6.0 DATA MANAGEMENT

A variety of data types will be generated during IA and BZ characterization and remediation to support data analysis and reporting requirements. ER will manage in-process field analytical data so that the characterization staff can evaluate these data on a daily basis. All field analytical data will be transferred to ASD for long-term data management. All off-site analytical data will be managed by ASD.

Data generated during IA characterization and remediation will include, but not be limited to, the following:

- Sampling location data;
- Field parameters (depth, sample interval, field instrument readings, and so forth);
- Surface and subsurface soil analytical data; and
- Investigative-derived materials data (for example, soil stockpiles).

All data collected during these activities will meet RFETS data quality requirements and project DQOs. Investigation data will be used for the following purposes:

- Document IA and BZ investigation activities and decisions;
- Provide final characterization of all residuals left in the IA and BZ;
- Provide data for the CRA; and
- Support the CAD/ROD and post-closure monitoring.

A generalized overview of the IA and BZ investigation environmental data management process is shown on Figure 35. This diagram also identifies where electronic and hard-copy data may be located. The majority of data collected will be available electronically and stored in shared data systems accessible to all project team members. Current environmental data systems are summarized in Table 9. The data systems used to support the IA and BZ investigations are in common RFETS standard platforms to facilitate integration of data and information among media and make data easily available to users.

6.1 Data Management Requirements

Soil data collected as part of the IA and BZ investigations will be stored in the applicable database listed in Table 9. All data collected and/or information generated as part of the IA and BZ investigation will be managed in accordance with the requirements presented below.

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Figure 35

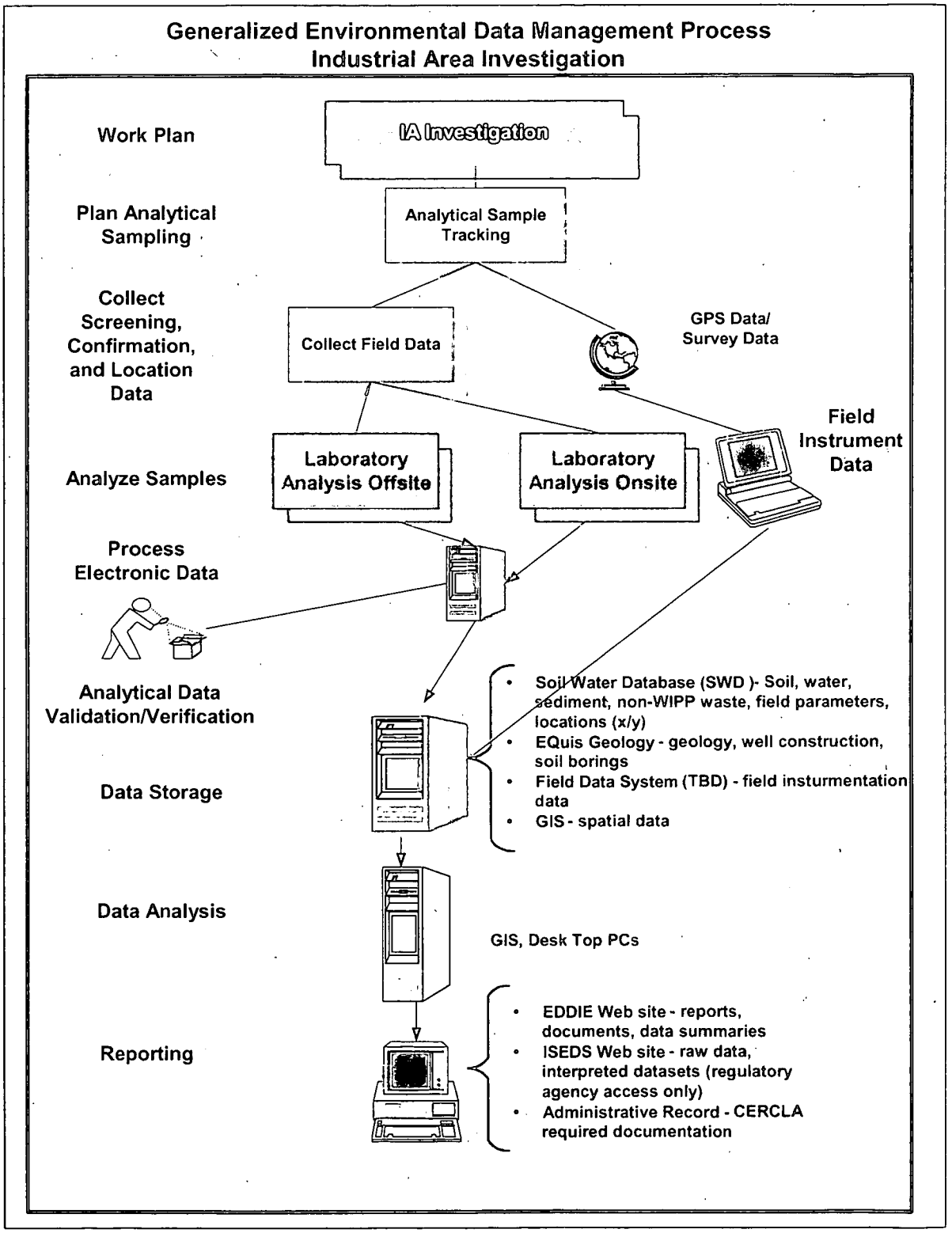
Generalized Environmental Data Management Process
Industrial Area Investigation
Work Plan
IA Investigation
Plan Analytical Sampling
Analytical Sample Tracking
Collect Screening, Confirmation, and Location Data
Collect Field Data
GPS Data/ Survey Data
Field Instrument Data
Analyze Samples
Laboratory Analysis Offsite
Laboratory Analysis Onsite
Process Electronic Data
Analytical Data Validation/Verification
Data Storage
Soil Water Database (SWD)- Soil, water, sediment, non-WIPP waste, field parameters, locations (x/y)
EQuis Geology - geology, well construction, soil borings
Field Data System (TBD) - field insturmentation data
GIS - spatial data
Data Analysis
GIS, Desk Top PCs
Reporting
EDDIE Web site - reports, documents, data summaries
ISEDS Web site - raw data, interpreted datasets (regulatory agency access only)
Administrative Record - CERCLA required documentation

Table 9
Current Environmental Data Systems at RFETS

Environmental Data System	Software Platform in FY00	Typical Data
Air Database (AIR)	Oracle V8.0	Effluent air, ambient air, meteorology
Soil Water Database (SWD)	Oracle V8.0	Laboratory analytical data for soil, groundwater, surface water, non-WIPP waste, sediment, and miscellaneous media; field parameters for environmental sampling; sampling locations (x/y)
Flow	Oracle V8.0	Surface water flow measurements
Ecology Database (SED)	Access	Ecological species, ecological sampling locations
Administrative Record (AR)	Oracle V8.0	Index of AR documents
Integrated Sitewide Environmental Data System (ISEDS)	Internet (regulatory agency access only)	Uninterpreted analytical data (all media), electronic field measurements, interpreted data sets, "residual" data sets
Environmental Data Dynamic Information Exchange (EDDIE)	Internet	Final environmental reports, photos, data summaries, and updated information on environmental programs
Geographic Information System (GIS)	ArcInfo V.8	Spatial data coverages for base features (topography, roads, buildings, and so forth) and interpreted spatial data for extent of chemical contamination
Remedial Action Decision Management System (RADMS)	Access	Database for ER characterization and remediation data
Waste and Environmental Management System (WEMS)	Oracle V 8.0	Waste drum tracking
Analytical Services Toolkit (AST)/EDDProPlus (BIG EDD)	Access/Oracle V 8.0	Laboratory analyses tracking, electronic laboratory analyses (EDD) processing

6.1.1 Sample Tracking Information

Laboratory Analytical Sample Tracking

All off-site laboratory analytical samples will be tracked using the Analytical Services Toolkit (AST) or equivalent system, which tracks the entire lifecycle of a sample request and provides a chain-of-custody. Samples will be numbered in accordance with ASD-003, *Identification System for Reports and Samples.*

Field Analytical Sample Tracking

All field analytical samples will be given an AST tracking number that will be used for the entire lifecycle of the sample request. The AST tracking number will ensure that data generated during characterization activities will be consistent with AST requirements and formats for transfer to SWD. Samples will be numbered in accordance with ASD-003, *Identification System for Reports and Samples.* Field analytical data will be tracked in the Remedial Action Decision Management System (RADMS) and transferred to SWD.

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6.1.2 Sampling Locations

Sampling Location Codes and Names

Sampling location codes and names used to support data analysis and Geographic Information System (GIS) analysis will be created following requirements specified in PRO-1058-ASD-005, *Environmental Data Management Procedure.*

Location Spatial Coordinates

Spatial coordinates will be collected at all sampling locations in accordance with OPS-PRO-947, *Location/Surveying.* Final approved coordinates will be stored in the SWD Master Location Table.

6.1.3 Analytical Laboratory Data

Electronic Analytical Data

Off-site laboratory analytical data collected during IA and BZ sampling activities will be processed, subjected to QC review and tracked through RADMS and EDDPRo Plus, and entered into SWD. Electronic analytical data packages in a portable document format (PDF) file will be managed by K-H ASD according to PRO-1058-ASD-005, *Environmental Data Management Procedure.*

Field Analytical Data

Field analytical data generated from instrument-specific software will be controlled, and data will be backed up daily on an RFETS server to ensure no loss of data occurs prior to transfer to ASD.

Hard-Copy Analytical Data

Hard-copy laboratory analytical data will be managed according to PRO-1058-ASD-005, *Environmental Data Management Procedure.*

6.1.4 Nonanalytical Field Data

Field Parameter Data

Field parameter data will be entered into RADMS and stored in SWD in accordance with PRO-1058-ASD-005, *Environmental Data Management Procedure.*

6.1.5 Maps

GIS Maps

GIS maps will be created using the RFETS GIS. All GIS files will be labeled and stored in the GIS tracking system following GIS Department SOPs. Map presentation will adhere to PRO-1130-ASD-006, *Spatial Data Map Control.*

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6.1.6 Samples/Data of Special Significance

Confirmation Soil Samples/Excavation Boundary Samples

Confirmation/excavation boundary soil samples collected to demonstrate performance will be labeled in SWD in accordance with PRO-1058-ASD-005, *Environmental Data Management Procedure*. Any excavation boundary samples representing material removed from the site will be labeled as no longer representative (NLR) in SWD within 10 days of determination.

NLR Data

If during characterization and remediation activities, data are determined to be NLR of site conditions (that is, source material has been removed and shipped from the site, or otherwise made not representative), they will be coded "NLR" in SWD within 10 days of determination in accordance with PRO-1058-ASD-005, *Environmental Data Management Procedure*.

Stockpile Sampling

Where treated or untreated soil has been stockpiled and sampled prior to returning it to an excavated location (put back), any sample results representative of the stockpile, and thus the returned soil, will be labeled with the appropriate final location in SWD.

Waste

All waste sample analyses and waste drums are tracked through the Waste and Environmental Management System (WEMS).

6.1.7 Final Decision Documents, Reports, and Data Sets

Final Reports - Electronic Version

All final reports and/or decision documents will be provided in electronic format to the RFETS Environmental Data Dynamic Information Exchange (EDDIE) Web site for dissemination to the public.

Final Reports - Hard Copy

All final reports and/or decision documents will be provided in hard copy to the CERCLA Administrative Record (AR) staff for inclusion into the RFETS AR.

Interpreted Report Data

The IA and BZ investigations will generate sets of subject matter expert (SME)-interpreted data to document decisions. These data sets will be created using RFETS standard software (such as Microsoft Excel, ArcInfo, or Microsoft Access) and will be stored electronically on the Integrated Sitewide Environmental Data System (ISEDS) Web site. Files will be clearly labeled to identify project and data set, and a text file

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describing the data set will be created and stored on the ISEDS site. Interpreted data sets will be provided to ISEDS within 10 days of submission of final approved report or decision document.

6.1.8 Field Analytical Data Management

Field analytical data generated during IA and BZ sampling activities will be managed so that data are easily configured and transferred to the appropriate Site databases. Field analytical data will be generated by several field instruments (Section 4.9). All field instrumentation will be equipped with instrument-specific software that will record and report all relevant environmental and QC data generated. Field measurements will be downloaded daily, or at the end of the sampling event if it is less than 1 day. Data will be configured for the following uses:

- ER data evaluation according to DQOs;
- Geostatistical analysis;
- AST; and
- SWD.

6.1.9 ER Data Evaluation

The ER data evaluation will include the following information for samples collected in each IHSS, PAC, and UBC Site:

- Location code;
- Project identification;
- Sample date;
- X-coordinate (latitude);
- Y-coordinate (longitude);
- Elevation;
- Depth interval;
- Sample type;
- Analyte;
- Results;
- Result units;
- MDLs/RLs;

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- Dilution factor (if applicable); and
- QC partners.

Geostatistical Evaluation

Geostatistical evaluation will include the following information:

- Location code;
- X-coordinate (latitude);
- Y-coordinate (longitude);
- Elevation;
- Depth interval;
- Soil horizon;
- Sample type;
- SOR for radionuclides at a sampling location relative to RFCA ALs; and
- SOR for nonradionuclides at a sampling location relative to RFCA ALs.

6.1.10 Field Instrument Data Deliverables

EDDs will be produced for all field sampling events through RADMS. EDDs will be consistent with ASD EDDs, but may include additional fields relevant only to the IABZSAP DQOs. If these additional fields are of archival value for future Site needs, SWD will be modified to accommodate the additional information.

Files will be in space-delimited text format that is easily portable to Microsoft Access or Microsoft Excel. The format may vary from the template displayed below; however, all records will include, at a minimum, the fields specified in Table 10.

6.1.11 Sample Handling and Documentation

Soil samples will be handled and containerized according to OPS-PRO.069, *Containerizing, Preserving, Handling, and Shipping of Soil and Water Samples.* Transferring and shipping samples will be performed according to PRO-908-ASD-004, *On-Site Transfer and Off-Site Shipment of Samples.*

Samples sent off site for analysis will require evaluation under 49 Code of Federal Regulations (CFR) 173, the U.S. Department of Transportation (DOT) radioactive materials criteria of 2,000 pCi/g total radioactivity. If radiological screening indicates levels above this threshold, samples may be analyzed on site or transported to off-site laboratories in accordance with hazardous materials transportation shipping requirements. DOT radiological screening samples will be collected and assigned a unique sample

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designation as described in Section 6.1.12. In addition, radiological screening samples collected under the IABZSAP will be sufficient to support DOT shipping and off-site laboratory license requirements.

Table 10
Electronic Digital Data Format

Field type	Field Name	Description	Definition
General Lab	LAB_CODE	Laboratory Code	Coded value identifying the analytical laboratory
Project-Specific	PROJECT_ID	Project Name	Project description/unique identification
Project-Specific	CUST_SAMP_NUM	Customer Sample Number	Text field used by the sampling team that identifies the sample
General Lab	LAB_SAMPLE_NUM	Laboratory Sample Number	Laboratory's unique sample identifier, assigned by the laboratory
General Lab	LAB_SAMPLE_RECEIPT_DATE	Laboratory Sample Receipt Date	Date laboratory received the sample
General Lab	LAB_BATCH_ID	Laboratory Batch ID	Laboratory's unique numeric identifier relating a group of samples to a given laboratory batch
General Lab	SAMPLE_VOLUME	Sample Volume	Volumetric amount of sample for analysis
General Lab	SAMPLE_VOLUME_UNIT_CODE	Sample Volume Unit Code	Coded value representing the volumetric units
General Lab	ALIQUOT	Aliquot Size	Volume or mass of aliquot analyzed
General Lab	ALIQUOT_UNITS	Units of Measure for the Aliquot	Units of measure for the volume or mass of the aliquot
General Lab	EXTR_METH_CODE	Code Denoting an Approved Sample Preparation/Extraction Method	Specific laboratory preparation or extraction procedure used to digest the sample prior to analysis
General Lab	ANAL_METH_NAME	Name of the Approved Test Method	Specific laboratory test methods used to analyze the sample
General Lab	% MOISTURE	Percent Moisture	Mass percentage of moisture in the sample; allows correction of result to dry weight basis
General Lab	LAB_EXTRACTION_DATE	Laboratory Extraction Date	Date the sample was extracted
General Lab	LAB_EXTRACTION_TIME	Laboratory Extraction Time	Time the sample was extracted
General Lab	LAB_ANALYSIS_DATE	Laboratory Analysis Date	Date of analysis
General Lab	LAB_ANALYSIS_TIME	Laboratory Analysis Time	Time of analysis
General Lab	INSTRUMENT_ID	Identification of Instrument	Unique ID number of the measurement system used to measure the sample
General Lab	CAS_NO	CAS Number	Code that identifies the analyte tested
General Lab	ANALYTE_NAME	Analyte Name	Name of the analyte
General Lab	RESULT	Measured Numerical Analytical Result	Analytical numeric result
General Lab	SIG_FIGS	Significant Figures	Number of significant figures for the result
General Lab	UNIT_CODE	Unit Code	Units used at the laboratory
General Lab	RESULT_TYPE_CODE	Result Type	Coded value identifying the type of sample, including all QC types (target, matrix spike, and so forth)
General Lab	DETECTION_LIMIT	Detection Limit	Numeric value representing the MDL or minimum detectable activity with same units as result
General Lab	DETECTION_LIMIT_TYPE_CODE	Detection Limit Type Code	Coded value indicating which detection limit was used (MDL, instrument detection, and so forth)
General Lab	BASIS	Wet or Dry Basis	Mass basis for reported concentration of a solid sample; typically, results are reported on a dry

Field type	Field Name	Description	Definition
			basis
General Lab	DILUTION_FACTOR	Serial Dilution Factor	Numeric factor when a sample was diluted prior to analysis
General Lab	RESULT_SEQUENCE_ID	Result Sequence Identifier	Unique record-level sequential identifier for the datum
General Lab	COMMENTS	Comment	Any comment that relates to the record
QC	SPIKE_AMOUNT	Amount of Spike Concentration or Reference Standard Value	Spike concentration of analyte or activity value for radioactive standards
QC	%_RECOVERY	Percent Recovery	Measured recovery, expressed as percentage, of a spike or reference standard value
QC	LCL	Lower Control Limit	Lower control limit on a measurement relative to a spike or reference standard amount
QC	UCL	Upper Control Limit	Upper control limit on a measurement relative to a spike or reference standard amount
QC	RPD	Relative Percent Difference	Relative percent difference between an original sample and its corresponding duplicate or replicate sample
QC	LAB_RESULT_QUALIFIER_CODES	Laboratory Result Qualifier Codes	Coded value indicating a laboratory qualifier or flag
QC	VALIDATION_QUALIFIER_CODE	Validation Qualifier Code	Coded value representing the validation qualifier or flag
QC	VALIDATION_REASON_CODES	Validation Reason Codes	Numeric value describing the reason for the validation qualifier
QC	VALIDATION_DATE	Validation Date	Date validation was performed on the laboratory batch
QC- Rad-Specific	COUNT_TIME	Counting Time for Radioactivity	Amount of time, in minutes, that sample was counted; for radiological measurements only
QC- Rad-Specific	DETECTOR_EFF	Detector Efficiency	Efficiency of the detector used for radiological measurement of the sample; unitless
QC- Rad-Specific	BACKGROUND	Radiological Background	Numeric background value
QC- Rad-Specific	CHEM_YIELD	Chemical Yield	Chemical yield of the tracer (radiometric) or carrier (gravimetric)
QC- Rad-Specific	BKGRD_UNITS	Background Units of Measure	Unit of measure for radiological background values, typically in pCi/g
QC- Rad-Specific	DUPLICATE_EQUIVALENCY	Duplicate Equivalency	Measure of precision using duplicate samples
QC- Rad-Specific	COUNT_ERROR	Counting Error	Measure of random error in the measurement based on the stochastic nature of radioactive decay
QC- Rad-Specific	TOTAL_ERROR	Total Error	Total error of the measurement, which includes random (for example, counting) and systematic error

Note: All parameter fields are left-justified and padded to the right with blanks. File Name field may be omitted if all records are provided as one file.

6.1.12 Sample Numbering

Unique sample numbers will be generated for each IHSS Group sampling effort. A report identification number (RIN) will be generated through the AST system. The unique sample number consists of the RIN, event number, and, if necessary, a bottle number. The event number is the sampling event at a given location and time. The bottle number is the number of bottles for multiple analyses from the same event.

The unique sample number format is presented below:

Format: YYNXXXX-EVT.BOT
RIN, seven digits, three parts YYNXXXX
YY= FY
N= use code
XXXX = sequential number

Each sample will be assigned a unique number in accordance with procedure ASD-003, *Identification System for Reports and Samples*. The RIN is used by ASD to track and file analytical data and will be designated by ASD prior to sampling activities. The unique sample number is broken down into the following three parts:

- RIN;
- Event number; and
- Bottle number.

As presented above, the RIN is a seven-digit alphanumeric code starting with the FY (for example, "00" for the year 2000). The RIN is followed by a dash, and then by the event number. The event number is a three-digit code, starting with "001" under the RIN, and is sequential. Each typical sampling location will have a unique event number under the RIN. QC samples will have unique event numbers to support a "blind" submittal to the analytical laboratories. The event number will be followed by a period, and then by the sequential bottle number. The bottle number is a three-digit sequential code, starting with "001," and is used to identify individual sample containers collected at the same location and same event number.

In addition to the sample numbering scheme above, additional information will be collected with respect to each sample and recorded on the project logsheets. This includes:

- Sample type; and
- QC code.

QC codes will include the following, as appropriate:

- REAL: regular sample; and
- DUP: duplicate sample.

A sample number will also be assigned to each sample collected for internal sample tracking. The block of sample numbers will be of sufficient size to include the entire

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number of possible samples (including QA samples) and location codes. In preparation for the final report, the ASD and project sample numbers will be cross-referenced with location codes.

6.2 Remedial Action Decision Management System

RADMS enhances RFETS staff's ability to manage the collection of samples, verify and validate analytical data, retrieve and analyze project-specific and Sitewide analytical data, and display and generate maps and reports. RADMS will interface with existing Site databases, including ASD and SWD, to ensure data consistency and integrity. Figure 36 illustrates the general data flow and system configuration.

Detailed specifications of the ER RADMS are described in the data management plan, which describes data generation, aggregation, QC, archival, and access policies. Field and analytical data are organized in Microsoft Access and linked with a GIS, specifically ArcView, to provide users with contaminant data by geographic location and the ability to perform spatial analyses as needed. The ER RADMS will interface with existing Site databases, including ASD and SWD, to ensure data consistency and retrievability.

ER staff intends to use RADMS to:

- Identify sampling locations;
- Manage the collection of samples;
- Track environmental samples and maintain chain-of-custody;
- Verify and validate analytical data;
- Retrieve project and Sitewide analytical data;
- Integrate historical data with new characterization data for statistics and reports;
- Perform Data Quality Assessments (DQAs) and evaluate project-specific data against predetermined quality objectives;
- Determine characterization sampling locations;
- Determine remediation areas;
- Determine confirmation sampling locations;
- Estimate risk from residual contamination;
- Produce maps and reports; and
- Provide a means to archive project data.

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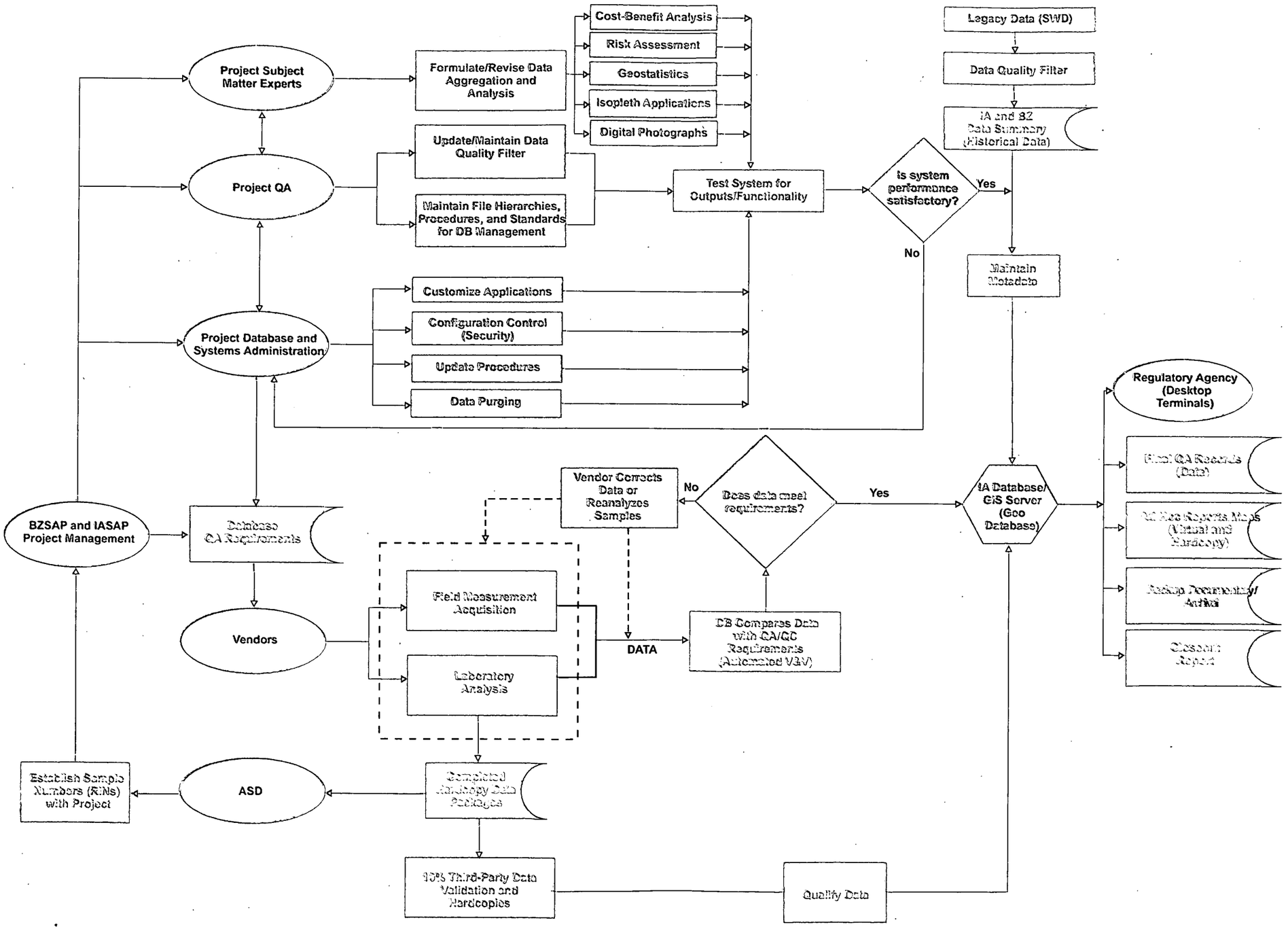
Figure 36
Remedial Action Decision Management System Configuration



RADMS will include several modules customized for ER program decision making. These modules and their current status are presented in Table 11.

Table 11
RADMS Modules

Module	Description	Status	Production Date
Geospatial	Used to identify sampling locations as required by DQOs	Implemented	August 2002
Field Data Collection	Used to organize field sampling information and produce sampling-related documentation	Implemented	September 2002
Verification and Validation	Used to verify and validate analytical sample data	Implemented	June 2003
Data Manager	Used to retrieve and reduce analytical data to project DQOs	Phase I implemented. Phase II implementation expected in March 2004.	March 2004
Environmental Data Transformer	Used to evaluate and transform SWD data into the RADMS data environment	Phase I implemented. Phase II implementation expected in March 2004.	March 2004
Risk Screen	Used to calculate human health and ecological risk	Contaminants of Concern Module implementation expected in March 2004. Other module implementation expected in June 2004.	June 2004

Additionally, RADMS will be available to CDPHE and EPA in their on-site ER offices. ER staff will work interactively with the regulatory agencies to:

- View existing data;
- Determine proposed characterization sampling locations;
- Determine remediation areas;
- Determine confirmation sampling locations; and
- Accelerate the review and approval process by working with virtual data and graphics prior to submittal of Closeout Reports.

6.2.1 Sample Tracking

All characterization and confirmation sampling locations will be identified and tracked through the RADMS Field Data Collection Module (FDCM). Samples will be located in accordance with the IABZSAP DQOs. The FDCM will track samples by project and

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sample purpose through the creation of Project Sampling Plans. The FDCM will generate all project-related sampling documentation, including Project Sampling Plans, bottle labels, and chains-of-custody.

6.2.2 Data Analysis

Data will be analyzed using several different modules as described above. The algorithms and data analysis routines are consistent with project DQOs. Data analysis will be performed on verified and/or validated data after characterization is complete, and again after remediation is complete. RADMS will also provide the capability to analyze and aggregate legacy data with characterization data if needed. Sitewide data analysis capabilities will also be available. A variety of statistical routines and tests will be linked to RADMS.

6.2.3 Verification and Validation

All data collected during ER characterization and remediation sampling will be verified and validated according to QA requirements. Verification will consist of ensuring that all data received from the analytical vendor(s) are complete and correctly formatted. Validation will consist of a systematic comparison of all QC requirements with results reported by the vendor (for example, relative to laboratory control samples [LCSs], matrix spikes [MSs], matrix spike duplicates [MSDs], and blanks). The V&V process will establish usability of the data by determining, reporting, and archiving the following criteria relative to each measurement set or batch:

- Precision;
- Accuracy;
- Bias;
- Sensitivity; and
- Completeness.

6.2.4 Spatial Analysis

Several data aggregation and evaluation options are available in the RADMS Geospatial Module. Spatial analysis will allow determination of contaminant concentration boundaries and isopleths as defined by RFCA ALs and background values. Additional functionality will be available to determine sampling locations and remediation areas, as well as graphical displays of geostatistical confidences in the values and decisions.

6.2.5 Risk Screen

The Risk Screening Module will be used to determine whether human health risks are acceptable in remediated areas. Algorithms in this module will be consistent with DQOs in the CRA Methodology (in progress) and IABZSAP.

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6.2.6 Reporting

RADMS is designed to allow RFETS staff to produce project reports and maps in a routine fashion. Hard-copy reports will typically consist of data tables, sampling location maps, chemical concentration posting maps, isopleth maps, remediation maps, and confirmation sampling location maps. Routine report elements will be available via RADMS workstations. User guides and training are provided to qualified users.

7.0 PROJECT ORGANIZATION

The overall project organization is designed to provide support to the project manager by ensuring the various support functions are consistent across the characterization program and available to the project. These support functions will include, but not necessarily be limited to, the following:

- H&S;
- QA;
- Field instrumentation and mobile laboratory services;
- Data configuration;
- Data analysis procedures;
- Interactions with ASD and SWD;
- Data management; and
- Reporting procedures.

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8.0 QUALITY ASSURANCE AND QUALITY CONTROL

QA requirements defined in this IABZSAP are consistent with quality requirements as defined by DOE (Order 414.1A, Quality Assurance) and EPA (QA/R-5, Requirements for Quality Assurance Project Plans for Environmental Data Operations, 1997b). These requirements are also consistent with RFETS-specific quality requirements as described in the K-H Team Quality Assurance Program, PADC-1996-00051 (K-H 1999).

The applicable QC categories include the following:

- **Management**
  - Quality Program;
  - Training;
  - Quality Improvement; and
  - Documents/Records
- **Performance**
  - Work Processes;
  - Design;
  - Procurement; and
  - Inspection/Acceptance Testing
- **Assessments**
  - Management Assessments; and
  - Independent Assessments.

The QAPjP (Appendix G) discusses in detail how these criteria will be implemented. The project manager will be in direct contact with the QA manager to identify and correct potential quality-affecting issues. Oversight of field sampling and analysis will be conducted to ensure data comply with quality requirements. The confidence levels of the data will be maintained by the collection of QC samples and implementation of the DQO process.

Data V&V will be performed according to ASD procedures. Analytical laboratories supporting this task undergo annual technical and QA audits performed by ASD.

Data quality will be measured in terms of the precision, accuracy, representativeness, completeness, and comparability (PARCC) parameters. Data collected during sampling activities will be evaluated using the PARCC parameters (Appendix G). Measurement sensitivity and bias will also be addressed.

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9.0 HEALTH AND SAFETY

All necessary H&S protocols will be followed in accordance with the specifications in the Integrated Work Control Program (IWCP), as appropriate. In addition, work will be conducted under Radiological Work Permits (RWPs), as applicable. A readiness review will be conducted before the start of field work for all IHSS Groups.

The Occupational Safety and Health Administration (OSHA) construction standard for Hazardous Waste Operations and Emergency Response, 29 CFR 1926.65, is followed at RFETS. Under this standard, an H&S plan that addresses the safety and health hazards of each phase of the project and specifies the requirements and procedures for employee protection will be developed. In addition, the DOE Order for Construction Project Safety and Health Management, 5480.9A, applies to this project. This Order requires the preparation of AHAs to identify each task, hazards associated with each task, and cautions necessary to mitigate the hazards. These requirements will be integrated wherever appropriate.

IABZSAP activities could expose workers to physical, chemical, and low levels of radiological hazards. Physical hazards include those associated with excavation activities, drilling, use of heavy equipment, noise, heat stress, cold stress, and work on uneven surfaces. Physical hazards will be mitigated by appropriate use of PPE and engineering and administrative controls. Chemical hazards will be mitigated by use of PPE and administrative controls. Appropriate skin and respiratory PPE will be worn throughout the project.

VOC monitoring will be conducted with an organic vapor monitor for any employees who must work near suspected VOC-contaminated soil (for example, soil sampling or excavation personnel). Based on employee exposure evaluations, the Site H&S officer may downgrade PPE requirements, if appropriate.

H&S data and controls will be continually evaluated. Field radiological screening will be conducted using radiological instruments appropriate to detect surface contamination and airborne radioactivity. As stated in 10 CFR 835, Radiation Protection of Occupational Workers, all applicable implementing procedures will be followed to ensure protection of workers. Dust minimization techniques will be used to minimize the suspension of contaminated soil.

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10.0 SCHEDULE

The schedule for characterization of IHSS Groups is shown on Figure 37. This figure illustrates the 2005 Working Schedule for RFETS Closure, but may change based on the decommissioning schedule and characterization acceleration opportunities.

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THIS TARGET SHEET REPRESENTS AN
OVER-SIZED MAP / PLATE FOR THIS DOCUMENT:
(Ref: 04-RF-01112; KLW-034-04)

Industrial Area and Buffer Zone Sampling and Analysis Plan Modification 1

Figure 37:

IHSS Group Schedule

NT_svr w:/projects/las/rsop/fy2003/schedules/closure_poster_fig-37.aml

CERCLA Administrative Record Document, SW-A-005011

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

GOLDEN, COLORADO

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11.0 REFERENCES

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LIST OF APPLICABLE STANDARD OPERATING PROCEDURES

Identification Number	Procedure Title
1-C91-EPR-SW.01	*Control and Disposition of Incidental Waters*
1-PRO-079-WGI-001	*Waste Characterization, Generation, and Packaging*
1-PRO-573-SWODP	*Sanitary Waste Offsite Disposal Procedure*
3-PRO-112-RSP-02.01	*Radiological Instrumentation*
4-S01-ENV-OPS-FO.03	*Field Decontamination Operations*
4-F99-ENV-OPS-FO.23	*Management of Soil and Sediment Investigative Derived Materials*
ASD-003	*Identification System for Reports and Samples*
ASD-004	On-Site Transfer and Off-Site Shipment of Samples
OPS-PRO.070	*Equipment Decontamination at Decontamination Facilities*
OPS-PRO.102	*Borehole Clearing*
OPS-PRO.112	*Handling of Field Decontamination Water*
OPS-PRO.114	*Drilling and Sampling Using Hollow-Stem Auger and Rotary Drilling and Rock Coring Techniques*
OPS-PRO.117	*Plugging and Abandonment of Boreholes*
OPS-PRO.121	*Soil Gas Sampling and Field Analysis*
OPS-PRO.124	*Push Subsurface Soil Sampling*
OPS-PRO-947	*Location/Surveying*
PRO-1058-ASD-005	*Environmental Data Management Procedure*
PRO-1130-ASD-006	*Spatial Data Map Control*
PRO-908-ASD-004	*On-Site Transfer and Off-Site Shipment of Samples*
RF/RMRS-98-200	*Evaluation of Data for Usability in Final Reports*

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	EPA Comments, October, 2003	Response
	1) Section 1.1.1, Accelerated Action Ecological Risk Screen Process, provides a good description of the process that will be used to identify data gaps associated with ecological receptors (i.e., the ecological action levels will be used during the Accelerated Action Ecological Screen). However, it is still not clear how and when the ecological action levels will be used in conjunction with the process to be used for the Wildlife Refuge Worker (WRW) Action Levels, as outlined in Section 3.0 (Inputs to the Decision). The presentation (as outlined in Item 4) appears to suggest that the ecological action levels would be used following a human health screening process, or that it will be two separate efforts. It is not evident as to why the WRW Action Levels are prioritized over the ecological action levels. It would be more efficient if both human health and ecological action levels could be used simultaneously in order to document data gaps. In addition, it is not evident whether the process as outlined, which utilizes a comparison to a background mean plus two standard deviations, would result in eliminating chemicals of potential ecological concern that may be above an ecological action levels. The document should indicate that the ecological action levels will be compared with WRW Action Levels to determine whether the lowest action level is associated with the WRW or an ecological receptor. If the lowest action level is associated with ecological receptors, then the Accelerated Action Ecological Screen Process will be	A sitewide Accelerated Action Ecological Screening Evaluation will be performed using a methodology developed by the inter-agency Risk Assessment Working Group.

	conducted. The document should also indicate that a table which presents a comparison of all action levels will be presented in the document.	
	2) It is indicated that the IABZSAP DQOs apply to surface and subsurface soil encountered during characterization and confirmation sampling. The DQOs should be adjusted to include provisions for sediment and surface water.	Consistent with RFCA the IABZSAP applies to surface and subsurface soil only.
	3) The document provides a list of 'PCOCs'. Please add dioxins to the list	Individual analytes are not included in the PCOCs, only groups of analytes. Individual PCOCs are determined on an IHSS Group basis.
	4) Item 2, Method Detection Limits (MDLs), indicates that the lowest RFCA Als for any exposure scenario are presented in Appendix E. Appendix E only contains human health action levels. The MDLs should be compared to ecological action levels, or PRGs, as available, to identify any MDLs that will above the action level. A table should be added to the text of the document to clearly identify all analytes with MDLs above the lowest action level	Appendix E was revised so that it is consistent with RFCA.
	5) Decision Rules: Which data points are being used in rule 5? This needs to be clearly specified in order for the rule to make sense	Section 3.1.1, *Decision Rules*, in Decision Rules 6 and 7 (page 50), the phrase "at a given location" was added to clarify that the SOR is calculated by location. Section 3.1.2, *Decision Rules*, in Decision Rules 5 and 6 (page 56), the phrase "at a given location" was added to clarify that the SOR is calculated by location.

	EPA Comments, January 22, 2004	**Response**
	General Comments	
1	This document is one piece of the overall effort to characterize and remediate Rocky Flats, and as a result of other efforts that are currently in progress, it is difficult to keep all documents and agreements consistent with each other. Some gaps and inconsistencies are present in this document that should be addressed and they are primarily related to efforts of the Risk Assessment Working Group to develop the final work plan for the Comprehensive Risk Assessment (CRA). Discussions regarding sampling in the buffer zone of unsampled areas on a 30 acre grid need to be finalized and the resulting agreed upon plan needs to be incorporated into this document. In addition, the DQOs described in this document need to be consistent with those of the CRA and the Data Adequacy Report.	CRA issues, including DQOs and sampling in unsampled areas are not addressed in the IABZSAP they will be included in the CRA Methodology and the Data Adequacy Report. The CRA Working Group has not yet finalized the CRA Methodology or the Data Adequacy Report. The following text was added to Section 1.2, paragraph 3: "While the IABZSAP describes sampling methods for CRA sampling, specific CRA DQOs are described in the CRA Methodology. Separate CRA sampling addenda will be developed to describe CRA sampling in accordance with CRA DQOs." (page 7)
	Specific Comments:	
2	Section 3.1.1. Page 43, The Problem There is no mention in this section that one of the main purposes it is serving is to determine whether an accelerated action should be taken based upon the data that is collected. Therefore	The decision whether to conduct an accelerated action is part of the ER RSOP not the IABZSAP. The IABZSAP describes the data evaluation criteria. As specified in Section 3.1.1, *The Problem*, first sentence "The nature and extent of contamination

	this should be included in the problem statement as well as in many other areas throughout the section, so that it is clear that the results of the characterization effort will be used to take accelerated actions where necessary and that accelerated actions are intended to be the main vehicle of remediation at the site.	must be known with adequate confidence to make accelerated action decisions". (page 42)
3	Page 45, Inputs to the decision: Section 4) RFCA comparison criteria: It should be mentioned here that RFCA ALs include not only human health, but also ecological levels. In addition, it should be mentioned that the eco levels are still in development and therefore, until they are final, all areas that undergo this sampling and evaluation process must be evaluated for ecological purposes at some later time.	A sitewide Accelerated Action Ecological Screening Evaluation will be performed using a methodology developed by the inter-agency Risk Assessment Working Group. In Section 3.1.1, *Inputs to the Decision*, number 4, "WRW" was added. (page 43) In Section 3.1.2, *Inputs to the Decision, number 6,* "WRW" was added. (page 53)
4	Section c) An exceedance is defined as either the ratio of each PCOC concentration to its AL > 1 or as the SOR for radionuclides > 1. Does this mean that rads are subject to both comparison criteria? If not, it should be clarified that only non-rads are subject to the first comparison	Section 3.1.1, *Inputs to the Decision*, number 4, item c) is specific to radionuclides. A separate item, item d) was added for non-radionuclides. (page 43) Section 3.1.2, *Inputs to the Decision*, number 6, item c) is specific to radionuclides. A separate item, item d) was added for non-radionuclides. (page 53)
5	Section e) Basically the same criteria are used to determine when PCOC concentrations are below RFCA Als. As stated above, the document needs to be clarified as to whether only non-rads are subject to	Section 3.1.1, number 4, and Section 3.1.2, number 6 and all sub-items are consistent with the IGD as specified by the regulatory agencies.

	the first comparison. Actually there really is no reason to define when data is "Below ALs" and the document would be improved by just deleting this section.	Section 3.1.1, number 4, Item e is specific to radionuclides. The nonradionuclide SOR is described in item f. (page 44). Section 3.1.2, number 6, Item e is specific to radionuclides. The nonradionuclide SOR is described in item f. (page 53).
6	Page 51, Decision Rules Rule 2: This rule addresses analytes that have ALs which are less than background levels. Such a situation indicates that one of these levels needs to be changed. In addition, it would be helpful to compile a list showing which analytes have AL < background levels so that these can be reviewed for possible revision. Also, in this situation would the AL be used or would the background level be used in making a determination about whether a PCOC becomes a COC?	DOE concurs that background values for some analytes should be recalculated. This issue is being discussed. There are no analytes with WRW ALs less than background.
7	Rule 3: Without a definition of the work "adequate", this rule is essentially meaningless.	In Section 3.1.1, *Decision Rules*, Decision Rule 3, the first occurrence of the word "adequately" was deleted (page 50) In Section 3.12, *Decision Rules*, Decision Rule 3, the first occurrence of the word "adequately" was deleted. (page 54)
8	Rule 6: If this rule only applies to non-rads, then that should be explicitly stated in the rule itself.	In Section 3.1.1, *Decision Rules*, Decision Rule 5 (now 6) was changed to indicate that it is for radionuclides. A new decision rule, Decision Rule 7 states that this rule is for nonradionuclides. (page 50) In Section 3.1.2, *Decision Rules*, Decision Rule 5 was changed to indicate that it is for radionuclides. A new decision rule, Decision Rule 6 states that this rule is for nonradionuclides.

		(page 56)
9	Rule 7: This rule should also state that the evaluation should follow the Ecological Accelerated Action Screening Process.	A sitewide Accelerated Action Ecological Screening Evaluation will be performed using a methodology developed by the inter-agency Risk Assessment Working Group. A decision rule is not required.
10	Figure 20, AOC Determination This figure should be renamed, since it covers much more than just AOC determination. It should also show that the eventual use of the data will be in the CRA.	Figure 20 (now Figure 19) (page 45) encompasses both the initial AOC determination based on existing data and the final AOC determination based on characterization and/or confirmation data. Figure 20 (now Figure 19) (page 45) was modified to reflect multiple OUs. The title is correct, however it was changed to "Initial and Final AOC Determination" to more accurately reflect the contents of the Figure. The "remediation" box was changed to "no further accelerated action". While the data may be used in the CRA, the determination of what data will be used is part of the CRA Data Adequacy Report

	CDPHE Comments, January 13, 2004	Response
1	Section 1.0 (page 1) The words "surface and subsurface" have been deleted throughout this document, which is appropriate wherever they are connected to action levels. However, there are distinctions between surface and subsurface sampling methods and how the sampling results are applied to surface and subsurface soil. The words should be inserted back into the first sentence of the first paragraph. Add the words "accelerated action" to the first sentence of the second paragraph ("...streamline the accelerated action decision process...") to distinguish this sampling process from the CRA sampling.	In accordance with the RFCA Modification (June 2003) there are no longer separate ALs for surface and subsurface soil (even through there may be different cleanup levels). Subsurface sampling methods are specifically called out in Section 4.9.3 (page 97). Accelerated action will not be added before the words decision process in the first sentence of the second paragraph. As specified in Section 3.1.1, first paragraph, first sentence: "The nature and extent of contamination must be known with adequate confidence to make accelerated action decisions." (page 42)
2	Section 1.1 (page 4) The advantages of the IA strategy would be clearer if the second to last sentence in the third paragraph of this section were expanded: The IA Strategy approach accelerates document preparation and review times by consolidating IHSSs into groups and requiring significantly fewer documents.	The following text was added in Section 1.1, third paragraph, fourth sentence: "...by consolidating IHSS, PAC, and UBC sites into groups that require significantly fewer documents." (page 4)

3	Section 1.3 (page 8) The third paragraph in this section should reflect the current SAP Addenda review and approval process. Addenda are often provided to CDPHE months prior to initiating work and the process generally involves a comment/comment resolution cycle, so the first sentence should read: "CDPHE and EPA will have 14 calendar days to review, provide comments, ask for an extension, or approve the Addenda". The 4th sentence should also be changed: "The regulatory agencies will be contacted to confirm that an addendum is approved if the regulatory agencies have not responded within the 14-day period".	Section 1.3, third paragraph, first sentence was revised to state: "CDPHE and EPA will have 14 calendar days to review and provide comments on IABZSAP Addenda. DOE will discuss and resolve regulatory agency comments before a final addendum is issued." (page 8)
4	Section 2.3 (pages 13-40) and Figures 5, 6, 7, 9, 11, 12, 14, 15, 16, 17, and 18 This section does not mention the 2003 modifications to RFCA, which further consolidated all the existing OUs into the IA and BZ OUs. This section and these figures continue to describe OUs 2, 4, 5, 6, 7, 8, 9, 10, 12, 13, and 14 in the present tense in some places. IHSS 143 (Old Outfall) and IHSS 165 (Triangle Area) should not be shown on the OU 6 map in Figure 9. They were moved out of OU 6 into the IA OU as a result of the OU consolidation in the 1996 RFCA. It is probably more confusing than helpful to continue to use the former OU designations beyond the Table 2 cross-referencing. It is also questionable whether this OU by OU presentation is necessary given the comprehensive compilation of data in Appendix C.	The initial consolidation of OUs into the IA and BZ OUs was approved by the regulatory agencies as Attachment 1 of RFCA (1996). The 2003 RFCA modifications did not further consolidate existing OUs into the IA and BZ OUs. Further consolidation was proposed in a 2003 RFCA Quarterly Report as an update to RFCA Attachment 1 and was agreed to by the RFCA Parties in April 2004. Changes are reflected in Table 2 (page 13) as appropriate. The OU 6 coverage on Figure 9 (page 27) was changed.

5	Figure 14 The OPWL lines on this map do not agree in some places with the maps being used for the OPWL characterization and remediation projects. The map does not necessarily have to be replaced, however.	The OPWL maps are continuously updated as work progresses. No action is necessary.
6	Section 3.1 (page 43) This section lists four purposes for the data collected under these DQOs. An inherent purpose in #3 is to determine where additional data collection outside of IHSSs (areas formerly known as White Space) may be necessary to adequately support the CRA. The IABZSAP should acknowledge that the data adequacy process in the CRA Methodology (which has now been removed as Appendix D) may identify the need for additional data collection under its own set of DQOs.	CRA DQOs are not addressed in the IABZSAP they will be included in the CRA Methodology. The CRA Working Group has not yet finalized the CRA Methodology or DQOs. A data gap analysis is being conducted to determine if additional sampling to meet CRA requirements is required. The following text was added to Section 1.2, paragraph 3: "While the IABZSAP describes sampling methods for CRA sampling, specific CRA DQOs are described in the CRA Methodology. Separate CRA sampling addenda will be developed to describe CRA sampling in accordance with CRA DQOs." (page 7)

7	Section 3.1.1 – *Inputs to the Decision* (page 44) The second item of information, MDLs, should also include minimum detectable activities to cover radionuclide PCOCs. Please verify the statement that all MDLs are lower than RFCA ALs. Appendix E currently lists MDLs that are greater than ALs. Is this statement also true for field instrument MDLs?	The text in Section 3.1.1 *Inputs to the Decision*, number 2 was changed to the following: 2. Method Detection Limits/Reporting Limits Reporting limits (RLs) for accelerated action data and method detection limits (MDLs) for existing data for IA and BZ PCOCs and analytical methods are presented in Appendix E. Analytical methods are organized in tables by general analytical suite. The tables present the minimum required analytes within each respective suite, as well as the required analytical sensitivity for each analyte. Sensitivities are expressed as RLs or MDLs, and are specific to the measurement systems used for IA and BZ sample analysis. (page 43) There are no MDLs greater than the existing RFCA Wildlife Refuge Worker ALs. Required RLs for arsenic are slightly less than the Wildlife Refuge Worker ALs. However, the RLs listed in Appendix E will change based on laboratory conditions and are frequently lower. This is evidenced by all the arsenic detections at the Site. Additionally, metals are not compared to the RL for inclusion in the AOC, they are compared to background mean plus two standard deviations.
8	Section 3.1.1 – *Inputs to the Decision* (page 44) To be consistent, the second sentence of item 4. a) should be modified: PCOC concentrations for organics will be compared to detection limits.	The text in Section 3.1.1, *Inputs to the Decision,* number 4, item a) was changed to the following: "Soil PCOC concentrations for inorganics will be compared to the background mean plus two standard deviations. Soil PCOC concentrations for organics will be compared to MDLs for existing data or RLs for accelerated action data." (page 43)

9	Section 3.1.1 – *Inputs to the Decision* (page 45) The phrase, "either nonradionuclides or", must be added back to items c) and e) in order to be compliant with RFCA Attachment 5 (Section 1.1) and the IGD (Section 3.7.2).	Non-radionuclides were added in Section 3.1.1, *Inputs to the Decision,* number 4, as a new item d). (page 43)
10	Section 3.1.1 – *Input to the Decision* (page 45) The five bullets under item f) go beyond determining the extent of an AOC and should be limited to that process or be re-titled. The description of this process should clarify that it begins with the data from an individual IHSS, PAC, or UBC rather than IHSS groups.	Section 3.1.1, *Inputs to the Decision*, number 4, item g [formerly f]) correctly describes the AOC process. The data is collected and described for the entire IHSS Group not on individual IHSS, PAC, or UBC sites. (page 44) Figure 20 (now Figure 19) was changed to clarify these concepts. (page 45) "Hot spot" in these sections was changed to "localized area of elevated PCOC concentration".
11	Figure 20 The process in this figure goes beyond determining the extent of an AOC and should be limited to that process or it should be re-titled. It is unclear what is meant by "Manage or Evaluate" to the right of the decision diamond asking, "Is remediation needed?"	Figure 20 (now Figure 19) encompasses both the initial AOC determination based on existing data and the final AOC determination based on characterization and/or confirmation data. Figure 20 (now Figure 19) was modified to reflect multiple OUs. The title is correct, however it was changed to "Initial and Final AOC Determination" to more accurately reflect the contents of the Figure. The "remediation" box was changed to "no further accelerated action". (page 45)

12	Section 3.1.1 – *Input to the Decision* (page 47) The Accelerated Action Ecological Screening Process (AAESP) has been added as the 7th input for making characterization decisions per this IABZSAP. However, the AAESP will not generate data on its own. Ecological data should be included as part of the "IABZSAP-generated characterization data" mentioned in item #6. Since the AAESP is largely independent from the IABZSAP decision process, including the AAESP as here as a source of data and in Appendix D may not be appropriate. It and the CRA Methodology should certainly be mentioned and their relationship to the IASZSAP summarized.	The text in Section 3.1.1, *Inputs to the Decisions*, number 7 was changed to the following: "Ecological information developed as part of the Accelerated Action Ecological Screening Evaluation (Appendix D)." (page 46)
13	Figures 22 and 24 The box at the top of these diagrams should read, "Usable Data (see Figure 21)". The new loop in these flow diagrams for nonradionuclides is unnecessary and is inconsistent with RFCA Attachment 5 and the IGD. All PCOCs should go through the paths that are now designated for radionuclides only. The term "single data point" in the Decision Rule 4 decision diamond should probably be replaced with "PCOC concentration" to be consistent with the text.	The first box at the top of Figure 22 (now Figure 21 on page 48) and 24 (now Figure 23 on page 55) was changed to "Dataset from DQF Process (Figure 20)". A separate loop for non-radionuclides is required and a box was added for the agreed-to SOR. In accordance with RFCA, the SOR for the RFCA radionuclides must be calculated. The term "single data point" was changed to "PCOC concentration".

14	Figure 23 The box at the top of the diagram should read, "Usable Data (see Figure 21)". The words, "for radionuclides", should be deleted from the second decision diamond.	The first box at the top of Figure 23 (now Figure 22, page 49) was changed to "Dataset from DQF Process (Figure 20)". A new decision diamond was added for non-radionuclides.
15	Section 3.1.1 –*Decision Rules* (page 51) The phrase, "metal and radionuclide PCOCs", should be changed to "inorganic and radionuclide PCOCs" twice in Decision Rule #2. A hot spot evaluation step should be included in the decision rules as it is in Figure 24. Section 5.2 should be referenced. Decision rules 4, 5, 6, and 7 must be revised to comply with RFCA Attachment 5 and the IGD. The following revisions are suggested: If a single maximum PCOC concentration in surface soil is equal to or greater than its RFCA AL, aggregation and evaluation as described in decision rule 6 are necessary in accordance with RFCA requirements. If surface soil concentrations at a given location for 2 or more PCOCs exceeds 10% of their respective WRW ALs	The phrase "metal and radionuclide PCOCs" in Section 3.1.1, Decision Rules, Decision Rule 2, was changed to "inorganic and radionuclide PCOCs." (page 46) The following decision rule was added to Section 3.1.1 *Decision Rules*, Decision Rule 9 (page 50) and to Section 3.2.1 *Decision Rules,* Decision Rule 8 (page 56): "If a single maximum surface soil COC concentration is equal to or greater than the RFCA AL and the ratio of the 95% UCL of the mean concentration to its respective RFCA AL is greater or equal to 1, additional evaluation as a potential hot spot will be necessary." The text is correct as stands. Decision Rule 5 (now 6) must be included because it is the radionuclide SOR. The following Decision Rule was added to Section 3.1.1, *Decision Rules*, Decision Rule 7: "If more than one non-radiological contaminant concentration is detected above RLs for organics or background mean plus two standard deviations for inorganics and exceeds 10 percent of the respective WRW AL, then an SOR at a given location will be calculated for those contaminants that exceed 10 percent of their WRW AL. If a SOR exceeds 1, the nonradiological carcinogenic contaminants and non-radiological noncarcinogenic contaminants may each be

	(10^{-6} risk or 0.1 of HI), then sum-of-ratios (SOR) values will be separately calculated, as necessary, for radionuclides, for non-radiological carcinogenic PCOCs, and for non-radiological non-carcinogenic PCOCs. If an SOR value at a given location is greater than or equal to 1, aggregation and evaluation as described in decision rule 7 will be made in accordance with RFCA requirements. Otherwise the PCOC concentrations are less than the RFCA ALs and the soil does not need to be further evaluated or remediated in accordance with RFCA requirements. If the ratio of the 95% UCL of the mean concentration for a PCOC in surface soil to its respective RFCA AL across the AOC is greater than or equal to 1, the PCOC is considered a COC and a remedial action decision will be made in accordance with RFCA requirements. Otherwise the PCOC concentrations are less than RFCA ALs in that AOC and the soil does not need to be further evaluated or remediated in accordance with RFCA requirements. If the SOR of the 95% UCL of the mean concentration for all PCOCs identified in Decision Rule #5 to 10% of their respective ALs across the AOC is greater than or equal to 1, the PCOCs are then considered COCs. Remedial action decisions based on COCs will be made in accordance with RFCA requirements. Otherwise the PCOC concentrations are less than RFCA ALs in that AOC and the soil does not need to be further evaluated or remediated in accordance with RFCA requirements.	summed separately. Data will be aggregated and evaluated as described in Decision Rule 8 in accordance with RFCA requirements. Otherwise the soil does not need to be further evaluated or remediated in accordance with RFCA requirements. If further evaluation is necessary, they may also be summed by target organ." (page 50) The other decision rules are correct as stand. Replacing evaluate or manage with remediation is not appropriate in this decision document because the remedial decision is part of the ER RSOP process not part of the SAP process. The following decision rules were added to Section 3.1.1, *Decision Rules*: Decision Rule 9 (page 50) "If a single maximum surface soil COC concentration is equal to or greater than the RFCA AL and the ratio of the 95% UCL of the mean concentration to its respective RFCA AL is greater or equal to 1, additional evaluation as a potential hot spot will be necessary". Decision Rule 10 (page 50) If a single subsurface soil COC concentration is equal to or greater than the RFCA AL evaluation as described in the RFCA Subsurface Soil Risk Screen is necessary.

	If soil contamination is identified below 6 inches in depth, evaluation as described in the RFCA Subsurface Soil Risk Screen is necessary.	
16	Section 3.1.2 – *Inputs to the Decision* (page 54) The fourth item of information, MDLs, should also include method activity limits (MALs) to cover radionuclide COCs.	The text in Section 3.1.2, *Inputs to the Decisions*, number 4 was changed to the following: 4. "Reporting Limits/Method Detection Limits RLs for accelerated action data and MDLs for existing data for IA and BZ COCs and analytical methods are presented in Appendix E. Analytical methods are organized in tables by general analytical suite. The tables present the minimum required analytes within each respective suite, as well as the required analytical sensitivity for each analyte. Sensitivities are expressed as RLs or MDLs, and are specific to the measurement systems used for IA and BZ sample analysis". (page 52)
17	Section 3.1.2 – *Inputs to the Decision* (page 55) The phrase, "either nonradionuclides or", must be added back to items c) and e) in order to be compliant with RFCA Attachment 5 (Section 1.1) and the IGD (Section 3.7.2).	Nonradionuclides were added as Section 3.1.2, *Inputs to the Decision*, number 6, item d) (page 53).
18	Section 3.1.2 – *Decision Rules* (pages 56 and 58) The comments above on the Decision Rules in Section 3.1.1 also apply to this section. Because these decision rules concern confirmation sampling, the term COC rather than PCOC should be used throughout.	PCOC was changed to COC as appropriate in Section 3.1.2, *Decision Rules* The phrase "metal and radionuclide COCs" in Section 3.1.2, Decision Rules, Decision Rule 2, was changed to "inorganic and radionuclide COCs." (page 54)

		The following decision rule was added to Section 3.1.1 *Decision Rules*, Decision Rule 9 (page 50) and to Section 3.2.1 *Decision Rules,* Decision Rule 8 (page 56): "If a single maximum surface soil COC concentration is equal to or greater than the RFCA AL and the ratio of the 95% UCL of the mean concentration to its respective RFCA AL is greater or equal to 1, additional evaluation as a potential hot spot will be necessary." The text is correct as stands. Decision Rule 5 must be included because it is the radionuclide SOR. The following Decision Rule was added to Section 3.1.2, *Decision Rules*, Decision Rule 6: "If an action was required based on a non-radiological SOR, and if more than one nonradiological contaminant concentration is detected above RLs for organics or background mean plus two standard deviations for inorganics and exceeds 10 percent of the respective WRW AL, then an SOR at a given location will be calculated for those contaminants that exceed 10 percent of their WRW AL. If a SOR exceeds one, the nonradiological carcinogenic contaminants and nonradiological noncarcinogenic contaminants may each be summed separately. Data will be aggregated and evaluated as described in Decision Rule 7 in accordance with RFCA requirements. Otherwise the soil does not need to be further evaluated or remediated in accordance with RFCA requirements. If further evaluation is necessary, they may also be summed by target organ." (page 56) The other decision rules are correct as stand. Replacing evaluate or manage with remediation is not appropriate in this decision document because the remedial decision is part of the ER RSOP

		process not part of the SAP process. The following decision rules were added to Section 3.1.2, *Decision Rules*: Decision Rule 8 (page 56) "If a single maximum surface soil COC concentration is equal to or greater than the RFCA AL, and the ratio of the 95% UCL of the mean concentration to its respective RFCA AL is greater or equal to 1, additional evaluation as a potential hot spot will be necessary". Decision Rule 9 (page 56) If a subsurface soil COC concentration is equal to or greater than the RFCA AL, evaluation as described in the RFCA SSRS is necessary. Additionally, please see response to comments 9, 10, 11, 13, 14.
19	Section 3.1.3 (page 60) The CRA will evaluate more than just the "soil contamination in accelerated action areas within the IA and BZ." This section should explain that data for the CRA will come from a combination of sources: 1) characterization sampling if the sample location remains intact, 2) confirmation sampling in remediated areas, and 3) any additional sampling required by the CRA DQOs to fill data adequacy needs (see Section 4.0).	Data used in the CRA is described in the CRA Methodology and is not addressed in the IABZSAP. The following text was added to Section 1.2, paragraph 3: "While the IABZSAP describes sampling methods for CRA sampling, specific CRA DQOs are described in the CRA Methodology. Separate CRA sampling addenda will be developed to describe CRA sampling in accordance with CRA DQOs." (page 7)

20	Section 4.0 (page 66) Figure 25 does not show IHSSs, PACs, and UBCs as implied in the first bullet.	The text in Section 4.0, paragraph 1, bullet 1 was changed to "Figures 1 and 2." (page 59)
21	Figures 26, 27, and 28 In these flow diagrams, PCOCs are eliminated and hot spots are evaluated before sampling begins.	These diagrams (now Figures 25, 26, and 27) are used to describe the process, using existing data, to determine sampling locations. Please refer to Figure 35 for information on when hot spots are evaluated. The words "hot spot" on these diagrams was changed to "localized areas of elevated PCOC concentration". Additionally, the text of the lead-in box (Figure 20) was clarified.
22	Section 4.2.2 (page 73) The paragraph which begins, "This methodology will provide..." could be added to the end of the second method of developing statistical grids. The next paragraph, which begins "At UBCs and IHSSs or PACs...", could become method #3.	The paragraph break in Section 4.2.2, between bullet 2 and the next paragraph was removed. The second paragraph break in Section 4.2.2 was removed and the text is now part of Method 2. (page 66).
23	Section 4.2.2 (page 74) The new discussion about sampling grid size differs from the previous discussion of grid size in the now deleted Section 4.3. This method should be more completely explained to show how it satisfies the Gilbert methodology and to explain whether it satisfies MARSSIM protocols. The discussion about the statistically minimum number of samples has been deleted from the paragraph about small-	The references to Gilbert's methodology are in Section 4.2.2., page 66. The IABZSAP methodology more than satisfies MARSSIM requirements because MARSSIM only requires 14 samples at all areas of concern. Section 4.2.2 (page 64 - 67) is characterization sampling and Section 4.5.2, which is now Section 4.4.1 (page 82) is

	sized IHSSs and PACs. The minimum number of 5 samples remains in sampling location method #2 in Section 4.5.2 (pages 92). This deletion should be explained.	confirmation sampling.
24	Section 4.5.2 (page 92) The last sentence in Section 4.5.1 states that field analytical data may be used for confirmation sampling if the regulatory agencies concur. The 5th sampling location method in Section 4.5.2 assumes this concurrence with respect to using HPGe for radiological contamination. The guidance and policy from EPA and CDPHE regarding radiological confirmation sampling has always been that field data could be used to support and supplement laboratory analyses, but laboratory data must be the primary basis for final completion of remediation decisions.	By approving the IASAP and BZSAP the agencies agreed that this approach was acceptable. (IASAP and BZSAP Section 4.5.2) The use of field analytical data for confirmation sampling was discussed with CDPHE and EPA and approved by EPA for use in the BZ. As such, this concept needs to be included in the IABZSAP. (Section 4.4.2, number 5, page 83)
25	Table 8 (page 127) Footnote 2 should read, "The AOC is initially based on…."	The text in Section 5.1.1, footnote to Table 8 was changed as suggested. (page 104)
26	Section 5.1.1 (page 12) The last sentences of the last two paragraphs are specific to the CRA data aggregation process and should be deleted.	The last sentences of the last two paragraphs in Section 5.1.1 were deleted. (page 104)
27	Section 5.1.2 (page 128) Step 2 should state, "SORs will be calculated when the	Section 5.1.2 was changed to match DQOs. (page 104)

	concentrations of 2 or more PCOCs exceed 10% of their respective ALs." Step 3 should state, "If the point-by-point comparison indicates that an analyte exceeds the RFCA AL or the SORs exceed 1, then the 95% UCL for that analyte will be calculated across the AOC." These steps seem redundant and slightly inconsistent with the decisions rules in Section 3.1.1.	
28	Section 6.1.9 (page 143) Replace the words, "and nonradionuclides" back into the last bullet.	The last bullet in Section 6.1.9 was not changed. A new bullet was added for nonradionuclides. (page 119)

29	EDITORIAL / TYPOGRAPHICAL: Have or will the appropriate changes due to RFCA modifications also be made to the appendices?	Yes, the appendices were modified to combine the IASAP and BZSAP, as appropriate and to bring them into compliance with the RFCA Modification of June 2003. Appendix A was not modified. Appendix B was modified to combine the IA and BZSAPs. Appendix C was modified to combine the IASAP and BZSAP text. Appendix D was modified to the Accelerated Action Ecological Screening Evaluation. Appendix E was modified to incorporate WRW ALs and to separately list MDLs for existing data (consistent with the IASAP and BZSAP) and RLs for accelerated action data. Appendix F was modified to add a column for the M+2SD. The surface soil background value for Uranium, Total was added and the subsurface soil background value for several metals was corrected. Appendix G was modified to change Tier 1 and Tier 2 to WRW ALs. The Appendix letter was changed to H. Appendix H was modified to change Tier 1 and Tier 2 to WRW ALs, combine the IA and BZSAPs, and to further describe QC samples. The Appendix letter was changed to G Appendix H-1was modified to change Tier 1 and Tier 2 to WRW ALs and combine the IA and BZSAPs. The Appendix letter was changed to G. Appendix I was modified to clarify that the regression was for in-situ HPGe analysis and to change Tier 1 and Tier 2 to WRW ALs. Appendix J was modified to change Tier 1 and Tier 2 to WRW ALs. Appendix K was not modified. The appendices will be provided in the final document.

	Due to deletions, some subsections need to be re-numbered. Page 1 – There is an extra "and" in the last sentence of the second paragraph. Suggest combining the last two sentences of the second paragraph in Section 1.0: IABZSAP Addenda will supplement the IABZSAP by providing specific characterization plans and will be prepared when circumstances present characterization opportunities.	The agencies were provided with a redline/strike out version that DOE recognizes can be confusing. The sections and subsections were renumbered when the redline/strikeout was removed. The extra "and" was removed from Section 1.0, second paragraph, last sentence. (page 1) The last 2 sentences of Section 1.0 paragraph 2 were combined as suggested. (page 1)
30	Page 43 – Add "and" after decision #1 under *Identification of Decisions*; remove "and" at the end of decision #2 and add a period.	In Section 3.1.1, *Identification of Decisions* "and" was removed at the end of the second bullet of Section 3.1.1, and a period was added. "And" was added to the end of the first bullet. (page 42)
31	Pages 45 and 55 – Item e) should be changed to d).	This change was made when the redline/strikeout was removed. (page 43 and 53)
32	Page 47 – The "1" labeling the first item under *Study Boundaries* has been struck out, but should be left as is. In the second item under *Study Boundaries*, the phrase, "located in the IA and BZ", is superfluous. In the fourth item, delete "IA" and change "IASAP" to "IABZSAP".	This change was made when the redline/strikeout is removed. In Section 3.1.1, *Study Boundaries* the "IA" in the fourth bullet (now the third bullet) was deleted and "IASAP" was changed to "IABZSAP". (page 46) In Section 3.2.1, *Study Boundaries* the "IA" in the sixth bullet was deleted. (page 54)

33	Figure 22 – The word "No" is missing between Decision Rule 4 and Decision Rule 5.	The word "No" was added between Decision Rule 4 and Decision Rule 5 on Figure 22 (now Figure 21) (page 48).
34	Page 58 – Remove the "4" at the top of the page and adjust the remaining numbers.	This change was made when the redline/strikeout was removed.
35	Page 60 – The phrase "within the IA and BZ" is repeated in the first paragraph of Section 3.1.3.	In Section 3.1.3, first paragraph, last sentence, the second occurrence of the phrase "within the IA and BZ" was removed. (page 57)
36	Page 73 – Add the word "detector" or "instrument" after the second HPGe in item 2.	In Section 4.2.2, item 2, the word "detector" was added after the second occurrence of HPGE. (page 66)
37	Page 91 – The number of the first sampling location method should be changed from 2 to 1	This change was made when the redline/strikeout was removed. (page 82)
38	Page 93 – It is unclear why "4.6" is struck out to the left of the Characterization Sampling Strategy title.	This change was made when the redline/strikeout was removed. This section is now Section 4.5. (page 84)
39	Figure 33 – It is unclear why this map is needed, since all the features are already on Figures 31 and 32.	Figure 33 was deleted.
40	Page 134 – Change the reference in the third bullet to Section 5.3.4.	The reference in Section 5.3.3, third bullet was changed to Section 5.3.4. (page 111)

41	App. E – The title of this appendix should probably include "minimum detectable activities" to cover radionuclide PCOCs.	Based on the modifications to Appendix E, the title was changed to include "reporting limits".

APPENDIX A

Industrial Area and Buffer Zone Sampling and Analysis Plan Modifications

APPENDIX B

Industrial Area and Buffer Zone Sampling and Analysis Plan
Example Addendum
IHSS Group 700-4

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ACRONYM LIST

D&D	Decontamination and Decommissioning
DQO	Data Quality Objective
IA	Industrial Area
IASAP	Industrial Area Sampling and Analysis Plan
IHSS	Individual Hazardous Substance Site
IWCP	Integrated Work Control Package
KOH	potassium hydroxide
NaOH	sodium hydroxide
OPWL	Original Process Waste Line
OU	Operable Unit
PAC	Potential Area of Concern
PCOC	potential contaminant of concern
RFI/RI	RCRA Facility Investigation/Remedial Investigation
RWP	Radiological Work Permit
SAP	Sampling and Analysis Plan
SVOC	semivolatile organic compound
UBC	Under Building Contamination
VOC	volatile organic compound

1.0 INTRODUCTION

This Industrial Area (IA) Sampling and Analysis Plan (SAP) (IASAP) Addendum for IHSS Group 700-4 includes Individual Hazardous Substance Site (IHSS) Group-specific information, sampling locations, and potential contaminants of concern (PCOCs) for all IHSS, Potential Area of Concern (PAC), and Under Building Contamination (UBC) Sites in IHSS Group 700-4. The location of IHSS Group 700-4 and all IHSSs, PACs, and UBC Sites in this group are shown on Figure B1.

2.0 EXISTING INFORMATION

Existing data for the IHSSs, PACs, and UBC Sites in IHSS Group 700-4 are available in Appendix C to the IASAP. Additional information gathered during Decontamination and Decommissioning (D&D), and initial UBC characterization is summarized below.

2.1 Potential Contaminants of Concern

PCOCs in IHSS Group 700-4 are presented by IHSS, PAC, and UBC Site in Table B1.

2.2 Existing Data Maps

Existing analytical data for IHSS Group 700-4 are shown on Figure B2. All analytical results, greater than background plus two standard deviations for metals and radionuclides or above detection limits for organics, are shown in accordance with IASAP data quality objectives (DQOs) (Section 3.0 of the IASAP).

3.0 SAMPLING LOCATIONS

Sampling locations will be based on two characterization phases. An initial UBC characterization phase will be conducted to evaluate potential contamination and health and safety concerns. This phase of sampling will take place before the demolition of the buildings. The initial UBC characterization phase will consist of biased sampling in areas of known or suspected contaminant releases. Figure B3 illustrates the Building 771 early characterization sampling locations. Sampling locations may change based on D&D reconnaissance-level characterization and D&D sampling results.

The second phase of sampling will occur when the buildings have been demolished and will include all of IHSS Group 700-4. Figure B4 shows proposed biased sampling locations based on existing data, early characterization sampling locations, and IASAP approaches. Sampling locations may change based on initial UBC characterization results. The majority of sampling locations are based on an equilateral triangular grid with a 36-foot grid spacing as shown on Figure B5. In IHSSs 126.1 and 150.3, the grid alignment is biased along known OPWL leaks. Additionally, the sampling locations take into account existing data (IHSSs 150.1, 150.3, and 163.1).

4.0 PROJECT ORGANIZATION

The project organization is shown on Figure B6.

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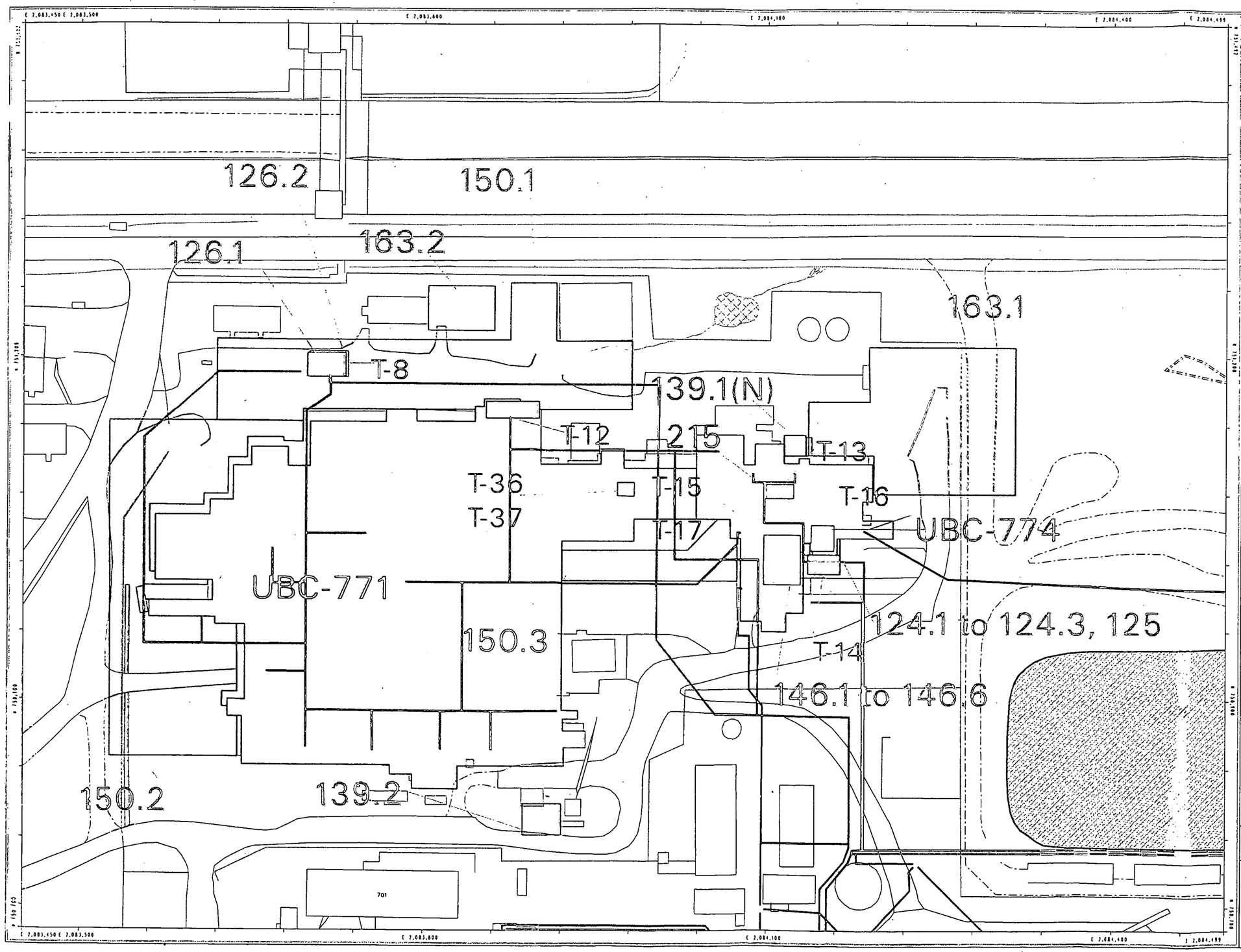
Figure B1
Location Map



EXPLANATION

Standard Map Features

- Buildings and other structures
- Solar Evaporation Ponds (SEP)
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences and other barriers
- Paved roads
- Dirt roads
- Industrial Area Operable Unit Boundary
- Original Process Waste Lines
- Location of Original Process Waste Lines that may have been removed

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

Data Source:
IIISS data approved by Nick Bremos (RMRS) 303-966-4605.

Scale = 1 : 1020
1 inch represents 85 feet

25 0 50 100ft

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: 01-0240

July 18, 2001

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Table B1
IHSS Group 700-4 Potential Contaminants of Concern

IHSS/PAC/UBC Site	Potential Contaminants of Concern	Data Source	Analytes	Sample Type	Sampling Location Method
UBC 771- Plutonium and Americium Recovery Operations	Trichloroethylene Americium Plutonium	Process Knowledge	Radionuclides Volatile Organic Compounds (VOCs) Semi Volatile Organic Compounds (SVOCs) Metals	Surface and subsurface soil to 6 feet	Biased toward known leaks, spills, and OPWL and Statistical Grid
UBC 774 – Liquid Process Waste Treatment	Americium Plutonium	Process Knowledge	Radionuclides VOCs SVOCs Metals	Surface and subsurface soil to 6 feet	Biased towards known leaks, spills, and OPWL and Statistical Grid
IHSS 150.2 – Radioactive Site West of Buildings 771/776	Plutonium	Process Knowledge	Radionuclides	Surface soil	Statistical Grid
IHSS 163.1 – Radioactive Site 700 North of Building 774 Wash Area	Plutonium SVOCs	Analytical Data (Operable Unit [OU] 8 RCRA Facility Investigation/ Remedial Investigation [RFI/RI]) Radionuclides VOCs SVOCs	Radionuclides SVOCs	Surface soil Subsurface soil to 6 feet	Biased to not overlap with existing sampling locations Statistical Grid

IHSS/PAC/UBC Site	Potential Contaminants of Concern	Data Source	Analytes	Sample Type	Sampling Location Method
		Metals			
IHSS 163.2 – Radioactive Site 700 Area 3 Americium Slab	Americium Plutonium Nitrate	Process Knowledge	Radionuclides Inorganics	Surface soil and subsurface soil to 2 feet below slab	Biased around slab
IHSS 215 – Abandoned Sump Near Building 774 Unit 55.13 T-40	Silver Plutonium Uranium Nitrate	Process Knowledge	Radionuclides Metals Inorganic	Surface and subsurface soil to 6 feet	Biased around sump
IHSS 139(N)(b) – Hydroxide Tank, KOH, NaOH Condensate	Potassium Hydroxide	Process Knowledge	Inorganics	Surface soil	Biased around tank
IHSSs 124.1, 124.2, and 124.3 – Tanks	Plutonium Uranium Nitrate	Process Knowledge	Radionuclides	Surface soil and subsurface soil to 2 feet below tanks	Biased around tanks
IHSS 125 – Holding Tank	Plutonium Uranium Nitrate	Process Knowledge	Radionuclides VOCs SVOCs Metals	Surface soil and subsurface soil to 2 feet below tank	Biased around tank
IHSS 126.1 and 126.2 – Out of Service Process Waste Tanks	Plutonium Uranium Nitrate Other constituents	Process Knowledge	Radionuclides VOCs SVOCs Metals	Surface and subsurface soil to 2 feet below tanks	Biased around tanks
IHSS 121 – OPWL Tank 8, East and West Process Tanks	Plutonium Uranium Solvents Metals Oil PCBs	Process Knowledge	Radionuclides VOCs SVOCs Metals	Surface and subsurface soil to 2 feet below tanks	Biased around tanks

IHSS/PAC/UBC Site	Potential Contaminants of Concern	Data Source	Analytes	Sample Type	Sampling Location Method
	Silver				
IHSS 121 – OPWL, Tank 12, Two Abandoned 20,000-Gallon Underground Concrete Tanks	Plutonium Uranium Nitrate	Process Knowledge	Radionuclides	Surface and subsurface soil to 2 feet below tanks	Biased around tanks
IHSS 121 – OPWL, Tank 13, Abandoned Sump – 600 Gallons	Plutonium Uranium Nitrate	Process Knowledge	Radionuclides	Surface and subsurface soil to 2 feet below tank	Biased around tank
IHSS 121 – OPWL, Tank 14, 30,000-Gallon Concrete Underground Storage Tank	Plutonium Uranium Metals Nitrate Acids Bases	Process Knowledge	Radionuclides VOCs SVOC Metals	Surface and subsurface soil to 2 feet below tank	Biased around tank
IHSS 121 – OPWL, Tank 15, Two 7,500-Gallon Process Waste Tanks	Plutonium Uranium Nitrate	Process Knowledge	Radionuclides	Surface and subsurface soil to 2 feet below tanks	Biased around tanks
IHSS 121 – OPWL, Tank 16, Two 30,000-Gallon Concrete Underground Storage Tanks	Plutonium Uranium Nitrate Metals	Process Knowledge	Radionuclides Metals	Surface and subsurface soil to 2 feet below tanks	Biased around tanks
IHSS 121 – OPWL, Tank 17, Four Concrete Process Waste Tanks	Plutonium Uranium Nitrate	Process Knowledge	Radionuclides	Surface and subsurface soil to 2 feet below tanks	Biased around tanks
IHSS 121 – OPWL, Tank 36, Steel Carbon Tetrachloride Sump	Carbon Tetrachloride	Process Knowledge	VOCs	Surface and subsurface soil to 2 feet below	Biased around sump

IHSS/PAC/UBC Site	Potential Contaminants of Concern	Data Source	Analytes	Sample Type	Sampling Location Method
				sump	
IHSS 121 – OPWL, Tank 37, Steel-Lined Concrete Sump	Plutonium Uranium Nitrate	Process Knowledge	Radionuclides	Surface and subsurface soil to 2 feet below sump	Biased around sump
IHSS 139.2 – Caustic/Acid Spills Hydrofluoric Tank	Hydrofluoric Acid	Process Knowledge	Inorganics	Surface soil	Biased around tank
IHSS 146.1, 146.2, 146.3, 146.4, 146.5, and 146.6, Process Waste Tanks	Plutonium Uranium Acids Caustics	Process Knowledge	Radionuclides VOCs SVOCs	Surface and subsurface soil to 2 feet below tanks	Biased around tanks
IHSS 150.1 – Radioactive Site North of Building 771	Aluminum Arsenic Barium Cobalt Copper Iron Lead Manganese Nickel Silver Strontium Vanadium Zinc Anthracene Benzo(k)fluoranthene Bis(2-ethylhexyl)phthalate Fluorene	Analytical Data (OU 8 RFI/RI) Radionuclides VOCs SVOCs Metals	Radionuclides VOCs SVOCs Metals	Surface and subsurface soil to 6 feet	Biased around OPWL and to not overlap with existing sampling locations
IHSS 150.3 – Radioactive Site	Aluminum	Analytical Data	Radionuclides	Surface soil	Biased around

IHSS/PAC/UBC Site	Potential Contaminants of Concern	Data Source	Analytes	Sample Type	Sampling Location Method
Between Buildings 771 and 774	Arsenic Barium Cobalt Copper Iron Lead Manganese Nickel Vanadium Zinc Anthracene Fluoranthene Pyrene	(OU 8 RFI/RI) Radionuclides VOCs SVOCs Metals	VOCs SVOCs Metals	and subsurface soil to 6 feet	OPWL and to not overlap with existing sampling locations

THIS TARGET SHEET REPRESENTS AN
OVER-SIZED MAP / PLATE FOR THIS DOCUMENT:
(Ref: 04-RF-01112; KLW-034-04)

Industrial Area and Buffer Zone Sampling and Analysis Plan Modification 1

Figure B2:

Draft Existing Data

Map ID: 2k-0404

July 7, 2001

CERCLA Administrative Record Document, SW-A-005011

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

GOLDEN, COLORADO

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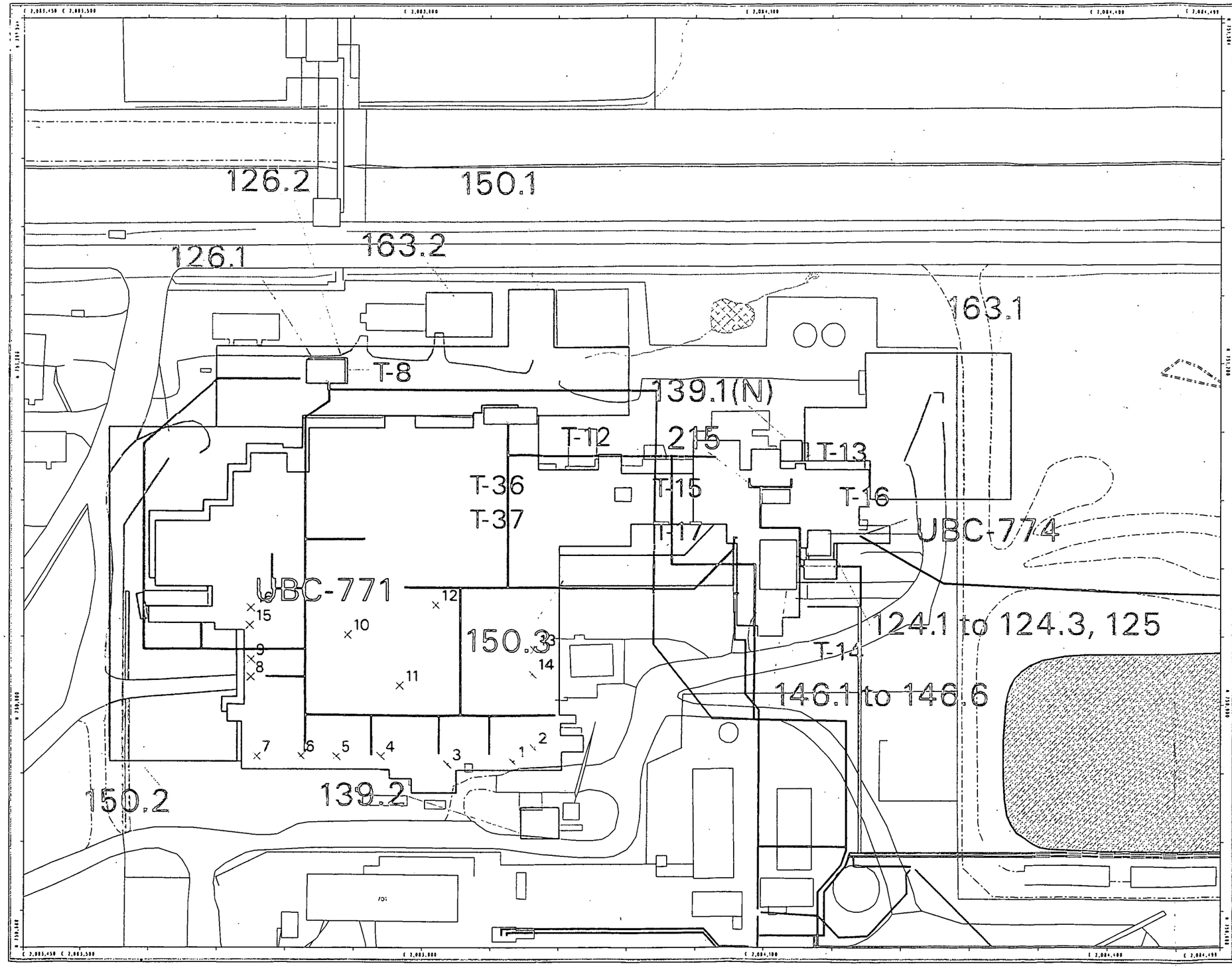
Figure B3
Building 771
Initial Sampling Locations



EXPLANATION

Standard Map Features

- Buildings and other structures
- Solar Evaporation Ponds (SEP)
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences and other barriers
- Paved roads
- Dirt roads
- Industrial Area Operable Unit Boundary
- Original Process Waste Lines
- Location of Original Process Waste Lines that may have been removed
- Boring Location
- Surface Soil Sampling Location

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, 11/95
Data Source:
IHSS data approved by Nick Demos (RMRS) 303-966-4005.

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Scale = 1 : 1050
1 inch represents approximately 88 feet

25 0 50 100 ft

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: 01-0240 July 18, 2001

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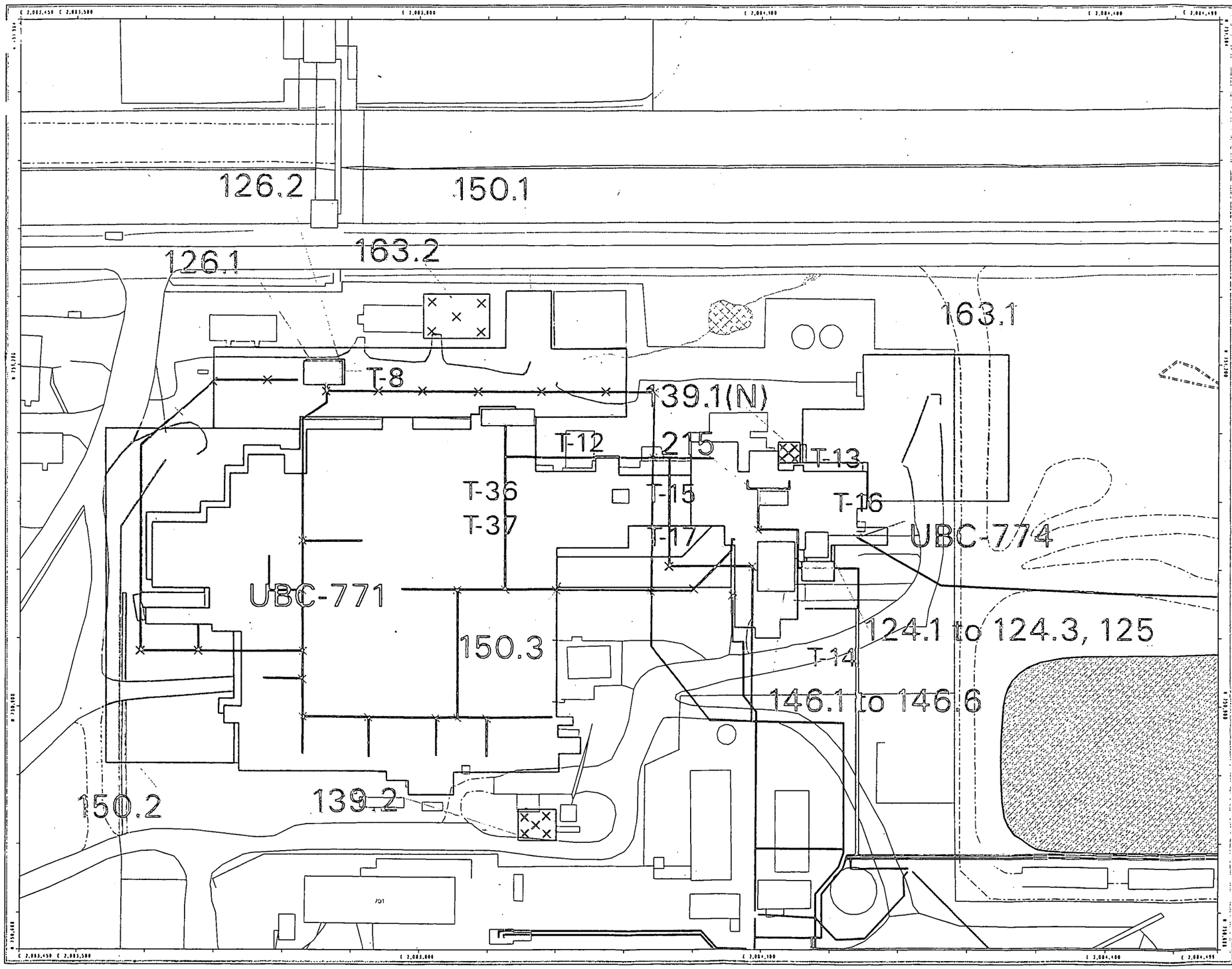

Figure B4
IA Group 700-4
Biased Sampling Locations

EXPLANATION

Standard Map Features

- Buildings and other structures
- Solar Evaporation Ponds (SEP)
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences and other barriers
- Paved roads
- Dirt roads
- Industrial Area Operable Unit Boundary
- Original Process Waste Lines
- Location of Original Process Waste Lines that may have been removed
- Boring Location
- Surface Soil Sampling Location

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
Data Source:
IHSS data approved by Nick Demos (RMRS) 303-966-4605.

Scale = 1 : 1050
1 inch represents approximately 88 feet

25 0 50 100 ft

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: 01-0240 July 18, 2001

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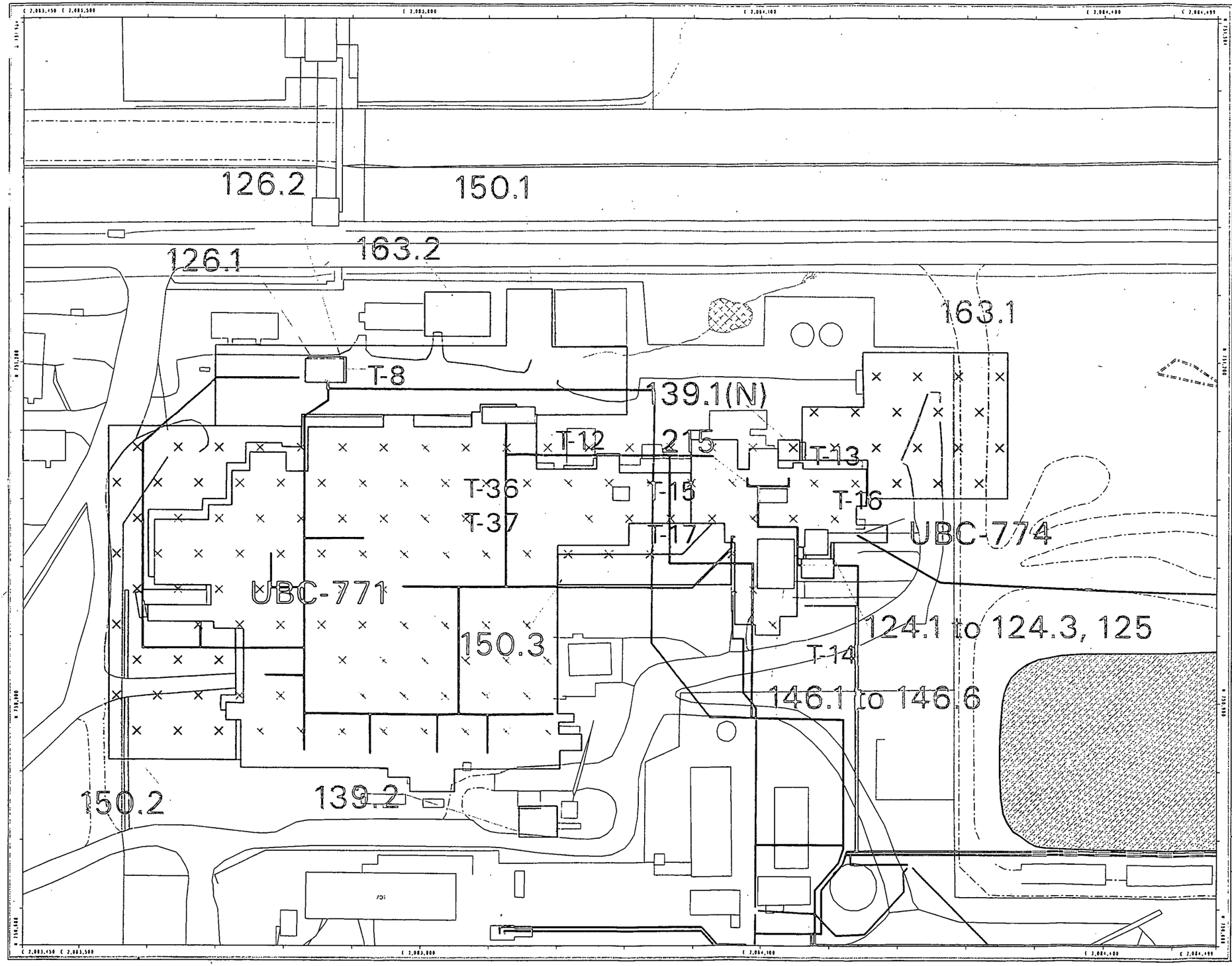

Figure B5
IA Group 700-4
Statistical Grid Sampling Locations

EXPLANATION

Standard Map Features

- Buildings and other structures
- Solar Evaporation Ponds (SEP)
- Lakes and ponds
- Streams, ditches, or other drainage features
- Fences and other barriers
- Paved roads
- Dirt roads
- Industrial Area Operable Unit Boundary
- Original Process Waste Lines
- Location of Original Process Waste Lines that may have been removed
- Boring Location
- Surface Soil Sampling Location

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
Data Source:
IHSS data approved by Nick Demos (RMRS) 303-966-4605.

Scale = 1 : 1050
1 inch represents approximately 88 feet

25 0 50 100 ft

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: 01-0240 July 18, 2001

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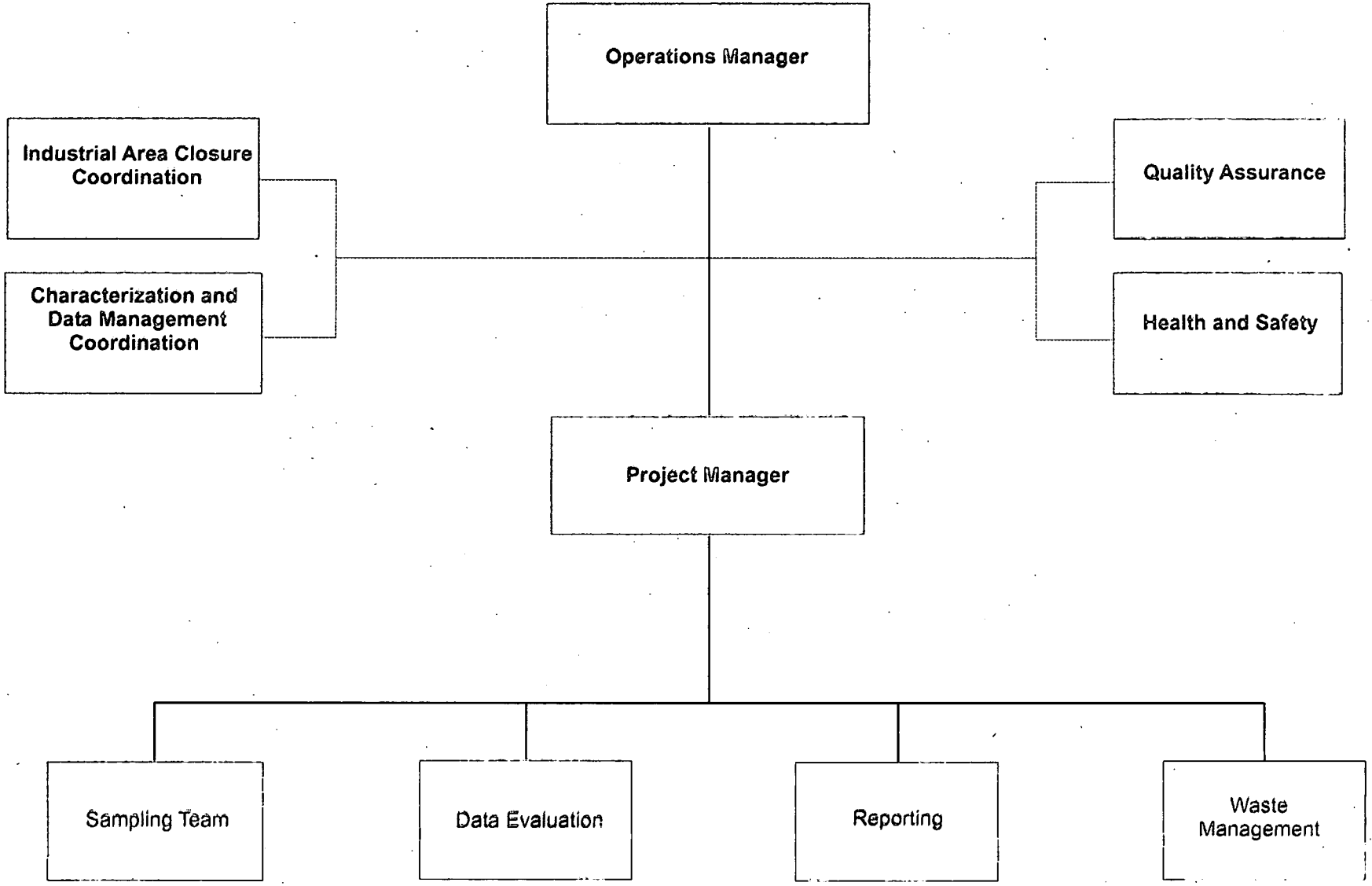
Figure B6
IHSS Group Characterization
Project Organization



5.0 IHSS GROUP 700-4 SPECIFIC DATA QUALITY OBJECTIVES

There are no IHSS Group 700-4-specific DQOs.

6.0 IHSS GROUP 700-4 SPECIFIC SAMPLING AND ANALYTICAL METHODS

The initial round of sampling at UBC Sites 771, 774, and 707 will consist of drilling through the building slabs and sampling soil directly beneath the slabs in accordance with the IASAP. These samples will be collected so that health and safety concerns can be addressed before the slabs are removed. Sampling locations will target areas of suspected contamination such as OPWL and documented spills. Figure B3 illustrates the proposed sampling locations in Building 771.

7.0 IHSS GROUP 700-4 SPECIFIC HEALTH AND SAFETY REQUIREMENTS

Health and safety requirements are contained in the Integrated Work Control Packages (IWCPs), as appropriate. In addition, work will be conducted under Radiological Work Permits (RWPs), as applicable. A readiness review will be conducted before the start of fieldwork for all IHSS Groups.

UBC Site initial characterization may result in hazards not normally encountered during routine field activities. Specific additional hazards that will be addressed include the following:

- Ventilation – Carbon monoxide emissions from combustible engines (e.g., Geoprobe rig) may result in respiratory distress. All combustible engine emissions will be diverted to an outside ventilation duct.

- Heavy Equipment Access – Maneuvering heavy equipment through building corridors will require appropriate transportation and restraining devices.

- Radiological Hazards – Radiological hazards are expected to be much higher within Buildings 771 and 774. Characterization activities will be performed in accordance with the building-specific Health and Safety Plan.

8.0 IHSS GROUP 700-4 SPECIFIC QUALITY ASSURANCE PROTOCOLS

There are no IHSS Group 700-4-specific quality assurance requirements for this project.

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