ADDENDUM TO THE FINAL QUALITY ASSURANCE PROJECT PLAN FOR NAVAL WEAPONS STATION EARLE COLTS NECK, NEW JERSEY, JUNE 1990

1. Chain of custody seals will be used for sample shipping containers. The word "optional" should be deleted from Figure 1-7.

2. Section 1.10.1, second bullet. Rinse blanks will be analyzed for every decontamination event limited to a maximum of one per day.

3. Section 2.3, 20 slot (0.02 inch) slotted screen has been used instead of 10 slot (0.01 inch) originally planned. Sand pack was adjusted accordingly. Fifteen wells installed in January - February 1991 have developed satisfactorily.

4. Revised well construction diagrams (Attachment I) are also included in this addendum for completion in water table, and shallow water table conditions. The latter construction technique was recommended by NJDEP and received around January 17, and has been used for subsequent well construction in shallow water table conditions (less than 5 feet below ground surface).

5. Attachment II outlines field decontamination steps for sampling equipment which will replace steps listed in Section 2.5.4.4 (p 2-15) of the QAPP (June, 1990).

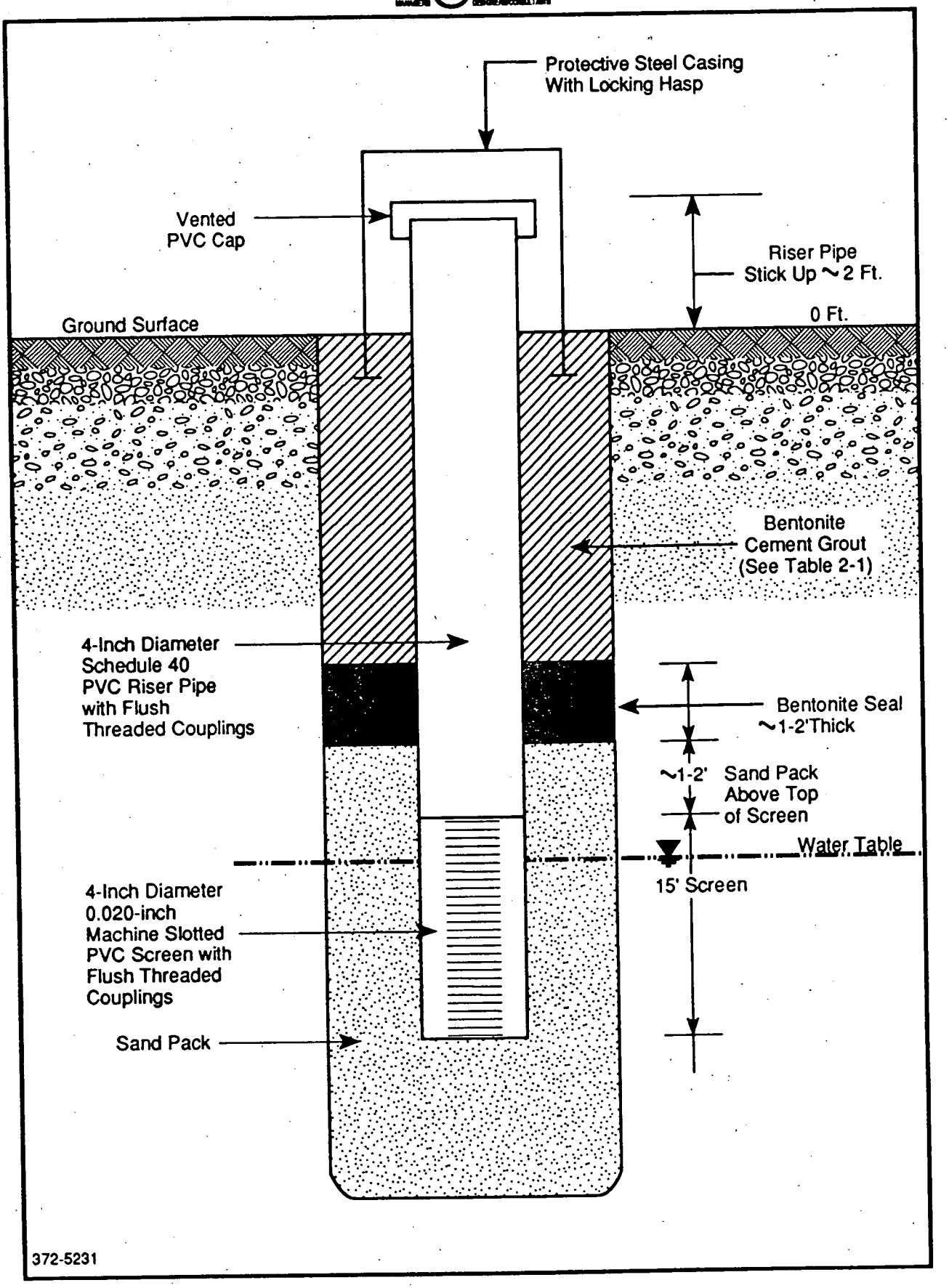
6. Attachment III outlines procedures for performing well slug tests. Analysis of data will be done initially using the Bower-Rice method for unconfined, partially penetrating aquifers.

7. Final sampling points established in the Work Plan (Tables 5-2, 5-3) and associated QC requirements (Tables 5-4, 5-5) replace tables 2-2, 2-3 in the QAPP. In addition, field duplicates for soils and sediments will be collected at a rate of 5 percent.

8. Section 2.2.1 Note that all soil samples for laboratory analyses will be taken at shallow depths with (<3 feet) hand augers. Deeper samples may be required at a later phase using procedures outlined in Section 2.2.1 of the QAPP.

9. A revised table 2-4 (Attachment IV) is included with this addendum. The revised table includes preservation for nitrate/nitrite analysis and corrections to several holding times.

10. 1.5 Sampling Procedures Regulations
Page 1-15 Under FEDERAL REGISTER, Change, "VOL. 51, NO. 114, 13 June 1986" to "VOL. 55, NO. 61, 29 March 1990, Part 261, Appendix II".



TYPICAL WELL CONSTRUCTION DIAGRAM

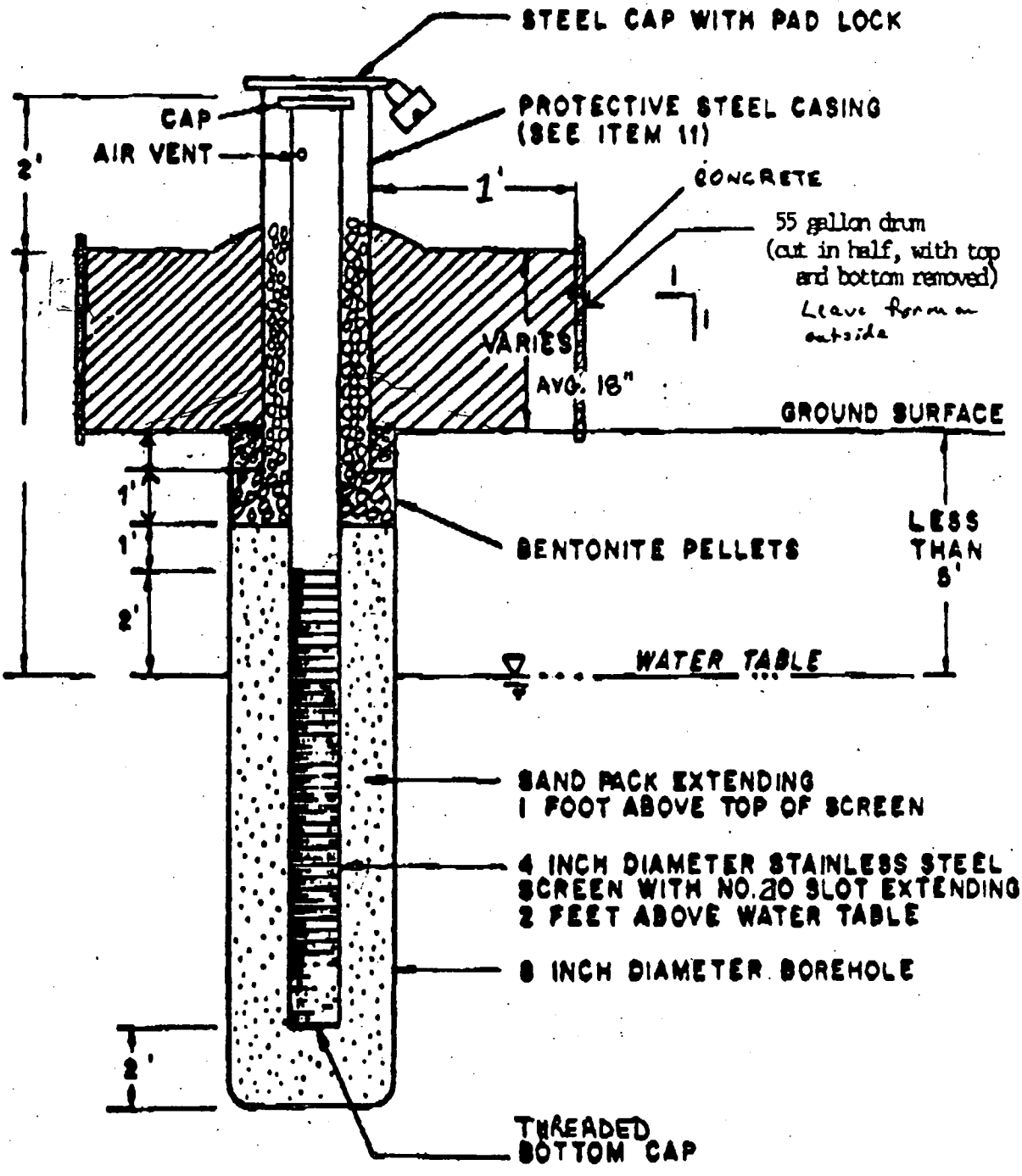
ATTACHMENT I

Attachment 1

MODIFIED
MONITOR WELL SPECIFICATION

GROUNDWATER SURFACE
LESS THAN 5 FEET
BELOW GROUND SURFACE

DRAFT



N.T.S

* If the static water level is significantly less than five feet, the NJDEP geol gist must be notified prior to completion f the monitor well

MONITORING WELL CONFIGURATION

GWQME/BGWPA/LMW - 08/90

ATTACHMENT II

EQUIPMENT DECONTAMINATION PROCEDURES FOR THE REMEDIAL INVESTIGATION AT NWS EARLE FEBRUARY, 1991

Decontamination procedures will be consistent with NJDEP guidelines including the following:

1. Non-phosphate detergent
2. Potable water rinse
3. Distilled/deionized water rinse
4. 10% Nitric acid rinse*
5. Distilled/deionized water rinse*
6. Acetone (pesticide grade) rinse
7. Total air dry
8. HPLC water rinse

* Only required for samples to be analyzed for metals.

The procedure above replaces the existing procedure referenced in subsection 2.5.4.4 of the QAPP.

ATTACHMENT III

FIELD PROCEDURES FOR SLUG TESTS

1. Test wells in an upgradient to downgradient sequence to be determined by initial water level data.

2. Examine the well to be tested to determine the condition of the well seal, locking cap, and casing. Document any problems.

3. Open the well, and measure and record a depth to water.

4. Protect the transducer cable by taping the well casing with duct tape to cover the top edge.

5. Clean the transducer by sequentially rinsing the probe and attached line with tap water, Alconox in tap water, and distilled water.

6. Lower the transducer into the well to approximately one foot above the bottom and secure it with duct tape in that position.

7. Connect the Hermit data logger to the transducer to determine the height of the water column above the transducer.

8. Wait before continuing the test to allow the well water level to re-equilibrate (especially important for 2-inch piezometers).

9. Lower a previously prepared slug (1-inch diameter PVC pie for a 2-inch well, 2.5-inch diameter PVC pipe for a 4-inch well) tied to a suitable hauling line, into the well to a point just above the water level.

10. Activate the Hermit data logger and run for about one (1) second. While the data logger is functioning, rapidly but smoothly lower the slug into the water in the well to just below the water level.

11. Secure the slug in this position, and continue the test for an appropriate time period anticipated to be no more than 30 minutes.

12. After the test period has elapsed, but before the Hermit is stopped, make a copy of the data readings on the field printer. Examine the data to determine whether the water level has reestablished equilibrium. Equilibrium is defined as four consecutive readings that are equal, within the permissible variance value for the selected transducer.

13. Extend the test for 10 additional minutes if the well has not reestablished equilibrium. Repeat this procedure for up to one hour if necessary.

14. When water level equilibrium has been reestablished, step the Hermit to the next setting to record the next phase of the slug test.

15. Untie the slug hauling line from its surface attachment, and activate the Hermit for a period of one (1) second.

16. Lift the slug upward above the water surface smoothly and quickly (but do not remove it from the well) and secure it to the well casing. Run the test as described in Items 10-14.

17. Make a complete copy of the data and remove the test apparatus from the well. Move the next well following steps 1 through 17.

Analytical Procedures

1. Data stored in memory, in the Hermit Data Logger will be downloaded to a personal computer for analysis.

2. The data will be analyzed using the Bouwer and Rice Slug Test Model. The Bouwer and Rice Slug Test analysis was originally developed to measure aquifer hydraulic conductivity in unconfined aquifers. The slug test can be based on quickly withdrawing a volume of water from the well and measuring the rate of rise of water level in the well. (The Bouwer and Rice Slug Test - An Update). Where the screen extends above the water table the second part of the test (slug removal) only will be analyzed.

ATTACHMENT IV

Table 2-4

Summary of Sample Container Specifications

Analyte	Minimum Sample Volume	Container	Preservative	Holding Time
Groundwater/Surface Water				
VOCs	40 mL x 2	Glass	HCl pH<2	14 days
Pesticides/PCBs	950 mL	Amber glass	Cool 4°C	7 days extraction/40 days analysis
BNAs	950 mL x 2	Amber glass	Cool 4°C	7 days extraction/40 days analysis
Metals	1 L	Plastic	HNO_3 pH<2	180 days (except Hg 28 days)
Cyanide	1 L	Plastic	NaOH pH>12	14 days
TPH	1 L	Amber glass	HCl pH<2	28 days
Explosives				
Nitrocellulose	950 mL	Amber glass	Cool 4°C	No established protocol
Nitroglycerin				48 hours
Nitrate/nitrite				
Picric acid	1 L	Amber glass	$HgCl_2$ (40 ppm)	7 days extraction/40 days analysis
2,4,6-TNT	950 mL	Amber glass	Cool 4°C	7 days extraction/40 days analysis
2,4-DNT				
2,6-DNT				
Tetryl				
1,3,5-Trinitrobenzene				
1,3-Dinitrobenzene				
HMX				
RDX				
Soil/Sediment				
VOCs	40 mL	Glass, septum	Cool 4°C	10 days
Pesticides/PCBs, BNAs	500 mL	Glass	Cool 4°C	7 days extraction/40 days analysis
Metals/cyanide	250 mL	Glass	Cool 4°C	180 days (except Hg (28 days) and CN (14 days))
Lead/cadmium	250 mL	Glass	Cool 4°C	180 days
TPH	250 mL	Glass	Cool 4°C	28 days
Explosives				
Nitrocellulose	250 mL	Amber glass	Cool 4°C	7 days extraction/40 days analysis
Nitroglycerin				
Picric acid				
Nitrate/nitrite				No established protocol
2,4,6-TNT	250 mL	Amber glass	Cool 4°C	7 days extraction/40 days analysis
2,4-DNT				
2,6-DNT				
Tetryl				
1,3,5-Trinitrobenzene				
1,3-Dinitrobenzene				
HMX				
RDX				

Table 5-4

Summary of Analytical QC Requirements for Soil and Sediment Analyses, NWS Earle, Colts Neck, NJ

Parameter	Sampling Points	MS/MSD	Field Blanks	Total Number of Samples
Explosives	30	4	3	37
Metals (including cyanide)	39	2	2	43
Lead/cadmium	32	4	4	40
VOCs (TCL)	17	4	4	25
BNAs (TCL) and pesticides/ PCBs (TCL)	16	4	2	22
Total petroleum hydrocarbons	25	0	4	29

Table 5-5

Summary of Analytical QC Requirements for Surface Water and Groundwater Analyses, NWS Earle, Colts Neck, NJ

Parameter	Sampling Points	MS/MSD	Duplicate Samples	Trip Blanks	Field Blanks	Total Number of Samples
*Explosives	16	2	2	0	2	22
Metals (TAL)	55	6	6	0	11	78
CN	55	6	6	0	11	78
VOCs (TCL)	55	6	6	11	11	89
BNAs	55	6	6	0	11	78
Pest/PCBs	55	6	6	0	11	78
TPH	7	0	1	0	1	9
VOCs (SW)	7	2	2	1	1	11

*Explosives require daily shipment -- sample three sites in 2 days.
Exact number of QC samples required may vary based on actual schedule and shipping conditions.