E+03	1.00E+00 [2]	1.62E+03	4.00E-01 [4]	4.05E+03
Cobalt	4.66E+03	2.00E+01 [2]	2.33E+02	NA	NA
Copper	4.61E+03	1.00E+02 [2]	4.61E+01	5.00E+01 [4]	9.22E+01
Iron	3.13E+05	NA	NA	NA	NA
Lead	1.96E+04	5.00E+01 [2]	3.92E+02	5.00E+02 [4]	3.92E+01
Magnesium	9.40E+04	NA	NA	NA	NA
Manganese	9.00E+04	5.00E+02 [2]	1.80E+02	NA	NA
Mercury	8.40E+00	3.00E-01 [2]	2.80E+01	1.00E-01 [4]	8.40E+01
Nickel	2.89E+04	3.00E+01 [2]	9.63E+02	2.00E+02 [4]	1.45E+02
Selenium	2.62E+02	1.00E+00 [2]	2.62E+02	7.00E+01 [4]	3.74E+00
Silver	1.14E+02	2.00E+00 [2]	5.70E+01	NA	NA
Thallium	2.27E+01	1.00E+00 [2]	2.27E+01	NA	NA
Vanadium	1.65E+02	2.00E+00 [2]	8.25E+01	NA	NA
Zinc	2.90E+03	5.00E+01 [2]	5.80E+01	2.00E+02 [4]	1.45E+01
Cyanide	2.30E+00	NA	NA	NA	NA

Notes:

NA = Not Available

[1]Site concentration represents maximum of detected concentrations.

[2]Reference: Will and Suter, 1995a.

[3]Value is for furan.

[4]Will and Suter, 1995b.

[5]Jorgensen et al., 1991.

[6]Value represents 95% mortality in earthworms.

HQ = Hazard Quotient = Concentration in Soil / TRV

TABLE 7-59

SUMMARY OF HAZARD QUOTIENTS FOR AMERICAN ROBIN, DEER MOUSE AND RED FOX

COPC	American Robin			Deer Mouse			Red Fox		
	EEtotal	TRV	HQ	EEtotal	TRV	HQ	EEtotal	TRV	HQ
Acetone	5.17E+00	NA	NA	1.25E+00	1.78E+01	7.03E-02	7.15E-02	4.58E+00	1.56E-02
Benzene	5.84E-03	NA	NA	1.72E-03	2.79E+01	6.15E-05	3.55E-04	7.34E+00	4.84E-05
2-Butanone	7.05E-01	NA	NA	1.73E-01	3.15E+03	5.48E-05	1.16E-02	8.11E+02	1.43E-05
2-Hexanone	1.54E-01	NA	NA	4.04E-02	2.57E+03	1.57E-05	4.98E-03	6.76E+02	7.36E-06
Methylene Chloride	8.73E-02	NA	NA	2.26E-02	1.04E+01	2.18E-03	2.57E-03	2.68E+00	9.59E-04
4-Methyl-2-pentanone	1.27E-01	NA	NA	3.26E-02	4.45E+01	7.33E-04	3.52E-03	1.15E+01	3.07E-04
Tetrachlorethene	3.35E-02	NA	NA	1.11E-02	1.48E+00	7.51E-03	3.20E-03	3.90E-01	8.21E-03
Acenaphthene	1.19E-01	NA	NA	4.11E-02	1.06E+00	3.88E-02	1.31E-02	2.80E-01	4.69E-02
Anthracene	9.02E-02	NA	NA	3.59E-02	1.06E+00	3.39E-02	1.44E-02	2.80E-01	5.15E-02
Benzo(a)anthracene	4.10E-01	NA	NA	1.93E-01	1.06E+00	1.82E-01	9.26E-02	2.80E-01	3.31E-01
Benzo(b)fluoranthene	3.01E+00	NA	NA	1.48E+00	1.06E+00	1.40E+00	7.30E-01	2.80E-01	2.61E+00
Benzo(k)fluoranthene	4.38E-01	NA	NA	2.16E-01	1.06E+00	2.04E-01	1.06E-01	2.80E-01	3.79E-01
Benzo(g,h,i)perylene	5.59E-01	NA	NA	2.73E-01	1.06E+00	2.57E-01	1.35E-01	2.80E-01	4.81E-01
Benzo(a)pyrene	1.06E+00	NA	NA	5.20E-01	1.06E+00	4.91E-01	2.56E-01	2.80E-01	9.13E-01
bis(2-ethylhexyl)phthalate	4.92E+00	NA	NA	2.45E+00	1.93E+01	1.27E-01	1.21E+00	5.09E+00	2.39E-01
Carbazole	5.47E-01	NA	NA	2.11E-01	NA	NA	7.86E-02	NA	NA
Chrysene	5.01E-01	NA	NA	2.40E-01	1.06E+00	2.26E-01	1.16E-01	2.80E-01	4.16E-01
Dibenz(a,h)anthracene	1.64E-01	NA	NA	7.92E-02	1.06E+00	7.48E-02	3.88E-02	2.80E-01	1.38E-01
Dibenzofuran	3.21E-01	NA	NA	1.43E-01	NA	NA	6.37E-02	NA	NA
Fluoranthene	1.25E+00	NA	NA	5.58E-01	1.06E+00	5.26E-01	2.55E-01	2.80E-01	9.12E-01
Fluorene	2.15E-01	NA	NA	9.68E-02	1.06E+00	9.13E-02	4.37E-02	2.80E-01	1.56E-01
Indeno(1,2,3-cd)pyrene	9.05E-01	NA	NA	4.44E-01	1.06E+00	4.19E-01	2.18E-01	2.80E-01	7.78E-01
2-Methylnaphthalene	2.45E-01	NA	NA	1.07E-01	1.06E+00	1.01E-01	4.69E-02	2.80E-01	1.68E-01
Naphthalene	1.00E-01	NA	NA	3.91E-02	1.06E+00	3.69E-02	1.49E-02	2.80E-01	5.32E-02
Phenanthrene	5.35E-01	NA	NA	2.18E-01	1.06E+00	2.05E-01	8.96E-02	2.80E-01	3.20E-01
Pyrene	1.82E+00	NA	NA	8.67E-01	1.06E+00	8.18E-01	4.14E-01	2.80E-01	1.48E+00
Endrin	1.88E-01	3.00E-01	6.28E-01	9.49E-02	1.00E-01	9.49E-01	4.70E-02	3.00E-02	1.57E+00
Total PCBs	2.86E+01	1.80E-01	1.59E+02	1.44E+01	1.00E-02	1.44E+03	7.12E+00	1.50E-03	4.75E+03
Uranium-238	4.43E-01	1.60E+01	2.77E-02	2.21E-01	3.25E+00	6.81E-02	1.09E-01	8.50E-01	1.28E-01
Radium-226	7.89E-08	NA	NA	3.96E-08	NA	NA	1.94E-08	NA	NA

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TABLE 7-59

SUMMARY OF HAZARD QUOTIENTS FOR AMERICAN ROBIN, DEER MOUSE AND RED FOX

COPC	American Robin			Deer Mouse			Red Fox		
	EEtotal	TRV	HQ	EEtotal	TRV	HQ	EEtotal	TRV	HQ
Radium-228	6.16E-10	NA	NA	3.05E-10	NA	NA	1.50E-10	NA	NA
Thorium-230	4.64E-06	NA	NA	2.32E-06	3.72E+01	6.23E-08	1.15E-06	9.80E+00	1.17E-07
Thorium-232	6.14E-01	NA	NA	3.07E-01	3.72E+01	8.25E-03	1.52E-01	9.80E+00	1.55E-02
Aluminum	1.75E+04	1.11E+02	1.57E+02	8.70E+03	2.04E+00	4.27E+03	4.30E+03	5.40E-01	7.97E+03
Antimony	2.28E+03	NA	NA	9.93E+02	1.30E-01	7.64E+03	4.32E+02	3.00E-02	1.44E+04
Arsenic	2.06E+03	5.14E+00	4.00E+02	9.96E+02	1.30E-01	7.66E+03	4.80E+02	4.00E-02	1.20E+04
Barium	2.44E+03	2.09E+01	1.17E+02	1.09E+03	9.00E+00	1.22E+02	4.91E+02	2.32E+00	2.12E+02
Beryllium	3.43E+00	NA	NA	1.70E+00	1.17E+00	1.45E+00	8.36E-01	3.00E-01	2.79E+00
Cadmium	3.32E+01	1.45E+00	2.29E+01	1.51E+01	2.00E-01	7.54E+01	6.76E+00	5.00E-02	1.35E+02
Chromium	6.95E+01	1.00E+00	6.95E+01	3.07E+01	4.87E+03	6.30E-03	1.46E+01	1.25E+03	1.16E-02
Cobalt	1.48E+03	NA	NA	7.32E+02	5.33E+01	1.37E+01	3.58E+02	1.37E+01	2.61E+01
Copper	3.71E+03	3.32E+01	1.12E+02	1.62E+03	3.11E+01	5.21E+01	7.05E+02	4.51E+00	1.56E+02
Iron	9.72E+03	NA	NA	4.94E+03	3.20E+01	1.54E+02	2.44E+03	8.24E+00	2.96E+02
Lead	6.16E+03	3.85E+00	1.60E+03	2.96E+03	1.42E+01	2.08E+02	1.42E+03	3.66E+00	3.88E+02
Magnesium	7.60E+04	NA	NA	2.57E+04	1.00E+02	2.57E+02	7.66E+03	2.56E+01	2.99E+02
Manganese	3.89E+04	9.77E+02	3.98E+01	1.65E+04	1.56E+02	1.06E+02	6.96E+03	4.03E+01	1.73E+02
Mercury	6.37E+00	6.40E-03	9.95E+02	2.19E+00	1.40E+01	1.57E-01	6.80E-01	3.67E+00	1.85E-01
Nickel	1.83E+04	7.74E+01	2.37E+02	8.97E+03	7.11E+01	1.26E+02	4.36E+03	1.83E+01	2.38E+02
Selenium	7.53E+02	5.00E-01	1.51E+03	3.79E+02	8.00E-02	4.74E+03	1.88E+02	2.00E-02	9.38E+03
Silver	5.78E+01	NA	NA	2.30E+01	2.11E+00	1.09E+01	8.93E+00	5.60E-01	1.59E+01
Thallium	7.00E+00	NA	NA	3.48E+00	1.30E-02	2.68E+02	1.72E+00	3.40E-03	5.07E+02
Vanadium	5.10E+01	1.14E+01	4.48E+00	2.54E+01	3.70E-01	6.86E+01	1.25E+01	1.00E-01	1.25E+02
Zinc	7.13E+03	3.00E+00	2.38E+03	3.03E+03	2.85E+02	1.06E+01	1.27E+03	7.33E+01	1.73E+01
Cyanide	1.86E+00	NA	NA	6.28E-01	1.22E+02	5.15E-03	1.87E-01	3.15E+01	5.95E-03

Notes:

NA = Not Available

EE_{total} = Total Estimated Exposure (mg/kg BW-day)

TRV = Toxicity Reference Value = NOAEL (mg/kg BW-day) from available literature (see Tables 7.4-11 and 7.4-12).

HQ = Hazard Quotient (EE_{total} / TRV)

301426

TABLE 7-60

RADIOLOGICAL RISK CHARACTERIZATION: AQUATIC RECEPTORS
LI TUNGSTEN SITE

Radionuclide	Aquatic Plant					Aquatic Invertebrate				
	D_{Pr} (rad/d)	R_{total} (rad/d)	Total Dose (rad/d)	TRV (rad/d)	HQ (unitless)	D_{Ir} (rad/d)	R_{total} (rad/d)	Total Dose (rad/d)	TRV (rad/d)	HQ (unitless)
Uranium-238	9.51E-04	1.68E-11	9.51E-04	1.00E+00	9.51E-04	1.06E-05	7.98E-10	1.06E-05	1.00E+00	1.06E-05
Uranium-234	1.08E-03	1.68E-11	1.08E-03	1.00E+00	1.08E-03	1.20E-05	9.95E-10	1.20E-05	1.00E+00	1.20E-05
Thorium-230	4.23E-04	2.24E-12	4.23E-04	1.00E+00	4.23E-04	1.41E-05	2.90E-10	1.41E-05	1.00E+00	1.41E-05
Radium-226	2.97E-02	1.58E-11	2.97E-02	1.00E+00	2.97E-02	9.91E-04	2.01E-09	9.91E-04	1.00E+00	9.91E-04
Lead-210	1.98E-03	1.58E-11	1.98E-03	1.00E+00	1.98E-03	4.95E-04	8.86E-10	4.95E-04	1.00E+00	4.95E-04
Thorium-232	2.52E-04	NA	2.52E-04	1.00E+00	2.52E-04	8.40E-06	NA	8.40E-06	1.00E+00	8.40E-06
Radium-228	2.03E-02	NA	2.03E-02	1.00E+00	2.03E-02	6.76E-04	NA	6.76E-04	1.00E+00	6.76E-04
Thorium-228	1.99E-03	NA	1.99E-03	1.00E+00	1.99E-03	6.64E-05	NA	6.64E-05	1.00E+00	6.64E-05
Totals:	5.67E-02	6.73E-11	5.67E-02	1.00E+00	5.67E-02	2.27E-03	4.98E-09	2.27E-03	1.00E+00	2.27E-03

Notes:

NA = Not Available

D_{Pr} = internal dose to plant

D_{Ir} = internal dose to invertebrate

D_{Fr} = internal dose to fish

R_{total} = total external exposure, from water and sediment

Total Dose = sum of internal and external doses

TRV = Toxicity Reference Value

HQ = Hazard Quotient = Total Dose / TRV

301427

TABLE 7-60

RADIOLOGICAL RISK CHARACTERIZATION: AQUATIC RECEPTORS
LI TUNGSTEN SITE

Radionuclide	Fish				
	D_{Fr} (rad/d)	R_{total} (rad/d)	Total Dose (rad/d)	TRV (rad/d)	HQ (unitless)
Uranium-238	5.28E-05	4.07E-10	5.28E-05	1.00E+00	5.28E-05
Uranium-234	6.02E-05	5.06E-10	6.02E-05	1.00E+00	6.02E-05
Thorium-230	1.41E-05	1.46E-10	1.41E-05	1.00E+00	1.41E-05
Radium-226	4.95E-05	1.01E-09	4.95E-05	1.00E+00	4.95E-05
Lead-210	1.98E-03	4.51E-10	1.98E-03	1.00E+00	1.98E-03
Thorium-232	8.40E-06	NA	8.40E-06	1.00E+00	8.40E-06
Radium-228	3.38E-05	NA	3.38E-05	1.00E+00	3.38E-05
Thorium-228	6.64E-05	NA	6.64E-05	1.00E+00	6.64E-05
Totals:	2.27E-03	2.52E-09	2.27E-03	1.00E+00	2.27E-03

Notes:

NA = Not Available

D_{Pr} = internal dose to plant

D_{Ir} = internal dose to invertebrate

D_{Fr} = internal dose to fish

R_{total} = total external exposure, from water and sediment

Total Dose = sum of internal and external doses

TRV = Toxicity Reference Value

HQ = Hazard Quotient = Total Dose / TRV

301428

TABLE 7-61

RADIOLOGICAL RISK CHARACTERIZATION: SEMI-AQUATIC RECEPTORS
LI TUNGSTEN SITE

Radionuclide	Plant			Meadow Vole			Raccoon		
	Dose (rad/d)	TRV (rad/d)	HQ (unitless)	Dose (rad/d)	TRV (rad/d)	HQ (unitless)	Dose (rad/d)	TRV (rad/d)	HQ (unitless)
Uranium-238	8.59E-05	1.00E-01	8.59E-04	2.75E-11	1.00E-01	2.75E-10	4.98E-09	1.00E-01	4.98E-08
Uranium-234	9.79E-05	1.00E-01	9.79E-04	3.13E-11	1.00E-01	3.13E-10	5.68E-09	1.00E-01	5.68E-08
Thorium-230	5.42E-06	1.00E-01	5.42E-05	5.20E-14	1.00E-01	5.20E-13	9.42E-12	1.00E-01	9.42E-11
Radium-226	2.18E-05	1.00E-01	2.18E-04	8.70E-12	1.00E-01	8.70E-11	1.58E-09	1.00E-01	1.58E-08
Lead-210	6.53E-05	1.00E-01	6.53E-04	3.13E-11	1.00E-01	3.13E-10	5.68E-09	1.00E-01	5.68E-08
Thorium-232	9.90E-07	1.00E-01	9.90E-06	9.51E-15	1.00E-01	9.51E-14	1.72E-12	1.00E-01	1.72E-11
Radium-228	2.11E-05	1.00E-01	2.11E-04	8.43E-12	1.00E-01	8.43E-11	1.53E-09	1.00E-01	1.53E-08
Thorium-228	1.27E-06	1.00E-01	1.27E-05	1.22E-14	1.00E-01	1.22E-13	2.20E-12	1.00E-01	2.20E-11
Totals:	3.00E-04	1.00E-01	3.00E-03	1.07E-10	1.00E-01	1.07E-09	1.95E-08	1.00E-01	1.95E-07

Notes:

TRV = Toxicity Reference Value
HQ = Hazard Quotient = Dose / TRV

301429

TABLE 7-62

RADIOLOGICAL RISK CHARACTERIZATION: TERRESTRIAL RECEPTORS
LI TUNGSTEN SITE

Radionuclide	Plant			Deer Mouse			Red Fox		
	Dose (rad/d)	TRV (rad/d)	HQ (unitless)	Dose (rad/d)	TRV (rad/d)	HQ (unitless)	Dose (rad/d)	TRV (rad/d)	HQ (unitless)
Uranium-238	8.78E-04	1.00E-01	8.78E-03	2.11E-10	1.00E-01	2.11E-09	4.85E-14	1.00E-01	4.85E-13
Uranium-234	7.30E-04	1.00E-01	7.30E-03	1.75E-10	1.00E-01	1.75E-09	2.94E-14	1.00E-01	2.94E-13
Thorium-230	5.79E-05	1.00E-01	5.79E-04	4.17E-13	1.00E-01	4.17E-12	1.90E-19	1.00E-01	1.90E-18
Radium-226	8.24E-04	1.00E-01	8.24E-03	2.47E-10	1.00E-01	2.47E-09	6.67E-14	1.00E-01	6.67E-13
Lead-210	3.39E-03	1.00E-01	3.39E-02	1.22E-09	1.00E-01	1.22E-08	1.63E-12	1.00E-01	1.63E-11
Thorium-232	3.82E-05	1.00E-01	3.82E-04	2.75E-13	1.00E-01	2.75E-12	8.89E-20	1.00E-01	8.89E-19
Radium-228	2.23E-03	1.00E-01	2.23E-02	6.70E-10	1.00E-01	6.70E-09	3.84E-13	1.00E-01	3.84E-12
Thorium-228	8.80E-05	1.00E-01	8.80E-04	6.33E-13	1.00E-01	6.33E-12	3.49E-19	1.00E-01	3.49E-18
Totals:	8.24E-03	1.00E-01	8.24E-02	2.53E-09	1.00E-01	2.53E-08	2.16E-12	1.00E-01	2.16E-11

Notes:

TRV = Toxicity Reference Value
HQ = Hazard Quotient = Dose / TRV

301430

TABLE 7-63

SUMMARY OF HAZARD QUOTIENTS FOR AMERICAN ROBIN, DEER MOUSE AND RED FOX USING 95% UCL SOIL CONCENTRATIONS

COPC	American Robin			Deer Mouse			Red Fox		
	EEtotal	TRV	HQ	EEtotal	TRV	HQ	EEtotal	TRV	HQ
Benzo(b)fluoranthene	2.90E-01	NA	NA	1.43E-01	1.06E+00	1.35E-01	7.05E-02	2.80E-01	2.52E-01
Pyrene	2.57E-01	NA	NA	1.22E-01	1.06E+00	1.15E-01	5.85E-02	2.80E-01	2.09E-01
Endrin	1.75E-02	3.00E-01	5.82E-02	8.80E-03	1.00E-01	8.80E-02	4.36E-03	3.00E-02	1.45E-01
Total PCBs	1.37E+00	1.80E-01	7.63E+00	6.91E-01	1.00E-02	6.91E+01	3.42E-01	1.50E-03	2.28E+02
Aluminum	3.12E+03	1.11E+02	2.80E+01	1.55E+03	2.04E+00	7.62E+02	7.69E+02	5.40E-01	1.42E+03
Antimony	5.13E+02	NA	NA	2.23E+02	1.30E-01	1.72E+03	9.71E+01	3.00E-02	3.24E+03
Arsenic	9.41E+02	5.14E+00	1.83E+02	4.55E+02	1.30E-01	3.50E+03	2.19E+02	4.00E-02	5.49E+03
Barium	1.64E+02	2.09E+01	7.85E+00	7.34E+01	9.00E+00	8.15E+00	3.29E+01	2.32E+00	1.42E+01
Beryllium	2.79E-01	NA	NA	1.39E-01	1.17E+00	1.19E-01	6.83E-02	3.00E-01	2.28E-01
Cadmium	1.36E+01	1.45E+00	9.35E+00	6.16E+00	2.00E-01	3.08E+01	2.76E+00	5.00E-02	5.52E+01
Cobalt	2.73E+02	NA	NA	1.36E+02	5.33E+01	2.56E+00	6.65E+01	1.37E+01	4.86E+00
Copper	2.32E+03	3.32E+01	6.97E+01	1.01E+03	3.11E+01	3.25E+01	4.40E+02	4.51E+00	9.75E+01
Iron	1.99E+04	NA	NA	9.95E+03	3.20E+01	3.11E+02	4.92E+03	8.24E+00	5.97E+02
Lead	6.21E+03	3.85E+00	1.61E+03	3.06E+03	1.42E+01	2.16E+02	1.47E+03	3.66E+00	4.01E+02
Magnesium	5.55E+03	NA	NA	1.88E+03	1.00E+02	1.88E+01	5.60E+02	2.56E+01	2.19E+01
Manganese	2.98E+03	9.77E+02	3.05E+00	1.27E+03	1.56E+02	8.11E+00	5.34E+02	4.03E+01	1.33E+01
Mercury	1.87E+00	6.40E-03	2.93E+02	6.45E-01	1.40E+01	4.61E-02	2.00E-01	3.67E+00	5.45E-02
Nickel	7.42E+02	7.74E+01	9.58E+00	3.64E+02	7.11E+01	5.12E+00	1.77E+02	1.83E+01	9.66E+00
Selenium	1.86E+02	5.00E-01	3.72E+02	9.36E+01	8.00E-02	1.17E+03	4.63E+01	2.00E-02	2.32E+03
Silver	5.78E+01	NA	NA	2.29E+01	2.11E+00	1.09E+01	8.91E+00	5.60E-01	1.59E+01
Thallium	4.81E-01	NA	NA	2.39E-01	1.30E-02	1.84E+01	1.18E-01	3.40E-03	3.48E+01
Vanadium	1.20E+01	1.14E+01	1.06E+00	6.00E+00	3.70E-01	1.62E+01	2.96E+00	1.00E-01	2.96E+01
Zinc	1.67E+03	3.00E+00	5.57E+02	7.11E+02	2.85E+02	2.49E+00	2.97E+02	7.33E+01	4.05E+00

Notes:

NA = Not Available

EE_{total} = Total Estimated Exposure (mg/kg BW-day)

TRV = Toxicity Reference Value = NOAEL (mg/kg BW-day) from available literature (see Tables 7.4-11 and 7.4-12).

HQ = Hazard Quotient (EE_{total} / TRV)

301431

TABLE 7-64

ECOLOGICAL ASSESSMENT SUMMARY

	Aquatic Receptors	Semi-aquatic Receptors	Terrestrial Plants and Invertebrates	Terrestrial Wildlife Receptors	Comments
Chemical Risk	HQs for most COPC in surface water are >1. HQs for acetone, 4,4'-DDD,4,4'- DDE, PCBs, Sb, As, Cd, Cr, Co, Cu, Fe, Pb, Mn, Hg, Ni and Zn in sediment are >1.	HQs for mallard are >1 for 4,4'-DDE, 4,4'-DDD, 4,4'-DDT, Al, As, Ba, Cd, Cr, Cu, Pb, Mn, Hg, Ni, Se, V and Zn. HQs for raccoon are >1 for PCBs, Al, Sb, As, Ba, Be, Cd, Co, Cu, Fe, Pb, Mg, Mn, Ni, Se, Ag, V and Zn.	HQs for plants are >1 for Al, Sb, As, Ba, Be, Cd, Cr, Co, Cu, Pb, Mn, Hg, Ni, Se, Ag, Th, V and Zn. HQs for earthworms are >1 for As, Cd, Cr, Cu, Pb, Hg, Ni, Se and Zn.	HQs for American robin are >1 for PCBs, Al, As, Ba, Cd, Cr, Cu, Pb, Mn, Hg, Ni, Se, V and Zn. HQs for deer mouse are >1 for benzo(b) fluoranthene, PCBs, Al, Sb, As, Ba, Be, Cd, Co, Cu, Fe, Pb, Mg, Mn, Ni, Se, Ag, Th, V and Zn. HQs for red fox are >1 for benzo(b)fluoranthene, pyrene, endrin, PCBs, Al, Sb, As, Ba, Be, Cd, Co, Cu, Fe, Pb, Mg, Mn, Ni, Se, Ag, Th, V and Zn.	Using 95% UCL conc. in soil, HQs for robin are >1 for PCB, Al, As, Ba, Cd, Cu,Pb, Mn, Hg, Ni, Se, V and Zn. Using 95% UCL conc. in soil, HQs for mouse are >1 for PCBs, Al, Sb, As, Cd, Co, Cu, Fe, Pb, Mg, Mn, Ni, Se, Ag, Th, V and Zn. Using 95% UCL conc. in soil, HQs for fox are >1 for PCBs, Al, Sb, As, Ba, Cd, Co, Cu, Fe, Pb, Mg, Mn, Ni, Se, Ag, Th, V and Zn.
Radiological Risk	HQs for aquatic plant, aquatic invertebrate and fish are less than one for all radionuclides.	HQs for plant, meadow vole and raccoon are less than one for all radionuclides.	HQs for plant are less than one for all radionuclides.	HQs for deer mouse and red fox are less than one for all radionuclides.	No potential risk from radionuclides in surface water, sediment or surface soil.

Notes:

Al = aluminum
Sb = antimony
As = arsenic
Ba = barium
Be = beryllium
Cd = cadmium
Cr = chromium
Co = cobalt
Cu = copper
Fe = iron
Pb = lead
Mg = magnesium
Mn = manganese
Hg = mercury
Ni = nickel
Se = selenium
Ag = silver
Th = thallium
V = vanadium
Zn = zinc
PCBs = polychlorinated biphenyls
HQ = hazard quotient

TABLE 7-65

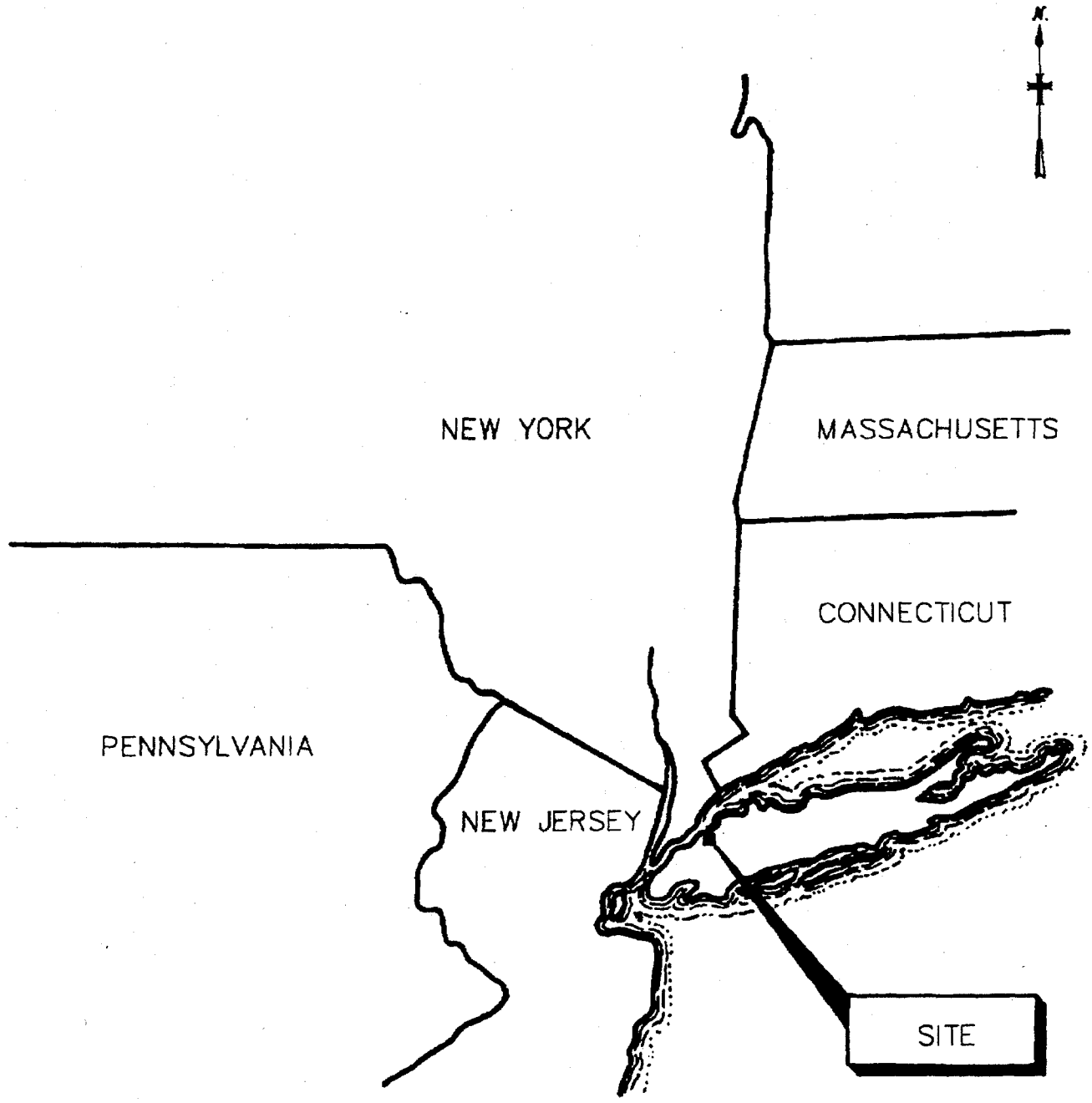
COPC WITH HQ > 1

COPC	Surface Water	Sediment	Mallard	Raccoon	Terrestrial Plant	Terrestrial Invertebrate	American Robin	Deer Mouse	Red Fox
Acetone		X							
Bis(2-ethylhexyl)phthalate	X								
Benzo(b)fluoranthene								X	X
Pyrene									X
4,4'-DDE	X	X	X						
4,4'-DDD	X	X	X						
4,4'-DDT	X		X						
Endrin									X
PCB	X	X		X			X*	X*	X*
Aluminum	X		X	X	X		X*	X*	X*
Antimony	X	X		X	X			X*	X*
Arsenic	X	X	X	X	X	X	X*	X*	X*
Barium			X	X	X		X*	X	X*
Beryllium				X	X			X	X
Cadmium	X	X	X	X	X	X	X*	X*	X*
Chromium		X	X		X	X	X		
Cobalt	X	X		X	X			X*	X*
Copper	X	X	X	X	X	X	X*	X*	X*
Iron	X	X		X				X*	X*
Lead	X	X	X	X	X	X	X*	X*	X*
Magnesium				X				X*	X*
Manganese	X	X	X	X	X		X*	X*	X*
Mercury	X	X	X		X	X	X*		
Nickel	X	X	X	X	X	X	X*	X*	X*
Selenium	X		X	X	X	X	X*	X*	X*
Silver	X			X	X			X*	X*
Thallium					X			X*	X*
Vanadium	X		X	X	X		X*	X*	X*
Zinc	X	X	X	X	X	X	X*	X*	X*

Notes:

*HQ > 1 using both maximum and 95% UCL soil concentrations.

FIGURES



TITLE:	DATE:	FIGURE NO.:
REGIONAL LOCATION MAP	MAY 1998	FIGURE 1-1

MALCOLM PIRNIE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

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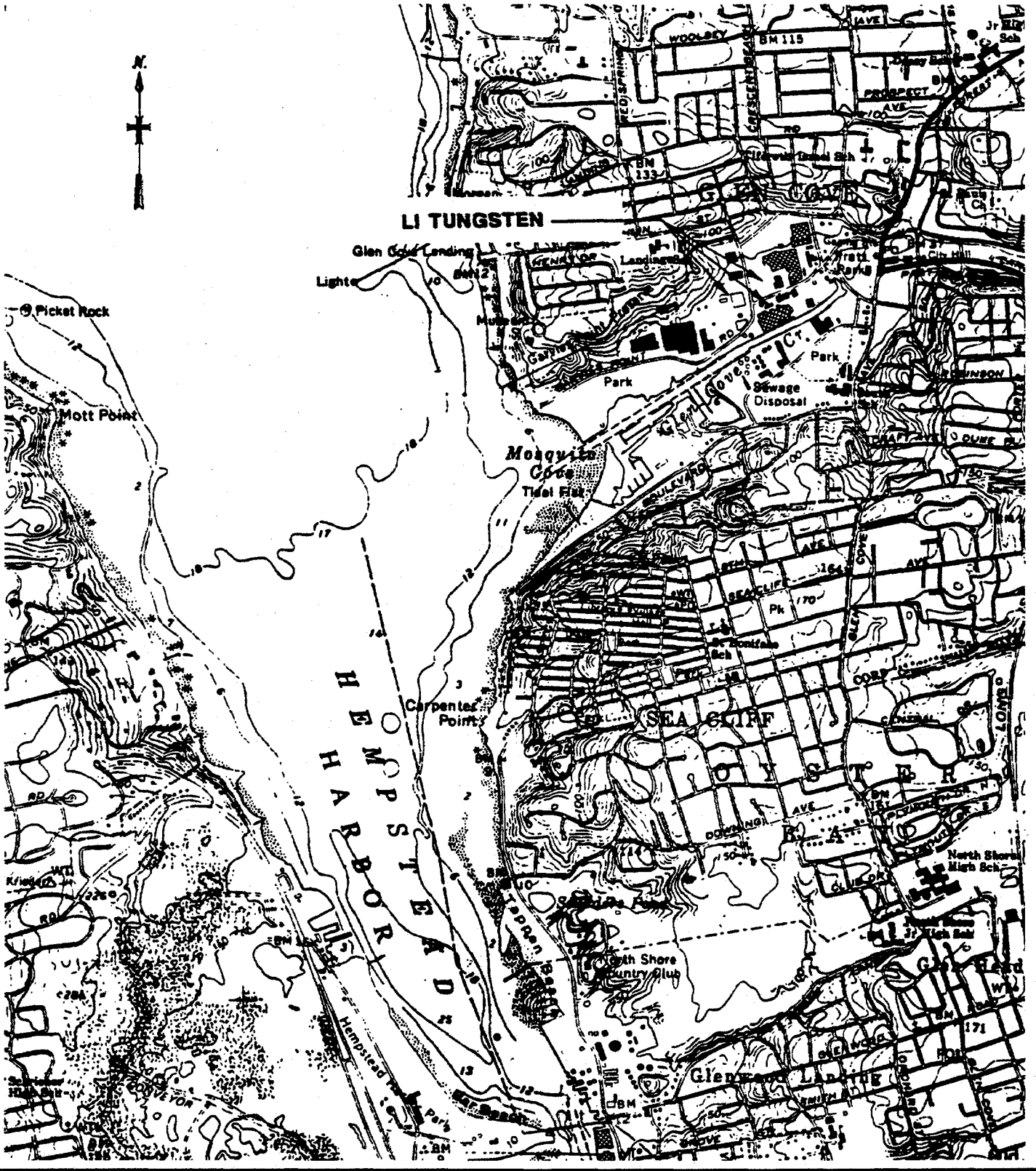
301435



TITLE:	DATE:	FIGURE NO.:
SITE LOCATION MAP	MAY 1998	FIGURE 1-2

MALCOLM PIRNIE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

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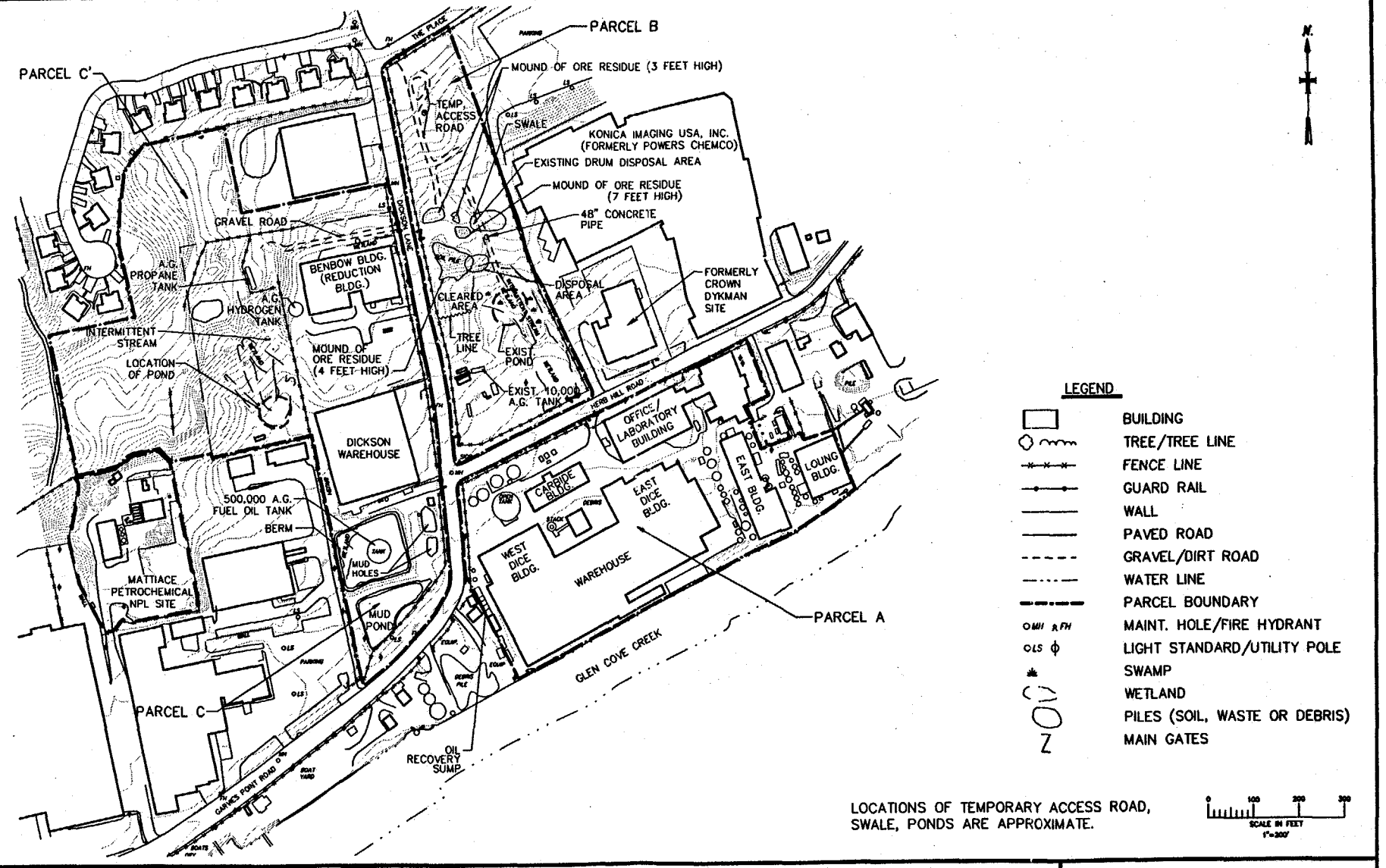
7308 ADMIN

301436



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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

DATE: MAY 1998

SITE PLAN

PROJECT NO.: 8001202

FIGURE 1-3

301437

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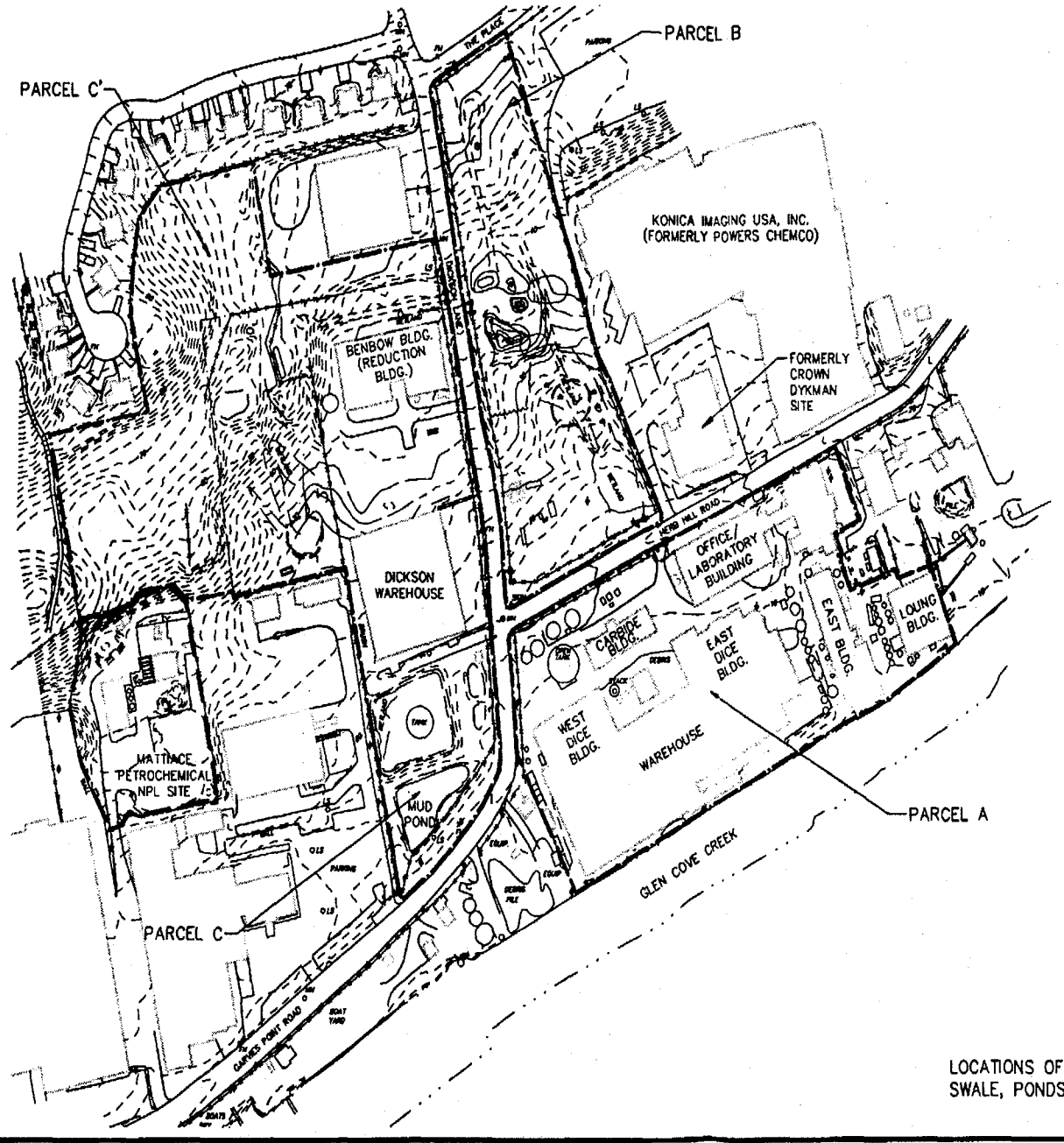
7308 AD



LEGEND

- BUILDING
- GROUND SURFACE CONTOUR
- TREE/TREE LINE
- FENCE LINE
- GUARD RAIL
- WALL
- PAVED ROAD
- GRAVEL/DIRT ROAD
- WATER LINE
- PARCEL BOUNDARY
- MAINT. HOLE/FIRE HYDRANT
- LIGHT STANDARD/UTILITY POLE
- SWAMP
- WETLAND
- PILES (SOIL, WASTE OR DEBRIS)
- MAIN GATES

LOCATIONS OF TEMPORARY ACCESS ROAD, SWALE, PONDS ARE APPROXIMATE.

0 100 200 300
SCALE IN FEET
1"=300'

MALCOLM PIRNIE

LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

TOPOGRAPHIC BASEMAP

DATE: MAY 1998

PROJECT NO.: 8001202

FIGURE 2-1

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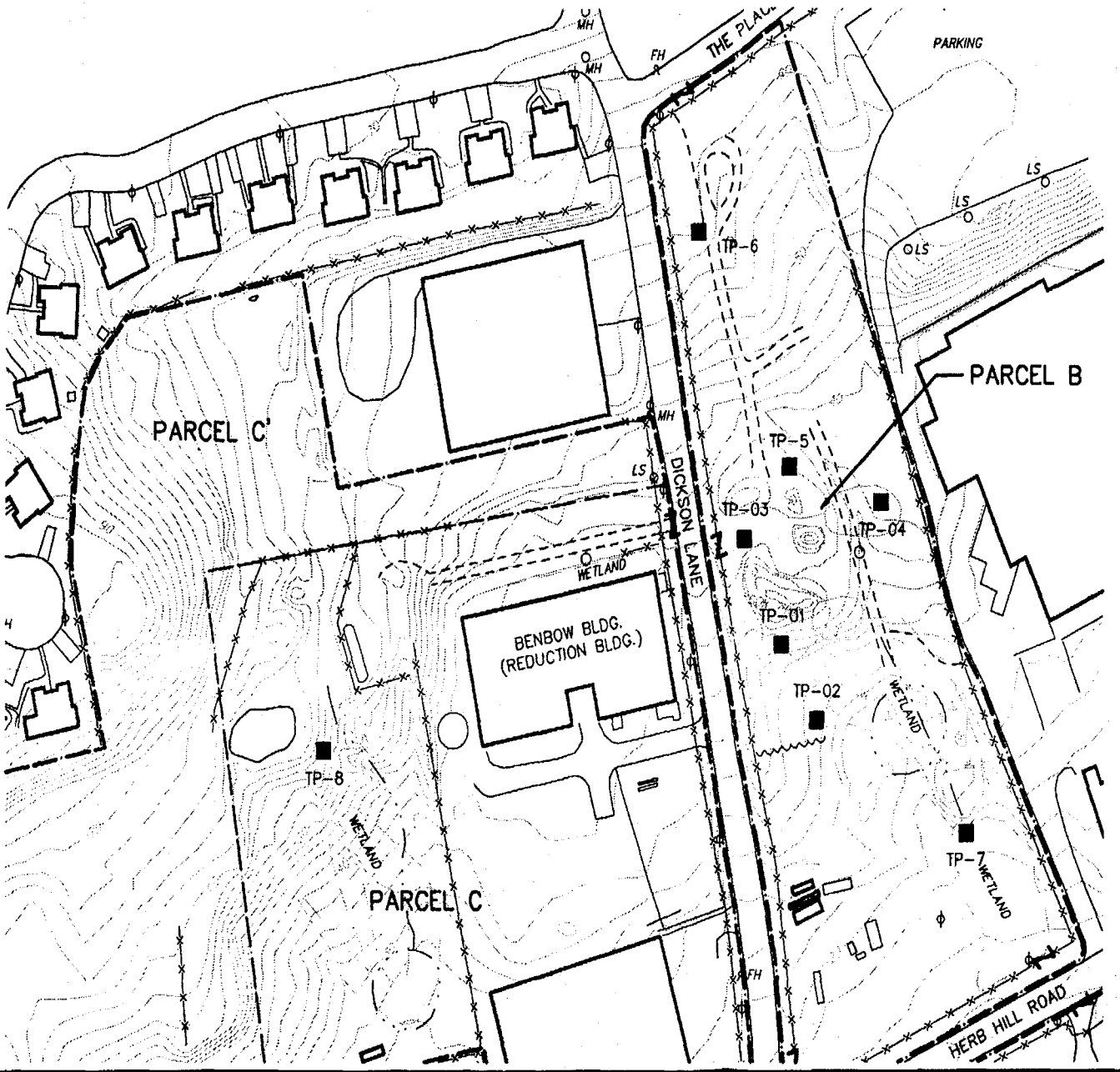

N.

LEGEND

- BUILDING
- TREE/TREE LINE
- FENCE LINE
- GUARD RAIL
- WALL
- PAVED ROAD
- GRAVEL/DIRT ROAD
- WATER LINE
- PARCEL BOUNDARY
- MH & FH — MAINT. HOLE/FIRE HYDRANT
- OLS — LIGHT STANDARD/UTILITY POLE
- SWAMP
- WETLAND
- PILES (SOIL, WASTE OR DEBRIS)
- MAIN GATES
- TP — TEST PIT LOCATION

LOCATIONS OF TEMPORARY ACCESS ROAD, SWALE, PONDS ARE APPROXIMATE.

0 50 100 150
SCALE IN FEET
1"=100'

MALCOLM PIRNIE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

DATE: MAY 1998

TEST PIT LOCATION MAP

PROJECT NO.: 8001202

FIGURE 2-2

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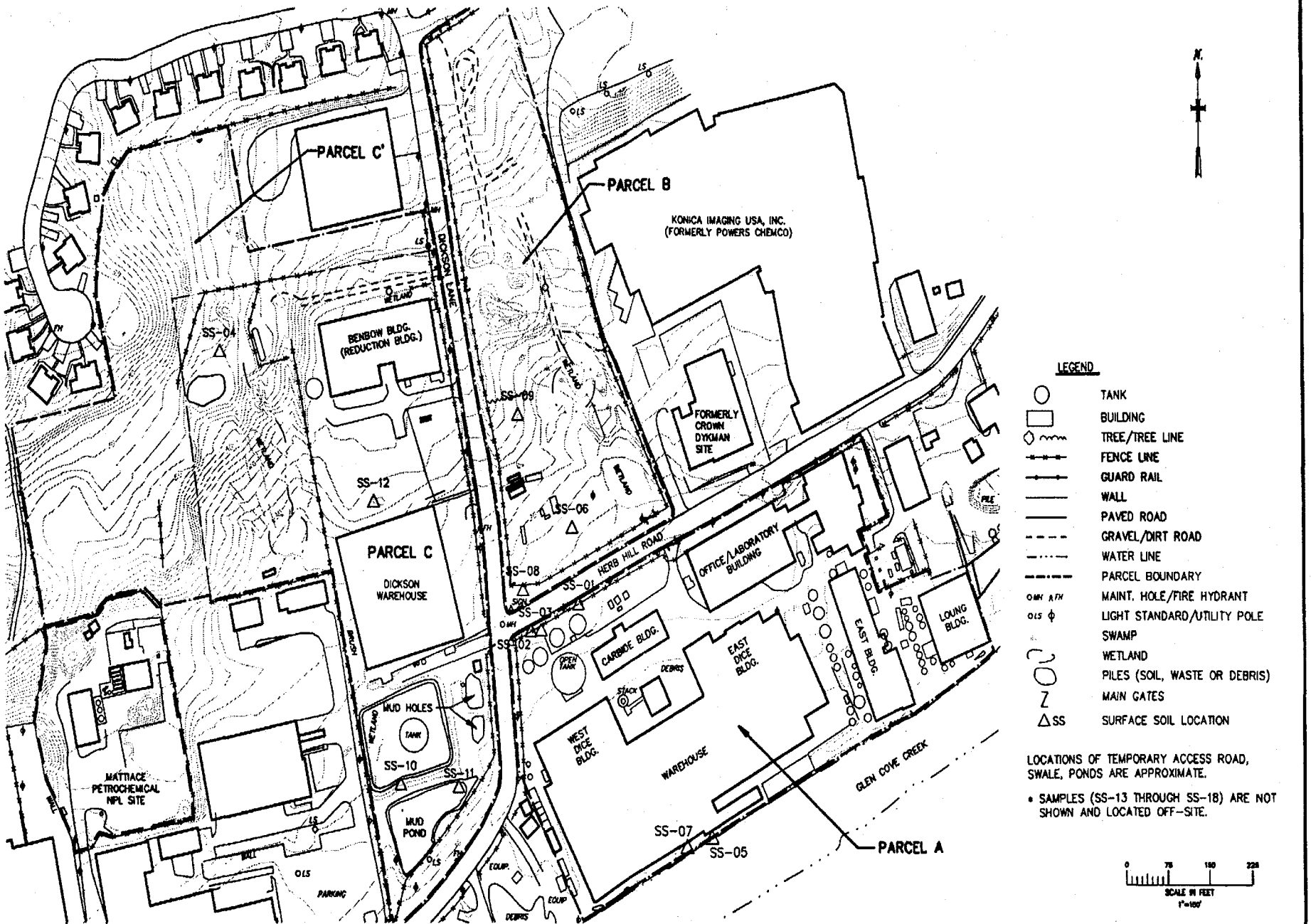

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GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

DATE: MAY 1998

SURFACE SOIL SAMPLE LOCATION MAP

PROJECT NO.: 8001202

FIGURE 2-3

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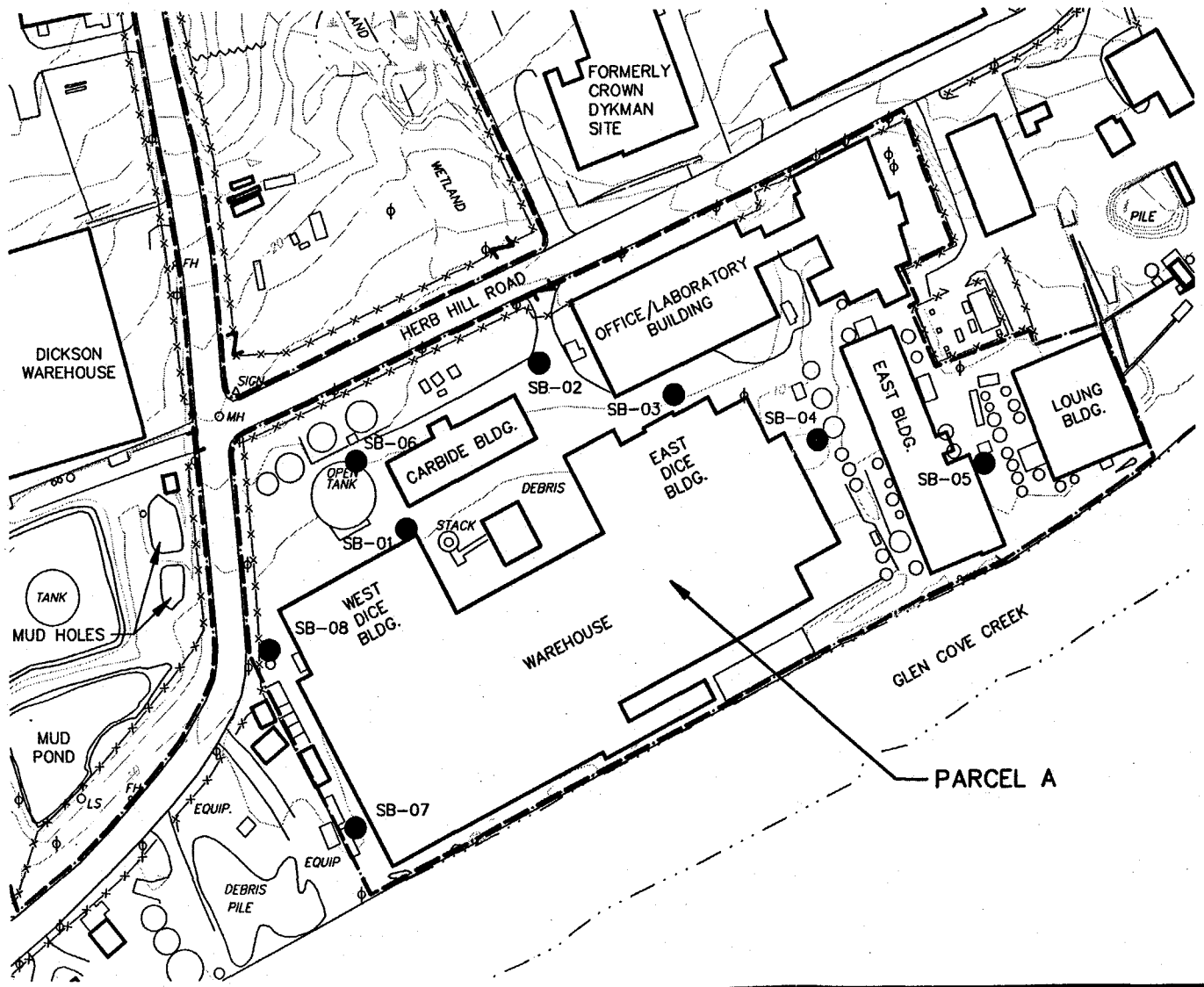
7308 ADMI



N.

LEGEND

- BUILDING
- TREE/TREE LINE
- FENCE LINE
- GUARD RAIL
- WALL
- PAVED ROAD
- GRAVEL/DIRT ROAD
- WATER LINE
- PARCEL BOUNDARY
- MAINT. HOLE/FIRE HYDRANT
- LIGHT STANDARD/UTILITY POLE
- SWAMP
- WETLAND
- PILES (SOIL, WASTE OR DEBRIS)
- MAIN GATES
- SB — SOURCE AREA SOIL BORING

LOCATIONS OF TEMPORARY ACCESS ROAD, SWALE, PONDS ARE APPROXIMATE.

0 50 100 150
SCALE IN FEET
1"=100'

MALCOLM PIRNIE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

DATE: MAY 1998

SOURCE AREA SOIL BORING LOCATION MAP - PARCEL A

PROJECT NO.: 8001202

FIGURE 2-4

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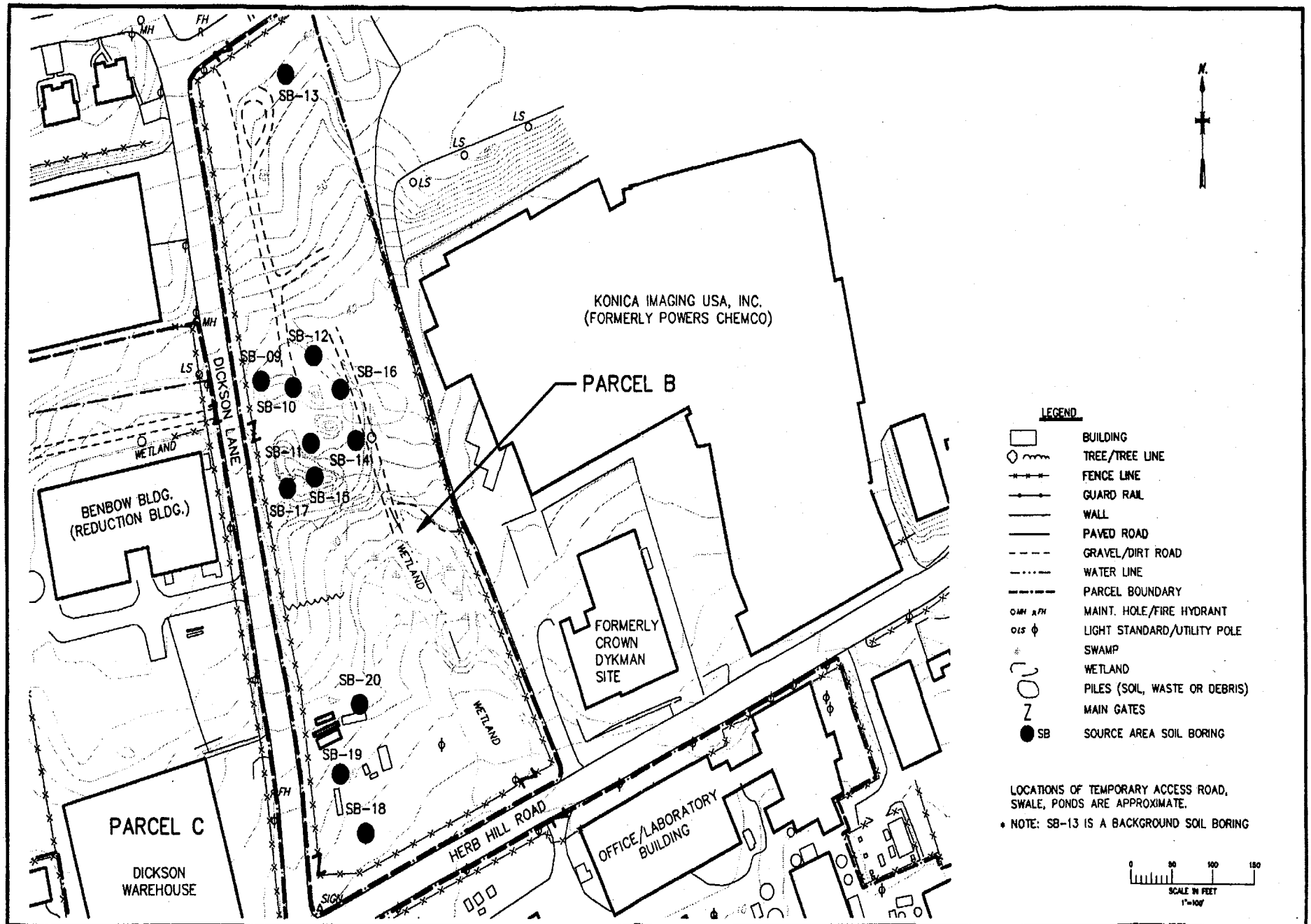

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GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

SOURCE AREA SOIL BORING
LOCATION MAP - PARCEL B

DATE: MAY 1998 | PROJECT NO.: 8001202 | FIGURE 2-5

I:\ACAD\PROJ\80012020\GISFILES\REPORT\8001LT05 Scal :1 Date: 05/05/1998 Time: 14:43

7308 ADMI

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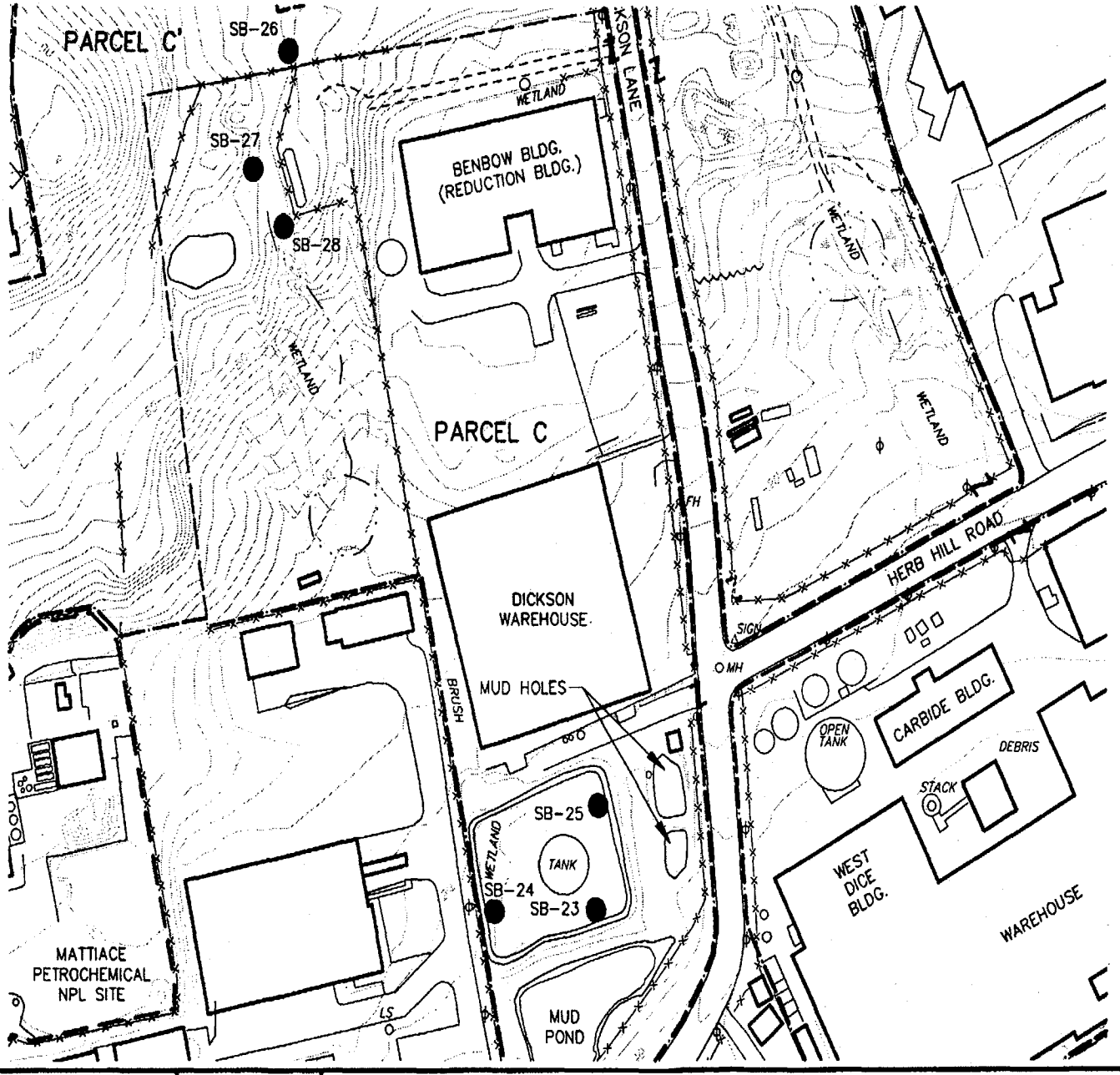

N.

LEGEND

- BUILDING
- TREE/TREE LINE
- FENCE LINE
- GUARD RAIL
- WALL
- PAVED ROAD
- GRAVEL/DIRT ROAD
- WATER LINE
- PARCEL BOUNDARY
- MH FH — MAINT. HOLE/FIRE HYDRANT
- LS — LIGHT STANDARD/UTILITY POLE
- SWAMP
- WETLAND
- PILES (SOIL, WASTE OR DEBRIS)
- MAIN GATES
- SB — SOURCE AREA SOIL BORING

LOCATIONS OF TEMPORARY ACCESS ROAD, SWALE, PONDS ARE APPROXIMATE.

0 50 100 150
SCALE IN FEET
1"=100'

MALCOLM PIRNIE

LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

DATE: MAY 1998

SOURCE AREA SOIL BORING
LOCATION MAP - PARCEL C

PROJECT NO.: 8001202

FIGURE 2-6

301443

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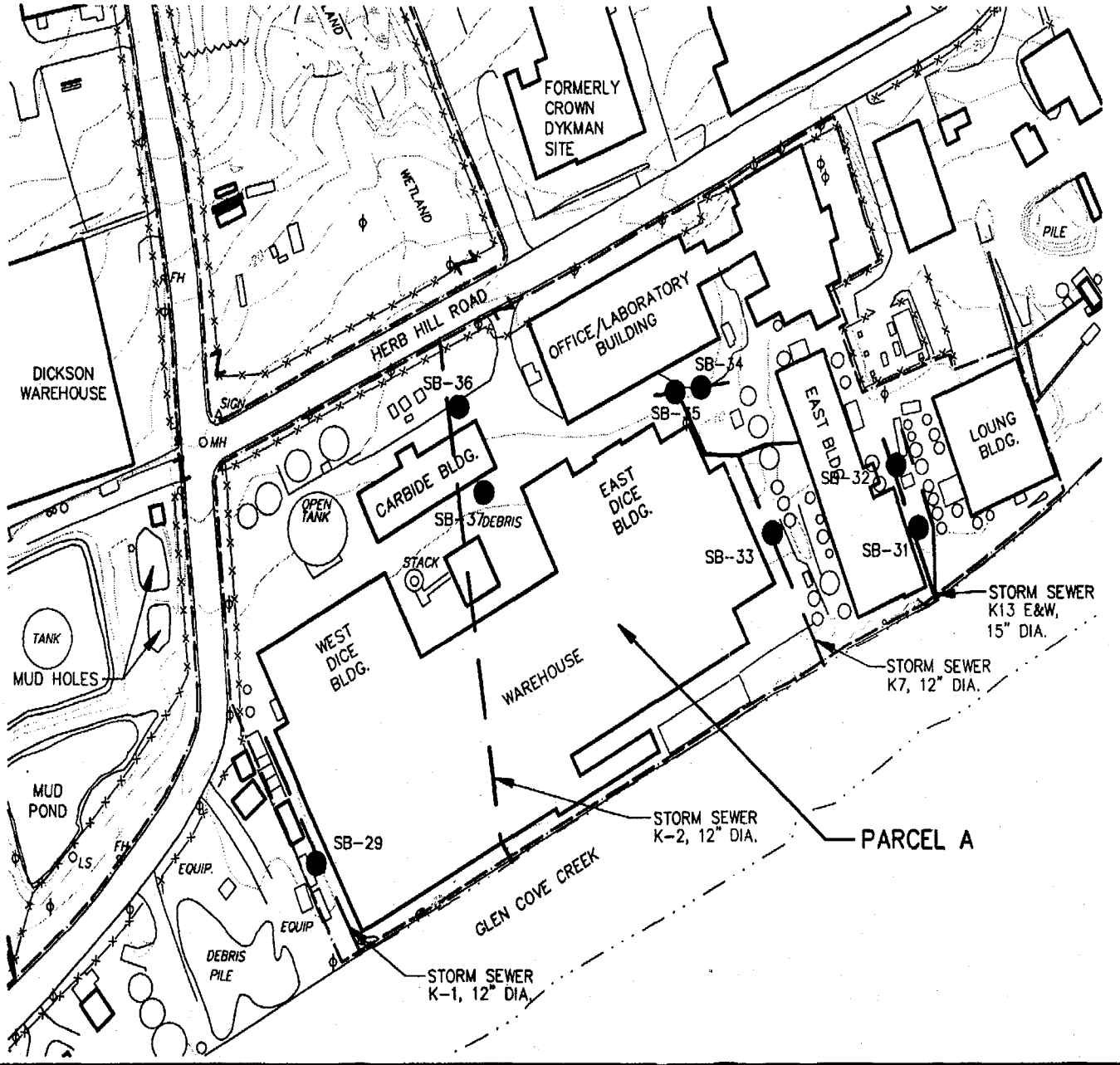

LEGEND

- BUILDING
- TREE/TREE LINE
- FENCE LINE
- GUARD RAIL
- WALL
- PAVED ROAD
- GRAVEL/DIRT ROAD
- WATER LINE
- PARCEL BOUNDARY
- STORM SEWER LINE
- MAINT. HOLE/FIRE HYDRANT
- LIGHT STANDARD/UTILITY POLE
- SWAMP
- WETLAND
- PILES (SOIL, WASTE OR DEBRIS)
- MAIN GATES
- SB — STORM SEWER SOIL BORING

LOCATIONS OF TEMPORARY ACCESS ROAD, SWALE, PONDS ARE APPROXIMATE.

SOURCE: WILLIAM F. COSULICH ASSOC., ENVIRONMENTAL ENGINEERS, LI TUNGSTEN DISCHARGES TO GLEN COVE CREEK, 2/7/75, SHEET 1 OF 1, JOB NO. 283

0 50 100 150
SCALE IN FEET
1"=100'

MALCOLM PIRNIE

LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

DATE: MAY 1998

STORM SEWER SOIL BORING LOCATION MAP - PARCEL A

PROJECT NO.: 8001202

FIGURE 2-7

301444

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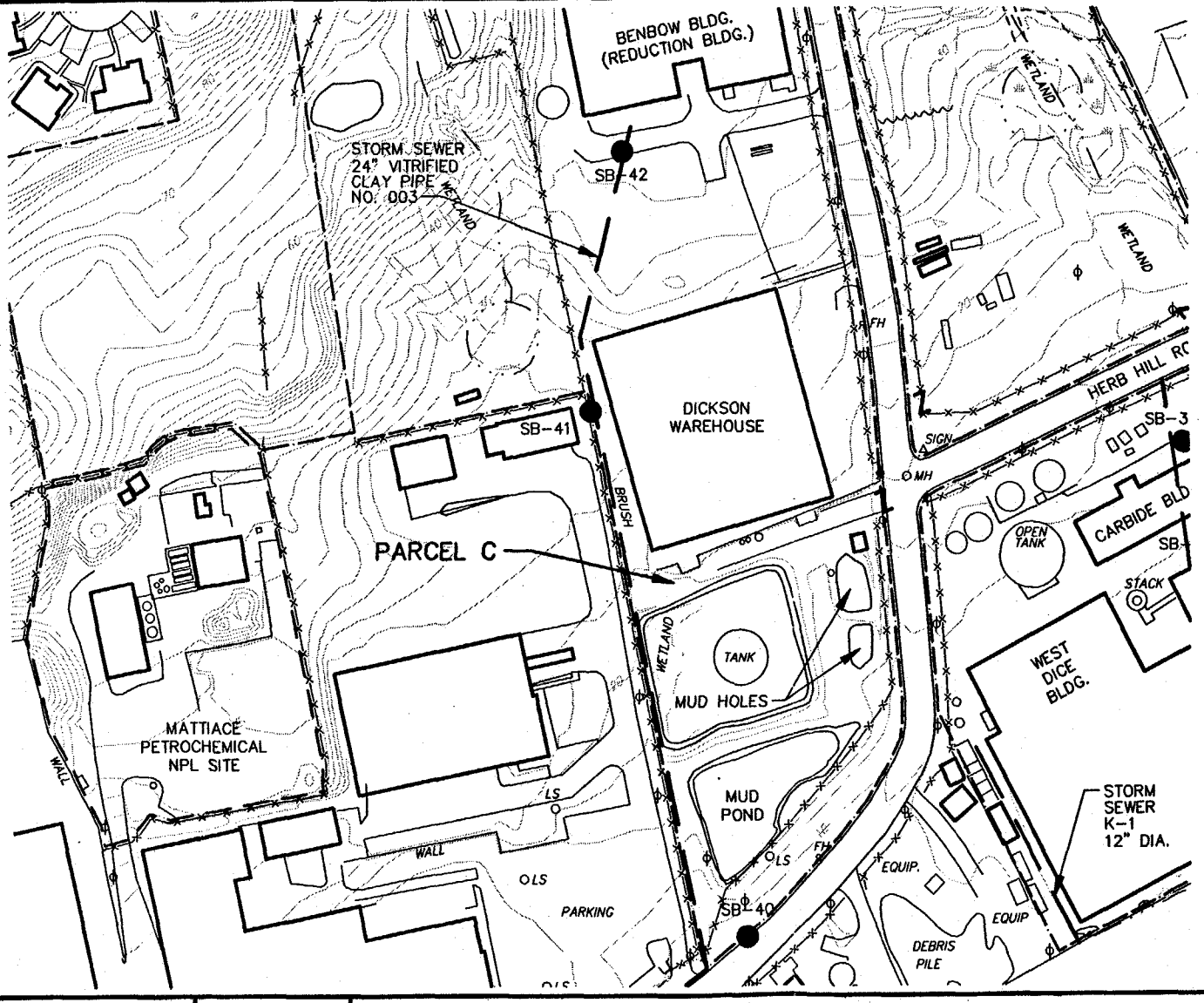
7308 ADMI



N.

LEGEND

- BUILDING
- TREE/TREE LINE
- FENCE LINE
- GUARD RAIL
- WALL
- PAVED ROAD
- GRAVEL/DIRT ROAD
- WATER LINE
- PARCEL BOUNDARY
- STORM SEWER LINE
- MAINT. HOLE/FIRE HYDRANT
- LIGHT STANDARD/UTILITY POLE
- SWAMP
- WETLAND
- PILES (SOIL, WASTE OR DEBRIS)
- MAIN GATES
- SB — STORM SEWER SOIL BORING

LOCATIONS OF TEMPORARY ACCESS ROAD, SWALE, PONDS ARE APPROXIMATE.

SOURCE: WILLIAM F. COSULICH ASSOC., ENVIRONMENTAL ENGINEERS, LI TUNGSTEN DISCHARGES TO GLEN COVE CREEK, 2/7/75, SHEET 1 OF 1, JOB NO. 283

0 50 100 150
SCALE IN FEET
1"=100'

MALCOLM PIRNIE

UNITED STATES ENVIRONMENTAL PROTECTION

LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

DATE: MAY 1998

STORM SEWER SOIL BORING
LOCATION MAP – PARCEL C

PROJECT NO.: 8001202

FIGURE 2-8

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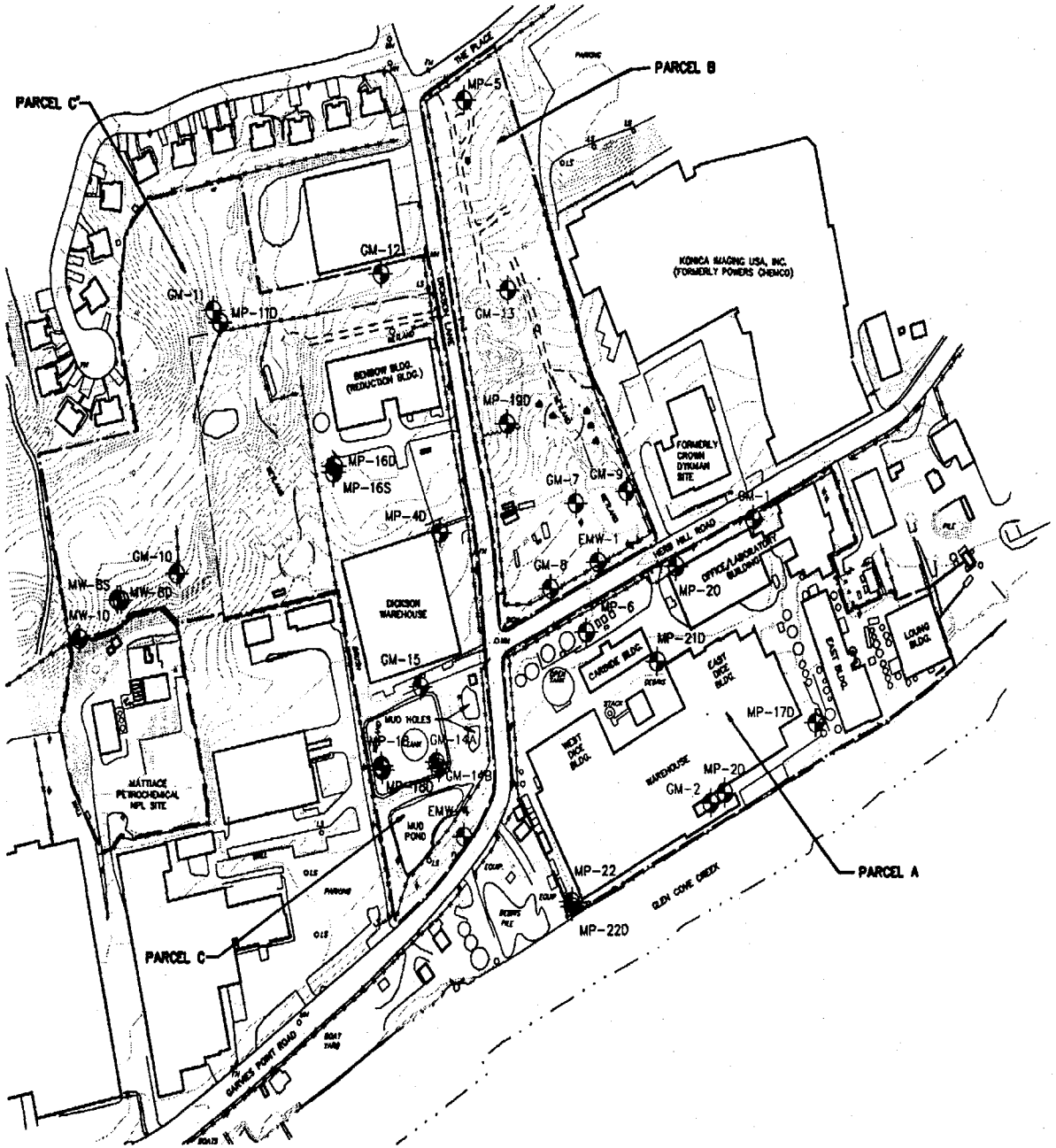

LEGEND

- BUILDING
- TREE/TREE LINE
- FENCE LINE
- GUARD RAIL
- WALL
- PAVED ROAD
- GRAVEL/DIRT ROAD
- WATER LINE
- PARCEL BOUNDARY
- MAINT. HOLE/FIRE HYDRANT
- LIGHT STANDARD/UTILITY POLE
- SWAMP
- WETLAND
- PILES (SOIL, WASTE OR DEBRIS)
- MAIN GATES
- MP — NEW MONITORING WELLS
- GM, EMW, MW — EXISTING MONITORING WELLS
- CLUSTERED WELLS

LOCATIONS OF TEMPORARY ACCESS ROAD, SWALE, PONDS ARE APPROXIMATE.

0 100 200 300
SCALE IN FEET
1"=200'

MALCOLM PIRNIE

LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

MONITORING WELL LOCATION MAP

DATE:	PROJECT NO.:	
MAY 1998	8001202	FIGURE 2-9

301446

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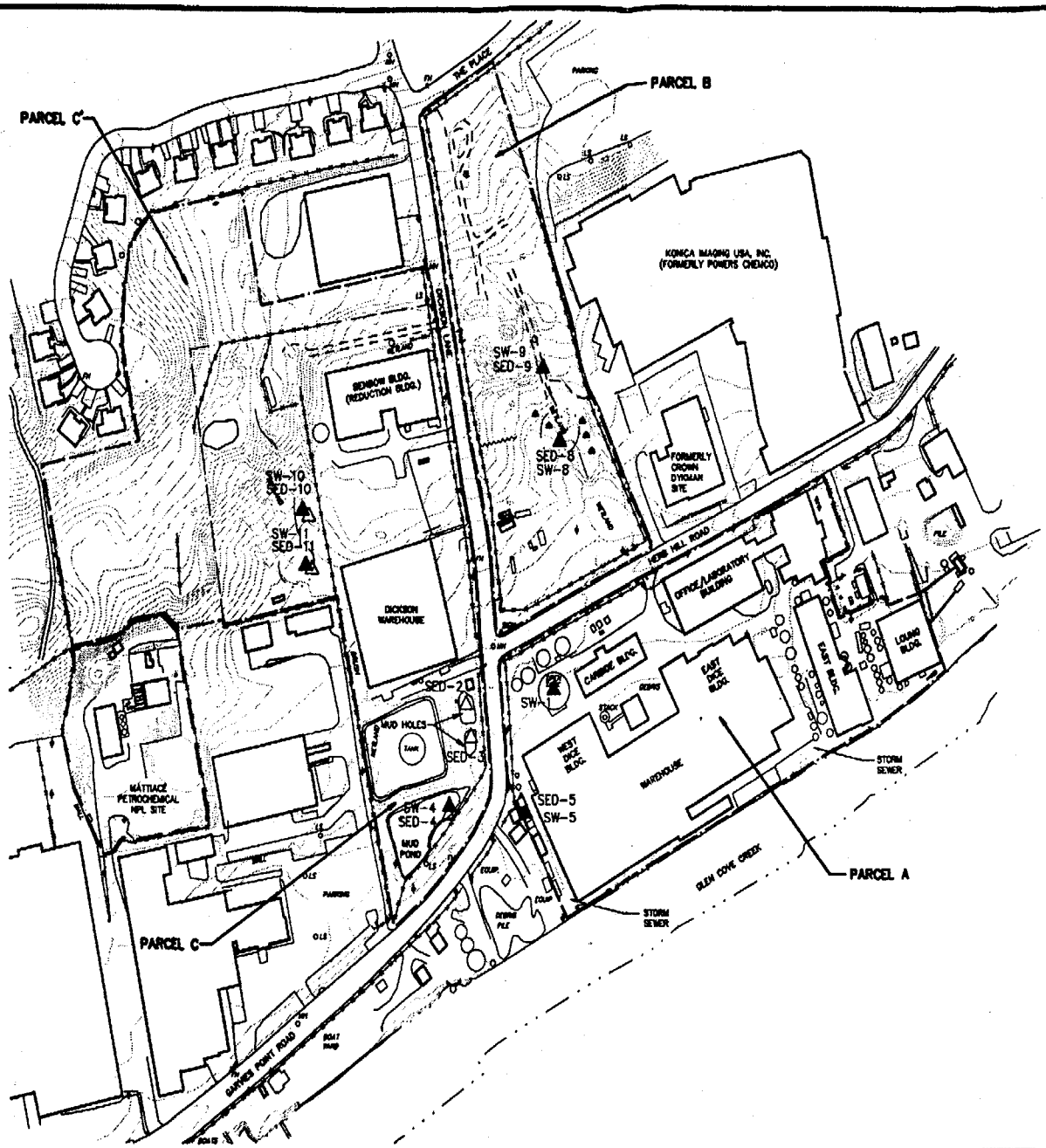

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LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

SURFACE WATER AND SEDIMENT LOCATION MAP

DATE: MAY 1998 | PROJECT NO.: 8001202 | FIGURE 2-10

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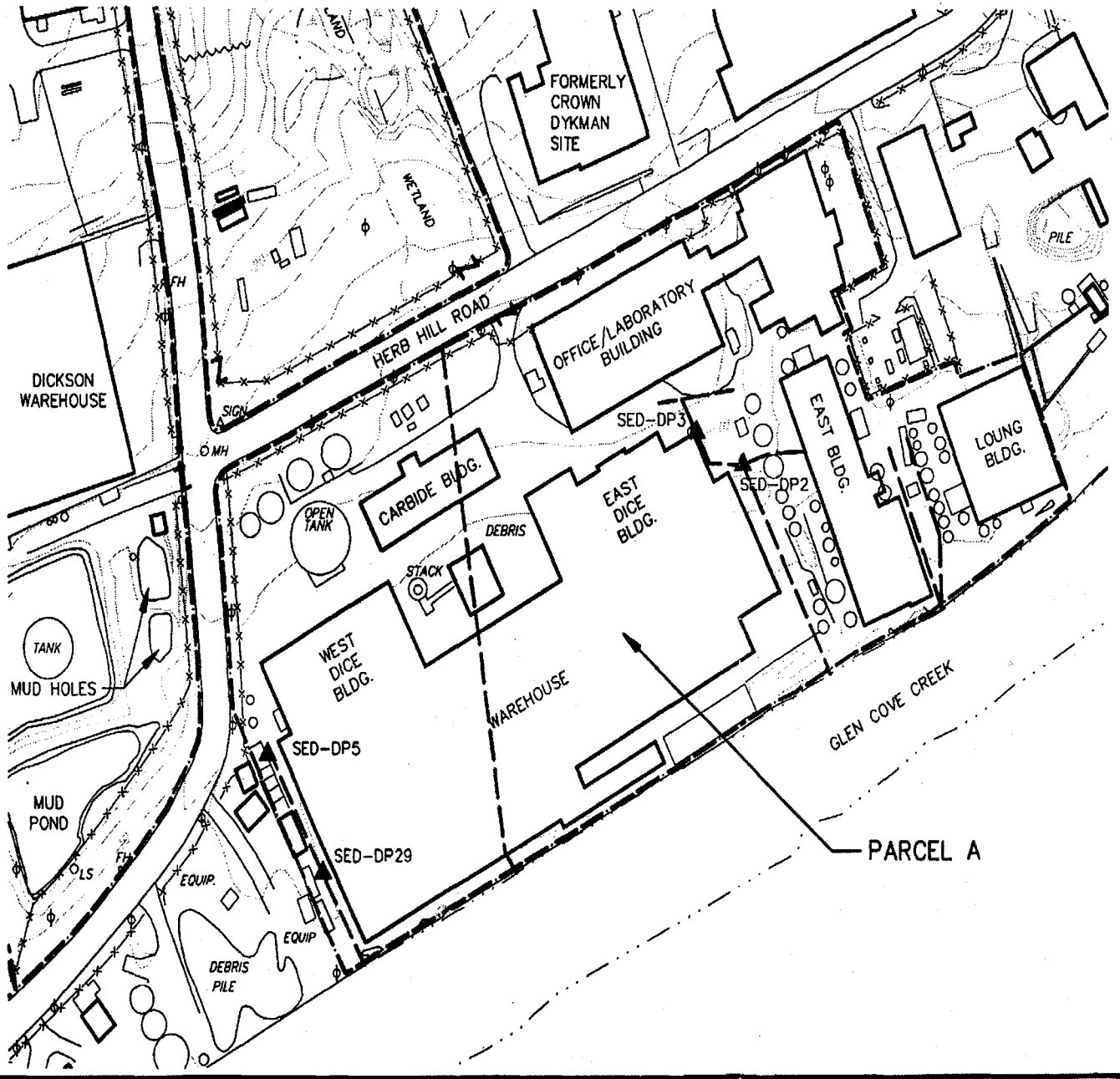

N.

LEGEND

- BUILDING
- TREE/TREE LINE
- FENCE LINE
- GUARD RAIL
- WALL
- PAVED ROAD
- GRAVEL/DIRT ROAD
- WATER LINE
- PARCEL BOUNDARY
- STORM SEWER LINE
- MAINT. HOLE/FIRE HYDRANT
- LIGHT STANDARD/UTILITY POLE
- SWAMP
- WETLAND
- PILES (SOIL, WASTE OR DEBRIS)
- MAIN GATES
- STORM SEWER SEDIMENT SAMPLE (SEDDDP-2)

LOCATIONS OF TEMPORARY ACCESS ROAD, SWALE, PONDS ARE APPROXIMATE.

0 50 100 150
SCALE IN FEET
1"=100'

MALCOLM PIRNIE

LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

DATE: MAY 1998

STORM SEWER SEDIMENT SAMPLE LOCATION MAP

PROJECT NO.: 8001202

FIGURE 2-11

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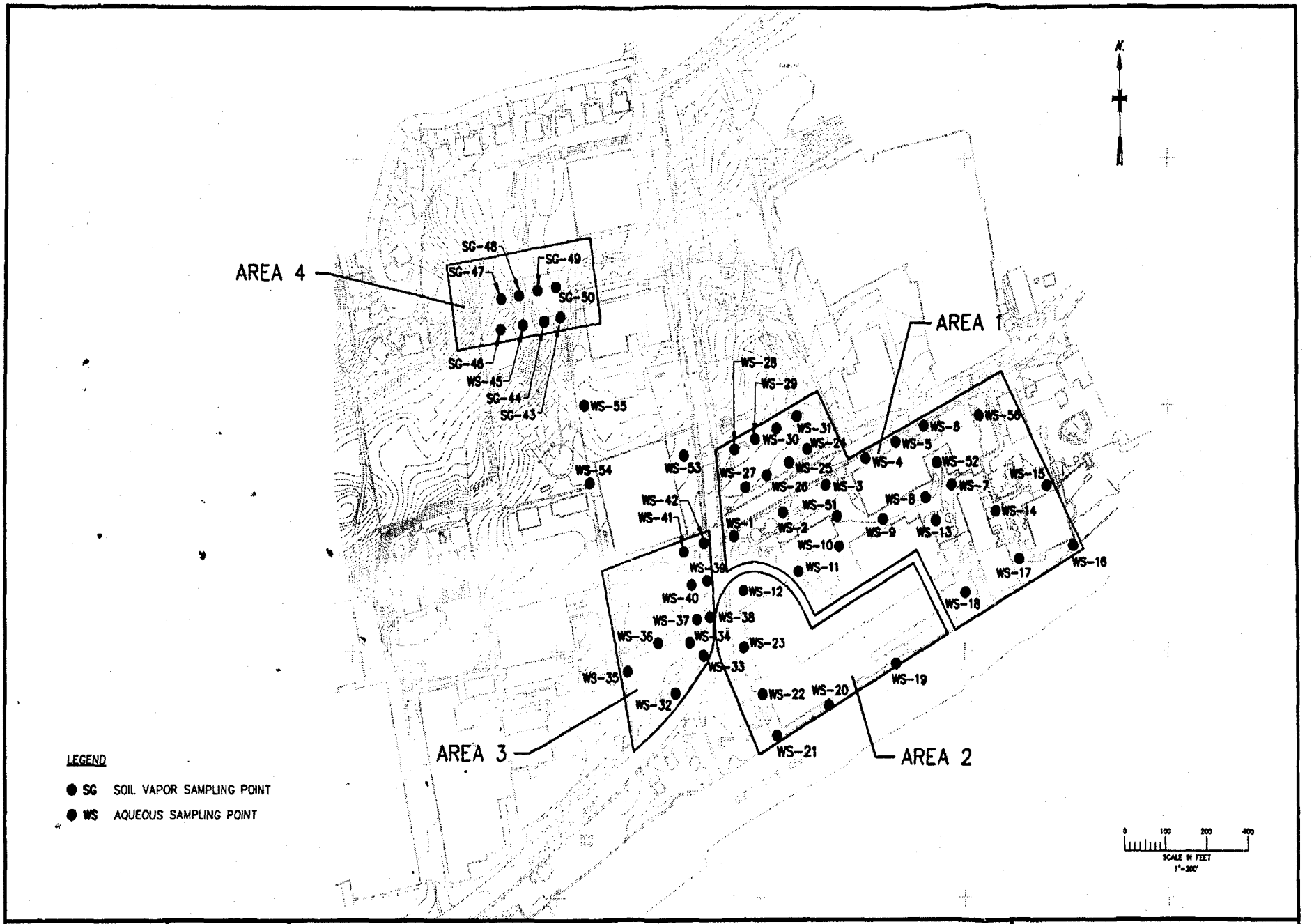

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GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

GEOPROBE/SOIL GAS
SAMPLE LOCATION MAP

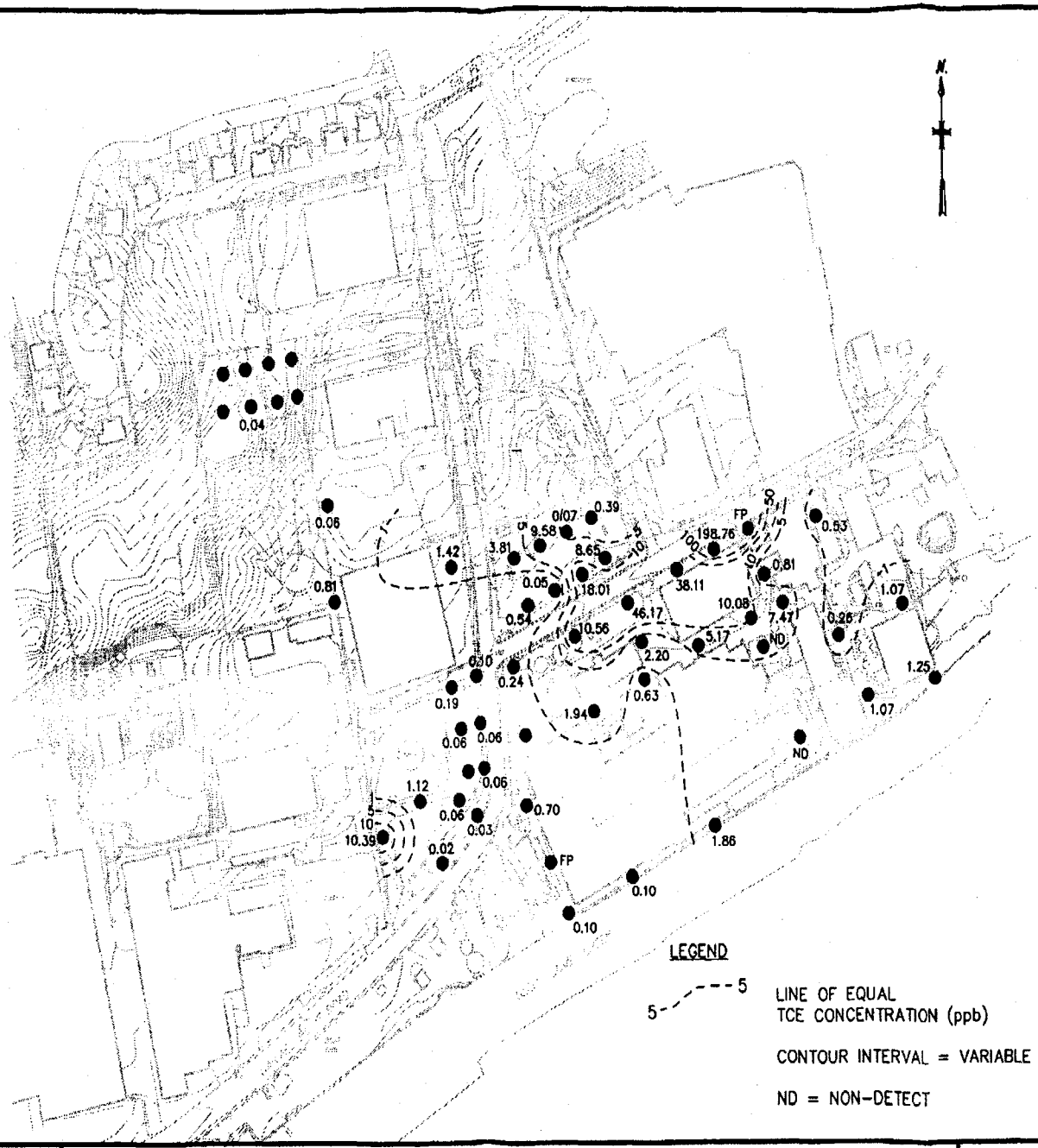
DATE: MAY 1998

PROJECT NO.: 8001202

FIGURE 2-12

301449

PARCEL C	
SAMPLE ID	TCE
WS-32	0.02 ug/L
WS-33	0.03 ug/L
WS-34	0.06 ug/L
WS-35	10.39 ug/L
WS-36	1.12 ug/L
WS-38	0.06 ug/L
WS-39	0.06 ug/L
WS-40	0.06 ug/L
WS-41	0.19 ug/L
WS-42	0.10 ug/L
SG-44	0.08 ug/Kg
WS-45	0.04 ug/L
SG-46	0.03 ug/Kg
SG-48	0.02 ug/Kg
WS-53	1.42 ug/L
WS-54	0.81 ug/L
WS-55	0.06 ug/L



PARCEL B	
SAMPLE ID	TCE ug/L
WS-24	8.65
WS-25	18.01
WS-26	0.05
WS-27	0.54
WS-28	3.81
WS-29	9.58
WS-30	0.07
WS-31	0.39

PARCEL A	
SAMPLE ID	TCE ug/L
WS- 1	0.24
WS- 2	10.56
WS- 3	46.17
WS- 4	38.11
WS- 5	198.76
WS- 6	FREE PRODUCT
WS- 7	7.47
WS- 8	10.08
WS- 9	5.17
WS-10	0.63
WS-11	1.94
WS-12	0.10
WS-13	ND
WS-14	0.26
WS-15	1.07
WS-16	1.25
WS-17	1.07
WS-18	ND
WS-19	1.86
WS-20	0.10
WS-21	0.10
WS-22	FREE PRODUCT
WS-23	0.70
WS-51	2.20
WS-52	0.81
WS-56	0.53

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GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

DATE: MAY 1998

GEOPROBE/SOIL GAS SURVEY-
TCE CONCENTRATION (ppb)

PROJECT NO.: 8001202

FIGURE 2-13

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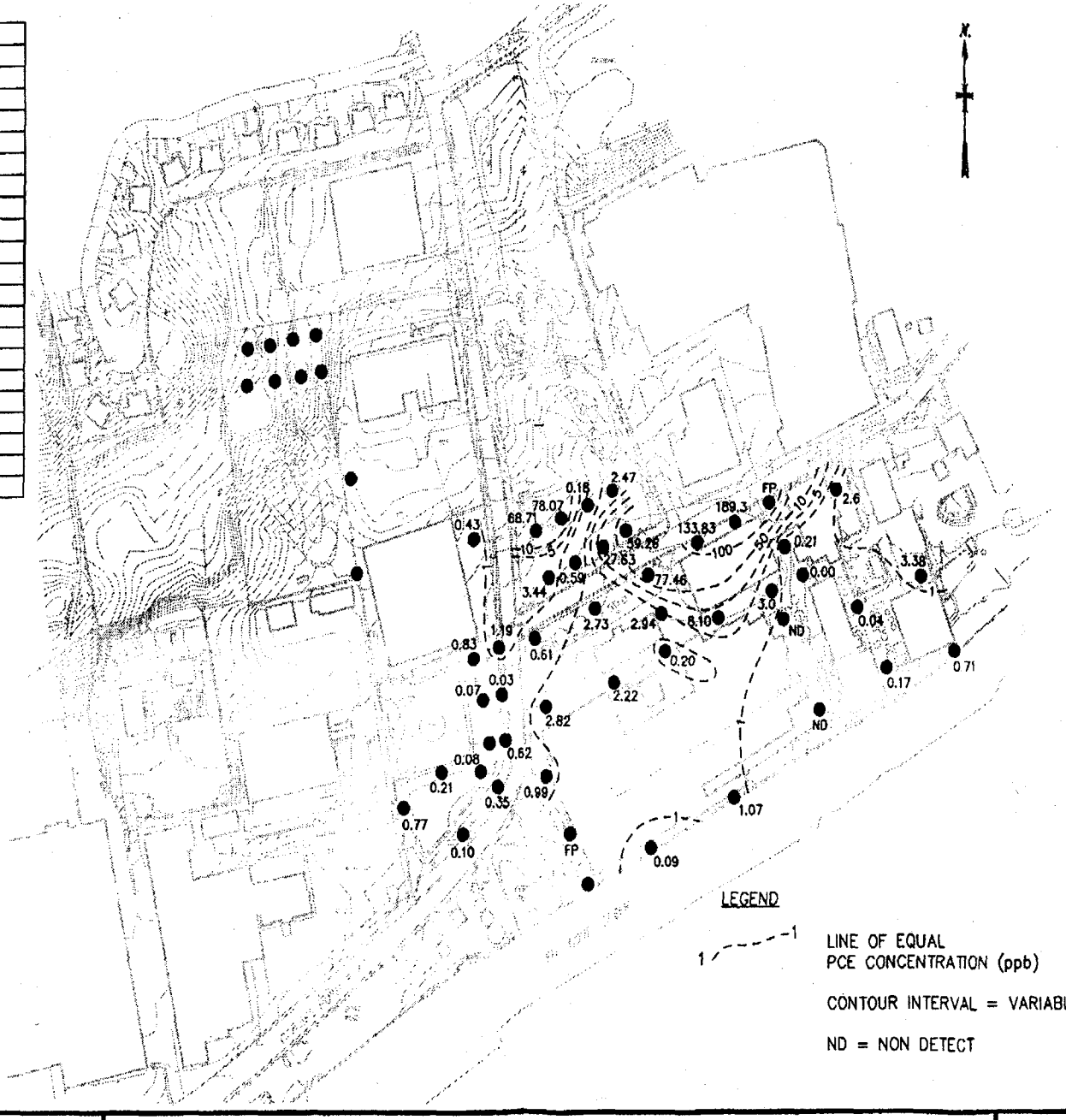
PARCEL C	
SAMPLE ID	PCE
WS-32	0.10 ug/L
WS-33	0.35 ug/L
WS-34	0.08 ug/L
WS-35	0.77 ug/L
WS-36	0.21 ug/L
WS-38	0.62 ug/L
WS-39	0.03 ug/L
WS-40	0.07 ug/L
WS-41	0.83 ug/L
WS-42	1.19 ug/L
SG-43	0.05 ug/Kg
SG-44	0.33 ug/Kg
WS-45	0.05 ug/L
SG-46	0.17 ug/Kg
SG-48	0.13 ug/Kg
SG-49	0.06 ug/Kg
SG-50	0.04 ug/Kg
WS-53	0.43 ug/L
WS-54	4.93 ug/L
WS-55	0.19 ug/L



PARCEL B	
SAMPLE ID	PCE ug/L
WS-24	59.26
WS-25	27.63
WS-26	0.59
WS-27	3.44
WS-28	68.71
WS-29	78.07
WS-30	0.18
WS-31	2.47

PARCEL A	
SAMPLE ID	PCE ug/L
WS- 1	0.61
WS- 2	2.73
WS- 3	77.46
WS- 4	133.83
WS- 5	189.30
WS- 6	FREE PRODUCT
WS- 7	2.28
WS- 8	3.00
WS- 9	8.10
WS-10	0.20
WS-11	2.22
WS-12	2.82
WS-13	ND
WS-14	0.04
WS-15	3.38
WS-16	0.71
WS-17	0.17
WS-18	ND
WS-19	1.07
WS-20	0.09
WS-22	FREE PRODUCT
WS-23	0.99
WS-51	2.94
WS-52	0.21
WS-56	2.60

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LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

DATE: MAY 1998

GEOPROBE/SOIL GAS SURVEY-
PCE CONCENTRATION CONTOURS (ppb)

PROJECT NO.: 8001202

FIGURE 2-14

301451

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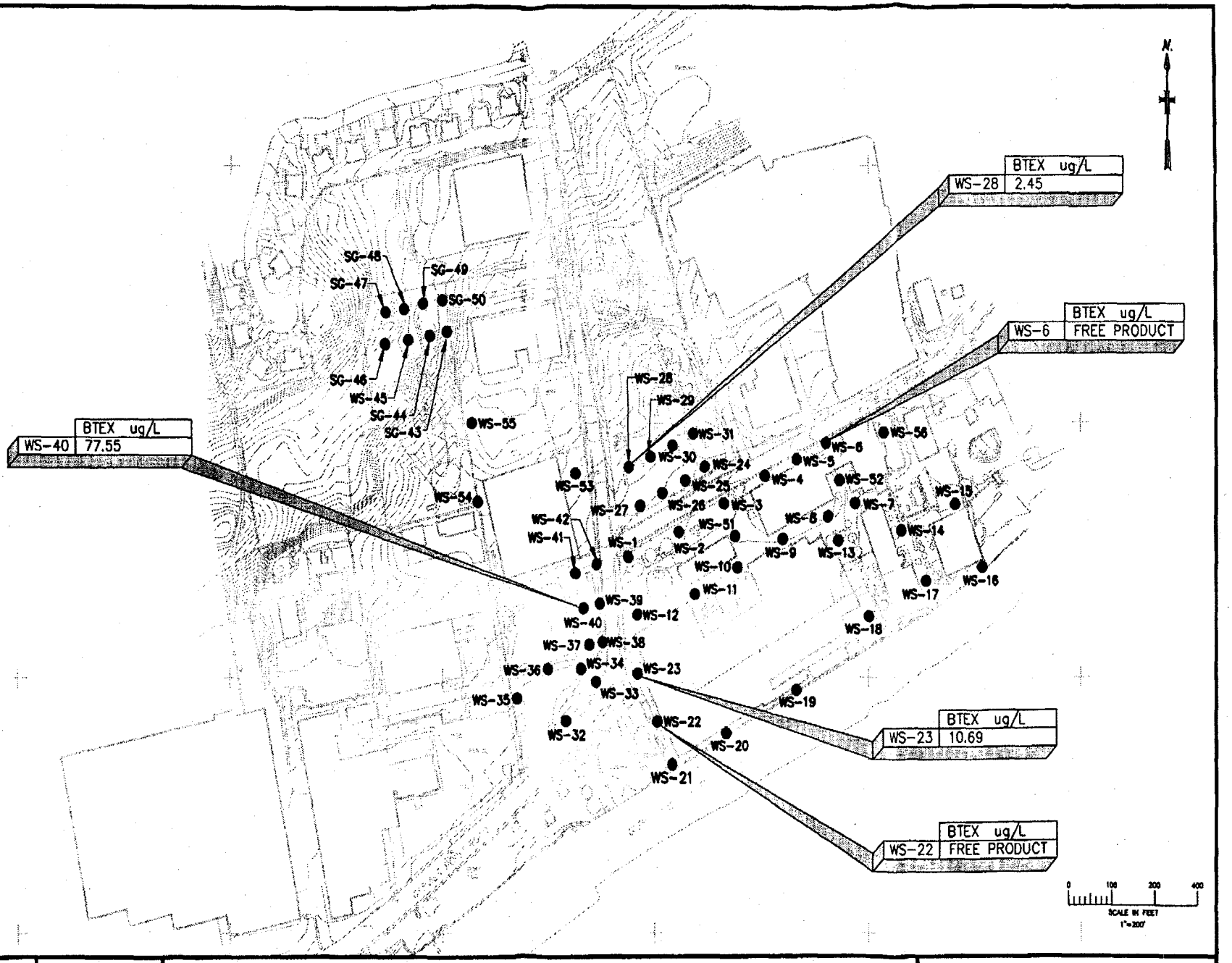

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GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

GEOPROBE/SOIL GAS SURVEY
BTEX CONCENTRATION (ug/L)

DATE: MAY 1998 | PROJECT NO.: 8001202 | FIGURE 2-15

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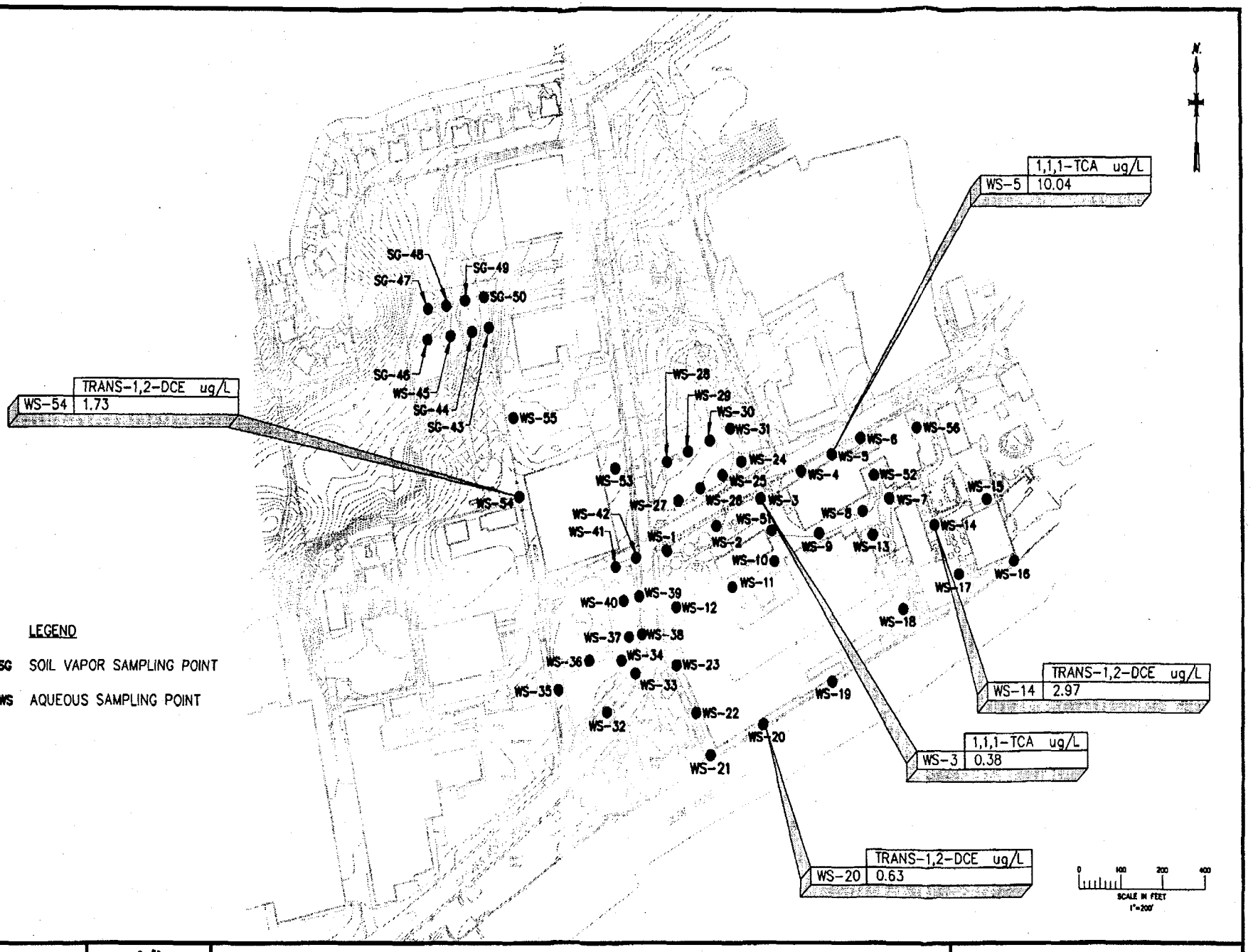


MALCOLM PIRNIE

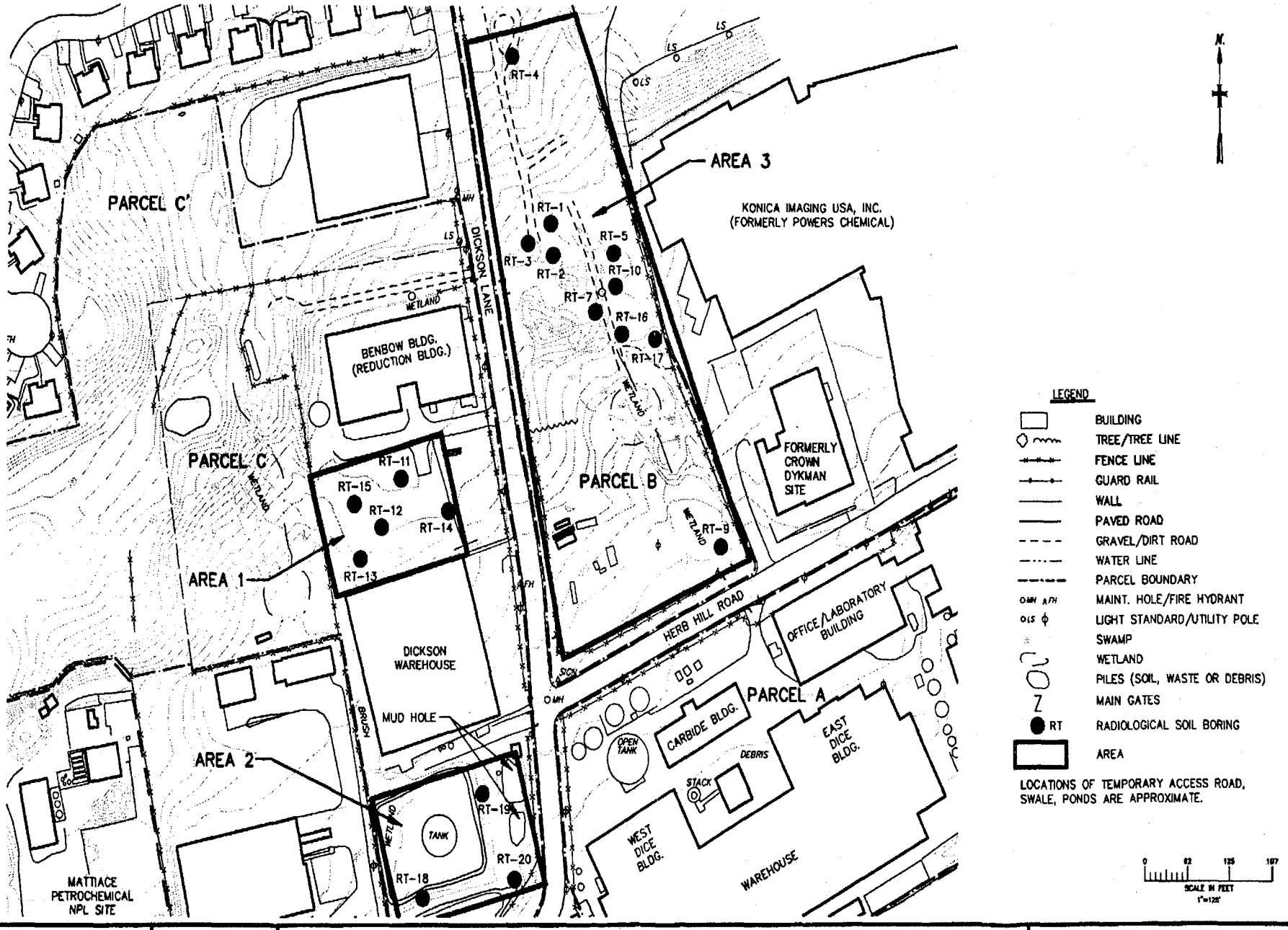
LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

GEOPROBE/SOIL GAS SURVEY-1,1,1-TCA
TRANS-1,2-DCE CONCENTRATION (ug/L)

DATE: MAY 1998 | PROJECT NO.: 8001202 | FIGURE 2-16

301453

7308 ADM. I:\ACAD\PROJ\8001202O\GISFILES\REPORT\8001LT78 Scc 1:1 Date: 05/05/1998 Time: 14:57



MALCOLM PIRNIE

LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

DATE: MAY 1998

RADIOLOGICAL BORINGS
LOCATION MAP - AREAS 1, 2 & 3

PROJECT NO.: 8001202

FIGURE 2-17

301454

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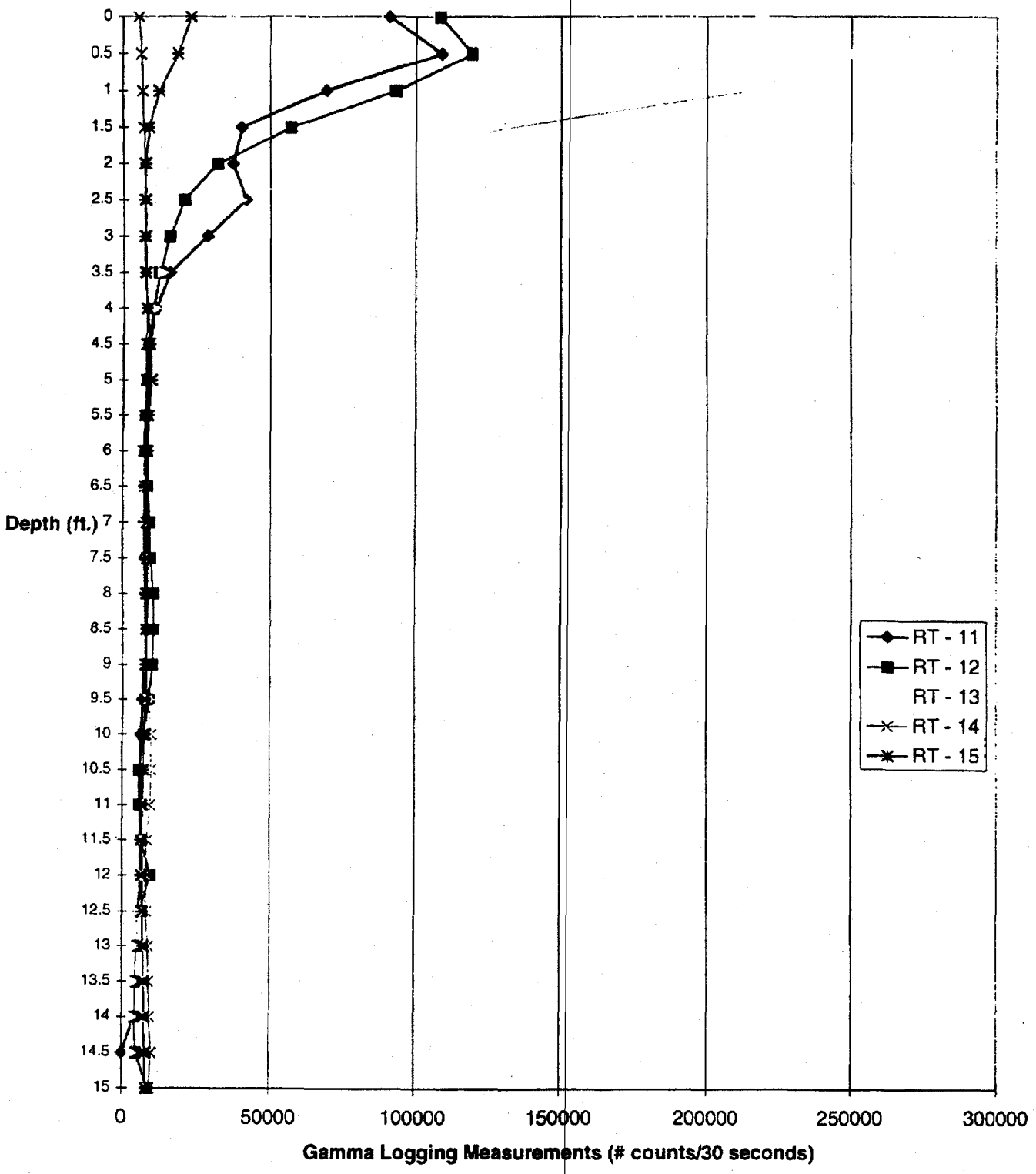
7308 ADMIN



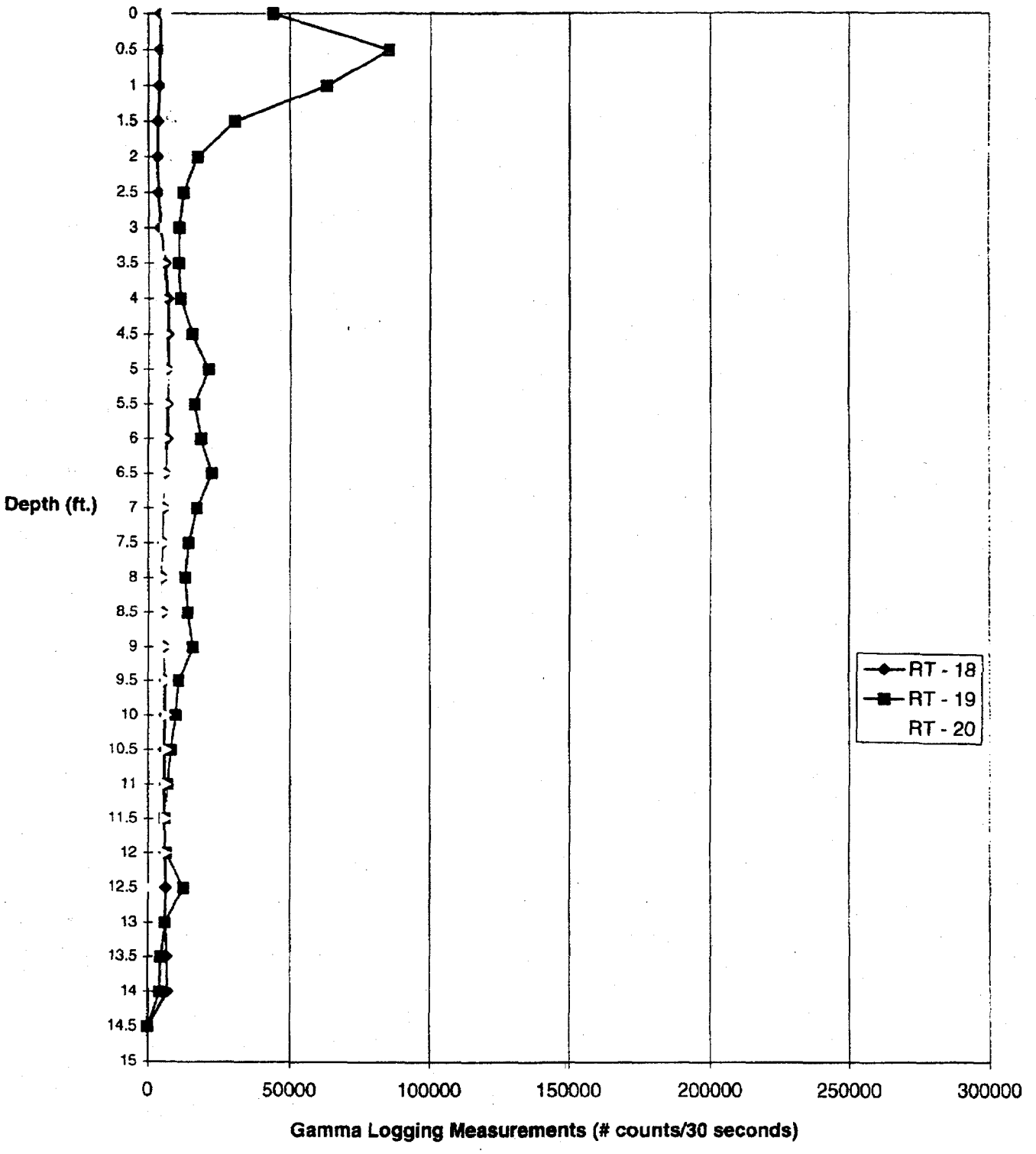
TITLE:	DATE:	FIGURE NO.:
GAMMA LOGGING DATA – AREA 1	MAY 1998	FIGURE 2-18

MALCOLM PIRNIE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

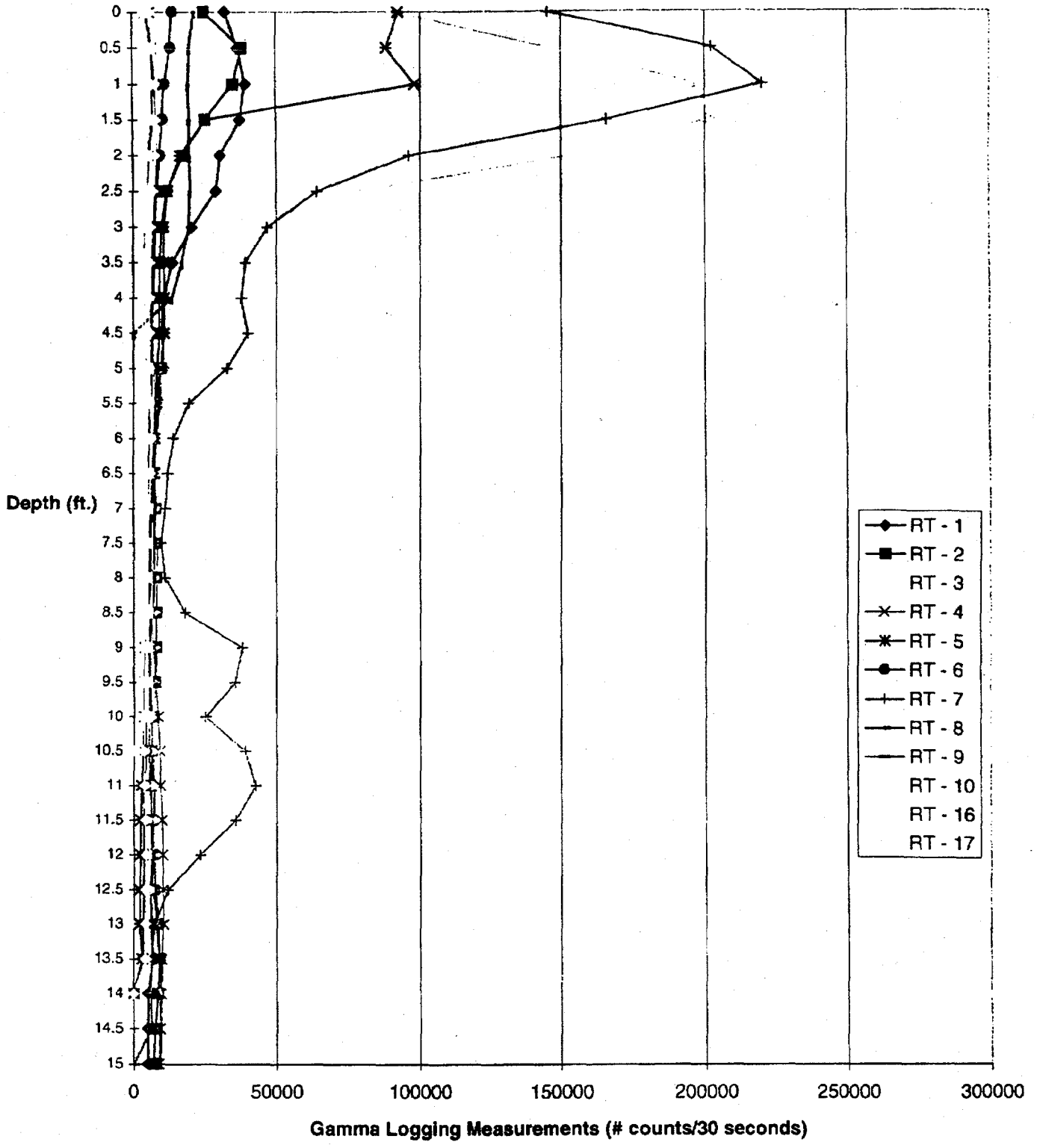
301455



TITLE:	DATE:	FIGURE NO.:
GAMMA LOGGING DATA – AREA 2	MAY 1998	FIGURE 2–19

MALCOLM PIRNIE

LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L



TITLE:	DATE:	FIGURE NO.:
GAMMA LOGGING DATA – AREA 3	MAY 1998	FIGURE 2-20

MALCOLM PIRNIE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

KEY

- 1/4 MILE RADIUS
- 1/2 MILE RADIUS
- 1 MILE RADIUS
- 2 MILE RADIUS
- 3 MILE RADIUS

0 2,000' 4,000' 8,000'
SCALE IN FEET
1"=4,000'

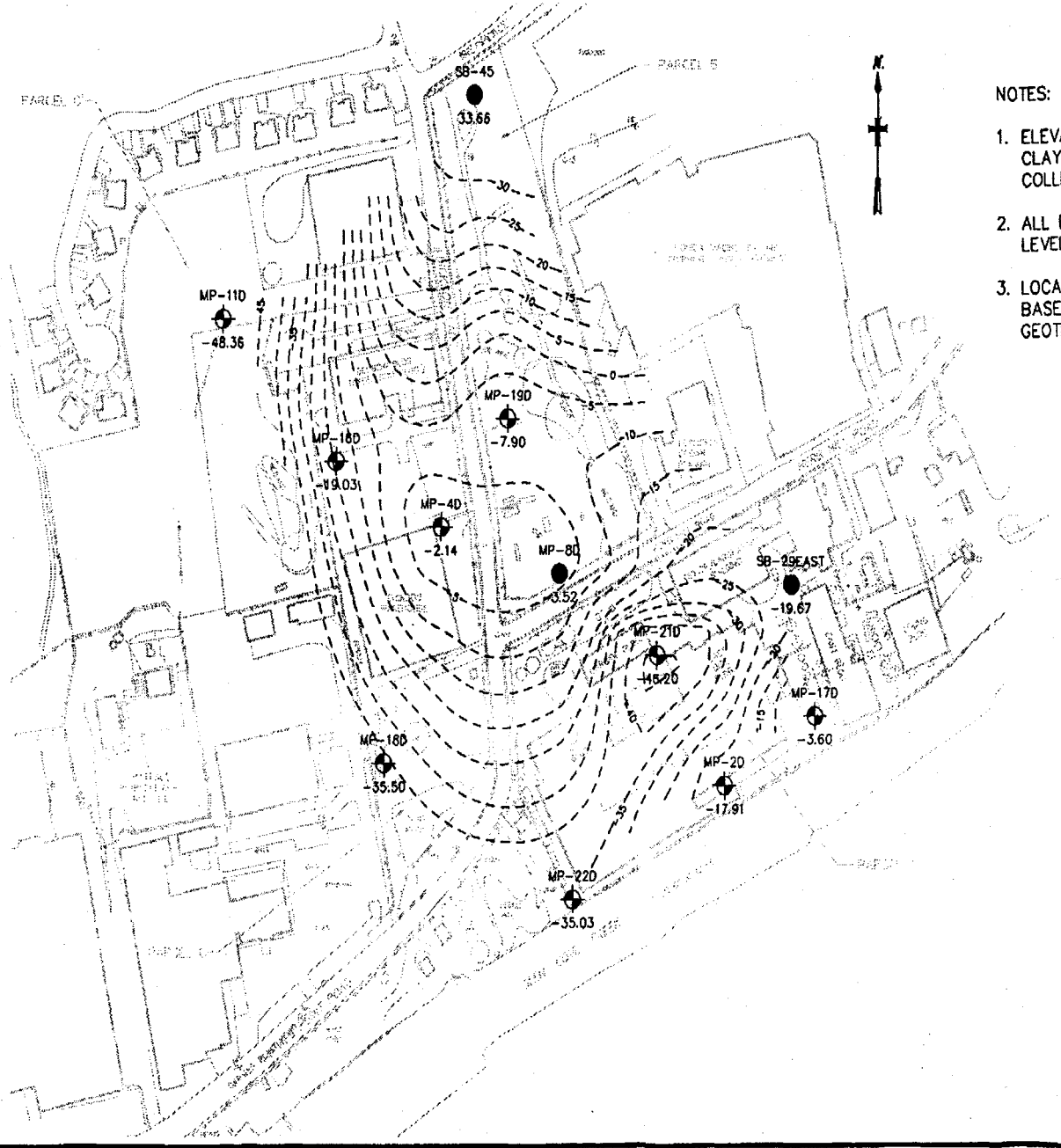
MALCOLM PIRNIE

LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

LAND USE CLASSIFICATION
3 MILE RADIUS MAP

DATE:	PROJECT NO.:	
MAY 1998	8001202	FIGURE 2-21

7308 ADMIN I:\8001202D\GISFILES\REPORT\POPULAT Scale: 1:1; Date: 05/06/1998 Time: 13:23



NOTES:

1. ELEVATION OF THE TOP OF THE PORT WASHINGTON CLAY IS BASED ON BORING LOGS AND SAMPLES COLLECTED.
2. ALL ELEVATIONS REFERENCED TO MEAN SEA LEVEL DATUM.
3. LOCATION OF MONITORING WELLS AND SOIL BORINGS BASED ON SURVEY CONDUCTED BY AMERICAN GEOTECH IN SEPTEMBER, 1996.

LEGEND

- APPROXIMATE PORT WASHINGTON CLAY ELEVATION CONTOUR
- BUILDING
- TREE/TREE LINE
- FENCE LINE
- GUARD RAIL
- WALL
- PAVED ROAD
- GRAVEL/DIRT ROAD
- WATER LINE
- PARCEL BOUNDARY
- MAINT. HOLE/FIRE HYDRANT
- LIGHT STANDARD/UTILITY POLE
- SWAMP
- WETLAND
- PILES (SOIL, WASTE OR DEBRIS)
- MAIN GATES
- MONITORING WELL AND GROUNDWATER ELEVATION

LOCATIONS OF TEMPORARY ACCESS ROAD, SWALE, PONDS ARE APPROXIMATE.

0 100 200 300
SCALE IN FEET
1"=200'

MALCOLM PIRNIE

LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

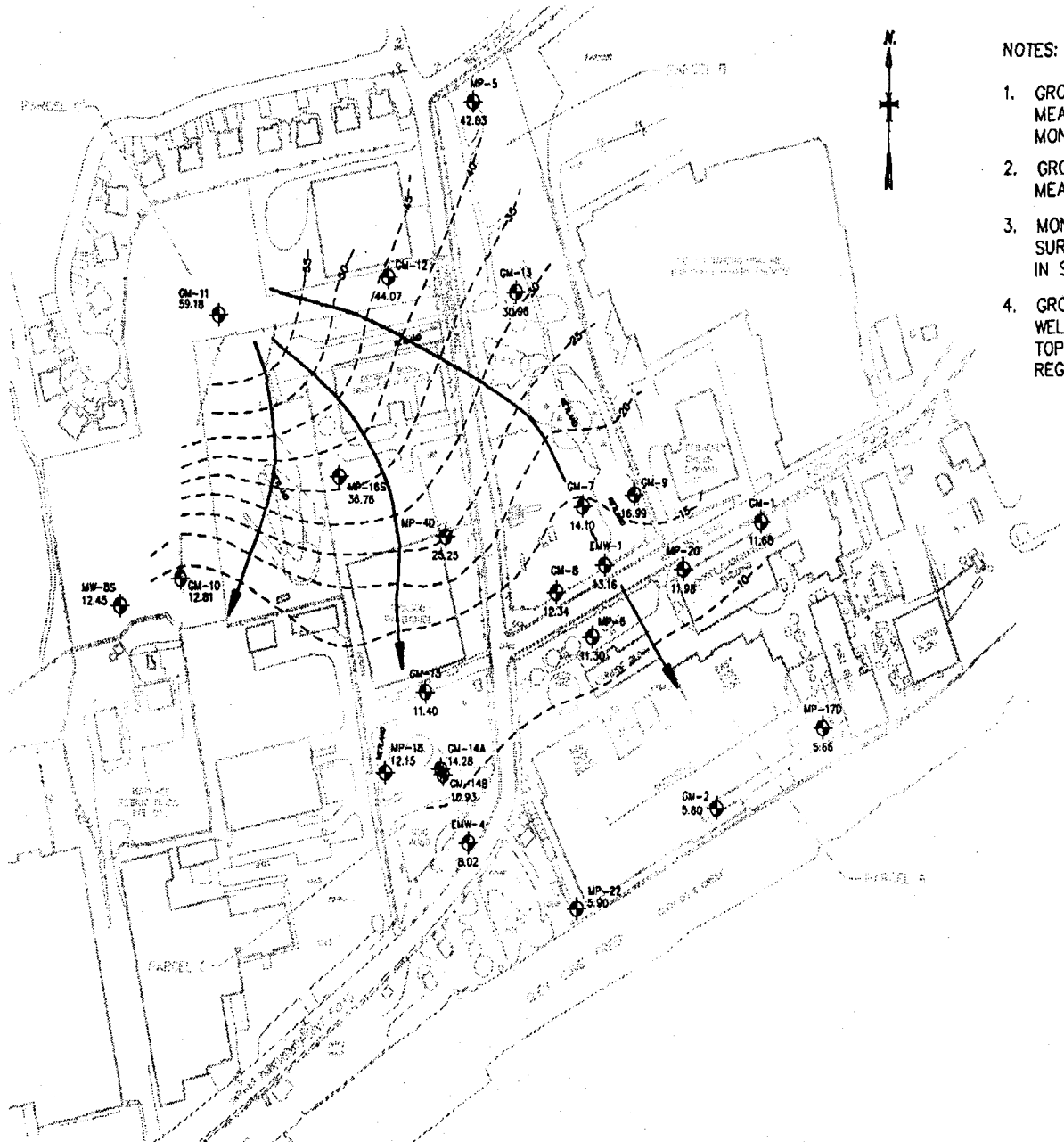
PORT WASHINGTON CLAY SURFACE ELEVATION MAP

DATE: MAY 1998 | PROJECT NO.: 8001202 | FIGURE 3-1

I:\ACAD\PROJ\80012020\GISFILES\REPORT\80017104 Sc 1:1i Date: 05/05/1998 Time: 15:00

7308 AD.

301459



NOTES:

1. GROUNDWATER ELEVATIONS ARE BASED ON MEASUREMENT OF WATER LEVELS IN MONITORING WELLS ON NOVEMBER 18, 1996.
2. GROUNDWATER ELEVATIONS ARE IN FEET ABOVE MEAN SEA LEVEL DATUM.
3. MONITORING WELL LOCATIONS ARE BASED ON SURVEY BY AMERICAN GEOTECH, INC. CONDUCTED IN SEPTEMBER 1996.
4. GROUNDWATER ELEVATION CONTOURS AWAY FROM WELL LOCATIONS ARE INTERPOLATED BASED ON TOPOGRAPHIC CONDITIONS AND KNOWLEDGE OF REGIONAL HYDROGEOLOGY.

LEGEND

- APPROXIMATE GROUNDWATER ELEVATION CONTOUR
- GROUNDWATER FLOW DIRECTION
- BUILDING
- TREE/TREE LINE
- FENCE LINE
- GUARD RAIL
- WALL
- PAVED ROAD
- GRAVEL/DIRT ROAD
- WATER LINE
- PARCEL BOUNDARY
- MAINT. HOLE/FIRE HYDRANT
- LIGHT STANDARD/UTILITY POLE
- SWAMP
- WETLAND
- PILES (SOIL, WASTE OR DEBRIS)
- MAIN GATES
- MP-20 / 11.98 — MONITORING WELL AND GROUNDWATER ELEVATION

LOCATIONS OF TEMPORARY ACCESS ROAD, SWALE, PONDS ARE APPROXIMATE.

0 100 200 300
SCALE IN FEET
1"=200'

MALCOLM PIRNIE

LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

SHALLOW GROUNDWATER CONTOUR MAP WITH FLOW DIRECTION- NOV. 18, 1996

DATE: MAY 1998 | PROJECT NO.: 8001202 | FIGURE 3-2

301460

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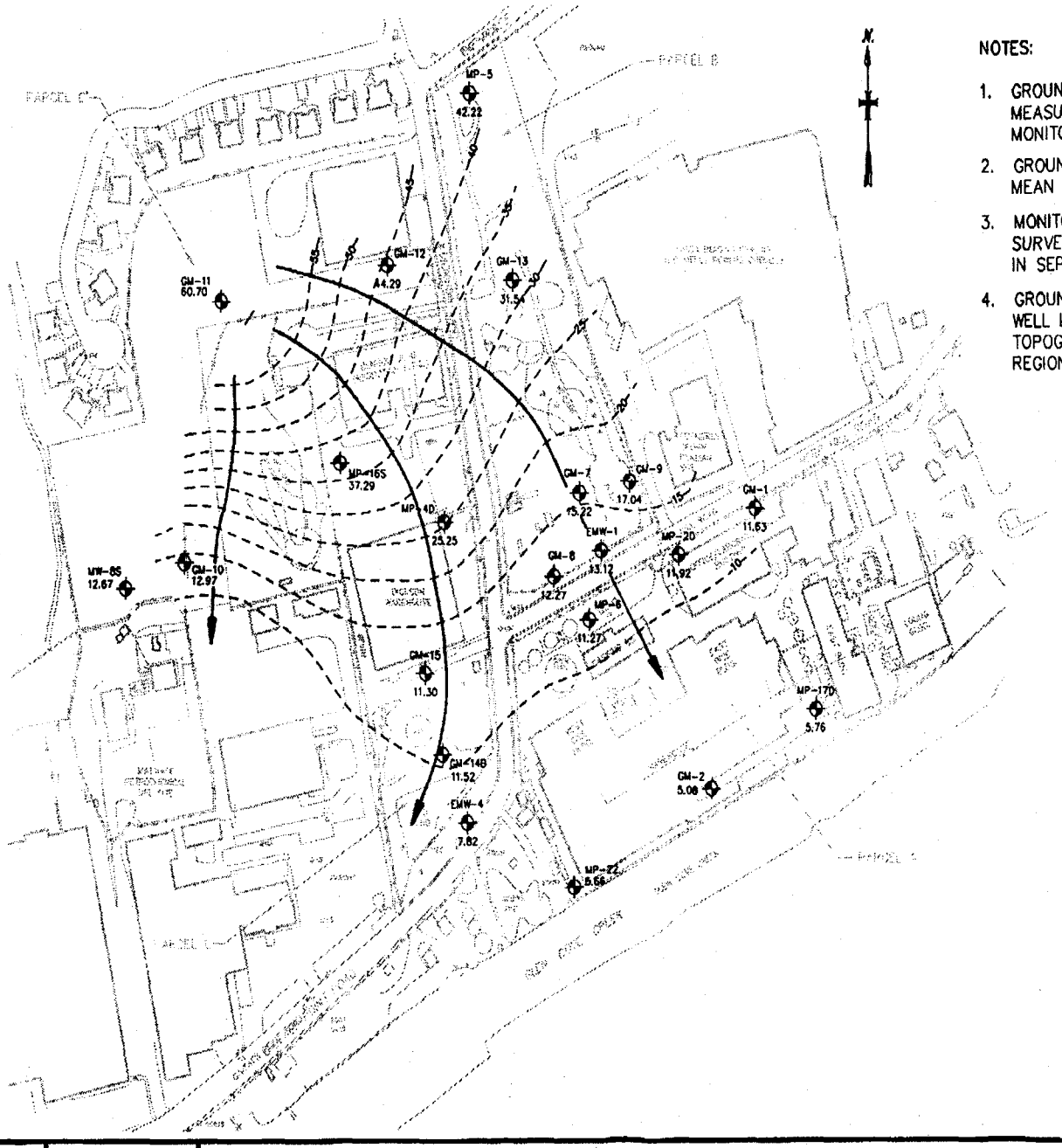


NOTES:

1. GROUNDWATER ELEVATIONS ARE BASED ON MEASUREMENT OF WATER LEVELS IN MONITORING WELLS ON JANUARY 15, 1997.
2. GROUNDWATER ELEVATIONS ARE IN FEET ABOVE MEAN SEA LEVEL DATUM.
3. MONITORING WELL LOCATIONS ARE BASED ON SURVEY BY AMERICAN GEOTECH, INC. CONDUCTED IN SEPTEMBER 1996.
4. GROUNDWATER ELEVATION CONTOURS AWAY FROM WELL LOCATIONS ARE INTERPOLATED BASED ON TOPOGRAPHIC CONDITIONS AND KNOWLEDGE OF REGIONAL HYDROGEOLOGY.

LEGEND

- 10 — APPROXIMATE GROUNDWATER ELEVATION CONTOUR
- GROUNDWATER FLOW DIRECTION
- BUILDING
- TREE/TREE LINE
- FENCE LINE
- GUARD RAIL
- WALL
- PAVED ROAD
- GRAVEL/DIRT ROAD
- WATER LINE
- PARCEL BOUNDARY
- MAINT. HOLE/FIRE HYDRANT
- LIGHT STANDARD/UTILITY POLE
- SWAMP
- WETLAND
- PILES (SOIL, WASTE OR DEBRIS)
- MAIN GATES
- MP-20 / 11.98 — MONITORING WELL AND GROUNDWATER ELEVATION

LOCATIONS OF TEMPORARY ACCESS ROAD, SWALE, PONDS ARE APPROXIMATE.

0 100 200 300
SCALE IN FEET
1"=200'

MALCOLM PIRNIE

LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

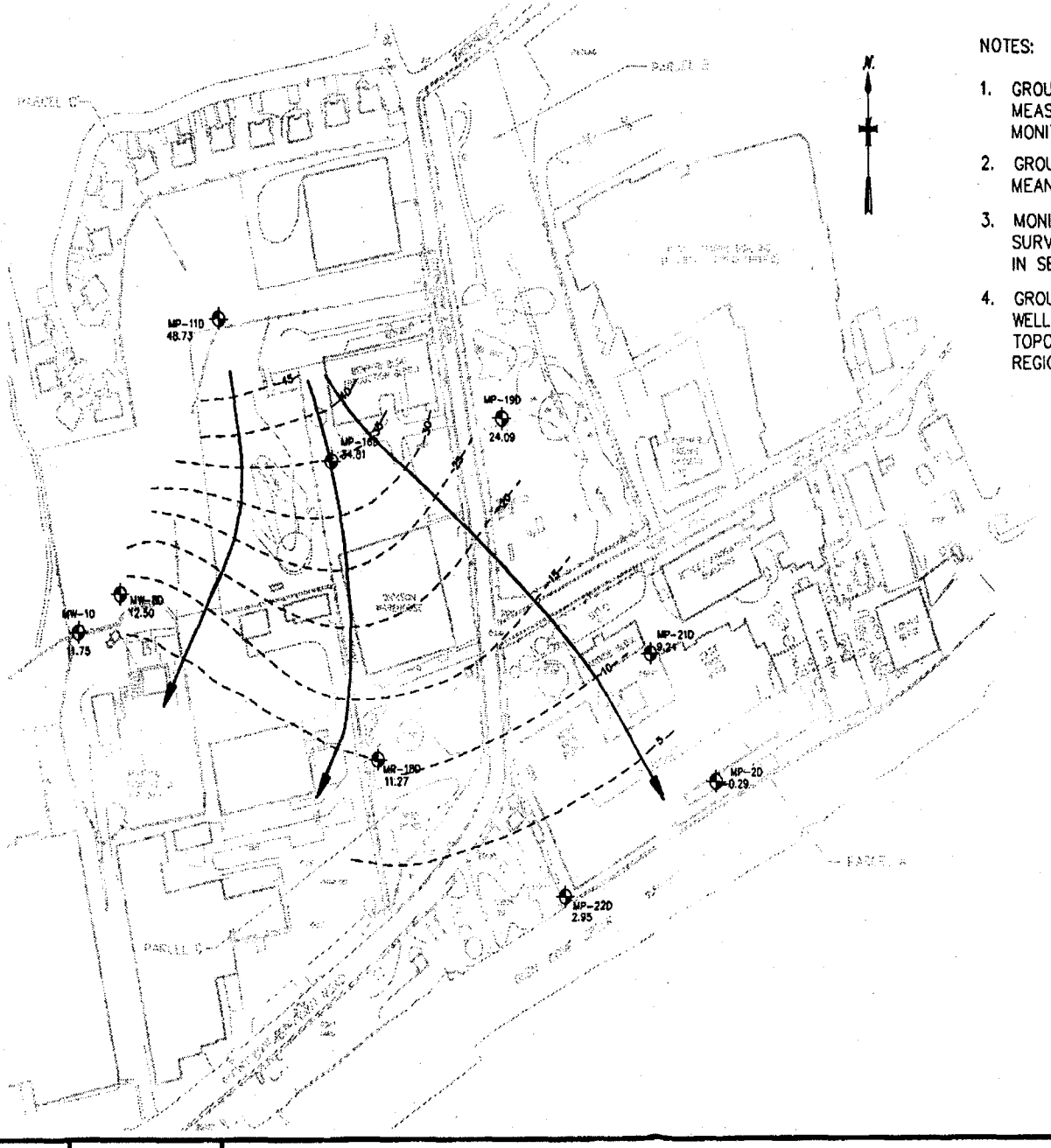
SHALLOW GROUNDWATER CONTOUR MAP WITH FLOW DIRECTION- JANUARY 15, 1997

DATE: MAY 1998 | PROJECT NO.: 8001202 | FIGURE 3-3

I:\ACAD\PROJ\80012020\GISFILES\REPORT\80011T08 Scal :1 Date: 05/05/1998 Time: 15:02

7308 ADMI.

301461



NOTES:

1. GROUNDWATER ELEVATIONS ARE BASED ON MEASUREMENT OF WATER LEVELS IN MONITORING WELLS ON NOVEMBER 18, 1996.
2. GROUNDWATER ELEVATIONS ARE IN FEET ABOVE MEAN SEA LEVEL DATUM.
3. MONITORING WELL LOCATIONS ARE BASED ON SURVEY BY AMERICAN GEOTECH, INC. CONDUCTED IN SEPTEMBER 1996.
4. GROUNDWATER ELEVATION CONTOURS AWAY FROM WELL LOCATIONS ARE INTERPOLATED BASED ON TOPOGRAPHIC CONDITIONS AND KNOWLEDGE OF REGIONAL HYDROGEOLOGY.

LEGEND

- 5 — APPROXIMATE GROUNDWATER ELEVATION CONTOUR
- GROUNDWATER FLOW DIRECTION
- BUILDING
- TREE/TREE LINE
- FENCE LINE
- GUARD RAIL
- WALL
- PAVED ROAD
- GRAVEL/DIRT ROAD
- WATER LINE
- PARCEL BOUNDARY
- MAINT. HOLE/FIRE HYDRANT
- LIGHT STANDARD/UTILITY POLE
- SWAMP
- WETLAND
- PILES (SOIL, WASTE OR DEBRIS)
- MAIN GATES
- MP-6 / 11.27 — MONITORING WELL AND GROUNDWATER ELEVATION

LOCATIONS OF TEMPORARY ACCESS ROAD, SWALE, PONDS ARE APPROXIMATE.

0 100 200 300
SCALE IN FEET
1"=200'

MALCOLM PIRNIE

LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

DEEP GROUNDWATER CONTOUR MAP WITH FLOW DIRECTION- NOV. 18, 1996

DATE:	PROJECT NO.:	
MAY 1998	8001202	FIGURE 3-4

301462

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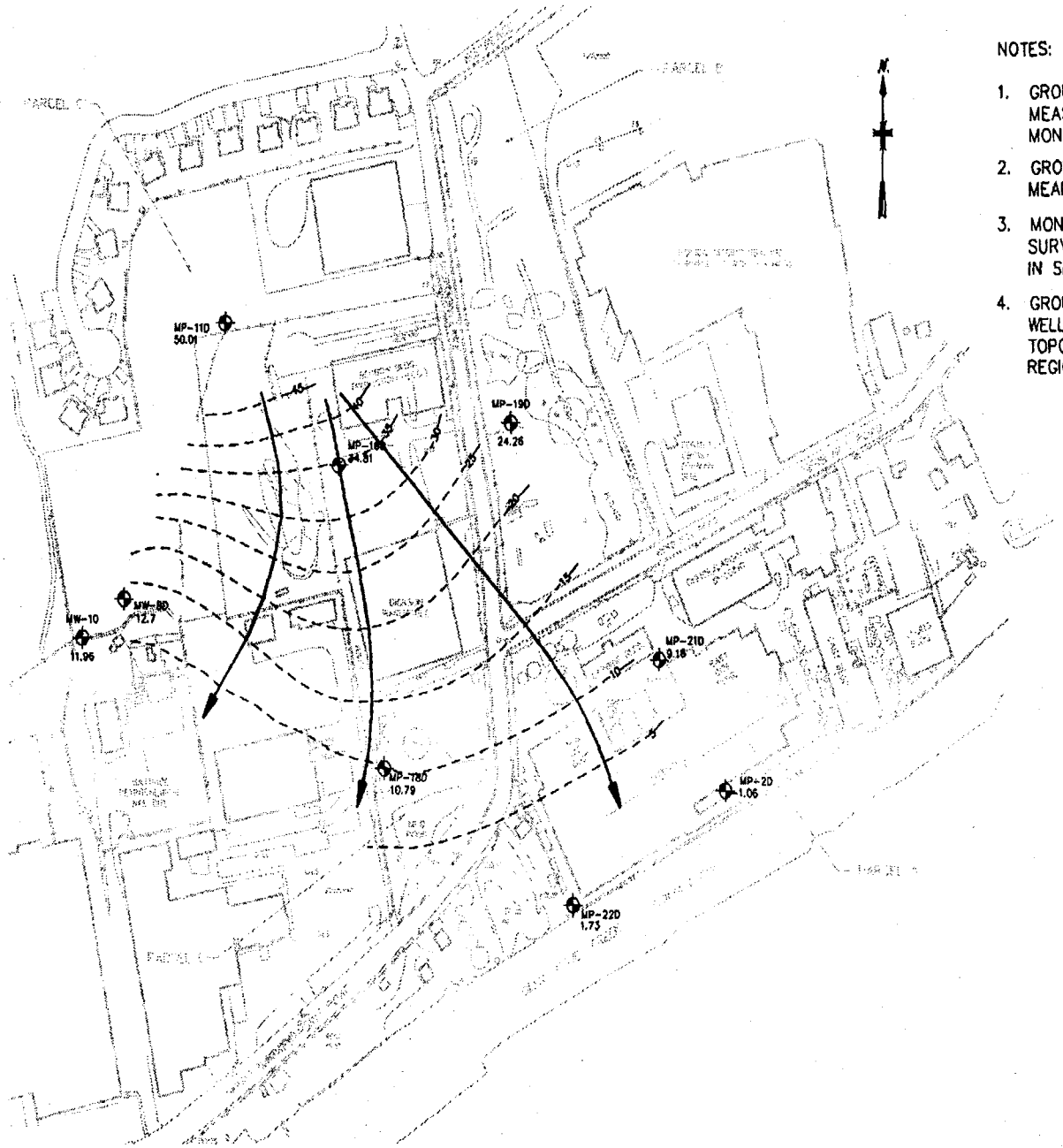

NOTES:

1. GROUNDWATER ELEVATIONS ARE BASED ON MEASUREMENT OF WATER LEVELS IN MONITORING WELLS ON JANUARY 15, 1997.
2. GROUNDWATER ELEVATIONS ARE IN FEET ABOVE MEAN SEA LEVEL DATUM.
3. MONITORING WELL LOCATIONS ARE BASED ON SURVEY BY AMERICAN GEOTECH, INC. CONDUCTED IN SEPTEMBER 1996.
4. GROUNDWATER ELEVATION CONTOURS AWAY FROM WELL LOCATIONS ARE INTERPOLATED BASED ON TOPOGRAPHIC CONDITIONS AND KNOWLEDGE OF REGIONAL HYDROGEOLOGY.

LEGEND

- 5 — APPROXIMATE GROUNDWATER ELEVATION CONTOUR
- GROUNDWATER FLOW DIRECTION
- BUILDING
- TREE/TREE LINE
- FENCE LINE
- GUARD RAIL
- WALL
- PAVED ROAD
- GRAVEL/DIRT ROAD
- WATER LINE
- PARCEL BOUNDARY
- MAINT. HOLE/FIRE HYDRANT
- LIGHT STANDARD/UTILITY POLE
- SWAMP
- WETLAND
- PILES (SOIL, WASTE OR DEBRIS)
- MAIN GATES
- MP-6 11.27 — MONITORING WELL AND GROUNDWATER ELEVATION

LOCATIONS OF TEMPORARY ACCESS ROAD, SWALE, PONDS ARE APPROXIMATE.

0 100 200 300
SCALE IN FEET
1"=300'

MALCOLM PIRNIE

LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

DEEP GROUNDWATER CONTOUR MAP WITH FLOW DIRECTION- JANUARY 15, 1997

DATE: MAY 1998 | PROJECT NO.: 8001202 | FIGURE 3-5

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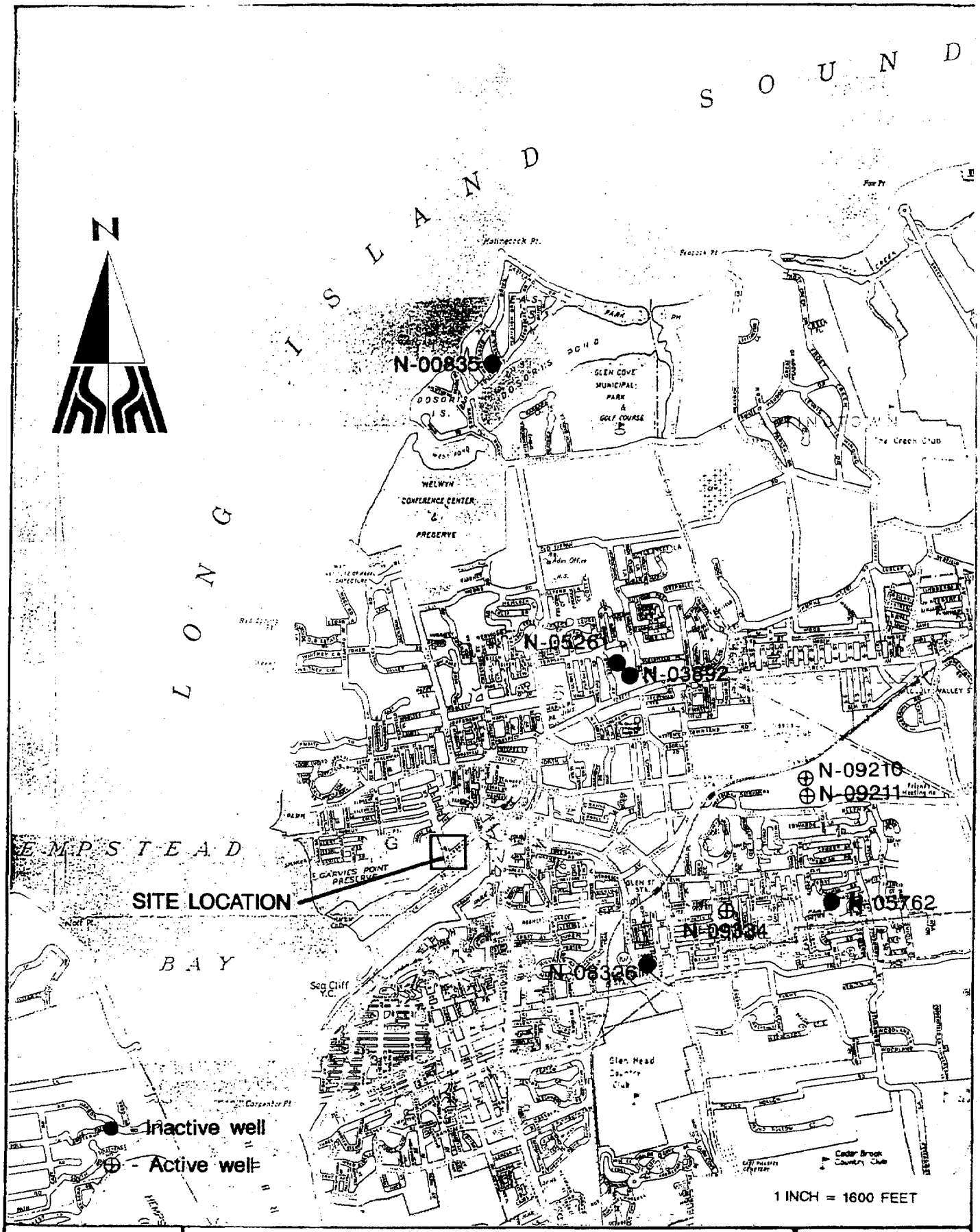


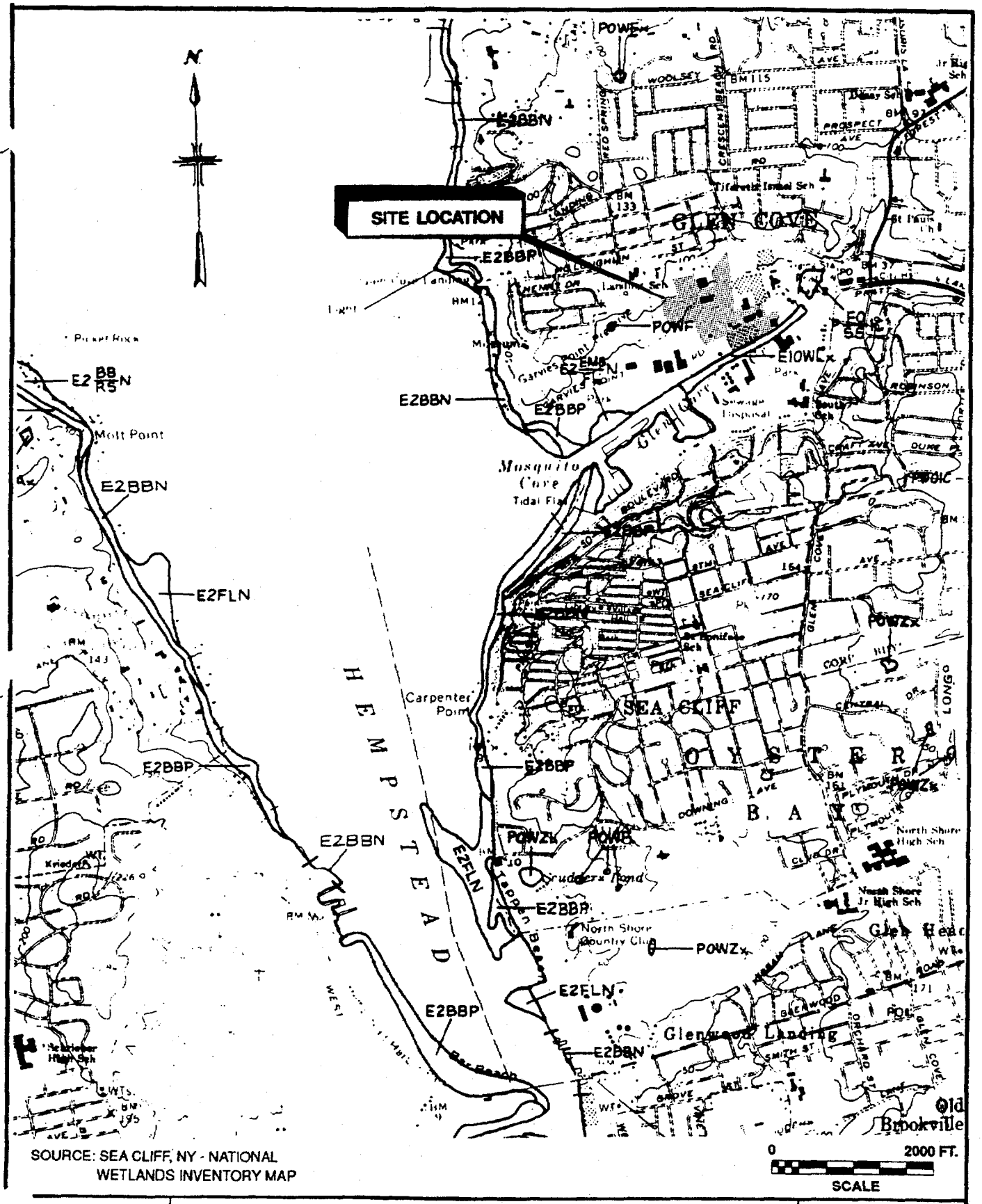
MALCOLM PIRNIE

MUNICIPAL WATER SUPPLY WELL LOCATIONS

MALCOLM PIRNIE, INC.

FIGURE 3-6

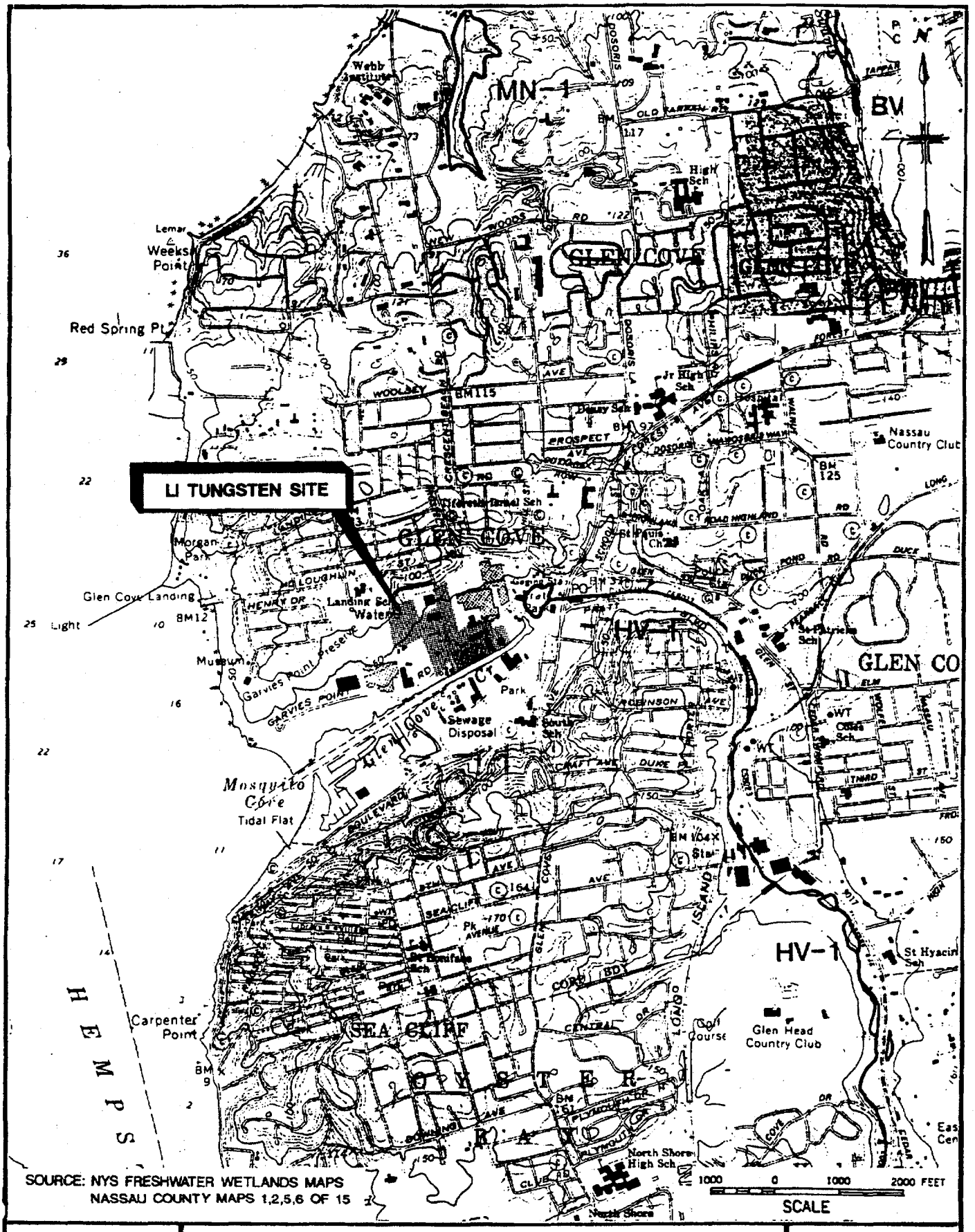
301464



SOURCE: SEA CLIFF, NY - NATIONAL WETLANDS INVENTORY MAP

MALCOLM PIRNIE	LI TUNGSTEN REMEDIAL INVESTIGATION GLEN COVE, NEW YORK USEPA REGION IIARCS **NATIONAL WETLANDS INVENTORY MAP**	MALCOLM PIRNIE, INC. **FIGURE 3-7**

301465



SOURCE: NYS FRESHWATER WETLANDS MAPS
NASSAU COUNTY MAPS 1,2,5,6 OF 15

MALCOLM PIRNIE

LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS

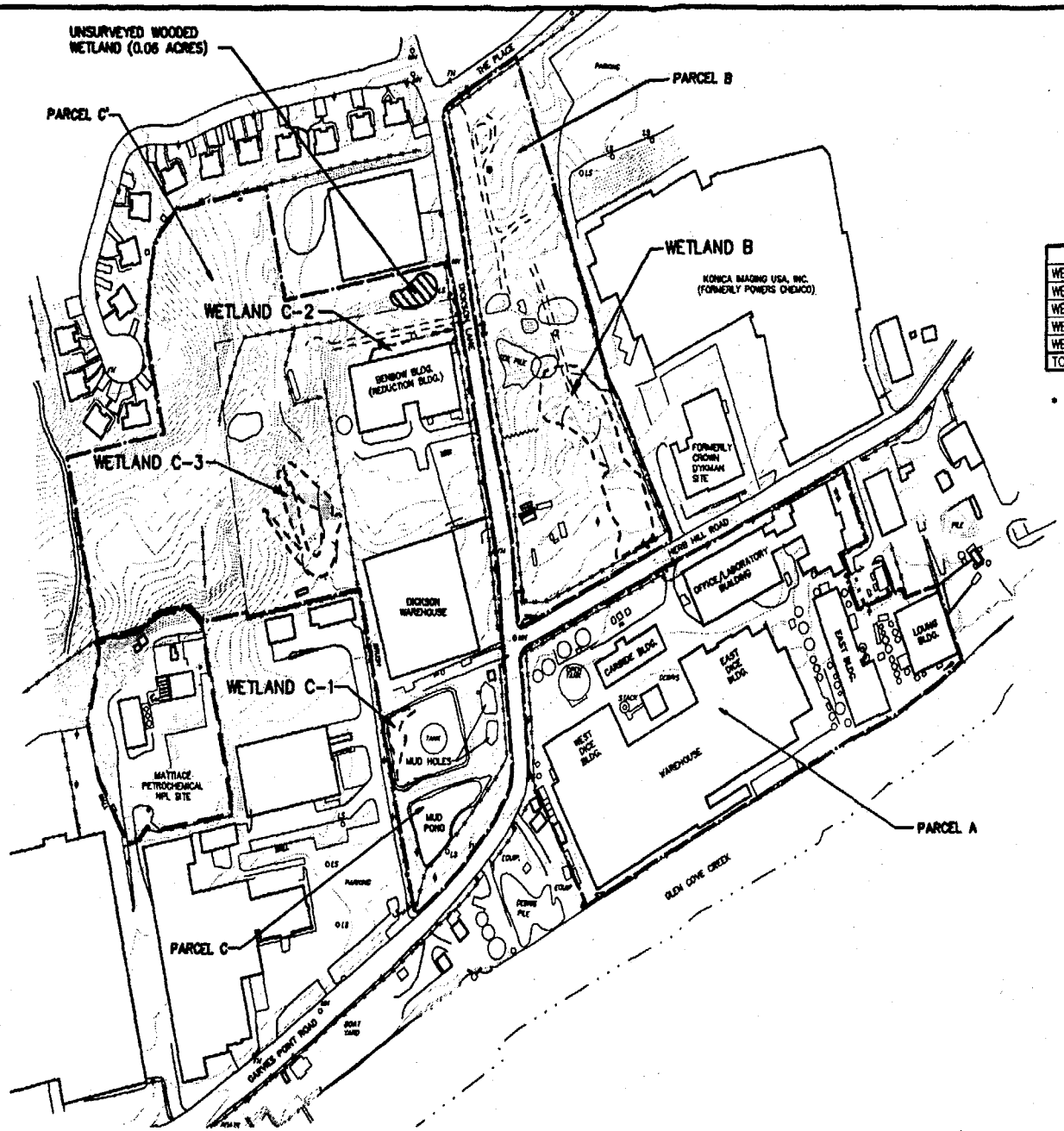
NEW YORK STATE FRESHWATER WETLANDS MAP

MALCOLM PIRNIE, INC.

FIGURE 3-8

159381

301466



N.

WETLAND AREAS		
WETLAND LOCATION	AREA	
WETLAND B	25,246 SQ. FT.	0.58 ACRES
WETLAND C-1	2,867 SQ. FT.	0.07 ACRES
WETLAND C-2	3,246 SQ. FT.	0.07 ACRES
WETLAND C-3	11,376 SQ. FT.	0.26 ACRES
TOTAL *	45,235 SQ. FT.	1.0 ACRE

* TOTAL INCLUDES SMALL WOODED WETLAND (0.06 ACRE)

LEGEND

- BUILDING
- TREE/TREE LINE
- FENCE LINE
- GUARD RAIL
- WALL
- PAVED ROAD
- GRAVEL/DIRT ROAD
- WATER LINE
- PARCEL BOUNDARY
- MAINT. HOLE/FIRE HYDRANT
- LIGHT STANDARD/UTILITY POLE
- SWAMP
- WETLAND
- UNSURVEYED WOODED WETLAND (0.06 ACRES)
- PILES (SOIL, WASTE OR DEBRIS)
- MAIN GATES

LOCATIONS OF TEMPORARY ACCESS ROAD, SWALE, PONDS ARE APPROXIMATE.

0 100 200 300
SCALE IN FEET
1"=200'

MALCOLM PIRNIE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

WETLAND DELINEATION MAP

DATE: MAY 1998 | PROJECT NO.: 8001202 | FIGURE 3-9

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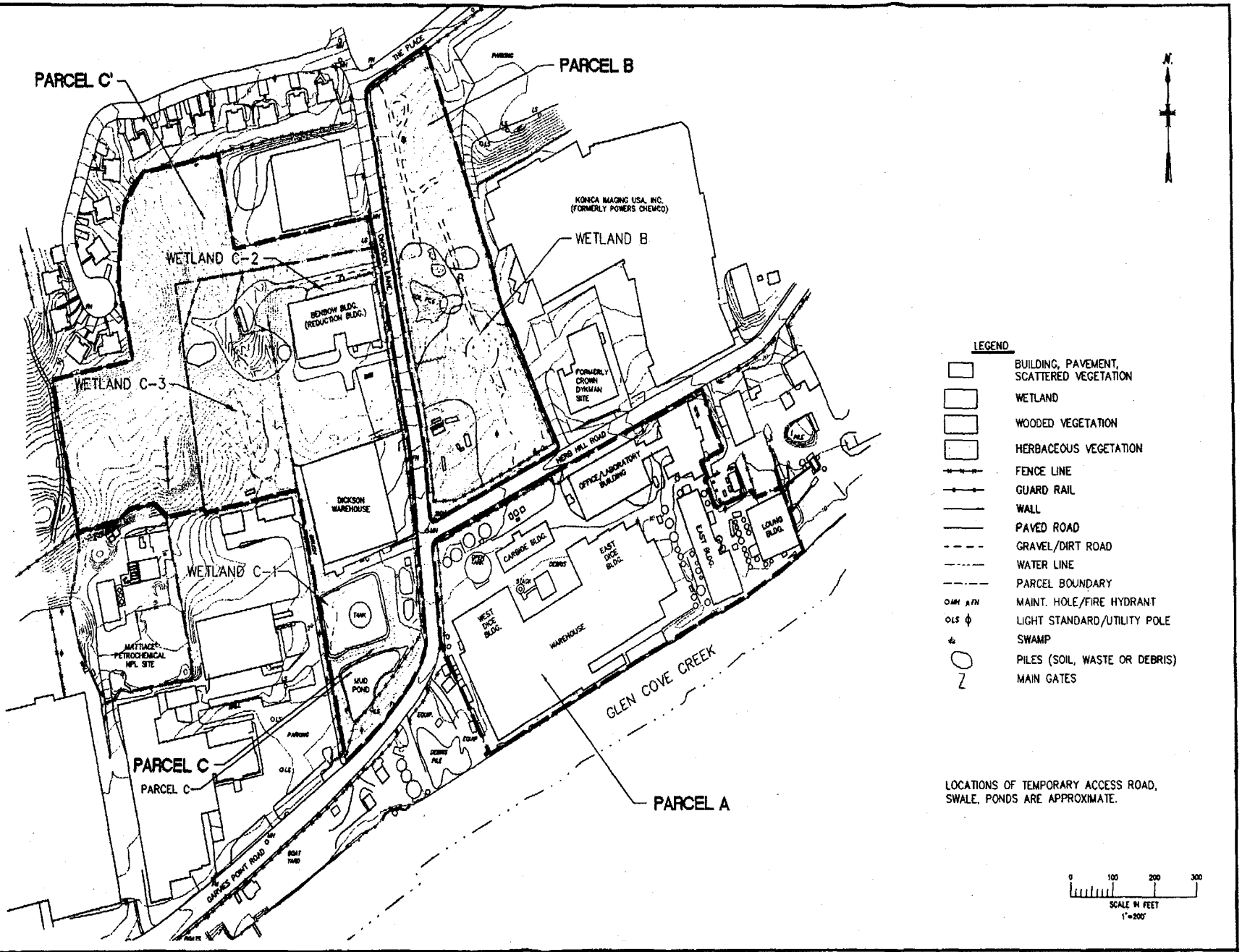
7308 ADMIN.

301467



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7308 ADMIN

MALCOLM PIRNIE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

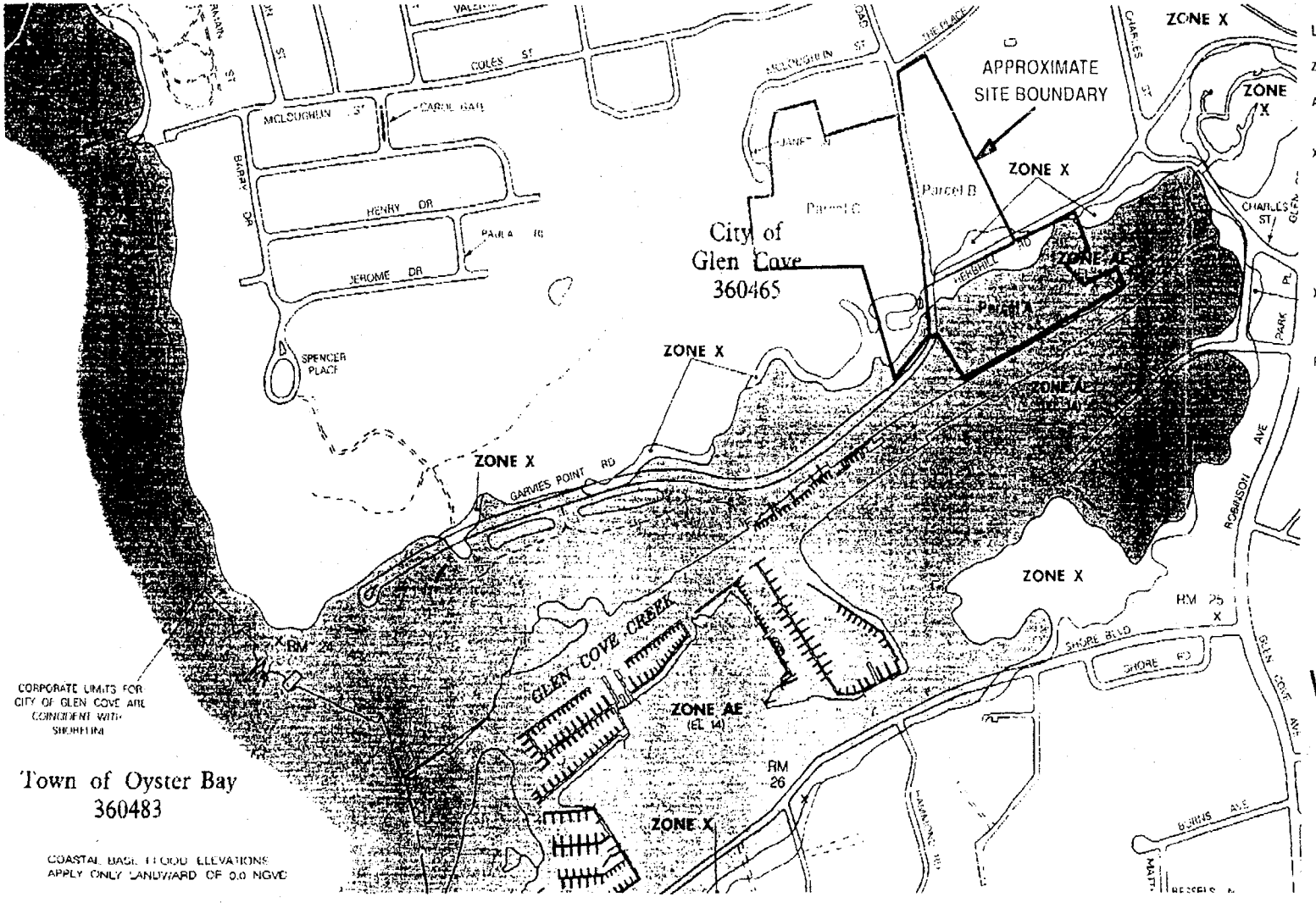
LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

DATE: MAY 1998

VEGETATION PATTERNS

PROJECT NO.: 8001202

FIGURE 3-10



Legend:

Zone	
AE	Area of 100-year floodplain (dark shading)
X	Areas of 500-year flood; areas of 100-year floodwith average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood. (light shading)
X	Areas determined to be outside 500-year floodplain. (no shading)
RM7	Elevation Reference Mark

0 400 feet

APPROXIMATE SCALE

Source: Flood Insurance Rate Map, Nassau County, NY (Panel 107 of 360)

MALCOLM PIRNIE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

FLOODPLAIN MAP

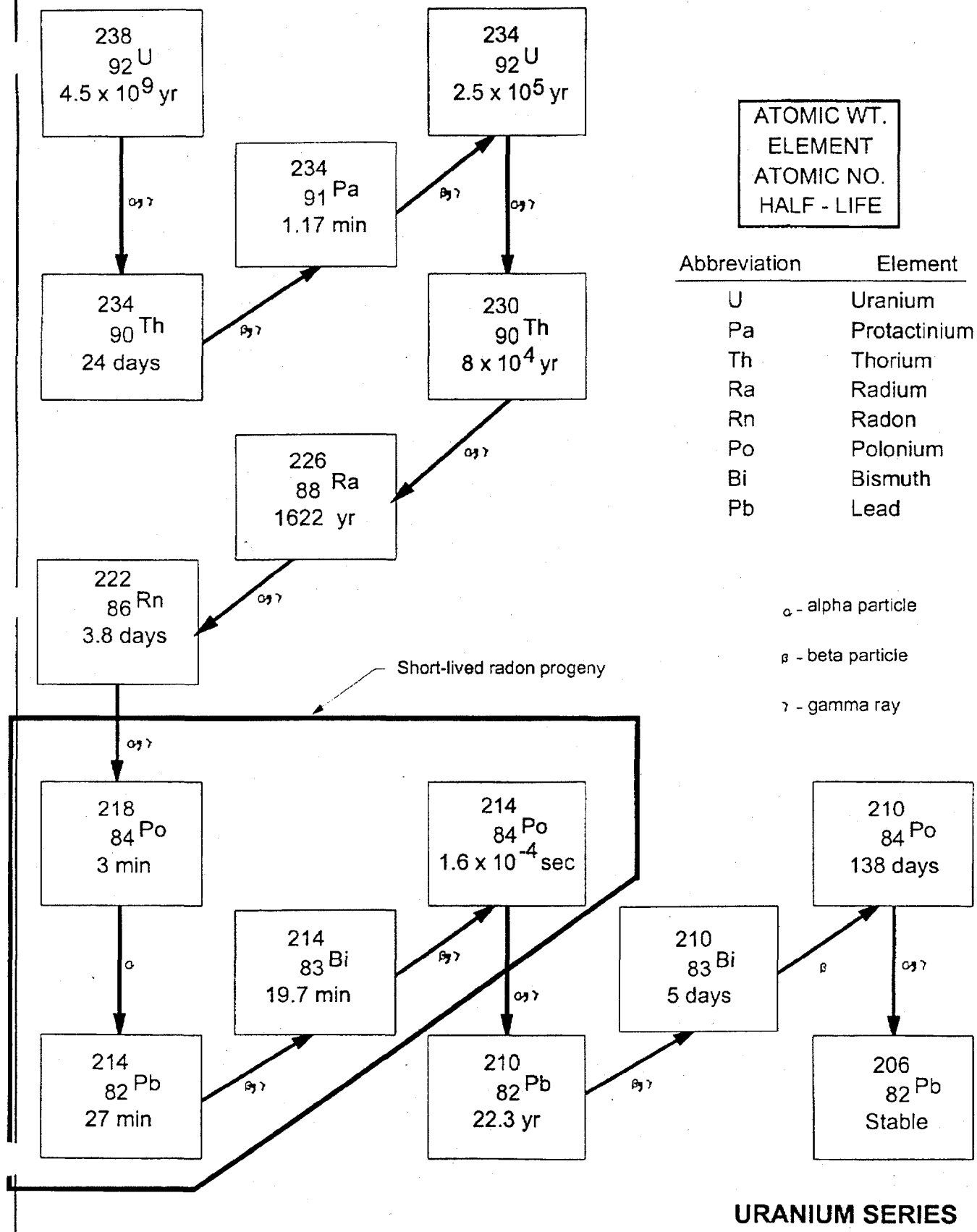
LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

DATE: MAY 1998

PROJECT NO.: 8001202

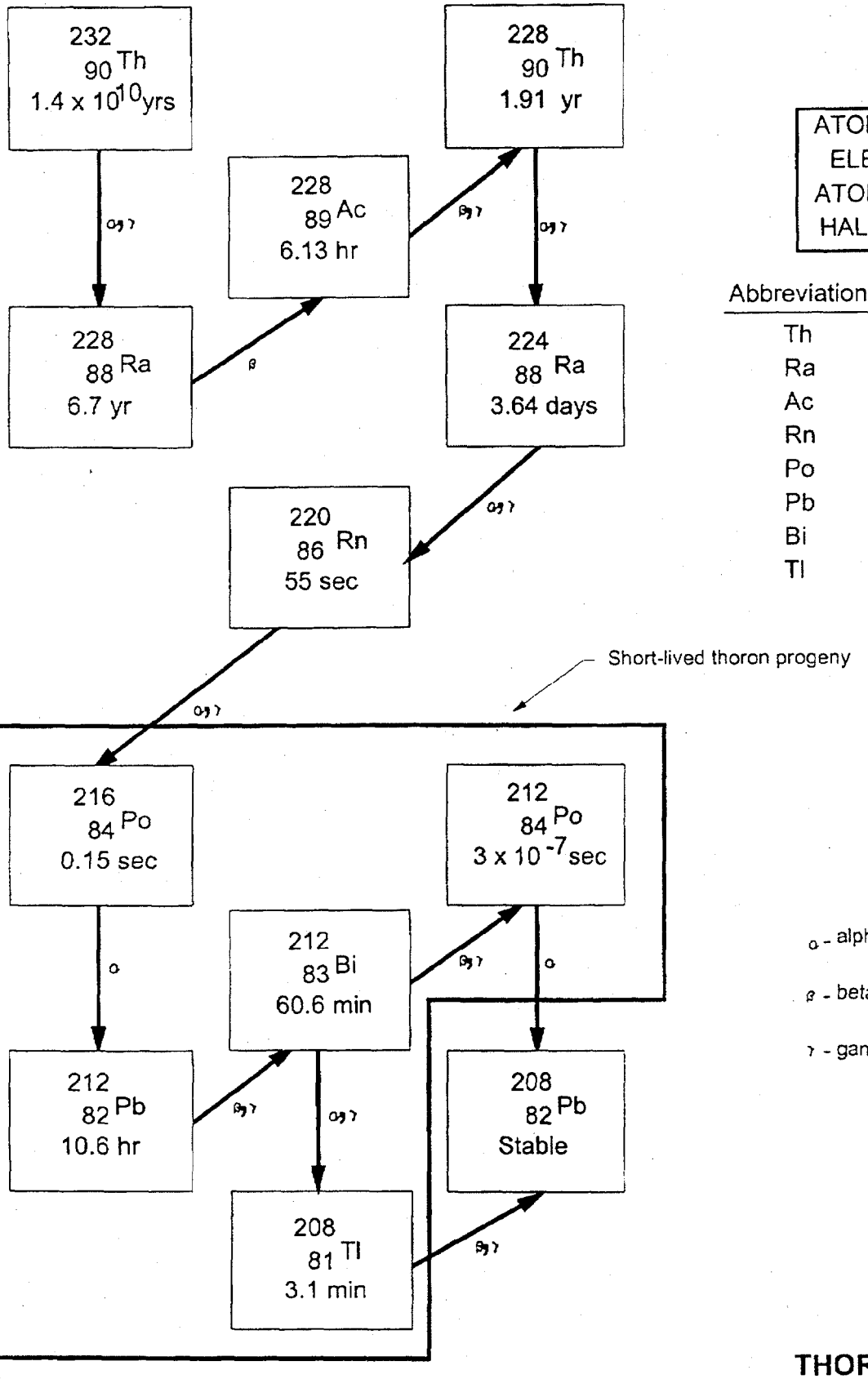
FIGURE NO.: FIGURE 3-11

FIGURE 4-1



301470

FIGURE 4-2

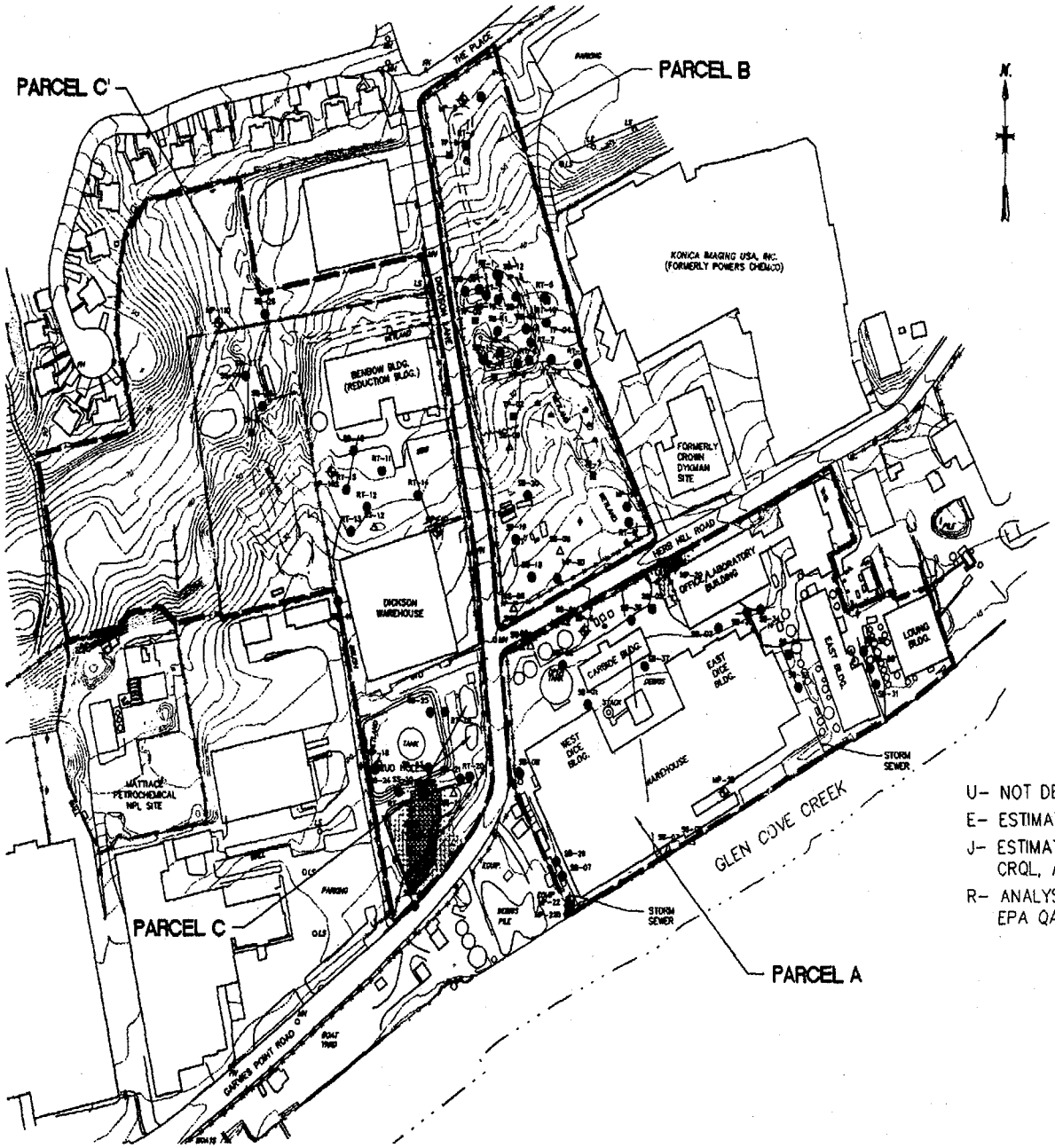


ATOMIC WT.
ELEMENT
ATOMIC NO.
HALF - LIFE

Abbreviation	Element
Th	Thorium
Ra	Radium
Ac	Actinium
Rn	Radon
Po	Polonium
Pb	Lead
Bi	Bismuth
Tl	Thallium

THORIUM SERIES

301471



TRICHLOROETHENE (ug/kg)

Site ID	Sample ID No.	Depth	Trichloroethene	Site ID	Sample ID No.	Depth	Trichloroethene
MP-11D	LT-SB-MP-11D	0- 2	U	SB-23	LT-SB-23	0- 2	U
MP-16	LT-SB-MP-16S	0- 2	U	SB-24	LT-SB-24	0- 2	U
MP-18	LT-SB-MP-18	0- 2	U	SB-25	LT-SB-25	0- 2	U
MP-20	LT-SB-MP-20	0- 2	3 J	SB-26	LT-SB-26	0- 2	U
MP-22	LT-SB-MP-22	1- 3	U	SB-27	LT-SB-27	0- 2	U
MP-22D	LT-SB-MP-22D	1- 3	U	SB-28	LT-SB-28	2- 4	U
MP-2D	LT-SB-MP-2D	1- 3	U	SB-29	LT-SB-29	3- 5	U
MP-4D	LT-SB-MP-4D	1- 3	U	SB-31	LT-SB-31	3- 5	U
MP-5	LT-SB-MP-5	0- 2	U	SB-32	LT-SB-32	3- 5	U
MP-6	LT-SB-MP-6	0- 2	U	SB-33	LT-SB-33	3- 5	U
MP-8D	LT-SB-MP-8D	0- 2	U	SB-34	LT-SB-34	1- 3	U
MP-9D	LT-SB-MP-9D	0- 2	U	SB-35	LT-SB-35	1- 3	U
SB-01	LT-SB-01	1- 3	U	SB-36	LT-SB-36	1- 3	U
SB-02	LT-SB-02	1- 3	U	SB-37	LT-SB-37	1- 3	U
SB-03	LT-SB-03	1- 3	U	SB-40	LT-SB-40	3- 5	2 J
SB-04	LT-SB-04	1- 3	U	SS-01	LT-SS-01R	0- 2	U
SB-05	LT-SB-5	0- 2	U	SS-02	LT-SS-02	0- 2	U
SB-06	LT-SB-06	2- 4	R	SS-03	LT-SS-03R	0- 2	U
SB-07	LT-SB-07	0- 2	U	SS-04	LT-SS-04	0- 2	U
SB-08	LT-SB-08	0- 2	U	SS-05	LT-SS-05R	0- 2	U
SB-09	LT-SB-09	0- 2	U	SS-06	LT-SS-06R	0- 2	U
SB-10	LT-SB-10	0- 2	U	SS-07	LT-SS-07	0- 2	U
SB-11	LT-SB-11	0- 2	U	SS-08	LT-SS-08R	0- 2	U
SB-12	LT-SB-12	0- 2	U	SS-09	LT-SS-09	0- 2	U
SB-13	LT-SB-13	0- 4	U	SS-10	LT-SS-10	0- 2	U
SB-14	LT-SB-14	0- 2	U	SS-11	LT-SS-11	0- 2	U
SB-15	LT-SB-15	0- 2	U	SS-12	LT-SS-12	0- 2	U
SB-16	LT-SB-16	0- 2	U	TP-01	LT-SB-TP-01	1- 2	U
SB-17	LT-SB-17	0- 2	U	TP-02	LT-SB-TP-02	1- 2	U
SB-18	LT-SB-18	0- 2	U	TP-03	LT-SB-TP-03	0- 1	U
SB-19	LT-SB-19	0- 2	U	TP-5	LT-SB-TP-05	0- 1	U
SB-20	LT-SB-20	0- 2	U	TP-6	LT-SB-TP-06	2- 3	U
SB-21	LT-SB-21	2- 4	R	TP-7	LT-SB-TP-07	1- 2	U
SB-22	LT-SB-22	4- 4	5 J	TP-8	LT-SB-TP-08	0- 1	U

DEPTHS ARE IN FEET BELOW GROUND SURFACE

U- NOT DETECTED

E- ESTIMATED VALUE

J- ESTIMATED VALUE, BELOW CRQL, ABOVE IDL

R- ANALYSES DID NOT PASS EPA QA/QC

IN A BOREHOLE WHERE TWO SAMPLES WERE COLLECTED FOR THE 0-4 FOOT INTERVAL, ONLY THE HIGHEST DETECTED CONCENTRATION WAS SELECTED FOR ILLUSTRATION.

TRICHLOROETHENE (ug/kg)

4+
3
2
1
0

0 100 200 300
SCALE IN FEET
1"=200'

MALCOLM PIRNIE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

TRICHLOROETHENE CONCENTRATIONS IN SOIL (0-4 FEET)

DATE: MAY 1998

PROJECT NO.: 8001202

FIGURE 5-1

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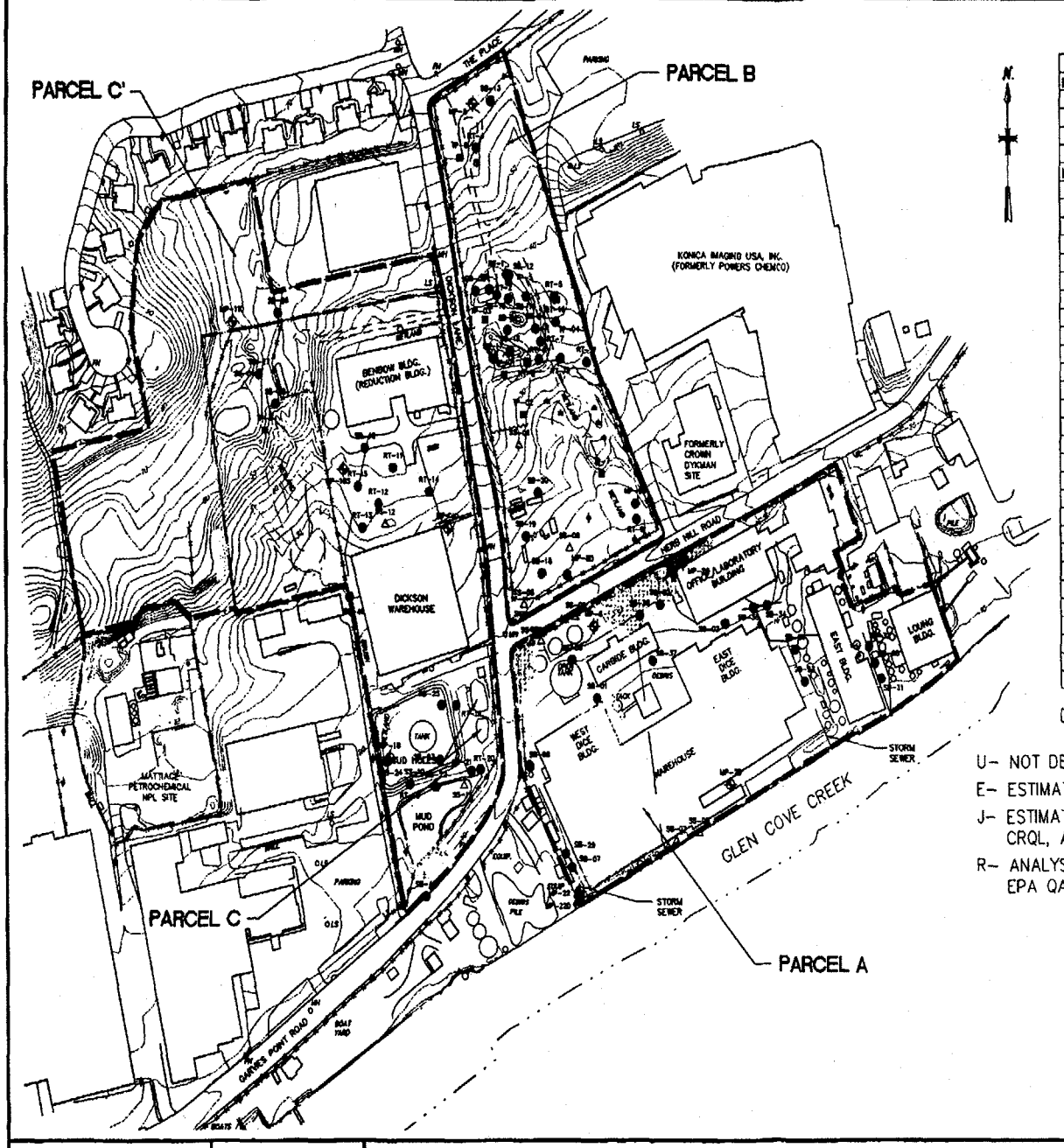
7308 ADMIN



TETRACHLOROETHENE (ug/kg)

Site ID	Sample ID No.	Depth	Tetrachloroethene	Site ID	Sample ID No.	Depth	Tetrachloroethene
MP-11D	LT-SB-MP-11D	0- 2	U	SB-24	LT-SB-24	0- 2	U
MP-16	LT-SB-MP-16S	0- 2	U	SB-25	LT-SB-25	0- 2	U
MP-18	LT-SB-MP-18	0- 2	U	SB-26	LT-SB-26	0- 2	U
MP-20	LT-SB-MP-20B	2- 3	45	SB-27	LT-SB-27	0- 2	U
MP-22	LT-SB-MP-22	1- 3	2 J	SB-28	LT-SB-28	2- 4	U
MP-22D	LT-SB-MP-22D	1- 3	U	SB-29	LT-SB-29	3- 5	U
MP-20	LT-SB-MP-20	1- 3	U	SB-31	LT-SB-31	3- 5	U
MP-40	LT-SB-MP-40	1- 3	U	SB-32	LT-SB-32	3- 5	U
MP-5	LT-SB-MP-5	0- 2	U	SB-33	LT-SB-33	3- 5	U
MP-6	LT-SB-MP-6	0- 2	U	SB-34	LT-SB-34	1- 3	U
MP-8D	LT-SB-MP-8D	0- 2	U	SB-35	LT-SB-35	1- 3	U
MP-9D	LT-SB-MP-9D	0- 2	U	SB-36	LT-SB-36	1- 3	3 J
SB-01	LT-SB-01	1- 3	1 J	SB-37	LT-SB-37	1- 3	U
SB-02	LT-SB-02	1- 3	U	SB-40	LT-SB-40	3- 5	2 J
SB-03	LT-SB-03	1- 3	U	SS-01	LT-SS-01R	0- 2	U
SB-04	LT-SB-04	1- 3	U	SS-02	LT-SS-02	0- 2	2 J
SB-05	LT-SB-5	0- 2	U	SS-03	LT-SS-03R	0- 2	U
SB-06	LT-SB-06	2- 4	R	SS-04	LT-SS-04	0- 2	U
SB-07	LT-SB-07	0- 2	U	SS-05	LT-SS-05R	0- 2	U
SB-08	LT-SB-08	0- 2	U	SS-06	LT-SS-06R	0- 2	U
SB-09	LT-SB-09	0- 2	U	SS-07	LT-SS-07	0- 2	U
SB-10	LT-SB-10	0- 2	U	SS-08	LT-SS-08R	0- 2	U
SB-11	LT-SB-11	0- 2	U	SS-09	LT-SS-09	0- 2	U
SB-12	LT-SB-12	0- 2	U	SS-10	LT-SS-10	0- 2	U
SB-13	LT-SB-13	0- 4	U	SS-11	LT-SS-11	0- 2	U
SB-14	LT-SB-14	0- 2	U	SS-12	LT-SS-12	0- 2	U
SB-15	LT-SB-15	0- 2	U	TP-01	LT-SB-TP-01	1- 2	U
SB-16	LT-SB-16	0- 2	U	TP-02	LT-SB-TP-02	1- 2	U
SB-17	LT-SB-17	0- 2	U	TP-03	LT-SB-TP-03	0- 1	U
SB-18	LT-SB-18	0- 2	U	TP-5	LT-SB-TP-05	0- 1	U
SB-19	LT-SB-19	0- 2	U	TP-6	LT-SB-TP-06	2- 3	U
SB-20	LT-SB-20	0- 2	U	TP-7	LT-SB-TP-07	1- 2	U
SB-21	LT-SB-21	2- 4	R	TP-8	LT-SB-TP-08	0- 1	U
SB-23	LT-SB-23	0- 2	U				

DEPTHS ARE IN FEET BELOW GROUND SURFACE

U- NOT DETECTED

E- ESTIMATED VALUE

J- ESTIMATED VALUE, BELOW CRQL, ABOVE IDL

R- ANALYSES DID NOT PASS EPA QA/QC

IN A BOREHOLE WHERE TWO SAMPLES WERE COLLECTED FOR THE 0-4 FOOT INTERVAL, ONLY THE HIGHEST DETECTED CONCENTRATION WAS SELECTED FOR ILLUSTRATION.

TETRACHLOROETHENE (ug/kg)

10
5
3
2
1
0

45+
40
35
30
25
20
15

0 100 200 300
SCALE IN FEET
1"=200'

MALCOLM PIRNIE

LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

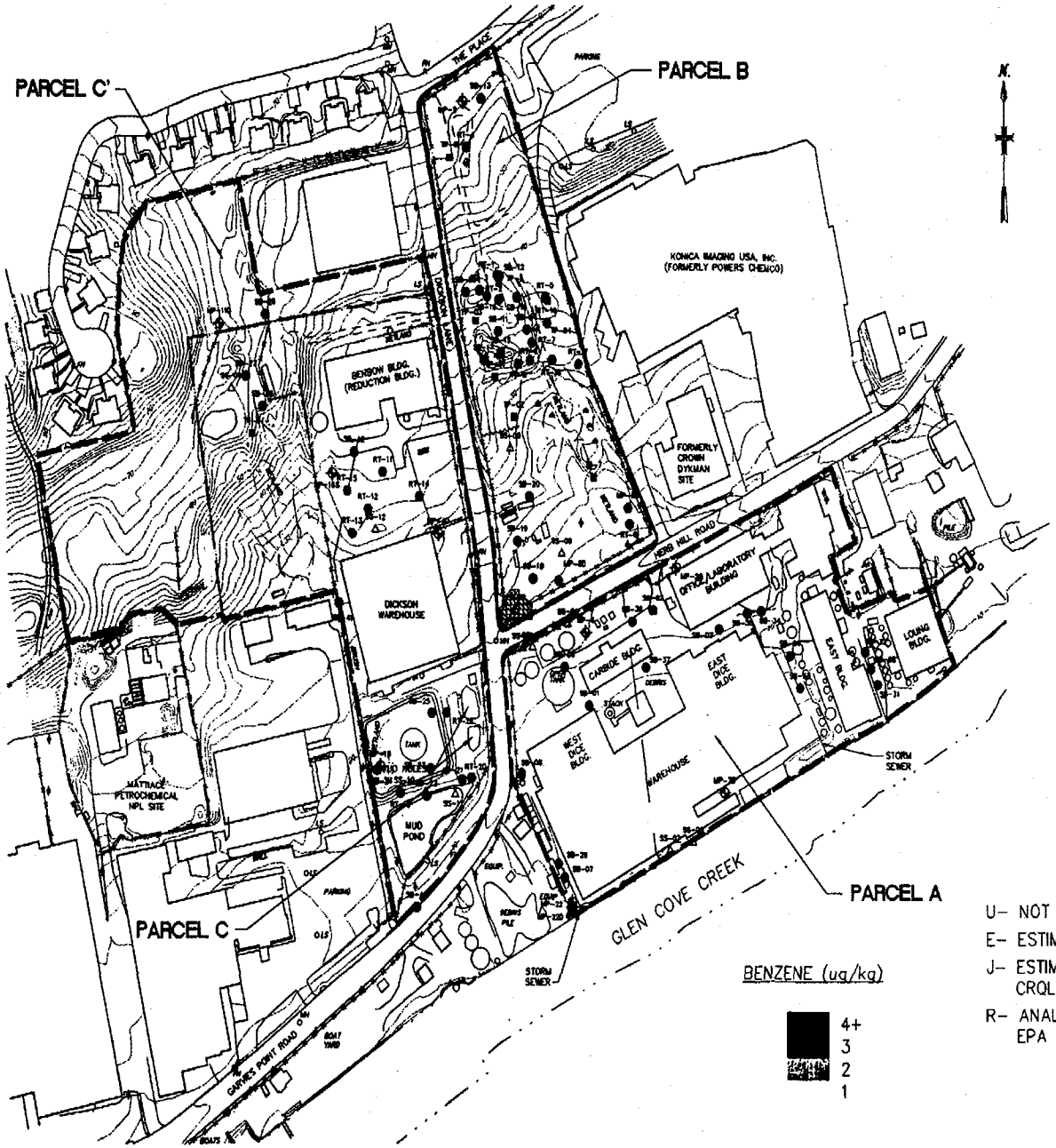
DATE: MAY 1998

TETRACHLOROETHENE CONCENTRATIONS IN SOIL (0-4 FEET)

PROJECT NO.: 8001202

FIGURE 5-2

7308 ADMIN I:\ACAD\PROJ\80012020\GISFILES\REPORT\8001LT82 Scale: 1:1 Date: 05/06/1998 Time: 08:30



BENZENE (ug/kg)

Site ID	Sample ID No.	Depth	Benzene	Site ID	Sample ID No.	Depth	Benzene
MP-11D	LT-SB-MP-11D	0- 2	U	SB-24	LT-SB-24	0- 2	U
MP-16	LT-SB-MP-16S	0- 2	U	SB-25	LT-SB-25	0- 2	U
MP-18	LT-SB-MP-18	0- 2	2 J	SB-26	LT-SB-26	0- 2	U
MP-20	LT-SB-MP-20	0- 2	U	SB-27	LT-SB-27	0- 2	U
MP-22	LT-SB-MP-22	1- 3	U	SB-28	LT-SB-28	2- 4	U
MP-22D	LT-SB-MP-22D	1- 3	U	SB-29	LT-SB-29	3- 5	U
MP-2D	LT-SB-MP-2D	1- 3	U	SB-31	LT-SB-31	3- 5	U
MP-4D	LT-SB-MP-4D	1- 3	U	SB-32	LT-SB-32	3- 5	U
MP-5	LT-SB-MP-5	0- 2	U	SB-33	LT-SB-33	3- 5	U
MP-6	LT-SB-MP-6	0- 2	U	SB-34	LT-SB-34	1- 3	U
MP-8D	LT-SB-MP-8D	0- 2	U	SB-35	LT-SB-35	1- 3	1 J
MP-9D	LT-SB-MP-9D	0- 2	U	SB-36	LT-SB-36	1- 3	U
SB-01	LT-SB-01	1- 3	U	SB-37	LT-SB-37	1- 3	U
SB-02	LT-SB-02	1- 3	U	SB-40	LT-SB-40	3- 5	U
SB-03	LT-SB-03	1- 3	U	SS-01	LT-SS-01R	0- 2	U
SB-04	LT-SB-04	1- 3	U	SS-02	LT-SS-02	0- 2	U
SB-05	LT-SB-5	0- 2	U	SS-03	LT-SS-03R	0- 2	U
SB-06	LT-SB-06	2- 4	R	SS-04	LT-SS-04	0- 2	U
SB-07	LT-SB-07	0- 2	U	SS-05	LT-SS-05R	0- 2	U
SB-08	LT-SB-08	0- 2	U	SS-06	LT-SS-06R	0- 2	U
SB-09	LT-SB-09	0- 2	U	SS-07	LT-SS-07	0- 2	U
SB-10	LT-SB-10	0- 2	U	SS-08	LT-SS-08R	0- 2	4 J
SB-11	LT-SB-11	0- 2	U	SS-09	LT-SS-09	0- 2	U
SB-12	LT-SB-12	0- 2	U	SS-10	LT-SS-10	0- 2	U
SB-13	LT-SB-13	2- 4	U	SS-11	LT-SS-11	0- 2	U
SB-14	LT-SB-14	0- 2	U	SS-12	LT-SS-12	0- 2	U
SB-15	LT-SB-15	0- 2	U	TP-01	LT-SB-TP-01	0- 2	U
SB-16	LT-SB-16	0- 2	U	TP-02	LT-SB-TP-02	1- 2	U
SB-17	LT-SB-17	0- 2	U	TP-03	LT-SB-TP-03	0- 1	U
SB-18	LT-SB-18	0- 2	U	TP-5	LT-SB-TP-05	0- 1	U
SB-19	LT-SB-19	0- 2	U	TP-6	LT-SB-TP-06	2- 3	U
SB-20	LT-SB-20	0- 2	U	TP-7	LT-SB-TP-07	1- 2	U
SB-21	LT-SB-21	2- 4	R	TP-8	LT-SB-TP-08	0- 1	U
SB-23	LT-SB-23	0- 2	U				

DEPTHS ARE IN FEET BELOW GROUND SURFACE

BENZENE (ug/kg)

4+
3
2
1

U- NOT DETECTED
E- ESTIMATED VALUE
J- ESTIMATED VALUE, BELOW CRQL, ABOVE IDL
R- ANALYSES DID NOT PASS EPA QA/QC

IN A BOREHOLE WHERE TWO SAMPLES WERE COLLECTED FOR THE 0-4 FOOT INTERVAL, ONLY THE HIGHEST DETECTED CONCENTRATION WAS SELECTED FOR ILLUSTRATION.

0 100 200 300
SCALE IN FEET
1"=200'

MALCOLM PIRNIE

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GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

DATE: MAY 1998

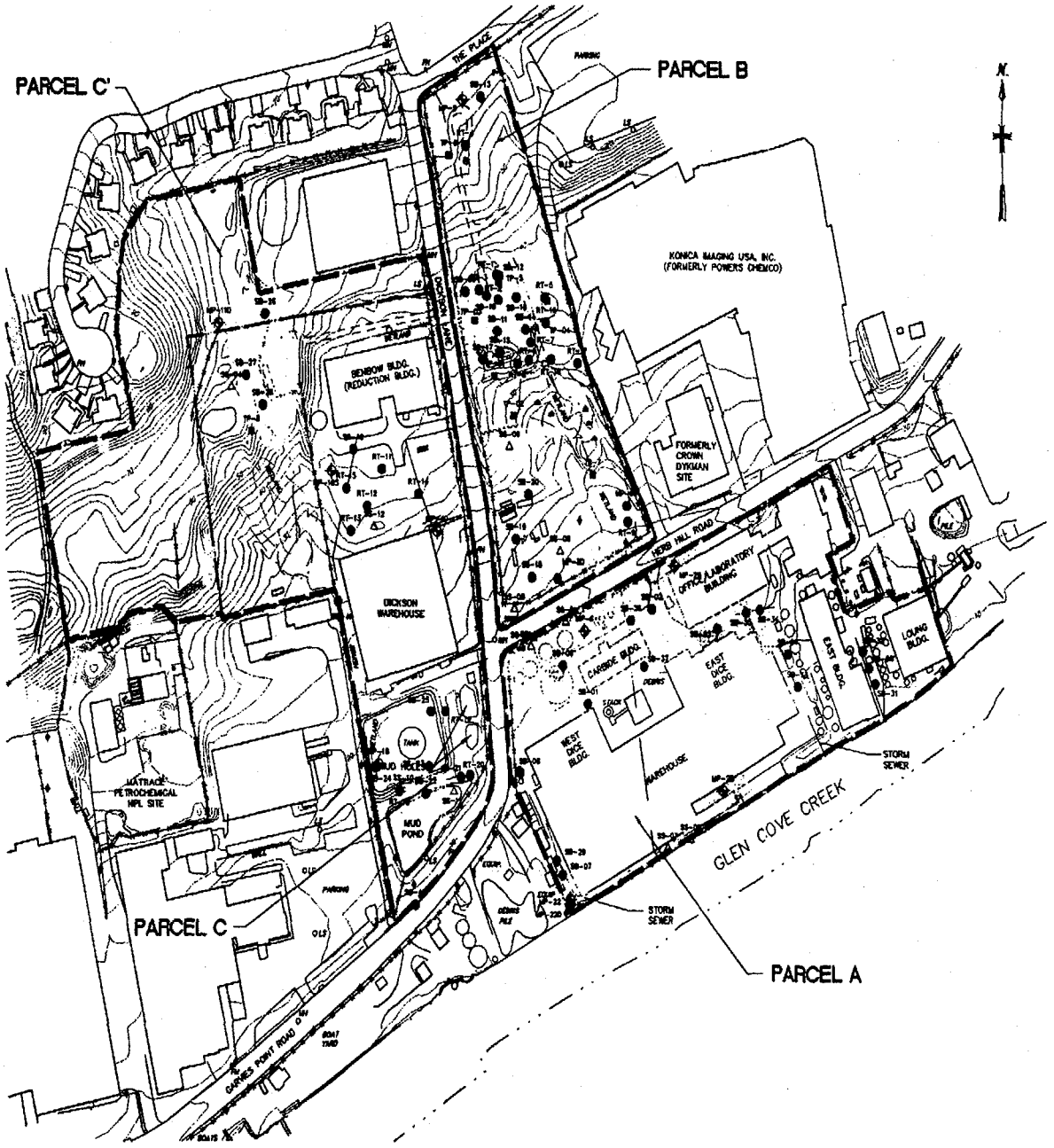
BENZENE CONCENTRATION IN SOIL (0-4 FEET)

PROJECT NO.: 8001202

FIGURE 5-3

7308 ADMIN

I:\ACAD\PROJ\80012020\GISFILES\REPORT\8001LTB1 Scale: 1:1i Date: 05/06/1998 Time: 08:31



BENZO[a]ANTHRACENE (ug/kg)

SITE_ID	Sample ID No.	Depth	Benzo(a)anthracene	SITE_ID	Sample ID No.	Depth	Benzo(a)anthracene
MP-110	LT-SB-MP-110	0- 2	U	SB-21	LT-SB-21R	2- 4	U
MP-16	LT-SB-MP-16S	0- 2	U	SB-22	LT-SB-22	4- 4	260 J
MP-18	LT-SB-MP-18	0- 2	U	SB-23	LT-SB-23	0- 2	U
MP-20	LT-SB-MP-20R	0- 2	99 J	SB-24	LT-SB-24	0- 2	U
MP-22	LT-SB-MP-22R	1- 3	310 J	SB-25	LT-SB-25	0- 2	U
MP-22	LT-SB-MP-22BR	3- 3	1100	SB-26	LT-SB-26	0- 2	170 J
MP-220	LT-SB-MP-220	1- 3	440	SB-27	LT-SB-27	0- 2	59 J
MP-220	LT-SB-MP-220B	3- 3	U	SB-27	LT-SB-27B	4- 6	U
MP-20	LT-SB-MP-20R	1- 3	280 J	SB-28	LT-SB-28R	2- 4	110 J
MP-40	LT-SB-MP-40R	1- 3	U	SB-28	LT-SB-28B	4- 6	43 J
MP-40	LT-SB-MP-40B	3- 5	U	SB-29	LT-SB-29R	3- 5	U
MP-5	LT-SB-MP-5	0- 2	U	SB-31	LT-SB-31	3- 5	9900 J
MP-6	LT-SB-MP-6B	2- 4	170 J	SB-32	LT-SB-32	3- 5	120 J
MP-80	LT-SB-MP-80	0- 2	U	SB-33	LT-SB-33R	3- 5	460 E
MP-80	LT-SB-MP-80B	4- 6	U	SB-34	LT-SB-34R	1- 3	U
MP-90	LT-SB-MP-90R	0- 2	U	SB-35	LT-SB-35R	1- 3	220 J
SB-01	LT-SB-01R	1- 3	570	SB-36	LT-SB-36R	1- 3	150 J
SB-02	LT-SB-02R	1- 3	U	SB-37	LT-SB-37R	1- 3	110 J
SB-02	LT-SB-02B	3- 5	U	SB-40	LT-SB-40R	3- 5	U
SB-03	LT-SB-03R	1- 3	1700	SB-42	LT-SB-42	4- 6	U
SB-03	LT-SB-03B	3- 5	U	SS-01	LT-SS-01R	0- 2	68 J
SB-04	LT-SB-04R	3- 5	U	SS-02	LT-SS-02	0- 2	81 J
SB-05	LT-SB-05	0- 2	540 E	SS-03	LT-SS-03R	0- 2	U
SB-06	LT-SB-06R	2- 4	200 J	SS-04	LT-SS-04	0- 2	U
SB-07	LT-SB-07R	0- 2	100 J	SS-05	LT-SS-05R	0- 2	3100
SB-08	LT-SB-08	0- 2	U	SS-06	LT-SS-06R	0- 2	U
SB-09	LT-SB-09R	0- 2	U	SS-07	LT-SS-07	0- 2	U
SB-10	LT-SB-10	0- 2	51	SS-08	LT-SS-08R	0- 2	U
SB-11	LT-SB-11	0- 2	100 J	SS-09	LT-SS-09	0- 2	92 J
SB-12	LT-SB-12	0- 2	U	SS-10	LT-SS-10	0- 2	U
SB-13	LT-SB-13	0- 4	U	SS-11	LT-SS-11	0- 2	U
SB-14	LT-SB-14	0- 2	U	SS-12	LT-SS-12	0- 2	U
SB-15	LT-SB-15	0- 2	U	TP-01	LT-SB-TP-01	1- 2	U
SB-15	LT-SB-15B	4- 6	U	TP-02	LT-SB-TP-02R	1- 3	U
SB-16	LT-SB-16R	0- 2	270 J	TP-03	LT-SB-TP-03R	0- 1	360 J
SB-17	LT-SB-17	0- 2	U	TP-04	LT-SB-TP-04R	4- 5	U
SB-17	LT-SB-17B	4- 6	U	TP-5	LT-SB-TP-05	0- 1	260 J
SB-18	LT-SB-18R	0- 2	U	TP-6	LT-SB-TP-06	2- 3	U
SB-19	LT-SB-19	0- 2	U	TP-7	LT-SB-TP-07	1- 2	U
SB-20	LT-SB-20	0- 2	U	TP-8	LT-SB-TP-08	0- 1	U

BENZO[a]ANTHRACENE (ug/kg)

4125
3300
2475
1650
825
43

9900+
9075
8250
7425
6600
5775
4950

0 100 200 300
SCALE IN FEET
1"=200'

MALCOLM PIRNIE

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LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

BENZO[a]ANTHRACENE CONCENTRATIONS IN SOIL (0-6 FEET)

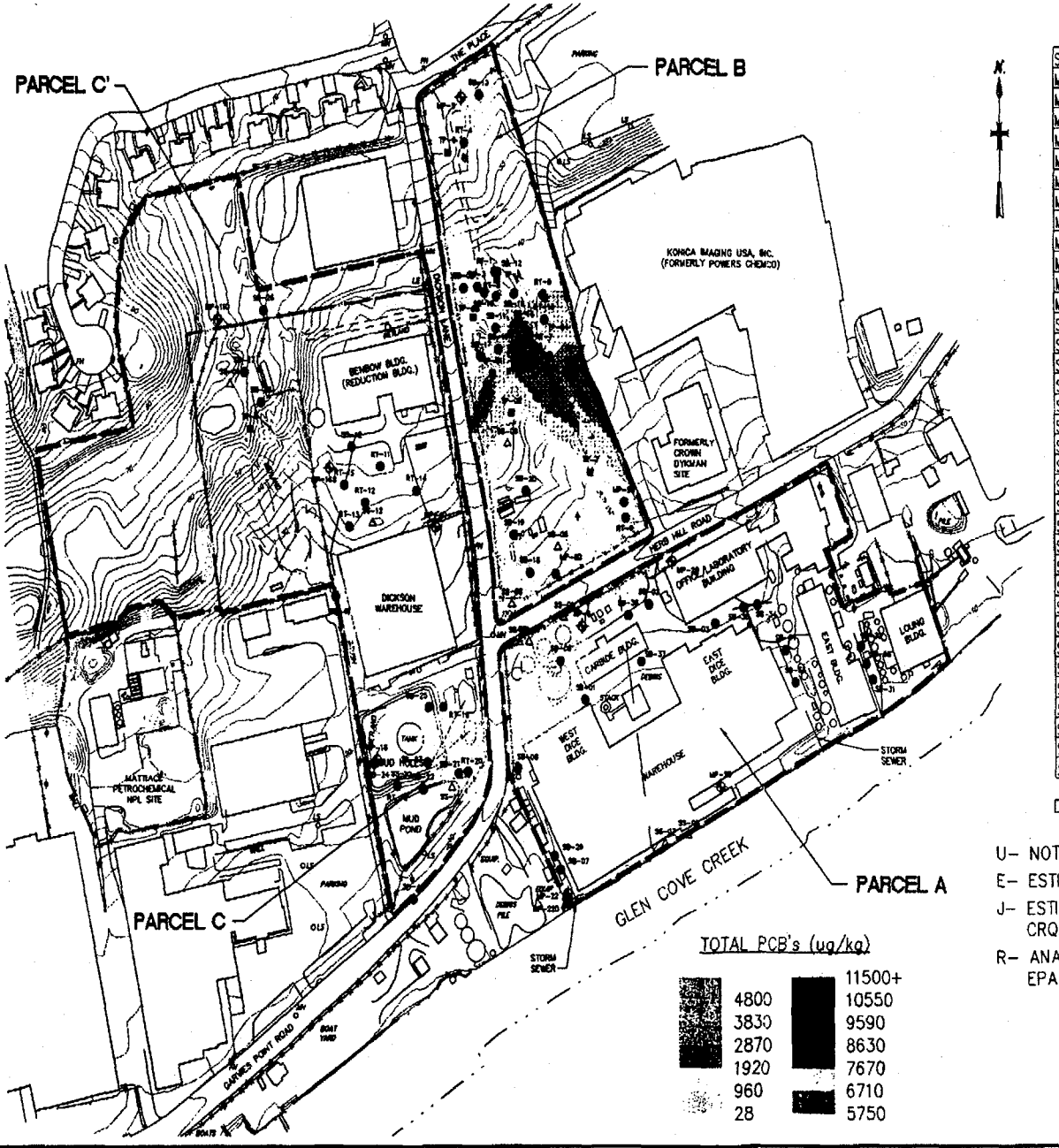
DATE: MAY 1998

PROJECT NO.: 8001202

FIGURE 5-4

I:\ACAD\PROJ\80012020\GISFILES\REPORT\8001LT86 Scale: 1:1 Date: 05/06/1998 Time: 08:33

7308 ADMIN



TOTAL PCB's (ug/kg)

SITE ID	Sample ID No.	Depth	Total PCB's	SITE ID	Sample ID No.	Depth	Total PCB's
MP-11D	LT-SB-MP-11D	0- 2	U	SB-24	LT-SB-24	0- 2	U
MP-16	LT-SB-MP-16S	0- 2	U	SB-25	LT-SB-25	0- 2	U
MP-18	LT-SB-MP-18	0- 2	U	SB-26	LT-SB-26	0- 2	U
MP-20	LT-SB-MP-20	0- 2	U	SB-27	LT-SB-27	0- 2	U
MP-22	LT-SB-MP-22	1- 3	U	SB-28	LT-SB-28	2- 4	U
MP-22D	LT-SB-MP-22D	1- 3	U	SB-29	LT-SB-29	3- 5	U
MP-2D	LT-SB-MP-2D	1- 3	U	SB-31	LT-SB-31	3- 5	U
MP-4D	LT-SB-MP-4D	1- 3	U	SB-32	LT-SB-32	3- 5	U
MP-5	LT-SB-MP-5	0- 2	U	SB-33	LT-SB-33	3- 5	U
MP-6	LT-SB-MP-6	0- 2	U	SB-34	LT-SB-34	1- 3	U
MP-8D	LT-SB-MP-8D	0- 2	U	SB-35	LT-SB-35	1- 3	U
MP-9D	LT-SB-MP-9D	0- 2	U	SB-36	LT-SB-36	1- 3	U
SB-01	LT-SB-01	1- 3	U	SB-37	LT-SB-37	1- 3	U
SB-02	LT-SB-02	1- 3	U	SB-40	LT-SB-40	3- 5	U
SB-03	LT-SB-03	1- 3	U	SB-41	LT-SB-41	4- 8	65
SB-04	LT-SB-04	1- 3	U	SS-01	LT-SS-01	0- 2	U
SB-04	LT-SB-04B	3- 5	U	SS-02	LT-SS-02	0- 2	U
SB-05	LT-SB-05	0- 2	U	SS-03	LT-SS-03	0- 2	340
SB-06	LT-SB-06	2- 4	1020	SS-04	LT-SS-04	0- 2	U
SB-07	LT-SB-07	0- 2	U	SS-05	LT-SS-05	0- 2	U
SB-08	LT-SB-08	0- 2	U	SS-06	LT-SS-06	0- 2	U
SB-09	LT-SB-09	0- 2	433	SS-07	LT-SS-07	0- 2	U
SB-10	LT-SB-10	0- 2	194	SS-08	LT-SS-08	0- 2	279
SB-11	LT-SB-11	0- 2	350	SS-09	LT-SS-09	0- 2	U
SB-12	LT-SB-12	0- 2	152	SS-10	LT-SS-10	0- 2	U
SB-13	LT-SB-13B	14- 16	49	SS-11	LT-SS-11	0- 2	U
SB-14	LT-SB-14	0- 2	15890	SS-12	LT-SS-12	0- 2	U
SB-15	LT-SB-15	0- 2	2110	TP-01	LT-SB-TP-01	1- 2	7490
SB-16	LT-SB-16	0- 2	U	TP-02	LT-SB-TP-02	1- 2	37
SB-17	LT-SB-17	0- 2	555	TP-03	LT-SB-TP-03	0- 1	620
SB-18	LT-SB-18	0- 2	41	TP-5	LT-SB-TP-05	0- 1	1100
SB-19	LT-SB-19	0- 2	U	TP-6	LT-SB-TP-06	2- 3	U
SB-20	LT-SB-20	0- 2	U	TP-7	LT-SB-TP-07	1- 2	510
SB-21	LT-SB-21	2- 4	920	TP-8	LT-SB-TP-08	0- 1	U
SB-23	LT-SB-23	0- 2	U				

DEPTHS ARE IN FEET BELOW GROUND SURFACE

U- NOT DETECTED

E- ESTIMATED VALUE

J- ESTIMATED VALUE, BELOW CRQL, ABOVE IDL

R- ANALYSES DID NOT PASS EPA QA/QC

IN A BOREHOLE WHERE TWO SAMPLES WERE COLLECTED FOR THE 0-4 FOOT INTERVAL, ONLY THE HIGHEST DETECTED CONCENTRATION WAS SELECTED FOR ILLUSTRATION.

0 100 200 300
SCALE IN FEET
1"=200'

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USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

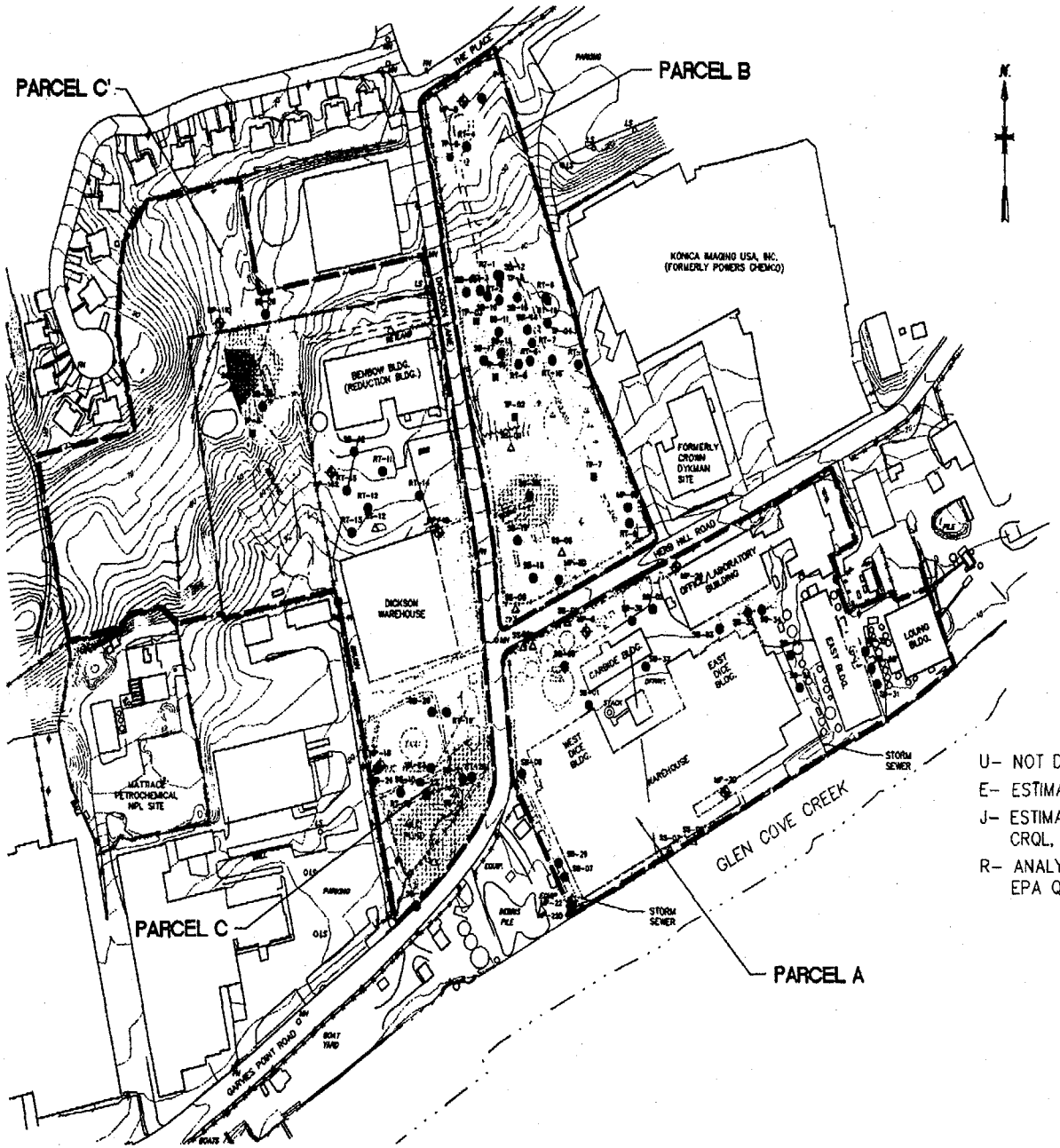
TOTAL PCB CONCENTRATIONS IN SOIL (0-5 FEET)

DATE: MAY 1998

PROJECT NO.: 8001202

FIGURE 5-5

I:\ACAD\PROJ\80012020\GISFILES\REPORT\8001LT87 Scale: 1:1 Date: 05/06/1998 Time: 08:34
7308 ADMIN



ARSENIC (mg/kg)

SITE ID	Sample ID No.	Depth	Arsenic	SITE ID	Sample ID No.	Depth	Arsenic
MP-11D	LT-SB-MP-11D	0- 2	4.4	SB-23	LT-SB-23B	2- 4	161
MP-16	LT-SB-MP-16SB	2- 4	3.9 E	SB-24	LT-SB-24	0- 2	114
MP-18	LT-SB-MP-18	0- 2	442	SB-25	LT-SB-25	0- 2	503
MP-20	LT-SB-MP-20	0- 2	6.4	SB-26	LT-SB-26	0- 2	10.9
MP-22	LT-SB-MP-22	1- 3	54.5	SB-27	LT-SB-27	0- 2	6300
MP-22D	LT-SB-MP-22D	1- 3	20	SB-28	LT-SB-28	2- 4	1620
MP-2D	LT-SB-MP-2D	1- 3	63.8	SB-29	LT-SB-29	3- 5	45.2
MP-4D	LT-SB-MP-4D	1- 3	2 J	SB-31	LT-SB-31	3- 5	13.2
MP-5	LT-SB-MP-5	0- 2	14.9	SB-32	LT-SB-32	3- 5	51.6
MP-6	LT-SB-MP-6B	2- 4	30.5	SB-34	LT-SB-34	1- 3	16.1 E
MP-8D	LT-SB-MP-8D	0- 2	R	SB-35	LT-SB-35	1- 3	7.3 E
MP-9D	LT-SB-MP-9D	0- 2	10	SB-36	LT-SB-36	1- 3	R
SB-01	LT-SB-01	1- 3	R	SB-37	LT-SB-37	1- 3	R
SB-02	LT-SB-02	1- 3	R	SB-40	LT-SB-40	3- 5	2950
SB-03	LT-SB-03	1- 3	R	SS-01	LT-SS-01	0- 2	59.9
SB-04	LT-SB-04	1- 3	R	SS-02	LT-SS-02	0- 2	125
SB-05	LT-SB-05B	2- 4	91.6	SS-03	LT-SS-03	0- 2	523
SB-06	LT-SB-06	0- 2	95	SS-04	LT-SS-04	0- 2	6210
SB-07	LT-SB-07B	2- 4	57.7	SS-05	LT-SS-05	0- 2	99.9
SB-08	LT-SB-08	0- 2	R	SS-06	LT-SS-06	0- 2	269
SB-09	LT-SB-09	0- 2	341	SS-07	LT-SS-07	0- 2	197
SB-10	LT-SB-10B	2- 4	10.2 E	SS-08	LT-SS-08	0- 2	324
SB-11	LT-SB-11	0- 2	418	SS-09	LT-SS-09	0- 2	35.2
SB-12	LT-SB-12	0- 2	105	SS-10	LT-SS-10	0- 2	534
SB-13	LT-SB-13	0- 4	R	SS-11	LT-SS-11	0- 2	R
SB-14	LT-SB-14	0- 2	168	SS-12	LT-SS-12	0- 2	R
SB-15	LT-SB-15	0- 2	1340	TP-01	LT-SB-TP-01	1- 2	516
SB-16	LT-SB-16	0- 2	R	TP-02	LT-SB-TP-02	1- 2	42
SB-17	LT-SB-17	0- 2	123	TP-03	LT-SB-TP-03	0- 1	725
SB-18	LT-SB-18	0- 2	205	TP-5	LT-SB-TP-05	0- 1	176
SB-19	LT-SB-19	0- 2	662	TP-6	LT-SB-TP-06	2- 3	5.1 E
SB-20	LT-SB-20	0- 2	1790	TP-7	LT-SB-TP-07	1- 2	61.4
SB-21	LT-SB-21	2- 4	1600	TP-8	LT-SB-TP-08	0- 1	694

DEPTHS ARE IN FEET BELOW GROUND SURFACE

U- NOT DETECTED
E- ESTIMATED VALUE
J- ESTIMATED VALUE, BELOW CRQL, ABOVE IDL
R- ANALYSES DID NOT PASS EPA QA/QC

IN A BOREHOLE WHERE TWO SAMPLES WERE COLLECTED FOR THE 0-4 FOOT INTERVAL, ONLY THE HIGHEST DETECTED CONCENTRATION WAS SELECTED FOR ILLUSTRATION.

ARSENIC (mg/kg)

2625
2100
1575
1050
525
2

6300+
5775
5250
4725
4200
3675
3150

0 100 200 300
SCALE IN FEET
1"=200'

MALCOLM PIRNIE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

DATE: MAY 1998

ARSENIC CONCENTRATIONS IN SOIL (0-4 FEET)

PROJECT NO.: 8001202

FIGURE 5-6

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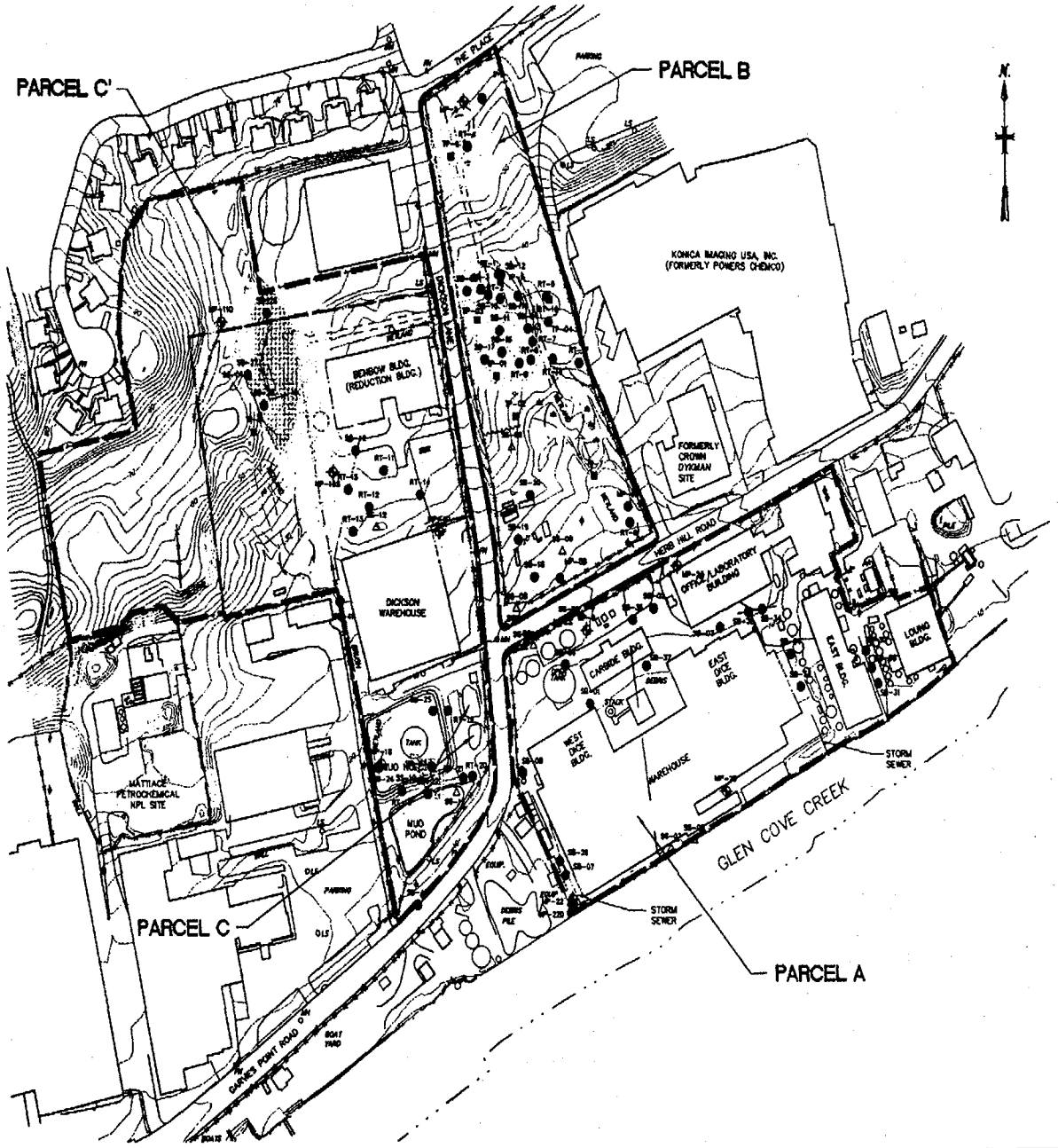
7308 ADMIN



ARSENIC (mg/kg)

SITE_ID	Sample ID No.	Depth	Arsenic
SB-02	LT-SB-02B	3- 5	R
SB-03	LT-SB-03B	3- 5	R
SB-04	LT-SB-04B	3- 5	R
MP-4D	LT-SB-MP-4DB	3- 5	1.4 J
MP-22	LT-SB-MP-22B	3- 5	45.9
MP-22D	LT-SB-MP-22DB	3- 5	27.4
SB-22	LT-SB-22	4- 4	1400
TP-04	LT-SB-TP-04	4- 5	6 E
SB-15	LT-SB-15B	4- 6	191
SB-17	LT-SB-17B	4- 6	45.9
SB-27	LT-SB-27B	4- 6	9.1
SB-28	LT-SB-28B	4- 6	2230
SB-42	LT-SB-42	4- 6	3.1 E
MP-8D	LT-SB-MP-8DB	4- 6	R
SB-41	LT-SB-41	4- 8	3.1 E
SB-09	LT-SB-09B	6- 8	17.5
SB-14	LT-SB-14B	6- 8	1.6 J
SB-11	LT-SB-11B	8- 10	R
SB-16	LT-SB-16B	8- 10	R
MP-11D	LT-SB-MP-11DB	8- 10	4.5
SB-26	LT-SB-26B	10- 12	1290
SB-13	LT-SB-13B	14- 16	2.4 E
MP-5	LT-SB-MP-5B	18- 20	6.5
SB-33	LT-SB-33	3- 5	2.2 J

DEPTHS ARE IN FEET BELOW GROUND SURFACE

U- NOT DETECTED

E- ESTIMATED VALUE

J- ESTIMATED VALUE, BELOW CRQL, ABOVE IDL

R- ANALYSES DID NOT PASS EPA QA/QC

ARSENIC (mg/kg)

2625
2100
1575
1050
525
1.4

6300+
5775
5250
4725
4200
3675
3150

0 100 200 300
SCALE IN FEET
1"=200'

I:\ACAD\PROJ\80012020\GISFILES\REPORT\8001LT91 Scale: 1:1i Date: 05/06/1998 Time: 08:37

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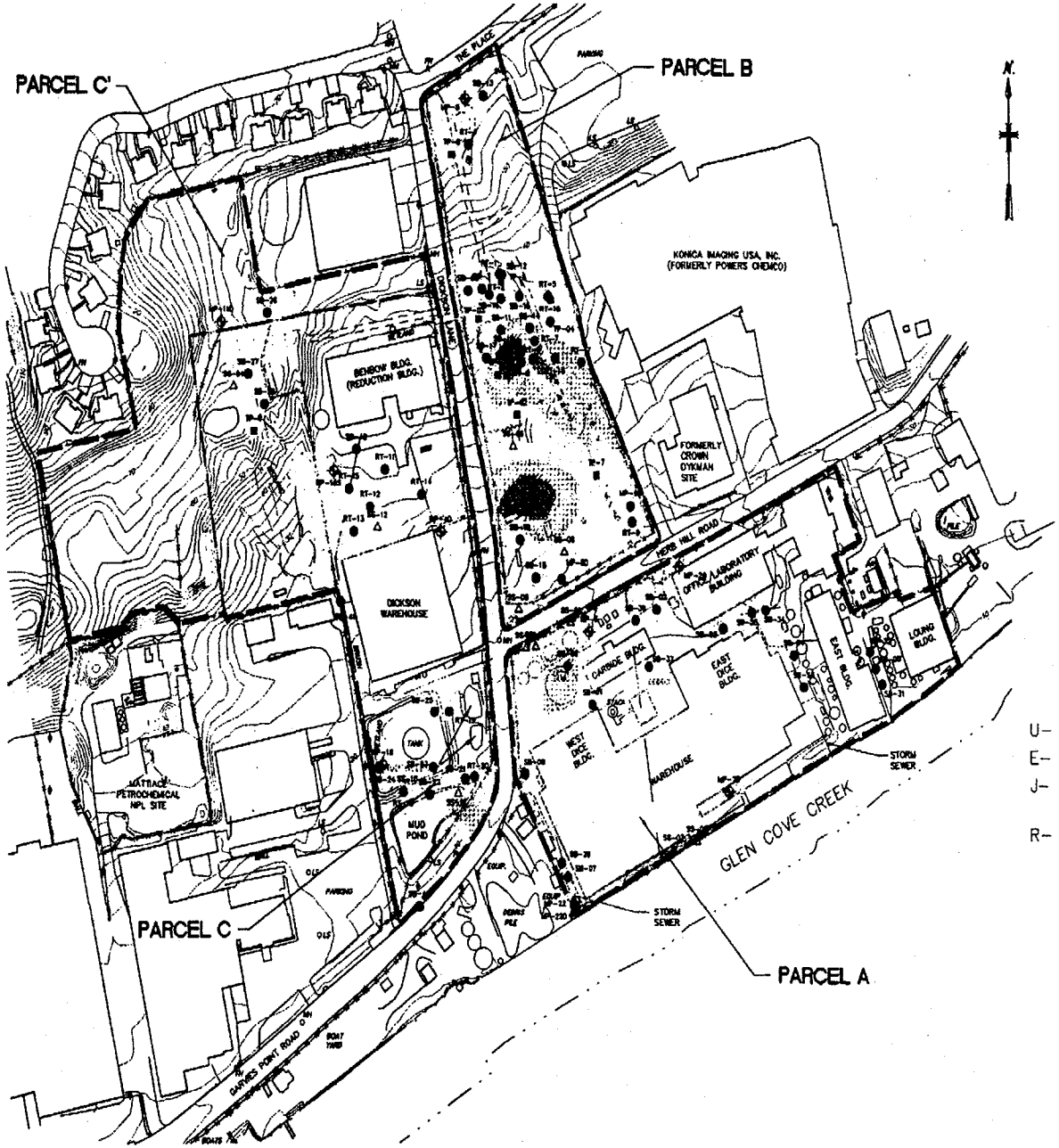
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

ARSENIC CONCENTRATION IN SOIL (BELOW 4 FEET)

DATE: MAY 1998

PROJECT NO.: 8001202

FIGURE 5-7



COBALT (mg/kg)

SITE ID	Sample ID No.	Depth	Cobalt	SITE ID	Sample ID No.	Depth	Cobalt
MP-11D	LT-SB-MP-11D	0- 2	2.2 J	SB-20	LT-SB-20	0- 2	4660
MP-16	LT-SB-MP-16S	0- 2	6 J	SB-21	LT-SB-21	2- 4	59.5
MP-18	LT-SB-MP-18B	2- 4	16.9 E	SB-23	LT-SB-23B	2- 4	9.2 J
MP-20	LT-SB-MP-20	0- 2	9.9 J	SB-24	LT-SB-24	0- 2	6.7 J
MP-22	LT-SB-MP-22	1- 3	10.7 J	SB-25	LT-SB-25	0- 2	14.6 E
MP-22D	LT-SB-MP-22D	1- 3	14.4	SB-26	LT-SB-26	0- 2	3.1 J
MP-2D	LT-SB-MP-2D	1- 3	53.4	SB-27	LT-SB-27	0- 2	17.5
MP-4D	LT-SB-MP-4D	1- 3	4.5 J	SB-28	LT-SB-28	2- 4	2.4
MP-5	LT-SB-MP-5	0- 2	15.9	SB-34	LT-SB-34	1- 3	12 E
MP-6	LT-SB-MP-6B	2- 4	20.4	SB-35	LT-SB-35	1- 3	81.1
MP-8D	LT-SB-MP-8D	0- 2	6.2 J	SB-36	LT-SB-36	1- 3	3.8 J
MP-9D	LT-SB-MP-9D	0- 2	8.4 J	SB-37	LT-SB-37	1- 3	9.1 J
SB-01	LT-SB-01	1- 3	27	SS-01	LT-SS-01	0- 2	19.3
SB-02	LT-SB-02	1- 3	5.2 J	SS-02	LT-SS-02	0- 2	16.3
SB-03	LT-SB-03	1- 3	5 J	SS-03	LT-SS-03	0- 2	102
SB-04	LT-SB-04	1- 3	3.1 J	SS-04	LT-SS-04	0- 2	53.6
SB-05	LT-SB-05	0- 2	18.3	SS-05	LT-SS-05	0- 2	1210
SB-06	LT-SB-06	2- 4	1310	SS-06	LT-SS-06	0- 2	165
SB-07	LT-SB-07B	2- 4	23	SS-07	LT-SS-07	0- 2	1560
SB-08	LT-SB-08	0- 2	34.6	SS-08	LT-SS-08	0- 2	91.2
SB-09	LT-SB-09	0- 2	63.9	SS-09	LT-SS-09	0- 2	12.2
SB-10	LT-SB-10	0- 2	51.8	SS-10	LT-SS-10	0- 2	262
SB-11	LT-SB-11	0- 2	554	SS-11	LT-SS-11	0- 2	764
SB-12	LT-SB-12	0- 2	20.5	SS-12	LT-SS-12	0- 2	121
SB-13	LT-SB-13	0- 4	8.4 J	TP-01	LT-SB-TP-01	1- 2	2200
SB-14	LT-SB-14	0- 2	2240 E	TP-02	LT-SB-TP-02	1- 2	20.2
SB-15	LT-SB-15	0- 2	4620	TP-03	LT-SB-TP-03	0- 1	87.3
SB-16	LT-SB-16	0- 2	11.2	TP-5	LT-SB-TP-05	0- 1	465
SB-17	LT-SB-17	0- 2	250 E	TP-6	LT-SB-TP-06	2- 3	11.6
SB-18	LT-SB-18	0- 2	5.2 J	TP-7	LT-SB-TP-07	1- 2	26.1
SB-19	LT-SB-19B	2- 4	4.3 J	TP-8	LT-SB-TP-08	0- 1	3.4 J

DEPTHS ARE IN FEET BELOW GROUND SURFACE

U- NOT DETECTED

E- ESTIMATED VALUE

J- ESTIMATED VALUE, BELOW CRQL, ABOVE IDL

R- ANALYSES DID NOT PASS EPA QA/QC

IN A BOREHOLE WHERE TWO SAMPLES WERE COLLECTED FOR THE 0-4 FOOT INTERVAL, ONLY THE HIGHEST DETECTED CONCENTRATION WAS SELECTED FOR ILLUSTRATION.

COBALT (mg/kg)

1940
1552
1164
776
388
1.6

4650+
4268
3880
3492
3104
2716
2328

0 100 200 300
SCALE IN FEET
1"=200'

MALCOLM PIRNIE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

COBALT CONCENTRATIONS IN SOIL (0-4 FEET)

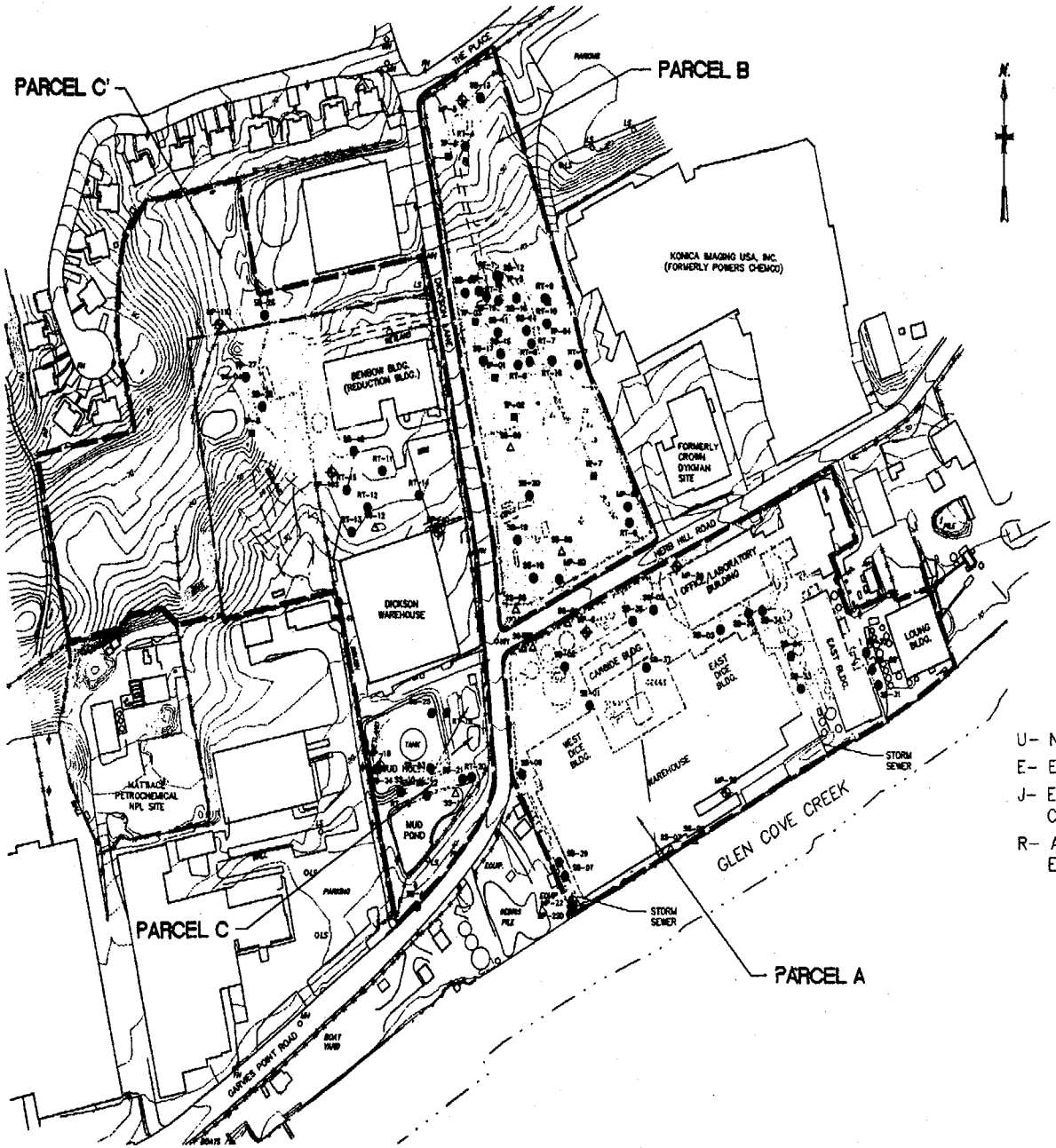
DATE: MAY 1998

PROJECT NO.: 8001202

FIGURE 5-8

I:\ACAD\PROJ\8001202O\GISFILES\REPORT\B001LT92 Scale: 1:1 Date: 05/06/1998 Time: 08:37

7308 ADMIN



COBALT (mg/kg)

SITE_ID	Sample ID No.	Depth	Cobalt
MP-11D	LT-SB-MP-11DB	8- 10	1.6 J
MP-22	LT-SB-MP-22B	3- 5	10.3 J
MP-22D	LT-SB-MP-22DB	3- 5	9.5 J
MP-40	LT-SB-MP-40B	3- 5	
MP-5	LT-SB-MP-5B	18- 20	2.6 J
MP-8D	LT-SB-MP-8DB	4- 6	2.4 J
SB-02	LT-SB-02B	3- 5	5.5 J
SB-03	LT-SB-03B	3- 5	9.5 J
SB-04	LT-SB-04B	3- 5	3.7 J
SB-09	LT-SB-09B	6- 8	7.2 J
SB-11	LT-SB-11B	8- 10	6.2 J
SB-13	LT-SB-13B	14- 16	7.6 J
SB-14	LT-SB-14B	6- 8	35.6 E
SB-15	LT-SB-15B	4- 6	196
SB-16	LT-SB-16B	8- 10	6.2 J
SB-17	LT-SB-17B	4- 6	55.7 E
SB-22	LT-SB-22	4- 4	119
SB-26	LT-SB-26B	10- 12	1.7
SB-27	LT-SB-27B	4- 6	7.9
SB-28	LT-SB-28B	4- 6	107
SB-29	LT-SB-29	3- 5	54.4
SB-31	LT-SB-31	3- 5	5.3
SB-32	LT-SB-32	3- 5	42.6
SB-33	LT-SB-33	3- 5	8.2
SB-40	LT-SB-40	3- 5	
SB-41	LT-SB-41	4- 8	3.2 J
SB-42	LT-SB-42	4- 6	3.3 J
TP-04	LT-SB-TP-04	4- 5	16

DEPTHS ARE IN FEET BELOW GROUND SURFACE

U- NOT DETECTED

E- ESTIMATED VALUE

J- ESTIMATED VALUE, BELOW CRQL, ABOVE IDL

R- ANALYSES DID NOT PASS EPA QA/QC

IN A BOREHOLE WHERE TWO SAMPLES WERE COLLECTED FOR THE 0-4 FOOT INTERVAL, ONLY THE HIGHEST DETECTED CONCENTRATION WAS SELECTED FOR ILLUSTRATION.

COBALT (mg/kg)

1940
1552
1164
776
388
1.6

4650+
4268
3880
3492
3104
2716
2328

0 100 200 300
SCALE IN FEET
1"=200'

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GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

COBALT CONCENTRATIONS IN SOIL (BELOW 4 FEET)

DATE: MAY 1998

PROJECT NO.: 8001202

FIGURE 5-9

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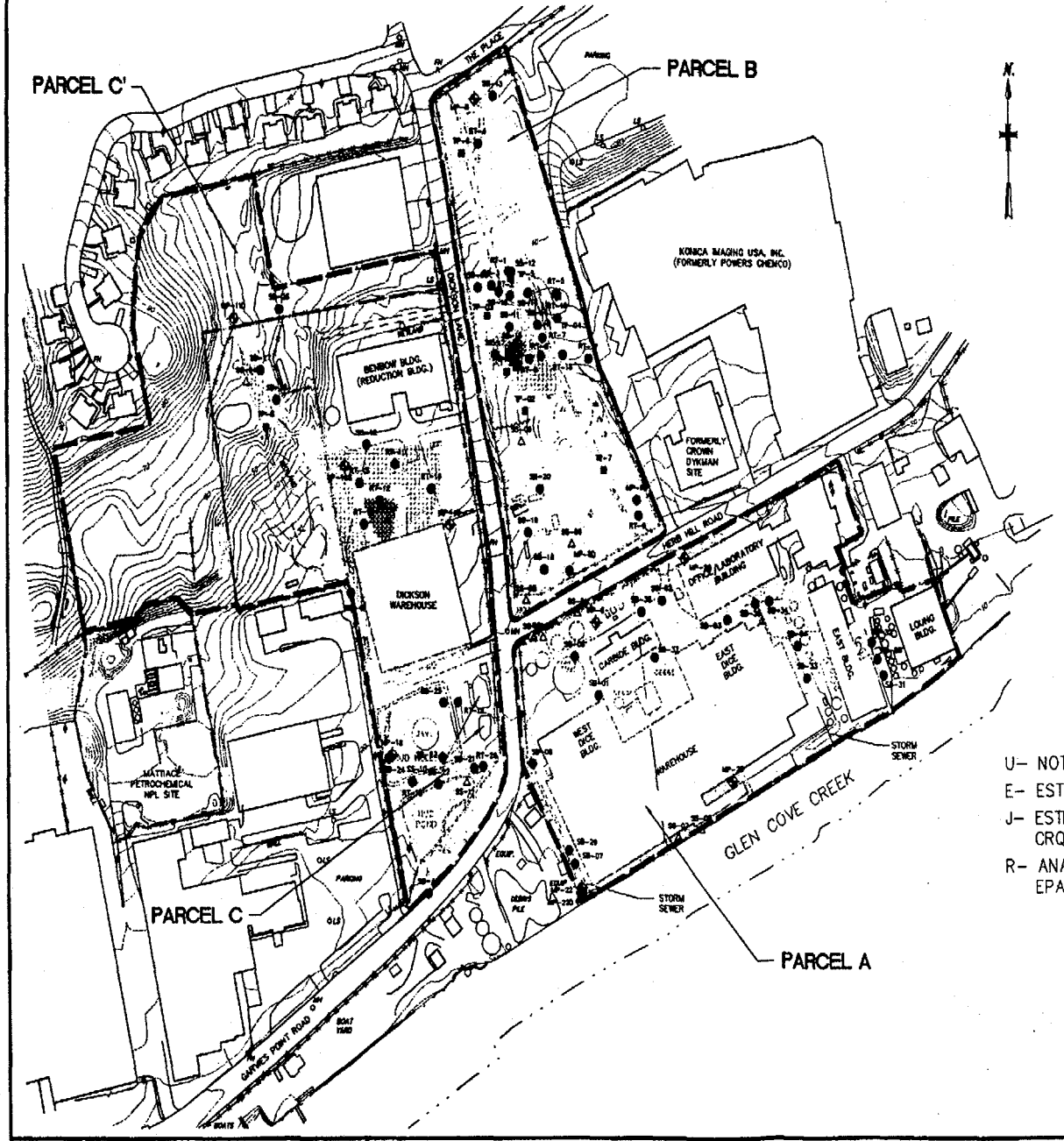
7308 ADMIN



MANGANESE (mg/kg)

SITE ID	Sample ID No.	Depth	Manganese	SITE ID	Sample ID No.	Depth	Manganese
MP-11D	LT-SB-MP-11D	0- 2	125 E	SB-24	LT-SB-24	0- 2	834 E
MP-16	LT-SB-MP-16S	0- 2	R	SB-25	LT-SB-25	0- 2	1050 E
MP-18	LT-SB-MP-18	0- 2	462 E	SB-26	LT-SB-26	0- 2	163 E
MP-20	LT-SB-MP-20B	2- 3	458 E	SB-27	LT-SB-27	0- 2	3650 E
MP-22	LT-SB-MP-22	1- 3	133 E	SB-28	LT-SB-28	2- 4	135 E
MP-22D	LT-SB-MP-22D	1- 3	78.1 E	SB-29	LT-SB-29	3- 5	112
MP-2D	LT-SB-MP-2D	1- 3	238 E	SB-31	LT-SB-31	3- 5	66.7 E
MP-4D	LT-SB-MP-4D	1- 3	205 E	SB-32	LT-SB-32	3- 5	65.9 E
MP-5	LT-SB-MP-5	0- 2	541 E	SB-33	LT-SB-33	3- 5	62 E
MP-6	LT-SB-MP-6B	2- 4	524 E	SB-34	LT-SB-34	1- 3	322 E
MP-8D	LT-SB-MP-8D	0- 2	196 E	SB-35	LT-SB-35	1- 3	145 E
MP-9D	LT-SB-MP-9D	0- 2	948 E	SB-36	LT-SB-36	1- 3	157
SB-01	LT-SB-01	1- 3	255	SB-37	LT-SB-37	1- 3	219
SB-02	LT-SB-02	1- 3	134	SB-40	LT-SB-40	3- 5	59.4 E
SB-03	LT-SB-03	1- 3	120	SS-01	LT-SS-01	0- 2	11600 E
SB-04	LT-SB-04	1- 3	72.5	SS-02	LT-SS-02	0- 2	415 E
SB-05	LT-SB-05	0- 2	129 E	SS-03	LT-SS-03	0- 2	1530 E
SB-06	LT-SB-06	2- 4	R	SS-04	LT-SS-04	0- 2	49600 E
SB-07	LT-SB-07	0- 2	92.1	SS-05	LT-SS-05	0- 2	1060 E
SB-08	LT-SB-08	0- 2	171	SS-06	LT-SS-06	0- 2	1050 E
SB-09	LT-SB-09	0- 2	858 E	SS-07	LT-SS-07	0- 2	3950 E
SB-10	LT-SB-10	0- 2	5170 E	SS-08	LT-SS-08	0- 2	875 E
SB-11	LT-SB-11	0- 2	1380	SS-09	LT-SS-09	0- 2	729 E
SB-12	LT-SB-12	0- 2	2030 E	SS-10	LT-SS-10	0- 2	2930
SB-13	LT-SB-13	0- 4	626	SS-11	LT-SS-11	0- 2	2550 E
SB-14	LT-SB-14	0- 2	1350 E	SS-12	LT-SS-12	0- 2	61700 E
SB-15	LT-SB-15	0- 2	90000 E	TP-01	LT-SB-TP-01	1- 2	2480 E
SB-16	LT-SB-16	0- 2	246	TP-02	LT-SB-TP-02	1- 2	470 E
SB-17	LT-SB-17	0- 2	20800 E	TP-03	LT-SB-TP-03	0- 1	4870 E
SB-18	LT-SB-18	0- 2	262 E	TP-5	LT-SB-TP-05	0- 1	1410 E
SB-19	LT-SB-19B	2- 4	172 E	TP-6	LT-SB-TP-06	2- 3	673 E
SB-20	LT-SB-20	0- 2	5680 E	TP-7	LT-SB-TP-07	1- 2	231 E
SB-21	LT-SB-21	2- 4	R	TP-8	LT-SB-TP-08	0- 1	57.1 E
SB-23	LT-SB-23B	2- 4	229 E				

DEPTHS ARE IN FEET BELOW GROUND SURFACE

U- NOT DETECTED

E- ESTIMATED VALUE

J- ESTIMATED VALUE, BELOW CRQL, ABOVE IDL

R- ANALYSES DID NOT PASS EPA QA/QC

IN A BOREHOLE WHERE TWO SAMPLES WERE COLLECTED FOR THE 0-4 FOOT INTERVAL, ONLY THE HIGHEST DETECTED CONCENTRATION WAS SELECTED FOR ILLUSTRATION.

MANGANESE (mg/kg)

37500
30000
22500
15000
7500
46.9

90000+
82500
75000
67500
60000
52500
45000

0 100 200 300
SCALE IN FEET
1"=200'

MALCOLM PIRNIE

LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

MANGANESE CONCENTRATIONS IN SOIL (0-4 FEET)

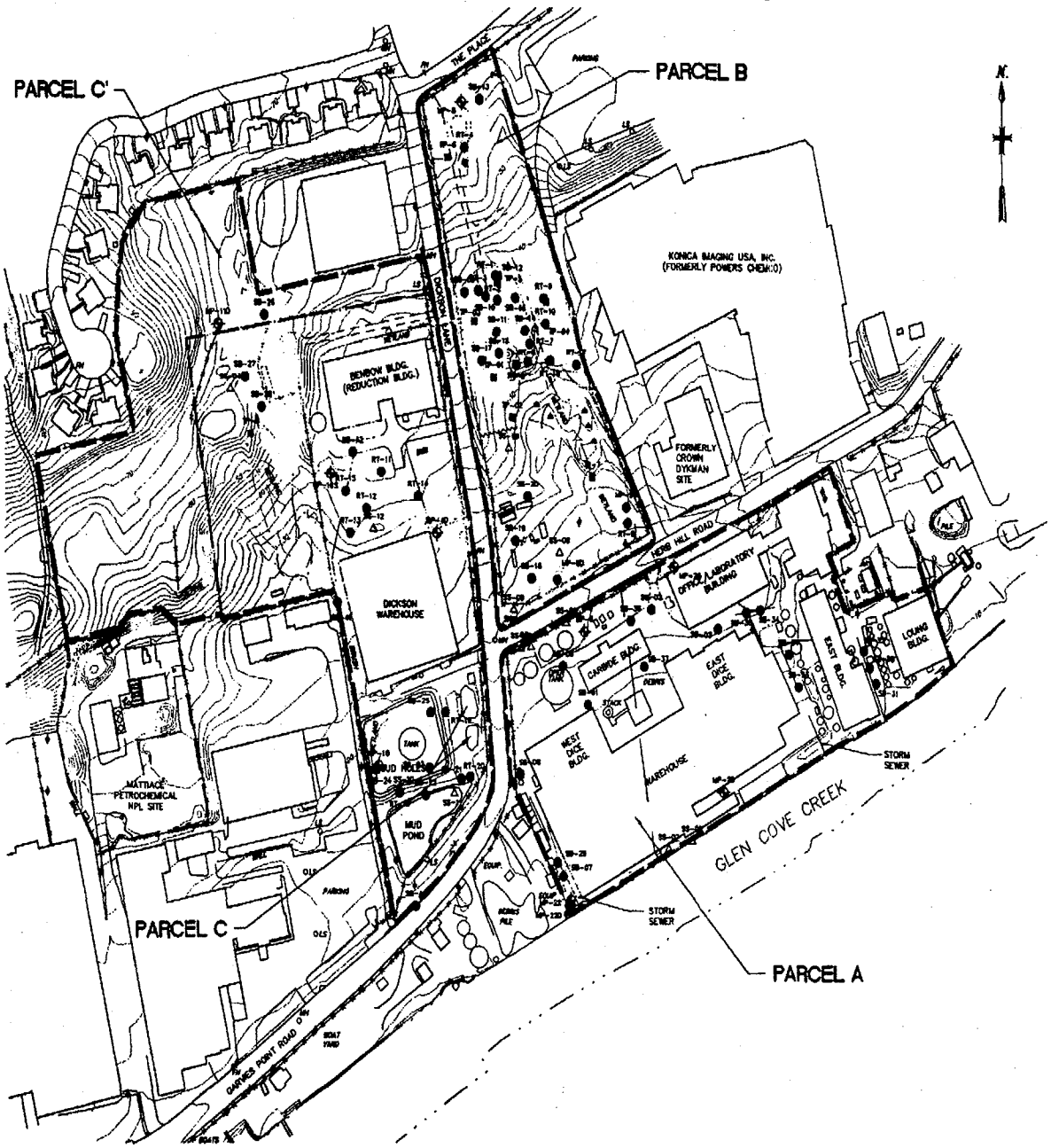
DATE: MAY 1998

PROJECT NO.: 8001202

FIGURE 5-10

I:\ACAD\PROJ\80012020\GISFILES\REPORT\8001LT94 Scale: 1:1 Date: 05/06/1998 Time: 08:39

7308 ADMIN



MANGANESE (mg/kg)

SITE_ID	Sample ID No.	Depth	Manganese
SB-02	LT-SB-02B	3- 5	132
SB-03	LT-SB-03B	3- 5	145
SB-04	LT-SB-04B	3- 5	46.9
MP-4D	LT-SB-MP-4DB	3- 5	137 E
MP-22	LT-SB-MP-22B	3- 5	64.6 E
MP-22D	LT-SB-MP-22DB	3- 5	66.2 E
SB-22	LT-SB-22	4- 4	R
TP-04	LT-SB-TP-04	4- 5	273 E
SB-15	LT-SB-15B	4- 6	1040 E
SB-17	LT-SB-17B	4- 6	6300 E
SB-27	LT-SB-27B	4- 6	275 E
SB-28	LT-SB-28B	4- 6	504 E
SB-42	LT-SB-42	4- 6	122 E
MP-8D	LT-SB-MP-8DB	4- 6	193 E
SB-41	LT-SB-41	4- 8	61 E
SB-09	LT-SB-09B	6- 8	108 E
SB-14	LT-SB-14B	6- 8	151 E
SB-11	LT-SB-11B	8- 10	1880
SB-16	LT-SB-16B	8- 10	252
MP-11D	LT-SB-MP-11DB	8- 10	55 E
SB-26	LT-SB-26B	10- 12	247 E
SB-13	LT-SB-13B	14- 16	2220 E
MP-5	LT-SB-MP-5B	18- 20	407 E

DEPTHS ARE IN FEET BELOW GROUND SURFACE

U- NOT DETECTED

E- ESTIMATED VALUE

J- ESTIMATED VALUE, BELOW CRQL, ABOVE IDL

R- ANALYSES DID NOT PASS EPA QA/QC

MANGANESE (mg/kg)

37500
30000
22500
15000
7500
46.9

90000+
82500
75000
67500
60000
52500
45000

0 100 200 300
SCALE IN FEET
1"=200'

MALCOLM PIRNIE

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CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

DATE: MAY 1998

MANGANESE CONCENTRATIONS IN SOIL (BELOW 4 FEET)

PROJECT NO.: 8001202

FIGURE 5-11

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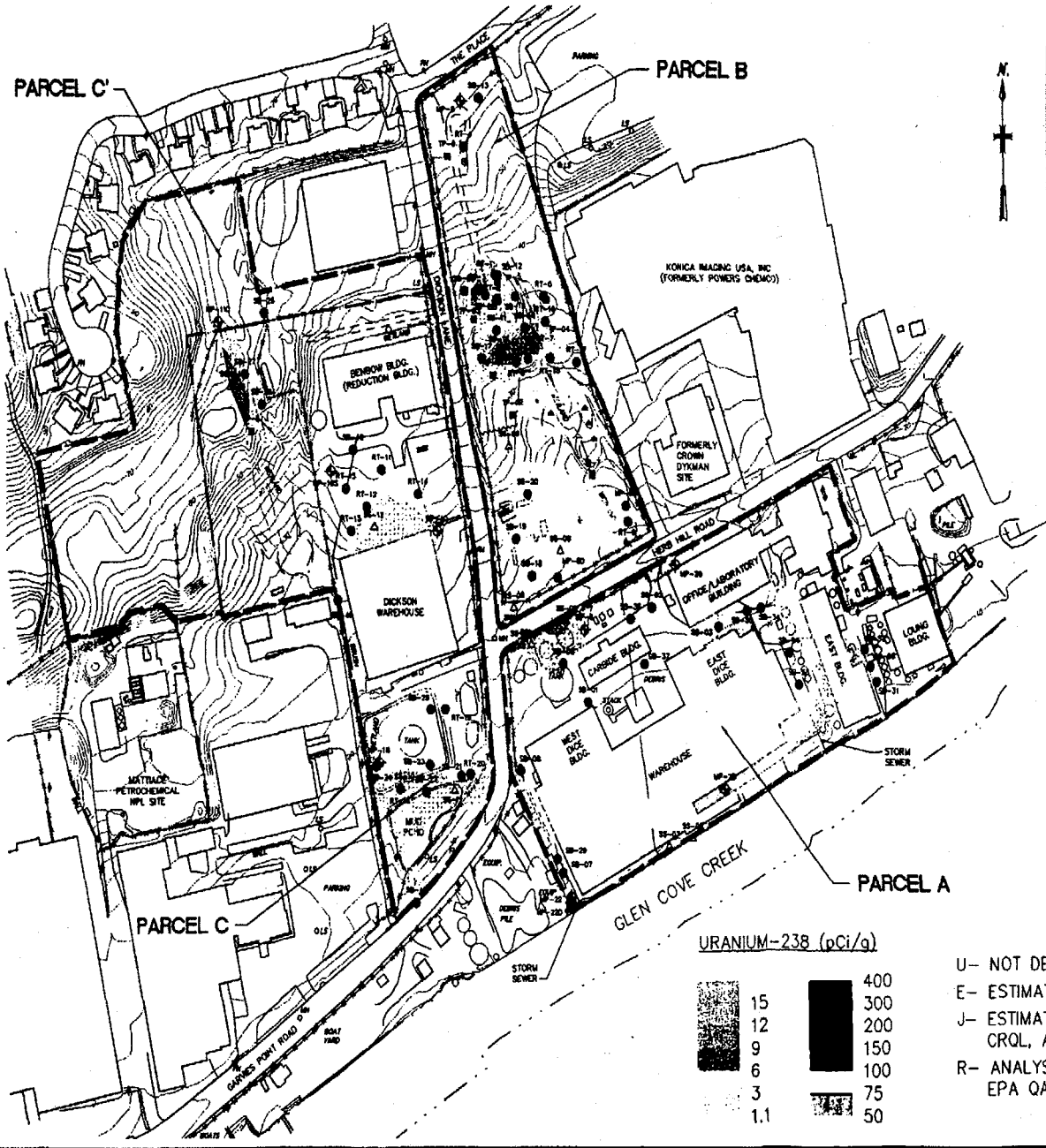
7308 ADMIN



URANIUM-238 (pCi/g)

SITE_ID	Sample ID No.	Depth	Uranium-238		SITE_ID	Sample ID No.	Depth	Uranium-238
MP-11D	LT-SB-MP-11D	0- 2	< 0.3		SB-12	LT-SB-12	0- 2	1.0
MP-16	LT-SB-MP-16SB	2- 4	1.0		SB-13	LT-SB-13	0- 4	1.0
MP-18	LT-SB-MP-18	0- 2	< 0.3		SB-14	LT-SB-14	0- 2	1.0
MP-20	LT-SB-MP-20	0- 2	1.0		SB-15	LT-SB-15	0- 2	180
MP-22	LT-SB-MP-22	1- 3	0.6		SB-16	LT-SB-16	0- 2	1.0
MP-22D	LT-SB-MP-22D	1- 3	0.6		SB-17	LT-SB-17	0- 2	26
MP-2D	LT-SB-MP-2D	1- 3	1.0		SB-18	LT-SB-18	0- 2	< 0.3
MP-4D	LT-SB-MP-4D	1- 3	< 0.3		SB-19	LT-SB-19	0- 2	2.0
MP-5	LT-SB-MP-5	0- 2	1.0		SB-20	LT-SB-20	0- 2	2.0
MP-6	LT-SB-MP-6B	2- 4	0.5		SB-21	LT-SB-21	2- 4	2.0
MP-8D	LT-SB-MP-8D	0- 2	1.0		SB-23	LT-SB-23	0- 2	1.0
MP-9D	LT-SB-MP-9D	0- 2	< 0.3		SB-24	LT-SB-24	0- 2	1.2
RT-1	LT-RT-01B	2- 4	25		SB-25	LT-SB-25B	2- 4	1.0
RT-10	LT-RT-10	0- 2	1.0		SB-26	LT-SB-26	0- 2	1.0
RT-11	LT-RT-11B	2- 4	1.0		SB-27	LT-SB-27	0- 2	1.0
RT-12	LT-RT-12	0- 0.25	4.0		SB-28	LT-SB-28	2- 4	0.60
RT-13	LT-RT-13B	2- 4	1.0		SB-29	LT-SB-29	3- 5	< 0.3
RT-14	LT-RT-14	0- 2	0.81		SB-31	LT-SB-31	3- 5	1.0
RT-15	LT-RT-15B	2- 4	1.0		SB-32	LT-SB-32	3- 5	1.0
RT-16	LT-RT-16	0- 2	1.0		SB-33	LT-SB-33	3- 5	< 0.3
RT-17	LT-RT-17	0- 2	1.0		SB-35	LT-SB-35	1- 3	< 0.3
RT-18	LT-RT-18	0- 2	3.0		SB-36	LT-SB-36	1- 3	< 0.3
RT-19	LT-RT-19	0- 2	1.0		SB-37	LT-SB-37	1- 3	ND
RT-2	LT-RT-02	0- 1	140		SB-40	LT-SB-40	3- 5	2.0
RT-20	LT-RT-20	0- 4	4.0		SS-01	LT-SS-01	0- 2	110
RT-3	LT-RT-03	0- 2	230		SS-02	LT-SS-02	0- 2	2.0
RT-4	LT-RT-04	0- 2	1.0		SS-03	LT-SS-03	0- 2	33
RT-5	LT-RT-05	0- 1	1.0		SS-04	LT-SS-04	0- 2	470
RT-6	LT-RT-06	0- 2	2.0		SS-05	LT-SS-05	0- 2	1.0
RT-7	LT-RT-07	0- 2	260		SS-06	LT-SS-06	0- 2	4.0
RT-8	LT-RT-08	0- 2	86		SS-07	LT-SS-07	0- 2	1.0
RT-9	LT-RT-09	0- 2	1.0		SS-08	LT-SS-08	0- 2	1.0
SB-01	LT-SB-01	1- 3	< 0.3		SS-09	LT-SS-09	0- 2	1.0
SB-02	LT-SB-02	1- 3	< 0.3		SS-10	LT-SS-10	0- 2	18
SB-03	LT-SB-03	1- 3	1.0		SS-11	LT-SS-11	0- 2	24
SB-04	LT-SB-04	3- 5	1.0		SS-12	LT-SS-12	0- 2	37
SB-05	LT-SB-05B	2- 4	3.7		TP-01	LT-SB-TP-01	1- 2	1.7 E
SB-06	LT-SB-06	2- 4	1.0		TP-02	LT-SB-TP-02	1- 3	1.0
SB-07	LT-SB-07	0- 2	1.0		TP-03	LT-SB-TP-03	0- 1	1.0
SB-08	LT-SB-08	0- 2	< 0.3		TP-5	LT-SB-TP-05	0- 1	27
SB-09	LT-SB-09	0- 2	< 0.3		TP-6	LT-SB-TP-06	2- 3	1.0
SB-10	LT-SB-10	0- 2	29		TP-7	LT-SB-TP-07	1- 2	< 0.3
SB-11	LT-SB-11	0- 2	2.0		TP-8	LT-SB-TP-08	0- 1	1.0

DEPTHS ARE IN FEET BELOW GROUND SURFACE

URANIUM-238 (pCi/g)

15
12
9
6
3
1.1

400
300
200
150
100
75
50

U- NOT DETECTED

E- ESTIMATED VALUE

J- ESTIMATED VALUE, BELOW CRQL, ABOVE IDL

R- ANALYSES DID NOT PASS EPA QA/QC

IN A BOREHOLE WHERE TWO SAMPLES WERE COLLECTED FOR THE 0-4 FOOT INTERVAL, ONLY THE HIGHEST DETECTED CONCENTRATION WAS SELECTED FOR ILLUSTRATION.

0 100 200 300
SCALE IN FEET
1"=200'

MALCOLM PIRNIE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

URANIUM-238 CONCENTRATIONS IN SOIL (0-4 FEET)

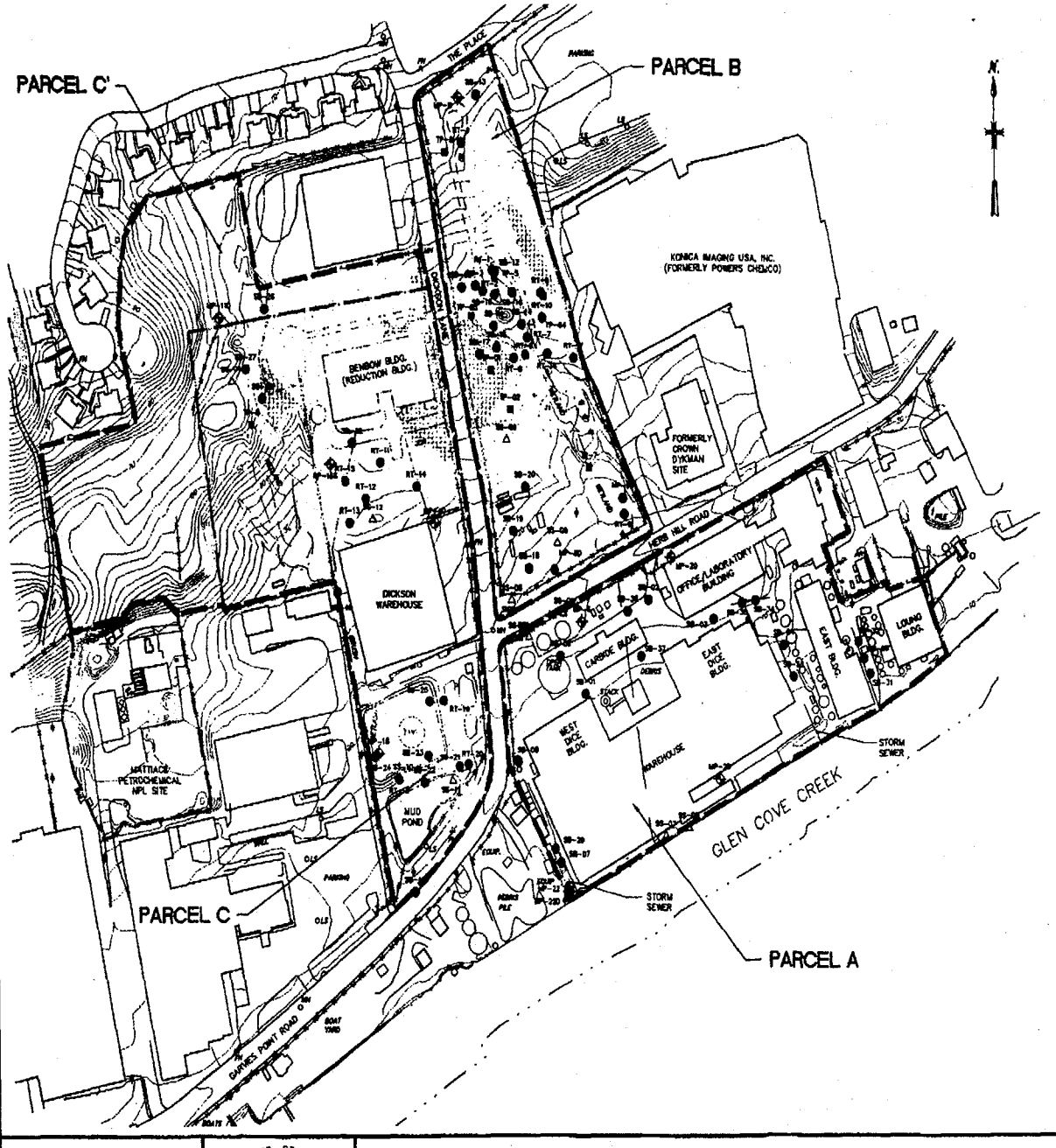
DATE: MAY 1998

PROJECT NO.: 8001202

FIGURE 5-12

I:\ACAD\PROJ\8001202\GISFILES\REPORT\8001LT54 Scale: 1:1 Date: 05/06/1998 Time: 08:41

7308 ADMIN



URANIUM-238 (pCi/g)

SITE ID	Sample ID No.	Depth	Uranium-238
MP-11D	LT-SB-MP-11DB	8- 10	0.71
MP-22	LT-SB-MP-22B	3- 5	1.1
MP-22D	LT-SB-MP-22DB	3- 5	0.5
MP-4D	LT-SB-MP-4DB	3- 5	U
MP-5	LT-SB-MP-5B	18- 20	0.4
MP-8D	LT-SB-MP-8DB	4- 6	0.6
RT-10	LT-RT-10B	4- 6	1.1
RT-12	LT-RT-12B	6- 8	0.5
RT-14	LT-RT-14B	8- 10	0.92
RT-16	LT-RT-16B	8- 10	0.6
RT-17	LT-RT-17B	8- 10	0.6
RT-18	LT-RT-18B	12- 14	2.4
RT-19	LT-RT-19B	4- 6	2.7
RT-20	LT-RT-20B	8- 10	0.78
RT-3	LT-RT-03B	12- 14	1.5
RT-4	LT-RT-04B	12- 14	0.71
RT-9	LT-RT-09B	12- 14	0.2
SB-02	LT-SB-02B	3- 5	0.5
SB-03	LT-SB-03B	3- 5	0.6
SB-09	LT-SB-09B	6- 8	1.2
SB-11	LT-SB-11B	8- 10	< 0.3
SB-13	LT-SB-13B	14- 16	0.1
SB-14	LT-SB-14B	6- 8	0.5
SB-15	LT-SB-15B	4- 6	2.8
SB-16	LT-SB-16B	8- 10	< 0.3
SB-17	LT-SB-17B	4- 6	15
SB-22	LT-SB-22	4- 6	2.8
SB-26	LT-SB-26B	10- 12	1.1
SB-27	LT-SB-27B	4- 6	0.6
SB-28	LT-SB-28B	4- 6	8.5
SB-41	LT-SB-41	4- 8	0.6
SB-42	LT-SB-42	4- 6	0.6
TP-04	LT-SB-TP-04	4- 5	5.4

DEPTHS ARE IN FEET BELOW GROUND SURFACE

U- NOT DETECTED

E- ESTIMATED VALUE

J- ESTIMATED VALUE, BELOW CRQL, ABOVE IDL

R- ANALYSES DID NOT PASS EPA QA/QC

URANIUM-238 (pCi/g)

15
12
9
6
3
1.1

400+
300
200
150
100
75
50

0 100 200 300
SCALE IN FEET
1"=200'

MALCOLM PIRNIE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

DATE: MAY 1998

URANIUM-238 CONCENTRATIONS IN SOIL (BELOW 4 FEET)

PROJECT NO.: 8001202

FIGURE 5-13

7308 ADMIN

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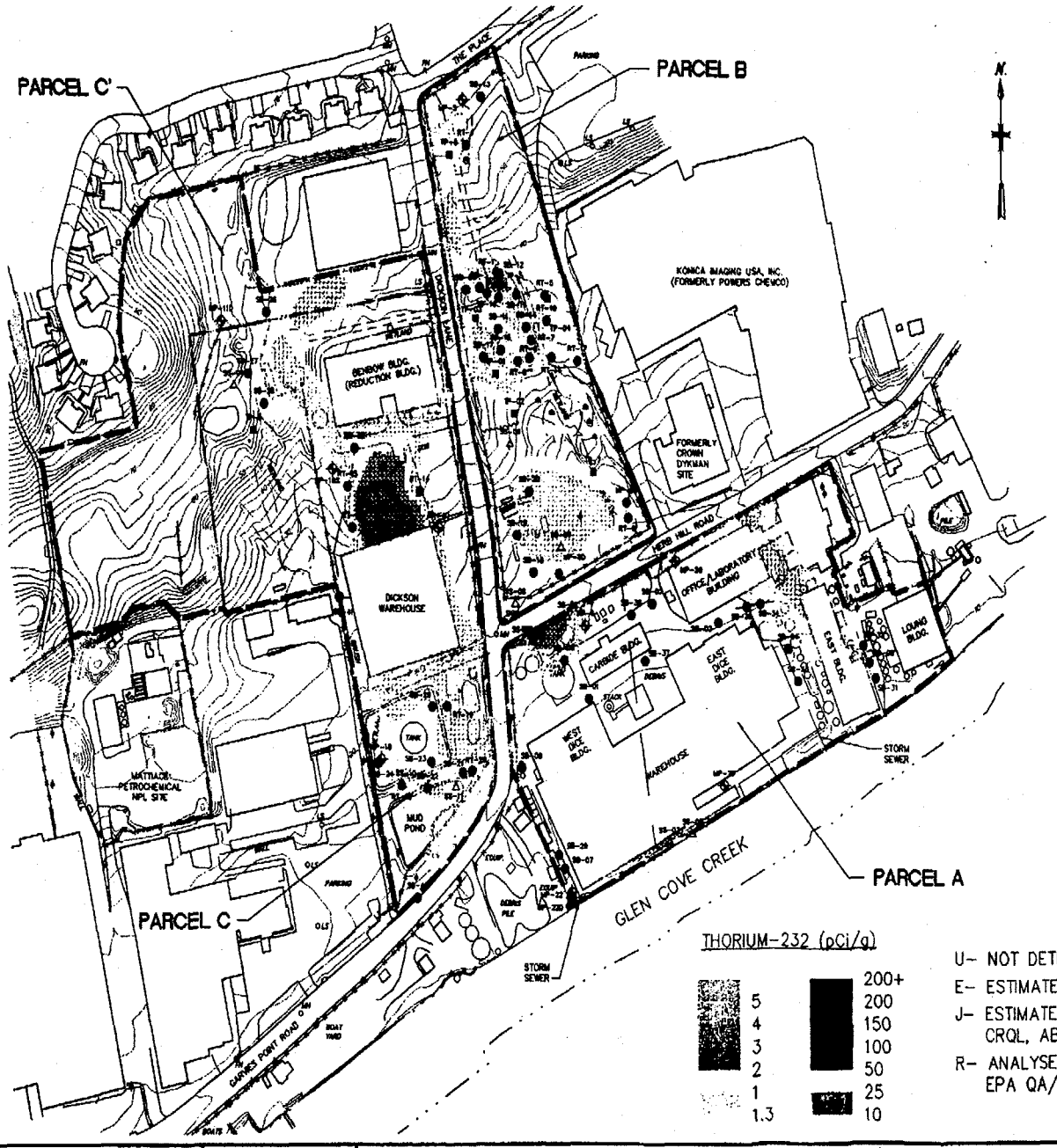


THORIUM-232 (pCi/g)

SITE_ID	Sample ID No.	Depth	Thorium-232
MP-11D	LT-SB-MP-11D	0-2	0.34
MP-16	LT-SB-MP-16SB	2-4	0.55
MP-18	LT-SB-MP-18B	2-4	1.1 E
MP-20	LT-SB-MP-20	0-2	0.48 E
MP-22	LT-SB-MP-22	1-3	0.61
MP-22D	LT-SB-MP-22D	1-3	0.37
MP-2D	LT-SB-MP-2D	1-3	0.7
MP-4D	LT-SB-MP-4D	1-3	0.95 E
MP-5	LT-SB-MP-5	0-2	1.1 E
MP-6	LT-SB-MP-6B	2-4	1.4 E
MP-8D	LT-SB-MP-8D	0-2	0.91 E
MP-9D	LT-SB-MP-9D	0-2	0.77 E
RT-1	LT-RT-01B	2-4	32 E
RT-10	LT-RT-10	0-2	1.4 E
RT-11	LT-RT-11	0-2	62
RT-12	LT-RT-12	0-0.25	190 E
RT-13	LT-RT-13	0-2	16 E
RT-14	LT-RT-14	0-2	1.0 E
RT-15	LT-RT-15	0-2	1.2
RT-16	LT-RT-16	0-2	0.62 E
RT-17	LT-RT-17	0-2	0.84 E
RT-18	LT-RT-18	0-2	< 0.47
RT-19	LT-RT-19	0-2	24
RT-2	LT-RT-02	0-1	17 E
RT-20	LT-RT-20	0-4	1.7
RT-3	LT-RT-03	0-2	R
RT-4	LT-RT-04	0-2	1.8 E
RT-5	LT-RT-05B	1-2	1.3 E
RT-6	LT-RT-06	0-2	6.1 E
RT-7	LT-RT-07	0-2	30
RT-8	LT-RT-08	0-2	12 E
RT-9	LT-RT-09	0-2	1.5 E
SB-01	LT-SB-01	1-3	0.49
SB-02	LT-SB-02	1-3	0.64
SB-03	LT-SB-03	1-3	1.1
SB-04	LT-SB-04	3-5	0.67
SB-05	LT-SB-05B	2-4	3.7
SB-06	LT-SB-06	2-4	1.7
SB-07	LT-SB-07	0-2	0.30 E
SB-08	LT-SB-08	0-2	0.79
SB-09	LT-SB-09	0-2	0.79
SB-10	LT-SB-10	0-2	2.2
SB-11	LT-SB-11	0-2	1.4

SITE_ID	Sample ID No.	Depth	Thorium-232
SB-12	LT-SB-12B	2-4	1.2
SB-13	LT-SB-13	0-4	0.95 E
SB-14	LT-SB-14	0-2	16
SB-15	LT-SB-15	0-2	26
SB-16	LT-SB-16	0-2	1.1
SB-17	LT-SB-17	0-2	7.1 E
SB-18	LT-SB-18	0-2	0.85
SB-19	LT-SB-19	0-2	3.8
SB-20	LT-SB-20	0-2	5.6 E
SB-21	LT-SB-21	2-4	1
SB-23	LT-SB-23B	2-4	0.93 E
SB-24	LT-SB-24	0-2	1.1 E
SB-25	LT-SB-25	0-2	3.3
SB-26	LT-SB-26	0-2	0.75
SB-27	LT-SB-27	0-2	0.70 E
SB-28	LT-SB-28	2-4	2
SB-29	LT-SB-29	3-5	0.58
SB-31	LT-SB-31	3-5	1.7
SB-32	LT-SB-32	3-5	2.3
SB-34	LT-SB-34	1-3	1.3 E
SB-35	LT-SB-35	1-3	0.71 E
SB-36	LT-SB-36	1-3	0.65
SB-37	LT-SB-37	1-3	0.32
SB-40	LT-SB-40	3-5	0.55
SS-01	LT-SS-01	0-2	48
SS-02	LT-SS-02	0-2	0.92 E
SS-03	LT-SS-03	0-2	93
SS-04	LT-SS-04	0-2	R
SS-05	LT-SS-05	0-2	10
SS-06	LT-SS-06	0-2	16
SS-07	LT-SS-07	0-2	57
SS-08	LT-SS-08	0-2	1.2
SS-09	LT-SS-09	0-2	0.91 E
SS-10	LT-SS-10	0-2	7.8 E
SS-11	LT-SS-11	0-2	2.4
SS-12	LT-SS-12	0-2	220
TP-01	LT-SB-TP-01	1-2	8.6
TP-02	LT-SB-TP-02	1-3	0.93
TP-03	LT-SB-TP-03	0-1	3.2
TP-5	LT-SB-TP-05	0-1	150
TP-6	LT-SB-TP-06	2-3	1.5
TP-7	LT-SB-TP-07	1-2	0.72
TP-8	LT-SB-TP-08	0-1	0.77

DEPTHS ARE IN FEET BELOW GROUND SURFACE

THORIUM-232 (pCi/g)

5, 4, 3, 2, 1, 1.3

200+, 200, 150, 100, 50, 25, 10

U- NOT DETECTED

E- ESTIMATED VALUE

J- ESTIMATED VALUE, BELOW CRQL, ABOVE IDL

R- ANALYSES DID NOT PASS EPA QA/QC

IN A BOREHOLE WHERE TWO SAMPLES WERE COLLECTED FOR THE 0-4 FOOT INTERVAL, ONLY THE HIGHEST DETECTED CONCENTRATION WAS SELECTED FOR ILLUSTRATION.

0 100 200 300
SCALE IN FEET
1"=200'

MALCOLM PIRNIE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

THORIUM-232 CONCENTRATIONS IN SOIL (0-4 FEET)

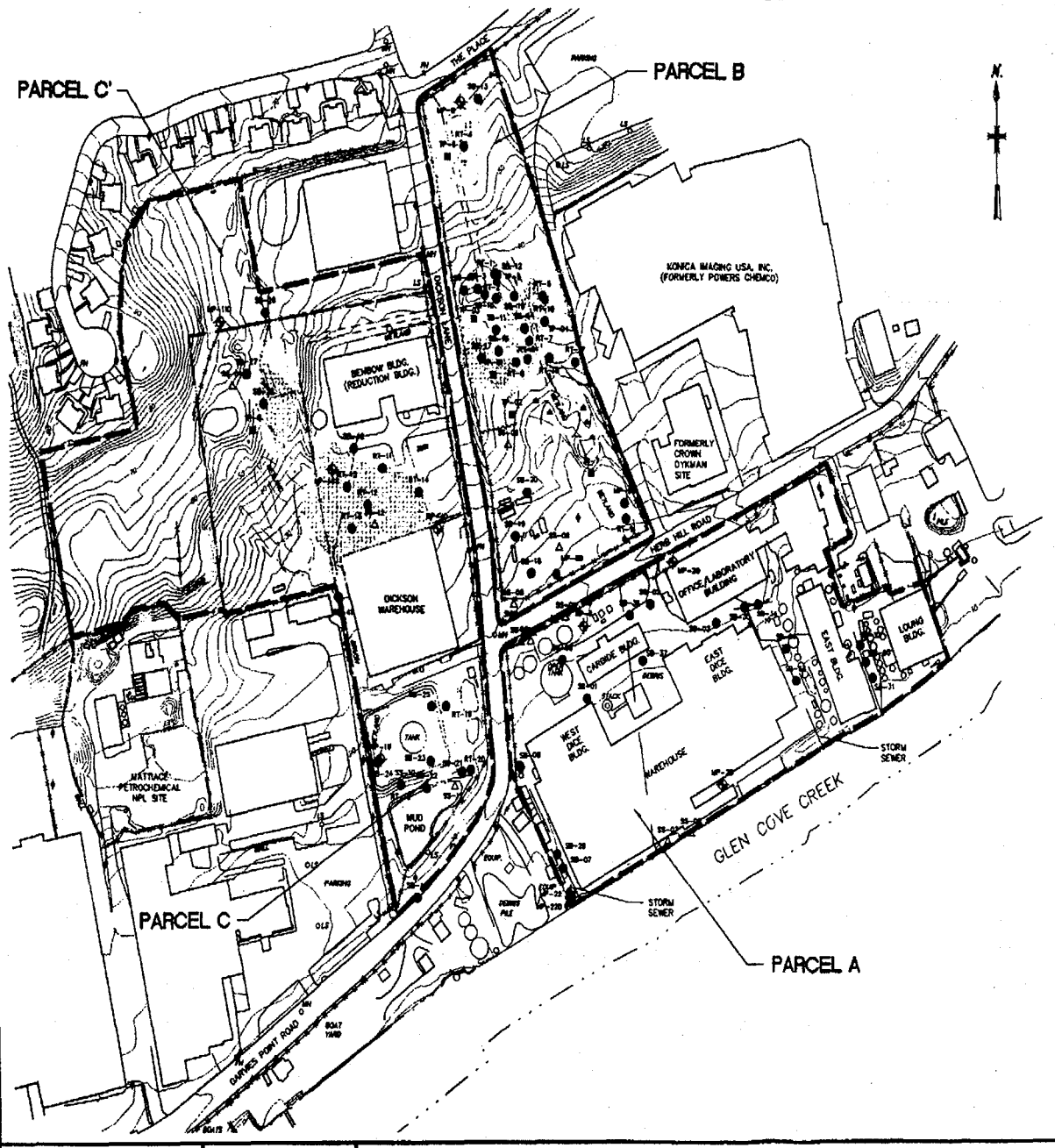
DATE: MAY 1998

PROJECT NO.: 8001202

FIGURE 5-14

I:\ACAD\PROJ\8001202\GISFILES\REPORT\8001LT52 Scale: 1:1i Date: 05/06/1998 Time: 08:44

7308 ADMIN



THORIUM-232 (pCi/g)

SITE_ID	Sample ID No.	Depth	Thorium-232
MP-11D	LT-SB-MP-11DB	8- 10	0.58
MP-22	LT-SB-MP-22B	3- 5	0.66
MP-22D	LT-SB-MP-22DB	3- 5	0.44
MP-4D	LT-SB-MP-4DB	3- 5	0.71 E
MP-5	LT-SB-MP-5B	18- 20	1.1
MP-8D	LT-SB-MP-8DB	4- 6	0.90 E
RT-10	LT-RT-10B	4- 6	1.0 E
RT-12	LT-RT-12B	6- 8	15
RT-14	LT-RT-14B	8- 10	2.8 E
RT-16	LT-RT-16B	8- 10	0.63 E
RT-17	LT-RT-17B	8- 10	0.32 E
RT-18	LT-RT-18B	12- 14	0.84
RT-19	LT-RT-19B	4- 6	1.5
RT-20	LT-RT-20B	8- 10	1.0
RT-3	LT-RT-03B	12- 14	0.68
RT-4	LT-RT-04B	12- 14	1.7 E
RT-9	LT-RT-09B	12- 14	0.79 E
SB-02	LT-SB-02B	3- 5	0.43
SB-03	LT-SB-03B	3- 5	0.63
SB-09	LT-SB-09B	6- 8	0.89
SB-11	LT-SB-11B	8- 10	1.1
SB-13	LT-SB-13B	14- 16	1.1 E
SB-14	LT-SB-14B	6- 8	13
SB-15	LT-SB-15B	4- 6	1.2
SB-16	LT-SB-16B	8- 10	1.1
SB-17	LT-SB-17B	4- 6	3.9 E
SB-22	LT-SB-22	4- 6	1.3
SB-26	LT-SB-26B	10- 12	0.86
SB-27	LT-SB-27B	4- 6	0.41
SB-28	LT-SB-28B	4- 6	5.1
SB-33	LT-SB-33	3-5	0.82
SB-41	LT-SB-41	4- 8	0.27
SB-42	LT-SB-42	4- 6	0.61
TP-04	LT-SB-TP-04	4- 5	3

DEPTHS ARE IN FEET BELOW GROUND SURFACE

U- NOT DETECTED

E- ESTIMATED VALUE

J- ESTIMATED VALUE, BELOW CRQL, ABOVE IDL

R- ANALYSES DID NOT PASS EPA QA/QC

THORIUM-232 (pCi/g)

10
5
4
3
2
1.3

200+
200
150
100
75
50
25

0 100 200 300
SCALE IN FEET
1"=200'

MALCOLM PIRNIE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

THORIUM-232 CONCENTRATIONS IN SOIL (BELOW 4 FEET)

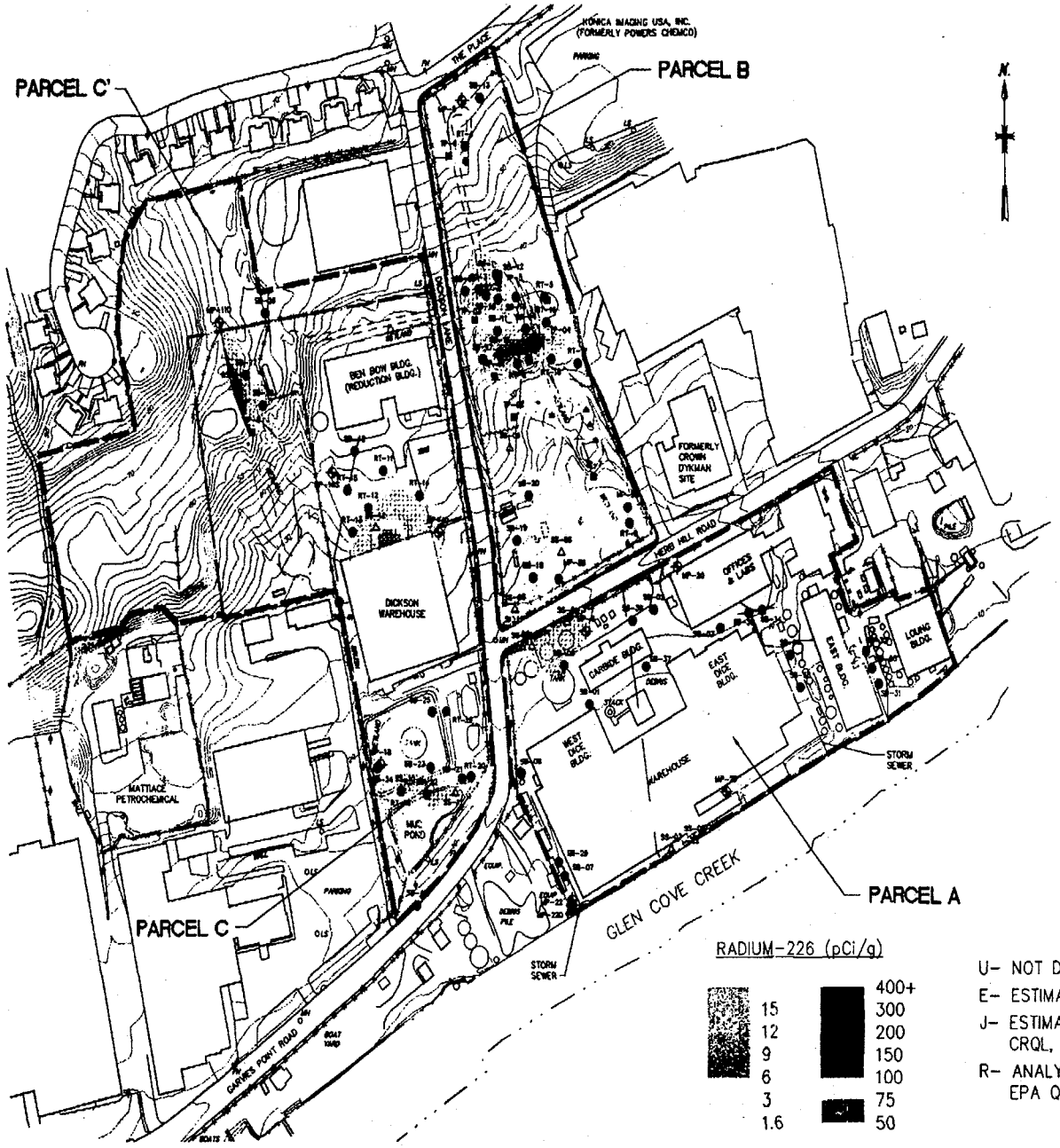
DATE: MAY 1998

PROJECT NO.: 8001202

FIGURE 5-15

I:\ACAD\PROJ\80012020\GISFILES\REPORT\8001LT53 Scale: 1:1 Date: 05/06/1998 Time: 08:45

7308 ADMIN



RADIUM-226 (pCi/g)

SITE ID	Sample ID No.	Depth	Radium-226	SITE ID	Sample ID No.	Depth	Radium 226
MP-11D	LT-SB-MP-11D	0- 2	0.81	SB-12	LT-SB-12	0- 2	2.9
MP-16	LT-SB-MP-16SB	2- 4	0.99	SB-13	LT-SB-13	0- 4	1.1
MP-18	LT-SB-MP-18B	2- 4	1.7	SB-14	LT-SB-14	0- 2	3.7
MP-20	LT-SB-MP-20	0- 2	1.3	SB-15	LT-SB-15	0- 2	140
MP-22	LT-SB-MP-22	1- 3	0.76	SB-16	LT-SB-16	0- 2	1.6
MP-22D	LT-SB-MP-22D	1- 3	0.92	SB-17	LT-SB-17	0- 2	14
MP-2D	LT-SB-MP-2D	1- 3	1.2	SB-18	LT-SB-18	0- 2	1.2
MP-4D	LT-SB-MP-4D	1- 3	0.68	SB-19	LT-SB-19	0- 2	2.3
MP-5	LT-SB-MP-5	0- 2	1.4	SB-20	LT-SB-20	0- 2	2.5
MP-6	LT-SP-MP-6	0- 2	1.4	SB-21	LT-SB-21	2- 4	1.8
MP-8D	LT-SB-MP-8D	0- 2	0.87	SB-23	LT-SB-23B	2- 4	1.4
MP-9D	LT-SB-MP-9D	0- 2	1.6 E	SB-24	LT-SB-24	0- 2	1.9
RT-1	LT-RT-01B	2- 4	23	SB-25	LT-SB-25	0- 2	2.4
RT-10	LT-RT-10	0- 2	1.3	SB-26	LT-SB-26	0- 2	0.85
RT-11	LT-RT-11B	2- 4	1.2	SB-27	LT-SB-27	0- 2	1.8
RT-12	LT-RT-12	0- 0.25	5.6	SB-28	LT-SB-28	2- 4	4.2
RT-13	LT-RT-13	0- 2	2.0	SB-29	LT-SB-29	3- 5	0.85
RT-14	LT-RT-14	0- 2	1.5	SB-31	LT-SB-31	3- 5	3.7
RT-15	LT-RT-15	0- 2	2.0	SB-32	LT-SB-32	3- 5	2.2
RT-16	LT-RT-16	0- 2	1.3	SB-33	LT-SB-33	3- 5	U
RT-17	LT-RT-17	0- 2	1.4	SB-35	LT-SB-35	1- 3	0.8
RT-18	LT-RT-18	0- 2	2.0	SB-36	LT-SB-36	1- 3	1.1
RT-19	LT-RT-19	0- 2	1.3	SB-37	LT-SB-37	1- 3	1.2
RT-2	LT-RT-02	0- 1	68	SB-40	LT-SB-40	3- 5	0.97
RT-20	LT-RT-20	0- 4	2.0	SS-01	LT-SS-01	0- 2	41
RT-3	LT-RT-03	0- 2	150	SS-02	LT-SS-02	0- 2	0.9
RT-4	LT-RT-04	0- 2	1.3	SS-03	LT-SS-03	0- 2	38
RT-5	LT-RT-05	0- 1	2.4	SS-04	LT-SS-04	0- 2	250
RT-6	LT-RT-06	0- 2	2.4	SS-05	LT-SS-05	0- 2	9.0
RT-7	LT-RT-07	0- 2	220	SS-06	LT-SS-06	0- 2	5.0
RT-8	LT-RT-08	0- 2	59	SS-07	LT-SS-07	0- 2	2.0
RT-9	LT-RT-09	0- 2	1.7	SS-08	LT-SS-08	0- 2	2.0
SB-01	LT-SB-01	1- 3	1.2	SS-09	LT-SS-09	0- 2	1.1
SB-02	LT-SB-02	1- 3	0.63	SS-10	LT-SS-10	0- 2	9.7
SB-03	LT-SB-03	1- 3	1.2	SS-11	LT-SS-11	0- 2	6.3
SB-04	LT-SB-04	3- 5	1.0	SS-12	LT-SS-12	0- 2	86
SB-05	LT-SB-05B	2- 4	3.3	TP-01	LT-SB-TP-01	1- 2	2.0
SB-06	LT-SB-06	2- 4	2.0	TP-02	LT-SB-TP-02	1- 3	1.2
SB-07	LT-SB-07B	2- 4	0.73	TP-03	LT-SB-TP-03	0- 1	2.6
SB-08	LT-SB-08	0- 2	0.87	TP-5	LT-SB-TP-05	0- 1	23
SB-09	LT-SB-09	0- 2	1.7	TP-6	LT-SB-TP-06	2- 3	1.4
SB-10	LT-SB-10	0- 2	14	TP-7	LT-SB-TP-07	1- 2	0.54
SB-11	LT-SB-11	0- 2	2.3	TP-8	LT-SB-TP-08	0- 1	1.1

DEPTHS ARE IN FEET BELOW GROUND SURFACE

RADIUM-226 (pCi/g)

15, 12, 9, 6, 3, 1.6

400+, 300, 200, 150, 100, 75, 50

U- NOT DETECTED

E- ESTIMATED VALUE

J- ESTIMATED VALUE, BELOW CRQL, ABOVE IDL

R- ANALYSES DID NOT PASS EPA QA/QC

IN A BOREHOLE WHERE TWO SAMPLES WERE COLLECTED FOR THE 0-4 FOOT INTERVAL, ONLY THE HIGHEST DETECTED CONCENTRATION WAS SELECTED FOR ILLUSTRATION.

0 100 200 300
SCALE IN FEET
1"=200'

MALCOLM PIRNIE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

RADIUM-226 CONCENTRATIONS IN SOIL (0-4 FEET)

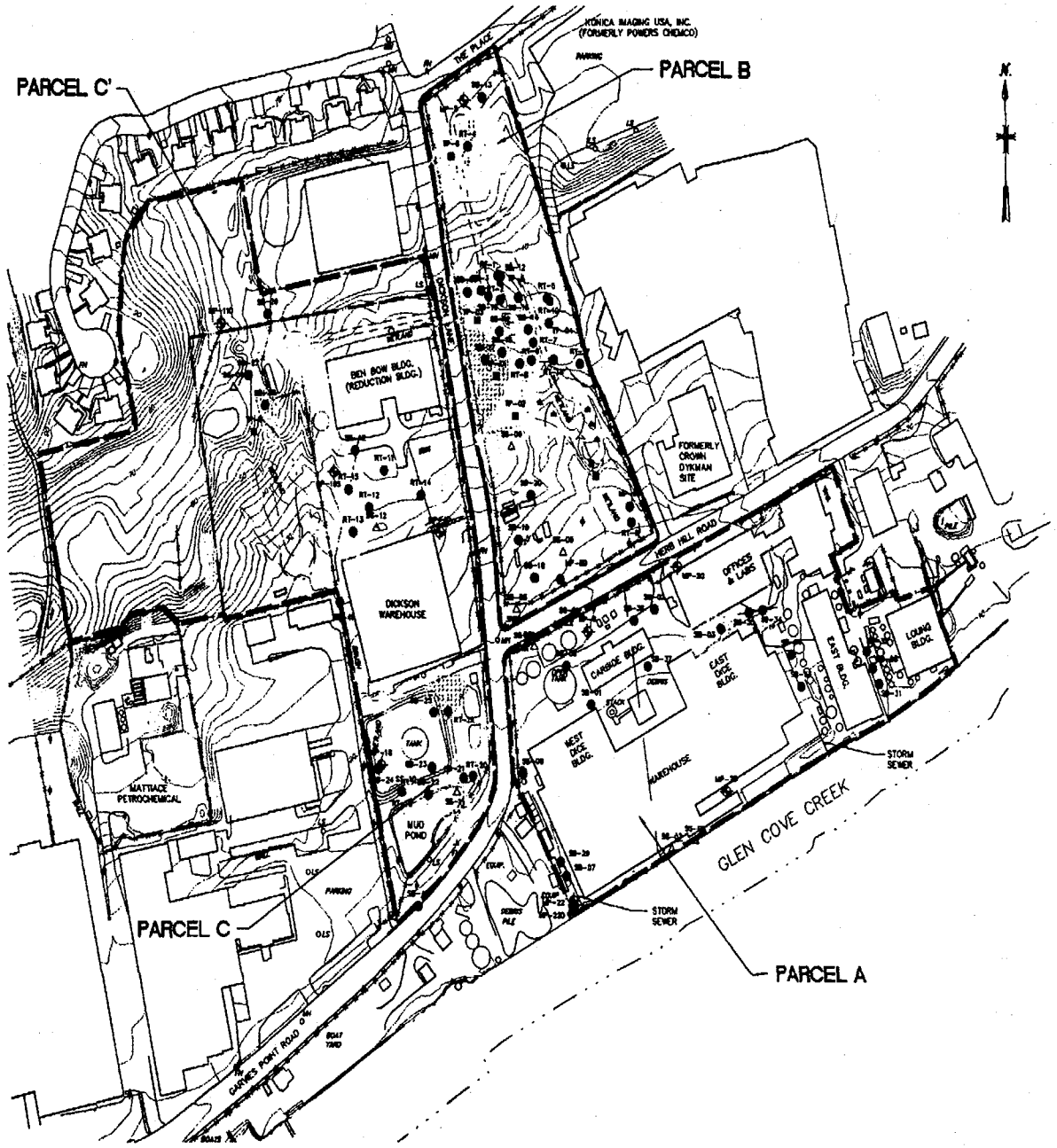
DATE: MAY 1998

PROJECT NO.: 8001202

FIGURE 5-16

I:\ACAD\PROJ\8001202\GISFILES\REPORT\8001LT56 Scale: 1:1 Date: 05/06/1998 Time: 08:46

7308 ADMIN



RADIUM-226 (pCi/g)

SITE_ID	Sample ID No.	Depth	Radium-226
MP-11D	LT-SB-MP-11DB	8- 10	0.99
MP-22	LT-SB-MP-22B	3- 5	0.75
MP-22D	LT-SB-MP-22DB	3- 5	0.69
MP-4D	LT-SB-MP-4DB	3- 5	0.58
MP-5	LT-SB-MP-5B	18- 20	0.75
MP-8D	LT-SB-MP-8DB	4- 6	0.73
RT-10	LT-RT-10B	4- 6	1.1
RT-12	LT-RT-12B	6- 8	1.5
RT-14	LT-RT-14B	8- 10	1.4
RT-16	LT-RT-16B	8- 10	0.88
RT-17	LT-RT-17B	8- 10	0.56
RT-18	LT-RT-18B	12- 14	1.1
RT-19	LT-RT-19B	4- 6	6.1
RT-20	LT-RT-20B	8- 10	1.3
RT-3	LT-RT-03B	12- 14	1.3
RT-4	LT-RT-04B	12- 14	2.4
RT-9	LT-RT-09B	12- 14	0.41
SB-02	LT-SB-02B	3- 5	1.0
SB-03	LT-SB-03B	3- 5	1.8
SB-09	LT-SB-09B	6- 8	2.2
SB-11	LT-SB-11B	8- 10	0.68
SB-13	LT-SB-13B	14- 16	1.2
SB-14	LT-SB-14B	6- 8	2.9
SB-15	LT-SB-15B	4- 6	2.5
SB-16	LT-SB-16B	8- 10	1.1
SB-17	LT-SB-17B	4- 6	10
SB-22	LT-SB-22	4- 6	2.5
SB-26	LT-SB-26B	10- 12	0.76
SB-27	LT-SB-27B	4- 6	0.9
SB-28	LT-SB-28B	4- 6	10
SB-41	LT-SB-41	4- 8	0.77
SB-42	LT-SB-42	4- 6	0.76
TP-04	LT-SB-TP-04	4- 5	1.4

DEPTHS ARE IN FEET BELOW GROUND SURFACE

U- NOT DETECTED

E- ESTIMATED VALUE

J- ESTIMATED VALUE, BELOW CRQL, ABOVE IDL

R- ANALYSES DID NOT PASS EPA QA/QC

RADIUM-226 (pCi/g)

15, 12, 9, 6, 3, 1.6

400+, 300, 200, 150, 100, 75, 50

0 100 200 300
SCALE IN FEET
1"=200'

I:\ACAD\PROJ\80012020\GISFILES\REPORT\8001LT57 Scale: 1:11 Date: 05/06/1998 Time: 08:47

7308 ADMIN

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

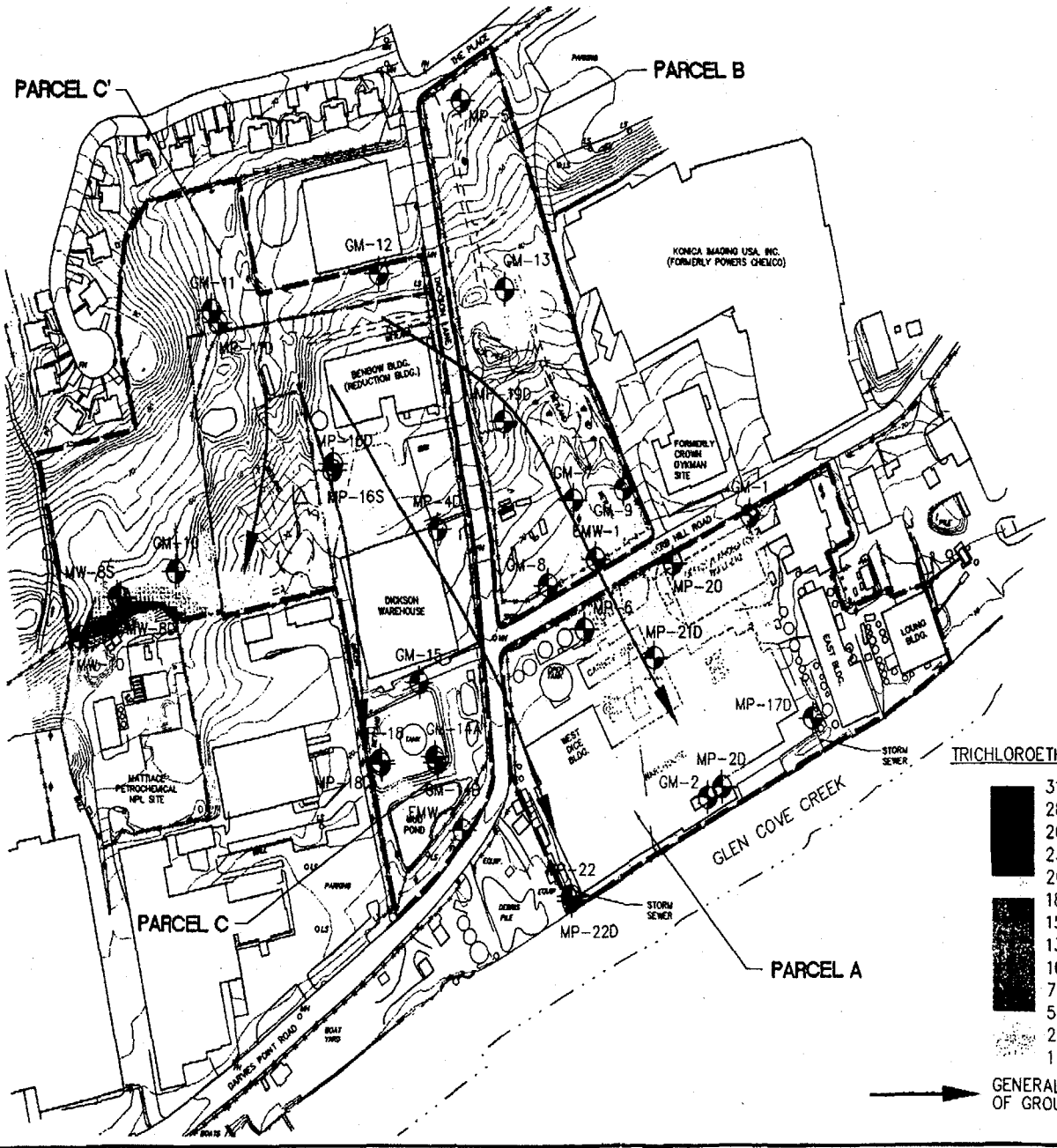
LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

RADIUM-226 CONCENTRATIONS IN SOIL (BELOW 4 FEET)

DATE: MAY 1998

PROJECT NO.: 8001202

FIGURE 5-17



CONCENTRATION LEVELS (ug/L)

GM-1	4.1 J
GM-2	U
GM-7	U
GM-8	U
GM-9	U
GM-10	320
GM-11	U
GM-12	U
GM-13	4 J
GM-14A	U
GM-14B	U
GM-15	NA
EMW-1	250
EMW-4	U
MW-8S	4,000
MW-8D	15,000
MW-10	31,000
MP-2D	87
MP-4	U
MP-5	U
MP-6	4.4
MP-11D	U
MP-16	U
MP-16D	3
MP-17D	U
MP-18	9
MP-18D	U
MP-19D	U
MP-20	4.4
MP-21D	140
MP-22	U
MP-22D	U

TRICHLOROETHENE (ug/L)

31,200
28,600
26,000
23,400
20,800
18,200
15,600
13,000
10,400
7,800
5,200
2,600
1

U- NOT DETECTED

E- ESTIMATED VALUE

J- ESTIMATED VALUE, BELOW CRQL, ABOVE IDL

R- ANALYSES DID NOT PASS EPA QA/QC

NA- NOT ANALYZED

GENERALIZED DIRECTION OF GROUNDWATER FLOW

0 100 200 300
SCALE IN FEET
1"=200'

MALCOLM PIRNIE

LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

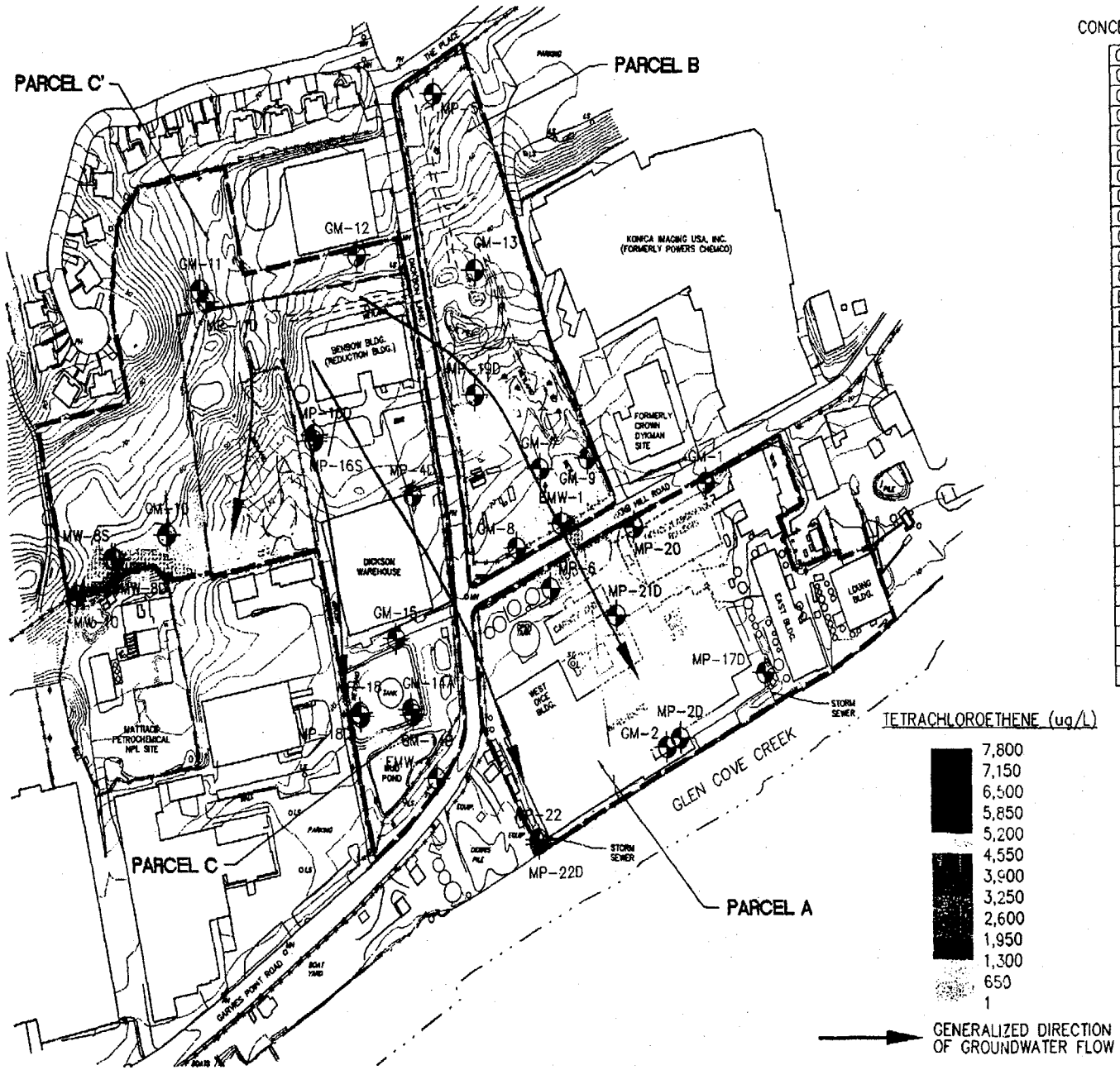
TRICHLOROETHENE CONCENTRATION IN GROUNDWATER (ROUND 1-DECEMBER 1996)

DATE: MAY 1998

PROJECT NO.: 8001202

FIGURE 5-18

7308 ADMIN I:\ACAD\PROJ\80012020\GISFILES\REPORT\8001LT40 Scale: 1:1 Date: 05/06/1998 Time: 08:59



CONCENTRATION LEVELS (ug/L)

GM-1	3.1
GM-2	U
GM-7	U
GM-8	1
GM-9	U
GM-10	110
GM-11	U
GM-12	U
GM-13	U
GM-14A	U
GM-14B	U
GM-15	NA
EMW-1	1,300
EMW-4	U
MW-8S	770
MW-8D	3,100
MW-10	6,600
MP-2D	61
MP-4	U
MP-5	U
MP-6	40
MP-11D	U
MP-16	U
MP-16D	U
MP-17D	U
MP-18	5 J
MP-18D	U
MP-19D	13
MP-20	38
MP-21D	590
MP-22	U
MP-22D	U

TETRACHLOROETHENE (ug/L)

7,800
7,150
6,500
5,850
5,200
4,550
3,900
3,250
2,600
1,950
1,300
650
1

U- NOT DETECTED

E- ESTIMATED VALUE

J- ESTIMATED VALUE, BELOW CRQL, ABOVE IDL

R- ANALYSES DID NOT PASS EPA QA/QC

GENERALIZED DIRECTION OF GROUNDWATER FLOW

0 100 200 300
SCALE IN FEET
1"=200'

MALCOLM PIRNIE

LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

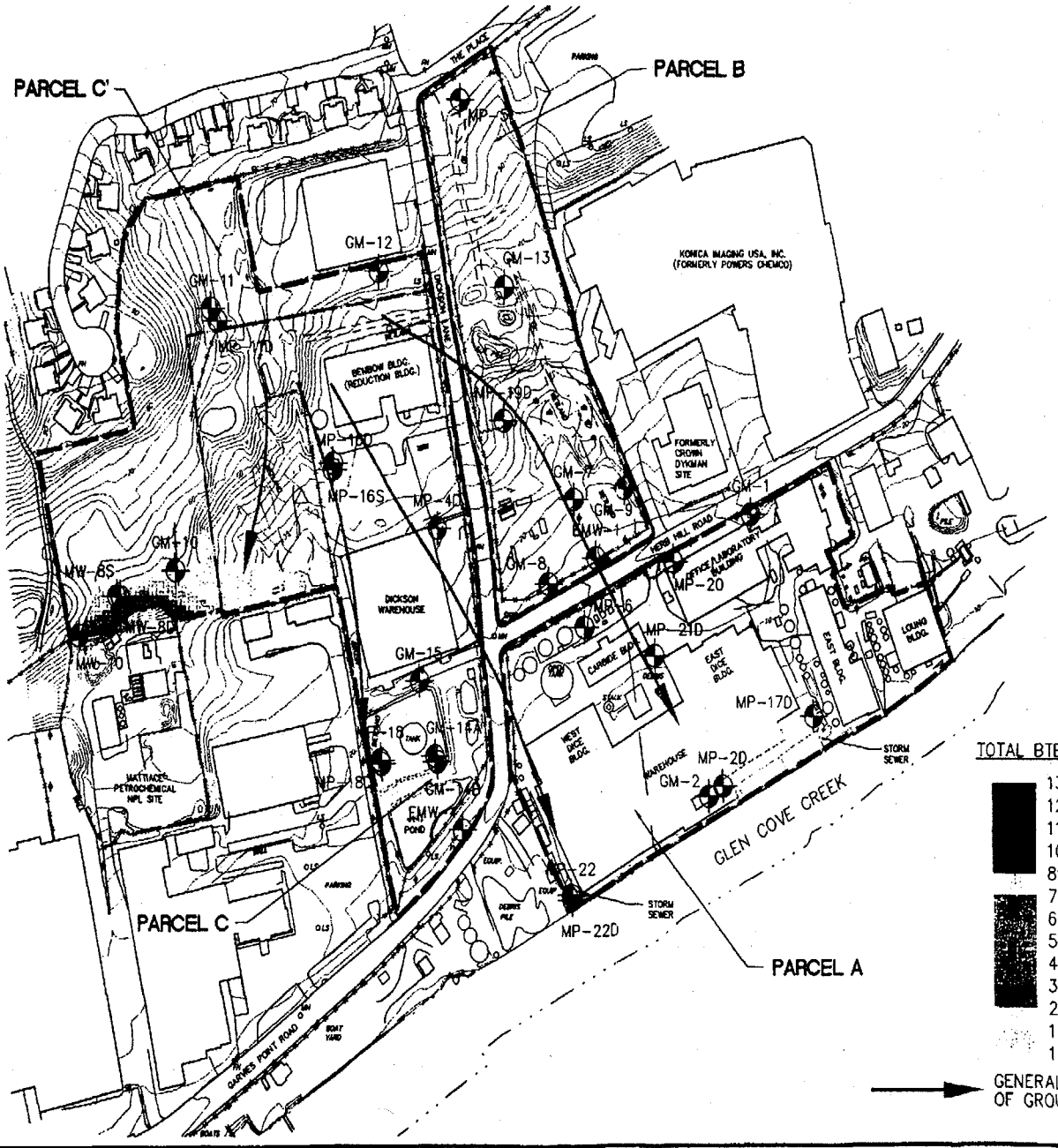
TETRACHLOROETHENE CONCENTRATION IN GROUNDWATER (ROUND 1-DECEMBER 1996)

DATE: MAY 1998

PROJECT NO.: 8001202

FIGURE 5-19

7308 ADMIN I:\ACAD\PROJ\80012020\GISFILES\REPORT\8001LT38 Scale: 1:1 Date: 05/06/1998 Time: 15:01



CONCENTRATION LEVELS (ug/L)

GM-1	U
GM-2	U
GM-7	U
GM-8	U
GM-9	U
GM-10	U
GM-11	U
GM-12	U
GM-13	U
GM-14A	U
GM-14B	2
GM-15	NA
EMW-1	U
EMW-4	U
MW-8S	1842
MW-8D	77640
MW-10	123340
MP-2D	3.3
MP-4	U
MP-5	U
MP-6	U
MP-11D	U
MP-16	U
MP-16D	58
MP-17D	10.7
MP-18	12.9
MP-18D	U
MP-19D	U
MP-20	U
MP-21D	U
MP-22	U
MP-22D	U

TOTAL BTEX (ug/L)

133608
122474
111340
100206
89072
77938
66804
55670
44536
33402
22268
11134
1

GENERALIZED DIRECTION OF GROUNDWATER FLOW

U- NOT DETECTED

E- ESTIMATED VALUE

J- ESTIMATED VALUE, BELOW CRQL, ABOVE IDL

R- ANALYSES DID NOT PASS EPA QA/QC

NA- NOT ANALYZED

BTEX= BENZENE, TOLUENE, ETHYLBENZENE, TOTAL XYLENES

0 100 200 300
SCALE IN FEET
1"=200'

MALCOLM PIRNIE

LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

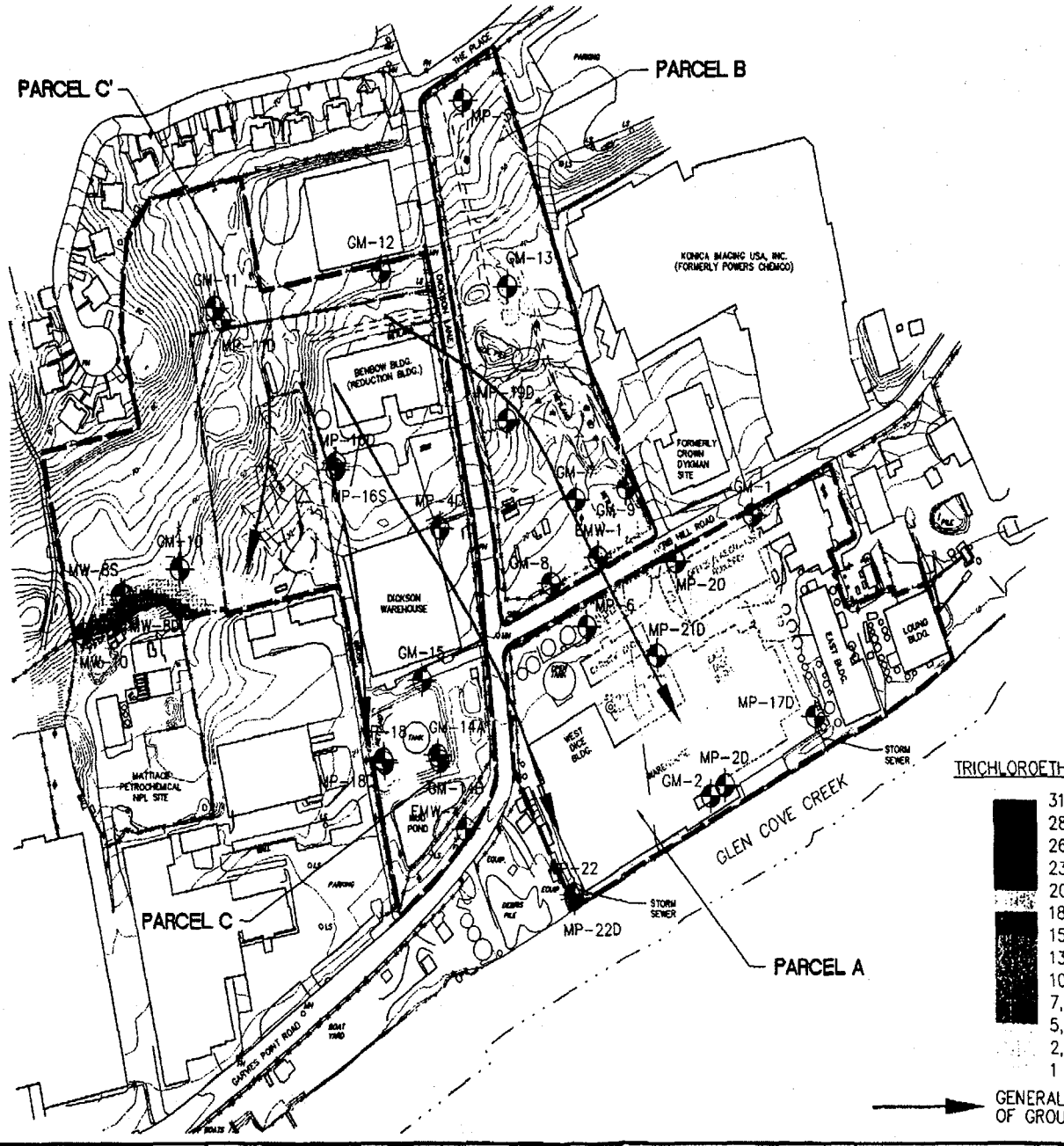
TOTAL BTEX CONCENTRATION IN GROUNDWATER (ROUND 1-DECEMBER 1996)

DATE: MAY 1998

PROJECT NO.: 8001202

FIGURE 5-20

7308 ADMIN I:\ACAD\PROJ\80012020\GISFILES\REPORT\8001LT72 Scale: 1 Date: 05/06/1998 Time: 10:21



CONCENTRATION LEVELS (ug/L)

GM-1	2,200
GM-2	U
GM-7	U
GM-8	U
GM-9	U
GM-10	180
GM-11	U
GM-12	U
GM-13	4 J
GM-14A	U
GM-14B	U
GM-15	U
EMW-1	210
EMW-4	U
MW-8S	4,600
MW-8D	20,000
MW-10	28,000
MP-2D	96
MP-4	U
MP-5	U
MP-6	6 J
MP-11D	U
MP-16	U
MP-16D	U
MP-17D	1 J
MP-18	12
MP-18D	U
MP-19D	U
MP-20	6 J
MP-21D	170
MP-22	U
MP-22D	U

N.

TRICHLOROETHENE (ug/L)

31,200
28,600
26,000
23,400
20,800
18,200
15,600
13,000
10,400
7,800
5,200
2,600
1

U- NOT DETECTED

E- ESTIMATED VALUE

J- ESTIMATED VALUE, BELOW CRQL, ABOVE IDL

R- ANALYSES DID NOT PASS EPA QA/QC

GENERALIZED DIRECTION OF GROUNDWATER FLOW

0 100 200 300
SCALE IN FEET
1"=200'

MALCOLM PIRNIE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

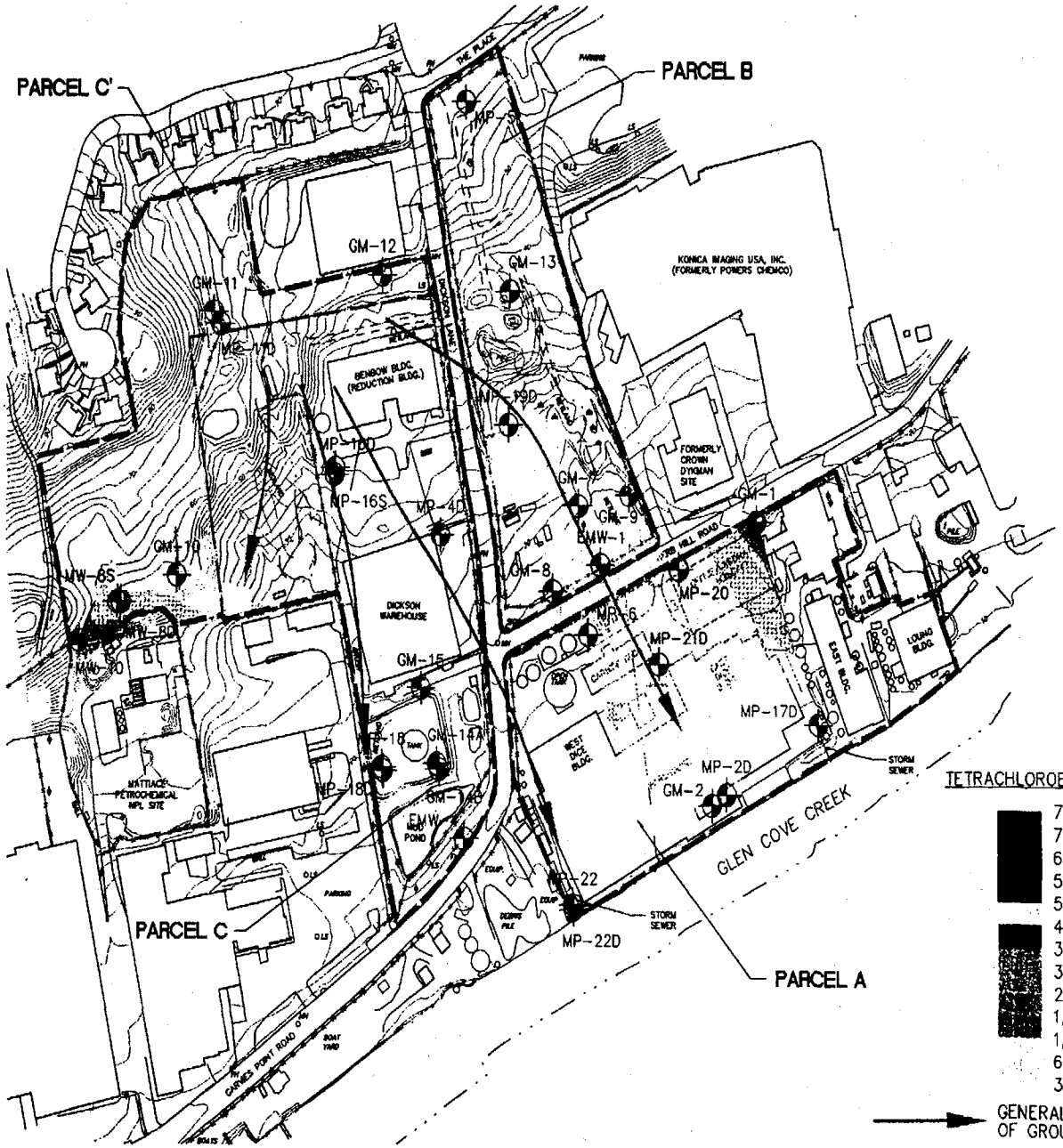
TRICHLOROETHENE CONCENTRATION IN GROUNDWATER (ROUND 2-JANUARY 1997)

DATE: MAY 1998

PROJECT NO.: 8001202

FIGURE 5-21

7308 ADMIN I:\ACAD\PROJ\8001202O\GISFILES\REPORT\8001LT41 Scale: Date: 05/06/1998 Time: 10:22



CONCENTRATION LEVELS (ug/L)

GM-1	6,900
GM-2	U
GM-7	U
GM-8	4 J
GM-9	U
GM-10	110
GM-11	U
GM-12	U
GM-13	U
GM-14A	U
GM-14B	U
GM-15	U
EMW-1	1,100
EMW-4	U
MW-8S	1,200
MW-8D	2,800 J
MW-10	7,800
MP-2D	90
MP-4	U
MP-5	U
MP-6	62
MP-11D	U
MP-16	U
MP-16D	U
MP-17D	U
MP-18	8 J
MP-18D	U
MP-19D	94
MP-20	11
MP-21D	700
MP-22	U
MP-22D	U

U- NOT DETECTED

E- ESTIMATED VALUE

J- ESTIMATED VALUE, BELOW CRQL, ABOVE IDL

R- ANALYSES DID NOT PASS EPA QA/QC

MALCOLM PIRNIE

LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

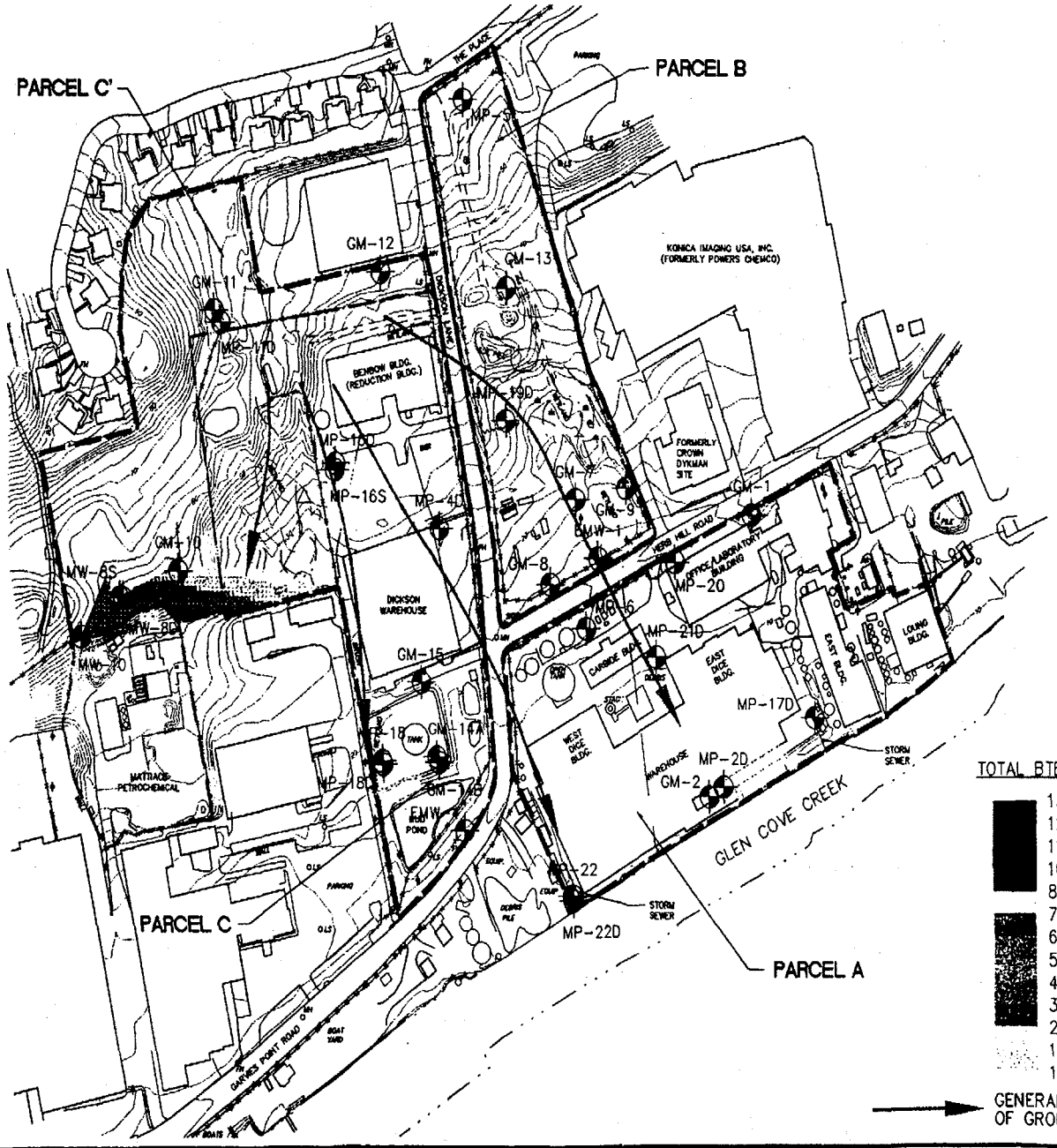
DATE: MAY 1998

TETRACHLOROETHENE CONCENTRATION IN GROUNDWATER (ROUND 2-JANUARY 1997)

PROJECT NO.: 8001202

FIGURE 5-22

7308 ADMIN I:\ACAD\PROJ\80012020\GISFILES\REPORT\8001LT39 Scale: 1:.. Date: 05/06/1998 Time: 10:23



CONCENTRATION LEVELS (ug/L)

GM-1	U
GM-2	U
GM-7	U
GM-8	U
GM-9	U
GM-10	U
GM-11	2
GM-12	U
GM-13	U
GM-14A	U
GM-14B	U
GM-15	U
EMW-1	U
EMW-4	U
MW-8S	460
MW-8D	67100
MW-10	133600
MP-2D	2
MP-4	U
MP-5	1
MP-6	U
MP-11D	U
MP-16	U
MP-16D	2
MP-17D	U
MP-18	21
MP-18D	U
MP-19D	U
MP-20	U
MP-21D	U
MP-22	U
MP-22D	U

N.

TOTAL BTEX (ug/L)

133608
122474
111340
100206
89072
77938
66804
55670
44536
33402
22268
11134
1

GENERALIZED DIRECTION OF GROUNDWATER FLOW

U- NOT DETECTED

E- ESTIMATED VALUE

J- ESTIMATED VALUE, BELOW CRQL, ABOVE IDL

R- ANALYSES DID NOT PASS EPA QA/QC

BTEX= BENZENE, TOLUENE, ETHYLBENZENE, TOTAL XYLENES

0 100 200 300
SCALE IN FEET
1"=200'

MALCOLM PIRNIE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

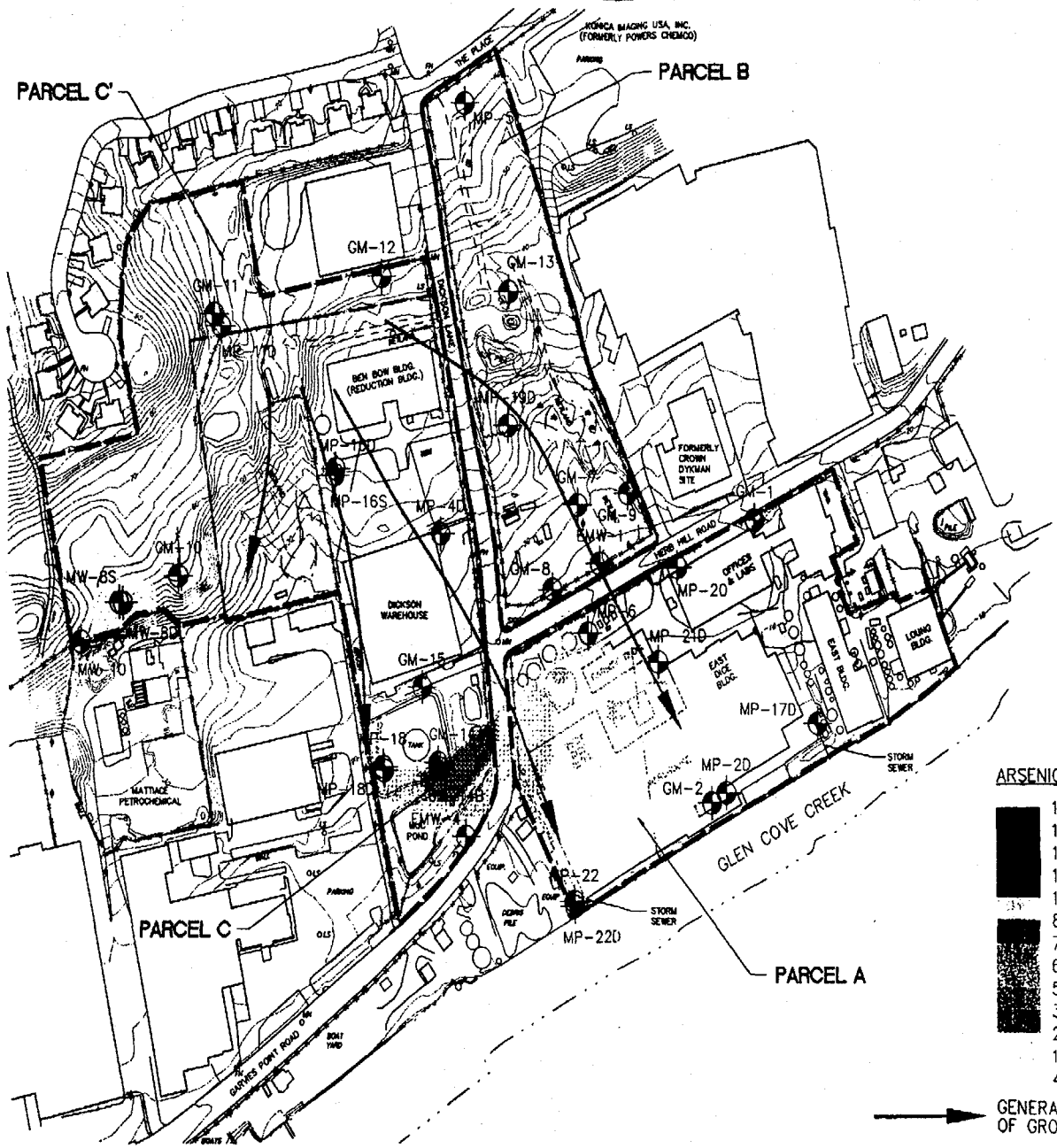
DATE: MAY 1998

TOTAL BTEX CONCENTRATION IN GROUNDWATER (ROUND 2-JANUARY 1997)

PROJECT NO.: 8001202

FIGURE 5-23

7308 ADMIN I:\ACAD\PROJ\8001202\GISFILES\REPORT\8001LT73 Scale: 1"=1 Date: 05/06/1998 Time: 10:24



CONCENTRATION LEVELS (ug/L)

GM-1	4.2 J
GM-2	27.2
GM-7	U
GM-8	U
GM-9	U
GM-10	U
GM-11	U
GM-12	U
GM-13	U
GM-14A	U
GM-14B	14,500 E
GM-15	U
EMW-1	U
EMW-4	84.7
MW-8S	6.3 J
MW-8D	8.8 J
MW-10	U
MP-2D	U
MP-4	U
MP-5	U
MP-6	9.2 J
MP-11D	U
MP-16	U
MP-16D	U
MP-17D	U
MP-18	40
MP-18D	U
MP-19D	U
MP-20	U
MP-21D	U
MP-22	403
MP-22D	35.3

U- NOT DETECTED

E- ESTIMATED VALUE

J- ESTIMATED VALUE, BELOW CRQL, ABOVE IDL

R- ANALYSES DID NOT PASS EPA QA/QC

MALCOLM PIRNIE

LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

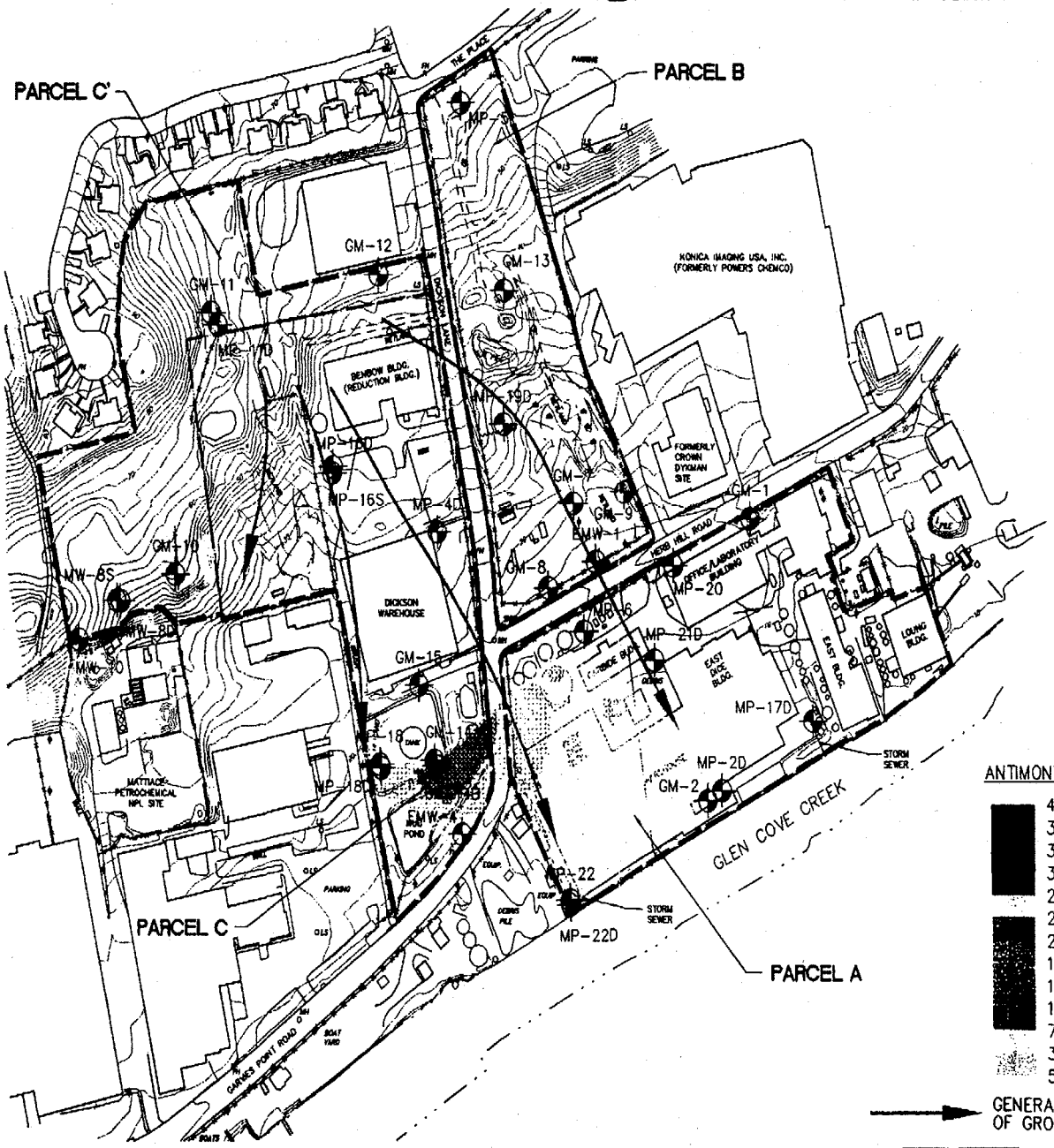
DATE: MAY 1998

ARSENIC CONCENTRATION IN GROUNDWATER (ROUND 1-DECEMBER 1996)

PROJECT NO.: 8001202

FIGURE 5-24

7308 ADMIN I:\ACAD\PROJ\80012020\GISFILES\REPORT\8001LT26 Scale: 1" Date: 05/06/1998 Time: 10:25



CONCENTRATION LEVELS (ug/L)

GM-1	U
GM-2	6.1 J
GM-7	U
GM-8	U
GM-9	U
GM-10	U
GM-11	U
GM-12	U
GM-13	U
GM-14A	10.7 J
GM-14B	4300
GM-15	U
EMW-1	U
EMW-4	U
MW-8S	U
MW-8D	U
MW-10	U
MP-2D	U
MP-4	U
MP-5	U
MP-6	U
MP-11D	U
MP-16	U
MP-16D	U
MP-17D	U
MP-18	48.1 J
MP-18D	16.6 J
MP-19D	U
MP-20	U
MP-21D	U
MP-22	52.8 J
MP-22D	5.8 J

U- NOT DETECTED

E- ESTIMATED VALUE

J- ESTIMATED VALUE, BELOW CRQL, ABOVE IDL

R- ANALYSES DID NOT PASS EPA QA/QC

MALCOLM PIRNIE

LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

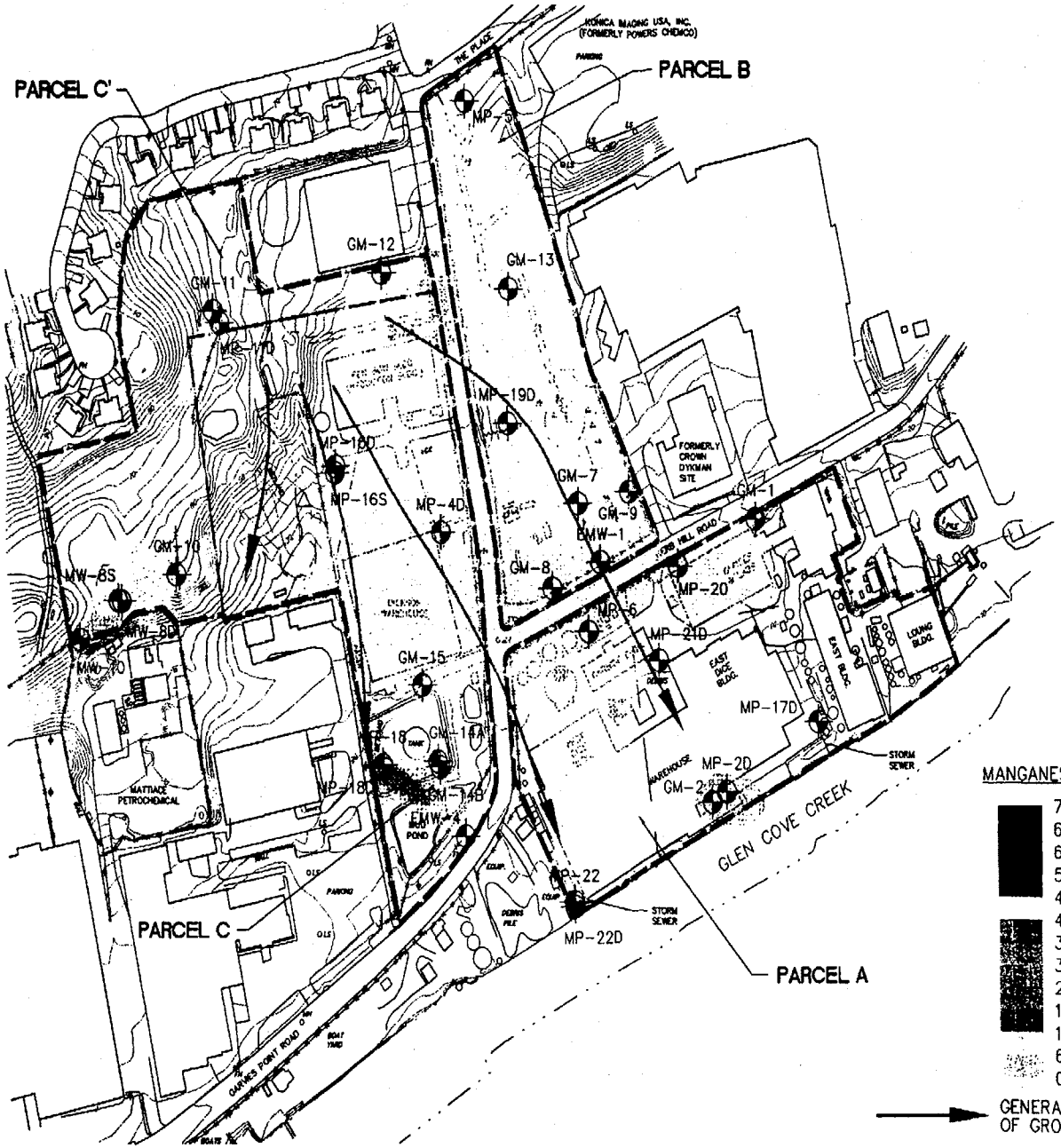
ANTIMONY CONCENTRATION IN GROUNDWATER (ROUND 1-DECEMBER 1996)

DATE: MAY 1998

PROJECT NO.: 8001202

FIGURE 5-25

7308 ADMIN I:\ACAD\PROJ\8001202O\GISFILES\REPORT\8001LT64 Scale: 1:1 Date: 05/06/1998 Time: 10:30



CONCENTRATION LEVELS (ug/L)

GM-1	6,940
GM-2	5,020
GM-7	1,520
GM-8	770
GM-9	1,870
GM-10	163
GM-11	588
GM-12	2,940
GM-13	10,000
GM-14A	1,720
GM-14B	246
GM-15	2,480
EMW-1	1,990
EMW-4	4,000
MW-8S	6,790
MW-8D	8,320
MW-10	18,000
MP-2D	34,200
MP-4	6,880
MP-5	1,150
MP-6	6,880
MP-11D	0.42 J
MP-16	153
MP-16D	30.3
MP-17D	2,500
MP-18	5,500
MP-18D	64,700 E
MP-19D	6.6 J
MP-20	1,410
MP-21D	U
MP-22	887
MP-22D	2 J

U- NOT DETECTED

E- ESTIMATED VALUE

J- ESTIMATED VALUE, BELOW CRQL, ABOVE IDL

R- ANALYSES DID NOT PASS EPA QA/QC

MALCOLM PIRNIE

LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

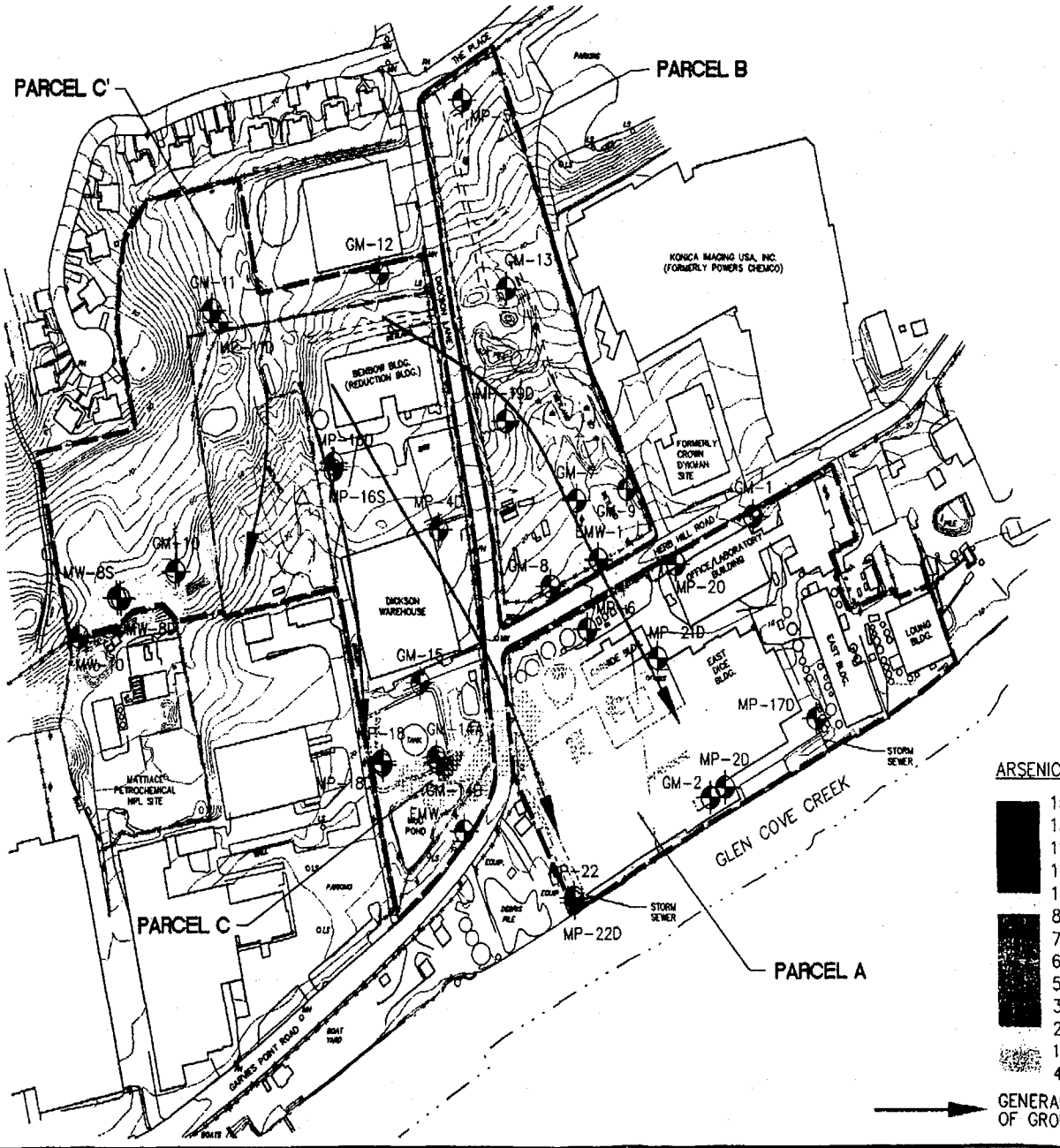
DATE: MAY 1998

MANGANESE CONCENTRATION IN GROUNDWATER (ROUND 1-DECEMBER 1996)

PROJECT NO.: 8001202

FIGURE 5-26

I:\ACAD\PROJ\8001202O\GISFILES\REPORT\8001LT23 Scale: 1:1 Date: 05/06/1998 Time: 10:32
7308 ADMIN



CONCENTRATION LEVELS (ug/L)

GM-1	U
GM-2	13.5
GM-7	U
GM-8	U
GM-9	U
GM-10	U
GM-11	U
GM-12	U
GM-13	U
GM-14A	12.6
GM-14B	9,440 E
GM-15	U
EMW-1	5.5 J
EMW-4	16.2
MW-8S	6.8 J
MW-8D	13.7
MW-10	U
MP-2D	U
MP-4	U
MP-5	U
MP-6	U
MP-11D	U
MP-16	U
MP-16D	U
MP-17D	U
MP-18	36.4
MP-18D	U
MP-19D	U
MP-20	U
MP-21D	U
MP-22	160
MP-22D	25.8

ARSENIC (ug/L)

15,000
13,750
12,500
11,250
10,000
8,750
7,500
6,250
5,000
3,750
2,500
1,250
4

U- NOT DETECTED
E- ESTIMATED VALUE
J- ESTIMATED VALUE, BELOW CRQL, ABOVE IDL
R- ANALYSES DID NOT PASS EPA QA/QC

GENERALIZED DIRECTION OF GROUNDWATER FLOW

0 100 200 300
SCALE IN FEET
1"=200'

MALCOLM PIRNIE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

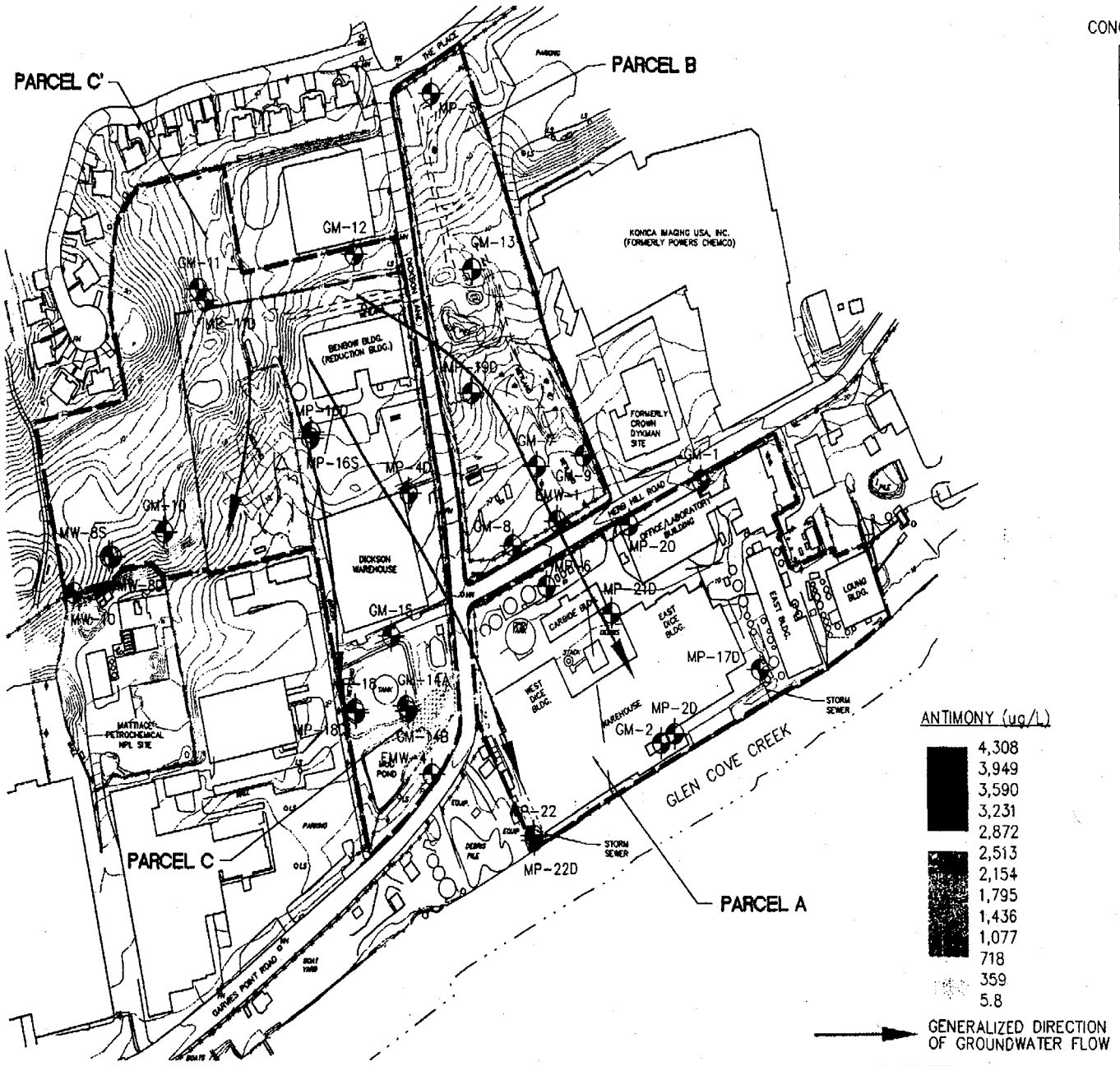
ARSENIC CONCENTRATION IN GROUNDWATER (ROUND 2-JANUARY 1997)

DATE: MAY 1998

PROJECT NO.: 8001202

FIGURE 5-27

7308 ADMIN I:\ACAD\PROJ\8001202O\GISFILES\REPORT\8001LT27 Scale: 1:1 Date: 05/06/1998 Time: 10:33



CONCENTRATION LEVELS (ug/L)

GM-1	U
GM-2	U
GM-7	U
GM-8	U
GM-9	U
GM-10	U
GM-11	U
GM-12	U
GM-13	U
GM-14A	66
GM-14B	824 E
GM-15	U
EMW-1	U
EMW-4	U
MW-8S	U
MW-8D	U
MW-10	U
MP-2D	U
MP-4	U
MP-5	U
MP-6	U
MP-11D	U
MP-16	U
MP-16D	U
MP-17D	U
MP-18	10 J
MP-18D	7.5 J
MP-19D	U
MP-20	U
MP-21D	U
MP-22	18.5 J
MP-22D	U

U- NOT DETECTED

E- ESTIMATED VALUE

J- ESTIMATED VALUE, BELOW CRQL, ABOVE IDL

R- ANALYSES DID NOT PASS EPA QA/QC

MALCOLM PIRNIE

LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

ANTIMONY CONCENTRATION IN GROUNDWATER (ROUND 2-JANUARY 1997)

DATE: MAY 1998

PROJECT NO.: 8001202

FIGURE 5-28

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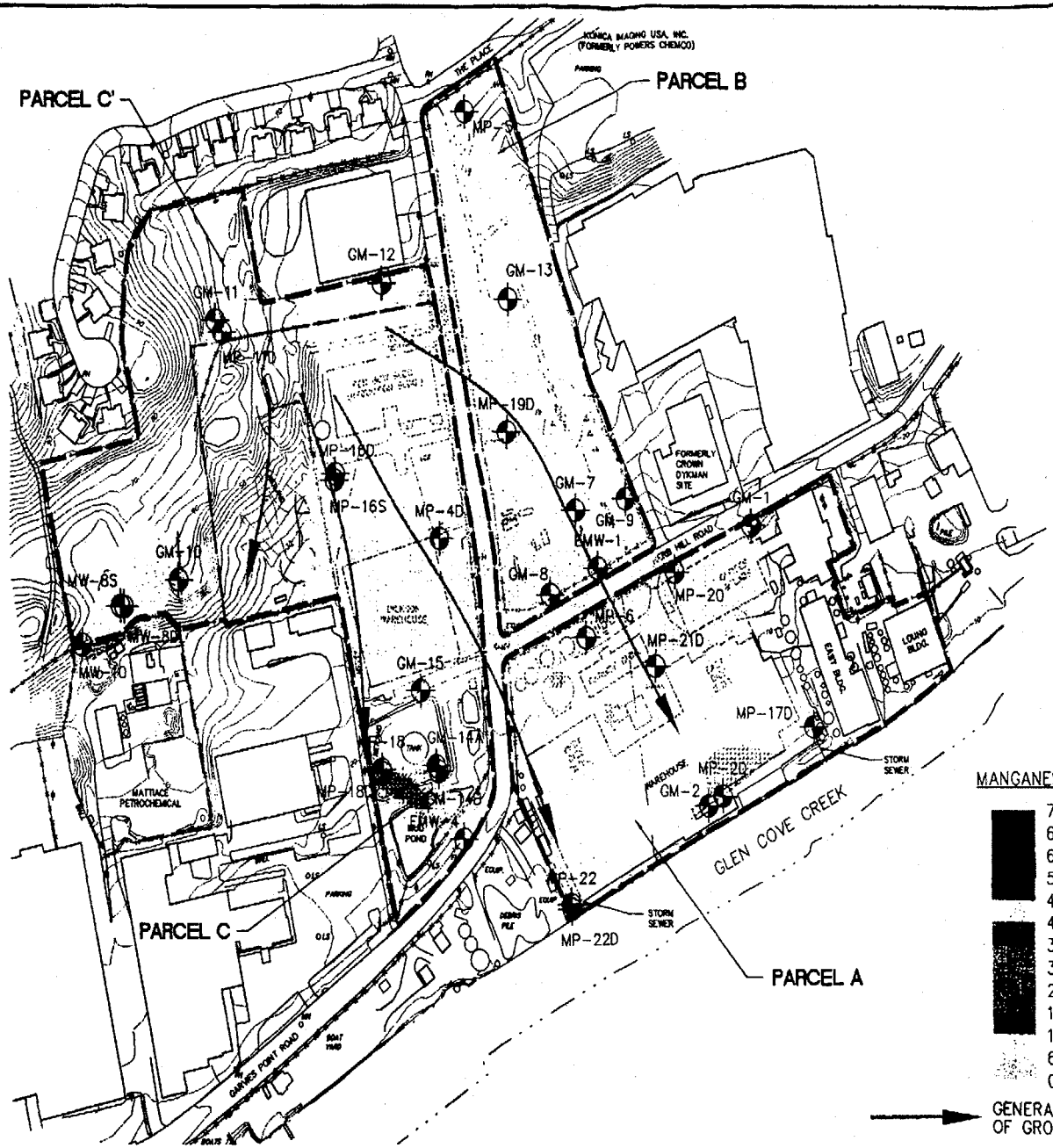
7308 ADMIN



CONCENTRATION LEVELS (ug/L)

GM-1	1,820
GM-2	7,600
GM-7	1,860
GM-8	1,240
GM-9	1,940
GM-10	325
GM-11	861
GM-12	2,350
GM-13	8,170
GM-14A	3,340
GM-14B	375 E
GM-15	2,340
EMW-1	2,020
EMW-4	3,410
MW-8S	5,790
MW-8D	6,020
MW-10	14,000
MP-2D	24,900
MP-4	4,650
MP-5	1,240
MP-6	6,070
MP-11D	U
MP-16	352
MP-16D	46.2
MP-17D	2,430
MP-18	4,950
MP-18D	69,800
MP-19D	2,220
MP-20	R
MP-21D	1,220
MP-22	1,230
MP-22D	0.42

U- NOT DETECTED

E- ESTIMATED VALUE

J- ESTIMATED VALUE, BELOW CRQL, ABOVE IDL

R- ANALYSES DID NOT PASS EPA QA/QC

MANGANESE (ug/L)

72,000
66,000
60,000
54,000
48,000
42,000
36,000
30,000
24,000
18,000
12,000
6,000
0.42

0 100 200 300
SCALE IN FEET
1"=200'

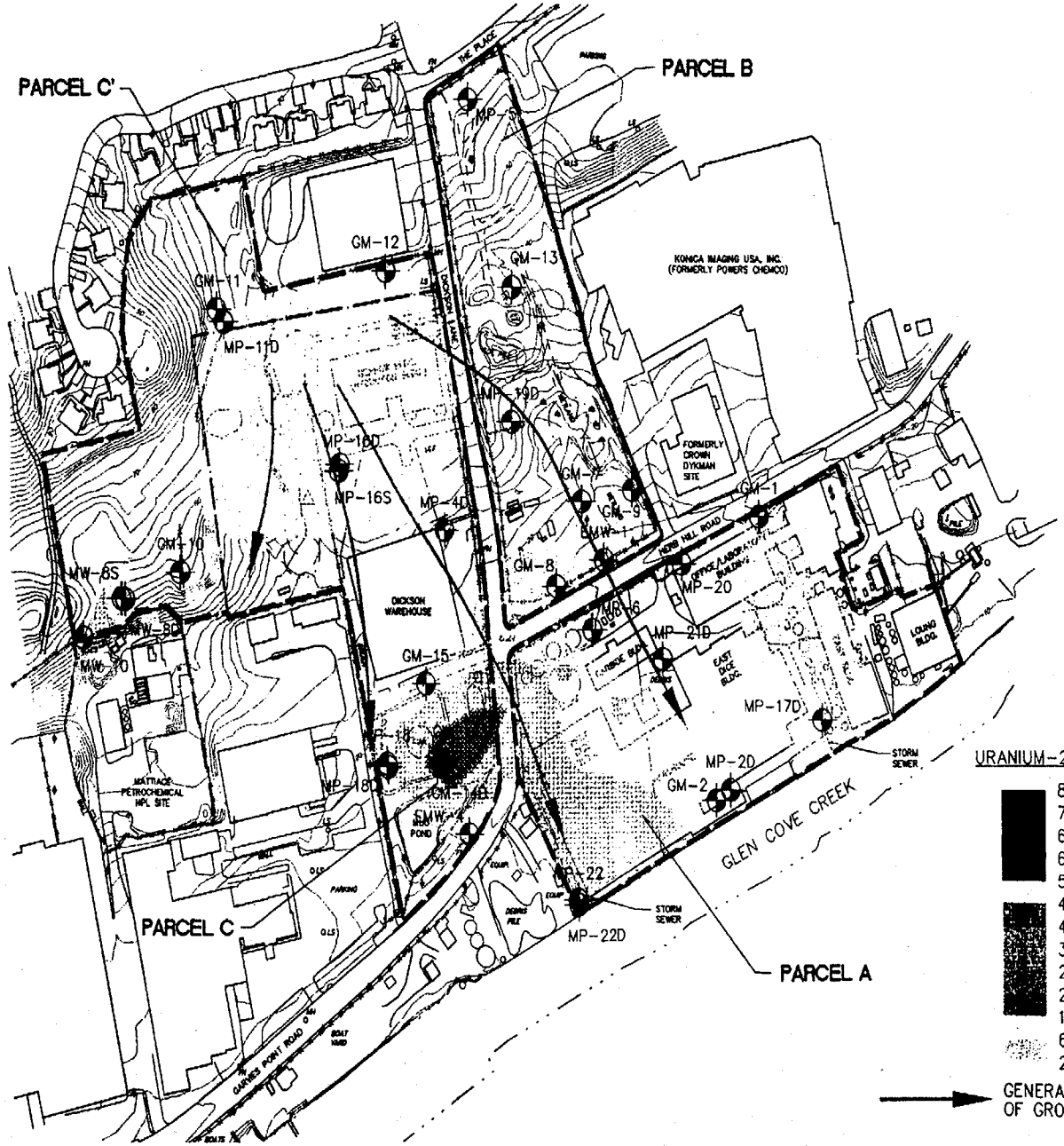
MALCOLM PIRNIE

LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

MANGANESE CONCENTRATION IN GROUNDWATER (ROUND 2-JANUARY 1997)

DATE: MAY 1998 | PROJECT NO.: 8001202 | FIGURE 5-29

7308 ADMIN I:\ACAD\PROJ\80012020\GISFILES\REPORT\8001LT24 Scale: 1:1 Date: 05/06/1998 Time: 10:40



CONCENTRATION LEVELS (ug/L)

GM-1	3.2
GM-2	2.1
GM-7	<0.32
GM-8	3.3
GM-9	0.75
GM-10	1
GM-11	2.6
GM-12	2.4 E
GM-13	0.62
GM-14A	2.10
GM-14B	67 E
GM-15	5.00
EMW-1	1.10
EMW-4	0.31
MW-8S	2.50
MW-8D	U
MW-10	59
MP-2D	1.8
MP-4	0.55
MP-5	0.29
MP-6	0.58
MP-11D	4.1
MP-16	<0.25
MP-16D	5.9
MP-17D	2.9
MP-18	2.1
MP-18D	9.6 E
MP-19D	<0.32
MP-20	<0.26
MP-21D	<0.28
MP-22	1.3
MP-22D	42

U- NOT DETECTED

E- ESTIMATED VALUE

J- ESTIMATED VALUE, BELOW CRQL, ABOVE IDL

R- ANALYSES DID NOT PASS EPA QA/QC

MALCOLM PIRNIE

LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

URANIUM-238 CONCENTRATION IN GROUNDWATER (ROUND 1-DECEMBER 1996)

DATE: MAY 1998

PROJECT NO.: 8001202

FIGURE 5-30

7308 ADMIN I:\ACAD\PROJ\80012020\GISFILES\REPORT\8001L42A Scale: 1i Date: 05/06/1998 Time: 10:46

CONCENTRATION LEVELS (pCi/L)

GM-1	0.4
GM-2	<0.4
GM-7	<0.2
GM-8	0.6
GM-9	<0.35
GM-10	1
GM-11	0.4
GM-12	2.4 E
GM-13	1.1
GM-14A	2.6
GM-14B	R
GM-15	0.33
EMW-1	0.43
EMW-4	<0.26
MW-8S	<0.33
MW-8D	<0.23
MW-10	1
MP-2D	1.3
MP-4	<0.4
MP-5	<0.5
MP-6	<0.33
MP-11D	1.7
MP-16	<0.3
MP-16D	0.77
MP-17D	0.66
MP-18	0.69
MP-18D	7
MP-19D	U
MP-20	U
MP-21D	<0.4
MP-22	0.41
MP-22D	0.71

U- NOT DETECTED

E- ESTIMATED VALUE

J- ESTIMATED VALUE, BELOW CRQL, ABOVE IDL

R- ANALYSES DID NOT PASS EPA QA/QC

I:\ACAD\PROJ\80012020\GISFILES\REPORT\8001L50A Scale: 1:1 Date: 05/06/1998 Time: 11:04

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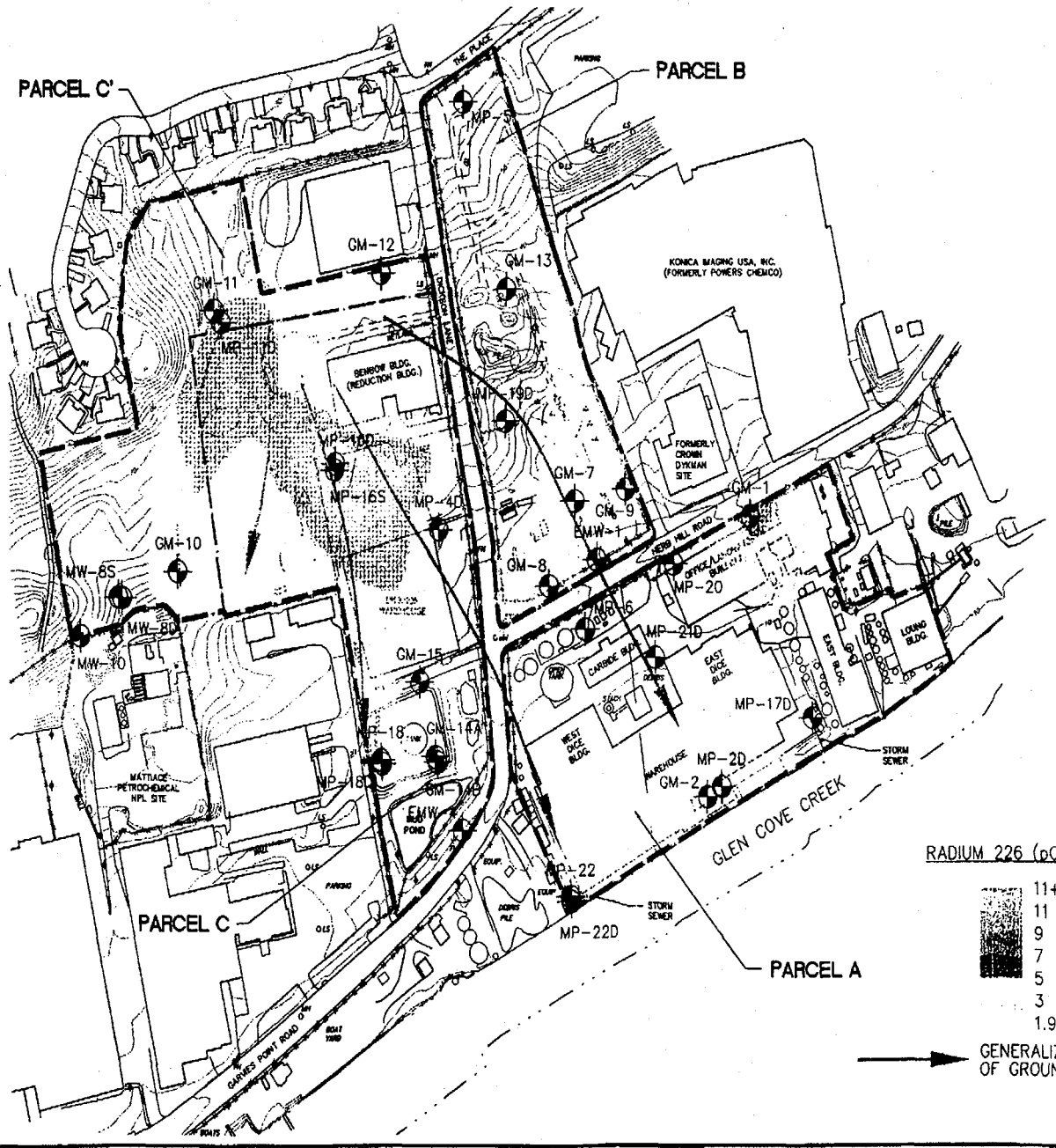
LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

DATE: MAY 1998

THORIUM-232 CONCENTRATION IN GROUNDWATER (ROUND 1-DECEMBER 1996)

PROJECT NO.: 8001202

FIGURE 5-31



CONCENTRATION LEVELS (pCi/L)

GM-1	5.3
GM-2	1.40
GM-7	2.3
GM-8	3.8
GM-9	2.5
GM-10	4
GM-11	5.7
GM-12	2.4 E
GM-13	1.8
GM-14A	1.20
GM-14B	1.5
GM-15	0.94
EMW-1	1.10
EMW-4	0.23
MW-8S	1.70
MW-8D	0.29
MW-10	4
MP-2D	2.8
MP-4	0.58
MP-5	ND
MP-6	1.1
MP-11D	6.4
MP-16	0.46
MP-16D	11
MP-17D	1.8
MP-18	0.67
MP-18D	3.6
MP-19D	ND
MP-20	ND
MP-21D	ND
MP-22	0.77
MP-22D	3

U- NOT DETECTED

E- ESTIMATED VALUE

J- ESTIMATED VALUE, BELOW CRQL, ABOVE IDL

R- ANALYSES DID NOT PASS EPA QA/QC

RADIUM 226 (pCi/L)

11+
11
9
7
5
3
1.9

GENERALIZED DIRECTION OF GROUNDWATER FLOW

0 100 200 500
SCALE IN FEET
1"=200'

MALCOLM PIRNIE

LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

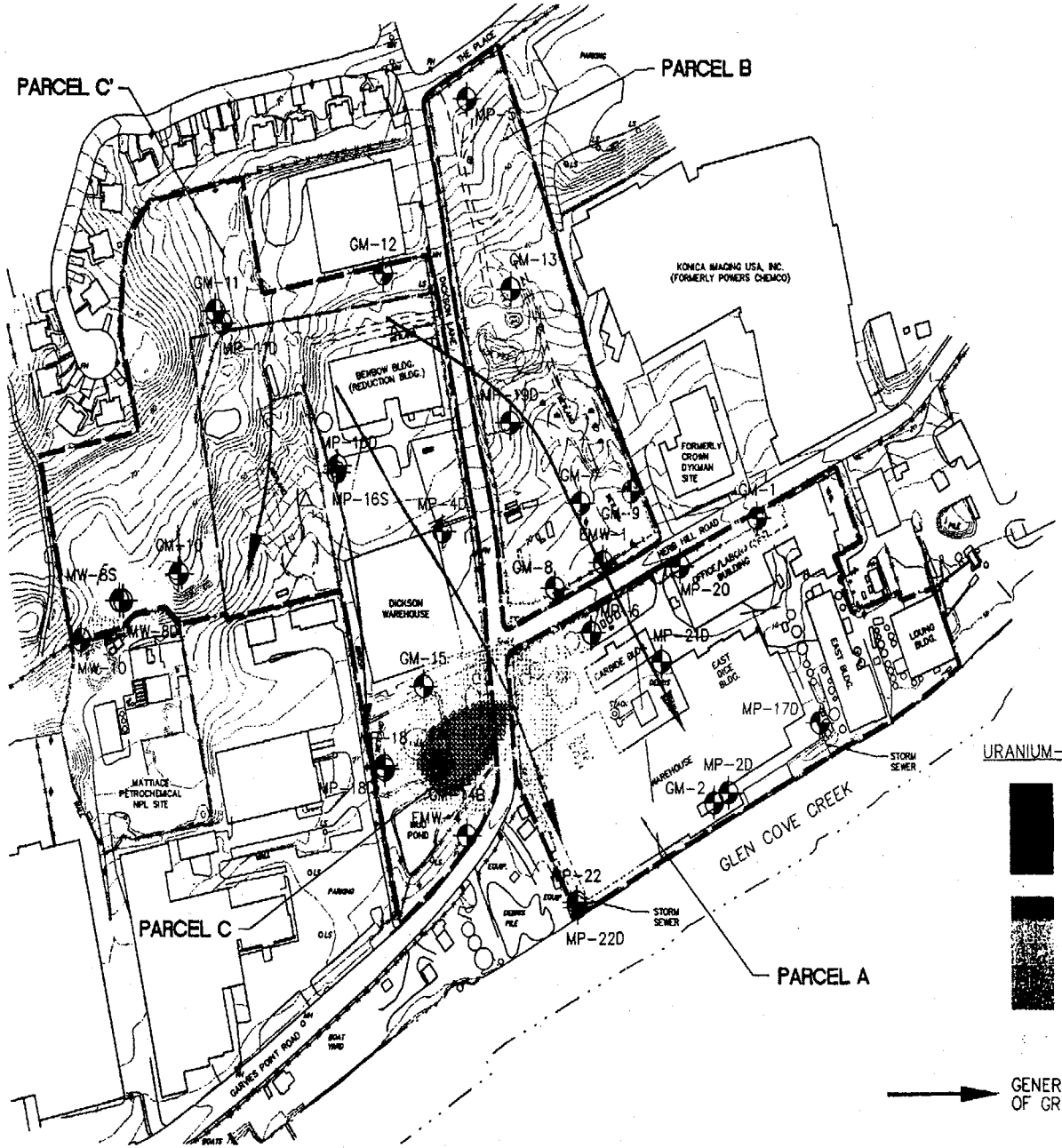
RADIUM-226 CONCENTRATION IN GROUNDWATER (ROUND 1-DECEMBER 1996)

DATE: MAY 1998

PROJECT NO.: 8001202

FIGURE 5-32

7308 ADMIN I:\ACAD\PROJ\80012020\GISFILES\REPORT\8001L44B Scale: 1:1 Date: 05/06/1998 Time: 14:31



CONCENTRATION LEVELS (pCi/L)

GM-1	4.1 E
GM-2	0.58
GM-7	1.5
GM-8	2.8
GM-9	5.6
GM-10	<0.24
GM-11	2
GM-12	1.4
GM-13	0.81
GM-14A	2.5 E
GM-14B	80 E
GM-15	7.5
EMW-1	0.92
EMW-4	<0.23
MW-8S	0.37
MW-8D	<0.23
MW-10	31
MP-2D	1.9
MP-4	0.57
MP-5	1.6
MP-6	0.29
MP-11D	<0.46
MP-16	0.41
MP-16D	2.1
MP-17D	<0.31
MP-18	3.9
MP-18D	1.9
MP-19D	<0.33
MP-20	2
MP-21D	<0.37
MP-22	4.1
MP-22D	<0.25

URANIUM-238 (pCi/L)

80
73
66
60
53
46
40
33
26
20
13
6
2.2

U- NOT DETECTED

E- ESTIMATED VALUE

J- ESTIMATED VALUE, BELOW CRQL, ABOVE IDL

R- ANALYSES DID NOT PASS EPA QA/QC

GENERALIZED DIRECTION OF GROUNDWATER FLOW

0 100 200 300
SCALE IN FEET
1"=200'

MALCOLM PIRNIE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

URANIUM-238 CONCENTRATION IN GROUNDWATER (ROUND 2-JANUARY 1997)

DATE: MAY 1998

PROJECT NO.: 8001202

FIGURE 5-33

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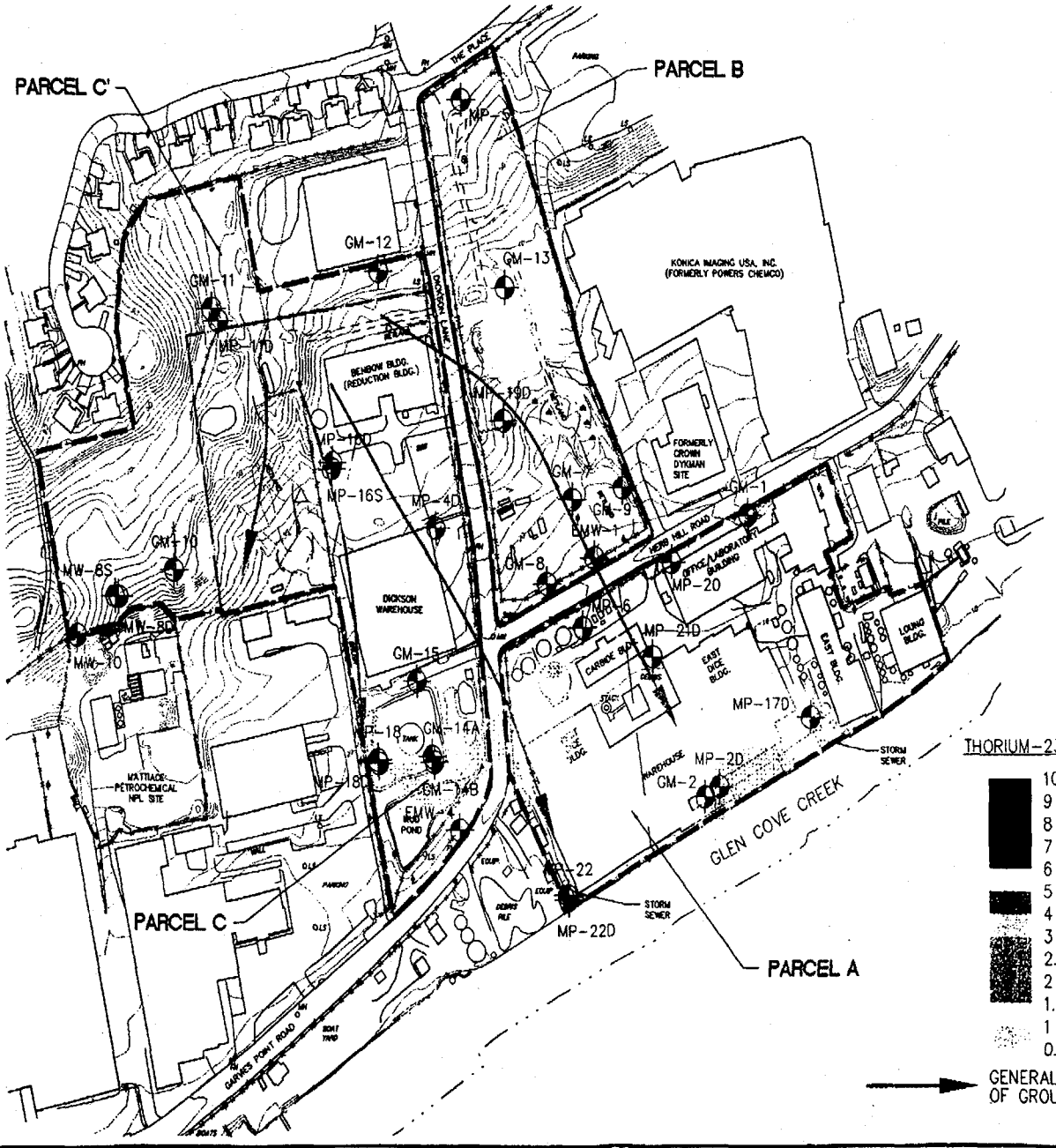

CONCENTRATION LEVELS (pCi/L)

GM-1	0.58
GM-2	0.23
GM-7	0.68
GM-8	<0.34
GM-9	<0.43
GM-10	0.66
GM-11	<0.36
GM-12	0.47
GM-13	1.3
GM-14A	1.2
GM-14B	6.8 E
GM-15	0.68
EMW-1	<0.22
EMW-4	<0.20
MW-8S	<0.41
MW-8D	<0.56
MW-10	0.5
MP-2D	3.8 E
MP-4	0.23
MP-5	0.29
MP-6	<0.44
MP-11D	<0.38
MP-16	<0.41
MP-16D	0.98
MP-17D	<1.2
MP-18	1.6
MP-18D	2.2
MP-19D	<0.46
MP-20	0.41
MP-21D	<0.32
MP-22	0.45
MP-22D	<0.31

U- NOT DETECTED

E- ESTIMATED VALUE

J- ESTIMATED VALUE, BELOW CRQL, ABOVE IDL

R- ANALYSES DID NOT PASS EPA QA/QC

MALCOLM PIRNIE

LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

THORIUM-232 CONCENTRATION IN GROUNDWATER (ROUND 2-JANUARY 1997)

DATE: MAY 1998 | PROJECT NO.: 8001202 | FIGURE 5-34

7308 ADMIN I:\ACAD\PROJ\80012020\GSFILES\REPORT\8001L51A Scale: ..1i Date: 05/06/1998 Time: 11:10

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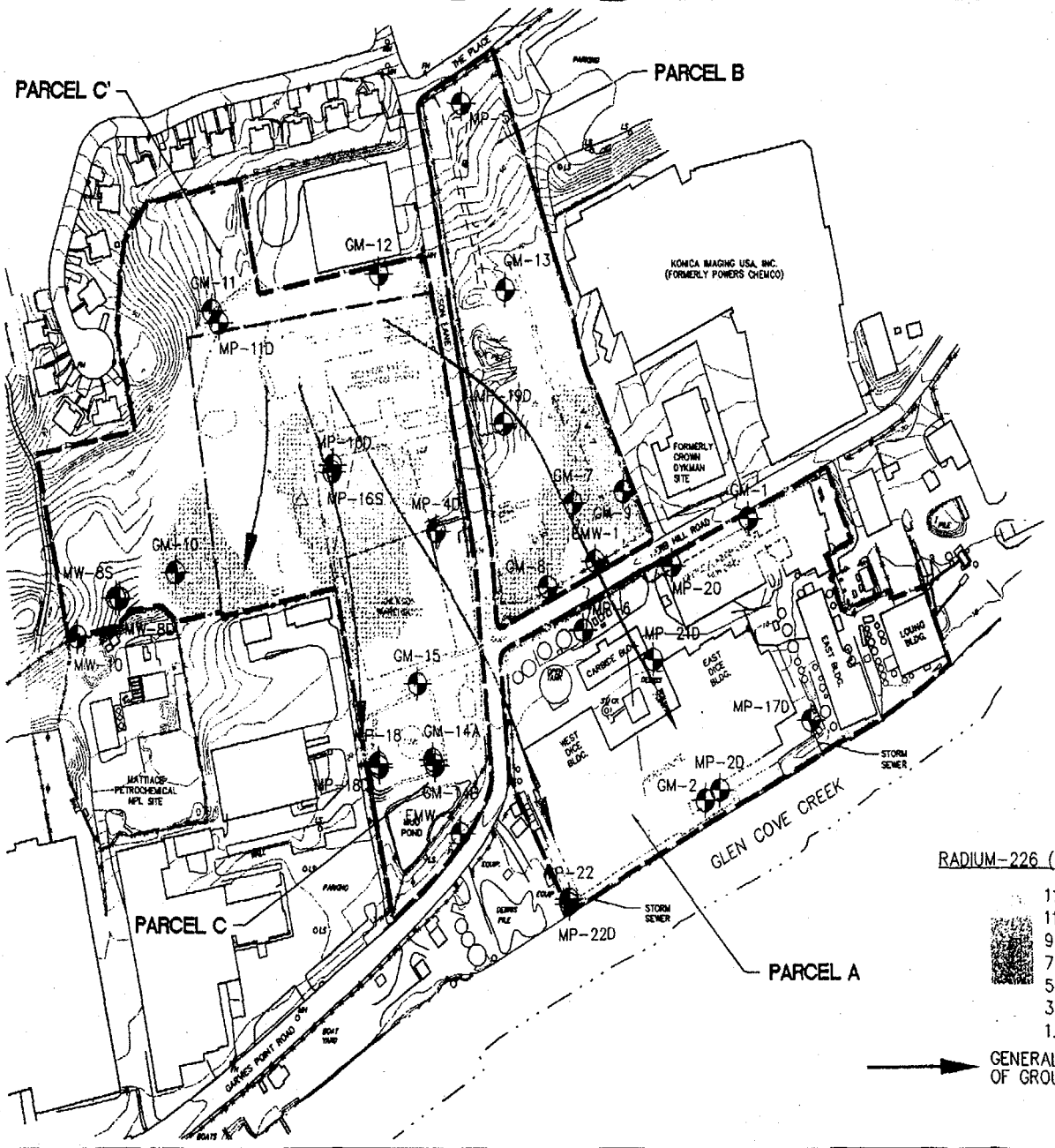

CONCENTRATION LEVELS (pCi/L)

GM-1	3.6
GM-2	1.5
GM-7	6.3
GM-8	6
GM-9	9
GM-10	7.2
GM-11	7
GM-12	2.8
GM-13	2
GM-14A	1.5
GM-14B	2.7
GM-15	3.7
EMW-1	1.1
EMW-4	<0.35
MW-8S	<0.35
MW-8D	<0.35
MW-10	3.3
MP-2D	4.3
MP-4	1.1
MP-5	1.6
MP-6	0.6
MP-11D	<0.35
MP-16	0.5
MP-16D	11
MP-17D	<0.31
MP-18	1
MP-18D	3.3
MP-19D	<0.35
MP-20	2.3
MP-21D	0.32
MP-22	4
MP-22D	1.3

U- NOT DETECTED

E- ESTIMATED VALUE

J- ESTIMATED VALUE, BELOW CRQL, ABOVE IDL

R- ANALYSES DID NOT PASS EPA QA/QC

RADIUM-226 (pCi/L)

11+
11
9
7
5
3
1.9

GENERALIZED DIRECTION OF GROUNDWATER FLOW

0 100 200 300
SCALE IN FEET
1"=200'

MALCOLM PIRNIE

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

DATE: MAY 1998

RADIUM-226 CONCENTRATION IN GROUNDWATER (ROUND 2-JANUARY 1997)

PROJECT NO.: 8001202

FIGURE 5-35

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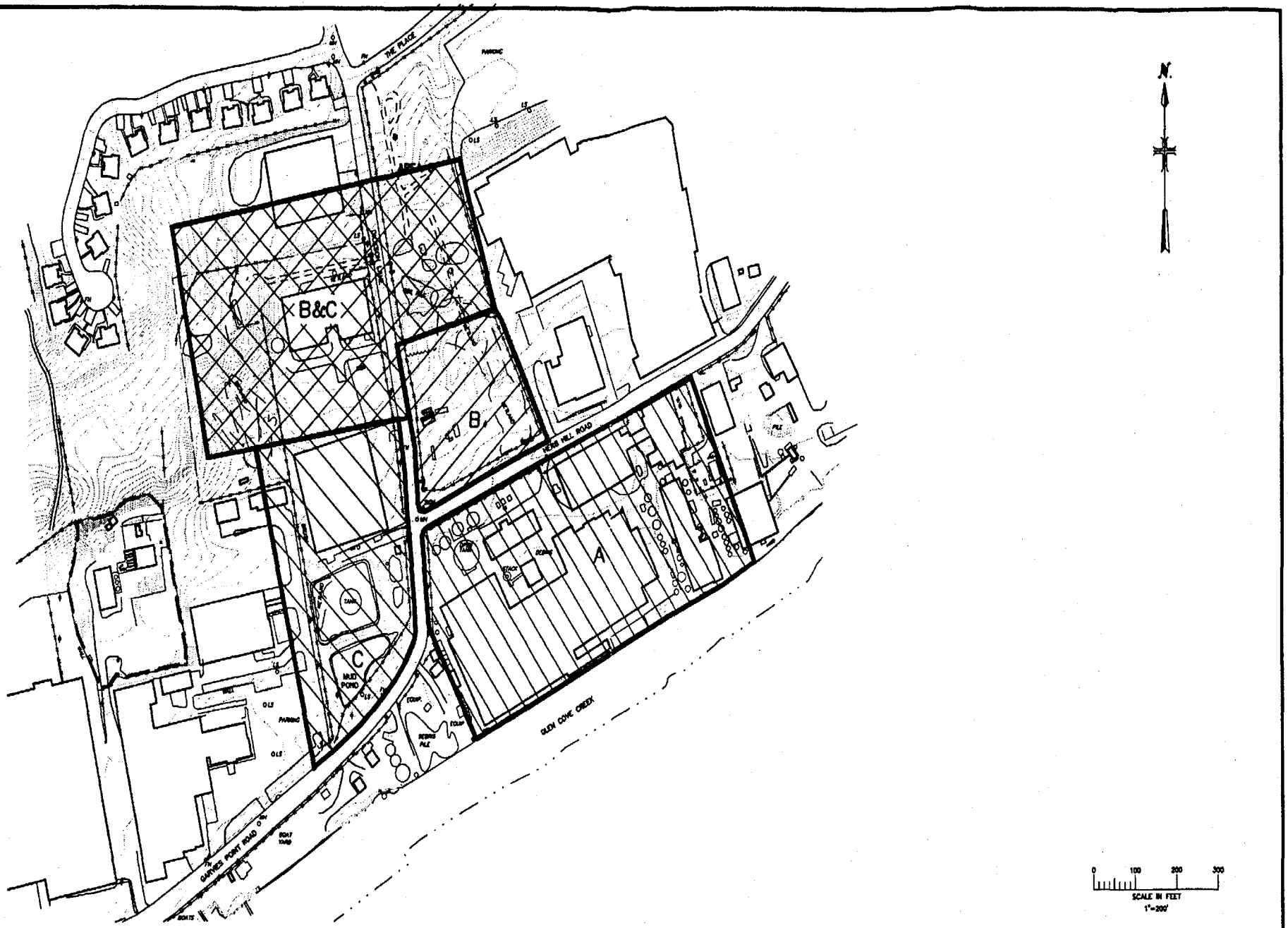
7308 ADMIN



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LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

SOIL DATA GROUPINGS

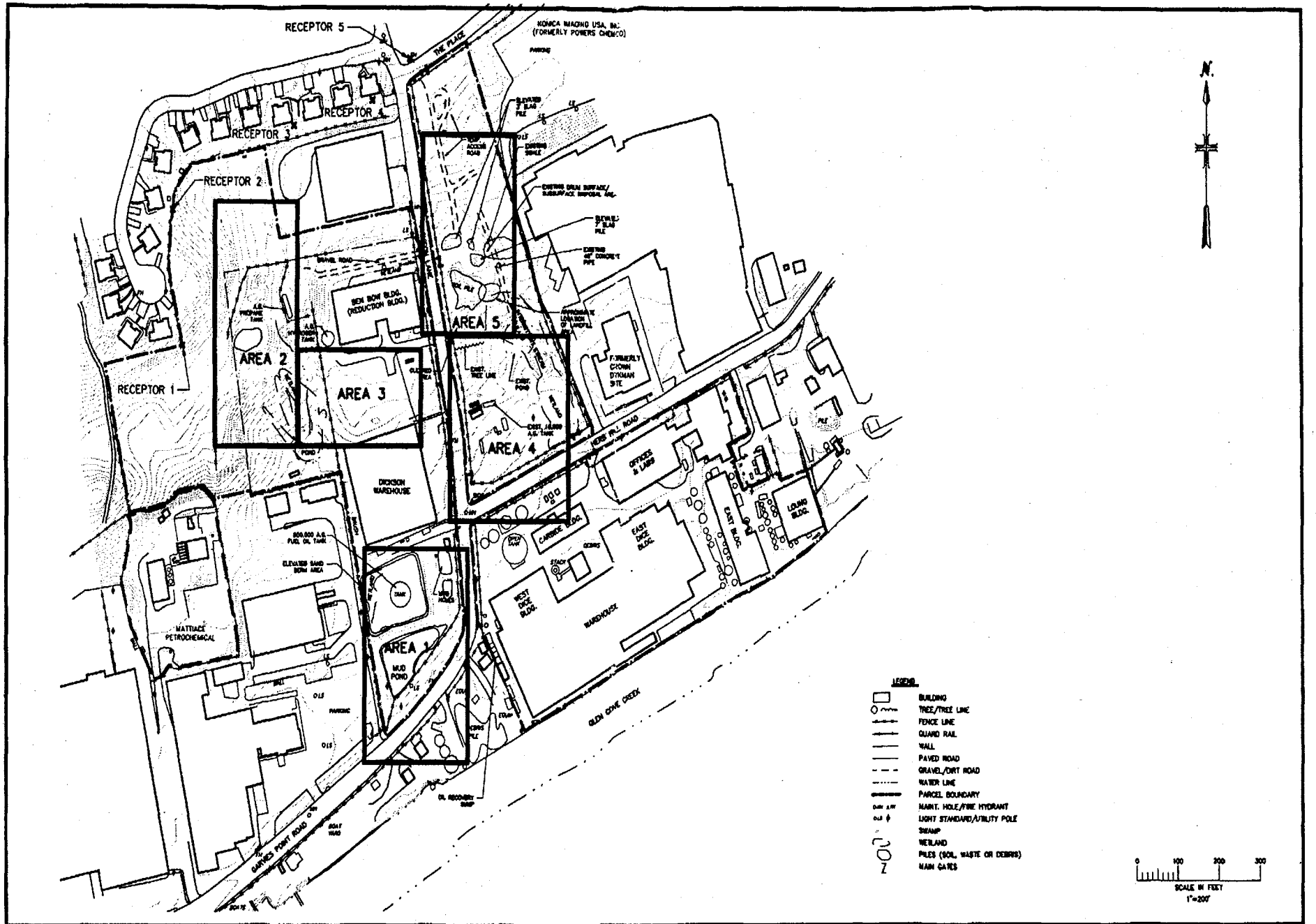
DATE:	PROJECT NO.:	
MAY 1998	8001202	FIGURE 7-1

I:\ACAD\PROJ\80012020\GISFILES\REPORT\SOILGRP Scale: 1:1i Date: 05/06/1998 Time: 11:22

7308 ADA

301507

301508



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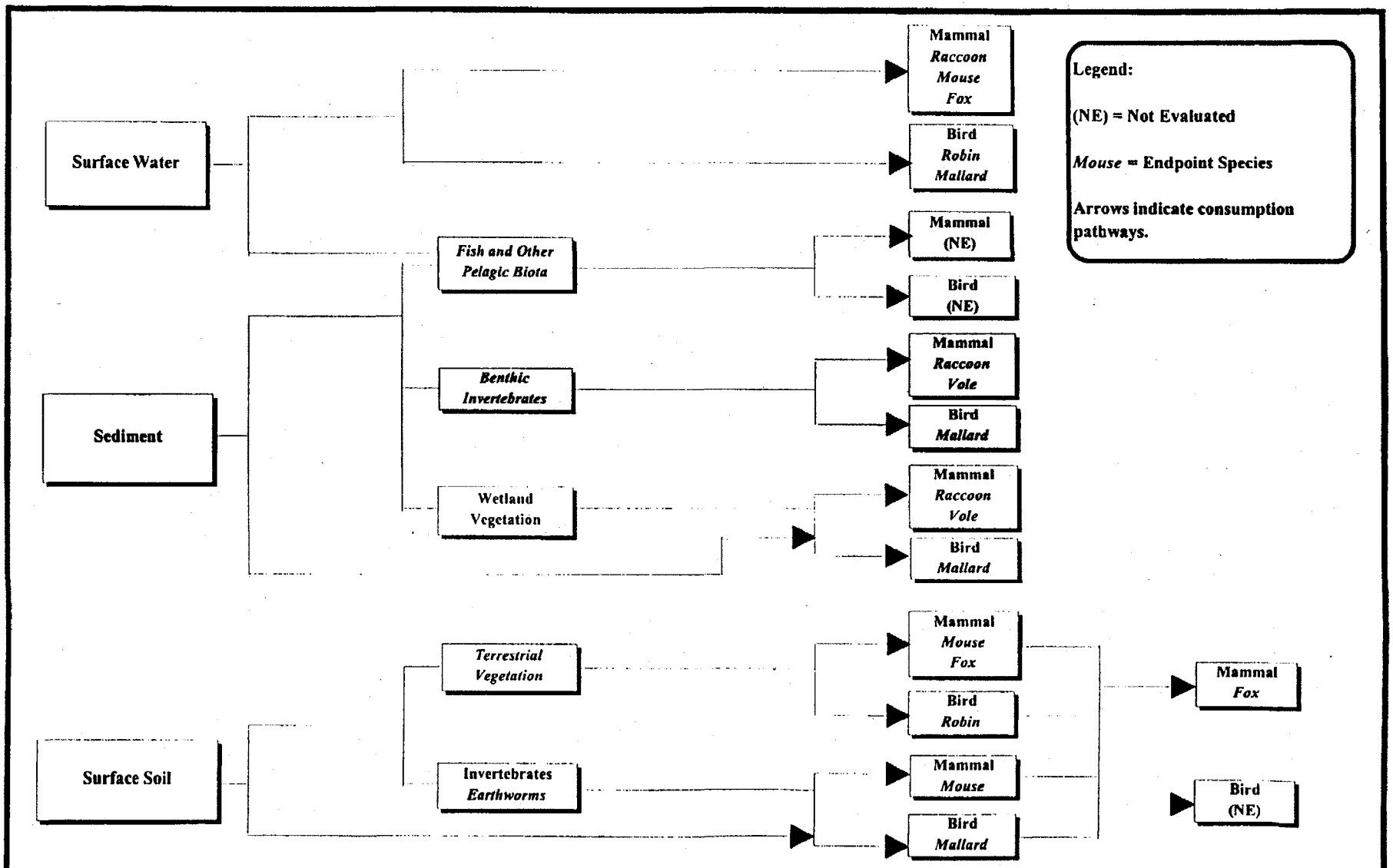
LI TUNGSTEN REMEDIAL INVESTIGATION
GLEN COVE, NEW YORK
USEPA REGION II ARCS
CONTRACT NO. 68-W9-0051; W.A. NO. 025-2L4L

SCHEMATIC OF MODEL SET-UP

DATE: MAY 1998 | PROJECT NO.: 8001202 | FIGURE 7-2

I:\ACAD\PROJ\8001202\GISFILES\REPORT\LTWINDER Sca. 1:11 Date: 05/06/1998 Time: 11:26

7308 ADM.



MALCOLM PIRNIE

CONCEPTUAL MODEL FOR ECOLOGICAL ASSESSMENT
LI TUNGSTEN SITE

MALCOLM PIRNIE, INC.

FIGURE 7-3

301509

PLATES

301510

EPA REGION II
SCANNING TRACKING SHEET

DOC ID # 36749

DOC TITLE/SUBJECT:
SITE PLAN FOR REMEDIAL INVESTIGATION (RI)
PLATE 1

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EPA REGION II
SCANNING TRACKING SHEET

DOC ID # 36749

DOC TITLE/SUBJECT:
GENERALIZED GEOLOGIC CROSS SECTIONS
A-A' AND B-B'
PLATE 2

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