MEMO

To: TBD-6000 Work Group

From: Bob Barton, SC&A

Date: June 3, 2014

Re: SC&A Position on Findings 6 and 7 of the Simonds Saw and Steel TBD Review

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Background:

On June 13, 2012, SC&A transmitted its review of the Simonds Saw and Steel site profile (SC&A 2012), which consisted of seven main findings. Findings 1–5 pertained to external and internal dose assignments during the operational period at Simonds (1/1/1948–12/31/1957); a summary of these findings and their current status can be found in Attachment 2. Findings 6 and 7 related to the external and internal dose assignment during the residual period and are the subject of this memo. These two findings are summarized below:

- ***Finding 6 – More Quantitative and Substantive Discussion of Available External Monitoring during Residual Period:*** *The TBD was deemed deficient in its description and analysis of available residual survey data as well as its justification for the penetrating and non-penetrating dose assignments made. Additionally, SC&A recommended expanding the assumed annual employment from 2,000 hours to 2,500 hours to be consistent with the assumed employment duration during the operational period.*

- ***Finding 7 – Appropriateness of Chosen Internal Methodology during Residual Period and Consistency with OTIB-0070 (ORAUT 2012[1]):*** *The Site Profile's use of the average general air samples collected from 1949–1953 is inappropriate for characterizing conditions at the end of operations. Additionally, no depletion factor was assumed for the period from 1982 to 2007 as prescribed by the methodology of OTIB-0070.*

This memo discusses the status of these two findings including: discussions to date, NIOSH white paper responses, and SC&A's current position and recommendations to the Work Group.

Discussions to Date:

Subsequent to the transmittal of SC&A's site profile review, NIOSH provided responses to the seven review findings on February 1, 2013, in the form of an updated review matrix (NIOSH 2013a). The original findings and NIOSH's responses were first substantively discussed at the TBD-6000 Work Group meeting on April 26, 2013 (ABRWH 2013a). During the course of

[1] ORAUT 2008 was cited in the original TBD review; however, the revised methodology present in ORAUT-OTIB-0070 Rev. 1 does not change SC&A's original findings related to internal dose assignment during the residual period.

discussions at this meeting, NIOSH acknowledged that they needed to revisit the proposed methodology for reconstructing internal and external doses during the residual period.

With respect to Finding 6 (reconstruction of external doses during the residual period), NIOSH agreed to investigate whether it was justifiable to shorten the assumed work day from 10 hours to 8 hours, as well as provide a more complete characterization of available survey data during the residual period (ABRWH 2013a, pp. 147–148). This would help justify the proposed dose assignments presented in the Technical Basis Document (TBD). With respect to Finding 7, NIOSH agreed that the current method of assigning internal dose during the residual period does not comport with ORAUT-OTIB-0070. NIOSH's action item following this meeting was to revise this portion of the TBD to reflect more contemporary approaches to dose reconstruction (ABRWH 2013a, pp. 251, 255–256).

Simonds Saw and Steel was again discussed at the June 20, 2013, Work Group meeting. During those discussions, NIOSH and SC&A agreed that the presumed annual work duration should be expanded from 2,000 to 2,500 hours per year for consistency between the operational and residual periods (ABRWH 2013b, pg. 195). The remaining portions of Finding 6 (characterization of residual surveys, justification of the choice of TBD assigned values) as well as Finding 7 remained under evaluation by NIOSH (ABRWH 2013b, pg. 196–198).

On September 30, 2013, NIOSH provided a white paper describing their new approach to reconstructing external doses during the residual period (NIOSH 2013b). The TBD-6000 Work Group met again on October 11, 2013; December 19, 2013; January 16, 2014; and April 23, 2014; however, Simonds Saw and Steel was not discussed. On February 4, 2014, NIOSH transmitted a second white paper describing the new approach to reconstructing internal doses during the residual period (NIOSH 2013c). These two white papers are the subject of this memo and are summarized in the following section, and include SC&A's comments and observations.

Summary of NIOSH Responses and SC&A Observations/Recommendations:

This section provides a summary of NIOSH's proposed approach to reconstructing external and internal doses during the residual period, as well as comments and observations made by SC&A during the review of this approach. SC&A's final recommendations to the Work Group based on this review are found in the next section.

External Dose during Residual Period:

NIOSH 2013b provides a brief history of the Simonds Saw and Steel site during the residual period. This includes how different areas of the site were parsed during the 1980s when portions of the site were purchased by the Allegheny Ludlum Corporation. The white paper also contains descriptions of the various radiological surveys performed at Simonds Saw and Steel during the residual period, including surveys performed in 1957, 1976, 1980, 1984, 1999, and 2007. A brief overview of the results of these surveys is provided in Table 1:

Table 1. Characterization of Survey Measurements Presented in NIOSH 2013b and Associated Survey Reports

Survey Year	Range of Gamma Values (µr/hr @ 3 ft)	Range of Beta Values (mrep/hr @ 3 ft)	Additional Comments
1957	ND[2]–80	0.05–1.7	Only five numerical values are listed for each external dosimetry category (gamma @ 3 feet and beta @ 3 feet) for this survey.
			High beta value of 1.7 mrep/hr was taken in approximately a 75 ft^2 area near the 10" bar mill (measurements in this area ranged from 1.3–1.7 mrep/hr).
			Trip Report states: *"The areas which were monitored included the Forge Area, the 16" Bar Mill Area, the 10" Strip Metal Area, and the shipping and receiving areas… With the exception of two small areas, the radiation readings at 3 feet above the floor never exceeded 0.2 mreps/hr combined beta and gamma radiation."* (Heatherton 1957)
1976	5–48	None Taken	Maximum observed gamma measurement (48 µR/hr) was in an area of the floor south of the 16" mill, east of the 10" mill and west of the 16" furnace area. The floor is bare (no floor plates) and was used for storing mill rollers.
			Gamma measurements near the 10" bar mill and 10" cooling bed ranged from 5–10 µR/hr.
			Survey report notes that 12 µR/hr (maximum measurement outside the main plant area) is within the range of background measurements in the Lockport, New York, area.
			See Attachment 1 for the contamination map of the plant area taken during this survey, as well as the 1980 ORNL survey.
1980	ND–300	None Taken	Survey report describes maximum gamma reading with the following: *"One spot under a step to the raised cinder bed area was found to read 300 µR/hr. It was determined that cooling water during the uranium milling operations ran in this direction. Apparently metallic uranium shavings were washed into this area and dropped out in a localized spot, as measurements directly south of this spot, where the water continued to flow, were reduced to 48 µR/hr about 10 ft (3m) away, and dropped to background thereafter."* (FDBU 1981)
			Another location about 10 feet to the west of the 300 µR/hr measurement read 100 µR/hr. Another area on the east side of the 16" rolling mill read 60 µR/hr.
			This report contained survey data not considered by NIOSH in developing its penetrating dose distribution (see SC&A Observation 1).
			See Attachment 1 for the contamination map of the plant area taken during this survey, as well as the 1976 ORNL survey.

[2] ND = Not Detected

Table 1. Characterization of Survey Measurements Presented in NIOSH 2013b and Associated Survey Reports

Survey Year	Range of Gamma Values (µr/hr @ 3 ft)	Range of Beta Values (mrep/hr @ 3 ft)	Additional Comments
1984	30–120	None Taken	From the survey report, pg. 6: "*Based on information provided by [the site escort] and on the physical appearance of the plant, there have not been any significant changes in the physical layout of the rolling mill area during its operation (i.e., there has been no apparent grading, scraping, or filling done). The material beneath the cast iron plates seems to contain most of the contamination. Specifically, a layer of yellowish material lying two to three inches below the iron plates appears to be the source of the elevated radiation levels. A sample of this material was collected as well as a sample of black dirt above this layer. Below is a vertical cross-section of the raised area*" (DOE 1984). The "vertical cross-section" mentioned is shown in Figure 1 below.
1999	5–50	None Taken	Highest observed measurement (50 µR/hr) was in Building 8, which is connected to Building 6; these two areas are considered "the main rolling area."
			As was noted in NIOSH 2013b, the survey in 1999 only presented a range of gamma exposures at 1 meter. In its data analysis, NIOSH did not consider the maximum values from selected areas which were not explicitly used during Atomic Energy Commission (AEC) operations. Additionally, NIOSH did not consider the lower end values of the ranges presented for any area. See SC&A Observation 2.
2007	2–63	None Taken	NIOSH does not utilize the gamma survey data presented in 2007 in developing their penetrating dose distribution (NIOSH 2013b). See SC&A Observation 3.

It can be seen in Table 1 that measurements of the beta dose component at a distance of 3 feet exist only in the earliest survey of the site post-operations (the 1957 survey). The actual beta measurements from that survey were contained in Table I of Heatherton 1957 and are recreated below in Table 2. As shown in that table, three beta dose rate measurements are provided for the following locations: front of shear, between mill floor plates, and the forge area. These dose rates ranged from 0.05–0.4 mreps/hr. The highest observed beta dose rates were in the 10" bar mill bed area. While it is unknown how many measurements were made in this area, the beta dose rate ranged from 1–1.7 mreps/hr. NIOSH has chosen to take the midpoint of this range (1.35 mreps/hr) and apply that dose rate as a constant throughout the entire residual period (see SC&A Observation 4). Heatherton 1957 noted that aside from "two small areas," the beta-gamma dose rate never exceeded 0.2 mreps/hr.

NIOSH has chosen the highest observed gamma dose rate from the 1957 survey (0.08 mR/hr or 80 µR/hr) to use as a constant value throughout the residual period. While some later surveys showed higher dose rates in localized hot spots, 80 µR/hr exceeds the 95th percentile of all available gamma measurements (see SC&A Observations 1–3). Of the 79 total gamma measurements available from 1958–2000, only 4 measurements exceeded the proposed value of 80 µR/hr. None of the 2007 measurements (nearly 2,100 in total) exceeded 80 µR/hr.

Table 2. Survey Results from Heatherton 1957 (Recreation of Table I)

Location (Approximate Volume of Contamination)	Contact β, γ – mreps/hr	3 Feet β – mreps/hr	3 Feet γ – mR/hr
10" Bar Mill Bed (75 ft^2–1/2 in. thick)	10–20	1.0–1.7	0.04, 0.05
Front of Shear (10 ft^2–1 in. thick)	1–2	0.4	0.08
Between Plates on Mill Floor (not given)	0.15	0.05	None Detected
Forge Area (not given)	0.7–1.2	0.2	0.02
Top of Furnace (150 ft^2–2 in. thick)	1.0	No Reading Taken	No Reading Taken

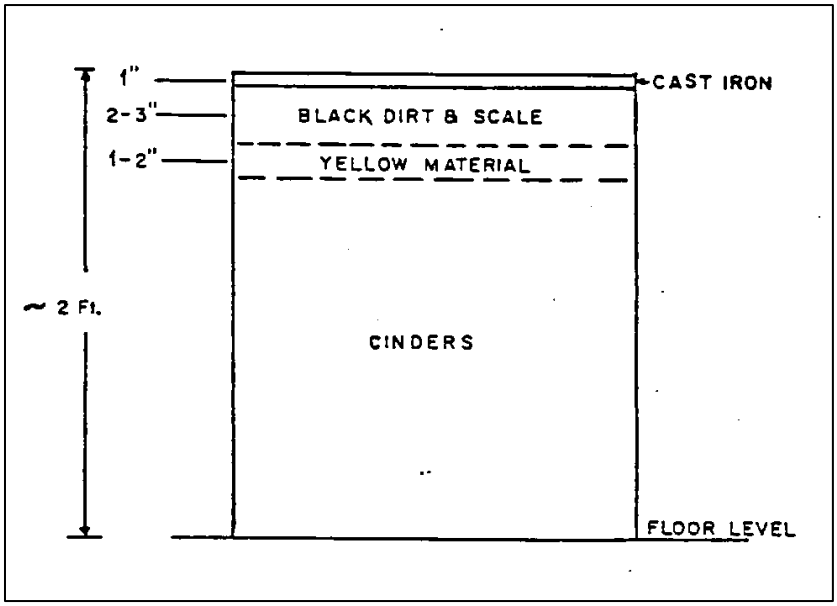


Figure 1. Cross Section of Raised Milling Area at Simonds as Characterized by the Department of Energy 1984 Residual Survey

SC&A Observation 1: NIOSH did not consider the additional gamma survey data contained in the 1980 residual survey performed by Ford, Bacon, and Davis Utah Inc. (FBDU 1981). This survey indicated measured contamination in the vicinity of the 16" bar mill as high as 300 µR/hr and another nearby area measuring 100 µR/hr. SC&A added the data from FBDU 1981 to the NIOSH compilation of survey data described in NIOSH 2013b. The resulting distribution increased the 95th percentile slightly (75 µR/hr increased to 77.6 µR/hr). Therefore, the effect of this additional data was negligible and the 95th percentile is still bounded by the proposed dose rate of 80 µR/hr.

SC&A Observation 2: In developing the distribution of gamma exposure values, NIOSH only considered the maximum values from Buildings 3, 6, and 8 from the 1999 residual survey (Vitkus 1999). Maximum values from other survey areas, as well as the minimum observed values from the 1999 survey, were not used. SC&A added these missing values to the distribution of gamma measurements and the resulting 95th percentile dropped from 75 µR/hr (NIOSH 2013b) to 66.5 µR/hr. If only the upper end of the range for each building was used, the 95th percentile still decreased from 75 to 72.1 µR/hr. Therefore, NIOSH's selection of 80 µR/hr bounds the 95th percentile of the combined dataset.

SC&A Observation 3: NIOSH elected not to include the 2007 gamma survey data (Earthtech 2010) in the distribution of penetrating dose rates, but did characterize the maximum measurements observed (NIOSH 2013b). SC&A examined the 2007 gamma survey data for relevance to the reconstruction of external doses (specifically penetrating doses) in the residual period. As noted in NIOSH 2013b, the highest observed gamma dose rate was 63 µR/hr in Building 2. The next highest measurements were taken in Buildings 6/8 at 45 and 30 µR/hr. Over 2,000 distinct measurements were taken at Simonds in 2007. When these measurements were fit to a lognormal distribution, the 95th percentile was only 9.72 µR/hr. If only Buildings 3, 6, and 8 are considered (where the AEC work was performed), the 95th percentile dose rate rises slightly to 11.34 µR/hr (nearly 1/8 the value proposed for residual dose assignment). Building 24's maximum value did not exceed 12 µR/hr. In essence, the 2007 survey data display the bounding nature of the proposed penetrating dose assignment of 80 µR/hr as presented in NIOSH 2013b.

SC&A Observation 4: Table 3.10 of Battelle 2011 provides factors for converting uranium surface contamination to external dose. The table displays conversion factors for both beta dose (non-penetrating) and photon dose (penetrating). The ratio of the dose conversion factors is approximately 100; in other words, one could expect the beta dose component from deposited natural uranium to be 100 times higher than the photon dose component. SC&A 2013 performed calculations using MCNP (Monte Carlo N-Particle Transport Code) that calculated a beta/gamma dose ratio closer to 45. However, in both cases (Battelle 2011 and SC&A 2013), it was assumed that the contamination was an infinitely thin slab of uranium with no self shielding taken into account. In reality, the beta component of natural uranium can only travel through a fraction of a millimeter of uranium metal, so the actual beta-to-gamma dose ratio will be much lower than either estimate.

NIOSH has chosen a beta dose value of 1.35 mrep/hr and a gamma value of 0.08 mR/hr (a ratio of approximately 17). Inspection of Table 2 shows that actual measured beta/gamma dose ratios ranged from 5–34. Given that the actual beta dose would have been partially shielded by the thickness of the contamination, as well as the fact that a significant portion of the contamination is contained under steel floor plates, SC&A believes that the chosen beta dose component is reasonable and claimant favorable. Additionally, the 1984 survey (DOE 1984) noted that the majority of the contamination was in the form of a "yellow material," which was located under both the steel plates and a 2–3" layer of black dirt and scale (see Figure 1 and the 1984 Survey entry in Table 1, above). This would further lower the actual beta dose rate.

Internal Dose during Residual Period:

NIOSH 2013c describes the proposed methodology for reconstructing internal doses during the residual period. No air sampling exists in the final 3 years of operation at Simonds Saw and Steel (1955–1957). Therefore, NIOSH utilized general air sampling data from 1954 uranium operations to establish a dust loading at the start of the residual period. There are 21 samples explicitly labelled "GA" or general air taken on 2 separate rolling days in 1954. When samples taken in the same area are averaged, the total number of values drops to 16. This total matches the number of general air samples SC&A identified in its original TBD review (SC&A 2012). Given that these general air samples reflect airborne contamination while the plant was in operation and handling uranium, they logically represent an overestimate of the actual airborne contamination that could have been resuspended during the residual period.

To estimate the potential dust loading at the end of the residual period, NIOSH utilized the 2007 Earthtech survey of the site (Earthtech 2010). Appendix B of NIOSH 2013c provides the analysis and rationale for the data used in the analysis. The analysis specifically looked at the buildings where AEC work took place and did not utilize survey data from buildings that were not involved in uranium milling. Additionally, only samples from the southern portion of Building 24 were included, because the northern portion of the building was not present during the operational period at Simonds. SC&A reviewed the original Earthtech survey reports and the underlying data provided by USACE and concurs with NIOSH's assessment of the survey data. Based on the analysis of three specific buildings (3, 8, and 24-South), NIOSH determined that the 95th percentile area contamination value was highest in Building 24 (67,000 dpm/100 cm^2). This value is a factor of approximately 1.2 higher than the 95th percentile contamination value measured in Building 24 during the 1999 survey (Vitkus 1999). This contamination value is utilized along with a resuspension factor of 10^{-6} m^{-1}, a breathing rate of 1.2 m^3/hr and a 2,500-hour work year. This results in an annual intake of 20,100 dpm or 24.6 pCi/d (see SC&A Observation 5). This daily intake rate is approximately a factor of 4.5 higher than the original TBD intake rate at the end of the residual period (5.4 pCi/d).

NIOSH 2013c also noted that the dust loading calculated based on area contamination is about an order of magnitude higher than the maximum measured air concentration that was observed during the 2007 residual survey. The air concentrations in 2007 were measured using breathing zone samplers during activities deemed likely to create resuspended contamination. These activities included:

- Brush clearing activities using the hydro-axe
- Boring activities in Buildings 6 and 8
- Radiological survey work conducted on the roof trusses of Building 24

Earthtech concludes the following: *"Breathing zone sample results demonstrated that airborne contamination during site activities was minimal. The maximum value for the breathing zone samples equated to 0.2 DAC-hrs, with the majority below detection limits."*

SC&A Observation 5: In the absence of data to establish airborne radioactivity levels during the residual period, ORAUT 2012 recommends using operational source term data with a depletion factor of 0.00067 d^{-1} to account for the removal of the contamination over time. In this case, there are obviously monitoring data during the residual period that can be used to reconstruct the airborne radioactivity from resuspended contamination. NIOSH proposes to use operational data to establish the starting source term and area contamination measurements taken at the end of the residual period. This method results in a depletion factor of 0.00016 d^{-1}, which is roughly 25% of the recommended depletion rate in OTIB-0070. Therefore, the proposed method for Simonds Saw and Steel represents a more conservative (claimant-favorable) approach than what is recommended in ORAUT 2012.

SC&A Recommendation:

Based on the above discussion, SC&A believes that NIOSH has satisfactorily addressed the original concerns with reconstruction of both internal and external doses during the residual period. SC&A's position is that the currently proposed methods represent a scientifically defensible, sufficiently accurate and claimant-favorable approach. Therefore, SC&A recommends that the Work Group accept the proposed approaches outlined in NIOSH 2013b and NIOSH 2013c and place Findings 6 and 7 "in abeyance" until the TBD is revised to reflect the new methodology.

References:

ABRWH 2013a. *Transcript of the Teleconference Meeting of the Work Group on TBD-6000*. Advisory Board on Radiation Worker Health. April 26, 2013.

ABRWH 2013b. *Transcript of the Teleconference Meeting of the Work Group on TBD-6000.* Advisory Board on Radiation Worker Health. June 20, 2013.

Battelle 2011. *Site Profiles for Atomic Weapons Employers that Worked Uranium Metals*. Battelle-TBD-6000, Rev. 1. Division of Compensation Analysis and Support. June 17, 2011.

DOE 1984. *DOE Completion Report – Residual Survey of Guterl Steel Corporation, Lockport, New York*. Department of Energy. December 1984.

Earthtech 2010. *Remedial Investigation Report Former Guterl Specialty Steel Corporation FUSRAP Site Lockport, New York*. Prepared for the U.S. Army Corps of Engineers (USACE) July 26, 2010.

FBDU 1981. *Preliminary Engineering and Environmental Evaluation of the Remedial Action Alternatives for the Former Simonds Saw and Steel Company Site, Lockport, New York*. Prepared for Bechtel National, Inc. by Ford Bacon and Davis Utah Inc. Salt Lake City, Utah. November 1981.

Heatherton 1957. *Trip Report to Simonds Saw and Steel Company, Lockport, New York*. National Lead Company. July 12, 1957.

NIOSH 2013a. *Simonds Saw and Steel Site Profile Review Issues Matrix*. National Institute for Occupational Safety and Health – Division of Compensation Analysis and Support. February 1, 2013.

NIOSH 2013b. *Review of Simonds Saw and Steel Plant Residual External Dose*. National Institute for Occupational Safety and Health – Division of Compensation Analysis and Support. September 30, 2013.

NIOSH 2013c. *Review of Simonds Saw and Steel Plant Residual Internal Dose*. National Institute for Occupational Safety and Health – Division of Compensation Analysis and Support. February 4, 2014.

ORAUT 2008. *Dose Reconstruction during Residual Radioactivity Periods at Atomic Weapons Employer Facilities*, ORAUT-OTIB-0070, Rev. 0. Oak Ridge Associated Universities Team. March 10, 2008.

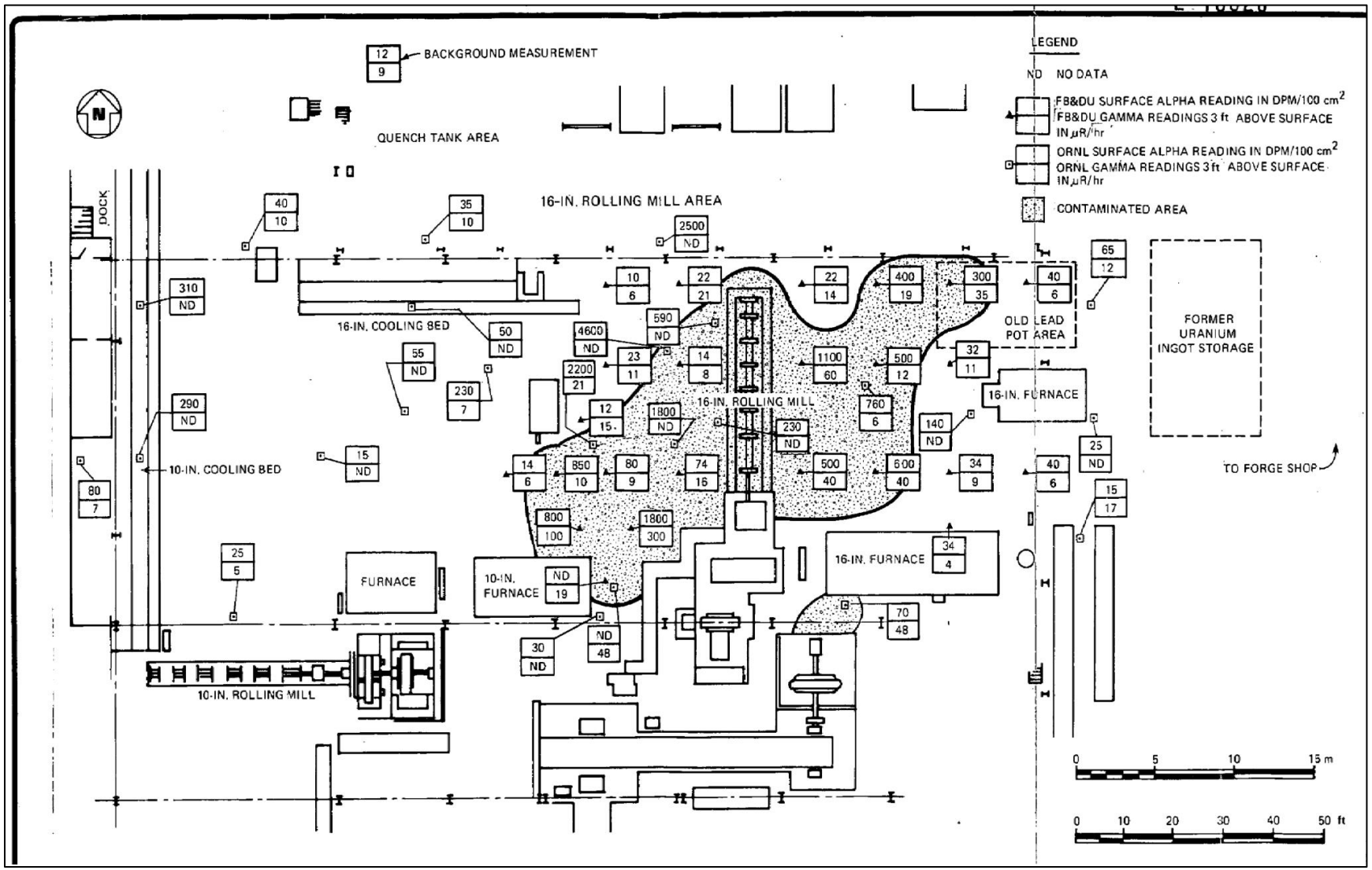
ORAUT 2012. *Dose Reconstruction during Residual Radioactivity Periods at Atomic Weapons Employer Facilities*, ORAUT-OTIB-0070, Rev. 1. Oak Ridge Associated Universities Team. March 5, 2012.

SC&A 2012. *Review of the Site Profile for the Simonds Saw and Steel Plant*. SC&A, Inc., Vienna, Virginia, and Saliant, Inc., Jefferson, Maryland. June 13, 2012.

SC&A 2013. *Analysis of Table 3.10, NIOSH TBD-6000: "Dose conversion factors from natural uranium surface contamination*. SC&A, Inc., Vienna, Virginia. April 27, 2013.

Vitkus 1999. *Radiological Survey of the Guterl Specialty Steel Corporation, Lockport, New York.* Oak Ridge Institute for Science and Education – Environmental Survey and Site Assessment Program, Oak Ridge, Tennessee. December 1999.

Attachment 1: Survey Map from 1980 Residual Survey in Comparison to 1976 Survey Results



Source: FBDU 1981, Figure 4-3

Attachment 2: Status of Additional Findings (1-5) for the Simonds Saw and Steel Site Profile Review

This attachment provides a condensed version of the Simonds Saw and Steel Site Profile Issue Matrix as transmitted to the Work Group on May 2, 2013. This material is provided for reference only and attempted to incorporate comments received by NIOSH/DCAS on that document subsequent to the original transmission.

Table A-1: Summary of Status for Findings 1-5 for Reference

Summary of Original Finding	Path Forward	Official Matrix Status
Finding 1: Operational External Doses TBD external dose assignment in operational period utilizes a combination of MCNP modeling, surrogate data from Aliquipa Forge, and a single general area measurement taken by the AEC. The TBD should discuss the limited available film badge at Simonds in the context of the claimant favorability of the approach taken in the TBD.	NIOSH provided their official position in an email to the TBD-6000 Work Group on 6/12/2013 which reflected the path forward agreed upon during the 4/26/2013 Work Group meeting. NIOSH to add/clarify discussion of film badges in the next TBD revision to justify the use and claimant favorability of the modeled external doses as discussed.	In Abeyance
Finding 2: Temporal Variations in Industrial Controls and Thus Exposure Potential for Simonds Saw and Steel Workers Simonds Saw and Steel had well documented changes in industrial hygiene practices as early visits from the AEC noted unacceptable worker exposure conditions. Subsequent changes improved working conditions markedly. However, these industrial controls were later removed or rendered ineffective in the latter years of operation. The TBD should discuss this variation in exposure potential in the context of the claimant favorability of the proposed internal model.	NIOSH plans to revise the TBD with an entirely new internal coworker model during the operational period to better comport with more recent methods utilized at other sites. One facet of the new internal coworker model will be to apply the 95th percentile of observed intake values for all plant workers to account for the variation in exposure potential. Alternately, the median value will be applied as a constant to office and administrative type workers. As part of the revision, NIOSH will add explanatory text how the new internal coworker model accounts for these variations in exposure potential.	In Abeyance

Table A-1: Summary of Status for Findings 1-5 for Reference

Summary of Original Finding	Path Forward	Official Matrix Status
Finding 3: Available Urinalysis Samples Showed Significant Variation Among Different Job Types and Among Different Shifts (Day versus Night). Urinalysis sampling generally occurred just prior and just after a rolling period. It may be beneficial to analyze the data for individual workers and individual job types to gain insight to varying exposure potential among workers. Additionally, documentation notes that there may have been a higher exposure potential to 2nd shift workers than to the 1st.	NIOSH examined the data for trends among different job types and among different shifts. The results of this investigation were inconclusive and did not indicate a reasonable basis for stratification of the coworker model. Due to significant, but not predictable, variations in urinalysis values among different job types and shifts, NIOSH is revising their coworker approach to apply the 95th percentile to mill workers and the 50th percentile to office/administrative workers. In revising the TBD, NIOSH will include the justification of the new coworker model as described herein. No further analysis of the urinalysis data is required.	In Abeyance
Finding 4: Large Variation in Exposure Potential Based on Daily Weighted Exposure Studies Similar to observed urinalysis values (Finding 3), daily weighted exposure studies at Simonds Saw and Steel showed significant variation in exposure potential even among the same job title. NIOSH should demonstrate that the proposed intakes are bounding for all types of workers and all types of exposure potential.	NIOSH acknowledges that there was significant variation in exposure potential to mill workers at the Simonds Saw and Steel facility. NIOSH is revising the internal coworker model in the TBD to reflect this variation by assigning the 95th percentile to mill workers and the 50th percentile to office/administrative workers. In revising the TBD, NIOSH will include the justification of the new coworker model as described herein. No further analysis of DWE/air sampling data is needed or warranted, although a short explanation of the significance of the air sampling data in the context of the internal dose model will be considered by NIOSH.	In Abeyance
Finding 5: Choice of Internal Coworker Model using Urinalysis Values instead of Daily Weight Exposure Data The TBD selects coworker intakes based on the urinalysis data although intakes derived from the DWE data are higher for certain periods and uranium solubility types. The TBD would benefit from a substantive discussion of the choice of urinalysis over DWE values to assure assigned intakes are bounding.	NIOSH and SC&A agree that urinalysis sampling is preferable in characterizing worker exposures to air sampling data. NIOSH is revising the internal coworker model in the TBD to reflect this variation by assigning the 95th percentile to mill workers and the 50th percentile to office/administrative workers. In revising the TBD, NIOSH will include the justification of the new coworker model as described herein. No further analysis of DWE/air sampling data is needed or warranted, although a short explanation of the significance of the air sampling data in the context of the internal dose model will be considered by NIOSH.	In Abeyance