Environmental Chemical Corporation

1125 Rt. 22 West
Suite 310
Bridgewater, NJ 08807
908-595-1777phone
908-595-1776 fax

TRANSMITTAL LETTER

TO: [redacted]

U.S. Army Corps of Engineers Buffalo District
1776 Niagara Street
Buffalo, N. Y. 14207

DATE: 26 August 2010 **PROJECT NO.:** 5210.004

RE: Niagara Falls Storage Site (NFSS) - for the Transportation and Disposal of Remedial Investigation Derived and Legacy Waste

SENDING:

[X] Attached AND [X] Under separate cover via _MAIL_____ the following items:

[ ] Shop drawings [ ] Prints [X] Plans [ ] Samples

[ ] Copy of letter [ ] Change order [ ] Cert Payroll [ ] Specifications

COPIES	DESCRIPTION
1	**Final Sampling and Analysis Plan**

TRANSMITTED:

Submittal Schedule	**Submittal Type Required**	**Classification**
S Prior to Shipment	**O** Original	**FIO** For information only
A Per S/C Schedule	**P** Print/Photocopy	**R1** PDT Review and Accept.
M Prior to Mobilization	**E** Electronic Format	**R2** CX/LRD/HQ Rev./Accept.
W Prior to Commencing Work	**M** Microfilm	
Y Prior to Progress Payment	**PH** Photograph	

REMARK(S): If you have any questions please do not hesitate to call me at [redacted] or email me at [redacted] My cell phone number is [redacted]

CC:

SIGNED: [redacted]

Digitally signed by [redacted]
Date: 2010.08.26 17:17:14 -04'00'

[redacted]
Project Manager

SUBMITTAL REQUIREMENTS SUMMARY

NOTICES

1. To each item submitted, the Contractor shall attach a copy of this form and circle the title of the item being submitted.
2. Failure to submit required submittals as delineated on this form may result in withholding of payment in accordance with provisions of the Contract.
3. The Contract Administrator is responsible for distributing submittals to the requesting Department (e.g., Construction). The Department is responsible for further distributions (e.g., Site Superintendent).

Submittal		Scope of Work (SOW) Paragraph	Classification	ITR Required	Submittal Schedule (Calendar Days after NTP)	Submittal (No.) and Type
1	Draft Sampling and Analysis Plan	5.1.1	R1	Yes	14	E, O
2	Draft Health, Safety and Radiation Protection Plan	5.1.2	R1	Yes	14	E, O
3	Draft Quality Control Plan and ITR documentation	5.1.3	R1	Yes	14	E, O
4	Draft Waste Management, Transportation, and Disposal Plan	5.1.4	R1	Yes	14	E, O
5	Final Work Plans	5.1	R1	Yes	35	E, O
6	IDW and Legacy Waste Manifests and Shipping Documents	5.5.2	R1	Yes	7 days prior to waste shipments	E, O
7	Draft Close Out Report	5.6.1	R1	Yes	As Specified in 5.6.1 and 6.1	E, O
8	Final Close Out Report	5.6.1	R1	Yes	As Specified in 5.6.1 and 6.1	E, O

FINAL

SAMPLING AND ANALYSIS PLAN

Niagara Falls Storage Site Transportation and Disposal of Remedial Investigation Derived and Legacy Waste

Lewiston, NY

August, 2010

Prepared for:

U.S. Army Corps of Engineers
Buffalo District

US Army Corps of Engineers ®
Buffalo District

Prepared by:

ECC
1125 Route 22 West, Suite 310
Bridgewater, NJ 08807

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TABLE OF CONTENTS

ATTACHMENTS

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ACRONYMS and ABBREVIATIONS

DOE	Department of Energy
DOT	Department of Transportation
DQI	Data Quality Indicator
DQO	Data Quality Objective
ECC	Environmental Chemical Corporation
FSP	Field Sampling Plan
FUSRAP	Formerly Utilized Sites Remedial Action Program
IDW	Investigation Derived Waste
LSA	Low Specific Activity
NFSS	Niagara Falls Storage Site
PARCC	Precision, Accuracy, Representativeness, Comparability, and Completeness
pCi/g	picocuries per gram
PM	Project Manager
PPE	Personal Protective Equipment
QA/QC	quality assurance/quality control
QAPP	Quality Assurance Project Plan
QCSM	Quality Control Systems Manager
RI	Remedial Investigation
SAP	Sampling and Analysis Plan
SOP	Standard Operating Procedure
SOW	Scope of Work
uR/hr	microroentgen per hour
USACE	United States Army Corps of Engineers
USEI	US Ecology - Idaho
WAC	Waste Acceptance Criteria
WCS	Waste Control Specialists, LLC

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1. INTRODUCTION

This document is the Sampling and Analysis Plan (SAP) for the Formerly Utilized Sites Remedial Action Program (FUSRAP) Niagara Falls Storage Site (NFSS) transportation and disposal of United States Department of Energy (DOE) legacy waste and investigation derived wastes (IDW) generated during multiphase Remedial Investigation (RI) activities and RI addendum activities. This SAP describes the approach, rationale, procedures, and quality assurance plans for activities planned during the project.

1.1 PROJECT SCOPE

The project scope includes the preparation, packaging, loading, transportation, and proper disposal of two waste streams. The two waste streams are the DOE legacy waste and IDW generated during multiphase RI activities and RI addendum activities. The wastes are present in both solid and liquid forms. Activities planned for the completion of the project include:

- Pre-transportation preparation;
- Packaging/repackaging of IDW and legacy wastes; and
- Loading and transportation of IDW.

Remedial and closure reporting activities are scheduled for completion by January 2010. All Project activities will be completed in accordance with applicable United States Army Corps of Engineers (USACE), Federal, New York State, and local requirements and regulations.

1.2 SAMPLING AND ANALYSIS PLAN ORGANIZATION

The SAP includes components often included in a separate Field Sampling Plan (FSP) and Quality Assurance Project Plan (QAPP). The FSP components include descriptions of field implementation procedures and project reporting requirements. The QAPP components include descriptions of detailed Data Quality Objectives (DQOs), and address data quality assurance/quality control (QA/QC) and the required procedures and programs to be utilized to ensure data accuracy and the achievement of all project objectives. All procedures described in this SAP will be in agreement will all Environmental Chemical Corporation (ECC) standard operating procedures (SOP). Attachment 1 of the SAP provides a list of applicable ECC SOPs.

2. DATA COLLECTION PROGRAM

The data collection program is derived from evaluation of data obtained from the Scope of Work (SOW) and conversations with potential disposal facilities. Waste Control Specialists, LLC (WCS) has performed a preliminary review of the data for the liquid and solid waste streams, and has indicated all materials are acceptable with the exception of three Low Specific Activity (LSA) boxes. These boxes do not have associated radioanalytical results due to the matrix of the contents (steel). The Waste Acceptance Criteria (WAC) of WCS requires radioanalytical results in the form of pCi/g, and WCS cannot convert results of health physics surveys into picocuries per gram (pCi/g) concentrations. US Ecology – Idaho (USEI) has been contacted to dispose of these three LSA boxes. USEI has indicated they can accept the materials based upon modeling of the contents of the boxes based upon external dose rates.

At the time of this revision of the SAP, no physical samples or off-site analytical analyses are required. If physical samples or off-site analytical services are identified, this SAP will be revised to identify the type of samples and analytical requirements.

2.1 LOW SPECIFIC ACTIVITY BOXES

Three LSA boxes have been identified as requiring addition information for waste profiling. These boxes are identified as numbers WC-170, WC-175, and WC-177. The contents of the boxes are identified as steel (locker parts from remediation). USEI is proposing to model the radiological content of the boxes utilizing external dose rates and the composition of the containers.

2.1.1 External Dose Rates

A Ludlum Model 19 exposure rate meter or equivalent will be utilized for the measurement of external dose rate. The meter measures gamma radiation and provides readings in microroentgen per hour (uR/hr).

USEI has requested that exposure rates be taken at the mid-point of each side of the container, and every four feet along the sides and ends of each container. The LSA boxes are four foot by six foot by four feet high. Since the boxes are less than eight feet wide in any dimension, exposure rate measurements will be taken at the mid-point and at the corners of the side. Exposure rate measurements will be taken at a distance of one inch from the container and at a distance of one meter from the container at each location.

Containers will be removed from the storage area to an area exhibiting a low background for the surveys. This will be performed to provide an accurate reading of the exposure rate without contributions from other waste containers. Dose rate measurements are expected to be in the low microRoentgen per hour range and will be utilized to model the containers, and will also be evaluated against the Department of Transportation (DOT) limits presented in Table 4.1 of the Waste Management, Transportation and Disposal Plan. As such, a dose rate meter with a low range (microroentgen) capacity has been selected.

2.1.2 Container Composition

In order to model the radiological contents of the LSA boxes, the physical composition of the containers must be known. This information includes the material the boxes are made from, the physical dimensions of the containers, and the thickness of the materials used to construct the containers. This information will be obtained utilizing one, or both of the following methods:

- The manufacturer's specification sheet for the construction of the boxes may be obtained to satisfy the requirements. The specification sheet will be analyzed to assure it contains all the required information and forwarded to USEI. Any additional information required will be obtained from the manufacturer.

- The boxes may be measured using tape measures and calipers. Tape measures will be utilized to measure the dimensions of the boxes, and calipers will be used to measure the thickness of the materials used to construct the boxes.

2.1.3 LSA Scanning Results

ECC mobilized to the NFSS Site on 08/06/10 to perform scanning surveys on the three LSA boxes numbered WC-170, WC-175, and WC-177. The boxes were separated from the rest of the LSA boxes into a low background area. The exposure rate was measured at the mid-point of each side of the boxes and every 4 feet after at a distance of one inch and one meter for each of the sides, and top. The bottoms of the boxes were measured at a one inch distance only. Results of the survey indicate exposure rates comparable to background. Results of the surveys are attached as Attachment 2. USEI has reviewed the surveys and information regarding the site and indicated the profiling process can move forward.

3. FIELD PROCEDURES

This section of the NFSS project SAP details the field procedures for each of the activities introduced in Section 2.0 for the additional characterization of the LSA boxes.

3.1 RADIOLOGICAL SCREENING

The following procedures relate to the exposure rate measurements required for the additional characterization of the LSA boxes:

ECC SOP R100, Instrument Calibration and Operational Check-out of Survey Instruments;
ECC SOP R102, Gamma Scintillation Detector Check-out and Cross Calibration;
ECC SOP R201, Background Measurements and Sampling;
ECC SOP R202, General Survey Approaches and Strategies;
ECC SOP R204, Surface Scanning; and
ECC SOP R208, Gamma Radiation Exposure Rate Measurement.

ECC will perform exposure rate scans and removable contamination surveys of packages prior to shipment to assure conformance to 49 CFR 173.441 and 49 CFR 173.443. The limits for packages for dose rate and removable contamination are provided in Table 4.1 of the Waste Management, Transportation and Disposal Plan.

3.2 DECONTAMINATION

No activities that will require chemical or radiological decontamination are planned during this project. If a spill, waste release, or any other condition occurs that may require chemical decontamination of waste containers, tools, or equipment, then an appropriate decontamination procedure will be identified based on the nature of the potential contamination. Radiological decontamination of waste containers, tools, or equipment will be conducted in accordance with the Project Radiation Protection Plan.

3.3 WASTE MANAGEMENT

IDW includes all materials generated during performance of an investigation that cannot be effectively reused, recycled, or decontaminated in the field. IDW consists of materials that could potentially pose a risk to human health and the environment (e.g., decontamination wastes) as well as materials that have little potential to pose risk to human health and the environment (e.g., sanitary solid wastes).

The following waste streams may be generated during planned project activities:

- Personal protective equipment (PPE); and
- Sanitary trash.

During project activities, waste generation will be minimized at all times to the greatest extent practical. Waste will be minimized by limiting access to restricted areas, decontamination and reuse of equipment, and use of non-hazardous materials.

The overall IDW management approach for the project is described below.

3.3.1 Personal Protective Equipment

Used disposable PPE items utilized during any decontamination of LSA boxes will be collected and placed in the LSA box with other contaminated materials. Container WC-227 is likely to be utilized for the materials as there is still remaining space in the container.

3.3.2 Sanitary Trash

Sanitary trash will consist of general waste materials that do not contact potentially contaminated environmental media. Sanitary trash will be collected in trash cans/bags and will be stored separate from potentially contaminated project IDW. Sanitary trash containers will be clearly labeled as "Sanitary Trash" to prevent the addition of potentially-contaminated materials.

4. QUALITY ASSURANCE PROJECT PLAN

This section of the NFSS project SAP describes the quality assurance procedures that will be followed to ensure quality data for the project.

4.1 DATA QUALITY INDICATORS

At the time of this revision of the SAP, no physical samples or off-site analytical analyses are required. If physical samples or off-site analytical services are identified, this SAP will be revised to identify the type of samples and analytical requirements. If a revision of this SAP is required, Data Quality Indicators (DQIs) for precision, accuracy, representativeness, comparability, and completeness (PARCC) will be developed. Details of the analytical parameters, methods, and quantitation levels will be provided in the event sampling and analysis is required.

4.2 QUALITY CONTROL AND ASSURANCE PROCEDURES

At the time of this revision of the SAP, no physical samples or off-site analytical analyses are required. If physical samples or off-site analytical services are identified, this SAP will be revised to identify the type of samples and analytical requirements. If a revision of this SAP is required, the number and analytical parameters of quality control and quality assurance samples will be identified.

4.3 CHAIN OF CUSTODY

No Chain-of Custody documentation or procedures have been identified for the SAP. Chain-of Custody documentation or procedures will be included if a revision of this SAP is required due to identification of sampling and analysis requirements.

4.4 CALIBRATION PROCEDURES AND FREQUENCY

This section describes procedures for maintaining the accuracy of the instruments and measuring equipment that are used for conducting the exposure rate measurements.

4.4.1 Radiation Monitoring

Radiation detectors are calibrated annually or at a frequency as suggested by the manufacturer. Instruments will be checked daily by using sealed calibration source checks. Calibration dates will be clearly identified on each instrument. All daily calibration check information will be recorded. Daily calibration is performed using traceable sources. Radiation monitoring is discussed in the RPP.

4.5 Corrective Actions

Project personnel will be responsible for reporting all suspected technical and QA nonconformance or suspected deficiencies of any activity or issued document by reporting the situation to his/her direct Supervisor or Manager. Upon notification, the ECC Project Manager (PM) or her designee will be responsible for assessing the suspected problems in consultation with the Project Quality Control Systems Manager (QCSM) to make a decision based on the potential for the situation to impact the quality of the data. When it is determined that the situation warrants a reportable nonconformance and corrective action, then nonconformance documentation will be initiated by the QCSM and approved by the PM.

The ECC PM and the QCSM will be responsible for ensuring that corrective actions for nonconformance are initiated by:

- Evaluating all reported nonconformance(s);
- Controlling additional work on nonconforming items;
- Determining and approving disposition or action to be taken;
- Maintaining a log of nonconformance;
- Reviewing nonconformance documentation and verifying corrective actions taken; and
- Ensuring that nonconformance documents are included in the final site documentation project files.

If appropriate, the PM will ensure that no additional work dependent on the nonconforming activity is performed until the corrective actions are completed.

Corrective action for field measurements may include:

- Repeating the measurement to check the error;
- Checking for all proper adjustments for ambient conditions such as temperature;
- Checking the batteries;
- Re-calibrating equipment;
- Checking the calibration;
- Replacing the instrument or measurement devices; and
- Stopping work (if necessary).

The PM or her designee is responsible for all site activities. In this role, he/she may at times be required to adjust the site activities to accommodate activity-specific needs. When it becomes necessary to modify an activity, the responsible person notifies the PM of the anticipated change and implements the necessary changes after obtaining the approval of the PM and the USACE PM. All such changes will be documented and signed by the initiators, the QCSM and the PM. The PM must approve the change in writing or verbally before field implementation. If unacceptable, the action taken during the period of deviation will be evaluated in order to determine the significance of any departure from established program practices and action taken.

The PM for the site is responsible for controlling, tracking, and implementing the identified changes. Reports on all changes will be distributed to all affected parties, including the USACE PM. The USACE will be notified whenever program changes in the field are made.

4.6 Data Reduction, Evaluation, and Reporting

Data reduction activities including field measurements as well as evaluation of data are included in this section.

4.6.1 Data Reduction

Raw data from field measurements and sample collection activities will be appropriately recorded in field logbooks. Data to be used in project reports will be reduced and summarized. The methods of data reduction will be documented.

The PM or his/her designee is responsible for data review of all field-generated data. This includes verifying that all field descriptive data are recorded properly, that all field instrument calibration requirements have been met, that all field QC data have met frequency and criteria goals, and that field data are entered accurately in all applicable logbooks and worksheets. Manifest packages, including weights, surveys, and packages transported for disposal will be transferred to the USACE. All project photographs will be transferred to the USACE.

4.6.2 Data Evaluation

If physical samples or off-site analytical services are identified, this SAP will be revised to identify the type of samples and analytical requirements. Analytical data evaluation categories such as holding times, blanks, laboratory control samples, recovery, internal standards, and laboratory case narratives will be described.

4.7 Preventative Maintenance Procedures

The field equipment for this project will include alpha/beta and gamma survey meters. Specific preventative maintenance procedures to be followed for field equipment are those recommended by the manufacturers. These procedures are included in the technical procedures governing the use of these instruments.

Field instruments will be checked and/or calibrated before they are shipped or carried to the field. Each field instrument will be checked daily against a traceable standard or reference with a known value to ensure that the instrument is in proper calibration. Instruments found to be out of calibration will be recalibrated before use in the field. If an instrument cannot be calibrated, it will be tagged for return to the supplier or manufacturer for recalibration. A back-up instrument will be used in its place. Calibration checks, calibrations, and maintenance will be documented.

Critical spare parts such as batteries will be kept on-site to minimize down time of malfunctioning instruments. Back-up instruments and equipment should be available on-site or within a 3-day shipment to avoid delays in the field schedules.

Equipment such as forklifts and vehicles will be subject to preventive maintenance as required. Due to the short duration of the field activities, equipment and vehicles are not expected to require maintenance.

4.8 Performance and System Evaluation

Performance and system audits of field activities may be conducted to verify that sampling is performed in accordance with the procedures established in the SAP.

4.8.1 Field Audits

Internal audits of field activities (sampling and measurements) may be conducted by ECC by the QCSM (or designee). Audits of field radiation measurements will be performed by the Project Health Physicist. The audits will include examination of surveys, field instrument operating records, and maintenance of QA procedures. These audits will occur at the onset of the Project to verify that all established procedures are followed (systems audit).

Performance audits will follow to ensure deficiencies have been corrected and to verify that QA practices/procedures are being maintained throughout the duration of the Project. These audits will involve reviewing field measurement records, and instrumentation calibration records.

External audits may be conducted at the discretion of the appropriate regulatory agencies.

4.9 Quality control Reports to Management

During the field activities performed for this project, ECC will prepare daily quality control reports, which will be signed and dated by the QCSM. These reports will be submitted to the USACE PM on a weekly basis. The contents of each report will include a summary of activities performed at the project site, weather information, results of QA/QC activities performed including field instrument calibrations, departures from the approved plans or problems encountered during field activities, and any instructions received from government personnel. Any deviations that may affect the project data quality objectives will be immediately conveyed to the USACE PM.

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Attachment 1

ECC Standard Operating Procedures

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ECC CORPORATE HEALTH & SAFETY PROGRAM AND SELECTED RADIOLOGICAL STANDARD OPERATING PROCEDURES

SOP HS-001 – Reserved
SOP HS-002 – Acknowledgements
SOP HS-003 – Injury & Illness Prevention Program
SOP HS-004 – General Information and Responsibility
SOP HS-005 – Hazard Evaluation Analysis
SOP HS-006 – Air Monitoring Program
SOP HS-007 – Hazard Communication Program
SOP HS-008 – Employee Safety Training Program
SOP HS-009 – Medical Surveillance Program
SOP HS-010 – Site Control Program
SOP HS-011 – Respiratory Protection Program
SOP HS-012 – Personal Protective Equipment Program
SOP HS-013 – Decontamination Program
SOP HS-014 – Hearing Conservation Program
SOP HS-015 – Cold Stress Monitoring Program
SOP HS-016 – Heat Stress Monitoring Program
SOP HS-017 – Confined Space Entry Program
SOP HS-018 – Excavation and Trenching Safety Program
SOP HS-019 – UST and AST Removal Program
SOP HS-020 – Electrical Safety Program
SOP HS-021 – Lockout and Tagout Program
SOP HS-022 – Vehicle and Heavy Equipment Safety Program
SOP HS-023 – Hoisting and Crane Operation Program
SOP HS-024 – Fall Protection Program
SOP HS-025 – Emergency Response and Contingency Program
SOP HS-026 – Spill and Discharge Control Program
SOP HS-027 – Fire Protection Program
SOP HS-028 – Unexploded Ordnance (UXO) Safety Program
SOP HS-029 – Asbestos Abatement Program
SOP HS-030 – Radiation Protection Program
SOP HS-031 – Chemical Hygiene Program
SOP HS-032 – Diving Management Plan
SOP HS-033 – Driver Fleet Safety Program
SOP HS-034 – Biological Hazard Program
SOP HS-035 – Blood Borne Pathogen Program
SOP HS-036 – Drug and Alcohol Program
SOP HS-037 – OSHA Record Keeping Program
SOP HS-038 – Employee Safety Incentive Program
SOP HS-039 – Hand and Power Tools Safety Program
SOP HS-040 – Back Injury Prevention Program
SOP HS-041 – Lead Remediation Operating Procedures
SOP HS-042 – Disciplinary Procedures
SOP HS-043 – Incident Reporting and Investigation
SOP HS-044 – Repeat Vehicle Accident Offender Program

ECC SOP R100, Instrument Calibration and Operational Check-out of Survey Instruments
ECC SOP R102, Gamma Scintillation Detector Check-out and Cross Calibration
ECC SOP R201, Background Measurements and Sampling
ECC SOP R202, General Survey Approaches and Strategies
ECC SOP R204, Surface Scanning
ECC SOP R208, Gamma Radiation Exposure Rate Measurement

Attachment 2

LSA Scanning Survey Results

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LSA Box WC-170

WASTE PACKAGE SURVEY REPORT

Dose Rate 1" See boxes (µR/hr) 1"/1meter
Dose Rate 1meter below (µR/hr)

Rear	Right Side	Top
3.17/3.39	2.97/3.24	3.17/3.64
Front	**Left Side**	**Bottom**
2.79/3.41	3.13/3.48	2.88

Date: 8-6-10 Time: 1030
Meter: 1350-1, # 232725 Probe: 44-10, PR182333
Cal Due Date: [redacted]
Surveyor [redacted]
Review [redacted]

- Background = 3.10 uR/hr - All readings are in uR/hr.
- Only did 1" reading on bottom of box because it was sitting on the ground.

LSA Box WC-175

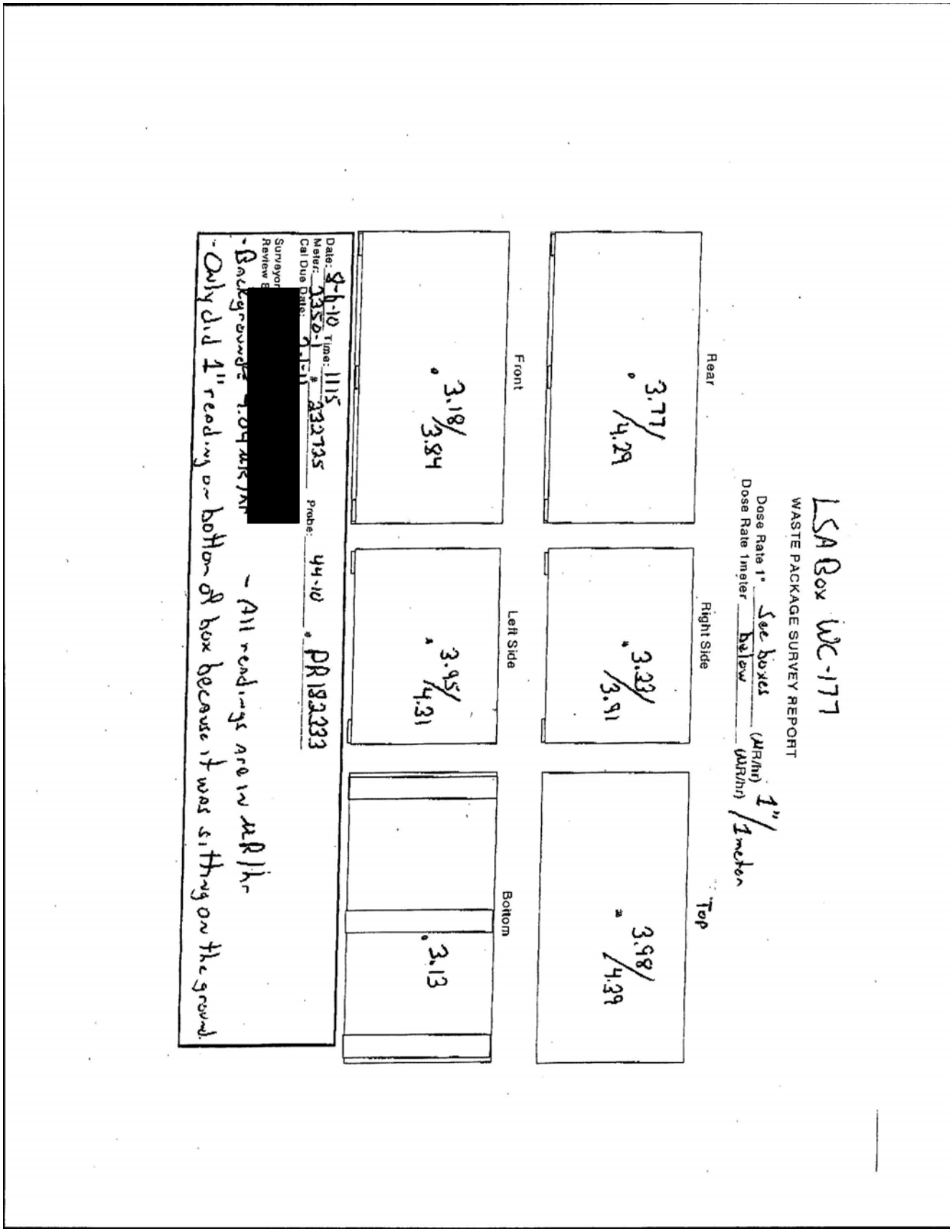
WASTE PACKAGE SURVEY REPORT

Dose Rate 1' see below (µR/hr) 1" / 1 meter
Dose Rate 1meter below (µR/hr)

Rear: 3.06 / 3.77
Right Side: 3.10 / 3.68
Top: 3.19 / 4.02
Front: 3.23 / 3.67
Left Side: 3.18 / 3.81
Bottom: 3.11

Date: 8-6-10 Time: 1050
Meter: 2350-1 S/N: 232725 Probe: 44-10 S/N: PR182333
Cal Due Date:
Surveyor: [redacted]
Review By:

- Background = 7.07 mR/hr
- Only did 1" readings on bottom of box because it was sitting on the ground.
- All readings are in mR/hr


LSA Box WC-177
WASTE PACKAGE SURVEY REPORT
Dose Rate 1" See boxes (μR/hr)
Dose Rate 1meter below (μR/hr)
1" / 1 meter
Rear
3.77 / 4.29
Right Side
3.33 / 3.91
Top
3.98 / 4.39
Front
3.18 / 3.84
Left Side
3.95 / 4.31
Bottom
3.13
Date: 8-6-10 Time: 1115
Meter: 33501 * 332735 Probe: 44-40 * PR182333
Cal Due Date: 2-1-11
Surveyor
Review
- Background 4.09 MR/hr
- All readings are in MR/hr
- Only did 1" readings on bottom of box because it was sitting on the ground.

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