



DEPARTMENT OF THE NAVY

CRANE DIVISION
NAVAL SURFACE WARFARE CENTER
300 HIGHWAY 361
CRANE, INDIANA 47522-5000

N00164.AR.000962
NSWC CRANE
5090.3a

IN REPLY REFER TO:
5090/S4.7
Ser RP3/5217

23 JUN 2005

Indiana Department of Environmental Management
Corrective Action Section
Office Of Land Quality
Hazardous Waste Permits
100 N Senate Ave
PO Box 6015
Indianapolis, In 46206-6015

Dear Mr. Workman:

Crane Division, Naval Surface Warfare Center submits a copy of the letter that was sent to the persons on the facility mailing list notifying them of the April 6, 2005 Class 1 Modification approval by the Indiana Department of Environmental Management. Enclosure (1) contains the letter with merge codes, the Statement of Basis that was an enclosure to the letter, and the facility mailing list. The permit required Certification Statement is provided as enclosure (2).

If you require any further information, my point of contact is Mr. Thomas J. Brent, Code RP3-TB, at 812-854-6160, email thomas.brent@navy.mil.

Sincerely,

JAMES M. HUNSICKER
Manager, Environmental Protection
By direction of the Commanding Officer

Enclosures: 1. Facility Mailing List Notification Documentation
2. Certification Statement

Copy to:
ADMINISTRATIVE RECORD
SOUTHNAVFACENGCOM (Code ES31)
USEPA (Pete Ramanauskas)
IDEM (Doug Griffin)

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.


SIGNATURE

Manager, Environmental Protection
TITLE

6/23/05
DATE

Enclosure (1)

Facility Mailing List Notification Documentation

5090/S4.7
Ser RP3/5212
20 JUN 2005

«ORGANIZATION»
«NAME»
«ADDRESS»
«CITY_STATE» «ZIP_CODE»[TJB]

On April 6, 2005, Crane Division, Naval Surface Warfare Center (NSWC Crane) received approval from the Director of the Indiana Department of Environmental Management (IDEM) for a Class 1 modification of its Final Resource Conservation and Recovery Act (RCRA) Hazardous Waste Management Permit dated October 18, 2001. This Class 1 modification required prior approval of the Director of IDEM. Three items are addressed in the permit modification.

The first modification results from a No Further Action (NFA) determination NSWC Crane received from the U. S. EPA for the Landfarm, Solid Waste Management Unit (SWMU) 30/00. The NFA was based on conclusions reached from ground water and soil/sludge samples that no excess risk existed from the previous application of sludges that were possibly contaminated with plating wastes. On October 20, 2004, the U. S. EPA issued a Statement of Basis for this SWMU, which is provided as enclosure (1) and also available on the NSWC Crane website at: www.crane.navy.mil/newscommunity/Envir_RAB_default.asp?bhcp=1

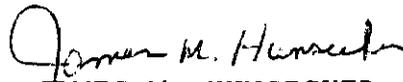
The second modification concerns the need to conduct a RCRA Facility Investigation (RFI) at a former munitions testing area. Specifically, the site is the Building 2044 Drop Tower and Test Rail [Area of Concern (AOC) 02/00]. This AOC was used from 1951 through 1973 for the drop testing of 20-mm cartridges as well as functional testing of cartridge actuated devices (CADs) and propellant actuated devices (PADs) used in ejection seats. The site consists of a drop tower that is approximately 100 feet tall and a 97 foot long test rail. The 20-mm cartridges were dropped from the tower onto a concrete pad. The CADs and PADs were tested on the test rail. An RFI will investigate impacts to all media and the need for remedial action.

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The third modification revises the descriptive language for the Load and Fill Area Buildings, SWMU 18, in Appendix J of the permit. The description of SWMU 18 was amended to ensure that the test pads on the hill behind Building 198 will be addressed in a future RFI.

If you require any further information, my point of contact is Mr. Thomas J. Brent, Code RP3-TB, at 812-854-6160, email thomas.brent@navy.mil.

Sincerely,



JAMES M. HUNSICKER
Manager, Environmental Protection
By direction of the Commanding Officer

Enclosure: 1. Statement of Basis

**UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
STATEMENT OF BASIS FOR NO FURTHER ACTION DETERMINATION
AT SOLID WASTE MANAGEMENT UNIT #30/00 (LANDFARM)
NAVAL SURFACE WARFARE CENTER
CRANE, INDIANA**

Introduction

On July 31, 1995, the United States Environmental Protection Agency (U.S. EPA) renewed a Resource Conservation and Recovery Act (RCRA) hazardous waste management permit for the U.S. Navy's Naval Surface Warfare Center - Crane Division (NSWC) located in Crane, Indiana. The permit became effective on September 14, 1995 for a duration of 5 years and contained both federal and state conditions. In 2001, the Indiana Department of Environmental Management (IDEM) renewed the entire RCRA Permit for NSWC as the State of Indiana has been authorized to administer the RCRA program in lieu of U.S. EPA. The permit establishes the Hazardous and Solid Waste Amendment (HSWA) Corrective Action Requirements and Compliance Schedules obligating the U.S. Navy to perform RCRA Facility Investigations (RFIs) at 33 Solid Waste Management Units (SWMUs), to conduct Corrective Measures Studies, and to implement corrective measures if needed. As part of a December 2001 Work Sharing Agreement between U.S. EPA and IDEM, the U.S. EPA retained oversight of work conducted at SWMU #30/00 (Landfarm). IDEM retains final decision making authority under the RCRA Permit and has classified this No Further Action (NFA) determination to be a Class I modification to the permit.

This Statement of Basis explains the reasons for a determination of NFA at SWMU #30/00. This document summarizes information that can be found in greater detail in the RCRA Facility Investigation (RFI) reports and other documents contained in the administrative record for this SWMU.

Background

NSWC operates a wastewater treatment plant that generates sludges. NSWC historically used land application for the disposal of sludge from its main on-site sewage treatment plant. These sludges are from the processing of domestic and process wastewater sources. Process sources include wastewater from metal finishing operations; surface coating operations; the loading, assembly, and packing of ordnance; water treatment plant backwash; boiler blowdowns; and industrial laundry.

In October 1980, NSWC filed a RCRA Section 3010 Notification and a Part A (interim status) permit application to operate as a treatment, storage, or disposal facility. The application for the Part A permit was approved and the facility was allowed to operate as though it had a permit. In December 1983, NSWC applied for and obtained a sludge application permit to spray sludges from its wastewater treatment plant

along approximately 18 miles of roadside near the western boundary of the facility. On April 13, 1988, NSWC was issued a permit (effective May 6, 1988) to apply sludge to a 2.5-acre site (Landfarm) located near an existing sanitary landfill. Sludges from the on-site wastewater treatment facility were applied to this site from November 16, 1988 through March 1995. In June of 1994, NSWC began applying sludges to eight new land-application-permitted sites located south and southeast of the Landfarm.

In 1992, the U.S. EPA became concerned that the sludges from the on-site treatment plant should be characterized as F006 waste (i.e., wastewater treatment sludges from electroplating operations). U.S. EPA contended that the wastewaters discharging from the electroplating shop pretreatment plants were mixing with other wastewaters in the sewer system prior to arrival at the main sewage treatment plant. In response to U.S. EPA concerns, NSWC implemented measures to prevent the discharge of wastes from the plating shops and the resulting mixing with other wastewaters. In 1995, U.S. EPA renewed and modified the NSWC permit to include the Landfarm as SWMU #30/00 to settle the enforcement issue concerning F006 and to modify the HSWA corrective action requirements and schedule. U.S. EPA had already required NSWC to conduct an RFI at the Landfarm as part of the 1989 permit to determine if the previous application of sludges possibly contaminated with plating wastes had adversely affected the shallow groundwater regime. The results of the RFI investigations at the Landfarm would be used to determine the need for activity along the 18 miles of roadside.

Investigations Conducted

NSWC submitted a RCRA Facility Investigation Report for this SWMU in May 2001. The purpose of the investigation was to determine if the previous application of sludges possibly contaminated with plating wastes had impacted the shallow groundwater regime. From October 1999 to October 2000, NSWC conducted five rounds of groundwater sampling from seven wells at the Landfarm. Samples were collected quarterly to examine the variability of the analytical data versus time and seasonal changes. Groundwater samples were analyzed for a list of parameters associated with sludge application operations. The parameters for the first two rounds of sampling included volatile organic compounds (VOCs), metals, explosives, cyanide, nitrate/nitrite, ammonia, and phosphorous. Data from the initial two rounds were used to focus the subsequent three sampling rounds on a list of potential contaminants of concern. Since metals were the primary contaminants of concern associated with this SWMU, metals analysis was conducted on all five sampling rounds.

VOCs and explosives were not detected in any of the wells during sampling rounds 1 and 2 and were eliminated from analysis for the remaining three rounds. Four metals exceeded their respective Risk Based Target Levels (RBTLs) in at least one sample. RBTLs are used as conservative screening values to identify potential constituents of concern. Chemical concentrations above a RBTL would not automatically

designate a site as "dirty" or trigger a response action. However, exceeding a RBTL suggests that further evaluation of the potential risks that may be posed by site contaminants is appropriate. The RFI RBTLs values were based on Drinking Water Standards, EPA's Region 9 Preliminary Remedial Goals (PRG), or other human health based criteria and are presented in Table 1 below along with the maximum detected value and the frequency of detection.

Table 1 - Metals exceeding RBTLs in Groundwater

Element	Number of Detections Over RBTLs in One Year	Maximum Detected Value (ug/L)	RFI RBTL (ug/L)	Drinking Water Standards (ug/L)	Lifetime HA ¹ (ug/L)	State of Indiana Residential Groundwater Level ² (ug/L)
Arsenic	15	6.8	2	10	NA	50
Cadmium	1	5.3	5	5	5	5
Nickel	1	108	100	NA	100	730
Thallium	2	2.8	2.4	2	0.5	2

1) Lifetime HA - The concentration of a chemical in drinking water that is not expected to cause any adverse noncarcinogenic effects for a lifetime of exposure

2) Indiana Department of Environmental Management Risk Integrated System of Closure (RISC) February 15, 2001 Table A: The default closure level for residential settings is the MCL, if the MCL has been established; if not, the default closure level is the lowest of either the ground water pathway or the solubility limit.

Arsenic was detected above its RBTL fifteen times throughout the sampling period, but the maximum detected value is below drinking water standards. Cadmium, Nickel, and Thallium were detected above their RBTLs very infrequently throughout the sampling period. As an additional check, a statistical test was performed to determine if parameter concentrations detected in downgradient wells were significantly different from those detected in samples from the upgradient wells. The Analysis of Variance (ANOVA) technique was the basic approach used to compare data from upgradient and downgradient monitoring well locations. The ANOVA technique was used to test whether there was statistically significant evidence of contamination associated with SWMU #30/00. The test was performed on all parameters detected at least once in the five downgradient wells during the five sampling rounds. The results of the ANOVA showed that none of the parameters had downgradient concentrations that were higher than their respective upgradient concentrations at a statistical significance of 5% (i.e., 95% confidence). This supports the hypothesis that there is no significant impact on groundwater at the site due to activities at the SWMU.

Because of no impact to groundwater, NSWC requested No Further Action at this SWMU for all media. The U.S. EPA recommended that NSWC collect and analyze soil/sludge samples from the Landfarm in order to identify any potential risks that may be present in the soil/sludge exposure pathway. In March 2002, NSWC collected 18 surface and subsurface soil samples. Samples were collected from a grid encompassing the SWMU proper as well as perimeter samples. The samples were analyzed for metals as these were the primary constituents of concern at the Landfarm. Sample results were compared to RBTLs (based on human health and ecological risk screening levels) as well as background metals soil values obtained from NSWC's Basewide Background Soil Investigation (January 2001).

The RBTLs used in the soils investigation included the lowest value taken from U.S. EPA Region 9 Preliminary Remediation Goals for exposure to soils (residential land use), IDEM Tier I Default Closure Levels for soils for residential land use, U.S. EPA Soil Screening Levels for Soil Ingestion, Transfer from Soils to Air, Migration from Soils to Groundwater, or U.S. EPA Region 5 Ecological Data Quality Levels (EDQLs). Soils were screened against the lowest human health or ecological risk based criteria. Metals which exceeded the RBTLs are listed in Table 2 below.

Table 2 - Metals exceeding RBTLs in Soil

Element	Maximum Detected Surface Soil Value (0 - 2 ft) (mg/kg)	Maximum Detected Subsurface Soil Value (2 - 4 ft) (mg/kg)	RFI RBTL ¹ (mg/kg)	State of Indiana Residential Soil Level ² (mg/kg)	Region 9 Residential Soil Direct Contact PRG (mg/kg)	Maximum Basewide Background Concentration Surface Soil ³ (mg/kg)	Maximum Basewide Background Concentration Subsurface Soil ³ (mg/kg)
Antimony	6	6U	0.1423	5.4	31	0.23U ⁴	10.8
Arsenic	22.4	12.9	0.39	3.9	0.39	6.8	6.0
Barium	181	161	1.04	1,600	5,400	155	94.4
Beryllium	1.5	1.4	0.1	63	150	0.74	0.69
Cadmium	1.6	0.72	0.00222	7.5	37	0.05U ⁴	0.05U ⁴
Chromium (hexavalent)	No Data	4	0.4	38	30	Not Analyzed	Not Analyzed
Chromium (total)	39.3	30.7	2.0	No Value	21	15.1	25.5
Cobalt	16.9	26.2	0.14033	No Value	900	17.1	9.2
Copper	38.7	20.3	2.96	580	3,100	11.3	16.4
Iron	42,500	35,800	23,000	No Value	23,000	17,400	27,700
Lead	30.7	35.0	0.05373	81	400	17.1	11.7
Manganese	2,890	4,690	1,800	No Value	1,800	1,960	370
Mercury	0.41	0.048	0.073	2.1	23	0.06	0.07
Nickel	20.6	17.7	7.0	950	1,600	17.4	13.1
Selenium	0.85	0.58	0.02765	5.2	390	0.33U ⁴	0.16U ⁴
Silver	19.7	0.14	2.0	31	390	0.05	0.05
Thallium	0.37	0.34	0.04	2.8	5.2	0.31	0.27
Vanadium	60.9	55.9	1.59	No Value	550	32.2	42.4
Zinc	115	68.8	6.62	10,000	23,000	49.6	35.3

1) Value is based on the lowest human health or ecological risk-based criteria.

2) Indiana Department of Environmental Management Risk Integrated System of Closure (RISC) February 15, 2001 Table A: Residential Soil Closure Level.

3) NSWG Basewide Background Soil Investigation Report (January 2001)

4) This value is the average of all non-detected values. Non-detected values were represented by using one-half the detection limit.

U – Not detected at Reporting Limit.

Antimony, arsenic, chromium, iron, manganese, and vanadium were the only inorganics detected at concentrations exceeding risk-based human health screening levels. All other inorganics noted in Table 2 exceeded ecological risk screening values. U.S. EPA Region 5 typically utilizes screening levels based on the U.S. EPA Region 9 PRGs. The screening value used for non-carcinogenic chemicals is one-tenth of the Region 9 PRG to account for the potential cumulative effects of multiple compounds affecting the same target organ. When chemical constituents are found to exceed screening levels, the U.S. EPA also requires an evaluation of cumulative cancer risk and non-cancer (Hazard Index (HI)) risk from the potential exposure to the presence of multiple chemicals. Two human receptors (the hypothetical future resident and typical industrial worker) were evaluated for health risks potentially resulting from exposure to these metals. The results of the cumulative risk evaluations are shown in Table 3. These risk estimates were calculated using a 95% Upper Confidence Limit value on sample results as the exposure point concentration of the chemical for human receptors.

Table 3 – Cancer and non-cancer risk estimates for Landfarm soils (95% UCL EPC)
 {tc VI "Table 3 – Cancer and non-cancer risk estimates for Landfarm soils (95% UCL EPC)}

	Grid Surface Soil	Perimeter Surface Soil	Grid Subsurface Soil	Perimeter Subsurface Soil
Hazard Index (Residential)	2.1	1.5	2.2	2.5
Cancer Risk (Residential)	3.1E-05	2.0E-5	2.5E-05	2.7E-05
Hazard Index (Industrial)	0.17	0.11	0.19	0.24
Cancer Risk (Industrial)	7.6E-06	5.0E-06	6.2E-06	6.6E-06

U.S. EPA typically considers sites with a calculated HI value below 1 and a cancer risk estimate range between 10^{-4} and 10^{-6} as generally not requiring additional remediation. The calculated cumulative cancer risk for both receptors falls within U.S. EPA's acceptable risk range. The metal driving the cancer risk above the low end of the acceptable risk range (10^{-6}) is arsenic. Although the arsenic concentrations found in the soils at the Landfarm exceed basewide background concentrations, arsenic is a naturally occurring metal.

The Hazard Index was calculated above 1 for all Landfarm soils. This Hazard Index value was determined by adding the individual Hazard Quotients (HQ) calculated for non-carcinogenic chemicals to determine their cumulative effects. The non-carcinogenic risk driver (HQ) found to be pushing the HI over 1 was Iron. For the purposes of a human health risk assessment, EPA recognizes that Iron is a naturally occurring constituent and an essential nutrient. For the soil data at the Landfarm, the 95% UCL concentration of 34,800 mg/kg Iron corresponds to an estimated HQ of 1.5 after comparison to the residential PRG value. This result can be interpreted to mean that chronic ingestion of this soil would add approximately 0.45 mg/kg-day to an individual's diet. This is not significantly higher than the provisional EPA No Observed Adverse Effect Level of 0.3 mg/kg-day and would correspond to an approximate doubling or tripling of the National Academy of Science Recommended Daily Allowance (RDA) for Iron. This increase would not be

expected to result in the onset of chronic adverse effects in typical individuals who display normal homeostatic control over iron accumulation and protein binding. Based on EPA's human health risk assessment guidance, the observations that Iron is a naturally occurring constituent, an essential nutrient, and that the highest HQ of 1.5 should not be associated with chronic adverse health effects, the total HIs accounting for all other metals present in Landfarm soils fall below 1.

Antimony, arsenic, beryllium, cadmium, chromium, copper, lead, mercury, silver, vanadium, and zinc were detected at concentrations exceeding the U.S. EPA Region 5 EDQLs for ecological receptors and basewide background soil concentrations. Similar to human health risk based values, chemical concentrations above an EDQL would not automatically designate a site as "dirty" or trigger a response action. However, exceeding an EDQL suggests that further evaluation of the potential ecological risks that may be posed by site contaminants is appropriate. Because EDQLs represent the lowest screening levels found in the literature for any receptor, they are not always applicable to site-specific receptors and conditions. As a next step, NSWC evaluated these chemicals against alternative ecological screening levels which may be more applicable (e.g., Canadian Soil Quality Guidelines). A comparison of the sampling concentrations to the various applicable screening levels as well as soil background concentrations indicates that there is a low probability of unacceptable ecological risk.

Determination of No Further Action

Based on this information and the information contained in the administrative record, there are no unacceptable present or potential future human health or ecological risks at SWMU #30/00.

There is no further action required at SWMU #30/00. Please note, however, that this does not preclude U.S. EPA or IDEM from requiring further action in the future if we obtain any information indicating that such action is needed to protect human health or the environment. Nothing in this Statement of Basis should be interpreted as prohibiting U.S. EPA or IDEM from taking any actions necessary to protect human health and the environment, including ordering additional corrective action if necessary.

The administrative record is available at the following location:

United States Environmental Protection Agency - Region 5
77 West Jackson Boulevard (DW-8J)
Chicago, IL 60604
(312) 886-7890
Between 8:00 a.m. and 4:00 p.m. (Monday - Friday excluding Federal holidays)

NSWC Crane Mailing List

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