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Woodward-Clyde Consultants

April 12, 1990
88C2076-4R

U.S. Environmental Protection Agency
Region III
841 Chestnut Street
Philadelphia, PA 19107

Attention: Mr. Randy Sturgeon
Enforcement Project Manager

Re: Du Pont-Newport Site
Newport, Delaware
Draft Phase III RI/FS Work Plan

Gentlemen:

On behalf of Du Pont, Woodward-Clyde Consultants (WCC) is pleased to submit six copies of the Draft Phase III Remedial Investigation/Feasibility Study (RI/FS) Work Plan for the Newport Site. Du Pont and WCC believe that the work tasks proposed herein satisfy EPA's March 8, 1990 and March 29, 1990 letter requests for additional RI data. Likewise, the enclosed schedule for completion of the RI/FS process at the Site is based on telephone conversations between Mr. R. Sturgeon of EPA and Du Pont's Mr. T. Hill.

Please contact either the Du Pont or WCC Project Manager if you have questions.

Very truly yours,

WOODWARD-CLYDE CONSULTANTS

James P. Buczala
Assistant Project Geologist

Roger T. Gresh, P.G.
Project Manager

JPB/RTG/kcs/WM-44S
encl.

cc: S. Johnson, Delaware DNREC
T. Hill, Du Pont
C. Trmal, Du Pont
A. Hirsch, WCC

AR305932

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Woodward-Clyde Consultants

April 12, 1990
88C2076-4R

Du Pont Environmental Services
500 West Dutton's Mill Road
Suite 102
Aston, Pennsylvania 19014

Attention: Mr. Timothy J. Hill

Re: Du Pont-Newport Site
Newport, Delaware
Draft Phase III RI/FS Work Plan

Gentlemen:

Enclosed please find three copies of the referenced document for submittal to the EPA. Based on the discussions between Du Pont and Woodward-Clyde Consultants, we believe this draft Work Plan satisfies EPA's request for a Phase III Remedial Investigation at the Newport Site.

Our understanding is that Du Pont will transmit one copy of this document to Ciba-Geigy Corporation for their files.

Very truly yours,

WOODWARD-CLYDE CONSULTANTS

James P. Buczala
Assistant Project Geologist

Roger T. Gresh, P.G.
Project Manager

JPB/RTG/kcs/WM-44S
encl.

cc: C. Trmal, Du Pont
A. Hirsch, WCC

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Woodward-Clyde Consultants

April 12, 1990
88C2076-4R

Du Pont Environmental Services
500 West Dutton's Mill Road
Suite 102
Aston, Pennsylvania 19014

Attention: Mr. Timothy J. Hill

Re: Du Pont-Newport Site
Draft Phase III RI/FS
Work Plan

Gentlemen:

The referenced Work Plan, dated April 12, 1990, was prepared by Mr. Roger Gresh. I have peer reviewed the document, in keeping with Woodward-Clyde Consultants (WCC) Corporate Quality Assurance policy. I have also peer reviewed the contents with regard to the hydrogeologic information obtained and reported in previous reports by WCC for the Newport Site. The interpretations and judgements herein, in my opinion, are consistent with the standards of technical practice for these services.

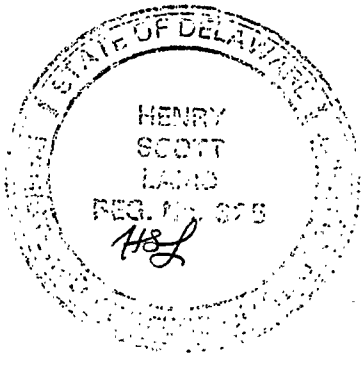
Thank you for your continuing confidence in Woodward-Clyde Consultants.

Very truly yours,

WOODWARD-CLYDE CONSULTANTS

H. Scott Laird

H. Scott Laird
Associate
Delaware Registered
Professional Geologist NO. 325



HSL/kcs/WM-44S

cc: S. Johnson, Delaware DNREC
C. Trmal, Du Pont
A. Hirsch, WCC

AR305934

DRAFT WORK PLAN - PHASE III
REMEDIAL INVESTIGATION/FEASIBILITY STUDY
DU PONT - NEWPORT SITE
NEWPORT, DELAWARE

Prepared for:

E.I. DU PONT DE NEMOURS & CO., INC.
Newport, Delaware

Prepared by:

WOODWARD-CLYDE CONSULTANTS
Plymouth Meeting, Pennsylvania

April 12, 1990

EXECUTIVE SUMMARY

This draft Work Plan has been prepared in general accordance with the guidelines provided in the "EPA Guidance for Remedial Investigations and Feasibility Studies under CERCLA, October 1988" and reflects the emphasis and provisions of the Superfund Amendments and Reauthorization Act of 1986.

The purpose of this draft Work Plan is to provide guidance for a third phase of investigation (Phase III) with respect to the Remedial Investigation/Feasibility Study (RI/FS) at the Du Pont-Newport Site. This Phase III RI was requested by the EPA on March 8, 1990. Furthermore, at the request of the EPA, the Site has been broken into two specific operating units (OUs). OU I encompasses only the two landfills, referred to as the North and South Disposal sites. OU II encompasses the Ciba-Geigy Newport Plant, the Du Pont Holly Run Plant, all the potentially impacted ground water, the associated wetlands, and the associated segment of the Christina River. EPA has requested no additional data collection for OU I. Thus, the work tasks for the Phase III RI apply only to OU II. These tasks have been broken into two components.

Component A covers the construction of the monitoring wells previously agreed upon between the EPA and Du Pont as outlined in the April 10, 1990 letter to the EPA prepared by Woodward-Clyde Consultants (WCC).

Component B involves the following proposed work tasks: well installations and soil borings at the Ciba-Geigy and Holly Run Plants; the collection and analysis of soil samples at the Ciba-Geigy and Holly Run Plants; the collection and analysis of groundwater samples from all of the existing and proposed monitoring wells plus four off-site private wells; and a Phase III Supplemental Wetlands Investigation in response to the EPA's March 29, 1990 Phase III wetlands program review comments.

All Components A and B data and information evaluations will be submitted to the EPA as a Phase III RI Investigation Data Sufficiency Report. An Endangerment Assessment and Remedial Investigation Report will be prepared for each of the OUs. Unless the Site is returned into one integral unit, separate Feasibility Reports will also be prepared for OU I and OU II. Assuming the specified contingencies are met, the RI/FS program will follow the enclosed calendar schedule.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

1.0 INTRODUCTION

This Work Plan has been prepared in general accordance with the guidelines provided in the "EPA Guidance for Remedial Investigations and Feasibility Studies under CERCLA, October 1988" and reflects the emphasis and provisions of the Superfund Amendments and Reauthorization Act of 1986.

The purpose of this Work Plan is to provide a scope of work and schedule (Table 1) for a third phase of investigation (Phase III) with respect to the Remedial Investigation/Feasibility Study (RI/FS) at the Du Pont-Newport Site. This Phase III RI was requested by the EPA on March 8, 1990. Furthermore, at the request of the EPA, the Site has been broken into two specific operating units (OUs). OU I encompasses only the two landfills, referred to as the North and South Disposal sites. OU II encompasses the Ciba-Geigy Newport Plant, the Du Pont Holly Run Plant, all the potentially impacted ground water, the associated wetlands, and the associated segment of the Christina River. EPA has requested no additional data collection for OU I. Thus, the work tasks for the Phase III RI apply only to OU II. These tasks have been broken into two components.

Component A covers the construction of the monitoring wells previously agreed upon between the EPA and Du Pont as outlined in the April 10, 1990 letter to the EPA prepared by Woodward-Clyde Consultants (WCC).

Component B involves the following proposed work tasks: well installations and soil borings at the Ciba-Geigy and Holly Run Plants; the collection and analysis of soil samples at the Ciba-Geigy and Holly Run Plants; the collection and analysis of groundwater samples from all of the existing and proposed monitoring wells plus four off-site private wells; and a Phase III Supplemental Wetlands Investigation in response to the EPA's March 29, 1990 Phase III wetlands program review comments.

This Work Plan provides a detailed description of the Phase III tasks. The document also defines the technical approach, relevant project management activities, plans, and schedules. The information comprising a Sampling and Analysis Plan is provided by this document and the previously submitted Quality Assurance Project Plan (QAPP, WCC, July 1988) and the Health and Safety Plan (HASP, WCC, June 1987). The QAPP and HASP for this

project (and subsequent document submittals with respect to these Plans) will be followed during this phase of the investigation, except as noted in this Work Plan, and are provided by reference only. The Site background and setting for the Newport Site were previously presented in the initial Work Plan (WCC, July 28, 1988).

1.1 DESCRIPTION OF PRESENT SITUATION

Two phases of the Remedial Investigation have been performed to date for the entire Site along with a third phase of wetlands investigation. The information collected and analyzed during these phases was presented to the EPA in the following documents:

- o RI/FS Work Plan (Phase I), Du Pont-Newport Site (WCC, July 28, 1988)
- o Wetlands Investigation, Du Pont-Newport Site (WCC, March 23, 1989) –
- o Data Sufficiency Memorandum, RI-Phase II, Du Pont-Newport Site (WCC, April 27, 1989)
- o Data Sufficiency Supplement, RI-Phase II, Du Pont-Newport Site (WCC, November 8, 1989)
- o Phase III Wetlands Investigation, Du Pont-Newport Site (WCC, January 19, 1990)

Phase III of the RI has been designed to provide additional data and to supplement data previously collected during the first two phases. The EPA has requested that monitoring wells be installed at select locations outside the perimeter of the Site to define the hydraulic gradients and chemical quality of the ground water off-site. To investigate potential sources related to Site-specific parameters (e.g., barium, cadmium, zinc, tetrachloroethylene and trichloroethylene) at the Ciba-Geigy Newport Plant and the Du Pont Holly Run Plant, monitoring wells and borings will be installed on-site.

The EPA has also requested that additional data collection and evaluation be conducted to supplement the Phase III Wetlands Investigation. Therefore, the Phase III RI will include collecting data in the wetlands near the North Disposal site and in the Christina River.

Sediment chemistry analysis and toxicity testing will be performed on the sediment samples and some vegetation will be evaluated for bioaccumulation of heavy metals.

2.0 SITE INVESTIGATION

As requested by the EPA, the Site has been broken into two OUs. The EPA has requested no additional data collection for OU I. Thus, the Phase III RI work tasks apply only to OU II. These work tasks have been divided to two components. Component A involves the construction of specific monitoring wells previously agreed upon by the EPA and Du Pont as outlined in the April 10, 1990 WCC letter to the EPA. Component B, proposed herein, encompasses the remaining well construction, soil borings, soils and groundwater analyses, and wetlands data collection considered sufficient to satisfy the requests of the EPA for OU II. The details of each component are discussed below. Approximate well and boring locations are shown on Figures 1 and 2. Final drilling locations are subject to adjustment due to such factors as accessibility, permitting, structures, utilities, and authorization from property owners. Du Pont will select the final locations. The potential exists that one or more of the proposed drilling locations might be eliminated if Du Pont determines that drilling at or near the proposed location is infeasible.

The proposed Component B monitoring well construction, groundwater sampling, soil borings, and soils analysis at the Ciba-Geigy plant have been designed to sample soils in the specific historic operations areas potentially responsible for the highest concentrations of soil contaminants, and to sample ground water in the vicinity of, and immediately downgradient of, the three centralized areas of historic (and some present day) operations potentially responsible for groundwater contamination. These efforts are considered sufficient by Du Pont to characterize the extent of potential soils and groundwater contamination at the Ciba-Geigy Plant and the Holly Run Plant.

Drilling procedures are expected to involve primarily hollow stem augers. If considered necessary by Du Pont, bentonite drilling mud might be added to the augering and/or mud rotary drilling methods might be employed. All measures considered necessary and appropriate by Du Pont will be taken to prevent cross-contamination between formations

during the drilling operations. Du Pont is likely to conduct downhole geophysical logging of the borehole at locations where a well or boring extends to the top of weathered bedrock. These logs should aid in the interpretation of stratigraphy and in the decision whether to install any deep zone (C) wells.

2.1 COMPONENT A

The nine approximate drilling locations agreed upon by Du Pont and the EPA for Component A of the Phase III RI are presented in Figure 1 as locations MW-20 through MW-28. A shallow zone (A) well will be installed at each of these locations to provide additional groundwater data on the Columbia Formation. In addition, a monitoring well will be installed into the intermediate zone (B) at four of the proposed locations to provide additional groundwater data on the Potomac Formation. At locations where both shallow and intermediate zone monitoring wells are to be installed, the intermediate zone well will be installed first in order to determine the stratigraphy of the location prior to installation of the shallow zone well. The boring for the intermediate zone well installation will be advanced to the top of weathered bedrock. Any geophysical logging conducted in the deep borings will aid in the determination of stratigraphy and water-bearing zones. Each of the individual monitoring well locations is discussed below:

Locations MW-20 and MW-21 - Both shallow zone (A) and intermediate zone (B) monitoring wells are planned for both of these locations. The overburden (Quaternary deposits) above the Columbia Formation will be sealed off from the screened horizon of the Columbia Formation in the shallow zone (A) wells at these locations and all other Phase III well locations.

Based on the boring log produced at MW-18B, it is anticipated (due to thinning) that only one permeable zone will be encountered within the Potomac Formation at these two locations. A monitoring well will be installed into this zone. If a second permeable water-bearing zone at least 5 feet thick is identified within the Potomac Formation that is clearly separated by a confining bed, then a third well will be installed at the location. These two

Potomac Formation wells at one location would then be designated as the intermediate zone (B) and deep zone (C) wells. The enclosed schedule (Table 1) does not allow for the construction of any deep zone (C) wells during the Phase III investigation.

Soil samples will be collected continuously from ground surface to completion depth in the deepest boring at each location. This will minimize the potential to miss an independent water-bearing zone and will provide a detailed stratigraphic record at these locations.

Locations MW-22 through MW-25 - One shallow zone (A) monitoring well will be installed at each of these locations to provide shallow groundwater data downgradient from the eastern and southeastern perimeters of the South Disposal site. These wells will be installed into the first water-bearing permeable unit encountered in the Columbia Formation.

Location MW-26 - One shallow zone (A) and one intermediate zone (B) monitoring well will be installed at this location to provide additional groundwater data in the area to the southwest of the South Disposal site. Again, the intermediate zone well installation will be completed prior to the installation of the shallow zone monitoring well. The boring for the intermediate zone well will be advanced to the top of the previously defined Hydrostratigraphic Unit III B (RI/FS Work Plan, WCC, July 28, 1988). The top of this unit is identified by a violet-red clay.

Location MW-27 - One shallow zone (A) monitoring well will be installed at this location to monitor shallow ground water in the Columbia Formation southwest of the North Disposal site and wells MW-3A and SM-4. The well will be installed into the first water-bearing permeable unit encountered in the Columbia Formation.

Location MW-28 - One shallow zone (A) and one intermediate zone (B) monitoring well will be installed at MW-28 to provide groundwater data for an upgradient location at the Site. The boring for the installation of the intermediate well will be advanced to the top of Hydrostratigraphic Unit III B. Following groundwater sampling (Component B Section 2.2.3), the subsequent analytical data will be used in the determination of background chemistry for the Columbia and the Potomac Formations' ground water.

Soil samples will be collected with split-spoon samplers at each of the single and multiple well drilling locations in advance of a well boring in order to provide data on the stratigraphy. For locations MW-20 and MW-21, soil sampling will be conducted continuously from ground surface to the top of weathered bedrock. At all the other Component A drilling locations, soil samples will be collected at 5-foot intervals from the ground surface to the borehole completion depth. At locations where more than one well is to be installed, the deepest well will be installed first and the soil samples will be collected in advance of the boring. The shallower well installation at multiple well locations will not require the collection of soil samples. Soil sampling for analytical purposes will not be conducted on monitoring wells associated with Component A.

2.2 COMPONENT B

The proposed work tasks in Component B are considered sufficient by Du Pont, in conjunction with the Component A work tasks, to satisfy all of the EPA's data requests for the Phase III RI. Component B generally includes: monitoring well construction and soil borings at the Ciba-Geigy and Holly Run Plants (see Figures 1 and 2); groundwater sampling and analyses; and supplemental wetlands data collection. Detailed descriptions of the specific proposed Component B work tasks are provided in the subsections below.

2.2.1 MONITORING WELLS

The proposed Component B for the Phase III RI includes the installation of monitoring wells in the Ciba-Geigy and Holly Run Plants. Ten monitoring wells at six of the

approximate locations (MW-29 through MW-34) shown on Figures 1 and 2 are proposed by Du Pont to clarify the potential impacts on ground water due to contaminant sources associated with historic (and possibly current) operations within these areas. The Component B drilling locations have been selected on the basis of contaminant concentration contour maps of the Site's target parameters (barium, zinc, cadmium, tetrachloroethylene and trichloroethylene). Groundwater elevation contour maps for the intermediate zone (Hydrostratigraphic Unit III A) and the shallow zone (Hydrostratigraphic Unit I), as presented in the Data Sufficiency Memorandum (WCC, April 1989), have also been used. Du Pont is likely to conduct geophysical logging at locations were a borehole extends to the top of weathered bedrock. Each monitoring well location, and the rational for its placement, is discussed below:

Location MW-29 - This location at the Du Pont Holly Run Plant has been selected due to its upgradient location from MW-1A and SM-2, where tetrachloroethylene (PCE) has been detected in the Columbia Formation at concentrations ranging from 20 to 720 parts per billion (ppb). This location is also in the heart of the Holly Run Plant, but on the downgradient side of the production buildings, and would help to confirm that the Holly Run Plant is neither a historic nor present source of the contaminants detected in wells MW-1A and SM-2. One shallow zone (A) well is proposed for this location. Du Pont and WCC believe that an intermediate zone (B) well in the Potomac Formation is not needed at this location because concentrations of PCE and trichloroethylene (TCE) in the nearby intermediate zone (B) wells MW-1B and WW-13 were just above the detection limit or not detected at all. Furthermore, concentrations of cadmium and zinc in the groundwater at MW-1B, which ranged from not detected to 8.6 ppb, and from 41 to 121 ppb, respectively, were considered low compared to concentrations found at many of the other well locations at the Site.

Location MW-30 - This location has been selected to provide groundwater data in the area of the oldest historic production buildings on-site. Groundwater concentration contours for zinc and cadmium suggest that one of

the sources of these metals associated with historic operations may be in this area. Solvents are reportedly also presently stored in this area. PCE was detected in a groundwater sample from the Phase II temporary monitoring well DB-2 located in this same general area. However, whether that groundwater sample was obtained from the Columbia or Potomac Formation is unclear. Thus, two wells, a shallow zone (A) well and an intermediate zone (B) well, are proposed for this location. The boring for the intermediate zone (B) well installation will be advanced to the top of weathered bedrock to provide a stratigraphic column at this location.

Location MW-31 - This location has been selected to provide groundwater data in the center of the area historically used for the storage and processing of zinc and barium ores. Concentration contours for zinc, barium, and cadmium suggest that a historic subsurface source of contamination may be in this area. Location MW-31 is also adjacent to Building 100, which once was a part of CPC production, where solvents such as PCE were used. A shallow zone (A) well and an intermediate zone (B) well are proposed for this location. The boring for the intermediate zone (B) well installation will be advanced to the top of weathered bedrock.

Location MW-32 - One shallow zone (A) well is proposed for this location to investigate further the possible source of PCE detected at existing shallow monitoring well MW-2A. The proposed location of MW-32 is downgradient from Buildings 200, 201, and 70, which have historically been involved in the production of CPC and involved the use of PCE. Existing Potomac Formation groundwater chemistry nearby does not warrant an intermediate zone (B) well at this location.

Location MW-33 - To replace the existing well SM-1 which sometimes is dry, one shallow zone (A) well sealed into the Columbia Formation will be installed. In addition, an intermediate zone (B) well will be installed at this location downgradient from historic Lithopone, CPC and QA production. The boring

for the intermediate zone (B) well installation will extend to the top of weathered bedrock.

Location MW-34 - Both a shallow zone (A) and intermediate zone (B) well are proposed for this location on the upgradient side, but within the area of, historic plant operations. The boring for the (B) well will extend to the top of weathered bedrock.

Soil samples will be collected with split-spoon samplers continuously from ground surface to completion depth at each of the monitoring well locations proposed for Component B. The split-spoon samplers will be driven in advance of the borings. Only the deeper boring will be sampled at multiple well locations. Analytical samples of the soil will be taken from these split-spoons at 6-foot intervals (every third split-spoon sample) from all six of the well drilling locations and analyzed for Target Compound List (TCL), Volatile Organic Compounds (VOCs) and Target Analyte List (TAL) metals.

2.2.2 SOIL BORINGS

As part of Component B of the Phase III RI, three soil borings are proposed at the approximate locations labeled B-1, B-2 and B-3 on Figure 2. These locations are distributed across the Ciba-Geigy Newport Plant to evaluate potential areas of soil contaminants in high concentrations. Specific attention was given to historical Lithopone, CPC and QA manufacturing operations in this area to select these boring locations. QA operations continue today at the Newport Plant, under Ciba-Geigy ownership, in the same buildings in which Du Pont conducted operations and using the same chemical processes and materials. The data from the borings will be evaluated in conjunction with the presently available soils data and the soils data collected during the installation of the proposed Phase III monitoring wells. The rationale behind the selected locations for the three proposed borings is outlined below:

B-1: This location is south and downgradient of Building 35 complex, a potential source for all of the Site's target parameters. Lithopone was once produced

there and QA is currently produced there. This boring will extend from ground surface to the top of weathered bedrock.

B-2: This location is west of Building 67, the area where barium ore was historically stockpiled. The completion depth will be at the top of the Potomac Formation.

B-3: This location is north of Building 17, where part of the historical Lithopone operations were located. Coal and/or barium ore were reportedly stockpiled between Building 17 and the railroad tracks. The boring will extend to the top of the Potomac Formation.

Soil samples will be collected with split-spoon samplers from each of the Component B soil borings continuously from ground surface to the boring completion depth. Analytical samples of the soil will be taken from these split-spoons at 6-foot intervals (every third split-spoon sample) from all three borings for TCL-VOCs and TAL-metals analyses.

2.2.3 GROUNDWATER SAMPLING

After completion of all the Component A and Component B drilling, one round of groundwater samples will be collected from all of the active existing Site monitoring wells and the proposed Phase III monitoring wells. In addition to the monitoring wells, the four private wells labeled R4, R5, R6 and R14 on Old Airport Road will also be sampled three times in 1990, if permission is granted by the owners. All these groundwater samples will be analyzed for TCL-VOCs and total and filtered TAL-metals. Detailed sampling procedures are presented in the QAPP (RI/FS Work Plan, WCC, July 28, 1988).

2.2.4 SUPPLEMENTAL WETLANDS INVESTIGATION

In August and December of 1989, a Phase III Wetlands Investigation was performed in the Christina River and drainageways in the vicinity of the Newport Site. In response to the EPA's March 29, 1990 review comments of the Phase III Wetlands Investigation

Technical Data Summary Report (WCC, January, 1990), Du Pont is proposing this supplemental Phase III effort to aid in the assessment of potential biological impacts associated with the Newport Site and to supplement and clarify data collected in Phases II and III.

The primary objective of the Phase III study was to evaluate the relative toxicity of Christina River and wetland sediments to aquatic biota. Sampling and analyses of sediments, surface water and benthos performed as part of the Phase II and Phase III investigations have shown that, with the exception of the pond and drainageway in the vicinity of the North Disposal site, viable biological communities persist at locations sampled despite apparently high levels of contaminants in most of the sediment samples and some of the surface water samples.

The Phase II and Phase III data also suggest that the pond and drainageway in the vicinity of the North Disposal site have been somewhat impacted by contaminants disposed of at the Newport Site. Based on these results, EPA has requested that additional data be collected in the vicinity of the North Disposal site and at one location in the Christina River. As part of Component B of the Phase III RI, Du Pont proposes to conduct additional sediment chemistry and toxicity testing in the North Disposal site drainageway to delineate areas which may require remediation. In the Christina River, a new location, RS01-A, will be established at the vicinity of the mouth of the drainageway from the North Disposal site (Figure 3) to substitute for the previous station RS01. This new station will be sampled to determine whether contaminated sediments from the northern drainageway are being transported into the river. RS01-A sediment will be analyzed for TAL metals and toxicity testing will be performed. As requested by the EPA, the potential for bioaccumulation by vegetation in the South Disposal site will also be evaluated by performing tissue analyses on samples collected from the area. A summary of all proposed sampling for the Supplemental Phase III efforts is provided in Table 2. Details of the individual work tasks for the proposed Supplemental Phase III Wetlands Investigation are provided below.

2.2.4.1 SEDIMENT CHEMISTRY AND PHYSICAL PARAMETERS

Chemical and physical analyses will be performed on sediments collected from five stations (AS09, AS08, AS07, AS06 and AS12) in the drainageway, and one station in the

Christina River at the mouth of the drainageway (RS01-A) (Figure 3). Stations AS09, AS08, AS07 and AS06 will be located at previously sampled stations from Phase II and Phase III investigations. Station AS12, a new station, will be located upstream of AS06 in the North Disposal site drainageway.

Sediment collection procedures will be those described in Section 2.2 of the Phase III Wetlands Investigation Work Plan (WCC, 1989). As previously requested by the EPA in the Phases II and III wetland programs, sediments will be analyzed for TAL metals, pH, Eh, sulfide and ferric and ferrous ion content. These parameters will be assessed as indices of contaminant bioavailability. A sub-sample will be taken from the homogenized composite sample to be analyzed for grain size distribution, percent moisture, percent combustible organics and total organic carbon (TOC).

2.2.4.2 SEDIMENT TOXICITY TESTING

Sediment chronic toxicity testing is proposed for sediment samples collected from the same six stations where chemical and physical analyses are performed. The purp of the toxicity testing is to determine the toxic effects, if any, that contaminant levels in elutriates prepared from contaminated sediments have on laboratory test organisms.

Chronic sediment elutriate toxicity testing will be performed using the cladoceran Ceriodaphnia dubia and the fathead minnow Pimephales promelas. Methodology to be employed will follow that given in Section 2.3 of the Phase III Wetlands Investigation Work Plan (WCC, 1989).

2.2.4.3 BENTHIC COMMUNITY SURVEYS

In the Phase III Wetlands Investigation, "viable biological (i.e., benthic) communities" were found where laboratory toxicity testing implied that sediment contaminant levels would preclude life. Hence, benthic community analyses are an important "in vivo" gage of aquatic environmental impacts.

As part of Component B of the Phase III RI, benthic community surveys are proposed for all six stations in the study area. Five replicates will be collected from each station and three will be analyzed. Field and laboratory methodologies will follow those given in Section 2.5 of the Phase III Wetlands Investigation Work Plan (WCC, 1989).

2.2.4.4 VEGETATION BIOACCUMULATION

The final work task category proposed by Du Pont to satisfy the requests of the EPA involves the bioaccumulation of contaminants by wetland vegetation. Du Pont proposes to evaluate this concern of the EPA by performing tissue analyses on selected emergent wetland plant species during the growing season (e.g., Peltandra virginica). Tissue samples will be collected from the South Disposal site pond (AS01), a drainageway from the South Disposal site pond (AS03), and a control location.

At each station, three replicate tissue samples of roots or rhizomes and above ground leaves will be collected. Using Method 3050 of USEPA SW8-46, above and below ground tissue samples will be analyzed for levels of TAL metals. Sediment samples will also be collected at each location and tested for TAL metals, grain-size distribution, percent moisture, percent combustible organics, total organic carbon, pH, Eh, sulfide and ratio of ferrous to ferric ions.

2.2.4.5 TECHNICAL DATA REPORT

The preparation of a Technical Data Report for the Supplemental Phase III Wetlands Investigation is proposed by Du Pont to supplement the Phase III Wetlands Investigation Technical Data Summary Report (WCC, January 1990) by:

- summarizing data generated in the Supplemental Phase III Investigation;
- presenting a relative comparison of stations based on data collected in North Disposal site drainageway; and
- evaluating potential for bioaccumulation based on plant tissue levels measured at the test stations and control station.

This report will be submitted to the EPA as part of the Phase III RI Investigation Data Sufficiency Report (see Section 3.0).

2.3 QUALITY ASSURANCE

As part of the effort to maintain quality assurance during the Phase III RI investigation, one set of two samples will be taken for matrix spikes and matrix spike duplicates for every 20 samples collected for each matrix. Field blanks and blind duplicates will be collected at the frequency of five percent for each matrix sampled. Trip blanks will accompany samples collected for TCL-VOA analysis at the frequency of one per day of sample shipment. Other facets of the QA/QC program are provided by reference to the QAPP (WCC, July 28, 1988) and its supplements.

3.0 SITE INVESTIGATION ANALYSIS

The objectives of this task are to:

- o perform QA/QC and data validation;
- o evaluate sufficiency of the collected data and information; and
- o evaluate, summarize and organize collected data and information.

These objectives will be met during the Phase III RI. The analytical data will be subjected to QA/QC evaluation for validation in accordance with the procedures presented in the QAPP (WCC, July 28, 1988). The validated analytical data and other information will be evaluated to determine if they meet the applicable data sufficiency objectives outlined in the Phase II Work Plan (WCC, July 28, 1988) and be submitted to the EPA as a Phase III RI Investigation Data Sufficiency Report. Included in this document will be Component A and Component B Phase III RI data and information evaluations and the Technical Data Report for the Supplemental Phase III Wetlands Investigation.

Two Endangerment Assessments (EAs) will be performed in accordance with the EPA's "Risk Assessment Guidance For Superfund, Volume I: Human Health Evaluation

Manual (September 29, 1989) and Volume II: Environmental Evaluation Manual (March 1989)." Due to EPA's splitting of the Newport Site into two OUs, an initial EA will first be prepared for OU I, based on existing Phase I and Phase II RI data. Following completion of the Phase III RI investigation, a second EA addressing OU II will be prepared and submitted to EPA. Because the EPA indicated that the groundwater and wetlands data in the vicinity of the landfills are not sufficient, these media will not be addressed in the EA for OU I.

4.0 REMEDIAL INVESTIGATION REPORTS

The results of Phases I and II of the RI that apply to OU I will be presented in a Remedial Investigation (OU I) report to EPA prepared in accordance with "EPA Guidance for Remedial Investigations and Feasibility Studies Under CERCLA" (October 1988) and additional updated guidance documents which may be provided by EPA.

Following completion of the Phase III RI investigation and approval of the EA (OU II) by EPA, a second RI addressing OU II will be similarly prepared and presented to EPA.

5.0 FEASIBILITY STUDY

The objectives of the Feasibility Study (FS) are to identify available remedial technologies, screen technologies, and develop and evaluate remedial alternatives based on the RI results for the Du Pont-Newport Site. The FS will be conducted in accordance with the "EPA Guidance for Remedial Investigations and Feasibility Studies Under CERCLA" (October 1988). Following completion of the Phase III RI investigation, Du Pont will re-evaluate and make a recommendation to EPA whether it is considered appropriate to keep the Newport Site split into two OUs for preparation of the FS report and subsequent steps in the Superfund process. If the decision is made to maintain the integrity of the two OUs, then Du Pont will prepare an initial FS report to address OU I and a second FS report to address OU II. Otherwise only one FS report will be prepared for the Newport Site.

6.0 DATA MANAGEMENT

A data management system will provide a mechanism for data tracking, storage, retrieval and identification of appropriate QA/QC procedures. The RI/FS Phase II Work Plan (WCC, July 28, 1988) provided an outline of the procedures to be used in tracking and processing information and analytical data, which will be followed during the Phase III investigation. The collected information and data will be processed and documented in a way which would make them available for use in site descriptions, groundwater modeling, endangerment assessments and engineering design of remedial alternatives.

7.0 SCHEDULE, REPORTING, DOCUMENT CONTROL AND PROJECT MANAGEMENT

The RI/FS activities in this Phase III Work Plan will be implemented according to Table 1, subject to the contingencies noted in this table and the Proposed Phase III Investigation (WCC, April 10, 1990) letter submitted to EPA. In addition to the deliverables identified in Table 1, monthly progress reports will continue to be submitted to EPA by tenth calendar day of each month.

The document control system outlined in the RI/FS Phase III Work Plan (WCC, July 28, 1988) will continue to be followed.

The currently designated project managers for the Newport Site are:

Du Pont Project Manager	Timothy Hill
WCC Project Manager	Roger T. Gresh, P.G.
EPA Remedial Project Manager	Randy Sturgeon

Tables

TABLE 1

PROPOSED RI/FS SCHEDULE
April 10, 1990
88C2076-4R

1.	Split Site Into Two OUs	March, 1990
2.	Draft Phase III Work Plan (OU II) Includes two components. Component A: all EPA-required wells in March 8, 1990 data sufficiency response letter; and Component B: proposed extra wells and soil borings at Ciba-Geigy Newport Plant and Du Pont Holly Run Plant plus proposed Phase III Supplemental Wetlands Investigation in response to EPA's March 29, 1990 letter regarding wetlands data sufficiency.	April 16, 1990
3.	Complete First Sampling of Four Private Wells Includes private wells R4, R5, R6 and R14 on Old Airport Road.	April 20, 1990
4.	Begin Phase III Drilling Program *Contingent upon EPA approval of Component A of the Draft Work Plan (OU II) by April 20, 1990, and availability of a drilling subcontractor acceptable to Du Pont.	May 29, 1990
5.	Draft EA (OU I) Because EPA indicated that the data in the vicinity of the two landfills are not sufficient, the EA (OU I) will not address the ground water or the wetlands.	May 29, 1990
6.	Final Phase III Work Plan (OU II) *Contingent upon EPA response to draft by April 30, 1990.	May 30, 1990

TABLE 1
(continued)

7.	Complete Phase III Drilling Program	July 13, 1990
	*Contingent upon EPA's approval by April 30, 1990 for Du Pont to only drill the wells required by EPA's March 8, 1990 letter plus the specific additional wells and soil borings at the Ciba-Geigy Plant and Holly Run Plant proposed by Du Pont in Component B of the Draft Work Plan (OU II).	
	*Contingent upon Du Pont's success in drilling wells within completion time frames previously experienced at the Site.	
	*Contingent upon not drilling any deep zone (C) wells.	
	Assumes using (2) drilling rigs. Includes well development but no pumping tests.	
8.	Final EA (OU I)	July 16, 1990
	*Contingent upon EPA acceptance of the exposure pathways defined in the draft and response to draft by June 12, 1990.	
9.	Complete Groundwater Sampling of Site Wells	August 3, 1990
	Includes 2-week groundwater chemistry stabilization period for Phase III wells.	
	Includes second round of sampling four private wells (R4, R5, R6 and R14).	
10.	Draft RI (OU I)	August 17, 1990
	*Contingent upon EPA approval of Final EA (OU I) by July 30, 1990.	
11.	Receive Analytical Results	September 3, 1990
	Includes soil and groundwater sampling.	

TABLE 1
(continued)

12.	Final RI (OU I) *Contingent upon EPA response to draft by August 31, 1991.	September 28, 1990
13.	Phase III Investigation/Data Sufficiency Report *Contingent upon EPA agreeing to a meeting with Du Pont on October 15, 1990 to discuss Phase III data. Includes QA/QC validation of analytical data. Included in report would be Du Pont recommendation on whether to return Site into one operating unit. Assumption made here for scheduling purposes is that Du Pont agrees to keep Site split into EPA's (March 8, 1990) original OU I and OU II. *Remainder of schedule regarding OU II is contingent upon EPA agreement by November 19, 1990, to data sufficiency for total project.	November 5, 1990
14.	Draft FS (OU I) *Contingent upon EPA approval of Final RI (OU I) by October 12, 1990.	November 30, 1990
15.	Complete Third Sampling of Four Private Wells Includes private wells R4, R5, R6 and R14 on Old Airport Road.	November 30, 1990
16.	Final FS (OU I) *Contingent upon EPA response to draft by December 14, 1990.	January 30, 1991
17.	Draft EA (OU II)	January 31, 1991

TABLE 1
(continued)

18.	Final EA (OU II)	March 15, 1991
	*Contingent upon EPA response to draft by February 14, 1991.	
19.	Draft RI (OU II)	April 15, 1991
	*Contingent upon EPA approval of Final EA (OU II) by March 29, 1991.	
20.	Final RI (OU II)	May 27, 1991
	*Contingent upon EPA response to draft by April 29, 1991.	
21.	Draft FS (OU II)	June 18, 1991
	*Contingent upon EPA approval of Final RI (OU II) by June 10, 1991.	
22.	Final FS (OU II)	July 30, 1991
	*Contingent upon EPA response to draft by July 2, 1991.	

Notes:

1.* If these contingencies cannot be met project schedule would be delayed.

2. The two week interval for EPA to provide written comments to Du Pont for all draft and final reports was verbally agreed to by EPA on March 19, 1990 in a telephone conversation between EPA's R. Sturgeon and T. Hill of Du Pont.

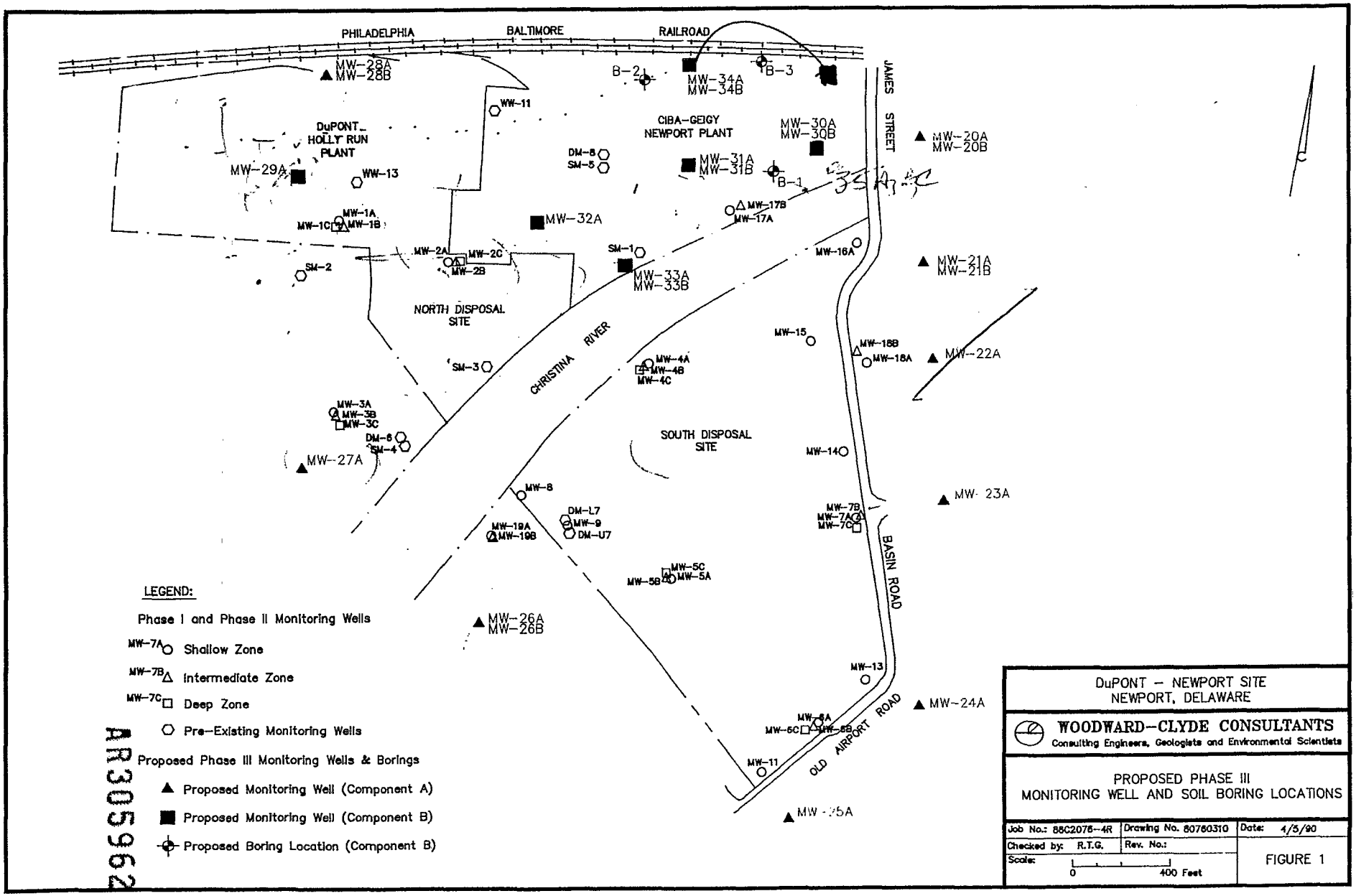
TABLE 2

PHASE III SUPPLEMENTAL WETLANDS INVESTIGATION SAMPLING SUMMARY DU PONT-NEWPORT SITE

Station	Sediment Chemistry	Benthos	Toxicity Testing	Physical Parameters	Plant Tissue Analyses
RS01-A	X	X	X	X	
AS09	X	X	X	X	
AS08	X	X	X	X	
AS07	X	X	X	X	
AS06	X	X	X	X	
AS12	X	X	X	X	
AS01	X			X	X
AS03	X			X	X
Control	X			X	X

WM-44S

Figures



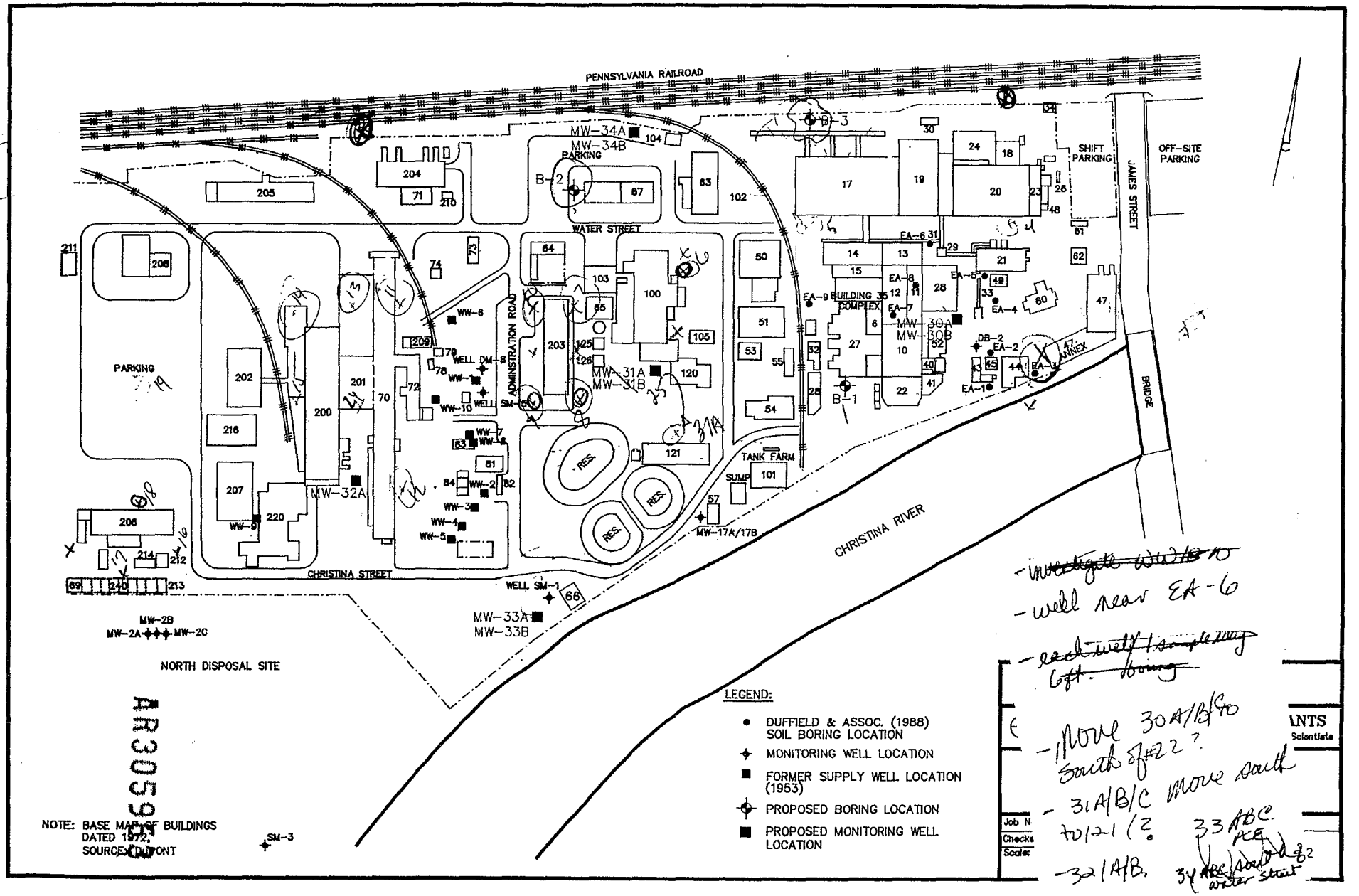
DuPONT – NEWPORT SITE
NEWPORT, DELAWARE

WOODWARD-CLYDE CONSULTANTS
Consulting Engineers, Geologists and Environmental Scientists

PROPOSED PHASE III
MONITORING WELL AND SOIL BORING LOCATIONS

Job No.: 88C2075-4R	Drawing No. 80760310	Date: 4/5/90
Checked by: R.T.G.	Rev. No.:	
Scale: 0 400 Feet		FIGURE 1

DR3059629



HRO3093

- ~~investigate WW-10~~
- well near EA-6
- ~~each well / complete off boring~~

- Move 30A/B/C to South of #22?
- 31A/B/C move south to 12-1 (2. 33 ABC. PCE
- 32 1A/B. 34 ABC Adjacent to water Street

UNSCANNED ITEM(S)

ONE OR MORE OF THE FOLLOWING ITEMS MAY BE ASSOCIATED WITH THIS DOCUMENT:

PHOTOGRAPHS
DRAWINGS
OVERSIZED MAPS
ROLLED MAPS

PLEASE CONTACT THE CERCLA RECORDS CENTER TO VIEW THE ITEM(S)