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

Draft
Radiological and Engineering Assessment

Vicinity Property No. SLC 020/SLC 320

Remedial Actions
Contractor
for the
Uranium Mill Tailings
Remedial Actions
Project

MORRISON
KNUDSEN

Vicinity Property No. SLC 020/SLC 320

DRAFT

THE RADIOLOGICAL AND ENGINEERING ASSESSMENT AND FINAL DESIGN FOR SALT LAKE CITY PROPERTY

SL-020/SL-320

March 22, 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-020/SL-320 is a commercial property located at 42 East 3300 South Street.

1.2 Evaluation and Recommendation

1.2.1 Residual Radioactive Material Involvement

There is one large area of contamination identified on this property in the area of the asphalt parking area.

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 $42,800.00.

1.2.4 Schedule

The estimated duration of the remedial action effort is 10 to 15 days.

2.0 ENGINEERING FIELD SURVEY

2.1 Property Description

2.1.1 Property Use and Occupancy

Property SL-020/SL-320 is a commercial property located at 42 East 3300 South Street and owned by the Church of Jesus Christ of Latter-Day Saints. The property is occupied by a complex of retail shops. The map in Figure 2.1 illustrates the property's vicinity location. Property SL-320 is an adjacent spillover property located at 54 Granite Avenue.

2.1.2 Legal Description

2.1.2.1 SL-020:

The legal description as recorded with the Salt Lake County Recorder's Office in Deed Book No. 5365, Page 057 follows:

All of lots 11, 23, 24, 25, 26 and 27 of Block 1, granite addition; and the south 28.0 feet of lots 12, 13 and 14 of Block 1, granite addition, according to the official plat thereof filed in Book "E" of Plats at Page 64, Records of Salt Lake County, Utah.

2.1.2.2 SL-320:

The legal description as recorded with the Salt Lake County Recorder's Office in Deed Book 5341, Page 1061 follows:

Lot 10, Block 1, Granite addition, Salt Lake County, Utah.

2.1.3 Bordering Properties

The lot is zoned Business-A, business, office, and retail. It is located in a commercial area less than two miles east of the old Vitro mill tailings site. The property is bounded on the north by commercial property; on the east by commercial property; on the south by 3300 South Street; and on the west by commercial property.

2.2 Existing Facilities and Structures

2.2.1 Structures

There is one principal structure on the property. It is of brick construction, formerly a church, currently being used as a retail antique store complex. The balance of the improved property is asphalt paved except for lawn areas in front of and to the east of the building.

2.2.2 Utilities

Utilities are serviced to the property as follows:

Electric power - from 3300 South Street.

Telephone - from north property line.

Water - from 3300 South Street.

Gas - from 3300 South Street.

Sewer - from 3300 South 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: Old Chapel Antiques

Address: 42 East 3300 South Street

Owner: Church of Jesus Christ of Latter-Day Saints

Occupancy: Employees/Occupants (Full Time): N/A

Employees/Occupants (Part Time): N/A

Remarks: No interior restoration work anticipated.

PROPERTY DESCRIPTION:

Structure: (Identify) Retail shops (formerly a church)

: SQ FT N/A Levels Two

: Construction Type Brick masonry

: Foundation Concrete

Remarks:

Structure: (Identify)

: SQ FT Levels

: Construction Type

: Foundation

Remarks:

TABLE 2.1

COMMERCIAL/INSTITUTIONAL

PROPERTY SURVEY DATA

Facility Name: Old Chapel Antiques

PROPERTY DESCRIPTION:

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

Remarks: Off 3300 South Street - rear access from Granite Avenue

Sidewalks: Concrete: X Asphalt: ____

Remarks: ____

Fences: Chain link X Mesh ____ Wood X

Remarks: ____

Grounds: Lawn Front and east side

Trees 3 in front lawn area

Shrubs Adjacent to building

Grading Level

Soil Type ____

Remarks AC paving on east and west sides

TABLE 2.1

COMMERCIAL/INSTITUTIONAL

PROPERTY SURVEY DATA

Facility Name: Old Chapel Antiques

UTILITIES: Heating: Gas X Electric X Oil ____

Hot Water ____ Other ____

Remarks: ____

Air Conditioning: Elec. Heating Pump X Gas ____

Evap. Cooler ____ Other ____

Remarks: ____

Electric Line Location: Along west property line, pole mounted

Gas Line Location: Not known

Water Line Location: 3300 South Street

Sewer Line Location: 3300 South Street

Telephone Line Location: North property line

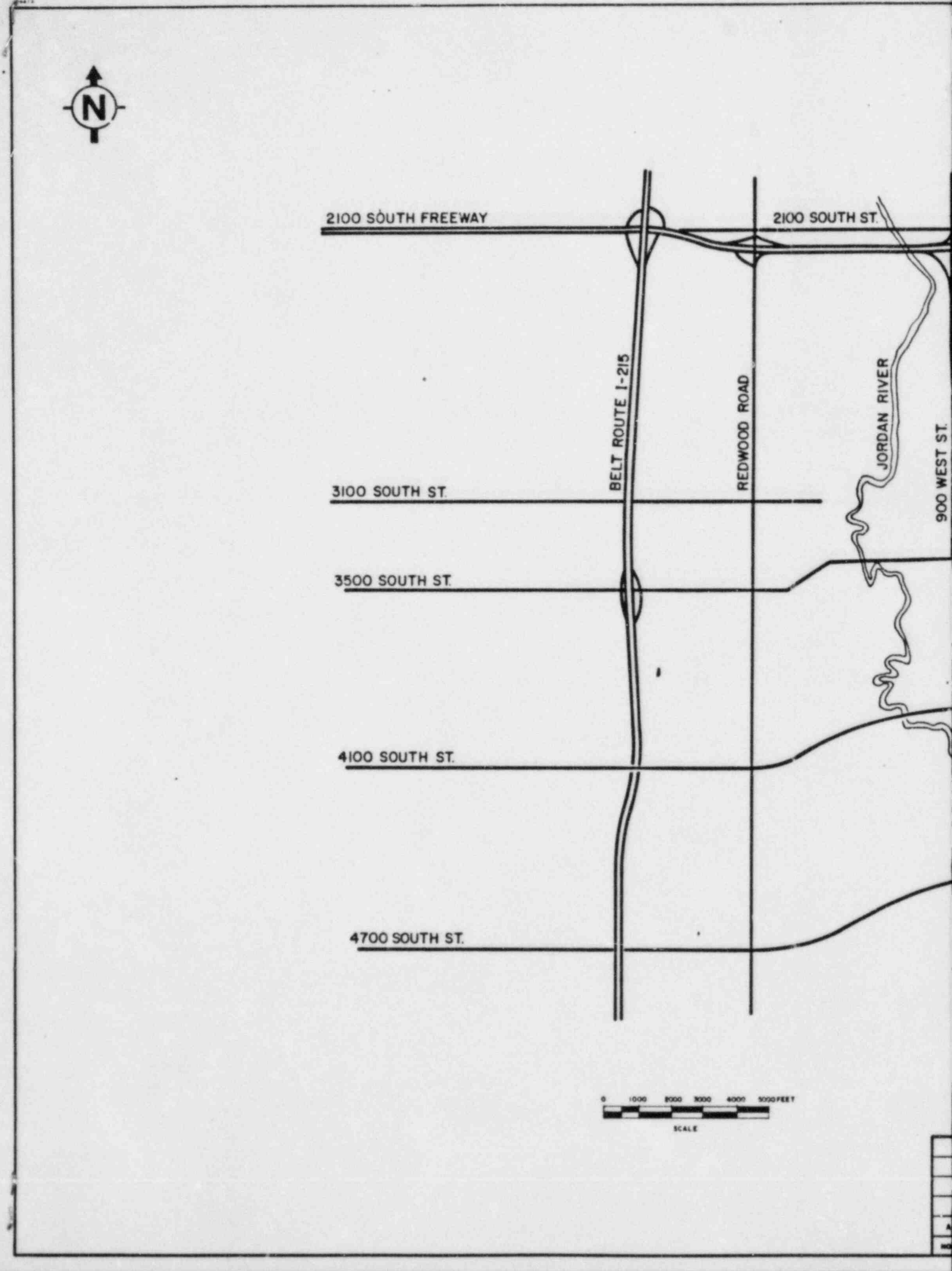
BUILDING CODES AND ZONING: N/A

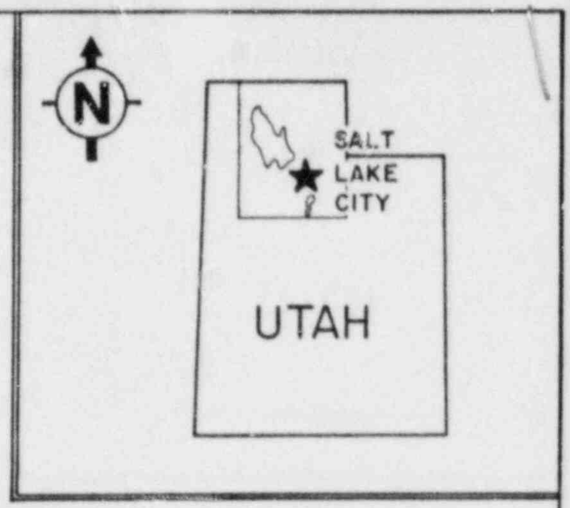
Building Code: UBC ____ BOCA ____

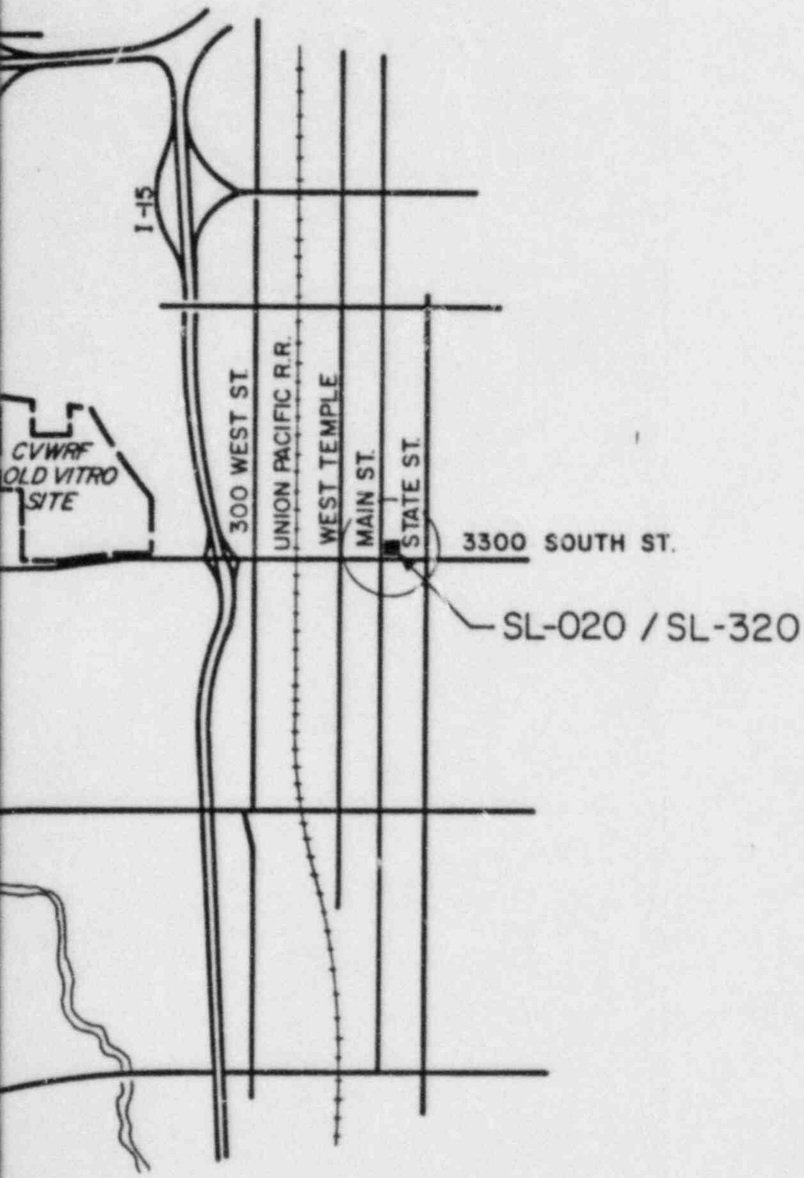
Remarks: ____

Zoning Jurisdiction: South Salt Lake City

Present Facility Zoning: Business-A


N
2100 SOUTH FREEWAY
2100 SOUTH ST.
BELT ROUTE I-215
REDWOOD ROAD
JORDAN RIVER
900 WEST ST.
3100 SOUTH ST.
3500 SOUTH ST.
4100 SOUTH ST.
4700 SOUTH ST.
0 1000 2000 3000 4000 5000 FEET
SCALE





NOTE:
PROPERTY LOCATED IN SALT LAKE COUNTY

8508010314 -01

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ALBUQUERQUE, NEW MEXICO

FIGURE 2.1
VICINITY MAP SL-020/SL-320
SALT LAKE COUNTY, UTAH
URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT

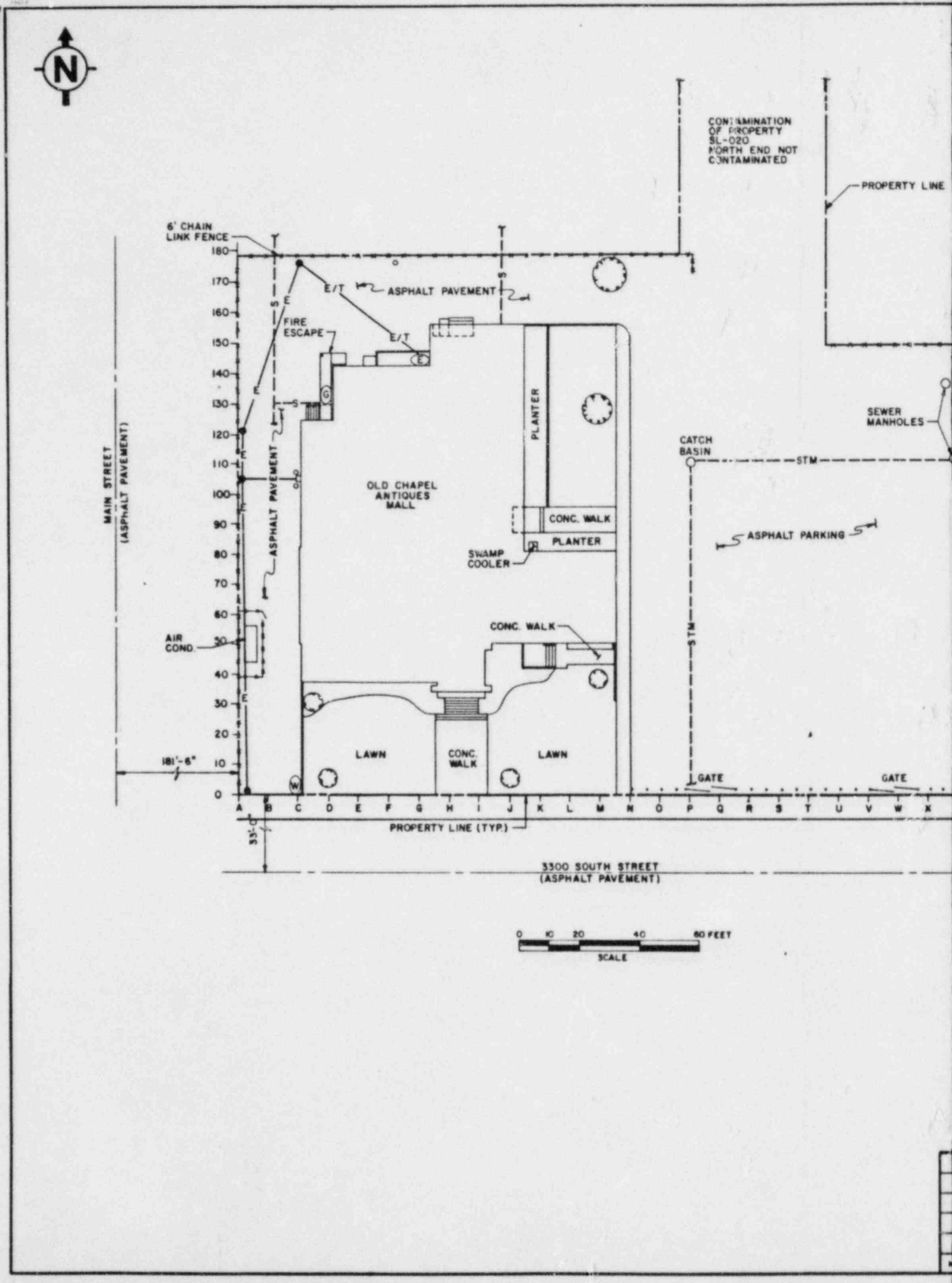
DESIGNED	DRAWN	CHECKED	REVIEWED	RECOMMENDED
	TLE			

APPROVED	DATE	DOE PROJECT MANAGER	DATE	DOE PROJECT ENGINEER	DATE
NR		NR		NR	

MORRISON KNUDSEN

PROJECT NO. DE-AC04-83AL18796
DRAWING NO. SL-020-005
REV. A

DATE	REVISIONS	DRAWN BY	CHECKED BY	APPRVL LOE	APPRVL DH	PROJ ENG	APPRVL DOE
3-85	FINAL REA SUBMITTAL	DHH		VCB		VCB	—


N
CONTAMINATION
OF PROPERTY
SL-020
NORTH END NOT
CONTAMINATED
PROPERTY LINE
6' CHAIN
LINK FENCE
ASPHALT PAVEMENT
FIRE
ESCAPE
E/T
OLD CHAPEL
ANTIQUES
MALL
PLANTER
CONC. WALK
PLANTER
SWAMP
COOLER
SEWER
MANHOLES
CATCH
BASIN
STM
ASPHALT PARKING
MAIN STREET
(ASPHALT PAVEMENT)
ASPHALT PAVEMENT
AIR
COND.
CONC. WALK
LAWN
CONC.
WALK
LAWN
GATE
GATE
181'-6"
33'-0"
PROPERTY LINE (TYP.)
3300 SOUTH STREET
(ASPHALT PAVEMENT)
0 10 20 40 60 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-020/SL-320

SALT LAKE COUNTY, UTAH
URANIUM MILL TAILINGS REMEDIAL ACTION PROJECT

DESIGNED	DRAWN				
	DHN				
CHECKED					
REVIEWED					
RECOMMENDED					
APPROVED NR	DATE	DOE PROJECT MANAGER NR	DATE	DOE PROJECT ENGINEER NR	DATE

MORRISON KNUDSEN

PROJECT NO. DE-AC04-83AL18796
DRAWING NO. SL-020-010 REV. A

NO.	DATE	REVISIONS	DRAWN BY	CHECKED BY	APPRVL LDE	APPRVL DH	PROJ ENG	APPRVL DOE
A	3-1-85	FINAL REA SUBMITTAL	DHN		VCD		VCD	—

East Side of Property Looking North

Figure 2.3 Property Photos

3.0 RADIOLOGICAL SURVEY AND ASSESSMENT

The original survey did not extend across the property line at the northeast corner of the property. However, after obtaining the adjacent property owners' permission, a survey was performed on the spillover property.

3.1 Gamma Exposure Rate Survey

3.1.1 Survey Method

The outdoor contaminated areas identified in the inclusion survey (Report of Inclusion Survey on Location SL-020, ORNL, March 1984) were surveyed in accordance with the RAC UMTRA Procedure 019. The survey was made on a 10' x 10' grid. A surface scan was made of the gridded area with a gamma scintillometer to identify the boundary of the contamination.

An indoor gamma survey was not conducted inside the building since the inclusion survey reported no radioactive material exceeding standards in or under the structure.

3.1.2 Survey Results

Surface gamma readings on the property range from 10 to 70 micro R/hr. This may be compared with the background for the Salt Lake City site of 10 micro R/hr. Table 3.1 gives surface gamma readings where these readings are greater than 13 micro R/hr.

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.

3.2.2 Survey Results

Contamination was found in 11 of the 16 outdoor holes augered on SL-020 and in 4 of 10 outdoor holes augered on SL-320. The location and depth of contamination is described in Table 3.2 and is shown in Figure 3.1.

At three boreholes the depth of contamination was not reached due to the difficulty of drilling. The count rate was diminishing, however, and the actual depth of contamination is probably about 6 inches below the deepest attainable hole.

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.

3.4 Estimated Extent of Contamination

The area of contamination identified varies in depth from 18 to 72 inches at various locations. The average depth of contamination is about 48 inches.

Table 3.1
OUTDOOR SURFACE GAMMA SURVEY
Property SL-020

POINT	MICRO R/hr
T+30	14
R+30	14
Q+30	14
I+40	15
J+40	14
R+40	14
S+40	17
T+40	18
U+40	15
Z+50	14
V+50	17
U+50	16
T+50	17
S+50	15
R+50	18
Q+50	14
R+60	15
T+60	15

Table 3.1 - Cont'd.
OUTDOOR SURFACE GAMMA SURVEY
Property SL-020

POINT	MICRO R/hr
U+60	14
V+60	15
Z+60	14
Y+70	14
W+70	14
V+70	16
T+70	21
S+70	22
T+80	14
V+80	15
W+80	14
Y+80	14
S+90	15
U+90	14
V+90	19
W+90	14
X+90	15
Y+90	21
Y+100	15
X+100	17

Table 3.1 - Cont'd.
OUTDOOR SURFACE GAMMA SURVEY
Property SL-020

POINT	MICRO R/hr
W+100	23
V+100	28
U+100	21
T+100	16
S+100	34
R+100	18
K+100	14
K+110	14
Q+110	17
R+110	15
S+110	33
T+110	33
U+110	30
V+110	35
W+110	25
X+110	29
Y+110	19
Z+120	16
Y+120	23
X+120	28

Table 3.1 - Cont'd.
OUTDOOR SURFACE GAMMA SURVEY
Property SL-020

POINT	MICRO R/hr
W+120	36
V+120	35
U+120	42
T+120	18
S+120	19
R+120	16
K+120	14
K+130	14
R+130	17
S+130	28
T+130	55
U+130	62
V+130	38
W+130	46
X+130	37
Y+130	26
Z+130	15
Z+140	19
Y+140	31
X+140	50

Table 3.1 - Cont'd.
OUTDOOR SURFACE GAMMA SURVEY
Property SL-020

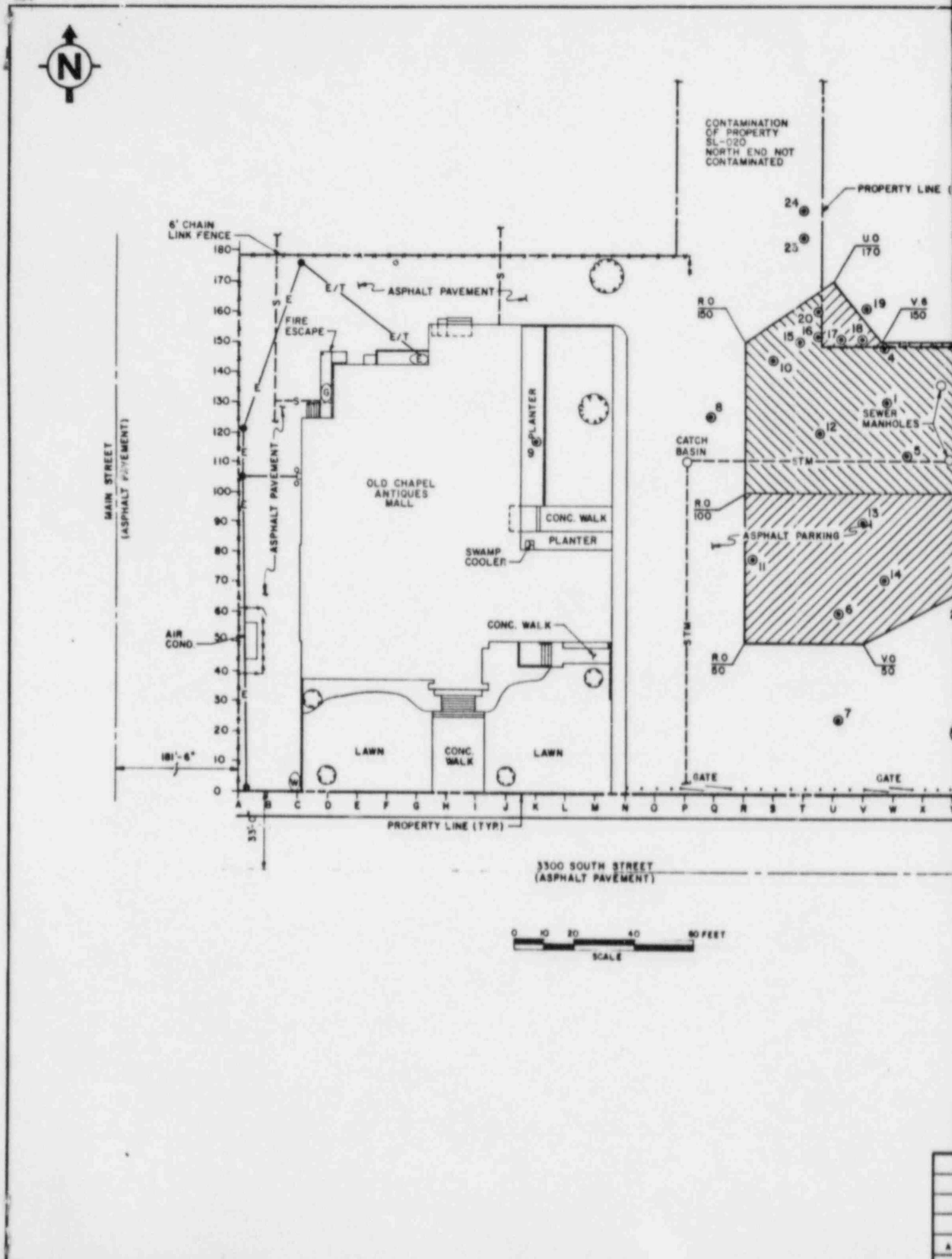
POINT	MICRO R/hr
W+140	70
V+140	59
U+140	40
T+140	55
S+140	32
K+140	14
Q+150	15
R+150	14
S+150	14
T+150	48
U+150	34
V+150	34
W+150	47
X+150	54
Y+150	31
Z+150	14

Table 3.2
BOREHOLE SURVEY
Property SL-020

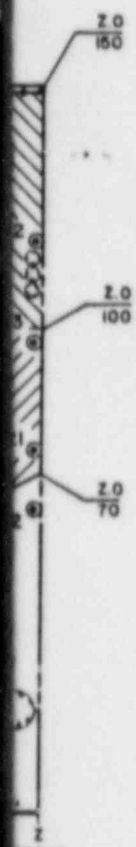
HOLE	LOCATION	CONTAMINATION DEPTH
1	V.8+130	0-54"+
2	Y.8+118	0-48"
3	Y.8+97	0-18"
4	V.7+148	0-48"
5	W.5+112	0-66"+
6	U.2+60	0-36"
7	U.2+25	None
8	P.9+125	None
9	K+117	None
10	S+144	0-48"
11	R.3+78	None
12	7.6+120	0-54"+
13	V+90	0-18"
14	V.7+71	0-30"
15	S.9+150	None*
16	T.5+152	0-36"
17	U.3+151	0-36"
18	V.0+151	0-36"
19	V.1+161	None
20	T.5+160	None*

Table 3.2 - Cont'd.
BOREHOLE SURVEY
Property SL-020

HOLE	LOCATION	CONTAMINATION DEPTH
21	Y.8+75	0-36"
22	Y.8+63	None
23	T.0+184	None
24	T.0+193	None



N
CONTAMINATION OF PROPERTY SL-020 NORTH END NOT CONTAMINATED
PROPERTY LINE
6' CHAIN LINK FENCE
ASPHALT PAVEMENT
FIRE ESCAPE
E/T
MAIN STREET (ASPHALT PAVEMENT)
ASPHALT PAVEMENT
OLD CHAPEL ANTIQUES MALL
PLANTER
CONC. WALK
PLANTER
SWAMP COOLER
CONC. WALK
AIR COND.
LAWN
CONC. WALK
LAWN
181'-6"
CATCH BASIN
STM
SEWER MANHOLES
ASPHALT PARKING
U.O 170
V.8 150
R.O 150
R.O 100
R.O 50
V.O 50
GATE
GATE
PROPERTY LINE (TYP.)
35'
3300 SOUTH STREET (ASPHALT PAVEMENT)
0 10 20 40 80 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.

⊙2 AUGER HOLE DESIGNATION

ESTIMATED DEPTH OF CONTAMINATION

36"

72"

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CARD

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ALBUQUERQUE, NEW MEXICO

DESIGNED / DRAWN DHN	FIGURE 3.1
CHECKED	RADIOLOGICAL SURVEY DATA SL-020/ SL-320
REVIEWED	SALT LAKE COUNTY, UTAH
RECOMMENDED	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-020-015

REV. A

DATE	REVISIONS	DRAWN BY	CHECKED BY	APPROVAL LDR	APPROVAL CH	PROJ. ENG.	APPROVAL DOE
3-85	FINAL REA SUBMITTAL	DHN					

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

Due to the limited extent of the contamination only two options were evaluated for property SL-020/SL-320:

Option 1: No action should be taken.

Option 2: Complete decontamination of the localized contaminated area 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:

- Remove and salvage existing wood fencing.
- Remove existing asphalt paving.
- Excavate contaminated soil.
- Install common backfill.
- Install six inches of aggregate base course.
- Repave excavated area.
- Reinstall wood fencing.
- Repaint effected parking stalls.

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 remedial action of 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 10 to 15 days, based on fair weather conditions.

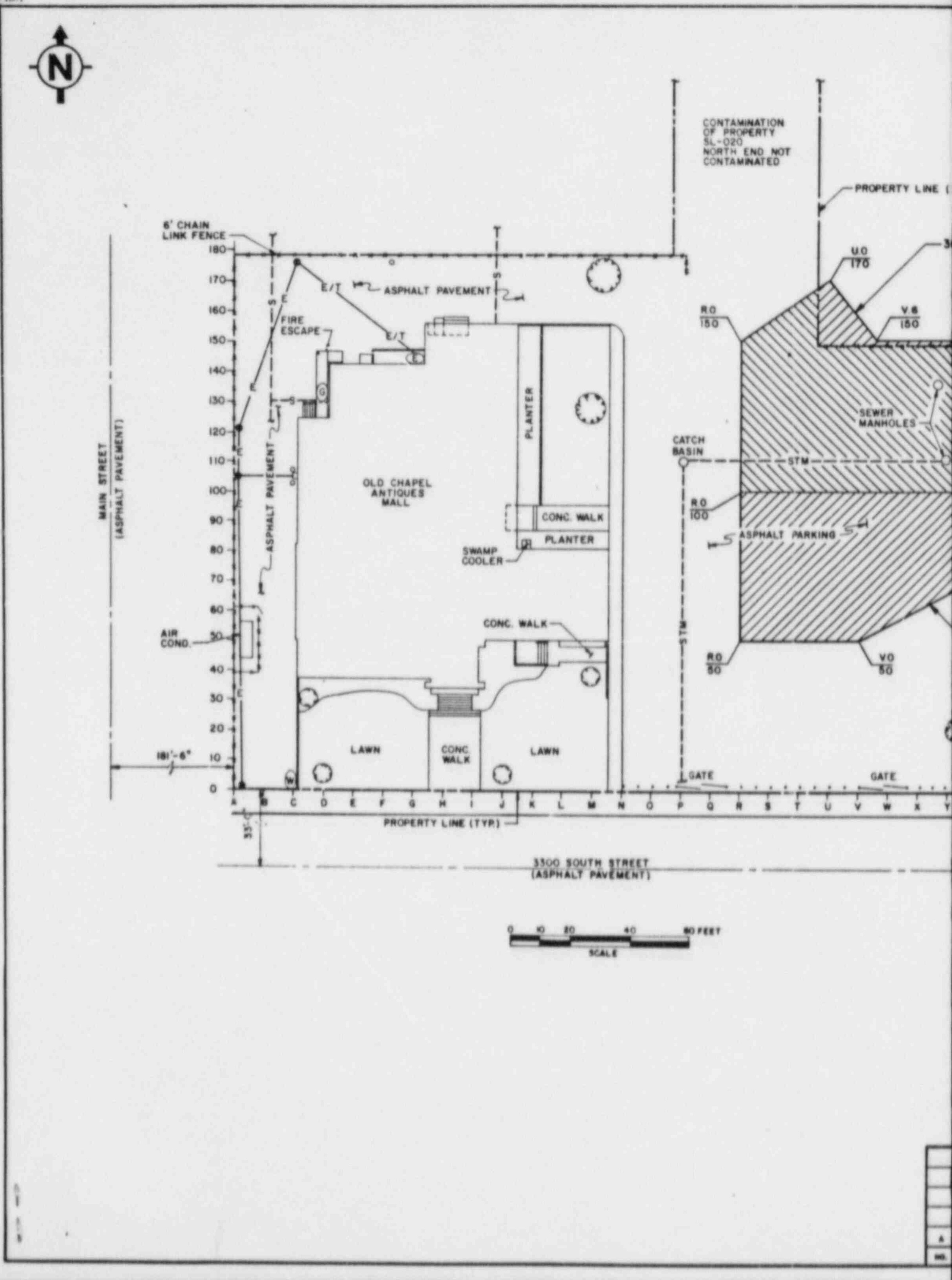
4.2 Recommendation

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 $42,800.00

Table 4.1
OPTION 2 COSTS

Activity	Unit Price	Quantity	Estimated Cost
Remove and salvage wood fencing	2.00	80 lf	160.00
Remove asphalt paving	0.20	890 sy	180.00
Excavation (machine)	3.40	1,550 cy	5,270.00
Backfill (machine)	7.50	1,400 cy	10,500.00
Aggregate base course	12.40	150 cy	1,860.00
Asphalt paving	6.00	890 sy	5,340.00
Parking striping	LS	20 ea	100.00
Reinstall wood fence	13.80	80 lf	1,100.00
Protect and retain sewer	LS	1	5,000.00

Subtotal	$29,510.00
5% Contractor's Contingency	1,475.00
20% Overhead and Profit	6,200.00
Subtotal	$37,185.00
15% Engineer's Contingency	5,575.00
Total (Rounded)	$42,800.00


N
CONTAMINATION OF PROPERTY SL-020 NORTH END NOT CONTAMINATED
PROPERTY LINE (
6' CHAIN LINK FENCE
ASPHALT PAVEMENT
FIRE ESCAPE
U.O 170
R.O 150
V.8 150
PLANTER
SEWER MANHOLES
CATCH BASIN
STM
MAIN STREET (ASPHALT PAVEMENT)
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R.O 50
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LAWN
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LAWN
GATE
GATE
181'-6"
PROPERTY LINE (TYP.)
33'
3300 SOUTH STREET (ASPHALT PAVEMENT)
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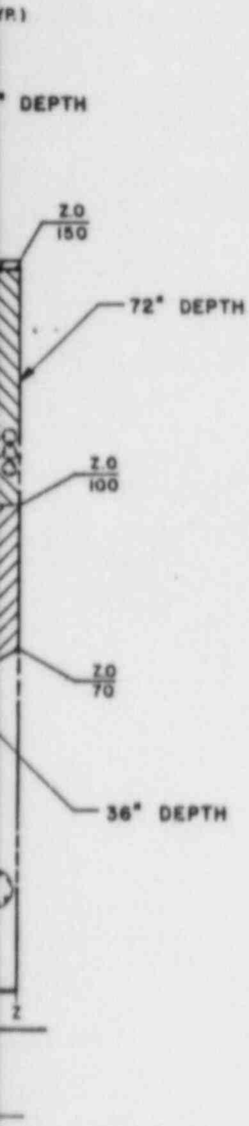
SCALE



LEGEND

——W——	WATER LINE
——G——	GAS LINE
——GM——	GAS MAIN
——S——	SEWER LINE
——SM——	SEWER MAIN
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—— — — ——	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-020/SL-320

   SECTION 02050
   DEMOLITION

   SECTION 02110
   CLEARING AND GRUBBING

   SECTION 02130
   CONTAMINATED MATERIAL REMOVAL

   SECTION 02200
   EXCAVATION AND BACKFILL

   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 EXISTING WOOD FENCING.
- REMOVE EXISTING ASPHALT PAVING
- EXCAVATE CONTAMINATED SOIL TO THE DEPTHS INDICATED.
- PROTECT AND RETAIN EXISTING UNDERGOUND UTILITIES.
- PLACE AND COMPACT COMMON BACKFILL.
- PLACE AND COMPACT 6 INCHES OF AGGREGATE BASE COURSE.
- REPAVE AREA WITH 3 INCHES OF ASPHALT PAVING.
- REINSTALL WOOD FENCING
- REPAINT AFFECTED PARKING STALL STRIPING.

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ALBUQUERQUE, NEW MEXICO

DESIGNED	DRAWN DHN
CHECKED	
REVIEWED	
RECOMMENDED	

FIGURE 4.1
EXCAVATION & RESTORATION PLAN SL-020/SL-320
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-020-020 REV. A

DATE	REVISIONS	DRAWN BY	CHECKED BY	APPROVAL L/DE	APPROVAL DH	PROJ/ENG	APPROVAL DOE
. 85	FINAL REA SUBMITTAL	DHN		VCD		VCD	—

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
SECTION 02050	DEMOLITION	X	
SECTION 02110	CLEARING AND GRUBBING	X	
SECTION 02130	CONTAMINATED MATERIAL REMOVAL	X	
SECTION 02200	EXCAVATION AND BACKFILL	X	
SECTION 02500	PAVING AND SURFACING	X	

6.0 CONSTRUCTION DRAWING

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

Drawing Number	Drawing Title
SL-020-020	Excavation & Restoration Plan SL-020/SL-320

APPENDIX A

SURVEY DATA LOGS

MORRISON KNUDSEN

OUTDOOR GAMMA SCREENING SURVEY DATA SHEET

LOGGING CREW: Von Black / Jeff Manship

SHEET 1 OF 10 PAGE 1

DATE: 7-19-84

PROPERTY ID: SL-020

INSTRUMENT ID NO.: 26511 / Probe # 015812

BACKGROUND CALCULATION:

#1 716 + #2 665 + #3 697 = 2078 ÷ 3 = 692 COUNTS/.1MIN*

AREA:			AREA:			AREA:			AREA:		
POINT ID	READING 1 m.	Surf.	POINT ID	READING 1 m.	Surf	POINT ID	READING 1 m.	Surf.	POINT ID	READING 1 m.	Surf.
A+0	1023	984	Y+0	914	991	D+10	1181	1272	U+20	1135	1165
B+0	981	1034	Z+0	1069	1038	C+10	1148	1128	V+20	1168	1191
C+0	1099	967	Z+10	1310	1504	B+10	1003	961	W+20	1065	1124
D+0	1130	1047	Y+10	977	1115	A+10	944	986	X+20	1053	1199
E+0	1110	986	X+10	1012	1090	A+20	1059	1011	Y+20	1164	1222
F+0	1168	1142	W+10	1072	1154	B+20	989	955	Z+20	1484	1513
G+0	1245	1084	V+10	1161	1142	C+20	1230	1226	Z+30	1320	1447
H+0	1219	1082	U+10	1210	1343	D+20	1308	1330	Y+30	1287	1330
I+0	1190	1199	T+10	1303	1498	E+20	1315	1355	X+30	1197	1201
J+0	1099	1093	S+10	1214	1243	F+20	1335	1385	W+30	1178	1233
K+0	1143	1061	R+10	1281	1389	G+20	1228	1200	V+30	1298	1235
L+0	1127	1013	Q+10	1251	1350	H+20	1228	1199	U+30	1265	1595
M+0	1083	1070	P+10	1223	1192	I+20	1223	1211	T+30	1421	1619
N+0	998	1091	O+10	1200	1237	J+20	1226	1259	S+30	1489	1546
O+0	1021	1053	N+10	1058	1010	K+20	1208	1252	R+30	1605	1597
P+0	1050	1027	M+10	1110	1109	L+20	1132	1158	Q+30	1600	1601
Q+0	1009	982	L+10	1046	1126	M+20	1098	1143	P+30	1302	1365
R+0	1060	1066	K+10	1133	1207	N+20	915	903	O+30	1197	1199
S+0	1111	973	J+10	1175	1191	O+20	997	1041	N+30	1088	1042
T+0	1019	929	I+10	1203	1254	P+20	1190	1305	M+30	1250	1233
U+0	1040	980	H+10	1455	1720	Q+20	1473	1638	L+30	1230	1273
V+0	985	1007	G+10	1473	1647	R+20	1559	1682	K+30	1276	1403
W+0	1016	1046	F+10	1255	1281	S+20	1355	1552	J+30	1352	1403
X+0	1024	962	E+10	1203	1154	T+20	1272	1341	I+30	1396	1504

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

VP-04A

MORRISON KNUDSEN

OUTDOOR GAMMA SCREENING SURVEY DATA SHEET

LOGGING CREW: Von Black
Jeff Manship

SHEET 2 OF 10 PAGE 2

DATE: 7-19-84

PROPERTY ID: SL-020

INSTRUMENT ID NO.: 26511/Probe #015812

BACKGROUND CALCULATION:

#1 ______ + #2 ______ + #3 ______ = ______ ÷ 3 = 700 COUNTS/.1MIN*

AREA:			AREA:			AREA:			AREA:		
POINT ID	READING 1 m.	Surf.	POINT ID	READING 1 m.	Surf	POINT ID	READING 1 m.	Surf.	POINT ID	READING 1 m.	Surf.
H+30	1303	1432	Y+40	1290	1451	W+60	1398	1363	U+80	1573	1404
G+30	1390	1469	Z+40	1333	1502	X+60	1279	1205	V+80	1730	1749
F+30	1461	1474	Z+50	1388	1562	Y+60	1328	1373	W+80	1590	1574
E+30	1483	1476	Y+50	1310	1437	Z+60	1306	1547	X+80	1467	1430
D+30	1411	1446	X+50	1382	1461	Z+70	1201	1388	Y+80	1506	1544
C+30	1284	1295	W+50	1371	1283	Y+70	1169	1626	Z+80	1192	1404
B+30	969	968	V+50	1711	2077	X+70	1300	1409	K+90	1242	1259
A+30	1069	976	U+50	1652	1919	W+70	1557	1623	L+90	1271	1223
I+40	1671	1750	T+50	1809	2067	V+70	1874	1871	M+90	1214	1168
J+40	1511	1594	S+50	1669	1782	U+70	1460	1430	N+90	1130	1061
K+40	1430	1412	R+50	1999	2277	T+70	1880	2712	O+90	1140	1213
L+40	1313	1434	Q+50	1516	1662	S+70	1763	2950	P+90	1340	1347
M+40	1237	1437	P+50	1287	1251	R+70	1317	1413	Q+90	1400	1420
N+40	1127	1109	O+50	1203	1221	Q+70	1282	1331	R+90	1293	1329
O+40	960	1035	N+50	1145	1088	P+70	1191	1153	S+90	1267	1844
P+40	1218	1281	N+60	1202	1100	O+70	1132	1201	T+90	1235	1382
Q+40	1433	1430	O+60	1218	1265	N+70	1127	1099	U+90	1736	1651
R+40	1698	1572	P+60	1132	1289	N+80	1112	937	V+90	2133	2462
S+40	1503	2111	Q+60	1376	1357	O+80	1195	1211	W+90	1745	1621
T+40	1471	2196	R+60	1602	1827	P+80	1214	1192	X+90	1794	1738
U+40	1535	1707	S+60	1403	1571	Q+80	1346	1214	Y+90	1962	2819
V+40	1299	1337	T+60	1725	2052	R+80	1297	1382	Z+90	1284	1301
W+40	1254	1359	U+60	1653	1691	S+80	1317	1379	Z+100	1389	1291
X+40	1299	1306	V+60	1725	1956	T+80	1397	1672	Y+100	1793	1749

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

VP-04A

MORRISON KNUDSEN

OUTDOOR GAMMA SCREENING SURVEY DATA SHEET

LOGGING CREW: Von Black
Jeff Manship

SHEET 3 OF 10 PAGE 3

DATE: 7-20-84

PROPERTY ID: SL-020

INSTRUMENT ID NO.: 26511 Pr. #015812

BACKGROUND CALCULATION:

#1 694 + #2 718 + #3 687 = 2099 ÷ 3 = 700 COUNTS/.1MIN*

AREA:			AREA:			AREA:			AREA:		
POINT ID	READING 1 m.	Surf.	POINT ID	READING 1 m.	Surf	POINT ID	READING 1 m.	Surf.	POINT ID	READING 1 m.	Surf.
X+100	2237	2058	U+110	3978	4160	M+130	1176	1233	P+140	1126	1214
W+100	2991	3048	V+110	4440	4947	N+130	969	1101	O+140	1033	1132
V+100	3577	3932	W+110	3340	3334	O+130	1060	1110	N+140	1011	1106
U+100	2644	2796	X+110	2841	4024	P+130	1235	1195	M+140	1152	1214
T+100	2420	1908	Y+110	2301	2388	Q+130	1375	1253	L+140	1163	1268
S+100	2774	4846	Z+110	1525	1445	R+130	1995	2175	K+140	1364	1575
R+100	1727	2274	Z+120	1824	1922	S+130	3454	3818	K+150	1422	1464
Q+100	1430	1519	Y+120	2888	3042	T+130	6638	8414	L+150	1178	1316
P+100	1343	1403	X+120	3397	3801	U+130	7142	9495	M+150	1225	1210
O+100	1227	1278	W+120	4871	5108	V+130	5680	5268	N+150	955	941
N+100	1108	1109	V+120	4701	4982	W+130	5598	6728	O+150	895	1068
M+100	1217	1299	U+120	4760	6743	X+130	4654	5184	P+150	1406	1258
L+100	1291	1387	T+120	2849	2324	Y+130	3285	3583	Q+150	1635	1764
K+100	1550	1612	S+120	2354	2490	Z+130	1673	1759	R+150	1464	1638
K+110	1388	1565	R+120	1761	1958	Z+140	1736	2349	S+150	2125	1694
L+110	1253	1277	Q+120	1332	1361	Y+140	4293	4259	T+150	4744	5522
M+110	1154	1260	P+120	1141	1240	X+140	5794	7353	U+150	4498	4725
N+110	1037	1068	O+120	981	1084	W+140	7131	10662	V+150	4127	4808
O+110	1223	1179	N+120	983	1076	V+140	7278	8933	W+150	4439	5361
P+110	1343	1428	M+120	1169	1238	U+140	6434	5806	X+150	4383	8076
Q+110	1694	2056	L+120	1301	1316	T+140	6725	8371	Y+150	3309	4296
R+110	1982	1745	K+120	1326	1621	S+140	3001	4499	Z+150	1382	1553
S+110	3540	4714	K+130	1500	1578	R+140	1471	1523	T+160	1143	1132
T+110	3821	4600	L+130	1266	1198	Q+140	1267	1201	S+160	991	1072

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

YP-04A

MORRISON KNUDSEN

OUTDOOR GAMMA SCREENING SURVEY DATA SHEET

LOGGING CREW: Von Black
Jeff Manship

SHEET 4 OF 10 PAGE 4

DATE: 7-20-84

PROPERTY ID: SL-020

INSTRUMENT ID NO.: 26511/Pr 015812

BACKGROUND CALCULATION:

#1 ______ + #2 ______ + #3 ______ = ______ ÷ 3 = 700 COUNTS/.1MIN*

AREA:			AREA:			AREA:			AREA:		
POINT ID	READING 1 m.	Surf.	POINT ID	READING 1 m.	Surf	POINT ID	READING 1 m.	Surf.	POINT ID	READING 1 m.	Surf.
R+160	1048	1078	G+170	1084	1133	J+176	1159	1269			
Q+160	1009	1052	H+170	1155	1154	I+176	1067	1219			
P+160	1167	1258	I+170	1193	1288	H+176	1193	1261			
O+160	1059	1166	J+170	1146	1243	G+176	1140	1357			
N+160	1087	1164	K+170	1195	1266	F+176	1125	1250			
M+160	1157	1168	L+170	1120	1150	E+176	1095	1190			
L+160	1175	1157	M+170	1098	1172	D+176	1118	1287			
K+160	1212	1241	N+170	1093	1111	C+176	1142	1404			
J+160	1162	1154	O+170	1097	1087	B+176	1158	1252			
I+160	1170	1179	P+170	1040	985	A+176	1153	1133			
H+160	1216	1241	Q+170	987	1030						
G+160	1149	1250	R+170	964	1039						
F+160	1184	1240	S+170	987	1006						
E+160	1109	1189	T+170	1125	1064						
D+160	1087	1124	T+176	1030	1015						
C+160	1018	1047	S+176	998	974						
B+160	1026	1040	R+176	999	956						
A+160	1115	1282	Q+176	1059	1029						
A+170	1374	1266	P+176	1024	1124						
B+170	1007	1089	O+176	1073	1250						
C+170	1041	1077	N+176	1137	1259						
D+170	1047	1064	M+176	1156	1171						
E+170	1033	1072	L+176	1176	1265						
F+170	1079	1020	K+176	1134	1288						

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

VP-04A

PROPERTY SURVEY SKETCH

Sheet 5 of 10

SITE LOCATION SLC, Utah

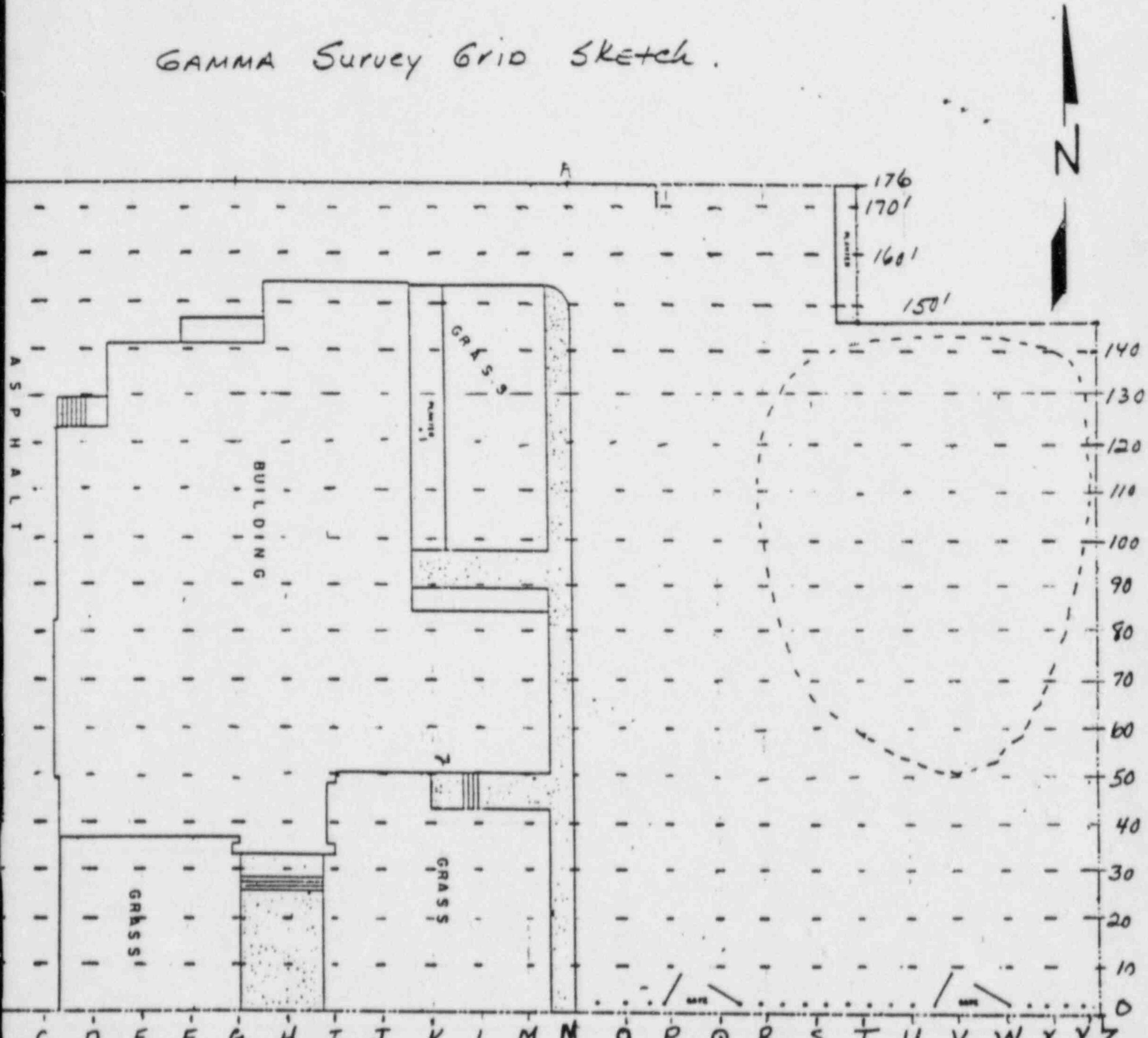
ADDRESS 42 E 3300 So.

PROPERTY TYPE Commercial LOT NO. SL-020

OWNER

SKETCH COMPLETED BY Von Black DATE 7/27/84

GAMMA Survey Grid Sketch.



MORRISON KNUDSEN

BOREHOLE LOG

LOGGING CREW: V. Black
J. Manship

INSTRUMENT ID NO. 26511/Pr. #05812

SHEET 6 OF 10 PAGE 6

DATE: 7-20-84/7-23-84

PROPERTY ID: SL-020

AREA: SLC

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: SL-020-1 TIME DRILLED: 1315 TIME LOGGED: 1330 SOIL TYPE:		HOLE ID: SL-020-2 TIME DRILLED: 1320 TIME LOGGED: 1340 SOIL TYPE:		HOLE ID: SL-020-3 TIME DRILLED: 0935 TIME LOGGED: 0945 SOIL TYPE:		HOLE ID: SL-020-4 TIME DRILLED: 0950 TIME LOGGED: 1000 SOIL TYPE:	
DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN
SURFACE		SURFACE		SURFACE		SURFACE	
0"	11912	0"	2702	0"	1442	0"	12373
6"	37396	6"	5019	6"	2471	6"	36811
12"	101101	12"	9965	12"	5051	12"	83269
18"	93987	18"	13296	18"	4674	18"	69904
24"	54284	24"	25951	24"	3778	24"	27115
30"	23807	30"	29437	30"	3277	30"	10512
36"	12802	36"	15294	36"	2821	36"	6128
42"	10004	42"	5442	42"	2624	42"	4983
48"	8534	48"	3740	48"	2546	48"	4309
54"	8190	54"	3245	54"	2409	54"	
60"		60"	2762	60"	2378	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:

MORRISON KNUDSEN

BOREHOLE LOG

LOGGING CREW: Von Black
Jeff Manship

SHEET 7 OF 10 PAGE 7

DATE: 7-23-84

PROPERTY ID: SL-020

INSTRUMENT ID NO. 26511 / Pr# 015812

AREA: SLC, Utah

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: SL-020-5 TIME DRILLED: 1005 TIME LOGGED: 1030 SOIL TYPE:		HOLE ID: SL-020-6 TIME DRILLED: 1015 TIME LOGGED: 1045 SOIL TYPE:		HOLE ID: SL-020-7 TIME DRILLED: 1020 TIME LOGGED: 1055 SOIL TYPE:		HOLE ID: SL-020-8 TIME DRILLED: 1040 TIME LOGGED: 1105 SOIL TYPE:	
DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN
SURFACE		SURFACE		SURFACE		SURFACE	
0"	5496	0"	2109	0"	1266	0"	1228
6"	13898	6"	6093	6"	2458	6"	1793
12"	43539	12"	17418	12"	2263	12"	1762
18"	74234	18"	11147	18"	2110	18"	1882
24"	76709	24"	7515	24"	1993	24"	1901
30"	33350	30"	5180	30"	1869	30"	
36"	14200	36"	3936	36"	1861	36"	
42"	10735	42"	3613	42"	1728	42"	
48"	8931	48"	3519	48"	1629	48"	
54"	8171	54"	3306	54"	1602	54"	
60"	6842	60"	2827	60"	1479	60"	
66"	6405	66"		66"		66"	
72"		72"		72"		72"	
78"		78"		78"		78"	
84"		84"		84"		84"	
90"		90"		90"		90"	
96"		96"		96"		96"	

REMARKS:

VP-04B

MORRISON KNUDSEN

BOREHOLE LOG

LOGGING CREW: V. Black
J. Manship

SHEET 8 OF 10 PAGE 8

DATE: 7-25-84

PROPERTY ID: SL-020

INSTRUMENT ID NO. 26511/Pr #015812

AREA: SLC, Utah

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.

7-23-84

HOLE ID: SL-020-9 TIME DRILLED: 1115 TIME LOGGED: 1125 SOIL TYPE:		HOLE ID: SL-020-10 TIME DRILLED: 1030 TIME LOGGED: 1050 SOIL TYPE:		HOLE ID: SL-020-11 TIME DRILLED: 1040 TIME LOGGED: 1100 SOIL TYPE:		HOLE ID: SL-020-12 TIME DRILLED: 1105 TIME LOGGED: 1125 SOIL TYPE:	
DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN
SURFACE		SURFACE		SURFACE		SURFACE	
0"	1662	0"	2861	0"	1504	0"	11671
6"	1941	6"	7222	6"	2503	6"	42479 ✓
12"	1942	12"	11371	12"	2808	12"	119224
18"	1573	18"	11056	18"	2332	18"	107999
24"	1607	24"	8654	24"	2148	24"	57582
30"		30"	6795	30"	2075	30"	20247
36"		36"	5778	36"	1858	36"	11465
42"		42"	4668	42"	1667	42"	8588
48"		48"	3789	48"	1580	48"	7158
54"		54"	3215	54"	1489	54"	6914
60"		60"		60"	1377	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:

MORRISON KNUDSEN

BOREHOLE LOG

LOGGING CREW: Black
Manship

SHEET 9 OF 10 PAGE 9

DATE: 7-25-84

PROPERTY ID: SL-020

INSTRUMENT ID NO. 26511/Pr.#015812

AREA: SLC, Utah

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: SL-020-13 TIME DRILLED: 1115 TIME LOGGED: 1135 SOIL TYPE:		HOLE ID: SL-020-14 TIME DRILLED: 1140 TIME LOGGED: 1145 SOIL TYPE:		HOLE ID: TIME DRILLED: TIME LOGGED: SOIL TYPE:		HOLE ID: TIME DRILLED: TIME LOGGED: SOIL TYPE:	
DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN	DEPTH	COUNTS/.1MIN
SURFACE		SURFACE		SURFACE		SURFACE	
0"	1725	0"	2408	0"		0"	
6"	4109	6"	7411	6"		6"	
12"	5101	12"	11271	12"		12"	
18"	4232	18"	8321	18"		18"	
24"	3330	24"	5783	24"		24"	
30"	2726	30"	3621	30"		30"	
36"	2627	36"	2805	36"		36"	
42"	2471	42"	2725	42"		42"	
48"	2178	48"	2581	48"		48"	
54"	2036	54"	2575	54"		54"	
60"	1748	60"	2303	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:

PROPERTY SURVEY SKETCH

Sheet 10 of 10

SITE LOCATION SLC, Utah

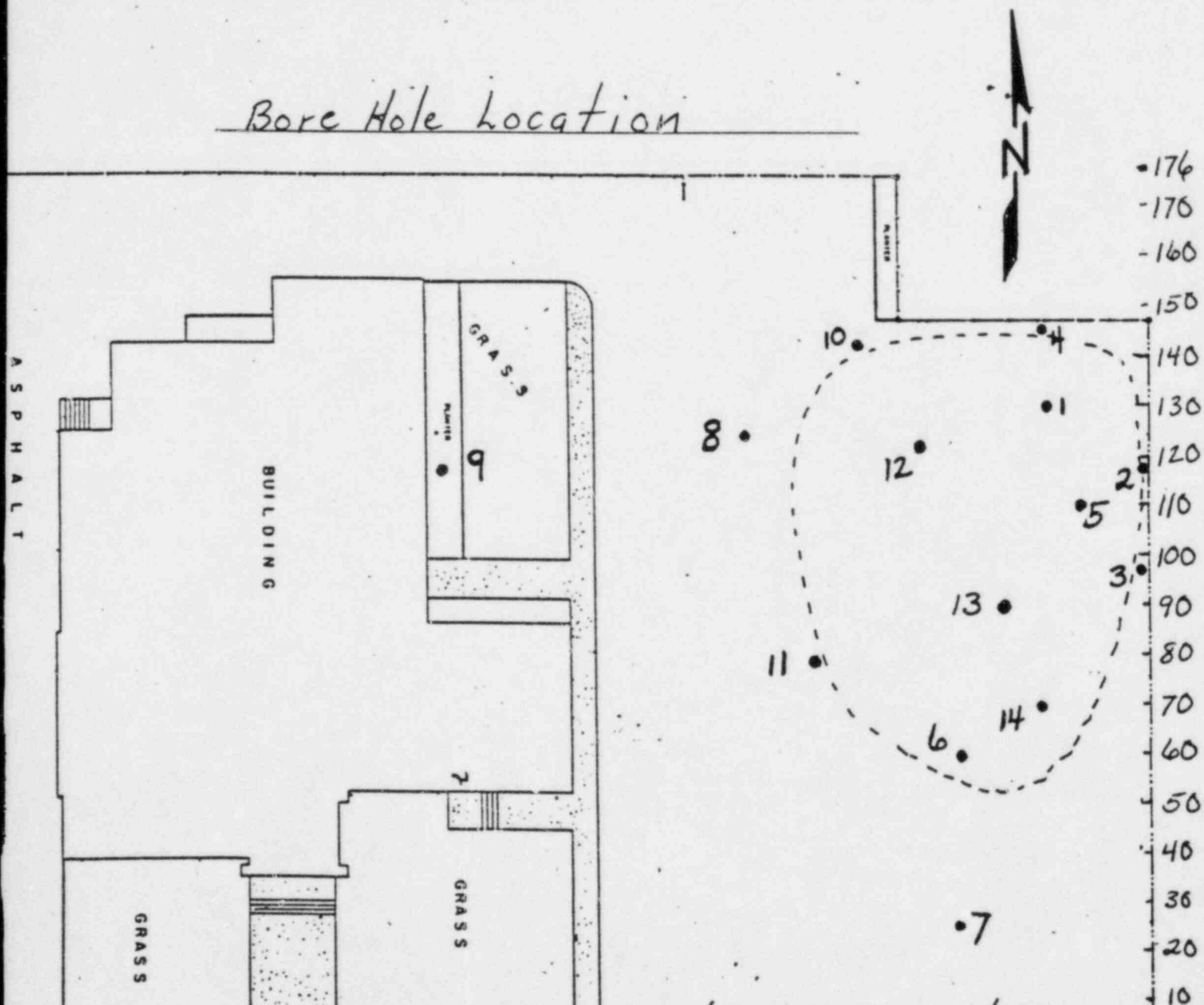
ADDRESS 42E. 3300 So.

PROPERTY TYPE Com. LOT NO. SL-020

OWNER

SKETCH COMPLETED BY Von Black DATE 7-27-84

Bore Hole Location



MORRISON-KNUDSEN COMPANY, INC.

UMTRA PROJECT OFFICE
P.O. BOX 9136
ALBUQUERQUE, NEW MEXICO 87119