



DEPARTMENT OF THE NAVY

CRANE DIVISION  
NAVAL SURFACE WARFARE CENTER  
300 HIGHWAY 361  
CRANE INDIANA 47522-5001

N00164.AR.000811  
NSWC CRANE  
5090.3a

IN REPLY REFER TO:

5090/S4.7.3  
Ser 095/3149

25 APR 2003

U.S. Environmental Protection Agency, Region V  
Waste, Pesticides, & Toxics Division  
Waste Management Branch  
Corrective Action Section  
Attn: Mr. Peter Ramanauskas (DW-8J)  
77 West Jackson Blvd.  
Chicago, IL 60604

Dear Mr. Ramanauskas:

Crane Division, Naval Surface Warfare Center (NAVSURFWARCENDIV Crane) submits for review and incorporation the response to comments and replacement pages for the Mine Fill B (MFB) Revision 1 Interim Measures Report (IMR) dated April 2003. Two copies of the response to comments and replacement pages are included as enclosure (1). Enclosure (2) is the required certification statement.

NSWC Crane point of contact is Ms. Christine D. Freeman,  
Code 09511, telephone 812-854-4423.

Sincerely,

JAMES M. HUNSICKER  
Director Environmental Protection  
Department  
By Direction  
Of The Commander

Encl:

- (1) Response to Comments/Replacement pages- MFB Revision 1 IMR
- (2) Certification Statement

Copy to:  
Administrative Record  
IDEM (D. Griffin)  
SOUTHNAVFACENCOM (ES32)  
TOLTEST Odon (w/o encls)

**RESPONSE TO EPA COMMENTS ON THE INTERIM MEASURES REPORT  
REMOVAL AND BIOREMEDIATION OF MINE FILL B MATERIAL  
DATED AUGUST 2002  
NAVAL SURFACE WARFARE CENTER  
CRANE, INDIANA**

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*Comment 1:*

Section 1.1, page 1-5: This page states in the top paragraph that contaminants likely to be present at the SWMU include explosives, SVOCs, dioxins, PCBs, and metals, yet some of these are not noted in Table 1-1 (e.g., PCB, dioxin).

*Response 1:*

This paragraph was taken from the Halliburton report, and in retrospect, should not have been included in its entirety in this IMR. As stated in section 1.4.2.1 of the QAPP, PCBs are a constituent of concern at MFB but dioxins are not. Table 1-1 has been updated to include PCBs as a COC.

*Comment 2:*

*Comment 2a:*

The last paragraph of Section 3.1.2. is confusing. Did initial characterization samples reveal this PCB contamination? Would B-161 have been the source of PCB? Verify that this area will be investigated during the MFB RFI.

*Comment 2b:*

B-161 is not noted on Figure 1-3; nor is B-177, B-2172 or B-3299.

*Comment 2c:*

Please provide an explanation for the presence of PCB near B-161 and 171 when the thermol boilers were near buildings 166 and 177.

*Response 2:*

*Response 2a:*

The use of B-161 in Section 3.1.2 was a misprint and should have been B-166. PCBs were never an issue around B-161 and as discussed in the last paragraph of Section 3.1.2, PCBs were not an issue at B-166 since the thermol boiler between B-165 and B-166 was downgradient of B-166. Cleanup of the PCBs unrelated to the explosives contaminated soils was not in the scope of work of this project. The thermol boiler area will be investigated during the MFB RFI.

*Response 2b:*

Building 161 is now identified on Figure 1-3. There is no B-177 in MFB and the reference to B-177 in the last paragraph on page 1-4 has been changed to B-171. Building 2172 no longer exists, having been replaced by B-3299, which is now identified on Figure 1-3.

*Response 2c:*

As noted previously, PCBs were not associated with B-161 or B-177 (which does not exist).

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*Comment 3:*

**Comment 3a:**

Table E-2 reports some metals hits over residential levels and there is a missing lead result in sample MFB ICS #297.

**Comment 3b:**

What do the asterisks and other data qualifiers for Aluminum, Barium, and Chromium results on Table E-2 page 5 represent?

**Comment 3c:**

The Appendix E and H tables should highlight those values that exceed a cleanup goal.

**Comment 3d:**

The units on Table H-2 are in error.

**Comment 3e:**

The second paragraph of Section 3.1.3 states that no metals or VOCs were detected above cleanup goals in any grid requiring excavation, yet Table E-2 page 1 shows values of mercury exceeding the residential cleanup goal (MFB ICS# 013 = 60J ppm), arsenic (MFB ICS# 001 = 7300J ppm) and selenium (MFB ICS# 090 and 092 = 820 ppm).

*Response 3:*

**Response 3a:**

Arsenic is the only metal above cleanup goals and should be compared to base-wide background levels. The missing lead result for sample #MFBICS297 has been entered into the table.

**Response 3b:**

The meaning of the asterisk and other data identifiers has now been identified at the end of Table E-2.

**Response 3c:**

Those results that are above cleanup goals in tables E and H are now highlighted (with the exception of Table H-2 where arsenic is consistently above cleanup goals and should be compared to base-wide background levels).

**Response 3d:**

The units of measure for table H-2 has been corrected.

**Response 3e:**

The values for mercury in sample #013, arsenic in #001, and selenium in #090 and 092 were entered incorrectly and have been corrected. The metals analysis for these samples have been provided as an attachment to this document (printed from the database provided by Morrison Knudsen, copies of Form 1 were not available).

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*Comment 4:*

The last paragraph of Section 2.2 on page 2-1 states that waste acetone from the field test kits was transported to ABG for treatment. Please provide an explanation for disposal of waste acetone at the ABG. The open burning of solvents is prohibited and is the reason for U.S. EPA's Subpart X Permit Condition X.D. If the waste solvent is a waste explosive that *has the potential to detonate*, then it can be open burned provided that the Subpart X unit fits the appropriate criteria. For more information see RCRA Permit Policy Compendium Document Number 9489.1988(01): *THERMAL TREATMENT UNITS, SCOPE OF SUBPART X, U.S. EPA MEMORANDUM, MAY 18 1988, SUBJECT: Morton Thiokol Thermal Treatment Units, FROM: Sylvia K. Lowrance, Director Office of Solid Waste, TO: Robert L. Duprey, Director Hazardous Waste Management Division Region VIII.*

*Response 4:*

Waste acetone was disposed of in accordance with Section 2.2 of the Full-Scale Operational Plan. According to NSWC Crane EPD personnel, the permit calls for the eventual elimination of solvent burning, not a ban on it. Permit condition X.D. reads: "Within 120 days of the effective date of this permit, the Permittee shall submit a plan to the Regional Administrator establishing a program to phase out the treatment of PEP contaminated solvents at the ABG." This no longer applies to the Biofacility since it is no longer in operation. However, if in the future the Biofacility were to begin generating PEP contaminated solvents again, NSWC Crane would have to develop a plan for handling them.

*Comment 5:*

The last paragraph on page 3-1, Section 3.1.1., refers to consolidation of several grids into one larger grid for areas where blast-wall berms were covered by a thick gravel layer. Was a Field Clarification Request submitted for this? It doesn't seem to appear in Table 1-2 or in Appendix A.

*Response 5:*

A formal Field Clarification Request was not submitted for this procedure, it was verbally discussed between the U.S. EPA, EPD, and ToITest to address the very difficult task of obtaining samples through the thick layer of gravel. These grids were consolidated for initial characterization sampling. The original, unconsolidated grids were used when obtaining post-excavation samples, except for those grids located around B-166 as discussed in the following paragraphs.

Grids 111 and 112 at B-166 did not require excavation since initial characterization results were below industrial levels in grid 112 (grid 111 was consolidated with grid 112). Grids 33 and 34 at B-168 did not require excavation since initial characterization results were below industrial levels in grid 33 (grid 34 was consolidated with grid 33).

Initial characterization grids were originally delineated on a Navy blueprint but actual site conditions did not exactly match those depicted on the map. This required consolidation of some of the grids. For instance, at B-166 it was discovered that a large amount of grid 119 contained the covered walkway and concrete blast wall. Therefore this grid was eliminated and what could actually be sampled was consolidated with grids 107 and 120. Similarly, it was discovered that the slope of the blast wall berm was such that it encompassed not just grids originally delineated on the slope but also grids originally thought to be on the flat area at the base of the slope. During post-excavation sampling activities, it was less confusing to delineate the entire slope of the berm as one grid instead of delineating separate grids that would have

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otherwise cut across the face of the berm. This then made those grids at the base of the slope (i.e. grids 114, 116, and 117) so small that they were consolidated with other grids for post-excavation sampling purposes. It was an oversight on the part of the sampling crew not to unconsolidate the remaining grids on the berm (i.e. grids 104, 106, and 108 – 110). Post-excavation sample results indicate that all of these consolidated grids on the berm met residential cleanup goals except for grid 103/104, which met industrial cleanup goals (RDX was detected at 9.2 ppm).

*Comment 6:*

Comment 6a:

Referring to Table E-4, why were most samples analyzed for only Aroclor 1242, 1254, and 1260 when sample MFBICS315 detected Aroclor 1248?

Comment 6b:

Furthermore, what is the source of the residential cleanup level of 66 ppm for these aroclors?

Comment 6c:

What is the definition of the "D" qualifier for Aroclor 1248 detected at 13,000 ppm?

Comment 6d:

It appears that Table E-4 notes the wrong units as the text in the third paragraph of Section 3.1.2. notes that "PCBs were detected in grid 137 at 13 ppm".

Comment 6e:

Why was confirmation sampling as shown in Table H-4 limited to the three aroclors noted above?

*Response 6:*

Response 6a:

The constituents of concern for MFB include Aroclor 1242, 1254, and 1260 only. Sample MFBICS315 was erroneously analyzed for the other Aroclor compounds and the results were reported in the table since they were available.

Response 6b:

The unit of measure for Table E-4 has been corrected and now reflects the correct Residential cleanup goal of 66 ppb.

Response 6c:

Morrison Knudsen supplied the result of the analysis for MFBICS315, but the definitions of the qualifiers were not supplied with the data. The standard definition of a "D" qualifier indicates an analysis at a secondary dilution factor. Qualifier definitions have been added to Table E-4.

Response 6d:

The units of measure for this table have been changed to ug/kg. The text in the third paragraph of Section 3.1.2 has been revised to reflect that Aroclor 1248 is not a COC at MFB.

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**Response 6e:**

As noted in Response 6a, only Aroclor 1242, 1254, and 1260 were constituents of concern at MFB.

*Comment 7:*

Comment 7a:

Page 6-2, section 6.2.3.1: The laboratory should improve their procedures for preparation of trip blanks for VOCs analyses. Given the broken vials and significant headspace, a low analyte bias would be anticipated.

**Comment 7b:**

Also, if the 48 hour holding times were sometimes exceeded, but samples were all analyzed within 14 days, exactly by how much were holding times exceeded?

*Response 7*

**Response 7a:**

While a low bias might be expected, VOCs were rarely detected in the soil samples, and even then only in the low ppb range (far below cleanup goals), therefore the anomalies associated with these few trip blanks had little affect on the outcome of the project.

**Response 7b:**

The VOC initial characterization samples were analyzed within the 14-day hold time as specified within the FS-QAPP and NEESA guidelines. The reference to the samples being EnCore or not is in error since there is no reference to a 48-hour hold time specified within the FS-QAPP or NEESA guideline for EnCore sample tubes. Samples that exceeded the 48-hour hold time were analyzed within 1 day to a maximum of 6 days after the initial 48-hour hold time. The EnCore tube 48-hour hold time was in reference to the manufacturer's recommendation of analyzing samples within 48 hours from time of sample collection. The QAPP, including the standard operating procedures, do not reference a 48 hour hold time.

*Comment 8:*

Page 6-3: Samples MFBICS 400- 408 had low recoveries for the explosives analyses although it isn't indicated just how low these recoveries were.

*Response 8:*

The MS/MSD recoveries for the explosive analysis associated with samples MFBICS400-408 were reported as listed in the following table:

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Analyte	MS %Recovery	MSD %Recovery	%RPD
HMX	0	0	2
RDX	0	0	2
TNB	96	99	2
DNB	98	97	0
NB	96	95	1
TNT	94	95	2
TETRYL	106	102	3
2,4 DNT	92	96	5
2,6 DNT	109	98	10
2ADNT	84	86	2
4ADNT	94	90	4
2NT	88	85	2
4NT	98	96	2
3NT	102	102	0
PETN	103	104	1

*Comment 9:*

Page 6-5: Here there is mention of a low VOCs surrogate value. What is the actual result?

*Response 9:*

The VOC surrogate percent recovery values that did not fall within the quality control limits are listed below:

**QC Limit (81-117)    QC Limit (74-121)    QC Limit (80-120)    QC Limit (80-120)**  
Toluene-d8    4-Bromofluorobenzene    1,2-Dichloroethane    Dibromofluormethane

Sample ID	%Recovery	%Recovery	%Recovery	%Recovery
MFBICS437	90	85	84	77
MFBICS437MS	92	90	96	78
MFBICS431MSD	91	88	84	74
MFBICS431	94	91	83	79
MFBICS434RE	94	88	84	79
MFBICS395	92	86	81	74
MFBICS395MS	89	85	85	74
MFBICSMSD	90	86	86	78
MFBICS410	116	125	102	106
MFBICS410MS	117	125	111	104
MFBICS413	120	138	108	112
MFBICS410RE	124	140	111	102
MFBICS413RE	103	93	92	77

*Comment 10:*

In the middle of 4th paragraph block on page 6-5 the section beginning with the phrase "The individual LCS/LCSD percent recoveries were acceptable and MS/MSD ...." and ending several sentences later with the phrase "...reported RPD values were 12% and 13% respectively." should be clarified.

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*Response 10:*

The program requirements for the LCS/LCSD RPD is 0-40% as stated in table 3-2 of the FS-QAPP [MK,1998b]. The reported RPD value for the LCS/LCSD pair associated with MFBICS508-510 samples was 12%, and the reported RPD value for the LCS/LCSD pair associated with MFBICS493-507 was 13%. This will be changed in the report.

*Comment 11:*

Please provide actual tabulated MS/MSD % recovery data for the sample sets mentioned in the 3rd paragraph on page 6-6.

*Response 11:*

The VOC MS/MSD percent recoveries and RPD values are listed in the tables below:

Analyte	MFBICS409-420				
	MS %Recovery	MSD %Recovery	RPD %Recovery	QC Limits RPD      %Recovery	
Acetone	386	96	120	27	55-152
Methylene Chloride	95	86	10	24	16-200
2-Butanone	112	104	7	41	20-180
4-Methyl-2-pentanone	112	94	17	20	45-151
Toluene	108	90	18	20	71-119
m,p-Xylenes	104	81	25	20	71-128
o-xylene	107	87	21	20	76-120

Analyte	MFBICS394-399				
	MS %Recovery	MSD %Recovery	RPD %Recovery	QC Limits RPD      %Recovery	
Acetone	19	39	69	27	55-152
Methylene Chloride	52	58	11	24	16-200
2-Butanone	87	91	4	41	20-180
4-Methyl-2-pentanone	68	72	6	20	45-151
Toluene	67	69	3	20	71-119
m,p-Xylenes	78	77	1	20	71-128
o-xylene	79	79	0	20	76-120

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**MFBICS457-465**

Analyte	MS	MSD	RPD	QC Limits	
	%Recovery	%Recovery	%Recovery	RPD	%Recovery
Acetone	63	38	50	27	55-152
Methylene Chloride	44	52	17	24	16-200
2-Butanone	118	118	0	41	20-180
4-Methyl-2-pentanone	92	91	1	20	45-151
Toluene	93	86	8	20	71-119
m,p-Xylenes	129	113	13	20	71-128
o-xylene	112	99	12	20	76-120

**MFBICS430-435**

Analyte	MS	MSD	RPD	QC Limits	
	%Recovery	%Recovery	%Recovery	RPD	%Recovery
Acetone	66	259	119	27	55-152
Methylene Chloride	42	56	29	24	16-200
2-Butanone	102	74	32	41	20-180
4-Methyl-2-pentanone	83	72	14	20	45-151
Toluene	72	57	23	20	71-119
m,p-Xylenes	102	78	27	20	71-128
o-xylene	88	64	32	20	76-120

**MFBICS436-444**

Analyte	MS	MSD	RPD	QC Limits	
	%Recovery	%Recovery	%Recovery	RPD	%Recovery
Acetone	52	19	93	27	55-152
Methylene Chloride	42	38	10	24	16-200
2-Butanone	98	60	48	41	20-180
4-Methyl-2-pentanone	51	24	72	20	45-151
Toluene	55	54	2	20	71-119
m,p-Xylenes	56	50	11	20	71-128
o-xylene	55	52	6	20	76-120

**MFBICS356-370**

Analyte	MS	MSD	RPD	QC Limits	
	%Recovery	%Recovery	%Recovery	RPD	%Recovery
Acetone	98	113	14	27	55-152
Methylene Chloride	81	93	14	24	16-200
2-Butanone	80	122	42	41	20-180
4-Methyl-2-pentanone	84	125	39	20	45-151
Toluene	77	84	9	20	71-119
m,p-Xylenes	80	82	2	20	71-128
o-xylene	83	86	4	20	76-120

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*Comment 12:*

Please submit the tabulated LCS and MS data for the m,p xylenes sample set MFBICS457-465, mentioned in the 3rd par. block on page 6-7.

*Response 12:*

The VOC LCS/LCSD and MS/MSD percent recoveries and RPD values for sample set MFBICS457-465 are listed in the table below:

Analyte	MFBICS457-465				QC Limits	
	MS %Recovery	MSD %Recovery	RPD %Recovery	RPD	%Recovery	
m,p-Xylenes	129	113	13	20	71-128	

Analyte %Recovery	MFBICS457-465				QC Limits
	LCS %Recovery	LCSD %Recovery	RPD %Recovery	RPD	RPD
m,p-Xylenes	136	131	4		71-128

*Comment 13:*

Page 6-11, section 6.2.4:

**Comment 13a:**

In the 5th sentence of the 2nd paragraph in this section, ("Higher temperatures did not appear to have adversely affected results..."), on what basis could such a conclusion be formulated?

**Comment 13b:**

Also, what kind of sample was MFB PES052 (i.e. a VOCs sample)? Given the significant headspace for trip blanks, a low analyte bias would be anticipated.

**Comment 13c:**

Also, if the 48 hour holding times were sometimes exceeded, but samples were all analyzed within 14 days, exactly by how much were holding times exceeded?

*Response 13:*

**Response 13a:**

The statement "Higher temperatures did not appear to have adversely affected results..." was in error and has been removed.

**Response 13b:**

The MFBPES052 was a VOC sample.

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**Response 13c:**

Samples that exceeded the 48-hour hold time were analyzed within 1 day to a maximum of 9 days after the initial 48-hour hold time. Only one sample was analyzed 9-days after the initial 48-hour hold time, MFBPES124.

*Comment 14:*

**Comment 14a:**

Referring to page 6-11, under 'Field QC,' in the 3rd paragraph block, could it be explained why acetone levels in a trip blank 'exceeded the calibration curve'? That sounds like an excessively high level of contamination.

**Comments 14b:**

Also, in this same paragraph, could the sentence, "The LCS/LCSD samples were outside the QC limits for 2-butanone for the trip blank associated with samples MFBPES387-412." be clarified as to meaning?

*Response 14:*

**Response 14a:**

The laboratory report did not explain why the trip blank results for acetone exceeded the curve. The trip blank was MFBTB11299 and was submitted with MFBPES175-186 samples. The results for MFBTB11299 acetone were reported as 90 E ug/L.

**Response 14b:**

The LCS/LCSD pair percent recoveries for 2-butanone water analysis, associated with sample set MFBPES387-412 were outside the QC limits. The analyte, 2-butanone, was not detected in the corresponding trip blank. This will be changed in the report.

*Comment 15:*

Referring to page 6-14, Field QC, what were the % RPD's reported for field duplicates for 'Day Last' samples?

*Response 15:*

Please see the attached tables for the %RPDs for the windrow field duplicates.

*Comment 16:*

Please provide tabulated MS/MSD data for samples referred to on page 6-14, 3rd paragraph under Lab QC.

*Response 16:*

The following tables list the MS/MSD data for the windrows:

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Analyte	MS	MSD	QC Limits		
	%Recovery	%Recovery	%RPD	%RPD	%Recovery
HMX	97	98	4	30	54-128
RDX	101	100	6	30	66-109
TNB	103	102	6	30	57-130
DNB	105	106	5	30	74-122
TETRYL	75	70	12	45	32-119
NB	105	104	5	30	70-135
TNT	103	110	1	35	44-124
4ADNT	122	118	9	40	60-140
2ADNT	104	100	8	40	60-140
2,6 DNT	104	84	28	35	58-125
2,4 DNT	104	109	0	35	59-120
2NT	101	102	4	35	79-124
4NT	100	101	4	35	74-128
3NT	101	101	4	35	79-121
PETN					

BIOM185 Day 16

Analyte	MS	MSD	QC Limits		
	%Recovery	%Recovery	%RPD	%RPD	%Recovery
HMX	90	44	14	30	54-128
RDX	462	0	24	30	66-109
TNB	91	106	11	30	57-130
DNB	106	113	2	30	74-122
TETRYL	128	152	12	45	32-119
NB	127	113	16	30	70-135
TNT	0	0	5	35	44-124
4ADNT	268	280	0	40	60-140
2ADNT	126	126	4	40	60-140
2,6 DNT	97	158	44	35	58-125
2,4 DNT	100	112	6	35	59-120
2NT	86	87	3	35	79-124
4NT	103	92	16	35	74-128
3NT	102	99	8	35	79-121
PETN					

BIOM115 Day 0

Analyte	MS	MSD	QC Limits		
	%Recovery	%Recovery	%RPD	%RPD	%Recovery
HMX	65	61	1	30	54-128
RDX	0	0	7	30	66-109
TNB	91	128	29	30	57-130
DNB	120	110	14	30	74-122
TETRYL	168	152	15	45	32-119
NB	114	114	5	30	70-135
TNT	0	0	12	35	44-124
4ADNT	286	188	46	40	60-140
2ADNT	125	114	14	40	60-140
2,6 DNT	134	96	37	35	58-125
2,4 DNT	102	96	11	35	59-120
2NT	90	86	10	35	79-124
4NT	99	93	11	35	74-128
3NT	101	98	8	35	79-121
PETN					

BIOS114 Day 0

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Analyte	MS	MSD	%RPD	QC Limits	
	%Recovery	%Recovery		%RPD	%Recovery
HMX	83	0	0	35	65-135
RDX	0	0	0	35	65-135
TNB	88	95	7.4	35	65-135
DNB	185	170	8.3	35	65-135
TETRYL	209	191	9	35	65-135
NB	83	84	0.68	35	65-135
TNT	72	82	7.4	35	65-135
4ADNT	83	90	6.2	35	65-135
2ADNT	76	80	4.0	35	65-135
2,6 DNT	212	206	3.2	35	65-135
2,4 DNT	120	117	2.4	35	65-135
2NT	75	76	2.4	35	65-135
4NT	75	72	3.4	35	65-135
3NT	74	73	2	35	65-135
PETN				35	65-135

BIOS107 Day 0

Analyte	MS	MSD	%RPD	QC Limits	
	%Recovery	%Recovery		%RPD	%Recovery
HMX	111	132	13	30	54-128
RDX	52	281	37	30	66-109
TNB	109	109	0	30	57-130
DNB	109	107	2	30	74-122
TETRYL	82	84	2	45	32-119
NB	104	102	3	30	70-135
TNT	100	104	4	35	44-124
4ADNT	110	111	1	40	60-140
2ADNT	93	93	1	40	60-140
2,6 DNT	96	99	3	35	58-125
2,4 DNT	95	93	2	35	59-120
2NT	96	90	7	35	79-124
4NT	119	100	17	35	74-128
3NT	105	100	6	35	79-121
PETN					

BIOM111 Day 0

Analyte	MS	MSD	%RPD	QC Limits	
	%Recovery	%Recovery		%RPD	%Recovery
HMX	83	104	31	30	54-128
RDX	82	104	31	30	66-109
TNB	84	104	31	30	57-130
DNB	84	105	30	45	74-122
TETRYL	66	84	31	30	32-119
NB	84	106	32	35	70-135
TNT	85	107	32	30	44-124
4ADNT	94	116	29	40	60-140
2ADNT	85	105	30	40	60-140
2,6 DNT	90	107	25	35	58-125
2,4 DNT	84	107	32	35	59-120
2NT	86	107	29	35	79-124
4NT	84	105	30	35	74-128
3NT	83	103	30	35	79-121
PETN					

BIOS154 Day 15

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Analyte	MS	MSD	%RPD	QC Limits	
	%Recovery	%Recovery		%RPD	%Recovery
HMX	90	90	5	30	54-128
RDX	89	118	31	30	66-109
TNB	89	88	4	30	57-130
DNB	92	91	5	45	74-122
TETRYL	74	71	2	30	32-119
NB	90	89	5	35	70-135
TNT	89	89	5	30	44-124
4ADNT	97	99	6	40	60-140
2ADNT	89	90	6	40	60-140
2,6 DNT	90	91	6	35	58-125
2,4 DNT	90	91	5	35	59-120
2NT	92	94	6	35	79-124
4NT	92	93	6	35	74-128
3NT	97	99	7	35	79-121
PETN					

BIOS146 Day 10

Analyte	MS	MSD	%RPD	QC Limits	
	%Recovery	%Recovery		%RPD	%Recovery
HMX	96	98	2	30	54-128
RDX	259	117	55	30	66-109
TNB	98	98	1	30	57-130
DNB	101	99	1	45	74-122
TETRYL	65	63	2	30	32-119
NB	96	95	1	35	70-135
TNT	98	97	2	35	44-124
4ADNT	109	108	1	40	60-140
2ADNT	98	96	2	40	60-140
2,6 DNT	99	98	2	35	58-125
2,4 DNT	102	100	2	35	59-120
2NT	103	103	0	35	79-124
4NT	98	97	1	35	74-128
3NT	111	107	3	35	79-121
PETN					

BIOM169 Day 7

Analyte	MS	MSD	%RPD	QC Limits	
	%Recovery	%Recovery		%RPD	%Recovery
HMX	121	106	9.4	35	65-135
RDX	61	86	15	35	65-135
TNB	88	94	7.5	35	65-135
DNB	91	95	3.5	35	65-135
TETRYL	22	30	28	35	65-135
NB	75	88	16	35	65-135
TNT	94	100	5.9	35	65-135
4ADNT	100	106	5.8	35	65-135
2ADNT	108	110	1.3	35	65-135
2,6 DNT	90	101	12	35	65-135
2,4 DNT	93	94	1.2	35	65-135
2NT	73	86	18	35	65-135
4NT	73	93	24	35	65-135
3NT	74	84	13	35	65-135
PETN	93	92	1.3	35	65-135

BIOM106 Day 9

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Analyte	MS	MSD	%RPD	QC Limits		
	%Recovery	%Recovery		%RPD	%Recovery	
HMX	94	97	8	30	54-128	BIOS201 Day 20
RDX	99	146	43	30	66-109	
TNB	103	140	35	30	57-130	
DNB	106	102	1	30	74-122	
TETRYL	56	57	6	45	32-119	
NB	98	101	8	30	70-135	
TNT	97	101	9	35	44-124	
4ADNT	117	122	9	40	60-140	
2ADNT	100	104	9	40	60-140	
2,6 DNT	107	108	6	35	58-125	
2,4 DNT	97	102	10	35	59-120	
2NT	102	108	11	35	79-124	
4NT	98	108	15	35	74-128	
3NT	96	105	13	35	79-121	
PETN						

Analyte	MS	MSD	%RPD	QC Limits		
	%Recovery	%Recovery		%RPD	%Recovery	
HMX	49	0	0	35	65-135	BIOM104 Day 19
RDX	258	100	60	35	65-135	
TNB	92	91	0.79	35	65-135	
DNB	95	96	0.73	35	65-135	
TETRYL	58	60	2.8	35	65-135	
NB	94	95	0.87	35	65-135	
TNT	102	102	0.45	35	65-135	
4ADNT	107	107	0.19	35	65-135	
2ADNT	95	96	1	35	65-135	
2,6 DNT	95	97	1.8	35	65-135	
2,4 DNT	92	93	1.3	35	65-135	
2NT	92	93	0.86	35	65-135	
4NT	93	92	0.27	35	65-135	
3NT	93	94	1.2	35	65-135	
PETN						

Analyte	MS	MSD	%RPD	QC Limits		
	%Recovery	%Recovery		%RPD	%Recovery	
HMX	83	128	43	30	76-119	BION214 Day 23
RDX	95	97	2	30	80-120	
TNB	87	86	1	30	73-121	
DNB	96	96	0	30	79-120	
TETRYL	85	83	2	45	24-139	
NB	96	96	0	30	79-121	
TNT	89	89	0	35	74-128	
4ADNT	96	96	0	40	64-142	
2ADNT	94	93	1	40	80-122	
2,6 DNT	87	93	6	35	77-119	
2,4 DNT	100	97	3	35	79-122	
2NT	95	94	2	35	79-121	
4NT	100	100	0	35	80-120	
3NT	97	99	2	35	79-122	
PETN						

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Analyte	MS	MSD	QC Limits		
	%Recovery	%Recovery	%RPD	%RPD	%Recovery
HMX	91	112	25	30	54-128
RDX	81	84	6	30	66-109
TNB	94	93	8	30	57-130
DNB	100	100	10	45	74-122
TETRYL	74	72	6	30	32-119
NB	96	98	10	35	70-135
TNT	98	98	11	35	44-124
4ADNT	106	108	10	40	60-140
2ADNT	95	97	10	40	60-140
2,6 DNT	96	98	10	35	58-125
2,4 DNT	98	99	10	35	59-120
2NT	100	102	10	35	79-124
4NT	97	98	9	35	74-128
3NT	98	101	11	35	79-121
PETN					

BIOM168 Day 8

Analyte	MS	MSD	QC Limits		
	%Recovery	%Recovery	%RPD	%RPD	%Recovery
HMX	558	168	40	30	54-128
RDX	1828	273	30	30	66-109
TNB	89	84	6	30	57-130
DNB	102	109	6	30	74-122
TETRYL	94	89	5	45	32-119
NB	102	102	0	30	70-135
TNT	112	96	14	35	44-124
4ADNT	120	114	5	40	60-140
2ADNT	115	98	16	40	60-140
2,6 DNT	107	91	16	35	58-125
2,4 DNT	100	92	8	35	59-120
2NT	86	86	0	35	79-124
4NT	108	86	23	35	74-128
3NT	105	94	11	35	79-121
PETN					

BIOM109 Day 0

Analyte	MS	MSD	QC Limits		
	%Recovery	%Recovery	%RPD	%RPD	%Recovery
HMX	64	100	41	30	76-119
RDX	76	93	20	30	80-120
TNB	69	85	21	30	73-121
DNB	82	93	13	30	79-120
TETRYL	77	86	12	45	24-139
NB	84	93	10	30	79-121
TNT	75	86	13	35	74-128
4ADNT	79	94	17	40	64-142
2ADNT	78	91	18	40	80-122
2,6 DNT	70	88	23	35	77-119
2,4 DNT	72	95	27	35	79-122
2NT	72	90	22	35	79-121
4NT	73	94	25	35	80-120
3NT	73	92	23	35	79-122
PETN					

BIOM215 Day 23

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Analyte	MS	MSD	%RPD	QC Limits		
	%Recovery	%Recovery		%RPD	%Recovery	
HMX	64	65	2	30	54-128	BIOS108 Day 0
RDX	99	110	5	30	66-109	
TNB	92	94	2	30	57-130	
DNB	109	107	2	30	74-122	
TETRYL	80	80	0	45	32-119	
NB	109	106	3	30	70-135	
TNT	101	96	6	35	44-124	
4ADNT	112	110	2	40	60-140	
2ADNT	95	94	2	40	60-140	
2,6 DNT	94	99	5	35	58-125	
2,4 DNT	108	103	4	35	59-120	
2NT	78	116	40	35	79-124	
4NT	101	95	6	35	74-128	
3NT	100	101	1	35	79-121	
PETN						

Analyte	MS	MSD	%RPD	QC Limits		
	%Recovery	%Recovery		%RPD	%Recovery	
HMX	131	124	1	30	54-128	BION200 Day 18
RDX	11	46	2	30	66-109	
TNB	106	102	4	30	57-130	
DNB	96	134	33	30	74-122	
TETRYL	48	39	21	45	32-119	
NB	102	104	3	30	70-135	
TNT	79	82	2	35	44-124	
4ADNT	102	102	0	40	60-140	
2ADNT	95	96	1	40	60-140	
2,6 DNT	100	106	5	35	58-125	
2,4 DNT	105	109	3	35	59-120	
2NT	110	110	0	35	79-124	
4NT	104	101	2	35	74-128	
3NT	106	105	1	35	79-121	
PETN						

Analyte	MS	MSD	%RPD	QC Limits		
	%Recovery	%Recovery		%RPD	%Recovery	
HMX	100	99	1	30	54-128	BIOS190 Day 16
RDX	105	104	1	30	66-109	
TNB	102	100	2	30	57-130	
DNB	105	104	1	30	74-122	
TETRYL	57	43	30	45	32-119	
NB	100	99	1	30	70-135	
TNT	94	91	3	35	44-124	
4ADNT	130	139	6	40	60-140	
2ADNT	101	100	1	40	60-140	
2,6 DNT	104	103	1	35	58-125	
2,4 DNT	102	101	1	35	59-120	
2NT	100	98	1	35	79-124	
4NT	99	98	1	35	74-128	
3NT	97	98	1	35	79-121	
PETN						

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Analyte	MS	MSD	%RPD	QC Limits	
	%Recovery	%Recovery		%RPD	%Recovery
HMX	86	92	6	30	76-119
RDX	95	98	3	30	80-120
TNB	83	88	6	30	73-121
DNB	96	102	6	30	79-120
TETRYL	40	70	56	45	24-139
NB	94	100	7	30	79-121
TNT	84	90	7	35	74-128
4ADNT	129	111	15	40	64-142
2ADNT	94	96	2	40	80-122
2,6 DNT	95	98	3	35	77-119
2,4 DNT	97	100	3	35	79-122
2NT	92	101	8	35	79-121
4NT	92	101	9	35	80-120
3NT	92	100	9	35	79-122
PETN					

BIOS212 Day 37

Analyte	MS	MSD	%RPD	QC Limits	
	%Recovery	%Recovery		%RPD	%Recovery
HMX	96	94	7	30	54-128
RDX	102	100	6	30	66-109
TNB	101	100	5	30	57-130
DNB	105	105	5	30	74-122
TETRYL	26	17	46	45	32-119
NB	103	103	5	30	70-135
TNT	91	90	6	35	44-124
4ADNT	147	154	0	40	60-140
2ADNT	103	102	6	40	60-140
2,6 DNT	105	104	6	35	58-125
2,4 DNT	105	104	6	35	59-120
2NT	102	101	6	35	79-124
4NT	110	107	7	35	74-128
3NT	101	99	6	35	79-121
PETN					

BIOS187 Day 19

Analyte	MS	MSD	%RPD	QC Limits	
	%Recovery	%Recovery		%RPD	%Recovery
HMX	97	97	4	30	54-128
RDX	117	102	16	30	66-109
TNB	98	90	12	30	57-130
DNB	104	97	11	45	74-122
TETRYL	54	36	44	30	32-119
NB	102	97	10	35	70-135
TNT	102	95	12	30	44-124
4ADNT	127	130	2	40	60-140
2ADNT	103	97	11	40	60-140
2,6 DNT	103	97	10	35	58-125
2,4 DNT	104	98	11	35	59-120
2NT	106	100	10	35	79-124
4NT	102	98	10	35	74-128
3NT	103	98	10	35	79-121
PETN					

BIOS178 Day 10

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Analyte	MS	MSD	QC Limits		
	%Recovery	%Recovery	%RPD	%RPD	%Recovery
HMX	98	98	0	30	54-128
RDX	126	118	6	30	66-109
TNB	102	103	1	30	57-130
DNB	106	106	0	45	74-122
TETRYL	39	65	50	30	32-119
NB	104	105	1	35	70-135
TNT	102	104	2	35	44-124
4ADNT	137	124	10	40	60-140
2ADNT	104	105	1	40	60-140
2,6 DNT	105	106	1	35	58-125
2,4 DNT	106	106	1	35	59-120
2NT	106	107	1	35	79-124
4NT	105	106	1	35	74-128
3NT	104	105	1	35	79-121
PETN					

BIOS163 Day 8

Analyte	MS	MSD	QC Limits		
	%Recovery	%Recovery	%RPD	%RPD	%Recovery
HMX	92	93	11	30	54-128
RDX	106	107	10	30	66-109
TNB	94	93	8	30	57-130
DNB	100	101	10	45	74-122
TETRYL	56	23	76	30	32-119
NB	98	97	9	35	70-135
TNT	98	95	6	30	44-124
4ADNT	120	139	24	40	60-140
2ADNT	101	99	7	40	60-140
2,6 DNT	100	98	8	35	58-125
2,4 DNT	99	99	9	35	59-120
2NT	100	100	9	35	79-124
4NT	98	98	10	35	74-128
3NT	97	98	10	35	79-121
PETN					

BIOS175 Day 12

Analyte	MS	MSD	QC Limits		
	%Recovery	%Recovery	%RPD	%RPD	%Recovery
HMX	96	90	7	30	54-128
RDX	100	100	1	30	66-109
TNB	94	92	1	30	57-130
DNB	98	99	1	45	74-122
TETRYL	52	33	46	30	32-119
NB	95	96	1	35	70-135
TNT	95	96	1	35	44-124
4ADNT	112	125	11	40	60-140
2ADNT	95	96	1	40	60-140
2,6 DNT	97	98	1	35	58-125
2,4 DNT	98	100	2	35	59-120
2NT	100	102	2	35	79-124
4NT	96	97	1	35	74-128
3NT	103	106	3	35	79-121
PETN					

BIOS171 Day 10

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Analyte	MS	MSD	%RPD	QC Limits	
	%Recovery	%Recovery		%RPD	%Recovery
HMX	86	94	8	30	54-128
RDX	93	90	3	30	66-109
TNB	91	101	10	30	57-130
DNB	96	104	7	45	74-122
TETRYL	11	17	47	30	32-119
NB	94	102	7	35	70-135
TNT	90	88	2	30	44-124
4ADNT	147	153	4	40	60-140
2ADNT	94	100	7	40	60-140
2,6 DNT	95	102	7	35	58-125
2,4 DNT	93	100	8	35	59-120
2NT	93	100	7	35	79-124
4NT	93	99	7	35	74-128
3NT	92	98	6	35	79-121
PETN					

BIOM188 Day 21

Analyte	MS	MSD	%RPD	QC Limits	
	%Recovery	%Recovery		%RPD	%Recovery
HMX	90	87	3	30	54-128
RDX	-15	-7	7	30	66-109
TNB	75	84	11	30	57-130
DNB	84	88	4	45	74-122
TETRYL	54	100	59	30	32-119
NB	85	88	4	35	70-135
TNT	99	104	4	30	44-124
4ADNT	87	83	5	40	60-140
2ADNT	81	81	0	40	60-140
2,6 DNT	80	79	1	35	58-125
2,4 DNT	82	83	1	35	59-120
2NT	73	76	4	35	79-124
4NT	83	86	3	35	74-128
3NT	85	86	2	35	79-121
PETN					

BIOS136 Day 19

Analyte	MS	MSD	%RPD	QC Limits	
	%Recovery	%Recovery		%RPD	%Recovery
HMX	112E	0	0	35	65-135
RDX	0E	0E	0	35	65-135
TNB	78	83	4.1	35	65-135
DNB	88	86	1.9	35	65-135
TETRYL	16	50	12	35	65-135
NB	77	78	1.3	35	65-135
TNT	152	136	11	35	65-135
4ADNT	274	90	61	35	65-135
2ADNT	127	112	12	35	65-135
2,6 DNT	92	83	10	35	65-135
2,4 DNT	90	82	9.6	35	65-135
2NT	79	63	23	35	65-135
4NT	84	77	9	35	65-135
3NT	82	70	16	35	65-135
PETN	97	90	7.3	35	65-135

BIOM106 Day 0

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Analyte	MS	MSD	%RPD	QC Limits		
	%Recovery	%Recovery		%RPD	%Recovery	
HMX	104	112	7	30	54-128	BIOS136 Day 9
RDX	89	124	21	30	66-109	
TNB	96	89	7	30	57-130	
DNB	105	100	5	45	74-122	
TETRYL	63	51	20	30	32-119	
NB	102	95	7	35	70-135	
TNT	157	106	37	30	44-124	
4ADNT	99	92	8	40	60-140	
2ADNT	95	89	7	40	60-140	
2,6 DNT	98	89	10	35	58-125	
2,4 DNT	98	93	5	35	59-120	
2NT	92	85	7	35	79-124	
4NT	101	94	7	35	74-128	
3NT	102	95	7	35	79-121	
PETN						

*Comment 17:*

Please provide tabulated RDX MS/MSD QC data referred to on the last paragraph of page 6-15 which was said to be off-spec.

*Response 17:*

The following tables list the MS/MSD data for RDX in the day last windrows that did not meet quality control limits:

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Windrow	RDX				
	MS %Recovery	MSD %Recovery	%RPD	QC Limits %RPD	%Recovery
BION105 DAY 6	370	0	0	35	65-135
BIOS103 DAY 15	119	2.8	19	35	65-135
BIOM106 DAY 9	61	86	15	35	65-135
BIOM104 DAY 19	258	100	60	35	65-135
BIOM119 DAY 9	63	76	18	30	66-109
BIOS122 DAY 7	52	52	0	30	66-109
BIOM123 DAY 9	100	28	21	30	66-109
BIOM126 DAY 7	123	92	17	30	66-109
BIOS117 DAY 7	40	0	0	35	65-135
BIOS133 DAY 8	164	48	38	30	66-109
BIOM132 DAY 10	-6	-25	18	30	66-109
BIOM134 DAY 12	78	180	44	30	66-109
BIOS136 DAY 9	89	124	21	30	66-109
BIOS136 DAY 19	-15	-7	7	30	66-109
BIOS139 DAY 11	57	48	9	30	66-109
BIOM141 DAY 11	55	44	7	30	66-109
BIOS143 DAY 13	118	106	9	30	66-109
BIOS142 DAY 14	122	92	28	30	66-109
BIOM145 DAY 11	102	119	7	30	66-109
BIOS146 DAY 18	67	130	48	30	66-109
BIOM149 DAY 14	123	104	13	30	66-109
BIOS154 DAY 15	82	104	31	30	66-109
BIOS159 DAY 9	44	27	18	30	66-109
BIOM161 DAY 10	106	112	5	30	66-109
BIOS162 DAY 10	124	117	6	30	66-109
BIOS163 DAY 08	126	118	6	30	66-109
BIOM164 DAY 10	58	22	30	30	66-109
BIOM165 DAY 09	192	142	27	30	66-109
BIOS167 DAY 10	114	117	2	30	66-109
BIOM169 DAY 7	259	117	55	30	66-109
BIOS170 DAY 12	125	110	12	30	66-109
BIOM176 DAY 12	118	107	9	30	66-109
BIOS178 DAY 10	117	102	16	30	66-109
BIOS183 DAY 12	163	120	14	30	66-109
BIOM184 DAY 13	134	100	17	30	66-109
BIOS191 DAY 17	112	112	4	30	66-109
BIOM199 DAY 22	48	51	4	30	66-109
BION200 DAY 18	11	46	2	30	66-109
BIOM215 DAY 23	76	93	20	30	80-120

Field ID	MFB-ICS-001
Compound	AG
Result	160
Units of Measure	UGKG
Data Qualifier	U
Dilution Factor	1
Sample Analysis Dat	5/21/98

Field ID	MFB-ICS-001
Compound	AL
Result	12800000
Units of Measure	UGKG
Data Qualifier	
Dilution Factor	1
Sample Analysis Dat	5/21/98

Field ID	MFB-ICS-001
Compound	AS
Result	7300
Units of Measure	UGKG
Data Qualifier	J
Dilution Factor	1
Sample Analysis Dat	5/21/98

Field ID	MFB-ICS-001
Compound	BA
Result	1110000
Units of Measure	UGKG
Data Qualifier	
Dilution Factor	1
Sample Analysis Dat	5/21/98

Field ID	MFB-ICS-013
Compound	HG
Result	60
Units of Measure	UGKG
Data Qualifier	J
Dilution Factor	1
Sample Analysis Dat	5/20/98

Field ID	MFB-ICS-013
Compound	HMX
Result	2200
Units of Measure	UGKG
Data Qualifier	U
Dilution Factor	2
Sample Analysis Dat	5/24/98

Field ID	MFB-ICS-013
Compound	NB
Result	260
Units of Measure	UGKG
Data Qualifier	U
Dilution Factor	2
Sample Analysis Dat	5/24/98

Field ID	MFB-ICS-013
Compound	PB
Result	23700
Units of Measure	UGKG
Data Qualifier	J
Dilution Factor	1
Sample Analysis Dat	5/21/98

Field ID	MFB-ICS-090
Compound	PETN
Result	250
Units of Measure	UGKG
Data Qualifier	U
Dilution Factor	2
Sample Analysis Dat	7/26/98

Field ID	MFB-ICS-090
Compound	RDX
Result	1000
Units of Measure	UGKG
Data Qualifier	U
Dilution Factor	2
Sample Analysis Dat	7/27/98

Field ID	MFB-ICS-090
Compound	SE
Result	820
Units of Measure	UGKG
Data Qualifier	
Dilution Factor	1
Sample Analysis Dat	7/24/98

Field ID	MFB-ICS-090
Compound	TETRYL
Result	650
Units of Measure	UGKG
Data Qualifier	U
Dilution Factor	2
Sample Analysis Dat	7/27/98

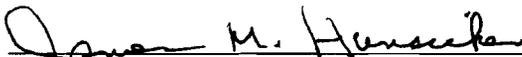
<b>Field ID</b>	MFB-ICS-092
<b>Compound</b>	SE
<b>Result</b>	820
<b>Units of Measure</b>	UGKG
<b>Data Qualifier</b>	
<b>Dilution Factor</b>	1
<b>Sample Analysis Dat</b>	7/24/98
<b>Field ID</b>	MFB-ICS-092
<b>Compound</b>	TETRYL
<b>Result</b>	650
<b>Units of Measure</b>	UGKG
<b>Data Qualifier</b>	U
<b>Dilution Factor</b>	2
<b>Sample Analysis Dat</b>	7/28/98
<b>Field ID</b>	MFB-ICS-093
<b>Compound</b>	135TNB
<b>Result</b>	250
<b>Units of Measure</b>	UGKG
<b>Data Qualifier</b>	U
<b>Dilution Factor</b>	2
<b>Sample Analysis Dat</b>	7/26/98
<b>Field ID</b>	MFB-ICS-093
<b>Compound</b>	13DNB
<b>Result</b>	250
<b>Units of Measure</b>	UGKG
<b>Data Qualifier</b>	U
<b>Dilution Factor</b>	2
<b>Sample Analysis Dat</b>	7/26/98

5090  
Ser 095/3149

25 APR 2003

The letter Ser 095/3149 was for the  
submittal of the response to comments and  
replacement pages for the Mine Fill B  
Interim Measures Report for SWMUs 13/14.  
The replacement pages for the Report have  
been incorporated into the previously  
submitted Final Report on 8/1/02.

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

DIRECTOR, ENVIRONMENTAL PROTECTION DEPARTMENT  
BY DIRECTION OF THE COMMANDER  
TITLE

4/24/03  
DATE