



Brown & Root Environmental

A Division of Halliburton NUS Corporation

(412) 921-7090

FAX: (412) 921-4040

C-49-04-8-019

MINUTES OF RESTORATION ADVISORY BOARD (RAB) MEETING

To: NSB-NLON RAB Meeting Attendees and RAB Members (See attached distribution list)

From: Corey Rich of Brown & Root Environmental *CR*

Date: April 3, 1998

Subject: RAB Meeting Minutes – February 11, 1998
Installation Restoration Program
Naval Subase - New London (NSB-NLON)
Groton, Connecticut

Attendees of the Meeting

Jeffery Sullivan	NSB-NLON
Richard Conant	NSB-NLON
Andy Stackpole	NSB-NLON
Mark Evans	Navy
Greta Deirocini	Navy
Mark Lewis	CTDEP
Felix Prokop III	Ledge Light Health District
Susan Orrill	RAB Co-Chair Member
Larry Gibson	RAB Member
Deborah Downie	RAB Member
Bob Jones	Regional Environmental Coordinator
Janice Peret	Subase PAO

The attendance sheet is included as Attachment 1.

Welcome and Introduction

Jeff Sullivan opened the meeting at 6:30 p.m. He reviewed the prior meeting minutes.



Sue Orrill stated she had a couple of questions regarding the GIS presentation. She asked if the Navy would have any of the off-site wells put into the GIS system. She knows it was preliminary at that point.

Jeff Sullivan stated that the wells on the Subase are surveyed in, but the wells off the Subase will be put on eventually.

Mark Evans stated that the whole purpose of the system is to make it easier for the community to obtain data regarding off-site wells. The next time the Navy updates the system this data will be included.

Sue Orrill stated that there was a year or two of sampling done.

Mark Evans stated that the Lower Subase RI that is being completed now will be entered into the system, and that will be a good time to put in the residential well data.

Jeff Sullivan introduced Jeff Brann from Portsmouth.

Historical Radiological Assessment Report Summary (See Attachment 2)

Jeff Brann stated that the reason he is here tonight is to discuss the Historical Radiological Assessment (HRA). The Subase has been environmentally monitored since the start of the Naval Nuclear Propulsion work. The results of the environmental monitoring program have been documented. They refer to the Blue Book. The Blue Book is named that way because of its cover. It summarizes the environmental monitoring data from all the nuclear facilities.

The Historical Radiological Assessment (HRA) is a detailed, site specific report, which satisfies CERCLA preliminary report guidelines. The first step when you identify operations at the site is to go through all the records that are available and determine whether there needs to be further investigations or not. A preliminary assessment is normally completed by the Environmental Protection Agency (EPA). In this case, because of the data, Portsmouth Naval Shipyard was contracted to do research and prepare the reports. This is a comprehensive review and assessment at the Subase.

Jeff Brann gave a presentation on the HRA for Subase (See Attachment 2).

Sue Orrill asked what is the half-life of the cobalt-60.

Jeff Brann stated approximately five years.

Andy Stackpole asked what is the detection level.



Jeff Brann stated they can measure down in the hundreds of a picocurie/gram.

Dick Conant asked if the sampling was spatially distributed.

Jeff Brann stated that the sampling was set up to look at the areas around the piers. There are maps that are in the HRA where the sampling locations are. The EPA surveys go out to Norwich and down to the mouth of the river so they cover a broader area. Both the EPA and the Navy surveys are comparable.

Dick Conant said he assumed that cobalt showed up in the sediments down by the piers.

Jeff Brann stated that the Nuclear Regulatory Commission (NRC) allows some low levels of discharges to the environment. The NRC allows some limits on what you can discharge out to the environment. There were limits back then we followed prior to 1973. We followed those regulations at the time and were releasing below the limits.

Mark Lewis asked if there was any sampling done across the river by the state pier.

Jeff Brann stated yes. The area around state pier had been sampled.

Larry Gibson asked if radon studies have been done.

Jeff Brann stated that he couldn't answer the question because he deals with CERCLA issues, but all Naval facilities over time are being tested.

Andy Stackpole stated that most of the radon sampling of the Subbase has come back negative. The Navy may have to mitigate one or two buildings.

Jeff Brann stated that approximately five years ago there was a monitoring program. The first concern was to look at all the housing units. That round of sampling was completed and through NAVFAC those buildings, if necessary, would be mitigated. Everyone is in the second round of testing and assessment now.

Sue Orrill asked if samples were taken from the Area "A" Wetlands.

Jeff Brann stated that there were water samples taken in that area, and there was a radiological survey that actually took readings at three feet and on the surface itself and mapped out the entire landfill.

Sue Orrill stated that she wasn't talking about the landfill. She meant the Area "A" Wetland.

Jeff Brann stated that there are wells in that area and those areas were screened.



Sue Orrill stated that she thought it was occurring in the sediment.

Jeff Brann stated that's true.

Sue Orrill stated that she is asking about the sediment in the Area "A" Wetlands which is adjacent to the landfill.

Mark Evans stated that the landfill is built on the same dredge spoils, and those were definitely sampled. The Phase II RI will have the sampling results that were performed in the Area "A" Wetlands. (Note: Sediment sampling in the Area "A" Wetlands was not performed, only groundwater sampling.)

Deborah Downie asked if there is any radioactivity that has made it into the aquifer.

Jeff Brann stated that is why you check the water samples. There was nothing above natural occurring radioactivity in the water samples.

Jeff Sullivan asked what is considered significant levels of cobalt-60.

Jeff Brann stated that it's relative. At the level now they are at ten to hundred times less than natural radioactivity. If they are less than natural radioactivity, there is no discernible raised activity. You need to go up several levels of magnitude before there would be a problem.

Update Site Management Plan Schedule Changes (See Attachment 3)

Mark Evans stated that approximately a year ago a Site Management Plan (SMP) was developed. All IR sites that had a description were summarized. Schedules were developed through the completion of the program. It was mainly for informational purposes for people to have one document. The plan was to update the SMP every year based on the investigations that were done for that year. Budgets and priorities can change for different sites from year to year. There was a meeting held a month ago with the State of Connecticut and EPA. It was a working meeting to decide what is a priority now and new schedules were developed. A draft of the SMP is to be completed this month. There will be a final by April.

Update Area "A" Downstream – Site 3

The Navy is in the process of starting the remedial design and planning on signing a Record of Decision in March. A draft Record of Decision was submitted. Everybody's comments have been incorporated. The Navy plans to begin remedial action next year.



Sue Orrill asked if the draft is the remedial design.

Mark Evans stated that the first task in the design is to do some more delineation of the DDT contamination. The location of DDT in the sediments is known. The extent of DDT in the soil is not exactly known. A sampling plan has been started.

Update Goss Cove – Site 8

Sue Orrill asked if there is an issue concerning the sediments in Goss Cove.

Mark Evans stated yes. There were approximately five or six sediment samples taken in the Goss Cove. A single toxicity test was done on one sample, and it came back toxic. With the associated chemistry, the toxicity can not be attributed to any particular chemical. It cannot be determined whether the sediments are toxic based on the physical nature of the area or chemistry, and with only one sample there is a high degree of uncertainty on making any type of decision. More data needs to be gathered.

Dick Conant asked if the scope is just for Goss Cove and not the Thames River.

Mark Evans stated yes, just Goss Cove.

Update DRMO – Site 6

Dick Conant asked if the groundwater samples at DRMO will use existing wells.

Mark Evans stated that a Groundwater Monitoring Plan is being finalized now. The plan requires one or two additional well locations, one up gradient and one down gradient well.

Dick Conant asked if samples would be taken from the storm water outfalls.

Mark Evans stated no, just groundwater.

Miscellaneous

Jeff Sullivan asked the community for recommendations on how to get more interest from the community.

Deborah Downie stated that maybe some of the colleges may have some interest.

Sue Orrill stated that she hasn't found any interest in the community. Sue Orrill asked if there were any volunteers that wanted to represent the community as Co-chair. She has



been Co-chair for two years and would like to give someone else a chance. She would agree to do it another year but feels it's time for a change.

Dick Conant stated that he and Jeff Sullivan will help Sue Orrill if she's willing do it another year.

Deborah Downie stated that she could help out.

Sue Orrill wanted to ask the RAB members their opinion on having their names released to outside environmental groups. Dick Conant had asked about releasing names to these outside environmental groups that are making requests to the RABs to release the community names. It is unclear as to the nature of the group. Sue Orrill has released her name. It has become part of the record and it's easily available. Sue Orrill will call this environmental group and request some information. The information that is received will be included in the minutes.

Future Meeting Date/Time

Next meeting will be May 6, 1998.

Meeting Adjourned

Meeting adjourned at 8:00 p.m.

ATTACHMENT 1

**SUBASE NEW LONDON
RESTORATION ADVISORY BOARD
MEETING**

6:30PM, February 11, 1998

Best Western Olympic Inn
360 Route 12, Groton CT

AGENDA

- | | | |
|----|--|------------|
| 1. | Review of Minutes From Last Meeting
- Jeff Sullivan, SUBASE NLON | 5 Minutes |
| 2. | Historical, Radiological Assessment
Report Summary
- Jeff Brann, Navy Nuclear Propulsion Program | 15 Minutes |
| 3. | Update, Area A Downstream
- Mark Evans, Northern Division | 15 Minutes |
| 4. | Update, Site Management Plan Schedule Changes
- Northern Division, TetraTECH NUS (Brown & Root) | 20 Minutes |
| 5. | Future Meeting Date | 5 Minutes |

US Navy Submarine Base

Box 39

Groton, CT 06349-5039

Meeting Description Remediation Advisory Board

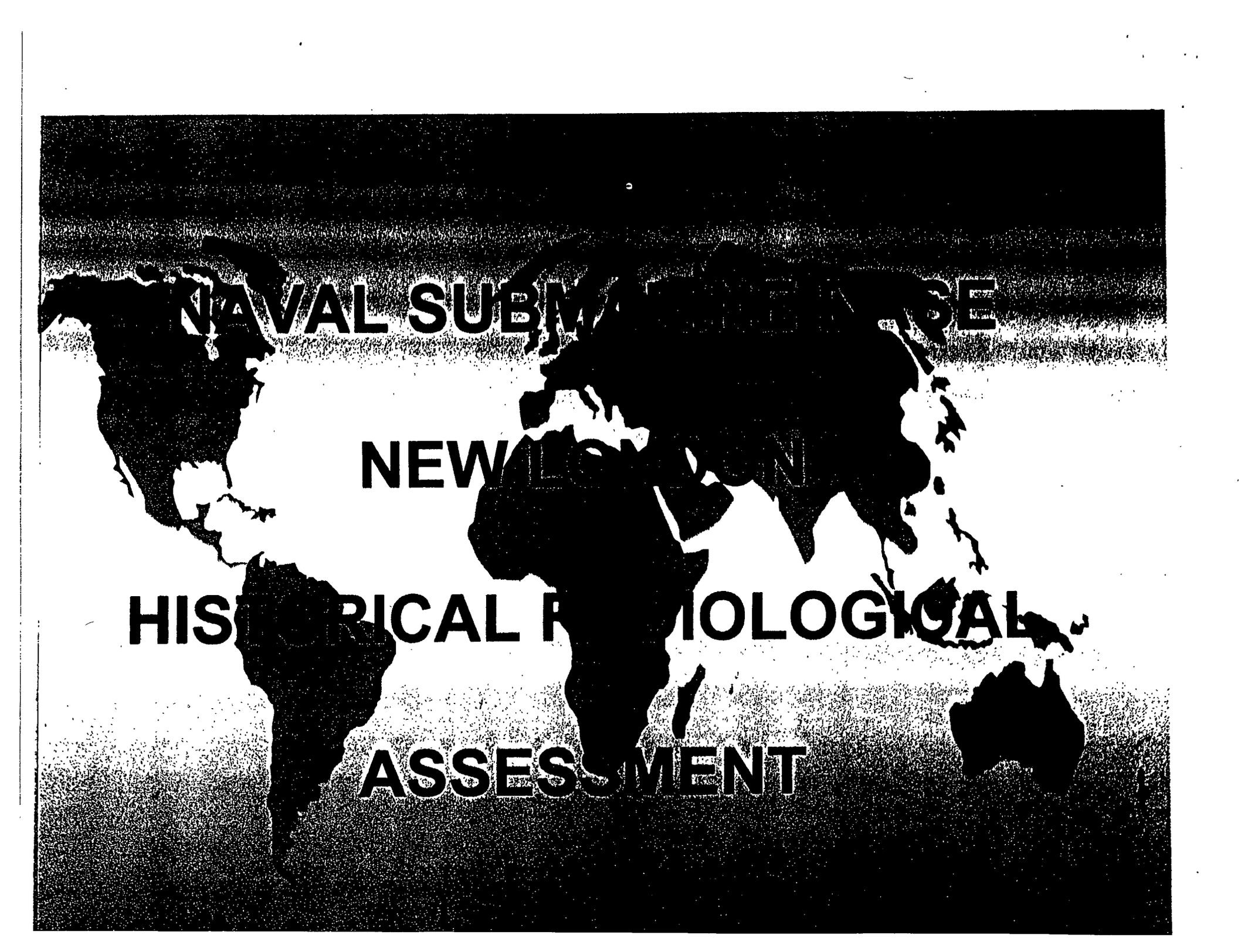
Date 11 February 1998

Time 6:30 pm

Location Best Western Olympic Inn, Groton

Persons Attending		
1	Jeffery Sullivan	SUBASE IR Program Manager
2	Richard Conant	SUBASE Environmental Department Restoration Division Head
3	Andy Stackpole	SUBASE Environmental Department Director
4	Mark Evans	Northern Division, Naval Facilities Engineering Command
5	Sue Orrill	
6	Mark Lewis	
7	Felix Prokopov	
8	Larry Gibson,	
9	Deborah Downie,	
10	Janice Peret	
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		

ATTACHMENT 2



NAVAL SUBMARINE SERVICE

NEW LEADERSHIP

HISTORICAL PSYCHOLOGICAL

ASSESSMENT

Subase Historical Radiological Assessment

- ◆ **Environmental Monitoring Since Start of Naval Nuclear Propulsion Program (NNPP)**
- ◆ **Documented in annual "Blue Book" since 1966 -- copies provided to state and EPA officials**
- ◆ **Now - HRA: Detailed site-specific radiological report which satisfies CERCLA Preliminary Assessment guidelines**
- ◆ **Comprehensive review/assessment of radiological operations and environmental monitoring at Subase**

HRA Process

- ◆ **Reviewed existing environmental documents**
 - **Installation restoration documents**
 - **Past Environmental Assessments**
- ◆ **Reviewed all Subase radiological environmental monitoring records and reports of inadvertent releases**
- ◆ **Reviewed results of state and EPA surveys**
- ◆ **Conducted interviews during the 1983 IAS and development of Community Relations Plan in 1994**
- ◆ **Conducted additional interviews of Subase personnel during HRA preparation**
- ◆ **Assessed potential exposure pathways**

Subase Radiological Background

Naval Nuclear Propulsion Program (NNPP)

- ◆ **Maintenance of nuclear-powered submarines since 1959**
- ◆ **Work performed to same strict requirements used at all NNPP facilities**
- ◆ **No radioactive waste ever buried at Subase**
- ◆ **Planned liquid discharges below federal limits occurred before 1973**
- ◆ **No significant unplanned release of NNPP radioactivity**

Subase Radiological Background

General Radioactive Material (G - RAM)

- ◆ **Medical use of radioisotopes (past and current)**
- ◆ **NRC regulated sources (e.g., sealed radiographic sources)**
- ◆ **Various small unregulated sources (e.g., NRC-exempt quantities)**
- ◆ **No records, interviews, or surveys indicate radioactive waste buried at Subase**

Terminology

◆ Curie (Ci)

- Unit used to define amount of radioactivity
- Corresponds to 3.7×10^{10} transformations per second
- A typical radiographic source contains 1 to 100 curies of iridium-192

◆ Microcurie (μCi)

- One millionth of a curie
- A household smoke detector contains up to 5 μCi of americium-241

◆ Picocurie (pCi)

- One millionth of a microcurie
- Soil typically contains 1 to 2 pCi/g of naturally occurring radium-226
Wood stove ash typically contains an average of 78 pCi/g of potassium-40
and 6 pCi/g of cesium-137

◆ Millirem (mrem)

- Unit of radiation dose
- A person receives ~ 300 mrem/yr from natural background radiation
(average value; varies widely in US)

Findings

- ◆ **Only natural radioactivity ever detected during environmental sampling of harbor water and edible aquatic species**
- ◆ **Trace levels of cobalt-60 are detectable within river bottom sediments. This radioactivity is attributable to the pre-1973 discharges of processed liquid**
- ◆ **Trace levels of cobalt-60 occasionally detected in non-edible aquatic samples in the past appeared to both the Navy and the EPA to be due to adherent sediment**
- ◆ **Surveys by the Public Health Service in 1966 as well as EPA laboratory in 1972 and 1989 found no cobalt-60 in any river water, drinking water, or edible sea food sample . The 1989 EPA survey concluded trace levels of cobalt-60 remain in the sediment, but the concentrations have significantly decreased since the earlier surveys**
- ◆ **The Area A Landfill, which contains dredge spoils from the Thames River, has been monitored for radioactivity. The only radionuclide identified was naturally-occurring potassium-40**
- ◆ **No other indications of any residual radioactivity in the environment from Subase operations**

Conclusions

- ◆ **Radiological operations at the Subase have had no adverse effect on human health or the environment**
- ◆ **No measurable exposure level to the public from residual radioactivity in the environment**
- ◆ **Trace levels of cobalt-60 in the Thames River sediment represents no radiological impact to the environment or individuals living or working in the area. By remaining in-situ, the process of radioactive decay will remove the radioactivity from the environment naturally**
- ◆ **Additional characterization or remedial actions unnecessary**
- ◆ **The EPA and State of Connecticut reviewed a draft of the HRA and agreed it should be issued as final**

ATTACHMENT 3

SITE 2 - AREA A LANDFILL

- MONITORING PLAN - AUGUST 1998
- QUARTERLY REPORTS
 - 1ST QUARTER - NOVEMBER 1998
 - 2ND QUARTER - FEBRUARY 1999
 - 3RD QUARTER - MAY 1999
 - 4TH QUARTER - OCTOBER 1999

SITE 3 - AREA A DOWNSTREAM

- RECORD OF DECISION - MARCH 1998
- REMEDIAL DESIGN - FEBRUARY 1999
- REMEDIAL ACTION -
 - START - FEBRUARY 1999
 - COMPLETE - JANUARY 2000

***BASEWIDE GROUNDWATER
OPERABLE UNIT***

- RI WORK PLAN - SEPTEMBER 1998
- RI REPORT - DECEMBER 1999
- FEASIBILITY STUDY - AUGUST 2000
- PROPOSED PLAN - JANUARY 2001
- RECORD OF DECISION - MAY 2001
- REMEDIAL DESIGN - APRIL 2002
- REMEDIAL ACTION - APRIL 2003

***SITE 4 - RUBBLE FILL AT
BUNKER A-86***

- PROPOSED PLAN - DECEMBER 1998
- RECORD OF DECISION - APRIL 1999

SITE 6 - DRMO

- RECORD OF DECISION - MAY 1998
- REMEDIAL ACTION
 - GW MONITORING QUARTERLY

SITE 7 - TORPEDO SHOPS

- DGI WORK PLAN - OCTOBER 1998
- DGI REPORT - JUNE 1999
- FEASIBILITY STUDY - MARCH 2000
- PROPOSED PLAN - JUNE 2000
- RECORD OF DECISION - JAN 2001
- REMEDIAL DESIGN - DECEMBER 2001
- REMEDIAL ACTION - DECEMBER 2002

***SITE 8 - GOSS COVE
LANDFILL***

- FEASIBILITY STUDY - NOV 1998
- PROPOSED PLAN - APRIL 1999
- RECORD OF DECISION - JULY 1999
- REMEDIAL DESIGN - JUNE 2000
- REMEDIAL ACTION
 - START - OCTOBER 2000
 - COMPLETE - JUNE 2001

SITE 20 - WEAPONS CENTER

- FEASIBILITY STUDY - JANUARY 1999
- PROPOSED PLAN - APRIL 1999
- RECORD OF DECISION - NOV 1999
- REMEDIAL DESIGN - OCTOBER 2000
- REMEDIAL ACTION
 - COMPLETE - OCTOBER 2001

LOWER SUBBASE SITES

- RI REPORT - OCTOBER 1998
- FEASIBILITY STUDY - APRIL 1999
- PROPOSED PLAN - JULY 1999
- RECORD OF DECISION - NOV 1999
- REMEDIAL DECISION - OCTOBER 2000
- REMEDIAL ACTION
 - COMPLETE - OCTOBER 2001