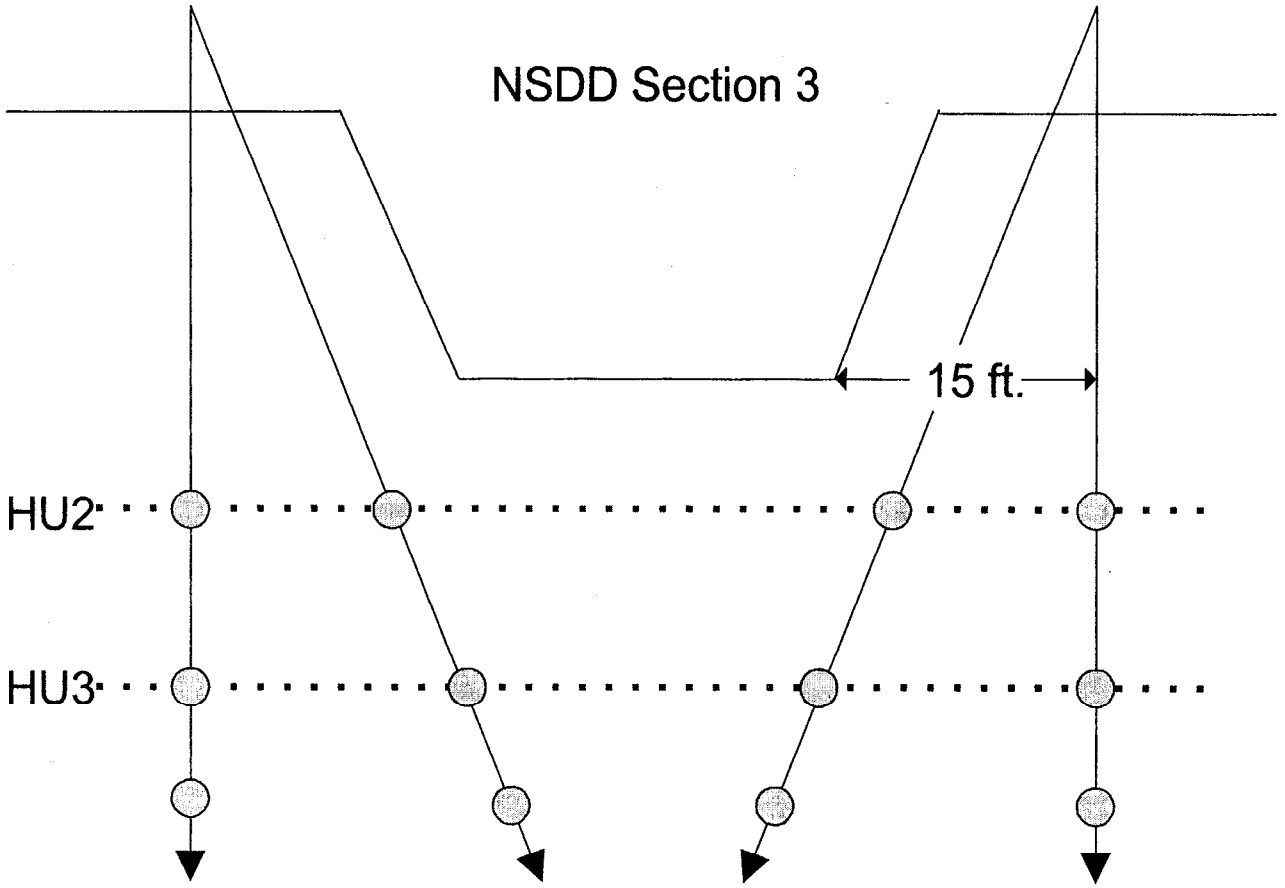

Fig. 5.2. Depiction of angled and vertical boreholes along NSDD.

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FIGURE No. c5ac90001sk394.ppt
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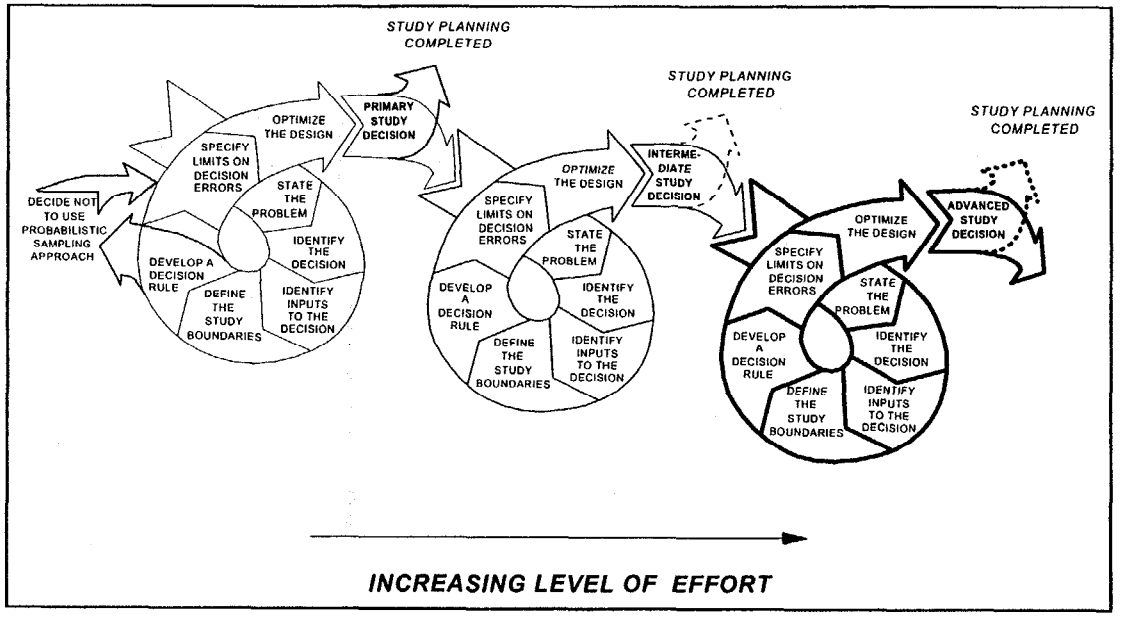

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Fig. 6.1. DQO process throughout lifecycle of a project

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FIGURE No.	dqoProcess.pdf
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Step 4 – Define the Boundaries of the Study. Step 4 evaluates the utility of historical data to assess the source of current groundwater contaminants, the area to be evaluated, and the use to which the different types of data can be applied. Defining the boundaries of the study defines the target population, determines the spatial and temporal boundaries, identifies practical constraints, and defines the scale of decision making.

Step 5 – Develop a Decision Rule. Development of a decision rule includes defining the statistical parameter that characterizes the population, determining what action is needed, and confirming that the Action Level exceeds minimum detection limits. The four main elements of a decision rule are (1) the parameter of interest, (2) the scale of decision-making, (3) the action level, and (4) the alternative actions. These four elements are defined below.

Parameter of interest is a descriptive measure (such as mean, median, or proportion) that specifies the attribute that the decision maker would like to know. The purpose of the data collection design is to produce environmental data than can be used to develop a reasonable estimate of the population parameter.

Scale of decision-making refers to the smallest, most appropriate subset for which decisions will be made.

Action level is a measurement threshold value of the parameter of interest. Action levels can be based on regulatory standards, exposure assessment, technology-based limits, or reference-based standards.

Alternative actions describe the actions that the decision maker would take depending on the true value of the parameter of interest.

Step 6 – Specify Tolerable Limits on Decision Errors. Step 6 sets acceptable limits for decision errors relative to consequences (health effects, costs). The acceptable limits establish performance goals for the data collection design. The following four activities are involved in this step:

- determine the possible range of the parameter of interest;
- identify the decision errors and choose the null hypothesis;
- specify a range of possible parameter values where the consequences of decision errors are relatively minor (the gray region); and
- assign probability values to points above and below the gray region that reflect the tolerable probability for the occurrence of decision errors.

Acceptable limits for decision errors for this RI will be incorporated into the final RI work plan.

Step 7 – Optimize the Design for Obtaining Data. Step 7 selects a resource-effective sampling and analysis plan (SAP) that meets the designated performance criteria. This SAP is incorporated into the final RI work plan.

6.1 DEFINE THE PROBLEM TO BE RESOLVED (DQO STEP 1)

The primary objective of the C-746-S&T Landfills RI is to identify active sources of contamination with respect to the groundwater pathway. Potential active sources located within the C-746-S&T Landfill complex are the main focus of this study.

Active sources of contamination can be identified by two methods. If the contaminant in question does not have an MCL, then the area will be considered an active source if statistical testing determines that the downgradient contaminant concentration is greater than the upgradient contaminant concentration. If the contaminant in question does have an MCL, an area will be considered to be an active source if it produces contaminant concentrations in excess of MCLs.

Compliance monitoring for the C-746-S&T Landfills has detected several contaminants in the RGA. TCE has been detected at concentrations that exceed the MCL for TCE. In 2001, the highest concentration of TCE detected in groundwater at the C-746-S&T Landfill area was 23 μg/L.

The highest activities of ^{99}Tc in groundwater at the C-746-S&T Landfills are present in the upper RGA near the south end of the C-746-S Landfill. The now abandoned MW181, located south of the C-746-S Landfill, exhibited a ^{99}Tc activity of 198 pCi/L in 2000. North of the C-746-S Landfill, MW179 contained 506 pCi/L ^{99}Tc during compliance monitoring in 2001. Other monitoring wells in the area typically exhibit ^{99}Tc activities of 30 to 40 pCi/L, which is well below the MCL of 900 pCi/L, but greater than the DOE action limit of 25 pCi/L established as ACO criteria.

Based on review of this historical information, the following draft problem statement was identified for the C-746-S&T Landfills RI.

> *"Groundwater contamination occurs in the RGA in the area of the C-746-S&T Landfills. The source of this contamination remains undefined."*

Additional questions that should be answered by the C-746-S&T RI are listed below.

- Are or were the C-746-S&T Landfills significant sources of groundwater contamination?
- Is or was the NSDD (south of the C-746-S&T Landfill) a source of groundwater contamination?
- Are or were the C-616 Lagoons a source of groundwater contamination?

6.2 DEFINE THE BOUNDARIES OF THE STUDY (DQO STEP 4)

The proposed spatial boundaries of study area for this RI include the C-746-S&T Landfills located north of PGDP and Ogden Landing Road and contiguous areas to the east, south, and west. The proposed study area is shown in Fig. 1.1. The area immediately downgradient of the C-746-S&T Landfills (the C-746-U Landfill) also has been included in the study area to aid in the interpretation of contaminant flow; however, data that may be evaluated from the U-Landfill will not be used to characterize the C-746-S&T Landfills. The U-Landfill data is not intended to be used in the characterization of the S&T Landfills so that additional potential source areas will not be introduced.

Vertical boundaries of the study area addressed by the C-746-S&T RI/FS will include surface deposits and extend to a depth that is inclusive of the base of the RGA and the first McNairy sand.

PCOCs to be addressed by the C-746-S&T Landfill RI are these:

- metals (e.g., arsenic and chromium);
- radionuclides (e.g., ^{99}Tc); and
- VOCs (TCE and its degradation products).

These PCOCs were designated based on knowledge of historical plant processes and review of PGDP analytical data summaries.

6.3 C-746-S&T DQO DECISION NETWORK (DQO STEPS 2, 3, AND 5)

6.3.1 Identification of Study Questions

The principal study questions that have been defined for the C-746-S&T Landfills RI are listed below.

- *"Are the C-746-S&T Landfills, including the SWMU 145 Subcontractors' Staging Area and the abandoned stretch of the NSDD, a significant source of groundwater contamination?"*
- *"Is the active NSDD located from the north side of the PGDP security fence to the north end of the C-746-S&T Landfills a significant source of groundwater contamination?"*
- *"Are the C-616 Lagoons, located north of the PGDP security fence, a significant source of groundwater contamination?"*

Possible resolutions of the principal study questions are that groundwater contamination observed in the vicinity of the C-746-S&T Landfills is derived from the C-746-S&T Landfills, from other SWMUs within the landfill area, from sources upgradient of the landfill, or, for some contaminants, from *in situ* degradation of well materials.

Alternative actions that could be taken to resolve each of the principal study questions differ depending on the answer to each study question. If the answer to a study question were "yes," the appropriate alternative action would be to identify the source of contamination and define the nature and extent of the contamination. If the answer to a study question is "no," no further action would be required.

The following decision statement has been drafted to guide the C-746-S&T Landfills RI activities.

"If the C-746-S&T Landfills (including the SWMU 145 Subcontractors' Staging Area and the abandoned stretch of the NSDD), the active NSDD located from the north side of the PGDP security fence to the north end of the C-746-S&T Landfills, or the C-616 Lagoons are a significant source of groundwater contamination, then characterize the source of contamination and the nature and extent of contamination."

6.3.2 Required Information Inputs

Table 6.1 lists required information inputs identified by the GWOU PCT for final scoping of the C-746-S&T Landfills RI and notes the sections of this scoping document that provide the requested information.

6.3.3 Decision Rules

During scoping meetings in November and December 2000, the GWOU PCT identified decision rules for the C-746-S&T Landfills complex, the C-616 Lagoons, and that section of the NSDD included within this RI study area. These decision rules are listed below.

6.3.3.1 C-746-S&T Landfills

The GWOU PCT has agreed that the C-746-S&T Landfills complex exhibited the following characteristics/conditions:

- the abandoned portion of the NSDD is the west boundary of the landfill complex;

Table 6.1. Summary of required inputs and information sources

Required Inputs	Information Source
Information on Historical Practices within the Study Area	Section 1.3, Description of the Study Area
Information on Historical Analytical Data within the Study Area	Section 2, Existing Data Appendix A, Maps depicting distribution of contaminants historically Appendix B, Maps depicting distribution of contaminants historically Appendix D, Database of Historical Data
PCOCs	Section 3.5, Potential Contaminants of Concern (Site-Related Constituents)
Appropriate Assessment Methods for the RI	Section 4, Response Scenarios
Proposed Action Levels	Section 3.5, Potential Contaminants of Concern (Site-Related Constituents)
Environmental Setting	Section 3.1, Geology/Hydrogeology
Regulatory Setting,	Section 1.1, Consistency with the NCP
Site History	Section 1.3, Description of the Study Area
Groundwater Flow Rate and Direction	Section 3.1, Geology/Hydrogeology
Nature and Extent of Contamination.	Section 3.2, Potential Contaminant Sources Section 3.3, RGA Contaminant Plumes

- the heterogeneous nature of the C-746-S&T Landfills complex and its surrounding area (approximately 20 acres) is too great to use angular drilling to obtain borehole samples and angular borehole samples would not provide any meaningful information;

- the UCRS can not be considered an integrator of contamination in the C-746-S&T Landfills area because groundwater flow within the unit is primarily vertical;

- it may be difficult to differentiate contaminant sources at the C-746-S&T Landfills from other sources of contamination in the area (i.e., the P Landfill, the abandoned portion of the NSDD, etc.); and

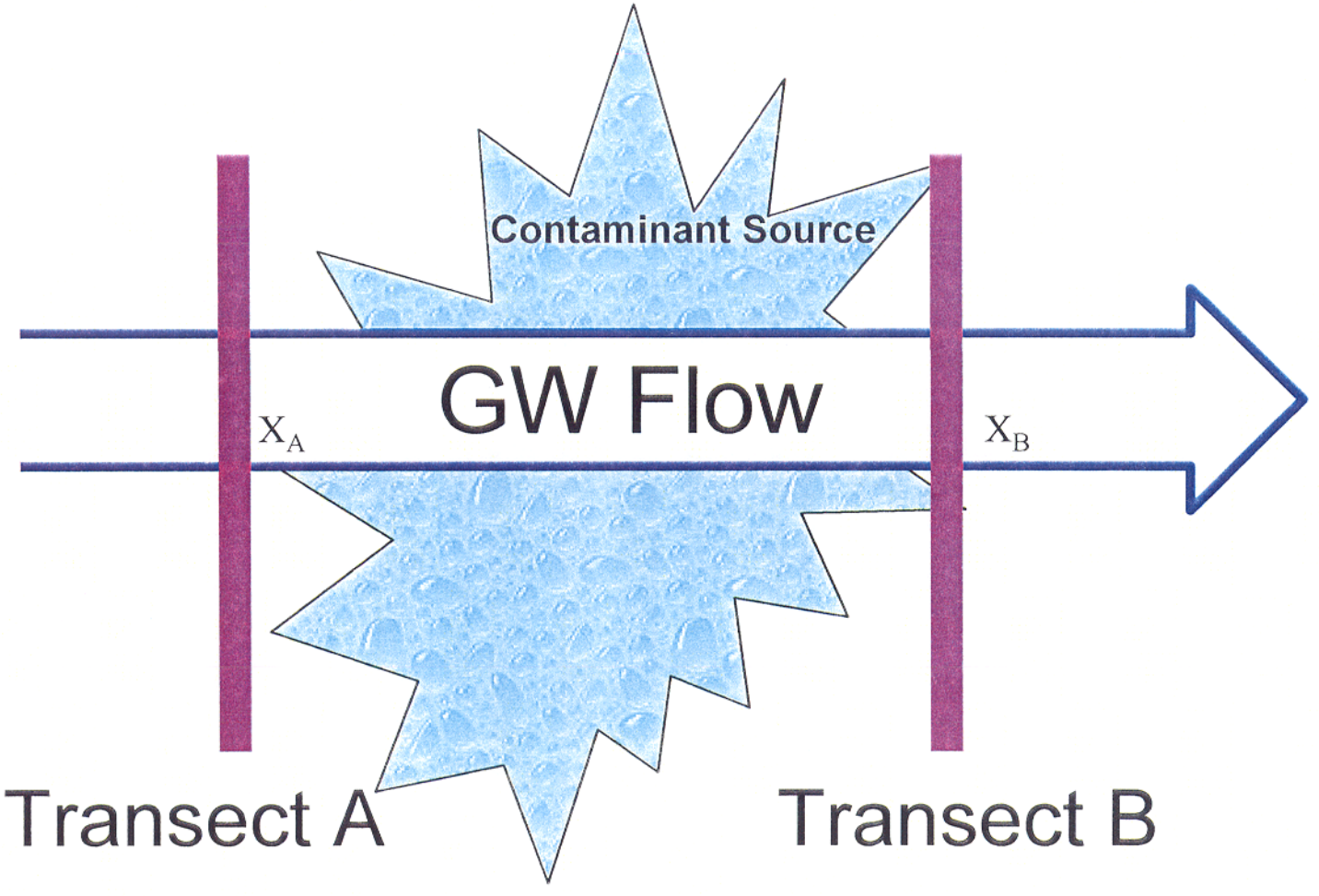
- three transects around the C-746-S&T Landfill, in addition to a transect running east/west north of NSDD Section 3 (T4), would provide the data necessary to determine if the landfill is leaking (Fig. 5.1).

Based on these characteristics/conditions, the GWOU PCT developed the following decision rules for the C-746-S&T Landfills:

- Where X_A and X_B equal the concentrations of contaminant X at locations A and B, respectively, if $X_B > X_A$, then an active source of contaminant X lies between locations A and B. If $X_B >$ risk-based concentration (RBC), the source will be located and evaluated with respect to source control measures. In addition, the GWOU PCT agreed that they were willing to accept the probability of encountering false positives inherent in this approach and that, if (X) > a site-specific level (SSL), a tiered modeling evaluation will be performed (see Fig. 6.2).

- The Solid Waste test [401 KAR 48:300 Sections 8 and 9 (i.e., X > SSL)] will be used to determine if there is a trend along any flow tube indicative of an intermediate source.

- An evaluation will be conducted if tiered modeling indicates that there is a release to groundwater (top of HU3) and water samples will be used to calibrate partitioning.



If $X_B > X_A$,
Then source area present

Fig. 6.2. Contaminant source identification.

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6.3.3.2 C-616 Lagoons

The GWOU PCT agreed that the C-616 Lagoons exhibit following characteristics/conditions:

- the C-616 Lagoons are located north of the plant boundary and west of the NSDD;
- the lagoons have a high pH environment (pH > 12);
- primary PCOCs are ^{99}Tc (one measurement of ^{99}Tc in the lagoon was 4,700 pCi/g in sediment) and metals (mainly arsenic and chromium);
- process history indicates that TCE is not an expected contaminant;
- the area is small enough to assume that if the lagoons are leaking, they will be leaking across the entire lagoon area (i.e., if the lagoons are leaking the assumption is that sampling will detect an increase in contaminant concentrations regardless of the origin of the leak in the lagoon); and
- two to three angle drilled borings around the perimeter of the C-616 Lagoons will be sufficient to determine if it is a source of groundwater contamination.

The GWOU PCT further specified the following:

- the project team should propose the locations of the angle borings,
- KDEP would like an unsaturated soil sample collected from the angle borings,
- samples should be collected from 28 ft bgs to the RGA, and
- the angle boring will extend approximately 20 ft horizontally from the edge of the lagoon toward the center.

Based on these characteristics and conditions, the following possible decision rules were discussed by the GWOU PCT.

- If mounding of groundwater is observed beneath the C-616 Lagoons, then leakage has occurred.
- If mounding of ground water is not observed beneath the C-616 Lagoons, then no leakage has occurred.

6.3.3.3 NSDD

The GWOU PCT agreed that the NSDD exhibits the following characteristics/conditions:

- the portion of the NSDD being evaluated (known as Section 3) is approximately 2,000 ft in length and is located approximately 4,500 to 5,000 ft north of the PGDP security boundary and
- the primary PCOCs are VOCs, ^{99}Tc and metals (mainly arsenic and chromium).

The GWOU PCT also agreed to the following recommendations.

- Soil and groundwater samples from the NSDD should be taken along transects as shown on Fig. 5.1.

- Due to the nature of the ditch, both angular boreholes and vertical boreholes located on the banks of the NSDD should be used to collect subsurface samples. This would reduce potential cross-contamination of subsurface samples with water from the ditch.

- The purpose of the angle borings is to determine if there is any evidence of a release below the NSDD. The purposed of the vertical bores is to confirm the boundary of any potential contamination and of the ditch.

- A soil sample should be taken in each boring from the top of the HU2, from the top of the HU3, and from 4 ft below the top of the HU3.

- A sample of the first water encountered in each borehole will be collected; however, no water samples will be collected from depths greater than 4 ft below the top of the HU3.

- Stratified samples will be taken along the vertical transect to provide a better understanding of the lower and upper RGA.

Based on these characteristics/conditions, the GWOU PCT developed the following decision rules for Section 3 of the NSDD.

- If contaminants are found above HU3, then the NSDD (Section 3) and/or the lagoons have had a release.

- Sampling for Section 3 of the NSDD will be conducted along a maximum of 3 transects, with 2 of the transects to be located in the worst areas of Section 3 (i.e., the 2 ends) (Fig. 5.1). A statistical method will be used to determine the distance of the stratified grid/transects and the intervals for depth of borings.

- Three to four samples will be taken per boring (based on soil column) between 10 and 40 ft bgs. The number of samples taken will be statistically determined based on the number of analytes.

- Media to be sampled include subsurface soil (through the 4 ft below the top of the HU3), groundwater samples from the UCRS, and layered soil samples from the RGA.

- No special techniques for the analysis of metals (such as micron filtering, beyond standard filtering for dissolved constituents) will be required.

Table 6.2 summarizes the appropriate responses to contamination found in relation to the NSDD.

Table 6.2. Appropriate Responses to Subsurface Contamination in Section 3 of the NSDD

Is contamination present below the HU3?	Is contamination present above the HU3?	
	YES	**NO**
YES	Ongoing source – Need Response	Upgradient – No source Action
NO	Characterize – Risk Assessment (only for contaminants not found in HU3)	No Further Action. No Action Required to protect groundwater

7. APPLICABLE OR RELEVANT AND APPROPRIATE REQUIREMENTS

This investigation is being conducted under CERCLA, which requires compliance with ARARs of other environmental and public health statutes when conducting remedial actions. As required within the CERCLA statute and the NCP, potential ARARs will be identified and complied with for the Remedial Action including but not limited to the activities being conducted during the RI/FS. The development of potential ARARs will comply with the requirements of CERCLA and implementing guidance.

Prior to the initiation of field activities, the potential ARARs for contemplated actions (including investigatory activities) will be identified and used during the RI/FS. As the identification of ARARs is often an iterative process, the ARARs set will be updated as necessary based upon new or changing information as appropriate. In addition, the initial ARARs set shall be provided to the KDEP and the EPA Region IV for review as specified within the Federal Facility Agreement between the DOE and the regulatory agencies.

In order to ensure compliance with the requirements of CERCLA, the ARARs set shall take into account chemical-, location-, and action-specific requirements associated with the area being investigated. It is anticipated that action-specific ARARs will change during the course of the investigation; however, for completeness, these potential requirements shall be included with ARARs set. The ARARs set shall be carried through the RI/FS and be used as the starting basis for the establishment of the final ARARs to be included within the ROD for the area under investigation.

In addition to the requirements of CERCLA, DOE has promulgated rules for compliance with the National Environmental Policy Act (NEPA). DOE policy states that NEPA values must be included within the CERCLA process to ensure compliance with these requirements. Due to this fact NEPA values shall be included within the ARARs development and analysis to ensure compliance with NEPA and CERCLA.

8. APPLICABILITY OF STREAMLINED RESPONSE ACTIONS

Removal actions are short-term actions taken to clean up or remove released hazardous substances, pollutants, or contaminants; mitigate a threat of release of hazardous substances; monitor and evaluate release conditions; dispose of removed material; and/or mitigate or prevent damage to public health, welfare, or the environment. Based upon the type of situation, the urgency of the threat of the release, and the subsequent time frame during which the action must be initiated, removal actions are categorized in three ways: (1) emergency removal actions, (2) time-critical removal actions, and (3) non-time-critical removal actions (consistent with §300.415 of the NCP).

The existing data associated with the C-746-S&T project, as outlined in section 2 of this document, suggests that a removal action is not warranted at this time. The distribution and concentration of contaminants are such that the initiation of a removal action prior to collecting additional data likely would be ineffective in mitigating potential damage to public health, welfare, or the environment. Collection of additional data may lead to a removal action. However it is expected that existing data and the needed data, identified in Chap. 5 of this document, will be incorporated into an FS. The FS will result in a remedial action. During the course of the investigative activities, DOE reserves the right to initiate a removal action in accordance with Section X of the Federal Facility Agreement "...to abate, minimize, stabilize, mitigate or eliminate the Release or threat of Release of Hazardous Substances, pollutants or contaminants, or Hazardous Wastes and Hazardous Constituents at or from PGDP."

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APPENDIX A

CONTAMINANT TRENDS IN SOILS

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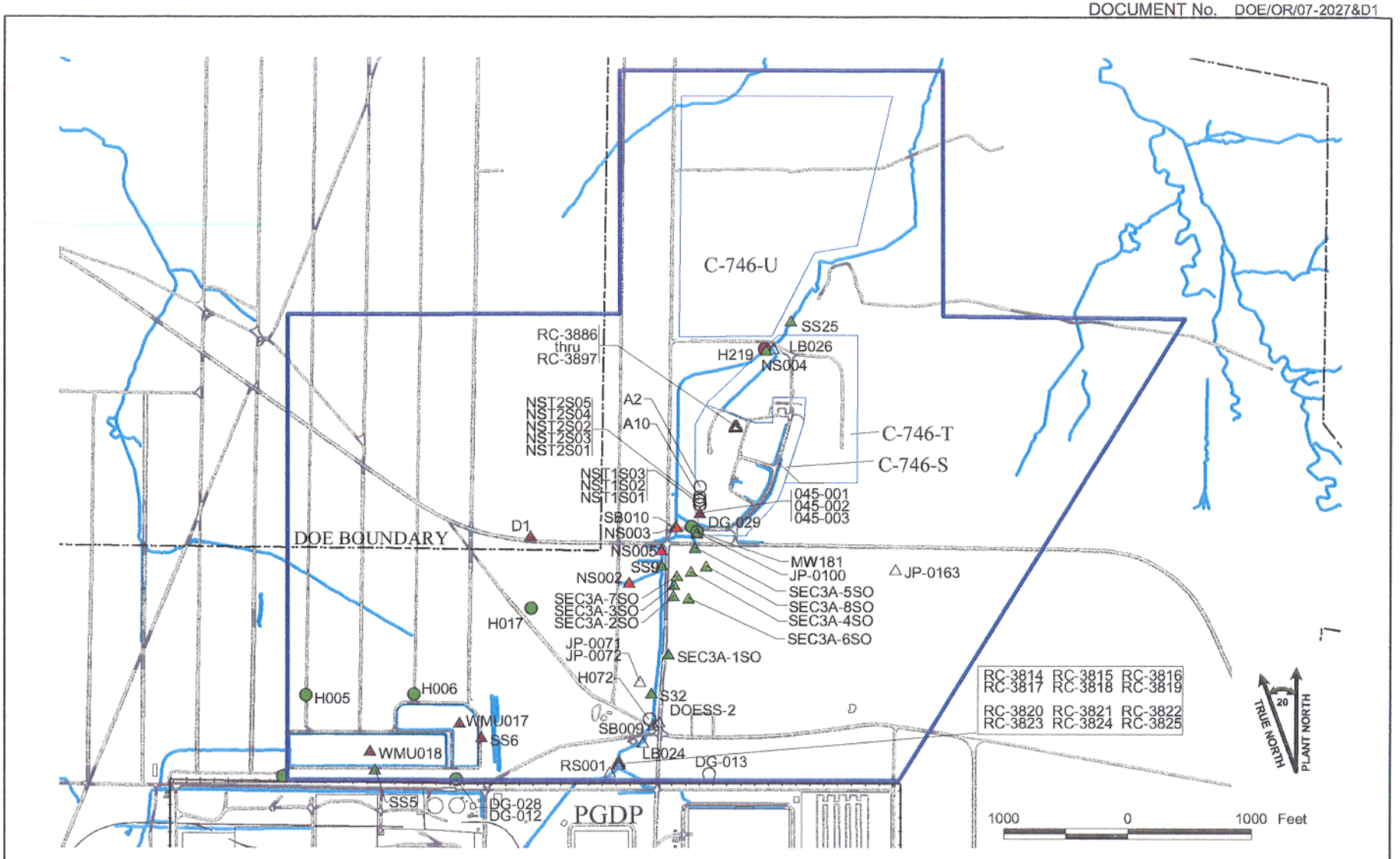

LEGEND

- FENCE
- ROAD
- STREAM
- LANDFILL BOUNDARY
- C-746-S&-T RI SCOPING AREA
- △ SURFACE SOIL SAMPLE
- ○ SUBSURFACE SOIL SAMPLE (SAMPLE END DEPTH > 1 FT)
- > 10 x BACKGROUND
- > 2 x BACKGROUND
- > 1 x BACKGROUND
- DETECTED, < BACKGROUND
- NOT DETECTED

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Fig. A.1. C-746-S&-T RI scoping area: antimony in soil.

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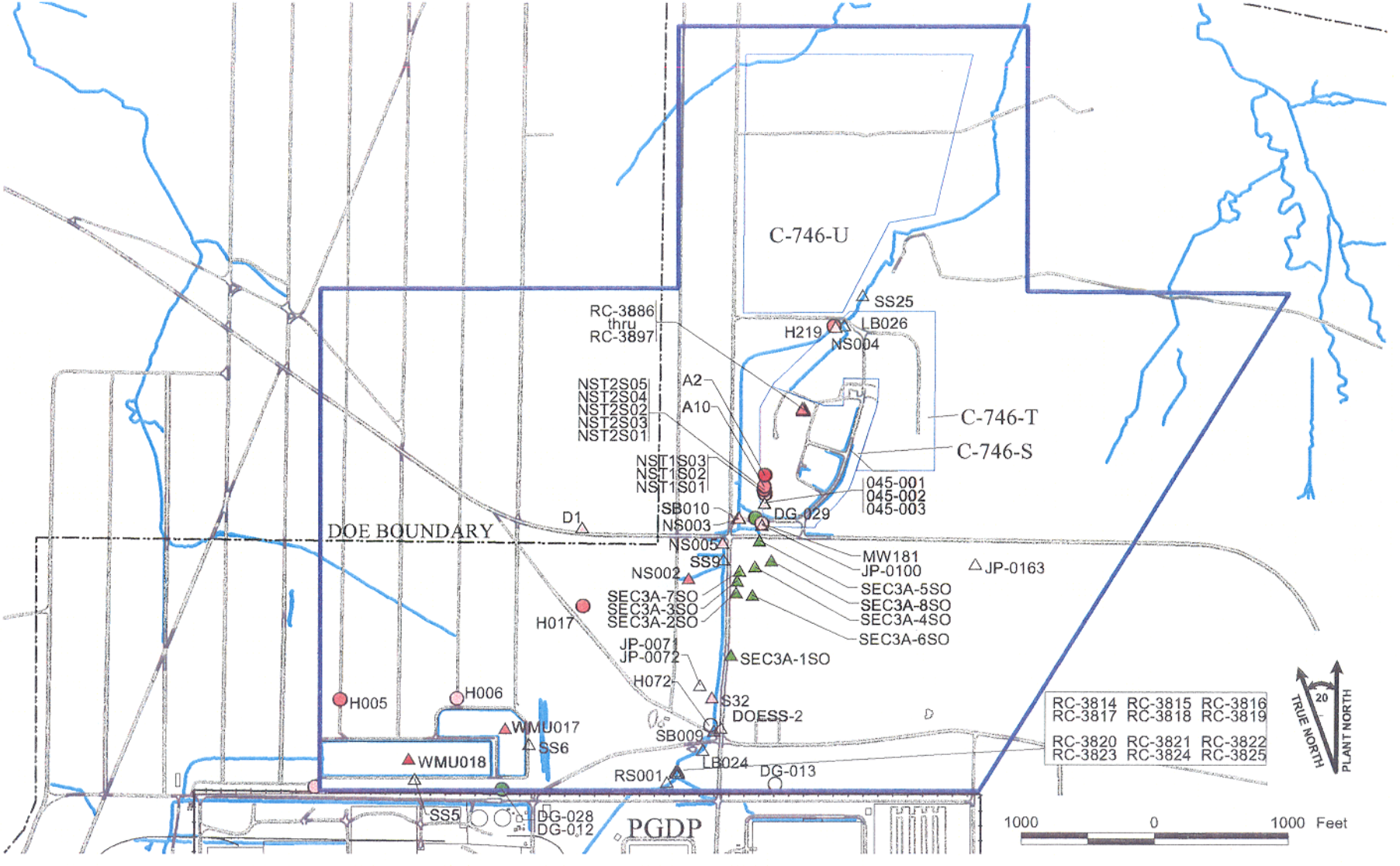

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- STREAM
- LANDFILL BOUNDARY
- C-746-S&-T RI SCOPING AREA
- △ SURFACE SOIL SAMPLE
- ○ SUBSURFACE SOIL SAMPLE (SAMPLE END DEPTH > 1 FT)
- > 10 x BACKGROUND
- > 2 x BACKGROUND
- > 1 x BACKGROUND
- DETECTED, < BACKGROUND
- NOT DETECTED

Fig. A.2. C-746-S&-T RI scoping area: arsenic in soil.

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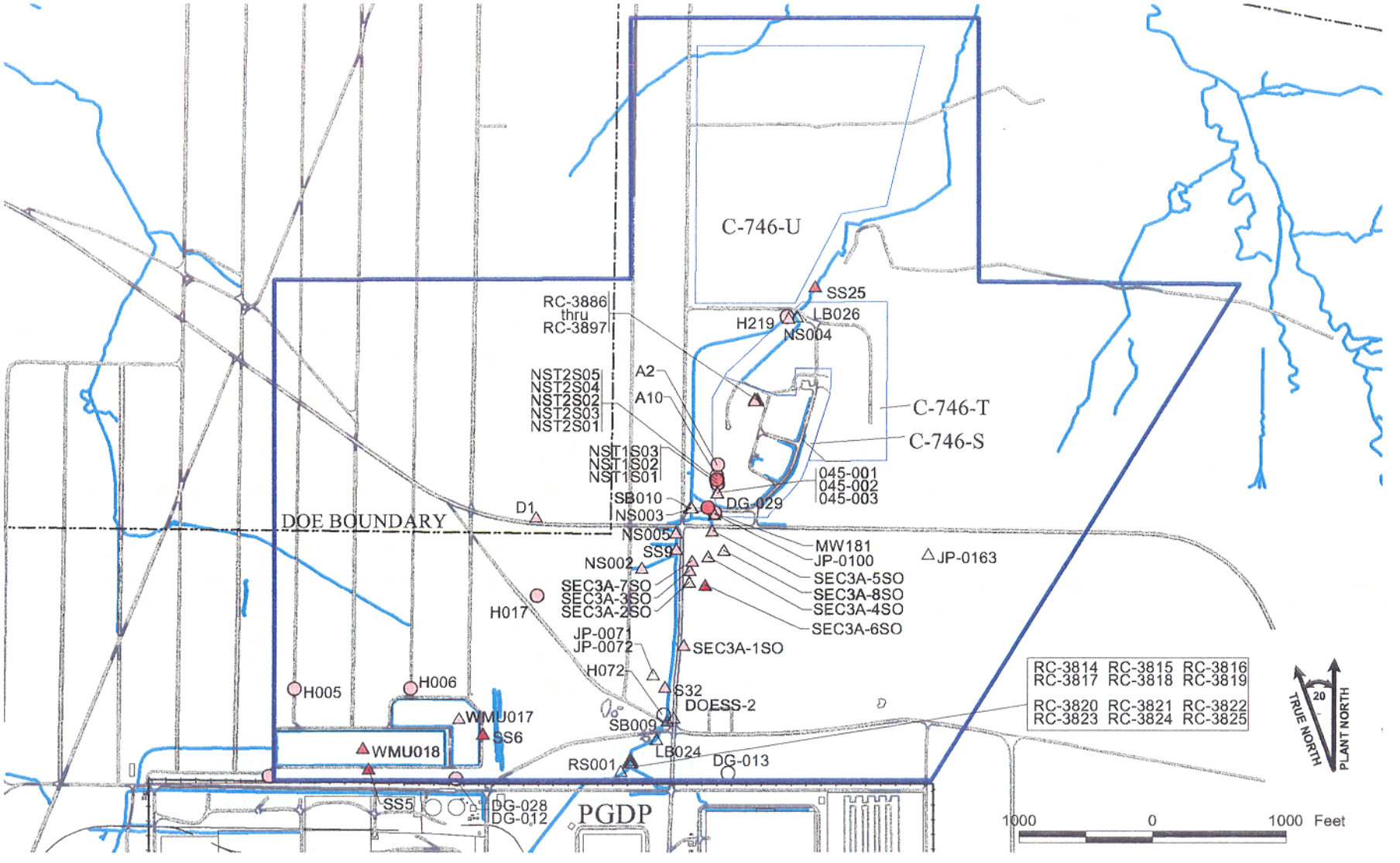

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- FENCE
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- > 10 x BACKGROUND
- > 2 x BACKGROUND
- > 1 x BACKGROUND
- DETECTED, < BACKGROUND
- NOT DETECTED

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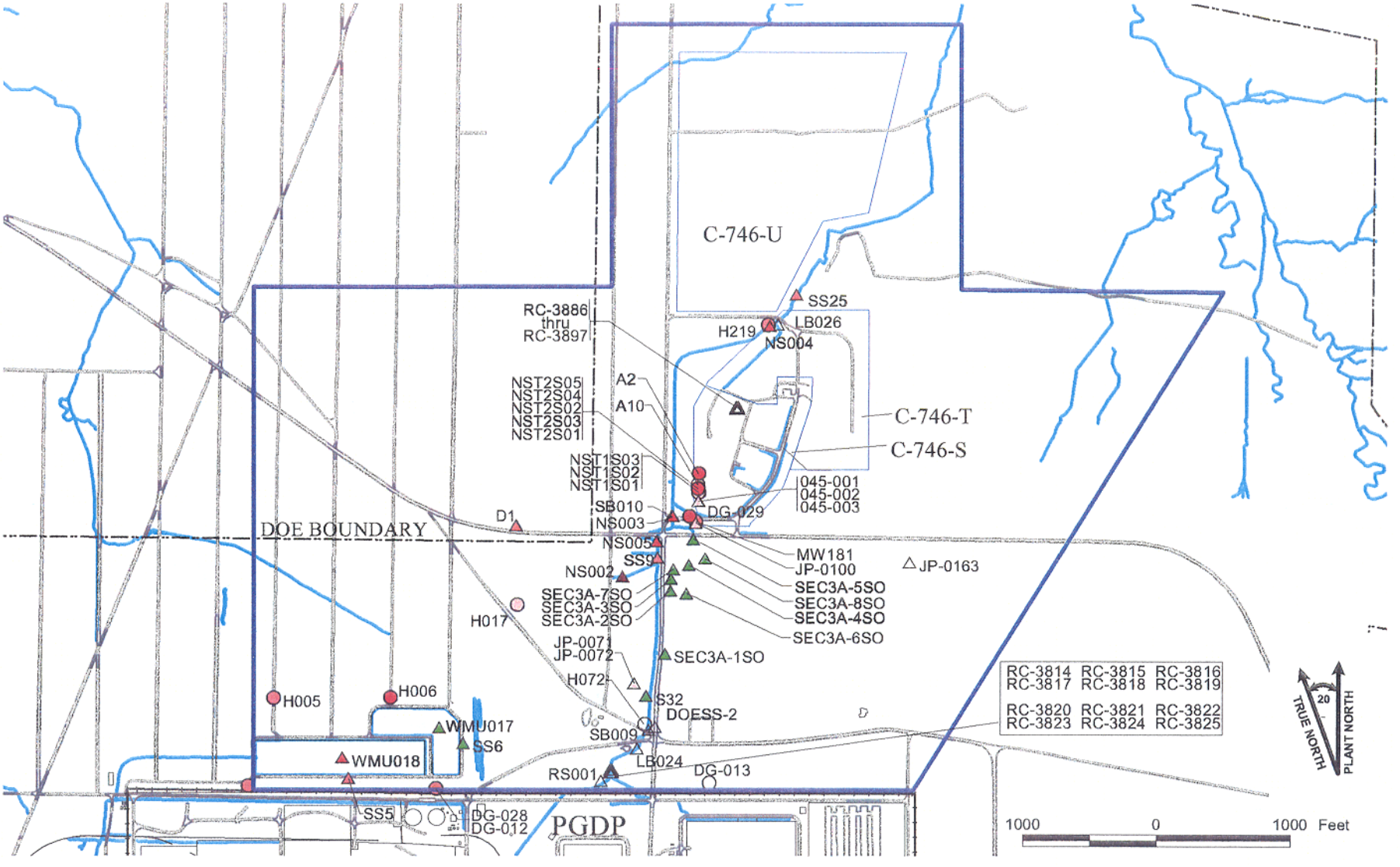
Fig. A.3. C-746-S&-T RI scoping area: barium in soil.

FIGURE No. c5ac90001sk044r1.apr
DATE 04-23-02



LEGEND

- FENCE
- ROAD
- STREAM
- LANDFILL BOUNDARY
- C-746-S&-T RI SCOPING AREA
- △ SURFACE SOIL SAMPLE
- ○ SUBSURFACE SOIL SAMPLE (SAMPLE END DEPTH > 1 FT)
- > 10 x BACKGROUND
- > 2 x BACKGROUND
- > 1 x BACKGROUND
- DETECTED, < BACKGROUND
- NOT DETECTED

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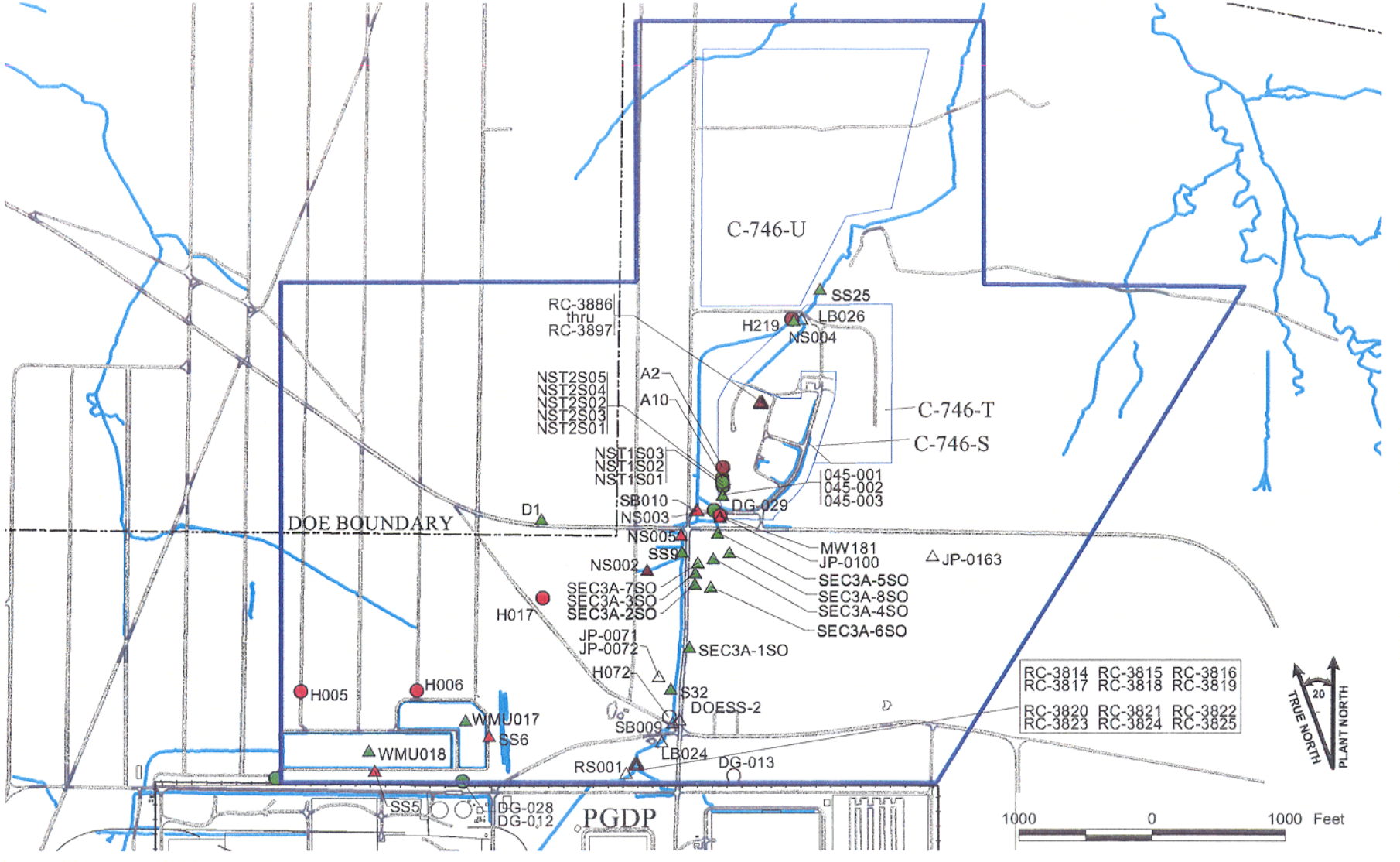
Fig. A.4. C-746-S&-T RI scoping area: beryllium in soil.

FIGURE No. c5ac90001sk047r1.apr
DATE 04-23-02



LEGEND

- FENCE
- ROAD
- STREAM
- LANDFILL BOUNDARY
- C-746-S&-T RI SCOPING AREA
- △ SURFACE SOIL SAMPLE
- ○ SUBSURFACE SOIL SAMPLE (SAMPLE END DEPTH > 1 FT)
- > 10 x BACKGROUND
- > 2 x BACKGROUND
- > 1 x BACKGROUND
- DETECTED, < BACKGROUND
- NOT DETECTED

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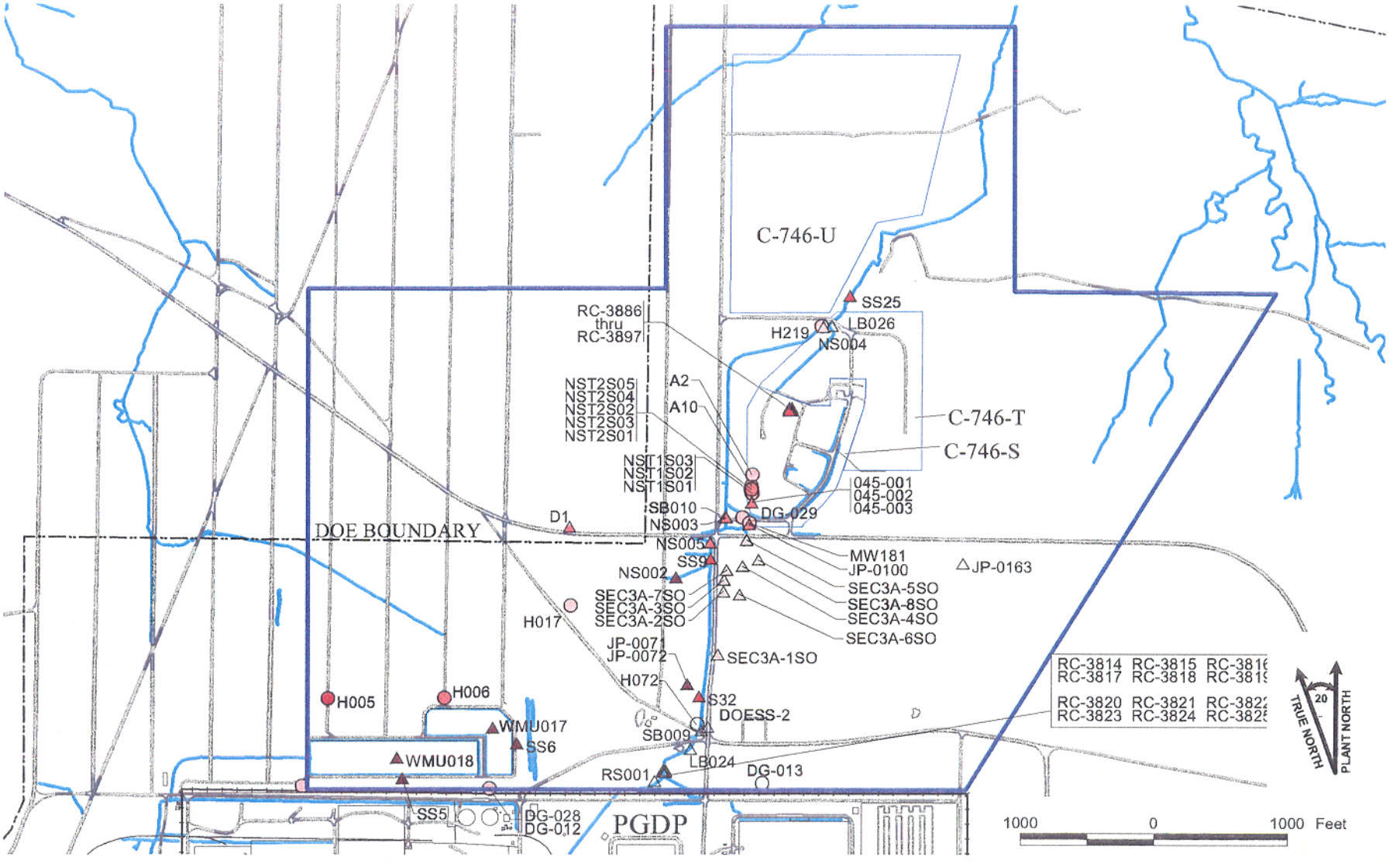
Fig. A. 5. C-746-S&-T RI scoping area: cadmium in soil.

FIGURE No. c5ac90001sk051r1.apr
DATE 04-23-02



LEGEND

- FENCE
- ROAD
- STREAM
- LANDFILL BOUNDARY
- C-746-S&-T RI SCOPING AREA
- △ SURFACE SOIL SAMPLE
- ○ SUBSURFACE SOIL SAMPLE (SAMPLE END DEPTH > 1 FT)
- > 10 x BACKGROUND
- > 2 x BACKGROUND
- > 1 x BACKGROUND
- DETECTED, < BACKGROUND
- NOT DETECTED

Fig. A. 6. C-746-S&-T RI scoping area: chromium in soil.

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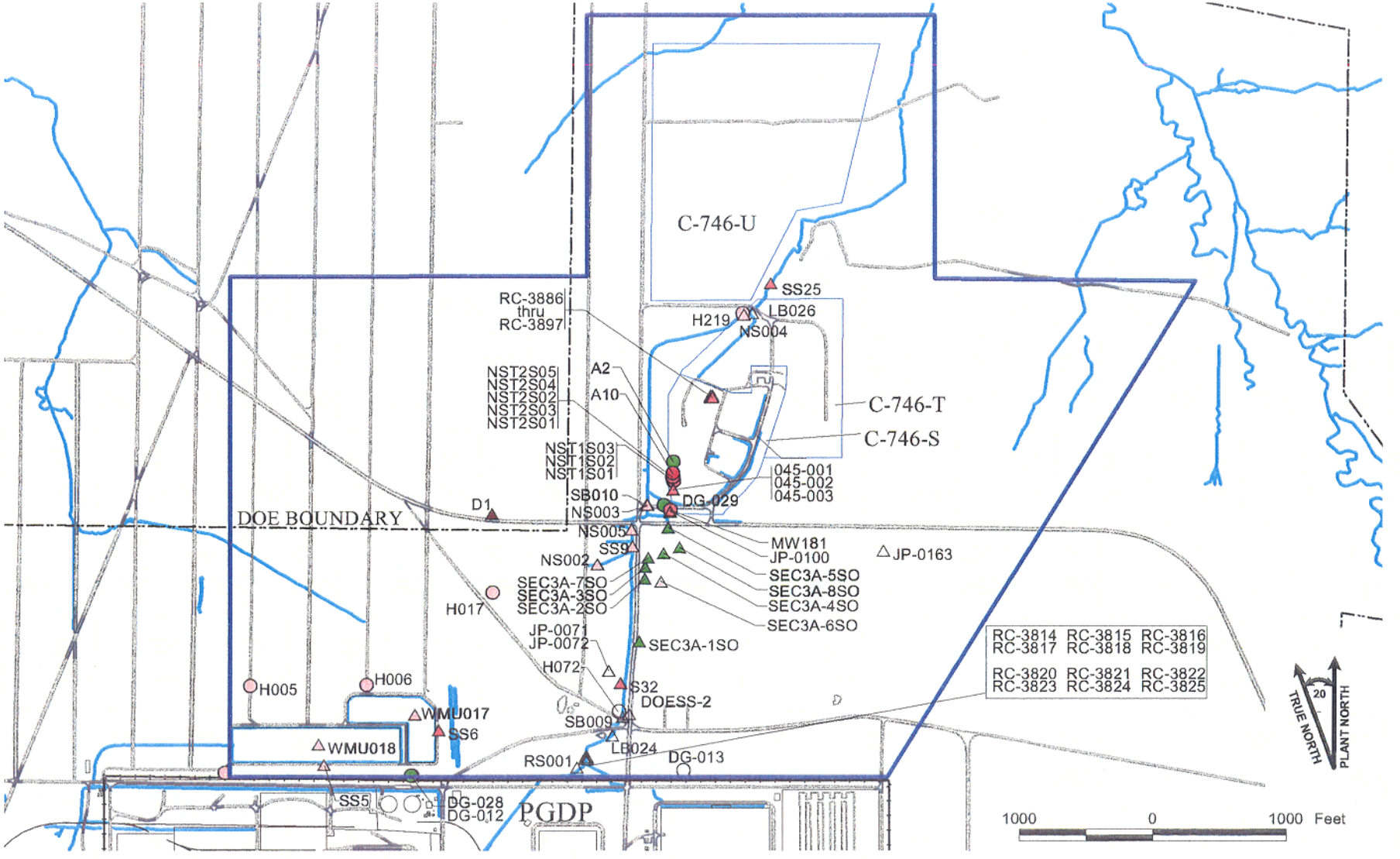
FIGURE No. c5ac90001sk054r1.apr
DATE 04-23-02



LEGEND

- FENCE
- ROAD
- STREAM
- LANDFILL BOUNDARY
- C-746-S&-T RI SCOPING AREA
- △ SURFACE SOIL SAMPLE
- ○ SUBSURFACE SOIL SAMPLE (SAMPLE END DEPTH > 1 FT)
- > 10 x BACKGROUND
- > 2 x BACKGROUND
- > 1 x BACKGROUND
- DETECTED, < BACKGROUND
- NOT DETECTED

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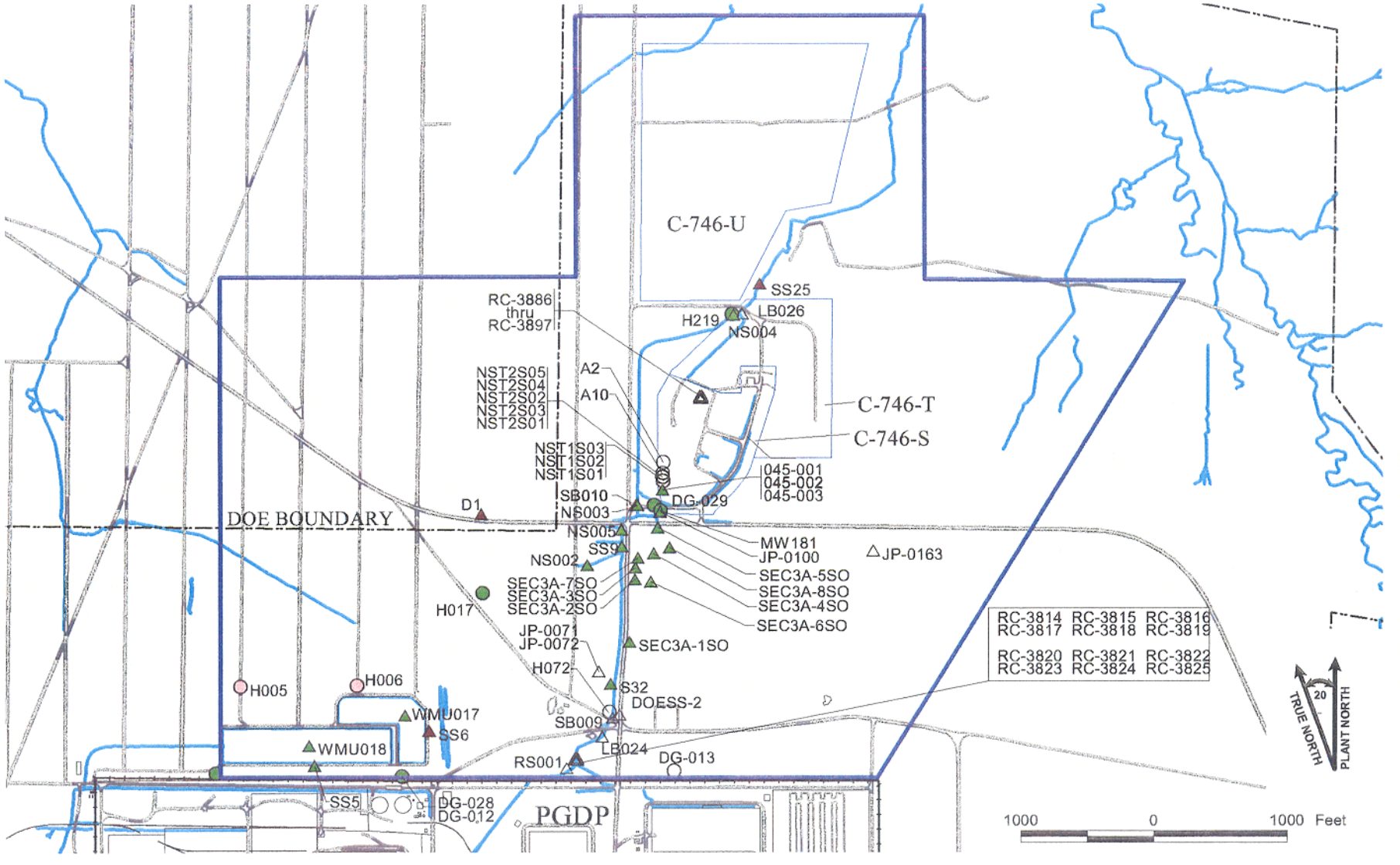
Fig. A. 7. C-746-S&-T RI scoping area: lead in soil.

FIGURE No. c5ac90001sk058r1.apr
DATE 04-23-02



LEGEND

- FENCE
- ROAD
- STREAM
- LANDFILL BOUNDARY
- C-746-S&-T RI SCOPING AREA
- △ SURFACE SOIL SAMPLE
- ○ SUBSURFACE SOIL SAMPLE (SAMPLE END DEPTH > 1 FT)
- > 10 x BACKGROUND
- > 2 x BACKGROUND
- > 1 x BACKGROUND
- DETECTED, < BACKGROUND
- NOT DETECTED

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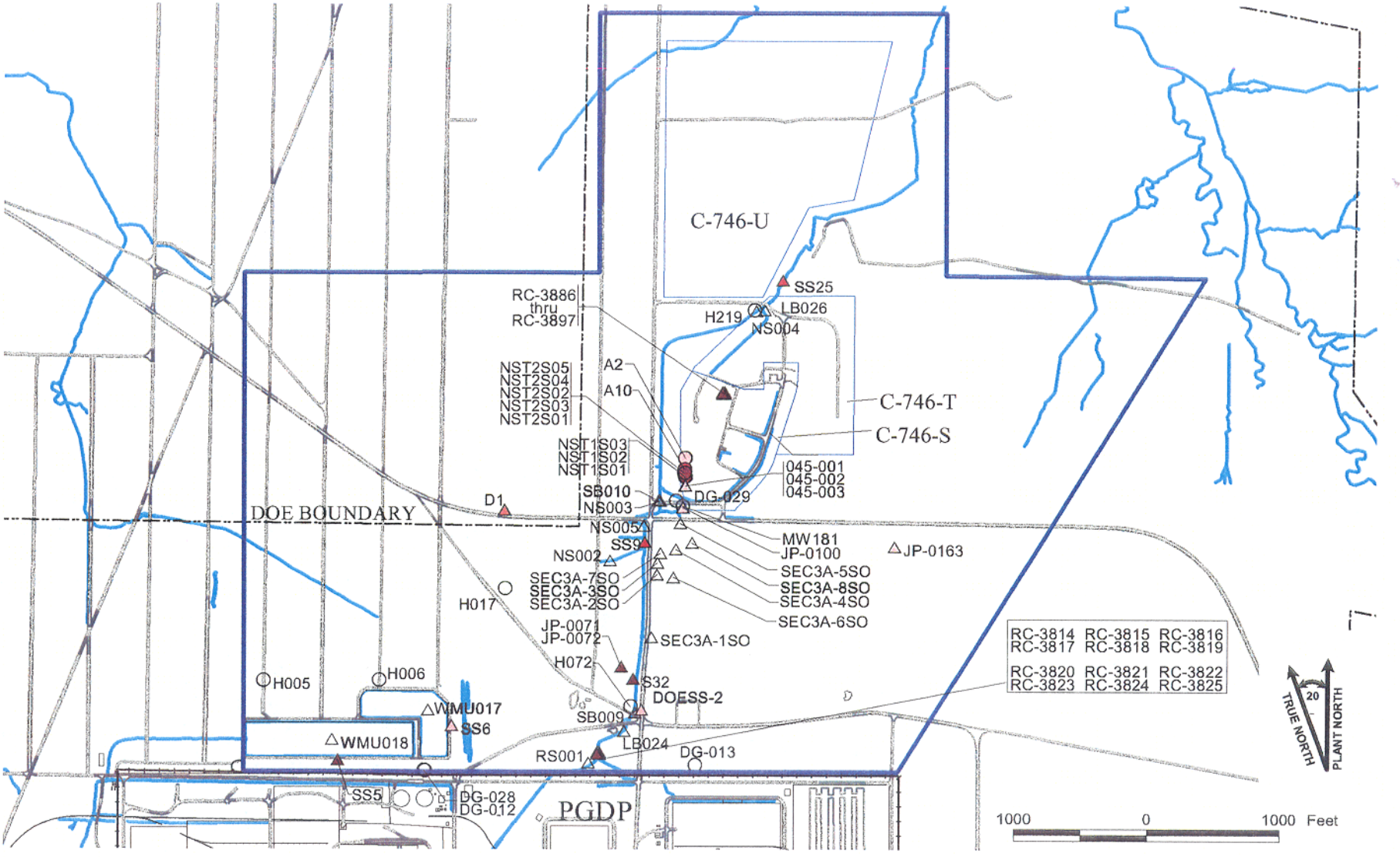
Fig. A. 8. C-746-S&-T RI scoping area: thallium in soil.

FIGURE No. c5ac90001sk074r1.apr
DATE 04-23-02



LEGEND

- FENCE
- ROAD
- STREAM
- LANDFILL BOUNDARY
- C-746-S&-T RI SCOPING AREA
- △ SURFACE SOIL SAMPLE
- ○ SUBSURFACE SOIL SAMPLE (SAMPLE END DEPTH > 1 FT)
- > 10 x BACKGROUND
- > 2 x BACKGROUND
- > 1 x BACKGROUND
- DETECTED, < BACKGROUND
- NOT DETECTED

Fig. A. 9. C-746-S&-T RI scoping area: uranium in soil.

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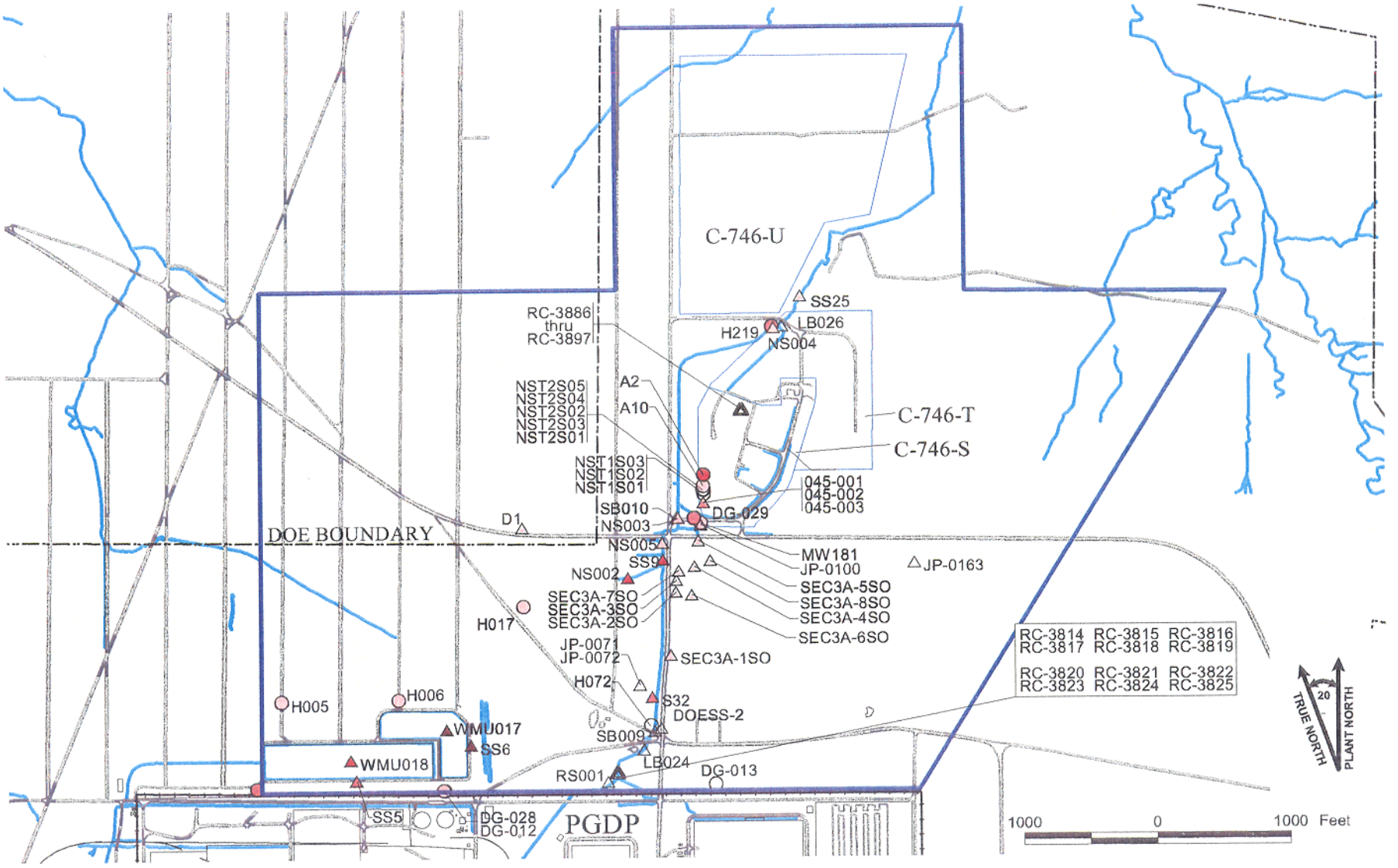
FIGURE No. c5ac90001sk078r1.apr
DATE 04-23-02



LEGEND

- FENCE
- ROAD
- STREAM
- LANDFILL BOUNDARY
- C-746-S&-T RI SCOPING AREA
- △ SURFACE SOIL SAMPLE
- ○ SUBSURFACE SOIL SAMPLE (SAMPLE END DEPTH > 1 FT)
- > 10 x BACKGROUND
- > 2 x BACKGROUND
- > 1 x BACKGROUND
- DETECTED, < BACKGROUND
- NOT DETECTED

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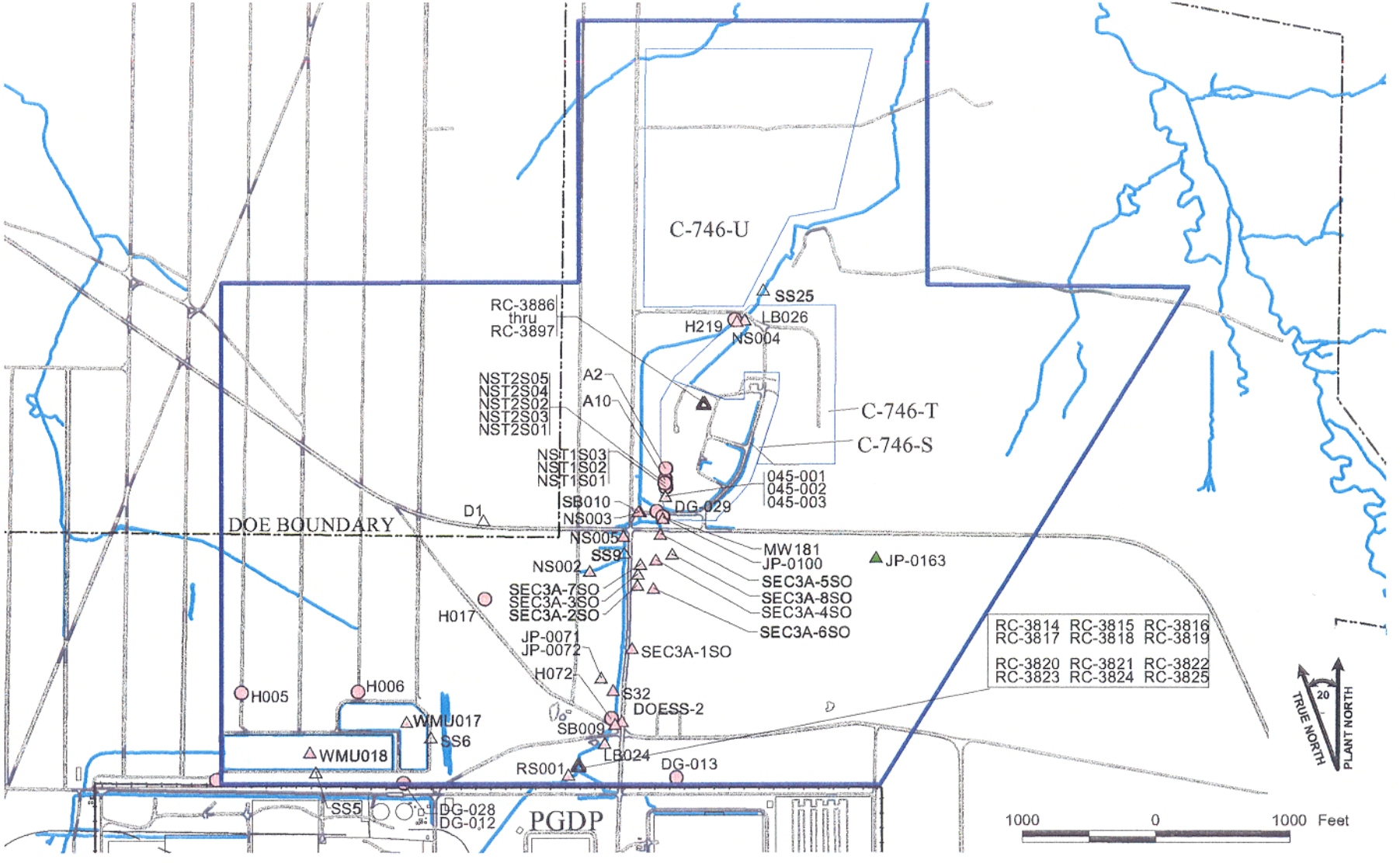
Fig. A.10. C-746-S&-T RI scoping area: zinc in soil.

FIGURE No. c5ac90001sk091r1.apr
DATE 04-23-02



LEGEND

- FENCE
- ROAD
- STREAM
- LANDFILL BOUNDARY
- C-746-S&-T RI SCOPING AREA
- △ SURFACE SOIL SAMPLE
- ○ SUBSURFACE SOIL SAMPLE (SAMPLE END DEPTH > 1 FT)
- DETECTED, < BACKGROUND
- NOT DETECTED

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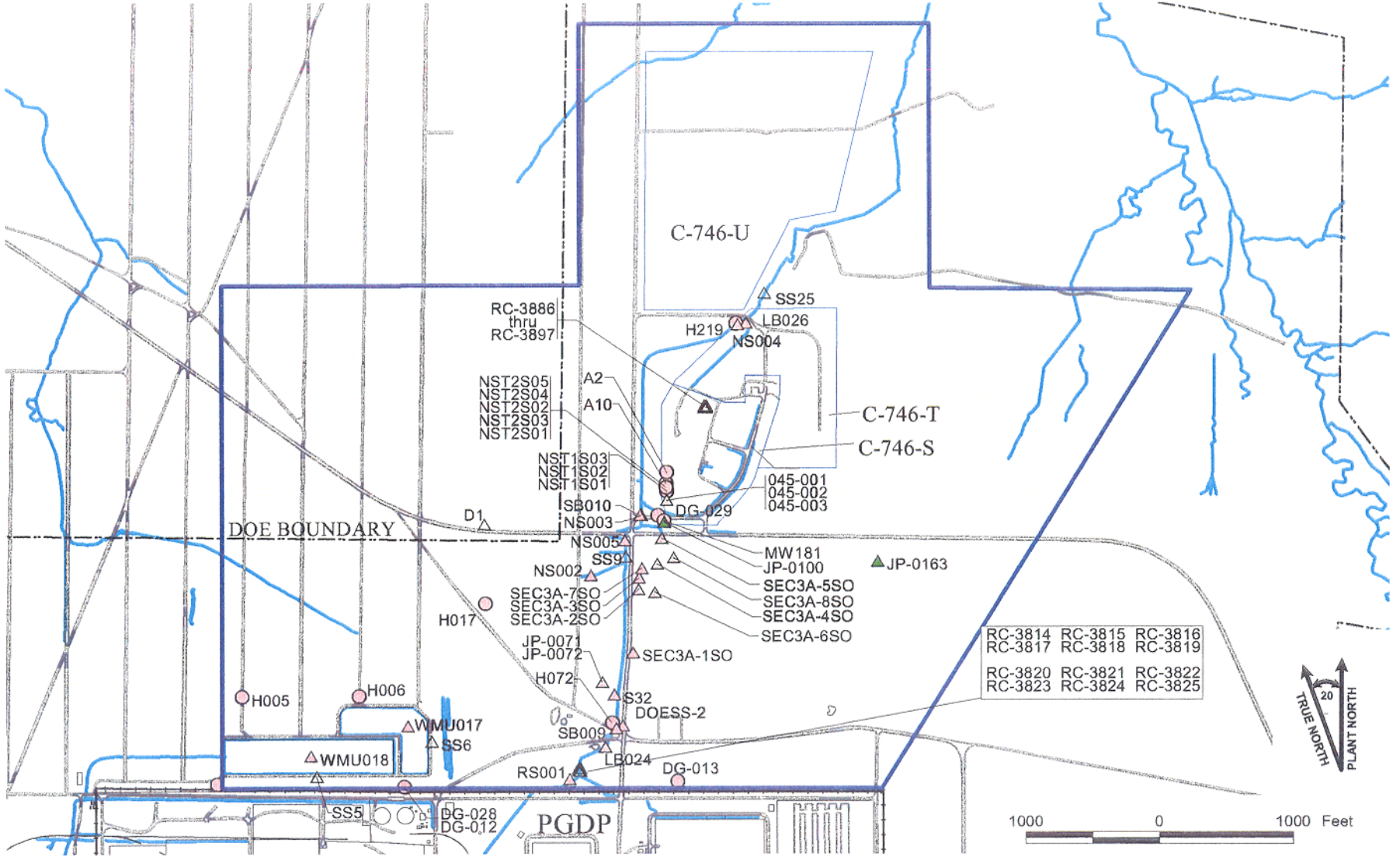
Fig. A. 11. C-746-S&-T RI scoping area: alpha activity in soil.

FIGURE No. c5ac90001sk037r1.apr
DATE 04-23-02



LEGEND

- FENCE
- ROAD
- STREAM
- LANDFILL BOUNDARY
- C-746-S&-T RI SCOPING AREA
- △ SURFACE SOIL SAMPLE
- ○ SUBSURFACE SOIL SAMPLE (SAMPLE END DEPTH > 1 FT)
- > 10 x BACKGROUND
- > 2 x BACKGROUND
- > 1 x BACKGROUND
- DETECTED, < BACKGROUND
- NOT DETECTED

Fig. A. 12. C-746-S&-T RI scoping area: beta activity in soil.

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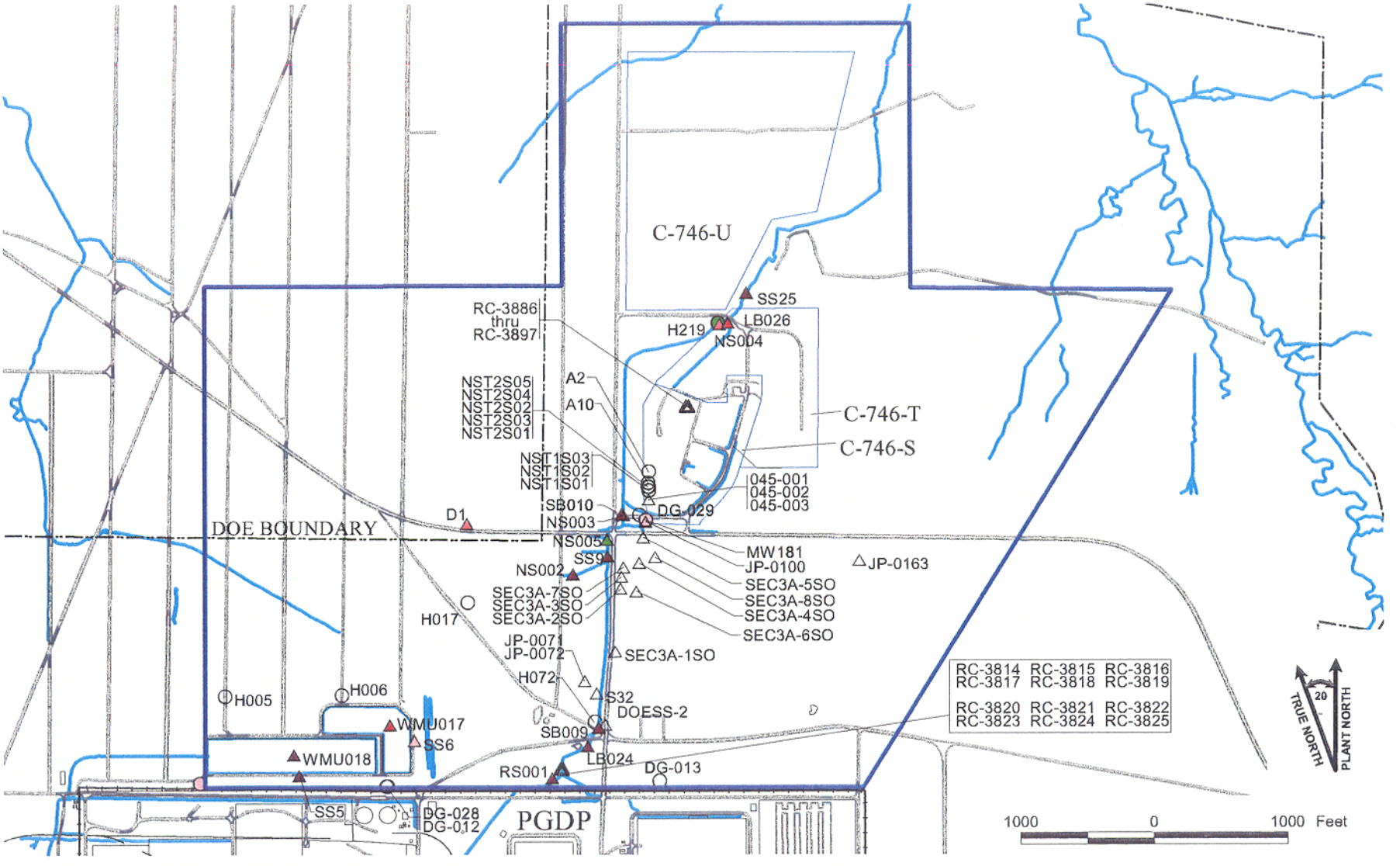
FIGURE No. c5ac90001sk049r1.apr
DATE 04-23-02



LEGEND

- FENCE
- ROAD
- STREAM
- LANDFILL BOUNDARY
- C-746-S&-T RI SCOPING AREA
- △ SURFACE SOIL SAMPLE
- ○ SUBSURFACE SOIL SAMPLE (SAMPLE END DEPTH > 1 FT)
- > 10 x BACKGROUND
- > 2 x BACKGROUND
- > 1 x BACKGROUND
- DETECTED, < BACKGROUND
- NOT DETECTED

Fig. A. 13. C-746-S&-T RI scoping area: plutonium-239 in soil.

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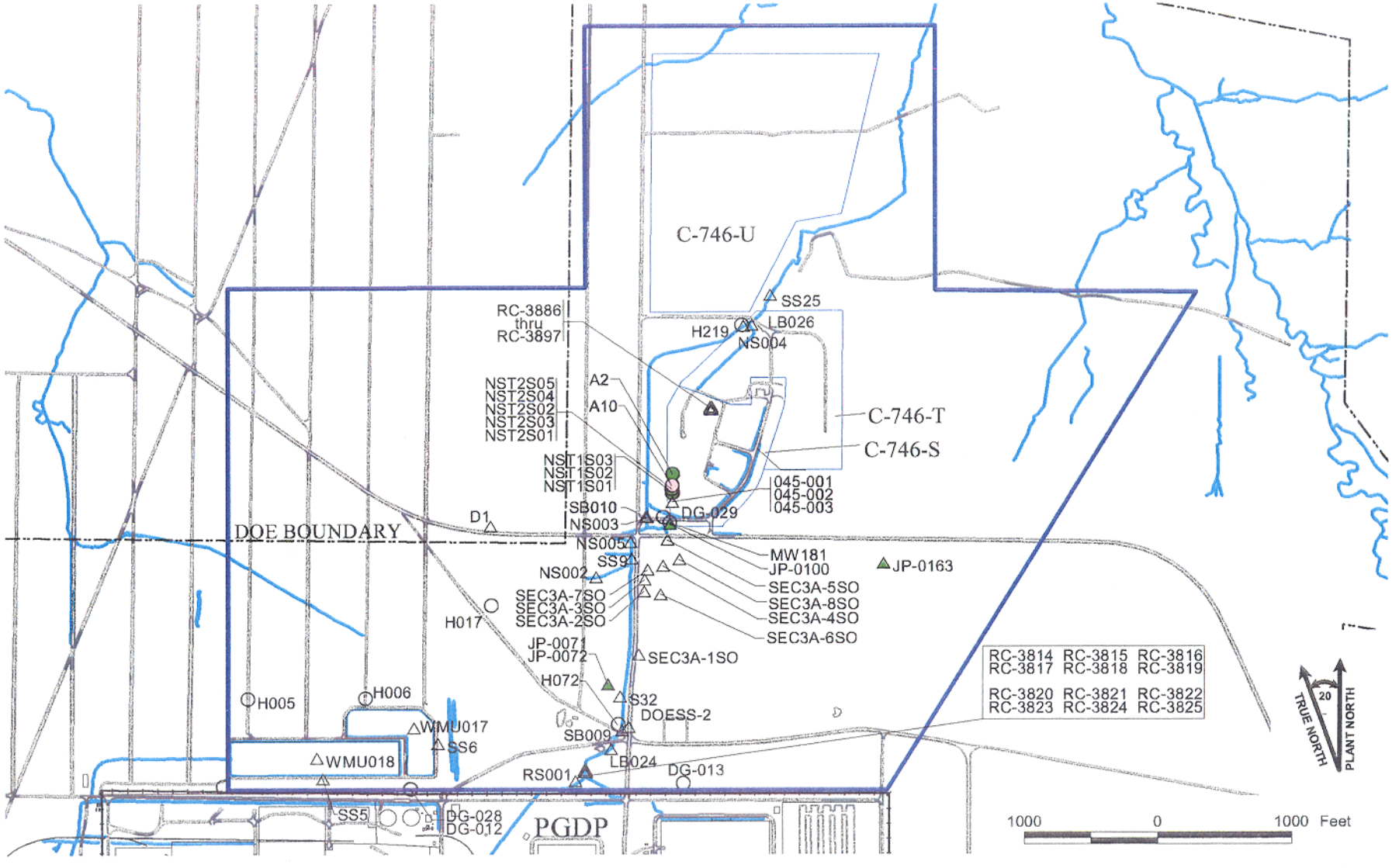
FIGURE No. c5ac90001sk063r1.apr
DATE 04-23-02



LEGEND

- FENCE
- ROAD
- STREAM
- LANDFILL BOUNDARY
- C-746-S&-T RI SCOPING AREA
- △ SURFACE SOIL SAMPLE
- ○ SUBSURFACE SOIL SAMPLE (SAMPLE END DEPTH > 1 FT)
- > 10 x BACKGROUND
- > 2 x BACKGROUND
- > 1 x BACKGROUND
- DETECTED, < BACKGROUND
- NOT DETECTED

Fig. A. 14. C-746-S&-T RI scoping area: radium-226 in soil.

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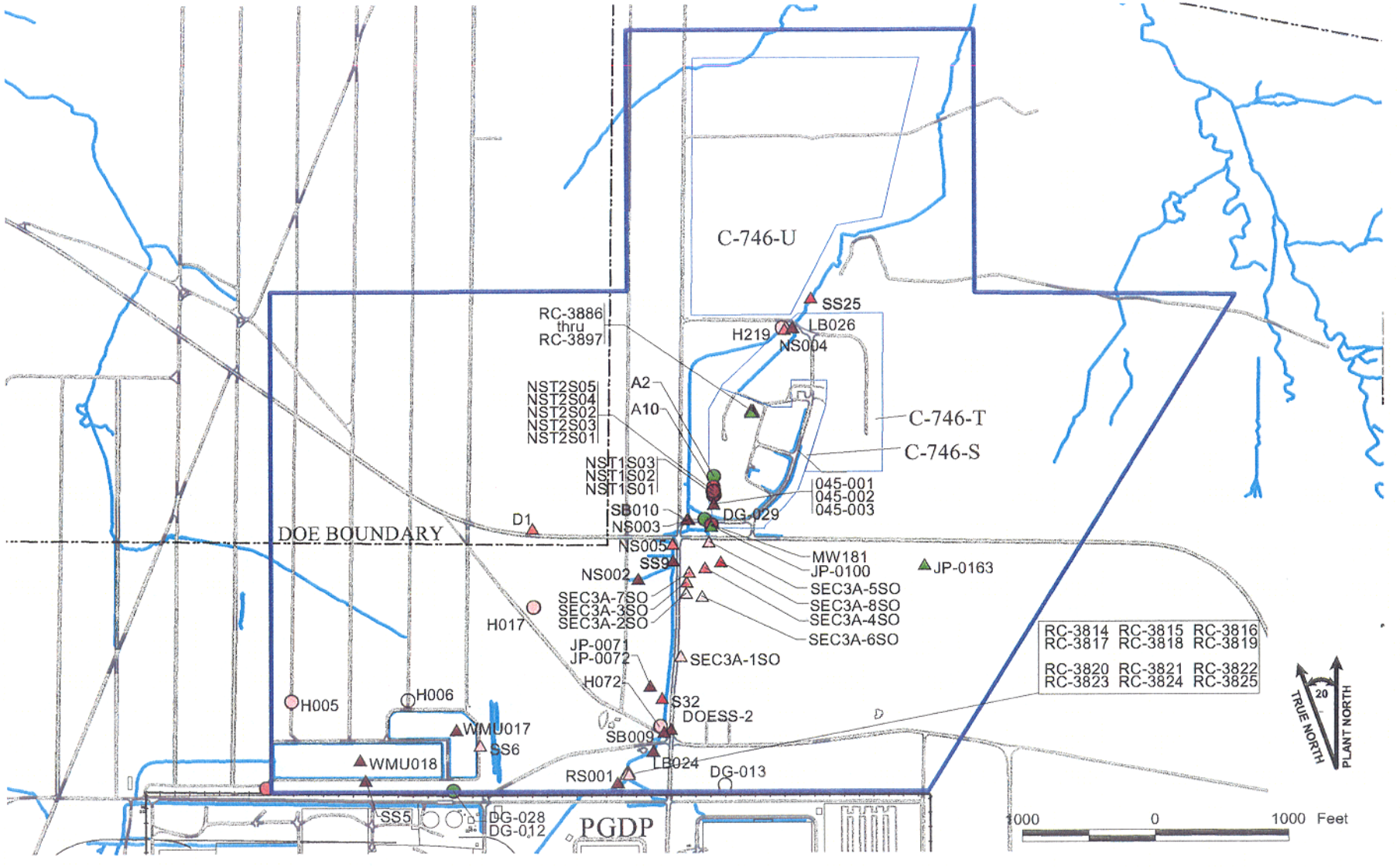
FIGURE No. c5ac90001sk065r1.apr
DATE 04-23-02



LEGEND

- FENCE
- ROAD
- STREAM
- LANDFILL BOUNDARY
- C-746-S&-T RI SCOPING AREA
- △ SURFACE SOIL SAMPLE
- ○ SUBSURFACE SOIL SAMPLE (SAMPLE END DEPTH > 1 FT)
- > 10 x BACKGROUND
- > 2 x BACKGROUND
- > 1 x BACKGROUND
- DETECTED, < BACKGROUND
- NOT DETECTED

Fig. A. 15. C-746-S&-T RI scoping area: technetium-99 in soil.

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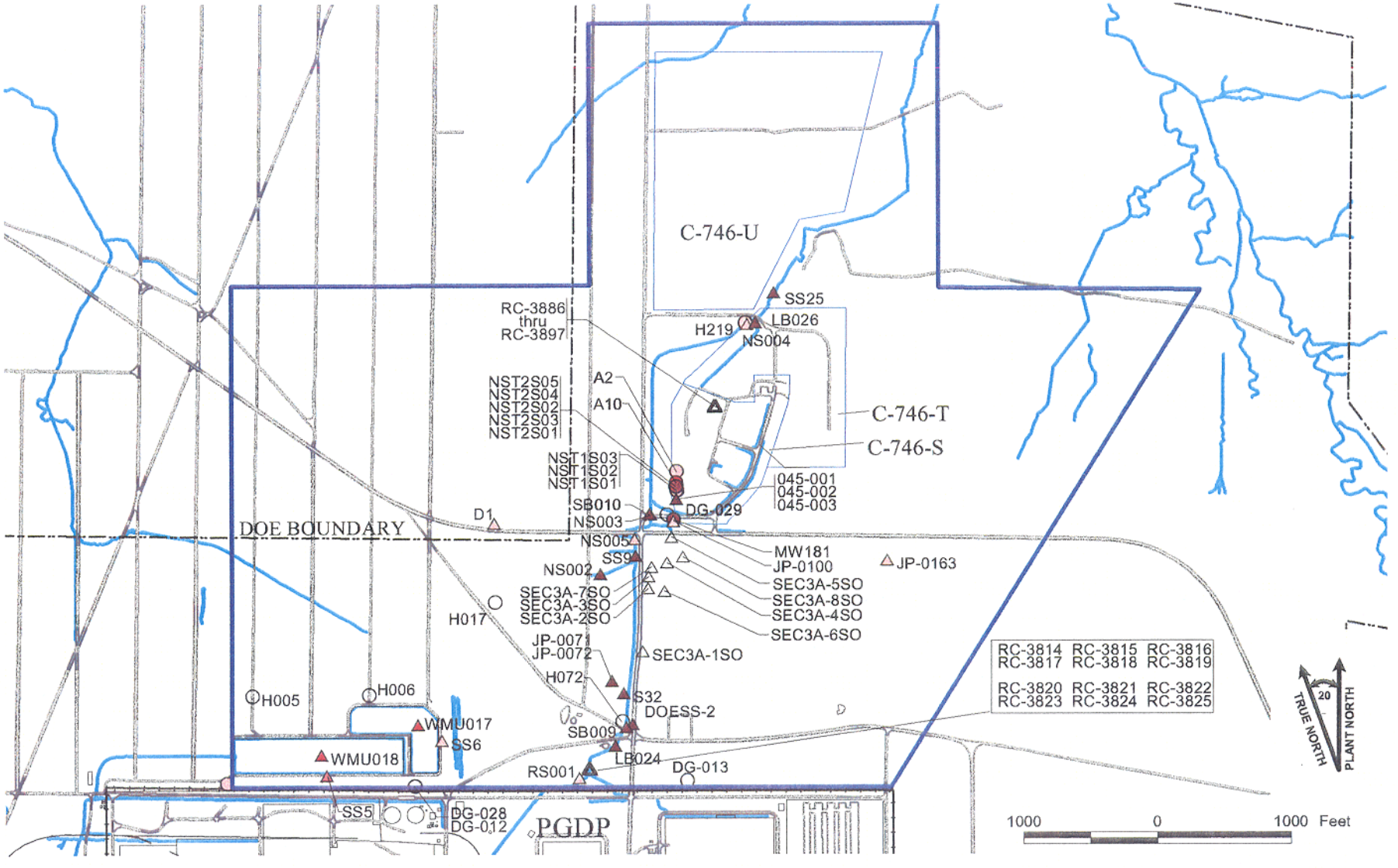
FIGURE No. c5ac90001sk070r1.apr
DATE 04-23-02



LEGEND

- FENCE
- ROAD
- STREAM
- LANDFILL BOUNDARY
- C-746-S&-T RI SCOPING AREA
- △ SURFACE SOIL SAMPLE
- ○ SUBSURFACE SOIL SAMPLE (SAMPLE END DEPTH > 1 FT)
- > 10 x BACKGROUND
- > 2 x BACKGROUND
- > 1 x BACKGROUND
- DETECTED, < BACKGROUND
- NOT DETECTED

Fig. A. 16. C-746-S&-T RI scoping area: thorium-230 in soil.

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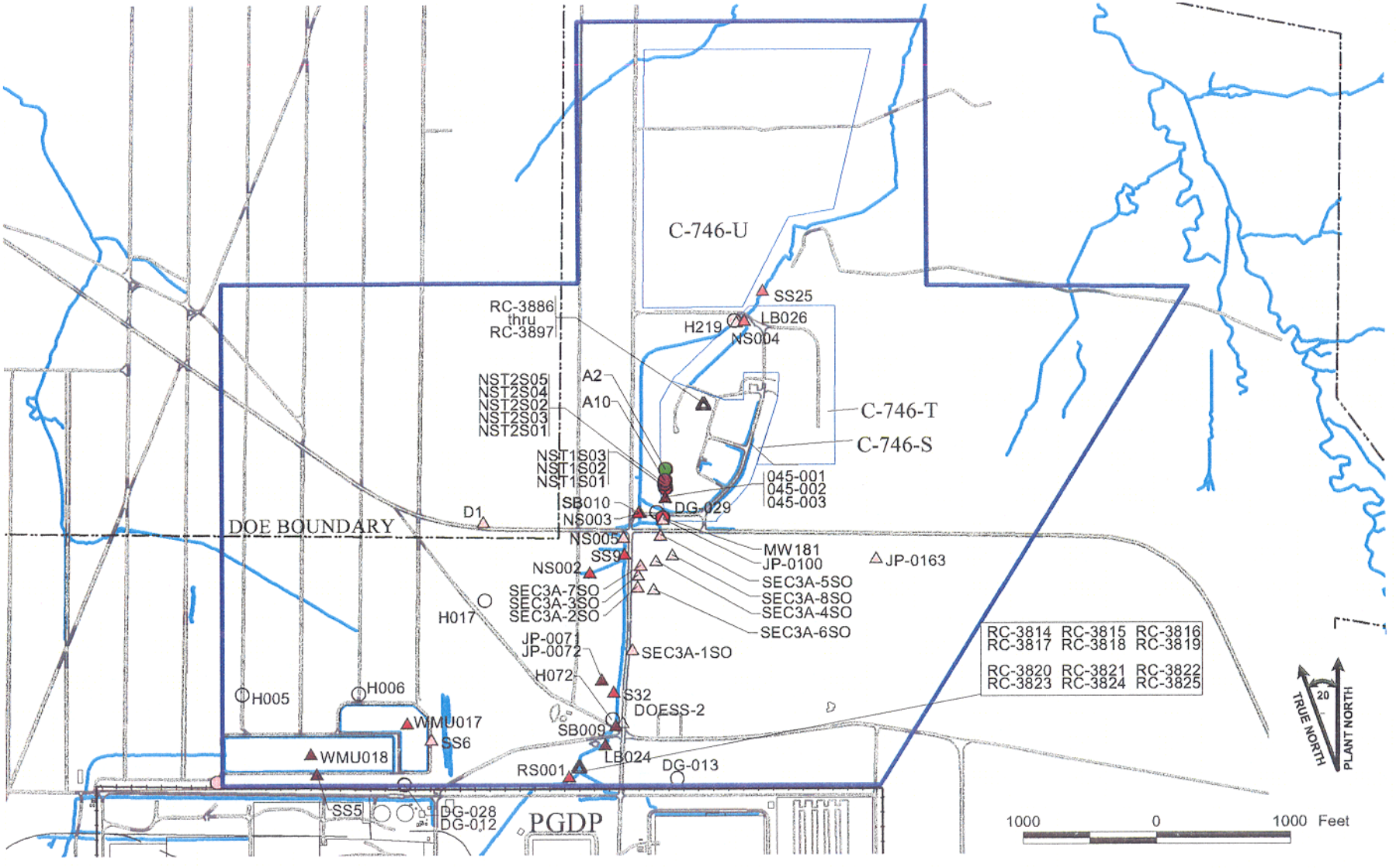
FIGURE No. c5ac90001sk076r1.apr
DATE 04-23-02



LEGEND

- FENCE
- ROAD
- STREAM
- LANDFILL BOUNDARY
- C-746-S&-T RI SCOPING AREA
- △ SURFACE SOIL SAMPLE
- ○ SUBSURFACE SOIL SAMPLE (SAMPLE END DEPTH > 1 FT)
- > 10 x BACKGROUND
- > 2 x BACKGROUND
- > 1 x BACKGROUND
- DETECTED, < BACKGROUND
- NOT DETECTED

Fig. A. 17. C-746-S&-T RI scoping area: uranium-234 in soil.

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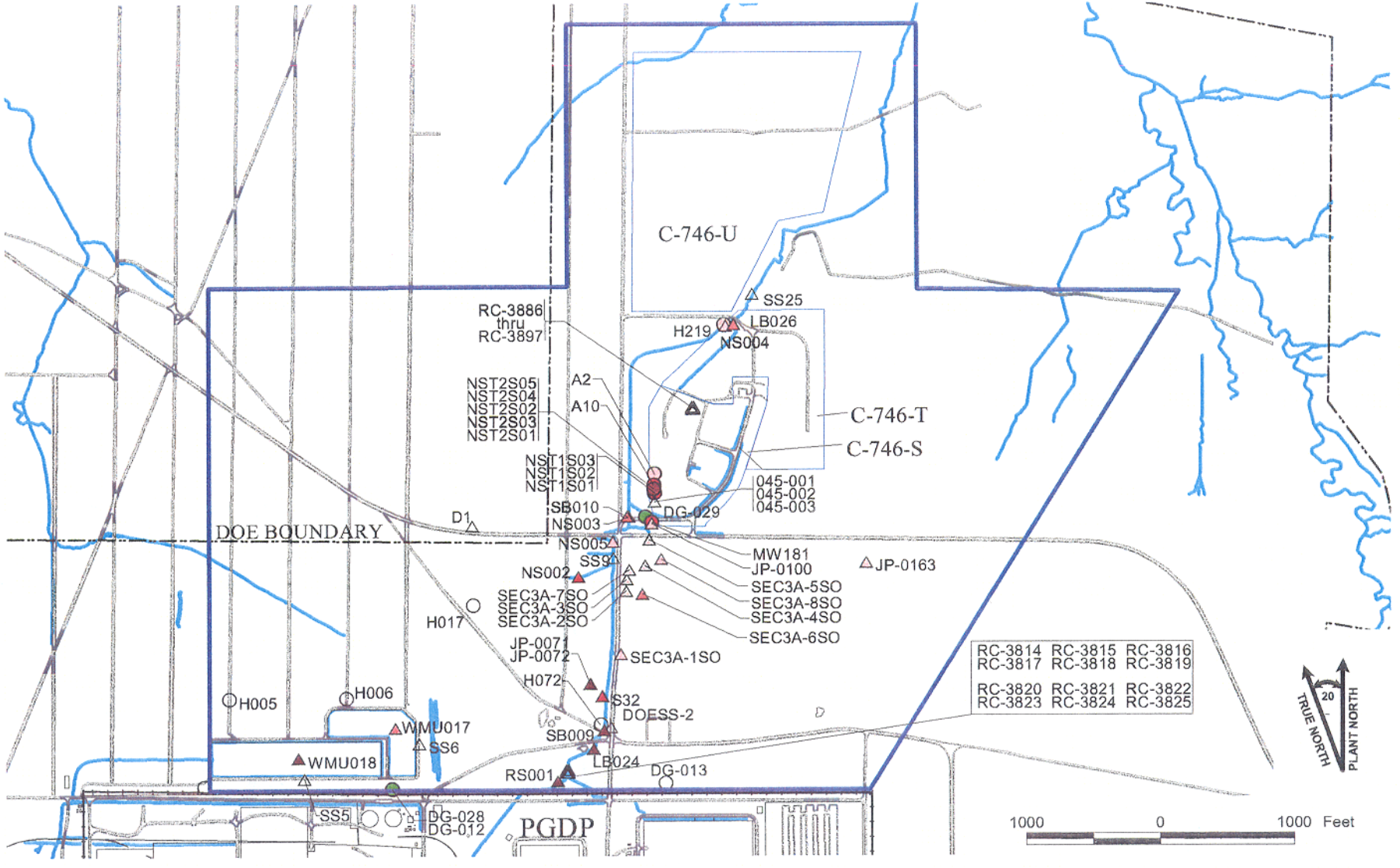
FIGURE No. c5ac90001sk080r1.apr
DATE 04-23-02



LEGEND

- FENCE
- ROAD
- STREAM
- LANDFILL BOUNDARY
- C-746-S&-T RI SCOPING AREA
- △ SURFACE SOIL SAMPLE
- ○ SUBSURFACE SOIL SAMPLE (SAMPLE END DEPTH > 1 FT)
- > 10 x BACKGROUND
- > 2 x BACKGROUND
- > 1 x BACKGROUND
- DETECTED, < BACKGROUND
- NOT DETECTED

Fig. A. 18. C-746-S&-T RI scoping area: uranium-235 in soil.

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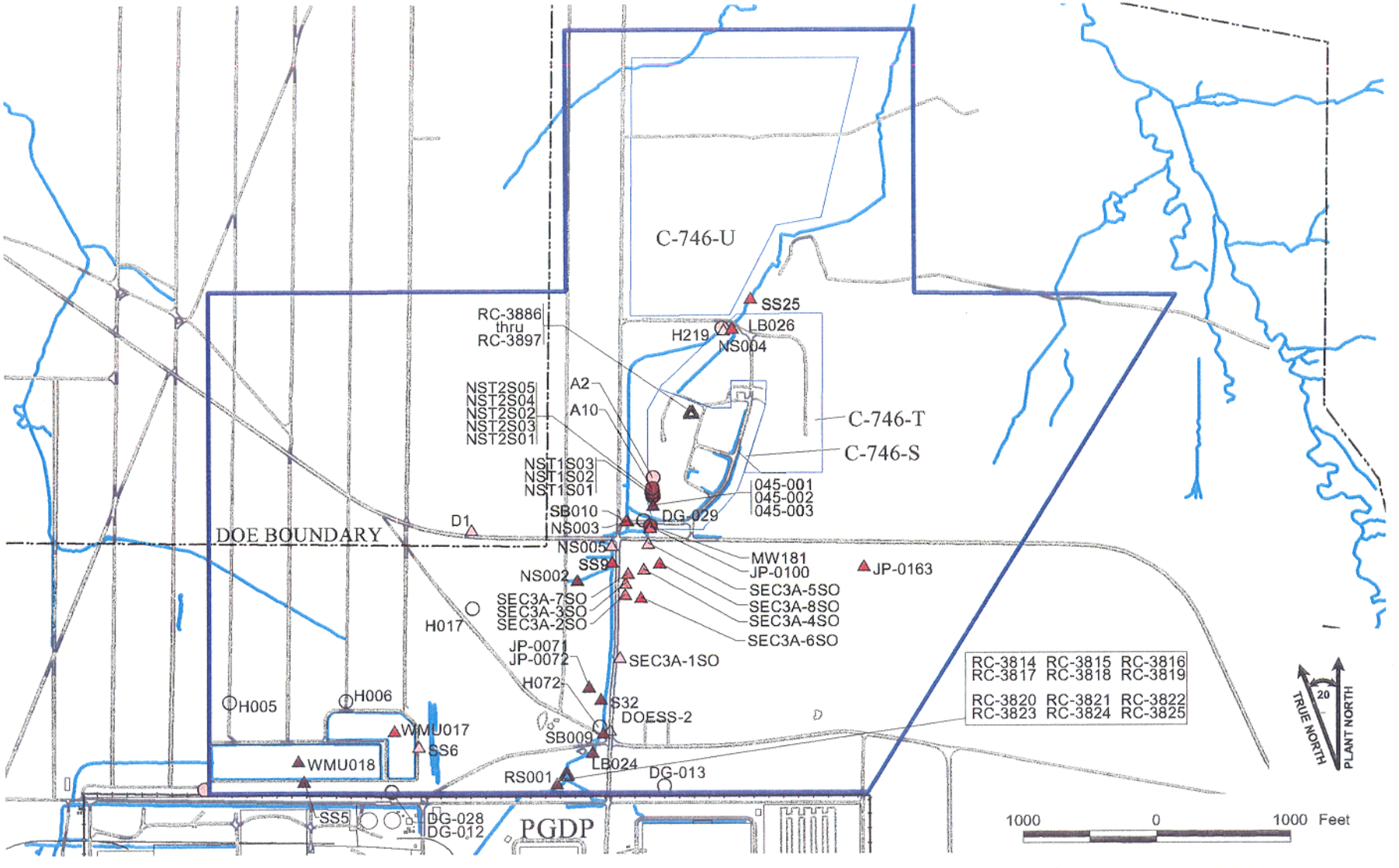
FIGURE No. c5ac90001sk082r1.apr
DATE 04-23-02



LEGEND

- FENCE
- ROAD
- STREAM
- LANDFILL BOUNDARY
- C-746-S&-T RI SCOPING AREA
- △ SURFACE SOIL SAMPLE
- ○ SUBSURFACE SOIL SAMPLE (SAMPLE END DEPTH > 1 FT)
- > 10 x BACKGROUND
- > 2 x BACKGROUND
- > 1 x BACKGROUND
- DETECTED, < BACKGROUND
- NOT DETECTED

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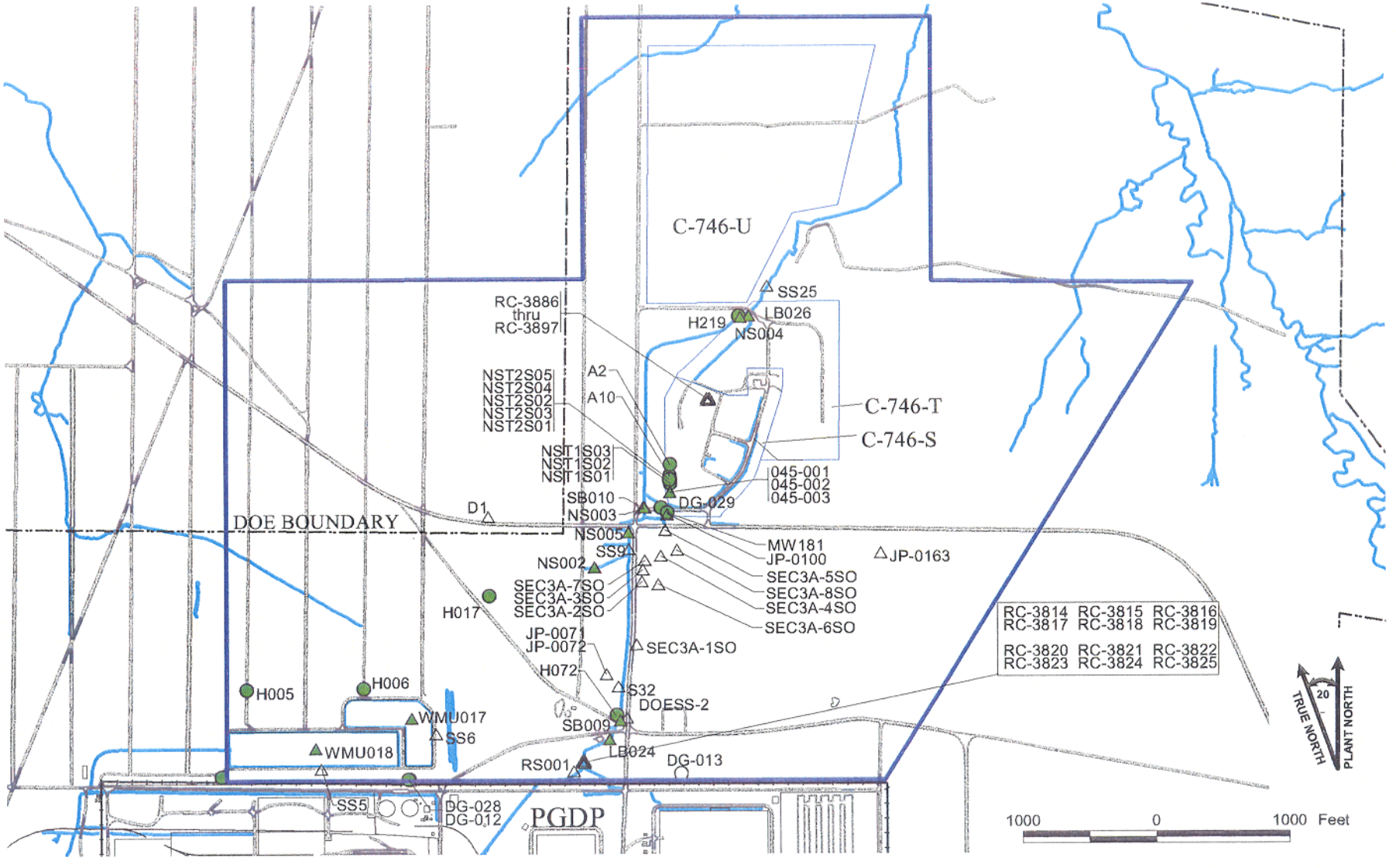
Fig. A. 19. C-746-S&-T RI scoping area: uranium-238 in soil.

FIGURE No. c5ac90001sk084r1.apr
DATE 04-23-02



LEGEND

- FENCE
- ROAD
- STREAM
- LANDFILL BOUNDARY
- C-746-S&-T RI SCOPING AREA
- △ SURFACE SOIL SAMPLE
- ○ SUBSURFACE SOIL SAMPLE (SAMPLE END DEPTH > 1 FT)
- DETECTED
- NOT DETECTED

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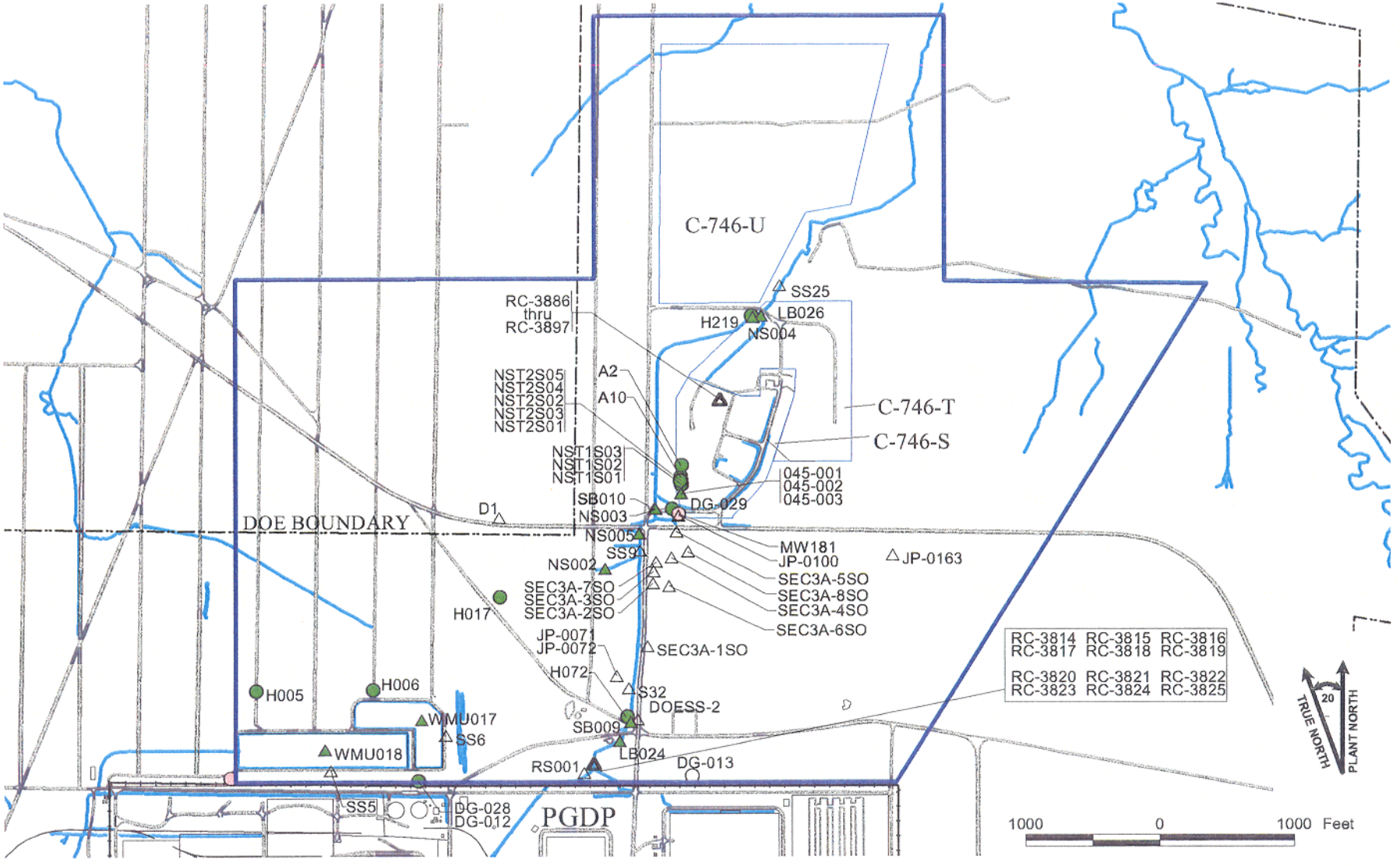
Fig. A. 20. C-746-S&-T RI scoping area: 1,1-dichloroethene in soil.

FIGURE No. c5ac90001sk035r1.apr
DATE 04-23-02



LEGEND

- FENCE
- ROAD
- STREAM
- LANDFILL BOUNDARY
- C-746-S&-T RI SCOPING AREA
- △ SURFACE SOIL SAMPLE
- ○ SUBSURFACE SOIL SAMPLE (SAMPLE END DEPTH > 1 FT)
- DETECTED
- NOT DETECTED

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Fig. A. 21. C-746-S&-T RI scoping area: trichloroethene in soil.

FIGURE No. c5ac90001sk072r1.apr
DATE 04-23-02

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APPENDIX B

CONTAMINANT DISTRIBUTION IN GROUNDWATER

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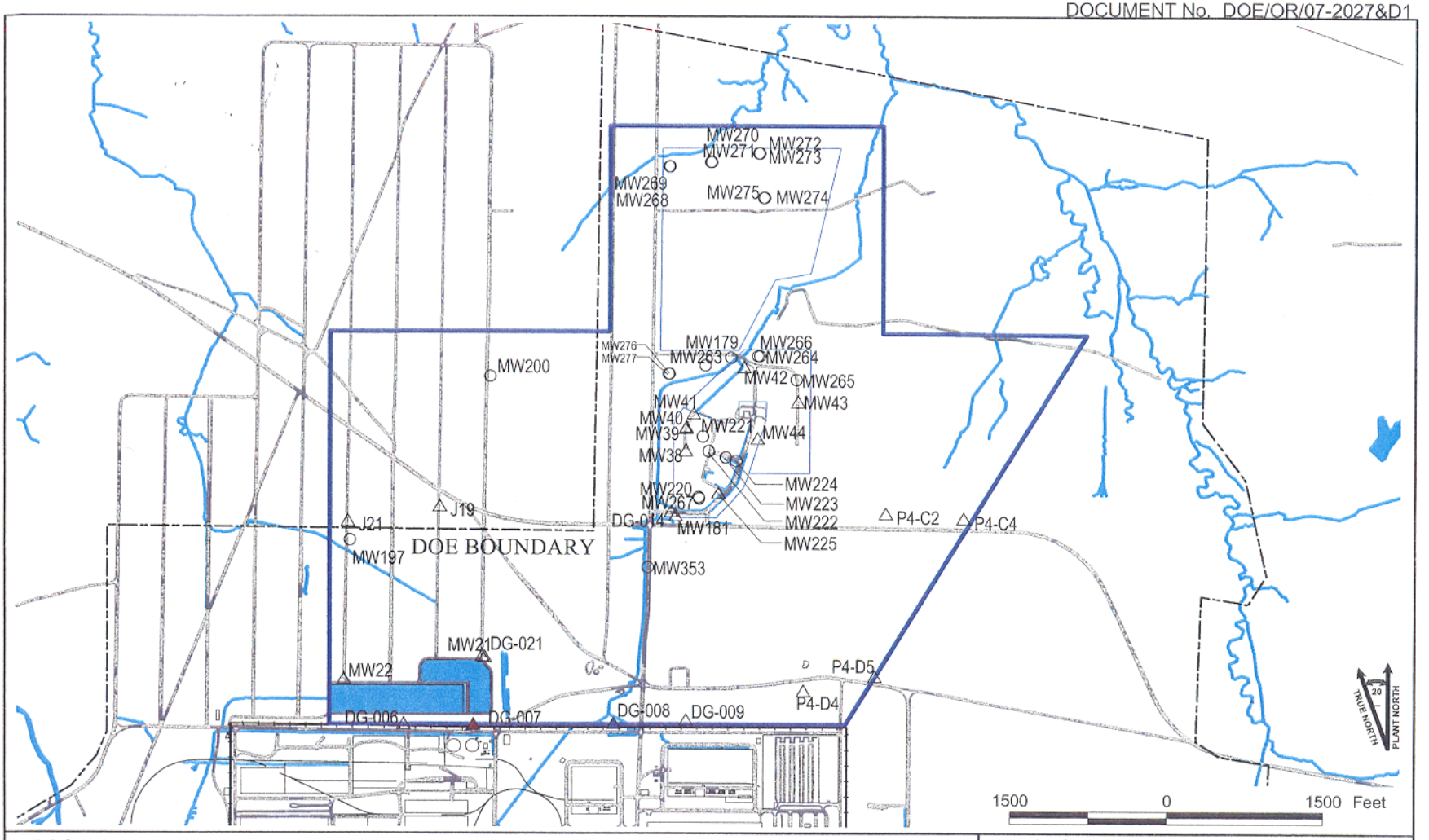

LEGEND

- DOE BOUNDARY
- ROAD
- STREAM
- LANDFILL BOUNDARY
- C-746-S&-T RI SCOPING AREA
- △ TEMPORARY BORING OR ABANDONED WELL
- ○ ACTIVE MONITORING WELL (samples available through 10/2001)
- DETECTED, > MCL > 10% FREQUENCY
- DETECTED, > MCL
- DETECTED, < MCL
- NOT DETECTED

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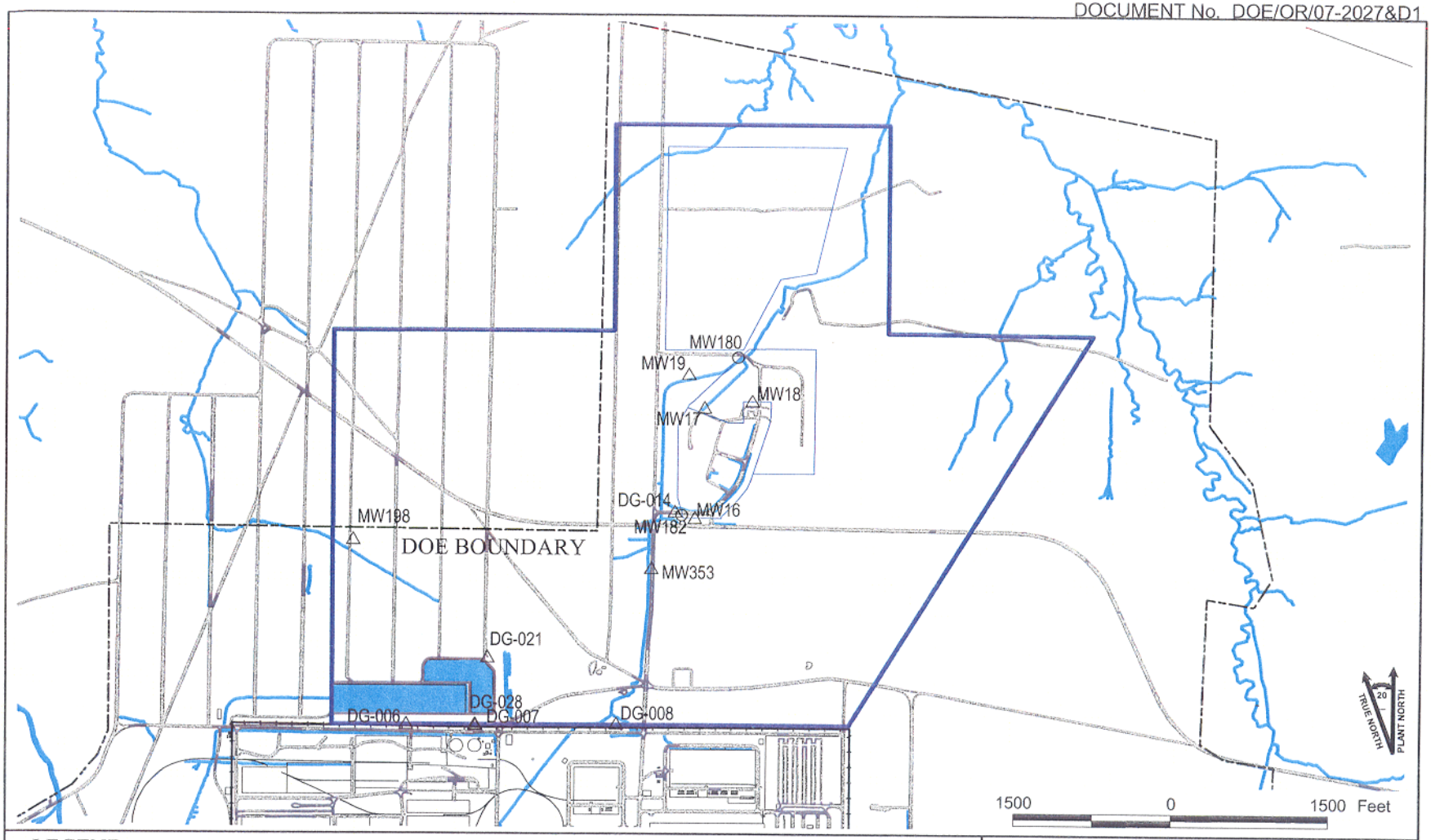
Fig. B.1. C-746-S&T RI scoping area: 1,1-dichloroethene in RGA groundwater.

FIGURE No. c5ac90001sk450.apr
DATE 04-23-02



LEGEND

- DOE BOUNDARY
- ROAD
- STREAM
- LANDFILL BOUNDARY
- C-746-S&-T RI SCOPING AREA
- △ TEMPORARY BORING OR ABANDONED WELL
- ○ ACTIVE MONITORING WELL (samples available through 10/2001)
- DETECTED, > MCL > 10% FREQUENCY
- DETECTED, > MCL
- DETECTED, < MCL
- NOT DETECTED

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PADUCAH GASEOUS DIFFUSION PLANT

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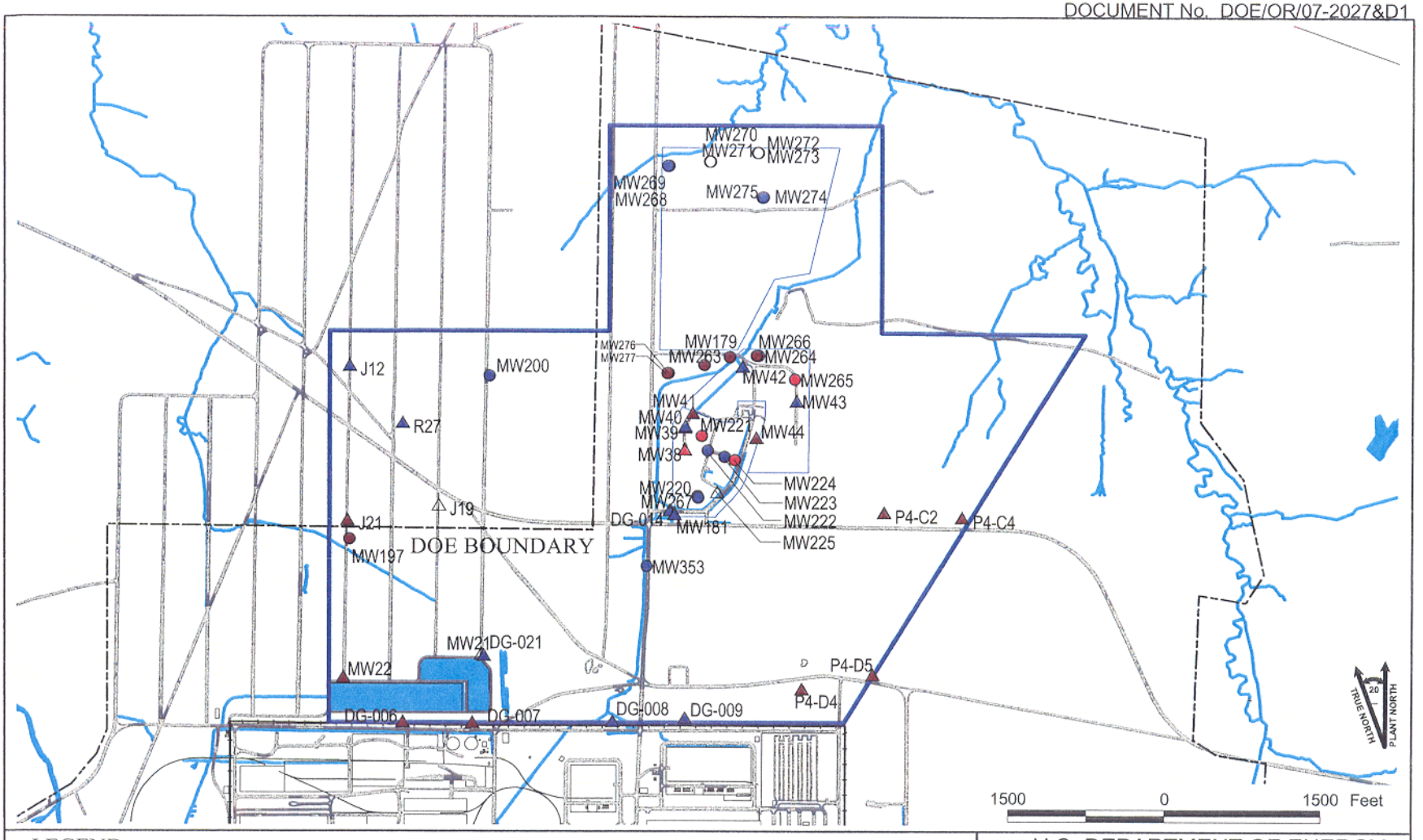
Fig. B.2. C-746-S&T RI scoping area: 1,1-dichloroethene in UCRS groundwater.

FIGURE No. c5ac90001sk451.apr
DATE 04-23-02



LEGEND

- FENCE
- ROAD
- STREAM
- LANDFILL BOUNDARY
- C-746-S&-T RI SCOPING AREA
- △ TEMPORARY BORING OR ABANDONED WELL
- ○ ACTIVE MONITORING WELL (samples available through 10/2001)
- DETECTED, > MCL > 10% FREQUENCY
- DETECTED, > MCL
- DETECTED, < MCL
- NOT DETECTED

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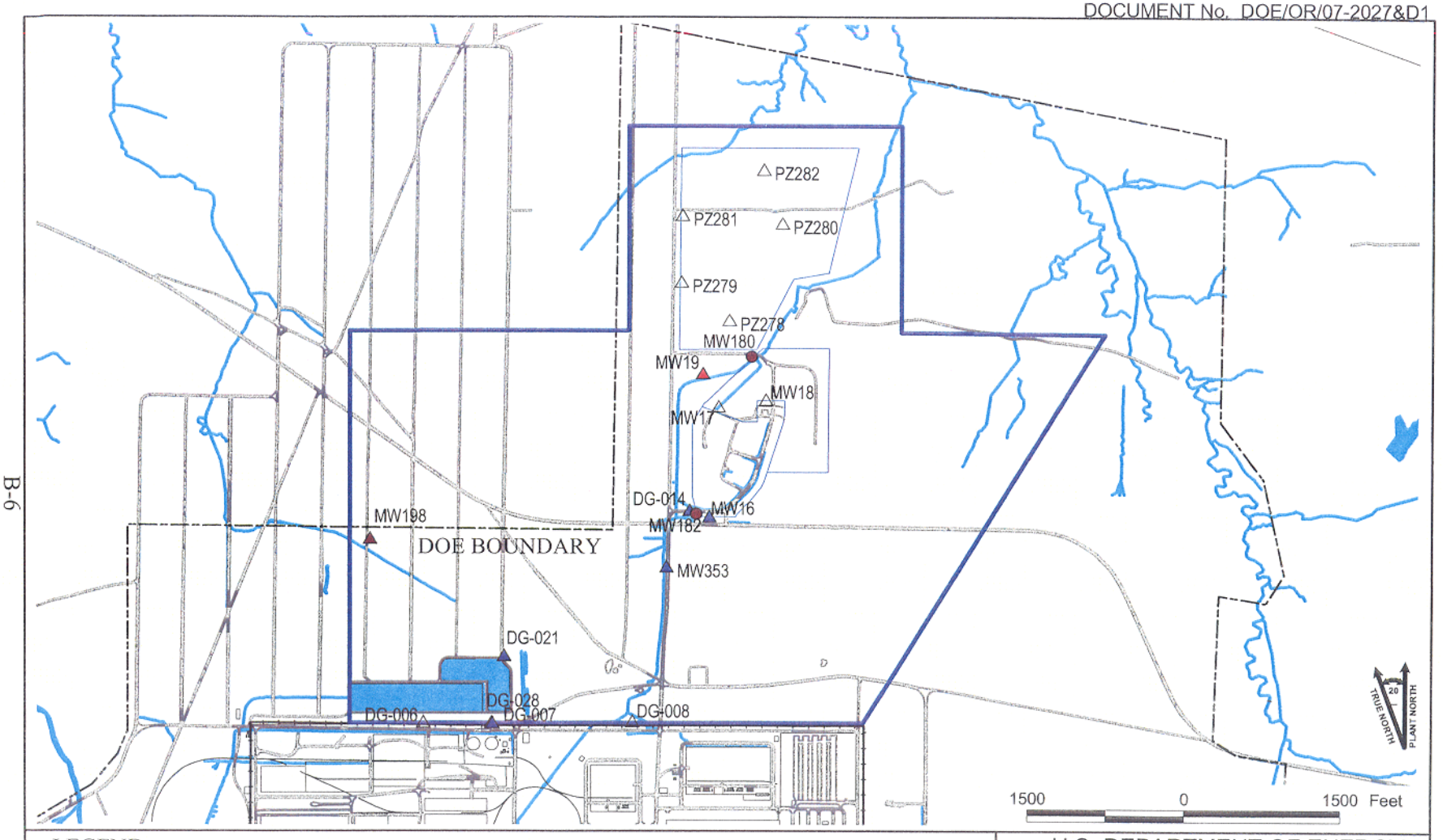
Fig. B.3. C-746-S&T RI scoping area: trichloroethene in RGA groundwater.

FIGURE No. c5ac90001sk452.apr
DATE 04-23-02



LEGEND

- FENCE
- ROAD
- STREAM
- LANDFILL BOUNDARY
- C-746-S&-T RI SCOPING AREA
- TEMPORARY BORING OR ABANDONED WELL
- ACTIVE MONITORING WELL (samples available through 10/2001)
- DETECTED, > MCL > 10% FREQUENCY
- DETECTED, > MCL
- DETECTED, < MCL
- NOT DETECTED

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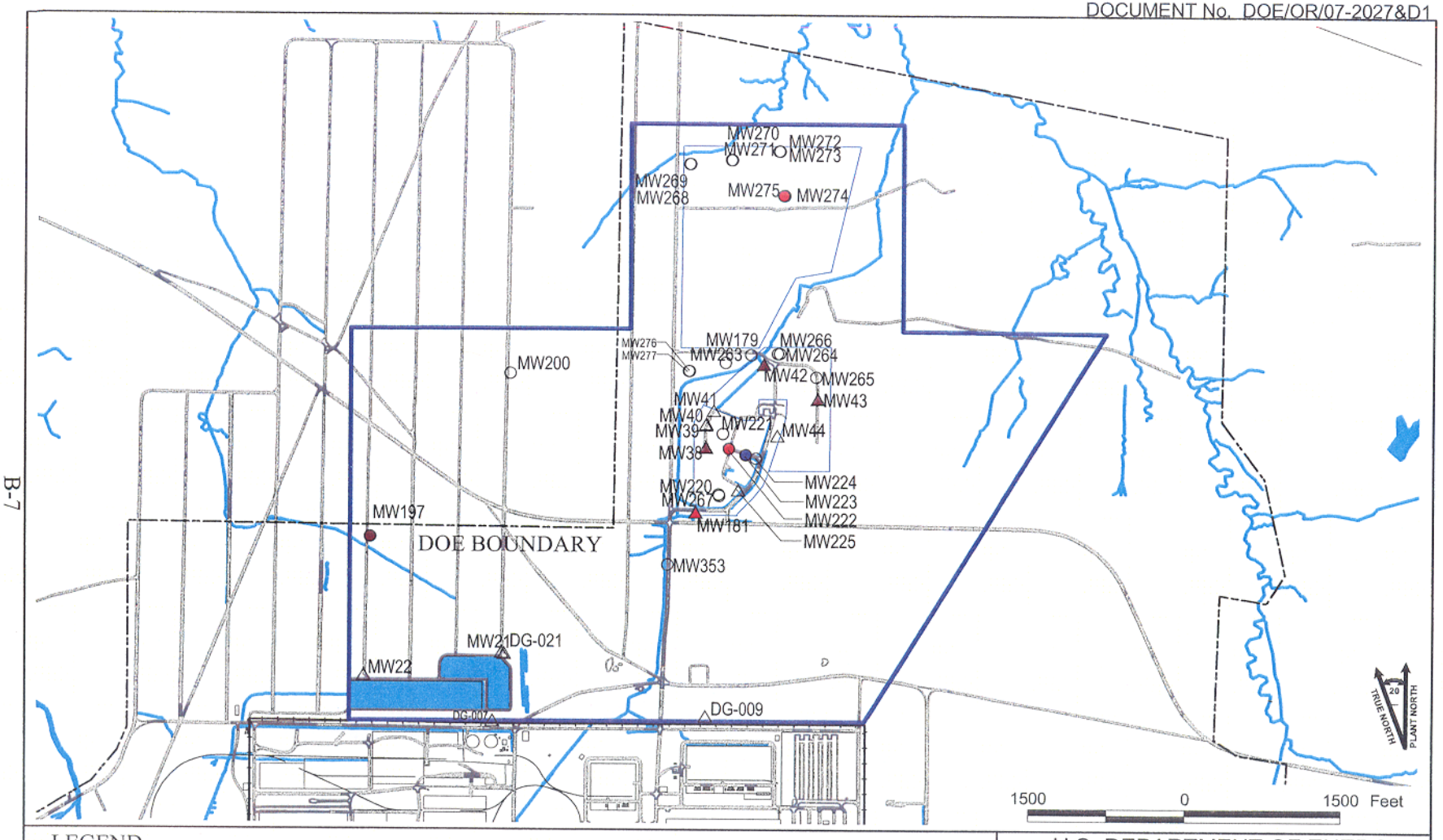
Fig. B.4. C-746-S&T RI scoping area: trichloroethene in UCRS groundwater.

FIGURE No. c5ac90001sk453.apr
DATE 04-23-02



LEGEND

- DOE BOUNDARY
- ROAD
- STREAM
- LANDFILL BOUNDARY
- C-746-S&-T RI SCOPING AREA
- TEMPORARY BORING OR ABANDONED WELL
- ACTIVE MONITORING WELL (samples available through 10/2001)
- DETECTED, > MCL > 10% FREQUENCY
- DETECTED, > MCL
- DETECTED, < MCL
- NOT DETECTED

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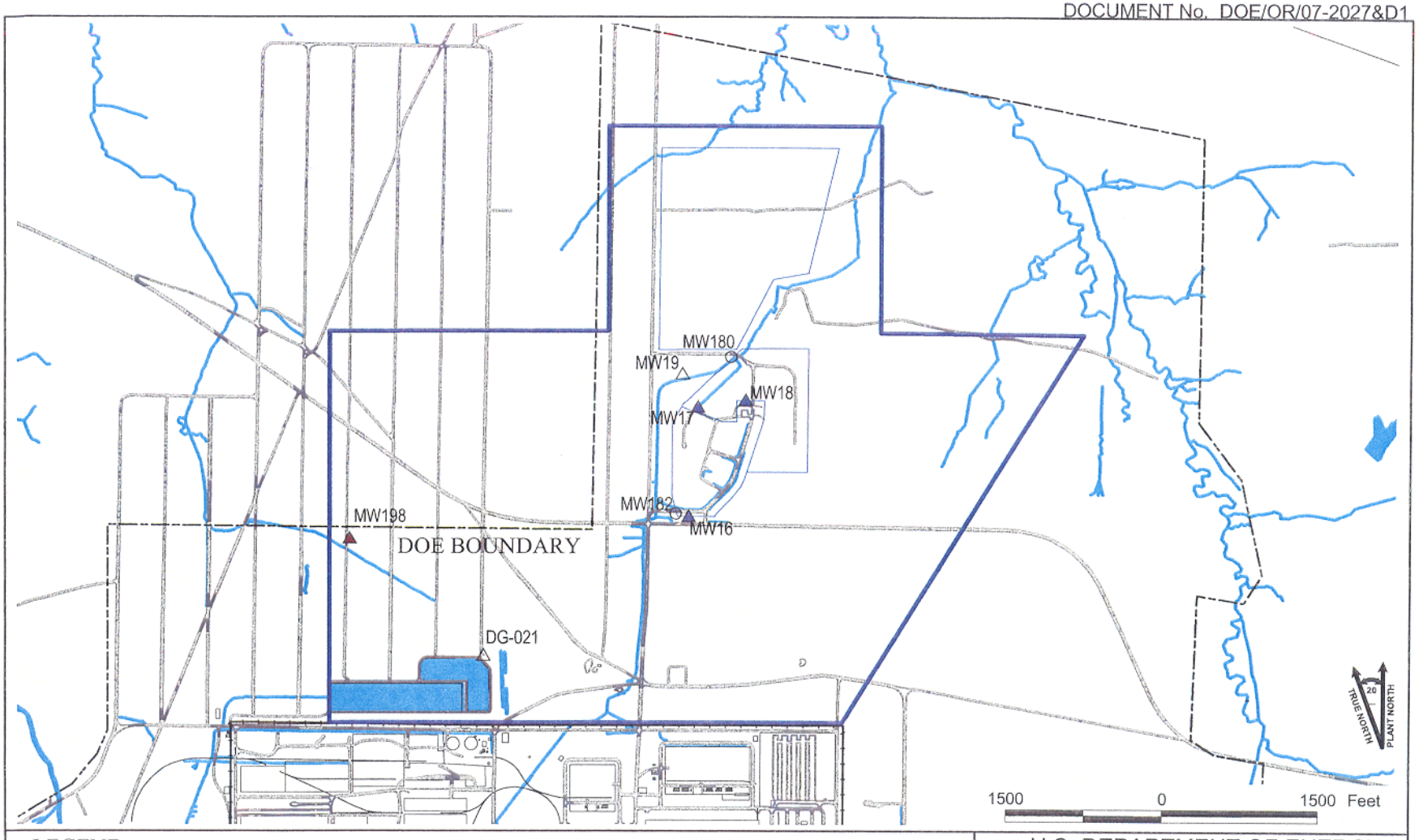
Fig. B.5. C-746-S&T RI scoping area: antimony in RGA groundwater.

FIGURE No. c5ac90001sk398.apr
DATE 04-23-02



LEGEND

- DOE BOUNDARY
- ROAD
- STREAM
- LANDFILL BOUNDARY
- C-746-S&-T RI SCOPING AREA
- TEMPORARY BORING OR ABANDONED WELL
- ACTIVE MONITORING WELL (samples available through 10/2001)
- DETECTED, > MCL > 10% FREQUENCY
- DETECTED, > MCL
- DETECTED, < MCL
- NOT DETECTED

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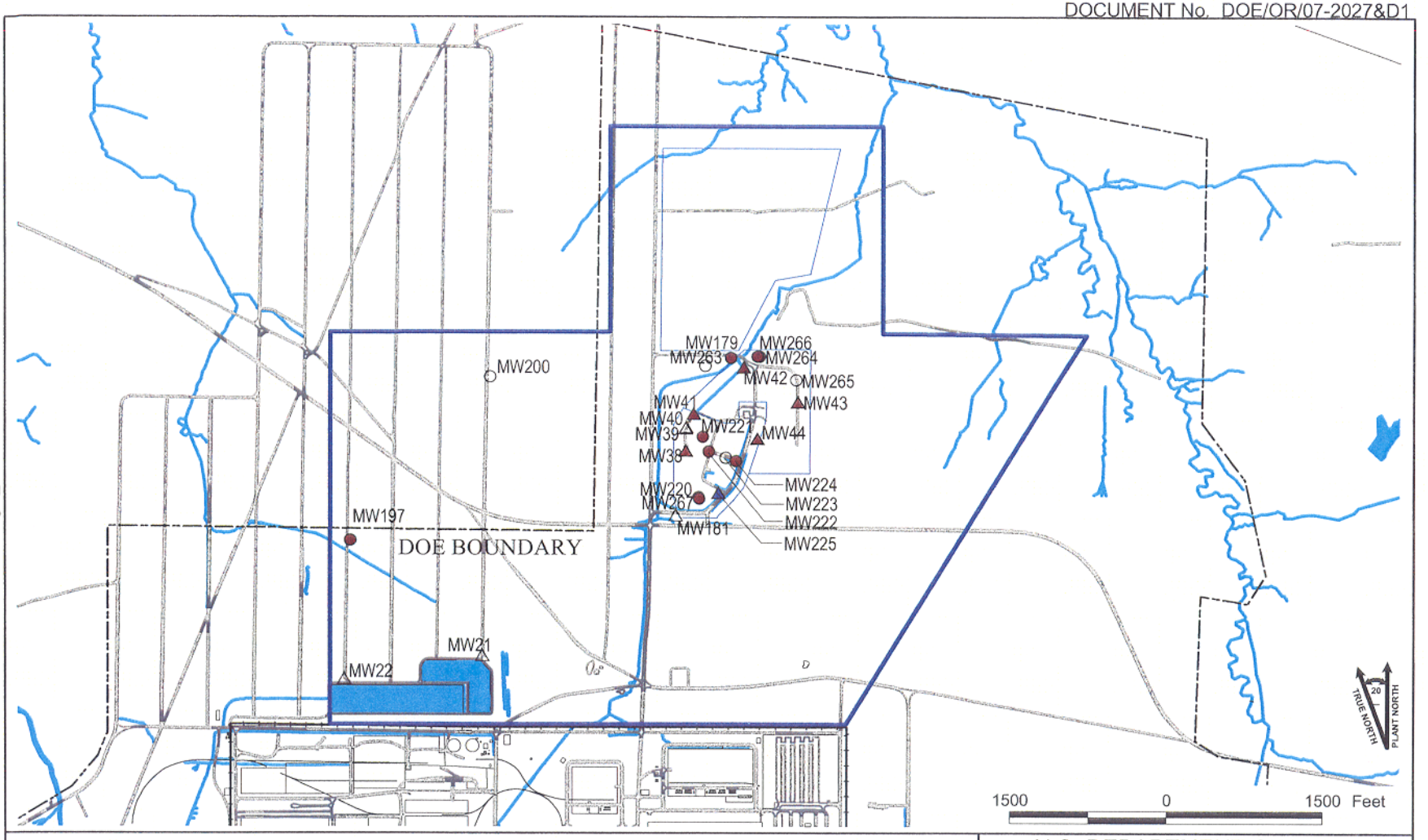
Fig. B.6. C-746-S&T RI scoping area: antimony in UCRS groundwater.

FIGURE No. c5ac90001sk399.apr
DATE 04-23-02



LEGEND

- DOE BOUNDARY
- ROAD
- STREAM
- LANDFILL BOUNDARY
- C-746-S&-T RI SCOPING AREA
- △ TEMPORARY BORING OR ABANDONED WELL
- ○ ACTIVE MONITORING WELL (samples available through 10/2001)
- DETECTED, > MCL > 10% FREQUENCY
- DETECTED, > MCL
- DETECTED, < MCL
- NOT DETECTED

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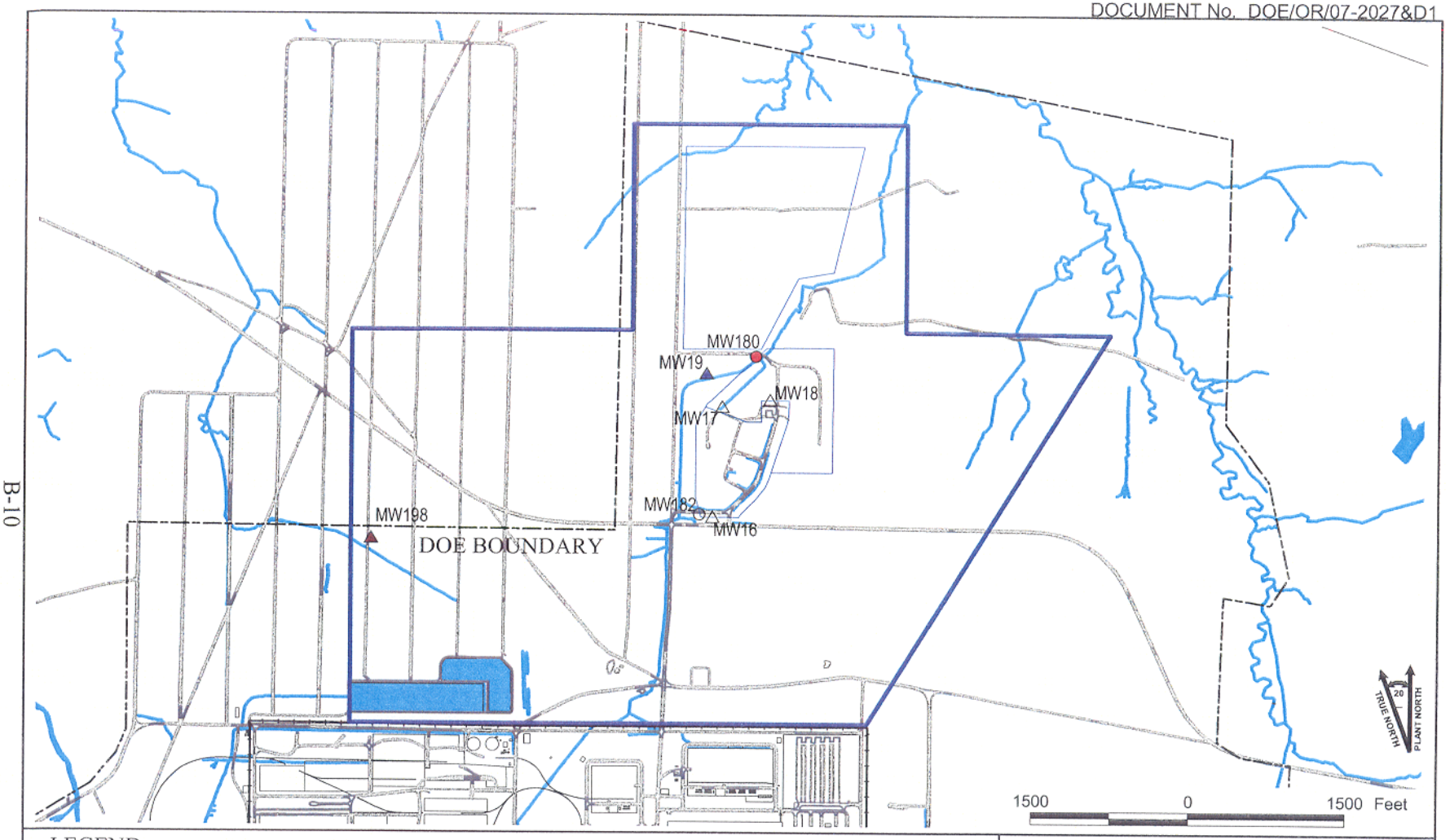
Fig. B.7. C-746-S&T RI scoping area: dissolved antimony in RGA groundwater.

FIGURE No. c5ac90001sk400.apr
DATE 04-23-02



LEGEND

- DOE BOUNDARY
- ROAD
- STREAM
- LANDFILL BOUNDARY
- C-746-S&-T RI SCOPING AREA
- TEMPORARY BORING OR ABANDONED WELL
- ACTIVE MONITORING WELL (samples available through 10/2001)
- DETECTED, > MCL > 10% FREQUENCY
- DETECTED, > MCL
- DETECTED, < MCL
- NOT DETECTED

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Fig. B.8. C-746-S&T RI scoping area: dissolved antimony in UCRS groundwater.

FIGURE No. c5ac90001sk401.apr
DATE 04-23-02

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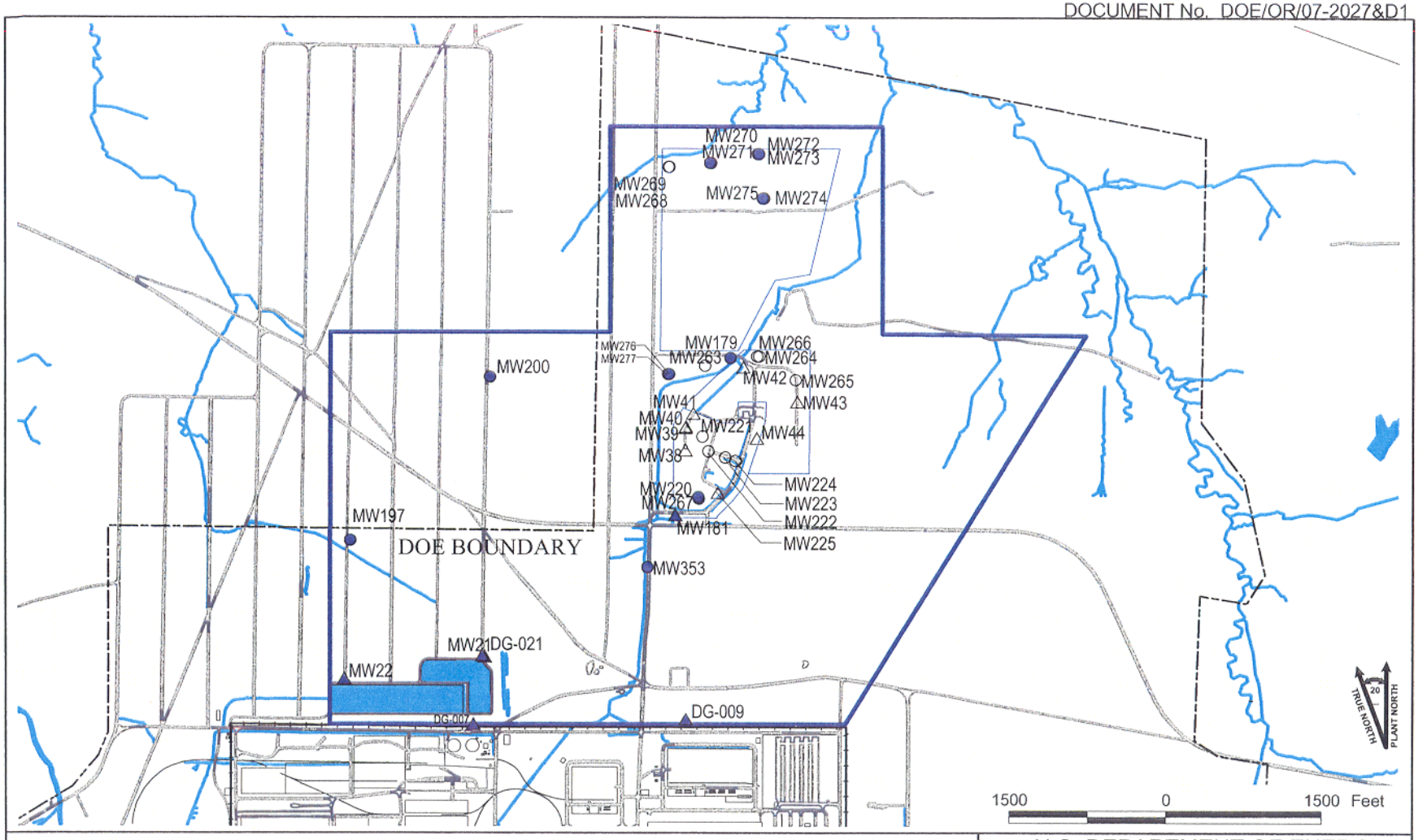

LEGEND

- DOE BOUNDARY
- ROAD
- STREAM
- LANDFILL BOUNDARY
- C-746-S&-T RI SCOPING AREA
- TEMPORARY BORING OR ABANDONED WELL
- ACTIVE MONITORING WELL (samples available through 10/2001)
- DETECTED, > MCL > 10% FREQUENCY
- DETECTED, > MCL
- DETECTED, < MCL
- NOT DETECTED

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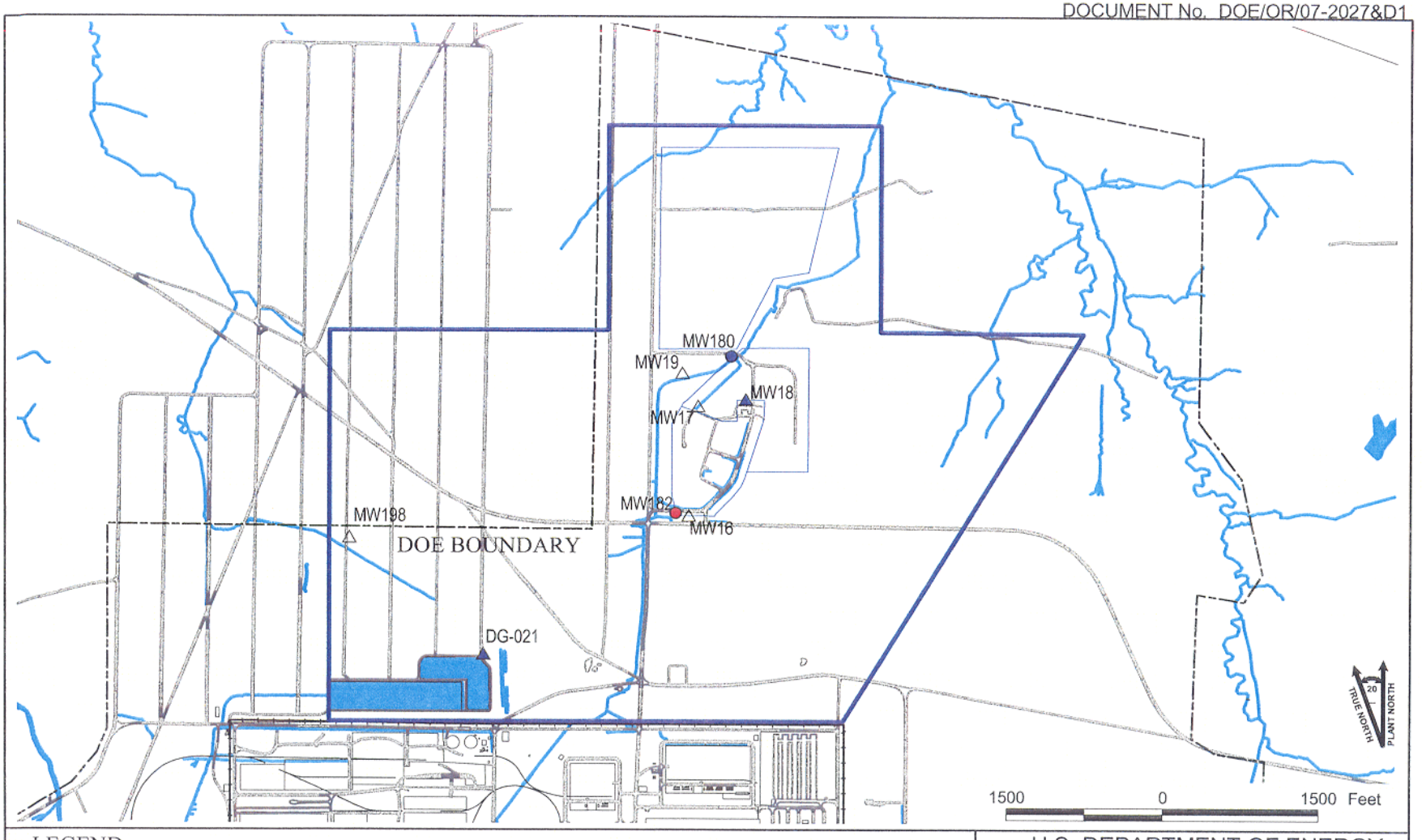
Fig. B.9. C-746-S&T RI scoping area: arsenic in RGA groundwater.

FIGURE No. c5ac90001sk402.apr
DATE 04-23-02



LEGEND

- DOE BOUNDARY
- ROAD
- STREAM
- LANDFILL BOUNDARY
- C-746-S&-T RI SCOPING AREA
- △ TEMPORARY BORING OR ABANDONED WELL
- ○ ACTIVE MONITORING WELL (samples available through 10/2001)
- DETECTED, > MCL > 10% FREQUENCY
- DETECTED, > MCL
- DETECTED, < MCL
- NOT DETECTED

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Fig. B.10. C-746-S&T RI scoping area: arsenic in UCRS groundwater.

FIGURE No. c5ac90001sk403.apr
DATE 04-23-02

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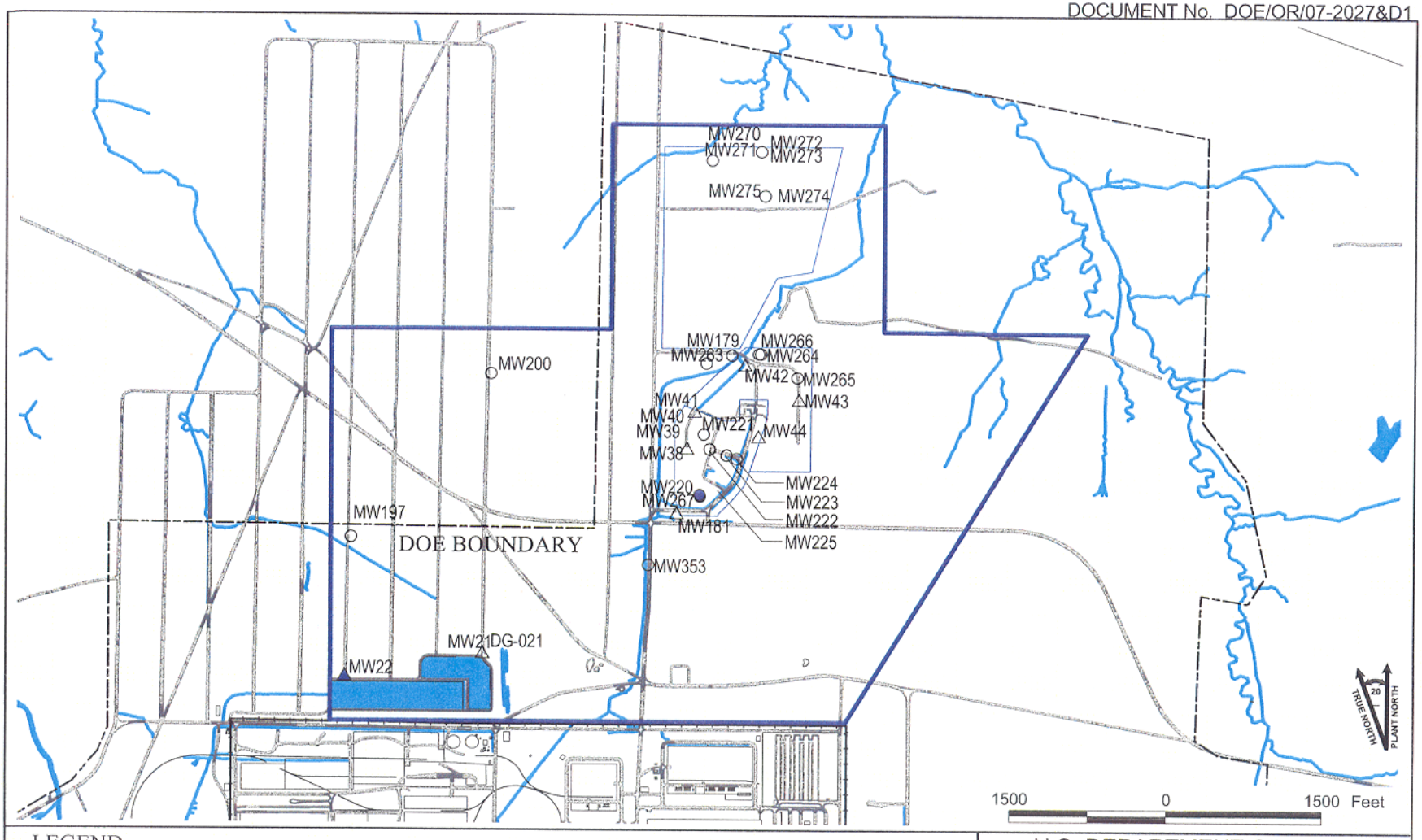

LEGEND

- DOE BOUNDARY
- ROAD
- STREAM
- LANDFILL BOUNDARY
- C-746-S&-T RI SCOPING AREA
- △ TEMPORARY BORING OR ABANDONED WELL
- ○ ACTIVE MONITORING WELL (samples available through 10/2001)
- DETECTED, > MCL > 10% FREQUENCY
- DETECTED, > MCL
- DETECTED, < MCL
- NOT DETECTED

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Fig. B.11. C-746-S&T RI scoping area: dissolved arsenic in RGA groundwater.

FIGURE No. c5ac90001sk404.apr
DATE 04-23-02