Environmental Cost Analysis System (ECAS)

USER'S MANUAL

Revision 0

March 15, 2010

**Office of Environmental Management
Consolidated Business Center
Office of Cost Estimating & Analysis
U.S. Department of Energy**

Table of Contents

Revision Record

Revision A (April 30, 2006): Base Draft Document

Revision B (May28, 2006):

1) Added project descriptions for ER and WM project types and corrected text to reflect additions in Attachment 5 and Attachment 6

2) Corrected D&D Project Description in Attachment 6

3) Updated TBD fields in Attachment 4

4) Corrected Media State descriptors in Attachment 4

Revision 0 (March 15, 2010)

1) Minor editorial changes

2) Added Attachment 14, Example ECAS Project Names Table

Purpose: Identify the processes and procedures that ECAS analysts and users will need to understand and follow to operate the ECAS system. This will include developing the information to be stored in the database, interfacing with the database to identify applicable information, and development of reports and data downloads as ECAS system outputs. The database software systems management will be addressed separately.

This version of the ECAS User's Manual (Revision 0) is intended to describe Section III, Data Collection and Input, in substantial detail and provide only general descriptive text in the other Sections. Future Revisions will provide additional detail in the remaining sections.

Section I. Introduction:

The ECAS provides an integrated system for accumulation, integration, analysis, and corporate access to actual costs and other relevant historical information from historical completed projects in an accessible format. Individuals ("Users") may retrieve that information for use in a variety of DOE-authorized purposes. These purposes may include development of independent cost estimates and reviews, analysis of projects, development of parametric factors or cost estimating relationships, development of benchmarks, and like-for-like project analysis.

The information is collected and inputted by individuals ("Analysts") from past-project accounting, and other project data and documents, and is captured in a database (Microsoft SQL). Users can then access the database to identify and search past projects for data applicable to their needs. The output will include user-defined cost and parameter data either provided as parametric factors or cost estimating relationships (e.g., cost factors such as $/square foot) or in a format that will allow a user can create cost estimating relationships or other constructs suitable for his or her analysis.

The fundamental basis for ECAS or any cost collection database is correlation of elements of scope with characteristics of that scope – cost, area, volume, level of contamination, type of work, etc. Development of cost factors requires that the cost and parametric characteristics map to the identical elements of scope. Scope elements that have cost data but no suitable parametric information (or vice versa), or where the cost and parametric information map to different elements of scope cannot be used directly to develop cost factors, although additional information may allow such factors to be calculated.

ECAS is organized based several ways of describing EM scope: the site-provided Work Breakdown Structure (WBS), the ECES code structure, and "ECAS Project."

The WBS of the inputted data is usually specific to the DOE site at which the project occurred, although the analyst must group and summarize the site-defined WBS elements to support database input requirements. Compatibility with the WBS allows the user to further examine backup information on a specific project that has been summarized in ECAS.

The ECES code structure (ASTM Standard E-2150) provides standard definitions of the types of remediation work, similar to the Construction Specifications Institute (CSI) code of accounts for

estimating construction activities. The analyst assigns ECES codes to the data based on the scope characteristics of the site-provided WBS elements and/or activities.

The "ECAS Project" is an analyst-defined grouping of scope elements based on the analyst's mapping of the scope of the site-provided information to the categories of project identified in ECAS. This is necessary because all EM Projects are unique (there will never be another Rocky Flats or Fernald Closure Project) but there are elements of scope within EM Projects (e.g., decommissioning of a building, capping of a SWMU) that are similar to other EM Project elements of scope.

The information contained in the ECAS database may be grouped into several categories: cost values, parameter values, ECAS-specific text, user-defined text, and descriptive text.

ECAS Operations Manual Organization: This manual is organized in five chapters – this Introduction, and chapters describing the ECAS structure, data collection/input, user interface/report generation, and configuration management.

Section II. ECAS Structure

The structure of the database is designed to collect the relevant information and the relationships between that information in a fashion that supports accessing it for future use. Appendix II, ECAS SYSTEM DESIGN, provides a schematic diagram of the database structure and relationships.

Section III. Data Collection and Input

The ability of an ECAS user to retrieve applicable and accurate information on past projects is based on the quality of the data in the database and dependent on the individuals who collect, analyze, and input the project information. This section, and the procedures and attachments associated with it, describe the process that results in an Excel table that can be inputted into the ECAS database. The section is organized with general discussion of the process and the specific procedures required for data input.

General: Each DOE-EM project is unique; the initial challenge of the analyst developing the information is to define "ECAS Projects" and identify those project characteristics that may be viewed as common to other projects in the ECAS database, and then collect, develop, and package information describing those characteristics. The analyst must also develop a description of the project that will provide a context for future users to understand and compensate for the differences between the project(s) in the ECAS database and the project that they are analyzing.

Projects currently in the ECAS database provide examples of ECAS Projects and project characteristics that should be considered, although unique project characteristics or available information may suggest additional parameters. The general approach for organizing data is to use the site WBS structure as the initial basis of elements of scope, superimpose ECAS Projects over that WBS structure, and then develop costs from accounting or project data consistent with

the WBS structure. Non-waste and waste parameters defining the same scope are inserted as appropriate. At least one of the parameters collected is used to develop a "Primary" parametric cost factor (e.g., $/square feet for D&D) for the project or subproject. ECES codes are then assigned to both cost and parameter scopes.

Ideally, parameters are quantitative and qualitative characteristics (quantitative are harder to get accurately) that an estimator can readily measure or observe from site walk-downs or collect from site information such as baseline estimates or real property inventory data. Examples of "measurable" non-waste previously-used parameters include square feet of floor-space or cubic feet of tankage for decommissioning, volume of soil removed or to-be-treated groundwater volume or flowrate for remediation, and cubic feet of waste for waste treatment. Derived parameter data (e.g., waste generated from decommissioning, number of samples required for remediation) may be included, if available, as secondary parameters. Qualitative data (e.g., types of facility construction, types of VOC contaminants) are also required to define projects. The approach to describe contamination has been to identify "threshold" levels that drive changes to approach (e.g., "Fissile Quantities" that require criticality precautions versus "TRU Concentrations" that require extensive PPE but where work is "criticality-incredible") in the database and provide additional information on detailed levels, nature, and extent in descriptive text. Often there is significant project data, just little appropriate or accurate data.

Once the data is all developed it needs to be assembled in a format that will interface with the relatively prescriptive data framework in the ECAS database. This involves summing and consolidating data into a ECAS Input Template, including differentiating direct and indirect costs, associating data with specific ECES and Site WBS codes, and complying with quality assurance and data management requirements.

ECAS Procedures: The process to define the ECAS Projects (the internal framework of the input data) and populate the ECAS Input Template has been subdivided into the 11 procedures identified below; these procedures are located in APPENDIX I, ECAS DATA INPUT PROCEDURES.

A. Evaluation of Potential ECAS Data
B. ECAS Project/Subproject Assignment
C. Development of ECAS Project Descriptors
D. ECES Code Assignment
E. ECAS Direct Cost Assignment
F. ECAS Non-Waste Parameter Identification/Collection/Assignment
G. ECAS Waste Parameter Identification/Collection/Assignment
H. Development of Data for and Population of ECAS Input Template
I. ECAS Indirect Cost Assignment
J. ECAS Data Validation
K. Pre-ECAS Input Data Management

Figure III-1 shows the interactions between the procedures. The initial two procedures address the up-front work to identify data and arrange it into distinct ECAS Project (and indirect/non-project) groupings, the basis upon which the additional data is organized. Procedure C through

Procedure G address the data collection and calculations to support the ECAS Project data with ECES-coded costs and parameters. Procedures H and I describe the final arrangement and assignment to develop the actual ECAS Input Template. Procedures J and K address the QA and Data Management elements that are addressed throughout the process.

Figure III-1, ECAS Input Procedure Interaction
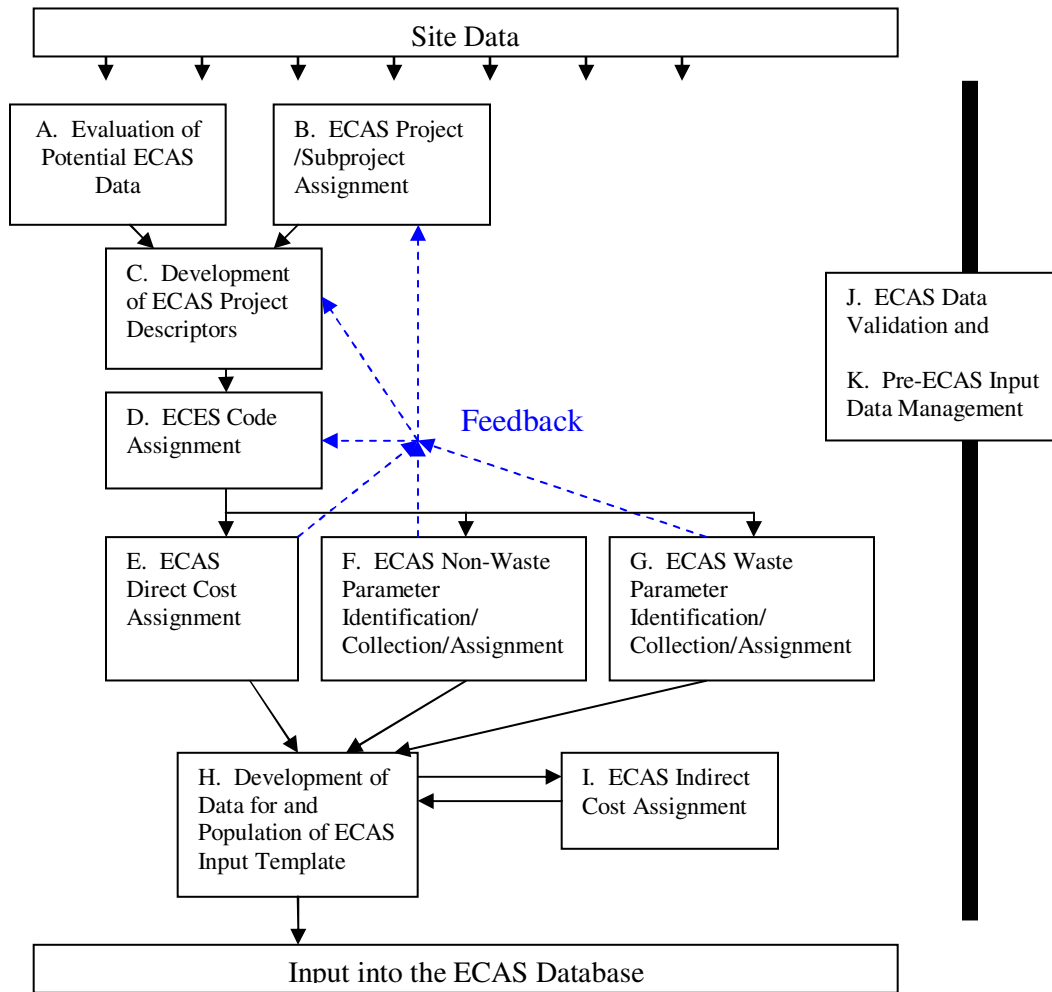
In addition to Procedures A-J, the following Attachments identified here and referenced in the procedures are included in APPENDIX II, ECAS DATA INPUT PROCEDURES-ATTACHMENTS.

1   Glossary/Acronyms
2   Standard Classification for Estimating Cost Element Components
3   Listing of Project Types, Group, and Project Type Detail (incl. Primary UOM)
4   ECAS Input Template Organization and Listing of ECAS System-Defined Terms.
5   ECAS Project Description Template
6   Example ECAS Project Descriptions

7   ECES Dictionary (Single example page only, complete Word/PDF file available at URL given below)
8   Rocky Flats Work Types (Single example page only, complete Excel file available)
9   Example Rocky Flats Cost Assignment Crosswalk
10   Example of Non-Waste Parameter Data
11   Examples of Rocky Flats WEMS Data
12   Example Rocky Flats approach to developing I/D Costs
13   Example ECAS Input Template (RF B371 select data)
14   Example ECAS Project Names Table

While it is useful to segregate the work among the procedures based on areas of emphasis, it should be recognized that much of the work proceeds in an interactive manner; e.g., data collected for cost (Procedure E) may impact ECES Code Assignment (Procedure D) and project descriptors (Procedure C). Also, the procedures have not been arranged around organizational responsibilities. They assume a single organization is executing all of the work, and there are no formal reviews or deliverables as might be required for contracted activities.

Section IV. User Interface and Report Generation

The ability of the ECAS Users to benefit form the ECAS data is based on their ability to navigate through and browse the available data; identify the data that they want to use; and select, format, and export the data as necessary. As a web-based system, the user accesses and manipulates the data via the ECAS web page.

The ECAS web page does this through a series of reports:
- Project Level - High-level to support generic cost factors (e.g., $/SF for a Reactor D&D ECAS Project)
- ECES Report – overall project cost arranged by ECES code
- Detailed (currently disabled) – reproduce Template level data
- Ad Hoc (available to selected users) – develop user-created reporting content and formats to support specific uses

All of these reports produce tables that can be printed or exported into a number of electronic formats (e.g., Excel, Word, PDF, etc.).

The general approach users would take to interface with ECAS would be to initially use the Project-level report to evaluate projects similar to the target activity or project that they intend to analyze or estimate. After evaluating which projects, they would select one or more projects and use one of the more detailed reports to identify the exact data that they want, and export it into Excel for further manipulation. The cost data is available in either original or system-escalated values.

Section V. Configuration Management

ECAS Configuration Management addresses the management of the database design, input templates, procedures, and user's manual. Changes that are proposed to the ECAS system

database or documentation are identified in a change proposal that identifies the level of change, the portions of the system that are impacted, reason, and impacts. Changes may be based on external impetus (e.g., a change to the ECES codes) or internal (e.g., new data types to be included). Adding additional data from new project does not constitute a change.

Change levels are generally defined as follows:
- Level 1 – Editorial with no functional impacts; e.g., editorial changes to documents or procedures
- Level 2 – Minor, e.g., changes to procedures with no database design impact, changes to user's manual, addition of elements to ECAS database tables involving template changes.
- Level 3 – Moderate, e.g. cause minor changes to the database design (add a new table), programmatic changes involving multiple procedures
- Level 4 – Major, e.g., changes that cause significant database impact that result in significant retesting of scripts and queries.

Changes at Level 1 may be made by the developers with appropriate documentation, Level 2 will be made with the approval of the ECAS Project Manager, and Level 3 and Level 4 will be made with the approval of the CE&A Manager.

Documents will have revision numbers and dates. The Configuration Management Change Log will be maintained by the ECAS Project Manager or his designate.

Configuration management of documentation supporting the development of the ECAS Input Template will be managed as described in Procedure K.

A.   Evaluation of Potential ECAS Data

Purpose and Scope:
Review site data, including WBS, cost and accounting data, regulatory and project documentation, cost estimates, and similar materials to evaluate data quality, identify data issues that may impact ECAS data quality, and additional information, sources, and resources that may be required.

Principles:
1. The best sources of data are original documents and databases, such as cost accounting databases that were used to develop the actual costs reported to DOE. The validity of such data is considered to be at the highest level. Even so, it should be confirmed against contractual documents to ensure that it represents the correct scope of work and that major elements of scope were not addressed outside of the database (e.g., direct DOE contract to execute a portion of the work).
2. Resources with detailed knowledge of on-site data are required to provide insight into scope elements and answer overarching questions on data arrangement. Each DOE site has quirks about how data was organized and blanket assumptions may prove inaccurate.

Prerequisite Actions:
1. Receive site information regarding WBS, actual costs, and parameters
2. Contact site-knowledgeable resources

Instructions:
1. Conduct an initial review what kind of data might be available and collect as much as feasible
2. Review site scope data, including WBS, baseline, etc. – understand how data is organized, how the site viewed its projects and subprojects, what information is available. What is the data date and has it been updated as the project progressed?
3. Review actual cost data – Is it the final (project complete) data or is there follow-on data available? How is it arranged (WBS?) and how detailed? Does it correspond to the scope/baseline data? Has new scope been added (and what additional scope description is needed)? Are actual accounting databases available? Progress reporting data? Closeout Report? Contractual documents? How does the cost correspond between the documents/ sources? Are the costs time phased (schedule dates can be associated with cost elements)? What kinds of download formats are available (Access, Excel, PDF, Word)? How well is it tied to scope (beginning/end of project)? Does it segregate direct and indirect costs? How reliable is it?
4. Review non-waste parameter data – what parameters ("Primary", "Secondary") are preferable for the individual types of work? Are they available? Can they be calculated from something that is available? Second choices? Are they acceptable? What other information is available? Cost Estimates for project (to get parameters, not necessarily estimated cost, although estimated costs may be

useful in allocating bundled actual costs)? Government/Prime Contractor estimate of subcontract costs? Baseline estimate data (e.g., number of widgets, not general scope information)? Contract change proposal estimates for new scope?

5. Review <u>waste generation data</u> - From waste database? How does it match with scope elements (e.g., does the database give waste generator building number/ room number/ project designator? Other sources of waste data (e.g., project closure reports)?

6. Identify other sources of information – Project Management Plans, Regulatory documents (e.g., RI/FSs), Closeout reports, SAPs, waste management plans. These may be used for both quantitative and qualitative (i.e., ECAS Project descriptive) information

7. Identify missing data – Develop initial status report that identifies obvious data gaps; this could be a short report with a few pages of tables and synopsis of issues to resolve.

8. Identify options – get additional data, calculate unavailable data, reduce expectations (higher-level projects, less ECES resolution, etc.). What can be done to get unavailable data? Look through archives? Contract with closure contractor parent? Hire retirees (Ex-project control personnel and lower-level management have been particularly useful to me in the past)?

9. How much can be done by the team and how much requires additional resources? What resources are required to answer questions (What was that charge code really used for?)?

Deliverables:
1. Initial Data Status report, including data collection issues, data gaps, and data management requirements, including approaches to get site data into Excel.
2. Memo identifying needed or missing data or other issues.
3. Catalogue of data sources listing relevant files and phrase describing content (e.g., "PSR 160 Closeout Report").

Post-Performance Activities:
1. As work progresses the data developers have a greater concept of the structure into which the data is incorporated; development of projects/subprojects, ECES code assignment, and costs and parameter compilation all will identify additional data collection requirements that must revisit this procedure including reorganizing projects, refining data requirements, and identifying new data sources.

Records Management/QA:
1. Identify and catalogue data available so that the basic information may be made available to all participants.
2. Identify sensitive or UCNI data and address such data management issues.
3. Initiate Data control process.

B.   ECAS Project/Subproject Assignment

Purpose and Scope:
Based on the site WBS, the activities performed, and previous ECAS input, divide scope
into ECAS Projects (ECAS Level 5 elements) that can be populated to support the ECAS
database. Develop subprojects and/or (Functional Space Areas (FSAs) as necessary to
highlight or segregate project scope. Identify "non-project" scope that will be addressed
as Indirect/Distributed Cost (I/D Cost) scope.

Principles:
1. The purpose of ECAS Projects is to have consistent groupings of scope that
    ECAS users may pull up and compare to support their cost estimating and
    analysis work. The ECAS Project needs to be scope a user can recognize.
2. The scope for the project selected should represent the entirety of the effort, not
    just the specific activities/elements represented by the targeted cost estimating
    relationships. Conversely, the project should not be part of an even larger project
    or contain unrelated sub-projects, unless relevant cost and project scope
    information is available for all aspects. An analyst may define an ECAS Project
    as discontinuous elements within the site WBS to address these problems.
3. ECAS Projects/subprojects should have direct costs and/or parameters associated
    with them; activities that consist only of I/D Costs (i.e., have no parameters)
    should not be defined as ECAS Projects.
4. Ideal ECAS Projects should have the following characteristics:
    a. be of substantial size (i.e., >$500,000),
    b. have distinct spatial and temporal boundaries,
    c. have definable/high pedigree actual costs and parameters,
    d. be managed as single entities,
    e. be vertically integrated (e.g., have PM, design, execution, and closeout
        elements),
    f. contain the same type of remediation (e.g., not mix GW pump-and-treat,
        capping, and D&D in the same project).
    Many ECAS projects do not meet all of these criteria.
5. Environmental projects have a tendency to be split into multiple procurements. It
    is important to ensure that the assembled information accounts for the full scope
    of the project. It is also common to combine unrelated project activities into a
    single procurement action. In these cases, the information must allow for easy
    identification and extraction of only pertinent project scope and cost data.
6. The ECAS system-specified data for the PROJECT_TYPE,
    PROJECT_TYPE_DETAIL, ER_PROJECT, and ER_PROJECT_DETAIL fields
    provide examples of ECAS Projects that have been used in the past, and every
    effort should be made to use those designators (See Attachment 3, Listing of
    Project Types, Group, and Project Type Detail).
7. Subprojects should be distinct entities within a project; subproject or FSA
    definition may allow visibility for distinct project sub-elements where these sub-
    elements do not meet the criteria to be full ECAS projects, have differences of
    level or accuracy between cost and parameter data, etc.

8. Avoid project/subprojects mimicking ECES codes – i.e., subproject for design, subproject for pump and treat, subproject for management.
9. Avoid project/subprojects repeating Organization Breakdown Structure just because data is expressed that way in the accounting database; projects/subprojects should be activity or product based.
10. Assignments should be consistent with Attachment 2, Standard Classification for Estimating Cost Element Components, Attachment 3, Listing of Project Types, Group, and Project Type Detail (incl. Primary UOM), and Attachment 4, ECAS Input Template Organization and Listing of ECAS System-Defined Terms.
11. Build in flexibility – as more data is collected and analyzed the structure and mapping of projects to WBS will change.

Prerequisite Actions:
1. Receive site information regarding WBS, actual costs, and parameters.
2. Coordinate with Procedure A. Evaluation of Potential ECAS Data.

Instructions:
1. Review all available site data.
2. Divide the scope fall into potential projects based on work type – e.g., decommissioning vs. restoration vs. waste management vs. site-level I/D Cost scope.
3. Evaluate approaches for subdividing work type scope (clean vs. contaminated buildings, groundwater vs. cap, etc.). Does the site WBS projectize (i.e., allocate unique project management and project support costs) certain scopes of work? Are project management or other support costs spreads across a number of potential ECAS Projects?
4. Identify groupings of WBS elements that are readily consistent with previously-identified ECAS Projects and meet the requirements in the Principles section above (i.e., make easy decisions). Identify potential subprojects for these ECAS Projects.
5. Confirm groupings of WBS elements from step 2 that are indirect/distributed elements and unlikely to be associated with projects (i.e., make easy decisions).
6. Evaluate remaining items for options – grouping into a composite project with subprojects, assignment to other somewhat-related projects, define as I/D Costs, etc. Are there scope elements that have both costs and parameters associated with them or are there costs-but-no-parameters or parameters-with-no-costs situations? Should they be separate projects or subprojects under a common project? Can they be resolved by rolling up to a higher-level project? Is there additional data that will allow the overall value to be accurately apportioned to lower-level scope elements to allow them to be ECAS Projects? Evaluate how costs and parameters might roll up to the ECAS Project – does that impact the viability of it being considered an ECAS Project?
7. Identify approach to allocate indirect costs from overall site activities and from waste management activities to direct cost elements consistent with Procedure I. ECAS Indirect Cost Assignment. Does this impact ECAS Project arrangements?

8. Establish ECAS Project boundaries – areas, start and finish dates, etc. – so that data may be determined to be part of the project or not. Provide sufficient description of project scope to allow subsequent use in Procedure C, Development of ECAS Project Descriptors.
9. Prepare a spreadsheet where the site WBS elements are assigned specific ECAS Project designations and proposed subproject designations. Provide general description of projectization method and general justification for project determinations, and identify potential issues to be considered as ECAS data development process progresses.

Deliverables:
1. Excel Spreadsheet with ECAS Project/subproject and I/C Cost designations of scope.
2. Memo identifying needed or missing data. The memo should also provide the general approach, general justifications, potential issues, and information required to address those issues.
3. Definition of all appropriate site elements are addressed, and overall boundaries and any excluded activities defined (e.g., "The Rocky Flats site ECAS data contains all activities involved in the Rocky Flats Closure Project, beginning February 1, 2000 through the end of the project. Note that this excludes many ER RI/FS/Sampling/IM/IRA cleanup activities as well as some deactivation, waste management, and decommissioning conducted before this date."

Post-Performance Activities:
1. Address feedback as data is collected regarding ECAS Project/subproject applicability, defined WBS or other elements.

Records Management/QA:
1. Archive Excel spreadsheet, and justification and project scope information to support ECES Code Assignment and Project Documentation activities.
2. Provide configuration control as ECAS Project definitions and WBS elements change.
3. Ensure all appropriate site elements are addressed, and overall boundaries defined.

C.   Development of ECAS Project Descriptors

Purpose and Scope:
Develop qualitative descriptors for ECAS Projects and Subprojects/FSAs based on the prescribed descriptors identified in the ECAS Template that support search data. Develop an ECAS Project Description that provides a text description of project conditions and approach to supplement the database values and descriptors in identifying project characteristics that are hard to quantify and may be used to qualitatively compare ECAS Projects. Review site data on an ECAS Project-by-Project basis to assist in subsequent ECES Code, cost, and parameter assignment efforts.

Principles:
1. Descriptors should be applied consistently between ECAS projects per Attachment 4, ECAS Input Template Organization and Listing of ECAS System-Defined Terms.
2. ECAS Project Descriptions provide supporting details on project and subproject scope, history and existing conditions, nature and extent of contamination, and project execution methods and issues per Attachment 5, ECAS Project Description Template and Attachment 6, Example ECAS Project Descriptions.
3. ECAS Project Descriptions should be concise (3-7 pages) summaries of project qualitative information. Additional reference documents in digital format (e.g., PDF) should be provided (as available and as necessary) to provide additional data. These reference documents might include Closure Reports, IM/IRAs, Project Designs, Decommissioning Plans, Project Management Plans, Characterization Reports, etc.
4. Project information should provide all relevant background information and describe any project peculiarities not otherwise evident (e.g., unusual site conditions) in order to normalize the data. Examples of information needed for this purpose include:
   a. project delays or accelerated schedules
   b. regulatory interaction
   c. scope growth (e.g., modifications)
   d. development status of the technology used (i.e., conventional, innovative, or emerging).

Prerequisite Actions:
1. Receive site information regarding WBS, actual costs, and parameters
2. Receive WBS with ECES Project designation.

Instructions:
1. Review all available site data.
2. Develop ECAS Project Description for the ECAS Projects identified in Procedure B.
3. Develop descriptor information for each project and FSA/subproject based on Attachment 4 and project information; develop brief justification for rationale (e.g., "Similar to XXX project").

4. Provide feedback to efforts covered under Procedure B; coordinate with efforts covered in Procedures D-F.
5. Update catalogue of data sources to better describe references.
6. Develop table listing project names and brief descriptions of their scope that are associated with their ECAS Project designator (See Attachment 14, Example ECAS Project Names Table).

Deliverables:
1. ECAS Project Descriptions.
2. Backup PDF files that will be referenced/linked from the ECAS database and any additional references and bibliography.
3. Spreadsheet with ECAS Project/subproject descriptors.
4. Memo identifying needed or missing data or other issues.
5. Project Names list.

Post-Performance Activities:
1. Address feedback as data is collected, particularly based on changes to ECAS Project/subproject organization.

Records Management/QA:
1. Spreadsheet with ECAS Project/subproject descriptors.
2. ECAS Project Descriptions.
3. Backup PDF files that will be referenced/linked from the ECAS database and references/bibliography.

D.   ECES Code Assignment

Purpose and Scope:
Using the ECES Dictionary and examples developed in Rocky Flats and other ECES applications, assign ECES codes to existing site WBS elements in a consistent manner. Identify any large and/or high-cost site WBS scopes that contain a melding of undifferentiated ECES elements and (if this can be done using an approach that is credible and can be validated) divide these scopes into sub-elements matching to ECES elements that will allow the calculation of costs and parameters. (Note: For purposes of ECES notation, ECES Level 1, the project Phase, is omitted; e.g. Phase 8.02.01 would be noted as .02.01.)

Principles:
1. For purposes of ECES notation, ECES Level 1, the project Phase, is omitted; e.g. Phase 8.02.01 would be noted as .02.01.
2. ECES codes should be applied consistently among all ECAS Projects and site input, and consistent with Attachment 7, ECES Dictionary and Attachment 8, Rocky Flats Work Types.
3. ECES code assignment to <u>costs</u> should apply at the lowest feasible level of the site WBS – e.g., charge number/description.
4. ECES code assignment to <u>parameters</u> should be consistent with the site WBS and ECAS Project/subproject scope; they are applied at the ECAS Project/subproject level based on what relevant parameters may be available; e.g., there may be multiple kinds of ECES codes applied to cost activities with a subproject but not multiple areas with different contamination levels.
5. The ECES is mostly driven by ER functions – typically functions involving D&D of contaminated facilities are in .31 (Facility Decommissioning and Dismantlement) and waste management functions are in .11, .12, and .13 (Treatment, Storage, and Disposal).
6. ECES code assignment should consider whether a scope element is "project-level" (ECES .02-.34) or "site-level" (ECES .01.00). Problem areas often include procurement, engineering, regulatory compliance, and training.
    a. Example 1: If procurement is done by a contract administrator assigned full-time to the project it is project management (.02.01), not a site service (.01.02.04, Procurement and Contracting).
    b. Example 2: The cost of site-level trainers is a program/site services cost; the cost for trainees is a project cost.
    c. Example 3: Overhead or Project Control support, which would be (.02.01, Project Management) at a project level, are (.01.02, Program Support) or (.01.03, Program Infrastructure) at the site level.
    d. Example 4: A "Project Management" charge number description located in a "Utilities" site WBS to manage steam plant operations is (.01.03.08, Utilities), not (.02.01, Project Management).
7. ECES code assignment should avoid going to a ECES Level/level of detail not supported by site data (e.g., a charge number description labeled "RI/FS" may contain sampling and regulator interface costs, not just report development costs,

particularly if such items are not identified in related charge number descriptions). Look at whole effort – what about things in ECES that are being done but not identified in WBS descriptions? A top down approach should be used: Is an activity .02 or .03 or .04? If it is .02 (Project Management and support) is it general project management or is <u>all</u> of the activity something more specific; if general, leave it at .02; if specific and well defined, go down an ECES level (to .02.03, Regulatory Interaction, for example). ECES Level 4 assignments should be used with care and Level 5 used rarely or never. Specific questions for ex-employees may resolve ambiguous charge number descriptions.

8. Ambiguity in assigning ECES codes due to insufficient information on scope may be resolved using three approaches:
    a. assign a "best fit" ECES code even if not quite right;
    b. use .XX.XX.9X, Other [for items like glovebox size reduction that are somewhat common]; or,
    c. roll up to higher level (e.g., .04.00 Studies/Design and Documentation if scope cannot be determined to be more like a design or more like an RI/FS).

   The second approach requires petition to ASTM to add "Other" categories.

9. Cost and parameter data should be assigned to the same ECES element when possible; in practice, most ECES codes have either cost or parameter data, since it is often not possible to identify unique parameters that determine unique costs. For example, costs may be captured under ECES Level 3 .31.09, Dismantlement and removal of Contaminated Equipment/Material but the "Equipment" may consist of linear feet of piping (ECES .31.09.03) and cubic feet of tanks (ECES .31.09.04), ECES Level 4 elements.

10. Ambiguity exists between ECES designations based on the flexibility of the ECES system. Examples include D&D being in ECES codes .05.04, .15.03, and .31.XX. Interpretations should be documented.

11. Sometimes site contracting approach makes ECES differentiation difficult (e.g., lumping large, multi-task subcontracts (with many ECES code scopes) into single charge numbers). Methods to address this include getting additional contract data, calculating ECES values based on independent data, time-based analysis of scope completion and cost, or acceptance of loss of ECES definition.

<u>Prerequisite Actions:</u>
1. Receive site information regarding WBS, actual costs, and parameters. This should ideally include costs at the lowest WBS level available (called "charge number" for the purposes of this procedure).
2. Receive WBS with ECAS Project designation.

<u>Instructions:</u>
1. Evaluate site cost data at lowest WBS level. Identify lowest-level WBS elements (i.e., charge number) descriptions that appear to directly correlate with ECES codes.
2. Identify larger-cost WBS elements that do not lend themselves to individual ECES codes. These may include elements that subcontract larger design/build

efforts or whole building cleanup efforts that include project management and waste management/disposal, not just physical dismantlement/demolition. Develop methods, if possible, to sub-divide costs and/or parameters into separate ECES codes while retaining data integrity or summary cost and parameter values. These subdivisions of site WBS may be made unique using the ECAS subproject field and/or a "dummy" site WBS level. This needs to be coordinated with the final cost and parameter assignment in Procedures E, F, and G.

3. Review charge number descriptions and develop "Work Type" descriptions (i.e., short descriptions that "normalize" work being identified) for each. Example: "Project Management, FY05", "Proj. Mgmt.", "Building 371 Project Management", etc. all are assigned a single "Project Management" Work Type using the approach shown in Attachment 8. The purpose of these Work Types is to ensure that the charge number descriptions are thoroughly reviewed and the type of work identified. If site knowledge or data provides additional more accurate information on the actual work charged to the charge number ("It says 'D&D the T-130-B trailer' but we really used that code to put in an analytical lab") the Work Type should reflect the real work.

4. Compare the "Work Type" descriptions against the Attachment 7 and Attachment 8 to identify potential ECES codes.

5. Determine the "best-fit" ECES code for the lowest-level WBS element based on the Attachment 7, Attachment 8, and position of the WBS element in the site WBS (e.g., is it in a site-level programmatic WBS element, a "Project Management" WBS element, or a direct/execution WBS element). Track assignment of ECES codes to assure consistency between analysts and over time.

6. Combine the Excel Spreadsheets with the WBS/ECES crosswalks from step 2 with the Excel spreadsheets with the WBS/ECES crosswalks from step 5 and the Excel spreadsheet with the WBS/ECAS Project designations to create a spreadsheet table that crosswalks the site WBS, ECES codes, and ECAS Projects. For large sites (at Rocky Flats this would have been hundreds of thousands of rows) the work may be broken into spreadsheets of workable size, typically based on the site WBS.

Deliverables:
1. Excel spreadsheets with the site WBS, ECES codes, and ECAS Projects crosswalks. This should include fields of identified Work Types.
2. Backup data showing approach to splitting WBS into smaller ECES Records (Step 2 above).
3. Memo identifying scope elements that have inadequate ECES differentiation and use of ".XX.XX.9X" ECES designators.

Post-Performance Activities:
1. Receive coordination and feedback from the cost and parameter assignment tasks that may change the ECES assignments.
2. Revisit ECES as additional information is identified based on cost and parameter assignment and on changes to the ECES Project/subproject structure.

APPENDIX I – ECAS DATA INPUT PROCEDURES

<u>Records Management/QA:</u>
1. Record Excel spreadsheets, justifications/calculations and memo.
2. Develop summary pivot table comparing ECES codes and Work Types and compare ECES code assignments within and between ECAS projects.
3. Provide visibility of ECES codes that must be acted upon by ASTM.

E. **ECAS Direct Cost Assignment**

<u>Purpose and Scope:</u>
Perform calculations on available budgeted and actual cost data to collect the costs into the categories identified in Attachment 4, ECAS Input Template Organization and Listing of ECAS System-Defined Terms. Distribute costs between ECAS Project/subprojects and ECES scopes that were defined in Procedures B-D.

<u>Principles:</u>
1. Costs should be allocated into the categories identified in the template based on Attachment 2, Standard Classification for Estimating Cost Element Components, Attachment 4, ECAS Input Template Organization and Listing of ECAS System-Defined Terms, and Attachment 9, Example Rocky Flats Cost Assignment Crosswalk.
2. Since the ultimate purpose of assembling this data is to develop the ECAS Input Template (see example in Attachment 13), the input information should be organized as closely as possible to that format.
3. Project cost information should be relatively recent (within five years).
4. Cost information should clearly indicate project year dollars and identify any markups/overhead (if sensitive, contractor markups may be summarized or excluded)
5. Assessment of data accuracy is required-how credible is the data – does the cost account represent the whole cost of everything that its title describes or are the costs for some of its scope charged to another cost account (e.g., trailer D&D costs $0, email support costs $0, etc. or D&D of 7 identical trailers costs $0 and the eighth costs $500K).
6. Accuracy tends to be greater at a higher WBS level; costs are sometimes miss-charged (e.g., trailer example above). Cross checks are needed to make sure that lower numbers sum/cross reference; if one factor is high and another is low, they tend to cancel out as the costs roll up the WBS structure.
7. Costs all need to add up. Crosscheck processes ensure that direct costs add up to overall site WBS costs. The ECAS data has to be the same as the data it was derived from or the differences explained.

<u>Prerequisite Actions:</u>
1. Receive site information regarding WBS, actual costs, and parameters
2. Receive site WBS, ECES Codes, and ECAS Project crosswalks

<u>Instructions:</u>
1. Confirm source data validity and Excel download accuracy.
2. Allocate costs into cost categories identified in Attachment 4 based on information provided in the cost data. Refer to Attachment 9.
3. Allocate cost data between charge number and low-level WBS elements based on method and parameters identified in Procedure B and Procedure D.
4. Identify whether the cost is calculated or actual and its pedigree

5. Perform QC checks to assure that allocation/apportionment is traceable and cost costs sum properly to overall values.

Deliverables:
1. Composite Excel spreadsheet containing crosswalk, cost data, and pedigree.
2. Waste management cost model.
3. Memo identifying missing cost data, such as dates, BCWS, and labor hours, and any other issues.
4. Cost QC in Step 5.

Post-Performance Activities:
1. Cost assignment changes and recalculations based on ECAS Project/subproject and ECES changes due to information identified in subsequent procedures.

Records Management/QA:
1. Composite Excel spreadsheet.
2. Waste management cost model.
3. Backup data or approach to allocating cost into template categories from site cost data, and memo.

F.   ECAS Non-Waste Parameter Identification/Collection/Assignment

Purpose and Scope:
Identify, quantify, and assign "primary" parameters for ECAS Projects and subprojects that will allow quantitative comparison with other similar projects. Identify "secondary" parameters that will support additional objective definition and analysis of ECAS Project and subproject scope; and support development of parametric factors and project comparisons. Identify the characteristics of the parameter as defined in the Attachment 4, ECAS Input Template Organization and Listing of ECAS System-Defined Terms.

Principles:
1. "Parameters" are metrics that provide a quantitative measure that can be used to adjust or "scale" estimates to the effort required to complete similar types of projects or activities
2. Primary parameters are from the list of parameters identified in Attachment 3, Listing of Project Types, Group, and Project Type Detail, to ensure that comparisons at the ECAS Project level are based on the same units of measure.
3. Although environmental restoration activities, especially ex-situ remediation, are often defined in terms of volume removed, the estimated volume is a better primary parameter than actual waste volume (although the waste volume should be included as a secondary parameter). The future user of the ECAS data will normally only have the estimated volume, so the original estimated volume from the baseline or project estimates is a better like-for-like comparison.
4. Secondary Parameters are quantitative metrics that provide additional information that can be used to estimate effort, such as volume of process tanks in a liquid waste treatment facility. They are based on values that can be determined from direct walkdowns and/or drawing takeoffs (not derived quantities like "length of cut" or "volume of size reduction enclosure" that require definition of an approach). The use of secondary parameters is based on ECAS Project type, subject to availability of data, and ECES element-specific.
5. Project information should clearly present all relevant descriptive parameters (e.g., activities performed, materials, equipment, labor), preferably in a way that can be associated with cost elements. These descriptive parameters should correspond closely to the input parameters required by the cost models.
6. Assessment of data accuracy is required-how credible is the data – does the ECAS Project/subproject value account for the complete quantity of everything that its title describes or are there values for some of its scope captured under other WBS elements?
7. Accuracy tends to be greater at a higher WBS level; parameters are sometimes misallocated. Cross checks are needed to make sure that lower WBS values sum/cross reference; if one factor is high and another is low, they tend to cancel out as the parameter values roll up the WBS structure.
8. Values of subprojects need to add up to total project and site values; all room areas in a building normally add to the total building area unless otherwise explained. The ECAS data has to be the same as the data it was derived from or the differences explained.

9. Assignment of parameter descriptors should be conservative but generally representative of the effort involved in executing the project or activity. For example, if 75% of a subproject area in a building is contaminated to greater than 100,000 DPM alpha, it would be considered a "_Rad_High Alpha" contamination area. If only 2% is contaminated to that level, it would be considered a "_Rad" contamination area, since dealing with the high contamination levels would be more hot spot removal than large area contamination removal.

10. Both costs and parameters are assigned ECES codes, but the relationships between "Secondary" parameters and costs are complicated, with three possible relationships:

    a. The ECES code contains both costs and parameters – Example: Decontamination of a building has a known cost based on a charge number and a known area based on the real property inventory.

    b. The ECES code for costs is at a higher ECES level than for parameters – Example: The removal of process equipment from a building subproject involves removing gloveboxes, tanks, piping, duct, and equipment. The parameters are available for all of these items (ECEC codes .31.09.01, .31.09.03, .31.09.04, etc.) but the cost only exists at the third ECES level (...31.09, Dismantling and Removal of Contaminated Equipment /Material).

    c. The ECES codes for costs are at a lower ECES level than for parameters – Example: A pump-and-treat system includes parameters for wells – number, depth, flowrate all spread across ECAS costs for RI/FS, Sampling, design, drilling, process equipment, operations, etc.

Prerequisite Actions:
1. Receive site information regarding WBS and parameters, including cost estimates, baseline data, basis of estimates, closure reports, work plans, etc.
2. Receive Excel Spreadsheet with ECAS Project/subproject designations.
3. Receive Composite Excel spreadsheet containing crosswalk, cost data, and pedigree.

Instructions:
1. Review all available site data, and map parameter data to site WBS and ECAS Project and subproject scope. This includes identifying the direct costs that are associated with scope elements and identifying how parameters map to costs at the ECES levels. Review against previous project data (Attachment 10).
2. Convert all necessary data to an Excel format.
3. Using site non-waste parameter information, such as cost estimates, allocate parameters to the appropriate ECES Projects and, if possible, subprojects/FSAs. Values for "Primary" parameters are associated whole ECAS Projects or subprojects, and are not associated with ECES codes. There is only one "Primary" parameter associated with each unique ECAS Project or FSA/subproject.
4. Assign ECES codes to each of the "Secondary" parameters. Values for "Secondary" parameters are associated with either specific ECES codes or with

the whole ECAS Projects or subprojects/FSAs. Refer to Attachment 13, Example ECAS Input Template for specific examples.

5. Identify direct cost elements that do not have associated parameters and situations where the parameters are at a different ECAS Project/subproject level than the costs. Examples would be costs for a several distinct RCRA Caps (with technical data on the size and composition of each cap) that are collected under a single WBS element [parametric data available at a lower level than cost data] ; or costs available for D&D at a room level within a building but no definition of room size [cost data available at a lower level than parametric data].

6. Evaluate if additional data can be found to match cost and parameter levels. This may include going back to source data, evaluating additional closure reports or administrative records, or identifying archived documents with specific information. For sites where closure is not complete it may involve interviews with on-site staff.

7. Evaluate if sufficient data exists to reliably apportion the data available at the higher level to the scope of the data at a lower level.

8. Evaluate if the ECAS Project or subproject structure needs to change to accommodate the calculated data. Alternatively, identify if a "dummy" WBS level should be used to differentiate elements. Coordinate with activities in Procedures B, and E.

9. Coordinate parameters with the appropriate ECES elements. Coordinate with activities in Procedures D, and E.

10. Identify descriptor data associated with the parameter (e.g., level of contamination associated with an area or building being decommissioned)

11. Develop a composite non-waste parameter spreadsheet detailing parametric data (primary and secondary) and its associated WBS, ECES, ECAS Project, subproject, and, if appropriate, cost crosswalk information.

12. Perform QC check to confirm assigned data corresponds to site provided data totals.

Deliverables:
1. Composite non-waste parameter spreadsheet detailing parametric data and its associated WBS, ECES, ECAS Project, subproject, and, if appropriate, cost crosswalk information.
2. Backup data to support changes to WBS/ECAS Project/subproject structure.
3. Back-up annotation indicating where data was derived from and justification of pedigree and contaminant of concern.
4. Memo identifying missing parameter data and other issues.

Post-Performance Activities:
1. Address feedback as data is collected as to data requirements and spreadsheet and/or organization changes.

Records Management/QA:
1. Composite spreadsheet, with configuration control.
2. Copies of source data with annotations as to where data was obtained.

3. Back-up data.
4. QC Check.

G.   ECAS Waste Parameter Identification/Collection/Assignment

Purpose and Scope:
Using site waste data, preferably databases that identify individual containers, collect, organize, and assign waste volumes (or Sanitary Waste weights) to ECAS Projects and (where possible) subprojects. Identify the characteristics of the waste as defined in the Attachment 4, ECAS Input Template Organization and Listing of ECAS System-Defined Terms.

Principles:
1. Waste values should be developed where possible from site databases; values should all sum to total values disposed of. However, volumes from sources such as closeout reports should be compared with site database values for discrepancies.
2. ECAS waste parameter units of measure should be based on the parameters used to determine disposal cost (cubic units for most wastes, weight for industrial/sanitary).
3. Provisions should be developed to allow waste management, transportation, and disposal cost to be allocated to the waste generating project as a distributed cost. See the waste management cost model in Procedure E.
4. Waste volumes are normally secondary parameters, but a specific type of waste may be primary parameters for Nuclear Material and Waste Management Operations Project Types (e.g., TRU waste may be the primary parameter but the project may also generate LLW). In this case the parameter will be duplicated as both the primary parameter and a secondary parameter for each of the management, transportation, and disposal ECES codes.
5. Assessment of data accuracy is required-how credible is the data – does ECAS Project/subproject amount represent the complete quantity of everything that its title describes or are there values for some of its scope captured under other WBS elements?
6. Accuracy tends to be greater at a higher WBS level; parameters are sometimes misallocated. Cross checks are needed to make sure that lower WBS values sum/cross reference; if one factor is high and another is low, they tend to cancel out as the waste volumes or weights roll up the WBS structure.
7. Values of subprojects need to add up to total project and site values; all room waste generation volumes in a building normally add to the total building area. Crosscheck processes ensure that lower WBS element values add up to overall site WBS values. The ECAS data has to be the same as the data it was derived from or the differences explained.
8. Waste parameters assigned management, treatment, and disposal ECES codes do not normally have direct costs. They will, however, have I/D Costs determined for them as discussed in Procedure I.

Prerequisite Actions:
1. Receive site information regarding WBS and parameters, including cost estimates, baseline data, basis of estimates, closure reports, work plans, etc.

2. Receive Composite Excel spreadsheet containing crosswalk, cost data, and pedigree
3. Receive non-waste parameter composite spreadsheet.

Instructions:
1. Review site waste data; get downloads of waste database and convert to an Excel format.
2. Identify approaches to match waste generation information to ECES Projects/subprojects; determine if use of waste database is feasible at a ECAS Project/subprojects or if calculations will be necessary. Attachment 11 provides examples of Rocky Flats database fields and consolidated data.
3. Map categories of waste in database to ECAS waste categories and units of measure.
4. Perform spreadsheet calculations to consolidate waste values as required.
5. Allocate waste parameters to the appropriate ECES Projects and, if possible, subprojects/FSAs.
6. Compare database-generated values to waste values available from other documentation (e.g., Closeout Reports). Identify and resolve discrepancies.
7. Assign ECES codes to each of the waste parameters.
8. Develop a composite waste parameter spreadsheet detailing parametric data and its associated WBS, ECES, ECAS Project, subproject, and, if appropriate, cost crosswalk information.
9. Perform QC check to confirm assigned data corresponds to site provided data totals.

Deliverables:
1. Consolidated spreadsheet.
2. Backup spreadsheets with detailed waste data. For large projects (at Rocky Flats this would have been hundreds of thousands of rows) the spreadsheets should be broken into spreadsheets of workable size.
3. Justification for mapping approach.
4. Back-up annotation indicating where data was derived from and justification of pedigree and contaminant of concern.
5. Memo identifying missing parameter data and other issues.

Post-Performance Activities:
1. Address feedback as data is collected as to data requirements and spreadsheet and/or organization changes.

Records Management/QA:
1. Composite spreadsheet, with configuration control.
2. Copies of source data with annotations as to where data was obtained.
3. Back-up data.
4. QC Check.

APPENDIX I – ECAS DATA INPUT PROCEDURES

H. Development of Data for and Population of ECAS Input Template

Purpose and Scope:
Based on the data developed in other procedures, collect, calculate, summarize, and ensure ECAS Input Template compliance prior to input of the ECAS data into the database.

Principles:
1. Ensure that ECAS database input data is in the correct format and uses the pre-defined terms from the Attachment 4, ECAS Input Template Organization and Listing of ECAS System-Defined Terms.
2. Ensure that the Excel table meets the ECAS Database system requirements such as unique text record definition (discussed below). This requires that there be no records (i.e., Excel rows) that have all site WBS, ECAS Project/subproject, ECES, and parameter descriptor fields identical
3. Ensure that costs and parameters roll-up accurately from site WBS-level Templates.
4. Avoid unnecessary levels of the site WBS.
5. The template is organized as follows, with the information organized by generating procedure:
    a. Site WBS information (initial site information)
    b. Project and subproject definition information (Procedure B)
    c. ECES definition (Procedure D)
    d. Direct cost values (Procedure E)
    e. Indirect/Distributed Cost values (Procedure I)
    f. Cost descriptors (Procedure E)
    g. Parameter values and descriptors (Procedure F and Procedure G)
    h. Project types (Procedure C)
    i. Project descriptors (Procedure C)
    j. D&D descriptors (Procedure C)
    k. ER descriptors (Procedure C)
    l. Subproject/FSA descriptors (Procedure C)

Prerequisite Actions:
1. Receive all spreadsheets with completed ECES code, cost, and parameter assignment.
2. After development of the Draft ECAS Input Template, receive the indirect/distributed cost (I/D Cost) assignment information.

Instructions:
1. Review all input information to assure that all cost and parameter data are properly developed, validated, traceable, and ready for final input.
2. Review Attachment 3, Listing of Project Types, Group, and Project Type Detail (incl. Primary UOM), Attachment 4, ECAS Input Template Organization and Listing of ECAS System-Defined Terms, and Attachment 13, Example ECAS

Input Template. The data from the site developed under these procedures must be in exactly this format to be properly inputted into the ECAS database.

3. Assemble all cost information in ECAS Input Template format, including information on site WBS, ECAS Project/subproject, ECES codes, ECAS Levels, and descriptors associated with cost (i.e., cost pedigree, Actual/Calculated, CE/Sum). This may require a number of Excel spreadsheets – the Rocky Flats data was over 100,000 Excel rows.

4. Evaluate the amount of roll-up of data that is possible. That is, if all of the charge numbers associated with a "project management" site WBS are ECES code Ph_1.02.01, and all have the same ECES Project/subproject and other ECAS parameters (i.e., they differ only by site WBS element), then they may be combined to a single row in the ECAS Input Template. This can most easily be done using an Excel pivot table. **Although a significant amount of effort, this roll-up step is necessary to avoid excessive and marginally useful records being incorporated into the ECAS database**.

5. Assemble all of the parameter information in the ECAS Input Template format, including information on site WBS, ECAS Project/subproject, ECES codes, ECAS Levels, and descriptors associated with parameters (i.e., parameter pedigree, UOM, contaminant of concern, waste type, etc.).

6. Combine cost and parameter data so that ECAS Project/FSA/subproject records are co-located

7. Assemble ECAS Project/FSA/subproject data (e.g., ECAS Project Type, Project Type Detail, other project/FSA descriptors, "Primary" parameters, ECAS Project Descriptions, etc.) and insert it into the ECAS Input template as appropriate records. Evaluate ECES correspondence between costs and parameter spreadsheets, and consolidate records if possible (see Procedure F, Principles, No.8)

8. Check ECAS Input Template data to ensure that inputted data corresponds to original data and rolls up to correct WBS elements.

9. Insert I/D Cost data into Draft ECAS Input Template (see Indirect Cost Assignment procedure)

10. Perform final checks for term usage against Attachment 4, ECAS Input Template Organization and Listing of ECAS System-Defined Terms, i.e., correct terms, no trailing spaces, etc.

11. Ensure data rolls-up to unique rows, i.e., there cannot be duplicate rows with the same site WBS, ECES Project/subproject, ECES identifiers, and other text descriptors that differ only by numeric (cost and parameter) values. For example, the calculations must summarize all Containerized LLW going to NTS as a single row per WBS element or ECAS Project/subproject scope element. One way to do this is by extending the WBS to whatever level is necessary to have unique WBS elements associated with Unique ECES codes. For instance, WBS Level 4 sub elements of a WBS Level 3 element are the same ECES code, roll up/summarize at Level 3.

12. Conduct review for overall data quality.

Deliverables:
1. Completed Template.
2. Back-up roll-up.
3. QC check.
4. Memo identifying data anomalies and other issues.

Post-Performance Activities:
1. Feedback from review and database input steps.

Records Management/QA:
1. Records of roll-up as back-up.
2. Initial and final review comments and resulting changes.
3. QA records.

I. ECAS Indirect Cost Assignment

Purpose and Scope:
Assign indirect or distributed costs in a manner that can be used to determine their contribution to the total project cost for each direct cost element. Develop any necessary models or cost engineering relationships so that the cost of waste disposal may be associated with the ECAS Project or subproject direct costs.

Principles:
1. ECAS "Indirect" costs consist of those costs that are typically overhead and that are not readily associated with objective parameters. See Attachment 2, Standard Classification for Estimating Cost Element Components.
2. ECAS "Distributed" costs consist of management or support costs that the site has collected at a level above the ECAS Project or subproject (i.e., it is "distributed" over several projects) and are most easily addressed as costs that may be pro-rated against direct costs in ECAS Projects or subprojects. If site knowledge provides a better apportionment of distributed cost than pro-ration against direct cost dollars (e.g., "95% of the waste assay cost was apportioned to the TRU program") it should be used and documented; otherwise I/D Costs should be pro-rated against and then added to direct costs.
3. Indirect/Distributed costs (I/D Costs) shall be collected into four levels – I/D Costs within the project (distributed across subprojects), I/D Costs within an ECAS Level 4/"Parent Project (distributed across ECAS Projects under that "Parent Project"), site-level costs (distributed across all site projects), and "waste costs." These I/D Costs will be added to the direct costs at the ECES Level to provide information on what the actual cost of the work is. Attachment 12, Example Rocky Flats approach to developing I/D Costs, provides the detail for Rocky Flats I/D Costs distribution.
4. "Waste costs" consist of the costs of on-site waste management, on-site treatment/ transportation, and disposal costs for those wastes generated by an ECAS Project. In most multi-project DOE sites a central materials disposition or waste management organization handles the waste generated by an EM project. The purpose of treating the waste disposition cost as a project cost, effectively "back-charging" the ECAS project, is to allow comparisons between projects to consider all project-related costs. Attachment 12, Example Rocky Flats approach to developing I/D Costs, provides the detail for Rocky Flats waste cost distribution. See Procedure E for information on the waste management cost model.

Prerequisite Actions:
1. Completion of all site cost development activities
2. Completion of all waste distribution among ECAS Projects/subprojects
3. Receipt of Draft ECAS Input Template containing all cost information and data organization except assignment of I/D Costs

APPENDIX I – ECAS DATA INPUT PROCEDURES

Instructions:
1. Ensure that all cost data has been reviewed and properly sums to the site WBS values.
2. Review Attachment 13, Example Rocky Flats approach to developing I/D Costs.
3. Assign descriptors to individual ECAS Input Template spreadsheet rows to identify the different non-waste I/D Cost level (see Principle No. 3 above)
4. Using the Excel Pivot Table feature, determine the direct cost and I/D Cost values for each ECAS Project, ECAS Level 4/ "Parent Project", and site
5. Develop factors (i.e., $ I/D Cost/$ direct cost) to allow I/D Cost values to be developed for each direct cost value (i.e., the factor that multiplied by the direct cost will yield each I/D Cost). Place those costs in the appropriate ECAS Input Template Field
6. Specifically review waste management costs to evaluate cost categories – treatment, general on-site waste management, transportation, and disposal. Consider issues of on-site disposal at sanitary landfills or on-site CERCLA cells. Develop Cost/CF or Cost/Ton factors by waste type. See Attachment 12 Example Rocky Flats approach to develop I/D Costs.
7. Develop the factors (i.e., $/CF or $/Ton) that include the waste costs (see Principle No. 4). This includes identifying and evaluating all available waste disposal costs against the volumes of project-generated waste. Legacy waste management/disposition is considered a separate project. Waste cost factors should be developed as closely as possible to reflect the waste types (e.g., LLW). Multiply the factors by waste volume (or weight) to derive disposition costs by ECAS Project for each waste spreadsheet row.
8. Ensure that total direct plus I/D Cost values equal site WBS total values, and the sum of the ACTUAL_COST_TOTAL and GRAND_TOTAL_COST are equal.

Deliverables:
1. ECAS Input Template with I/D Costs included
2. Backup spreadsheets showing the mechanics of cost assignment

Post-Performance Activities:
1. Change I/D Costs as other costs and waste volumes change

Records Management/QA:
1. ECAS Input Template with I/D Costs included
2. Backup spreadsheets showing the mechanics of cost assignment

J.   ECAS Data Validation

<u>Purpose and Scope:</u>
Ensure that ECAS data is consistent with the available site data, and deviations from site data are identified, justified, and recorded. Ensure that the costs in the ECAS database properly roll-up to higher-level site WBS costs. Ensure that ECAS data development reviews are properly executed.

<u>Principles:</u>
1. EMCBC reviews will be sufficient to assure compliance.
2. Inputting personnel will have training on the input procedures.
3. ECAS cost data should roll up to the total site data where possible. If only partial DOE site data is available, clear definition of boundaries shall be identified.
4. ECAS data shall be traceable to original documents.
5. Calculations used to assign or apportion cost or parametric values shall be identified and recorded to allow evaluation of the methodology.
6. Calculated data should cross-check against site data to within at least four significant figures or the nearest dollar, whichever is more feasible. Cross-checks with multiple calculations are often easiest if data is made accurate to the nearest dollar, sometimes through assignment of residual costs to particular elements.)
7. Data quality expectations should be identified in initial planning.

<u>Prerequisite Actions:</u>
1. Receive site information regarding WBS, actual costs, and parameters
2. Receive the output of all procedures for review and checks

<u>Instructions:</u>
1. Identify internal document review points. Ensure resources are available to perform reviews.
2. Develop the QC check process (e.g., pivot table reports, other methods) to confirm that allocated values sum to reference values for costs and parameters. While differing input data requires some flexibility, all output cost and parameter values needs to be traceable to input data.
3. Develop a lessons learned memo to identify process improvements.

<u>Deliverables:</u>
1. Memo identifying internal review points and outlining QC process.
2. Record copies of all QA documents.
3. Review results and evidence of correction.
4. Lessons Learned at conclusion of the input process.

<u>Post-Performance Activities:</u>
1. Feedback as data is collected.

<u>Records Management/QA:</u>
1. Copies of deliverables for archive.

APPENDIX I – ECAS DATA INPUT PROCEDURES

K.   Pre-ECAS Input Data Management

Purpose and Scope:
Provide data management process to ensure traceability, integration between multiple input personnel, and file backup protection.

Principles:
1. Data control will be maintained between parallel activities, with sufficient backup copies to recreate documents that are overwritten or corrupted.
2. File backup and traceability shall be such that when ECAS database formats or requirements change the original and derived data files will be available for EMCBC staff to extract or re-run the roll-up process and update the database.
3. Archived data will be available in digital format.
4. Data management efforts shall be commensurate with the amount of effort necessary to reconstruct data – keep it simple, don't spend more time managing data than developing data.
5. Some of the data may be proprietary or sensitive – i.e., it is contractually protected. All of the available data has been paid for by, and is the property of, the DOE. Contractually sensitive information may include:
    a. Overhead and fringe information for subcontracted or contractor home office activities (typically, pay for on-site employee classification is a mater of public record)
    b. Some records may have personal data such as social security numbers
    c. Contract fee amounts, tables or formula may be considered to provide an advantage in future procurement.

    Such information, where actually determined to be proprietary or contract-sensitive, must be protected through limitation on information access and non-disclosure agreements.
6. Some data may be potentially UCNI otherwise controlled. Some materials that are labeled UCNI (e.g., building floor plans) are no longer UCNI after the building is demolished; however, a classification review is required.

Prerequisite Actions:
1. Receive site information regarding WBS, actual costs, and parameters
2. Receive the final output of all procedures for archive and record copies
3. Receive interim procedure documentation as necessary to maintain configuration control.

Instructions:
1. Identify Record Documents required and configuration control methodology to ensure traceability. Issue memo describing the process to be used.
2. Determine approach to archiving documents (preferably electronically); include the file backup process.
3. Execute the process throughout the development of the ECAS data.

APPENDIX I – ECAS DATA INPUT PROCEDURES

Deliverables:
1. Memo identifying record documents and process.
2. Archive of record documents.
3. Archive of interim documents.

Post-Performance Activities:
1. Feedback as data is collected

Records Management/QA:
1. Cross check that all record and interim documents are included in archives.
2. Confirm Data management process is followed.

Attachment 1   Glossary/Acronyms

Term	Definition
Analyst	Individual working in support of the ECAS data input process
Composite Labor Cost	See Attachment 2
Composite Materials/Utilities	See Attachment 2
Composite Subcontractor Cost	See Attachment 2
Construction/Subcontracts	See Attachment 2
Cost components	TBD
Cost element	A cost that might correspond to a charge number or WBS element scope
Cost element components	TBD
Cost estimate	Costs developed to predict the costs of executing a given scope
Cost Estimating Relationship (CER)	Factor or equation that relates one or more input values such as parameters into costs (e.g., cost factor, such as $/SF)
Craft Labor	See Attachment 2
Descriptor	ECAS system-specified text that assigns a qualitative characteristic to a field, such as "Very High" ER project complexity or "_LLW_CH" waste type.
ECAS Project	Scope from site EM scope identified as a project within the ECAS database
Equipment/rentals	See Attachment 2
Fuel and Utilities	See Attachment 2
General and Administrative	See Attachment 2
I/D Cost	Indirect/Distributed Cost; cost that has no parameter associated with it, is distributed over other direct costs. Includes overhead.
Materials and Supplies	See Attachment 2
Melton Valley (MV)	The Melton Valley Watershed remediation project, a group of projects at DOE's Oak Ridge National Laboratory, from which ECAS data has been collected
Professional Labor	See Attachment 2
Professional Services	See Attachment 2
Profit and Fee	See Attachment 2
Project Description	Short (several page) description providing detailed information on project scope, conditions, and execution
Rocky Flats (RF)	A DOE site near Denver, Colorado, closed in 2005, from which ECAS data has been collected
Total Activity Cost	See Attachment 2
Total Direct Costs	See Attachment 2
Total Indirect Costs	See Attachment 2
TRU	Transuranic, with regards to waste
User or ECAS User	Individual extracting data from the ECAS database using its report capabilities
WBS	Work Breakdown Structure

Note: The glossary will be expanded to support changes in the User's Manual

Attachment 2   Standard Classification for Estimating Cost Element Components

A. Scope

A.1 This classification standard provides identification of cost elements that are common to all project activities.

A.2 These common cost elements are further broken down into code of accounts items, sub-elements, or components of which the cost elements are comprised.

A.3 The classification standard defines the individual cost element components that are common to all project activities and the standard hierarchy with which they can be summarized or rolled up.

B. Significance and Use

B.1 Use of this classification standard will improve communication and common understanding among all the stakeholders involved in preparing estimates as well as evaluating, and using project cost information.

B.2 Most cost estimating unit cost data books and databases provide unit cost data for the cost element components, but these unit cost sources do not all use the same terminology or definitions.

B.3 Cost element component definitions sometimes conflict, overlap, or leave gaps in their coverage of activities.

B.4 This standard defines a structure for the major components of cost in a construction, environmental cleanup or other project type.

B.5 Virtually all types of cost estimating will benefit from this standardization, including estimating for buildings, site work, environmental costs, or operations and processing activities.

C. Basis of Classification

C.1 This standard sets forth a listing of cost element components, along with a hierarchy and set of definitions of cost categories for cost element components.

C.2 Every Work Breakdown Structure (WBS) and cost reporting system divides each project into multiple activities. Each activity consists of specific elements, many of which are common to all activities. Figure 1 (below) identifies the elements that are common to all project activities.
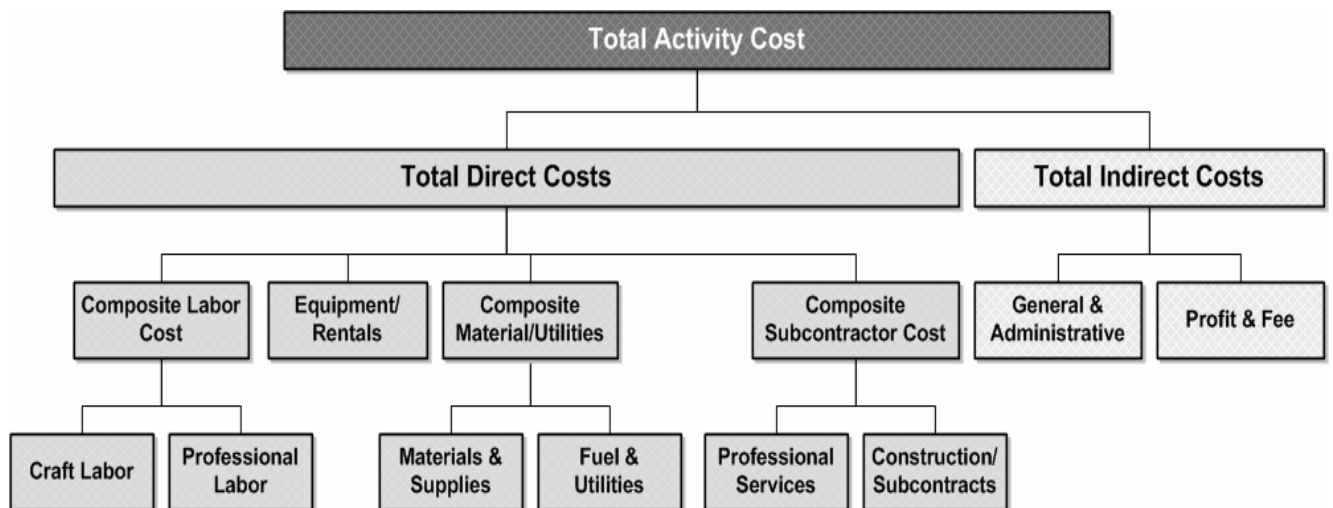

Figure 1 – Activity Cost Breakdown

APPENDIX IA - Attachments

These elements and their definitions are provided below.
C.3 Definitions

Table A2-1, Attachment 2 Definitions

Item	Definition
Total Activity Cost	The sum of the total direct cost and total indirect costs that can be linked to the activity.
Total Direct Costs	Any costs that can be specifically identified with a particular project or activity, including salaries, travel, equipment, and supplies directly benefiting the project or activity. *(Appendix A of DOE Cost Guide, Volume 6, November 1994, Rev. 0)* Direct costs are those costs that can be traced exclusively to one output, such as hands on labor or material consumed directly in the production of an output. Direct costs tend to (but not always) change proportionally with the quantity of output. *Web Site - http://www.nps.navy.mil/drmi/uccostout.htm accessed on 4-11-07*
Total Indirect Costs	The sum of all general and administrative (G&A) costs, profit, fees, and overhead directly attributable to the activity. Costs incurred by an organization for common or joint objectives, and which cannot be identified specifically with a particular activity or project.[1]
Composite Labor Costs	The sum of direct craft labor and professional labor directly attributable to the activity.
Equipment/Rentals	Equipment costs include both rental and operating costs for equipment under normal use. The operating costs include parts and labor for routine servicing such as repair and replacement of pumps, filters, and worn lines. Normal operating expendables such as fuel, lubricants, tires, and electricity are also included. Extraordinary operating expendables with highly variable wear patterns such as diamond bits and blades are excluded. These costs are included under materials.[4] Construction Equipment normally includes items such as earthmoving equipment, trucks, drill rigs, etc., as required to perform the work.[4]
Composite Materials/Utilities	The sum of materials, supplies, fuel, and utilities directly attributable to the activity.
Materials & Supplies	Materials are generally considered to be consumable items with indeterminate life expectations such as saw blades, drill bits, etc. Office Supplies and Expenses – Expenses of administrative or field offices including stationery, forms, blueprints, reproduction equipment and supplies, furniture, photography, telecommunications services and personnel, janitorial services, heating and air conditioning, lighting, water and sewage, depreciation of office facilities and equipment, repairs and maintenance of office buildings and equipment, messenger and mail services, and office employees not chargeable to other accounts. This is an indirect cost.[1]
Fuel & Utilities	The cost of fuel, electricity, non-office telephones, and similar expenses that can be directly attributed to the activity.

Item	Definition
Composite Subcontractor Costs	The sum of all subcontractors that can be directly attributed to the activity.
General & Administrative (G&A) Cost	The expenses of operating a business that are not directly linked to the company's products or services. They include salaries, rent and payments to utilities generally known as overhead. *Web Site - http://www.teachmefinance.com/Financial_Terms/general_and_administrative_expenses.html accessed 4-5-07.*
Profit/Overhead/Fee	Profit is the fee earned by the contractor on top of direct costs, general conditions, and overhead items. Profit is generally applied as a percentage of the sum of direct costs, general conditions, and overhead. Different profit percentages may be applied to prime contractor costs and subcontractor costs.[4] Overhead costs are items required to support the contractor's permanent staff and offices that provide indirect support to the contractor's field operations. These costs are typically allocated to project expenses as a percentage of the project direct cost for professional labor, craft labor, materials and equipment. Overhead costs may be applied in different ways but are generally grouped into the following categories: ▪ Professional services overhead ▪ Home office expense ▪ Operations and maintenance service contract overhead[4]
Craft Labor	Comprised of the direct pay to the laborer plus any required fringe benefits, but do not include overhead or profit items for performing the particular items of work.[4]
Professional Labor	Comprised of engineers, scientists, site health and safety officials and other professional disciplines required to support the work on the site. Professional Labor is distinguished from Craft Labor because it generally includes a significantly higher labor overhead than craft labor. *R S Means, Environmental Remediation Cost Data – Unit Price, 11th Annual Edition, 2005.*
Professional Services	Service rendered by certified public accountants, public accountants, architects, attorneys, podiatrists, chiropractors, dentists, pharmacists, professional engineers, land surveyors, registered professional nurses, optometrists, physicians and surgeons, physician assistants, psychologists, veterinarians, and all other professionals licensed, registered, certified, or otherwise authorized and permitted to practice independently. *Web Site - http://www.gencourt.state.nh.us/rsa/html/XXVII/294-A/294-A-1.htm accessed 4-11-07*
Construction/Subcontract Costs	Labor, construction, and subcontract costs associated with the activity.

(Note: This document was modified slightly, with the endnotes inserted in the table and Section 4, "Keywords," included in the Glossary.)

Attachment 3   Listing of Project Types, Group, and Project Type Detail (incl. Primary UOM)

This Attachment consists of three tables that address the Environmental Restoration; Building/Facility D&D; and Nuclear Material and Waste Management Operations ECAS Projects. The first column indicates the overall ECAS Project Type (i.e., the types given above), and is placed in the ECAS Input Template under the column titled "PARAMETER_PROJECT_TYPE." The second column indicates the allowable sub-types under that overall type), and is placed in the ECAS Input Template under the column titled "ER_TYPE" or "BUILDING_TYPE" (there are no elements in the Nuclear Material/Waste Management Operation categories). The third column provides the detailed project type, and is placed in the ECAS Input Template under the column titled "ER_TYPE_DETAIL" or "PROJECT_TYPE_DETAIL." Project types in the "ER_TYPE_DETAIL" or "PROJECT_TYPE_DETAIL" categories may only be used under the "ER_TYPE" or "BUILDING_TYPE" categories associated with them in the second column. The template headings are color coded in yellow and the allowed inputs are color coded blue.

Table A3-1, Environmental Restoration Project Types

PARAMETER_PROJECT_TYPE			UOM *(Units of Measure)*
Environmental Restoration Project Type	ER_TYPE	ER_TYPE_DETAIL	
	In Situ GW Technologies		
		Capping	_SF
		Vertical Cut-Off Wall	_L_Ft
		Enhanced Bioremediation	_Gal
		Phytoremediation	_SF
		In-Well Air Stripping	_Ea
		Air Sparging	_P_CFM
		Treatment Wall	_L_Ft
		Skimming	_Gal
		Bioslurping	_Gal
		Two-Phase Extraction	_Gal
		Draw-Down Pumping	_Gal
		OTHER In Situ GW Project	TBD
	In Situ Soil or Sediment Technologies		
		Capping	_SF
		Bioventing	_SF
		Land Tilling	_SF
		Phytoremediation	_SF
		Soil Flushing	_SF
		In Situ Soil Vapor Extraction	_P_CFM
		In Situ Heating - High Temp	_SF
		In Situ Heating - Low Temp	_SF

		In Situ Stabilization - Solidification	_CF
		Munitions of Explosive Concern (MEC) Remediation	_Ea
		OTHER In Situ Soils Project	TBD
	Buried Waste Retrieval		
		Drum Removal	_Ea
		Tank Removal	_Ea
		Excavation with Off-Site Disposal	_CY
		OTHER Buried Waste Project	TBD
	Site Work		
		Cleanup/Landscaping/Revegetation	_SF
		OTHER Site Work Project	TBD
	Sampling & Monitoring		
		Natural Attenuation	_Yr
		Groundwater Monitoring	_Yr
		Long-Term Monitoring	_Yr
		OTHER Sampling Projects	TBD
	Ex Situ GW Treatment		
		Pump and Treat - Facility Construction	_P_GPM
		Pump and Treat - Facility Operations & Maintenance	_Yr
		OTHER Ex Situ GW	TBD
	Ex Situ Solids Treatment		
		Excavation with Off-Site Disposal	_CF
		Confined Disposal Facility	_CF
		Biopile-Composting	_CF
		Land Application	_CF
		Slurry Phase Bioreactors - Rotating Biologic	_CF
		Glycolate Dehalogenation	_CF
		Base-Catalyzed Decomposition Process	_CF
		Solvent Extraction	_CF
		Chemical Leaching	_CF
		Ex Situ Soil Vapor Extraction	_CF
		Ex Situ Soil Vapor Extraction - Hot Air	_CF
		Physical Separation - Sieving and Removal of Debris	_CF
		Soil Washing	_CF
		Incineration	_CF
		Thermal Desorption	_CF
		Ex Situ Solidification - Stabilization	_CF
		OTHER Ex Situ Soil	TBD
	Site Characterization		
		Phase 1 Studies (e.g., PA/SI)	_Ac
		Site Assessment	_Ea

		Phase 2 Studies (e.g., RI/FS)	_Ac
		Corrective Action Plan	_Ea
		Regulatory Interaction (e.g., Closure Reports, NEPA, etc.)	_Ea
		Munitions of Explosive Concern (MEC) Investigation	_Ea
		OTHER Professional Labor Project	TBD
	Long-Term Management		
		Land-Use Controls (Institutional and Legal)	_Yr
		Surveillance Inspection and Maintenance	_Yr
		On-going Regulatory Projects (i.e., Multi-Site CERCLA 5 Year Review)	_Yr
		OTHER LTM Project	TBD

Table A3-2, Facility Disposition Project Types

PARAMETER_PROJECT_TYPE			Units of Measure (UOM)
Building / Facility D&D Project Type	BUILDING_TYPE	PROJECT_TYPE_DETAIL	
	_B_Typ_1		
		Transite/High Asbestos Non-Radioactively-Contaminated Building	_SF
		Coal/Oil Power/Steam Plant	_SF
		Commercial/Industrial Non-Nuclear Facility(ies)	_SF
		Office Building(s)	_SF
		Non-contaminated Equipment	_SF
		OTHER Type 1	_SF
	_B_Typ_2	Parameter Values	
		Plutonium Storage Facility	_SF
		Reactor - Test/Small Experimental	_SF
		LLW Tanks w/ Sludge	_SF
		LLW Tanks w/o Sludge	_SF
		Contaminated Chimney/Stack	_SF
		Low-Level Laboratory Facility	_SF
		Generic Radiological Facility(ies)	_SF
		Generic Radiological Facility(ies)-Extensive Loose Contamination	_SF
		Solid Waste Packaging Facility	_SF
		Contaminated Exterior Equipment	_SF
		Waste Storage Facility (Packaged Waste Only)	_SF
		OTHER Type 2	_SF
	_B_Typ_3	Parameter Values	
		Reactor - Weapons Production/Commercial	_SF
		Spent Fuel Reprocessing Facility	_SF
		Plutonium/Enriched Uranium Processing Facility	_SF
		Remote Waste Treatment (Liquid/Solid)	_SF
		Semi-Remote Waste Treatment Facility	_SF
		Spent Fuel Basin w/ Sludge	_SF
		Spent Fuel Basin w/o Sludge	_SF
		Uranium Enrichment Facility	_SF
		HLW Tanks w/ Sludge	_SF
		HLW Tanks w/o Sludge	_SF
		High-Rad Laboratory/Hot Cell Facility	_SF
		OTHER Type 3	_SF

Table A3-3, Nuclear Material and Waste Management Operations Project Types

PARAMETER_PROJECT_TYPE			Units of Measure (UOM)
Nuclear Material Operations Project Type		PROJECT_TYPE_DETAIL	
		Spent Nuclear Fuel Mgt & Disposition	_CF
		Excess Nuclear Material Mgt & Disposition	_CF
Waste Management Operations Project Type		PROJECT_TYPE_DETAIL	
		Tank Waste Mgt & Disposition – Treatment, Storage, Disposal	_CF
		Remote Handled TRU Waste Mgt & Retrieval – Treatment, Storage, Disposal	_CF
		Contact Handled TRU Waste Mgt & Disposition – Treatment, Storage, Disposal	_CF
		Mixed Low-Level Waste Mgt & Disposition – Treatment, Storage, Disposal	_CF
		Low-Level Waste Mgt & Disposition – Treatment, Storage, Disposal	_CF
		Other	_CF

TBD - Definitions for all project types/project type details?

Attachment 4   ECAS Input Template Organization and Listing of ECAS System-Defined Terms

This Attachment is organized into the Table 1 below and two supplementary tables. Table A4-1 identifies the columns of the ECAS Input Template, including all user and system-defined terms, and provides a summary level explanation of their purpose or refers the user to a location that provides additional data. Table A4-2, Reliability and Complexity Definitions identifies the meaning of the qualitative evaluations that the analyst will provide. Table A4-3, Principal Contaminant Designations, provides additional data on the appropriate use of this data field. Fields in blue in the Explanation/Prescribed Text column represent quantitative data that must be inputted as given. Blue shading serves only to differentiate types of input.

Table A4-1, ECES Input Template Column Designations

Input Category	Input Type Title	Text or Numeric	System or User Defined	Explanation/Prescribed Text
Site WBS	SITE_WBS_LEVEL_1	Text	User	Site WBS Nomenclature
	SITE_WBS_LEVEL_2	Text	User	Site WBS Nomenclature
	SITE_WBS_LEVEL_3	Text	User	Site WBS Nomenclature
	SITE_WBS_LEVEL_4	Text	User	Site WBS Nomenclature
	SITE_WBS_LEVEL_5	Text	User	Site WBS Nomenclature
	SITE_WBS_LEVEL_6	Text	User	Site WBS Nomenclature
	SITE_WBS_LEVEL_7	Text	User	Site WBS Nomenclature
	SITE_WBS_LEVEL_8	Text	User	Site WBS Nomenclature
	WBS_DESCRIPTION	Text	User	Site WBS Nomenclature/Description
Project/ Subproject Definition	PROJECT_NAME	Text	User	Unique name to identify all ECAS Project records (e.g., RF B371 D&D)
	ECAS_LEVEL	Text	System	Grouping level within the ECAS structure. ECAS Projects are always Level 5 (_5_T_A_Proj)
				_1_Resvtn
				_2_Instltn
				_3_Mjr_Prj
				_4_Prj_Grp
				_5_T_A_Proj
				_6_Comp_T_A_Elmnt
				_7_Elmnt
				_8_Elmnt_Detl
	SUM_OR_CE	Text	System	Designates whether a record is a project/subproject designator or contains cost/parameter data
				_Sum
				_Partl_Sum
				_CE
				_CE_Dist
				_CE_Mix
	SUBPROJECT_NAME	Text	User	Project-unique name to identify all sub-project records within an ECAS Project (e.g., Set 1)

APPENDIX IA - Attachments

ECES Designators	ECES_LEVEL_1	Text	System	Designates ECES Phase (See ASTM Standard E-2150)
				_Ph_1
				_Ph_2
				_Ph_3
				_Ph_4
				_Ph_5
				_Ph_6
				_Ph_7
				_Ph_8
	ECES_LEVEL_2	Text	System	.XX format in ASTM Standard E-2150
	ECES_LEVEL_3	Text	System	.XX format in ASTM Standard E-2150
	ECES_LEVEL_4	Text	System	.XX format in ASTM Standard E-2150
	ECES_LEVEL_5	Text	System	.XX format in ASTM Standard E-2150
	ECES_DESC	Text	System	Description in ASTM Standard E-2150
Direct Cost Data	PHASE_START_DATE	Date	User	Date associated with costs in record
	PHASE_END_DATE	Date	User	Date associated with costs in record
	BUDGET_HRS	Numeric	User	Hours associated with costs in record
	BUDGET_COST	Numeric	User	BCWS at Completion
	BUDGET_HOURS_UNIT	Text	User	Time Unit (normally hours)
	ACTUAL_HRS	Numeric	User	Hours associated with costs in record
	ACTUAL_COST	Numeric	User	Total ACWP at Completion
	ACTUAL_HOURS_UNIT	Text	User	Time Unit (normally hours)
	PROF_LABOR_COST	Numeric	User	Sub-element cost from accounting data
	CRAFT_LABOR_COST	Numeric	User	Sub-element cost from accounting data
	LABOR_COST_TOTAL	Numeric	User	Sub-element cost from accounting data
	PROF_SERVICES_COST	Numeric	User	Sub-element cost from accounting data
	CONST_SUBCONT_COST	Numeric	User	Sub-element cost from accounting data
	SERVICES_CONST_SUBCONT_TOTAL	Numeric	User	Sub-element cost from accounting data
	EQUIPMENT_RENTAL_COST	Numeric	User	Sub-element cost from accounting data
	MATERIAL_SUPPLIES_COST	Numeric	User	Sub-element cost from accounting data
	FUEL_UTILITIES_COST	Numeric	User	Sub-element cost from accounting data
	MATERIALS_UTILITIES_TOTAL	Numeric	User	Sub-element cost from accounting data
	DIRECT_COST_TOTAL	Numeric	User	Sub-element cost from accounting data
	PROFIT_OVERHEAD_COST	Numeric	User	Sub-element cost from accounting data
	ACTUAL_COST_TOTAL	Numeric	User	Total ACWP at Completion
Indirect/Distributed Cost	INDIRECT_DISTRIBUTED_COST_L5	Numeric	User	Calculated I/D Cost-Project Level for record
	INDIRECT_DISTRIBUTED_COST_L4	Numeric	User	Calculated I/D Cost-ECAS Level 4/ Parent Project Level for record
	INDIRECT_DISTRIBUTED_COST_SITE	Numeric	User	Calculated I/D Cost-Site Level for record
	INDIRECT_DISTRIBUTED_COST_WASTE	Numeric	User	Calculated I/D Cost for record based on allocated waste management cost
	GRAND_TOTAL_COST	Numeric	User	Total ACWP and indirect cost
Cost Descriptors	CALC_OR_ACTUAL	Text	System	Designates actual or calculated data
				_Calc
				_Actl
	COST_PEDIGREE	Text	System	Indicates reliability (See Table 2)
Parameter Values and Descriptors	PARAMETER_UOM	Text	System	Unit of measure (Reference UOM list)
	PARAMETER_VALUE	Numeric	User	Record parameter value

	PRINCIPAL_CONTAMINANT	Text	System	Parameter Contamination Characteristics (See Table 3)
	WASTE_OR_MATERIAL_TYPE	Text	System	Waste/Material Types
				_HLLW
				_Mx_TRU_CH*
				_Mx_TRU_RH*
				_Mx_LLW_LDR
				_Mx_LLW_Non_LDR
				_Mx_LLW_TSCA
				_LLW_Asbestos
				_LLW_CH
				_LLW_RH
				_NORM
				_U_Mill_Tl
				_Haz
				_Haz_PCB
				_Non_Rad_Asbestos
				_Non_Haz
				_San
				_Mx_LLW_Liquid-Aqueous
				_SNM
				_SNF
				_Transfer_Matl
				_Recycle_Matl
				_Recycle_Concr_Asph
				_Borrow
				_Equip_Salvg
	PCKG_TYPE	Text	System	Packaging types
				Bulk
				Containerized - General
				Containerized - Small Box
				Containerized - Medium Box
				Containerized - Large Box
				Cask for High-Rad Waste
				Container for Liquid Transp - Tank, HIC, etc.
				Drum
				B25 Box
				Soft-sided Bulk Container
				Overpack
				Other Box
	DISP_TRTMT	Text	System	Treatment approach (generally for mixed waste)
				_No_Trt
				_Trt_at_Origin
				_Trt_at_Disp_Fac
	DISP_FAC_REG	Text	System	Type of facility regulation that waste is taken for disposal; Sanitary waste not regulated under federal law
				CERCLA (incl. Env Care/NTS)
				CERCLA-DOE Regulated

				CERCLA-Local On-Site Disposal Cell
				CERCLA-NRC Regulated
				POTW
				Regulatory - LDR
				Regulatory - LDR
				Regulatory - RCRA
				Regulatory - TSCA
	PARAMETER_PEDIGREE	Text	System	Indicates reliability (See Table 2)
Project Types	PARAMETER_PROJECT_TYPE	Text	System	See Attachment 3
	BUILDING_TYPE	Text	System	See Attachment 3
	PROJECT_TYPE_DETAIL	Text	System	See Attachment 3
	ER_TYPE	Text	System	See Attachment 3
	ER_TYPE_DETAIL	Text	System	See Attachment 3
Project Descriptors	MGMT_CMPLX	Text	System	Indicates Complexity (See Table 2)
	TECH_CMPLX	Text	System	Indicates Complexity (See Table 2)
	REG_CMPLX	Text	System	Indicates Complexity (See Table 2)
	PUB_CMPLX	Text	System	Indicates Complexity (See Table 2)
	PL_ALL	Text	System	Protection (PPE) Level: A-E; Graded
D&D Descriptors	CONSTRUCTION_TYPE	Text	System	Provides building characteristics
				Single Story No Levels (Below Grade Surface) BGS
				Single Story 1 Level BGS
				Multiple Story No Levels (Below Grade Surface) BGS
				Multiple Story 1 Level BGS
				High Bay Facility
				Other
	STRUCTURE_TYPE	Text	System	Provides building characteristics
				Masonry Exterior Walls
				Brick & Glass
				Metal
				Prefabricated/modular
				Reinforced Concrete
				Steel Framed, Siding
				Steel Framed, Unfinished Shell
				Trailer
				Wood Frame, Siding
				High Bay Facility
ER Descriptors	ER_CMPLX	Text	System	Indicates Complexity (See Table 2)
	GW_CMPLX	Text	System	Indicates Complexity (See Table 2)
	SW_CMPLX	Text	System	Indicates Complexity (See Table 2)
	SOIL_CMPLX	Text	System	Indicates Complexity (See Table 2)
	ECO_CMPLX	Text	System	Indicates Complexity (See Table 2)
	WET_WILD	Text	System	Indicates Complexity (See Table 2)
	HIST	Text	System	Indicates Complexity (See Table 2)
	MEDIA_ST	Text	System	Indicates soil/media composition
				Sand
				Sandy Loam
				Gravel - Sand

Subproject/FSA Descriptors	FSA_TYPE	Text	System	Indicates area use
				Sandy Clay
				Solid Rock
				Fractured Rock
				Process Area-Exclusion, Remote Access Only
				Process Area-Exclusion, Contact Access
				Process Area-Glovebox/ Hood
				Process Area-Accessible Contaminated Equipment
				Haz Storage/Staging Area w/ Drums, Boxes
				Storage Vault
				Contaminated HVAC and Mechanical Area
				Stand-alone stacks or chimneys
				Occupied Spaces - Offices, Corridors, Locker Rooms, etc.
				Electrical/Communications Room
				Uncontaminated Mechanical Room
				Maintenance Shop, Uncontaminated
				Warehouse/Uncontaminated Storage
				Exterior/Support Buildings/Equipment
				Other
	FSA_CMPLX	Text	System	Indicates Complexity (See Table 2)
Comments	COMMENTS	Text	User	Analyst's comments

* Note: TRU (AEA-regulated), Mixed-TRU-RCRA, and Mixed-TRU-TSCA are all combined under the _Mx_TRU_CH and _Mx_TRU_RH categories.

Table A4-2, Reliability and Complexity Definitions

Identifier	Very High	High	Medium	Low
COST_PEDIGREE	Direct from complete and valid source (e.g., accounting system), validated, no calculations	Processed from a complete and valid source, apportioned or calculated with good data	From accounting system with significant calculations or secondary/incomplete source reconciled with accounting system data	From incomplete or un-validated source; calculated/ apportioned; or from questionable source
PARAMETER_PEDIGREE	Direct from high-reliability source, validated, no calculations	From high reliability source, apportioned or calculated with good data	From un-validated secondary source reconciled with other data, or minimal calculations	From questionable documents; calculated/ apportioned; or "better than nothing"
MGMT_CMPLX	Large project, many subcontractors or funding sources, poor characterization and/or end-state definition, unaddressed technology and management uncertainties,	Moderate to large project, reasonable characterization and technology maturity, substantial uncertainties	Small to medium-large project, well defined remediation expectations and data, "bounded" uncertainties with a	Small project, routine work, well-characterized media, defined waste options

			defined path to resolution	
TECH_CMPLX	Unproven technology, addressing challenging contaminant or remediation requirements, significant risk of failure	Proven technology in new or unique application, complex treatment processes, uncertainty in contaminant conditions	Commercially available technology in moderate-risk conditions and/or significant contaminant uncertainties	Commercially available technology in low-risk application
REG_CMPLX	Regulatory process and end-state uncertain with contentious regulatory relationships; work stoppages	Regulatory process negotiated with little execution experience; end-state not defined, significant unresolved issues	Regulatory process established; unresolved issues remain but work progressing	Regulatory process and end-state for site established, good regulatory relationships; efficient workflow
PUB_CMPLX	Public does not support project, significant management effort in CAB-like forums; local government/ union opposition	Significant fringe or vocal opposition, but general local government/ union acceptance	General public acceptance but at a significant management effort and/or project cost	Public generally supports project, no major efforts or work stoppages
FSA_CMPLX	Significant levels of effort in high-rad/high contamination exclusion areas	Large amounts of highly contaminated equipment, significant contamination control issues; manual removal required	Smaller amounts of less-contaminated equipment; area decontamination required with hot-spot removals	Little or no contamination, little manual work required (most work is done using construction equipment)
ER_CMPLX	Significant project risk due to insufficient characterization, large quantities of contaminants, or large risk to the public; difficult to begin project execution	Significant uncertainties in characterization, or technical or regulatory risk; some physical work can begin	Larger but well-understood project or smaller project with uncertainties; work proceeds with ongoing resolution of uncertainties	Straightforward , smaller project that addresses well-understood problem with proven approach
GW_CMPLX	Significant flow/ contaminant migration, poor hydro-geologic models/ characterization	Significant contaminant/ groundwater flow with well understood remediation process	Modest groundwater flow or contaminant levels; amenable to moderate treatment methods (more than just natural attenuation)	Little groundwater flow or contaminant migration; does not contribute to ER risk
SW_CMPLX	Major surface water management required to avoid contaminant spread	Significant surface water issues	Moderate or intermittent surface water issues	Little surface water flow or contaminant migration; does not contribute to ER risk
SOIL_CMPLX	Large quantity and/or concentration of contaminants, poorly characterized media, significant project risk	Significant soil removals required, amenable to standard techniques, generally well characterized	Modest soil removal required	Little soil contamination to be remediated; does not contribute to ER risk
Identifier	Yes			No
ECO_CMPLX	Ecological considerations must be addressed. These may include ecosystem complexity, one or more threatened or endangered species; and may require significant documentation			Few ecological considerations; does not contribute to ER risk
WET_WILD	Wetlands considerations must be addressed. These include changes to surface water conditions, contaminant mitigation, public involvement, etc.			Few wetlands considerations; does not contribute to ER risk
HIST	Historical or cultural resource issues must be addressed. This may include development of plans, characterization and archeological studies, and public involvement.			Few historical considerations; does not contribute to ER risk

Notes: "None" may be appropriate under for select circumstances. [Yes] and [No] designations provided in lieu of "Very High" to "Low" scale identified for other descriptors.

Table A4-3, Principal Contaminant Designations

Tier 1	Tier 2	Tier3	Definition
_Rad			Generic radiological contamination – PPE levels C-D, or no further data available
	_Rad_High_Dose_Haz		Dose levels greater than 100 mRem that require extensive remote or robotic efforts or worker stay times
	_Rad_Fissile_Quant		Quantities of fissile material that require criticality precautions, nuclear safety controls, etc.
	_Rad_High Alpha		Quantities of alpha-emitting radioactivity that require Level A or Level B PPE
	_Rad_TRU_Conc		Quantities of alpha-emitting radioactivity that require management of TRU waste (similar to _Rad_High Alpha above)
	_Rad_SNF		Activities involving spent nuclear fuel
	_Rad_Other		Radiological activities requiring greater than general radiological contamination precautions/ considerations but not specifically addressed above
	_Mixed_Rad_Haz		Radiological remediation with significant RCRA hazardous constituent drivers
	_Mixed_Rad_PCB		Radiological remediation with significant PCB or PCB and RCRA hazardous constituent drivers
	_Mixed_Rad_Asbestos		Radiological remediation with significant asbestos drivers (i.e., where asbestos abatement makes up a significant portion of the effort)
_Haz			Generic hazardous constituents – PPE levels C-D, RCRA-permitted area, and/or no further data available
	_TCL_Org		EPA-designated Targeted Compound List (TCL) - Organic Compounds
		All VOCs (8260)	General category for all or mixtures of Volatile Organic Compounds (based on SW-846, Method 8260)
		All SVOCs (8270)	All Semi-Volatile Organic Compounds (based on SW-846, Method 8270)
		Halogenated VOCs (TCE, PCE, DCE, 1,2-DCA, etc. (Method 8260B) –LTM	The subgroup of halogenated VOCs (TCE, PCE, DCE, 1,2-DCA, etc. (Method 8260B) –LTM
		Nonhalogenated VOCs only (Benzene, Toluene, Xylenes, MTBE, etc. (Method 8260B)	The subgroup of nonhalogenated VOCs only (Benzene, Toluene, Xylenes, MTBE, etc. (Method 8260B)
	_TCL_PCB,Pest, Hrb		Other TCL-identified materials - PCBs, Pesticides, & Herbicides
		PCBs and Pesticides (8081 & 8082)	PCBs and Pesticides (Methods 8081 & 8082)
		PCBs (8082)	PCBs (Method 8082)
		Pesticides (8081)	Pesticides (Method 8081)
		Chlorinated Herbicides (8151)	Chlorinated Herbicides (Method 8151)
	_EC		Explosive Compounds (Nitroaromatics and Nitramines)
	_IN		Inorganic Compounds (TAL Metals)
	_NAM		Natural Attenuation Monitoring (NAM) (Bio Indicators)
	_Fuels		Fuels
		TPH-Diesel Range Organics (DRO (Method 8015B)	TPH-Diesel Range Organics (DRO (Method 8015B)
		TPH-Gas Range Organics (GRO (Method 8015)	TPH-Gas Range Organics (GRO (Method 8015)
	_BTEX		BTEX (8021)
	_Percl		Perchlorate
	_Bio_Haz		Mold and other Biological Hazards
_Non_Haz			Hazardous and Radioactive categories are Not

			Applicable
_Cntl_Matl			Other Controlled Materials (e.g., Asbestos, bulk Lead), that are not addressed/managed under RCRA or TSCA

Notes:

1) "None" may be appropriate under for select circumstances, although "_Non_Haz" would normally be used.

2) Tier 1 values represent general levels or levels where more specific data is not available; Tier 2 and Tier 3 provide additional detail that would cause additional precautions or effort.

3) Principal Contaminant designations are based on overall difficulty or impact on the job. For instance, if a large building has generally low levels of contamination (<10,000 DPM) but a small area of TRU contamination [e.g., a waste storage facility with a glovebox used for infrequent repackaging] it should be considered a _Rad level Principal Contaminant. If the higher levels of contaminant dominate the remediation approach [e.g., gloveboxes in >20% of the areas – less than half the area but the cleanup problem that drives the project] it should be a the higher level, say a Rad_TRU_Conc Principal Contaminant. The analyst needs to determine the "best-fit" category.

Attachment 5   ECAS Project Description Template

This template covers D&D and ER ECAS Projects. Use D&D Facility Data/D&D Execution, ER Initial Condition Data/ER Execution, or WM Facility Data/WM Project Execution, as appropriate.

Project Name:	*ECAS Project Name*
Project Type:	*Category of ECAS Project (ER, D&D, WM)*
ER Project or **Building Type:**	*Intermediate Descriptor title*
ER or **Project Type Detail:**	*Detail Descriptor title*
Supplementary Reference Documents	*PDF files of detailed project documents*

Site Context: *Generic Site information, repeated for all Project Descriptions for the Site*
ECAS Level 4/Parent Project Context: *Generic ECAS Level 4 information, repeated for all Project Descriptions under that ECAS Level 4 element*
D&D Facility Data: Date Placed In Service: *Construction date* Facilities: *List of buildings, or reference to other document if too long* Construction Details: *Kind of construction of major buildings that may drive D&D approach* Facility Use: *Discussion of use, particularly to contaminate building* Processes causing contamination: *Sufficient detail to help ECAS user identify similarities and differences; 2-3 paragraph, and then reference detailed linked document* Contaminants of concern (including extent of contamination by major contaminant): *Sufficient detail to give a good text concept of level of contamination to help ECAS user identify similarities and differences and quantify cost differences if possible; 2-3 paragraph, and then reference detailed linked document*
D&D Project Execution Site WBS Organization within the ECAS Project Scope: *Description to allow understanding of mapping of ECAS Project and Site WBS data* Methods of execution: *Cover Management, Regulatory, Physical Approach, and Technologies; address high points and reference detailed documents if possible for additional details* Activities self-performed: *General description of activities performed by prime/operating contractor* Activities subcontracted: *General description of activities subcontracted by prime/operating contractor* Issues that impacted the project: *Incidents or activities that occurred during execution that impacted the schedule (e.g., project had safety shutdown for 6 months).* Scope Growth: *As stated*
ER Site Initial Conditions Data: Source of/activities causing contamination: *Sufficient detail to help ECAS user identify similarities and differences; 2-3 paragraph, and then reference detailed linked document* Details of topography/media: *Sufficient detail to help ECAS user identify similarities and differences; 2-3 paragraph, and then reference detailed linked document* Contaminants of concern (including extent of contamination by major contaminant): *Sufficient detail to give a good text concept of level of contamination to help ECAS user identify similarities and differences and quantify cost differences if possible; 2-3 paragraph, and then reference detailed linked document*
ER Project Execution

Approach to remediation and justification: *As stated*

CERCLA/other documents required: *As stated*

Site WBS Organization within the ECAS Project Scope: *Description to allow understanding of mapping of ECAS Project and Site WBS data*

Methods of execution: *Cover Management, Regulatory, Physical Approach, and Technologies; address high points and reference detailed documents if possible for additional details*

Activities self-performed: *General description of activities performed by prime/operating contractor*

Activities subcontracted: *General description of activities subcontracted by prime/operating contractor*

Issues that impacted the project: *Incidents or activities that occurred during execution that impacted the schedule (e.g., project had safety shutdown for 6 months).*

Scope Growth: *As stated*

Waste Management Facility Data:

Function: *General description of the purpose of the process.*

Process Systems: *Details of the process systems that make up the process, such as throughput, flowrate, equipment type, tank volumes, etc.*

Contaminants of Concern: *Contaminant types and general concentrations.*

Permitting: *General permitting descriptions, if appropriate.*

Safety/Exposure Considerations: *Issues that could be used by a user to evaluate equivalence to future projects, such as levels of radiation, shielding considerations, criticality controls, organic vapor mitigation, etc.*

Construction Details: *Facility description issues not discussed under the Process Systems section above.*

Waste Management Project Execution

Site WBS Organization within the ECAS Project Scope: *Information on the way the execution was organized.*

Methods of execution: *Cover Management, Regulatory, Physical Approach, and Technologies; address high points and reference detailed documents if possible for additional details*

Activities self-performed: *General description of activities performed by prime/operating contractor*

Activities subcontracted: *General description of activities subcontracted by prime/operating contractor*

Issues that impacted the project: *Incidents or conditions that impacted the cost per unit (e.g., project had safety shutdown for 6 months).*

Notes Regarding Use of Data

Analyst information on features of the site data that may impact its use

Attachment 6   Example ECAS Project Descriptions

Example A - RF B371 D&D

Project Name:	RF B371 D&D
Project Type:	Facility D&D
Building Type:	Type 3
Project Type Detail:	Plutonium/Enriched Uranium Processing Facility
Supplementary Reference Documents	RFCP Project Management Plan Project Baseline Document [A] 371 Project B371 Project Management Plan, 7/31/01 B371 Recon Level Char Report, 8/28/00 B371 Decom. Operations Plan (Rev2, Mod5), 12/8/04 B371 Cluster Closeout Report, 10/05

Site Context:

All ECAS Projects are part of the Rocky Flats Closure Project (RFCP), which included all activities necessary to close the Rocky Flats Environmental Technology Site (Site) that occurred between February 1, 2000 through September 30, 2005 (and minor subsequent closeout activities). Not included were previous closure or environmental restoration activities and subsequent legacy management (i.e., site surveillance and maintenance) activities. Total cost was approximately $4.1B.

From 1952 through 1989 the Rocky Flats Site manufactured plutonium "pits" for nuclear weapons, with operations including machining plutonium, uranium, beryllium, and other metals; recovering and purifying scrap plutonium, management of radioactive wastes, and other ancillary activities. It contained 6 major plutonium processing facilities, 5 major uranium processing facilities, and numerous support facilities. There were numerous environmental releases but no major on-site radioactive material burial grounds.

From 1990 to 2000 Rocky Flats proceeded through several pre-closure phases that included preparation for resumption of operations, stabilization of residual facility hazards (e.g., large quantities of plutonium nitrate solutions), stabilization of plutonium "residues" in anticipation of their shipment to WIPP, clarification of the regulatory structure under which closure could occur, and some small preliminary decommissioning and restoration activities. In January, 2000 the Rocky Flats Closure Project (RFCP, Kaiser-Hill LLC closure contract) was signed; the subsequent work represents the bulk of the closure activities and all of the activities addressed in the project (See Rocky Flats Closure Project: Project Execution Plan). The78 ECAS Projects are contained within the seven "Closure Projects" identified below, that (along with additional non-project or overhead scope) comprise the RFCP.

    A – 371 Project (major plutonium processing facility)
    B – 707 Project (major plutonium processing facility)
    C – 771 Project (major plutonium processing facility)
    D – 776 Project (major plutonium processing facility)
    E – Industrial Sites Project (other facility D&D [and other site services])
    F – Material Stewardship Project (waste management [and security])
    G – Environmental Restoration Project (remediation activities)

ECAS Level 4/Parent Project Context:
The 371 Project included essentially all of the activities performed in Building 371/374, one of the 4 major plutonium processing facilities. It is the ECAS Level 4/Parent Project for the following ECAS Projects:

- RF B371 D&D – Facility decommissioning
- RF B374 Liq Waste Ops – Treatment of all on-site liquid radioactive waste
- RF SNM Disposition – Stabilization, packaging, and shipment of plutonium metals and oxides
- RF B371 Wet Residues – Stabilization and packaging of plutonium residues
- RF B371 Salt Residues – Stabilization and packaging of plutonium residues
- RF B371 SSC Residues – Stabilization and packaging of plutonium residues
- RF B371 Dry Residues – Stabilization and packaging of plutonium residues

In 2000 the 371 Project work emphasized high-security dry processing of plutonium metal/oxide materials, preparation of the plutonium "residues" to meet the WIPP waste acceptance criteria, and processing of low-activity plutonium liquids. Minor efforts supported deactivation of liquid systems and unused processing systems, removing "hold-up" materials and liquids, and clearing out unused areas to provide staging and support areas for subsequent decommissioning. As SNM and residue processing completed in 2001-2002 and the Site liquids processing transitioned to a alternate system, operations activities ceased, stringent security requirements were removed, and decommissioning became the only active project. ECAS Level 4 indirect/distributed costs consist primarily of facility management (activities necessary to keep the buildings maintained and in compliance with their authorization basis) and overall 371 Project project management.

D&D Facility Data:

Facilities:

Building	Title	Area (SF)	In-Service Date
371	Plutonium Recovery	315,022	1980
373	Cooling Tower (replaced by 373C, also removed)	3,200	1980
374	Liquid Process Waste Treatment - Low Level Pu	43,636	1980
376	Warehouse (was Fluorine Storage)	3,000	1983
T371H	Trailer (Offices)	720	1988
T371J	Trailer (Offices)	720	1983
T371K	Trailer (Offices)	1,440	1989
T376A	Trailer (Offices)	1,960	1989
381	Fluorine Building	1,320	1980

Construction Details: B371-Reinforced Concrete (seismically qualified), with interior "canyon" areas with concrete shielding; B374-tilt-up concrete panels and CMU; ancillary facilities-CMU, metal/transite (cooling tower), or trailer

Facility Use: B371 Plutonium recovery, plutonium nitrate process systems, plutonium pyrochemistry, plutonium storage. B374 radioactive liquid waste processing.

Processes causing contamination: plutonium nitrate ion exchange, precipitation, and hydrofluorination; pyrochemical processing, incineration, residue packaging, SNM storage and packaging; liquid waste treatment, precipitation, spray drying, and evaporation; waste packaging and non-destructive analysis; HVAC and other contaminated support systems.

Contaminants of concern (including extent of contamination by major contaminant):

Building	Chemical Hazard	Location/Extent	Radiological Hazard	Location/Extent
B371	Asbestos	Multiple, including roofing material, panels, tiles & insulation.	Fixed and removable alpha contamination	Extensive; on interior bldg surfaces, on & in equip. & systems, and metal roofing.
	Metals, organic solvents, beryllium (Be) & PCBs	As residual inside gloveboxes, equipment, tanks, piping and plenums.		
B374	Asbestos	Multiple, including roofing material, panels, tiles & insulation	Fixed and removable alpha contamination	Various; on interior bldg surfaces, on & in equip. & systems, and metal roofing.
	Metals, organic solvents, Be & PCBs	As residual inside tanks, equipment and piping		
Ancillary Structures	Asbestos	Transite panels & piping insulation	None found	

The principal contaminant was plutonium (weapons-grade isotopic composition) and its decay products. Plutonium was found as nitrate in limited quantities at >100 gm/l in piping systems (most of the bulk liquids in tanks had been removed and solidified earlier) and plutonium oxide in hundred-gram quantities in gloveboxes and process-equipment rooms (i.e., "canyons"), requiring criticality and nuclear safety controls in controls in numerous areas, specifically those Functional Space Areas (FSAs) identified as "Process Area-Exclusion, Contact Access" and "Process Area-Glovebox/ Hood." Although the vast majority of the plutonium was confined to the gloveboxes and process equipment, isolated hot spots with substantial levels of contamination (i.e., 100,000 DPM alpha) existed outside of gloveboxes in all Process FSAs. Other major contaminants included lead sheeting used as shielding for gloveboxes (located in glovebox/hood FSAs) and friable asbestos (associated with utility pipe insulation throughout the facility), and asbestos in modest amounts of transite and vinyl-asbestos tile.

D&D Project Execution
Site WBS Organization within the ECAS Project Scope:
The D&D portion of the 371 Project is organized into 46 "Sets" (including a Deactivation "Set") and 15 "Areas" which contain all of the direct D&D work scope. The "Set" work consisted of removal of the process equipment which required special expertise and was self-performed. Once the "Set" scope was complete in a given location or group of rooms, the location was released so that the remaining equipment removal and decontamination of structural surfaces could be performed. This remaining D&D "Area" scope, although still involving radioactive materials, was sufficiently less hazardous to be efficiently performed by subcontractors using construction trades labor. The direct D&D costs are all contained in the AAC (Deactivation scope), AAD01 (D&D "Set" scope), and AAD02 (D&D "Area" scope) Site WBS elements. The remaining indirect/distributed scope in the B371 D&D ECAS Project consists principally of project management, waste management, and materials/supplies costs that were not directly attributed to the "Sets" or "Areas" (there are no indirect parameters). For the purposes of ECAS, the "Sets" and "Areas" were each assigned as an FSA/Subproject with an associated area. More detail on the scope of the individual "Set" and "Area" scope may be found in the B371 Decommissioning Operations Plan (Rev2, Mod5).

Methods of execution:
Management: The scope was planned, managed, and executed by location/area (e.g., not by system). As the major project on the overall Site critical path, management made several decisions during 2004-2005 that accelerated schedule despite an increased project cost to achieve an overall Site cost savings. D&D activities were intentionally reduced and postponed during

2000 and 2001 to reduce conflict with nuclear operations.

Regulatory: The D&D work was regulated under CERCLA under the Rocky Flats Cleanup Agreement (RFCA) between the DOE, EPA, and State of Colorado. RFCA provided for a decision document called a "Decommissioning Operations Plan" that developed to identify the controls on 371 Project decommissioning, went through public comment, and was executed.

Physical Approach: The contractor performed initial characterization, planned (using detailed work packages), and executed removal of process equipment. It manually removed process equipment using various contamination containment approaches and using hand-held power-tools. Subcontractors removed remaining equipment and decontaminated structural surfaces as necessary to permit the building demolition; demolished the building principally using excavators, leaving a substantial portion of the decontaminated, below-grade basement structural concrete in place. The voids were backfilled to grade. Significant portions of the above ground structure was demolished as contaminated, and disposed of as LLW to Envirocare instead of decontaminating and characterizing for free release due to schedule acceleration. The contractor built a rail spur to improve bulk waste disposal efficiency.

Technologies: The contractor used aggressive decontamination of process gloveboxes and tanks (often using a cerium nitrate solution) to reduce size reduction (required to fit materials in TRU SWBs). It measured and calculated the glovebox and tank activities to be non-TRU (i.e., LLW using the SCO process. It used larger (Cargo) containers for disposal of LLW instead of size reduction to smaller waste box size. Large holes were cut in building walls, and large airlocks were installed to accelerate removal of large equipment. The contractor decontaminated large tanks, fixed interior contamination, and sealed flange opening to allow shipment as self-contained waste containers.

Activities self-performed:
- All management and key technical positions along with a portion of the technical staff
- All of the United Steel Workers (Site hourly labor) doing the physical removal of process equipment
- Waste management
- Used significant professional services contracted (i.e., seconded) labor inter-mixed with prime contractor staff

Activities subcontracted:
- Removal of non-process equipment
- Decontamination of structural surfaces
- Characterization of surfaces prior to demolition
- Waste treatment of mixed wastes (on-site and off-site)
- Demolition of structures

Issues that impacted the project:
- Security constraints (D&D activities for the first two years required DOE Q-cleared staff and entry and exit through multiple layers of security portals)
- Co-location with nuclear operations (Authorization Basis, Nuclear Facility work controls)
- Significant initial waste storage constraints associated with residue processing (drums in

every corridor and room)
- Shutdown due to glovebox fire (smoldering rags cause in-room release)

Scope Growth:
No identified scope growth

Notes Regarding Use of Data

Use of "Set" and "Area" Data
The areas without process equipment did not have "Set" scope (i.e., the sum of the "Set" work did not equal the total building area), however, the "Areas" covered the area of all of building 371/374 and the ancillary buildings. Thus the "Set" and "Area" square footages do not total to the total building area for cost factor purposes – the cost of removing the process equipment/square foot needs to be added to the cost of removing non-process equipment/per square foot for the same area to get the total area D&D cost.

Example B – RF 903 Pad

Project Name:	RF 903 Pad
Project Type:	Environmental Restoration
ER Type:	Ex Situ Solids Treatment
ER Type Detail:	Excavation with Off-Site Disposal
Supplementary Reference Documents	RFCP Project Management Plan
	Project Baseline Description [G] Environmental Restoration
	Final Historical Release Report (June, 2006)
	Industrial Area/Buffer Zone Sampling and Analysis Plan (May, 2004)
	Closeout Report for IHSS Group 900-11, IHSS 112 - 903 Pad (903 Drum Storage Area) (January, 2005)
	Closeout Report for IHSS Group 900-11, IHSS 155, 903 Lip Area and IHSS 140, Hazardous Disposal Area (January, 2005) – Not currently in the Administrative Record

Site Context:
All ECAS Projects are part of the Rocky Flats Closure Project (RFCP), which included all activities necessary to close the Rocky Flats Environmental Technology Site (Site) that occurred between February 1, 2000 through September 30, 2005 (and minor subsequent closeout activities). Not included were previous closure or environmental restoration activities and subsequent legacy management (i.e., site surveillance and maintenance) activities. Total cost was approximately $4.1B.

From 1952 through 1989 the Rocky Flats Site manufactured plutonium "pits" for nuclear weapons, with operations including machining plutonium, uranium, beryllium, and other metals; recovering and purifying scrap plutonium, management of radioactive wastes, and other ancillary activities. It contained 6 major plutonium processing facilities, 5 major uranium processing facilities, and numerous support facilities. There were numerous environmental releases but no major on-site radioactive material burial grounds.

From 1990 to 2000 Rocky Flats proceeded through several pre-closure phases that included

preparation for resumption of operations, stabilization of residual facility hazards (e.g., large quantities of plutonium nitrate solutions), stabilization of plutonium "residues" in anticipation of their shipment to WIPP, clarification of the regulatory structure under which closure could occur, and some small preliminary decommissioning and restoration activities. In January, 2000 the Rocky Flats Closure Project (RFCP, Kaiser-Hill LLC closure contract) was signed; the subsequent work represents the bulk of the closure activities and all of the activities addressed in the project (See Rocky Flats Closure Project: Project Execution Plan). The78 ECAS Projects are contained within the seven "Closure Projects" identified below that (along with additional non-project or overhead scope) comprise the RFCP.

  A – 371 Project (major plutonium processing facility)
  B – 707 Project (major plutonium processing facility)
  C – 771 Project (major plutonium processing facility)
  D – 776 Project (major plutonium processing facility)
  E – Industrial Sites Project (other facility D&D [and other site services])
  F – Material Stewardship Project (waste management [and security])
  G – Environmental Restoration Project (remediation activities)

ECAS Level 4/Parent Project Context:
The Environmental Restoration (ER) Project included essentially all of the environmental restoration and most of the final Site closure activities. It is the ECAS Level 4/Parent Project for 34 ECAS Projects. Twenty-four of those projects are principally ex-situ soil remediation (sampling and soil removal), including projects for post-demolition building slab and under-slab contamination removal, remediation of small waste burial trenches, remediation of retention pond sludge, process waste line removal, and soil removal to remediate multiple minor hot spots and a few major releases. The other ten include projects for plume remediation, Type C and Type D RCRA caps, sewer line removal, soil sampling with no further action, final site regarding/re-contouring, and administrative closeout.

Site ER activities began in the 1980s, emphasizing investigation and interim actions addressing releases of RCRA constituents (since DOE was considered to have authority over radioactive constituents) and releases off-site and in the "buffer zone" outside the core "industrial area". Through 1994 significant RI/FS-type documents were produced, some (particularly groundwater) sampling was conducted, numerous Individual Hazardous Substance Sites (IHSSs, similar to SWMUs), Operable Units (OUs), and regulatory milestones were defined, and (from a closure perspective) relatively minor removal actions occurred in a relatively contentious regulatory environment.

The Rocky Flats Cleanup Agreement (RFCA) was signed in 1994, revising the regulatory approach and emphasizing the completion of Site SNM operations and decommissioning prior to final remedial actions. Although some ER work continued between1994 and 2000, most was performed under the ER Project as part of the RFCP; however, the ER Project relied significantly on the sampling, analysis, and planning performed in the previous 15 years. Comparison to other projects should consider the dependence of these ECAS Projects on previous work, resulting in presumed reductions in their costs for planning, sampling and analysis, and regulatory interaction vis-à-vis projects having to complete all of this work.

The ER approach depended on two key regulatory features. One was the ER RFCA Standard Operating Protocol (RSOP) which streamlined the process of executing the sampling and soil

removal ER scope – the RSOP provided procedures for executing work, interacting with regulators, confirmatory sampling, achieving "no further action" status, and IHSS closure with minimal paperwork.

The other was negotiated, risk-based Radionuclide Soil Action Levels (RSALs) and Subsurface Soil Action Levels (SSALs). Tier I SALs were concentrations above which soil removal was required, Tier II SALs were concentrations below which material could remain, and concentrations between were to be determined consultatively. The RSAL process allowed work to proceed while awaiting final risk assessment decisions. In 2003 the final status of the Site was designated a wildlife refuge and most soil cleanup was based on achieving acceptable risk to wildlife refuge workers (WRWs).

ER Site Initial Conditions Data:

Source of/activities causing contamination:
Drums that contained hydraulic fluids and lathe coolant contaminated with plutonium-239/240 and uranium were stored in the area from 1958 to 1967; leaks resulted in a release of an estimated 5,000 gallons of contaminated liquid containing approximately 86 grams of plutonium. When cleanup operations began in 1967, a total of 5,237 drums were at the 903 Pad. From 1968 through 1970, radiologically contaminated material was removed from the 903 Pad and Lip Area, and an asphalt cover approximately 400 ft. square was placed over the locations of greatest contamination. However, during drum removal and cleanup activities, wind and rain spread plutonium-contaminated soil east and southeast from the 903 Pad area resulting in contamination of the 903 Lip Area. Several limited excavations removed some of the plutonium-contaminated soil from the 903 Lip Area; however, sampling in the 1980 and 1990s confirmed that radionuclide-contaminated soil remained. The 903 Pad (IHSS 900-112) and 903 Lip (IHSS 900-155) were consolidated in IHSS Group 900-11 for management purposes.

Details of topography/media:
The 903 Pad and 903 Lip areas extend east of the Industrial Area. The overall Rocky Flats topography is a broad, relatively flat pediment that slopes eastward from the foothills. The pediment is capped by unconsolidated surficial deposits. In the 903 Pad area is mostly pediment surface, but the southern portion slopes towards a stream, with bedrock located beneath the surface colluvium. The elevation is approximately 6,000 feet above mean sea level.

The unconsolidated surficial deposit of Rocky Fats Alluvium (averaging less than 30 feet in depth) above the Arapahoe Formation weathered claystone bedrock forms the permeable layer that is the primary conduit for groundwater flow and groundwater contaminant transport. Artificial fill material is found throughout the areas, the result of construction of roads and backfill of the early pad remediation efforts.

Hydrology is dominated by losses to evapotranspiration, with the relatively small portion of infiltrating precipitation that does become shallow groundwater ultimately discharging to surface water south of the 903 Pad area. Contaminant flow was substantially arrested by the installation of the asphalt pad; there was no indication of a plume as such despite a significant source term.

Contaminants of concern (including extent of contamination by major contaminant):
The primary contaminants of concern for environmental media were Pu, Am, U, and VOCs (primarily chlorinated solvents such as carbon tetrachloride and perchloroethylene). A large

number of locations in the 903 Area were contaminated to levels that exceeded Wildlife Worker Action Levels (WRW ALs). In many locations the contaminant levels were many orders of magnitude higher than WRW ALs.

Pre-remediation characterization indicated that remediation of the 903 Pad area would result in removal of 292,048 CF of in-place soil at Tier 1 RSAL/SSAL levels and 394,901 CF of soil at Tier 2 RSAL/SSAL levels, of this, approximately 148,000 CF was asphalt and fill dirt that had to be removed to access the contaminated soil. Remediation of the 903 Lip (and "Americium Zone") area would result in removal of 44,726 CF of in-place soil at Tier 1 RSAL levels and 319,563 CF of soil at Tier 2 RSAL levels; there were no SSAL exceedances in the 903 Lip area. These estimates were based on soil excavations averaging about 1.0 feet under Tier 1 levels (and 1.7 feet under Tier II levels) under most of the 903 Pad, and about 0.5 feet over an area of 2 acres or 15 acres for the 903 Lip area based on Tier I or Tier II assumptions, respectively.

Actual remediation resulted in the discovery of considerably greater quantities of soil requiring removal for both Pad and Lip areas. This occurred despite the negotiation and implementation of WRW ALs, which increased the effective VOC SSALs by more than three orders of magnitude and would have been expected to reduce the depth of soil removal required under the Pad (the RSALs did not change). Some of the under-Pad soils were contaminated to TRU levels, with the highest plutonium concentration being 10,000 nci/gm at a known hot spot, although soils in most of the areas were much lower. In addition, soil was removed in some areas to a depth of greater than 8 feet below the level of the Pad. In the Lip area significant additional areas of contamination were identified bringing the area remediated to 36 acres. Soils were removed based on in-process characterization; after in-process characterization was complete confirmatory samples were taken to confirm satisfactory remediation and the location backfilled. Residual soil VOC levels were addressed as part of the Site-wide comprehensive risk assessment associated with groundwater. While the VOCs levels in waste were monitored (VOC-contaminated waste was disposed of as MLLW), no VOC sample results were provided in the Closeout Report.

ER Project Execution

Approach to remediation and justification:
The remediation approach was the removal of all soils contaminated with plutonium, uranium, and chlorinated solvents to the appropriate SALs, which resulted in acceptable residual risk per the determinations of the Site Comprehensive Risk Assessment.

CERCLA/other documents required:
Activities required the IHSSs to be addressed in the following IHSS-specific RFCA execution documents:

- ER RSOP Notification #02-09, 2002,
- Interim Measure/Interim Remedial Action for the 903 Lip Area and Windblown Area, 2004.
- Close-out Report for IHSS Group 900-11, IHSS 112-903 Pad (903 Drum Storage Area), 2005.
- Close-out Report for IHSS Group 900-11, IHSS 900-155, 903 Lip Area, 2005.
- Characterization Report for the 903 Drum Storage Area, 903 Lip Area, and Americium Zone, June 26, 2000.

Numerous additional Site documents, such as the Industrial Area and Buffer Zone Sampling and Analysis Plan, the Comprehensive Risk Assessment, the Historical Release Report, etc., incorporated IHSS elements that were better addressed and reviewed at an overall Site level.

Site WBS Organization within the ECAS Project Scope:
The Site WBS identifies all 903 Pad and Lip activities as part or the Group 900-11 WBS Level 6 element. Activities under this element include preparatory and oversight activities (e.g., SAP and Closeout Report preparation, Documentation), 903 Pad mobilization and execution (mostly subcontract cost), Lip and Americium Zone remediation, and Project Support. The ECAS Project was not subdivided into any subprojects.

Methods of execution:
Management: The scope for the physical soil removal was largely subcontracted. Separate subcontracts were let for the 903 Pad and 903 Lip/Americium Zone.
Regulatory: The remediation work was regulated under CERCLA under the Rocky Flats Cleanup Agreement (RFCA) between the DOE, EPA, and State of Colorado. RFCA provided for a decision document called the ER RSOP as a means of executing an interim action. The Site notified the regulators of its intent to execute the work under the ER RSOP and maintained close consultation with on-Site regulator representatives. Consultation resulted in a number of changes to the process. The Site provided a Closeout Report which, after review, provided the basis for a No Further Action determination.
Physical Approach: The initial work started in the Pad area, with two small, readily movable sprung structures (90ft X 110ft footprint) used to cover excavation and filling of the intermodal containers used for low-level waste transportation off-Site. The Pad area was divided into 225-25ft X 25ft "cells." The asphalt and fill dirt were removed to expose "native" soil. Soil was removed to WRW AL standards (i.e., nominally <50 pci/gm plutonium) as determined by an on-site laboratory. After cell soil removal was complete, final "confirmatory samples" were taken to verify WRW AL achievement, the area was backfilled, and the sprung structure moved to the next excavation cell. The Lip area was characterized using a mobile germanium iodide system to identify surface areas above WRW ALs, at which point the material was removed. All Pad and Lip areas were backfilled, regraded as necessary, and revegitated.
Technologies: Excavation was basic backhoe work. In-process characterization was either on-site laboratory results or germanium-iodide detector scans. All technologies were conventional in terms of their development status. After completion of 903 Pad soil remediation and as the result of consultations on groundwater remediation, a "hydrogen containing compound" was injected into the soil beneath the backfill to accelerate VOC in-situ degradation.
Closure Process: Final closure consisted of preparation and acceptance of Closeout Reports, a finding of No Further Action, and consideration of VOCs as part of the groundwater remediation and management.
Post-Closure Stewardship Requirements: Since there is still a residual source term, long-term stewardship requires erosion control and periodic sampling of surface water runoff and seasonal "daylighting "of groundwater from the impacted area.

Activities self-performed:
- All management and key technical positions along with a portion of the technical staff
- Waste management (waste package certification)
- Used significant professional services contracted (i.e., seconded) labor inter-mixed with prime

contractor staff

Activities subcontracted:
- Soil remediation
- In-process characterization/sampling and analysis
- Final confirmatory sampling and analysis
- Off-Site waste transportation and disposal

Issues that impacted the project (sufficient to bias parametric use of the data):
- Substantial increase in volume of soil to be removed above the estimated volume
- Multiple layers of asphalt cap (previously unknown site conditions)
- After-the-fact decision to conduct independent verification using MARSSIM techniques (ORISE as independent verification contractor, Lip area only)
- Changes to removal standards (Tier I/Tier II to WRW ALs)
- Additional requirement to inject hydrogen containing compound post remediation

Scope Growth:
The studies defining the nature of the problem established the types, highest concentration, and general extent of the contamination, which did not change. In-process characterization identified substantially greater soil volumes to be removed, particularly in the Lip area, resulting in significant scope growth, partially mitigated by more efficient disposal methods and contracts.

Notes Regarding Use of Data
Comparison to other projects should consider the dependence of these ECAS Projects on previous work in the costs of planning, sampling and analysis, and regulatory interaction. Overall Site regulatory documents are included as part of the Level 4 distributed costs. Prime contractor G&A is included as part of the Total Project Cost; subcontractor G&A as part of subcontract cost. 903 Pad and 903 Lip areas were combined because cost and parameter data were not readily separable between the two elements, despite difference in cleanup processes.

Example C - RF 374 Liq Waste Ops

Project Name:	RF B374 Liq Waste Ops
Project Type:	Waste Management Operations Project Type
Building Type:	Type 3
Project Type Detail:	Mixed Low-Level Waste Mgt & Disposition – Treatment, Storage, Disposal
Supplementary Reference Documents	RFCP Project Management Plan Project Baseline Document [A] 371 Project B371 Project Management Plan, 7/31/01 B371 Decommissioning Operations Plan (Rev2, Mod5), 12/8/04 B371 Cluster Closeout Report, 10/05

Site Context:
All ECAS Projects are part of the Rocky Flats Closure Project (RFCP), which included all activities necessary to close the Rocky Flats Environmental Technology Site (Site) that occurred between February 1, 2000 through September 30, 2005 (and minor subsequent closeout

activities). Not included were previous closure or environmental restoration activities and subsequent legacy management (i.e., site surveillance and maintenance) activities. Total cost was approximately $4.1B.

From 1952 through 1989 the Rocky Flats Site manufactured plutonium "pits" for nuclear weapons, with operations including machining plutonium, uranium, beryllium, and other metals; recovering and purifying scrap plutonium, management of radioactive wastes, and other ancillary activities. It contained 6 major plutonium processing facilities, 5 major uranium processing facilities, and numerous support facilities. There were numerous environmental releases but no major on-site radioactive material burial grounds.

From 1990 to 2000 Rocky Flats proceeded through several pre-closure phases that included preparation for resumption of operations, stabilization of residual facility hazards (e.g., large quantities of plutonium nitrate solutions), stabilization of plutonium "residues" in anticipation of their shipment to WIPP, clarification of the regulatory structure under which closure could occur, and some small preliminary decommissioning and restoration activities. In January, 2000 the Rocky Flats Closure Project (RFCP, Kaiser-Hill LLC closure contract) was signed; the subsequent work represents the bulk of the closure activities and all of the activities addressed in the project (See Rocky Flats Closure Project: Project Execution Plan). The 78 ECAS Projects are contained within the seven "Closure Projects" identified below, that (along with additional non-project or overhead scope) comprise the RFCP.

> A – 371 Project (major plutonium processing facility)
> B – 707 Project (major plutonium processing facility)
> C – 771 Project (major plutonium processing facility)
> D – 776 Project (major plutonium processing facility)
> E – Industrial Sites Project (other facility D&D [and other site services])
> F – Material Stewardship Project (waste management [and security])
> G – Environmental Restoration Project (remediation activities)

ECAS Level 4/Parent Project Context:

ECAS Level 4/Parent Project Context:

The 371 Project included essentially all of the activities performed in Building 371/374, one of the 4 major plutonium processing facilities. It is the ECAS Level 4/Parent Project for the following ECAS Projects:

- RF B371 D&D – Facility decommissioning

- RF B374 Liq Waste Ops – Treatment of all on-site liquid radioactive waste

- RF SNM Disposition – Stabilization, packaging, and shipment of plutonium metals and oxides

- RF B371 Wet Residues – Stabilization and packaging of plutonium residues

- RF B371 Salt Residues – Stabilization and packaging of plutonium residues

- RF B371 SSC Residues – Stabilization and packaging of plutonium residues

- RF B371 Dry Residues – Stabilization and packaging of plutonium residues

In 2000 the 371 Project work emphasized high-security dry processing of plutonium metal/oxide materials, preparation of the plutonium "residues" to meet the WIPP waste acceptance criteria, and processing of low-activity plutonium liquids. Minor efforts supported deactivation of liquid systems and unused processing systems, removing "hold-up" materials and liquids, and clearing

out unused areas to provide staging and support areas for subsequent decommissioning. As SNM and residue processing completed in 2001-2002 and the Site liquids processing transitioned to a alternate system, operations activities ceased, stringent security requirements were removed, and decommissioning became the only active project. ECAS Level 4 indirect/distributed costs consist primarily of facility management (activities necessary to keep the buildings maintained and in compliance with their authorization basis) and overall 371 Project project management.

Waste Management Facility Data:

Function: Provided treatment of radioactive and other aqueous liquid wastes generated by all process activities at the Rocky Flat Site. In particular, the building was to treat the dilute (<10E-3 gm Plutonium/L) nitric acid wastes generated by the plutonium recovery activities in the adjacent Building 371, replacing processes that had been previously been performed in Building 774 and the "Solar Evaporation Ponds."

Process Systems:

The Liquid Waste Treatment Facility contained 56 RCRA-permitted tanks and 10 other permitted pieces of process equipment, and consisted of the following process systems:

Waste Receiving & Neutralization Process, Rm. 2804: This system included a number of large tank that received relatively dilute, non-acidic liquid wastes from site facilities, and stored them until they could be blended and evaporated. The process included 13 tanks and assorted piping and pumps with a total of over 130,000 gallons of storage space within Building 374 itself. Criticality limits were <1E-5 g/L actinide. It also included operations of the process waste lines and valve vaults and an additional million gallons of liquid waste storage capacity in 231A and 231B outside the building that provided buffer storage [the 231A and 231B tanks had deactivation and sludge removal by a different project]. Up to approximately 4 million gallons of mostly dilute liquid waste were processed yearly during operations in FY00-01.

Acid Waste Neutralization Process. Rms. 3801, 2804, and 3805: This system received nitric acid wastes from Building 371 and neutralized them prior to the precipitation process. The process included six stainless steel tanks and pumps in glovebox-like enclosures with over 6,400 gallons of storage space. Tanks were not critically safe, and actinide concentrations were administratively controlled to <10E-3 g/L.

Precipitation Process, Rm. 3801: This system contained a three-stage carrier precipitation (iron oxide and flocculants) designed to remove actinides from the Building 371 and any other waste stream <10E-3 g/L actinide. System contained 13 carbon steel tanks, settling tanks, and equipment, with over 72,000 gallons of capacity; it processed approximately 200,000 gallons per year during operations. The precipitated sludge from the settling tanks was processed in the vacuum filter system; the supernatant became evaporator feed.

Evaporation Process, Rms. 3810, 4814, and including tanks and evaporator units outside B374: This system treated all liquids, with the distillate recycled as boiler makeup and cooling tower feed and the concentrated brine proceeding to the spray dryer system. It consisted of a quadruple-effect evaporator and assorted feed tanks, and processed approximately 4 million gallons per year.

Spray Dryer & Saltcrete Process, Rms. 2804, 3801, 3809, 4802, 4812. This system solidified the evaporator concentrate stream in a spray dryer and then mixed the "salt" with concrete, resulting in a cardboard-boxed solidified waste form suitable for shipment as a relatively low activity low-level mixed waste. Water vapor was removed through a baghouse followed by a HEPA filtration plenum. The system consisted of a spray dryer unit and over 110,000 gallons of feed tankage, and treated 650,000 gallons of brine and produced 2 million cubic feet of

"saltcrete" yearly.

Vacuum Filter & Sludge Solidification Process, Rms. 2804, 4805, and 4807: This system, mostly located inside a two-story containment enclosure, filtered the sludge from the precipitation in a small (approximately 5' diameter), partially gloveboxed drum filter, with the filtrate returning to the precipitation process. The wet solids were solidified in a drummed cement matrix waste form suitable for shipment as a relatively high activity low-level mixed waste. This sludge cementation process was also used during the cleanout of sludge from all system tanks during deactivation of the systems. The sludge process consisted of eight tanks and other pieces of process equipment.

Contaminants of Concern: The major liquid waste contaminants included actinides (plutonium, americium) uranium, acids (nitric, sulfuric), and bases (sodium and potassium hydroxide). However, waste streams included soluble/trace quantities of metal and organic constituents that were used in manufacturing or processing, such as chlorinated hydrocarbons, lead, chlorides, etc. RCRA codes included: D001, D002, D004-D011, F001-F003, F005-F009, P030, P098, P099, P106, U002, U103, U108, U117, U154, U161, and U213.

Permitting: All processes were part of the Site's RCRA Part B Permit.

Safety/Exposure Considerations: The systems processed materials that were relatively low activity and low-exposure wastes. There was no significant shielding against gamma or beta external radiation. All process areas were maintained at a negative differential for general contamination control, with the lowest pressures in the process equipment (e.g., tanks) gloveboxes, hoods, and contamination enclosure areas. The process areas required level D PPE for normal operations, with level C PPE required for maintenance or work in the Vacuum Filter enclosure. An authorization basis was in place and criticality controls were based on administratively limiting actinide concentrations.

Construction Details: Building 374 was a 43,636 square foot multi-story, which included process support systems such as HVAC, reagent storage, warehouse, receiving/shipping docks, logistics and solid waste storage areas, maintenance, office, and other support areas. The facility was masonry and concrete tilt-up construction, placed in service in 1980, and operated through 2001.

Waste Management Project Execution
Site WBS Organization within the ECAS Project Scope:
The Site segregated work in the following categories by fiscal year: Evaporator Operations [and AWTS], Sprayer Dryer Operations, Precipitation Operations, Environmental Operations [and Deactivation], Maintenance Operations, and B374 Waste Ops Support. Operations were conducted from the start of the contract (February, 2000) though mid-2001, and deactivation, principally removal and packaging of tank sludge, continued trough FY 2002.
One significant additional activity that this ECAS Project performed was the design, procurement and operation of the Aqueous Waste Treatment System (AWTS). This ECES Project designed the small treatment system in FY2000, began operations in mid FY 2001 (at which point Evaporator operations were shut down), and turned over operations in March, 2002 to the site utilities function.
The WBSs associated with the 371 Liq Waste Ops ECAS Project nominally included the scope for management of the process waste lines, valve vaults, and exterior tanks associated with pumping all liquids from their source buildings to Building 374. In practice all activities outside

of the Building 374 facility except for the operations of the AWTS were insignificant (<1% of the total cost). Deactivation included draining of tankage and lines prior to RCRA closure and turnover for D&D.

Methods of execution:
Management: The scope was sustained operations until process shutdown, and deactivation was planned, managed, and executed by system.
Regulatory: All operations were regulated under RCRA and the AEA.
Physical Approach: Processes and technologies were previously described in the Process Systems section. Operations were mostly control-room based, with some manual operations to support solids handling. Deactivation consisted of draining process lines and tanks, processing sludges, and triple-rinsing tanks to ensure RCRA closure (the tanks were still disposed of as LLW/LLM during D&D). Sludges were solidified using dewatering processes or mixed directly with cement to form a suitable waste form.
Technologies: Status of technology – well proven, suitable for large volumes, not optimized for actual volumes generated

Activities self-performed:
- All management and key technical positions along with a portion of the technical staff
- All of the United Steel Workers operating the processes and performing deactivation and sludge processing.
- Waste management

Activities subcontracted:
- Used significant professional services contracted (i.e., seconded) labor inter-mixed with prime contractor staff
- Contracted Alternate Waste Treatment design and construction

Issues that impacted the project
- Security constraints (D&D activities for the first two years required DOE Q-cleared staff and entry and exit through multiple layers of security portals
- Co-location with nuclear operations (Authorization Basis, Nuclear Facility work controls)
- Removal, treatment, and disposal of tank sludge was an ongoing problem
- The systems were oversized based on the expected generation of liquid waste from Building 371 plutonium recovery operations that never operated.

Scope Growth:
Removal, treatment, and disposal of tank sludge was a greater effort than expected.

Notes Regarding Use of Data
Some management costs are included as distributed costs associated with management and conduct of operations activities performed at the 371 Project level.

Attachment 7   ECES Dictionary *(Single example page only, complete Word/PDF file available at URL given below)*

DEFINITIONS

.01.00 Program Management, Support, and Infrastructure (Optional)

.01.01 Program Management
All Phases—Activities by personnel who plan and oversee and plan the environmental program and develop and coordinate policy. Activities include develop guidance, resolve of environmental compliance and project integration issues, and management of multiple projects. UOM=LS

.01.01.01 Program Planning
All Phases—Plan and establish goals, missions, organizational hierarchy, and strategies; coordinate and evaluate work; evaluate contracting approaches; and related tasks. Obtain personnel and other resources (e.g., computers, travel funds, supplies) needed for planning such activities. UOM=LS

.01.01.02 Compliance Management
All Phases—Manage and supervise to ensure that the program remains compliant with regulatory and technical requirements and development of program procedures and policies. UOM=LS

.01.01.03 Pollution Prevention Management
All Phases—Establish policies, develop documents, and perform activities to ensure program is conducting pollution prevention and waste minimization activities. UOM=LS

.01.01.04 Conservation/Environmental Program Management
All Phases—Manage and supervise other managers and manage the program wide activities, including coordinate-work, evaluate personnel, and provide overall guidance. UOM=LS

.01.01.05 Meetings and Interfaces
All Phases—Attend, participate in, and conduct meetings and interfaces to discuss issues, plan activities, coordinate efforts, support auditors, or address other program needs. Cost of travel and per diem for attending and participating in meetings are included here. UOM=LS

.01.01.06 Budgeting and Financial Controls/Tracking/Reporting
All Phases—Prepare, consolidate, update, allocate, manage, track, control, and report cost, budgets, and financial information. Also, respond to budget requests from various organizations, draft congressional reports, and compile questions and answers. UOM=LS

Reference for complete document: http://www.em.doe.gov/stakepages/aceteam_eces.aspx. The ECAS system does not use the ECES units of measure for primary parameters.

Attachment 8   Rocky Flats Work Types

The table below shows an example of the scope identified in the charge number descriptions/work types that were assigned to the ranged of ECES codes from .04.04 through.05.02. Work types were assigned in a similar fashion to all of the 96 ECES codes used to describe all Rocky Flats scope. The complete spreadsheet with all ECES codes and all work types is available upon request.

ECES Code	ECES Description	Work Type
Previous ECES Codes (less than .04.04.00.00)		
.04.04	Risk Assessment Documentation	Comprehensive Risk Assessment Field Sampling / Lab Analysis
.04.04	Risk Assessment Documentation	Comprehensive Risk Assessment Field Sampling/Phase 2 Data Adequacy
.04.04	Risk Assessment Documentation	Comprehensive Risk Assessment Work Plan
.04.04	Risk Assessment Documentation	Comprehensive Risk Assessment Work Plan
.04.04	Risk Assessment Documentation	Risk Assessment Methodology
.04.10	Document Feasibility Study (Corrective Measure Study)	Analysis of Alternatives
.04.10	Document Feasibility Study (Corrective Measure Study)	Analysis of Alternatives Review
.04.10	Document Feasibility Study (Corrective Measure Study)	RI/FS Report
.04.10	Document Feasibility Study (Corrective Measure Study)	RI/FS Report
.04.10	Document Feasibility Study (Corrective Measure Study)	RI/FS Work Plan - Incorp Agency Comments
.04.10	Document Feasibility Study (Corrective Measure Study)	RI/FS Workplan
.04.10	Document Feasibility Study (Corrective Measure Study)	RI/FS Workplan
.04.11	Environmental Management Project Design	Eng Design / Planning
.04.11	Environmental Management Project Design	Title I,II,III Design
.04.11	Environmental Management Project Design	Title II/Title III Design
.04.12	Decontamination/Dismantlement Project Designs	Advance Planning
.04.12	Decontamination/Dismantlement Project Designs	Eval for Radiation Detec Applic in CSV
.04.13	Facility Design	ASTRP PRELIMINARY DESIGN
.04.13	Facility Design	Design
.04.13	Facility Design	Design Engineering
.04.13	Facility Design	Design/Build Contract-Eval/Negotiate/Awa
.04.13	Facility Design	Design/Build Title 1
.04.13	Facility Design	Design-Cooling Tower
.04.13	Facility Design	Develop Portable Crit System
.04.13	Facility Design	Engineering
.04.13	Facility Design	Engineering Services
.04.13	Facility Design	Facility Design
.04.13	Facility Design	P&E Support to Breathing Air System
.04.13	Facility Design	Planning & Engineering
.04.13	Facility Design	Revise Design Package
.04.13	Facility Design	Safeguards & Security Design
.04.13	Facility Design	Shielding Concept. Des
.04.13	Facility Design	Site Eng. Support T/III
.04.13	Facility Design	Site Eng. Support TII
.04.13	Facility Design	Site Eng/Design
.05.01.03	Temporary Facilities	Comm. Center Repairs and Upgrades
.05.01.03	Temporary Facilities	Office Space
.05.01.03	Temporary Facilities	Portable Restrooms
.05.01.03	Temporary Facilities	Portable Restrooms
.05.01.03	Temporary Facilities	Temporary Buildings

.05.01.03	Temporary Facilities	Temporary Offices
.05.01.03	Temporary Facilities	Trailers
.05.01	Mobilization	Mobilization
.05.01	Mobilization	Mobilization & Site Preparation
.05.01	Mobilization	Mobilization / Demobilization
.05.01	Mobilization	Tent Construction
.05.01	Mobilization	Tent Procurement
.05.02	Cleanup/Landscaping/Revegetation	Asphalt Removal
.05.02	Cleanup/Landscaping/Revegetation	Backfill
.05.02	Cleanup/Landscaping/Revegetation	Backfill / Regrade & Seed
.05.02	Cleanup/Landscaping/Revegetation	Culvert Removal
.05.02	Cleanup/Landscaping/Revegetation	Dam Conversion
.05.02	Cleanup/Landscaping/Revegetation	Dam Reconfiguration
.05.02	Cleanup/Landscaping/Revegetation	Excavation/Demobilization/Reclamation
.05.02	Cleanup/Landscaping/Revegetation	Final Seed/Erosion Matting Install
.05.02	Cleanup/Landscaping/Revegetation	Grass Reseeding
.05.02	Cleanup/Landscaping/Revegetation	Haul & Place Backfill for 881(ECC)
.05.02	Cleanup/Landscaping/Revegetation	Install Culverts
.05.02	Cleanup/Landscaping/Revegetation	Parking Lot Removal
.05.02	Cleanup/Landscaping/Revegetation	Reconstruction
.05.02	Cleanup/Landscaping/Revegetation	Regrade Industrial Area
.05.02	Cleanup/Landscaping/Revegetation	Restoration
.05.02	Cleanup/Landscaping/Revegetation	Revegetation
.05.02	Cleanup/Landscaping/Revegetation	SITE RECLAMATION
.05.02	Cleanup/Landscaping/Revegetation	Site Regrading
.05.02	Cleanup/Landscaping/Revegetation	Soil Transfer
.05.02	Cleanup/Landscaping/Revegetation	Yard Bollard Removal
Subsequent ECES Codes (greater than .05.02.00.00)		

Attachment 9 Example Rocky Flats Cost Assignment Crosswalk

The following table gives the types of cost categories from the Rocky Flats accounting system that were mapped to the ECAS cost categories.

Cost Assignment Label from ECAS	Cost Element Label in Rocky Flats accounting database
CONST_SUBCONT_COST	CONSTRUCTION
	CSS FIXED PRICE
	SUBCONTRACTED SRVS
	SUBCONTRACTOR FEE (BUDGET ONLY)
	SUBCONTRACTOR G&A (BUDGET ONLY)
EQUIPMENT_RENTAL_COST	RENTALS
FUEL_UTILITIES_COST	FUEL & UTILITIES
LABOR_CRAFT_COST_TOTAL	BENEFITS
	COMPANY G&A
	FRINGE BENEFITS
	FRINGE BENEFITS - Building Trades
	FRINGE BENEFITS - Special Rate
	Incentive/CRP/Exec Payment
	LUMP SUM PAYMENTS
	MISC STAFF AUGMENTEES
	OTHER PAYMENTS
	OTHER PREMIUMS
	OVERTIME BASE & PRE.
	PAID ABSENCES
	RECRUITING
	SITE G&A
	STRAIGHT TIME BASE
	Vacation Liability Adjustment
	Wkly Sick& Accident/Short Term - Salary
MATERIAL_SUPPLIES_COST	SUPPLIES
PROF_SERVICES_COST	ASI
	DYNCORP I&ET
	E-2
	LATA
	MACTEC
	SEMA
	SOURCE ONE
	TENERA
	WORLD WIDE SERVICES
PROFIT_OVERHEAD_COST	BCWS Adjustment Factor
	Construction Trades Vacation
	CONTINGENCY
	ESCALATION
	FEE
	INSURANCE
	LEASED LABOR
	MISC EXPENSES
	ORG BURDEN
	SECOND TIER G&A

APPENDIX IA - Attachments

SEVERANCE PAY
TAXES
TRAVEL/TRAIN/RELOCAT
Wkly Sick& Accident/Short Term

Attachment 10 Example of Non-Waste Parameter Data

The following table provides the primary parameter used to define the scope of the Facility D&D and Environmental Restoration ECAS Projects for Rocky Flats. Nuclear Material and Waste Management Operations projects (except for SNM disposition) were defined by waste volumes and hence had no non-waste primary parameter. Non-waste secondary parameters included: glovebox volume, piping length, tank volume, duct area, conduit length, equipment weight, and sample numbers.

ECAS Project Type*	ECAS Project Name	Non-Waste Primary Parameter Designation	Unit of Measure
Facility D&D	RF B371 D&D	_Rad_Fissile_Quant	_SF
	RF B707 D&D	_Rad_Fissile_Quant	_SF
	RF B771 D&D	_Rad_Fissile_Quant	_SF
	RF B776 D&D	_Rad_Fissile_Quant	_SF
	RF Electrical Substations/Infrastructure	None	_SF
	RF Garage, Fire Station&Assc Facs	_Fuels	_SF
	RF Non-nuclear Manufacturing Facility(460)	_Non_Haz	_SF
	RF Office Bldg, WH&Trailers-Gr1	_Non_Haz	_SF
	RF Office Bldgs&Assc Facs-Gr2	_Cntl_Matl	_SF
	RF Office Bldgs&Assc Facs-Gr3	_Cntl_Matl	_SF
	RF Office Bldgs&Assc Facs-Gr4	_Cntl_Matl	_SF
	RF Plutonium Lab&Assc Facs(D&D)	_Rad_TRU_Conc	_SF
	RF Security Facs	_Cntl_Matl	_SF
	RF Sewage Trmt Plant&Assc Facs	_Cntl_Matl	_SF
	RF SNM Shipping&Assc Facs	_Rad	_SF
	RF Solar Pond Waste Facs	_Mixed_Rad_Haz	_SF
	RF Steam Plant/Utility Piping	_Cntl_Matl	_SF
	RF TRU Waste Shipping&Assc Facs	_Rad	_SF
	RF U Fac&Assc Facs(444)	_Rad_High Alpha	_SF
	RF U Fac&Assc Facs(865)	_Rad_High Alpha	_SF
	RF U Fac&Assc Facs(881)	_Rad_High Alpha	_SF
	RF U Fac&Assc Facs(883)	_Rad_High Alpha	_SF
	RF U Fac&Assc Facs(886)	_Rad_High Alpha	_SF
	RF Waste Mgmt Bldgs&Assc Facs	_Rad	_SF
	RF Water Plant&Assc Facs	_Cntl_Matl	_SF
	RF WH, Trailers&Assc Fac	_Cntl_Matl	_SF
Environmental Restoration	RF 663 Hot Spot	_Rad	_SF
	RF 771 Foot Drain Pond	_Rad	_SF
	RF 903 Pad	_Rad_High Alpha	_SF
	RF Ash Pits	_Rad	_SF
	RF B123 Slab/UBC	_Rad	_SF
	RF B335 Slab/UBC	_Haz	_SF
	RF B441 Slab/UBC	_Mixed_Rad_Haz	_SF
	RF B442 Slab/UBC	_Rad	_SF
	RF B559 Slab/UBC	_Rad_High Alpha	_SF
	RF B776 Slab/UBC	_Rad_High Alpha	_SF
	RF B779 Slab/UBC	_Rad	_SF
	RF B865 Slab/UBC	_Rad	_SF

RF B883 Slab/UBC	_Rad	_SF
RF B889 Slab/UBC	_Mixed_Rad_Haz	_SF
RF Buffer Area Characterization	None	_SF
RF DNAPL/CCl3 Remediation	Halogenated VOCs	_SF
RF Effluent Retention Ponds	_Rad	_SF
RF Final Sector Cleanup	None	_Ac
RF Industrial Area Characterization and Closeout	None	_SF
RF Industrial Area Regrading /Physical Closure	_Rad	_SF
RF Large Area Sample&NFA	_Rad	_SF
RF Minor Hot Spots (Multiple SWMUs)	_Rad	_SF
RF New Process Waste Lines	_Mixed_Rad_Haz	_L_Ft
RF Oil Burn Pit	_TCL_Org	_SF
RF Original Process Waste Lines	_Mixed_Rad_Haz	_L_Ft
RF OU-1 French Drain Removal	_TCL_Org	_SF
RF Plume Remediation	_TCL_Org	_In_GPM
RF RCRA-C Cover	_Rad	_SF
RF RCRA-D Cover	_Rad	_SF
RF Regrade Unused Landfill	None	_SF
RF Sample&NFA (Multiple SWMUs)	_Rad	_SF
RF Sanitary Sewer	None	_L_Ft
RF Solar Ponds	_Rad	_SF
RF TK66/Liq Radwaste Hot Spot	_Rad	_SF
RF Waste Trenches	_Rad	_SF

* ECAS Waste Management project types have waste parameters as their primary parameters

Attachment 11 Examples of Rocky Flats WEMS Data

The following tables show examples of the types and use of data derived from the waste tracking database at a DOE site. The database provides accurate total data that can be used to apportion waste by type to different ECAS Projects. Table A11-1 provides an excerpt of the data recorded on each container that was useful in assigning waste to ECAS Projects and subprojects. The WEMS system included all container information, "cradle to grave"; it also included container storage locations, dates and types of NDA, radionuclide types and activities, etc. Table A11-2 provides a summary of the waste data for Rocky Flats Building 371.

Table A11-1, Data extracted from the Rocky Flats WEMS Database

Available Descriptive Data (partial)	Example Container Information	Explanation
CONTAINER_NBR	B08077	Unique for each of approx.100,000 containers
STATUS	S	"Shipped" (also inactive or repackaged, stored in XX bldg, etc.)
PBD	A	WBS number
GEN_BLDG	371	Building where waste was placed in container and container sealed
GEN_ROOM	VARIOUS	Room where waste was from
FILL_DATE	6/10/2004	As Stated
WASTE_TYPE	LLM	As Stated
IDC_WFC_CODE	5001	Site-specific code identifying process generating waste or material type
CONTAINER_TYPE	BBS	Code designating container
DESCR	9H X10W X20L SIDE LOADING IP-2 METAL BOX	Container Description
CUBIC_METERS	50.97	Container volume
CUBIC_FEET	1800	Container volume
NET_WT	12877	As Stated
GROSS_WT	22610	As Stated
VOLUME		Disposal Volume if not container volume (e.g., gondola, intermodal)
WASTE_VOLUME_UNITS		As Stated
CERTIFY_DATE	8/5/2004 0:00:00	As Stated
SHIPMENT_DATE	10-Aug-04	As Stated
DESTINATION	ENV	Disposal Site
MANIFEST	08923	Shipping Manifest Number (for tracking)
CARRIER_ID	CAST	Carrier (i.e., trucking company) designation

Table A11-2, Summary of waste data for all Building 371 ECAS Projects

WASTE_TYPE	Sum of Container CUBIC_FEET	Sum of BULK_VOLUME	Count of CONTAINER_NBR
HAZ	141	53	33
LLM	198,106	102,852	3,662
LLT	81		11
LLW	899,296	1,731,141	4,865
NON	160	171	38
TRM	50,770		4,969
TRU	128,144		8,189
TSC	4	810	4
Grand Total	1,276,704	1,835,027	21,771

Attachment 12 Example Rocky Flats approach to developing I/D Costs

ECAS recognizes two general types of Indirect/Distributed Costs (I/D Costs):

1) I/D Costs that are derived from overhead (e.g., Site electricity) or costs that apply across multiple ECAS Projects or subprojects (e.g., the project management costs applied to individual subprojects, and
2) I/D Costs associated with the cost of waste management, transportation, and disposition applied back to the generating project.

The costs are applied in the INDIRECT_DISTRIBUTED_COST field for each record. If a record is an indirect cost (i.e., _CE_Dist), this field contains the negative of the value in the ACTUAL_COST_TOTAL field, so that the GRAND_TOTAL_COST, the sum of the two fields, is zero. For direct costs (i.e., _CE), the INDIRECT_DISTRIBUTED_COST field contains the cost in the ACTUAL_COST_TOTAL field multiplied by a factor pro-rating all of the appropriate I/D Costs to that record. Table A12-1 shows the approach used to develop these factors for Rocky Flats ECAS Projects.

The costs associated with waste management, transportation, and disposal are applied based on the costs for each of those activities pro-rated based on the volume of waste – i.e., the waste volume in a specific record is multiplied by a factor apportioning the cost of the ECES activity associated with that waste volume. For instance, the amount of LLW from the Rocky Flats RF B371 D&D Deactivation subproject (20,103 CF) is multiplied by a factor ($5.47/CF) to determine the waste cost associated with ECES code .32.01, Transportation by Truck. This cost is placed in the record in the INDIRECT_DISTRIBUTED_COST field. The approach used to determine the factors for Rocky Flats for LLW Transportation is shown in Table A12-2. The costs shown include the I/D Costs associated with the Waste Project, PBD, and Site overheads.

It should be noted that the total LLW volume shipped from Rocky Flats included both the waste generated by the ECAS Projects (FY 2000-FY2005) as well as "legacy" waste generated from previous activities. Both ECAS Project-generated and legacy wastes required management and, in many cases, repackaging and treatment. With the cost of the management of the ECAS-generated waste removed(in the INDIRECT_DISTRIBUTED_COST field), the remaining total project cost of the RF LLW ECAS Project reflects the cost to manage, transport, and dispose of the legacy waste.

Table A12-2, LLW Cost factors

LLW Activity	Cost ($)	Total LLW Volume (CF)	Cost/Volume ($/CF)
On-Site LLW	77,023,943	10,071,013	7.65
Transportation (Truck Only)	55,043,342	10,071,013	5.47
NTS-Disposal	94,934,592	10,071,013	9.43
EOU-Disposal	77,068,662	10,071,013	7.65
EOU Rail Trans& Disposal	169,968,179	10,071,013	16.88
Total Low Level Waste Disposition	474,038,718	10,071,013	47.07

Table A12-1, Development of Indirect/Distributed Cost Factors for Rocky Flats

PBD	Project Name	Project Direct	Project Indirect	PBD Indirect	Site Indirect	Grand Total	Intra-Project Factor	Intra-PBD Factor	Site Factor	Total Factor
A	RF B371 D&D	114,488,256	127,672,777			242,161,033	1.115	0.215	0.421	2.652
	RF B371 Dry Residues	7,025,386				7,025,386		0.215	0.421	0.727
	RF B371 Salt Residues	5,106,808				5,106,808		0.215	0.421	0.727
	RF B371 SSC Residues	606,854				606,854		0.215	0.421	0.727
	RF B371 Wet Residues	21,441,380				21,441,380		0.215	0.421	0.727
	RF B374 Liq Waste Ops	16,266,037				16,266,037		0.215	0.421	0.727
	RF SNM Disposition	119,151,147				119,151,147		0.215	0.421	0.727
	PBD			112,794,231		112,794,231				
	A Total	284,085,867	127,672,777	112,794,231		524,552,875				
B	RF 707 SNM Disposition	3,552,985				3,552,985		0.297	0.421	0.843
	RF B707 Ash Residues	7,273,796				7,273,796		0.297	0.421	0.843
	RF B707 D&D	96,824,967	57,483,726			154,308,692	0.594	0.297	0.421	1.938
	RF B707 Dry Residues	1,707,822				1,707,822		0.297	0.421	0.843
	RF B707 Salt Residues	1,793,143				1,793,143		0.297	0.421	0.843
	PBD			71,330,555		71,330,555				
	B Total	111,152,712	57,483,726	71,330,555		239,966,993				
C	RF B771 D&D	95,584,298	88,429,001			184,013,298	0.925	0.206	0.421	2.299
	I/D Cost			47,697,943	24,227,059	71,925,002				
	C Total	95,584,298	88,429,001	45,973,951	25,951,051	255,938,301				
D	RF B776 D&D	103,904,470	55,040,209			158,944,679	0.530	0.316	0.421	1.861
	PBD			73,460,903		73,460,903				
	D Total	103,904,470	55,040,209	73,460,903		232,405,582				
PBD-E through PBD-G Data removed for clarity										
	H Total				182,776,242	182,776,242				
	J Total				429,035,833	429,035,833				
	T Total				600,599,828	600,599,828				
	X Total				74,594,160	74,594,160				
	Grand Total	1,515,200,987	473,222,747	403,459,702	1,739,460,174	4,131,343,610				

Attachment 13 Example ECAS Input Template (RF B371 select data)

The following six pages show an abbreviated version of the Rocky Flats B371 ECAS Level 4/parent project element, including the parts of two ECAS Projects. The complete template is over 1,000 rows in length. The six pages show a horizontal slice of the template with the top rows consistent with the elements shown in Attachment 4.

SITE_WBS_LEVEL_1	SITE_WBS_LEVEL_2	SITE_WBS_LEVEL_3	SITE_WBS_LEVEL_4	SITE_WBS_LEVEL_5	SITE_WBS_LEVEL_6	SITE_WBS_LEVEL_7	SITE_WBS_LEVEL_8	WBS_DESCRIPTION	PROJECT_NAME	ECAS_LEVEL	SUM_OR_CE	SUBPROJECT_NAME
A										4_Prj_Grp		
1AAA								Project Management			CE_Dist	
1AAB								Facilities Management			CE_Dist	
1AAB								Facilities Management			CE_Dist	
1AAB								Facilities Management			CE_Dist	
1AAB								Facilities Management			CE_Dist	
1AAB								Facilities Management			CE_Dist	
1AAB								Facilities Management			CE_Dist	
1AAB	1AAB01							371/374 Cluster Compliance Surveillance			CE_Dist	
1AAB	1AAB01							371/374 Cluster Compliance Surveillance			CE_Dist	
1AAB	1AAB01							371/374 Cluster Compliance Surveillance			CE_Dist	
1AAB	1AAB01							371/374 Cluster Compliance Surveillance			CE_Dist	
1AAB	1AAB02							371/374 Cluster Maintenance			CE_Dist	
1AAB	1AAB02							371/374 Cluster Maintenance			CE_Dist	
1AAB	1AAB03							371/374 Cluster Operations Tech Support			CE_Dist	
1AAB	1AAB03							371/374 Cluster Operations Tech Support			CE_Dist	
1AAB	1AAB03							371/374 Cluster Operations Tech Support			CE_Dist	
1AAB	1AAB04							371/374 Cluster Operations Management			CE_Dist	
1AAB	1AAB04							371/374 Cluster Operations Management			CE_Dist	
1AAB	1AAB04							371/374 Cluster Operations Management			CE_Dist	
1AAB	1AAB04							371/374 Cluster Operations Management			CE_Dist	
1AAB	1AAB04							371/374 Cluster Operations Management			CE_Dist	
1AAB	1AAB05							Authorization Basis Development and Impl			CE_Dist	
1AAB	1AAB05							Authorization Basis Development and Impl			CE_Dist	
1AAB	1AAB07							Cooling Tower			CE_Dist	
1AAB	1AAB07							Cooling Tower			CE_Dist	
Sum	Sum	Sum							RF B371 D&D	5_T_A_Proj	Sum	
1AAD	1AAD01	1AAD0101						Set 1 - (Attic North)	RF B371 D&D	6_Comp_T_A_Elmnt	Sum	Set 1 - (Attic North)
1AAD	1AAD01	1AAD0101						Set 1 - (Attic North)	RF B371 D&D	6_Comp_T_A_Elmnt	CE	Set 1 - (Attic North)
1AAD	1AAD01	1AAD0101						Set 1 - (Attic North)	RF B371 D&D	6_Comp_T_A_Elmnt	CE	Set 1 - (Attic North)
1AAD	1AAD01	1AAD0101						Set 1 - (Attic North)	RF B371 D&D	6_Comp_T_A_Elmnt	CE	Set 1 - (Attic North)
1AAD	1AAD01	1AAD0101						Set 1 - (Attic North)	RF B371 D&D	6_Comp_T_A_Elmnt	CE	Set 1 - (Attic North)
1AAD	1AAD01	1AAD0101						Set 1 - (Attic North)	RF B371 D&D	6_Comp_T_A_Elmnt	CE	Set 1 - (Attic North)
1AAD	1AAD01	1AAD0102						Set 2 - (Attic South)	RF B371 D&D	6_Comp_T_A_Elmnt	Sum	Set 2 - (Attic South)
1AAD	1AAD01	1AAD0102						Set 2 - (Attic South)	RF B371 D&D	6_Comp_T_A_Elmnt	CE	Set 2 - (Attic South)
1AAD	1AAD01	1AAD0102						Set 2 - (Attic South)	RF B371 D&D	6_Comp_T_A_Elmnt	CE	Set 2 - (Attic South)
1AAD	1AAD01	1AAD0102						Set 2 - (Attic South)	RF B371 D&D	6_Comp_T_A_Elmnt	CE	Set 2 - (Attic South)
1AAD	1AAD01	1AAD0103						Set 3 - (Nitric Acid Recovery 3517)	RF B371 D&D	6_Comp_T_A_Elmnt	Sum	Set 3 - (Nitric Acid Recovery 3
1AAD	1AAD01	1AAD0103						Set 3 - (Nitric Acid Recovery 3517)	RF B371 D&D	6_Comp_T_A_Elmnt	CE	Set 3 - (Nitric Acid Recovery 3
1AAD	1AAD01	1AAD0103						Set 3 - (Nitric Acid Recovery 3517)	RF B371 D&D	6_Comp_T_A_Elmnt	CE	Set 3 - (Nitric Acid Recovery 3
1AAD	1AAD01	1AAD0103						Set 3 - (Nitric Acid Recovery 3517)	RF B371 D&D	6_Comp_T_A_Elmnt	CE	Set 3 - (Nitric Acid Recovery 3
1AAD	1AAD01	1AAD0103						Set 3 - (Nitric Acid Recovery 3517)	RF B371 D&D	6_Comp_T_A_Elmnt	CE	Set 3 - (Nitric Acid Recovery 3
1AAD	1AAD01	1AAD0103						Set 3 - (Nitric Acid Recovery 3517)	RF B371 D&D	6_Comp_T_A_Elmnt	CE	Set 3 - (Nitric Acid Recovery 3
1AAD	1AAD01	1AAD0103						Set 3 - (Nitric Acid Recovery 3517)	RF B371 D&D	6_Comp_T_A_Elmnt	CE	Set 3 - (Nitric Acid Recovery 3
1AAD	1AAD01	1AAD0103						Set 3 - (Nitric Acid Recovery 3517)	RF B371 D&D	6_Comp_T_A_Elmnt	CE	Set 3 - (Nitric Acid Recovery 3
1AAD	1AAD01	1AAD0103						Set 3 - (Nitric Acid Recovery 3517)	RF B371 D&D	6_Comp_T_A_Elmnt	CE	Set 3 - (Nitric Acid Recovery 3
1AAD	1AAD01	1AAD0103						Set 3 - (Nitric Acid Recovery 3517)	RF B371 D&D	6_Comp_T_A_Elmnt	CE	Set 3 - (Nitric Acid Recovery 3
1AAD	1AAD01	1AAD0103						Set 3 - (Nitric Acid Recovery 3517)	RF B371 D&D	6_Comp_T_A_Elmnt	CE	Set 3 - (Nitric Acid Recovery 3
1AAD	1AAD01	1AAD0103						Set 3 - (Nitric Acid Recovery 3517)	RF B371 D&D	6_Comp_T_A_Elmnt	CE	Set 3 - (Nitric Acid Recovery 3
1AAD	1AAD01	1AAD0103						Set 3 - (Nitric Acid Recovery 3517)	RF B371 D&D	6_Comp_T_A_Elmnt	CE	Set 3 - (Nitric Acid Recovery 3
1AAD	1AAD01	1AAD0103						Set 3 - (Nitric Acid Recovery 3517)	RF B371 D&D	6_Comp_T_A_Elmnt	CE	Set 3 - (Nitric Acid Recovery 3
1AAD	1AAD01	1AAD0103						Set 3 - (Nitric Acid Recovery 3517)	RF B371 D&D	6_Comp_T_A_Elmnt	CE	Set 3 - (Nitric Acid Recovery 3
1AAD	1AAD01	1AAD0103						Set 3 - (Nitric Acid Recovery 3517)	RF B371 D&D	6_Comp_T_A_Elmnt	CE	Set 3 - (Nitric Acid Recovery 3
Sum								B374 Waste Operations	RF B374 Liq Waste	5_T_A_Proj	Sum	
1AAE	1AAE01							B374 Waste Ops	RF B374 Liq Waste	6_Comp_T_A_Elmnt	CE	
1AAE	1AAE01							B374 Waste Ops	RF B374 Liq Waste	6_Comp_T_A_Elmnt	CE	
1AAE	1AAE01							B374 Waste Ops	RF B374 Liq Waste	6_Comp_T_A_Elmnt	CE	
1AAE	1AAE01							B374 Waste Ops	RF B374 Liq Waste	6_Comp_T_A_Elmnt	CE	
1AAE	1AAE01							B374 Waste Ops	RF B374 Liq Waste	6_Comp_T_A_Elmnt	CE	
1AAE	1AAE01							B374 Waste Ops	RF B374 Liq Waste	6_Comp_T_A_Elmnt	CE	
1AAE	1AAE02							910 Cluster Landlord Functions	RF B374 Liq Waste	6_Comp_T_A_Elmnt	CE	
1AAE	1AAE03							Liquid Waste Treatment	RF B374 Liq Waste	6_Comp_T_A_Elmnt	CE	
1AAE	1AAE04							Interceptor Trench Operations	RF B374 Liq Waste	6_Comp_T_A_Elmnt	CE	
1AAE	1AAE04							Interceptor Trench Operations	RF B374 Liq Waste	6_Comp_T_A_Elmnt	CE	
1AAE								B374 Waste Operations	RF B374 Liq Waste	6_Comp_T_A_Elmnt	CE	
1AAE								B374 Waste Operations	RF B374 Liq Waste	6_Comp_T_A_Elmnt	CE	
1AAE								B374 Waste Operations	RF B374 Liq Waste	6_Comp_T_A_Elmnt	CE	
1AAE								B374 Waste Operations	RF B374 Liq Waste	6_Comp_T_A_Elmnt	CE	
1AAE								B374 Waste Operations	RF B374 Liq Waste	6_Comp_T_A_Elmnt	CE	
1AAE								B374 Waste Operations	RF B374 Liq Waste	6_Comp_T_A_Elmnt	CE	
1AAE								B374 Waste Operations	RF B374 Liq Waste	6_Comp_T_A_Elmnt	CE	
1AAE								B374 Waste Operations	RF B374 Liq Waste	6_Comp_T_A_Elmnt	CE	
1AAE								B374 Waste Operations	RF B374 Liq Waste	6_Comp_T_A_Elmnt	CE	
1AAE								B374 Waste Operations	RF B374 Liq Waste	6_Comp_T_A_Elmnt	CE	
1AAE								B374 Waste Operations	RF B374 Liq Waste	6_Comp_T_A_Elmnt	CE	
1AAE								B374 Waste Operations	RF B374 Liq Waste	6_Comp_T_A_Elmnt	CE	
1AAE								B374 Waste Operations	RF B374 Liq Waste	6_Comp_T_A_Elmnt	CE	
1AAE								B374 Waste Operations	RF B374 Liq Waste	6_Comp_T_A_Elmnt	CE	
1AAE								B374 Waste Operations	RF B374 Liq Waste	6_Comp_T_A_Elmnt	CE	

ECES Designators						Cost Data							
ECES_LEVEL_1	ECES_LEVEL_2	ECES_LEVEL_3	ECES_LEVEL_4	ECES_LEVEL_5	ECES_DESC	PHASE_START_DATE	PHASE_END_DATE	BUDGET_HRS	BUDGET_COST	BUDGET_HOURS_UNIT	ACTUAL_HRS	ACTUAL_COST	ACTUAL_HOURS_UNIT
0	.00	.00	.00	.00									
Ph_4	.02	.01			Project Management/Support/Administration	7/19/2002	6/3/2003	143,082	17,153,119	LS	176,265	22,313,075	LS
Ph_4	.02	.01			Project Management/Support/Administration	10/1/2003	9/30/2004	-	-	LS	43,370	2,789,047	LS
Ph_4	.02	.14			Project Safety and Health	9/4/2003	8/29/2004	19,639	3,258,570	LS	13,278	1,920,813	LS
Ph_4	.04	.13			Facility Design	2/1/2000	5/21/2000	-	153	LS	-	585	LS
Ph_5	.06	.03	.01		Surveillance and Inspections	10/1/2003	9/30/2004	21,524	816,702	LS	6,228	623,395	LS
Ph_5	.06	.03	.02		Facility/Building Maintenance	11/30/2003	10/3/2003	35,265	2,033,760	LS	33,999	2,378,555	LS
Ph_5	.06	.03	.07		Routine Radiological Surveys	10/1/2003	9/30/2004	-	-	LS	43,281	2,237,052	LS
Ph_5	.06	.03	.01		Surveillance and Inspections	7/16/2001	4/29/2002	187,872	7,403,684	LS	247,615	11,377,639	LS
Ph_4	.06	.03	.04		Major Facility Repairs	10/1/2004	5/19/2005	21,524	877,226	LS	-	-	LS
Ph_5	.06	.03	.07		Routine Radiological Surveys	10/1/2003	9/30/2004	-	-	LS	25,817	1,431,279	LS
Ph_4	.31	.07			Radiological Inventory Categorization for D&D	10/1/2002	9/30/2003	-	-	LS	1,086	869,034	LS
Ph_5	.06	.03	.02		Facility/Building Maintenance	6/21/2001	4/27/2002	311,150	16,849,549	LS	286,480	18,591,680	LS
Ph_4	.06	.03	.04		Major Facility Repairs	10/1/2004	4/19/2005	35,264	2,091,455	LS	-	-	LS
Ph_4	.02	.01			Project Management/Support/Administration	6/7/2001	3/31/2002	49,749	6,468,716	LS	89,499	16,046,931	LS
Ph_4	.02	.14			Project Safety and Health	4/1/2002	3/31/2003	29,291	4,445,364	LS	-	-	LS
Ph_4	.06	.03	.04		Major Facility Repairs	10/1/2004	4/19/2005	3,518	628,585	LS	-	-	LS
Ph_4	.02	.01			Project Management/Support/Administration	5/7/2001	2/3/2002	293,978	21,579,392	LS	324,866	25,865,056	LS
Ph_4	.02	.14			Project Safety and Health	7/23/2001	3/15/2002	-	9,775	LS	202	3,987	LS
Ph_5	.06	.03	.01		Surveillance and Inspections	6/5/2001	3/5/2002	20,614	692,977	LS	74,475	3,259,374	LS
Ph_5	.06	.03	.02		Facility/Building Maintenance	5/8/2002	5/7/2003	-	-	LS	50	4,530	LS
Ph_4	.06	.03	.04		Major Facility Repairs	10/1/2004	4/19/2005	16,120	2,716,400	LS	-	-	LS
Ph_4	.31	.02			Deactivation	10/2/2000	3/29/2001	-	-	LS	567	32,473	LS
Ph_4	.02	.14			Project Safety and Health	4/3/2001	12/30/2001	1,481	917,709	LS	2,384	1,659,072	LS
Ph_4	.06	.03	.04		Major Facility Repairs	10/1/2004	4/19/2005	-	46,636	LS	-	-	LS
Ph_4	.02	.14			Project Safety and Health	5/22/2000	2/19/2001	-	-	LS	-	(73)	LS
Ph_4	.06	.03	.04		Major Facility Repairs	4/7/2000	10/15/2000	2,126	1,412,769	LS	19,532	1,390,727	LS
0	.00	.00	.00	.00									
0	.00	.00	.00	.00		7/14/2003	9/8/2003	12,070	578,969		1,276	80,221	
Ph_4	.03	.01			Workplan	7/14/2003	7/31/2003	65	52,784	LS	-	5,256	LS
Ph_4	.31	.09			Dismantling and Removal of Contaminated E	8/4/2003	9/8/2003	12,005	526,185	LS	1,276	74,965	LS
Ph_4	.31	.09	.01		Cutting, Sizing, and Removal of Equipment								
Ph_4	.31	.09	.04		Cutting, Sizing, and Removal of Tanks								
Ph_4	.31	.09	.94		Cutting, Sizing, and Removal of Conduit								
0	.00	.00	.00	.00		7/14/2003	9/8/2003	12,245	578,335	-	33	6,348	-
Ph_4	.03	.01			Workplan	7/14/2003	7/31/2003	65	52,784	LS	23	1,600	LS
Ph_4	.31	.09			Dismantling and Removal of Contaminated E	8/4/2003	9/8/2003	12,180	525,551	LS	10	4,749	LS
Ph_4	.31	.09	.94		Cutting, Sizing, and Removal of Conduit								
0	.00	.00	.00	.00		1/31/2002	3/21/2003	20,144	1,130,102	-	7,298	549,452	-
Ph_4	.03	.01			Workplan	1/31/2002	5/4/2002	62	64,883	LS	232	100,632	LS
Ph_4	.31	.09			Dismantling and Removal of Contaminated E	7/25/2002	3/21/2003	20,082	1,065,219	LS	7,066	448,820	LS
Ph_4	.31	.09	.01		Cutting, Sizing, and Removal of Equipment								
Ph_4	.31	.09	.01		Cutting, Sizing, and Removal of Equipment								
Ph_4	.31	.09	.94		Cutting, Sizing, and Removal of Conduit								
Ph_4	.31	.09	.92		Cutting, Sizing, and Removal of Duct								
Ph_4	.31	.09	.91		Cutting, Sizing, and Removal of Gloveboxes								
Ph_4	.31	.09	.03		Cutting, Sizing, and Removal of Piping								
Ph_4	.31	.09	.03		Cutting, Sizing, and Removal of Piping								
Ph_4	.31	.09	.04		Cutting, Sizing, and Removal of Tanks								
Ph_5	.11	.10			Environmental Management High Hazard Functional Area (e.g., ALLW, MALLW, TRU, Spent Fuel, & CWM)								
Ph_5	.32	.01			Waste Stream Handling/Packaging								
Ph_5	.32	.01			Waste Stream Handling/Packaging								
Ph_5	.32	.01			Waste Stream Handling/Packaging								
Ph_5	.32	.11			Transportation by truck								
Ph_5	.32	.11			Transportation by truck								
Ph_5	.32	.11			Transportation by truck								
Ph_5	.33	.06			Off-site DOE Disposal Costs, Fees, and Taxes								
Ph_5	.33	.06			Off-site DOE Disposal Costs, Fees, and Taxes								
Ph_5	.33	.08			Off-Site Commercial Disposal Costs, Fees, and Taxes								
Ph_5	.33	.08			Off-Site Commercial Disposal Costs, Fees, and Taxes								
0	.00	.00	.00	.00									
Ph_4	.02	.01			Project Management/Support/Administration	6/28/2000	2/1/2001	1,849	80,037	LS	1,877	84,458	LS
Ph_5	.24	.12			Neutralization	10/3/2000	4/8/2001	21,643	971,021	LS	8,767	1,142,528	LS
Ph_5	.26	.00			EX SITU PHYSICAL TREATMENT	10/1/2000	8/23/2001	127,191	7,315,749	LS	180,607	10,542,946	LS
Ph_5	.26	.17			Evaporation	9/3/2000	5/22/2001	31,209	1,983,473	LS	38,169	1,689,142	LS
Ph_5	.26	.36			Solids Dewatering/Drying	9/28/2000	5/25/2001	45,727	1,541,106	LS	24,671	1,452,485	LS
Ph_4	.31	.02			Deactivation	1/29/2001	10/23/2003	-	-	LS	5,529	1,043,096	LS
Ph_5	.26	.00			EX SITU PHYSICAL TREATMENT	6/7/2000	1/1/2001	1,299	61,452	LS	255	15,452	LS
Ph_5	.26	.00			EX SITU PHYSICAL TREATMENT	11/11/2000	10/11/2001	11,552	1,451,687	LS	252	212,082	LS
Ph_4	.02	.01			Project Management/Support/Administration	2/1/2000	5/21/2000	-	4,122	LS	-	653	LS
Ph_5	.20	.03			Pumping/Draining/Collection	9/10/2000	2/16/2001	1,554	169,358	LS	1,672	83,194	LS
Ph_5	.11	.09			Environmental Management Moderate Hazard Functional Area (e.g., Hazardous/Toxic, LLW & MLLW)								
Ph_5	.11	.10			Environmental Management High Hazard Functional Area (e.g., ALLW, MALLW, TRU, Spent Fuel, & CWM)								
Ph_5	.32	.01			Waste Stream Handling/Packaging								
Ph_5	.32	.01			Waste Stream Handling/Packaging								
Ph_5	.32	.01			Waste Stream Handling/Packaging								
Ph_5	.32	.01			Waste Stream Handling/Packaging								
Ph_5	.32	.01			Waste Stream Handling/Packaging								
Ph_5	.32	.01			Waste Stream Handling/Packaging								
Ph_5	.32	.11			Transportation by truck								
Ph_5	.32	.11			Transportation by truck								
Ph_5	.32	.11			Transportation by truck								
Ph_5	.32	.11			Transportation by truck								
Ph_5	.32	.11			Transportation by truck								
Ph_5	.33	.06			Off-site DOE Disposal Costs, Fees, and Taxes								
Ph_5	.33	.06			Off-site DOE Disposal Costs, Fees, and Taxes								
Ph_5	.33	.08			Off-Site Commercial Disposal Costs, Fees, and Taxes								
Ph_5	.33	.08			Off-Site Commercial Disposal Costs, Fees, and Taxes								
Ph_5	.33	.08			Off-Site Commercial Disposal Costs, Fees, and Taxes								
Ph_5	.33	.08			Off-Site Commercial Disposal Costs, Fees, and Taxes								

PROF_LABOR_COST	CRAFT_LABOR_COST	LABOR_CRAFT_COST_TOTAL	PROF_SERVICES_COST	CONST_SUBCONT_COST	SERVICES_CONST_SUBCONT_TOTAL	EQUIPMENT_RENTAL_COST	MATERIAL_SUPPLIES_COST	FUEL_UTILITIES_COST	MATERIALS_UTILITIES_TOTAL	DIRECT_COST_TOTAL	PROFIT_OVERHEAD_COST	ACTUAL_COST_TOTAL
		15,248,714	1,984,729	6,681,838	8,666,567	45,559	(2,257,343)	39,562	(2,217,781)	21,743,058	570,016	22,313,075
		2,204,568		584,185	584,185	79	19		19	2,788,852	195	2,789,047
		625,102	499	1,265,875	1,266,374	-	29,337		29,337	1,920,813	-	1,920,813
			585		585				-	585		585
		432,322		170,507	170,507	711	19,802		19,802	623,341	54	623,395
		1,544,723	4,082	807,676	811,758	3,364	15,974	-	15,974	2,375,818	2,737	2,378,555
		2,000,747		236,305	236,305				-	2,237,052	0	2,237,052
		9,920,760	12,434	1,350,448	1,362,882		92,029		92,029	11,375,671	1,968	11,377,639
		-		-	-		-		-	-	-	-
		1,225,469		205,810	205,810				-	1,431,279		1,431,279
		51,341		815,212	815,212		2,180		2,180	868,734	300	869,034
		11,156,341	1,926,160	4,379,469	6,305,629	10,178	1,095,623	40	1,095,663	18,567,810	23,869	18,591,680
		-	-		-	-			-	-	-	-
		5,021,950	1,951,414	8,256,744	10,208,159		844,077		844,077	16,074,186	(27,254)	16,046,931
		-	-	-	-		-		-	-	-	-
		-	-		-		-		-	-	-	-
		15,094,235	1,157,223	3,730,138	4,887,361	5,436	593,524	8,319	601,844	20,588,875	5,276,181	25,865,056
		107	3,982	(446)	3,536		344		344	3,987	-	3,987
		2,919,232	1,132	182,643	183,775		156,304		156,304	3,259,311	64	3,259,374
		2,029		2,502	2,502				-	4,530		4,530
		-	-		-	-			-	-		-
		20,711	2,056		2,056	6,033	4,456		4,456	33,257	(785)	32,473
		137,585	220,545	1,297,810	1,518,355		3,662		3,662	1,659,601	(529)	1,659,072
		-		-	-		-		-	-	-	-
					-		(73)		(73)	(73)		(73)
		783,968	283,572	28,672	312,244	2,627	291,889		291,889	1,390,727		1,390,727
		49,224		30,997	30,997	-	-	-	-	80,221	-	80,221
		-		5,256	5,256				-	5,256	-	5,256
		49,224		25,740	25,740		-		-	74,965	-	74,965
-	-	2,195	-	4,153	4,153	-	-	-	-	6,348	-	6,348
		1,484		116	116				-	1,600	-	1,600
		711		4,038	4,038		-		-	4,749	-	4,749
-	-	371,818	1,653	175,974	177,627	-	-	-	-	549,445	7	549,452
		46,530	1,653	52,449	54,101				-	100,632	-	100,632
		325,288		123,525	123,525		-		-	448,813	7	448,820
		65,606	16,279	2,439	18,717	134	(0)		(0)	84,458	-	84,458
		355,674	59,353	715,070	774,423		9,630		9,630	1,139,727	2,801	1,142,528
		7,385,907	836,882	1,745,513	2,582,395	61,751	512,275		512,275	10,542,328	619	10,542,946
		1,490,587	97,874	79,569	177,444		20,066		20,066	1,688,096	1,046	1,689,142
		1,024,914	25,504	126,778	152,282		275,073		275,073	1,452,269	216	1,452,485
		549,978	7,027	350,049	357,076	44,246	90,221		90,221	1,041,522	1,574	1,043,096
		13,681	1,621	3,129	4,750		(2,978)		(2,978)	15,452	-	15,452
		146,675	31,627	31,316	62,943		2,464		2,464	212,082	-	212,082
				653	653				-	653		653
		71,107	2,212	3,482	5,695		6,392		6,392	83,194	-	83,194

Indirect/Distributed Cost					Cost Descriptors	
INDIRECT_DISTRIBUTED_COST_L5	INDIRECT_DISTRIBUTED_COST_L4	INDIRECT_DISTRIBUTED_COST_SITE	INDIRECT_DISTRIBUTED_COST_WASTE	GRAND_TOTAL_COST	CALC_OR_ACTUAL	COST_PEDIGREE
	(22,313,075)			-	Actl	High
	(2,789,047)			-	Actl	High
	(1,920,813)			-	Actl	High
	(585)			-	Actl	High
	(623,395)			-	Actl	High
	(2,378,555)			-	Actl	High
	(2,237,052)			-	Actl	High
	(11,377,639)			-	Actl	High
	-			-	Actl	High
	(1,431,279)			-	Actl	High
	(869,034)			-	Actl	High
	(18,591,680)			-	Actl	High
	-			-	Actl	High
	(16,046,931)			-	Actl	High
	-			-	Actl	High
	-			-	Actl	High
	(25,865,056)			-	Actl	High
	(3,987)			-	Actl	High
	(3,259,374)			-	Actl	High
	(4,530)			-	Actl	High
	-			-	Actl	High
	(32,473)			-	Actl	High
	(1,659,072)			-	Actl	High
	-			-	Actl	High
	73			-	Actl	High
	(1,390,727)			-	Actl	High
					Actl	High
					Actl	High
2,679	3,807	7,614		19,356	Actl	High
38,207	54,294	108,587		276,052	Actl	High
			-	-	None	None
			-	-	None	None
					Actl	High
815	1,159	2,317		5,891	Actl	High
2,420	3,439	6,879		17,487	Actl	High
			-	-	None	None
					Actl	High
51,288	72,883	145,767		370,571	Actl	High
228,747	325,061	650,123		1,652,751	Actl	High
			-	-	None	None
			-	-	None	None
			-	-	None	None
			-	-	None	None
			-	-	None	None
			-	-	None	None
			515,475	515,475	Calc	Moderate
			515,475	515,475	Calc	Moderate
			67,594	67,594	Calc	Moderate
			26,239	26,239	Calc	Moderate
			-	-	Calc	Moderate
			24,474	24,474	Calc	Moderate
			28,749	28,749	Calc	Moderate
			-	-	Calc	Moderate
			81,284	81,284	Calc	Moderate
			84,903	84,903	Calc	Moderate
			58	58	Calc	Moderate
					Actl	High
25,150	35,739	71,479		216,826	Actl	High
340,225	483,477	966,954		2,933,184	Actl	High
3,139,502	4,461,398	8,922,796		27,066,642	Actl	High
502,997	714,785	1,429,569		4,336,493	Actl	High
432,524	614,640	1,229,279		3,728,928	Actl	High
310,615	441,401	882,802		2,677,914	Actl	High
4,601	6,539	13,078		39,670	Actl	High
63,154	89,746	179,491		544,473	Actl	High
194	276	553		1,677	Actl	High
24,774	35,205	70,409		213,581	Actl	High
			1,276,494	1,276,494	Calc	Moderate
			36,964	36,964	Calc	Moderate
			36,964	36,964	Calc	Moderate
			291,186	291,186	Calc	Moderate
			1,146,151	1,146,151	Calc	Moderate
			14,451	14,451	Calc	Moderate
			14,638	14,638	Calc	Moderate
			1,448	1,448	Calc	Moderate
			-	-	Calc	Moderate
			105,430	105,430	Calc	Moderate
			414,989	414,989	Calc	Moderate
			5,232	5,232	Calc	Moderate
			16,038	16,038	Calc	Moderate
			373	373	Calc	Moderate
			-	-	Calc	Moderate
			45,370	45,370	Calc	Moderate
			1,642,243	1,642,243	Calc	Moderate
			1,439,645	1,439,645	Calc	Moderate
			18,152	18,152	Calc	Moderate
			971	971	Calc	Moderate

Parameter Data and Descriptors

PARAMETER_UOM	PARAMETER_VALUE	PRINCIPAL_CONTAMINANT	WASTE_OR_MATERIAL_TYPE	PCKG_TYPE	DISP_TRTMT	DISP_FAC_REG	PARAMETER_PEDIGREE
							None
							None
							None
							None
							None
							None
							None
							None
							None
							None
							None
							None
							None
							None
							None
							None
							None
							None
							None
							None
							None
							None
							None
SF	366,498	Rad_Fissile_Quant					High
SF	24,624	Rad_TRU_Conc					High
							None
							None
Lb		Rad					Low
CF	2	Rad_TRU_Conc					High
L_Ft	5,823	Rad					Low
SF	30,403	Rad_TRU_Conc					High
							None
							None
L_Ft	8,207	Rad					Low
SF	1,123	Rad_Fissile_Quant					High
							None
							None
Lb		Rad_TRU_Conc					Low
Lb		Rad					Low
L_Ft	1,184	Rad					Low
SF	675	Rad_TRU_Conc					High
CF	550	Rad_TRU_Conc					High
L_Ft	1,072	Rad					Moderate
L_Ft	305	Rad_TRU_Conc					Moderate
CF	675	Rad_TRU_Conc					High
_CF	1,135		Mx_TRU_CH	Containerized - Gene	_No_Trt	CERCLA (incl. Env Ca	Moderate
_CF	1,135		Mx_TRU_CH	Containerized - Gene	_No_Trt	CERCLA (incl. Env Ca	Moderate
CF	1,408		Mx_LLW_LDR	Containerized - Gene	_No_Trt	Regulatory - RCRA	Moderate
CF	5,260		LLW_CH	Containerized - Gene	No_Trt	CERCLA (incl. Env Ca	Moderate
_CF	1,135		Mx_TRU_CH	Containerized - Gene	No_Trt	CERCLA (incl. Env Ca	Moderate
_CF	1,408		Mx_LLW_LDR	Containerized - Gene	No_Trt	Regulatory - RCRA	Moderate
_CF	5,260		LLW_CH	Containerized - Gene	No_Trt	CERCLA (incl. Env Ca	Moderate
_CF	1,135		Mx_TRU_CH	Containerized - Gene	_No_Trt	CERCLA (incl. Env Ca	Moderate
CF	5,257		LLW_CH	Containerized - Gene	No_Trt	CERCLA-DOE Regulat	Moderate
CF	1,408		Mx_LLW_LDR	Containerized - Gene	No_Trt	Regulatory - RCRA	Moderate
_CF	3		LLW_CH	Containerized - Gene	No_Trt	CERCLA-NRC Regulat	Moderate
Gal	4,000,000		Mx_LLW_Non_LDR				Low
							None
							None
							None
							None
							None
							None
							None
							None
							None
CF	6,065		Mx_LLW_Non_LDR	Containerized - Gene	Trt_at_Disp_Fac	Regulatory - RCRA	Moderate
_CF	81		Mx_TRU_CH	Containerized - Gene	No_Trt	CERCLA-DOE Regulat	Moderate
CF	81		Mx_TRU_CH	Containerized - Gene	No_Trt	CERCLA-DOE Regulat	Moderate
_CF	6,065		Mx_LLW_Non_LDR	Containerized - Gene	Trt_at_Disp_Fac	Regulatory - RCRA	Moderate
_CF	23,873		Mx_LLW_LDR	Containerized - Gene	No_Trt	Regulatory - RCRA	Moderate
CF	301		Mx_LLW_LDR	Bulk	No_Trt	Regulatory - RCRA	Moderate
CF	2,934		LLW_CH	Containerized - Gene	No_Trt	CERCLA-DOE Regulat	Moderate
_CF	19		Non_Haz	Containerized - Gene	No_Trt	None	Moderate
CF	81		Mx_TRU_CH	Containerized - Gene	_No_Trt	CERCLA-DOE Regulat	Moderate
CF	6,065		Mx_LLW_Non_LDR	Containerized - Gene	Trt_at_Disp_Fac	Regulatory - RCRA	Moderate
CF	23,873		Mx_LLW_LDR	Containerized - Gene	No_Trt	Regulatory - RCRA	Moderate
CF	301		Mx_LLW_LDR	Bulk	No_Trt	Regulatory - RCRA	Moderate
_CF	2,934		LLW_CH	Containerized - Gene	_No_Trt	CERCLA-DOE Regulat	Moderate
CF	19		Non_Haz	Containerized - Gene	No_Trt	None	Moderate
CF	81		Mx_TRU_CH	Containerized - Gene	No_Trt	CERCLA-DOE Regulat	Moderate
CF	2,934		LLW_CH	Containerized - Gene	No_Trt	CERCLA-DOE Regulat	Moderate
CF	6,065		Mx_LLW_Non_LDR	Containerized - Gene	Trt_at_Disp_Fac	Regulatory - RCRA	Moderate
CF	23,873		Mx_LLW_LDR	Containerized - Gene	No_Trt	Regulatory - RCRA	Moderate
_CF	301		Mx_LLW_LDR	Bulk	_No_Trt	Regulatory - RCRA	Moderate
_CF	19		Non_Haz	Containerized - Gene	No_Trt	None	Moderate

PARAMETER_PROJECT_TYPE	BUILDING_TYPE	PROJECT_TYPE_DETAIL	ER_TYPE	ER_TYPE_DETAIL	MGMT_CMPLX	TECH_CMPLX	REG_CMPLX	PUB_CMPLX	PL_ALL	CONSTRUCTION_TYPE	STRUCTURE_TYPE	ER_CMPLX	GW_CMPLX	SW_CMPLX	SOIL_C_MPLX	ECO_CMPLX	WET_WILD	HIST	MEDIA_ST
Building / Facility	B_Typ	Plutonium/Enriched Uranium Processing Facility			High	High	High	High	B	Multiple Story	Reinforced Concrete								
Waste Management Opera		Mixed Low-Level Waste Mgt & Disposition – Treat			Low	Modera	Low	Low	C										

Subproject/FSA Descriptors		Comments
FSA_TYPE	FSA_CMPLX	COMMENTS
Uncontaminated Mecha	Low	
Uncontaminated Mecha	Low	
Process Area-Glovebox	Moderate	

Attachment 14 Example ECAS Project Names Table

The following table provides an example of the level of detail of the project names for a selection of Rocky Flats ECAS Projects:

ECAS Project Designator	Project Type	Project Name
RF 371 SNM DISPOSITION	NM	Rocky Flats Special Nuclear Material Disposition Operations in Building 371 [NM operations to process plutonium metal and oxide prior to shipment to Savannah River]
RF 663 HOT SPOT	ER	Rocky Flats Remediation of the Building 663 Hot Spot ER [Removal of radiologically contaminated soil adjacent to Building 663 resulting from outdoor waste handling]
RF 707 SNM DISPOSITION	NM	Rocky Flats Special Nuclear Material Disposition Operations in Building 707 [NM operations to process plutonium metal and oxide prior to shipment to Savannah River]
RF 771 FOOT DRAIN POND	ER	Rocky Flats Building 771 Footing Drain Pond ER [Removal and treatment of soil and sludges resulting from radiologically contaminated building outfall]
RF 903 PAD	ER	Rocky Flats 903 Pad ER [Removal of soil with plutonium and solvent contamination resulting from deterioration of drums stored outside and wind and water dispersion]
RF ASH PITS	ER	Rocky Flats Ash Pits ER [Characterization and removal of a legacy combustible office waste incinerator and the above-regulatory limit ash previously buried in associated trenches]
RF B123 SLAB/UBC	ER	Rocky Flats Building 123 Slab/Under-Building Contamination ER [Removal of the slab and slightly radiologically-contaminated soil from a 1950s-era bioassay laboratory]
RF B335 SLAB/UBC	ER	Rocky Flats Building 335 Slab/Under-Building Contamination ER [Removal of the slab and slightly petroleum-contaminated soil from a 1950s-era vehicle garage]
RF B371 D&D	D&D	Rocky Flats Building 371 D&D [D&D of a large 1980s-era plutonium recovery facility, including removal of plutonium nitrate process systems, gloveboxes, tanks, support systems, and associated structures]
RF B371 DRY RESIDUES	WM	Rocky Flats Dry Residue Treatment Operations in Building 371 [Operations to treat and package high-plutonium dry wastes to meet the WIPP waste acceptance requirements]
RF B371 SALT RESIDUES	WM	Rocky Flats Salt Residue Treatment Operations in Building 371 [Operations to treat and package high-plutonium chloride salt wastes to meet the WIPP waste acceptance requirements]