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N60028_002689
TREASURE ISLAND
SSIC NO. 5090.3.A

DATE: December 11, 2015

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SUBJ: CDPH-EMB document review comments for the **DRAFT Report Final Status Survey of Building 3**, Former Naval Station Treasure Island San Francisco, California.
Issued October 15, 2015.

The California Department of Public Health (CDPH) - EMB has reviewed the subject document and has comments to submit. Please see the attached review comments. This review was performed by Matthew Wright in support of the Interagency Agreement between DTSC and CDPH-EMB.

If you have any questions concerning this review, or if you need additional information, please contact Matthew Wright at (916) 449-5687.



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The Environmental Management Branch (EMB) of the California Department of Public Health (CDPH) appreciates the opportunity to review the submitted document, *DRAFT REPORT FINAL STATUS SURVEY OF BUILDING 3* Former Naval Station Treasure Island San Francisco, California. Issued October 15, 2015.

General Comments:

1. Please note that CDPH-EMB utilizes Section 30256 in Title 17 of the California Code of Regulations (17 CCR 30256) to render a decision to concur with an unrestricted release. As a result, CDPH-EMB requires a final status survey report that compares the distribution of data from the excavation site with applicable reference area data and documents the remediation efforts. The final status survey should document and explain reasonable efforts that have been made to remediate the site.
2. Background reference areas were not presented nor applied in this *DRAFT REPORT FINAL STATUS SURVEY OF BUILDING 3*. This represents a significant departure from the standard practices embodied in Multi-Agency Radiation Survey and Site Investigation Manual, (MARSSIM) NUREG-1575, Revision 1. August 1997; utilized by CDPH-EMB to grant a radiological unrestricted release recommendation (RURR). Please include a comparison of the distribution of data from the surveyed site(s) with applicable reference area datasets for the interior floor/ lower wall surfaces, optical shop roof area, outside building perimeter and sanitary sewer from optical shop.

Additionally, Section 3.6 APPLICATION OF RADIOLOGICAL SCREENING CRITERIA, page 11 of the ITSI Gibleane Final Radiological Management Plan Former Naval Station Treasure Island San Francisco, California, (July 2013), states the following, "The criteria provided in Table 3.1 are NOT intended to be used as the principal means of radiologically clearing buildings, structures, and land areas for unrestricted use. The survey data will be statistically compared to background to determine if residual radioactivity levels are indistinguishable from background."

3. Final Historical Radiological Assessment-Supplemental Technical Memorandum (July, 2014), Naval Station Treasure Island San Francisco, California; figure two, "Newly Identified Radiologically Impacted Areas", the Installation Restoration Site 21 boundary subsumes a portion of Building 3 Site. Please explain.

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Specific Comments:

4. EXECUTIVE SUMMARY, page vi, paragraph two, sentence two, "The final status survey was designed to collect data from those areas to determine if radioactivity is present at levels that exceed the release criteria; and, if not, to provide a suitable technical basis for radiological clearance of Building 3 for unrestricted use". CDPH-EMB believes that this statement is meant to apply to the survey results of gross gamma scans, alpha/beta scans, static measurements and removable loose surface contamination surveys. However, CDPH-EMB notes that Table 1-3 Release Criteria, page seven, footnote, "e", states, "No release criterion for Th-232 has been established at NSTI", for Volumetric Radioactivity (pCi/g). Please explain why there is no release criterion for Th-232 Volumetric Radioactivity (pCi/g).
5. Section 1.1 OBJECTIVE AND SCOPE, page one, paragraph one, sentence three, "The final status survey was designed to collect data from those areas to determine if radioactivity is present at levels that exceed the release criteria." Please see comment one and two.
6. Section 1.2.4 Sanitary Sewer from Optical Shop, page four, paragraph one, sentence four, "The optical shop was demolished in 1969, and part of the drain line serving the shop was removed along with the shop." Which sections of the pipe was removed? Please clarify.
7. Section 2.3.1 Number of Measurements, page 12, paragraph one, two, "Using a hot spot activity of 300 dpm/100 cm² i.e., three times the release criterion, equates to three times the N/2 sampling density given in MARSSIM (DoD, 2000) Table 5.3, or 27 static measurements per survey unit." This appears to be in error in interpretation of MARSSIM Table 5.3, Values of N/2 for a Given Relative Shift (Δ/σ).

CDPH-EMB appreciates that the Navy's Radiological Affairs Support Office (RASO) guidance document entitled, "Conducting Alpha Scans for Radium", (Navy, 2013), was issued in December 2013, after the bulk of the surveys were completed. None the less, a review of Attachment 1 of the Final Radiological Management Plan (ITSI Gilbane, 2013a), "Number of Measurements", Section, Estimation of Variability in Residual Radioactivity in Concentration, page one, paragraph two, sentence one, states, "MARSSIM (DoD, 2000) states that the relative shift values greater than 3.0 will not result

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in significant changes in the number of measurements required to support a decision. Therefore the upper bound for the survey design goal for the relative shift (Δ/σ) is 3.0.”

Additionally in Section, Acceptable Decision Errors (α/β), page two, paragraph two, sentence two, “This type of decision error is designated Type I. A decision error rate of 5% is assigned at the Upper Bound of the Gray Region (UBGR), which means there is at least 95% confidence that areas with radionuclide concentrations greater than the UBGR will be investigated.”

Also in Section, Acceptable Decision Errors (α/β), page two, paragraph three, sentence two, “This type of decision error is designated Type II. A decision error rate of 5% is also assigned at the UBGR, which means there is at least 95% confidence that areas with residual radioactivity below the radiological screening criteria will not require additional investigation.”

A review of MARSSIM Table 5.3, Values of N/2 for a Given Relative Shift (Δ/σ), α and β when the Contamination is Present in the Background; shows for Type I error, $\alpha = 0.05$ and Type II error, $\beta = 0.05$; with a $\Delta/\sigma = 3.0$; the value for N/2 = 10. Three times the N/2 sampling density of 10 \neq 27. Please verify.

8. Section 3.1.2 Instrument Response, page 15, paragraph one, sentence two, “Instrument response was checked before instrument use each day data were collected, using a check source that emits the same type of radiation (i.e., alpha, beta, and/or gamma) as the radiation being measured and that gives a similar instrument response.” Please ensure that at the conclusion of the final day of survey, each instrument passes the same checks detailed above so as to document, “book end”, proper functioning of the instrument at the end of the survey.
9. Table 3-2 Detection Sensitivities, page 16, footnote, “d”, states “ 4π detection efficiency assumed”. The Model 43-10-1 Alpha/Beta Sample Counter November 2015 product manual details steps to calculate the 4π detection efficiency for this model. Therefore why is the 4π detection efficiency assumed and not calculated?
10. Table 5-2 Interior Static Measurement Data Summary: West Areas (SU 1), page 32, column one, shows the number of, “Static (Total Activity) Beta

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Measurements > than release criterion”, as zero (0)”. There are no release criteria for beta-emitters. Please replace the number zero (0) for Static (Total Activity) Beta Measurements in this, and all similar charts with the notation, “Not Applicable” (N/A). Please add a footnote to this, and all similar charts, explaining why there are no release criteria for beta-emitters.

11. Section 6.4 ALPHA/BETA SCANS, page 44, paragraph one, sentence three, “The surveyor observed the visual meter indication and listened to the audible meter response. Based on this method, no roof areas were identified with elevated readings suspected to be above the release criteria.” This method of survey is heavily reliant on the skill of the technician performing the survey. Please supply training records of the technician(s) performing the survey demonstrating mastery of both the instruments and the survey techniques to a senior technician level.
12. Section 6.4 ALPHA/BETA SCANS, page 44, paragraph one, sentence five, “Since alpha/beta scan data were not captured electronically, numerical and graphical review of the data was not performed.” Where was this information captured? Please provide survey data, documents, field notes, log entries etc., which document the survey results reported.
13. Section 8.2 DATA COLLECTION, page 59, paragraph one, sentence two, “The collected data are presented in Appendix O”. It appears the correct Appendix reference is Appendix K.
14. Section 8.3 GROSS GAMMA SCANS, page 61, paragraph one, sentence one, “Gross gamma scans were performed on roof drains and vertical drain piping runs accessed from the roof of Building 3 (see Figure 8-1).” During the course of these gross gamma scans, including those in the interior of the pipe, were visual inspections performed? Were any cracks or sediment deposits noted in the interior of the pipe runs?
15. Section 8.4 VOLUMETRIC SAMPLING, page 61, paragraph one, sentence three, “Th-232 was reported at a concentration of 0.11 pCi/g.” Please see specific comment number two.
16. Section 8.5 DATA ASSESSMENT, page 62, paragraph three, sentence three, “The results of the sediment sample collected from the manhole reported 0.15 pCi/g Ra-226, which is well below the release criterion.” Please note that Th-232 is also listed in Table 1-2, Radionuclides of Concern

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Sanitary, Sewer from Optical Shop, as a Radionuclide of Concern. Please include the results of the sediment sample for Th-232; placed in a context that compares the distribution of data from the surveyed site to applicable reference area data.

- 17 Appendix A, Probability-Based Detection Method for Elevated Alpha Radioactivity, page one, paragraph two, sentence four, "Using the performance characteristics of the Ludlum Model 43-37 (see Table 3-2) and a scan rate of 5 cm/sec, solving the above equation results in a probability of detection of 76%, which falls within the acceptable range of 68% to 90%, according to RASO guidance (Navy, 2013)." Please note when the equation is worked out the probability of detection is 83%.

$$(n \geq 2) = 1 - e^{-(GE+B)t60} (1 + (GE + B)t60) =$$

$$1 - e^{-((1,752)(0.04)+2)2.760} (1 + 194.660) = 0.83$$

Please explain the discrepancy between the value given in the text, 76%, and the value given as a result of working the equation, 0.83, which equates to 83%.