SEC Petition Evaluation Report
Petition SEC-00168

Report Rev #: 0 Report Submittal Date: March 24, 2010

Subject Expert(s):	Chris Miles, Michael Domal
Site Expert(s):	N/A

Petitioner Administrative Summary			
Petition Under Evaluation			
Petition #	Petition Type	Petition A Receipt Date	DOE/AWE Facility Name
SEC-00168	83.14	March 10, 2010	De Soto Avenue Facility

NIOSH-Proposed Class Definition
All employees of the Department of Energy, its predecessor agencies, and their contractors and subcontractors who worked at the De Soto Avenue Facility in Los Angeles County, California, from January 1, 1959 through December 31, 1964, for a number of work days aggregating at least 250 work days, occurring either solely under this employment or in combination with work days within the parameters established for one or more other classes of employees included in the Special Exposure Cohort.

Related Petition Summary Information			
SEC Petition Tracking #(s)	Petition Type	DOE/AWE Facility Name	Petition Status
SEC-00093	83.13	Area IV of the Santa Susana Field Laboratory	Class included in the SEC for 1955-1958
SEC-00151	83.13	Canoga Avenue Facility	Class proposed by NIOSH (1955-1960)
SEC-00156	83.14	Area IV of the Santa Susana Field Laboratory	Class proposed by NIOSH and ABRWH (1959-1964)
SEC-00167	83.14	Downey Facility	Class proposed by NIOSH (1948-1955)

Related Evaluation Report Information	
Report Title	DOE/AWE Facility Name
SEC Petition Evaluation Report for Petition SEC-00093	Area IV of the Santa Susana Field Laboratory
SEC Petition Evaluation Report for Petition SEC-00151	Canoga Avenue Facility
SEC Petition Evaluation Report for Petition SEC-00156	Area IV of the Santa Susana Field Laboratory
SEC Petition Evaluation Report for Petition SEC-00167	Downey Facility

ORAU Lead Technical Evaluator: Chris Miles	**ORAU Peer Review Completed By:** Michael Kubiak

Peer Review Completed By:	[Signature on file] *Lara Hughes*	3/24/2010 *Date*
SEC Petition Evaluation Reviewed By:	[Signature on file] *J. W. Neton*	3/25/2010 *Date*
SEC Evaluation Approved By:	[Signature on file] *Stuart L. Hinnefeld*	3/25/2010 *Date*

This page intentionally left blank

Evaluation Report Summary: SEC-00168, De Soto Avenue Facility

This evaluation report by the National Institute for Occupational Safety and Health (NIOSH) addresses a class of employees proposed for addition to the Special Exposure Cohort (SEC) per the *Energy Employees Occupational Illness Compensation Program Act of 2000*, as amended, 42 U.S.C. § 7384 *et seq.* (EEOICPA) and 42 C.F.R. pt. 83, *Procedures for Designating Classes of Employees as Members of the Special Exposure Cohort Under the Energy Employees Occupational Illness Compensation Program Act of 2000*.

NIOSH-Proposed Class Definition

All employees of the Department of Energy, its predecessor agencies, and their contractors and subcontractors who worked at the De Soto Avenue Facility in Los Angeles County, California, from January 1, 1959 through December 31, 1964, for a number of work days aggregating at least 250 work days, occurring either solely under this employment or in combination with work days within the parameters established for one or more other classes of employees included in the Special Exposure Cohort.

Feasibility of Dose Reconstruction Findings

NIOSH lacks sufficient information, which includes biological monitoring data, sufficient air monitoring information, or sufficient process and radiological source information, to allow it to estimate with sufficient accuracy the potential internal exposures to various radionuclides to which the proposed class may have been subjected. NIOSH finds that it is likely feasible to reconstruct external dose, including occupational medical dose, for De Soto Avenue Facility workers with sufficient accuracy.

The NIOSH dose reconstruction feasibility findings are based on the following:

- Principal sources of both internal and external radiation doses for members of the NIOSH-proposed class included exposures to uranium and fission products. These sources of exposure were also present at the Santa Susana Field Laboratory (SSFL), Area IV. The De Soto Avenue and SSFL-Area IV facilities were related facilities, both operated by Atomics International, a division of North American Aviation.

- NIOSH previously determined in its evaluation of petition SEC-00093 that some SSFL-Area IV workers could have received intakes of radioactive materials that went unmonitored from the beginning of the covered period for SSFL-Area IV operations in 1955 through the end of 1958, and that limitations in the available data did not allow NIOSH to estimate such radiation doses with sufficient accuracy. Subsequently, NIOSH determined in its evaluation of petition SEC-00156 that similar limitations in data also existed for the 1959 through 1964 time period. NIOSH has recommended SEC classes for SSFL-Area IV workers, covering the time period from January 1, 1955 through December 31, 1964.

- NIOSH has found that the internal radiation monitoring program in place at the De Soto Avenue Facility during this time period was the same program that was in place for SSFL-Area IV, and the resulting data generated from both facilities had similar limitations.

- NIOSH has determined that, like workers at the SSFL-Area IV facility, De Soto Avenue Facility workers could have also received unmonitored intakes of radioactive materials during the years prior to 1965. Due to similar limitations in the available data for the two sites, NIOSH has determined that, like SSFL-Area IV, it cannot estimate radiation doses to De Soto Avenue Facility workers with sufficient accuracy from the beginning of covered De Soto Avenue operations in 1959 through the end of 1964.

- Pursuant to 42 C.F.R. § 83.13(c)(1), NIOSH determined that there is insufficient information to either: (1) estimate the maximum radiation dose, for every type of cancer for which radiation doses are reconstructed, that could have been incurred under plausible circumstances by any member of the class; or (2) estimate the radiation doses of members of the class more precisely than a maximum dose estimate.

- Although NIOSH found that it is not possible to completely reconstruct radiation doses for the proposed class, NIOSH intends to use any internal and external monitoring data that may become available for an individual claim (and that can be interpreted using existing NIOSH dose reconstruction processes or procedures). Therefore, dose reconstructions for individuals employed at the De Soto Avenue Facility during the period from January 1, 1959 through December 31, 1964, but who do not qualify for inclusion in the SEC, may be performed using these data as appropriate.

Health Endangerment Determination

The NIOSH evaluation did not identify any evidence supplied by the petitioners or from other resources that would establish that the class was exposed to radiation during a discrete incident likely to have involved exceptionally high-level exposures, such as nuclear criticality incidents or other events involving similarly high levels of exposures. However, the evidence reviewed in this evaluation indicates that some workers in the class may have accumulated chronic radiation exposures through intakes of fission products and other radionuclides, as well as from direct exposure to radioactive materials. Therefore, 42 C.F.R. § 83.13(c)(3)(ii) requires NIOSH to specify that health may have been endangered for those workers covered by this evaluation who were employed for a number of work days aggregating at least 250 work days within the parameters established for this class or in combination with work days within the parameters established for one or more other classes of employees in the SEC.

Table of Contents

This page intentionally left blank

SEC Petition Evaluation Report for SEC-00168

ATTRIBUTION AND ANNOTATION: This is a single-author document. All conclusions drawn from the data presented in this evaluation were made by the ORAU Team Lead Technical Evaluator: Chris Miles, Quantaflux, LLC. The rationales for all conclusions in this document are explained in the associated text.

1.0 Purpose and Scope

This report evaluates the feasibility of reconstructing doses for employees who worked at a specific facility during a specified time. It provides information and analysis germane to considering a petition for adding a class of employees to the Congressionally-created SEC.

This report does not make any determinations concerning the feasibility of dose reconstruction that necessarily apply to any individual energy employee who might require a dose reconstruction from NIOSH, with the exception of the employee whose dose reconstruction could not be completed, and whose claim consequently led to this petition evaluation. The finding in this report is not the final determination as to whether or not the proposed class will be added to the SEC. This report will be considered by the Advisory Board on Radiation and Worker Health (the Board) and by the Secretary of Health and Human Services (HHS). The Secretary of HHS will make final decisions concerning whether or not to add one or more classes to the SEC in response to the petition addressed by this report.

This evaluation, in which NIOSH provides its findings both on the feasibility of estimating radiation doses of members of this class with sufficient accuracy and on health endangerment, was conducted in accordance with the requirements of EEOICPA and 42 C.F.R. § 83.14.

2.0 Introduction

Both EEOICPA and 42 C.F.R. pt. 83 require NIOSH to evaluate qualified petitions requesting that the Department of Health and Human Services add a class of employees to the SEC. The evaluation is intended to provide a fair, science-based determination of whether it is feasible to estimate, with sufficient accuracy, the radiation doses of the proposed class of employees through NIOSH dose reconstructions.[1]

NIOSH is required to document its evaluation in a report, and to do so, relies upon both its own dose reconstruction expertise as well as technical support from its contractor, Oak Ridge Associated Universities (ORAU). Once completed, NIOSH provides the report to both the petitioners and the Advisory Board on Radiation and Worker Health. The Board will consider the NIOSH evaluation report, together with the petition, comments of the petitioner(s) and such other information as the Board considers appropriate, to make recommendations to the Secretary of HHS on whether or not to add one or more classes of employees to the SEC. Once NIOSH has received and considered the advice of the Board, the Director of NIOSH will propose a decision on behalf of HHS. The Secretary of HHS will make the final decision, taking into account the NIOSH evaluation, the advice of the

[1] NIOSH dose reconstructions under EEOICPA are performed using the methods promulgated under 42 C.F.R. pt. 82 and the detailed implementation guidelines available at http://www.cdc.gov/niosh/ocas.

Board, and the proposed decision issued by NIOSH. As part of this final decision process, the petitioner(s) may seek a review of certain types of final decisions issued by the Secretary of HHS.[2]

3.0 NIOSH-Proposed Class Definition and Petition Basis

The NIOSH-proposed class includes all employees of the Department of Energy, its predecessor agencies, and their contractors and subcontractors who worked at the De Soto Avenue Facility in Los Angeles County, California, from January 1, 1959 through December 31, 1964, for a number of work days aggregating at least 250 work days, occurring either solely under this employment or in combination with work days within the parameters established for one or more other classes of employees included in the Special Exposure Cohort. During this period, employees at this facility were involved with the operation of a small research reactor, nuclear fuel fabrication, gamma irradiations, mass spectroscopy of neutron-irradiated samples, and various radiochemistry operations.

The evaluation responds to Petition SEC-00168, which was submitted by an EEOICPA claimant whose dose reconstruction could not be completed by NIOSH due to a lack of sufficient dosimetry-related information. NIOSH's determination that it is unable to complete a dose reconstruction for an EEOICPA claimant is a qualified basis for submitting an SEC petition pursuant to 42 C.F.R. § 83.9(b).

NIOSH has determined that the De Soto Avenue Facility shared many radiological control and monitoring practices, as well as radiological monitoring records programs, with Area IV of the Santa Susana Field Laboratory (SSFL). Both of these facilities were operated during the same time period by Atomics International.

There is currently one class of SSFL-Area IV workers associated with the NIOSH evaluation of SEC petition SEC-00093, for which the Secretary of Health and Human Services (HHS) has designated inclusion in the Special Exposure Cohort:

> Class added to the SEC effective July 18, 2009: *Employees of the Department of Energy (DOE), its predecessor agencies, and DOE contractors and subcontractors who worked in any area of Area IV of the Santa Susana Field Laboratory for a number of work days aggregating at least 250 work days from January 1, 1955 through December 31, 1958, or in combination with work days within the parameters established for one or more other classes of employees in the SEC* (HHS, 2009).

Detailed information associated with the SEC-00093 worker class added to the SEC can be found in the NIOSH evaluation report, *SEC Petition Evaluation Report for Petition SEC-00093, Santa Susana Field Laboratory-Area IV* (NIOSH, 2009). The basis for this 1955-1958 SEC class was the determination that NIOSH does not have access to sufficient personnel monitoring, workplace monitoring, or source term data to bound potential internal exposures from the various radionuclides for the evaluated worker class at Area IV of SSFL during the period from January 1, 1955 through December 31, 1958 (HHS, 2009).

[2] See 42 C.F.R. pt. 83 for a full description of the procedures summarized here. Additional internal procedures are available at http://www.cdc.gov/niosh/ocas.

Through the course of ongoing dose reconstruction, continued data capture efforts, and investigations associated with SEC-00093, NIOSH subsequently determined that insufficient access controls were employed at SSFL-Area IV. As a result, there were some workers who should have been monitored, but were not, and who could have received unmonitored intakes of radioactive materials after 1958. During this subsequent investigation, NIOSH determined that the available bioassay data have limitations prior to 1965, which preclude the development of adequate co-worker dose distribution models for the years prior to 1965. These NIOSH findings were presented in a second NIOSH evaluation report for Area IV of the SSFL, *SEC Petition Evaluation Report for Petition SEC-00156, Santa Susana Field Laboratory-Area IV* (NIOSH, 2010), which resulted in NIOSH proposing a second SEC class to include DOE employees who worked at Area IV of the SSFL from January 1, 1959 through December 31, 1964.

Because the De Soto Avenue Facility shared many radiological practices and radiological record-keeping programs with the SSFL-Area IV facility, NIOSH has determined that it also does not have access to sufficient personnel monitoring, workplace monitoring, or source term data to bound potential unmonitored internal exposures that may have occurred at the De Soto Avenue Facility from the beginning of the facility's DOE operations in 1959 through the end of those operations in 1964.

4.0 Radiological Operations Relevant to the Proposed Class

The following subsections summarize the radiological operations at the De Soto Avenue Facility from January 1, 1959 through December 31, 1964, and the information available to NIOSH to characterize particular processes and radioactive source materials. Using available sources, NIOSH has attempted to gather process and source descriptions, information regarding the identity and quantities of radionuclides of concern, and information describing processes through which the radiation exposures of concern may have occurred and the physical environment in which they may have occurred. The information included within this evaluation report is meant only to be a summary of the available information.

4.1 Operations Description

This section describes the operations at the De Soto Avenue Facility that are relevant to the NIOSH-proposed SEC class for all workers from January 1, 1959 through December 31, 1964.

Radiological operations occurred at the De Soto Avenue Facility from 1959 through 1964, and beyond. These operations involved work with nuclear fuel and other radioactive materials in Buildings 001 and 004. In later years, these building numbers were changed to Buildings 101 and 104, respectively (Boeing, 2003). The following paragraphs briefly summarize the nuclear operations in these buildings.

L-77 Reactor (NRC Licensed)

The L-77 small research reactor operated in Building 004 from 1960 to 1976. The L-77 was a low-power (10 W) reactor that used enriched uranyl sulfate solution. The L-77 was a prototype teaching reactor sold to many universities and around the world (Boeing, 2003).

Advanced Test Reactor (ATR) Fuel Fabrication and Supporting Activities

Fuel fabrication operations were conducted in Building 001, with radiochemistry support operations conducted in Building 004. These support activities included hot chemistry laboratories, an emission spectroscopy laboratory, and an x-ray diffraction laboratory (Boeing, 2003).

Many fuel manufacturing programs were conducted during the 1960s and 1970s, using 2% to 93% enriched uranium metal and composites. One of the larger programs was fuel manufacturing for the ATR using uranium-aluminum plates (Boeing, 2003).

Gamma Irradiation Facility (GIF)

This aboveground vault in Building 004 used sealed cesium-137 and cobalt-60 sources for radiation-hardening tests of electronic components and for food irradiation research (Boeing, 2003).

Mass Spectroscopy Laboratory (Helium Laboratory)

The mass spectroscopy laboratory was used to analyze radioactive specimens of neutron-irradiated radioactive samples for helium content. These samples were shipped from other U.S. and international research organizations. The mass spectroscopy laboratory was located in Building 004 (Boeing, 2003).

4.2 Radiation Exposure Potential from Operations

The potential for external radiation dose existed at the De Soto Avenue Facility in all areas where radioactive materials were handled or stored. Based on the site operations outlined in Section 4.1, sources of exposure included photon and beta radiation emitted from the various radioactive materials used at the site. To a lesser extent, neutron exposures could have resulted from operating the small research reactor and from operations involving nuclear fuel.

The primary potential sources of internal radiation exposure at the site were inhalation and ingestion of radioactive contamination that could have resulted from operations involving unsealed radioactive materials, such as nuclear fuel fabrication, radiochemistry, and mass spectroscopy operations.

4.3 Time Period Associated with Radiological Operations

Per the DOE Office of Health, Safety and Security, the time period associated with DOE operations at the De Soto Avenue Facility is from 1959-1995, with a DOE remediation period of 1998 (DOE, 2010). As presented in Section 3.0 of this report, HHS has already designated that SSFL-Area IV workers during the period January 1, 1955 through December 31, 1958 be included in the SEC, and NIOSH has subsequently proposed a second SEC class for SSFL-Area IV due to the continued inability to estimate, with sufficient accuracy, the total internal dose for the employees of SSFL-Area IV extending through December 31, 1964 (NIOSH, 2010). Because the De Soto Avenue Facility shared many radiological practices and radiological record-keeping programs with the SSFL-Area IV facility, NIOSH has determined that the same dose reconstruction infeasibilities exist for the De Soto Avenue Facility as were found for SSFL-Area IV in petition evaluation reports SEC-00093 (NIOSH 2009) and SEC-00156 (NIOSH 2010). The period of radiological operations associated with this evaluation of the De Soto Avenue Facility begins on January 1, 1959 and continues through December 31, 1964.

4.4 Site Locations Associated with Radiological Operations

Through the course of ongoing dose reconstruction and continued research for the De Soto Avenue Facility and the SSFL-Area IV site, NIOSH has determined that the site-specific and claimant-specific data available for the time period of this evaluation (1959-1964) are insufficient to allow NIOSH to characterize worker movements throughout the De Soto Avenue site. NIOSH is therefore unable to define individual worker exposure scenarios based on specific work locations within the De Soto Avenue Facility during the period from January 1, 1959 through December 31, 1964.

4.5 Job Descriptions Affected by Radiological Operations

Through the course of ongoing dose reconstruction and research for the De Soto Avenue Facility and the SSFL-Area IV site, NIOSH has determined that the site-specific and claimant-specific data available for the De Soto Avenue Facility for the time period of this evaluation (1959-1964) are insufficient to allow NIOSH to determine that any specific work group was not potentially exposed to radioactive material releases or possible subsequent contamination. NIOSH has insufficient information associating job titles and/or job assignments with specific radiological operations or conditions and is, therefore, unable to define potential radiation exposure conditions based on worker job descriptions.

5.0 Summary of Available Monitoring Data for the Proposed Class

The primary data used for determining internal exposures are derived from personal monitoring data, such as urinalyses, fecal samples, and whole-body counting results. If these are unavailable, the air monitoring data from breathing zone and general area monitoring are used to estimate the potential internal exposure. If personal monitoring and breathing zone area monitoring are unavailable, internal exposures can sometimes be estimated using more general area monitoring, process information, and information characterizing and quantifying the source term.

This same hierarchy is used for determining the external exposures to the cancer site. Personal monitoring data from film badges or thermoluminescent dosimeters (TLDs) are the primary data used to determine such external exposures. If there are no personal monitoring data, exposure rate surveys, process knowledge, and source term modeling can sometimes be used to reconstruct the potential exposure.

A more detailed discussion of the information required for dose reconstruction can be found in OCAS-IG-001, *External Dose Reconstruction Implementation Guideline*, and OCAS-IG-002, *Internal Dose Reconstruction Implementation Guideline*. These documents are available at: http://www.cdc.gov/niosh/ocas/ocasdose.html.

5.1 Data Capture Efforts and Sources Reviewed

In addition to examining its Site Research Database (SRDB) to locate documents supporting the evaluation of the proposed class, NIOSH completed an extensive database and Internet search for information regarding the De Soto Avenue Facility. The database search included the DOE Legacy Management Considered Sites database, the DOE Office of Scientific and Technical Information (OSTI) database, the Energy Citations database, the Atomic Energy Technical Report database, and

the Hanford Declassified Document Retrieval System. In addition to general Internet searches, the NIOSH Internet search included OSTI OpenNet Advanced searches, OSTI Information Bridge Fielded searches, Nuclear Regulatory Commission (NRC) Agency-wide Documents Access and Management (ADAMS) web searches, the DOE Office of Human Radiation Experiments website, and the DOE-National Nuclear Security Administration-Nevada Site Office-search.

NIOSH data capture efforts have also included visits to the SSFL site in September and November 2009, and a visit to the San Bruno Federal Records Center in September 2009. NIOSH has worked with representatives from DOE Legacy Management and the SSFL site in an attempt to gather documents and data relevant to dose reconstruction of claims for the De Soto Avenue Facility and the other related Energy Technology Engineering Center (ETEC) sites, which included the De Soto Avenue Facility, the Downey Facility, the Canoga Avenue Facility, and Area IV of the SSFL (ORAUT-TKBS-0038-2). These facilities were operated by Atomics International, a division of North American Aviation. NIOSH's SRDB currently contains over 1,500 documents associated with the ETEC-related sites, including over 200 documents associated specifically with the De Soto Avenue Facility. Attachment One contains a summary of De Soto-related documents. The summary identifies specific data capture details for each document retrieved.

5.2 Worker Interviews

Given that the De Soto Avenue Facility shared many radiological practices and radiological record-keeping programs with the SSFL-Area IV facility, NIOSH reviewed the information obtained in previously-conducted ETEC-related (i.e., Area IV of the Santa Susana Field Laboratory, Canoga Avenue Facility, De Soto Avenue Facility, and Downey Facility) interviews to determine its relevance to the De Soto Avenue Facility. Although not interviewed exclusively for the purpose of obtaining information about the De Soto Facility, NIOSH deemed the following seven interviews relevant to the De Soto effort because the interviewees either worked at, or provided information that could be considered pertinent to the De Soto Facility.

- Personal Communication, 2005, *Personal Communication with a Medical Director;* Telephone Interview by ORAU Team; December 1, 2005; 12:00 PM EST; SRDB Ref ID: 20534

- Personal Communication, 2007a, *Personal Communication with Health Physicist*; Telephone Interview by ORAU Team; November 20, 2007 11:00 AM PST; SRDB Ref ID: 37534

- Personal Communication, 2007b, *Personal Communication with HP-Radiation Engineer*; Telephone Interview by ORAU Team; November 29, 2007 1:00 PM PST; SRDB Ref ID: 37537

- Personal Communication, 2007c, *Personal Communication with Health and Safety Manager*; Telephone Interview by ORAU Team; November 30, 2007 9:00AM PST; SRDB Ref ID: 37538

- Personal Communication, 2009a, *Personal Communication with Nuclear Research Technician;* Telephone Interview by ORAU Team; December 7, 2009 1:30 PM EST; SRDB Ref ID: 77824

- Personal Communication, 2009b, *Personal Communication with Chemistry Research Analyst;* Telephone Interview by ORAU Team; December 8, 2009 2:30 PM EST; SRDB Ref ID: 77822

- Personal Communication, 2009c, *Personal Communication with Research Engineer;* Telephone Interview by ORAU Team; December 16, 2009 1:00 PM EST; SRDB Ref ID: 77825

5.3 Internal Personnel Monitoring Data

There are currently 219 De Soto Avenue Facility claims in the NIOSH DCAS Claims Tracking System (NOCTS). Ninety-seven of the 219 De Soto claims have employment in the time period under evaluation in this report (1959-1964), with 50 of the 97 claims having internal monitoring data available to NIOSH in the NOCTS database.

Radionuclides of concern for the facilities and processes at the De Soto Avenue Facility included uranium, fission products, and activation products. Exposure to transuranics may have also been possible (NIOSH, 2009). Details regarding the various internal dosimetry analyses used at the De Soto Avenue Facility, and the associated minimum detectable activities, are presented in the *Technical Basis Document for the Energy Technology Engineering Center - Occupational Internal Dose* (ORAUT-TKBS-0038-5).

Since the De Soto Facility was operated by the same company as was SSFL-Area IV, both facilities shared the same worker monitoring program and record keeping practices. Today, bioassay records for all SSFL-Area IV related facilities (Downey Facility, Canoga Avenue Facility, De Soto Facility) are stored at SSFL-Area IV. Subsequent to the NIOSH evaluations of SEC-00093 and SEC00156, which recommended SEC classes for SSFL- Area IV for 1955-1958 and 1959-1964 respectively, NIOSH has determined that the same internal monitoring data deficiencies existed at the De Soto facility.

NIOSH has found indications that, similar to SSFL-Area IV, not all potentially-exposed workers at De Soto were included in the internal dose monitoring program. Consequently, an individual worker's potential for internal radiation exposure at the De Soto Avenue Facility cannot be determined based solely on the existence of an individual monitoring record. Because of this, the reconstruction of internal doses for unmonitored workers, who had the potential for exposure, requires the development of a coworker model. NIOSH worked with current site representatives for SSFL-Area IV to obtain data to develop an internal coworker model applicable to both the Area IV SSFL, as well as the De Soto sites.

During a review of the available data, NIOSH discovered that SSFL-Area IV and DeSoto facilities used a number of bioassay labs throughout its history. Each vendor had its own reporting methods and report format. SSFL-Area IV historically maintained the results in each worker's health and safety file as reported and also transferred these results onto sheets summarizing the results for an individual; these were called the McBee cards and are relatively consistent through time. For some analyses of interest, the McBee cards had only a "+" entered when the result was positive and the reviewer was directed to go to the original lab card for the magnitude of the result. NIOSH worked with the SSFL-Area IV and De Soto site representative to evaluate the varying formats for the original vendor lab reports, and to assign more appropriate and descriptive field names, enter missing information, and recombine the data into a searchable database.

Internal monitoring data for both sites are available beginning in late 1958, but all bioassay data prior to 1961 are very limited in scope and quantity, and the data from these years was not incorporated into the bioassay data base. In spite of the efforts described above, for the years 1961 and 1962, it

could not be verified that the available database contained all the bioassay sample results collected from workers at the facility. Further, it was not possible for NIOSH to resolve all questions about the data in those years. By 1963, the data consist of over 1,100 urinalysis results, and over 1,400 results are available for 1964, but there are still approximately 135 analyses for these years that are indicated to be positive for which NIOSH does not have a value to quantify the positive result.

Because of these shortcomings, NIOSH ultimately determined that the available internal data and supporting reports contained a substantial amount of ambiguous or indeterminate field entries for years prior to 1965, making the available data inadequate to support the development of bounding co-worker distribution models for years prior to 1965. Beginning in 1965, the data available to NIOSH are sufficient for the development of bounding co-worker internal dose distributions for both facilities. The available data include over 1,350 urinalysis results for the year 1965, with adequate values being given for positive results. There are over 17,000 results for post-1964 years, and NIOSH has determined the data to be sufficient for statistical modeling.

5.4 External Personnel Monitoring Data

There are currently 219 De Soto Avenue Facility claims in NOCTS. Ninety-seven of the 219 De Soto claims have employment in the time period under evaluation in this report (1959-1964), with 85 of the 97 claims having external monitoring data available to NIOSH in the NOCTS database.

NIOSH has access to photon, beta, and neutron external dosimetry results, as well as other supporting data, for the entire period evaluated in this report (available for all years of site operation). The policy at SSFL-Area IV, and also at the De Soto Avenue Facility, was to assign the applicable dosimetry to anyone with the potential for photon, beta, or neutron exposure; it was assigned based on job assignments that required exposure to radioactive materials (NIOSH, 2009; ORAUT-TKBS-0038-6). Details regarding the various analyses used, and the associated minimum detectable activities, are presented in *Atomics International – Occupational External Dose* (ORAUT-TKBS-0038-6).

Through the course of ongoing dose reconstruction and investigations, NIOSH determined that although external monitoring data are available for most workers at the De Soto Avenue Facility, some workers could have received external radiation exposures that went unmonitored. To assess potential external dose to unmonitored workers, NIOSH has developed a co-worker dose distribution model (ORAUT-OTIB-0077).

5.5 Workplace Monitoring Data

NIOSH has access to limited workplace air, surface, and environmental monitoring data for the De Soto Avenue Facility prior to 1965. These data are inadequate for sufficiently accurate dose reconstructions in the absence of personnel monitoring data.

5.6 Radiological Source Term Data

Sources of radiation doses to members of the evaluated class included, but were not limited to, nuclear fuel, neutron-irradiated samples, a small research reactor, and numerous radiochemistry operations involving a variety of radionuclides. The source term and activity data available to NIOSH are inadequate for sufficiently accurate dose reconstructions in the absence of personnel or workplace monitoring data.

6.0 Feasibility of Dose Reconstruction for the Proposed Class

42 C.F.R. § 83.14(b) states that HHS will consider a NIOSH determination that there was insufficient information to complete a dose reconstruction, as indicated in this present case, to be sufficient, without further consideration, to conclude that it is not feasible to estimate the levels of radiation doses of individual members of the class with sufficient accuracy.

In the case of a petition submitted to NIOSH under 42 C.F.R. § 83.9(b), NIOSH has already determined that a dose reconstruction cannot be completed for an employee at the DOE or AWE facility. This determination by NIOSH provides the basis for the petition by the affected claimant. Per § 83.14(a), the NIOSH-proposed class defines those employees who, based on completed research, are similarly affected and for whom, as a class, dose reconstruction is similarly not feasible.

In accordance with § 83.14(a), NIOSH may establish a second class of co-workers at the facility for whom NIOSH believes that dose reconstruction is similarly infeasible, but for whom additional research and analysis is required. If so identified, NIOSH would address this second class in a separate SEC evaluation rather than delay consideration of the claim currently under evaluation (see Section 10). This would allow NIOSH, the Board, and HHS to complete, without delay, their consideration of the class that includes a claimant for whom NIOSH has already determined a dose reconstruction cannot be completed, and whose only possible remedy under EEOICPA is the addition of a class of employees to the SEC.

This section of the report summarizes research findings by which NIOSH determined that it lacked sufficient information to complete the relevant dose reconstruction and on which basis it has defined the class of employees for which dose reconstruction is not feasible. NIOSH's determination relies on the same statutory and regulatory criteria that govern consideration of all SEC petitions.

6.1 Feasibility of Estimating Internal Exposures

NIOSH has evaluated the available personnel and workplace monitoring data and source term information and has determined that there are insufficient data for estimating internal exposures, as described below.

As presented in Section 3.0 of this report, HHS has already designated an SEC class for SSFL-Area IV workers for the period from January 1, 1955 through December 31, 1958 (HHS, 2009). NIOSH subsequently determined that the available bioassay data have limitations through 1964, which made it necessary for NIOSH to propose a second SEC class for SSFL-Area IV to include DOE employees who worked at Area IV of the SSFL from January 1, 1959 through December 31, 1964 (NIOSH, 2010).

NIOSH has determined that the De Soto Avenue Facility shared many radiological practices and radiological recordkeeping programs with the SSFL-Area IV facility. Through extensive research into operations at the SSFL-Area IV facility, NIOSH has determined that there were also insufficient access controls in place at the De Soto Avenue Facility; as a result, there may have been some workers who should have been monitored, but were not monitored. Although bioassay data are available for most monitored workers, NIOSH has determined that some De Soto Avenue Facility workers could have received intakes of radioactive materials, during the years prior to 1965, which went unmonitored. As presented in Section 5.3 of this report, NIOSH has determined that the

available internal monitoring data contain a substantial amount of ambiguous or indeterminate results for periods prior to 1965, making the available data inadequate for developing bounding co-worker distribution models for years prior to 1965. These NIOSH findings are consistent with those presented for SSFL-Area IV in *SEC Petition Evaluation Report for Petition SEC-00156, Santa Susana Field Laboratory-Area IV* (NIOSH, 2010).

NIOSH does not have access to sufficient personnel monitoring, workplace monitoring, or source term data to estimate potential internal exposures to fission products and other radionuclides at the De Soto Avenue Facility during the period from January 1, 1959 through December 31, 1964. Consequently, NIOSH finds that it is not feasible to estimate, with sufficient accuracy, internal exposures to fission products and other radionuclides and resulting doses for the class of employees covered by this evaluation.

Although NIOSH found that it is not possible to completely reconstruct internal radiation doses for the period from January 1, 1959 through December 31, 1964, NIOSH intends to use any internal monitoring data that may become available for an individual claim (and that can be interpreted using existing NIOSH dose reconstruction processes or procedures). Dose reconstructions for workers at the De Soto Avenue Facility, during the period from January 1, 1959 through December 31, 1964, but who do not qualify for inclusion in the SEC, may be performed using these data as appropriate.

6.2 Feasibility of Estimating External Exposures

This evaluation responds to a petition based on NIOSH determining that internal radiation exposures to fission products and other radionuclides could not be reconstructed for a dose reconstruction referred to NIOSH by the Department of Labor (DOL). As noted above, HHS will consider this determination to be sufficient without further consideration to determine that it is not feasible to estimate the levels of radiation doses of individual members of the class with sufficient accuracy. Consequently, it is not necessary for NIOSH to fully evaluate the feasibility of reconstructing external radiation exposures for the class of workers covered by this report.

Since NIOSH has found that it is unable to bound internal dose, an exhaustive evaluation of feasibility of external dose reconstruction was not performed for the purposes of this report. However, partial dose reconstructions may be feasible, on a case-by-case basis, using available personnel monitoring data. To assess potential external dose to unmonitored workers, NIOSH has developed a co-worker dose distribution model that is applicable to the De Soto Avenue Facility (ORAUT-OTIB-0077).

Adequate reconstruction of medical dose is likely to be feasible by using claimant-favorable assumptions in the technical information bulletin titled, *Dose Reconstruction from Occupationally Related Diagnostic X-Ray Procedures* (ORAUT-OTIB-0006), and in site profile documents associated with the ETEC-related sites.

6.3 Class Parameters Associated with Infeasibility

Consistent with the NIOSH findings in *SEC Petition Evaluation Report for Petition SEC-00156, Santa Susana Field Laboratory-Area IV* (NIOSH, 2010) for the SSFL-Area IV site, NIOSH has determined that it is unable to estimate, with sufficient accuracy, the total internal dose for workers at the De Soto Avenue Facility prior to 1965. NIOSH has therefore recommended that the proposed

SEC class for the De Soto Avenue Facility include the period from January 1, 1959 through December 31, 1964.

As discussed in Section 4.4, NIOSH is unable to define individual worker exposure scenarios based on specific work locations at the De Soto Avenue Facility. NIOSH therefore recommends that the class definition include the entire De Soto Avenue Facility during the specified time period.

NIOSH has found insufficient documentation associating job titles and/or job assignments with specific radiological operations or conditions. Without such information, NIOSH is unable to define the proposed SEC class based on worker job descriptions or the availability of individual monitoring data. NIOSH has therefore recommended that the class include all employees of the Department of Energy, its predecessor agencies, and their contractors and subcontractors who worked at the De Soto Avenue Facility during the specified time period, regardless of whether a worker was monitored for radiation exposure.

7.0 Summary of Feasibility Findings for Petition SEC-00168

This report evaluates the feasibility for completing dose reconstructions for workers at the De Soto Avenue Facility from January 1, 1959 through December 31, 1964. NIOSH determined that members of this class may have received radiation exposures from intakes of fission products and other radionuclides. NIOSH lacks sufficient information, which includes biological monitoring data, sufficient air monitoring information, or sufficient process and radiological source term information that would allow it to estimate the potential internal exposures to which the proposed class may have been exposed.

NIOSH has documented herein that it cannot complete the dose reconstructions related to this petition. The basis of this finding demonstrates that NIOSH does not have access to sufficient information to estimate either the maximum radiation dose incurred by any member of the class or to estimate such radiation doses more precisely than a maximum dose estimate.

Although NIOSH found that it is not possible to completely reconstruct radiation doses for the period from January 1, 1959 through December 31, 1964, NIOSH intends to use any internal or external monitoring data that may become available for an individual claim (and that can be interpreted using existing NIOSH dose reconstruction processes or procedures). Dose reconstructions for individuals employed at the De Soto Avenue Facility during the period from January 1, 1959 through December 31, 1964, but who do not qualify for inclusion in the SEC, may be performed using these data as appropriate.

8.0 Evaluation of Health Endangerment for Petition SEC-00168

The health endangerment determination for the class of employees covered by this evaluation report is governed by EEOICPA and 42 C.F.R. § 83.14(b) and § 83.13(c)(3). Pursuant to these requirements, if it is not feasible to estimate with sufficient accuracy radiation doses for members of the class, NIOSH must determine that there is a reasonable likelihood that such radiation doses may have endangered the health of members of the class. The regulations require NIOSH to assume that any duration of unprotected exposure may have endangered the health of members of a class when it has been

established that the class may have been exposed to radiation during a discrete incident likely to have involved levels of exposure similarly high to those occurring during nuclear criticality incidents. If the occurrence of such an exceptionally high-level exposure has not been established, then NIOSH is required to specify that health was endangered for those workers who were employed for a number of work days aggregating at least 250 work days within the parameters established for the class or in combination with work days within the parameters established for one or more other classes of employees in the SEC.

NIOSH has determined that members of the class were not exposed to radiation during a discrete incident likely to have involved levels of exposure similarly high to those occurring during nuclear criticality incidents. However, the evidence reviewed in this evaluation indicates that some workers in the class may have accumulated chronic radiation exposures through intakes of fission products and other radionuclides and from direct exposure to radioactive materials. Consequently, NIOSH is specifying that health was endangered for those workers covered by this evaluation who were employed for a number of work days aggregating at least 250 work days within the parameters established for this class or in combination with work days within the parameters established for one or more other classes of employees in the SEC.

9.0 NIOSH-Proposed Class for Petition SEC-00168

The evaluation defines a single class of employees for which NIOSH cannot estimate radiation doses with sufficient accuracy. This class includes all employees of the Department of Energy, its predecessor agencies, and their contractors and subcontractors who worked at the De Soto Avenue Facility in Los Angeles County, California, from January 1, 1959 through December 31, 1964, for a number of work days aggregating at least 250 work days, occurring either solely under this employment or in combination with work days within the parameters established for one or more other classes of employees included in the Special Exposure Cohort.

10.0 Evaluation of Second Similar Class

In accordance with § 83.14(a), NIOSH may establish a second class of co-workers at the facility, similar to the class defined in Section 9.0, for whom NIOSH believes that dose reconstruction may not be feasible, and for whom additional research and analyses are required. If a second class is identified, it would require additional research and analyses. Such a class would be addressed in a separate SEC evaluation rather than delay consideration of the current claim. At this time, NIOSH has not identified a second similar class of employees at the De Soto Avenue Facility for whom dose reconstruction may not be feasible.

11.0 References

42 C.F.R. pt. 81, *Guidelines for Determining the Probability of Causation Under the Energy Employees Occupational Illness Compensation Program Act of 2000;* Final Rule, Federal Register/Vol. 67, No. 85/Thursday, p 22,296; May 2, 2002; SRDB Ref ID: 19391

42 C.F.R. pt. 82, *Methods for Radiation Dose Reconstruction Under the Energy Employees Occupational Illness Compensation Program Act of 2000*; Final Rule; May 2, 2002; SRDB Ref ID: 19392

42 C.F.R. pt. 83, *Procedures for Designating Classes of Employees as Members of the Special Exposure Cohort Under the Energy Employees Occupational Illness Compensation Program Act of 2000*; Final Rule; May 28, 2004; SRDB Ref ID: 22001

42 U.S.C. §§ 7384-7385 [EEOICPA], *Energy Employees Occupational Illness Compensation Program Act of 2000*; as amended; OCAS website

Boeing, 2003, *Radiological Operations and Cleanup at the De Soto Facility, Appendix B*; The Boeing Company; June 12, 2003; SRDB Ref ID: 19145, pp. 2-7

DOE, 2010, *Energy Employees Occupational Illness Compensation Program Facilities List*, for the De Soto Avenue Facility, U.S. Department of Energy, Office of Health, Safety, and Security; http://www.hss.energy.gov/healthsafety/fwsp/advocacy/faclist/findfacility.cfm; last accessed on March 3, 2010; page last updated June 4, 2008; SRDB Ref ID: 79304

HHS, 2009, *HHS Designation of Additional Members of the Special Exposure Cohort under the Energy Employees Occupational Illness Compensation Program Act of 2000, Designating a Class of Employees from Santa Susana Field Laboratory – Area IV Santa Susana, California*; Department of Health and Human Services (HHS); July 23, 2009; OSA Ref ID: 109364

NIOSH, 2009, *SEC Petition Evaluation Report for Petition SEC-00093, Santa Susana Field Laboratory-Area IV*; National Institute for Occupational Safety and Health; April 28, 2009; available on OCAS website at: http://www.cdc.gov/niosh/ocas/pdfs/sec/area4/ssfler-93-r1.pdf; SRDB Ref ID: 76961

NIOSH, 2010, *SEC Petition Evaluation Report for Petition SEC-00156, Santa Susana Field Laboratory-Area IV*; National Institute for Occupational Safety and Health; January 12, 2010; available on OCAS website at: http://www.cdc.gov/niosh/ocas/pdfs/sec/area4/ssfler-156-r0.pdf; SRDB Ref ID: 79567

ORAUT-OTIB-0006, *Dose Reconstruction from Occupationally Related Diagnostic X-Ray Procedures*, Rev. 03 PC-1; Oak Ridge Associated Universities (ORAU); Oak Ridge, Tennessee; December 21, 2005; SRDB Ref ID: 20220

ORAUT-OTIB-0077, *External Coworker Dosimetry Data for Area IV of the Santa Susana Field Laboratory, the Canoga Avenue Facility (Vanowen Building), and the De Soto Avenue Facility (sometimes referred to as Energy Technology Engineering Center [ETEC] or Atomics International)*, Rev. 00; Oak Ridge Associated Universities (ORAU); Oak Ridge, Tennessee; August 3, 2009; SRDB Ref ID: 72162

ORAUT-TKBS-0038-2; *Energy Technology Engineering Center – Site Description*, Rev. 00; Oak Ridge Associated Universities (ORAU); Oak Ridge, Tennessee; February 2, 2006; SRDB Ref ID: 22140

ORAUT-TKBS-0038-5; *Energy Technology Engineering Center – Occupational Internal Dose*, Rev. 00; Oak Ridge Associated Universities (ORAU); Oak Ridge, Tennessee; February 22, 2006; SRDB Ref ID: 22287

ORAUT-TKBS-0038-6; *Atomics International – Occupational External Dose*, Rev. 01; Oak Ridge Associated Universities (ORAU); Oak Ridge, Tennessee; November 16, 2006; SRDB Ref ID: 30082

Personal Communication, 2005, *Personal Communication with a Medical Director;* Telephone Interview by ORAU Team; December 1, 2005, 12:00 PM EST; SRDB Ref ID: 20534

Personal Communication, 2007a, *Personal Communication with Health Physicist*; Telephone Interview by ORAU Team; November 20, 2007, 11:00 AM PST; SRDB Ref ID: 37534

Personal Communication, 2007b, *Personal Communication with HP-Radiation Engineer*; Telephone Interview by ORAU Team; November 29, 2007, 1:00 PM PST; SRDB Ref ID: 37537

Personal Communication, 2007c, *Personal Communication with Health and Safety Manager*; Telephone Interview by ORAU Team; November 30, 2007, 9:00AM PST; SRDB Ref ID: 37538

Personal Communication, 2009a, *Personal Communication with Nuclear Research Technician;* Telephone Interview by ORAU Team; December 7, 2009, 1:30 PM EST; SRDB Ref ID: 77824

Personal Communication, 2009b, *Personal Communication with Chemistry Research Analyst;* Telephone Interview by ORAU Team; December 8, 2009, 2:30 PM EST; SRDB Ref ID: 77822

Personal Communication, 2009c, *Personal Communication with Research Engineer;* Telephone Interview by ORAU Team; December 16, 2009, 1:00 PM EST; SRDB Ref ID: 77825

Attachment One: Data Capture Synopsis

Table A1-1: Data Capture Synopsis for Canoga Ave., De Soto Ave., and Downey Facilities			
Data Capture Information	**General Description of Documents Captured**	**Date Completed**	**Uploaded**
Primary Site/Company Name: Canoga Avenue Facility; DOE 1955-1960 De Soto Avenue Facility; DOE 1959-1995; DOE Remediation 1998 Downey Facility; DOE 1948-1955 Other Site Names: Rocketdyne Atomics International North American Aviation North American Rockwell Rockwell International Boeing	Boeing has possession of the company-maintained records for the Canoga Avenue Facility, De Soto Avenue Facility, and Downey Facility at the Santa Susana Field Laboratory (SSFL). Data Captures have been conducted at SSFL in December 2007, November 2008, September 2009, and November 2009. 21 documents from the September and November 2009 data captures are still undergoing sensitivity and legal reviews. The summary for documents received from SSFL is under SSFL below.	Ongoing	See SSFL below.
State Contacted: Gonzalo Perez, California Department of Public Health, Radiologic Health Branch Judy Hardy, California Department of Public Health, Public Records Coordinator	The state has copied and forwarded California Radioactive Material License 0015, including the original issue and all subsequent amendments. The document package, which includes ancillary information such as Boeing financial reports, is undergoing review for relevant data.	Ongoing	0
Cincinnati Operations Center Library	The design and operational characteristics of a portable instrument calibrator containing 3 mCi of Sr-90 and environmental monitoring following waste disposal at sea.	09/11/2009	2
Cincinnati Public Library	North American Aviation research reports and articles including the disposal of organic moderated reactor wastes by burning, plutonium recycling, processing uranium and thorium fuels, a discussion regarding potential reactor scram techniques, a method for U-238 activation analysis, reports on the L-88 reactor, thorium-uranium fuel for the Sodium Reactor Experiment, the low decontamination method for processing metallic reactor fuels containing thorium, and a review of three cohort studies of cancer mortality among Rocketdyne workers.	10/28/2009	13
DOE Legacy Management - Grand Junction Office	Correspondence regarding 6% enriched uranium sent to Atomics International in 1958 and a 1987 update on FUSRAP actions.	11/15/2008	3

Table A1-1: Data Capture Synopsis for Canoga Ave., De Soto Ave., and Downey Facilities			
Data Capture Information	**General Description of Documents Captured**	**Date Completed**	**Uploaded**
DOE Legacy Management - MoundView (Fernald Holdings, includes Fernald Legal Database)	DOE correspondence regarding potential mixed waste shipments to the Nevada Test Site, operating procedure for a Fernald production run of slugs for North American Aviation, the nationwide survey of normal uranium scrap, and a New Brunswick Laboratory proposed work program for 1953-1954 which includes analyzing the boron concentration in heavy water for North American Aviation.	05/21/2008	7
DOE Office of Scientific and Technical Information (OSTI)	A 1961 survey of irradiation facilities. The results of the OSTI search of their non-publicly available holdings for the Downey Facility has been forwarded to Objective 4. The OSTI search did not turn up documents for the Canoga Avenue and De Soto Avenue Facilities.	Ongoing	1
Federal Records Center, San Bruno	A 1984 environmental report, appraisals of the occupational medical program, a report of radiation exposures during chest x-rays, and a 1969 appraisal of the industrial hygiene program.	09/15/2009	9
Internet - DOE Comprehensive Epidemiologic Data Resource (CEDR)	The executive summary from and appendices to the Rocketdyne worker health study, a brief publication explaining the study, and an article from Radiation Research which presented the Boice study.	11/10/2009	3
Internet - DOE Hanford Declassified Document Retrieval System (DDRS)	A 1956 report which indicates that Hanford was testing sodium for the Sodium Reactor Experiment.	11/10/2009	1 Added through site association review.
Internet - DOE OpenNet	AEC reports to Congress.	11/10/2009	2 Added through site association review.
Internet - DOE OSTI Energy Citations	A test of NTA film to fast neutrons, gamma and neutron streaming from the Sodium Reactor Experiment, 1960 environmental report, 1992 hot lab decommissioning report, pathway analysis for soil remediation, and testing of the Hallam reactor core components for releases during maintenance.	11/10/2009	7

Table A1-1: Data Capture Synopsis for Canoga Ave., De Soto Ave., and Downey Facilities			
Data Capture Information	**General Description of Documents Captured**	**Date Completed**	**Uploaded**
Internet - DOE OSTI Information Bridge	The summary of FY 1964 AEC radioisotope shipments, hot lab decommissioning annual reports, the verification survey of Building 4059, reports on sodium-graphite reactor technology, sodium component test installation reports, Organic Moderated Reactor reports, Sodium-Graphite Reactor fuel test reports, uranium-molybdenum studies for the Hallam reactor, SNAP reactor studies, and shielding and coolant system maintenance studies for the Sodium Reactor Experiment.	11/14/2009	116
Internet - ETEC Website	A UCLA epidemiologic study and environmental reports.	09/03/2009	4
Internet - Google	An aerial radiological survey, a dose reconstruction methodology, histories of the Canoga Avenue, De Soto Avenue, and Downey Facilities, a survey of the De Soto gamma irradiation facility, environmental reports, federal facility review, incident reports, news articles, verification survey reports, progress reports, an NRC inspection report, depleted uranium waste disposal alternatives, a DOE press release summarizing the State of California epidemiologic study, and an article which describes and summarizes the UCLA epidemiologic study.	11/14/2009	90
Internet - National Academies Press (NAP)	No relevant data identified.	11/10/2009	0
Internet - National Nuclear Security Administration (NNSA) - Nevada Site Office	No relevant data identified.	11/10/2009	0
Internet - NRC Agencywide Document Access and Management (ADAMS)	Special Nuclear Materials Licenses SNM-21 and SNM-33 with correspondence, byproduct material licenses and applications, the list of documents provided in response to FOIA request FOIA/PA-207-0262, and the feasibility report for the manufacture of 164 19% enriched pins for the Sodium Reactor Experiment test program.	11/14/2009	23
Internet - Washington State University (U.S. Transuranium and Uranium Registries)	A poster session regarding the longevity of workers exposed to plutonium.	11/10/2009	1
NARA Atlanta	A 1952 request for one kilogram of UF_4 from Oak Ridge National Laboratory.	05/20/2008	1

Table A1-1: Data Capture Synopsis for Canoga Ave., De Soto Ave., and Downey Facilities			
Data Capture Information	**General Description of Documents Captured**	**Date Completed**	**Uploaded**
Santa Susana Field Laboratory (SSFL)	Environmental reports, annual reviews of radiation controls, radiation survey reports, effluent monitoring reports, radiation surveys of the Canoga diagnostic x-ray facility, routine room surveys, access controls for the x-ray cells, California Radioactive Material License 0273-59, the wound monitoring procedure, facility maps, urinalysis results, annual radiation exposure reports, waste operations procedures, radiological controls manual and procedures, some amendments from California Radioactive Material License 0015, Building 001 plan, radiation safety reviews, L-77 Reactor surveys, air sample data, and raw environmental data.	12/22/2009, pending the delivery of the remaining 21 documents undergoing review.	160
TOTAL			**443**

Table A1-2: Database Searches for Canoga Ave., De Soto Ave., and Downey Facilities			
Database/Source	**Keywords / Phrases**	**Hits**	**Uploaded**
DOE CEDR http://cedr.lbl.gov/ COMPLETED 11/10/2009	"North American Aviation" Rocketdyne "Atomics International" "North American Rockwell" "Rockwell International" "United Technologies" Downey (Key Word) De Soto (Key Word)	13	3
DOE Hanford DDRS http://www2.hanford.gov/declass/ COMPLETED 11/10/2009	"North American Aviation "01/01/1955 - 08/21/2009 "Rocketdyne" +Canoga 01/01/1955 - 08/21/2009 "Atomics International" "North American Rockwell" 01/01/1955 - 08/23/2009 "Rockwell International"01/01/1955 - 08/28/2009 "United Technologies" 01/01/1955 - 08/28/2010 "Rocketdyne" +"Vanowen" 01/01/1955 - 08/28/2010 Downey or "De Soto" (Simple Search)	0	0

Table A1-2: Database Searches for Canoga Ave., De Soto Ave., and Downey Facilities			
Database/Source	**Keywords / Phrases**	**Hits**	**Uploaded**
DOE OpenNet http://www.osti.gov/opennet/advancedsearch.jsp COMPLETED 11/10/2009	"North American Aviation" +"Canoga" 01/01/1955 - 08/15/2009 "North American Aviation" +Vanowen 01/01/1955 - 08/21/2009 "Rocketdyne" +Canoga 01/01/1955 - 08/21/2009 "Rocketdyne" +Vanowen 01/01/1955 - 08/21/2009 "Atomics International" +Canoga 01/01/1955 - 08/23/2009 "Atomics International" +Vanowen 01/01/1955 - 08/23/2009 "North American Rockwell" +Canoga 01/01/1955 - 08/23/2009 "North American Rockwell" +Vanowen 01/01/1955 - 08/23/2009 "Rockwell International" +"Canoga" 01/01/1955 - 08/28/2009 "Rockwell International" +"Vanowen" 01/01/1955 - 08/28/2009 "United Technologies" +"Canoga" 01/01/1955 - 08/28/2010 "United Technologies" +"Vanowen" 01/01/1955 - 08/28/2010 Downey or "De Soto" (Full Text)	154	0
DOE OSTI Energy Citations http://www.osti.gov/energycitations/ COMPLETED 11/10/2009	"North American Aviation" +"Canoga" 01/01/1955 - 08/09/2009 "North American Aviation" +Vanowen 01/01/1955 - 08/21/2009 "Rocketdyne" +Canoga 01/01/1955 - 08/21/2009 "Rocketdyne" +Vanowen 01/01/1955 - 08/21/2009 "Atomics International" +Canoga 01/01/1955 - 08/22/2009 "Atomics International" +Vanowen 01/01/1955 - 08/23/2009 "North American Rockwell" +Canoga 01/01/1955 - 08/23/2009 "North American Rockwell" +Vanowen 01/01/1955 - 08/23/2009 "Rockwell International" +"Canoga" 01/01/1955 - 08/28/2009 "Rockwell International" +"Vanowen" 01/01/1955 - 08/28/2009 "United Technologies" +"Canoga" 01/01/1955 - 08/28/2010 "United Technologies" +"Vanowen" 01/01/1955 - 08/28/2010 Downey or "De Soto" (all fields)	10,442	7
DOE OSTI Information Bridge http://www.osti.gov/bridge/advancedsearch.jsp COMPLETED 11/14/2009	"North American Aviation" +"Canoga" 01/01/1955 - 08/09/2009 "North American Aviation" +Vanowen 01/01/1955 - 08/21/2009 "Rocketdyne" +Canoga 01/01/1955 - 08/21/2009 "Rocketdyne" +Vanowen 01/01/1955 - 08/21/2009 "Atomics International" +Canoga 01/01/1955 - 08/21/2009 "Atomics International" +Vanowen 01/01/1955 - 08/23/2009 "North American Rockwell" +Canoga 01/01/1955 - 08/23/2009 "North American Rockwell" +Vanowen 01/01/1955 - 08/23/2009 "Rockwell International" +"Canoga" 01/01/1955 - 08/28/2009 "Rockwell International" +"Vanowen" 01/01/1955 - 08/28/2009 "United Technologies" +"Canoga" 01/01/1955 - 08/28/2010	2,319	116

Table A1-2: Database Searches for Canoga Ave., De Soto Ave., and Downey Facilities			
Database/Source	**Keywords / Phrases**	**Hits**	**Uploaded**
	"United Technologies" +"Vanowen" 01/01/1955 - 08/28/2010 Downey or "De Soto" (all fields)		
Google http://www.google.com COMPLETED 11/14/2009	"North American Aviation" "Canoga" OR "Vanowen" "americium OR Am241 OR Am-241 OR Am 241 OR 241Am OR 241-Am OR "241 Am" OR ionium OR Th230 OR Th-230 OR "Th 230" OR 230Th OR 230-Th OR "230 Th" "North American Aviation" "Canoga" OR "Vanowen" "neptunium OR Np237 OR Np-237 OR "Np 237" OR 237Np OR 237-Np OR "237 Np" OR palm OR palmolive OR polonium OR Po210 OR Po-210 OR "Po 210" OR 210Po OR 210-Po OR "210 Po" "North American Aviation" "Canoga" OR "Vanowen" "thorium OR thoria OR Th232 OR Th-232 OR "Th 232" OR 232Th OR 232-Th OR "232 Th" OR "Z metal" OR Z-metal OR myrnalloy OR "chemical 10-66" OR "chemical 1066" OR "chemical 10 66" "North American Aviation" "Canoga" OR "Vanowen" "chemical 18-12" OR "chemical 1812" OR "chemical 18 12" OR "chemical 10-12" OR "chemical 1012" OR "chemical 10 12" OR UX1 OR UX2" "North American Aviation" "Canoga" OR "Vanowen" "Th-234 OR Th234 OR "Th 234" OR 234-Th OR 234Th OR "234 Th" OR tritium OR H3 OR H-3 OR mint OR HTO" "North American Aviation" "Canoga" OR "Vanowen" "uranium OR U233 OR U-233 OR "U 233" OR 233U OR 233-U OR "233 U" OR U234 OR "U 234" OR U-234 OR 234U OR 234-U OR "234 U" OR U235 OR "U 235" OR U-235 OR 235-U OR 235U OR "235 U" "North American Aviation" "Canoga" OR "Vanowen" "U238 OR "U 238" OR U-238 OR 238-U OR 238U OR "238 U" OR U308 OR "U 308" OR U-308 OR 308-U OR 308U OR "308 U" OR "black oxide" OR "brown oxide" OR "green salt" OR "orange oxide" OR "yellow cake"	2,183,873	90

Table A1-2: Database Searches for Canoga Ave., De Soto Ave., and Downey Facilities			
Database/Source	**Keywords / Phrases**	**Hits**	**Uploaded**
	"North American Aviation" "Canoga" OR "Vanowen" "UO2 OR UO3 OR UF4 OR UF6 OR C-216 OR C-616 OR C-65 OR C-211 OR U3O8 OR "uranium extraction" OR "uranium dioxide" OR "uranium hexafluoride" OR "uranium tetrafluoride" OR "uranium trioxide" "North American Aviation" "Canoga" OR "Vanowen" "plutonium OR Pu-238 OR Pu238 OR "Pu 238" OR 238Pu OR 238-Pu OR "238 Pu" OR Pu-239 OR Pu239 OR "Pu 239" OR 239Pu OR 239-Pu" "North American Aviation" "Canoga" OR "Vanowen" "239 Pu" OR Pu-240 OR Pu240 OR "Pu 240" OR 240Pu OR 240-Pu OR "240 Pu" OR Pu-241 OR Pu241 OR "Pu 241" OR 241Pu OR 241-Pu OR "241 Pu" "North American Aviation" "Canoga" OR "Vanowen" "radium OR Ra-226 OR Ra226 OR "Ra 226" OR 226-Ra OR 226Ra OR "226 Ra" OR Ra-228 OR Ra228 OR "Ra 228" OR 228Ra OR 228-Ra OR "228 Ra" OR radon OR Rn-222 OR Rn222 OR "Rn 222" OR 222Rn OR 222-Rn" "North American Aviation" "Canoga" OR "Vanowen" "222 Rn" OR thoron OR Rn-220 OR Rn220 OR "Rn 220" OR 220Rn OR 220-Rn OR "220 Rn" OR protactinium OR Pa-234m OR Pa234m OR "Pa 234m" OR 234mPa OR 234m-Pa OR "234m Pa" "North American Aviation" "Canoga" OR "Vanowen" strontium OR Sr-90 OR Sr90 OR "Sr 90" OR 90-Sr OR 90Sr OR "90 Sr" OR oralloy OR postum OR tuballoy OR "uranyl nitrate hexahydrate" OR UNH OR K-65 OR "sump cake" "North American Aviation" "Canoga" OR "Vanowen" accident OR "air count" OR "air dust" OR "air filter" OR "airborne test" OR alpha OR "belgian congo ore" OR beta OR bioassay OR bio-assay OR breath OR "breathing zone" OR BZ "North American Aviation" "Canoga" OR "Vanowen" "body burden" OR calibration OR "chest count" OR columnation OR contamination OR curie OR denitration OR "denitration pot" OR derby OR regulus OR "derived air concentration" OR DAC OR dose OR dosimeter		

Table A1-2: Database Searches for Canoga Ave., De Soto Ave., and Downey Facilities			
Database/Source	**Keywords / Phrases**	**Hits**	**Uploaded**
	"North American Aviation" "Canoga" OR "Vanowen" dosimetric OR dosimetry OR electron OR environment OR "Ether-Water Project" OR exposure OR "exposure investigation" OR "radiation exposure" OR external OR "F machine" OR fecal OR "feed material" "North American Aviation" "Canoga" OR "Vanowen" femptocurie OR film OR fission OR fluoroscopy OR "Formerly Utilized Sites Remedial Action Program" OR FUSRAP OR gamma-ray OR "gamma ray" OR "gas proportional" OR "gaseous diffusion" OR health "North American Aviation" "Canoga" OR "Vanowen" "health instrument" OR "health physics" OR H.I. OR HI OR HP OR "highly enriched uranium" OR HEU OR hydrofluorination OR "in vitro" OR "in vivo" "North American Aviation" "Canoga" OR "Vanowen" incident OR ingestion OR inhalation OR internal OR investigation OR isotope OR isotopic OR "isotopic enrichment" OR "JS Project" OR Landauer OR "liquid scintillation" "North American Aviation" "Canoga" OR "Vanowen" log OR "log sheet" OR "log book" OR "low enriched uranium" OR LEU OR "lung count" OR "maximum permissible concentration" OR MPC OR metallurgy OR microcurie OR millicurie "North American Aviation" "Canoga" OR "Vanowen" "mixed fission product" OR MFP OR monitor OR "air monitoring" OR nanocurie OR "nasal wipe" OR neutron OR "nose wipe" OR nuclear OR Chicago-Nuclear OR "nuclear fuels" OR "nuclear track emulsion type A" "North American Aviation" "Canoga" OR "Vanowen" NTA OR "occupational radiation exposure" OR occurrence OR "ore concentrate" OR "PC Project" OR permit OR "radiation work permit" OR "safe work permit" OR "special work permit" OR RWP OR SWP		

Table A1-2: Database Searches for Canoga Ave., De Soto Ave., and Downey Facilities			
Database/Source	**Keywords / Phrases**	**Hits**	**Uploaded**
	"North American Aviation" "Canoga" OR "Vanowen" "phosphate research" OR photon OR picocurie OR pitchblende OR "pocket ion chamber" OR PIC OR problem OR procedure OR radeco OR radiation OR radioactive OR radioactivity OR radiograph OR radiological "North American Aviation" "Canoga" OR "Vanowen" "Radiological Survey Data Sheet" OR RSDS OR radionuclide OR raffinate OR reactor OR respiratory OR "retention schedules" OR roentgen OR sample OR "air sample" OR "dust sample" "North American Aviation" "Canoga" OR "Vanowen" "general area air sample" OR sampling OR "air sampling" OR "dust sampling" OR "general area air sampling" OR "solvent extraction" OR source OR "sealed source" OR spectra OR spectrograph "North American Aviation" "Canoga" OR "Vanowen" spectroscopy OR spectrum OR standard OR operating OR processing OR survey OR "building survey" OR "routine survey" OR "special survey" OR "technical basis" OR "thermal diffusion" "North American Aviation" "Canoga" OR "Vanowen" "thermoluminescent dosimeter" OR TLD OR "Tiger Team" OR "tolerance dose" OR urinalysis OR urine OR "whole body count" OR WBC OR "working level" OR WL OR X-ray OR "X ray" OR Xray "North American Rockwell" "Canoga" OR "Vanowen" americium OR Am241 OR Am-241 OR "Am 241" OR "241Am" OR 241-Am OR "241 Am" OR ionium OR Th230 OR Th-230 OR "Th 230" OR 230Th OR 230-Th OR "230 Th" "North American Rockwell" "Canoga" OR "Vanowen" neptunium OR Np237 OR Np-237 OR "Np 237" OR 237Np OR 237-Np OR "237 Np" OR palm OR palmolive OR polonium OR Po210 OR Po-210 OR "Po 210" OR 210Po OR 210-Po OR "210 Po"		

Table A1-2: Database Searches for Canoga Ave., De Soto Ave., and Downey Facilities			
Database/Source	**Keywords / Phrases**	**Hits**	**Uploaded**
	"North American Rockwell" "Canoga" OR "Vanowen" thorium OR thoria OR Th232 OR Th-232 OR "Th 232" OR 232Th OR 232-Th OR "232 Th" OR "Z metal" OR Z-metal OR myrnalloy OR "chemical 10-66" OR "chemical 1066" OR "chemical 10 66" "North American Rockwell" "Canoga" OR "Vanowen" "chemical 18-12" OR "chemical 1812" OR "chemical 18 12" OR "chemical 10-12" OR "chemical 1012" OR "chemical 10 12" OR UX1 OR UX2 "North American Rockwell" "Canoga" OR "Vanowen" Th-234 OR Th234 OR "Th 234" OR 234-Th OR 234Th OR "234 Th" OR tritium OR H3 OR H-3 OR mint OR HTO "North American Rockwell" "Canoga" OR "Vanowen" uranium OR U233 OR U-233 OR "U 233" OR 233U OR 233-U OR "233 U" OR U234 OR "U 234" OR U-234 OR 234U OR 234-U OR "234 U" OR U235 OR "U 235" OR U-235 OR 235-U OR 235U OR "235 U" "North American Rockwell" "Canoga" OR "Vanowen" U238 OR "U 238" OR U-238 OR 238-U OR 238U OR "238 U" OR U308 OR "U 308" OR U-308 OR 308-U OR 308U OR "308 U" OR "black oxide" OR "brown oxide" OR "green salt" "North American Rockwell" "Canoga" OR "Vanowen""orange oxide" OR "yellow cake" "North American Rockwell" "Canoga" OR "Vanowen" femptocurie OR film OR fission OR fluoroscopy OR "Formerly Utilized Sites Remedial Action Program" OR FUSRAP OR gamma-ray OR "gamma ray" OR "gas proportional" OR "gaseous diffusion" OR health "North American Rockwell" "Canoga" OR "Vanowen" "health instrument" OR "health physics" OR H.I. OR HI OR HP OR "highly enriched uranium" OR HEU OR hydrofluorination OR "in vitro" OR "in vivo"		

Table A1-2: Database Searches for Canoga Ave., De Soto Ave., and Downey Facilities			
Database/Source	**Keywords / Phrases**	**Hits**	**Uploaded**
	"North American Rockwell" "Canoga" OR "Vanowen" incident OR ingestion OR inhalation OR internal OR investigation OR isotope OR isotopic OR "isotopic enrichment" OR "JS Project" OR Landauer OR "liquid scintillation" "North American Rockwell" "Canoga" OR "Vanowen" log OR "log sheet" OR "log book" OR "low enriched uranium" OR LEU OR "lung count" OR "maximum permissible concentration" OR MPC OR metallurgy OR microcurie OR millicurie "North American Rockwell" "Canoga" OR "Vanowen" "mixed fission product" OR MFP OR monitor OR "air monitoring" OR nanocurie OR "nasal wipe" OR neutron OR "nose wipe" OR nuclear OR Chicago-Nuclear OR "nuclear fuels" OR "nuclear track emulsion type A" "North American Rockwell" "Canoga" OR "Vanowen" NTA OR "occupational radiation exposure" OR occurrence OR "ore concentrate" OR "PC Project" OR permit OR "radiation work permit" OR "safe work permit" OR "special work permit" OR RWP OR SWP "North American Rockwell" "Canoga" OR "Vanowen" "phosphate research" OR photon OR picocurie OR pitchblende OR "pocket ion chamber" OR PIC OR problem OR procedure OR radeco OR radiation OR radioactive OR radioactivity OR radiograph OR radiological "North American Rockwell" "Canoga" OR "Vanowen" "Radiological Survey Data Sheet" OR RSDS OR radionuclide OR raffinate OR reactor OR respiratory OR "retention schedules" OR roentgen OR sample OR "air sample" OR "dust sample" "North American Rockwell" "Canoga" OR "Vanowen" "general area air sample" OR sampling OR "air sampling" OR "dust sampling" OR "general area air sampling" OR "solvent extraction" OR source OR "sealed source" OR spectra OR spectrograph		

Table A1-2: Database Searches for Canoga Ave., De Soto Ave., and Downey Facilities			
Database/Source	**Keywords / Phrases**	**Hits**	**Uploaded**
	"North American Rockwell" "Canoga" OR "Vanowen" spectroscopy OR spectrum OR standard OR operating OR processing OR survey OR "building survey" OR "routine survey" OR "special survey" OR "technical basis" OR "thermal diffusion" "North American Rockwell" "Canoga" OR "Vanowen" "thermoluminescent dosimeter" OR TLD OR "Tiger Team" OR "tolerance dose" OR urinalysis OR urine OR "whole body count" OR WBC OR "working level" OR WL OR X-ray OR "X ray" OR Xray "Rocketdyne" "Canoga" OR "Vanowen"americium OR Am241 OR Am-241 OR "Am 241" OR "241Am" OR 241-Am OR "241 Am" OR ionium OR Th230 OR Th-230 OR "Th 230" OR 230Th OR 230-Th OR "230 Th" "Rocketdyne" "Canoga" OR "Vanowen"neptunium OR Np237 OR Np-237 OR "Np 237" OR 237Np OR 237-Np OR "237 Np" OR palm OR palmolive OR polonium OR Po210 OR Po-210 OR "Po 210" OR 210Po OR 210-Po OR "210 Po" "Rocketdyne" "Canoga" OR "Vanowen"thorium OR thoria OR Th232 OR Th-232 OR "Th 232" OR 232Th OR 232-Th OR "232 Th" OR "Z metal" OR Z-metal OR myrnalloy OR "chemical 10-66" OR "chemical 1066" OR "chemical 10 66" "Rocketdyne" "Canoga" OR "Vanowen""chemical 18-12" OR "chemical 1812" OR "chemical 18 12" OR "chemical 10-12" OR "chemical 1012" OR "chemical 10 12" OR UX1 OR UX2 "Rocketdyne" "Canoga" OR "Vanowen"Th-234 OR Th234 OR "Th 234" OR 234-Th OR 234Th OR "234 Th" OR tritium OR H3 OR H-3 OR mint OR HTO "Rocketdyne" "Canoga" OR "Vanowen"uranium OR U233 OR U-233 OR "U 233" OR 233U OR 233-U OR "233 U" OR U234 OR "U 234" OR U-234 OR 234U OR 234-U OR "234 U" OR U235 OR "U 235" OR U-235 OR 235-U OR 235U OR "235 U"		

Table A1-2: Database Searches for Canoga Ave., De Soto Ave., and Downey Facilities			
Database/Source	**Keywords / Phrases**	**Hits**	**Uploaded**
	"Rocketdyne" "Canoga" OR "Vanowen"U238 OR "U 238" OR U-238 OR 238-U OR 238U OR "238 U" OR U308 OR "U 308" OR U-308 OR 308-U OR 308U OR "308 U" OR "black oxide" OR "brown oxide" OR "green salt" OR "orange oxide" OR "yellow cake" "Rocketdyne" "Canoga" OR "Vanowen"UO2 OR UO3 OR UF4 OR UF6 OR C-216 OR C-616 OR C-65 OR C-211 OR U3O8 OR "uranium extraction" OR "uranium dioxide" OR "uranium hexafluoride" OR "uranium tetrafluoride" OR "uranium trioxide" "Rocketdyne" "Canoga" OR "Vanowen"plutonium OR Pu-238 OR Pu238 OR "Pu 238" OR 238Pu OR 238-Pu OR "238 Pu" OR Pu-239 OR Pu239 OR "Pu 239" OR 239Pu OR 239-Pu "Rocketdyne" "Canoga" OR "Vanowen" "239 Pu" OR Pu-240 OR Pu240 OR "Pu 240" OR 240Pu OR 240-Pu OR "240 Pu" OR Pu-241 OR Pu241 OR "Pu 241" OR 241Pu OR 241-Pu OR "241 Pu" "Rocketdyne" "Canoga" OR "Vanowen"radium OR Ra-226 OR Ra226 OR "Ra 226" OR 226-Ra OR 226Ra OR "226 Ra" OR Ra-228 OR Ra228 OR "Ra 228" OR 228Ra OR 228-Ra OR "228 Ra" OR radon OR Rn-222 OR Rn222 OR "Rn 222" OR 222Rn OR 222-Rn "Rocketdyne" "Canoga" OR "Vanowen""222 Rn" OR thoron OR Rn-220 OR Rn220 OR "Rn 220" OR 220Rn OR 220-Rn OR "220 Rn" OR protactinium OR Pa-234m OR Pa234m OR "Pa 234m" OR 234mPa OR 234m-Pa OR "234m Pa" "Rocketdyne" "Canoga" OR "Vanowen"strontium OR Sr-90 OR Sr90 OR "Sr 90" OR 90-Sr OR 90Sr OR "90 Sr" OR oralloy OR postum OR tuballoy OR "uranyl nitrate hexahydrate" OR UNH OR K-65 OR "sump cake" "Rocketdyne" "Canoga" OR "Vanowen"accident OR "air count" OR "air dust" OR "air filter" OR "airborne test" OR alpha OR "belgian congo ore" OR beta OR bioassay OR bio-assay OR breath OR "breathing zone" OR BZ		

Table A1-2: Database Searches for Canoga Ave., De Soto Ave., and Downey Facilities			
Database/Source	**Keywords / Phrases**	**Hits**	**Uploaded**
	"Rocketdyne" "Canoga" OR "Vanowen""body burden" OR calibration OR "chest count" OR columnation OR contamination OR curie OR denitration OR "denitration pot" OR derby OR regulus OR "derived air concentration" OR DAC OR dose OR dosimeter "Rocketdyne" "Canoga" OR "Vanowen"dosimetric OR dosimetry OR electron OR environment OR "Ether-Water Project" OR exposure OR "exposure investigation" OR "radiation exposure" OR external OR "F machine" OR fecal OR "feed material" "Rocketdyne" "Canoga" OR "Vanowen"femptocurie OR film OR fission OR fluoroscopy OR "Formerly Utilized Sites Remedial Action Program" OR FUSRAP OR gamma-ray OR "gamma ray" OR "gas proportional" OR "gaseous diffusion" OR health "Rocketdyne" "Canoga" OR "Vanowen""health instrument" OR "health physics" OR H.I. OR HI OR HP OR "highly enriched uranium" OR HEU OR hydrofluorination OR "in vitro" OR "in vivo" "Rocketdyne" "Canoga" OR "Vanowen" incident OR ingestion OR inhalation OR internal OR investigation OR isotope OR isotopic OR "isotopic enrichment" OR "JS Project" OR Landauer OR "liquid scintillation" "Rocketdyne" "Canoga" OR "Vanowen"og OR "log sheet" OR "log book" OR "low enriched uranium" OR LEU OR "lung count" OR "maximum permissible concentration" OR MPC OR metallurgy OR microcurie OR millicurie "Rocketdyne" "Canoga" OR "Vanowen""mixed fission product" OR MFP OR monitor OR "air monitoring" OR nanocurie OR "nasal wipe" OR neutron OR "nose wipe" OR nuclear OR Chicago-Nuclear OR "nuclear fuels" OR "nuclear track emulsion type A"		

Table A1-2: Database Searches for Canoga Ave., De Soto Ave., and Downey Facilities			
Database/Source	**Keywords / Phrases**	**Hits**	**Uploaded**
	"Rocketdyne" "Canoga" OR "Vanowen"NTA OR "occupational radiation exposure" OR occurrence OR "ore concentrate" OR "PC Project" OR permit OR "radiation work permit" OR "safe work permit" OR "special work permit" OR RWP OR SWP "Rocketdyne" "Canoga" OR "Vanowen""phosphate research" OR photon OR picocurie OR pitchblende OR "pocket ion chamber" OR PIC OR problem OR procedure OR radeco OR radiation OR radioactive OR radioactivity OR radiograph OR radiological "Rocketdyne" "Canoga" OR "Vanowen""Radiological Survey Data Sheet" OR RSDS OR radionuclide OR raffinate OR reactor OR respiratory OR "retention schedules" OR roentgen OR sample OR "air sample" OR "dust sample" "Rocketdyne" "Canoga" OR "Vanowen""general area air sample" OR sampling OR "air sampling" OR "dust sampling" OR "general area air sampling" OR "solvent extraction" OR source OR "sealed source" OR spectra OR spectrograph "Rocketdyne" "Canoga" OR "Vanowen"spectroscopy OR spectrum OR standard OR operating OR processing OR survey OR "building survey" OR "routine survey" OR "special survey" OR "technical basis" OR "thermal diffusion" "Rocketdyne" "Canoga" OR "Vanowen""thermoluminescent dosimeter" OR TLD OR "Tiger Team" OR "tolerance dose" OR urinalysis OR urine OR "whole body count" OR WBC OR "working level" OR WL OR X-ray OR "X ray" OR Xray "Atomics International" "Canoga" OR "Vanowen" americium OR Am241 OR Am-241 OR "Am 241" OR "241Am" OR 241-Am OR "241 Am" OR ionium OR Th230 OR Th-230 OR "Th 230" OR 230Th OR 230-Th OR "230 Th"		

Table A1-2: Database Searches for Canoga Ave., De Soto Ave., and Downey Facilities			
Database/Source	**Keywords / Phrases**	**Hits**	**Uploaded**
	"Atomics International" "Canoga" OR "Vanowen" neptunium OR Np237 OR Np-237 OR "Np 237" OR 237Np OR 237-Np OR "237 Np" OR palm OR palmolive OR polonium OR Po210 OR Po-210 OR "Po 210" OR 210Po OR 210-Po OR "210 Po" "Atomics International" "Canoga" OR "Vanowen" thorium OR thoria OR Th232 OR Th-232 OR "Th 232" OR 232Th OR 232-Th OR "232 Th" OR "Z metal" OR Z-metal OR myrnalloy OR "chemical 10-66" OR "chemical 1066" OR "chemical 10 66" "Atomics International" "Canoga" OR "Vanowen" "chemical 18-12" OR "chemical 1812" OR "chemical 18 12" OR "chemical 10-12" OR "chemical 1012" OR "chemical 10 12" OR UX1 OR UX2 "Atomics International" "Canoga" OR "Vanowen" Th-234 OR Th234 OR "Th 234" OR 234-Th OR 234Th OR "234 Th" OR tritium OR H3 OR H-3 OR mint OR HTO "Atomics International" "Canoga" OR "Vanowen" uranium OR U233 OR U-233 OR "U 233" OR 233U OR 233-U OR "233 U" OR U234 OR "U 234" OR U-234 OR 234U OR 234-U OR "234 U" OR U235 OR "U 235" OR U-235 OR 235-U OR 235U OR "235 U" "Atomics International" "Canoga" OR "Vanowen" U238 OR "U 238" OR U-238 OR 238-U OR 238U OR "238 U" OR U308 OR "U 308" OR U-308 OR 308-U OR 308U OR "308 U" OR "black oxide" OR "brown oxide" OR "green salt" OR "orange oxide" OR "yellow cake" "Atomics International" "Canoga" OR "Vanowen" UO2 OR UO3 OR UF4 OR UF6 OR C-216 OR C-616 OR C-65 OR C-211 OR U3O8 OR "uranium extraction" OR "uranium dioxide" OR "uranium hexafluoride" OR "uranium tetrafluoride" OR "uranium trioxide" "Atomics International" "Canoga" OR "Vanowen" plutonium OR Pu-238 OR Pu238 OR "Pu 238" OR 238Pu OR 238-Pu OR "238 Pu" OR Pu-239 OR Pu239 OR "Pu 239" OR 239Pu OR 239-Pu		

Table A1-2: Database Searches for Canoga Ave., De Soto Ave., and Downey Facilities			
Database/Source	**Keywords / Phrases**	**Hits**	**Uploaded**
	"Atomics International" "Canoga" OR "Vanowen" "239 Pu" OR Pu-240 OR Pu240 OR "Pu 240" OR 240Pu OR 240-Pu OR "240 Pu" OR Pu-241 OR Pu241 OR "Pu 241" OR 241Pu OR 241-Pu OR "241 Pu" "Atomics International" "Canoga" OR "Vanowen" radium OR Ra-226 OR Ra226 OR "Ra 226" OR 226-Ra OR 226Ra OR "226 Ra" OR Ra-228 OR Ra228 OR "Ra 228" OR 228Ra OR 228-Ra OR "228 Ra" OR radon OR Rn-222 OR Rn222 "Atomics International" "Canoga" OR "Vanowen" "Rn 222" OR 222Rn OR 222-Rn "Atomics International" "Canoga" OR "Vanowen" "222 Rn" OR thoron OR Rn-220 OR Rn220 OR "Rn 220" OR 220Rn OR 220-Rn OR "220 Rn" OR protactinium OR Pa-234m OR Pa234m OR "Pa 234m" OR 234mPa OR 234m-Pa OR "234m Pa" "Atomics International" "Canoga" OR "Vanowen" strontium OR Sr-90 OR Sr90 OR "Sr 90" OR 90-Sr OR 90Sr OR "90 Sr" OR oralloy OR postum OR tuballoy OR "uranyl nitrate hexahydrate" OR UNH OR K-65 OR "sump cake" "Atomics International" "Canoga" OR "Vanowen" accident OR "air count" OR "air dust" OR "air filter" OR "airborne test" OR alpha OR "belgian congo ore" OR beta OR bioassay OR bio-assay OR breath OR "breathing zone" OR BZ "Atomics International" "Canoga" OR "Vanowen" "body burden" OR calibration OR "chest count" OR columnation OR contamination OR curie OR denitration OR "denitration pot" OR derby OR regulus OR "derived air concentration" OR DAC OR dose OR dosimeter "Atomics International" "Canoga" OR "Vanowen" dosimetric OR dosimetry OR electron OR environment OR "Ether-Water Project" OR exposure OR "exposure investigation" OR "radiation exposure" OR external OR "F machine" OR fecal OR "feed material"		

Table A1-2: Database Searches for Canoga Ave., De Soto Ave., and Downey Facilities			
Database/Source	**Keywords / Phrases**	**Hits**	**Uploaded**
	"Atomics International" "Canoga" OR "Vanowen" femptocurie OR film OR fission OR fluoroscopy OR "Formerly Utilized Sites Remedial Action Program" OR FUSRAP OR gamma-ray OR "gamma ray" OR "gas proportional" OR "gaseous diffusion" OR health "Atomics International" "Canoga" OR "Vanowen" "health instrument" OR "health physics" OR H.I. OR HI OR HP OR "highly enriched uranium" OR HEU OR hydrofluorination OR "in vitro" OR "in vivo" "Atomics International" "Canoga" OR "Vanowen" incident OR ingestion OR inhalation OR internal OR investigation OR isotope OR isotopic OR "isotopic enrichment" OR "JS Project" OR Landauer OR "liquid scintillation" "Atomics International" "Canoga" OR "Vanowen" "log sheet" OR "log book" OR "low enriched uranium" OR LEU OR "lung count" OR "maximum permissible concentration" OR MPC OR metallurgy OR microcurie OR millicurie "Atomics International" "Canoga" OR "Vanowen" "mixed fission product" OR MFP OR monitor OR "air monitoring" OR nanocurie OR "nasal wipe" OR neutron OR "nose wipe" OR nuclear OR Chicago-Nuclear OR "nuclear fuels" OR "nuclear track emulsion type A" "Atomics International" "Canoga" OR "Vanowen" NTA OR "occupational radiation exposure" OR occurrence OR "ore concentrate" OR "PC Project" OR permit OR "radiation work permit" OR "safe work permit" OR "special work permit" OR RWP OR SWP "Atomics International" "Canoga" OR "Vanowen" "phosphate research" OR photon OR picocurie OR pitchblende OR "pocket ion chamber" OR PIC OR problem OR procedure OR radeco OR radiation OR radioactive OR radioactivity OR radiograph OR radiological		

Table A1-2: Database Searches for Canoga Ave., De Soto Ave., and Downey Facilities			
Database/Source	**Keywords / Phrases**	**Hits**	**Uploaded**
	"Atomics International" "Canoga" OR "Vanowen" "Radiological Survey Data Sheet" OR RSDS OR radionuclide OR raffinate OR reactor OR respiratory OR "retention schedules" OR roentgen OR sample OR "air sample" OR "dust sample" "Atomics International" "Canoga" OR "Vanowen" "general area air sample" OR sampling OR "air sampling" OR "dust sampling" OR "general area air sampling" OR "solvent extraction" OR source OR "sealed source" OR spectra OR spectrograph "Atomics International" "Canoga" OR "Vanowen" spectroscopy OR spectrum OR standard OR operating OR processing OR survey OR "building survey" OR "routine survey" OR "special survey" OR "technical basis" OR "thermal diffusion" "Atomics International" "Canoga" OR "Vanowen" "thermoluminescent dosimeter" OR TLD OR "Tiger Team" OR "tolerance dose" OR urinalysis OR urine OR "whole body count" OR WBC OR "working level" OR WL OR X-ray OR "X ray" OR Xray "Rockwell International" "Canoga" OR "Vanowen"americium OR Am241 OR Am-241 OR "Am 241" OR "241Am" OR 241-Am OR "241 Am" OR ionium OR Th230 OR Th-230 OR "Th 230" OR 230Th OR 230-Th OR "230 Th" "Rockwell International" "Canoga" OR "Vanowen"neptunium OR Np237 OR Np-237 OR "Np 237" OR 237Np OR 237-Np OR "237 Np" OR palm OR palmolive OR polonium OR Po210 OR Po-210 OR "Po 210" OR 210Po OR 210-Po OR "210 Po" "Rockwell International" "Canoga" OR "Vanowen"thorium OR thoria OR Th232 OR Th-232 OR "Th 232" OR 232Th OR 232-Th OR "232 Th" OR "Z metal" OR Z-metal OR myrnalloy OR "chemical 10-66" OR "chemical 1066" OR "chemical 10 66"		

Table A1-2: Database Searches for Canoga Ave., De Soto Ave., and Downey Facilities			
Database/Source	**Keywords / Phrases**	**Hits**	**Uploaded**
	"Rockwell International" "Canoga" OR "Vanowen""chemical 18-12" OR "chemical 1812" OR "chemical 18 12" OR "chemical 10-12" OR "chemical 1012" OR "chemical 10 12" OR UX1 OR UX2 "Rockwell International" "Canoga" OR "Vanowen"Th-234 OR Th234 OR "Th 234" OR 234-Th OR 234Th OR "234 Th" OR tritium OR H3 OR H-3 OR mint OR HTO "Rockwell International" "Canoga" OR "Vanowen"uranium OR U233 OR U-233 OR "U 233" OR 233U OR 233-U OR "233 U" OR U234 OR "U 234" OR U-234 OR 234U OR 234-U OR "234 U" OR U235 OR "U 235" OR U-235 OR 235-U "Rockwell International" "Canoga" OR "Vanowen"235U OR "235 U" "Rockwell International" "Canoga" OR "Vanowen"U238 OR "U 238" OR U-238 OR 238-U OR 238U OR "238 U" OR U308 OR "U 308" OR U-308 OR 308-U OR 308U OR "308 U" OR "black oxide" OR "brown oxide" OR "green salt" OR "orange oxide" OR "yellow cake" "Rockwell International" "Canoga" OR "Vanowen"UO2 OR UO3 OR UF4 OR UF6 OR C-216 OR C-616 OR C-65 OR C-211 OR U3O8 OR "uranium extraction" OR "uranium dioxide" OR "uranium hexafluoride" OR "uranium tetrafluoride" OR "uranium trioxide" "Rockwell International" "Canoga" OR "Vanowen"plutonium OR Pu-238 OR Pu238 OR "Pu 238" OR 238Pu OR 238-Pu OR "238 Pu" OR Pu-239 OR Pu239 OR "Pu 239" OR 239Pu OR 239-Pu "Rockwell International" "Canoga" OR "Vanowen""239 Pu" OR Pu-240 OR Pu240 OR "Pu 240" OR 240Pu OR 240-Pu OR "240 Pu" OR Pu-241 OR Pu241 OR "Pu 241" OR 241Pu OR 241-Pu OR "241 Pu" "Rockwell International" "Canoga" OR "Vanowen"radium OR Ra-226 OR Ra226 OR "Ra 226" OR 226-Ra OR 226Ra OR "226 Ra" OR Ra-228 OR Ra228 OR "Ra 228" OR 228Ra OR 228-Ra OR "228 Ra" OR radon OR Rn-222 OR Rn222 OR "Rn 222" OR 222Rn OR 222-Rn		

Table A1-2: Database Searches for Canoga Ave., De Soto Ave., and Downey Facilities			
Database/Source	**Keywords / Phrases**	**Hits**	**Uploaded**
	"Rockwell International" "Canoga" OR "Vanowen""222 Rn" OR thoron OR Rn-220 OR Rn220 OR "Rn 220" OR 220Rn OR 220-Rn OR "220 Rn" OR protactinium OR Pa-234m OR Pa234m OR "Pa 234m" OR 234mPa OR 234m-Pa OR "234m Pa" "Rockwell International" "Canoga" OR "Vanowen"strontium OR Sr-90 OR Sr90 OR "Sr 90" OR 90-Sr OR 90Sr OR "90 Sr" OR oralloy OR postum OR tuballoy OR "uranyl nitrate hexahydrate" OR UNH OR K-65 OR "sump cake" "Rockwell International" "Canoga" OR "Vanowen"accident OR "air count" OR "air dust" OR "air filter" OR "airborne test" OR alpha OR "belgian congo ore" OR beta OR bioassay OR bio-assay OR breath OR "breathing zone" OR BZ "Rockwell International" "Canoga" OR "Vanowen""body burden" OR calibration OR "chest count" OR columnation OR contamination OR curie OR denitration OR "denitration pot" OR derby OR regulus OR "derived air concentration" OR DAC OR dose OR dosimeter "Rockwell International" "Canoga" OR "Vanowen"dosimetric OR dosimetry OR electron OR environment OR "Ether-Water Project" OR exposure OR "exposure investigation" OR "radiation exposure" OR external OR "F machine" OR fecal OR "feed material" "Rockwell International" "Canoga" OR "Vanowen"femptocurie OR film OR fission OR fluoroscopy OR "Formerly Utilized Sites Remedial Action Program" OR FUSRAP OR gamma-ray OR "gamma ray" OR "gas proportional" OR "gaseous diffusion" OR health "Rockwell International" "Canoga" OR "Vanowen""health instrument" OR "health physics" OR H.I. OR HI OR HP OR "highly enriched uranium" OR HEU OR hydrofluorination OR "in vitro" OR "in vivo"		

Table A1-2: Database Searches for Canoga Ave., De Soto Ave., and Downey Facilities			
Database/Source	**Keywords / Phrases**	**Hits**	**Uploaded**
	"Rockwell International" "Canoga" OR "Vanowen"incident OR ingestion OR inhalation OR internal OR investigation OR isotope OR isotopic OR "isotopic enrichment" OR "JS Project" OR Landauer OR "liquid scintillation" "Rockwell International" "Canoga" OR "Vanowen"log OR "log sheet" OR "log book" OR "low enriched uranium" OR LEU OR "lung count" OR "maximum permissible concentration" OR MPC OR metallurgy OR microcurie OR millicurie "Rockwell International" "Canoga" OR "Vanowen""mixed fission product" OR MFP OR monitor OR "air monitoring" OR nanocurie OR "nasal wipe" OR neutron OR "nose wipe" OR nuclear OR Chicago-Nuclear OR "nuclear fuels" OR "nuclear track emulsion type A" "Rockwell International" "Canoga" OR "Vanowen"NTA OR "occupational radiation exposure" OR occurrence OR "ore concentrate" OR "PC Project" OR permit OR "radiation work permit" OR "safe work permit" OR "special work permit" OR RWP OR SWP "Rockwell International" "Canoga" OR "Vanowen""phosphate research" OR photon OR picocurie OR pitchblende OR "pocket ion chamber" OR PIC OR problem OR procedure OR radeco OR radiation OR radioactive OR radioactivity OR radiograph OR radiological "Rockwell International" "Canoga" OR "Vanowen""Radiological Survey Data Sheet" OR RSDS OR radionuclide OR raffinate OR reactor OR respiratory OR "retention schedules" OR roentgen OR sample OR "air sample" OR "dust sample" "Rockwell International" "Canoga" OR "Vanowen""general area air sample" OR sampling OR "air sampling" OR "dust sampling" OR "general area air sampling" OR "solvent extraction" OR source OR "sealed source" OR spectra OR spectrograph		

Table A1-2: Database Searches for Canoga Ave., De Soto Ave., and Downey Facilities			
Database/Source	**Keywords / Phrases**	**Hits**	**Uploaded**
	"Rockwell International" "Canoga" OR "Vanowen"spectroscopy OR spectrum OR standard OR operating OR processing OR survey OR "building survey" OR "routine survey" OR "special survey" OR "technical basis" OR "thermal diffusion" "Rockwell International" "Canoga" OR "Vanowen""thermoluminescent dosimeter" OR TLD OR "Tiger Team" OR "tolerance dose" OR urinalysis OR urine OR "whole body count" OR WBC OR "working level" OR WL OR X-ray OR "X ray" OR Xray "United Technologies" "Canoga" OR "Vanowen"americium OR Am241 OR Am-241 OR "Am 241" OR "241Am" OR 241-Am OR "241 Am" OR ionium OR Th230 OR Th-230 OR "Th 230" OR 230Th OR 230-Th OR "230 Th" "United Technologies" "Canoga" OR "Vanowen"neptunium OR Np237 OR Np-237 OR "Np 237" OR 237Np OR 237-Np OR "237 Np" OR palm OR palmolive OR polonium OR Po210 OR Po-210 OR "Po 210" OR 210Po OR 210-Po OR "210 Po" "United Technologies" "Canoga" OR "Vanowen"thorium OR thoria OR Th232 OR Th-232 OR "Th 232" OR 232Th OR 232-Th OR "232 Th" OR "Z metal" OR Z-metal OR myrnalloy OR "chemical 10-66" OR "chemical 1066" OR "chemical 10 66" "United Technologies" "Canoga" OR "Vanowen""chemical 18-12" OR "chemical 1812" OR "chemical 18 12" OR "chemical 10-12" OR "chemical 1012" OR "chemical 10 12" OR UX1 OR UX2 "United Technologies" "Canoga" OR "Vanowen"Th-234 OR Th234 OR "Th 234" OR 234-Th OR 234Th OR "234 Th" OR tritium OR H3 OR H-3 OR mint OR HTO "United Technologies" "Canoga" OR "Vanowen"uranium OR U233 OR U-233 OR "U 233" OR 233U OR 233-U OR "233 U" OR U234 OR "U 234" OR U-234 OR 234U OR 234-U OR "234 U" OR U235 OR "U 235" OR U-235 OR 235-U OR 235U OR "235 U"		

Table A1-2: Database Searches for Canoga Ave., De Soto Ave., and Downey Facilities			
Database/Source	**Keywords / Phrases**	**Hits**	**Uploaded**
	"United Technologies" "Canoga" OR "Vanowen"U238 OR "U 238" OR U-238 OR 238-U OR 238U OR "238 U" OR U308 OR "U 308" OR U-308 OR 308-U OR 308U OR "308 U" OR "black oxide" OR "brown oxide" OR "green salt" OR "orange oxide" OR "yellow cake" "United Technologies" "Canoga" OR "Vanowen"UO2 OR UO3 OR UF4 OR UF6 OR C-216 OR C-616 OR C-65 OR C-211 OR U3O8 OR "uranium extraction" OR "uranium dioxide" OR "uranium hexafluoride" OR "uranium tetrafluoride" OR "uranium trioxide" "United Technologies" "Canoga" OR "Vanowen"plutonium OR Pu-238 OR Pu238 OR "Pu 238" OR 238Pu OR 238-Pu OR "238 Pu" OR Pu-239 OR Pu239 OR "Pu 239" OR 239Pu OR 239-Pu "United Technologies" "Canoga" OR "Vanowen""239 Pu" OR Pu-240 OR Pu240 OR "Pu 240" OR 240Pu OR 240-Pu OR "240 Pu" OR Pu-241 OR Pu241 OR "Pu 241" OR 241Pu OR 241-Pu OR "241 Pu" "United Technologies" "Canoga" OR "Vanowen"radium OR Ra-226 OR Ra226 OR "Ra 226" OR 226-Ra OR 226Ra OR "226 Ra" OR Ra-228 OR Ra228 OR "Ra 228" OR 228Ra OR 228-Ra OR "228 Ra" OR radon OR Rn-222 OR Rn222 OR "Rn 222" OR 222Rn OR 222-Rn "United Technologies" "Canoga" OR "Vanowen""222 Rn" OR thoron OR Rn-220 OR Rn220 OR "Rn 220" OR 220Rn OR 220-Rn OR "220 Rn" OR protactinium OR Pa-234m OR Pa234m OR "Pa 234m" OR 234mPa OR 234m-Pa OR "234m Pa" "United Technologies" "Canoga" OR "Vanowen"strontium OR Sr-90 OR Sr90 OR "Sr 90" OR 90-Sr OR 90Sr OR "90 Sr" OR oralloy OR postum OR tuballoy OR "uranyl nitrate hexahydrate" OR UNH OR K-65 OR "sump cake" "United Technologies" "Canoga" OR "Vanowen"accident OR "air count" OR "air dust" OR "air filter" OR "airborne test" OR alpha OR "belgian congo ore" OR beta OR bioassay OR bio-assay OR breath OR "breathing zone" OR BZ		

Table A1-2: Database Searches for Canoga Ave., De Soto Ave., and Downey Facilities			
Database/Source	**Keywords / Phrases**	**Hits**	**Uploaded**
	"United Technologies" "Canoga" OR "Vanowen""body burden" OR calibration OR "chest count" OR columnation OR contamination OR curie OR denitration OR "denitration pot" OR derby OR regulus OR "derived air concentration" OR DAC OR dose OR dosimeter "United Technologies" "Canoga" OR "Vanowen"dosimetric OR dosimetry OR electron OR environment OR "Ether-Water Project" OR exposure OR "exposure investigation" OR "radiation exposure" OR external OR "F machine" OR fecal OR "feed material" "United Technologies" "Canoga" OR "Vanowen"femptocurie OR film OR fission OR fluoroscopy OR "Formerly Utilized Sites Remedial Action Program" OR FUSRAP OR gamma-ray OR "gamma ray" OR "gas proportional" OR "gaseous diffusion" OR health "United Technologies" "Canoga" OR "Vanowen""health instrument" OR "health physics" OR H.I. OR HI OR HP OR "highly enriched uranium" OR HEU OR hydrofluorination OR "in vitro" OR "in vivo" "United Technologies" "Canoga" OR "Vanowen"incident OR ingestion OR inhalation OR internal OR investigation OR isotope OR isotopic OR "isotopic enrichment" OR "JS Project" OR Landauer OR "liquid scintillation" "United Technologies" "Canoga" OR "Vanowen"log OR "log sheet" OR "log book" OR "low enriched uranium" OR LEU OR "lung count" OR "maximum permissible concentration" OR MPC OR metallurgy OR microcurie OR millicurie "United Technologies" "Canoga" OR "Vanowen""mixed fission product" OR MFP OR monitor OR "air monitoring" OR nanocurie OR "nasal wipe" OR neutron OR "nose wipe" OR nuclear OR Chicago-Nuclear OR "nuclear fuels" OR "nuclear track emulsion type A"		

Table A1-2: Database Searches for Canoga Ave., De Soto Ave., and Downey Facilities			
Database/Source	**Keywords / Phrases**	**Hits**	**Uploaded**
	"United Technologies" "Canoga" OR "Vanowen"NTA OR "occupational radiation exposure" OR occurrence OR "ore concentrate" OR "PC Project" OR permit OR "radiation work permit" OR "safe work permit" OR "special work permit" OR RWP OR SWP "United Technologies" "Canoga" OR "Vanowen""phosphate research" OR photon OR picocurie OR pitchblende OR "pocket ion chamber" OR PIC OR problem OR procedure OR radeco OR radiation OR radioactive OR radioactivity OR radiograph OR radiological "United Technologies" "Canoga" OR "Vanowen""Radiological Survey Data Sheet" OR RSDS OR radionuclide OR raffinate OR reactor OR respiratory OR "retention schedules" OR roentgen OR sample OR "air sample" OR "dust sample" "United Technologies" "Canoga" OR "Vanowen""general area air sample" OR sampling OR "air sampling" OR "dust sampling" OR "general area air sampling" OR "solvent extraction" OR source OR "sealed source" OR spectra OR spectrograph "United Technologies" "Canoga" OR "Vanowen"spectroscopy OR spectrum OR standard OR operating OR processing OR survey OR "building survey" OR "routine survey" OR "special survey" OR "technical basis" OR "thermal diffusion" "United Technologies" "Canoga" OR "Vanowen""thermoluminescent dosimeter" OR TLD OR "Tiger Team" OR "tolerance dose" OR urinalysis OR urine OR "whole body count" OR WBC OR "working level" OR WL OR X-ray OR "X ray" OR Xray neptunium OR Np237 OR Np-237 OR "Np 237" OR 237Np OR 237-Np OR "237 Np" OR palm OR palmolive OR polonium OR Po210 OR Po-210 OR "Po 210" OR 210Po OR 210-Po OR "210 Po" Downey OR De-Soto "North American Aviation"		

Table A1-2: Database Searches for Canoga Ave., De Soto Ave., and Downey Facilities			
Database/Source	**Keywords / Phrases**	**Hits**	**Uploaded**
	thorium OR thoria OR Th232 OR Th-232 OR "Th 232" OR 232Th OR 232-Th OR "232 Th" OR "Z metal" OR Z-metal OR myrnalloy OR "chemical 10-66" OR "chemical 1066" OR "chemical 10 66" Downey OR De-Soto "North American Aviation" "chemical 18-12" OR "chemical 1812" OR "chemical 18 12" OR "chemical 10-12" OR "chemical 1012" OR "chemical 10 12" OR UX1 OR UX2 Downey OR De-Soto "North American Aviation" uranium OR U233 OR U-233 OR "U 233" OR 233U OR 233-U OR "233 U" OR U234 OR "U 234" OR U-234 OR 234U OR 234-U OR "234 U" OR U235 OR "U 235" OR U-235 OR 235-U OR 235U OR "235 U" Downey OR De-Soto "North American Aviation" U238 OR "U 238" OR U-238 OR 238-U OR 238U OR "238 U" OR U308 OR "U 308" OR U-308 OR 308-U OR 308U OR "308 U" Downey OR De-Soto "North American Aviation" "black oxide" OR "brown oxide" OR "green salt" OR "orange oxide" OR "yellow 5cake" Downey OR De-Soto "North American Aviation" UO2 OR UO3 OR UF4 OR UF6 OR C-216 OR C-616 OR C-65 OR C-211 OR U3O8 OR "uranium extraction" Downey OR De-Soto "North American Aviation" "uranium dioxide" OR "uranium hexafluoride" OR "uranium tetrafluoride" OR "uranium trioxide" Downey OR De-Soto "North American Aviation" plutonium OR Pu-238 OR Pu238 OR "Pu 238" OR 238Pu OR 238-Pu OR "238 Pu" OR Pu-239 OR Pu239 OR "Pu 239" OR 239Pu OR 239-Pu Downey OR De-Soto "North American Aviation" "239 Pu" OR Pu-240 OR Pu240 OR "Pu 240" OR 240Pu OR 240-Pu OR "240 Pu" OR Pu-241 OR Pu241 OR "Pu 241" OR 241Pu OR 241-Pu OR "241 Pu" Downey OR De-Soto "North American Aviation"		

Table A1-2: Database Searches for Canoga Ave., De Soto Ave., and Downey Facilities			
Database/Source	**Keywords / Phrases**	**Hits**	**Uploaded**
	radium OR Ra-226 OR Ra226 OR "Ra 226" OR 226-Ra OR 226Ra OR "226 Ra" OR Ra-228 OR Ra228 OR "Ra 228" OR 228Ra Downey OR De-Soto "North American Aviation" 228-Ra OR "228 Ra" OR radon OR Rn-222 OR Rn222 OR "Rn 222" OR 222Rn OR 222-Rn Downey OR De-Soto "North American Aviation" "222 Rn" OR thoron OR Rn-220 OR Rn220 OR "Rn 220" OR 220Rn OR 220-Rn OR "220 Rn" OR protactinium OR Pa-234m OR Pa234m OR "Pa 234m" OR 234mPa OR 234m-Pa OR "234m Pa" Downey OR De-Soto "North American Aviation" strontium OR Sr-90 OR Sr90 OR "Sr 90" OR 90-Sr OR 90Sr OR "90 Sr" OR oralloy OR postum OR tuballoy OR "uranyl nitrate hexahydrate" OR UNH OR K-65 OR "sump cake" Downey OR De-Soto "North American Aviation" accident OR "air count" OR "air dust" OR "air filter" OR "airborne test" OR alpha OR "belgian congo ore" OR beta OR bioassay OR bio-assay OR breath OR "breathing zone" OR BZ Downey OR De-Soto "North American Aviation" "body burden" OR calibration OR "chest count" OR columnation OR contamination OR curie OR denitration OR "denitration pot" Downey OR De-Soto "North American Aviation" derby OR regulus OR "derived air concentration" OR DAC OR dose OR dosimeter Downey OR De-Soto "North American Aviation" dosimetric OR dosimetry OR electron OR environment OR "Ether-Water Project" OR exposure OR "exposure investigation" Downey OR De-Soto "North American Aviation" "radiation exposure" OR external OR "F machine" OR fecal OR "feed material" Downey OR De-Soto "North American Aviation"		

Table A1-2: Database Searches for Canoga Ave., De Soto Ave., and Downey Facilities			
Database/Source	**Keywords / Phrases**	**Hits**	**Uploaded**
	femptocurie OR film OR fission OR fluoroscopy OR "Formerly Utilized Sites Remedial Action Program" OR FUSRAP Downey OR De-Soto "North American Aviation" gamma-ray OR "gamma ray" OR "gas proportional" OR "gaseous diffusion" OR health Downey OR De-Soto "North American Aviation" "health instrument" OR "health physics" OR H.I. OR HI OR HP OR "highly enriched uranium" OR HEU OR hydrofluorination OR "in vitro" OR "in vivo" Downey OR De-Soto "North American Aviation" incident OR ingestion OR inhalation OR internal OR investigation OR isotope OR isotopic OR "isotopic enrichment" OR "JS Project" OR Landauer OR "liquid scintillation" Downey OR De-Soto "North American Aviation" log OR "log sheet" OR "log book" OR "low enriched uranium" OR LEU OR "lung count" OR "maximum permissible concentration" OR MPC OR metallurgy OR microcurie OR millicurie Downey OR De-Soto "North American Aviation" "mixed fission product" OR MFP OR monitor OR "air monitoring" OR nanocurie OR "nasal wipe" OR neutron OR "nose wipe" Downey OR De-Soto "North American Aviation" nuclear OR Chicago-Nuclear OR "nuclear fuels" OR "nuclear track emulsion type A" Downey OR De-Soto "North American Aviation" NTA OR "occupational radiation exposure" OR occurrence OR "ore concentrate" OR "PC Project" OR permit OR "radiation work permit" Downey OR De-Soto "North American Aviation" "safe work permit" OR "special work permit" OR RWP OR SWP Downey OR De-Soto "North American Aviation"		

Table A1-2: Database Searches for Canoga Ave., De Soto Ave., and Downey Facilities			
Database/Source	**Keywords / Phrases**	**Hits**	**Uploaded**
	"phosphate research" OR photon OR picocurie OR pitchblende OR "pocket ion chamber" OR PIC OR problem OR procedure Downey OR De-Soto "North American Aviation" radeco OR radiation OR radioactive OR radioactivity OR radiograph OR radiological Downey OR De-Soto "North American Aviation" "Radiological Survey Data Sheet" OR RSDS OR radionuclide OR raffinate OR reactor OR respiratory OR "retention schedules" OR roentgen OR sample OR "air sample" OR "dust sample" Downey OR De-Soto "North American Aviation" "general area air sample" OR sampling OR "air sampling" OR "dust sampling" OR "general area air sampling" OR "solvent extraction" OR source OR "sealed source" OR spectra Downey OR De-Soto "North American Aviation" spectrograph OR spectroscopy OR spectrum OR standard OR operating OR processing OR survey OR "building survey" OR "routine survey" OR "special survey" OR "technical basis" Downey OR De-Soto "North American Aviation" "thermal diffusion" OR "thermoluminescent dosimeter" OR TLD OR "Tiger Team" OR "tolerance dose" OR urinalysis OR urine Downey OR De-Soto "North American Aviation" "whole body count" OR WBC OR "working level" OR WL OR X-ray OR "X ray" OR Xray Downey OR De-Soto "North American Aviation" americium OR Am241 OR Am-241 OR "Am 241" OR "241Am" OR 241-Am OR "241 Am" OR ionium OR Th230 OR Th-230 OR "Th 230" OR 230Th OR 230-Th OR "230 Th" Downey OR De-Soto "Rocketdyne" "chemical 18-12" OR "chemical 1812" OR "chemical 18 12" OR "chemical 10-12" OR "chemical 1012" OR "chemical 10 12" OR UX1 OR UX2 Downey OR De-Soto "Rocketdyne"		

Table A1-2: Database Searches for Canoga Ave., De Soto Ave., and Downey Facilities			
Database/Source	**Keywords / Phrases**	**Hits**	**Uploaded**
	Th-234 OR Th234 OR "Th 234" OR 234-Th OR 234Th OR "234 Th" OR tritium OR H3 OR H-3 OR mint OR HTO Downey OR De-Soto "Rocketdyne" uranium OR U233 OR U-233 OR "U 233" OR 233U OR 233-U OR "233 U" OR U234 OR "U 234" OR U-234 OR 234U OR 234-U OR "234 U" OR U235 OR "U 235" OR U-235 OR 235-U OR 235U OR "235 U" Downey OR De-Soto "Rocketdyne" U238 OR "U 238" OR U-238 OR 238-U OR 238U OR "238 U" OR U308 OR "U 308" OR U-308 OR 308-U OR 308U OR "308 U" Downey OR De-Soto "Rocketdyne" "black oxide" OR "brown oxide" OR "green salt" OR "orange oxide" OR "yellow 5cake" Downey OR De-Soto "Rocketdyne" UO2 OR UO3 OR UF4 OR UF6 OR C-216 OR C-616 OR C-65 OR C-211 OR U3O8 OR "uranium extraction" Downey OR De-Soto "Rocketdyne" "uranium dioxide" OR "uranium hexafluoride" OR "uranium tetrafluoride" OR "uranium trioxide" Downey OR De-Soto "Rocketdyne" plutonium OR Pu-238 OR Pu238 OR "Pu 238" OR 238Pu OR 238-Pu OR "238 Pu" OR Pu-239 OR Pu239 OR "Pu 239" OR 239Pu OR 239-Pu Downey OR De-Soto "Rocketdyne" "239 Pu" OR Pu-240 OR Pu240 OR "Pu 240" OR 240Pu OR 240-Pu OR "240 Pu" OR Pu-241 OR Pu241 OR "Pu 241" OR 241Pu OR 241-Pu OR "241 Pu" Downey OR De-Soto "Rocketdyne" radium OR Ra-226 OR Ra226 OR "Ra 226" OR 226-Ra OR 226Ra OR "226 Ra" OR Ra-228 OR Ra228 OR "Ra 228" OR 228Ra Downey OR De-Soto "Rocketdyne"		

Table A1-2: Database Searches for Canoga Ave., De Soto Ave., and Downey Facilities			
Database/Source	**Keywords / Phrases**	**Hits**	**Uploaded**
	228-Ra OR "228 Ra" OR radon OR Rn-222 OR Rn222 OR "Rn 222" OR 222Rn OR 222-Rn Downey OR De-Soto "Rocketdyne" "222 Rn" OR thoron OR Rn-220 OR Rn220 OR "Rn 220" OR 220Rn OR 220-Rn OR "220 Rn" OR protactinium OR Pa-234m OR Pa234m OR "Pa 234m" OR 234mPa OR 234m-Pa OR "234m Pa" Downey OR De-Soto "Rocketdyne" strontium OR Sr-90 OR Sr90 OR "Sr 90" OR 90-Sr OR 90Sr OR "90 Sr" OR oralloy OR postum OR tuballoy OR "uranyl nitrate hexahydrate" OR UNH OR K-65 OR "sump cake" Downey OR De-Soto "Rocketdyne" "body burden" OR calibration OR "chest count" OR columnation OR contamination OR curie OR denitration OR "denitration pot" Downey OR De-Soto "Rocketdyne" derby OR regulus OR "derived air concentration" OR DAC OR dose OR dosimeter Downey OR De-Soto "Rocketdyne" dosimetric OR dosimetry OR electron OR environment OR "Ether-Water Project" OR exposure OR "exposure investigation" Downey OR De-Soto "Rocketdyne" "radiation exposure" OR external OR "F machine" OR fecal OR "feed material" Downey OR De-Soto "Rocketdyne" femptocurie OR film OR fission OR fluoroscopy OR "Formerly Utilized Sites Remedial Action Program" OR FUSRAP Downey OR De-Soto "Rocketdyne" gamma-ray OR "gamma ray" OR "gas proportional" OR "gaseous diffusion" OR health Downey OR De-Soto "Rocketdyne" "health instrument" OR "health physics" OR H.I. OR HI OR HP OR "highly enriched uranium" OR HEU OR hydrofluorination OR "in vitro" OR "in vivo" Downey OR De-Soto "Rocketdyne"		

Table A1-2: Database Searches for Canoga Ave., De Soto Ave., and Downey Facilities			
Database/Source	**Keywords / Phrases**	**Hits**	**Uploaded**
	incident OR ingestion OR inhalation OR internal OR investigation OR isotope OR isotopic OR "isotopic enrichment" OR "JS Project" OR Landauer OR "liquid scintillation" Downey OR De-Soto "Rocketdyne" log OR "log sheet" OR "log book" OR "low enriched uranium" OR LEU OR "lung count" OR "maximum permissible concentration" OR MPC OR metallurgy OR microcurie OR millicurie Downey OR De-Soto "Rocketdyne" "mixed fission product" OR MFP OR monitor OR "air monitoring" OR nanocurie OR "nasal wipe" OR neutron OR "nose wipe" Downey OR De-Soto "Rocketdyne" nuclear OR Chicago-Nuclear OR "nuclear fuels" OR "nuclear track emulsion type A" Downey OR De-Soto "Rocketdyne" NTA OR "occupational radiation exposure" OR occurrence OR "ore concentrate" OR "PC Project" OR permit OR "radiation work permit" Downey OR De-Soto "Rocketdyne" "safe work permit" OR "special work permit" OR RWP OR SWP Downey OR De-Soto "Rocketdyne" "phosphate research" OR photon OR picocurie OR pitchblende OR "pocket ion chamber" OR PIC OR problem OR procedure Downey OR De-Soto "Rocketdyne" radeco OR radiation OR radioactive OR radioactivity OR radiograph OR radiological Downey OR De-Soto "Rocketdyne" "Radiological Survey Data Sheet" OR RSDS OR radionuclide OR raffinate OR reactor OR respiratory OR "retention schedules" OR roentgen OR sample OR "air sample" OR "dust sample" Downey OR De-Soto "Rocketdyne"		

Table A1-2: Database Searches for Canoga Ave., De Soto Ave., and Downey Facilities			
Database/Source	**Keywords / Phrases**	**Hits**	**Uploaded**
	"general area air sample" OR sampling OR "air sampling" OR "dust sampling" OR "general area air sampling" OR "solvent extraction" OR source OR "sealed source" OR spectra Downey OR De-Soto "Rocketdyne" spectrograph OR spectroscopy OR spectrum OR standard OR operating OR processing OR survey OR "building survey" OR "routine survey" OR "special survey" OR "technical basis" Downey OR De-Soto "Rocketdyne" "thermal diffusion" OR "thermoluminescent dosimeter" OR TLD OR "Tiger Team" OR "tolerance dose" OR urinalysis OR urine Downey OR De-Soto "Rocketdyne" "whole body count" OR WBC OR "working level" OR WL OR X-ray OR "X ray" OR Xray Downey OR De-Soto "Rocketdyne" americium OR Am241 OR Am-241 OR "Am 241" OR "241Am" OR 241-Am OR "241 Am" OR ionium OR Th230 OR Th-230 OR "Th 230" OR 230Th OR 230-Th OR "230 Th" Downey OR De-Soto "Atomics International" "chemical 18-12" OR "chemical 1812" OR "chemical 18 12" OR "chemical 10-12" OR "chemical 1012" OR "chemical 10 12" OR UX1 OR UX2 Downey OR De-Soto "Atomics International" Th-234 OR Th234 OR "Th 234" OR 234-Th OR 234Th OR "234 Th" OR tritium OR H3 OR H-3 OR mint OR HTO Downey OR De-Soto "Atomics International" uranium OR U233 OR U-233 OR "U 233" OR 233U OR 233-U OR "233 U" OR U234 OR "U 234" OR U-234 OR 234U OR 234-U OR "234 U" OR U235 OR "U 235" OR U-235 OR 235-U OR 235U OR "235 U" Downey OR De-Soto "Atomics International"		

Table A1-2: Database Searches for Canoga Ave., De Soto Ave., and Downey Facilities			
Database/Source	**Keywords / Phrases**	**Hits**	**Uploaded**
	U238 OR "U 238" OR U-238 OR 238-U OR 238U OR "238 U" OR U308 OR "U 308" OR U-308 OR 308-U OR 308U OR "308 U" Downey OR De-Soto "Atomics International" "black oxide" OR "brown oxide" OR "green salt" OR "orange oxide" OR "yellow 5cake" Downey OR De-Soto "Atomics International" UO2 OR UO3 OR UF4 OR UF6 OR C-216 OR C-616 OR C-65 OR C-211 OR U3O8 OR "uranium extraction" Downey OR De-Soto "Atomics International" "uranium dioxide" OR "uranium hexafluoride" OR "uranium tetrafluoride" OR "uranium trioxide" Downey OR De-Soto "Atomics International" plutonium OR Pu-238 OR Pu238 OR "Pu 238" OR 238Pu OR 238-Pu OR "238 Pu" OR Pu-239 OR Pu239 OR "Pu 239" OR 239Pu OR 239-Pu Downey OR De-Soto "Atomics International" "239 Pu" OR Pu-240 OR Pu240 OR "Pu 240" OR 240Pu OR 240-Pu OR "240 Pu" OR Pu-241 OR Pu241 OR "Pu 241" OR 241Pu OR 241-Pu OR "241 Pu" Downey OR De-Soto "Atomics International" radium OR Ra-226 OR Ra226 OR "Ra 226" OR 226-Ra OR 226Ra OR "226 Ra" OR Ra-228 OR Ra228 OR "Ra 228" OR 228Ra Downey OR De-Soto "Atomics International" 228-Ra OR "228 Ra" OR radon OR Rn-222 OR Rn222 OR "Rn 222" OR 222Rn OR 222-Rn Downey OR De-Soto "Atomics International" "222 Rn" OR thoron OR Rn-220 OR Rn220 OR "Rn 220" OR 220Rn OR 220-Rn OR "220 Rn" OR protactinium OR Pa-234m OR Pa234m OR "Pa 234m" OR 234mPa OR 234m-Pa OR "234m Pa" Downey OR De-Soto "Atomics International"		

Table A1-2: Database Searches for Canoga Ave., De Soto Ave., and Downey Facilities			
Database/Source	**Keywords / Phrases**	**Hits**	**Uploaded**
	strontium OR Sr-90 OR Sr90 OR "Sr 90" OR 90-Sr OR 90Sr OR "90 Sr" OR oralloy OR postum OR tuballoy OR "uranyl nitrate hexahydrate" OR UNH OR K-65 OR "sump cake" Downey OR De-Soto "Atomics International" accident OR "air count" OR "air dust" OR "air filter" OR "airborne test" OR alpha OR "belgian congo ore" OR beta OR bioassay OR bio-assay OR breath OR "breathing zone" OR BZ Downey OR De-Soto "Atomics International" "body burden" OR calibration OR "chest count" OR columnation OR contamination OR curie OR denitration OR "denitration pot" Downey OR De-Soto "Atomics International" derby OR regulus OR "derived air concentration" OR DAC OR dose OR dosimeter Downey OR De-Soto "Atomics International" dosimetric OR dosimetry OR electron OR environment OR "Ether-Water Project" OR exposure OR "exposure investigation" Downey OR De-Soto "Atomics International" "radiation exposure" OR external OR "F machine" OR fecal OR "feed material" Downey OR De-Soto "Atomics International" femptocurie OR film OR fission OR fluoroscopy OR "Formerly Utilized Sites Remedial Action Program" OR FUSRAP Downey OR De-Soto "Atomics International" gamma-ray OR "gamma ray" OR "gas proportional" OR "gaseous diffusion" OR health Downey OR De-Soto "Atomics International" "health instrument" OR "health physics" OR H.I. OR HI OR HP OR "highly enriched uranium" OR HEU OR hydrofluorination OR "in vitro" OR "in vivo" Downey OR De-Soto "Atomics International"		

Table A1-2: Database Searches for Canoga Ave., De Soto Ave., and Downey Facilities			
Database/Source	**Keywords / Phrases**	**Hits**	**Uploaded**
	incident OR ingestion OR inhalation OR internal OR investigation OR isotope OR isotopic OR "isotopic enrichment" OR "JS Project" OR Landauer OR "liquid scintillation" Downey OR De-Soto "Atomics International" log OR "log sheet" OR "log book" OR "low enriched uranium" OR LEU OR "lung count" OR "maximum permissible concentration" OR MPC OR metallurgy OR microcurie OR millicurie Downey OR De-Soto "Atomics International" "mixed fission product" OR MFP OR monitor OR "air monitoring" OR nanocurie OR "nasal wipe" OR neutron OR "nose wipe" Downey OR De-Soto "Atomics International" nuclear OR Chicago-Nuclear OR "nuclear fuels" OR "nuclear track emulsion type A" Downey OR De-Soto "Atomics International" NTA OR "occupational radiation exposure" OR occurrence OR "ore concentrate" OR "PC Project" OR permit OR "radiation work permit" Downey OR De-Soto "Atomics International" "safe work permit" OR "special work permit" OR RWP OR SWP Downey OR De-Soto "Atomics International" "phosphate research" OR photon OR picocurie OR pitchblende OR "pocket ion chamber" OR PIC OR problem OR procedure Downey OR De-Soto "Atomics International" radeco OR radiation OR radioactive OR radioactivity OR radiograph OR radiological Downey OR De-Soto "Atomics International" "Radiological Survey Data Sheet" OR RSDS OR radionuclide OR raffinate OR reactor OR respiratory OR "retention schedules" OR roentgen OR sample OR "air sample" OR "dust sample" Downey OR De-Soto "Atomics International"		

Table A1-2: Database Searches for Canoga Ave., De Soto Ave., and Downey Facilities			
Database/Source	**Keywords / Phrases**	**Hits**	**Uploaded**
	"general area air sample" OR sampling OR "air sampling" OR "dust sampling" OR "general area air sampling" OR "solvent extraction" OR source OR "sealed source" OR spectra Downey OR De-Soto "Atomics International" spectrograph OR spectroscopy OR spectrum OR standard OR operating OR processing OR survey OR "building survey" OR "routine survey" OR "special survey" OR "technical basis" Downey OR De-Soto "Atomics International" "thermal diffusion" OR "thermoluminescent dosimeter" OR TLD OR "Tiger Team" OR "tolerance dose" OR urinalysis OR urine Downey OR De-Soto "Atomics International" "whole body count" OR WBC OR "working level" OR WL OR X-ray OR "X ray" OR Xray Downey OR De-Soto "Atomics International" americium OR Am241 OR Am-241 OR "Am 241" OR "241Am" OR 241-Am OR "241 Am" OR ionium OR Th230 OR Th-230 OR "Th 230" OR 230Th OR 230-Th OR "230 Th" Downey OR De-Soto "North American Rockwell" "chemical 18-12" OR "chemical 1812" OR "chemical 18 12" OR "chemical 10-12" OR "chemical 1012" OR "chemical 10 12" OR UX1 OR UX2 Downey OR De-Soto "North American Rockwell" Th-234 OR Th234 OR "Th 234" OR 234-Th OR 234Th OR "234 Th" OR tritium OR H3 OR H-3 OR mint OR HTO Downey OR De-Soto "North American Rockwell" uranium OR U233 OR U-233 OR "U 233" OR 233U OR 233-U OR "233 U" OR U234 OR "U 234" OR U-234 OR 234U OR 234-U OR "234 U" OR U235 OR "U 235" OR U-235 OR 235-U OR 235U OR "235 U" Downey OR De-Soto "North American Rockwell"		

Table A1-2: Database Searches for Canoga Ave., De Soto Ave., and Downey Facilities			
Database/Source	**Keywords / Phrases**	**Hits**	**Uploaded**
	U238 OR "U 238" OR U-238 OR 238-U OR 238U OR "238 U" OR U308 OR "U 308" OR U-308 OR 308-U OR 308U OR "308 U" Downey OR De-Soto "North American Rockwell" "black oxide" OR "brown oxide" OR "green salt" OR "orange oxide" OR "yellow 5cake" Downey OR De-Soto "North American Rockwell" UO2 OR UO3 OR UF4 OR UF6 OR C-216 OR C-616 OR C-65 OR C-211 OR U3O8 OR "uranium extraction" Downey OR De-Soto "North American Rockwell" NTA OR "occupational radiation exposure" OR occurrence OR "ore concentrate" OR "PC Project" OR permit OR "radiation work permit" Downey OR De-Soto "United Technologies" "uranium dioxide" OR "uranium hexafluoride" OR "uranium tetrafluoride" OR "uranium trioxide" Downey OR De-Soto "North American Rockwell" plutonium OR Pu-238 OR Pu238 OR "Pu 238" OR 238Pu OR 238-Pu OR "238 Pu" OR Pu-239 OR Pu239 OR "Pu 239" OR 239Pu OR 239-Pu Downey OR De-Soto "North American Rockwell" "239 Pu" OR Pu-240 OR Pu240 OR "Pu 240" OR 240Pu OR 240-Pu OR "240 Pu" OR Pu-241 OR Pu241 OR "Pu 241" OR 241Pu OR 241-Pu OR "241 Pu" Downey OR De-Soto "North American Rockwell" radium OR Ra-226 OR Ra226 OR "Ra 226" OR 226-Ra OR 226Ra OR "226 Ra" OR Ra-228 OR Ra228 OR "Ra 228" OR 228Ra Downey OR De-Soto "North American Rockwell" 228-Ra OR "228 Ra" OR radon OR Rn-222 OR Rn222 OR "Rn 222" OR 222Rn OR 222-Rn Downey OR De-Soto "North American Rockwell"		

Table A1-2: Database Searches for Canoga Ave., De Soto Ave., and Downey Facilities			
Database/Source	**Keywords / Phrases**	**Hits**	**Uploaded**
	"222 Rn" OR thoron OR Rn-220 OR Rn220 OR "Rn 220" OR 220Rn OR 220-Rn OR "220 Rn" OR protactinium OR Pa-234m OR Pa234m OR "Pa 234m" OR 234mPa OR 234m-Pa OR "234m Pa" Downey OR De-Soto "North American Rockwell" strontium OR Sr-90 OR Sr90 OR "Sr 90" OR 90-Sr OR 90Sr OR "90 Sr" OR oralloy OR postum OR tuballoy OR "uranyl nitrate hexahydrate" OR UNH OR K-65 OR "sump cake" Downey OR De-Soto "North American Rockwell" accident OR "air count" OR "air dust" OR "air filter" OR "airborne test" OR alpha OR "belgian congo ore" OR beta OR bioassay OR bio-assay OR breath OR "breathing zone" OR BZ Downey OR De-Soto "North American Rockwell" "body burden" OR calibration OR "chest count" OR columnation OR contamination OR curie OR denitration OR "denitration pot" Downey OR De-Soto "North American Rockwell" derby OR regulus OR "derived air concentration" OR DAC OR dose OR dosimeter Downey OR De-Soto "North American Rockwell" dosimetric OR dosimetry OR electron OR environment OR "Ether-Water Project" OR exposure OR "exposure investigation" Downey OR De-Soto "North American Rockwell" "radiation exposure" OR external OR "F machine" OR fecal OR "feed material" Downey OR De-Soto "North American Rockwell" femptocurie OR film OR fission OR fluoroscopy OR "Formerly Utilized Sites Remedial Action Program" OR FUSRAP Downey OR De-Soto "North American Rockwell" gamma-ray OR "gamma ray" OR "gas proportional" OR "gaseous diffusion" OR health Downey OR De-Soto "North American Rockwell"		

Table A1-2: Database Searches for Canoga Ave., De Soto Ave., and Downey Facilities			
Database/Source	**Keywords / Phrases**	**Hits**	**Uploaded**
	"health instrument" OR "health physics" OR H.I. OR HI OR HP OR "highly enriched uranium" OR HEU OR hydrofluorination OR "in vitro" OR "in vivo" Downey OR De-Soto "North American Rockwell" incident OR ingestion OR inhalation OR internal OR investigation OR isotope OR isotopic OR "isotopic enrichment" OR "JS Project" OR Landauer OR "liquid scintillation" Downey OR De-Soto "North American Rockwell" log OR "log sheet" OR "log book" OR "low enriched uranium" OR LEU OR "lung count" OR "maximum permissible concentration" OR MPC OR metallurgy OR microcurie OR millicurie Downey OR De-Soto "North American Rockwell" "mixed fission product" OR MFP OR monitor OR "air monitoring" OR nanocurie OR "nasal wipe" OR neutron OR "nose wipe" Downey OR De-Soto "North American Rockwell" nuclear OR Chicago-Nuclear OR "nuclear fuels" OR "nuclear track emulsion type A" Downey OR De-Soto "North American Rockwell" NTA OR "occupational radiation exposure" OR occurrence OR "ore concentrate" OR "PC Project" OR permit OR "radiation work permit" Downey OR De-Soto "North American Rockwell" "safe work permit" OR "special work permit" OR RWP OR SWP Downey OR De-Soto "North American Rockwell" "phosphate research" OR photon OR picocurie OR pitchblende OR "pocket ion chamber" OR PIC OR problem OR procedure Downey OR De-Soto "North American Rockwell" radeco OR radiation OR radioactive OR radioactivity OR radiograph OR radiological Downey OR De-Soto "North American Rockwell"		

Table A1-2: Database Searches for Canoga Ave., De Soto Ave., and Downey Facilities			
Database/Source	**Keywords / Phrases**	**Hits**	**Uploaded**
	"Radiological Survey Data Sheet" OR RSDS OR radionuclide OR raffinate OR reactor OR respiratory OR "retention schedules" OR roentgen OR sample OR "air sample" OR "dust sample" Downey OR De-Soto "North American Rockwell" "general area air sample" OR sampling OR "air sampling" OR "dust sampling" OR "general area air sampling" OR "solvent extraction" OR source OR "sealed source" OR spectra Downey OR De-Soto "North American Rockwell" spectrograph OR spectroscopy OR spectrum OR standard OR operating OR processing OR survey OR "building survey" OR "routine survey" OR "special survey" OR "technical basis" Downey OR De-Soto "North American Rockwell" "thermal diffusion" OR "thermoluminescent dosimeter" OR TLD OR "Tiger Team" OR "tolerance dose" OR urinalysis OR urine Downey OR De-Soto "North American Rockwell" "whole body count" OR WBC OR "working level" OR WL OR X-ray OR "X ray" OR Xray Downey OR De-Soto "North American Rockwell" americium OR Am241 OR Am-241 OR "Am 241" OR "241Am" OR 241-Am OR "241 Am" OR ionium OR Th230 OR Th-230 OR "Th 230" OR 230Th OR 230-Th OR "230 Th" Downey OR De-Soto "Rockwell International" "chemical 18-12" OR "chemical 1812" OR "chemical 18 12" OR "chemical 10-12" OR "chemical 1012" OR "chemical 10 12" OR UX1 OR UX2 Downey OR De-Soto "Rockwell International" Th-234 OR Th234 OR "Th 234" OR 234-Th OR 234Th OR "234 Th" OR tritium OR H3 OR H-3 OR mint OR HTO Downey OR De-Soto "Rockwell International"		

Table A1-2: Database Searches for Canoga Ave., De Soto Ave., and Downey Facilities			
Database/Source	**Keywords / Phrases**	**Hits**	**Uploaded**
	uranium OR U233 OR U-233 OR "U 233" OR 233U OR 233-U OR "233 U" OR U234 OR "U 234" OR U-234 OR 234U OR 234-U OR "234 U" OR U235 OR "U 235" OR U-235 OR 235-U OR 235U OR "235 U" Downey OR De-Soto "Rockwell International" U238 OR "U 238" OR U-238 OR 238-U OR 238U OR "238 U" OR U308 OR "U 308" OR U-308 OR 308-U OR 308U OR "308 U" Downey OR De-Soto "Rockwell International" "black oxide" OR "brown oxide" OR "green salt" OR "orange oxide" OR "yellow 5cake" Downey OR De-Soto "Rockwell International" UO2 OR UO3 OR UF4 OR UF6 OR C-216 OR C-616 OR C-65 OR C-211 OR U3O8 OR "uranium extraction" Downey OR De-Soto "Rockwell International" "uranium dioxide" OR "uranium hexafluoride" OR "uranium tetrafluoride" OR "uranium trioxide" Downey OR De-Soto "Rockwell International" plutonium OR Pu-238 OR Pu238 OR "Pu 238" OR 238Pu OR 238-Pu OR "238 Pu" OR Pu-239 OR Pu239 OR "Pu 239" OR 239Pu OR 239-Pu Downey OR De-Soto "Rockwell International" "239 Pu" OR Pu-240 OR Pu240 OR "Pu 240" OR 240Pu OR 240-Pu OR "240 Pu" OR Pu-241 OR Pu241 OR "Pu 241" OR 241Pu OR 241-Pu OR "241 Pu" Downey OR De-Soto "Rockwell International" radium OR Ra-226 OR Ra226 OR "Ra 226" OR 226-Ra OR 226Ra OR "226 Ra" OR Ra-228 OR Ra228 OR "Ra 228" OR 228Ra Downey OR De-Soto "Rockwell International" 228-Ra OR "228 Ra" OR radon OR Rn-222 OR Rn222 OR "Rn 222" OR 222Rn OR 222-Rn Downey OR De-Soto "Rockwell International"		

Table A1-2: Database Searches for Canoga Ave., De Soto Ave., and Downey Facilities			
Database/Source	**Keywords / Phrases**	**Hits**	**Uploaded**
	"222 Rn" OR thoron OR Rn-220 OR Rn220 OR "Rn 220" OR 220Rn OR 220-Rn OR "220 Rn" OR protactinium OR Pa-234m OR Pa234m OR "Pa 234m" OR 234mPa OR 234m-Pa OR "234m Pa" Downey OR De-Soto "Rockwell International" strontium OR Sr-90 OR Sr90 OR "Sr 90" OR 90-Sr OR 90Sr OR "90 Sr" OR oralloy OR postum OR tuballoy OR "uranyl nitrate hexahydrate" OR UNH OR K-65 OR "sump cake" Downey OR De-Soto "Rockwell International" accident OR "air count" OR "air dust" OR "air filter" OR "airborne test" OR alpha OR "belgian congo ore" OR beta OR bioassay OR bio-assay OR breath OR "breathing zone" OR BZ Downey OR De-Soto "Rockwell International" "body burden" OR calibration OR "chest count" OR columnation OR contamination OR curie OR denitration OR "denitration pot" Downey OR De-Soto "Rockwell International" derby OR regulus OR "derived air concentration" OR DAC OR dose OR dosimeter Downey OR De-Soto "Rockwell International" dosimetric OR dosimetry OR electron OR environment OR "Ether-Water Project" OR exposure OR "exposure investigation" Downey OR De-Soto "Rockwell International" "radiation exposure" OR external OR "F machine" OR fecal OR "feed material" Downey OR De-Soto "Rockwell International" femptocurie OR film OR fission OR fluoroscopy OR "Formerly Utilized Sites Remedial Action Program" OR FUSRAP Downey OR De-Soto "Rockwell International" gamma-ray OR "gamma ray" OR "gas proportional" OR "gaseous diffusion" OR health Downey OR De-Soto "Rockwell International"		

Table A1-2: Database Searches for Canoga Ave., De Soto Ave., and Downey Facilities			
Database/Source	**Keywords / Phrases**	**Hits**	**Uploaded**
	"health instrument" OR "health physics" OR H.I. OR HI OR HP OR "highly enriched uranium" OR HEU OR hydrofluorination OR "in vitro" OR "in vivo" Downey OR De-Soto "Rockwell International" incident OR ingestion OR inhalation OR internal OR investigation OR isotope OR isotopic OR "isotopic enrichment" OR "JS Project" OR Landauer OR "liquid scintillation" Downey OR De-Soto "Rockwell International" log OR "log sheet" OR "log book" OR "low enriched uranium" OR LEU OR "lung count" OR "maximum permissible concentration" OR MPC OR metallurgy OR microcurie OR millicurie Downey OR De-Soto "Rockwell International" "mixed fission product" OR MFP OR monitor OR "air monitoring" OR nanocurie OR "nasal wipe" OR neutron OR "nose wipe" Downey OR De-Soto "Rockwell International" nuclear OR Chicago-Nuclear OR "nuclear fuels" OR "nuclear track emulsion type A" Downey OR De-Soto "Rockwell International" NTA OR "occupational radiation exposure" OR occurrence OR "ore concentrate" OR "PC Project" OR permit OR "radiation work permit" Downey OR De-Soto "Rockwell International" "safe work permit" OR "special work permit" OR RWP OR SWP Downey OR De-Soto "Rockwell International" "phosphate research" OR photon OR picocurie OR pitchblende OR "pocket ion chamber" OR PIC OR problem OR procedure Downey OR De-Soto "Rockwell International" radeco OR radiation OR radioactive OR radioactivity OR radiograph OR radiological Downey OR De-Soto "Rockwell International"		

Table A1-2: Database Searches for Canoga Ave., De Soto Ave., and Downey Facilities			
Database/Source	**Keywords / Phrases**	**Hits**	**Uploaded**
	"Radiological Survey Data Sheet" OR RSDS OR radionuclide OR raffinate OR reactor OR respiratory OR "retention schedules" OR roentgen OR sample OR "air sample" OR "dust sample" Downey OR De-Soto "Rockwell International" "general area air sample" OR sampling OR "air sampling" OR "dust sampling" OR "general area air sampling" OR "solvent extraction" OR source OR "sealed source" OR spectra Downey OR De-Soto "Rockwell International" spectrograph OR spectroscopy OR spectrum OR standard OR operating OR processing OR survey OR "building survey" OR "routine survey" OR "special survey" OR "technical basis" Downey OR De-Soto "Rockwell International" "thermal diffusion" OR "thermoluminescent dosimeter" OR TLD OR "Tiger Team" OR "tolerance dose" OR urinalysis OR urine Downey OR De-Soto "Rockwell International" "whole body count" OR WBC OR "working level" OR WL OR X-ray OR "X ray" OR Xray Downey OR De-Soto "Rockwell International" americium OR Am241 OR Am-241 OR "Am 241" OR "241Am" OR 241-Am OR "241 Am" OR ionium OR Th230 OR Th-230 OR "Th 230" OR 230Th OR 230-Th OR "230 Th" Downey OR De-Soto "United Technologies" "chemical 18-12" OR "chemical 1812" OR "chemical 18 12" OR "chemical 10-12" OR "chemical 1012" OR "chemical 10 12" OR UX1 OR UX2 Downey OR De-Soto "United Technologies" Th-234 OR Th234 OR "Th 234" OR 234-Th OR 234Th OR "234 Th" OR tritium OR H3 OR H-3 OR mint OR HTO Downey OR De-Soto "United Technologies"		

Table A1-2: Database Searches for Canoga Ave., De Soto Ave., and Downey Facilities			
Database/Source	**Keywords / Phrases**	**Hits**	**Uploaded**
	uranium OR U233 OR U-233 OR "U 233" OR 233U OR 233-U OR "233 U" OR U234 OR "U 234" OR U-234 OR 234U OR 234-U OR "234 U" OR U235 OR "U 235" OR U-235 OR 235-U OR 235U OR "235 U" Downey OR De-Soto "United Technologies" U238 OR "U 238" OR U-238 OR 238-U OR 238U OR "238 U" OR U308 OR "U 308" OR U-308 OR 308-U OR 308U OR "308 U" Downey OR De-Soto "United Technologies" "black oxide" OR "brown oxide" OR "green salt" OR "orange oxide" OR "yellow 5cake" Downey OR De-Soto "United Technologies" UO2 OR UO3 OR UF4 OR UF6 OR C-216 OR C-616 OR C-65 OR C-211 OR U3O8 OR "uranium extraction" Downey OR De-Soto "United Technologies" "uranium dioxide" OR "uranium hexafluoride" OR "uranium tetrafluoride" OR "uranium trioxide" Downey OR De-Soto "United Technologies" plutonium OR Pu-238 OR Pu238 OR "Pu 238" OR 238Pu OR 238-Pu OR "238 Pu" OR Pu-239 OR Pu239 OR "Pu 239" OR 239Pu OR 239-Pu Downey OR De-Soto "United Technologies" "239 Pu" OR Pu-240 OR Pu240 OR "Pu 240" OR 240Pu OR 240-Pu OR "240 Pu" OR Pu-241 OR Pu241 OR "Pu 241" OR 241Pu OR 241-Pu OR "241 Pu" Downey OR De-Soto "United Technologies" radium OR Ra-226 OR Ra226 OR "Ra 226" OR 226-Ra OR 226Ra OR "226 Ra" OR Ra-228 OR Ra228 OR "Ra 228" OR 228Ra Downey OR De-Soto "United Technologies" 228-Ra OR "228 Ra" OR radon OR Rn-222 OR Rn222 OR "Rn 222" OR 222Rn OR 222-Rn Downey OR De-Soto "United Technologies"		

Table A1-2: Database Searches for Canoga Ave., De Soto Ave., and Downey Facilities			
Database/Source	**Keywords / Phrases**	**Hits**	**Uploaded**
	"222 Rn" OR thoron OR Rn-220 OR Rn220 OR "Rn 220" OR 220Rn OR 220-Rn OR "220 Rn" OR protactinium OR Pa-234m OR Pa234m OR "Pa 234m" OR 234mPa OR 234m-Pa OR "234m Pa" Downey OR De-Soto "United Technologies" strontium OR Sr-90 OR Sr90 OR "Sr 90" OR 90-Sr OR 90Sr OR "90 Sr" OR oralloy OR postum OR tuballoy OR "uranyl nitrate hexahydrate" OR UNH OR K-65 OR "sump cake" Downey OR De-Soto "United Technologies" accident OR "air count" OR "air dust" OR "air filter" OR "airborne test" OR alpha OR "belgian congo ore" OR beta OR bioassay OR bio-assay OR breath OR "breathing zone" OR BZ Downey OR De-Soto "United Technologies" "body burden" OR calibration OR "chest count" OR columnation OR contamination OR curie OR denitration OR "denitration pot" Downey OR De-Soto "United Technologies" derby OR regulus OR "derived air concentration" OR DAC OR dose OR dosimeter Downey OR De-Soto "United Technologies" dosimetric OR dosimetry OR electron OR environment OR "Ether-Water Project" OR exposure OR "exposure investigation" Downey OR De-Soto "United Technologies" "radiation exposure" OR external OR "F machine" OR fecal OR "feed material" Downey OR De-Soto "United Technologies" femptocurie OR film OR fission OR fluoroscopy OR "Formerly Utilized Sites Remedial Action Program" OR FUSRAP Downey OR De-Soto "United Technologies" gamma-ray OR "gamma ray" OR "gas proportional" OR "gaseous diffusion" OR health Downey OR De-Soto "United Technologies"		

Table A1-2: Database Searches for Canoga Ave., De Soto Ave., and Downey Facilities			
Database/Source	**Keywords / Phrases**	**Hits**	**Uploaded**
	"health instrument" OR "health physics" OR H.I. OR HI OR HP OR "highly enriched uranium" OR HEU OR hydrofluorination OR "in vitro" OR "in vivo" Downey OR De-Soto "United Technologies" incident OR ingestion OR inhalation OR internal OR investigation OR isotope OR isotopic OR "isotopic enrichment" OR "JS Project" OR Landauer OR "liquid scintillation" Downey OR De-Soto "United Technologies" log OR "log sheet" OR "log book" OR "low enriched uranium" OR LEU OR "lung count" OR "maximum permissible concentration" OR MPC OR metallurgy OR microcurie OR millicurie Downey OR De-Soto "United Technologies" "mixed fission product" OR MFP OR monitor OR "air monitoring" OR nanocurie OR "nasal wipe" OR neutron OR "nose wipe" Downey OR De-Soto "United Technologies" nuclear OR Chicago-Nuclear OR "nuclear fuels" OR "nuclear track emulsion type A" Downey OR De-Soto "United Technologies" "safe work permit" OR "special work permit" OR RWP OR SWP Downey OR De-Soto "United Technologies" "phosphate research" OR photon OR picocurie OR pitchblende OR "pocket ion chamber" OR PIC OR problem OR procedure Downey OR De-Soto "United Technologies" radeco OR radiation OR radioactive OR radioactivity OR radiograph OR radiological Downey OR De-Soto "United Technologies" "Radiological Survey Data Sheet" OR RSDS OR radionuclide OR raffinate OR reactor OR respiratory OR "retention schedules" OR roentgen OR sample OR "air sample" OR "dust sample" Downey OR De-Soto "United Technologies"		

Table A1-2: Database Searches for Canoga Ave., De Soto Ave., and Downey Facilities			
Database/Source	**Keywords / Phrases**	**Hits**	**Uploaded**
	"general area air sample" OR sampling OR "air sampling" OR "dust sampling" OR "general area air sampling" OR "solvent extraction" OR source OR "sealed source" OR spectra Downey OR De-Soto "United Technologies" spectrograph OR spectroscopy OR spectrum OR standard OR operating OR processing OR survey OR "building survey" OR "routine survey" OR "special survey" OR "technical basis" Downey OR De-Soto "United Technologies" "thermal diffusion" OR "thermoluminescent dosimeter" OR TLD OR "Tiger Team" OR "tolerance dose" OR urinalysis OR urine Downey OR De-Soto "United Technologies" "whole body count" OR WBC OR "working level" OR WL OR X-ray OR "X ray" OR Xray Downey OR De-Soto "United Technologies" americium OR Am241 OR Am-241 OR "Am 241" OR "241Am" OR 241-Am OR "241 Am" OR ionium OR Th230 OR Th-230 OR "Th 230" OR 230Th OR 230-Th OR "230 Th" Downey OR De-Soto "Boeing" "chemical 18-12" OR "chemical 1812" OR "chemical 18 12" OR "chemical 10-12" OR "chemical 1012" OR "chemical 10 12" OR UX1 OR UX2 Downey OR De-Soto "Boeing" Th-234 OR Th234 OR "Th 234" OR 234-Th OR 234Th OR "234 Th" OR tritium OR H3 OR H-3 OR mint OR HTO Downey OR De-Soto "Boeing" uranium OR U233 OR U-233 OR "U 233" OR 233U OR 233-U OR "233 U" OR U234 OR "U 234" OR U-234 OR 234U OR 234-U OR "234 U" OR U235 OR "U 235" OR U-235 OR 235-U OR 235U OR "235 U" Downey OR De-Soto "Boeing"		

Table A1-2: Database Searches for Canoga Ave., De Soto Ave., and Downey Facilities			
Database/Source	**Keywords / Phrases**	**Hits**	**Uploaded**
	U238 OR "U 238" OR U-238 OR 238-U OR 238U OR "238 U" OR U308 OR "U 308" OR U-308 OR 308-U OR 308U OR "308 U" Downey OR De-Soto "Boeing" "black oxide" OR "brown oxide" OR "green salt" OR "orange oxide" OR "yellow 5cake" Downey OR De-Soto "Boeing" UO2 OR UO3 OR UF4 OR UF6 OR C-216 OR C-616 OR C-65 OR C-211 OR U3O8 OR "uranium extraction" Downey OR De-Soto "Boeing" "uranium dioxide" OR "uranium hexafluoride" OR "uranium tetrafluoride" OR "uranium trioxide" Downey OR De-Soto "Boeing" plutonium OR Pu-238 OR Pu238 OR "Pu 238" OR 238Pu OR 238-Pu OR "238 Pu" OR Pu-239 OR Pu239 OR "Pu 239" OR 239Pu OR 239-Pu Downey OR De-Soto "Boeing" "239 Pu" OR Pu-240 OR Pu240 OR "Pu 240" OR 240Pu OR 240-Pu OR "240 Pu" OR Pu-241 OR Pu241 OR "Pu 241" OR 241Pu OR 241-Pu OR "241 Pu" Downey OR De-Soto "Boeing" radium OR Ra-226 OR Ra226 OR "Ra 226" OR 226-Ra OR 226Ra OR "226 Ra" OR Ra-228 OR Ra228 OR "Ra 228" OR 228Ra Downey OR De-Soto "Boeing" 228-Ra OR "228 Ra" OR radon OR Rn-222 OR Rn222 OR "Rn 222" OR 222Rn OR 222-Rn Downey OR De-Soto "Boeing" "222 Rn" OR thoron OR Rn-220 OR Rn220 OR "Rn 220" OR 220Rn OR 220-Rn OR "220 Rn" OR protactinium OR Pa-234m OR Pa234m OR "Pa 234m" OR 234mPa OR 234m-Pa OR "234m Pa" Downey OR De-Soto "Boeing" strontium OR Sr-90 OR Sr90 OR "Sr 90" OR 90-Sr OR 90Sr OR "90 Sr" OR oralloy OR postum OR tuballoy OR "uranyl nitrate hexahydrate" OR UNH OR K-65 OR "sump cake" Downey OR De-Soto "Boeing"		

Table A1-2: Database Searches for Canoga Ave., De Soto Ave., and Downey Facilities			
Database/Source	**Keywords / Phrases**	**Hits**	**Uploaded**
	accident OR "air count" OR "air dust" OR "air filter" OR "airborne test" OR alpha OR "belgian congo ore" OR beta OR bioassay OR bio-assay OR breath OR "breathing zone" OR BZ Downey OR De-Soto "Boeing" "body burden" OR calibration OR "chest count" OR columnation OR contamination OR curie OR denitration OR "denitration pot" Downey OR De-Soto "Boeing" derby OR regulus OR "derived air concentration" OR DAC OR dose OR dosimeter Downey OR De-Soto "Boeing" dosimetric OR dosimetry OR electron OR environment OR "Ether-Water Project" OR exposure OR "exposure investigation" Downey OR De-Soto "Boeing" "radiation exposure" OR external OR "F machine" OR fecal OR "feed material" Downey OR De-Soto "Boeing" femptocurie OR film OR fission OR fluoroscopy OR "Formerly Utilized Sites Remedial Action Program" OR FUSRAP Downey OR De-Soto "Boeing" gamma-ray OR "gamma ray" OR "gas proportional" OR "gaseous diffusion" OR health Downey OR De-Soto "Boeing" "health instrument" OR "health physics" OR H.I. OR HI OR HP OR "highly enriched uranium" OR HEU OR hydrofluorination OR "in vitro" OR "in vivo" Downey OR De-Soto "Boeing" incident OR ingestion OR inhalation OR internal OR investigation OR isotope OR isotopic OR "isotopic enrichment" OR "JS Project" OR Landauer OR "liquid scintillation" Downey OR De-Soto "Boeing" log OR "log sheet" OR "log book" OR "low enriched uranium" OR LEU OR "lung count" OR "maximum permissible concentration" OR MPC OR metallurgy OR microcurie OR millicurie Downey OR De-Soto "Boeing"		

Table A1-2: Database Searches for Canoga Ave., De Soto Ave., and Downey Facilities			
Database/Source	**Keywords / Phrases**	**Hits**	**Uploaded**
	"mixed fission product" OR MFP OR monitor OR "air monitoring" OR nanocurie OR "nasal wipe" OR neutron OR "nose wipe" Downey OR De-Soto "Boeing" nuclear OR Chicago-Nuclear OR "nuclear fuels" OR "nuclear track emulsion type A" Downey OR De-Soto "Boeing" NTA OR "occupational radiation exposure" OR occurrence OR "ore concentrate" OR "PC Project" OR permit OR "radiation work permit" Downey OR De-Soto "Boeing" "safe work permit" OR "special work permit" OR RWP OR SWP Downey OR De-Soto "Boeing" "phosphate research" OR photon OR picocurie OR pitchblende OR "pocket ion chamber" OR PIC OR problem OR procedure Downey OR De-Soto "Boeing" radeco OR radiation OR radioactive OR radioactivity OR radiograph OR radiological Downey OR De-Soto "Boeing" "Radiological Survey Data Sheet" OR RSDS OR radionuclide OR raffinate OR reactor OR respiratory OR "retention schedules" OR roentgen OR sample OR "air sample" OR "dust sample" Downey OR De-Soto "Boeing" "general area air sample" OR sampling OR "air sampling" OR "dust sampling" OR "general area air sampling" OR "solvent extraction" OR source OR "sealed source" OR spectra Downey OR De-Soto "Boeing" spectrograph OR spectroscopy OR spectrum OR standard OR operating OR processing OR survey OR "building survey" OR "routine survey" OR "special survey" OR "technical basis" Downey OR De-Soto "Boeing"		

Table A1-2: Database Searches for Canoga Ave., De Soto Ave., and Downey Facilities			
Database/Source	**Keywords / Phrases**	**Hits**	**Uploaded**
	"thermal diffusion" OR "thermoluminescent dosimeter" OR TLD OR "Tiger Team" OR "tolerance dose" OR urinalysis OR urine Downey OR De-Soto "Boeing" "whole body count" OR WBC OR "working level" OR WL OR X-ray OR "X ray" OR Xray Downey OR De-Soto "Boeing"		
National Academies Press http://www.nap.edu/ COMPLETED 11/10/2009	Downey California De Soto California "North American Aviation" Rocketdyne "Atomics International" "North American Rockwell" "Rockwell International" "United Technologies"	1,083	0
NNSA - Nevada Site Office www.nv.doe.gov/main/search.htm COMPLETED 11/10/2009	"North American Aviation" Rocketdyne "Atomics International" "North American Rockwell" "Rockwell International" "United Technologies" Downey or "De Soto"	0	0
NRC ADAMS Reading Room http://www.nrc.gov/reading-rm/adams/web-based.html COMPLETED 11/14/2009	"Atomics International" "North American Aviation" "Rocketdyne" "North American Rockwell" "Rockwell International" "United Technologies" Downey or "De Soto" (Advanced Search Boolean)	2,075	23
U.S. Transuranium & Uranium Registries http://www.ustur.wsu.edu/ COMPLETED 11/10/2009	"North American Aviation" Rocketdyne "Rockwell International" "United Technologies" "Atomics International" "North American Rockwell" Downey De Soto	4	1

Table A1-3: OSTI Documents Requested for Canoga Ave., De Soto Ave., and Downey Facilities			
Document Number	**Document Title**	**Requested**	**Received**
DOC Number: NA OSTI ID: NA Ref ID: 73068	The Effects Of Internal Radiation Exposure On Cancer Mortality In Nuclear Workers At Rocketdyne/Atomics International. Author(S): Ritz, B., Morgenstern, H., Crawford-Brown, D., Young, B. B. Journal Date: 2001 Journal Name: Environmental Health Perspectives Journal Volume: 108:743-751 BFSID: 1481	09/03/2009	09/03/2009
DOC Number: TID-26442 OSTI ID: 4442347 Ref ID: 73065	Environmental Monitoring. Annual Report, 1972 Creator/Author Moore, J.D. Publication Date 1972 Jan 01	09/03/2009	09/03/2009
DOC Number: AI-77-14 OSTI ID: 7294807 Ref ID: 73073	Atomics International Environmental Monitoring And Facility Effluent Annual Report, 1976 Creator/Author Moore, J.D. Publication Date 1977 Jan 01	09/03/2009	09/03/2009
DOC Number: TID-13863 OSTI ID: 4840693 Ref ID: 73070	Environmental Monitoring Report, January 1, 1961-March 31, 1961 Publication Date 1961 Oct 31	09/03/2009	09/03/2009
DOC Number: NA OSTI ID: NA Ref ID: 73078	Health Bulletin: Mortality Study Of Rocketdyne/Atomics International Workers BFSID: 3522	09/03/2009	09/03/2009
DOC Number: NAA-SR-3989 OSTI ID: 4203423 Ref ID: 73052	Gamma-Ray And Fast Neutron Annular Streaming Evaluation Through Sodium Reactor Experiment (Sre)-Mark Ii Control And Safety Rod Assemblies Creator/Author Anderson, F.D. Publication Date 1959 Oct 15	09/03/2009	09/03/2009
DOC Number: NAA-SR-3990 OSTI ID: 4233098 Ref ID: 73054	Sodium Reactor Experiment (Sre) Shielding Evaluation For Thermal Neutron Streaming At Reactor Vessel Coolant Pipe Penetrations Creator/Author Anderson, F.D. Publication Date 1959 Oct 31	09/03/2009	09/03/2009
DOC Number: NAA-SR-1536 OSTI ID: 358658 Ref ID: 73063	Fast Neutron Monitoring With Nta Film Packets Creator/Author Hart, R.S.; Hale, J.P. Jr. Publication Date 1956 Jul 15	09/03/2009	09/03/2009

Table A1-4: Cincinnati Public Library Documents Ordered for Canoga Ave., De Soto Ave., and Downey Facilities			
Document Number	**Document Title**	**Requested**	**Received**
DOC Number: NA OSTI ID: 4748756 Ref ID: 75053	Atomics International's L-88 Nuclear Reactor For Neutron Radiography. Creator/Author Henrie, J.O. Journal Name: Isotopes And Radiation Technology Vol 9: No. 1, 41-4(Fall 1971)	09/10/2009	10/28/2009
DOC Number: A/CONF.15/P/1780 OSTI ID: 4322507 Ref ID: 75059	Methods And Equipment For Low Decontamination Processing Of Metallic Nuclear Fuels Creator/Author Brand, G.E. ; Sinizer, D.I. ; Murbach, E.W. ; Hansen, W.N. ; Foltz, J.R. ; Mattern, K.L. Publication Date 1958 Oct 31	09/10/2009	10/06/2009
DOC Number: NA OSTI ID: 030059777 Ref ID: 73543	The Radiolysis Of Deuterated Biphenyls: Mechanism Of Hydrogen Formation, Journal Of Physical Chemistry, October 1960, Vol. 64(10):1367-1374	09/24/2009	09/30/2009
DOC Number: A/CONF.15/P/785 OSTI ID: 4306907 Ref ID: 75060	Thorium-Uranium Fuel Elements For Sre Creator/Author Hayward, B.R. & Corzine, P. Publication Date 1958 Oct 31 Prepared For The Second U.N. International Conference On The Peaceful Uses Of Atomic Energy, 1958	09/10/2009	09/30/2009
DOC Number: NA OSTI ID: NA Ref ID: 75057	Effects Of Radiation And Chemical Exposures On Cancer Mortality Among Rocketdyne Workers: A Review Of Three Cohort Studies. Author(S): Morgenstern, H., Ritz, B. Journal Name: Occupational Medicine: State Of The Art Reviews Journal Volume: 16(2):219-237 Bfsid: 1490 Dated 2001	09/10/2009	09/30/2009
DOC Number: NA OSTI ID: 4000032 Ref ID: 73111	Prepare Thorium-Aluminum Alloys... By Direct Reduction Creator/Author Raleigh, D.O. Publication Date 1961 Jun 01 Journal Name: Industrial And Engineering Chemistry Vol: 53(6):445-448	09/14/2009	09/15/2009
DOC Number: NA OSTI ID: 4211191 Ref ID: 73098	Low-Decontamination-Processing Of Uranium Dioxide By Oxidation And Reduction Creator/Author Strausberg, S. ; Luebben, T.E. ; Rosen, F.D. ; Guon, J. ; Murbach, E.W. Publication Date 1960 Jan 01 Journal Name: Industrial And Engineering Chemistry Vol: 52(1):45-46	09/14/2009	09/15/2009
DOC Number: NA OSTI ID: 4275332 Ref ID: 73084	A Portable Calibrator For Beta/-Gamma Survey Instruments Using Sr90 Creator/Author Nelson, C.T. Publication Date 1959 Mar 01 Health Physics Journal Vol 1 Pp 447-448??	09/11/2009	09/11/2009
DOC Number: NA OSTI ID: 4811731 Ref ID: 73090	Sea Water Monitoring Following Radioactive Waste Disposal Operations Creator/Author Alexander, R.E. Publication Date 1961 Dec 01 Health Physics Journal Vol: 7: Nos. 1 And 2, Pp 106-113	09/11/2009	09/11/2009
DOC Number: NA OSTI ID: 4059901 Ref ID: 73096	Disposal Of Omr High Boiler Fractions By Burning Creator/Author Stiens, R.P. Publication Date 1961 Jun 01 Journal Name: Trans. Am. Nuclear Soc. Vol: 4: No. 1 Pp 41-42;	09/11/2009	09/11/2009

Table A1-4: Cincinnati Public Library Documents Ordered for Canoga Ave., De Soto Ave., and Downey Facilities			
Document Number	**Document Title**	**Requested**	**Received**
DOC Number: NA OSTI ID: 4089327 Ref ID: 73093	Beta-Gamma Delayed Coincidence Method For U-238 Activation Analysis Creator/Author Beller, L.S. Publication Date 1961 Jun 01 Journal Name: Trans. Am. Nuclear Soc.; Journal Volume: Vol: 4: No. 1 Pp 28-29	09/11/2009	09/11/2009
DOC Number: NA OSTI ID: 4293816 Ref ID: 73118	Pyroprocessing Thorium Fuels Creator/Author Murbach, E.W. ; Hansen, W.N. Publication Date 1959 Feb 01 Journal Name: Industrial And Engineering Chemistry Journal Volume: Vol: 51(2):177-178	09/11/2009	09/11/2009
DOC Number: NA OSTI ID: 4308032 Ref ID: 73120	Special Safety Devices Creator/Author Huston, N.E.; Miller, N.C. Publication Date 1958 May 01 Other Number(S) Nucleonics Vol 16(5):86-87 Dated May 1958	09/10/2009	09/10/2009
DOC Number: NA OSTI ID: 4280405 Ref ID: 73115	Processing Re-fabrication Of Metallic-Uranium Fuel Creator/Author Sinizer, D.I.; Mattern, K.L.; Foltz, J.R.; Kendall, E.G. Publication Date 1959 Jan 01 Nucleonics Vol 17(1):50-53 Jan 1959	09/10/2009	09/10/2009
DOC Number: NA OSTI ID: 4325061 Ref ID: 73103	Plutonium Recycling With Molten Uf4 Creator/Author Buyers, A.G. Publication Date 1957 Nov 01 Nucleonics Vol 15(11):100-103 Nov 1957	09/10/2009	09/10/2009