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ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE BUFFER ZONE DATA SUMMARY REPORT

• Environmental Restoration •
Rocky Flats Environmental Technology Site

July 2001

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DRAFT ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE BUFFER ZONE DATA SUMMARY REPORT

July 2001

2

TABLE of CONTENTS

1.0 INTRODUCTION 1

2.0 DATA SUMMARY DESCRIPTION 2

Location 2

Validation Qualifiers 2

Association with Validated Laboratory Batches 8

Nondetected Results Where Negative Bias May Be Present 8

Approved/Controlled Documents Used for Field Sampling 8

Multiple-Result Records 8

Analytical Data 10

3.0 GEOGRAPHIC INFORMATION SYSTEM MAPS 10

4.0 REFERENCES 21

LIST of TABLES

Table 1 — Database Field Name Definitions 3

Table 2 — Number of Records by IHSS and Analytical Suite 12

Table 3 — Test Method Names 15

Table 4 – Summary of Buffer Zone Samples Greater than Background and RFCA ALs 16

LIST of FIGURES

Figure 1 — Data Quality Filter for the Buffer Zone Sampling and Analysis Plan and Comprehensive Risk Assessment 5

Figure 2 — Buffer Zone Data Quality Filter – Subsurface Soil 6

Figure 3 — Buffer Zone Data Quality Filter – Surface Soil 7

Figure 4 — Multiple Record Screen 9

Figure 5 — Entity Relationship Diagram 11

3

LIST of PLATES

Plate 1. Buffer Zone IHSS & PACs

Plate 2. Buffer Zone IHSS & PACs – Southeast Quadrant

Plate 3. Buffer Zone IHSS & PACs – Northeast Quadrant

Plate 4. Buffer Zone IHSS & PACs – Northwest Quadrant

Plate 5. Buffer Zone IHSS & PACs – Southwest Quadrant

Plate 6. IHSS 106 – 106 Outfall

Plate 7. IHSS 111.1 - Trench T4

Plate 8. IHSS 113 – Mound Area

Plate 9. IHSS 114 – Present Landfill

Plate 10. IHSS119.1 – Solvent Spill Site OU 1

Plate 11. IHSS 130 – Radiological Site 800 Area

Plate 12. IHSS 141 – Sludge Disposal Area, IHSSs 142.5 – 142.8 (B-Series Ponds) IHSS 156.2 – Soil Disposal Area, IHSS 216.1 – East Spray Field North Area

Plate 13. IHSS 112 – 903 PAD, IHSS 155 – 903 Lip Area, IHSS 140 – Hazardous Disposal Area

Plate 14. IHSS 167.1 – Landfill Pond Spray Area

Plate 15. IHSSs 167.2 and 167.3 - Landfill Pond

Plate 16. IHSS 168 – West Spray Field

Plate 17. IHSS 170 – PU&D Storage Yard

Plate 18. IHSS 174a – PU&D Yard – Drum Storage

Plate 19. IHSS 203 – Inactive Hazardous Waste Storage Area

Plate 20. SW IHSSs & PACs

LIST of ATTACHMENTS

Attachment 1 — Chemical and Radiochemical Sample Results Database on Compact Disc

4

LIST of ACRONYMS

BZ	Buffer Zone
BZSAP	Buffer Zone Sampling and Analysis Plan
CD	compact disc
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CRA	Comprehensive Risk Assessment
ERD	Entity Relationship Diagram
GIS	Geographic Information System
IHSS	Individual Hazardous Substance Site
OPWL	Original Process Waste Line
OU	Operable Unit
PAC	Potential Area of Concern
QC	Quality Control
RCRA	Resource Conservation and Recovery Act
RFCA	Rocky Flats Cleanup Agreement
RFETS	Rocky Flats Environmental Technology Site
RFI/RI	RCRA Facility Investigation/Remedial Investigation
Site	Rocky Flats Environmental Technology Site
SME	Subject Matter Expert
SWD	Soil Water Database
UBC	Under Building Contamination

5

1.0 INTRODUCTION

The Buffer Zone (BZ) Data Summary Report is a compilation of analytical data from sediment, surface, and subsurface soil samples collected at the Rocky Flats Environmental Technology Site (RFETS or Site) BZ. Analytical data generated by on-site and off-site laboratories are stored in electronic format in the Soil Water Database (SWD).

The purpose of this report is to provide a qualified set of data for characterization and risk assessment. This report describes the data quality filters used to qualify the data as acceptable, acceptable with qualifications, or rejected. The data quality filters are based on the Data Quality Objectives (DQOs) for the BZ Sampling and Analysis Plan (DOE, 2001) and Comprehensible Risk Assessment (CRA) Methodology (DOE, 2000). The data qualifications address the differences in usability requirements between characterization and risk assessment purposes.

This report includes data collected in support of Resource Conservation and Recovery Act (RCRA) Facility Investigations/Remedial Investigations (RFI/RIs) and other relevant characterizations of the following Operable Units (OUs):

- OU 1 – 881 Hillside Area
- OU 2 – 903 Pad, Mound and East Trenches Area
- OU 5 – Woman Creek Priority Drainage
- OU 6 – Walnut Creek Priority Drainage
- OU 7 – Present Landfill and Inactive Hazardous Waste Storage Area
- OU 10 – Other Outside Closures
- OU 11 – West Spray Field
- OU 16 – Low Priority Sites (IHHS 195)

Also included in the BZ Database, are *in situ* HPGe radiological survey results of surface soils measured during characterization of the 903 Lip Area and Americium Zone. These data were acquired from Appendix E (electronic database) of *the Characterization Report for the 903 Drum Storage Area, 903 Lip Area, and Americium Zone* (DOE, 2000). Data from OU 4 (Solar Evaporation Ponds) and OU 5 (Woman Creek RFI/RIs) are included if the data are within the BZ. Surface and subsurface analytical data collected during other field programs (investigations, remediations, drilling programs, etc.) within the BZ are also included.

The BZ Data Summary Report consists of three parts:

1. The Data Summary Description is a narrative that describes the overall database structure.

2. Sample locations and corresponding analytical suites for Individual Hazardous Substance Site (IHSSs) and Potential Areas of Concern (PACs) are presented in 11 x 17-inch foldouts and plate-size Geographic Information System (GIS) maps.

3. The Buffer Zone Database is presented in Attachment 1 and consists of radiological and chemical analytical data, in electronic format (compact disc [CD]). The database is compiled in a Microsoft Access (BZ_Data_rev5.mdb) file.

2.0 DATA SUMMARY DESCRIPTION

The electronic data submittal (Attachment 1) consists of 736,502 unique records with 55 fields and 4,901 unique sample locations. The 55 fields are listed in Table 1. Sample types consist of sediment, surface soil and borehole (subsurface soil) media for this version of the data set. The data set will be augmented as the project progresses. The data are controlled by the RFETS BZ Project through "Read-only" submittals to data users (e.g., the CD), and version control of the original data set that resides at RFETS Building 116.

The database file, *BZ_Data_rev5.mdb*, includes *A Query By Form*, which will allow the user to easily perform various queries on the data set. Accesing the "Forms" tab (within the ACCESS application), followed by accessing the file name "frmVALIDATION" will activate the *Query By Form.*

Existing sediment, surface, and subsurface soil analytical data from the RFETS environmental Soil Water Database (SWD) were filtered through a data quality filter (by means of Microsoft Access queries). The basic design of the data quality filter is shown on Figure 1. The data quality filter is designed for all locations and media types in SWD to determine data potentially available for characterization and the CRA. Specific quality control (QC) criteria are presented in Figures 2 and 3. These filters accept, conditionally accept (qualify), or disqualify data for use (reject) based on several decision criteria. A brief discussion of each data quality filter step in Figures 2 and 3 is provided below.

Location

The first filter segregates sample results by geographic location. Only those samples within the Buffer Zone (i.e., locations outside of the Industrial Area and within the RFETS boundary) were filtered (Plate 1). Data were filtered by description type (e.g, Buffer Zone, OU, IHSS, etc) or by specifying sample results within the easting and northing coordinates that define the Buffer Zone area.

Validation Qualifiers

This filter is used to separate data that have not passed laboratory validation guidelines. Validated environmental data fall into one of three basic categories: rejected, valid, or acceptable with qualification. The validation filter omits all rejected data from further consideration.

V	No problems with the data were observed at the indicated review level.
J	The associated value is an estimated quantity.
JB	Result qualified due to blank contamination for results below the RDL
U	The associated value is considered undetected at an elevated level of detection
NJ	The associated value is presumptively estimated
UJ	The associated value is considered estimated at an elevated level of detection
R	The data are unusable. (Note: analyte may or may not be present.)

Table 1 — Database Field Name Definitions

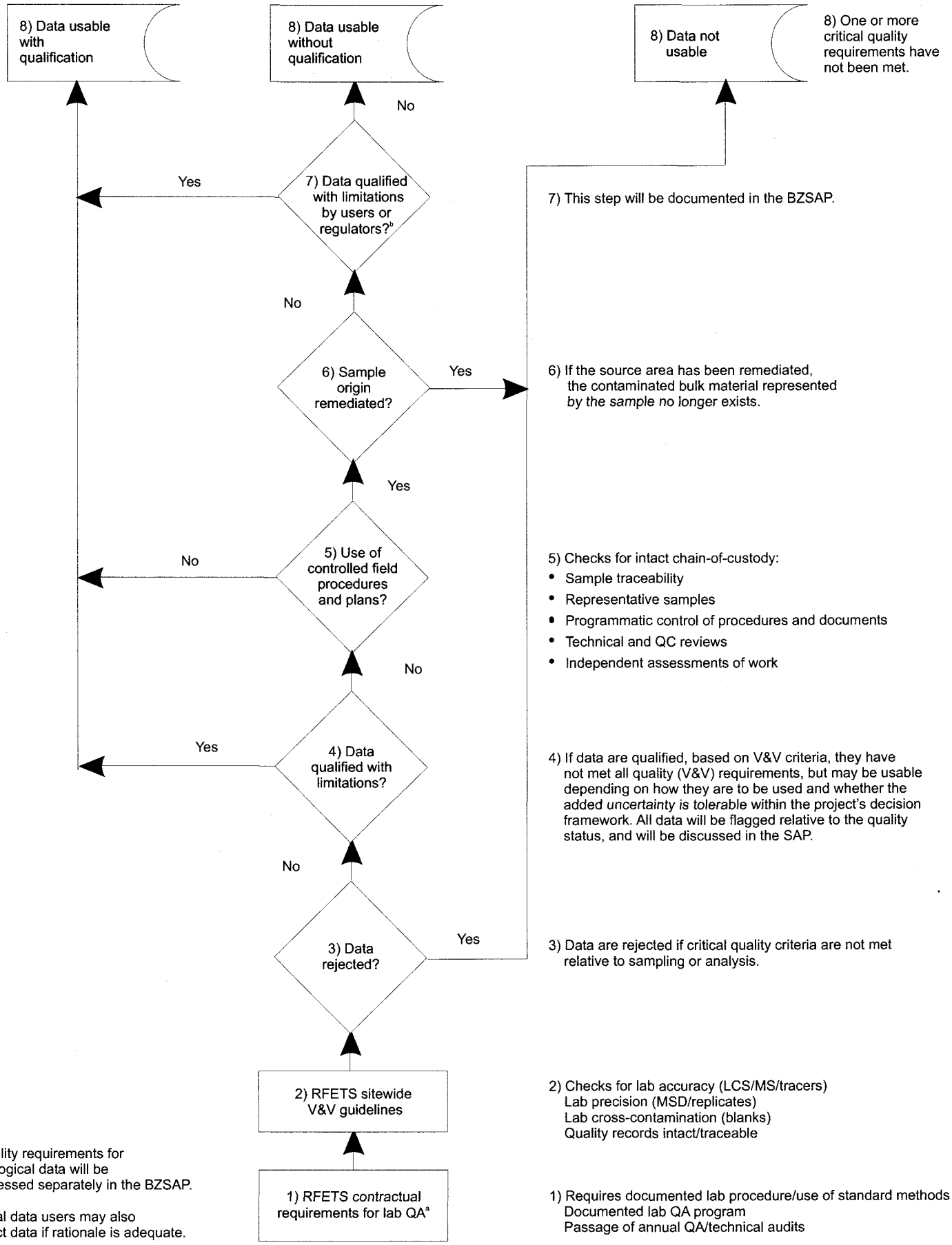
Field Name	Description	Definition
LOCATION_C	Location Code	The four- to eight-digit unique code assigned to the specific x and y coordinates at this sample location
SMPL_TYPE	Sample Type	Sample media options: surface soil (SS), borehole (BH), or groundwater (GW)
CUST_SAMP_NUM	Customer Sample Number	Text field used by the sample team that identifies the sample
COLLECTION_DATE	Collection Date	Date the sample was collected in the field
TEST_METHOD_NAME	Test Method Name	Specific laboratory test methods used to analyze the sample
RESULT_SEQUENCE_ID	Result Sequence Identifier	Unique record-level identifier for this piece of analytical data
DATA_PACKAGE_ID	Data Package Identifier	Unique identifier relating the sample to its analytical data package
DATA_SOURCE	Data Source	Source of data upload
CAS_NO	CAS Number	Code that identifies the analyte tested
RESULT_TYPE_CODE	Result Type	Coded value identifying the type of sample. (target, matrix spike, etc.)
UNIT_CODE	Unit Code	Units used at the laboratory
RESULT	Numerical Analytical Result	Numeric result of laboratory's analytical run
LAB_CODE	Laboratory Code	Coded value identifying the analytical laboratory
LAB_ANALYSIS_DATE	Laboratory Analysis Date	Date analytical laboratory performed the analysis
LAB_SAMPLE_NO	Laboratory Sample Number	Laboratory's unique sample identifier, assigned by the laboratory
LAB_BATCH_ID	Laboratory Batch ID	Laboratory's unique numerical identifier relating a group of samples to a given laboratory batch
REVISION_DTTM	Revision Date/Time	Date/time field identifying when a sample result was modified
REVISION_USER_ID	Revision User	User's name who revised the data
EDD_FILE_NAME	EDD File Name	Electronic data deliverable file name
EDD_FILE_CREATION_DATE	EDD Creation Date	Electronic data deliverable creation date
LAB_SAMPLE_RECEIPT_DATE	Laboratory Sample Receipt Date	Date contract laboratory received the sample
LAB_RESULT_QUALIFIER_CODES	Laboratory Result Qualifier Codes	Coded value indicating a laboratory qualifier or flag
DETECTION_LIMIT_TYPE_CODE	Detection Limit Type Code	Coded value indicating which detection limit was used (method detection limit, instrument detection, etc.)
DETECTION_LIMIT	Detection Limit	Numeric value representing the detection limit per analytical run
SS_DILUTION_FACTOR	Serial Dilution Factor	Numeric factor when a given analytical run was diluted
SS_LAB_EXTRACTION_DATE	Laboratory Extraction Date	Date the sample was extracted for an analytical run
RC_SAMPLE_VOLUME	Sample Volume	Volumetric amount of sample for analysis
RC_SAMPLE_VOLUME_UNIT_CODE	Sample Volume Unit Code	Coded value representing the volumetric units
RC_SIGMA_ERROR	Sigma Error	Amount of sigma error for a given radiological sample

Field Name	Description	Definition
RC_LCS_FRACTIONAL_SMPL_RECOVER	LCS Fractional Sample Recovery	Laboratory control sample's fractional recovery
RC_DUPLICATE_EQUIVALENCY	Duplicate Equivalency	Measure of precision using duplicate samples
RC_LCS_YIELD_FRACTION	LCS Yield Fraction	Laboratory control sample's yield fraction
VALIDATION_QUALIFIER_CODE	Validation Qualifier Code	Coded value representing the validation qualifier or flag
VALIDATION_REASON_CODES	Validation Reason Codes	Numeric value describing the reason for the validation qualifier
VALIDATION_DATE	Validation Date	Date validation was performed on the laboratory batch
SECOND_RESULT_TYPE_CODE	Second Result Type Code	Code to designate tentatively identified compounds (TICs) or surrogates (SURs)
NO_LONGER_REP_IND	No Longer Representative Indicator	Boolean value indicating whether the sample's origin has been remediated
ERROR_IND	Error Indicator	Boolean value indicating whether error was present during sample analysis
JOURNAL_COMMENT	Journal Comment	Comment relating to the status of a certain sample
TOTAL_PROPAGATED_ERROR	Total Propagated Error	Total propagated error at 2 sigma
DENSITY_FACTOR	Density Factor	Density factor/geotechnical measurement
TIME_ANALYZED	Time Analyzed	Time a sample was analyzed
SRT_RECORD_NUM	SRT Record Number	Unique numeric identifier associated with a specific record in SWD's Stage Result Table
ANALYTE_NAME	Analyte Name	Name of the analyte
BZ_FILTER_CODE	BZ Filter Code	Boolean value indicating whether the sample was compared against the BZ filter
HRR_ZONE	HRR Zone	HRR Zone
BZ_GROUP	BZ Group	BZ Group
IHSS_NUM	IHSS Number	Individual hazardous substance site identifier
PAC_NUM	PAC Number	Potential area of concern identifier
UBC_NUM	UBC Site Number	Under-building contamination site identifier
WHITE_SPAC	White Space	White space
ASWD_RATING	ASWD Rating	Coded value identifying the quality filter rating
DUPLICATE	Duplicate Record	Duplication of a record based on location code, customer sample number, collection date, and analyte
NORTHING	Mapping Coordinate	UTM State Plane Coordinate (Y coordinate), in feet
EASTING	Mapping Coordinate	UTM State Plane Coordinate (X coordinate), in feet
ELEVATION	Mapping Coordinate	Elevation above sea level, in feet

ASWD – Approved SWD Data
CAS – Chemical Abstract Service
EDD – Electronic Data Deliverable
HRR – Historical Release Report
BZ – Buffer Zone
IHSS – Individual Hazardous Substance Site
LCS – Laboratory Control Sample
PAC – Potential Area of Concern
SRT - Stage Result Table
UBC – Under Building Contamination

9

Figure 1
Data Quality Filter for the Buffer Zone Sampling and Analysis Plan and Comprehensive Risk Assessment



[a] Quality requirements for ecological data will be addressed separately in the BZSAP.

[b] Final data users may also reject data if rationale is adequate.

Figure 2
Buffer Zone Data Quality Filter - Subsurface Soil

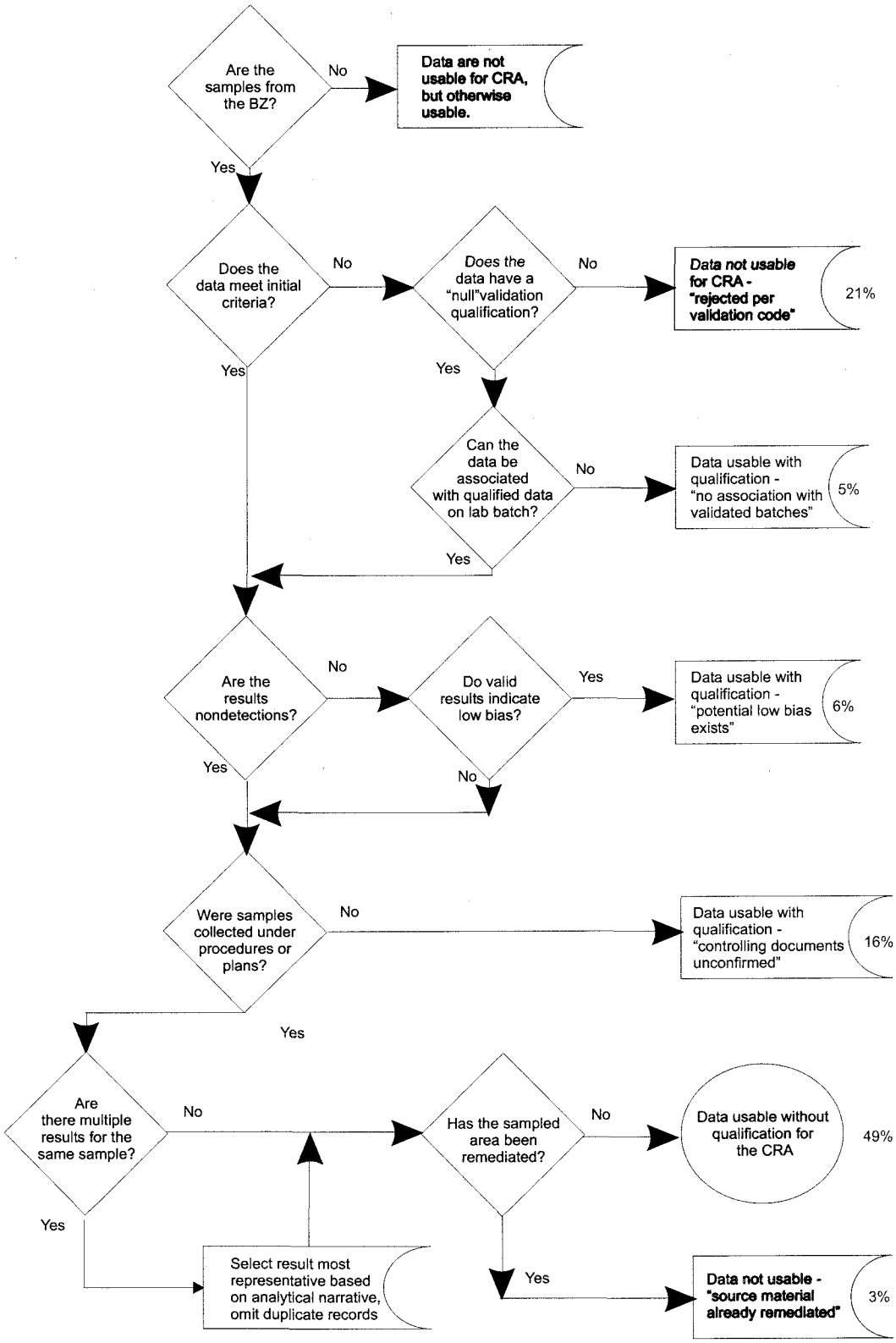
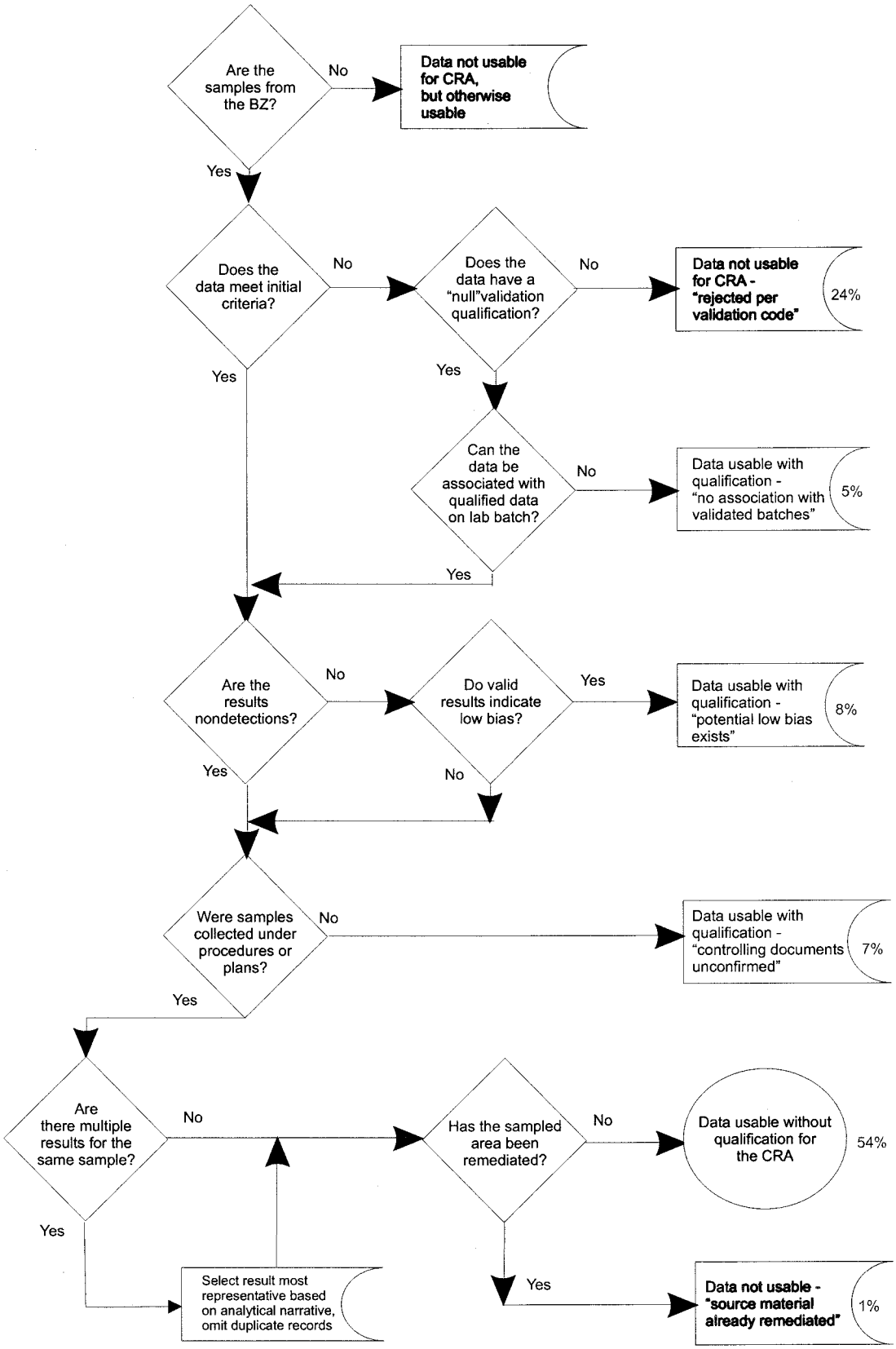


Figure 3
Buffer Zone Data Quality Filter - Surface Soil



Association with Validated Laboratory Batches

Data that have no formal laboratory validation qualifiers are examined to determine whether they can be associated with laboratory batches containing other valid data. If data can be associated with valid laboratory batches, they pass through the filter and a qualification is assigned.

Nondetected Results Where Negative Bias May Be Present

A nondetect value may be the result of an absence of a specific compound, or it may be the result of sample dilution. Nondetections due to dilutions are qualified because low biased results may potentially increase the false negative rate (i.e., incorrectly deeming a sample clean with respect to RFCA Action Levels [ALs]. Some validation qualifiers indicate a bias may be present in the results; however, they are not explicit as to whether the bias is positive or negative. As a result, the potential for negative bias in nondetections is identified in the qualifier and therefore, requires further evaluation.

Approved/Controlled Documents Used for Field Sampling

Valid (usable) data require the use of quality controls in sample collection. A basic element of valid data is the use of approved and controlled procedures. This filter consists of a date query, whereby samples corresponding to use of approved and controlled procedures in the field were considered to be within an established quality program. The date June 28, 1991, was chosen because it corresponds to the implementation of RCRA and the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) environmental investigation requirements at RFETS. This implementation included a requirement for regulatory agency review and approval of work plans and procedures.

Multiple-Result Records

A filter was created to eliminate duplicate records and select the most representative concentration or activity value when multiple analyses were performed on the same sample. This filter serves multiple purposes:

1. To qualify (flag) QC results so that results are not used in data aggregation or statistical applications of the real (sample) results;

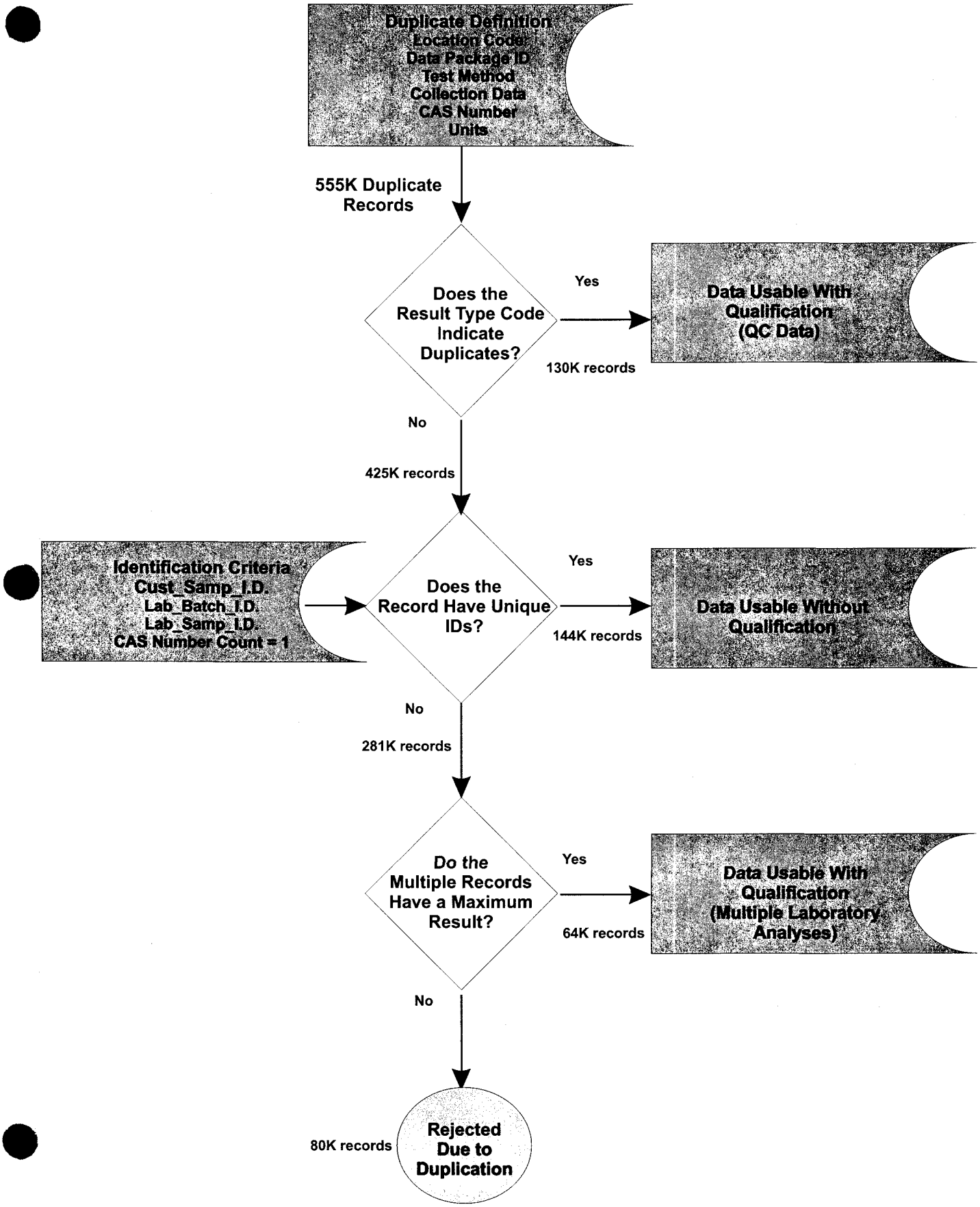
2. To eliminate replicate entries (results) of the same information (analyte) per sample, within the database; and,

3. To qualify multiple concentration (or activity) values of the same sample when the laboratory performed multiple analyses (e.g., results associated with dilutions).

The data user must evaluate the samples with multiple values to determine the most appropriate result. The filter described above consisted of multiple queries performed sequentially. These queries are presented in Figure 4. Some sample results show multiple results for one sample, because of dilutions, QC issues, or other reasons. For each of these occurrences, the most representative value must be selected for the sample. The filter flags the samples that have multiple results; it cannot automatically select the "best" value. Consequently, after the samples are flagged, data users (Subject Matter Experts [SMEs]) review the sample results and select the most representative result based on the analytical history. The final value used to represent the sample will be flagged accordingly; the values not used will be rejected from further use (by flagging accordingly).

13

Figure 4
Multiple Record Screen



Analytical Data

The electronic data submittal consists of 736,502 records, with the parameter fields and database relationships illustrated in an entity relationship diagram (ERD) on Figure 5. The ERD illustrates the RFETS SWD data sets used to produce the BZ Data Summary Report data set. Data are organized by IHSS, PAC, and UBC Site on the CD enclosed in Attachment 1.

Data fields are described on Table 1. A compilation of the number of records by IHSS and test method is shown on Table 2. Table 3 provides a crosswalk between test method names, as shown in the database, along with the test methods shown on the GIS maps. Table 4 provides a summary of samples that exceed background levels (mean concentration/activity + 2 standard deviations) and RFCA ALs.

3.0 GEOGRAPHIC INFORMATION SYSTEM MAPS

The GIS maps (Plates 2 through 20) included in this report consist of all known sample data within the BZ boundary, as of July 18, 2000, that have been qualified as usable or usable with qualification.

15

Figure 5
Entity Relationship Diagram

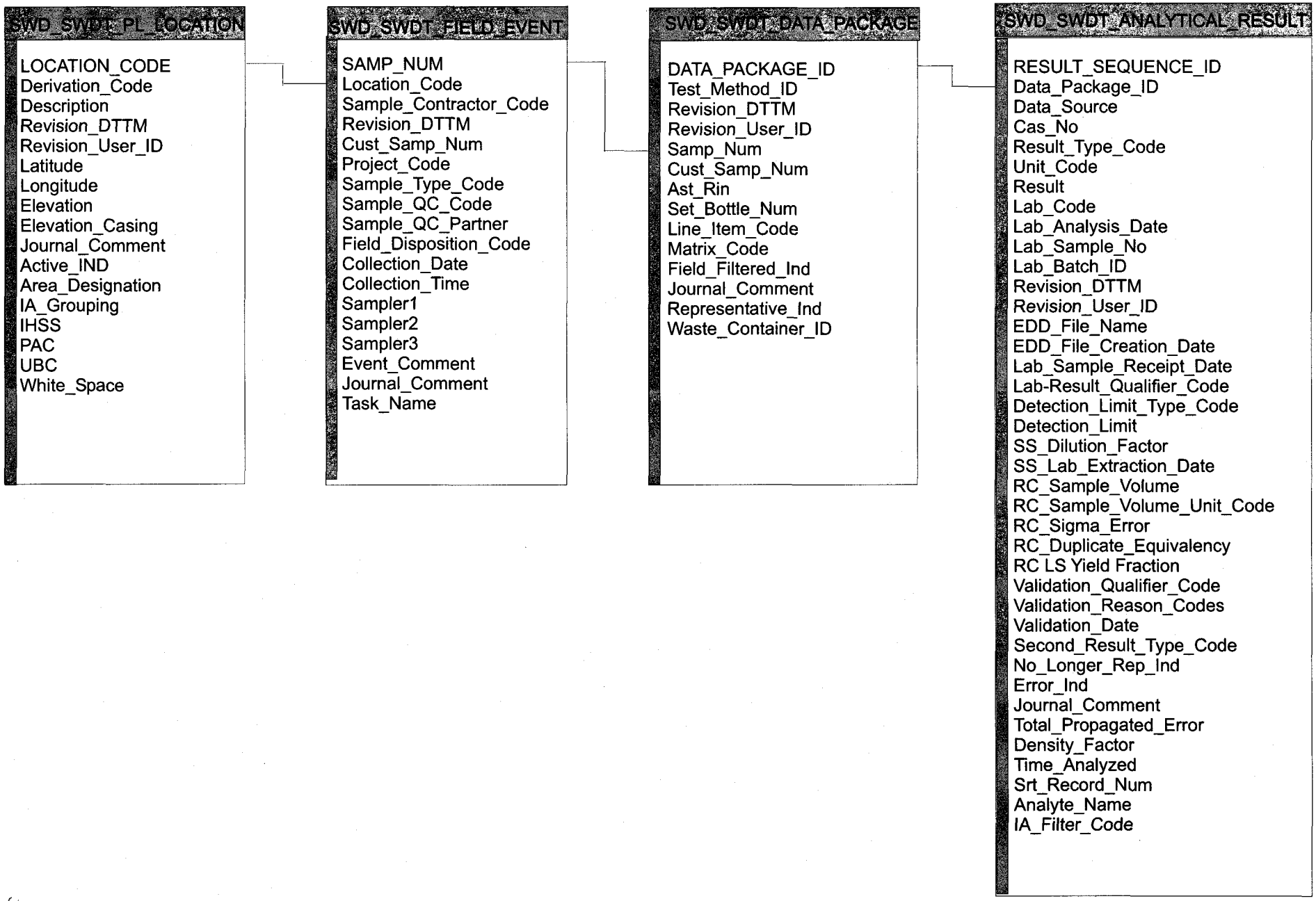


Table 2 — Number of Records by IHSS and Analytical Suite

IHSS Number	Geotech	Herbicides	Metals	Misc	Nitrates	PCBs	Pesticides	Pesticides/ PCBs	Rads	SVOCs	TPH	VOCs	VOCs (water)	Water Quality Paramters
102			305				289		67	720		528		28
103			108				112			284		185		9
104			110				108		55	325		176		8
107			294				82		90	66		274		
108			29				28		7	71				
109			162						40	502	12			
110			1,120				333		330	2,622	6	1,413		97
111.1							1			9		120		9
111.2			560				456		220	1,475		878	4	50
111.3			165				57		38	338		188		13
111.4			863				375		322	1,991		1,027		98
111.5			96				104		27	260		140		
111.6			342				169		131	905		360		39
111.7			274				96		70	837		6		
111.8			510				43		181	1,120		654		82
112		15	1,684				1,154		1,849	2,818		6,716	4	357
113			611				412		174	910		985		19
190			382				286		83	589		1,847		44
114	81	61	14,296				1,869		4,371	11,385		7,552		2,241
119.1		68	2,820				1,548		1,014	4,512		3,371	261	311
119.2			1,062				600		354	1,696		1,144		93
130			1,720				764		575	2,035		2,641		116
133.1			308						87					
133.2			1,166						267					
133.3			280						89					
133.4			359						105					
133.5			246						56					1
133.6			28				28		7	71				
140		1	872				433		307	1,647		1,833		55
141			1,270				1,282		305					46
142.1		2	212			54	197		164	503		262		32

17

IHSS Number	Geotech	Herbicides	Metals	Misc	Nitrates	PCBs	Pesticides	Pesticides/ PCBs	Rads	SVOCs	TPH	VOCs	VOCs (water)	Water Quality Paramters
142.10			56				56		28	142		74		4
142.11		6	261				125		21	255		156		64
142.12			218				169		66	432		352		16
142.2		2	138			54	119		167	302		157		29
142.3		3	227			36	117		58	308		165		35
142.4		30	822			59	243		44	414		186		116
142.5			274			74	303		234	940		290		32
142.6			140			72	142		191	296		151		20
142.7		5	220			36	174		74	527		172		149
142.8			252			63	253		99	644		188		31
142.9		8	722			63	260		88	628		426		75
143			84				85		21	337		262		6
155		2	1,719				909		19,287	2,374		3,930	14	310
156.2			2,938						767			4,422		28
166.1		1	442				13		174	44		1,777		10
166.2			392						111			1,637		
166.3			442						124			1,637		
167.1			1,668						421					60
167.2			266						109					26
167.3			177						85					22
168			7,946				3		1,641	11,346		8,319		1,045
170	8		1,342	2			1,126			3,546		146	25	70
174a	12		766	3			655			2,454		563		39
174b	8		79	2			58			292		292		11
190			597				444		159	887		249		36
197			190						53					
203		9	692				312		290	348				96
209			287				84		50	214		306		6
213									62					
216.1			710						178			463		26
216.2			281				45		7	117		1,004	6	104
216.3			1,649				721		577	1,462		3,096	16	319
White Space	419	186	116,594	120		801	33,036	1,748	34,133	117,450	115	138,329	3,107	14,013

18

IHSS – Individual Hazardous Substance Site
VOC – Volatile Organic Compound
SVOC – Semivolatile Organic Compound
Rads – Radionuclides
PCB – Polychlorinated Biphenyl
TPH – Total Petroleum Hydrocarbons
Misc– Miscellaneous tests run on samples including microbacterial analysis, pH, etc.
NA – White Space

19

Table 3 — Test Method Names

Database Test Method Name	Map Test Method Name	Map Subscript Number
ALPHA SPEC	Rads	3
ASTMD422	Geotech	13
ASTMD854	Geotech	13
BNA625	SVOCs	2
BNACLP	SVOCs	2
BNCLP	SVOCs	2
CLP-SOW-DISSOLVED	Metals	4
DMETADD	Metals	4
DRADS	Rads	3
DSMETCLP	Metals	4
DWQPL	Water Quality Parameters	5
EPA 353.1	Nitrates	12
EPA 524.2	VOCs (water)	8
HERB8150	Herbicides	11
METADD	Metals	4
METCLP	Metals	4
PCB8080C	PCBs	9
PESTCLP	Pesticides	6
PSTPCB508	Pesticides/PCBs	7
SMETCLP	Metals	4
TPH8015A	Total Petroleum Hydrocarbons	10
TRADS	Rads	3
VOA524.2	VOCs	1
VOACLP	VOCs	1
VOASWEEP	VOCs	1
WQPL	Water Quality Parameters	5
EPA 300.0	Water Quality Parameters	5
EPA 415.1	Water Quality Parameters	5
SW-846 8080A/8081	Pesticides/PCBs	1
SW-846 8260	VOCs	1
SW-846 8270B	SVOCs	2
SW-846 9040B	Water Quality Parameters	5
SW-846-TOTAL	Metals	4
SW846 8330	VOCs	1
NA	Data Not Available	DNA

DNA – Data Not Available
NA – Not Available
PCB – Polychlorinated Biphenyl
Rads – Radionuclides
SVOC – Semivolatile Organic Compound
VOC – VOLATILE ORGANIC COMPOUND

20

Table 4 – Summary of Buffer Zone Samples Greater than Background and RFCA ALs

Medium	Analyte	Units	Mean	Minimum	Maximum	Mean + 2 SD	No. > BKGD	Tier I	Tier II	No. > Tier I	No. > Tier II	IHSS/PACs > Tier II
Metals												
Surface Soil	Aluminum	mg/kg	17900.00	17300.00	18700.00	16902.00	3	1000000	1000000			
Surface Soil	Barium	mg/kg	152.00	152.00	152.00	141.26	1	133000				
Surface Soil	Beryllium	mg/kg	1.00	1.00	2.00	0.97	320	104	1.04		1	White Space
Surface Soil	Cadmium	mg/kg	2.13	2.00	3.00	1.61	8	1920	1920			
Surface Soil	CALCIUM	mg/kg	13676.00	4520.00	96900.00	4467.00	29	NA	NA			
Surface Soil	Cobalt	mg/kg	12.36	11.00	25.00	10.91	58	115000	115000			
Surface Soil	Copper	mg/kg	28.56	20.00	68.00	18.06	9	71100	71100			
Surface Soil	Iron	mg/kg	18700.00	18700.00	18700.00	18037.00	1	576000	576000			
Surface Soil	Lead	mg/kg	120.20	58.00	234.00	54.62	5	1000	1000			
Surface Soil	Lithium	mg/kg	15.34	12.00	42.00	11.55	117	38400	38400			
Surface Soil	MAGNESIUM	mg/kg	3782.50	2900.00	4580.00	2849.30	8	NA	NA			
Surface Soil	Manganese	mg/kg	480.94	368.00	911.00	365.08	18	83600	83600			
Surface Soil	Mercury	mg/kg	1.25	1.00	2.00	0.13	8	576	576			
Surface Soil	Nickel	mg/kg	18.20	15.00	24.00	14.91	10	38400	38400			
Surface Soil	POTASSIUM	mg/kg	3520.00	3030.00	5160.00	2967.20	9	NA	NA			
Surface Soil	Selenium	mg/kg	2.91	2.00	9.00	1.22	11	9610	9610			
Surface Soil	SODIUM	mg/kg	273.14	92.00	2090.00	91.84	476	NA	NA			
Surface Soil	Strontium	mg/kg	102.40	49.00	421.00	48.94	89	1000000	1000000			
Surface Soil	Vanadium	mg/kg	56.67	46.00	73.00	45.59	3	13400	13400			
Surface Soil	Zinc	mg/kg	193.93	74.00	1050.00	73.76	30	576000	576000			
Radionuclides												
Surface Soil	Americium-241	pCi/g	20.26	5.00	149.00	0.02	1112	215	38		122	155, White Space
Surface Soil	CESIUM-137	pCi/g	2.00	2.00	2.00	1.69	1	NA	NA			
Surface Soil	Plutonium-239/24	pCi/g	104.57	1.00	938.00	0.07	1114	1429	252		82	155
Surface Soil	RADIUM-226	pCi/g	11.87	1.00	117.00	0.93	45					
Surface Soil	RADIUM-228	pCi/g	3.00	3.00	3.00	2.31	6	NA	NA			
Surface Soil	STRONTIUM-89,-90	pCi/g	1.02	1.00	2.00	0.51	53	NA	NA			
Surface Soil	Uranium-234	pCi/g	3.43	3.00	5.00	2.25	7	1738	307			
Surface Soil	Uranium-238	pCi/g	3.53	3.00	5.00	2.00	15	586	103			
PCBs												
Surface Soil	Aroclor-1248	mg/kg	447.87	88.00	1500.00	NA	15	224000	2240			
Surface Soil	Aroclor-1254	mg/kg	1053.27	10.00	11000.00	NA	132	224000	2240		15	142.5,142.6,142.7,170,174a, White Space
Surface Soil	Aroclor-1260	mg/kg	868.82	11.00	21000.00	NA	39	224000	2240		2	White Space
Pesticides												
Surface Soil	4,4-DDT	mg/kg	21.83	5.00	50.00	NA	6	1320000	13200			
Surface Soil	Aldrin	mg/kg	28.00	2.00	54.00	NA	2	26400	264			
Surface Soil	beta-BHC	mg/kg	13.50	11.00	20.00	NA	4	249000	2490			
Surface Soil	Dieldrin	mg/kg	40.50	4.00	92.00	NA	4	28000	280			
Surface Soil	Endosulfan I	mg/kg	5.00	3.00	7.00	NA	2	1000000000	11500000			
Surface Soil	Endosulfan II	mg/kg	10.00	5.00	18.00	NA	3	1000000000	11500000			
Surface Soil	gamma-BHC	mg/kg	6.67	2.00	25.00	NA	9	345000	3450			
Surface Soil	Heptachlor	mg/kg	12.00	2.00	39.00	NA	4	99600	996			
Surface Soil	Heptachlor epoxide	mg/kg	23.00	23.00	23.00	NA	1	49300	493			

Medium	Analyte	Units	Mean	Minimum	Maximum	Mean + 2 SD	No. > BKGD	Tier I	Tier II	No. > Tier I	No. > Tier II	IHSS/PACs > Tier II
SVOCs												
Surface Soil	1,2,4 -Trichlorobenzene	mg/kg	130.00	130.00	130.00	NA	1	19200000	19200000			
Surface Soil	4-Methylphenol	mg/kg	893.50	68.00	2300.00	NA	14	9610000	9610000			
Surface Soil	Acenaphtene	mg/kg	414.56	38.00	3200.00	NA	114	115000000	115000000			
Surface Soil	Anthracene	mg/kg	448.71	37.00	4000.00	NA	139	115000000	115000000			
Surface Soil	Benzo(a)anthracene	mg/kg	649.26	29.00	9200.00	NA	239	614000	6140		3	White Space
Surface Soil	Benzo(a)pyrene	mg/kg	661.17	38.00	9800.00	NA	222	61400	614		54	114,142.5, White Space
Surface Soil	Benzo(b)flouranthene	mg/kg	979.60	30.00	17000.00	NA	239	614000	6140		5	White Space
Surface Soil	Benzo(k)flouranthene	mg/kg	423.09	23.00	4700.00	NA	183	6140000	61400			
Surface Soil	Benzoic Acid	mg/kg	270.58	41.00	3300.00	NA	151	1000000000	1000000000			
Surface Soil	Benzyl Alcohol	mg/kg	155.50	41.00	270.00	NA	2	576000000	576000000			
Surface Soil	bis(2-Ethylhexyl)phthalate	mg/kg	1891.61	35.00	88000.00	NA	328	32000000	320000			
Surface Soil	Butylbenzylphthalate	mg/kg	231.60	36.00	2000.00	NA	55	384000000	384000000			
Surface Soil	Chrysene	mg/kg	646.73	41.00	11000.00	NA	277	61400000	614000			
Surface Soil	Di-n-butylphthalate	mg/kg	110.36	28.00	1000.00	NA	81	192000000	192000000			
Surface Soil	Di-n-octylphthalate	mg/kg	206.13	38.00	2000.00	NA	32	1000000000	49400000			
Surface Soil	Dibenzo(a,h)anthracene	mg/kg	256.09	38.00	1100.00	NA	54	61400	614		4	White Space
Surface Soil	Diethylphthalate	mg/kg	200.33	48.00	460.00	NA	3	1000000000	1000000000			
Surface Soil	Flouranthene	mg/kg	1132.32	31.00	29000.00	NA	349	76800000	76800000			
Surface Soil	Fluorene	mg/kg	372.47	37.00	2800.00	NA	102	76800000	76800000			
Surface Soil	Hexachlorobenzene	mg/kg	440.00	440.00	440.00	NA	1	280000	2800			
Surface Soil	Indeno(1,2,3-cd)pyrene	mg/kg	476.61	32.00	4300.00	NA	137	614000	6140			
Surface Soil	Isophorone	mg/kg	96.00	96.00	96.00	NA	1	1000000000	4720000			
Surface Soil	n-Nitrosodiphenylamine	mg/kg	990.00	990.00	990.00	NA	1	365000000	915000			
Surface Soil	Naphthalene	mg/kg	264.80	41.00	1100.00	NA	70	76800000	76800000			
Surface Soil	Pentachlorophenol	mg/kg	194.50	39.00	350.00	NA	2	14900000	37400			
Surface Soil	Phenol	mg/kg	282.50	110.00	660.00	NA	8	1000000000	1000000000			
Surface Soil	Pyrene	mg/kg	1114.21	31.00	26000.00	NA	353	57600	57600			
VOCs												
Surface Soil	1,1,1-Trichloroethane	mg/kg	5496.91	1.00	60000.00	NA	11	38400000	38400000			
Surface Soil	1,1,2,2-Tetrachloroethane	mg/kg	54.00	2.00	210.00	NA	4	2240000	22400			
Surface Soil	1,1,2-Trichloroethane	mg/kg	3.00	1.00	6.00	NA	3	31400000	78600			
Surface Soil	1,1-Dichloroethane	mg/kg	9.43	4.00	19.00	NA	7	192000000	192000000			
Surface Soil	1,1-Dichloroethene	mg/kg	48.50	47.00	50.00	NA	4	747000	7470			
Surface Soil	1,2-Dichloropropane	mg/kg	2.00	1.00	3.00	NA	2	6590000	65900			
Surface Soil	2-Butanone [Methylethyl Ketone]	mg/kg	124.39	2.00	4600.00	NA	66	1000000000	1000000000			
Surface Soil	4-Methyl-2-pentanone	mg/kg	4338.00	3.00	18000.00	NA	6	154000000	154000000			
Surface Soil	Acetone	mg/kg	361.20	2.00	11000.00	NA	90	192000000	192000000			
Surface Soil	Benzene	mg/kg	23.20	3.00	50.00	NA	5	15500000	155000			
Surface Soil	Bromomethane	mg/kg	1.00	1.00	1.00	NA	1	2690000	2690000			
Surface Soil	Carbon Disulfide	mg/kg	2.50	1.00	6.00	NA	4	192000000	192000000			
Surface Soil	Carbon Tetrachloride	mg/kg	415.00	390.00	440.00	NA	2	3450000	34500			
Surface Soil	Chlorobenzene	mg/kg	49.00	48.00	50.00	NA	2	38400000	384000			
Surface Soil	Chloroform	mg/kg	21.25	2.00	60.00	NA	4	73500000	735000			
Surface Soil	Chloromethane [Methyl Chloride]	mg/kg	45.33	18.00	99.00	NA	3	34500000	345000			
Surface Soil	Cis-1,2,-Dichloroethene	mg/kg	48.50	47.00	50.00	NA	4	747000	7470			

Medium	Analyte	Units	Mean	Minimum	Maximum	Mean + 2 SD	No. > BKGD	Tier I	Tier II	No. > Tier I	No. > Tier II	IHSS/PACs > Tier II
Surface Soil	Ethylbenzene	mg/kg	7017.50	1.00	27000.00	NA	6	192000000	192000000			
Surface Soil	Methoxychlor	mg/kg	41.00	41.00	41.00	NA	1	9610000	9610000			
Surface Soil	Methylene Chloride	mg/kg	62.43	1.00	890.00	NA	51	239000000	598000			
Surface Soil	Styrene	mg/kg	2.00	2.00	2.00	NA	1	384000000	384000000			
Surface Soil	Tetrachloroethene	mg/kg	11449.24	1.00	220000.00	NA	29	8620000	86200		2	White Space
Surface Soil	Toluene	mg/kg	706.75	1.00	53000.00	NA	136	384000000	384000000			
Surface Soil	Trichloroethene	mg/kg	293.25	2.00	4000.00	NA	20	520,000	407000			
Surface Soil	Vinyl chloride	mg/kg	24.00	24.00	24.00	NA	1	236000	2360			
Surface Soil	Xylene (total)	mg/kg	43820.88	2.00	220000.00	NA	8	1000000000	10000000			
Metals												
Subsurface Soil	Antimony	mg/kg	1549.82	17.00	6800.00	16.97	17	768	768	4	4	113, 140
Subsurface Soil	Arsenic	mg/kg	2452.86	14.00	10000.00	13.14	7	299	2.99	2	7	113,130, 140, White Space
Subsurface Soil	Barium	mg/kg	704.00	319.00	1610.00	289.38	4	133000	133000			
Subsurface Soil	Cadmium	mg/kg	4.00	2.00	11.00	1.70	5	1920	1920			
Subsurface Soil	CALCIUM	mg/kg	72225.00	47500.00	116000.00	39382.27	8	NA	NA			
Subsurface Soil	Cobalt	mg/kg	399.50	98.00	701.00	29.04	2	115000	115000			
Subsurface Soil	Iron	mg/kg	97400.00	97400.00	97400.00	41046.52	1	576000	576000			
Subsurface Soil	Lead	mg/kg	50.67	25.00	145.00	24.97	6	1000	1000			
Subsurface Soil	MAGNESIUM	mg/kg	9480.00	9480.00	9480.00	9315.44	1	NA	NA			
Subsurface Soil	Manganese	mg/kg	2130.00	1070.00	3460.00	901.62	6	83600	83600			
Subsurface Soil	Mercury	mg/kg	6.00	6.00	6.00	1.52	1	576	576			
Subsurface Soil	Molybdenum	mg/kg	28.33	27.00	30.00	25.61	3	9610	9610			
Subsurface Soil	Nickel	mg/kg	255.00	255.00	255.00	62.21	1	38400	38400			
Subsurface Soil	Selenium	mg/kg	202.60	6.00	360.00	4.80	5	9610	9610			
Subsurface Soil	Silver	mg/kg	310.00	51.00	490.00	24.54	4	9610	9610			
Subsurface Soil	SODIUM	mg/kg	142170.00	2580.00	700000.00	1251.24	5	NA	NA			
Subsurface Soil	Strontium	mg/kg	223.38	212.00	234.00	211.38	29	1000000	1000000			
Subsurface Soil	THALLIUM	mg/kg	2.48	2.00	7.00	1.84	21	NA	NA			
Subsurface Soil	Zinc	mg/kg	519.00	519.00	519.00	139.10	1	576000	576000			
PCBs												
Subsurface Soil	Aroclor-1242	mg/kg	473.33	0.00	1300.00	NA	3	531000	5310			
Subsurface Soil	Aroclor-1248	mg/kg	7200.00	7200.00	7200.00	NA	1	531000	5310		1	119.2
Subsurface Soil	Aroclor-1254	mg/kg	1515.31	11.00	8900.00	NA	35	531000	5310		3	110,112, White Area
Subsurface Soil	Aroclor-1260	mg/kg	327.11	84.00	730.00	NA	9	531000	5310			
Pesticides												
Subsurface Soil	cis-1,3,-Dichloropropene	mg/kg	52.00	51.00	53.00	NA	4	120	1.2			
Subsurface Soil	Heptachlor	mg/kg	4.67	2.00	8.00	NA	3	1940000	19400			
SVOCs												
Subsurface Soil	1,2,4 -Trichlorobenzene	mg/kg	24.60	1.00	60.00	NA	5	433000	4330			
Subsurface Soil	1,2-Dichlorobenzene	mg/kg	1.00	1.00	1.00	NA	3	1320000	13200			
Subsurface Soil	1,4-Dichlorobenzene	mg/kg	24.00	1.00	78.00	NA	6	165000	1650			
Subsurface Soil	2,4-Dichlorophenol	mg/kg	440.00	440.00	440.00	NA	1	63500	635			
Subsurface Soil	2,4-Dimethylphenol	mg/kg	5929.67	89.00	12000.00	NA	3	577000	5770		1	109
Subsurface Soil	2-Chlorophenol	mg/kg	46.00	46.00	46.00	NA	1	257000	2570			
Subsurface Soil	2-Methylphenol	mg/kg	10576.00	96.00	33000.00	NA	6	706000	7060		2	109
Subsurface Soil	4-Methylphenol	mg/kg	2999.89	61.00	19000.00	NA	18	9610000	9610000			
Subsurface Soil	Acenaphtene	mg/kg	222.42	42.00	2000.00	NA	26	53400000	534000			
Subsurface Soil	Anthracene	mg/kg	334.80	44.00	4600.00	NA	35	1000000000	11200000			

Medium	Analyte	Units	Mean	Minimum	Maximum	Mean + 2 SD	No. > BKGD	Tier I	Tier II	No. > Tier I	No. > Tier II	IHSS/PACs > Tier II
Subsurface Soil	Benzo(a)anthracene	mg/kg	480.11	36.00	6800.00	NA	47	160000	1600		3	104,111.7
Subsurface Soil	Benzo(a)pyrene	mg/kg	903.27	41.00	11000.00	NA	44	701000	7010		1	111.7
Subsurface Soil	Benzo(b)flouranthene	mg/kg	473.49	34.00	4800.00	NA	43	495000	4950			
Subsurface Soil	Benzo(k)flouranthene	mg/kg	357.69	35.00	5200.00	NA	26	4950000	49500			
Subsurface Soil	Benzoic Acid	mg/kg	465.43	43.00	3400.00	NA	53	10900000	109000			
Subsurface Soil	bis(2-Ethylhexyl)phthalate	mg/kg	891.10	9.00	71000.00	NA	489	311000000	3110000			
Subsurface Soil	Butylbenzylphthalate	mg/kg	396.95	35.00	4900.00	NA	65	1000000000	14400000			
Subsurface Soil	Chrysene	mg/kg	545.95	40.00	6100.00	NA	55	16000000	160000			
Subsurface Soil	Di-n-butylphthalate	mg/kg	188.98	22.00	4600.00	NA	271	426000000	4260000			
Subsurface Soil	Di-n-octylphthalate	mg/kg	160.36	44.00	580.00	NA	11	1000000000	1000000000			
Subsurface Soil	Dibenzo(a,h)anthracene	mg/kg	407.40	47.00	1700.00	NA	5	153000	1530		1	
Subsurface Soil	Diethylphthalate	mg/kg	423.64	36.00	3100.00	NA	22	31000000	310000			
Subsurface Soil	Dimethylphthalate	mg/kg	755.33	26.00	2100.00	NA	3	1000000000	1000000000			
Subsurface Soil	Flouranthene	mg/kg	602.30	37.00	14000.00	NA	76	537000000	5370000			
Subsurface Soil	Fluorene	mg/kg	406.82	40.00	3200.00	NA	22	69400000	694000			
Subsurface Soil	Hexachlorobenzene	mg/kg	730.00	160.00	1300.00	NA	2	189000	1890			
Subsurface Soil	Hexachlorobutadiene	mg/kg	86.00	2.00	170.00	NA	2	201000	2010			
Subsurface Soil	Hexachloroethane	mg/kg	735.00	370.00	1100.00	NA	2	37700	377		1	
Subsurface Soil	Indeno(1,2,3-cd)pyrene	mg/kg	413.40	37.00	3800.00	NA	20	1400000	14000			
Subsurface Soil	n-Nitrosodiphenylamine	mg/kg	131.39	33.00	2400.00	NA	66	78400	784		2	111.2, 111.7
Subsurface Soil	Naphthalene	mg/kg	1043.18	1.00	8600.00	NA	38	10100000	101000			
Subsurface Soil	Pentachlorophenol	mg/kg	68.00	41.00	95.00	NA	2	2110	21.1		2	White Space
Subsurface Soil	Phenol	mg/kg	983.90	110.00	7100.00	NA	59	3750000	37500			
Subsurface Soil	Pyrene	mg/kg	899.41	39.00	13000.00	NA	80	397000000	3970000			
VOCs												
Subsurface Soil	1,1,1-Trichloroethane	mg/kg	12672.37	1.00	430000.00	NA	52	94800	948	2	4	109, White Area
Subsurface Soil	1,1,2,2-Tetrachloroethane	mg/kg	29.38	5.00	54.00	NA	8	168	1.68		8	110,111.4, White Area
Subsurface Soil	1,1,2-Trichloroethane	mg/kg	29.25	3.00	52.00	NA	8	1230	12.3		5	110, White Area
Subsurface Soil	1,1-Dichloroethane	mg/kg	516.91	4.00	4700.00	NA	11	689000	6890			
Subsurface Soil	1,1-Dichloroethene	mg/kg	34.82	1.00	330.00	NA	44	14000	140		14	109,110
Subsurface Soil	1,2 -Dichlorethane	mg/kg	41.50	3.00	64.00	NA	6	668	6.68		4	110
Subsurface Soil	1,2-Dichloropropane	mg/kg	63.22	2.00	330.00	NA	9	1130	11.3		6	109,110
Subsurface Soil	2-Butanone [Methylethyl Ketone]	mg/kg	366.24	1.00	3700.00	NA	237	1000000000	1000000000			
Subsurface Soil	4-Methyl-2-pentanone	mg/kg	524.17	1.00	5300.00	NA	42	154000000	154000000			
Subsurface Soil	Acetone	mg/kg	704.28	1.00	120000.00	NA	515	27200000	272000			
Subsurface Soil	Benzene	mg/kg	18.40	1.00	61.00	NA	15	1410	14.1		4	110
Subsurface Soil	Bromodichloromethane	mg/kg	52.00	51.00	53.00	NA	4	26400	264			
Subsurface Soil	Bromoform	mg/kg	33.00	1.00	51.00	NA	6	37200	372			
Subsurface Soil	Bromomethane	mg/kg	196.80	63.00	690.00	NA	5	5980	59.8		5	110,112
Subsurface Soil	Carbon Disulfide	mg/kg	39.44	1.00	160.00	NA	16	988000	9880			
Subsurface Soil	Carbon Tetrachloride	mg/kg	51.07	1.00	650.00	NA	75	3560	35.6		21	110,112,140, White Area
Subsurface Soil	Chlorobenzene	mg/kg	22.87	1.00	74.00	NA	15	83000	830			
Subsurface Soil	Chloroethane	mg/kg	52.40	8.00	67.00	NA	5	1550000	1550000			
Subsurface Soil	Chloroform	mg/kg	28.93	1.00	770.00	NA	166	21400	214		3	White Space
Subsurface Soil	Chloromethane [Methyl Chloride]	mg/kg	130.17	49.00	400.00	NA	6	NA	NA			
Subsurface Soil	Cis-1,2,-Dichloroethene	mg/kg	34.82	1.00	330.00	NA	44	14000	140		14	109,110
Subsurface Soil	cis-1,3,-Dichloropropene	mg/kg	52.00	51.00	53.00	NA	4	120	1.2		4	110

Medium	Analyte	Units	Mean	Minimum	Maximum	Mean + 2 SD	No. > BKGD	Tier I	Tier II	No. > Tier I	No. > Tier II	IHSS/PACs > Tier II
Subsurface Soil	Dibromochloromethane	mg/kg	49.25	47.00	51.00	NA	4	5340000	53400			
Subsurface Soil	Methylene Chloride	mg/kg	394.76	1.00	44000.00	NA	608	578	5.78	44	359	White Space, 109, 110, 111.2, 111.3, 111.4,111.6, 111.7, 111.8, 112, 113, 190, 114, 119.1, 130, 140, 143, 155, 156.2, 166.1, 166.2, 166.3, 168, 170, 174a, 209, 216.3
Subsurface Soil	Styrene	mg/kg	57.20	1.00	330.00	NA	30	274000	2740			
Subsurface Soil	Tetrachloroethene	mg/kg	29082.37	1.00	1100000.00	NA	244	3150	31.5	40	98	White Space, 109, 110, 111.2,111.4, 111.7, 112,113, 190, 174a

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Plates

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21

THIS TARGET SHEET REPRESENTS AN OVER-SIZED MAP / PLATE FOR THIS DOCUMENT: No Unique Numeric Identifier (Ref: 01-RF-01753)

BUFFER ZONE DATA SUMMARY REPORT

July 2001

Plate 1:

Buffer Zone, IHSS & PACS, Draft

Map ID: 10-02678

8-7-01

July 03, 2001

CERCLA Administrative Record Document, BZ - A -

U.S. DEPARTEMENT OF ENERGY
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

GOLDEN, COLORADO

28

THIS TARGET SHEET REPRESENTS AN OVER-SIZED MAP / PLATE FOR THIS DOCUMENT: No Unique Numeric Identifier (Ref: 01-RF-01753)

BUFFER ZONE DATA SUMMARY REPORT

July 2001

Plate 2:

Buffer Zone, IHSS & PACS, Southeast Quadrant, Draft

Map ID: 10-0267

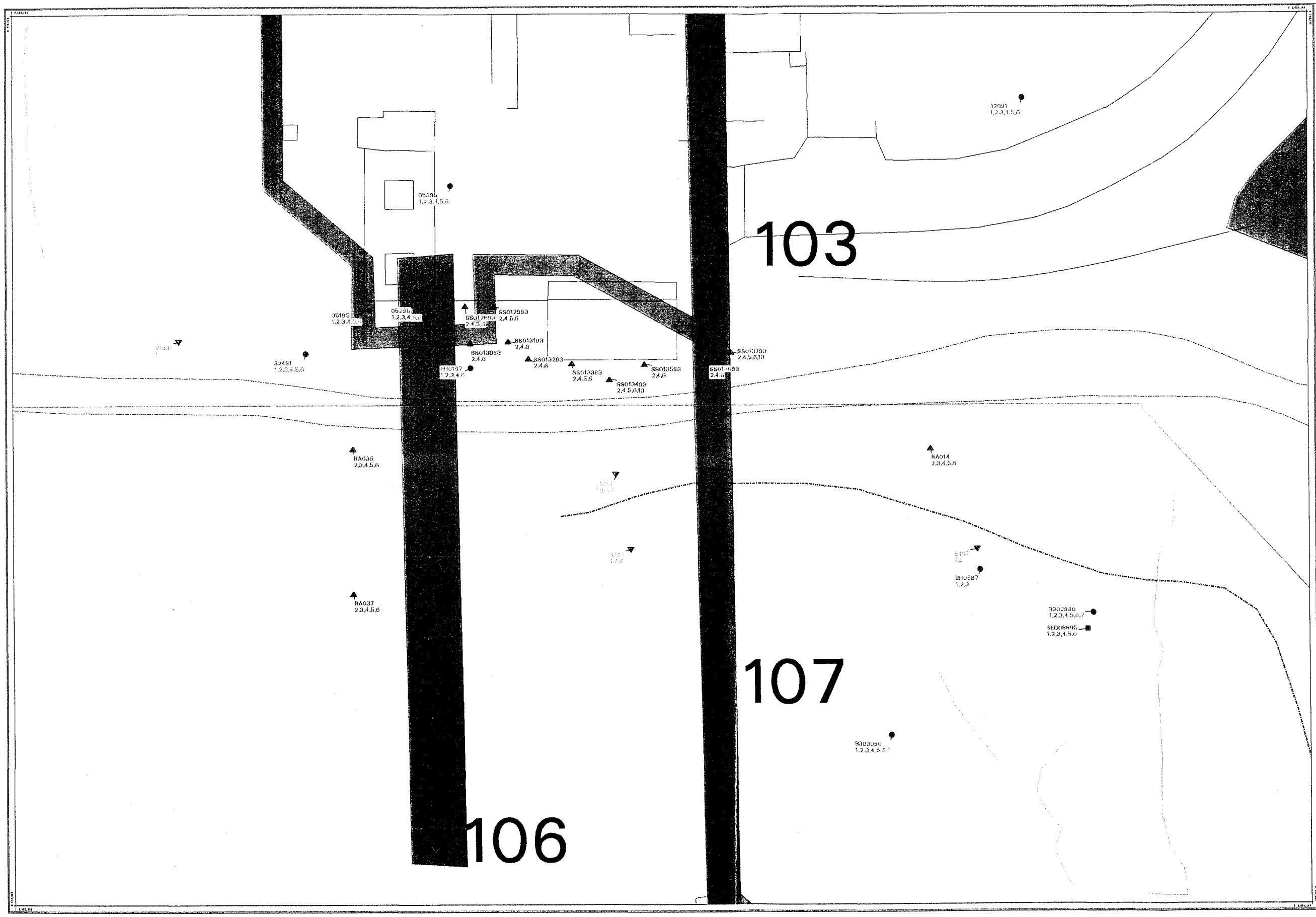
July 03, 2001

CERCLA Administrative Record Document, BZ - A -

U.S. DEPARTEMENT OF ENERGY
ROCKY FLATS ENVIRONMENTAL TECHNOLOGY SITE

GOLDEN, COLORADO

29



Buffer Zone Data Summary Report

Plate 6

IHSS 106

106 Outfall

EXPLANATION

- Borehole
- Surface Soil
- Sediment
- Groundwater Well
- OU1
- HRR Zone Boundary
- Industrial Area Boundary

Standard Map Features

- Buildings and other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Paved roads
- Dirt roads

TEST METHODS

Subscript	Description
1	VOCs
2	SVOCs
3	Radionuclides
4	Metals
5	Water Quality Parameters
6	Pesticides
7	Pesticides/PCBs
8	VOCs (Water)
9	PCBs
10	Total Petroleum Hydrocarbons
11	Herbicides
12	Nitrates
13	Geotech
DNA	Data Not Available

DATA SOURCE BASE FEATURES:
Buildings, fences, hydrography, roads and other structures from 1994 aerial flyover data compiled by EG&G RSL, Las Vegas. Digitized from the orthophotographs, 1/95

Scale = 1 : 400
1 inch represents approximately 33 feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

GIS Dept. 303-966-7707

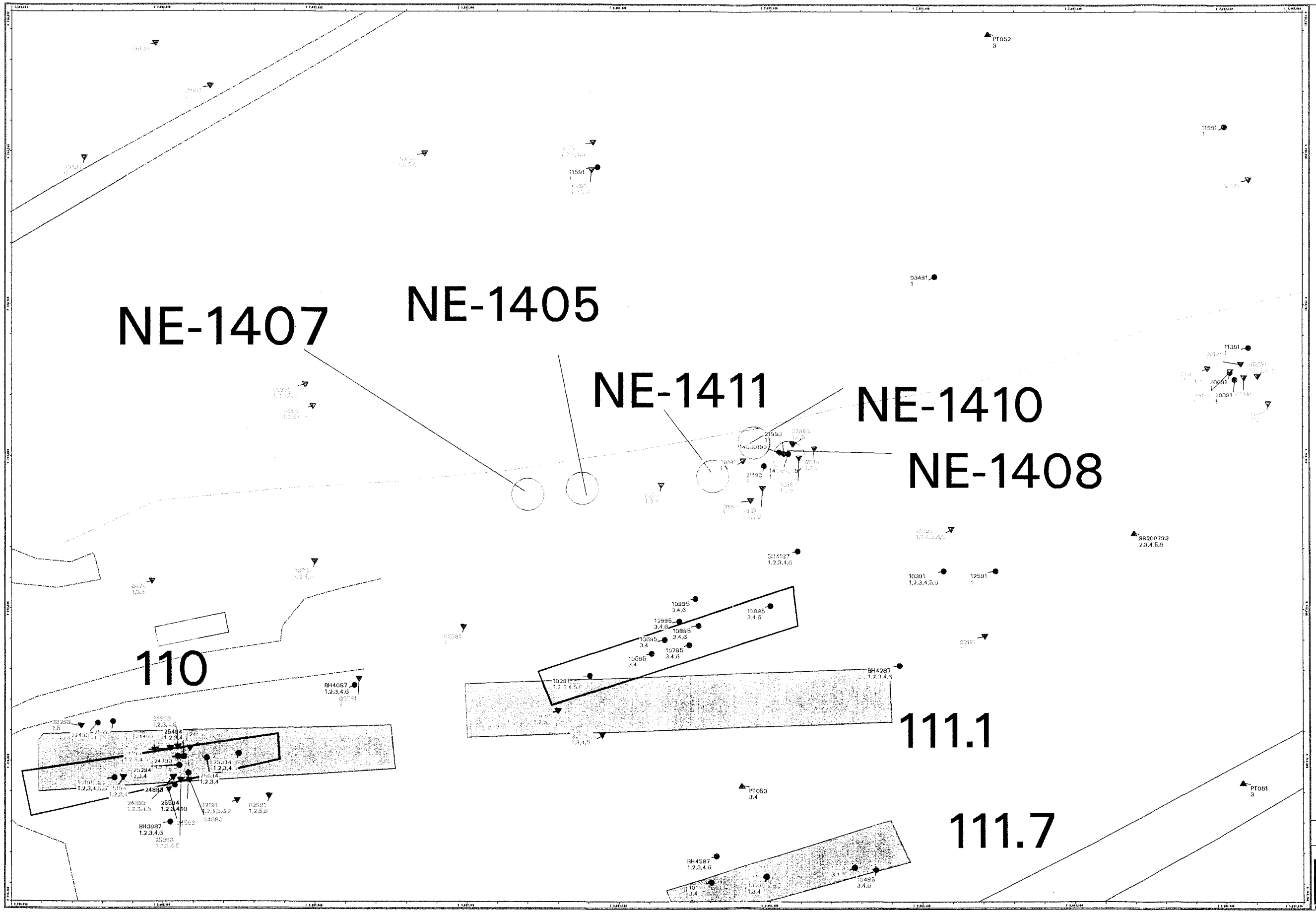
DRAFT

MAP ID: 01-0267

March 18, 2001

NT_Svr h:/projects/fy2001/01-0267/ihss_106.aml

33



Buffer Zone
Data Summary Report
Plate 7
IHSS 111.1
Trench T-4

EXPLANATION

- Borehole
- Surface Soil
- Groundwater Well
- BZOU
- PAC
- HRR Zone Boundary
- Industrial Area Boundary
- Excavation Boundary

Standard Map Features

- Buildings and other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Paved roads
- Dirt roads

TEST METHODS

Subscript	Description
1	VOCs
2	SVOCs
3	Radionuclides
4	Metals
5	Water Quality Parameters
6	Pesticides
7	Pesticides/PCBs
8	VOCs (water)
9	PCBs
10	Total Petroleum Hydrocarbons
11	Herbicides
12	Nitrates
13	Geotech
DNA	Data Not Available

DATA SOURCE BASE FEATURES:
Buildings, fences, hydrogeologic roads and other structures from 1994 aerial fly-over data captured by EG&G RSL, Las Vegas. Digitized from the orthophotographs. 1/95

Scale = 1 : 750
1 inch represents approximately 63 feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

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MAP ID: 01-0267 March 19, 2001

NT_Svr h:/projects/fy2001/01-0267/ihss_111_1.aml

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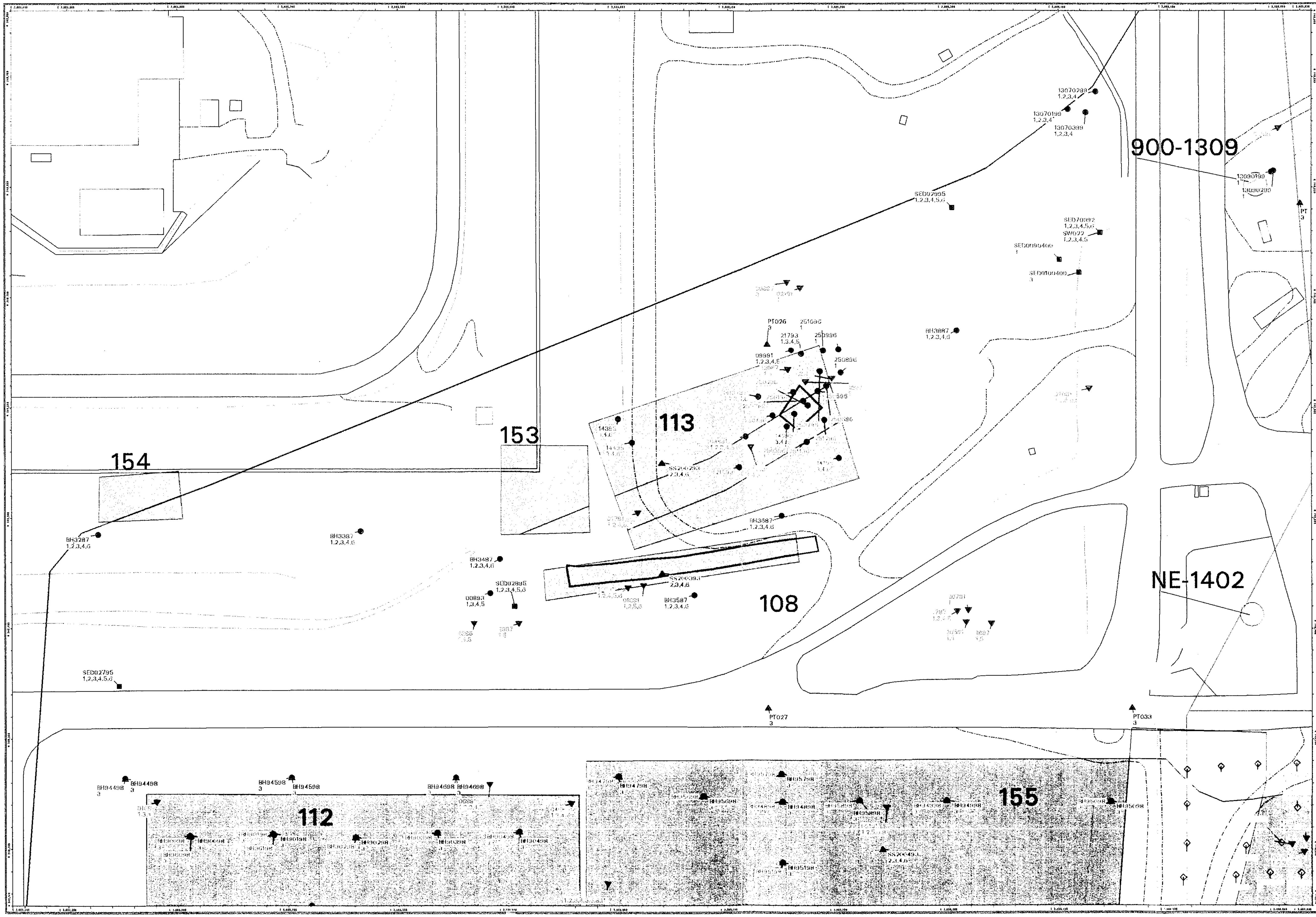

Buffer Zone
Data Summary Report
Plate 8
IHSS 113
Mound Area

EXPLANATION

- ● Borehole
- ▲ Surface Soil
- ■ Sediment
- ▼ Groundwater Well
- ◇ HPge (Test Method = 3)
- BZOU
- PAC
- HRR Zone Boundary
- Industrial Area Boundary
- Excavation Boundary

Standard Map Features

- Buildings and other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Paved roads
- Dirt roads

TEST METHODS

Subscript	Description
1	VOCs
2	SVOCs
3	Radionuclides
4	Metals
5	Water Quality Parameters
6	Pesticides
7	Pesticides/PCBs
8	VOCs (Water)
9	PCBs
10	Total Petroleum Hydrocarbons
11	Herbicides
12	Nitrates
13	Geotech
DNA	Data Not Available

DATA SOURCE BASE FEATURES:
Buildings, fences, hydrography, roads and other structures from 1994 aerial fly-over data captured by EG&G RSL, Las Vegas. Digitized from the orthophotographs. 1/95

Scale = 1 : 1050
1 inch represents approximately 88 feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

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MAP ID: 01-0287 March 19, 2001

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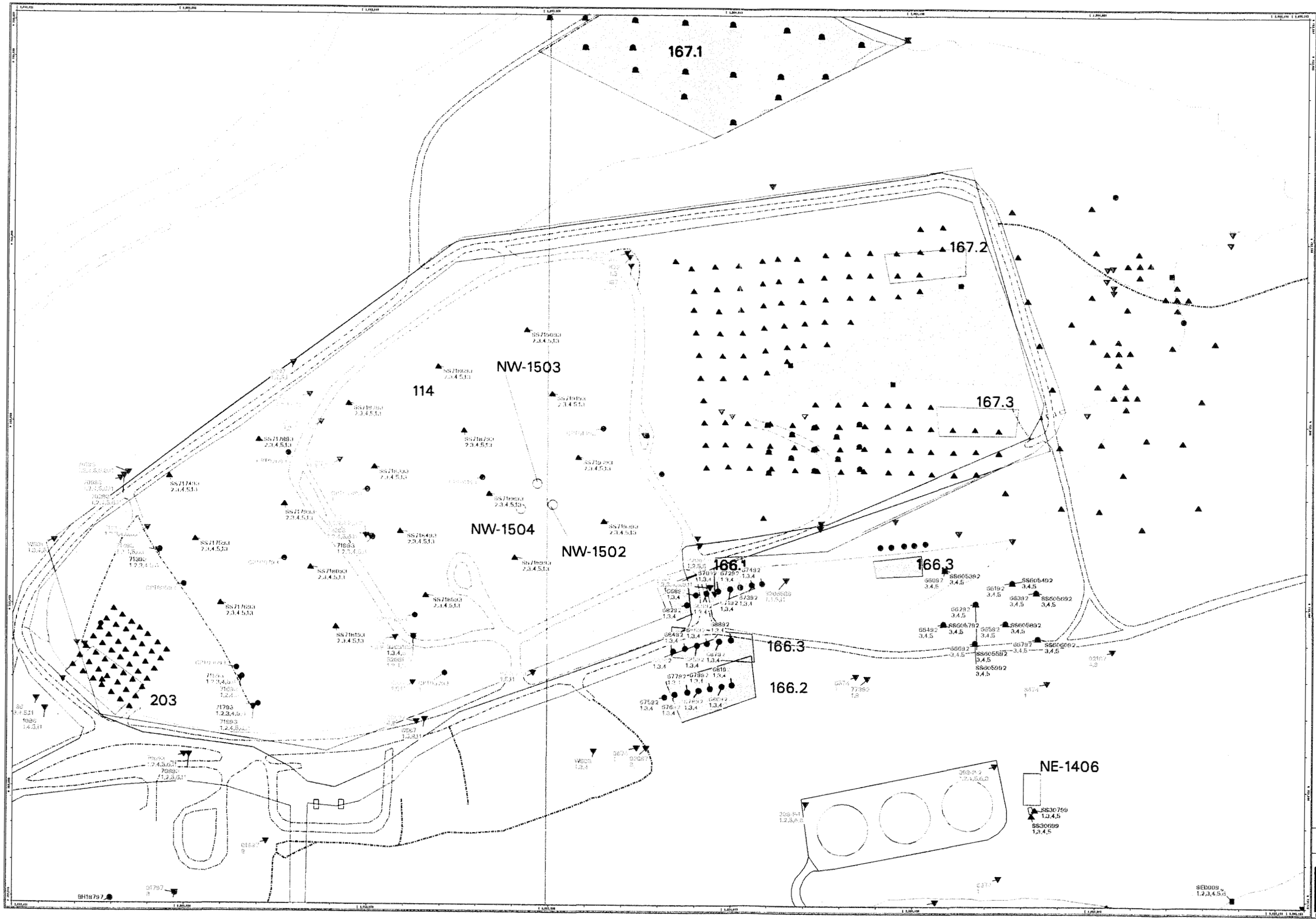
35



Buffer Zone
Data Summary Report
Plate 9
IHSS 114
Present Landfill

EXPLANATION

- Borehole
- Surface Soil
- Sediment
- Groundwater Well
- OU6
- OU7
- PAC
- HRR Zone Boundary
- Industrial Area Boundary

Standard Map Features

- Buildings and other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Paved roads
- Dirt roads

TEST METHODS

Subscript	Description
1	VOCs
2	SVOCs
3	Radionuclides
4	Metals
5	Water Quality Parameters
6	Pesticides
7	Pesticides/PCBs
8	VOCs (water)
9	PCBs
10	Total Petroleum Hydrocarbons
11	Herbicides
12	Nitrates
13	Geotech
DNA	Data Not Available

DATA SOURCE BASE FEATURES:
Buildings, fences, hydrograms, roads and other structures from 1994 aerial fly-over data captured by EG&G RSL, Las Vegas. Digitized from the orthophotograms, 1/95

Scale = 1 : 2520
1 inch represents 210 feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

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MAP ID: 01-0267 March 18, 2001

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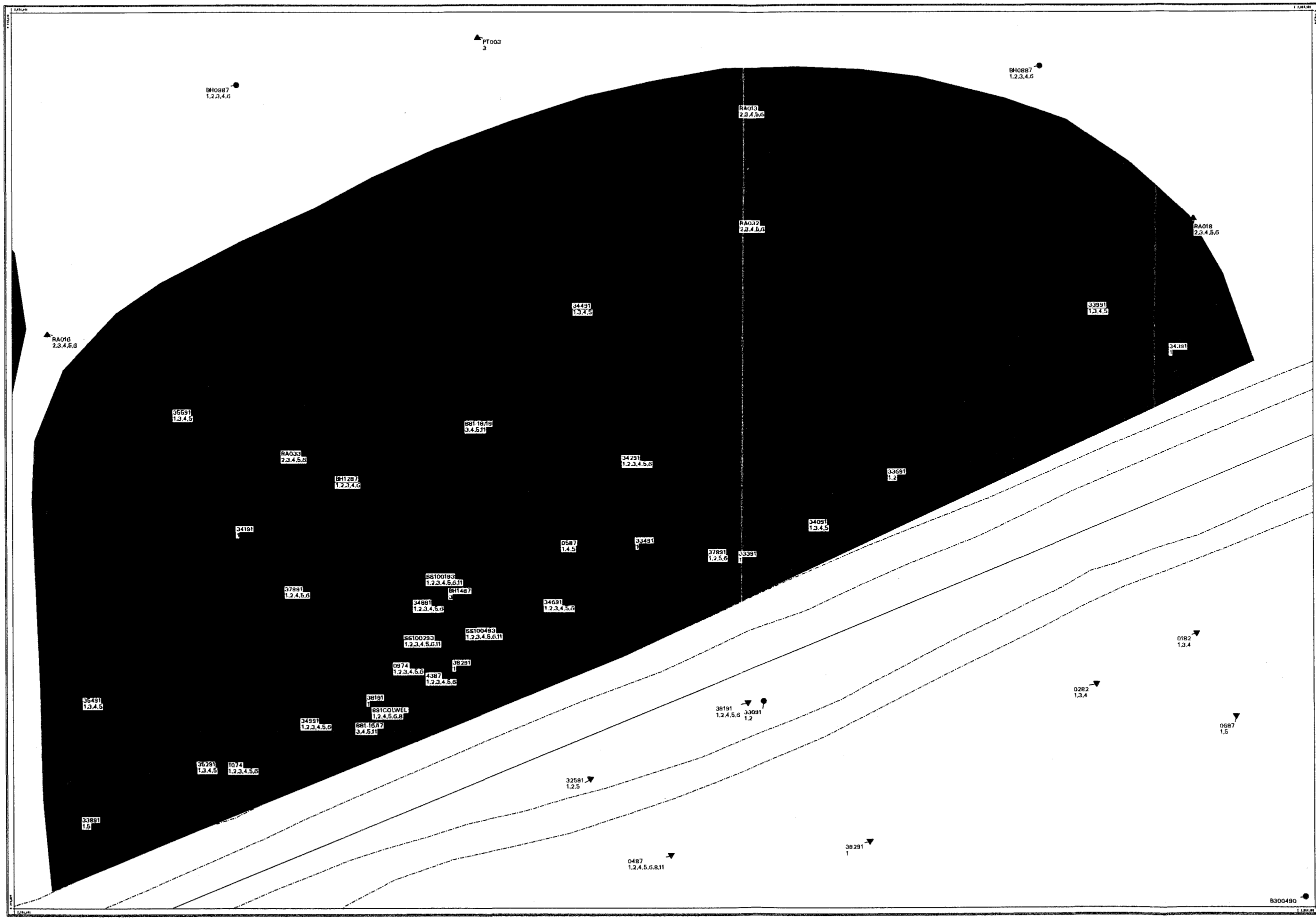

Buffer Zone Data Summary Report

Plate 10

IHSS 119.1 Solvent Spill Site OU1

EXPLANATION

- Borehole
- Surface Soil
- Groundwater Well
- OU1
- HRR Zone Boundary
- Industrial Area Boundary

Standard Map Features

- Buildings and other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Paved roads
- Dirt roads

TEST METHODS

Subscript	Description
1	VOCs
2	SVOCs
3	Radionuclides
4	Metals
5	Water Quality Parameters
6	Pesticides
7	Pesticides/PCBs
8	VOCs (water)
9	PCBs
10	Total Petroleum Hydrocarbons
11	Herbicides
12	Nitrates
13	Geotech
DNA	Data Not Available

DATA SOURCE BASE FEATURES:
Buildings, fences, hydrography, roads and other structures from 1994 aerial flyover data collected by EG&G RSL, Las Vegas. Digitized from the orthophotographs. 1/95

Scale = 1 : 500
1 inch represents approximately 42 feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

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MAP ID: 01-0267

March 16, 2001

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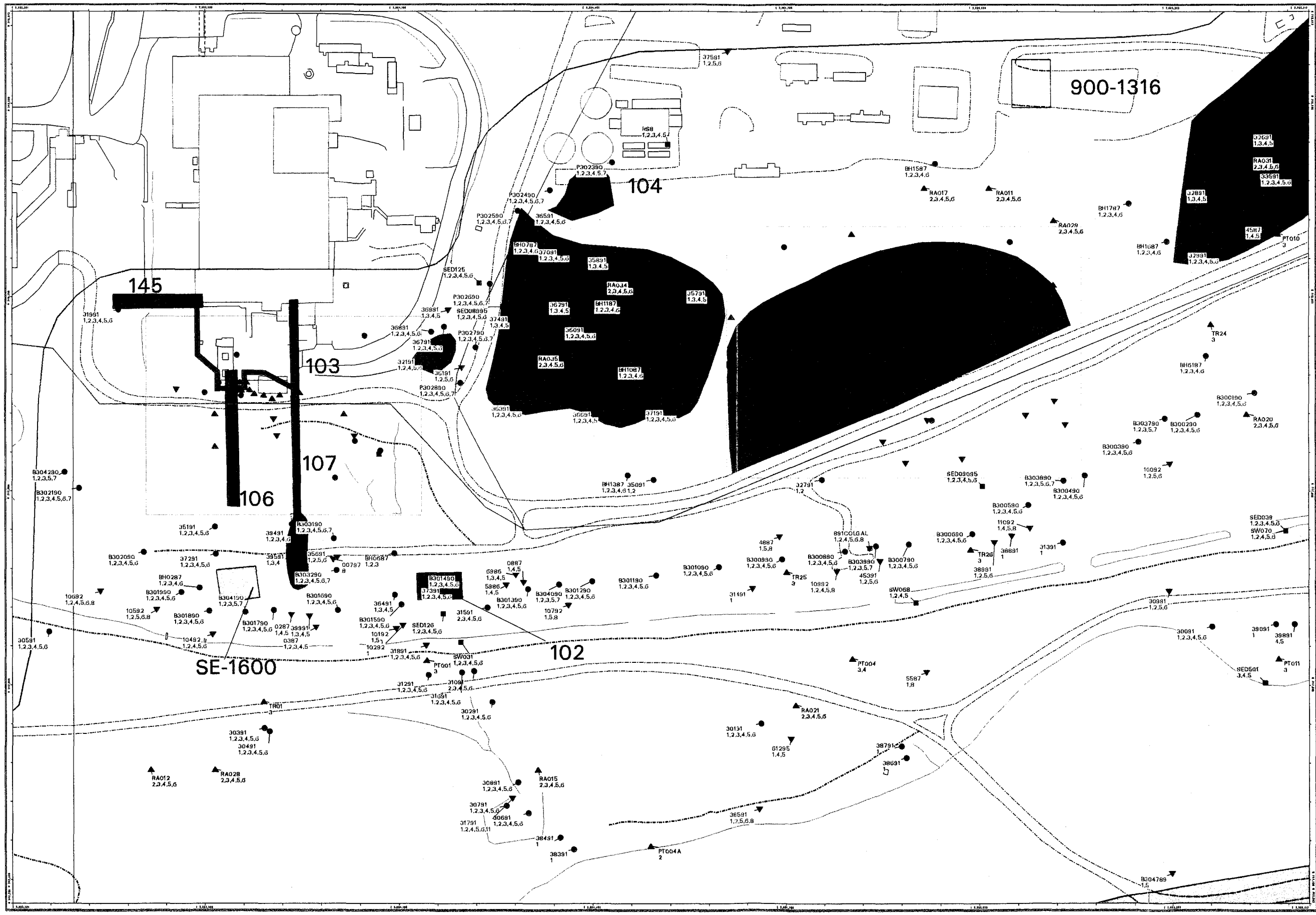
31



Buffer Zone
Data Summary Report
Plate 11
IHSS 130
Radiological Site 800 Area

EXPLANATION

- Borehole
- Surface Soil
- Sediment
- Groundwater Well
- OU1
- PAC
- HRR Zone Boundary
- Industrial Area Boundary

Standard Map Features

- Buildings and other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Paved roads
- Dirt roads

TEST METHODS

Subscript	Description
1	VOCs
2	SVOCs
3	Radionuclides
4	Metals
5	Water Quality Parameters
6	Pesticides
7	Pesticides/PCBs
8	VOCs (water)
9	PCBs
10	Total Petroleum Hydrocarbons
11	Herbicides
12	Nitrates
13	Geotech
DNA	Data Not Available

DATA SOURCE BASE FEATURES:
Buildings, fences, hydrograph roads and other structures from 1994 aerial fly-over data captured by EG&G RSL, Las Vegas. Digitized from the orthophotographs. 1/95

Scale = 1 : 1760
1 inch represents approximately 148 feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

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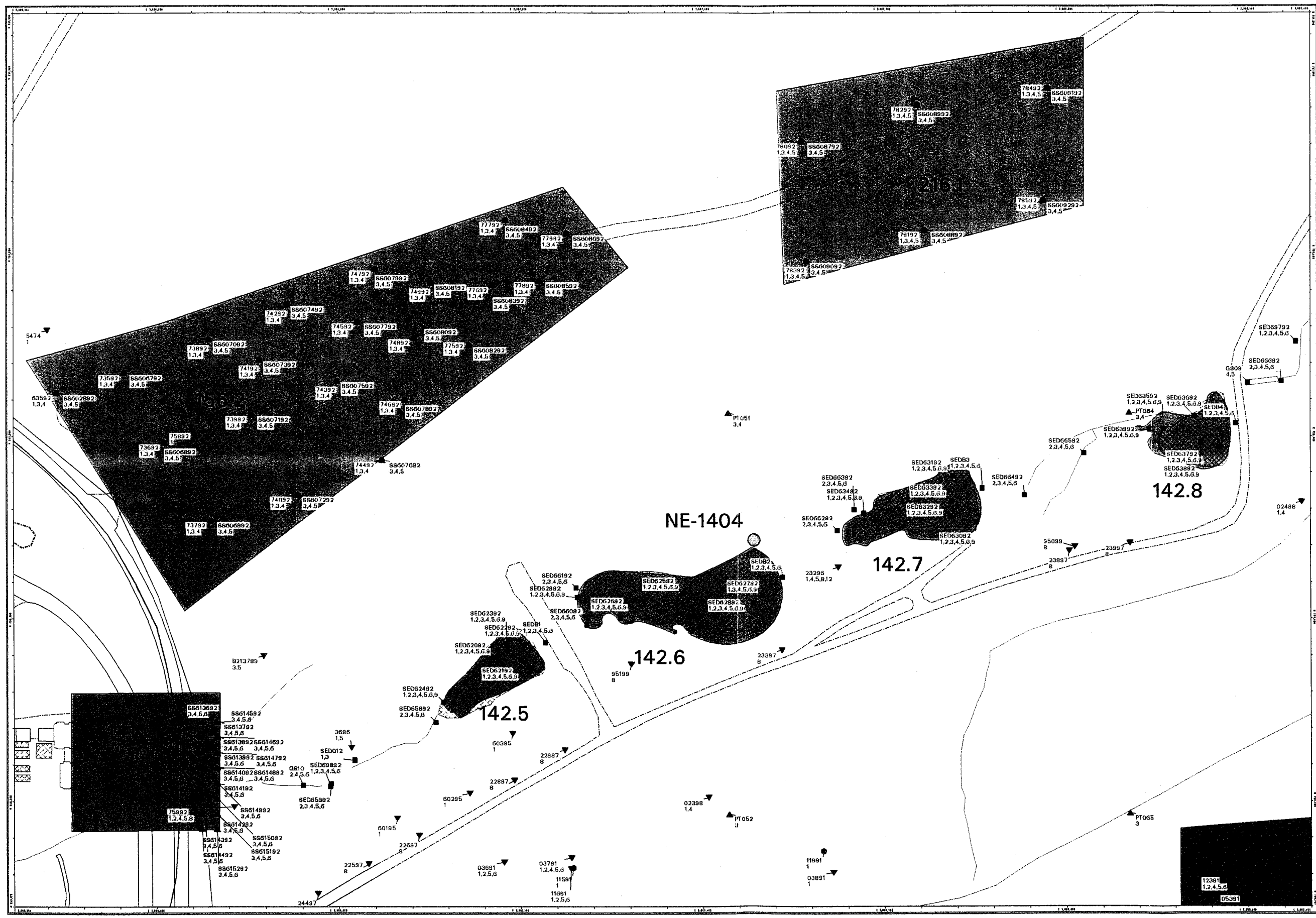
MAP ID: 01-0267
March 18, 2001

NT_Svr h:/projects/fy2001/01-0267/ihss_130.aml

38



Buffer Zone
Data Summary Report
Plate 12

IHSS 142.5-142.8 - B-Series Ponds
IHSS 156.2 - Soil Disposal Area
IHSS 216.1 - East Spray Field – North Area
IHSS 141 - Sludge Disposal Area

EXPLANATION

- Borehole
- Surface Soil
- Sediment
- Groundwater Well
- BZOU
- OU6
- PAC
- HRR Zone Boundary
- Industrial Area Boundary

Standard Map Features

- Buildings and other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Paved roads
- Dirt roads

TEST METHODS

Subscript	Description
1	VOCs
2	SVOCs
3	Radionuclides
4	Metals
5	Water Quality Parameters
6	Pesticides
7	Pesticides/PCBs
8	VOCs (water)
9	PCBs
10	Total Petroleum Hydrocarbons
11	Herbicides
12	Nitrates
13	Geotech
DNA	Data Not Available

DATA SOURCE BASE FEATURES:
Buildings, fences, hydrogeneous roads and other structures from 1994 aerial fly-over data captured by EG&G RSL, Las Vegas. Digitized from the orthophotograms. 1/95

Scale = 1 : 1800
1 inch represents approximately 150 feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

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GIS Dept. 303-966-7707

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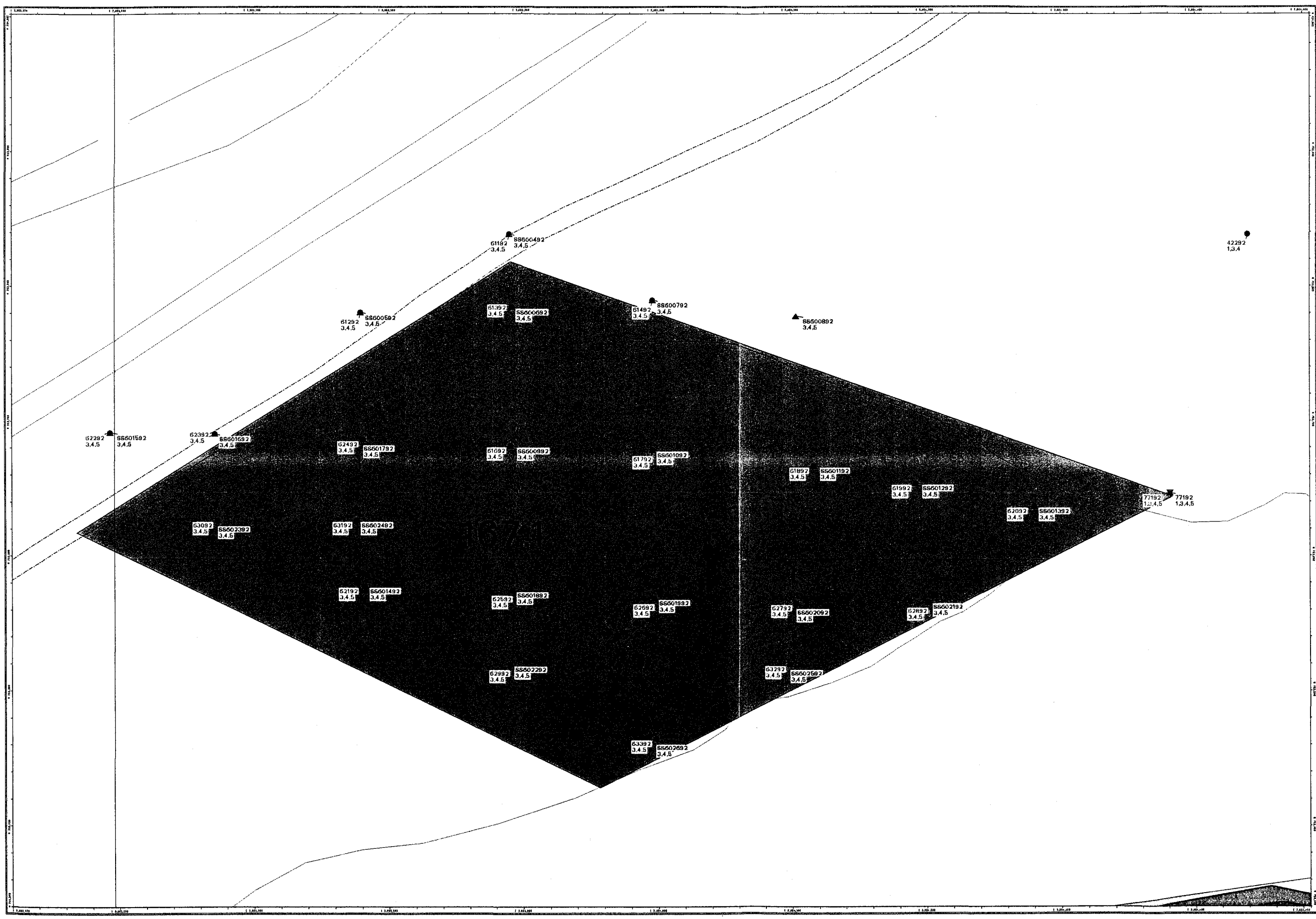
MAP ID: 01-0267 March 19, 2001

NT_Svr h:/projects/fy2001/01-0267/bponds.aml

39



Buffer Zone
Data Summary Report
Plate 14
IHSS 167.1
Landfill Pond Spray Area

EXPLANATION

- Borehole
- Surface Soil
- Groundwater Well
- OU6
- OU7
- PAC
- HRR Zone Boundary
- Industrial Area Boundary

Standard Map Features

- Buildings and other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Paved roads
- Dirt roads

TEST METHODS

Subscript	Description
1	VOCs
2	SVOCs
3	Radionuclides
4	Metals
5	Water Quality Parameters
6	Pesticides
7	Pesticides/PCBs
8	VOCs (water)
9	PCBs
10	Total Petroleum Hydrocarbons
11	Herbicides
12	Nitrates
13	Geotech
DNA	Data Not Available

DATA SOURCE BASE FEATURES:
Buildings, fences, hydrograms, roads and other structures from 1994 aerial fly-over data captured by EG&G RSL, Las Vegas. Digitized from the orthophotograms. 1/95

Scale = 1 : 850
1 inch represents approximately 71 feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

GIS Dept. 303-966-7707

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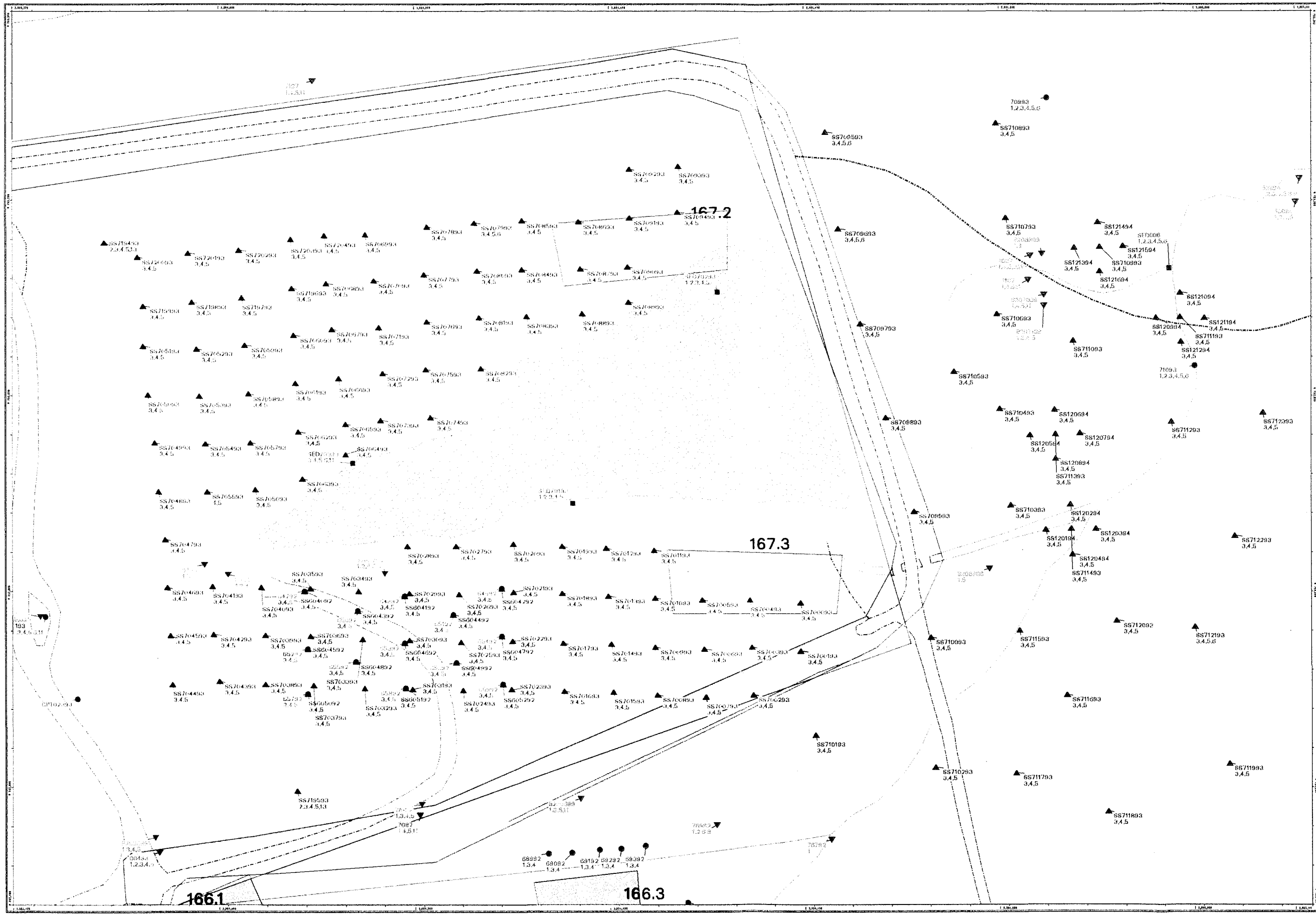
MAP ID: 01-0267 March 19, 2001

NT_Svr h:/projects/fy2001/01-0267/ihss_167_1.aml

41



Buffer Zone Data Summary Report

Plate 15

IHSSs 167.2 and 167.3 Landfill Pond

EXPLANATION

- Borehole
- Surface Soil
- Sediment
- Groundwater Well
- OU6
- OU7
- PAC
- HRR Zone Boundary
- Industrial Area Boundary

Standard Map Features

- Buildings and other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Paved roads
- Dirt roads

TEST METHODS

Subscript	Description
1	VOCs
2	SVOCs
3	Radionuclides
4	Metals
5	Water Quality Parameters
6	Pesticides
7	Pesticides/PCBs
8	VOCs (water)
9	PCBs
10	Total Petroleum Hydrocarbons
11	Herbicides
12	Nitrates
13	Geotech
DNA	Data Not Available

DATA SOURCE BASE FEATURES:
Buildings, fences, hydrography, roads and other structures from 1994 aerial fly-over data collected by EG&G RSL, Las Vegas. Digitized from the orthophotographs. 1/95

Scale = 1 : 1180
1 inch represents approximately 98 feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site
GIS Dept. 303-966-7707

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MAP ID: 01-0267 March 16, 2001

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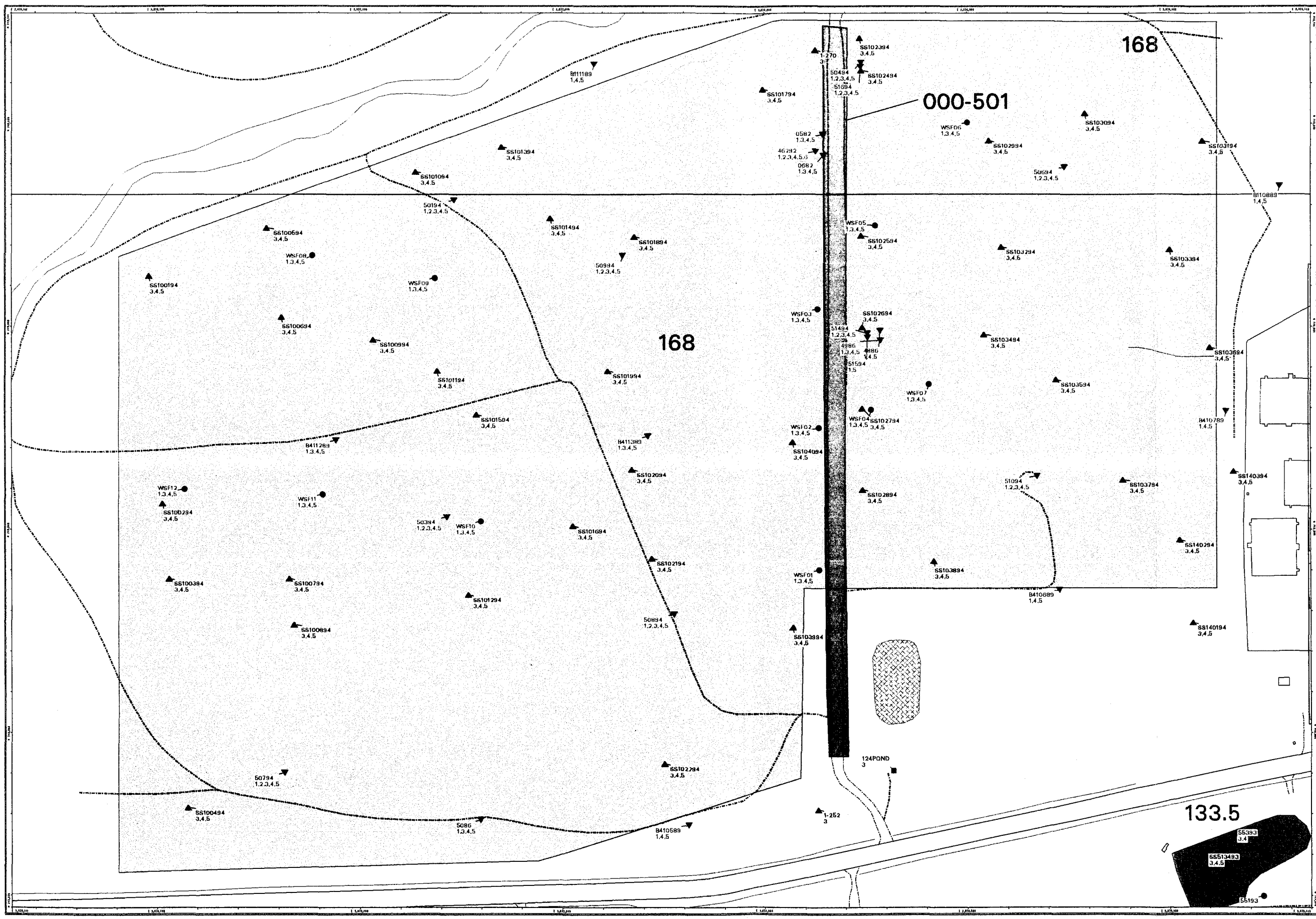
42



Buffer Zone
Data Summary Report
Plate 16
IHSS 168
West Spray Field

EXPLANATION

- Borehole
- Surface Soil
- Sediment
- Groundwater Well
- OU5
- OU11
- PAC
- HRR Zone Boundary
- Industrial Area Boundary

Standard Map Features

- Buildings and other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Paved roads
- Dirt roads

TEST METHODS

Subscript	Description
1	VOCs
2	SVOCs
3	Radionuclides
4	Metals
5	Water Quality Parameters
6	Pesticides
7	Pesticides/PCBs
8	VOCs (water)
9	PCBs
10	Total Petroleum Hydrocarbons
11	Herbicides
12	Nitrates
13	Geotech
DNA	Data Not Available

DATA SOURCE BASE FEATURES:
Buildings, fences, hydrogram, roads and other structures from 1994 aerial fly-over data captured by EG&G RSL, Las Vegas. Digitized from the orthophotograms 1/95

Scale = 1 : 2840
1 inch represents approximately 237 feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site
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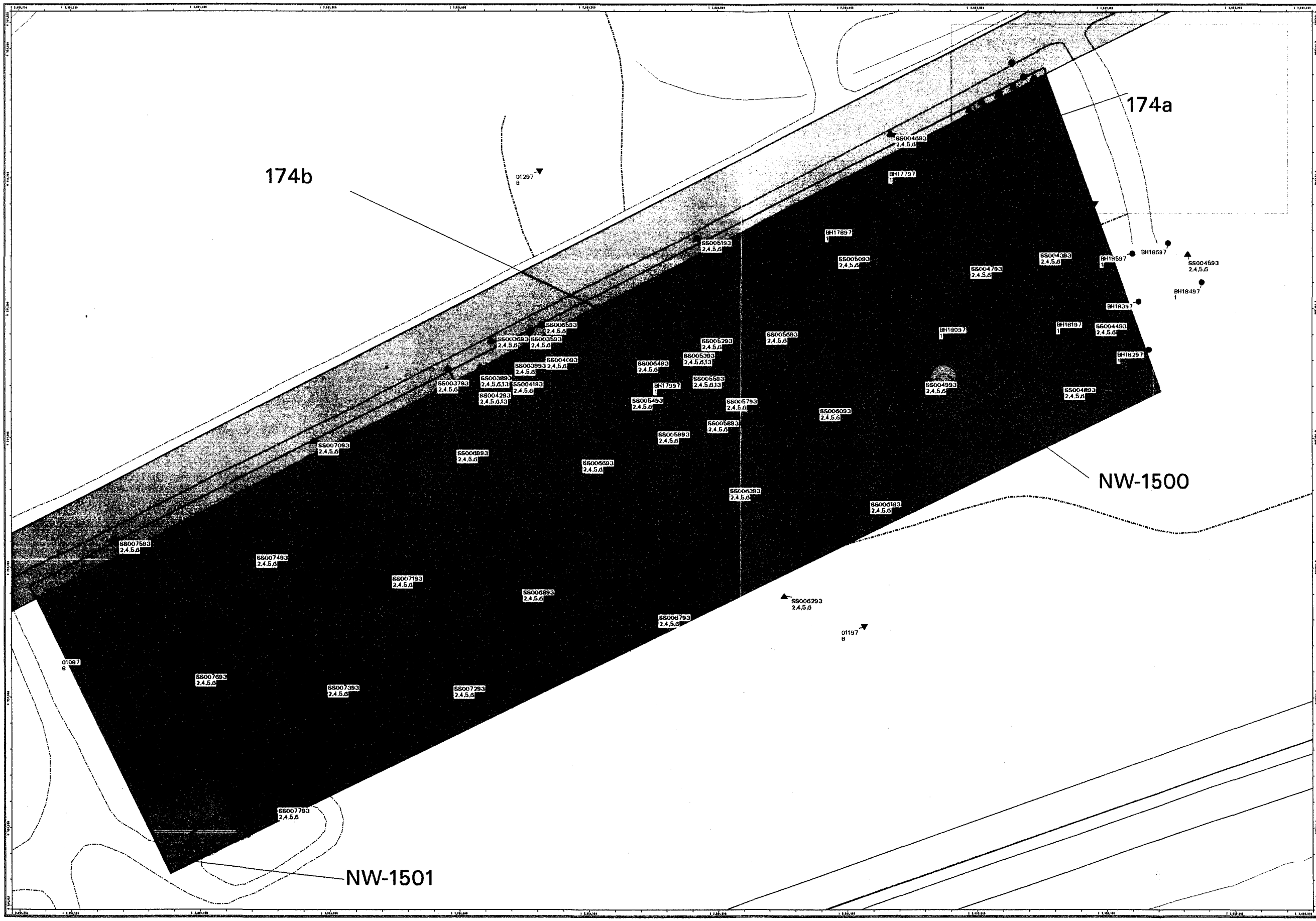
MAP ID: 01-0267
March 19, 2001

NT_Svr h:/projects/fy2001/01-0267/ihss_168.aml

43



Buffer Zone
Data Summary Report
Plate 17
IHSS 170
PU&D Storage Yard

EXPLANATION

- Borehole
- Surface Soil
- Groundwater Well
- BZOU
- PAC
- HRR Zone Boundary
- Industrial Area Boundary

Standard Map Features

- Buildings and other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Paved roads
- Dirt roads

TEST METHODS

Subscript	Description
1	VOCs
2	SVOCs
3	Radionuclides
4	Metals
5	Water Quality Parameters
6	Pesticides
7	Pesticides/PCBs
8	VOCs (water)
9	PCBs
10	Total Petroleum Hydrocarbons
11	Herbicides
12	Nitrates
13	Geotech
DNA	Data Not Available

DATA SOURCE BASE FEATURES:
Buildings, fences, hydrogeologic roads and other structures from 1994 aerial fly-over data captured by EG&G RSL, Las Vegas. Digitized from the orthophotograms. 1/95

Scale = 1 : 800
1 inch represents approximately 74 feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

GIS Dept. 303-966-7707

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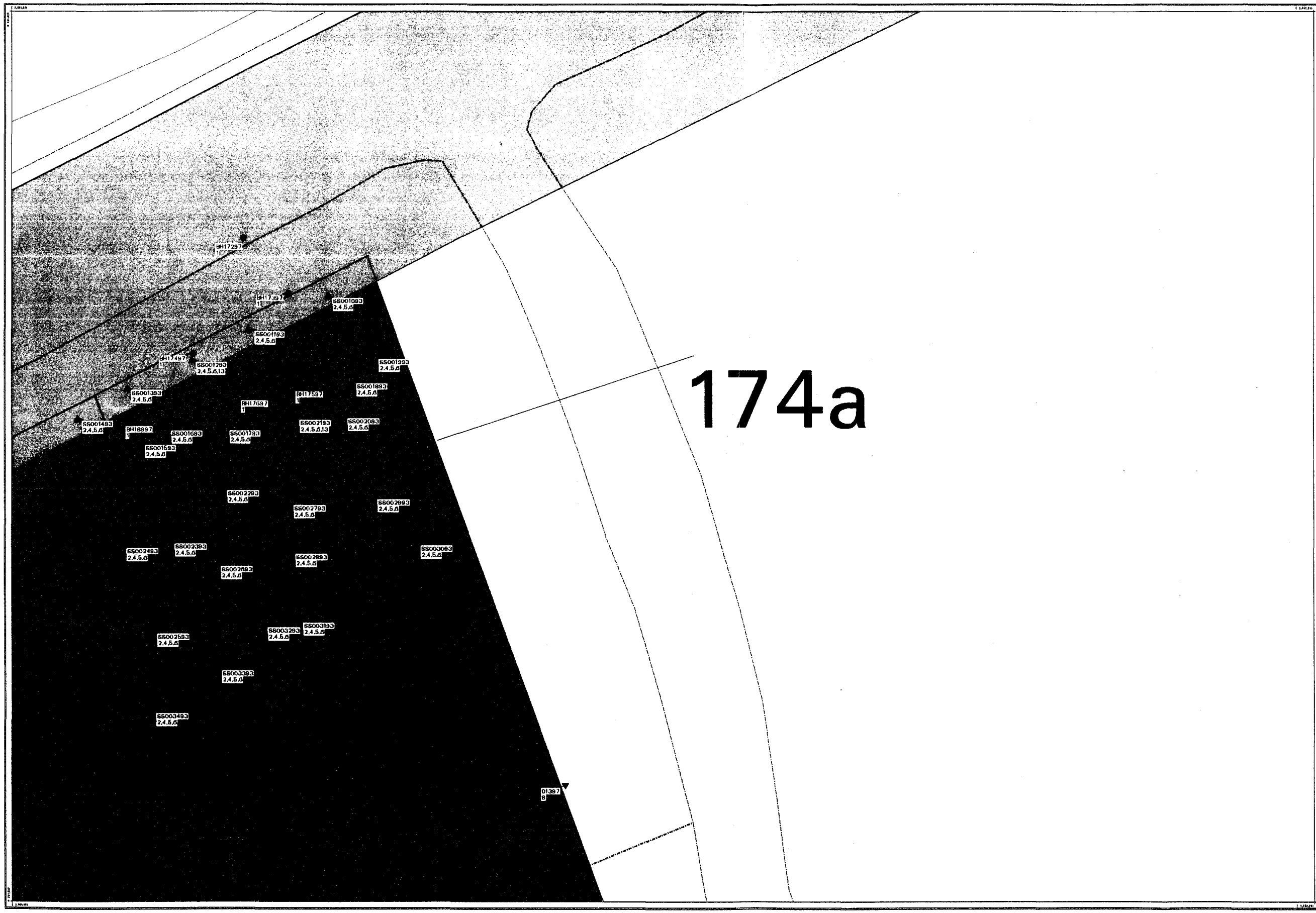
MAP ID: 01-0267 March 18, 2001

NT_Svr h:/projects/fy2001/01-0267/ihss_170.aml

44



Buffer Zone
Data Summary Report

Plate 18

IHSS 174a

PU&D Yard -- Drum Storage

EXPLANATION

- Borehole
- Surface Soil
- Groundwater Well
- BZOU
- PAC
- HRR Zone Boundary
- Industrial Area Boundary

Standard Map Features

- Buildings and other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Paved roads
- Dirt roads

TEST METHODS

Subscript	Description
1	VOCs
2	SVOCs
3	Radionuclides
4	Metals
5	Water Quality Parameters
6	Pesticides
7	Pesticides/PCBs
8	VOCs (water)
9	PCBs
10	Total Petroleum Hydrocarbons
11	Herbicides
12	Nitrates
13	Geotech
DNA	Data Not Available

DATA SOURCE BASE FEATURES:
Buildings, fences, hydrography, roads and other structures from 1994 aerial flyover data exploited by EG&G RSL, Las Vegas. Digitized from the orthophotographs. 1/95

Scale = 1 : 330
1 inch represents approximately 18 feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

GIS Dept. 303-966-7707

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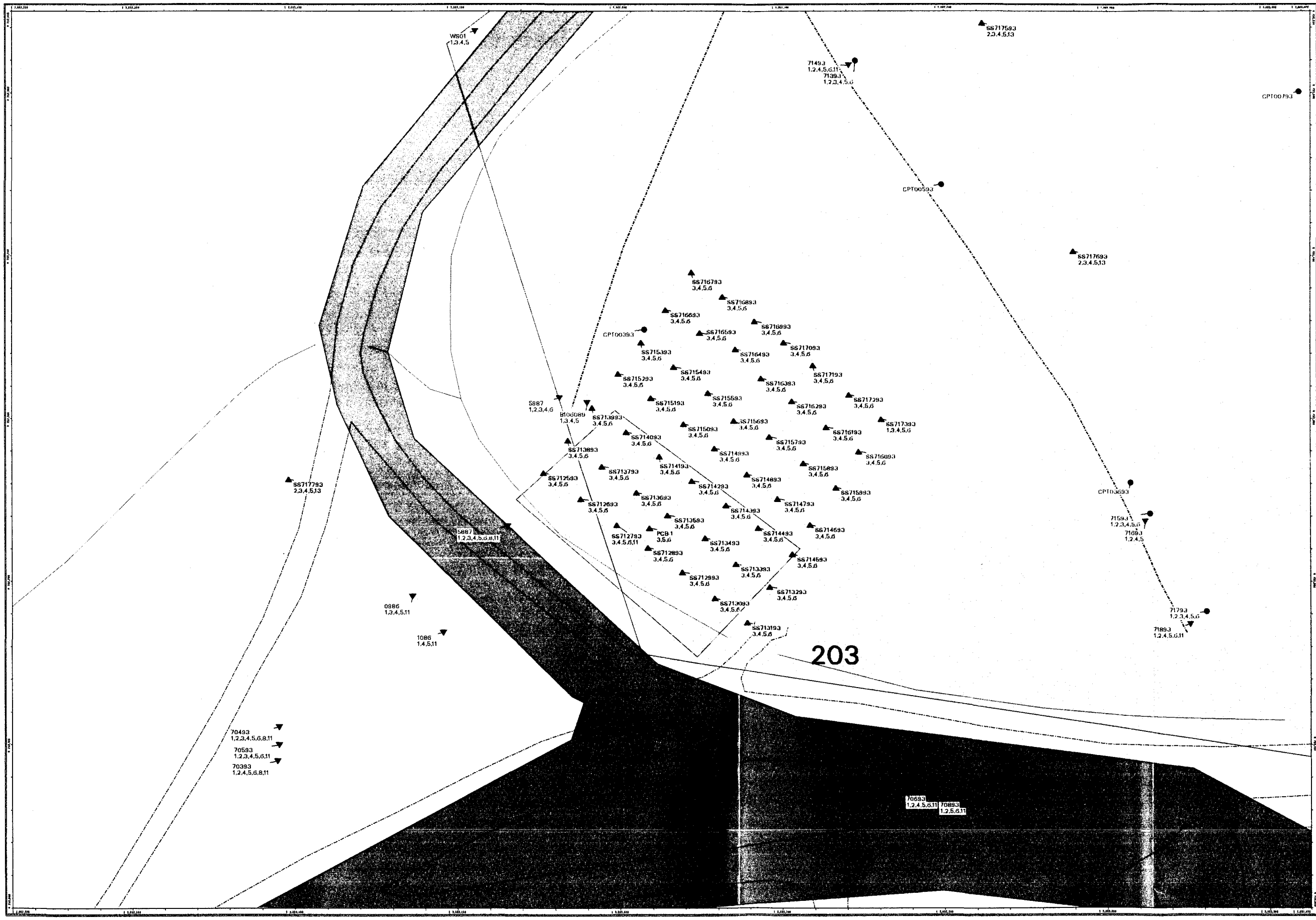
MAP ID: 01-0287

March 18, 2001

NT_Svr h:/projects/fy2001/01-0287/ihss_174a.aml

45



Buffer Zone
Data Summary Report
Plate 19
IHSS 203
Inactive Hazardous Waste Storage Area

EXPLANATION

- Borehole
- Surface Soil
- Groundwater Well
- OU7
- PAC
- HRR Zone Boundary
- Industrial Area Boundary

Standard Map Features

- Buildings and other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Paved roads
- Dirt roads

TEST METHODS

Subscript	Description
1	VOCs
2	SVOCs
3	Radionuclides
4	Metals
5	Water Quality Parameters
6	Pesticides
7	Pesticides/PCBs
8	VOCs (water)
9	PCBs
10	Total Petroleum Hydrocarbons
11	Herbicides
12	Nitrates
13	Geotech
DNA	Data Not Available

DATA SOURCE BASE FEATURES:
Buildings, fences, hydrograms, roads and other structures from 1994 aerial fly-over data captured by EG&G RSL, Las Vegas. Digitized from the orthophotograms. 1/95

Scale = 1 : 710
1 inch represents approximately 59 feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

GIS Dept. 303-966-7707

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MAP ID: 01-0267 March 19, 2001

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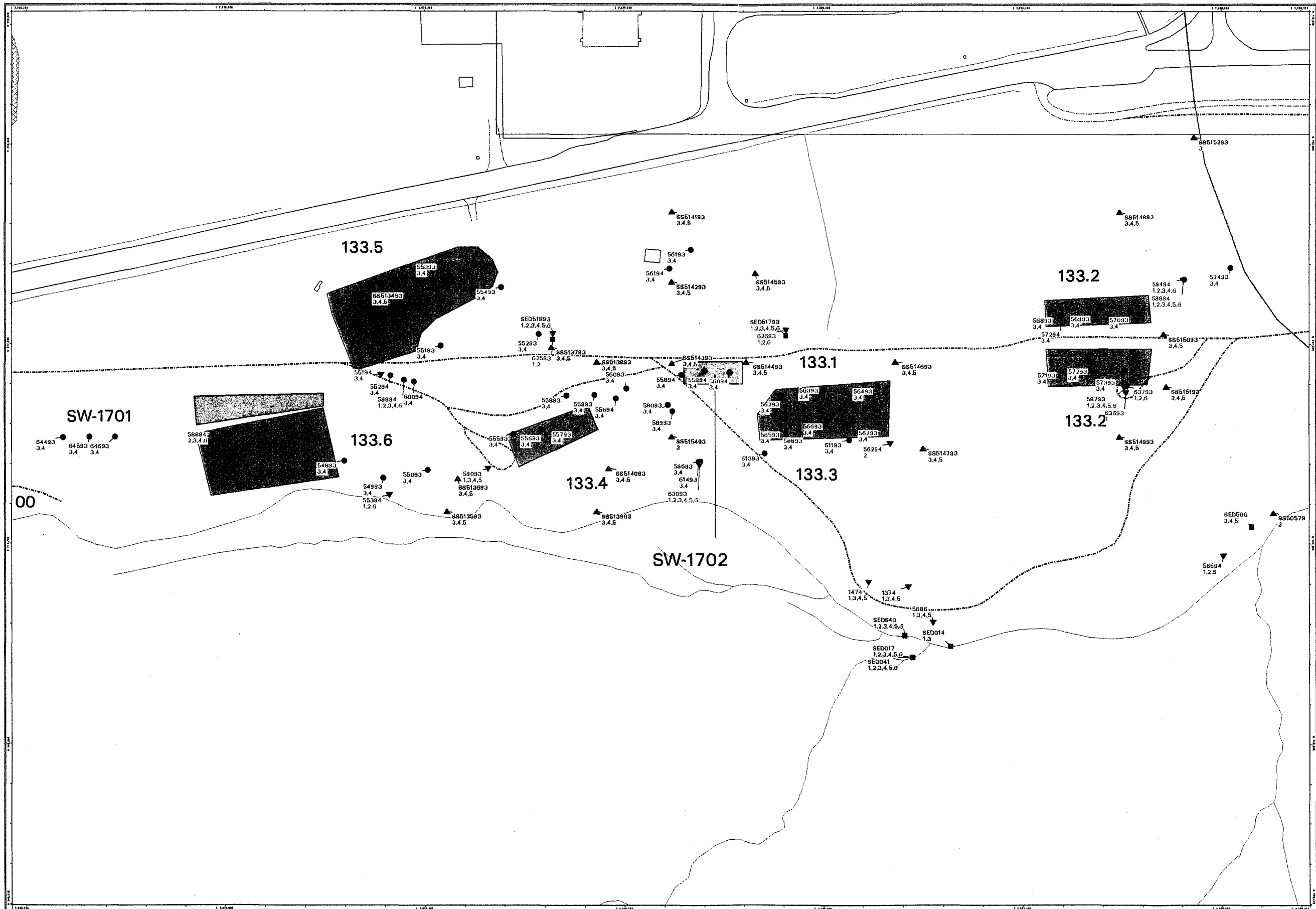
44



Buffer Zone Data Summary Report

Plate 20

SW IHSSs & PACs

EXPLANATION

- Borehole
- Surface Soil
- Sediment
- Groundwater Well
- OU5
- PAC
- HRR Zone Boundary
- Industrial Area Boundary

Standard Map Features

- Buildings and other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Paved roads
- Dirt roads

TEST METHODS

Subscript	Description
1	VOCs
2	SVOCs
3	Radionuclides
4	Metals
5	Water Quality Parameters
6	Pesticides
7	Pesticides/PCBs
8	VOCs (water)
9	PCBs
10	Total Petroleum Hydrocarbons
11	Herbicides
12	Nitrates
13	Geotech
DNA	Data Not Available

DATA SOURCE BASE FEATURES:
Buildings, fences, hydrography, roads and other structures from 1994 aerial flyover data evaluated by EG&G RSL, Las Vegas. Digitized from the orthophotographs, 1995

Scale = 1 : 2310
1 inch represents approximately 192 feet

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

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GIS Dept. 303-966-7707

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MAP ID: 01-0267 March 19, 2001

NT_Svr h:/projects/fy2001/01-0267/sw_pacs.aml

47/47

Buffer Zone Data Summary Report

Plate 3

Buffer Zone IHSS & PACS Northeast Quadrant

EXPLANATION

- Borehole
- Surface Soil
- Sediment
- Borehole converted to Groundwater Well
- HPge (Test Method = 3)
- BZOU
- OU6
- OU7
- PAC
- HRR Zone Boundary
- Industrial Area Boundary

Standard Map Features

- Buildings and other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Paved roads
- Dirt roads

TEST METHODS

Subscript	Description
1	VOCs
2	SVOCs
3	Radionuclides
4	Metals
5	Water Quality Parameters
6	Pesticides
7	Pesticides/PCBs
8	VOCs (water)
9	PCBs
10	Total Petroleum Hydrocarbons
11	Herbicides
12	Nitrates
13	Geotech
DNA	Data Not Available

DATA SOURCE BASE FEATURES:

Buildings, fences, hydrography, roads and other structures from 1994 aerial fly-over data captured by EG&G RSL, Las Vegas. Digitized from the orthophotographs. 1/95

Scale = 1 : 3520
1 inch represents approximately 293 feet

200 0 400 800ft

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

GIS Dept. 303-966-7707

DRAFT

MAP ID: 01-0267

July 30, 2001

Buffer Zone Data Summary Report

Plate 1

Buffer Zone IHSS & PACS

EXPLANATION

- BZOU
- OU1
- OU5
- OU6
- OU7
- OU11
- OU16
- PAC
- Accepted NFAs
- HRR Zone Boundary
- Industrial Area Boundary

Standard Map Features

- Buildings and other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Paved roads
- Dirt roads

DATA SOURCE BASE FEATURES:
Buildings, fences, hydrography, roads and other structures from 1994 aerial fly-over data captured by EG&G RSL Las Vegas. Digitized from the orthophotographs. 1/95

Scale = 1 : 7280
1 inch represents approximately 607 feet

500 0 1000 2000ft

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

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MAP ID: 01-0267

July 03, 2001

p.28 NF-01-RF-01753 BZ-A

Buffer Zone Data Summary Report

Plate 2

Buffer Zone IHSS & PACS Southeast Quadrant

EXPLANATION

- Borehole
- Surface Soil
- Sediment
- Borehole converted to Groundwater Well
- HPge (Test Method = 3)
- BZOU
- OU1
- OU5
- OU6
- PAC
- HRR Zone Boundary
- Industrial Area Boundary

Standard Map Features

- Buildings and other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Paved roads
- Dirt roads

TEST METHODS

Subscript	Description
1	VOCs
2	SVOCs
3	Radionuclides
4	Metals
5	Water Quality Parameters
6	Pesticides
7	Pesticides/PCBs
8	VOCs (water)
9	PCBs
10	Total Petroleum Hydrocarbons
11	Herbicides
12	Nitrates
13	Geotech
DNA	Data Not Available

DATA SOURCE BASE FEATURES:

Buildings, fences, hydrography, roads and other structures from 1994 aerial fly-over data captured by EG&G RSL, Las Vegas. Digitized from the orthophotographs. 1/95

Scale = 1 : 3490
1 inch represents approximately 291 feet

200 0 400 800Ft

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

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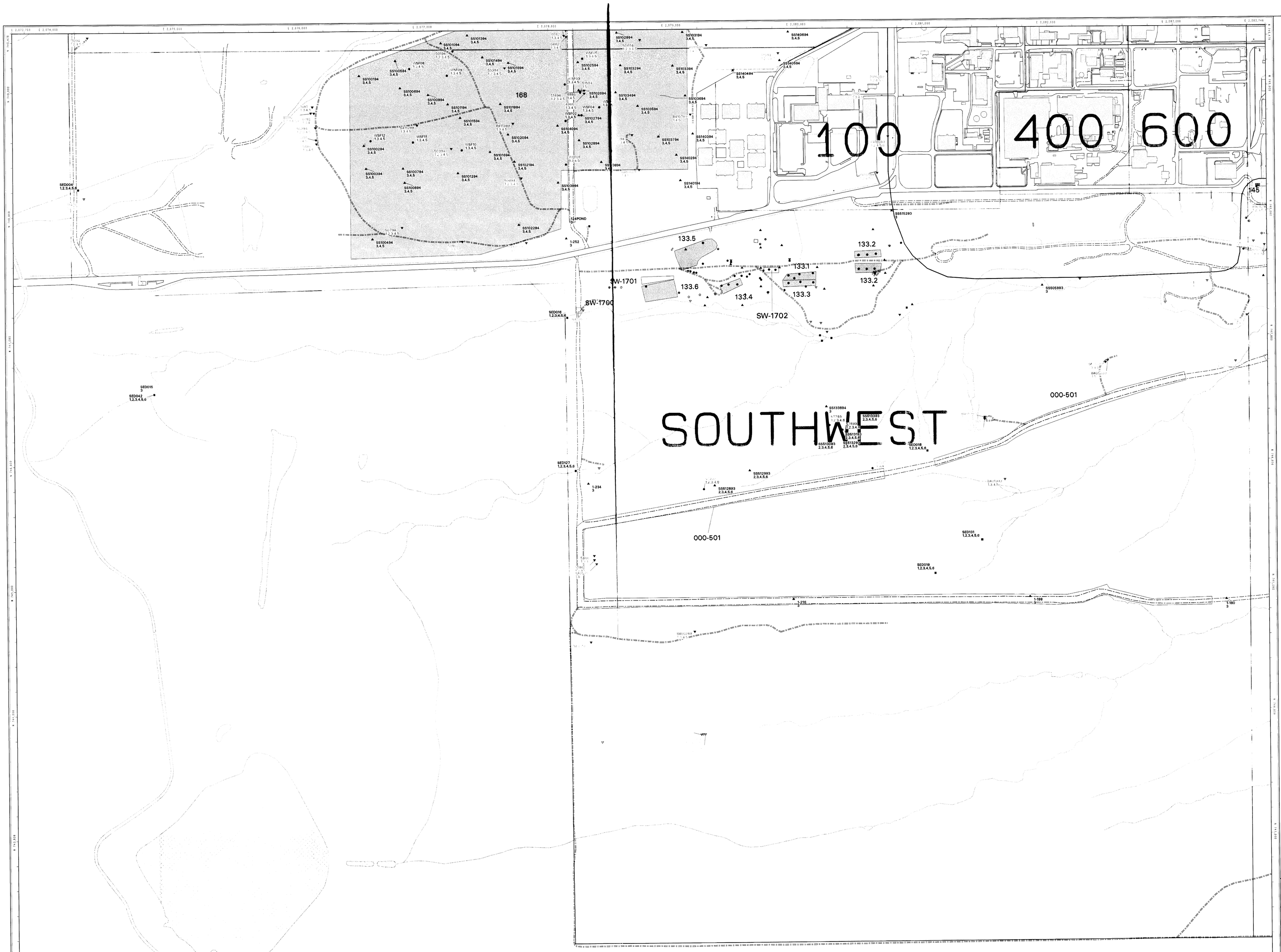
MAP ID: 01-0267

July 03, 2001

P29 REF CLRF 01753

BZ-A-



Buffer Zone Data Summary Report

Plate 5

Buffer Zone IHSS & PACS Southwest Quadrant

EXPLANATION

- Borehole
- Surface Soil
- Sediment
- Borehole converted to Groundwater Well
- OU1
- OU5
- OU11
- PAC
- HRR Zone Boundary
- Industrial Area Boundary

Standard Map Features

- Buildings and other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Paved roads
- Dirt roads

TEST METHODS

Subscript	Description
1	VOCs
2	SVOCs
3	Radionuclides
4	Metals
5	Water Quality Parameters
6	Pesticides
7	Pesticides/PCBs
8	VOCs (water)
9	PCBs
10	Total Petroleum Hydrocarbons
11	Herbicides
12	Nitrates
13	Geotech
DNA	Data Not Available

DATA SOURCE BASE FEATURES:

Buildings, fences, hydrography, roads and other structures from 1994 aerial fly-over data captured by EG&G RSL, Las Vegas. Digitized from the orthophotographs. 1/95

Scale = 1 : 3280
1 inch represents approximately 273 feet

100 0 200 400ft

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

GIS Dept. 303-966-7707

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MAP ID: 01-0267

August 02, 2001

p 32 REF: 01-RF-01753 BZ-A-000512

Buffer Zone
Data Summary Report

Plate 4

Buffer Zone IHSS & PACS
Northwest Quadrant

EXPLANATION

- ○ Borehole
- ▲ Surface Soil
- ■ Sediment
- ▽ Borehole converted to Groundwater Well
- BZOU
- OU6
- OU7
- OU11
- OU16
- PAC
- HRR Zone Boundary
- Industrial Area Boundary

Standard Map Features

- Buildings and other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Paved roads
- Dirt roads

TEST METHODS

Subscript	Description
1	VOCs
2	SVOCs
3	Radionuclides
4	Metals
5	Water Quality Parameters
6	Pesticides
7	Pesticides/PCBs
8	VOCs (water)
9	PCBs
10	Total Petroleum Hydrocarbons
11	Herbicides
12	Nitrates
13	Geotech
DNA	Data Not Available

DATA SOURCE BASE FEATURES:
Buildings, fences, hydrography, roads and other structures from 1994 aerial fly-over data captured by EG&G RSL, Las Vegas. Digitized from the orthophotographs. 1/95

Scale = 1 : 3440
1 inch represents approximately 287 feet

200 0 400 800 ft

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

U.S. Department of Energy
Rocky Flats Environmental Technology Site

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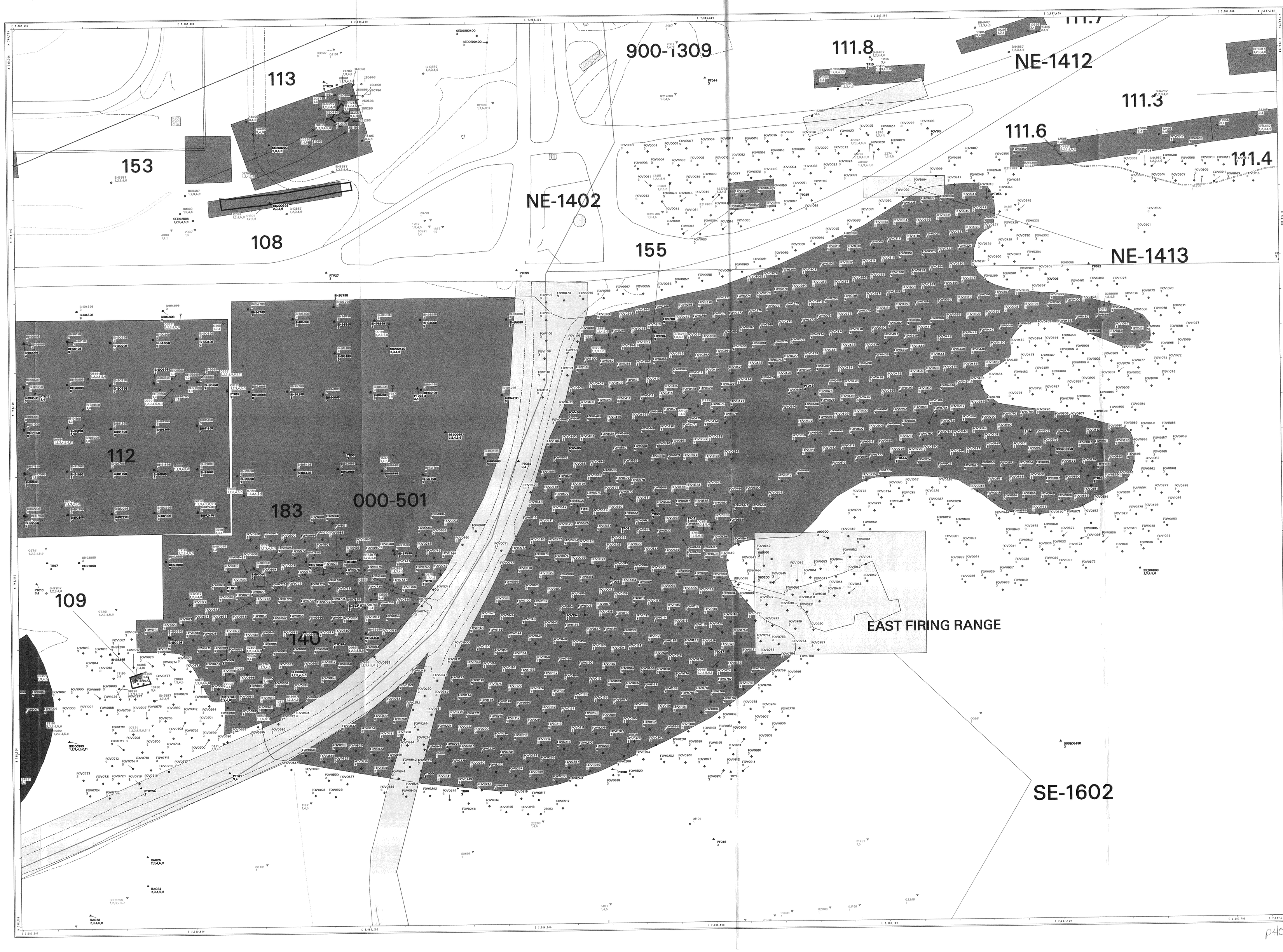
July 30, 2001



Buffer Zone Data Summary Report

Plate 13

IHSS 112 - 903 Pad
IHSS 155 - 903 Lip Area
IHSS 140 - Hazardous Disposal Area

EXPLANATION

- Borehole
- Surface Soil
- Sediment
- Borehole converted to Groundwater Well
- HPge (Test Method = 3)
- BZOU
- OU1
- PAC
- HRR Zone Boundary
- Industrial Area Boundary
- Excavation Boundary

Standard Map Features

- Buildings and other structures
- Lakes and ponds
- Streams, ditches, or other drainage features
- Paved roads
- Dirt roads

TEST METHODS

Subscript	Description
1	VOCs
2	SVOCs
3	Radionuclides
4	Metals
5	Water Quality Parameters
6	Pesticides
7	Pesticides/PCBs
8	VOCs (water)
9	PCBs
10	Total Petroleum Hydrocarbons
11	Herbicides
12	Nitrates
13	Geotech
DNA	Data Not Available

DATA SOURCE BASE FEATURES:
Buildings, fences, hydrography, roads and other structures from 1994 aerial fly-over data captured by EG&G RSL, Las Vegas. Digitized from the orthophotographs. 1/95

Scale = 1 : 920
1 inch represents approximately 77 feet

25 0 50 100ft

State Plane Coordinate Projection
Colorado Central Zone
Datum: NAD27

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p40 Ref: 01-RF-01753 82-A-00052