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NCBC GULFPORT
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TECHNICAL PROPOSAL FOR SOIL SAMPLING AND GROUNDWATER MONITORING PLAN
DEVELOPMENT NCBC GULFPORT MS
5/17/1990
VERSAR, INC



TECHNICAL PROPOSAL

SOIL SAMPLING AND GROUND-WATER
MONITORING PLAN DEVELOPMENT FOR NCBC IN
GULFPORT, MISSISSIPPI

REQUEST FOR PROPOSAL NO. C86-130982-000-0017

VERSAR PROPOSAL NO. P90-8313

SUBMITTED TO:

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STATEMENT OF WORK FOR EG&G RFP NO. C86-130982-000-0017

This statement of work (SOW) describes the strategies to be detailed in guidelines for a soil sampling and analysis plan and a ground-water sampling plan that the Navy can submit to the regulating agencies to aid in the closure of NCBC site number eight.

1.0 SOIL SAMPLING STRATEGY

The soil sampling strategy to be defined in the sampling and analysis plan is predicated on meeting two fundamental data objectives: first and foremost, to provide data so that a risk assessment of the site can be conducted, and secondly to allow for the identification of areas within the site that may potentially require additional remediation to reduce unacceptable exposure risks.

The proposed soil testing approach will use as a basis the grid network previously defined for the polychlorinated dibenzodioxin (i.e., PCDD) characterization effort. The existing 20 ft. x 20 ft. grids will be grouped in plot areas. For example, 8 plots consisting of 10 grids each are illustrated on Figure 1. One discrete soil sample will be collected from the center of each grid. The sample from each grid will be representative of soil from the surface to 6 inches or deeper if the PCDD data indicated extensive contamination at deeper levels. A composite sample will be prepared using each grid sample and representing the entire plot. Since some individual grids may have been excavated as part of the PCDD decontamination effort, separate composite of excavated and unexcavated grids will be prepared. In addition to the composite samples, a portion of the discrete sample from each grid location will be retained for additional analysis, if warranted. Therefore, a maximum total of 16 composites using the attached example will be prepared.

Each composite representing the excavated and unexcavated portions of each plot will be analyzed for the constituents of concern associated with herbicide orange.

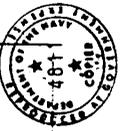
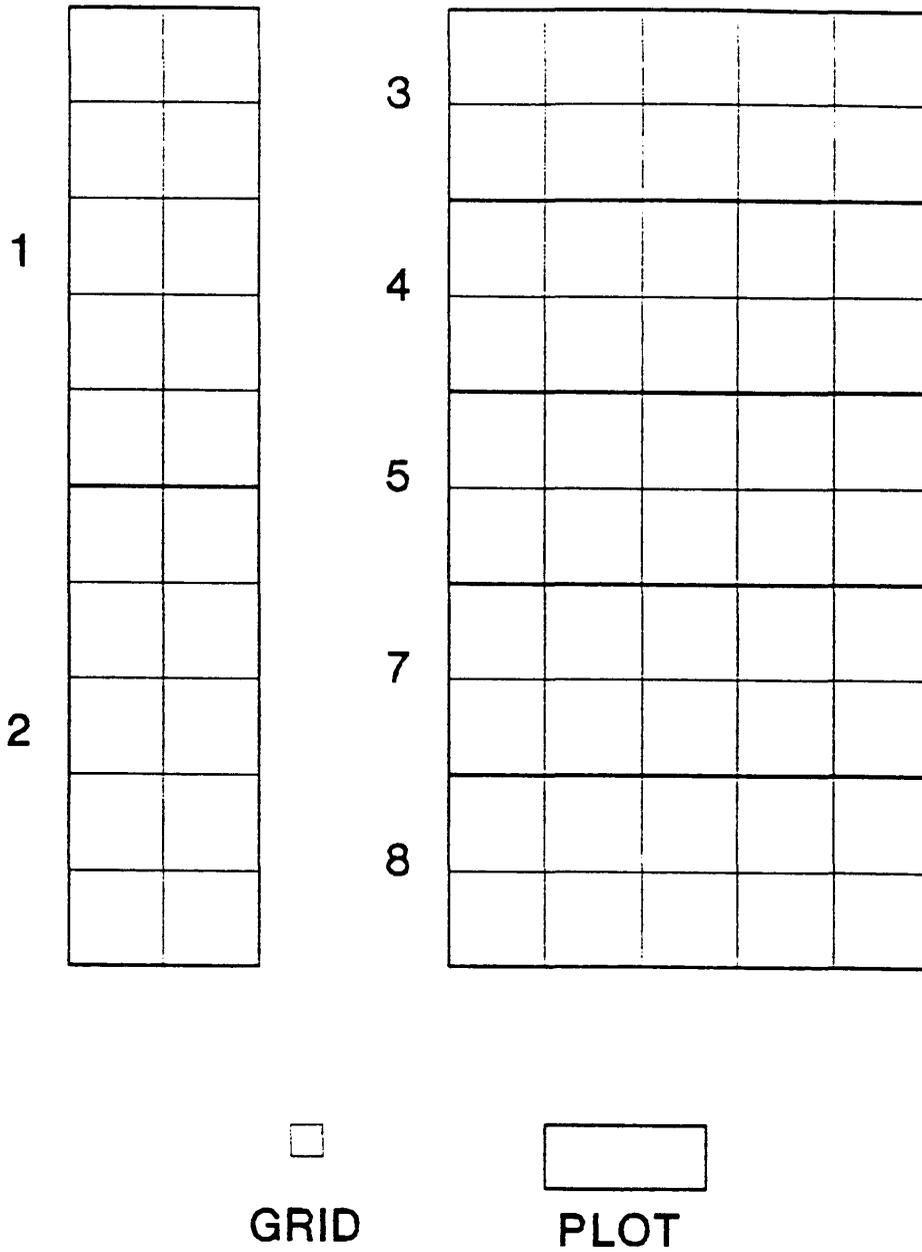


FIGURE 1- CONCEPTUAL DEPICTION
OF SAMPLING GRIDS AND PLOTS



Prior to the evaluation of the soil characterization data, ARARs associated with the contaminants of concern will be compiled. If published ARARs are not available for the contaminant of concern, target action levels will be developed based on published toxicity levels and modeling results used to calculate exposure levels at potential receptor points. The ARARs values and/or the target action levels will be used as a basis for comparison.

The soil characterization data will be statistically evaluated using analysis of variance (ANOVA) or equivalent techniques to determine if the excavated and unexcavated areas are statistically similar (i.e., same population). In addition, using the variability estimates of the data and the ARARs (e.g., regulatory thresholds or criteria), an estimate will be made of the number of samples that should have been tested to characterize the soil to a defined level of confidence.

If one or more plots, either excavated or unexcavated, exceeds the ARARs for the contaminants of concern, then the data representing those plots will be excluded and the variability will be reassessed. For those plots that exceed the ARARs, analysis of the discrete grid samples, previously archived, may be analyzed to characterize the extent of contamination. The data for plots which does not exceed ARARs will be suitable for subsequent risk assessment evaluation.

The sample plan will detail the plot configurations, indicating their location with consideration to the relative number of unexcavated versus excavated grids within each plot, and the total number of plots to be established to achieve a sufficient measure of constituent variability. These plots and grids will be superimposed onto existing site drawings to facilitate the sampling effort.

The sampling plan will detail the depths, sample volumes, compositing procedures to be adhered to during sampling activities. It will also detail sample containerization, labelling, preservation, and shipping procedures. Since additional analyses of samples are possible, field documentation is of the utmost importance. For this reason a field sampling form will be designed and included in the sampling plan.

Analysis Plan

The analytical methods and target detection limits will be detailed in the analysis portion of the Sampling and Analysis Plan. It is anticipated that all methods will adhere to SW-846 designated methods. If the case arises that the ARAR based target levels are below published analytical detection limits, alternate methods or ancillary methods will be designated. The analysis plan will establish both field and analytical laboratory QA/QC requirements.

2.0 GROUND-WATER MONITORING STRATEGY

A. Ground-Water Monitoring System Design

The strategic work plan for the ground-water investigation at the Herbicide Storage Area (HSA) of NCBC Gulfport will contain a detailed discussion of the approach proposed to assess the presence, magnitude, and extent of any ground-water contamination around the HSA. In order to prepare a work plan that meets Navy, State, and Federal objectives, the following steps are proposed:

1. Review of available site investigation reports/data (1984, 1986, etc.); review of topographic maps of NCBC and the HSA; review of available aerial photographs taken during the HSA period of operation (1965-1977).
2. Review the existing input parameters and objectives of the site ground-water model and risk assessment.
3. Review of the Geohydrologic summary and Proposed Monitoring Wells for Herbicide Residues at Eglin Air Force Base, Florida, and the Naval Construction Battalion Center, Mississippi (EG&G Idaho, Inc., January 1986).
4. Review guidance, recommendations, and requirements for site closure from the U.S. Navy, NCBC base officials, the State of Mississippi, and the U.S. Environmental Protection Agency.
5. Compile the above listed information and define the Data Quality Objectives for the ground-water investigation at the HSA of NCBC.
6. Conduct a site visit (by a hydrogeologist) to: discuss the MSA with base officials; evaluate the adequacy of any existing monitoring wells, tentatively identify the number and locations

of any additional monitoring wells required, determine any required drill rig staging/decontamination areas; determine site accessibility (i.e., roads, subsurface utilities); and assess topographic and, by influence, shallow ground-water hydraulic gradients.

7. Establish the analytical parameters and procedures of concern such that appropriate well construction materials and installation procedures can be evaluated and specified for any new wells.

The aforementioned steps should be performed prior to the initiation of work plan preparation. Nonetheless, many of the steps can be performed concurrently. Much of the proposed approach will be based upon the 1986 EG&G hydrogeological report, and any ground-water monitoring done to date.

The following issues will be addressed in the strategic work plan for the monitoring system evaluation and design, if required: (1) number of monitoring wells; (2) diameter and screened interval of monitoring wells; (3) well construction materials; (4) placement of monitoring wells; (5) drilling and well installation procedures; (6) soil sampling intervals (split-spoons); (7) equipment decontamination procedures; (8) worker health and safety issues and procedures; (9) well security; (10) well development; (11) disposal of drill cuttings and development water; (12) well surveying; and (13) aquifer testing to determine hydrogeologic characteristics.

In accordance with RCRA Corrective Action guidance (Interim Final, November 1986) the Strategic Work Plan will address informational needs for a comprehensive hydrogeological investigation. Available information will be summarized in the work plan and any information gaps will be identified and addressed during work plan implementation. Per RCRA Corrective Action Guidance, this information shall include the following issues:

1. A description of the regional and facility specific geologic and hydrogeologic characteristics affecting ground-water flow beneath the facility.
 - includes stratigraphy, structural geology depositional history, recharge/discharge, ground-water flow patterns.

2. A description of area and site topographic features.
3. A representative and accurate description of the hydrogeologic units which may be part of the migration pathways at the site.
 - includes hydraulic conductivity, porosity, lithologic description, attenuation capacity of sediments.
4. Presentation of hydrogeologic cross-sections of the study area; to include identification of water bearing zones and stratigraphic horizons.
5. Presentation of water-level (potentiometric) contour maps illustrating the ground-water flow system.
6. A discussion of man-made influences on the area hydrogeology; including ground-water withdrawals, pipelines,, retention ponds, NPDES outfalls, ditches, etc.
7. Subsequent to a determination that ground-water contamination exists, information concerning the direction and rate of containment movement will be needed for the ground-water model and risk assessment calculations. This information will be dependent on both hydrogeologic characteristics and contaminant characteristics.

B. Ground-Water Sampling and Analysis

After review of site history, model and risk assessment input requirements, and Navy, State, and Federal concerns/requirements, the appropriate analyses for testing of HSA-area ground water will be determined. The Strategic Work Plan will include a discussion of the analytical methods (i.e., SW-846) and field and laboratory QA/QC requirements for ground-water sampling. The work plan will detail all well sampling protocols; including ambient air monitoring, water level measurements, well purging procedures, well sampling equipment and procedures, and sample containerization, labelling, preservation, custody documentation, and shipping procedures. A discussion of field in-situ measurements of pH, specific conductance and temperature will also be presented in the work plan for ground-water sampling and analysis. The strategic work plan will include a discussion of the procedures to be used for data reduction validation and presentation.



Subsequently, the physical and chemical data will be used in model testing and site risk assessment calculations.

3.0 PERFORMANCE SCHEDULE

Versar will commence review applicable existing data and determine the required model inputs upon notification to proceed and will submit the Draft Soil Sampling and Analysis and Ground-Water Monitoring Plans to EG&G 30 days after commencement. Versar anticipates that any and all EG&G comments will be addressed and incorporated in 1 week after receipt of EG&G input. All designated personnel for this effort can be made available immediately upon notification to proceed.