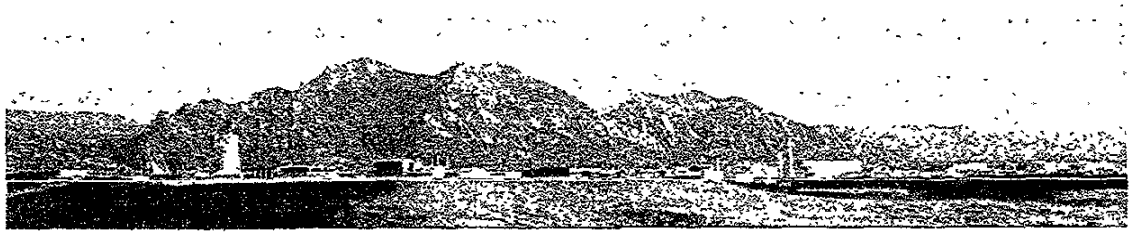
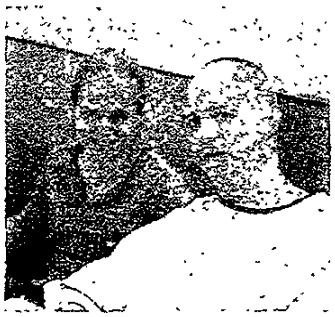
[redacted]

Basis for Petition

[redacted]



BASIS FOR PETITION



Basis for Petition

The class of Rocky Flats workers identified by this petition meet all the specifications and requirements for inclusion in the Special Exposure Cohort based on the following factors which will be elaborated on in greater detail in response to Special Exposure Cohort Petition, Form B:

1) **Exposure to a unique form of plutonium referred to as high fired oxides** or super class Y materials that are metabolized differently and have self-shielding properties which make accurate assessment of dose impossible. In addition, the uniquely small particle size of high fired oxides – as small as 0.12 um Activity Median Aerodynamic Diameter (AMAD) – makes current dose models inaccurate. Dose models in use at Rocky Flats use a particle size of 1.0 um AMAD and underestimate high fired oxide doses by a factor of 1-3. Current models in use by NIOSH – International Commission on Radiological Protection (ICRP) 66 – use a particle size of 5.0 um AMAD and underestimate these doses by as much as a factor of 10. High fired oxides were generated from the Building 771 fire in 1957, the Building 776 fires in 1965 and 1969, numerous other smaller fires, and multiple high temperature processes in furnaces, incinerators and production process areas used in multiple plutonium buildings at Rocky Flats. A detailed accounting of these activities is included in our petition. The impossibility of accurate dose assessment for high fired oxide exposure is summarized in more detail on the following pages.

2) **Inability to link exposures to specific incidents or events** as evidenced by the Building 771 worker exposure issue as recently as 2000/2001. In this incident, workers received undetected exposures through chronic long-term exposures below the threshold of workplace monitors that were discovered only by happenstance. Without a date to enter into the equation for bioassay results, an accurate dose assignment is impossible.

3) **Periods of inadequate monitoring, lack of monitoring, changes in methodology, and inconsistency in procedures** over the history of the Rocky Flats site which make accurate dose reconstruction over time impossible. Examples include: no routine lung counting until the late 1960s, no monitoring for neutron radiation prior to late 1950s and neutron measurements found in error until 1970s.

4) **Unmonitored exposures surfacing throughout time.** As recently as 2004, a former worker from the 1950s was monitored under a DOE former worker radiation program and was found to have a significant internal deposition that had gone undetected and unrecorded for nearly 50 years.

5) **Negative effects of site closure on accuracy of dose reconstruction.** As a closure site, Rocky Flats presents unique challenges for dose reconstruction in that the entire infrastructure will be eliminated and with it the subject matter experts that provide information and clarification for dose reconstruction questions. No one will be left that understands the data. Currently the Rocky Flats dosimetry department answers calls on a regular basis in support of dose reconstruction where data is missing, or part of a file is missing, in particular with the change in 1989 from systemic burden to dose when the Radiation Control Manual was implemented. When Rocky Flats is gone, there will be no one left who understands these nuances, making accurate dose reconstruction impossible.

6) With closure, **worker recall monitoring programs are going away.** The contract has ended for the former worker recall program through Oak Ridge where workers were called back every three years. The Rocky Flats program that recalls active

employees on an annual basis will go away at closure. Currently there is nothing in place to replace these important activities.

7) **Exposure to plutonium has been causally linked to more than 20 types of cancer as well as lung fibrosis.** Plutonium exposure, in particular to high-fired oxides and their related ailments endanger the health of the members of this Rocky Flats class of workers. DOE and the federal government have recognized the causal role of plutonium exposure in these specific cancers as evidenced in the Energy Employees Occupational Illnesses Compensation Program Act (EEOICPA) which designates a list of cancers currently linked to radiation exposure. Additionally, the effects of synergism of exposures to different toxins are not known. In particular the effects of combination exposures where an individual has both plutonium and toxic chemical exposure, such as carbon tetrichloride, trichloroethylene, nitric acids, and numerous other toxic chemicals used at Rocky Flats. Synergism has been documented, for example, for the combination of plutonium exposure and cigarette smoking. The result is that a person who was exposed to plutonium and also smoked is 10 times more likely to contract lung cancer than a person who was not exposed to plutonium and smoked.

High Fired Oxides

Due to the extreme nature of high fired oxides, we have focused our basis for petition primarily on, but not limited to this unique area. High fired oxides are a relatively recently identified class of plutonium material. This form of plutonium is generated when plutonium is exposed to high temperatures in excess of 600 degrees Celsius (some argue this number to be as low as 400 degrees Celsius). High fired oxides at Rocky Flats were generated from the 1957 fire, the 1965 fire, the 1969 fire, numerous smaller fires, and numerous high temperature processes in several plutonium production facilities as described in response to Section E.2 of Form B. The 1965 fire had recorded temperatures in excess of 1800 degrees Celsius. High fired oxides are also referred to as Super Class Y materials. "(T)he possibility of a super class Y (super Y) form has been identified. Super Y was defined by the Hanford Internal Dosimetry Program in 1988 to describe highly nontransportable forms of plutonium based on some actual observed cases at Hanford (Bihl et al. 1988; Carbaugh, Bihl, and Sula, 1991)." The presence of Super Class Y materials has also been noted by experts at Rocky Flats, including Dr. Robert Bistline. The PNNL-MA-860 Chapter 8.0 issued January 31, 2003, noted that Super Class Y material is highly insoluble with retention half-lives of transport from lungs to blood 20 times longer than normal Class Y materials. It also noted the uncertainty surrounding this new class of material: "**The precise nature of super class Y material is not known**, although it appears to have been associated with processes involving high fired plutonium oxides. The phenomenon has been informally verified by dosimetry personnel at Rocky Flats, Savannah River, and Los Alamos sites, and is supported by literature (PNNL-MA-860 Chapter 8.0, Page 8.13)." In addition, British literature in the last few years has also noted the unique attributes of high fired oxides.

What is known about high fired oxides at Rocky Flats are that they are highly insoluble, may not be detected by standard bioassay, and result in particle sizes as small as 0.12 um AMAD.

The following factors make accurate assessment of dose for high fired oxides impossible:

1) High fired oxides are highly insoluble. This means that they can take as long as 6,000 days or more to show up in a urine bioassay. So by the time a high fired oxide exposure is detected in urine it is nearly impossible to link the exposure in time to the actual exposure incident, making accurate dose assignment impossible. In addition, standard chemistry used in fecal bioassay is unable to dissolve high fired oxides, invalidating many fecal results in which special chemistry was not used.

2) Little is known about high fired oxides. Accurate dose modeling takes decades to develop. Because high fired oxides are a relatively recent phenomenon, they are not accounted for in dose modeling in use today by NIOSH or in dose modeling for instance at Rocky Flats. Current models in use underestimate high fired oxide exposure by as much as a factor of 10 according to Dr. Bob Bistline. For example, high fired oxides at Rocky Flats have been found to range from 0.12 to 0.3 um AMAD, however NIOSH uses a particle size of 5.0 (ICRP 66) and even Rocky Flats Dosimetry Department uses a particle size of 1.0.

3) High fired oxides have self-shielding properties that make accurate assessment, even by lung count, impossible. When plutonium particles are heated to extreme temperatures they become "ceramicized" or glazed over on the outside of the particle. The hardened outer surface of the high fired oxide particle actually shields or masks the plutonium alpha radiation being emitted from the particle. This factor tricks the lung counter into detecting less plutonium than is actually present in the lung. According to Dr. Bistline with high fired oxides, the calculation of lifetime dose based on lung count is usually in error.

4) It is impossible to tell whether plutonium detected by lung count is soluble or insoluble so it is impossible to know what model to apply. Rocky Flats has both soluble and insoluble forms of plutonium. Using even a moderately soluble equation results in calculations that are completely in error. "Super Y screws up the modeling," said one dose assessment expert at Rocky Flats.

5) Because of the insolubility of high fired oxides, worker exposures can go undetected for decades. "We have found a number of people now years later that have plutonium in their bodies that was never picked up by the monitoring in place at the time," Dr. Bistline said in a recent phone interview. These new-found exposures cannot be tied to an incident date and so accurate dose reconstruction is impossible. "Dose assessment works well when you know the incident that the dose came from, not when you don't," according to a Rocky Flats dose assessment expert.

Legal Right of Representation

It is on the basis of the numerous factors outlined above that the United Steelworkers of America, Local 8031, in good faith submits this Petition for inclusion in the Special Exposure Cohort on behalf of its membership. USWA, Local 8031 has legal right of representation of this Rocky Flats class of workers both through vote certified by the National Labor Relations Review Board and as recognized in labor-management contracts, including the most recent contract with Kaiser-Hill Company, LLC signed on February 2, 2001. Documentation of legal representation by USWA, Local 8031 is included as an attachment to SEC Petition, Form B. The Rocky Flats class of workers has been under union representation since May 18, 1953. Unions that have represented this class of workers include: Denver Metal Trades Council (1953-1964), United Mine Workers of America (1965-1968), International Union of District 50 (1968-1972), and United Steelworkers of America (1972-Present).

Rocky Flats Class of Employees and Relevant Locations of the Facility

The class of employees covered by this petition were/are employed at the U.S. Department of Energy's Rocky Flats site near Golden, Colorado, also known as Rocky Flats Plant, Rocky Flats Environmental Technology Site and Rocky Flats Closure Project anytime during the period of April 1952 through present and as of the date of this petition. The class of employees includes all workers who were either:

1) Monitored using a dosimeter badge and/or bioassay or who worked in positions that are now required to be monitored wearing a dosimeter badge and/or bioassay, and/or

2) Who worked in areas of plutonium exposure, in particular focusing on but not limited to facilities with known high fired oxide processes or exposures, including: Building 371/374, Building 559, Building 707, Building 771, Building 774, Building 776, Building 777, Building 778, Building 779 and any others identified.

Unmonitored, Unrecorded or Inadequately Monitored or Recorded Exposures and Supporting Documentation

This petition is based on multiple unmonitored, unrecorded, or inadequately monitored or recorded exposures that are not specific to specified incidents. Therefore, this petition covers the entire time period of plutonium exposure at Rocky Flats from April 1952 to the date of petition submittal. Specifics regarding unmonitored, unrecorded, inadequately monitored or recorded exposures are included in our SEC Petition Form B, Section E.5. This petition is further based on the fact that records and information are inadequate for individual dose reconstructions based on the fact that 1) certain types of radiation exposures and doses incurred by the Rocky Flats class were not monitored for certain periods of time and certain types of exposure (i.e. to high fired oxides) are inaccurately modeled and reported on dose records; 2) for certain areas either no monitoring occurred or dosimetry chips were destroyed or lost during processing resulting in no data available; 3) for many employees accurate records of what facilities a person worked in and when they worked there do not exist, and 4) expert testimony supports the inability to reconstruct dose for high fired oxides; technical documents including site independent investigation reports, Price Anderson Amendment Act and Defense Nuclear Facility Safety Board reports support periods of inadequate monitoring. As applicable, these reports and expert testimony are referenced and attached to the SEC Petition, Form B.

Unique Challenges of a Closure Site

This petition is further based on the unique challenges of a closure site that render the accuracy of future dose reconstruction impossible. This coupled with the passage of time, the secrecy of the past weapons production mission and the elimination of the recall programs that allowed for model refinement preclude accurate dose reconstruction. As stated by R. Williams Field, M.S, Ph.D., from the College of Public Health, Department of Epidemiology, "It is a fatal flaw to assume that an investigator, 30 to 50 years after the fact, can validly reconstruct work conditions and processes that led to maximal exposures at the time of employment. . .. Because of the secrecy of much of the former AEC/DOE work, especially on bomb construction and dismantlement, much of the work process information has been intentionally suppressed or destroyed."

The USWA, Local 8031 reserves the right to provide additional information beyond that which is included in this petition in support of our efforts to achieve Special Exposure Cohort designation.

SEC PETITION, FORM B

Special Exposure Cohort Petition
under the Energy Employees Occupational Illness Compensation Act

U.S. Department of Health and Human Services
Centers for Disease Control and Prevention
National Institute for Occupational Safety and Health

OMB Number: 0920-0639 Expires: 05/31/2007

Special Exposure Cohort Petition — Form B

Use of this form and disclosure of Social Security Number are voluntary. Failure to use this form or disclose this number will not result in the denial of any right, benefit, or privilege to which you may be entitled.

General Instructions on Completing this Form *(complete instructions are available in a separate packet)*:

Except for signatures, please **PRINT** all information clearly and neatly on the form.

Please read each of Parts A — G in this form and complete the parts appropriate to you. If there is more than one petitioner, then each petitioner should complete those sections of parts A – C of the form that apply to them. Additional copies of the first two pages of this form are provided at the end of the form for this purpose. A maximum of three petitioners is allowed.

If you need more space to provide additional information, use the continuation page provided at the end of the form and attach the completed continuation page(s) to Form B.

If you have questions about the use of this form, please call the following NIOSH toll-free phone number and request to speak to someone in the Office of Compensation Analysis and Support about an SEC petition: **1-800-356-4674.**

If you are:			
	☒ A Labor Organization,	Start at D	on Page 3
	☐ An Energy Employee (current or former),	Start at C	on Page 2
	☐ A Survivor (of a former Energy Employee),	Start at B	on Page 2
	☐ A Representative (of a current or former Energy Employee),	Start at A	on Page 1

A Representative Information — Complete Section A if you are authorized by an Employee or Survivor(s) to petition on behalf of a class.

A.1 **Are you a contact person for an organization?** ☐ Yes (Go to A.2) ☐ No (Go to A.3)

A.2 **Organization Information:**

Name of Organization

Position of Contact Person

A.3 **Name of Petition Representative:**

Mr./Mrs./Ms. First Name Middle Initial Last Name

A.4 **Address:**

Street Apt # P.O. Box

City State Zip Code

A.5 **Telephone Number:** ( ) -

A.6 **Email Address:**

A.7 ☐ Check the box at left to indicate you have attached to the back of this form written authorization to petition by the survivor(s) or employee(s) indicated in Parts B or C of this form. An authorization

If you are representing a Survivor, go to Part B. If you are representing an Employee, go to Part C.

Name or Social Security Number of First Petitioner: Anthony W. DeMaiori, USWA, 8031

B Survivor Information — Complete Section B if you are a Survivor or representing a Survivor.

B.1 **Name of Survivor:**

Mr./Mrs./Ms. First Name Middle Initial Last Name

B.2 **Social Security Number of Survivor:** _____

B.3 **Address of Survivor:**

Street Apt # P.O. Box

City State Zip Code

B.4 **Telephone Number of Survivor:** ( ) -

B.5 **Email Address of Survivor:** _____

B.6 **Relationship to Employee:** ☐ Spouse ☐ Son/Daughter ☐ Parent ☐ Grandparent ☐ Grandchild

Go to Part C

C Employee Information — Complete Section C UNLESS you are a labor organization.

C.1 **Name of Employee:**

Mr./Mrs./Ms. First Name Middle Initial Last Name

C.2 **Former Name of Employee** (e.g., maiden name/legal name change/other):

Mr./Mrs./Ms. First Name Middle Initial Last Name

C.3 **Social Security Number of Employee:** _____

C.4 **Address of Employee** (if living):

Street Apt # P.O. Box

City State Zip Code

C.5 **Telephone Number of Employee:** ( ) -

C.6 **Email Address of Employee:** _____

C.7 **Employment Information Related to Petition:**

C.7a Employee Number (if known): _____

C.7b Dates of Employment: Start _____ End _____

C.7c Employer Name: _____

C.7d Work Site Location: _____

C.7e Supervisor's Name: _____

Go to Part E

D Labor Organization Information — Complete Section D ONLY if you are a labor organization.

D.1 **Labor Organization Information:**

United Steelworkers of America, Local 8031 (Rocky Flats)
Name of Organization

President
Position of Contact Person

D.2 **Name of Petition Representative:**

A

D.3 **Address of Petition Representative:**

Street Apt # P.O. Box

Golden **Colorado** **80403**
City State Zip Code

D.4 **Telephone Number of Petition Representative:**

D.5 **Email Address of Petition Representative:**

D.6 **Period during which labor organization represented employees covered by this petition** (please attach documentation): Start End

D.7 **Identity of other labor organizations that may represent or have represented this class of employees** (if known):

Denver Metal Trades Council, United Mineworkers of America, International Union of District 50

Go to Part E

E Proposed Definition of Employee Class Covered by Petition — Complete Section E.

E.1 **Name of DOE or AWE Facility:** **Rocky Flats (also Rocky Flats Plant, Rocky Flats Environmental Technology Site, Rocky Flats Closure Project)**

E.2 **Locations at the Facility relevant to this petition:**
Facilities where plutonium operations occurred, focusing on but not limited to facilities with known high fired oxide processes or exposures.

Such as Buildings 371, 374, 559, 707, 771, 776, 777, 778, 779 and any others to be identified.

E.3 **List job titles and/or job duties of employees included in the class. In addition, you can list by name any individuals other than petitioners identified on this form who you believe should be included in this class:**

All - See Tab E.3 for additional information

E.4 **Employment Dates relevant to this petition:**

St art _____ End _____

St art _____ End _____

St art _____ End _____

E.5 **Is the petition based on one or more unmonitored, unrecorded, or inadequately monitored or recorded exposure incidents?:** ☒ Yes ☐ No **See Tab E.5 for additional details.**

If yes, provide the date(s) of the incident(s) and a complete description (attach additional pages as necessary):

This petition is based on multiple unmonitored, unrecorded or inadequately monitored or recorded exposures that are not related to a specific incident. It is our contention that throughout the history of the site it was common practice for incidents in the workplace to be handled at the floor or building level and not officially reported. Some exposure incidents were below the detection thresholds in place at the time which varied greatly over time. This is evidenced by the 2000/2001 Building 771 worker exposure incident in which several workers were found to have received doses that had gone undetected by workplace monitoring. Because there was no incident to tie the dose to, the dose estimates assigned are suspect. Most importantly, this incident provides proof that exposures routinely go undetected. Tab E.5 contains more information on this incident, a copy of the investigation report and details of additional incidents.

Go to Part F

F Basis for Proposing that Records and Information are Inadequate for Individual Dose — Complete Section F.

Complete **at least one** of the following entries in this section by checking the appropriate box and providing the required information related to the selection. You are not required to complete more than one entry.

F.1 ☐☒ I/We have attached either documents or statements provided by affidavit that indicate that radiation exposures and radiation doses potentially incurred by members of the proposed class, that relate to this petition, were not monitored, either through personal monitoring or through area monitoring.

(Attach documents and/or affidavits to the back of the petition form.)

Describe as completely as possible, to the extent it might be unclear, how the attached documentation and/or affidavit(s) indicate that potential radiation exposures were not monitored.

The highly insoluble forms of plutonium resulting from past fires and high temperature processes are only now being recognized as a complex issue when determining internal dose. Although Rocky Flats has had a long standing history of personnel monitoring, it is has only been with the improvement of laboratory analysis that workers considered to be falsely positive be re-evaluated as having a positive internal deposition, many of which had no significant event or events associated to their intake.
Tab F.1 includes additional details, testimony and other documentation.

F.2 ☐☒ I/ We have attached either documents or statements provided by affidavit that indicate that radiation monitoring records for members of the proposed class have been lost, falsified, or destroyed; or that there is no information regarding monitoring, source, source term, or process from the site where the employees worked.

(Attach documents and/or affidavits to the back of the petition form.)

Describe as completely as possible, to the extent it might be unclear, how the attached documentation and/or affidavit(s) indicate that radiation monitoring records for members of the proposed class have been lost, altered illegally, or destroyed.

Tab F.2 includes additional details, and signed worker statement.

Part F is continued on the following page.

F.3 ☐☒ I/We have attached a report from a health physicist or other individual with expertise in radiation dose reconstruction documenting the limitations of existing DOE or AWE records on radiation exposures at the facility, as relevant to the petition. The report specifies the basis for believing these documented limitations might prevent the completion of dose reconstructions for members of the class under 42 CFR Part 82 and related NIOSH technical implementation guidelines.

(Attach report to the back of the petition form.) **See Tab F.3**

F.4 ☐☒ I/We have attached a scientific or technical report, issued by a government agency of the Executive Branch of Government or the General Accounting Office, the Nuclear Regulatory Commission, or the Defense Nuclear Facilities Safety Board, or published in a peer-reviewed journal, that identifies dosimetry and related information that are unavailable (due to either a lack of monitoring or the destruction or loss of records) for estimating the radiation doses of employees covered by the petition.

See Tab F.4

Go to Part G

G Signature of Person(s) Submitting this Petition — Complete Section G.

All Petitioners should sign and date the petition. A maximum of three persons may sign the petition.

Signature				Date
	Anthony	DeMaiori	President	2-15-05
	Bob	Santangelo	V.P.	2-15-05
	Steven	Trujillo	Committee	2-15-05

Notice: Any person who knowingly makes any false statement, misrepresentation, concealment of fact or any other act of fraud to obtain compensation as provided under EEOICPA or who knowingly accepts compensation to which that person is not entitled is subject to civil or administrative remedies as well as felony criminal prosecution and may, under appropriate criminal provisions, be punished by a fine or imprisonment or both. I affirm that the information provided on this form is accurate and true.

Send this form to:

SEC Petition
Office of Compensation Analysis and Support
NIOSH
4676 Columbia Parkway, MS-C-47
Cincinnati, OH 45226

If there are additional petitioners, they must complete the Appendix Forms for additional petitioners. The Appendix forms are located at the end of this document.

Public Burden Statement

Public reporting burden for this collection of information is estimated to average 300 minutes per response, including time for reviewing instructions, gathering the information needed, and completing the form. If you have any comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, send them to CDC Reports Clearance Officer, 1600 Clifton Road, MS-E-11, Atlanta GA, 30333; ATTN:PRA 0920-0639. Do not send the completed petition form to this address. Completed petitions are to be submitted to NIOSH at the address provided in these instructions. Persons are not required to respond to the information collected on this form unless it displays a currently valid OMB number.

Privacy Act Advisement

In accordance with the Privacy Act of 1974, as amended (5 U.S.C. § 552a), you are hereby notified of the following:

The Energy Employees Occupational Illness Compensation Program Act (42 U.S.C. §§ 7384-7385) (EEOICPA) authorizes the President to designate additional classes of employees to be included in the Special Exposure Cohort (SEC). EEOICPA authorizes HHS to implement its responsibilities with the assistance of the National Institute for Occupational Safety (NIOSH), an Institute of the Centers for Disease Control and Prevention. Information obtained by NIOSH in connection with petitions for including additional classes of employees in the SEC will be used to evaluate the petition and report findings to the Advisory Board on Radiation and Worker Health and HHS.

Records containing identifiable information become part of an existing NIOSH system of records under the Privacy Act, 09-20-147 "Occupational Health Epidemiological Studies and EEOICPA Program Records. HHS/CDC/NIOSH." These records are treated in a confidential manner, unless otherwise compelled by law. Disclosures that NIOSH may need to make for the processing of your petition or other purposes are listed below.

NIOSH may need to disclose personal identifying information to: (a) the Department of Energy, other federal agencies, other government or private entities and to private sector employers to permit these entities to retrieve records required by NIOSH; (b) identified witnesses as designated by NIOSH so that these individuals can provide information to assist with the evaluation of SEC petitions; (c) contractors assisting NIOSH; (d) collaborating researchers, under certain limited circumstances to conduct further investigations; (e) Federal, state and local agencies for law enforcement purposes; and (f) a Member of Congress or a Congressional staff member in response to a verified inquiry.

This notice applies to all forms and informational requests that you may receive from NIOSH in connection with the evaluation of an SEC petition.

Use of the NIOSH petition forms (A and B) is voluntary but your provision of information required by these forms is mandatory for the consideration of a petition, as specified under 42 CFR Part 83. Petitions that fail to provide required information may not be considered by HHS.

Name or Social Security Number of First Petitioner: **Anthony W. DeMaiori, USWA, 8031**

FORM NLRB 760
(4-62)

UNITED STATES OF AMERICA
NATIONAL LABOR RELATIONS BOARD

DOW CHEMICAL COMPANY,
ROCKY FLATS DIVISION,

Employer

and

INTERNATIONAL UNION OF DISTRICT 30,
UNITED MINE WORKERS OF AMERICA,

Petitioner

Case No. 27-RC-2693

Date Issued October 8, 1964

Type of election (Check one):

- [X] Consent Agreement
- [ ] Stipulation
- [ ] Board Direction
- [ ] RD Direction
- [ ] 8(b) (7)

TALLY OF BALLOTS

The undersigned agent of the Regional Director certifies that the results of the tabulation of ballots cast in the election held in the above case, and concluded on the date indicated above, were as follows:

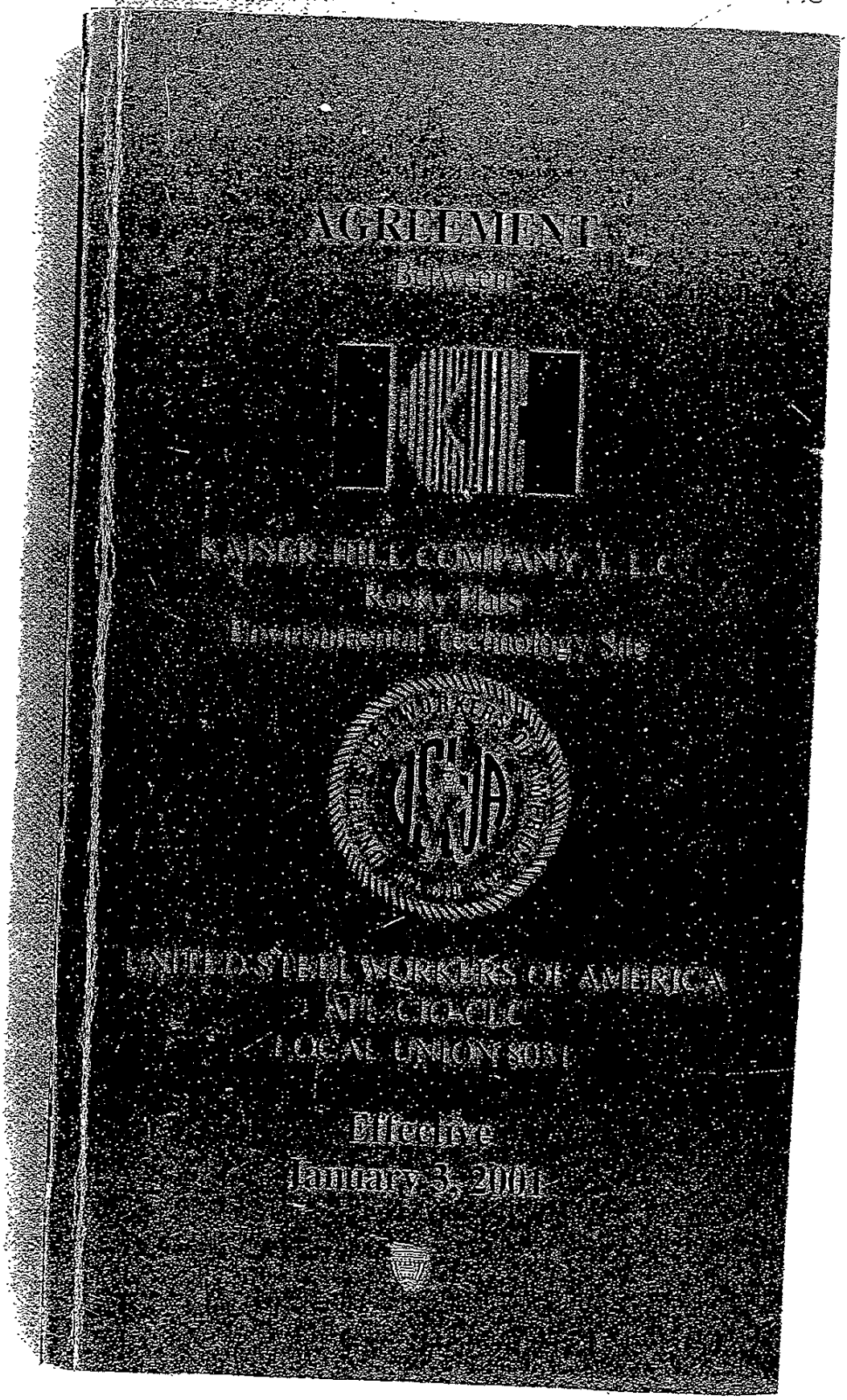
1. Approximate number of eligible voters 1711
2. Void ballots 3
3. Votes cast for ... UNITED MINE WORKERS, PETITIONER 818
4. Votes cast for ... DENVER METAL TRADES COUNCIL, INTERVENOR 783
5. Votes cast against participating labor organization(s) .....
6. Valid votes counted (sum of 3, 4, 5, and 6) 1601
7. Challenged ballots 5
8. Valid votes counted plus challenged ballots (sum of 7 and 8) 1606
9. Challenges are (not) sufficient in number to affect the results of the election.
10. A majority of the valid votes counted plus challenged ballots (Item 9) has (not) been cast for:

.....

For the Regional Director

.....

D.6


AGREEMENT
Between
KAISER-HILL COMPANY, L.L.C.
Rocky Flats
Environmental Technology Site
UNITED STEEL WORKERS OF AMERICA
AFL-CIO-CLC
LOCAL UNION 8031
Effective
January 3, 2001

ACCEPTED AND AGREED TO

BY THE

UNITED STEELWORKERS OF AMERICA,
AFL-CIO-CLC

On Behalf of
Local Union 8031

L. W. Gerard
International President

A. W. DeMaiori
President
Local 8031

J. English
International Secretary/Treasurer

J. W. Barton
Vice President
Local 8031

L. Lynch
International Vice President
of Human Affairs

R. F. Malito
Treasurer/Committeeperson
Local 8031

R. H. Davis
International Vice President
of Administration

C. W. Buchholz
Financial Sec./Committeeperson
Local 8031

T. Bonds
Director
District 12

R. F. DiGiorgio
Committeeperson
Local 8031

D. Kins
Sub-Director
Sub-District 5

C. A. Miller
Trustee/Committeeperson
Local 8031

C. N. Morris
International Representative

A. C. Scarpella
Trustee/Committeeperson
Local 8031

ACCEPTED AND AGREED TO

BY

KAISER-HILL COMPANY, L. L. C.

A. M. Parker
Executive Vice President &
Chief Operating Officer

M. S. Elenbaas
Manager
Benefits Administration

L. A. Martinez
Vice President & CFO
Administration

M. C. Keese
Representative
Labor Relations

R. C. Easdon
Division Manager
Labor Relations

S. A. Shaw
Representative
Labor Relations

R. L. Piers
Manager
Labor Relations

R. D. Slaughter
Representative
Labor Relations

E.2 Locations at this facility relevant to this petition:

The United Steelworkers of America Local 8031 is seeking Special Exposure Cohort designation under the Energy Employees Occupational Illness Compensation Act for all current and former Rocky Flats employees who as by job description or by circumstance came into contact with high fired oxides, salts, ash, and plutonium metals, all of which produce large amounts of penetrating radiation and are highly insoluble to the lung when inhaled. The locations of the Rocky Flats facility that are relevant to this petition include all plutonium process areas, including but not limited to areas in which high fire oxides occurred through unintentional fires or thermal processes.

The following provides additional information on the locations at Rocky Flats where plutonium exposures occurred that either went unmonitored or unrecorded or where inadequate monitoring and recording occurred. It is our contention that inaccurate recording of doses includes the inability of current models to accurately assess dose of high fired oxides otherwise known as super class Y materials. Therefore, the following information is focused in particular, but not limited to, areas in which high fired oxides were present.

The following are some, but not all, of the materials processed/handled at Rocky Flats that had the potential to result in high fired oxide/insoluble plutonium exposures: plutonium and enriched uranium oxides, metal buttons for molten salt process, metal buttons and skin turnings for molten salt, americium oxide and miscellaneous oxides, anode heel, high level caustic waste oxide, high purity oxide heel, peroxide cake, green cake, impure peroxide cake, Hanford Purex oxide, grease oxide, high fired DOR oxide, Plutonium Stabilization and Packaging System (PUSPS), pure and impure metals and oxides, PUSPS chlorinated oxides, incinerator sludge, hydride from TA crucibles, unpulverized slag, grounded/blended slag, unpulverized and pulverized sand, slag and crucible, sand, slag and crucible (SS&C) heel, ground SS&C heel, molten salt pulverized and unpulverized (CA, Zn and K), electrorefining salts, plutonium chloride mixed salt, incinerator ash and pulverized incinerator ash, ash and debris from the 1969 fire, ash heel, soot and soot heals, resin, unleached resin, electrorefining salts and ceramics, etc.

Building and Process History

Building 771 was built in 1952 and became operational in 1953. It was designed for plutonium recovery and purification operations. It had the capability of producing plutonium buttons. Although many of the process lines were of an aqueous nature, many others were dry. Building 771 was the site of the second largest fire in Rocky Flats history. That fire occurred in 1957. As a result of the fire much of the facility became contaminated with high fired oxides. Numerous other smaller fires throughout the building history also contributed to high fired oxide exposures, including the incinerator plenum fire in 1980. Deactivation and decommissioning (D&D) of the facility began in 1995. The D&D workers tearing apart Building 771 were exposed to high fired oxides. Additionally, Building 771 had several dry lines that would take the wet plutonium material and by procedure heat it to a prescribed temperature, creating an ash or light powdered oxide. These thermal processes created high fired oxides. And finally, the infamous Building 771 incinerator which was a central topic in the FBI raid of 1989 burned plutonium contaminated wastes and residues also generating high fired oxides. All dosimeter-bearing workers and workers who worked in positions where dosimeters or bioassays were later required had potential

exposure to high fired plutonium oxides. However since Building 771 also involved processes in which soluble forms of plutonium were handled, it is impossible to determine by bioassay alone what form of plutonium a worker was exposed to making accurate dose reconstruction impossible. Building 771 was also the facility known for the Building 771 Worker Exposure Incident in which several workers received exposures that could not be linked to an incident. An investigation concluded that the cause of the exposures was chronic long-term exposure to small amounts of airborne contamination that were below the detection limit of monitoring equipment. This was documented in the March 2001 investigative report which is attached to this petition. Examples of Building 771 processes generating high fired oxides are as follows.

- The incinerator line was designed to recover plutonium from contaminated objects, by heating a burn box type furnace to approximately 800 degrees Celsius; this process would create a fine ash type material that would eventually be run through the ball mill process.
- The Calcination line would take a high gram per liter wet green cake material (PuO3) and by heating it to approximately 1200 degrees Celsius it would be dried into a powdery light oxide and staged for the hydrofluorination line.
- The fluorination line would take the green cake (PuO3) and by a heat and chemical reaction convert it to pink cake (PuF4).
- Button breakout was a high-fired line that produced an almost pure plutonium button. This was achieved by taking PuF4, an initiator (magnesium metal) placing them into a crucible and then into a reaction vessel (RV). The RV would then be inserted into K furnace. Extreme heat would cause a reaction creating pressure that would initiate a small explosion, generating a button.
- The crusher line would take button breakouts crucibles as well as the sand and slag from the incinerator and pulverize it into a fine powder so that it could be dissolved *and the plutonium recaptured.*

<u>Building 371</u> was built between 1973 and 1981. It was designed to replace Building 771 recovery operations. Design problems forced the shutdown of the chemical processing part in 1985, however high fired oxide, ash, and salt residue repack and stabilization continued on a full time basis until the early 2000s. The last of the material was packaged and sent off site by the Plutonium Stabilization and Packaging System group (PUSPS) in early 2004. High fired oxide exposures stem from the processes bulleted below. Similarly to Building 771, Building 371 also involved processes using soluble forms of plutonium. The form of plutonium a person was exposed to cannot be accurately determined since both forms are present on a day-to-day basis. Not knowing the form of plutonium makes it impossible to accurately assess dose. Building 371 was also the site of numerous small fires, including the most recent glovebox fire in 2003. The D&D of Building 371 began in 2000 and continues today. Workers performing D&D in areas where thermal processes occurred and in areas contaminated by multiple fires have potential for exposure to high fired oxides.

- Room 3206 (site return) would take plutonium oxide that was stored in the stacker retriever and high fire it in an oven at 450 degrees Celsius for up to four hours then package it in produce cans for shipment to Los Alamos.

- Room 3602 (shipping and receiving) would take non-weapons speck plutonium metal and cook it in a muffle furnace at 450 degrees Celsius turning it into oxide.
- 3515 (button breakout) fired buttons before being shut down in 1989.
- 3701 and 3717 continuously had four furnaces going at 850 degrees Celsius for approximately four hours to stabilize oxide for shipment to Savannah River.
- 3305 (Electro refining) yielded dry plutonium oxide, metal, and 411 high gamma neutron salts.

Building 374 was a waste processing facility adjacent to Building 371. Building 374 included a thermal process known as the spray dryer where liquid plutonium waste was dried and atomized using a high temperature furnace and spray process. Building 374 was also the site of smaller fires, including a fire in the bag house for the spray dryer in the late 1970s.

Building 776-777 was built between 1956 and 1957. It went into service in 1958 to handle the increased plutonium workload. While building 771 undertook recovery operations, Building 776 would perform the plutonium machining, and Building 777 would handle the assembly operations. In 1968 a process known as molten salt extraction was introduced to Building 776. This process would take the pure plutonium metal from site returns and remove the americium ingrowth. The plutonium metal would then be sent directly to the plutonium foundry operations in Building 777 for casting and subsequent processing into plutonium components. Other refining processes included direct oxide reduction and salt scrub processing. Building 776 was the site of the largest plutonium fire in Rocky Flats history. At the time this fire was also the largest industrial fire to have ever occurred in our nation. The fire started at approximately 2 p.m. on Mother's Day, May 11, 1969, and burned for over 6 hours. The temperature of this fire was so hot it melted through stainless steel gloveboxes and released massive amounts of contamination throughout the entire building. See Building 776/777 Contamination Map as attached to the end of this section E.2. Because worker protection standards were less at the time fire cleanup workers in 1969 wore inferior respiratory protection resulting in internal depositions of high fired oxides. Building 776 was also the site of an earlier fire in 1965 that resulted in the highest radiation exposure to workers. This fire which burned in an oil-laden pipe under a glovebox burned at temperatures in excess of 1800 degrees Celsius. More than 25 workers received significant internal depositions from the 1965 fire with some as high as 30 times the maximum allowable lung dose at the time which equated to lung burdens of more than 480 nanocuries. More than 380 people received special lung counts and many more than 25 workers have now been identified through further lung counts as having received exposures from the 1965 fire. The D&D of Building 776/777 began in 1997. D&D workers in Building 776 have the greatest chance of undetected high fired oxide exposure from day-to-day operations and D&D operations in the facility in which the small high fired oxide particles can become airborne at levels undetectable by workplace monitoring equipment. These particles have both self-sheilding properties because they were ceramicized by the high temperature of the fire and deep penetration with particles as small as .12 um AMAD. Also these are highly insoluble taking as much as 6,000 days to show up in urine bioassays. The following bullets provide additional information on thermal processes in Building 776/777.

- Six production-scale electric furnaces were installed in 1966 to conduct electro-refining and were later discontinued due to low yields. In 1988 the process was

restarted to produce pure plutonium metal, salts (magnesium, sodium, and potassium) and anode heels.

- In 1972 six furnaces were installed to remove americium salts and plutonium chloride salts from the contaminated salt process. Also known as the "salt scrub process".
- Without using aqueous processing, direct oxide reduction processes produced plutonium metal from plutonium oxide, and eliminated a high-exposure hydroflurination step used in Building 771.

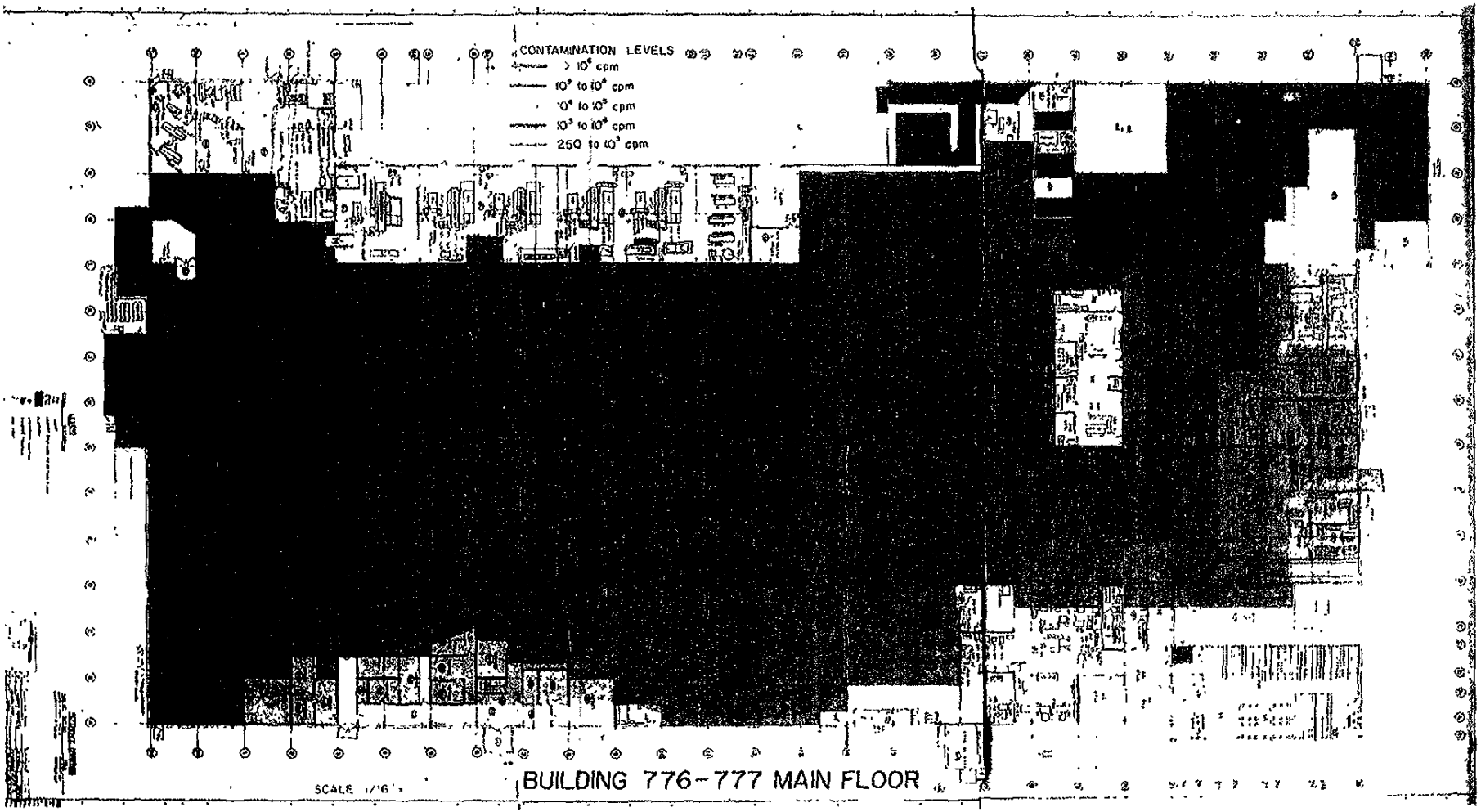
Building 707 was built in the late sixties, and was known as the new assembly building. It took over final assembly operations from Building 776 shortly after the fire. Solid waste treatment and size reduction started in 1972. The building contained eight side by side modules (A through H) and Building 707A housed modules J and K. these two modules contained plutonium foundry operations and two plutonium storage vaults. Building 707 was also the site of smaller fires and included processes that produced both soluble and insoluble forms of plutonium. D&D in Building 707 began in the 1990s and were completed with demolition in late 2004. D&D workers in Building 707 that removed the furnaces and D&Ded areas where high temperature processes or past fires occurred were exposed to high fired oxides.

- J-module contained several tilt pour furnaces. These furnaces were designed to melt the non-speck Plutonium buttons and other material not meeting a specific standard. They would run at 950 degrees Celsius for about one hour. The molten metal would then be poured into a 680 degree Celsius graphite mold. J module also contained several bottom pour furnaces with a range of operation between 500 to 600 degrees Celsius.
- K-module contained several tilt pour and bottom pour furnaces and ran at operating temperatures similar to J module.
- A-module contained a muffler furnace, burn box, and tilt pour furnaces.
- In the 1990s and early 2000, Building 707 furnaces were used to perform plutonium oxide stabilization processes in response to a Defense Board milestone. These processes involved temperatures in excess of 900 degrees Celsius and generated high fired oxides.

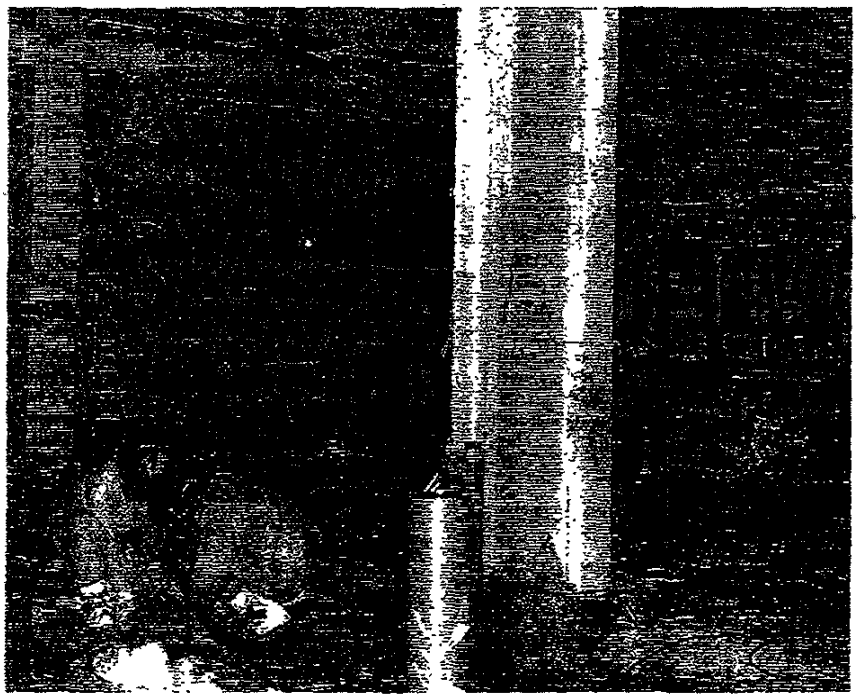
E.2 ATTACHMENTS

Building 776/777 Contamination Map

Building 776/777 1969 Fire Cleanup Photos


CONTAMINATION LEVELS
> 10⁶ cpm
10⁵ to 10⁶ cpm
10⁴ to 10⁵ cpm
10³ to 10⁴ cpm
250 to 10³ cpm
SCALE 1/16"
BUILDING 776-777 MAIN FLOOR

Building 776/777 1969 Fire Cleanup Photos



E.3 List Job Titles and/or job duties of employees included in the class.

All employees represented by USWA, Local 8031 or its predecessors who meet the criteria outlined below. The class of employees covered by this petition were/are employed at the U.S. Department of Energy's Rocky Flats site near Golden, Colorado, also known as Rocky Flats Plant, Rocky Flats Environmental Technology Site and Rocky Flats Closure Project anytime during the period of April 1952 through present and as of the date of this petition. The class of employees includes:

1) All workers who either were monitored using a dosimeter badge or bioasssay or who worked in positions that are now required to be monitored wearing a dosimeter badge or bioassay, and/or

2) Who worked in areas of plutonium exposure, in particular focusing on but not limited to, facilities with known high fired oxide processes or exposures, including: Building 371/374, Building 559, Building 707, Building 771, Building 774, Building 776, Building 777, Building 778, Building 779 and any others identified.

Job titles and/or job duties of employees included in this class include, but are not limited to, both production operations classifications and D&D classifications of employees. Due to the nature of D&D great potential exists for exposure to plutonium, including but not limited to high fired oxides, during the D&D process which go undetected because they are below the detection threshold of workplace monitoring equipment; refer to Investigation Team Report – Investigation of the source of potential internal radiological exposures involving 11 personnel in Building 771 dated March 15, 2001, and included as an attachment to this petition. In particular, D&D workers in areas of past plutonium fires and areas of high temperature thermal processes are vulnerable to exposures that could go undetected for years. Inability to link these exposures to an incident date, lack of knowledge regarding particle size and forms of plutonium exposed to and self-shielding and unique metabolic properties of high fired oxides make dose reconstruction for these employees included in this class impossible.

Workers traveled from facility to facility in later production days and even more so during D&D. Accurate records were not kept on where an employee worked or when he/she worked in a particular facility. Therefore it is difficult to track what building an exposure came from when there is no incident to tie the exposure to. A worker may be assigned to a non-plutonium area and yet work two days of overtime a week in a plutonium area where high fired oxides are present. Additionally workers who worked as Steelworkers at one time and transferred to a subcontractor(s) may have multiple employee numbers so when their dose records are retrieved for evaluation, entire periods of time and exposure may be missing.

Attached is a listing of some of the job titles under our union contract at Rocky Flats. As stated above, this petition is to cover ALL our represented employees who meet the criteria outlined above.

E.3 ATTACHMENT

List of Job Titles

PARTIAL LIST OF POTENTIAL HAZARDS ASSOCIATED WITH VARIOUS JOB DESCRIPTIONS AND LOCATIONS

Much of the data in the following table is taken from DOE Uranium Mass Balance Project report found at *http://tis.eh.doe.gov/legacy/reports/rockyflats/section1_2.pdf*. This table is not a comprehensive listing of potential radiological exposures associated with Rocky Flats, but is a summary of data readily available at this time.

Job title	Process description	Building	Type of work	Begin	End	Material	Primary radiation type	Maximum energy
Analytical laboratory technicians	Sample processing	559	Plutonium sample analysis			Pu	α	5.16 MeV
Analytical laboratory technicians	Sample processing	881	HEU or DU sample analysis	1953	1965	HEU	α	4.6 MeV
Assemblers	Pit Assembly	700	Handled "War Reserve" components					
Assemblers	Varied - similar to Metallurgical Operators depending on location	Varied	Handled metal parts					
Boiler vent operators (bvos)	Varied - depending on location	Varied	Monitor exhaust systems, waste tanks, and process waste lines					
Carpenters	Varied - depending on location	Varied	Refractory replacement in casting and heat treatment furnaces					
Chemical operators	Pu metal reprocessing	371	Handled contaminated reagents					
Chemical operators	Waste treatment	374	Handled contaminated reagents					
Chemical operators	Waste handling	447	Handled contaminated reagents	1956	1989	DU	α	4.2 MeV
Chemical operators	Component cleaning	447	Handled contaminated reagents	1956	1989	DU	α	4.2 MeV
Chemical operators	Waste handling	447	Processed waste materials	??	??	DU chips	α	4.2 MeV
Chemical operators	Electrolytic decon of legacy HEU contaminated with Pu	707	Handled contaminated reagents	1997	1999	HEU Pu	α	4.6 MeV 5.6 MeV
Chemical operators	Pu metal reprocessing	771	Handled contaminated reagents; Pu-contaminated $^{235}U_3O_8$ oxide	1965?	1989	Pu-^{235}U oxide	α	5.16 MeV 4.2 MeV
Chemical operators	Waste treatment	774	Handled contaminated reagents, liquid wastes from 881	1953	1989	HEU liquid wastes	α	4.6 MeV
Chemical operators	Molten salt processing	776	Handled contaminated reagents	1958	1989	Pu-239	α	5.16 MeV
Chemical operators	Process DU metal	865	Handled contaminated reagents	1953	1989	DU	α	4.2 MeV
Chemical operators	HEU metal reprocessing	881	Handled contaminated reagents	1953	1965	HEU	α	4.6 MeV
Chemical operators	Uranyl nitrate processing	886	Handled contaminated reagents					
Clerk packers	Varied - depending on location	Varied	Little hands-on work with radioactive materials.					
Configuration control authority personnel	Varied - depending on location	Varied	Routine access to process areas; little hands-on work					
Decontamination & decommissioning workers	Varied - depending on location	883	Deconned	1993	1995	HEU DU	α	4.6 MeV 4.2 MeV
Decontamination & decommissioning workers	Varied - depending on location	881 B side	Deconned	1985	1987	HEU	α	4.6 MeV

Attachment 2E (Continued)

Job title	Process description	Building	Type of work	Begin	End	Material	Primary radiation type	Maximum energy
Decontamination & decommissioning workers	Varied - depending on location	Varied	Drained systems, removed contaminated equipment. Often in high airborne contamination areas. Often wore PPE, including respirators with or without supplied air.					
Electricians	Varied - depending on location	Varied	Repair of instruments and controllers inside gloveboxes and other systems					
Experimental operators	Varied - depending on location	Varied	Operated prototype systems, often unshielded					
Handymen	Varied - depending on location	Varied	Little hands-on work with radioactive materials.					
Inspection technicians	Dimensional inspection	881	HEU	1953	1965	HEU	α	4.6 MeV
Inspectors	Testing	444	Inspected completed parts	1953	1994	DU	α	4.2 MeV
Janitors	Varied - depending on location	Varied	Little hands-on work with radioactive materials.					
Machinists	Pit Assembly	700	Handled "War Reserve" components					
Machinists	Machining of Pu parts	776	Operated machining equipment	1958	1969	Pu-239	α	5.16 MeV
Machinists	Plutonium assembly	777	Drilling, turning, polishing		1969	Pu-239	α	5.16 MeV
Machinists	Process DU metal	865	Machined DU and DU alloys	1953	1989	DU	α	4.2 MeV
Machinists		881	Stainless steel boost reservoirs, etc.	1966	1967			
Machinists	Rod mill grinding	881	Machined HEU parts	1953	1965	HEU	α	4.6 MeV
Machinists	Rolling, forming, machining	881	HEU	1953	1965	HEU	α	4.6 MeV
Machinists	Presses, rolling mills	883 - B	Operated machining equipment	1957	1965	HEU	α	4.6 MeV
Machinists	Roll and press DU into sheets	883 - C	Rolling mills, shears	1983	1992	DU	α	4.2 MeV
Machinists	Rolling, forming, machining	883-A	Operated machining equipment	1957	1992	DU, DU alloys	α	4.2 MeV
Machinists	Varied - similar to Metallurgical Operators depending on location	Varied	Repair of mechanical systems					
Material analysts	Varied - similar to Metallurgical Operators depending on location	Varied	Collected metal samples					
Metallurgical operators	Casting and machining	444	Operated metal handling equipment	1956	1989	DU	α	4.2 MeV
Metallurgical operators	Casting and machining	444	Operated metal handling equipment	1980	1984	DU	α	4.2 MeV
Metallurgical operators	Casting and cleaning	444	Operated metal handling equipment	1967	1969	DU/Mo	α	4.2 MeV
Metallurgical operators	Trim and polish DU sheets	444	Operated metal handling equipment	1953	1989	DU	α	4.2 MeV
Metallurgical operators	Roll and press DU	447	Operated metal handling equipment	1956	1989	DU	α	4.2 MeV
Metallurgical operators	Roll and press Pu	707	Operated metal handling equipment			Pu-239	α	5.16 MeV
Metallurgical operators	Roll and press Pu	776	Operated metal handling equipment	1958	1969	Pu-239	α	5.16 MeV
Metallurgical operators	Plutonium assembly	777			1969	Pu-239	α	5.16 MeV
Metallurgical operators	Casting, rolling, forming, shearing, and cleaning	865	Operated metal handling equipment	1979	1988	DU, DU alloys	α	4.2 MeV
Metallurgical operators	Casting, extruding, machining	865	Operated metal handling equipment	1979	1988	DU, DU alloys	α	4.2 MeV
Metallurgical operators	Process DU metal	865	Machined DU and DU alloys	1953	1989	DU	α	4.2 MeV
Metallurgical operators	Uranium casting	881	Operated metal handling equipment	1953	1965	Uranium	α	4.6 MeV
Metallurgical operators	Melting and casting	881	HEU	1953	1965	HEU	α	4.6 MeV
Metallurgical operators	Annealing	883 - B	Operated metal handling equipment	1957	1965	HEU	α	4.6 MeV
Metallurgical operators	Roll and press DU into sheets	883 - C	Operated metal handling equipment	1983	1992	DU	α	4.2 MeV
Metallurgical operators	Roll and press DU	883 A side	Operated metal handling equipment			DU	α	4.2 MeV
Metallurgical operators	Roll and press HEU	883 B side	Operated metal handling equipment	1953	1964	HEU	α	4.6 MeV

Attachment 2E (Continued)

Job title	Process description	Building	Type of work	Begin	End	Material	Primary radiation type	Maximum energy
Metallurgical operators	Roll and press Be	883 B side	Operated metal handling equipment	1964	??	Be metal		
Metallurgical operators	Casting, rolling, forming, shearing, and cleaning	883-A	Operated metal handling equipment	1957	1992	DU, DU alloys	α	4.2 MeV
Metrology technicians	Varied - depending on location	Varied	Little hands-on work with radioactive materials.					
Non-destructive testing tech	Testing	444	Tested parts	1953	1994	DU	α	4.2 MeV
Non-destructive testing tech	Tensile testing, etc.	447	Tested parts	1956	1989	DU	α	4.2 MeV
Non-destructive testing technicians	Varied - depending on location	700	Sampled completed pits					
Non-destructive testing technicians	Casting, extruding, machining	865	Operated metal handling equipment	1979	1988	DU, DU alloys	α	4.2 MeV
Non-destructive testing technicians	Testing	881	HEU	1953	1965	HEU	α	4.6 MeV
Non-destructive testing technicians	Varied - depending on location	Varied	Sampled completed pits					
Painters	Varied - depending on location	Varied	Paint over contamination					
Pipefitters	Varied - depending on location	Varied	Repair leaks on process lines					
Radiation control technicians	Varied - depending on location	Varied	Monitoring in support of chemical and metallurgical processes; exposures similar to chemical and metallurgical operators					
Security guards	Varied - depending on location	Varied	Routine security patrols					
Shift managers	Varied - depending on location	Varied	Routine access to process areas; little hands-on work					
Stationary operating engineers (SOES)	Varied - depending on location	Varied	Monitor exhaust systems, waste tanks, and process waste lines					
Welders	Welding	444	Welded parts as necessary	1953	1994	DU	α	4.2 MeV
Welders	Electron-beam, tungsten-inert gas welding	447	Welded parts as necessary	1956	1989	DU	α	4.2 MeV
Welders	Plutonium assembly	777	Welding, brazing		1969	Pu-239	α	5.16 MeV
Welders	Varied - similar to Metallurgical Operators depending on location	Varied	Welded metal parts					

E.5 Is this petition based on one or more unmonitored, unrecorded or inadequately monitored or recorded exposure incidents?

Yes. In response to this question, we provide two forms of documenting evidence: 1) a description of incidents or occurrences which document unmeasured or unrecorded or inadequately measured or recorded exposure incidents and 2) evidence of inadequacy in monitoring or recording of exposure incidents in particular in light of the unique properties of high fired oxides which make accurate dose reconstruction impossible. We contend that exposures to high fired oxides cannot and have never been accurately recorded.

The federal government has recognized the role of plutonium exposure in causing more than 20 types of cancers as addressed by the Compensation Act. In particular plutonium has been linked to cancers of the bone, liver, lung and leukemia and chromosome aberrations (Potential Health Problems from Exposure to Selected Radionuclides, May 2000). Other research has suggested that plutonium exposure weakens the immune system and leads to the development of cancers outside the lymph nodes. In 1987, a study by Gregg Wilkinson of Rocky Flats workers concluded that workers with plutonium inside their bodies had an increased risk of lymphopoietic neoplasms (tumors affecting white blood cells). One of the difficulties in assessing causation is the long lapse of time between when exposure occurs and when cancers are developed and diagnosed. "For plutonium exposure, the latency period is estimated to be more than 30 years, but it can vary depending on the dose received (Voelz, 1991)." Another difficulty is that research has yet to determine at what level plutonium exposure is harmful. In some cases an individual with low exposures contracts cancer and other suspected plutonium-related ailments, while in other cases an individual with abundant exposure does not. There are too many unknowns with respect to individual susceptibility to cancer and individual body reactions to plutonium exposure for causation determiners to set limits for an exposure level that is deemed by them to be harmful. Additionally, the effects of synergism of exposures to different toxins are not known. In particular the effects of combination exposures where an individual has both plutonium and toxic chemical exposure, such as carbon tetrachloride, trichloroethylene, nitric acids, and numerous other toxic chemicals used at Rocky Flats. Synergism has been documented, for example, for the combination of plutonium exposure and cigarette smoking. The result is that a person who was exposed to plutonium and also smoked is 10 times more likely to contract lung cancer than a person who was not exposed to plutonium and smoked.

This petition is based on multiple unmonitored, unrecorded, or inadequately monitored or recorded exposures that are not necessarily specific to a particular "incident." Therefore, this petition covers the entire time period of plutonium exposure at Rocky Flats from April 1952 to the date of petition submittal. Specifics regarding unmonitored, unrecorded, inadequately monitored or recorded exposures are included below. This petition is further based on the fact that records and information are inadequate for individual dose reconstructions based on the fact that 1) certain types of radiation exposures and doses incurred by the Rocky Flats class were not monitored for certain periods of time and certain types of exposure (i.e. to high fired oxides) are inaccurately modeled and reported on dose records; 2) for certain areas either no monitoring occurred or dosimeter chips were destroyed or lost during processing resulting in no data available; 3) expert testimony supporting inability to reconstruct dose for high fired oxides; *technical documents including site independent investigation reports, Price Anderson* Amendment Act and Defense Nuclear Facility Safety Board reports that support periods of

inadequate monitoring. As applicable, these reports and expert testimony are referenced and attached to the SEC Petition, Form B.

Finally, due to changing methodologies, a worker can end up with multiple different dose calculations. Pre-1989, Rocky Flats used a systemic burden model for calculating dose and then switched to a lifetime dose assessment. While the systemic burden analysis calculation tended to overestimate doses, the later doses calculated using the ICRP 26 tended to underestimate and the program that NIOSH currently uses based on ICRP 66 underestimates dose by up to a factor of 10. So a worker ends up with three different calculations – none of which are accurate.

A review of the Defense Threat Reduction Agency's Dose Reconstruction Program similarly concluded that dose reconstruction is not accurate. "The committee has concluded, however, that upper-bound doses from external gamma, neutron, and beta exposure are often under estimated, sometimes considerably, particularly when doses are reconstructed (National Academy of Sciences Press, A Review of the Dose Reconstruction Program of the Defense Threat Reduction Agency, 2003, Page 258.) Similarly, the committee also found "Estimation of internal dose – most important, the dose from inhalation – is an inherently more difficult problem . . . because data that could be used to estimate intakes of radionuclides by the atomic veterans is not available." This very closely mirrors the issue at Rocky Flats; the data needed to accurately estimate dose – the form of plutonium (soluble or insoluble) and the date of exposure – are often not available. Absent this knowledge it is impossible to accurately record dose.

1) Dates and Descriptions of Incidents

1953-Present – Undetected/under recorded exposures to high fired oxides. See High Fired Oxides on the following pages for a detailed discussion on the basis for petition based on exposure to high fired oxides at Rocky Flats.

April 1952-1964 – Rocky Flats had no lung counting capabilities until 1964 and did not routinely perform lung counts on workers until the late 1960s. Exposures to high fired oxides are not detected in standard urine bioassay for as long as 6,000 days after the exposure occurred making accurate dose modeling impossible. Dr. Robert Bistline from the Department of Energy, Rocky Flats Field Office stated in his testimony to the Advisory Board on Radiation and Worker Health that " Before 1964 we had no lung-counting capabilities and to try to go back and capture the exposures of individuals back in the 1950s and sixties is next to impossible." And that " If you didn't have lung-counting capabilities that some of the old-timers that worked back in the fifties and sixties would show no indication of positive bioassays." Dr. Bistline's Testimony is included as an attachment in response to F.3 of Form B.

April 1952-1958 – No neutron dose recorded. Neutron dosimetry was not in use at site until the late 1950s.

1958-1968 – Improper reading of dosimetry films resulted in inaccurate reporting of dose; more than 88,000 film badges were affected. Subsequent dose reconstruction efforts could not accurately record dose due to the time that had elapsed and inability to tie doses to specific exposure incident dates. In 1994, Roger B. Falk a health effects expert at Rocky Flats presented his finding on Historical Neutron Dosimetry and stated that "Few radiation workers were monitored for neutron doses in the 1950's and that neutron doses were poorly evaluated from neutron film until 1967." His presentation is included as an attachment in response to Section F.3 of Form B. The fact that the neutron track plates and NTA film badges were poorly evaluated was not determined for certain until at 1994 study, nearly 25 years after the fact. The study concluded that actual exposures could have been significantly different than what was recorded. Twenty-five years from today, it is likely that the same thing will be said of the doses recorded for Rocky

Flats workers in the 1990s and 2000s. A letter regarding dose reconstruction authored by the Radiation Protection Manager July 26, 1994, is included in its entirety in response to F.4.

1966-Present – In 1966, the type of dosimeter badge used to monitor employees' exposure to radiation was a Type-A gamma ray film badge. However, very few if any radiation workers used them in the fifties and early sixties. By 1969, all gamma ray dosimeters were converted to thermoluminescent dosimeters (TLDs) and by 1976 all neutron badges used were TLD badges. These had their faults, because in order to obtain the information in the employee's dosimeter badge the crystal chips had to be activated by heat, and if not done appropriately the record would be lost. The presence of body oils or hair on the chips could result in false readings and improper and inconsistent practices with employee dosimetry use resulted in missing information (forgot to wear badge or wore it under a lead apron) or inaccurate information. The crystals are also very small and would easily get lost. See an employee letter included as an attachment in response to Section F.2 of Form B. In addition, the site routinely under reported lower level exposures over time. Investigations into unusual dosimetry results frequently resulted in the assignment of zero when the investigator was unable to determine the cause of the exposure. From 1951 through 1992 Rocky Flats embraced a philosophy of reporting dose down to zero. In 1993 a minimum reported dose level of 10 mrem was adopted. Any dose below this level is reported as zero (RFETS 2001). This practice is still in place today.

1976-Present – The Technical Basis Document (TBD) used by NIOSH to reconstruct Rocky Flats doses does not capture any radiological incidents or events past 1976. However, a review of the most recent five years worth of Radiological Incident Reports documents more than 200 exposure incidents just in that five-year timeframe. None of these incidents is accounted for in the Rocky Flats TBD.

1957 – The second largest plutonium-related fire occurred in Building 771 generating high fired oxides that spread throughout the facility. See High Fired Oxides discussion later in this section.

1965 – Building 776 was also the site of an earlier fire in 1965 that resulted in the highest radiation exposure to workers. This fire which burned in an oil-laden pipe under a glovebox burned at temperatures in excess of 1800 degrees Celsius. More than 25 workers received significant internal depositions from the 1965 fire with some as high as 30 times the maximum allowable lung dose at the time which equated to lung burdens of more than 480 nanocuries. More than 380 people received special lung counts and many more than 25 workers have now been identified through further lung counts as having received exposures from the 1965 fire.

1969 – The largest plutonium fire at Rocky Flats occurred in Building 776 in May 1969. At the time the Building 776 fire was the most costly industrial fire in U.S. history. This fire generated plutonium particle sizes as small as 0.12 um AMAD. These high fired oxide particles spread throughout the building and some were released to the environment. These particles posed a significant exposure risk to workers both during production days and later during D&D of the facility when the tiny particles would become re-suspended during D&D operations.

December 1, 1993 – A Defense Nuclear Facilities Safety Board report, included in its entirety in response to F.4, noted that "the potential existed for workers to be exposed to radiation with out being monitored . . ." This resulted from TLDs on a storage rack in an area in Building 771 where workers were not required to wear dosimeters resulted in readings as high as 300 mrem. The Defense Board noted that workers in the area could have received in excess of 100 mrem without being monitored. The same report also noted the use of wrong correction factors in assessing dosimeter chips and the fact that an accreditation program in place at the time "failed to respond adequately to the plant's various neutron radiation fields." The report goes on to list numerous deficiencies in radiation protection.

1996 and 1997 – A few years later, a similar incident in Building 371 resulted in office workers receiving unmonitored exposure that penetrated the operations area wall and exposed adjacent office workers, one of whom included a pregnant worker. These incidents illustrate that the potential for unmonitored and unrecorded exposures has existed throughout time at Rocky Flats. The Building 371 unmonitored exposures and several other radiological issues, including unrecognized intakes, less than adequate monitoring, and unnecessary exposures was the topic of a April 14, 1998, Price Anderson Amendments Act Investigation that is included in its entirety in response to F.4. The contractor was fined $100,000 for these failures in radiological monitoring and protection of the workers.

May 15, 2001 – On May 15, 2001, Rocky Flats Closure contractor Kaiser-Hill issued a comprehensive report detailing its independent investigation into exposure incidents in Building 771, *Investigative Team Report Investigation of the source of potential internal radiological exposures involving eleven personnel in Building 771.* The Building 771 worker exposure investigation came to the disturbing conclusion that: [emphasis added]

> "When D&D activities take place in facilities contaminated with plutonium, the challenges to a radiation safety program are especially great. **Workplace indicators are not capable of detecting low levels of plutonium contamination in equipment and materials or as airborne radioactivity.** In addition, **urinalysis and lung counting do not have the sensitivity necessary to detect intakes of plutonium at the DOE investigative level of 100 mrem**. . . . In summary the investigative team concluded that the most likely cause of the positive bioassay results was exposure to low levels of airborne plutonium radioactivity from radiological work operations exacerbated by D&D operations. **These low levels of airborne radioactivity are below the threshold of workplace indicators."**

The report (included as an attachment in response to F.4) outlines a series of poor work practices, poor record keeping on radiological jobs, inadequate worker protection and inabilities of work place monitoring systems to detect longer term chronic exposures – "an exposure of 10 to 20 DAC-hours protracted over a working year would not be detected by work place indicators."

The results of this investigation are important for several reasons:

1) The report provides evidence that as recently as 2000/2001 workers at Rocky Flats routinely received exposures that went undetected by workplace indicators and standard urinalysis bioassay. It concludes that it is impossible to prevent undetected exposures in a plutonium facility undergoing D&D.

2) The exposures were detected by happenstance as part of the review on an unrelated issue identified by a DOE facility representative in which an instrument being used was past its calibration date. If this unrelated issue had not been raised on Oct. 16, 2000, then these exposures very likely would still be undetected today.

3) After nearly five months of investigation, the expert review team could not with certainty ascertain the exact source of exposure. Without the source and date of exposure, as indicated in the report "interpretation of the results, without a known intake event, is very difficult." Imagine how difficult this will become after Rocky Flats is closed and 10 years down the road a dose reconstruction expert is trying to estimate dose for Rocky Flats workers.

This incident was part of a July 17, 2001, Price Anderson Amendment Act enforcement action. A copy of that Notice of Violation is included in its entirety in response to F.4.

April 20, 2004 – Item 3 on the Event Safety Daily Summary for April 20, 2004, reported on an event from November 1, 1993, under OR SC3 2004-0055 for a radiological incident from Building 776. The summary stated the following:

> "An individual was assigned a dose for 1993 of 1,900 mrem Committed Effective Dose Equivalent (CEDE). A routine urine sample was collected as part of the Rocky Flats Bioassay Program on July 14, 2003. The result was greater than the decision level for Pu 239/240. Followup samples were collected in September and December 2003. Internal Dosimetry performed an investigation including five incidents from June 1986 through November 1993 that could have resulted in a significant intake. Routine urine samples for 2001 and 2002 had also resulted in above decision level for Pu 239/240. Followup samples and/or recounted samples were below the decision level and Internal Dosimetry determined the original [2001 and 2002] results to be false positive. ***It is probable that detection of Pu 239/240 at this time is a result of improved sensitivity in laboratory analysis and there were small amounts of Pu 239/240 in the urine from old intakes that were only recently detectable.***"

This incident is important to our basis for petition for the following reasons:

1) A dose of 1.9 rem was detected 10 years after the assigned date providing evidence that significant doses can go undetected potentially for decades and raising the question of how many other large doses have thus far been undetected.

2) Investigation was unable to link this dose to an incident making accurate reconstruction impossible. Investigators had full access to all the infrastructure of Rocky Flats and still could not accurately assign dose. Therefore, dose reconstruction personnel a decade after Rocky Flats closure will have even a more difficult time.

3) Not one but two times before this individual had bioassay results above the decision level that were dismissed as "false positives." How many other people had real doses that have been dismissed as false positives and had zero dose assigned for significant exposures?

4) As equipment sensitivity continues to increase, we are detecting more and more previously undetected exposures. How many workers have exposures that are still undetected?

2) HIGH FIRED OXIDES

Unique Properties of High Fired Oxides which Make Accurate Dose Reconstruction Impossible

High fired oxides are a relatively recently identified class of plutonium material. This form of plutonium is generated when plutonium is exposed to high temperatures in excess of 600 degrees Celsius (some argue this number to be as low as 400 degrees Celsius). High fired oxides at Rocky Flats were generated from the *1957* fire, the *1965* fire, the *1969* fire, numerous smaller fires, and numerous high temperature processes in several plutonium production facilities as described in response to Section E.2 of Form B. The 1965 fire had recorded temperatures in excess of 1800 degrees Celsius. High fired oxides are also referred to as Super Class Y materials. "(T)he possibility of a super class Y (super Y) form has been identified. Super Y was defined by HIDP in 1988 to describe highly nontransportable forms of plutonium based on some actual observed cases at Hanford (Bihl et al. 1988; Carbaugh, Bihl, and Sula, 1991)." The presence of Super Class Y materials has also been noted by experts at Rocky Flats, including Dr. Bob Bistline. The PNNL-MA-860 Chapter 8.0 issued January 31, 2003, noted that Super Class Y

material is highly insoluble with retention half-lives of transport from lungs to blood 20 times longer than normal Class Y materials. It also noted the uncertainty surrounding this new class of material: "**The precise nature of super class Y material is not known,** although it appears to have been associated with processes involving high fired plutonium oxides. The phenomenon has been informally verified by dosimetry personnel at Rocky Flats, Savannah River, and Los Alamos sites, and is supported by literature (PNNL-MA-860 Chapter 8.0, Page 8.13)."

What is known about high fired oxides at Rocky Flats are that they are highly insoluble, may not be detected by standard bioassay, and result in particle sizes as small as 0.12 um AMAD.

The following factors make accurate assessment of dose for high fired oxides impossible:

1) High fired oxides are highly insoluble. This means that they can take as long as 6,000 days or more to show up in a urine bioassay. So by the time a high fired oxide exposure is detected in urine it is nearly impossible to link the exposure in time to the actual exposure incident, making accurate dose assignment impossible. In addition, standard chemistry used in fecal bioassay is unable to dissolve high fired oxides, invalidating many fecal results in which special chemistry was not used.

2) Little is known about high fired oxides. Accurate dose modeling takes decades to develop. Because high fired oxides are a relatively recent phenomenon, they are not accounted for in dose modeling in use today by NIOSH or in dose modeling for instance at Rocky Flats. Current models in use underestimate high fired oxide exposure by as much as a factor of 10 according to Dr. Bob Bistline. For example, high fired oxides at Rocky Flats have been found to range from 0.12 to 0.3 um AMAD, however NIOSH uses a particle size of 5.0 (ICRP 66) and even Rocky Flats Dosimetry Department uses a particle size of 1.0.

3) High fired oxides have self-shielding properties that make accurate assessment, even by lung count, impossible. When plutonium particles are heated to extreme temperatures they become "ceramicized" or glazed over on the outside of the particle. The hardened outer surface of the high fired oxide particle actually shields or masks the plutonium alpha radiation being emitted from the particle. This factor tricks the lung counter into detecting less plutonium than is actually present in the lung. According to Dr. Bistline with high fired oxides, the calculation of lifetime dose based on lung count is usually in error.

4) It is impossible to tell whether plutonium detected by lung count is soluble or insoluble so it is impossible to know what model to apply. Rocky Flats has both soluble and insoluble forms of plutonium. Using even a moderately soluble equation results in calculations that are completely in error. "Super Y screws up the modeling," said one dose assessment expert at Rocky Flats.

5) Because of the insolubility of high fired oxides, worker exposures can go undetected for decades. "We have found a number of people now years later that have plutonium in their bodies that was never picked up by the monitoring in place at the time," Dr. Bistline said in a recent phone interview. These new-found exposures cannot be tied to an incident date and so accurate dose reconstruction is impossible. "Dose assessment works well when you know the incident that the dose came from, not when you don't," according to a Rocky Flats dose assessment expert.

The following are some, but not all, of the materials processed/handled at Rocky Flats that had the potential to result in high fired oxide exposures: plutonium and enriched uranium oxides, metal buttons for molten salt process, metal buttons and skin turnings for molten salt, americium

oxide and miscellaneous oxides, anode heel, high level caustic waste oxide, high purity oxide heel, peroxide cake, green cake, impure peroxide cake, Hanford Purex oxide, grease oxide, high fired DOR oxide, PUSPS pure and impure metals and oxides, PUSPS chlorinated oxides, incinerator sludge, hydride from TA crucibles, unpulverized slag, grounded/blended slag, unpulverized and pulverized sand, slag and crucible, SS&C heel, ground SS&C heel, molten salt pulverized and unpulverized (CA, Zn and K), electrorefining salts, plutonium chloride mixed salt, incinerator ash and pulverized incinerator ash, ash and debris from the 1969 fire, ash heel, soot and soot heals, resin, unleached resin, ER salts and ceramics, etc.

E.5 ATTACHMENT

Rocky Flats Historic Lung Counting and Dosimetry Background Information

Rocky Flats Historic Lung Counting and Dosimetry Background Information

From the early 1950s until approximately 1989 several processes were employed at Rocky Flats that required the purity of plutonium. Of these processes many dealt with highly insoluble forms, including high fired oxides in particular.

All of the work activities described in response to Section E.2 of Form B were very high in penetrating radiation exposure and known by employees as burn out lines. Because of the nature of these materials it was not uncommon to have an airborne excursion, some so high in contamination that it would take months to decontaminate. Unfortunately the only way a worker would know of a release was when the selective alpha air monitors (SAAMs) would alarm. At the time of these alarms, the workers were typically without respiratory protection and nasal and mouth smears and lung counts were not readily employed. Only when skin contamination was involved were bioassay actions taken and an employee sent up to lung count. The lung counter could not detect plutonium because of the low abundance of gamma photons and the severe attenuation of L X-rays. Instead, the 59.5-keV gamma photon from Americium 241 was used to detect americium in the lung. The activity of plutonium was then calculated from the detected americium by measuring, calculating, or assuming the fraction of the Americium 241 in the plutonium mixture on the date of the lung count. Direct in vivo measurement of plutonium in the lungs, although investigated, was never implemented at Rocky Flats. The following bullets describe lung counting capabilities over time. Note that no lung counting capabilities existed from 1952 to 1964 and that they were seldom used from 1964 to 1968.

- 1964 – 1968 - One counting room consisting of two NaI(Tl) scintillation detectors and a third detector used for cesium and potassium measurements.
- 1969 – 1976 - Two counting rooms with three 4x4 NaI(Tl) scintillation detectors, two over the upper chest and one over the liver. The liver detector was eliminated in 1974. An index method was developed by Robert Bistline to reflect chest wall thickness.
- 1976 – 1984 - Three counting rooms were equipped with the new high-purity Germanium (Ge) detector array system. The NaI(Tl) system would latter only be used as a backup system.
- 1985 – 1995 - Ge detectors in the organ pipe configuration were implemented.
- 1995 – Present - The lung counter hardware, software, and detectors were upgraded.

In 1966, the type of dosimeter badge used to monitor employees' exposure to radiation was a Type-A gamma ray film badge. However, very few if any radiation workers used them in the fifties and early sixties. By 1969, all gamma ray dosimeters were converted to thermoluminescent dosimeters (TLDs) and by 1976 all neutron badges used were TLD badges. These had their faults, because in order too obtain the information in the employee's dosimeter badge the crystal chips had to be activated by heat, and if not done appropriately the record would be lost. The presence of body oils or hair on the chips could result in false readings and improper and inconsistent practices with employee dosimetry use resulted in missing information (forgot to wear badge or wore it under a lead apron) or inaccurate information. The crystals are also very small and would easily get lost. See an employee letter included as an attachment in response to Section F.2 of Form B. In addition, the site routinely under reported lower level exposures over time.

Investigations into unusual dosimetry results frequently resulted in the assignment of zero when the investigator was unable to determine the cause of the exposure. From 1951 through 1992 Rocky Flats embraced a philosophy of reporting dose down to zero. In 1993 a minimum reported dose level of 10 mrem was adopted. Any dose below this level is reported as zero (RFETS 2001). This practice is still in place today.

F.1 Records and Information are Inadequate for Individual Dose: Radiation Exposures Not Monitored

As discussed in response to E.5, there are several examples throughout history where worker exposures were not monitored for periods of time. For example, from 1952 to 1958 when no monitoring was conducted for neutron exposure, in Buildings 371 and 771 when workers in office areas and non-dosimetry areas had potential to receive up to 300 mrem in unmonitored dose. In addition, worker exposures and doses have gone uncaptured due to a variety of engineering, poor work practices and procedural deficiencies.

For example, employees routinely removed lead-lined or water shielded glove port covers because when the ports were opened they hit the employee in the chest while working. Once removed, the employees frequently forgot or chose not to put these important exposure shielding devices back on the gloveport. Then the employees would sit in chairs with their heads near the open glove ports. Your dosimeter is worn on the front of your chest. There is no dosimeter for your head so exposure to the head goes unmonitored and uncaptured.

Similarly, many glove lines had lots of different glove ports at different elevations. Some operations required access from many different areas. Operators would open a glove port for part of the job at waist level and leave it open and then open and work from another glove port overhead. While working overhead their pelvic region was receiving exposure from the open glove port below. This exposure was not monitored or captured because there is no dosimeter at that level.

Another example is workers removing "produce" cans of material. The workers would be wearing lead aprons and the cans were supposed to be shielded in a lead container, but many times when the work took longer, workers would remove the produce cans and place them under their arms or between their legs with no shielding in order to cut and tap it out of the line faster. The workers would be gaining exposure to their underarms and legs where no lead apron was present and where no monitoring devices existed to capture this exposure.

Lead aprons themselves presented a problem, because it was not clear to workers whether their dosimeter was supposed to go under or over the lead apron. So, depending on the job or building area, workers did it differently. Those who wore their dosimeters under the lead apron would have no record of dose exposure to the rest of their bodies (head, arms, legs, etc.). In particular with exposure to the head, a lawsuit involving an employee who contracted a brain tumor after receiving unmonitored exposure to the head was ruled in favor of the deceased employee. In another instance an NDT operator who wore lead aprons for a high exposure job now has cancer in an area that was unprotected by his apron (his larynx). He wore his dosimeter under the lead apron so his exposure was unrecorded. His testimony letter is included as an attachment in response to Section 4.

During production days, each plutonium building had a calculated background dose that was subtracted from the workers exposure. This was based on the exposure the TLD received from just hanging on the storage board in the hallway. However, two things are wrong with that scenario: 1) workers in the building, but not in the back area, were receiving unmonitored dose just like the dosimeters on the board, and 2) many workers did not store their dosimeters on the storage board so when the background was subtracted it actually resulted in lesser exposure being recorded. Workers also frequently forgot to wear their dosimeters into the production areas and most would not self-report so doses went uncaptured.

Another issue surrounded proximity of glovebox lines. In many buildings there would be a very "hot" operation requiring lead aprons going on next to a line that did not require lead aprons. So

workers working a couple feet from each other would not be wearing the same protective equipment.

The practice of borrowing or assigning dose from an employee's co-worker when dose information for the employee has been lost or was not gathered has created inaccurate dose records for many employees.

Finally, in many instances workers would perform special "furtive" job tasks to help out their supervisors or managers, many times to correct a problem, clean up a contamination incident or perform rework. This work would be done outside the bounds of normal work controls with no airborne contamination monitoring and with no special worker monitoring. One RCT said that after such a job, he was highly contaminated and simply took off his respirator and contaminated clothing and threw it in the same waste drum with the mess he was cleaning up. This worker was working in an area with high fired oxide contaminates. Because the work evolution was not documented, no nasal smears or bioassays were conducted and no monitoring for dose beyond TLD was conducted. In talking to numerous workers, this sort of practice was more common than not.

Rocky Flats workers were chronically and repeated the recipients of unmonitored exposures. The engineering, procedural and work practice deficiencies, examples of which are outlined above, prevalent in Rocky Flats history make accurate dose reconstruction impossible.

Attached is a presentation that documents the fact that neutron doses were not monitored during the early years of site and inaccurately reported until 1968. Attached in response to Section F.4 is additional documentation of unmonitored exposures as indicated in official government technical reports.

F.2 Records and Information are Inadequate for Individual Dose: Records Lost, Falsified or Destroyed

Attached is a copy of a letter from a worker who provides evidence that dosimetry chips were inadvertently lost or destroyed during the reading process, calling into question the accuracy of completeness of individual dose assessments.

F.3 Records and Information are Inadequate for Individual Dose: Health Physicist or Expert on Dose Reconstruction Limitations

Attached are pages of the testimony of Dr. Robert Bistline to the Advisory Board on Radiation and Worker Health on July 1, 2002, in Denver, Colorado. Dr. Bistline's testimony supports our basis for petition with respect to the inability to accurately reconstruct doses associated with high fired oxides. Attached is also a presentation presented by Health Effects Dosimetrist Roger B. Falk that supports our basis for petition with respect to no monitoring data for neutron exposure prior to 1958 and difficulties associated with dose reconstruction.

F.3

THE U.S. DEPARTMENT OF HEALTH AND HUMAN SERVICES
PUBLIC HEALTH SERVICE
CENTERS FOR DISEASE CONTROL AND PREVENTION
NATIONAL INSTITUTE FOR OCCUPATIONAL SAFETY AND HEALTH

convenes the

ADVISORY BOARD ON

RADIATION AND WORKER HEALTH

VOLUME I

The verbatim transcript of the Meeting of the Advisory Board on Radiation and Worker Health held at the Hyatt Regency Denver, Denver, Colorado, on Monday, July 1, 2002.

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in the nuclear network, and I still have some questions about that. There are a lot of other worker studies out there. I don't know exactly whether -- how we're looking at those things or if we are looking at those things. But we certainly should assure ourselves that we need to compare apples to apples and oranges to oranges.

There was one other thing that I had and I don't -- I'm trying to think here; I didn't get it jotted down.

Well, those were the three particular things that I had in mind. If I think of the other one I'll mention it. But with that, I guess those would be my comments.

DR. ZIEMER: Thank you very much. If you'd remain there just a moment, let me ask if any of the Board members have questions or items they want clarified here.

(No responses)

DR. ZIEMER: Okay. Thank you.

Did Phillip come back in?

UNIDENTIFIED: No, still not back yet.

DR. ZIEMER: Let's see, Dr. Bistline? You can go next.

DR. BISTLINE: I'm Dr. Bob Bistline with the

Department of Energy, Rocky Flats Field Office. And I just wanted to make a few comments to the Board here this afternoon, and I appreciate the opportunity, Dr. Ziemer and Board members.

My background is I've been at Rocky Flats for about 36 years, a little over 36 years, and worked on the contractor side in their internal dosimetry, lung counting and so forth, and started a study back in 1980 bringing back old retired workers from the plant that had known depositions of plutonium or had exposures greater than 20 rem dose, overall external dose, and recognized some of the problems with the dosimetry of the program at Rocky Flats. And so started that program in 1980. I had about 900 individuals that I was bringing back to the site every three years for physical exams.

I presently work for the Department of Energy, have been there with the Department of Energy for about a little over seven years now heading up the internal dosimetry oversight, occupational medicine oversight, and the beryllium program oversight.

But I want to concentrate, and appreciate any helpfulness that can be given by the Board, in

terms of clarification of the SEC part of it. I know Henry and Jim and Tony have addressed some of those issues as it stands, and I bring out the point that we are seriously considering at Rocky Flats looking at Special Exposure Cohorts in a couple of areas.

One particularly that stands out -- and if this is not the intent of it, we certainly would like to hear, because I'm struggling with that clarification myself -- things like the fact that before 1964 we had no lung-counting capability. And we know now from our experiences with plutonium and the insolubility of the material that if you didn't have lung-counting capabilities, we're now finding some of these old-timers that worked back in the fifties and sixties showed no indication of bioassay, positive bioassays, and had very little external exposure recorded for them; that now, lo and behold, we brought in a 92-year-old gentleman here a while back, and he's got quite an extensive lung deposition of plutonium. And so there's a whole cohort of population before 1964 that we have no internal dosimetry in terms of lung counting.

Prior to 1957 there were only 18 people out of the entire population at the plant that had ever been given neutron dosimeters. There is a neutron dose reconstruction project, and I know Larry -- Mr. Elliott and the crew are looking at that. Some of that data is -- we're making progress on re-reading some of the films, but there isn't even data available on some of these people.

And so there are very specific types of cohorts here that I'm concerned, we're concerned about. And I think that those kinds of nuances probably occur throughout the nuclear industry, the Department of Energy, with different sites. And I would hope that -- and I don't know how extensive that's going as far as capturing the unique information that is lacking at the various sites, the historical information that some of us know about.

And I know the NIOSH people are trying to explore that, and I certainly would encourage any information that they can gain by various sources. And maybe through the public comment at stakeholder meetings and so forth they could capture some of that through some of the old-

timers that could provide additional information along the dosimetry lines, because there is a lot of information that's lacking in, I think, all the sites. Probably we're not unique at Rocky Flats. I know other sites are struggling with some of the same things that -- to try to go back and capture the exposures of individuals back in the 1950's and sixties is next to impossible.

And on internal dosimetry of plutonium, with the insolubility and the various differences that you find, just going to a fellow worker and looking at a fellow worker, it doesn't necessarily give you anything in terms of internal deposition. We've found at Rocky Flats where we're doing a lot of hands-on work, and I think this is a unique population at Rocky Flats because these guys have been doing hands-on work with plutonium for years. In fact, we still have over 12 tons of plutonium out there right now. And these are the guys that made almost all the nuclear weapons in the Defense Department over the years. And we know that some of these guys, two guys standing side by side, one guy can be pumping the gloves and be pumping, and a hole in the glove, and that guy gets an intake; and the

guy next to him, standing shoulder to shoulder with him, comes up with nothing. And so you can't really rely on fellow workers as an indicator of internal uptakes in a lot of cases.

So I just bring those points out to the Board, that there's a lot of uniqueness with working around a facility like that. And I certainly hope that all the information possible can be captured in terms of historical knowledge of the dosimetry. And I know Larry and people are anxious to capture as much of that as possible, but unfortunately at a place like Rocky there aren't very many of us old-timers around anymore that have the historical knowledge of the site and the dosimetry. Most of the guys that work out there now in closure, most of the old-timers are gone. And it's guys that have worked there less than five years, or five to ten years is the lifespan of most of those guys.

So I just encourage you, that the Board work on trying to get a little more clarification in some of these areas that would certainly be helpful to some of us in considering whether Special Exposure Cohorts would be appropriate to pursue. Thank you.

DR. ZIEMER: Thank you very much.

Again, let me ask if there are questions or clarifications? I might ask one question. I assume now on these ones where you're going back and doing the lung counts, assuming some kind of a clearance model, you can reconstruct doses then on them?

DR. BISTLINE: It's -- yeah, you can do a pretty good job of it if you capture those. But unfortunately, like in this particular individual, it just so happens that he's 92 years old. He left the plant site before we ever got a lung counter. So we are able to go back on that individual. But there's a lot of people that are no longer living, and a lot of people that worked at the site that aren't a part of this particular recall cohort. And so many of those people have never been lung-counted, historically never have been lung-counted. But yeah, Dr. Ziemer, we have been able to go back and get a fairly good range of dose that this -- the internal uptake from the dosimetry models on this individual.

DR. ZIEMER: Yes, Tony.

DR. ANDRADE: I'm curious, sir. In your follow-up bioassay, is it only lung counting that

you are performing, or are you doing any special, say, urinalysis or --

DR. BISTLINE: Yeah, we're doing urinalysis and the lung counting both. The reason why that's particularly important, because at Rocky Flats we have quite a cohort of population that has been exposed to what you would call high-fired plutonium oxide.

And just to give you a good example, one of the individuals that I did an autopsy on back a number of years ago -- I've done autopsies on about 120 people from Rocky Flats, former workers -- and one of these individuals was involved in a fire in 1965 with high-fired plutonium oxide, and there were a number of people -- in fact, there's quite a few people -- that have been exposed to this type of material. At the time of this autopsy, 20 years post-exposure, almost 20 years post-exposure, at the time I did the autopsy he had 222 nanocuries of plutonium, 48 nanocuries of americium still in his lungs and lymph nodes; and in all the rest of the body -- the soft tissues, the bones, et cetera -- less than 10 nanocuries after 20 years. So the models that exist out there for transport of plutonium in the case of

high-fired oxides have absolutely no relevance whatsoever.

DR. ANDRADE: Right. I completely agree in that particular case. And, furthermore I wanted to ask you if you had tried any of the ultra-sensitive techniques with some of the folks -- for example, mass spectrometry, whether it be thermal or inductively-coupled plasma?

DR. BISTLINE: We haven't done that with any of the folks at Rocky that I'm aware of. I don't think anybody has tried that with any of those. Back in 1967 I started up with the -- converting over to germanium, hyper-pure germanium detectors for lung counting. But as far as looking at the bioassay with some of these newer techniques, no, we haven't. Only just on a few people, isolated people.

DR. ANDRADE: The last point I'd like to make is just simply a comment. I think that this is precisely the type of case that I think one would, in my opinion, would be considered for a special cohort status, because new information has come to light about an activity that was common to many, many people for many, many years that we perhaps never kept any formal records on.

F.4

HISTORICAL NEUTRON DOSIMETRY AT ROCKY FLATS

presented by

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May 18, 1994

EG&G ROCKY FLATS

Preliminary Conclusions:

1. Few radiation workers were monitored for neutron doses in the 1950's.

2. The radiation workers most exposed to neutrons in the early 1950's (until July,1958) were not monitored for neutron doses.

3. Neutron doses were poorly evaluated from neutron film until 1967, with some exceptions.