



March 1, 1995

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Ms. Sherrel D. Taylor-Domville
United States Environmental Protection Agency
Section II
Emergency and Remedial Response Division
290 Broadway
New York, New York 10007-1866

**Results of February 14 and 15, 1995 Quality Assurance Field Audit
Island Chemical Company Site
Remedial Investigation
St. Croix, U.S. Virgin Islands**

Dear Ms. Taylor-Domville:

This report has been prepared to document results of the field Quality Assurance (QA) audit performed during the Remedial Investigation at the Island Chemical Company Site in St. Croix, U.S. Virgin Islands, on February 14 and 15, 1995. This report is prepared in accordance with the requirements specified in Section VII Part Ai(3)(g) of the Administrative Order on Consent (Consent Order) for this project dated September 29, 1994 (EPA Index No. II-CERCLA-94-0401) and described in Harding Lawson Associate's (HLA) conditionally-approved Quality Assurance Project Plan (QAPP) revised August 5, 1994, Section C8.1.

On Tuesday and Wednesday, February 14 and 15, Mr. Bharat Patel of HLA performed a QA field audit. EPA was present during the QA field audit. The purpose of the audit was to evaluate the groundwater sampling program including: sample identification, sample control, chain-of-custody (COC) procedures, field documentation, and sampling operations, handling, and packaging procedures. The audit was not announced to the field team before its occurrence. The field audit began on the first day of groundwater sampling activities and continued through the second day. The audit was performed during the first day of groundwater sampling to identify any concerns as early as possible and to preclude problems from being carried forward through subsequent sampling rounds. Preliminary results were reviewed in the field with the sampling team and corrective actions were identified and implemented for the remainder of the sampling event. Several record-keeping deficiencies were noted on the field forms, however, because the information was recorded in the field log books, these deficiencies did not affect the integrity of the samples.

1.0 FINDINGS OF AUDIT

1.1 Sample Labels

The auditor examined sample labels for completeness and accuracy. The following sample labels were reviewed:

All bottles for sample MW-4/021495
All bottles for sample MS/MSD/MW-4/021495
All bottles for sample TB/021495
All bottles for sample RBGW/021595

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The sample labels were found to be in compliance with the requirements specified in Section 6.1.2.1 of the QAPP, with the exception that sample labels for the first day of sampling (February 14, 1995) were not affixed to the sample containers until the samples were prepared for shipment on February 15. However, the sample locations were written directly on the sample bottles and caps during sampling to identify the correct sample locations.

1.2 Chain-of-Custody Records

The auditor examined three COC records for the samples shipped on February 15 (MW-1/021495 and MS/MSD/MW-1/021495) and one COC record for a sample collected on February 15 (sample RBGW/021595). The records were reviewed to determine whether (1) the station number, station description, date, and time corresponded to the sample label, (2) the parameters to be analyzed were properly identified, and (3) custody transfers had been documented and the date and time of transfer had been recorded. The auditor also reviewed whether the samples were kept in custody at all times and were properly and securely stored. Findings were as follows:

- HLA's COC form, included in the QAPP, were not used; COCs supplied by the laboratory were used. The laboratory COC contained the necessary information.
- COC records were not prepared concurrently for the sampling on February 14, but were prepared prior to packing the sample coolers for shipment on February 15.
- Station numbers were identified as "Sample Description."
- Sample date and times did correspond to sample labels.
- Parameters to be analyzed were identified correctly, with the exception that TAL metals analysis was incorrectly identified as TAL inorganics analysis. The COC was corrected prior to sample shipment.
- The date and time of transfer of field custody for sample RBGW/021595 was properly completed.

Upon completion of the field sampling program, the COC records were again reviewed for completeness. The following deficiencies were noted:

- Station descriptions were not included on the COC records.

1.3 Field Logbooks and Other Forms

The field logbooks, Groundwater Sampling Forms and Water Level Measurement Forms were reviewed during the field audit to confirm that each was signed and that all entries were dated. The following deficiencies were noted:

- The water level measurement form was not used for the complete round of water levels measured on February 14, 1995.

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- Field Operations Manager's logbook did not document transfer of other logbooks to field personnel.
- The Groundwater Sampling Form for well MW-1 (the only one reviewed in the field) was not complete. The following information was missing or deficient in the Groundwater Sampling Form:
 - Calculated and actual volume of water purged
 - References to Quality Control Samples
 - Screened intervals in wells
 - Occasional missing entries were noted on individual forms. In each instance, this information had been recorded in the field logbooks.
 - Several entries were crossed out but not initialed.
 - Separate reference points were used to record depth to water prior to purging (referenced to depth below grade) and after purging (referenced to depth below top of casing), without indicating as such on the form. The discrepancy was identified and corrected during sampling.

1.4 Sampling Operations

The auditor reviewed sampling operations to determine if they were performed as stated in the Field Sampling Plan (FSP) and as directed by the Project Manager. Findings were as follows:

- Due to problems beyond the control of the field team, the generator was not compatible with the low flow sampling pumps and the PVC tubing, instead of Teflon™ was provided by the supplier. Due to time constraints, purging and sampling was performed using bailers. This change was approved by EPA in the field.
- A nylon rope was used for the bailers which were used for purging well MW-1. Cotton rope was purchased for the rest of the sampling.
- Although depth to water was measured prior to purging, it was not remeasured immediately prior to sampling at MW-1.

The auditor determined that the proper number of samples were collected at the assigned locations and that the samples were in proper containers and properly preserved. The auditor also confirmed that the required field measurements and QA checks were performed and documented. A round of water levels was collected from the monitoring wells prior to initiating the purging of the first sampling location.

2.0 CORRECTIVE ACTIONS

2.1 Sample Labels

No corrective actions were deemed necessary for the sample labels, with the exception that the pre-printed sample labels will be affixed to the containers immediately after the sampling of the respective station.

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2.2 Chain-of-Custody Records

The following corrective actions were undertaken to address the deficiencies noted in the COC Records (see Section 1.2).

- The sample naming system used for this project includes sufficient information to describe the sample station. Descriptions and notes regarding each sampling location are documented in the field notes.
- The field crew was reminded of the importance of completing the COC records concurrent with sampling activities.
- The leader of the field crew on all sampling events is responsible for a careful review of all COC records as they are completed.

2.3 Field Logbooks and Other Forms

- The Field Operations Manager and sampling crew were reminded of the requirements noted above.
- Quality control samples are referenced in the field logbooks and can be identified by reviewing the COC records. However, the field crew has been specifically instructed to note all related quality control samples on the Groundwater Sampling Forms.
- Well screen intervals are noted in the field log books. The field crew has been specifically instructed to include this information on the Groundwater Sampling Forms where appropriate.
- The leader of the field crew on all future sampling events will be responsible for a careful review of all field records as they are completed each day. Missing entries will be documented and corrected in the field, if possible.

2.4 Sampling Operations

If possible, future sampling events will be performed using low-flow sampling pumps, multi-parameter field sampling equipment, and in-line meters as described in the work plan. However, limitations in the availability of adequate support equipment, such as generators, on the island may necessitate the use of bailers for future purging and sampling activities.

3.0 Conclusions

Results of this audit indicated a number of deficiencies in the manner in which the field crew recorded pertinent data. Although the data were recorded, they were not necessarily recorded on the forms selected for this project. These results do not suggest problems with the quality of the samples, however they do indicate the need for improved record keeping. Because all of the necessary information was recorded, these deficiencies will not affect the quality of the samples or the objectives

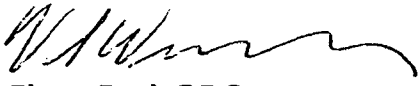
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of the project. At least one additional field audit will be performed to ensure that record keeping practices are in accordance with the QAPP.

If you have any questions regarding this, or any other project matter, please do not hesitate to contact either of the undersigned.

Very truly yours,

HARDING LAWSON ASSOCIATES



for Bharat Patel, C.P.G.
Associate Hydrogeologist



Jason M. Schindler
Associate Geologist

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cc: Mr. Cecil A. Williams, Department of Planning and Natural Resources
Lori G. Singer, Sills, Cummis, Zuckerman, Radin, Tischman, Epstein & Gross

This document was prepared for the sole use of Island Chemical Company; Sills, Cummis, Zuckerman, Radin, Tischman, Epstein & Gross, and the regulatory agencies involved in this project, the only intended beneficiary of our work. No other party should rely on the information contained herein without prior written consent of HLA.