

DEPARTMENT OF ENERGY
ALBUQUERQUE OPERATIONS OFFICE
CONTRACT NO. DE-AC04-83AL18796

Draft Radiological and Engineering Assessment

Vicinity Property No. SLC 092

Remedial Actions
Contractor
for the
Uranium Mill Tailings
Remedial Actions
Project



MORRISON
KNUDSEN

8508010320 850327
PDR WASTE PDR
WM-41

Vicinity Property No. SLC 092

DRAFT

THE RADIOLOGICAL AND ENGINEERING ASSESSMENT

AND FINAL DESIGN

FOR

SALT LAKE CITY PROPERTY

SL-092

March 26, 1985

PREPARED FOR

URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT OFFICE

UNITED STATES DEPARTMENT OF ENERGY

PREPARED BY

MORRISON-KNUDSEN COMPANY, INC.

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1.0 EXECUTIVE SUMMARY

1.1 Introduction

Property SL-092 is a commercial property located at 48 Gregson Avenue, Salt Lake City, UT.

1.2 Evaluation and Recommendation

1.2.1 Residual Radioactive Material Involvement

There is one area of contamination located on this property.

1.2.2 Recommended Remedial Action Option

The recommended option is to remove the contaminated material.

1.2.3 Estimated Costs

The estimated cost for removal of the contaminated material and restoration of the property is \$4,400.00.

1.2.4 Schedule

The estimated duration of the remedial action effort is 5 to 7 days.

2.0 ENGINEERING FIELD SURVEY

2.1 Property Description

2.1.1 Property Use and Occupancy

Property SL-092 is a commercial property located at 48 Gregson Avenue and owned by Dennis R. Schmidt, Geraldine E. Schmidt, Michael D. Schmidt, Connie W. Schmidt, Ronald K. Schmidt, and Debra M. Schmidt. The map in Figure 2.1 illustrates the property's vicinity location.

2.1.2 Legal Description

The legal description as recorded with the Salt Lake County Recorder's Office in Deed Book No. 5515, Page 2979 follows:

Commencing at a point 31 feet south and 333 feet west from the northwest corner of Lot 15, Block 33, Ten Acre Plat "A", Big Field Survey (which point is also a point on the southern line of a street known as Gregson Avenue at 300 feet from the point where said Avenue at its Eastern end connects with the Western line of State Street), and running thence West along the Southern line of said Gregson Avenue 130 feet; thence south 82.5 feet; thence east 130 feet; thence north 82.5 feet to the point of beginning.

2.1.3 Bordering Properties

The lot is zoned "Mixed-Use" for mixed compatible uses. It is located in a residential area less than one mile east of the old Vitro mill tailings site. The property is bounded on the north by Gregson Street; on the east by a residence; on the south by commercial property; and on the west by commercial property.

2.2 Existing Facilities and Structures

2.2.1 Structures

The principal structures on the property consist of two older residences, two older wooden storage buildings and one new masonry storage/garage building.

The two residence structures are of wood frame construction; the east residence is constructed on a concrete basement wall foundation, the west residence is constructed on concrete stem wall foundations with crawlspace.

The two wooden storage buildings are of wood frame construction with wood siding and composition roll roofing on a shed roof. The foundations are poured concrete spread footings with concrete slab-on-grade floor.

The concrete masonry storage garage is constructed on concrete spread footings with concrete slab-on-grade floor.

The balance of the property is surfaced with asphalt paving except for the northeast corner which is a garden plot.

2.2.2 Utilities

Utilities are serviced to the property as follows:

Electric power - From Gregson Street.

Telephone - From Gregson Street.

Water - From Gregson Street.

Gas - From Gregson Street.

Sewer - From Gregson Street.

2.2.3 Site Plan and Survey Data

See Figure 2.2 for a site plan of the property. Property survey data and photos are presented in Table 2.1 and Figure 2.3.

TABLE 2.1

COMMERCIAL/INSTITUTIONAL

PROPERTY SURVEY DATA

GENERAL:

Facility Name: Schmidt Concrete Construction

Address: 48 East Gregson

Owner: Schmidt Et Al

Occupancy: Employees/Occupants (Full Time): 2

Employees/Occupants (Part Time):

Remarks: Facility used as equipment storage and garage for concrete
contractor

PROPERTY DESCRIPTION:

Structure: (Identify) Single story residence and sheds

: SQ FT Levels 1

: Construction Type Wood frame and wood siding

: Foundation Concrete

Remarks: Older structures

No remedial work anticipated

Structure: (Identify) Storage garage

: SQ FT Levels 1

: Construction Type Concrete masonry

: Foundation Concrete

Remarks: New structure

No remedial work anticipated

TABLE 2.1

COMMERCIAL/INSTITUTIONAL

PROPERTY SURVEY DATE

Facility Name: Schmidt Concrete Construction

PROPERTY DESCRIPTION:

Driveway/Access: Concrete: _____ Asphalt: X Gravel: _____

Remarks: _____

Sidewalks: Concrete: _____ Asphalt: _____

Remarks: No public side walk

Fences: Chain link X Mesh _____ Wood _____

Remarks: _____

Grounds: Lawn None

Trees Six fruit trees

Shrubs Minimal

Grading Level

Soil Type Sandy loam

Remarks Construction materials randomly stored on the property

TABLE 2.1

COMMERCIAL/INSTITUTIONAL

PROPERTY SURVEY DATA

Facility Name: Schmidt Concrete Construction

UTILITIES: Heating: Gas X Electric _____ Oil _____
Hot Water _____ Other _____

Remarks: _____

Air Conditioning: Elec. Heating Pump _____ Gas _____
Evap. Cooler _____ Other _____

Remarks: No air conditioning

Electric Line Location: North side of Gregson

Gas Line Location: Gregson Street

Water Line Location: Gregson Street

Sewer Line Location: Gregson Street

Telephone Line Location: North side of Gregson

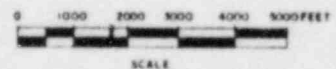
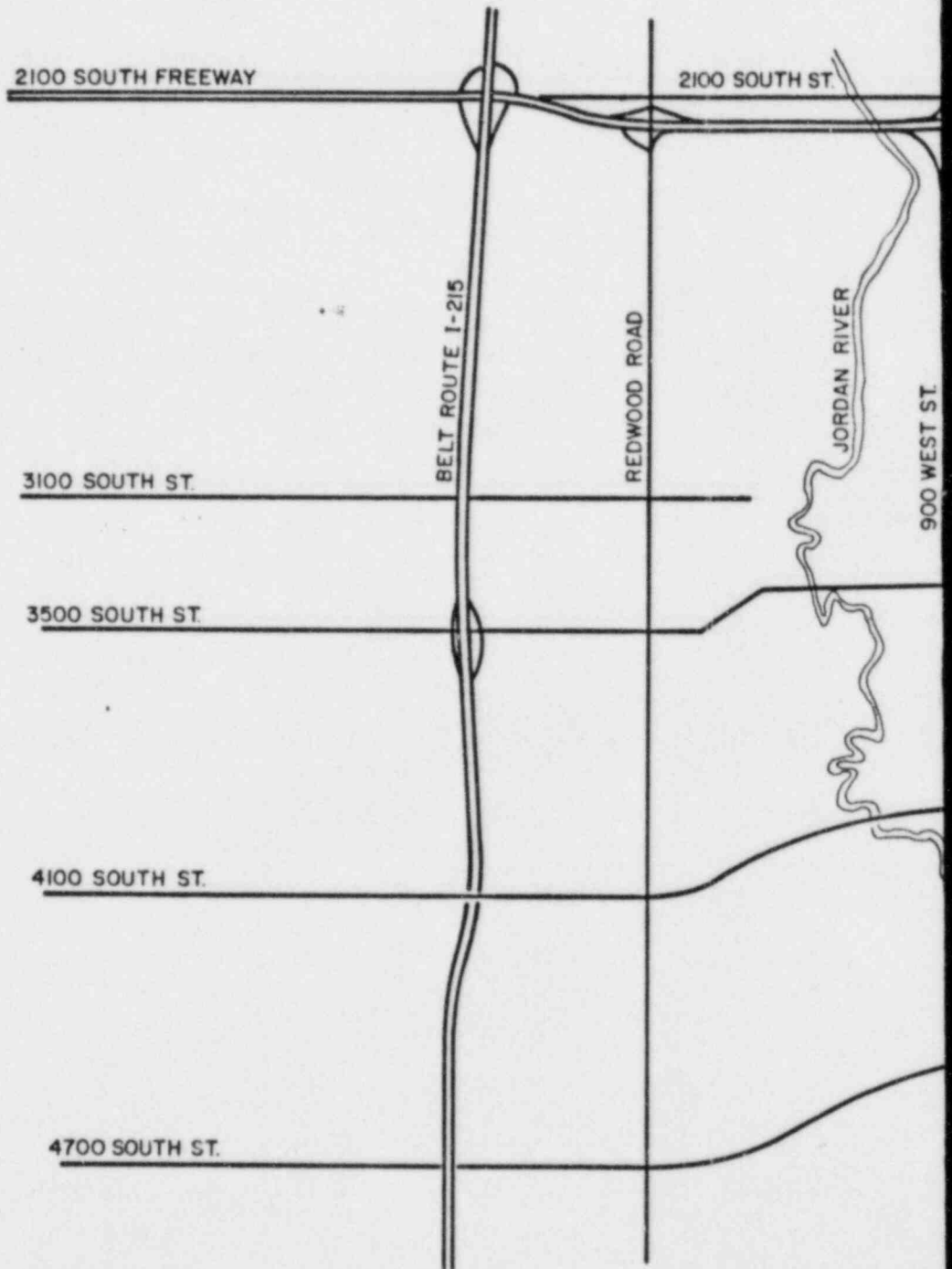
BUILDING CODES AND ZONING:

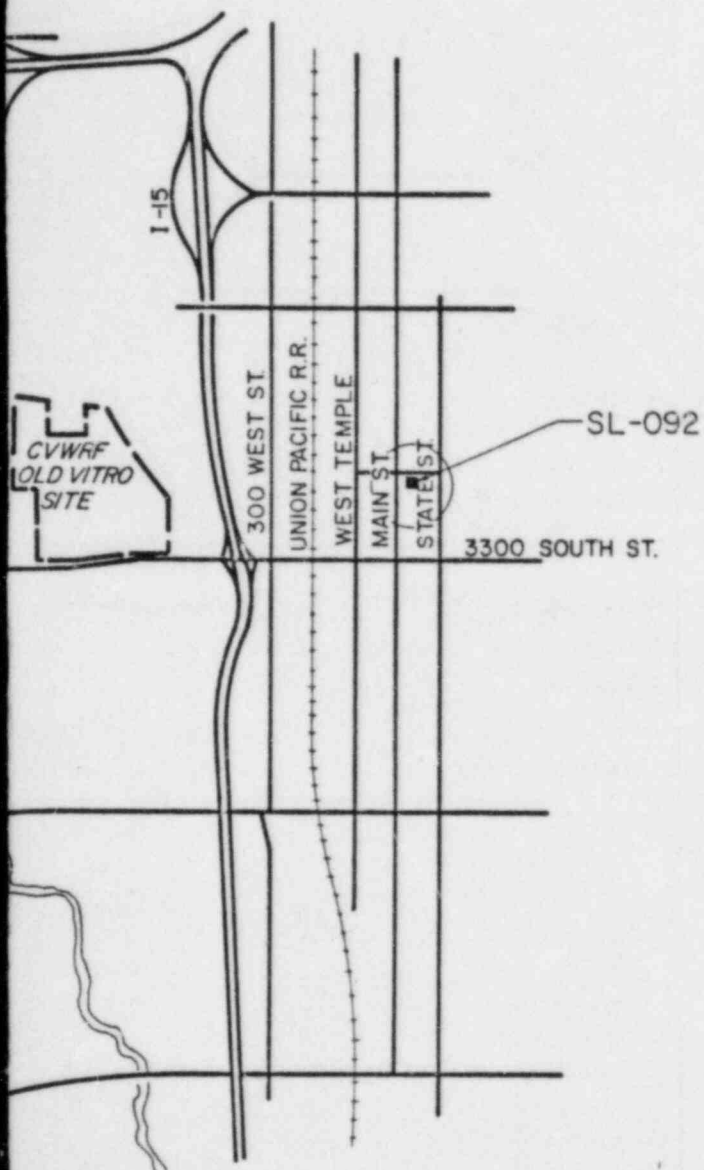
Building Code: UBC X BOCA _____

Remarks: _____

Zoning Jurisdiction: South Salt Lake City

Present Facility Zoning: Mixed-Use





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NOTE:

PROPERTY LOCATED IN SALT LAKE COUNTY

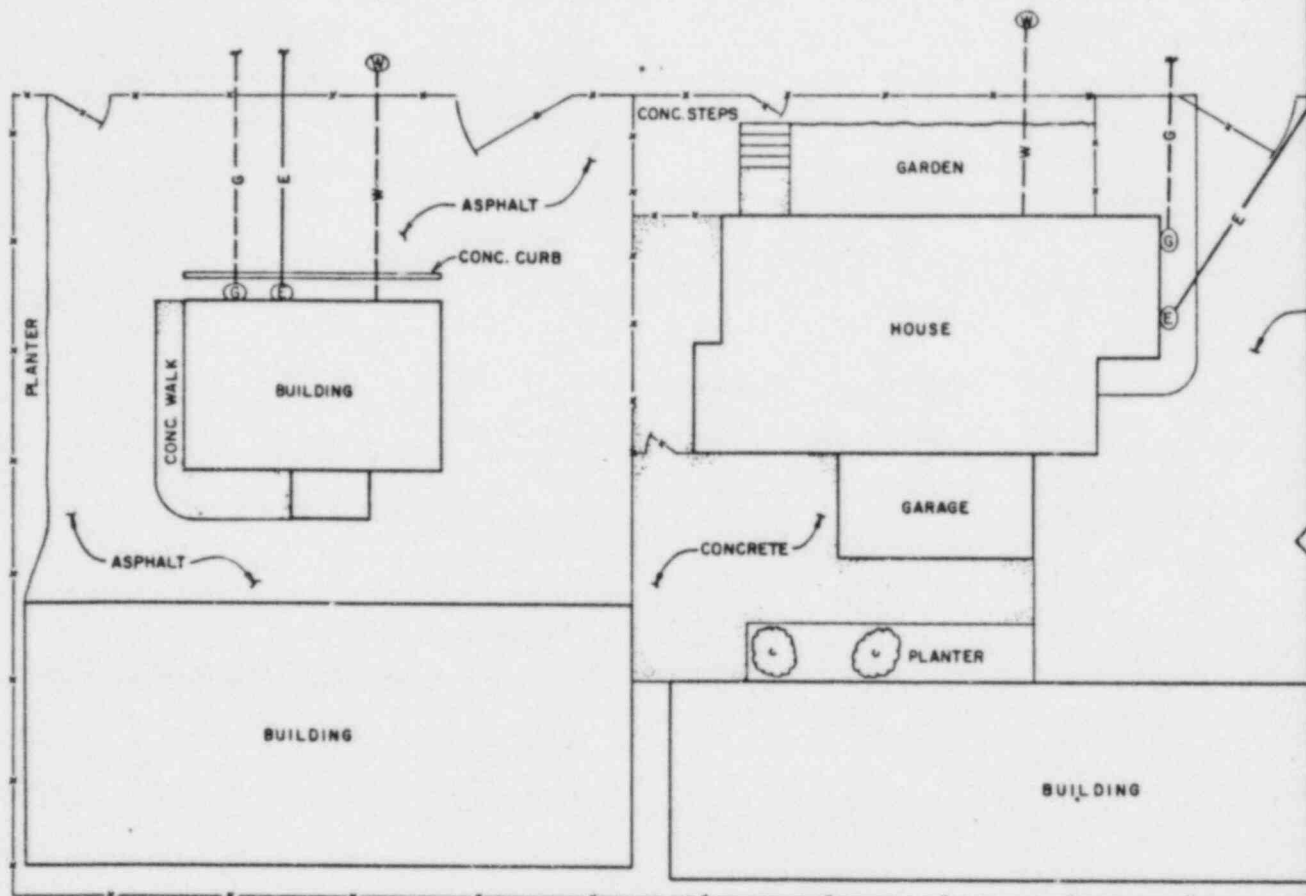
8508010320 - 01

[illegible]



GREGSON AVENUE

190 180 170 160 150 140 130 120 110 100 90 80 70

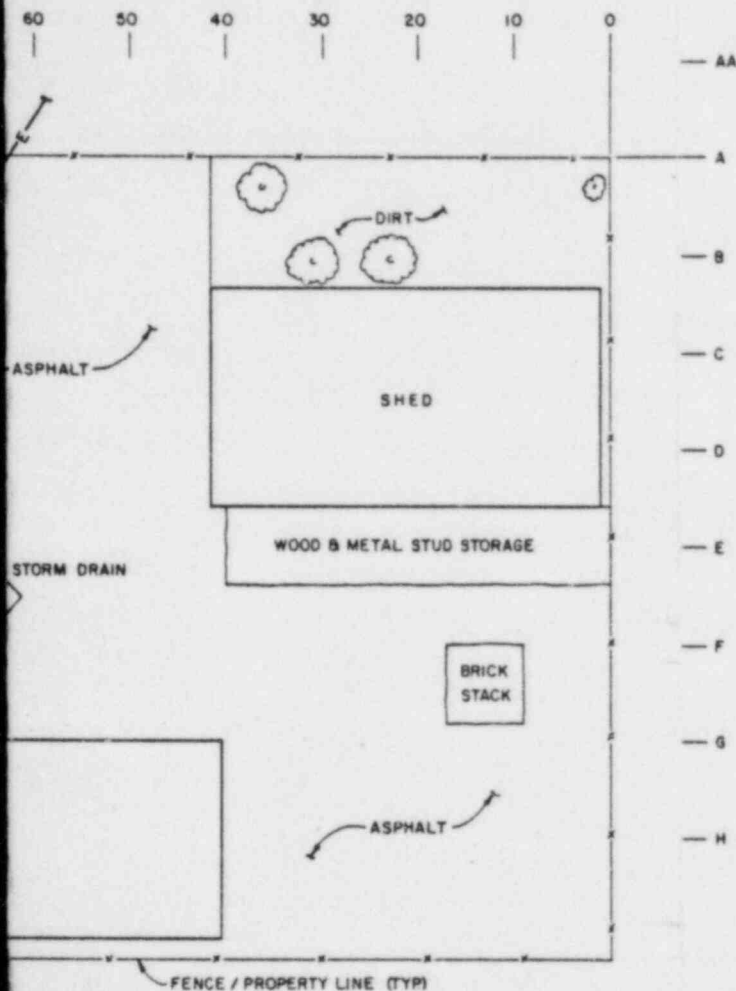


0 5 10 20 30 FEET
SCALE

LEGEND

— W —	WATER LINE
— G —	GAS LINE
— GM —	GAS MAIN
— S —	SEWER LINE
— SM —	SEWER MAIN
— STM —	STORM SEWER
— E —	ELECTRICAL LINE
— T —	TELEPHONE LINE
— TV —	CABLE TV
— — —	PROPERTY LINE
— x — x — x —	FENCE LINE
⊙ G, W or E	METER
⊗ G or W	VALVE
⊙	PROPERTY PIN
⊙	POWER POLE

NOTE: OVERHEAD SERVICE DENOTED BY SOLID LINE.
UNDERGROUND SERVICE DENOTED BY DASHED LINE.



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ALBUQUERQUE, NEW MEXICO

FIGURE 2.2

SITE PLAN SL-092

SALT LAKE COUNTY, UTAH
URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT

DESIGNED	DRAWN	FIGURE 2.2			
CHECKED	BY	SITE PLAN SL-092			
REVIEWED	BY	SALT LAKE COUNTY, UTAH			
RECOMMENDED	BY	URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT			
APPROVED	DATE	DOE PROJECT MANAGER	DATE	DOE PROJECT ENGINEER	DATE
NR		NR		NR	
PROJECT NO.		DE-AC04-83AL18796			
DRAWING NO.		SL-092-010			
REV.		A			

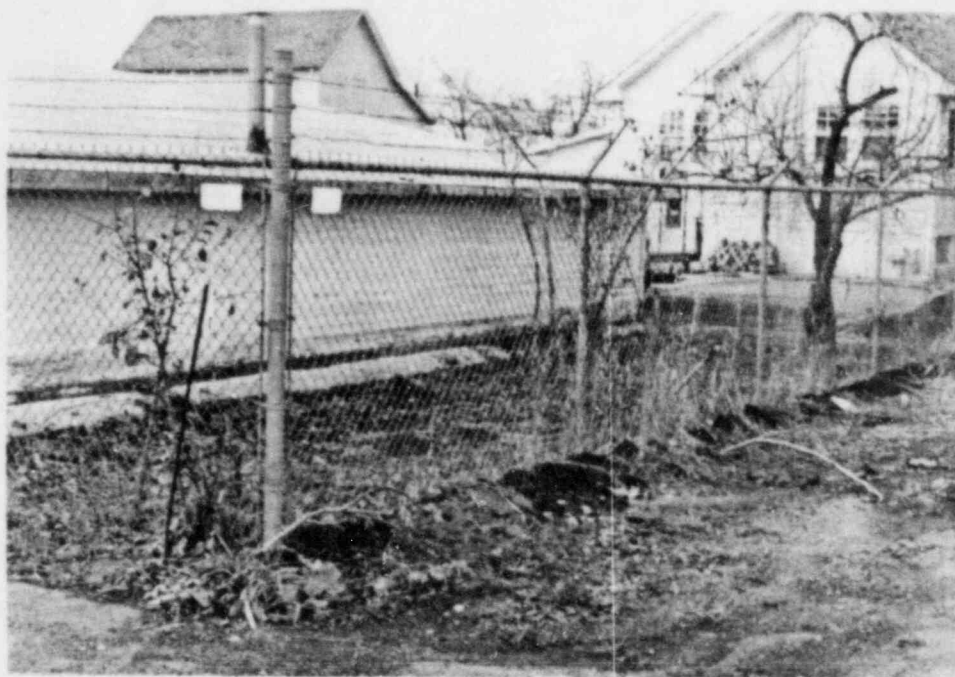


MORRISON
KNUDSEN

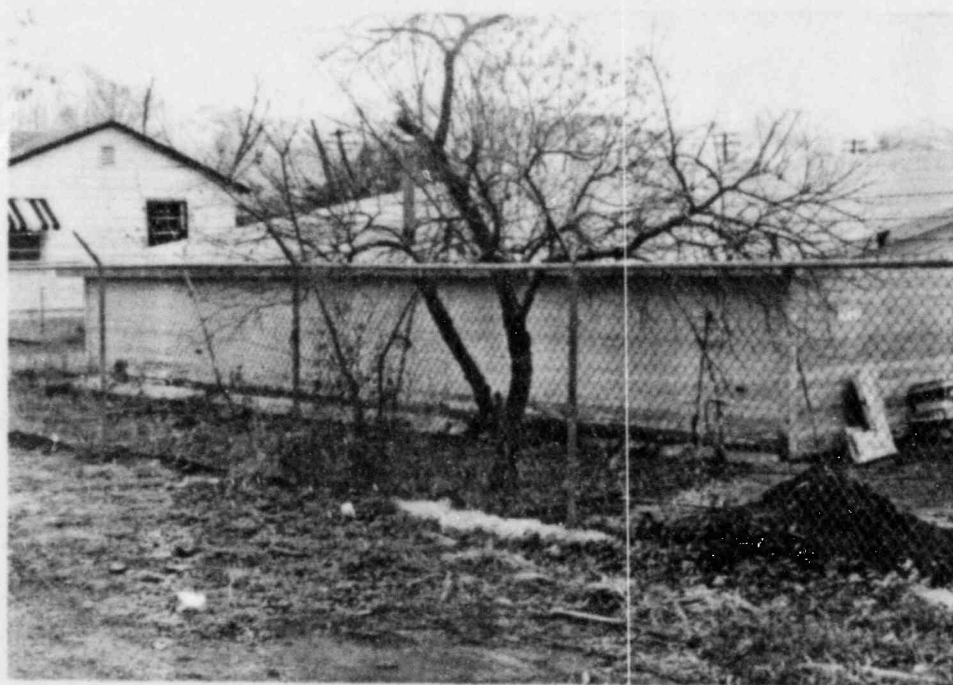
DISSEMINATION FINAL REA SUBMITTAL

DATE REVISIONS

BY CHECKED BY APPROVALS APPROVALS PROJ. ENG. APPROVALS



North Side of Property Looking Southwest



North Side of Property Looking Southeast

Figure 2.3 Property Photos

3.0 RADIOLOGICAL SURVEY AND ASSESSMENT

3.1 Gamma Exposure Rate Survey

3.1.1 Survey Method

A gamma survey in accordance with the RAC Procedure 019 was impractical due to the proximity of SL-092 to the site. High background readings indicated the need for a shielded probe ("delta") survey. A delta survey was conducted in accordance with Section 4.1.2 Appendix C of the Health Physics Monitoring Plan. This survey was conducted in areas identified in the inclusion survey (Results of the Radiological Survey at SL-092, ORNL, June 1983), and other areas as described in this document.

3.1.2 Survey Results

Contamination concentration readings on the property range from 1 to 120 pCi/g, as described in Table 3.1 and shown in Figure 3.1.

3.2 Borehole Survey

3.2.1 Survey Method

A gasoline-powered hand auger was used to drill 4-inch diameter holes in and around the regions identified as contaminated during the gamma survey. The holes were surveyed in compliance with the RAC UMTRA Procedure 018.

3.2.2 Survey Results

Contamination was found in 3 of the 13 outdoor holes augered. The location and depth of the contamination is described in Table 3.2 and is shown in Figure 3.1.

3.3 Radon/Radon Daughter Survey

No radon/radon daughter surveys were performed inside buildings at the property, since the inclusion survey reported that no contamination is present in or under the structures.

Radon daughter surveys taken during the inclusion survey measured 0.005 to 0.001 WL in Buildings 1 and 2, respectively. The radon concentration in the house was 0.005 and 0.007 WL, about one-third of the typical value found in U.S. basements.

3.4 Estimated Extent of Contamination

The area is contaminated to approximately 24 inches in depth. These findings concur with those of the inclusion survey.

Table 3.1
OUTDOOR GAMMA SCAN (DELTA SYSTEM)
Property SL-092

LOCATION	CONCENTRATION (pCi/g)
A+0,+00	80
A+0,+10	100
A+0,+20	120
A+0,+30	100
A+0,+40	77
A+0,+50	5
A+0,+60	46

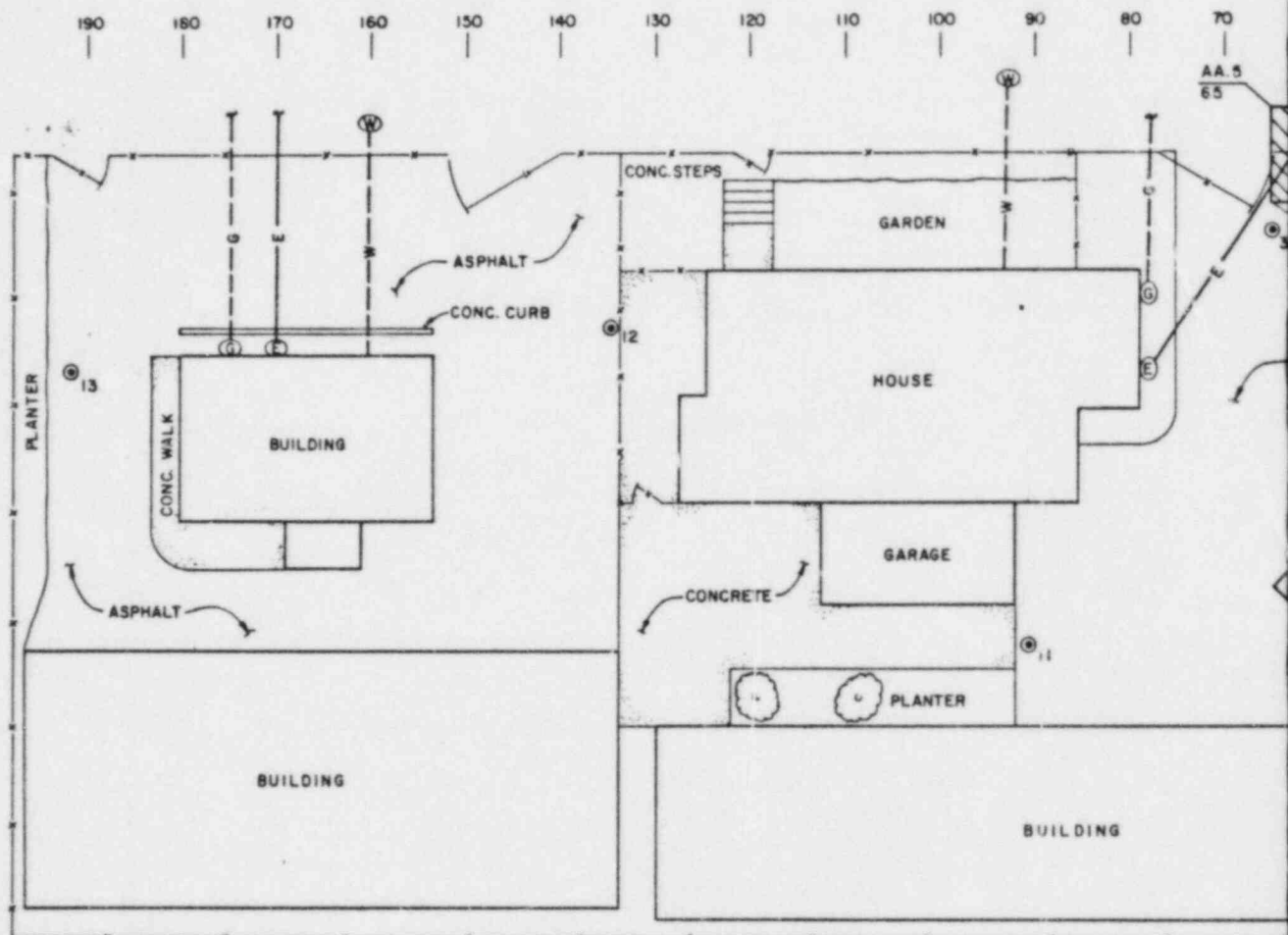
Radiological and Engineering Assessment: Property SL-092

Table 3.2
BOREHOLE SURVEY
Property SL-092

HOLE	LOCATION	CONTAMINATION DEPTH
1	AA-2,+38	--
2	AA+0,+6	--
3	A+8,+65	--
4	.+2,+40	0-24"+
5	A+2,+22	0-18"
6	A+2,+1	0-18"
7	B+0,+8	--
8	B+0,+27	--
9	F+5,+16	--
10	E+7,+60	--
11	F+1,+91	--
12	B+8,+134	--
13	C+2.5,+192	--



GREGSON AVENUE



0 5 10 20 30 FEET
SCALE

LEGEND

— W —	WATER LINE
— G —	GAS LINE
— GM —	GAS MAIN
— S —	SEWER LINE
— SM —	SEWER MAIN
— STM —	STORM SEWER
— E —	ELECTRICAL LINE
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— TV —	CABLE TV
— — —	PROPERTY LINE
— x — x — x —	FENCE LINE
⊙ G, W or E	METER
⊗ G or W	VALVE
⊙	PROPERTY PIN
⊙	POWER POLE

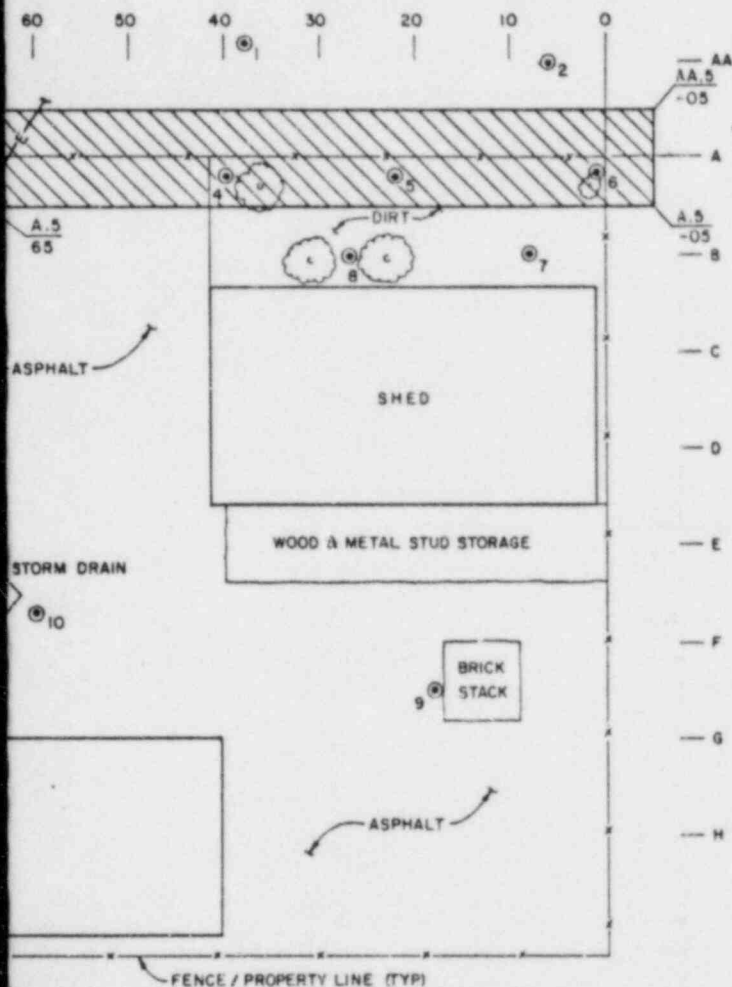
NOTE: OVERHEAD SERVICE DENOTED BY SOLID LINE.
UNDERGROUND SERVICE DENOTED BY DASHED LINE.

⊙₂ AUGER HOLE DESIGNATION

ESTIMATED DEPTH OF CONTAMINATION



24"



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FIGURE 3.1

RADIOLOGICAL SURVEY DATA SL-092

SALT LAKE COUNTY, UTAH

URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT

APPROVED _____ DATE _____ DOE PROJECT MANAGER _____ DATE _____ DOE PROJECT ENGINEER _____ DATE _____

NR

NR

NR



MORRISON
KNUDSEN

PROJECT NO.
DE-AC04-83AL18796

DRAWING NO.
SL-092-015

REV.
A

315-85 FINAL REA SUBMITTAL

GJW

DRAWN BY _____ CHECKED BY _____ APPR'D BY _____ DATE _____

DATE _____ REVISIONS _____

4.0 ENGINEERING ASSESSMENT

Engineering options were formulated and evaluated based on the radiological and engineering assessment for this property. Factors forming the basis of the evaluation were: the extent and location of the contamination, construction costs, and required demolition and constructibility for the various options. Results of the evaluation are detailed below.

4.1 Evaluation of Options

4.1.1 Options

Two options were evaluated for property SL-092:

Option 1 - No action should be taken.

Option 2 - Complete decontamination of the property including retrieval of the contaminated material and restoration of the property to a clean condition.

The decontamination of the property will proceed in the following manner:

- o Remove and salvage 60 linear feet of chain link fencing.
- o Install 37 linear feet of temporary security fencing with gate.
- o Remove 300 square feet of asphalt paving.
- o Remove three fruit trees.
- o Excavate to 24 inch depth.
- o Backfill with clean common fill.
- o Backfill in garden area with clean topsoil.
- o Replace three fruit trees with fruit trees of like specie.
- o Place and compact 6 inch aggregate base course.
- o Repave with 3 inches of asphalt paving.
- o Replace chain link fencing.
- o Remove temporary security fencing.

Existing utilities should pose no safety problems to the subcontractor. However, special care should be exercised during excavation and backfill operations to protect existing underground utilities during the remedial work.

The property occupants will not require relocation during the remedial action on this property.

4.1.2 Costs

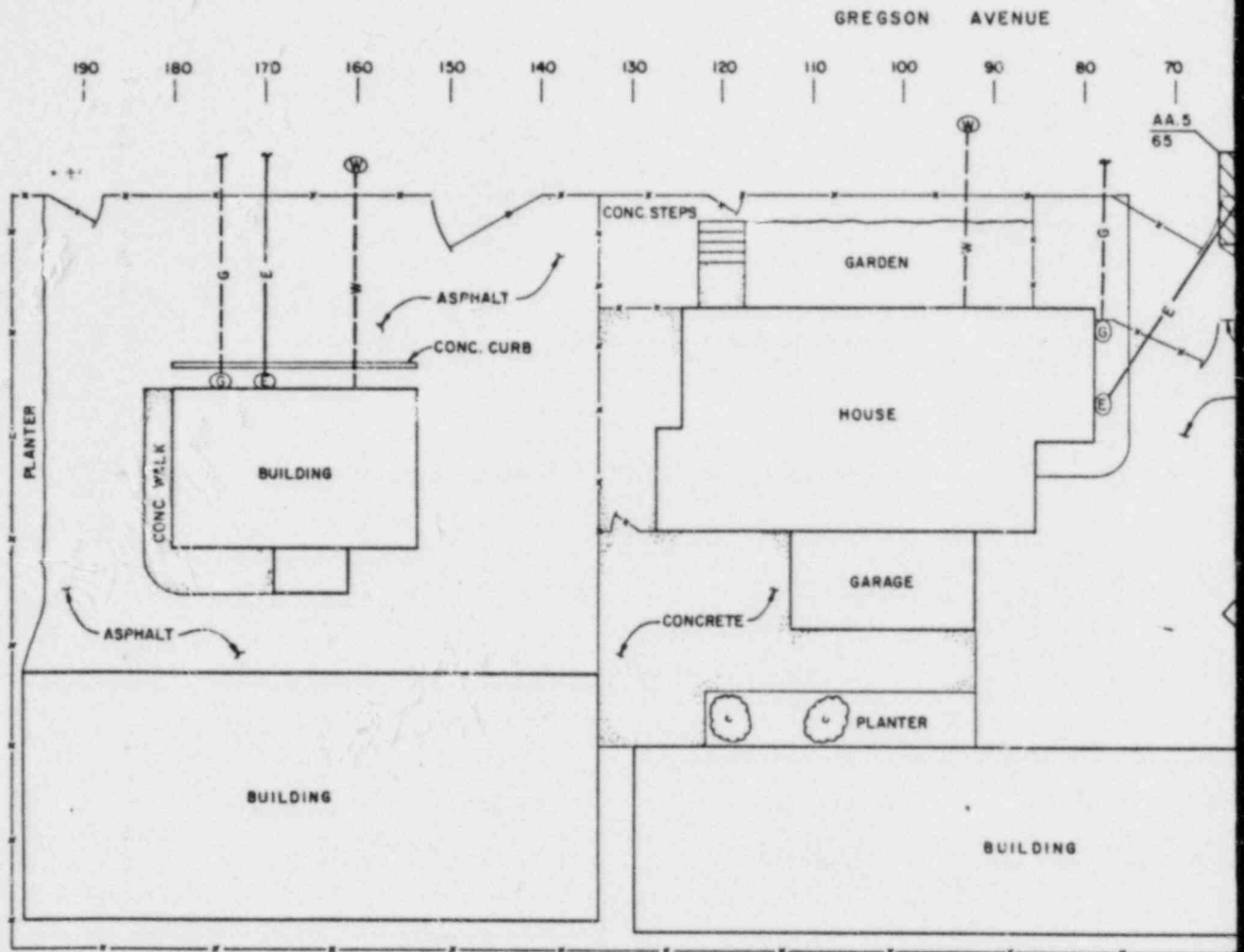
Estimated costs for the activities associated with Option 2 are detailed in Table 4.1. Costs include labor, insurance, material, equipment, supplies, overhead, profit, and contingency. All costs are listed in 1985 dollars. It is anticipated that the time required for the subcontractor to complete the work will be 5 to 7 days based on fair weather conditions.

4.2 Recommendation

The limited cost and amount of remedial action work precluded evaluating any more than these two options. The results of the radiological assessment concluded that contamination levels on the property exceeded EPA guidelines. Therefore, based on these guidelines, it is recommended that Option 2, decontamination of the property, be pursued. The total estimated cost for Option 2 is \$4,400.00.

Table 4.1
OPTION 2 COSTS

Activity	Unit Price	Quantity	Estimated Cost
Remove and Salvage Fencing	3.00	60 lf	180.00
Install Temporary Fence	8.20	37 lf	300.00
Remove Asphalt Paving	0.20	300 sf	60.00
Remove Fruit Trees	150.00	3 ea	450.00
Excavation (Machine)	8.70	52 cy	450.00
Backfill (Machine)	7.50	48 cy	360.00
Topsoil	13.00	4 cy	52.00
Replace Fruit Trees	150.00	3 ea	450.00
Aggregate Base Course	13.70	6 cy	82.00
Replace Asphalt Paving	6.00	34 sy	204.00
Reinstall Chain link Fencing	8.20	60 lf	492.00
Remove Temporary Fence	3.00	37 lf	111.00
Subtotal			3,200.00
5% Contractor's Contingency			160.00
20% Overhead and Profit			<u>670.00</u>
Subtotal			4,030.00
10% Engineer's Contingency			<u>400.00</u>
Total (Rounded)			4,400.00



LEGEND

— W —	WATER LINE
— G —	GAS LINE
— GM —	GAS MAIN
— S —	SEWER LINE
— SM —	SEWER MAIN
— STM —	STORM SEWER
— E —	ELECTRICAL LINE
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— TV —	CABLE TV
— — —	PROPERTY LINE
— X — X — X —	FENCE LINE
⊙ G, W or E	METER
⊗ G or W	VALVE
⊙	PROPERTY PIN
⊙	POWER POLE

NOTE: OVERHEAD SERVICE DENOTED BY SOLID LINE.
UNDERGROUND SERVICE DENOTED BY DASHED LINE.

NOTES:

1. THE LATEST REVISION OF THE FOLLOWING TECHNICAL SPECIFICATIONS APPLY TO THE REMEDIAL ACTION WORK REQUIRED FOR PROPERTY NO. SL-092.

SECTION 02050
DEMOLITION

SECTION 02110
CLEARING AND GRUBBING

SECTION 02130
CONTAMINATED MATERIAL REMOVAL

SECTION 02200
EXCAVATION AND BACKFILL

SECTION 04280
LANDSCAPING

SECTION 02500
PAVING AND SURFACING

2. UTILITY LOCATIONS ARE FOR REFERENCE ONLY. ACTUAL LOCATIONS SHALL BE DETERMINED BY THE SUBCONTRACTOR PRIOR TO START OF CONSTRUCTION.

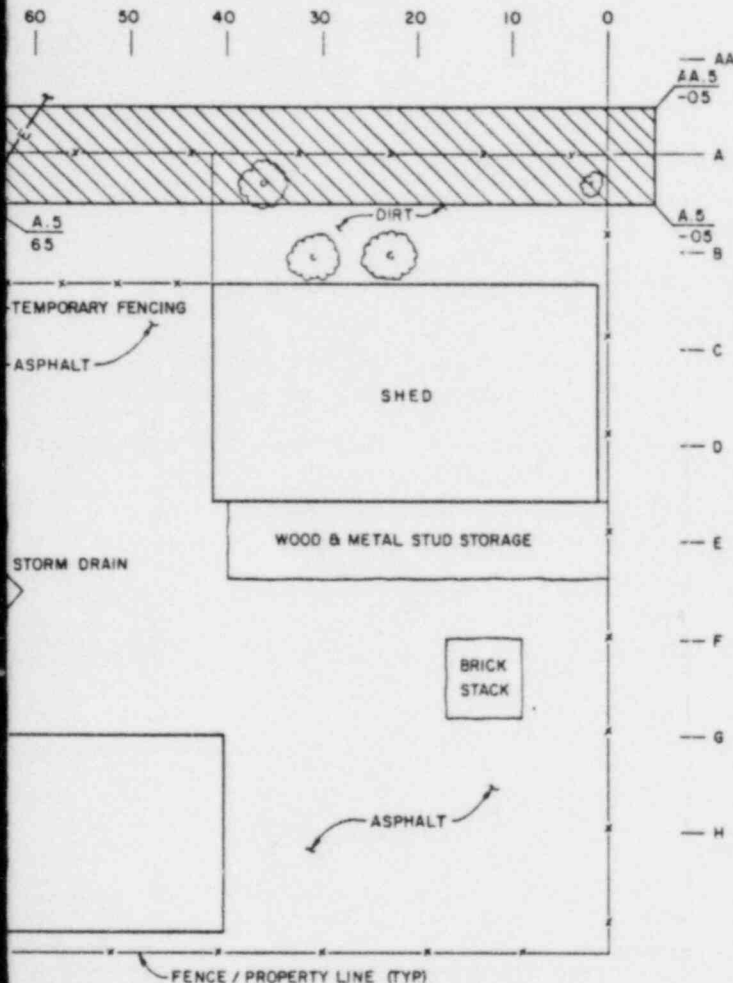
3. THE EXCAVATION LIMITS AND DEPTHS ARE BASED ON A LIMITED NUMBER OF BORINGS TAKEN DURING THE RADIOLOGICAL SURVEYS OF THIS PROPERTY. ADDITIONAL RADIOLOGICAL SURVEYS PERFORMED DURING REMEDIAL ACTION MAY REQUIRE MORE OR LESS EXCAVATION TO BE TAKEN FROM THE DESIGNATED AREAS. ALL CHANGES TO THE LIMITS AND DEPTHS OF EXCAVATION AS SHOWN ON THE DESIGN DRAWINGS SHALL BE AS DIRECTED BY THE CONTRACTORS REPRESENTATIVE.

SCOPE OF WORK:

- REMOVE AND SALVAGE CHAIN LINK FENCING.
- INSTALL TEMPORARY SECURITY FENCING WITH GATE AS SHOWN.
- REMOVE TREES WITHIN CONTAMINATED AREA.
- REMOVE ASPHALT PAVING.
- EXCAVATE TO A DEPTH OF 24 INCHES.
- BACKFILL WITH CLEAN COMMON FILL.
- PLACE 12 INCHES OF CLEAN TOPSOIL IN GARDEN AREA.
- REPLACE TREES WITH SIMILAR TYPE AND SIZE SUBJECT TO APPROVAL OF CONTRACTOR'S REPRESENTATIVE.
- PLACE AND COMPACT 6 INCHES OF AGGREGATE BASE COURSE IN PAVED AREA.
- REPAVE WITH 3 INCHES OF ASPHALT PAVING.
- REPLACE CHAIN LINK FENCING.
- REMOVE TEMPORARY SECURITY FENCING.

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ALBUQUERQUE, NEW MEXICO

FIGURE 4 I

EXCAVATION & RESTORATION PLAN SL-092

SALT LAKE COUNTY, UTAH
URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT

DESIGNED/DRAWN
CHECKED
REVIEWED
RECOMMENDED
APPROVED

NR

DATE

DOE PROJECT MANAGER

DATE

DOE PROJECT ENGINEER

DATE

NR

NR

PROJECT NO.

DE-AC04-83AL18796

DRAWING NO.

SL-092-020

REV
A



MORRISON
KNUDSEN

315-85 FINAL REA SUBMITTAL

GJW

✓

VLD

✓

YH

VLD

✓

DRAWN

CHECKED

BY

BY

APPROVAL

LOC

DATE

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DATE

5.0 TECHNICAL SPECIFICATIONS

Technical specifications applicable to this property are indexed in Table 5.1 . Specifications previously approved by the Department of Energy (DOE) are noted in the table. Also listed are specifications not previously submitted to the DOE which require approval. The text for these additional specifications follow the table.

Table 5.1
INDEX OF TECHNICAL SPECIFICATIONS

Description	Specifications	
	Previously Approved	Specifications Requiring DOE Approval
Division 2 - Site Work		
SECTION 02050	DEMOLITION	X
SECTION 02110	CLEARING AND GRUBBING	X
SECTION 02130	CONTAMINATED MATERIAL REMOVAL	X
SECTION 02200	EXCAVATION AND BACKFILL	X
SECTION 02480	LANDSCAPING	X
SECTION 02500	PAVING AND SURFACING	X

6.0 CONSTRUCTION DRAWINGS

Listed below is an index of the construction drawings required for remedial action on this property.

<u>Drawing Number</u>	<u>Drawing Title</u>
SL-092-020	Excavation & Restoration Plan SL-092

APPENDIX A
SURVEY DATA LOGS

OUTDOOR GAMMA SCREENING SURVEY DATA SHEET

LOGGING CREW: Jeff Manship
Joe Worthen
Von Black

SHEET 2 OF 4 PAGE 2

DATE: Nov. 2, 1984

PROPERTY ID: SL-092

INSTRUMENT ID NO.: 31983 probe #019570

BACKGROUND CALCULATION:

#1 827 + #2 869 + #3 871 = 2567 ÷ 3 = 855.6 COUNTS/.1MIN *

AREA:				AREA:				AREA:			
Point ID	1 meter reading	surface reading	delta reading	Point ID	1 meter reading	surface reading	delta reading	Point ID	1 meter reading	surface reading	delta reading
A+00	1648	3854	725	B+30	7619	415	224	E+90	864	491	203
A+10	3122	4815	1031	B+40	1354	423	227	E+120	725	395	172
A+20	3894	5973	1394	B+50	1141	368	158	E+130	851	319	166
A+30	4158	5257	1345	B+60	1136	284	154	E+140	953	361	155
A+40	2972	3999	995	B+70	1076	513	214	E+150	1012	314	168
A+50	1796	653	241	B+80	997	390	167	E+160	876	383	181
A+60	2462	2697	796	C+40	811	325	178	E+170	779	333	148
A+70	1043	566	185	C+50	878	301	134	E+180	728	270	148
A+80	997	510	183	C+60	881	350	136	E+190	1010	381	179
A+90	887	357 177	177	C+70	1012	422	174	E+W.P.L	867	351	151
A+100	883	314	175	D+80	949	418	197	D+W.P.L	902	419	171
A+110	918	401	147	D+70	941	406	144	D+190	914	370	150
A+120	827	325	138	D+60	872	384	116	D+180	845	269	115
A+130	798	338	133	D+50	727	414	164	C+W.P.L	816	319	164
A+140	874	335	150	D+40	785	387	149	C+190	948	358	161
A+150	807	360	145	E+100	774	333	147	C+180	830	226	138
A+160	706	326	132	E+110	676	N.A.	N.A.	C+170	827	349	157
A+170	732	337	135	E+120	727	N.A.	N.A.	C+160	815	322	123
A+180	715	362	143	E+130	792	N.A.	N.A.	C+150	918	416	161
A+190	871	388	179	E+140	726	276	153	C+140	900	381	183
A+W.P.L	763	407	162	E+150	835	325	141	C+130	854	333	168
B+00	1360	614	265	E+160	930	369	135	D+130	827	286	157
B+10	1817	698	302	E+170	912	404	157	D+140	976	401	180
B+20	1742	421	236	E+180	1004	413	169	D+150	938	418	191

REMARKS: * ALL READINGS ARE IN COUNTS/ 0.1 MIN.

Surface readings made with a one-half inch lead collimator

Delta readings made with a one-half inch 10" X 10" lead plate on the surface below the collimated detector

OUTDOOR GAMMA SCREENING SURVEY DATA SHEET

LOGGING CREW: Jeff Manship
Tee Worthen
Von Black

SHEET 3 OF 4 PAGE 3

DATE: Nov. 2, 1984

PROPERTY ID: SL-092

INSTRUMENT ID NO.: 31983 probe # 019576

BACKGROUND CALCULATION:

#1 827 + #2 869 + #3 891 = 2567 ÷ 3 = 855.6 COUNTS/.1MIN *

AREA:				AREA:				AREA:			
Point ID	1 meter reading	surface reading	delta reading	Point ID	1 meter reading	surface reading	delta reading	Point ID	1 meter reading	surface reading	delta reading
B+140	987	404	186	F+170	986	356	151	D+00	850	354	146
E+150	890	318	146	F+180	1092	389	137	SPL+00	876	425	176
B+160	688	253	141	F+190	1068	409	171	SPL+10	998	408	177
B+170	774	259	123	F+WPL	899	324	154	SPL+20	920	429	180
B+180	831	289	143	G+130	844	380	158	SPL+30	872	434	152
B+190	897	354	176	G+120	798	331	142	SPL+40	888	444	154
B+WPL	875	339	180	G+110	942	422	164	SPL+50	867	419	175
F+00	803	385	142	G+100	824	402	136	SPL+60	910	476	178
F+10	699	262	95	G+90	837	346	161	SPL+70	988	466	194
F+20	695	274	112	G+80	882	416	165	SPL+80	1012	479	180
F+30	807	290	134	G+70	747	324	126	SPL+90	1020	426	189
F+40	852	288	141	G+60	697	307	119	SPL+100	966	504	228
F+50	816	275	127	G+50	779	351	168	SPL+110	1044	582	192
F+60	845	302	109	G+40	833	377	136	SPL+120	1126	482	214
F+70	907	346	138	G+30	861	287	129	SPL+130	1107	541	201
F+80	1028	362	158	G+20	1013	351	170	SPL+140	1105	418	205
F+90	1034	413	176	G+10	902	345	147	SPL+150	1106	468	169
F+100	836	350	176	G+00	865	407	173	SPL+160	1222	394	195
F+110	903	363	189	H+00	876	422	191	SPL+170	1203	466	227
F+120	859	356	148	H+10	1088	552	226	SPL+180	1129	423	218
F+130	875	336	158	H+20	1038	475	177	SPL+190	1212	379	205
F+140	911	325	157	H+30	1118	463	175	SPL+WPL	836	365	176
F+150	1033	324	159	H+40	1008	453	166	G+WPL	1037	395	207
F+160	1073	372	184	C+00	897	336	151	H+WPL	1119	415	194

REMARKS: * ALL READINGS ARE IN COUNTS/ 0.1 MIN.

Surface readings made with a one-half inch lead collimator

Delta readings made with a one-half inch 10" X 10" lead plate on the surface below the collimated detector

BOREHOLE LOG

LOGGING CREW: Von Black
Joe Worthen

SHEET 24 OF 5 PAGE 86

DATE: Nov. 5, 1984

PROPERTY ID: SL-092

INSTRUMENT ID NO. 26279 probe# 015811

AREA: SALT LAKE

NOTES: 1. ALL HOLES ARE 4" DIA. UNLESS OTHERWISE NOTED.
2. RECORD UNUSUAL CONDITIONS, SUCH AS THE PRESENCE OF WATER IN BOREHOLES AND DEPTH, CASING TYPE AND THICKNESS IF USED, CONCRETE CORES AND THICKNESS, OBSTRUCTIONS, UTILITIES, ETC., IN THE REMARKS SECTION.

HOLE ID: <u>SL-092-1</u>		HOLE ID: <u>SL-092-2</u>		HOLE ID: <u>SL-092-3</u>		HOLE ID: <u>SL-092-4</u>	
TIME DRILLED: _____		TIME DRILLED: _____		TIME DRILLED: _____		TIME DRILLED: _____	
TIME LOGGED: _____		TIME LOGGED: _____		TIME LOGGED: _____		TIME LOGGED: _____	
SOIL TYPE: _____		SOIL TYPE: _____		SOIL TYPE: _____		SOIL TYPE: _____	
DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN
SURFACE		SURFACE		SURFACE		SURFACE	
0"	<u>1312</u>	0"	<u>1111</u>	0"	<u>1309</u>	0"	<u>11250</u>
6"	<u>1926</u>	6"	<u>1503</u>	6"	<u>1923</u>	6"	<u>30152</u>
12"	<u>2097</u>	12"	<u>1961</u>	12"	<u>2076</u>	12"	<u>19576</u>
18"	<u>2010</u>	18"	<u>2286</u>	18"	<u>2019</u>	18"	<u>8778</u>
24"	<u>1928</u>	24"	<u>3585</u>	24"	<u>2123</u>	24"	<u>4970</u>
30"	<u>1865</u>	30"	<u>3436</u>	30"		30"	
36"		36"		36"		36"	
42"		42"		42"		42"	
48"		48"		48"		48"	
54"		54"		54"		54"	
60"		60"		60"		60"	
66"		66"		66"		66"	
72"		72"		72"		72"	
78"		78"		78"		78"	
84"		84"		84"		84"	
90"		90"		90"		90"	
96"		96"		96"		96"	

REMARKS: _____

BOREHOLE LOG

LOGGING CREW: Wen Black
Joe Worthen

SHEET 3 OF 5 PAGE 7

DATE: Nov. 5, 1984

PROPERTY ID: SL-092

INSTRUMENT ID NO. 26279 probe 015811

AREA: SALT LAKE

- NOTES: 1. ALL HOLES ARE 4" DIA. UNLESS OTHERWISE NOTED.
2. RECORD UNUSUAL CONDITIONS, SUCH AS THE PRESENCE OF WATER IN BOREHOLES AND DEPTH, CASING TYPE AND THICKNESS IF USED, CONCRETE CORES AND THICKNESS, OBSTRUCTIONS, UTILITIES, ETC., IN THE REMARKS SECTION.

HOLE ID: <u>SL-092-5</u>	HOLE ID: <u>SL-092-6</u>	HOLE ID: <u>SL-092-7</u>	HOLE ID: <u>SL-092-8</u>
TIME DRILLED: _____	TIME DRILLED: _____	TIME DRILLED: _____	TIME DRILLED: _____
TIME LOGGED: _____	TIME LOGGED: _____	TIME LOGGED: _____	TIME LOGGED: _____
SOIL TYPE: _____	SOIL TYPE: _____	SOIL TYPE: _____	SOIL TYPE: _____

DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN
SURFACE		SURFACE		SURFACE		SURFACE	
0"	<u>10833</u>	0"	<u>6508</u>	0"	<u>1341</u>	0"	<u>1510</u>
6"	<u>8806</u>	6"	<u>7718</u>	6"	<u>1707</u>	6"	<u>1867</u>
12"	<u>4454</u>	12"	<u>4220</u>	12"	<u>1816</u>	12"	<u>1909</u>
18"	<u>3514</u>	18"	<u>2808</u>	18"	<u>1941</u>	18"	<u>1927</u>
24"	<u>2804</u>	24"	<u>2425</u>	24"	<u>1859</u>	24"	<u>1901</u>
30"	<u>2713</u>	30"	<u>2335</u>	30"	<u>1799</u>	30"	<u>1887</u>
36"		36"		36"		36"	
42"		42"		42"		42"	
48"		48"		48"		48"	
54"		54"		54"		54"	
60"		60"		60"		60"	
66"		66"		66"		66"	
72"		72"		72"		72"	
78"		78"		78"		78"	
84"		84"		84"		84"	
90"		90"		90"		90"	
96"		96"		96"		96"	

REMARKS: _____

BOREHOLE LOG

LOGGING CREW: Van Black
Joe Warthen

SHEET 34 OF 5 PAGE 268

DATE: Nov. 5, 1984

PROPERTY ID: SL-092

INSTRUMENT ID NO. 26279 probe # 015811

AREA: SALT LAKE

- NOTES: 1. ALL HOLES ARE 4" DIA. UNLESS OTHERWISE NOTED.
2. RECORD UNUSUAL CONDITIONS, SUCH AS THE PRESENCE OF WATER IN BOREHOLES AND DEPTH, CASING TYPE AND THICKNESS IF USED, CONCRETE CORES AND THICKNESS, OBSTRUCTIONS, UTILITIES, ETC., IN THE REMARKS SECTION.

HOLE ID: <u>SL-092-9</u>		HOLE ID: <u>SL-092-10</u>		HOLE ID: <u>SL-092-11</u>		HOLE ID: <u>SL-092-12</u>	
TIME DRILLED: _____		TIME DRILLED: _____		TIME DRILLED: _____		TIME DRILLED: _____	
TIME LOGGED: _____		TIME LOGGED: _____		TIME LOGGED: _____		TIME LOGGED: _____	
SOIL TYPE: _____		SOIL TYPE: _____		SOIL TYPE: _____		SOIL TYPE: _____	
DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN
SURFACE		SURFACE		SURFACE		SURFACE	
0"	1014	0"	847	0"	1162	0"	1058
6"	1527	6"	1329	6"	1878	6"	1562
12"	1801	12"	1557	12"	1833	12"	1768
18"	1867	18"	1678	18"	1877	18"	1975
24"	1886	24"	1893	24"	1914	24"	2083
30"	1747	30"	1771	30"	1927	30"	2135
36"		36"		36"		36"	
42"		42"		42"		42"	
48"		48"		48"		48"	
54"		54"		54"		54"	
60"		60"		60"		60"	
66"		66"		66"		66"	
72"		72"		72"		72"	
78"		78"		78"		78"	
84"		84"		84"		84"	
90"		90"		90"		90"	
96"		96"		96"		96"	

REMARKS: _____

BOREHOLE LOG

 LOGGING CREW: Von Black
Joe Worthen

 SHEET 5 OF 5 PAGE 9

 DATE: Nov. 5, 1984

 PROPERTY ID: SL-092

 INSTRUMENT ID NO. 26279 probe# 015811

 AREA: SALT LAKE

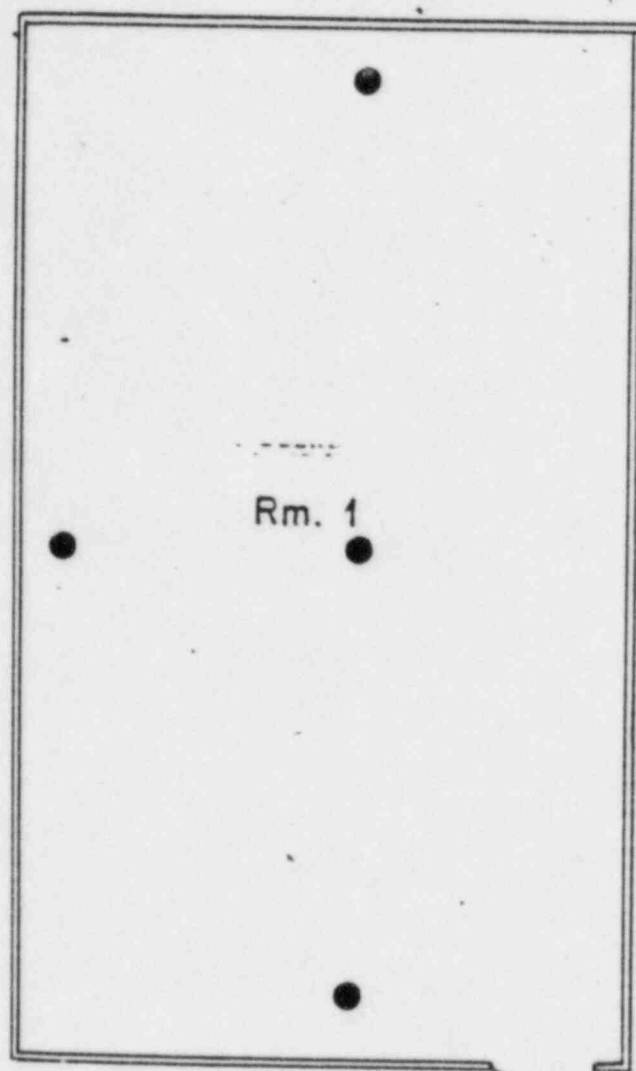
- NOTES: 1. ALL HOLES ARE 4" DIA. UNLESS OTHERWISE NOTED.
 2. RECORD UNUSUAL CONDITIONS, SUCH AS THE PRESENCE OF WATER IN BOREHOLES AND DEPTH, CASING TYPE AND THICKNESS IF USED, CONCRETE CORES AND THICKNESS, OBSTRUCTIONS, UTILITIES, ETC., IN THE REMARKS SECTION.

HOLE ID: <u>SL-092-13</u>	HOLE ID: _____	HOLE ID: _____	HOLE ID: _____
TIME DRILLED: _____	TIME DRILLED: _____	TIME DRILLED: _____	TIME DRILLED: _____
TIME LOGGED: _____	TIME LOGGED: _____	TIME LOGGED: _____	TIME LOGGED: _____
SOIL TYPE: _____	SOIL TYPE: _____	SOIL TYPE: _____	SOIL TYPE: _____

DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN
SURFACE		SURFACE		SURFACE		SURFACE	
0"	<u>1097</u>	0"		0"		0"	
6"	<u>1615</u>	6"		6"		6"	
12"	<u>1819</u>	12"		12"		12"	
18"	<u>1905</u>	18"		18"		18"	
24"	<u>1951</u>	24"		24"		24"	
30"	<u>1697</u>	30"		30"		30"	
36"		36"		36"		36"	
42"		42"		42"		42"	
48"		48"		48"		48"	
54"		54"		54"		54"	
60"		60"		60"		60"	
66"		66"		66"		66"	
72"		72"		72"		72"	
78"		78"		78"		78"	
84"		84"		84"		84"	
90"		90"		90"		90"	
96"		96"		96"		96"	

 REMARKS: _____

Interior Gamma Survey Locations



BUILDING 3

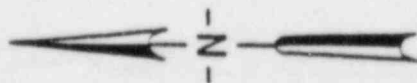
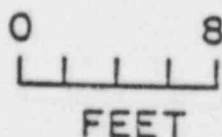


Fig. 6. Floor plan of Building 3 at property SL092.



MORRISON-KNUDSEN COMPANY, INC.

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