



Energy Employees Claimant Assistance Project

Report on Mound Tritium Bioassay Samples and the 1959-1980 SEC January 13, 2010

On August 13, 2010 the new Mound Special Exposure Cohort (SEC) took effect under the designation of the Secretary of Health and Human Services (HHS). The SEC covers Mound workers who had at least one tritium bioassay and had worked at least 250 days between March 1, 1959 and March 15, 1980.

In early December 2010 EECAP began hearing reports that the Washington, DC Department of Labor (DOL) office had put a hold on all Mound claims for this SEC until a “matter of policy” was resolved. The issue is that claimants who meet all the requirements of the SEC are not being paid unless their names also appear on a National Institute of Occupational Safety and Health (NIOSH)-generated list. DOL applies this procedure even when claimants present evidence of the required tritium bioassay sample.

NIOSH generated this list by compiling names from logbooks which Mound used to track tritium bioassays. DOL can appropriately use this list to verify a worker’s exposure to tritium but the list should not be the only accepted proof of the required tritium bioassay sample.

The SEC’s class definition states that a claimant must have had “at least one tritium bioassay sample”. It does not state that a claimant’s name must appear on a NIOSH-generated list. If DOL wishes to change the class definition, [42CFR§ 83.19](#) spells out the procedure. The Secretary of HHS is the only person who can modify an SEC class. Neither DOL nor NIOSH have the authority to do this.

A review of Mound documents shows that Mound tracked tritium bioassay samples in several ways, including forms, punch cards, computer databases, reports, and logbooks. Also, because some of Mound’s tritium programs’ bioassay results were classified as “sensitive,” urinalysis samples were also often known as “Hot Gas” samples.

Mound had “thousands and thousands” of tritium bioassay samples from the many people involved in tritium work. Potentially-exposed personnel submitted bioassay samples two to three times per week. The format of primary and secondary tritium records changed many times in Mound’s years of tritium work. No comprehensive list of the ways Mound recorded tritium bioassay samples is known to exist, but Mound used a

computer system for recording tritium bioassay results beginning early in the tritium program.

Herb Meyer, longtime Mound Health Physics chief, stated in 1992 that the large tritium bioassay sample database from Mound's many tritium programs was kept in Mound's mainframe computer as required by DOE order 5480.11.

A Mound report entitled *Mound Laboratory's External Dosimetry Historical Records File—1947 through 1973* describes a computer-tape file of annual tritium exposures taken from tritium bioassay samples and external monitoring data. The report was written to provide information for an unknown study. This document is detailed and quite informative. It seems likely that the computer-tape file discussed is the earliest form of what later became the MESH database. The report contains the following fields:

- ❖ Employee [sic] Type—this field uses “M” or “A” to specify Monsanto and AEC employees. While generating this report, computer personnel failed to identify Energy Research and Development Administration (ERDA) employees with “A”. This was later corrected. A “T” precedes “M” for some employees terminated before 1974. “T” was not always entered before “M” as some employees without “T” before “M” were also terminated before 1974.
- ❖ Health Physics Number—The HP # is an in-house numbering system that began as a way to identify employees for exposure records. Later it was broadened to include other applications. Before an unknown date in 1965, HP numbers of terminated employees were reassigned to new employees. Therefore, these numbers are not unique and more than one employee can have the same HP number.
- ❖ Name — last, first and middle name.
- ❖ Social Security Number—not all the social security numbers in this field are correct. When Mound was unable to locate the social security number of some terminated employees, they substituted a “bogus” social security number.
- ❖ Year—Exposure values in mrem are entered to the right of each year. If a worker had exposure from another site before working at Mound “Prev” is entered. The report also states, “You will note that in the consecutive listings of years that some years are omitted. Interpret this to mean that the employe [sic] was not monitored for exposure during the unlisted year(s).” This statement is **VERY** important because MESH tritium database printouts are in most workers' files and is one alternative method of proving bioassay that DOL is currently discounting as valid proof of a tritium bioassay sample.
- **1954-1968:** Bioassay Group Monthly Reports were collected annually and put into brown binders.
- **1956:** Urinalyses listed in large, green, hardbound record books were put into use.
- **1957:** The documents agree that Mound did not do bioassay for tritium prior to the end of 1957. Samples were submitted by exposed personnel two-three times per week by the end of 1957.
- **1958:** The *Weekly Urinalysis Results Reports* began in 1958 and constitute a continuing record. The first reporting of tritium bioassay samples was published

in either February or March, 1958. These typed reports contained analytical results of bioassay samples. The data collected includes name, isotope bioassayed for and result in c/m/24-hr sample.

- **1959:** In August the *Weekly Urinalysis Results Reports* began using Form 0-756. The information collected was: name, date submitted, type of sample, analyzed for, and result.
- **1959:** The use of IBM cards began in April or May to computerize exposure records in the EXAS [sic] program which began on May 4, 1959. In 1978 data from EXAS was converted into the ERAD [sic] Program. In September 1989 the data in ERAD [sic] was converted into the Mound Environmental Safety and Health (MESH) program which was still being used in 1992. The Mound document, *Volume I History of Personnel External Dosimetry Program at the Dayton Project and Mound Laboratory, 1946 to 1993* states, "MESH is an on-going system that contains all personnel radiation records from 1947 to the present time. In early years, only annual summary data was available." This is important because it validates the accuracy of MESH tritium printouts for the period of the 1959-1980 SEC. The same document also states, under a heading of *Key Punching Instructions, Tritium Exposures*, "Punch positive exposures or zeros if analysis of samples were performed. Leave blank if no samples were processed." This is **VERY** important because it verifies that a worker with zeros for exposure in the MESH tritium database had been bioassayed for tritium and is covered under the 1959-1980 Mound SEC. If no tritium bioassay was performed during the year the field was left blank and no exposure was reported for that year.
- **1960-1962:** Mound continued using the same 0-756 form.
- **1963:** In April the format changed and the "type of sample" was replaced with the employee's Health Physics number. The HP number is not the same as the worker's badge or social security number. By May 13, 1963 this new form was called 0-756 Rev. 5-13-63.
- **1964:** Continued use of form 0-756 Rev. 5-13-63.
- **1965:** Form 0-756 was revised to include more room for the worker's name so it could be read when the forms were enclosed in a binder. This revision was called 0-756 Rev. 2-25-65.
- **1966-1970:** Continued use of form 0-756 Rev. 2-25-65.
- **1967:** *Technical Manual MD-20736, Air Monitoring and Radiological Urinalysis Procedures* revised March 30, 1967, Chapter 6, entitled "Bioassay Analysis for Tritium" describes the process used for tritium bioassay and states, "'Spot' urine samples are grouped and logged alphabetically under each cost center in the tritium record book each day." and, "After the samples have been counted for the required time Calculate the concentration in microcuries per liter, and record the value in the Tritium Log Book." 1967 is the earliest dated mention I was able to find of a tritium log book.
- **1971-1976:** *Weekly Urinalysis Results Reports* are missing for these years.
- **1973:** Form 0-756 was revised again in January 1973 and renamed MRC-ML-756 (1-73).

- **1977:** Yellow spiral bound notebook, “24 hour Urinalysis Record” begins using form MRC-ML-6178 (A) (B) and (C). The first notebook covers March 1, 1977-February 15, 1978. It contained plutonium urinalyses unless otherwise indicated in the comment column. In 1992 a package containing *Weekly Urinalysis Results Reports* from April 4, 1977-September 26, 1977 written on form MRC-ML-756 was found. The revised form included the following at the top:
 - <.1 c/m/24 hours = background
 - .1 - .25 = Count is Positive - No Restriction
 - >.25 = Possible Restriction
- **1977:** The *Weekly Urinalysis Results Reports* used the revised form MRC-ML-756. The processing of the bioassay samples seemed to be random for this period with not all samples being processed.
- **1978:** EXAS computer database is replaced by ERAD computer database.
- **1978:** Bioassay sample results in the *Weekly Urinalysis Results Reports* seem to end in February 1978. Form 0-756 weekly reports end after February 1978.
- **1978-1980:** The second Urine Lab Log Books is also a yellow spiral bound book. It covers February 16, 1978-September 16, 1980.
- **1989:** Tritium bioassay sample data was entered into the new MESH computer database. The MESH database replaced the “old ERAD program”.
- **1996:** The Mound newsletter, [New Directions for February 1996](#) discusses upgrades to the Mound Bioassay Monitoring Program and states, “As reported in the [December, 1995 edition of New Directions](#) several upgrades have been made to Mound's Bioassay Monitoring Program such as the upgrading of the MESH compute system which automatically schedules and tracks bioassay samples.”
- **1997:** [Remediation Workers' Exposure Assessment Feasibility Study at the Department of Energy's Mound Site](#) states on page 62, “Mound maintains personnel medical records in individual file folders by employee social security number as well an Oracle database application known as "Mound Environmental Safety and Health" (MESH). These records include information obtained from HASPs [sic] and R. WPs [sic], pre-employment and annual physicals and accident reports. Annual physicals include chest X-rays. drug screen, audiogram. vision test, blood tests, baseline urinalysis, blood workup, spirometry, Thermoluminescent Dosimetry (TLD) results. urine, fecal and blood sampling results and Invivo (“in the body”) dosimetry information.”
Ibid, page 202 defined MESH—“Mound Environmental Safety & Health. Personnel medical, occupational exposure records in individual files maintained in a database format.”

The following is a list of additional forms that Mound used to record tritium bioassay:

1. 0-584—Personnel Internal Exposure Questionnaire
2. 0-634—Record of Special Personnel Monitoring
3. 0-102—Radiation Urinalysis Record (1053)
4. Yellow IBM card—“Health Physics Urinalysis”
5. 0-799—Urinalysis Work sheets

6. 0-689—Radioative Gas Exposure Evaluation
7. 0-755—Hot Gas Urinalysis Results
8. 0-756—Urinalysis Results
9. 0-374—Request for 24-hr. Urine Sample
- 10.0-318—Bioassay
11. Notice of Placement on Hot Roster
12. Notice of Removal from Hot Roster
- 13.0-129—Notice of Delinquent Urine Samples

This list is not meant to be all-inclusive.

In summary:

- DOL is denying claims for the 1959-1980 Mound SEC if a claimant's name is not on the NIOSH list taken from Mound Tritium Bioassay logbooks.
- DOL is disallowing MESH tritium printouts or other forms of Mound tritium bioassay samples when these are presented if the worker's name is not on the NIOSH list.
- There are many valid ways that Mound recorded tritium bioassay samples.
- There is a long history of the MESH tritium database being a valid source of Tritium exposure.
- For the 1959-1980 SEC period zeros entered into the MESH tritium database mean that the worker was bioassayed. If no bioassay was done the field is left blank.
- Health Physics numbers are different from an employee's badge or social security number.
- Health Physics numbers were reused and are not unique numbers as they were reassigned in some situations so if these numbers are incorrect it does not mean this should invalidate the worker's claim.
- "Bogus" social security numbers were assigned in some situations so if a worker's social security number is incorrect this does not mean it should invalidate the worker's claim.
- DOL needs to accept as valid other Mound documentation of workers' tritium bioassay samples as well as using the NIOSH-generated list.