**881 HILLSIDE GEOTECHNICAL INVESTIGATION**

**HEALTH AND SAFETY DOCUMENTATION**

"REVIEWED FOR CLASSIFICATION/UCNI
By B. L. MILLER
Date 6-12-90"

**ADMIN RECORD**

"REVIEWED FOR CLASSIFICATION/UCNI
By [illegible]
Date 5/16/90"

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# ADDENDUM 1 TO THE 881 HILLSIDE GEOTECHNICAL INVESTIGATION HEALTH AND SAFETY PLAN

On March 26, 1990, the Environmental Protection Agency (EPA) conducted a performance audit of activities on the 881 Hillside Geotechnical Investigation As a consequence, the site specific 881 Hillside Geotechnical Investigation Health and Safety plan has been modified and/or clarified The modifications and clarifications presented herein supercede the relevant portions of the existing plan

## DUST SUPPRESSION

Under Section III A 1 of the 881 Hillside Geotechnical Investigation Health and Safety Plan, engineering control methods for suppression of dust include wetting soil during drilling operations Dust suppression in these areas will be based on wind speed and an inspection of the soil moisture at the time of drilling

## RADIATION MONITORING

The use of Radiation Monitoring Equipment is described in Section IV A 1 in the 881 Hillside Geotechnical Investigation Site Specific Health & Safety Plan Two types of radiation monitoring devices will be used during drilling activities, the GM-pancake (beta gamma detection) and an alpha scintillometer (alpha particle detection) Radioactive material is generally in surface and shallow subsurface top soil Therefore, radiation monitoring should be conducted while drilling (augering) to bedrock As an added precaution, bedrock coring operations will also be monitored for radioactivity Continuous monitoring during drilling is required in all areas where above background radioactivity is encountered Readings above 3X background warrant evacuation and notification of EG&G and the Regional Health and Safety Officer Radiation monitoring will be conducted under the guidance of the 881 Hillside Geotechnical Investigation Site Safety Officer

## HEALTH AND SAFETY TRAINING PRIOR TO FIELD ACTIVITIES

Prior to February 2, 1990, 881 Hillside drilling activities began, radiation health and safety training was given to project personnel on January 15 and 29, 1990 Radiation Health and Safety training was presented by Frank Kabot-Rocky Mountain Operations Regional Health and Safety Officer The first two-hour session was presented on the 15th of January 1990 The agenda is included as Attachment 1 and subjects covered include radiation theory, ionizing radiation, radiation characteristics, radiation detection and units of measurement, and exposure The second two-hour training program, given on the 29th of January, addressed instrument operation, instrument application to sample types, and instrument calibration using calibration sources

To date, no above background radioactivity or organic vapors have been detected in the 881 Geotechnical Investigation EG&G radiation protection personnel and Health and Safety personnel have conducted daily monitoring

## DAILY HEALTH AND SAFETY SUMMARY FORMS

In order to assist in organizing Health and Safety records of the 881 Hillside Geotechnical Site Investigation, Daily Health & Safety forms shall be used These forms contain important health & safety information which shall be documented by each drilling rig crew Personnel working on the drill rig shall be responsible for completing the form At the end of the day, the site Health & Safety Coordinator is responsible for consolidating each crew's form into one composite form (saving originals). The site Health & Safety Officer will then post a copy of each daily form in the field trailer and provide the EG&G Environmental Restoration field supervisor with the original daily form Backup information (logbooks, calibration forms etc ) will be attached Attachment 2 provides a copy of the Daily Health & Safety Summary form and the instructions for its completion

## ATTACHMENT 1

## TRAINING AGENDA (2 HOURS)

### Radioactivity/Ionizing Radiation

Nature of the Atom and Atomic Nucleus

Radiation Types, Electromagnetic Spectrum

- Microwave
- Ultraviolet - Visible - Infra Red (UV-VIS-IR)
- X-Rays
- High Energy Gamma Rays

Ionizing Radiation

High Energy Radiation

- X-Rays
- Gamma Rays

Subatomic Particles

- $\alpha$ particles
- $\beta$ particles
- neutrons
- positrons

Radiation Characteristics

- Penetration
- Distance
- Shielding

Radionuclide Characteristics

- Half Life
- Radiation Emitted
- Energy

Radiation Measurement

- Activity
- Curie
- RAD and REM
- Roentgen
- Quality Factor

Radiation Protection

- External
- Internal

## TRAINING AGENDA (2 HOURS)
## Radiation Detection

Radiation of Concern at RFP

Radiation Detection

- Gas Ionization
- Scintillation
- GM
- Thermoluminescence
- Photographic Emulsion

Instrumentation Types

- Ludlum
- Pancake
- Fidler
- Smears

Instrumentation Use and Calibration

## ATTACHMENT 2

## INSTRUCTIONS FOR FILLING OUT THE DAILY PROJECT LOG

### 1 0 Introduction

This discussion provides instructions for filling out the Environmental Restoration Department's Daily Project Log. The Daily Project Log is designed to document site-specific health and safety requirements implemented and observed in the field for construction, drilling, and environmental monitoring activities on a daily basis.

The log is a daily summary of: (1) health and safety requirements used and implemented, (2) general climatic conditions encountered; and, (3) a summary of environmental monitoring recorded each day All modifications or departures from the site-specific plans and procedures shall be documented and noted in this log.

### 2.0 LOG PREPARATION INSTRUCTIONS

### 2.1 Daily Site Health and Safety Requirements

The on-site health and safety officer will provide a summary of daily health and safety requirements used during the day As shown on the form in Section 1 0, specific requirements followed, documentation of field inspections, and the time of inspection will be noted. The name and signature of the inspector and the employer will be included on the right side of the form next the time of inspection. Any other comments regarding anything that pertains to health and safety field requirements shall be noted in the comments.

### 2 2 Climate Conditions

Section 2.0 is designed for the on-site health and safety officer to record a summary of daily climatic conditions. Qualitative readings are sufficient for this daily log; however, if quantitative readings are known

those readings should be noted as such. Any other comments regarding anything that pertains to climatic conditions encountered on a specific day shall be noted in the comments.

## 2 3 Summary of Environmental Controls and Monitoring

Section 3.0 is designed to record a summary of monitoring for radiation and organic vapors during construction, drilling and environmental monitoring activities on a daily basis. The on-site health and safety officer should provide a summary of details regarding monitoring conducted over the course of the day for each site location If monitoring was performed but gross or acute readings were not observed, then that should be noted in the comments. Any other expectations or additions to the daily monitoring summary shall also be noted in the comments.

## 3 0 ATTACHMENTS

The consultant or subcontractor shall attach copies of daily records such as air monitoring, radiation monitoring and calibration forms, field notes and all other information which is appropriate and provides documentation for filing of the daily log with EG&G's Environmental Restoration Department (ERD) The log will not be accepted by ERD if back-up materials are not attached.

## 4 0 LOG SUBMISSION

The consultant's or contractor's on-site health and safety officer will fill out this form daily and submit it to EG&G's Field Supervisor prior to starting work the following morning.

# DAILY PROJECT LOG

Project _____ Task _____

Date _____ Time _____

## 1.0 DAILY SITE HEALTH AND SAFETY REQUIREMENTS

| Requirements | Inspected By | Time of Inspection |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

Comments _____

## 2.0 CLIMATIC PHYSICAL CONDITIONS

| Condition | Time | Qualitative Reading |
|---|---|---|
| Wind | | |
| Precip. | | |
| Temp. | | |
| Sun (%) | | |
| Soil Moisture | | |

Comments _____

## 3.0 SUMMARY OF ENVIRONMENTAL CONTROLS AND MONITORING

| Radiation Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| Ludlum | | | | |
| Pancake | | | | |
| Fiddler | | | | |
| Smears | | | | |

Comments _____

| Organic Vapor Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| PID or FID (Circle one) | | | | |

Comments _____

# SITE HEALTH AND SAFETY PLAN (HASP) FORM

Prepared By: T BARRETT Date 01 08 90 W.O.# 2029-33 09
FRANK J. KABOT

I General Information

A Project Identification

1 Division E 2. Department/Office DENVER

4. Site Name 881 Hillside 5. Client EG & G

6 Work Location Address ~~Golden CO~~
881 Hillside Area is located on the south side of the Rocky Flats Plant security area. Well drilling locations are along the proposed French drain. French drain will not cross over [illegible] the identified SWMU

B. Site History

1 Describe briefly: The following Solid Waste Management Units have been identified in the 881 Hillside Area
Oil Sludge Pit, Chemical Burial Site, Liquid Dumping Site, Out of service Fuel Tanks, Outfall site, Radioactive site.

C. Scope of Work

1 Describe briefly:
GEOTECHNICAL BORINGS/SAMPLING, WELL CONSTRUCTION AND CONSTRUCTION OF FRENCH DRAIN

( ) Site Visit only. Site HASP not necessary, list personnel here & sign-off below:

_____, _____, _____, _____

D Hazard Assessment and Regulatory Status

1 Indicate Yes (Y)/No (N) to types of hazards anticipated. (Y) Physio-chemical; Toxic Chemical - Levels (N) >TLV-TWA, (N) >TLV-STEL, (N) >IDLH, (N) Bio-Hazards; (Y) Radiation; ( ) Physical; (Y) Construction type; ( ) Industrial type; (Y) Nuclear Industry type

2. Site Regulatory Status: CERCLA/SARA - (Y) U.S. EPA, (Y) State, ( ) NPL Site; RCRA - (Y) U.S. EPA, (Y) State; OSHA - (Y) 1910, ( ) 1926, ( ) State; NRC -(Y) 10 CFR 20; Other Fed. Agency - (Y) DOE, ( ) USATHAMA, ( ) Air Force; Based on the Hazard Assessment and Regulatory Status, determine the Standard HASP(s) applicable to this project. Indicate below which Standard Hasp will be used and append the appropriate pages of this Form along with the Standard Plan.

3. Standard Plan to be used: ( ) Stack Test ( ) Air Emissions ( ) Asbestos ( ) Industrial Hygiene ( ) Life Systems ( ) Hazardous Mat. ( ) Construction ( ) NRC/DOE ( ) USATHAMA ( ) Air Force

D Review and Approval Documentation

1 Reviewed By: a. P.M. Bert J. Hyde Date: 29 January 1990
b. P.D. Date:
c. DSO/RSO Date:
d. SHSC Date:

2. Approved By: Frank Kabot Date: 29 Jan 1990
( ) a. Corporate Health and Safety Director (CHSD)
( ) b. DSO/RSO (Only with specific delegation by CHSD)

Project Start Date: 01 15 90 End Date: 12 31 90 This Site HASP must be Reissued/Reapproved for any activities conducted after: Date 12-31-90

Amendment Date(s) 1. 2. 3. 4 5.

## E. KEY PERSONNEL/IDENTIFICATION OF HEALTH AND SAFETY PERSONNEL

### 1.0 Key Personnel

The following personnel and organizations are key to the activities at this site.

EPA Representatives

| Organization/Branch | Name/Title | Address | Telephone |
|---|---|---|---|

Roles and Responsibilities:

Other EPA Contractors & Subcontractors

| Organization/Branch | Name/Title | Address | Telephone |
|---|---|---|---|

**Roles and Responsibilities:**

**Other Regulatory Agency Representatives**

| Organization/Branch | Name/Title | Address | Telephone |
|---|---|---|---|

**Roles and Responsibilities:**

**WESTON Representatives**

| Organization/Branch | Name/Title | Address | Telephone |
|---|---|---|---|
| ECON | Bert Hyde/PM | | 303 980 6800 |
| | Janet Marks/Site Mgr | | |
| | Greg Sherman/Geotech Task Mgr | | |
| | Scott Yoshino/Site Safety Coordinator | | |

**Roles and Responsibilities.**

Bert Hype - overall project responsibility

Janet Marks - responsible for daily project activity of field crew and subcontractors.

Tom Barrett - Responsible for on site health & safety

Scott Yoshino -

(WESTON Subcontractors)

| Organization/Branch | Name/Title | Address | Telephone |
|---|---|---|---|
| 1) Boyles Brothers Drilling Co. | Karl High | 15865 W. 5th Ave. Golden, CO 80401 | |
| 2) Chett and Assoc | | 96 So Zuni St Denver CO 80223 | |
| 3) SALAZAR | | | |

Roles and Responsibilities:

1) Drilling

2) Geotechnical Oversight of Drilling Activities

2.2 Site Specific Health and Safety Personnel

The SHSC for activities to be conducted at this Site is Thomas Barrett / Scott Yoshine

The Site Health and Safety Coordinator (SHSC) has total responsibility for ensuring that the provisions of this Site HASP are adequate and implemented in the field.

Changing field conditions may require decisions to be made concerning adequate protection programs. Therefore, the personnel assigned as SHSC's are experienced and meet the additional training requirements specified by OSHA in 29 CFR 1910.120

Qualifications:

~~Meet all corporate and federal requirements as stated above~~

40 Hour OSHA Training, 8 Hour Refresher, 8 hour Site Safety Coordinator, CPR & First Aid

Designated alternatives include:

II. Health and Safety Evaluation

A Hazard Assessment

1 Background Review: Complete (X) Partial ( ) If partial, why? _____

See Attachment 1

2. Activities Covered Under this Plan

| No | Task/Subtask | Description | Schedule Begin 29dA |
|---|---|---|---|
| 09 | Geotechnical Investigation of 881 Hillside Area where French Drain will be Installed. Activity Includes Drilling and Geotechnical Sampling and Logging. | | |

3 Types of Hazards: (Place a Y/N in each ( ) to indicate presence/absence of hazard)

a. PhysioChemical (X) Flammable ( ) Explosive ( ) Corrosive ( ) Reactive ( ) $O_2$ Rich ( ) $O_2$ Deficient [1]*

Chemically Toxic (X) Inhal (X) Ingest. ( ) Cont ( ) Absorb ( ) Carcin (X) Mutagen ( ) Terat. ( ) OSHA 1910 1000 Substance ( ) OSHA Specific Hazard. Sub Standard, Describe _____

b Biological ( ) Etiol Agent ( ) Other - Plant insect animal [2]*

c Radiation Ionizing - ( ) Internal Exposure (X) External exposure [3]* Non-ionizing - ( ) UV, ( ) IR, ( ) RF, ( ) MicroW, ( ) LASER

d. Physical Hazards (X) [4]* e. Construction Activities ( ) [5]*
Drilling, heavy equipment

* The number in the [ ] refers to one of the following hazard evaluation forms Complete hazard evaluation forms for each appropriate Hazard Class

B Source/Location of Contaminants and Hazardous Substances

1 Directly Related to Tasks

(X) Air , (X) Soil
( ) Other Surface , ( ) S. Water
(X) G. Water , ( ) Other

2 Indirectly Related to Work - Nearby Process(s) which could affect team members
Not Applicable
( ) Client Facility; ( ) Nearby Non-client Facility. Describe:

( ) Client briefing arranged.

---

[1] Chemical Hazards

[a] Identify and attach Material Safety Data Sheets for all reagent type chemicals, solutions or other materials identified as or which in normal use could produce hazardous substances used in performing tasks related to tasks related to this project. (X) N/A

[b] Chemical Contaminants of Concern ( ) N/A If present, provide following data.

See Attachment 2

| Hazardous Substance/ Tasks | Physical Properties and Characteristics* | Exposure Limits PEL/TLV** | Route(s)of Exposure***/ Symptoms | Monitoring Instruments/IP+ % Response |
|---|---|---|---|---|

(* ) State _____

pH____ FP_____ LEL_____ UEL_____

Auto.Ig_____ BP _____ MP_____

Incompatible with -

_____

_____

_____

Sp.Gr_____ Vap.D_____

Vap.P_____ H20 Sol._____

Oth._____

---

(* ) State _____

pH____ FP_____ LEL_____ UEL_____

Auto.Ig_____ BP _____ MP_____

Incompatible with -

_____

_____

_____

Sp.Gr_____ Vap.D_____

Vap.P_____ H20 Sol _____

Oth _____

---

* E = Explosive, F = Flammable, C = Corrosive, R = Reactive, W = Water reactive, O = Oxidizer, Ra = Radioactive State = Normal physical state at site/proj temp

Attachment 2

** Use lowest of two, if no TLV/PEL, use Toxicity data in following order: Lowest Toxic Conc. in humans (LTC-HMN), Lowest Lethal Conc. in humans (LLC-HMN), Lowest Toxic Dose in humans (LTD-HMN), Lowest Lethal Dose in humans (LLD-HMN), $LC_{50}$ or $LD_{50}$ in humans, the Lowest Toxic Concentration or Lowest Toxic Dose in animals, the lowest $LC_{50}$ or $LD_{50}$ in animals.

*** I = Inhalation, G = Ingestion, S = Skin Absorption, C= Contact, D - Direct Penetration

+ IP = Ionization Potential

[1] Chemical Hazards

[a] Identify and attach Material Safety Data Sheets for all reagent type chemicals, solutions or other materials identified as or which in normal use could produce hazardous substances used in performing tasks related to tasks related to this project ( ) N/A

[b] Chemical Contaminants of Concern ( ) N/A If present, provide following data

| Hazardous Substance/ Tasks | Physical Properties and Characteristics* | Exposure Limits PEL/TLV** | Route(s)of Exposure***/ Symptoms | Monitoring Instruments, IP+ % Response |
|---|---|---|---|---|
| | (* ) State_____<br>pH____FP_____LEL_____UEL_____<br>Auto Ig_____BP _____MP_____<br>Incompatible with -<br>_____<br>_____<br>_____<br>Sp.Gr_____Vap.D_____<br>Vap.P_____H20 Sol _____<br>Oth._____ | | | |
| | (* ) State_____<br>pH____FP_____LEL_____UEL_____<br>Auto Ig_____BP _____MP_____<br>Incompatible with -<br>_____<br>_____<br>_____<br>Sp.Gr_____Vap.D_____<br>Vap.P_____H20 Sol _____<br>Oth._____ | | | |

Attachment 2

* E = Explosive, F = Flammable, C = Corrosive, R = Reactive, W = Water reactive, O = Oxidizer, Ra = Radioactive. State = Normal physical state at site/proj. temp

** Use lowest of two, if no TLV/PEL, use Toxicity data in following order Lowest Toxic Conc. in humans (LTC-HMN), Lowest Lethal Conc in humans (LLC-HMN), Lowest Toxic Dose in humans (LTD-HMN), Lowest Lethal Dose in humans (LLD-HMN), $LC_{50}$ or $LD_{50}$ in humans, the Lowest Toxic Concentration or Lowest Toxic Dose in animals, the lowest $LC_{50}$ or $LD_{50}$ in animals.

*** I = Inhalation, G = Ingestion, S = Skin Absorption, C= Contact, D - Direct Penetration

+ IP = Ionization Potential

[2] Biological Hazards Of Concern None

| No Hazard | (Y/N) | Task No (s)* | Location/ Source (K,S)** | Route of Exposure (I,G,C,D)+ | Team Member(s) Allergic? | Immunization Required? |
|---|---|---|---|---|---|---|
| 1 Poisonous Plants | ( ) | | | | | |
| 2 Insects | ( ) | | | | | |
| 3 Snakes, Reptiles | ( ) | | | | | |
| 4 Animals | ( ) | | | | | |
| 5 Sewage | ( ) | | | | | |
| 6 Etiologic Agents | ( ) (List) | | | | | |

* List all task Nos. which would involve potential exposure to these hazard(s)
** K = Known, S = Suspect. + I = Inhalation, G = Ingestion, C = Contact, D = Direct Penetration (Bite, Inject, Open wound or sore)

[3] Radiation Hazards of Concern

TYPE

1 Ionizing

DOE Order 5480.11
10CFR 20 Table II

| Radionuclide | Location/ Source | Type Emiter | Task No (s) | Air MPC µCi/cc Exposure Limits | Protection Protocol Reference |
|---|---|---|---|---|---|
| $Pu^{238,239,240}$ | soil | α, gamma | 09 | $2 \times 10^{-12}$ | |
| $Am^{241}$ | soil | α, gamma | 09 | $2 \times 10^{-12}$ | |
| $U^{238}$ | soil | α, gamma electron | 09 | $2 \times 10^{-11}$ (DOE) $3 \times 10^{-12}$ (10CFR) | |

2. Non-ionizing N/A

| Radionuclide | Location/ Source | Type Emiter | Task No.(s) | Exposure Limits | Protection Protocol Reference |
|---|---|---|---|---|---|
| Ultra Violet | | | | | |
| Infra Red | | | | | |
| Microwave | | | | | |
| Radio-Freq. | | | | | |
| LASER | | | | | |

[4] Physical Hazards of Concern

| | | Hazard (Y/N) | Task No.(s) | Protection OP(s) Attached |
|---|---|---|---|---|
| 1 Noise | | ( ) | | |
| 2. Heat - ambient air | | ( ) | | |
| - Hot Process - Steam | | ( ) | | |
| - Hot Process - LT3 | | ( ) | | |
| - Hot Process - Incin. | | ( ) | | |
| 3. Cold | | (Y) | 09 | |
| 4. Rain | | ( ) | | |
| 5. Snow | | (Y) | | |
| 6. Electric Storms | | ( ) | | |
| 7 Confined Space Entry | | ( ) | | |
| 8 "Hot Work" | | ( ) | | |
| 9 Heavy Manual Lifting/Moving | | (Y) | ✓ | |
| 10. Rough Terrain | | (Y) | ✓ | |
| 11. Housekeeping | | ( ) | | |
| 12. Structural Integrety | | ( ) | | |
| 13. Neighborhood | | ( ) | | |
| 14 Remote Area | | ( ) | | |
| 15. Compressed Gases | | ( ) | | |
| 16. Diving | | ( ) | | |
| 17. Using Boats | | ( ) | | |
| 18. Working over Water | | ( ) | | |
| 19. Traffic | | ( ) | | |
| 20. Explosives | | ( ) | | |
| 21. Heavy Equipment Operation | | (Y) | ✓ | |
| 22. Lifting Equipment Operation. | - Cranes. | (Y) | ✓ | |
| | - Manlifts | ( ) | | |
| 23. Working at Elevation | | ( ) | | |
| 24 Using Ladders | | ( ) | | |
| 25. Using Scaffolding | | ( ) | | |

| | Hazard (Y/N) | Task No(s) | Protection OP(s) Attached |
|---|---|---|---|
| 26 Excavating/Trenching | ( ) | | |
| 27. Materials Handling | ( ) | | |
| 28 Haz. Mat. Use/Storage - flam liq /gases | ( ) | | |
| - oxidizers | ( ) | | |
| - corrosives | ( ) | | |
| 29 Fire Prevent/Reponse plan required | ( ) | | |
| 30. Fire Extinguishers required | X | | |
| 31 Demolition | ( ) | | |
| 32. Utilities - Underground | ( ) | | |
| - Overhead | ( ) | | |
| 33. Electrical - General | ( ) | | |
| - High Voltage | ( ) | | |
| 34 Welding/cutting/burning | ( ) | | |
| 35 Hand tools | ( ) | | |
| 36 Power Hand Tools | ( ) | | |
| 37 High Pressure Water | ( ) | | |
| 38 Other Drilling Hazards | X | | |
| 39 Other _____ | ( ) | | |
| 40 Other _____ | ( ) | | |

TASK BY TASK RISK ANALYSIS

The preceding Tables identify the hazards known or suspected to be present in accomplishing the tasks involved in this project

Section II A. 2. of this HASP describes the background of this site/project and identifies the tasks involved.

Below briefly describe each task and the likelihood of exposure to the hazards identified and the protective protocols to be used.

1 Drilling and geotechnical logging will be performed along the proposed location of the french drain. No drillir will take place in the identified SWMU's. Work will be performed in Level D (modified)

III Personnel Protection Plan

A Engineering Controls

1 Describe Engineering Controls used as part of Personnel Protection Plan.

Task(s)

09 Dust suppression will be accomplished by wetting soil during drilling operations.

B. Administrative Controls

1. Describe Administrative controls used as part of Personnel Protection Plan:

Task(s) All personnel will have OSHA training and medical certification.

C. Personnel Protective Equipment *

1. Action Levels for Changing Levels of Protection

(1) Task No.(s) Define Action Levels for up or down grade for each task

09 Any reading above background in the breathing zone will result in upgrade to level C. Readings encountered above 5 units in the breathing zone will result in upgrade to level B.

c Description of Levels

| Task(s) | 09 | |
|---|---|---|
| | Level D | Level D |
| Head | (X) Hardhat | ( ) |
| Eye & Face | (X) Safety glasses with side shields | ( ) |
| Hearing | ( ) | ( ) |
| Arms & Legs only | ( ) | ( ) |
| Whole Body | (X) Tyvek Coveralls | ( ) |
| Apron | ( ) | ( ) |
| Hand - gloves | (X) Cotton work gloves | ( ) |
| - gloves | ( ) | ( ) |
| - gloves | ( ) | ( ) |
| Foot - Boots | (X) Safety shoes | ( ) |
| - Boots | (X) Boot covers | ( ) |
| - Boots | ( ) | ( ) |

| Task(s) | 09 | |
|---|---|---|
| | Level C | Level _ |
| Head | * Hard Hat | |
| Eye & Face | * Safety Glasses | ( ) |
| Hearing | ( ) | ( ) |
| Arms & Legs only | ( ) | ( ) |
| Whole Body | * Tyvek Coveralls | ( ) |
| Apron | ( ) | ( ) |
| Hand - gloves | * Cotton work gloves/liners | ( ) |
| - gloves | * Nitrile outer gloves | ( ) |
| - gloves | ( ) | ( ) |
| Foot - Boots | * Safety Boots | ( ) |
| - Boots | * Boot Covers | ( ) |
| - Boots | ( ) | ( ) |
| APR - Neg. Pres. | ( ) | ( ) |
| Half Face | ( ) | ( ) |
| Cart./Canister | ( ) | ( ) |
| Full Face | * | ( ) |
| Cart./Canister | * GMC-H | ( ) |
| PAPR | ( ) | ( ) |
| Cart./Canister Type C | ( ) | ( ) |
| SAR - Airline | ( ) | ( ) |
| SCBA | ( ) | ( ) |
| Comb. Airline/SCBA | ( ) | ( ) |
| Cascade Syst. | ( ) | ( ) |
| Compressor | ( ) | ( ) |
| Fall Protection | ( ) | ( ) |
| Floatation | ( ) | ( ) |

| Task(s) | _____ | _____ |
|---|---|---|
| | Level __ | Level __ |
| Head | ( ) | ( ) |
| Eye & Face | ( ) | ( ) |
| Hearing | ( ) | ( ) |
| Arms & Legs only | ( ) | ( ) |
| Whole Body | ( ) | ( ) |
| Apron | ( ) | ( ) |
| Hand - gloves | ( ) | ( ) |
| - gloves | ( ) | ( ) |
| - gloves | ( ) | ( ) |
| Foot - Boots | ( ) | ( ) |
| - Boots | ( ) | ( ) |
| - Boots | ( ) | ( ) |
| APR - Neg. Pres. | ( ) | ( ) |
| Half Face | ( ) | ( ) |
| Cart./Canister | ( ) | ( ) |
| Full Face | ( ) | ( ) |
| Cart./Canister | ( ) | ( ) |
| PAPR | ( ) | ( ) |
| Cart./Canister Type C | ( ) | ( ) |
| SAR - Airline | ( ) | ( ) |
| SCBA | ( ) | ( ) |
| Comb. Airline/SCBA | ( ) | ( ) |
| Cascade Syst. | ( ) | ( ) |
| Compressor | ( ) | ( ) |
| Fall Protection | ( ) | ( ) |
| Floatation | ( ) | ( ) |

IV Site or Project Hazard Monitoring Program

A. Direct Reading Air Monitoring Instruments

1 Instrument Selection & Initial Check Record

All instruments will be calibrated daily prior to being taken into the field

| | No. | Task No (s) | Instrument Checked Upon Receipt | Initials |
|---|---|---|---|---|
| CGI | ( ) | | | |
| O2 | ( ) | | | |
| CGI/O2 | ( ) | | | |
| CGI/O2/tox-PPM.H2S.H2S/CO | ( ) | | | |
| RAD-GM. Pancake | X | | | |
| - NaI | ( ) | | | |
| - ZnS α, scintillometer | X | | | |
| - OTHER_____ | ( ) | | | |
| PID | ( ) | | | |
| - HNU 10.2 | X | | | |
| - HNU 11.7 | ( ) | | | |
| - HNU 9 5, | ( ) | | | |
| - PHOTOVAC.TMA.OTHER | ( ) | | | |
| FID | ( ) | | | |
| - FOX-128 | X | | | |
| - FOX 128GC | ( ) | | | |
| -HEATH.AID.OTHER____ | ( ) | | | |
| RAM, Mini-RAM, Other____ | X | | | |
| MONITOX-HCN | ( ) | | | |
| H2S | ( ) | | | |
| COCL, | ( ) | | | |

The OVA 128 will be used in lieu of PID when atmospheric humidity makes the PID unusable

| Instrument, Mfg., Model, Eqp. I.D. No. | Date | Time | Calib. Material | Calib. Method Mfg.'s | Other | Initial Setting& Reading | Final Setting& Reading | Calibs. Initials |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
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Site Air Monitoring Program

Air Monitoring Instrument:

**Air Monitoring Frequency** **Tasks** C9

___ 1 Periodically
___ 2. Periodically
✓ 3. Continuous
___ 4 Other:

**Monitoring Locations** **Tasks**

___ 1. Upwind/downwind of site activities.
___ 2. Near residents, etc.
___ 3. Key site activity locations:
- ___ decon area
- ___ staging area
- ___ excavation area
- ___ field lab area
- ___ storage tanks
- ___ lagoons
- ___ drums

| | No. | Task No.(s) | Instrument Checked Upon Receipt | Initials |
|---|---|---|---|---|
| SO2. | ( ) | | | |
| OTHER TLD | X | | all Weston project staff will particip in WESTON's TLD Program. | |
| Bio-Aerosol Monitor | ( ) | | | |
| Detector Tubes | ( ) | | | |
| Pump - MSA,Draeger,Sensidyne | ( ) | | | |
| - Tubes(No.)/type | ( ) | | | |
| - Tubes(No.)/type | ( ) | | | |

Reporting Format:

X 1 Field Notebook ___ 2 Field Data Sheets ___ 3 Air Monitoring Log
___ 4 Trip Report ___ 5 Other

2. Direct Reading Air Monitoring Instruments Calibration Record

| Instrument, Mfg., Model, Eqp I.D. No. | Date | Time | Calib. Material | Calib. Method Mfg.'s | Other | Initial Setting& Reading | Final Setting& Reading | Calibs Initials |
|---|---|---|---|---|---|---|---|---|
| | | | | | | | | |
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| | | | | | | | | |

___ 4 Fixed stations
X 5. Other: Drilling Site

Air Monitoring Instrument: PID/FID/

**Air Monitoring Frequency** Tasks 09

___ 1. Periodically
___ 2. Periodically
X 3. Continuous
___ 4 Other:

**Monitoring Locations** Tasks 07

___ 1. Upwind/downwind of site activities.
___ 2. Near residents, etc.
___ 3. Key site activity locations:
___ decon area
___ staging area
___ excavation area
___ field lab area
___ storage tanks
___ lagoons
___ Drums
___ 4 Fixed stations
X 5. Other: Drilling Site

D. Action Levels

___ 1. Explosive atmosphere: Tasks:

| Action Level | Action |
|---|---|
| <10% LEL | Continue investigation |
| 10%-25% LEL | Continue on-site monitoring with extreme caution as higher levels are encountered. |
| >25% LEL | Explosion hazard. Withdraw from area immediately. |

___ 2. Oxygen: Tasks:

| Action Level | Action |
|---|---|
| <19.5% | Monitor wearing SCBA. |
| | NOTE. Combustible gas readings may not be valid in atmospheres with <19 5% oxygen. |
| 19.5%-25% | Continue investigation with caution, as Oxygen levels > 21% require extreme caution. Other than normal level may be due to presence of other substances. |

| | | |
|---|---|---|
| | >25% | Fire hazard potential. Stop work and Consult a fire safety specialist. |
| X | 3 Radiation. | Tasks. 09 |
| | Action Level | Action |
| | 3 x Bkg - <2 mR/hr | Radiation above background levels (normally 0 01-0 02 mR/hr)g signifies possible source(s) radiation present.<br><br>Continue investigation with caution. Perform thorough monitoring. Consult with a health physicist |
| | > 2 mrem/hr | Potential radiation hazard Evacuate site Continue investigation only upon the advice of a health physicist. |
| X | 4 Organic gases and vapors | > Background (level C) < 5 unit |
| ___ | 5 Inorganic gases and vapors | |
| | Action Level | Action |
| | Depends on chemical | Consult standard reference manuals or air concentration/toxicity data Action level depends on PEL, REL, TLV |

These Action Levels, if not defined by regulation, is some percent (usually 50%) of the applicable PEL/REL/TLV. That number must also be adjusted to account for instrument response factors

Ambient Air Sampling - Decision Logic and action levels to institute Air Sampling

___ No air sampling is required on this site

X An air sampling plan is incorporated in this HASP

Check situations which will require or action levels which will apply to deciding to institute or increase scope of planned air sampling

Meteorological conditions:

___ a. Dry weather for ___ days.
___ b. ambient temperature above __ °F

X c Wind increasing potential of more contaminant dispersion in or migration out of controlled area. Work will cease when wind speed exceeds safe level as determined by Site Manager or RFP (35 mph)

Activities which will require instituting or increasing scope of air sampling.

___ a major spills

___ b. new site activity resulting in potential presence of new chemical hazards.

___ c. site activity increases airborne contaminants possibilities

___ d. Air sampling documentation required for:
___ Downgrading from stipulated level of protection.
___ Documenting no migration of contaminants off site through air

Applicable Action Levels for instituting Air Sampling: (Check as Appropriate)

X a. Visible vapor/gas clouds or vapors levels, or
b. Visible dust or particulate levels measured with Direct Reading Instrument, two - three times background or above action level, sustained over 10-15 minute period.

1) Sampling Matrix/air interface - Monitor matrix/air interface and breathing zone periodically with DRI, if Vapor levels > 2-3 times background, monitor continuously, follow No. 4.

2) Container opening - Monitor opening and breathing zone periodically with DRI, if Vapor levels > 2-3 times background, monitor opening and breathing zone continuously, follow No. 4

3) Excavation/Drilling/Intrusive work - Monitor at ground level and breathing zone periodically with DRI, if Vapor levels > 2-3 times background, monitor opening and breathing zone continuously, follow No. 4

4) Breathing zone - Ensure level of protection specified in HASP is being used. Consult HASP or Corporate Health and Safety relative to instituting personnel, area or perimeter Sampling.

Other:

B. Sample Location

___ 1. Ambient background - Locations: Substances Sampled for

a.
b.

___ 2. Personal samples on-site - Locations

a.
b.
c.
d.
e.
f.

___ 3. Personal samples, off-site - Locations

a.
b.
c.
d.

____ 4 **Fixed on-site samples - Locations:**

a.
b.
c.
d.
e.
f

____ 5 **Fixed off-site samples - Locations:**

a.
b.
c.
d.
e.

____ 6. **Mobile off-site samples - Locations:**

a.
b
c.

____ 7 **Mobile on-site samples - Locations.**

a.
b.
c.

____ 8. **Background sample stations - Locations**

a.
b.
c.

B Air Sampling

1 Personal Sampling Pumps - Gilian,SKC,MSA No ( )

Sampling Media - Sorbent Tubes

| Task(s) | Location | Duration | Frequency | Type | Anal. Meth. |
|---|---|---|---|---|---|

**Sampling Media - Filter**

| Task(s) | Location | Duration | Frequency | Type | Anal. Meth. |
|---|---|---|---|---|---|

**Sampling Media - Impinger**

| Task(s) | Location | Duration | Frequency | Type | Anal. Meth. |
|---|---|---|---|---|---|

**Sampling Media - Air Bag**

| Task(s) | Location | Duration | Frequency | Type | Anal. Meth. |
|---|---|---|---|---|---|

B. Air Sampling

1 Personal Sampling Pumps - Gilian,SKC,MSA No. ( )

**Sampling Media - Sorbent Tubes**

| Task(s) | Location | Duration | Frequency | Type | Anal. Meth. |
|---|---|---|---|---|---|

**Sampling Media - Sorbent Tubes (cont.)**

| Task(s) | Location | Duration | Frequency | Type | Anal. Meth. |
|---|---|---|---|---|---|

**Sampling Media - Filter**

| Task(s) | Location | Duration | Frequency | Type | Anal. Meth. |
|---|---|---|---|---|---|

2. **Hi-Volume Pumps**

**Sampling Media - Filter**

| Task(s) | Location | Duration | Frequency | Type | Anal. Meth. |
|---|---|---|---|---|---|

3 **Portable Gas Chromatograph Task(s):** **Type:**

**Portable GC Analytical Plan:**

4 **Passive Dosimeters**

| | | Task(s) | Type | Location | Frequency | Duration |
|---|---|---|---|---|---|---|
| Organic Vapor | ( ) | | | | | |
| Mercury Vapor | ( ) | | | | | |
| Paper Color Change | ( ) | | | | | |
| TLD | ( ) | | | | | |
| Film Badge | ( ) | | | | | |
| Liquid Media | ( ) | | | | | |

5 Wipe Sampling

a. Wipe Sampling Plan

C. <u>Physical Hazard and Miscellanous Monitors and Detectors</u>

| | Task(s) | Calibration RQD? Method | Location | Frequency |
|---|---|---|---|---|
| SOUND LEVEL METER | ( ) | ( ) | | |
| NOISE DOSIMETER(s) | ( ) | ( ) | | |
| OCTAVE BAND ANALYER | ( ) | ( ) | | |
| LIGHT METER | ( ) | ( ) | | |
| ELECTRIC CIRC. DETECTOR | ( ) | ( ) | | |
| Thermometer | ( ) | ( ) | | |

| | Task(s) | Calibration RQD? Method | Location | Frequency |
|---|---|---|---|---|
| Wind Speed Indic. | ( ) | ( ) | | |
| Barometer | ( ) | ( ) | | |
| Psychrometer | ( ) | ( ) | | |
| Infra Red Thermom. | ( ) | ( ) | | |
| Micro Wave Detector | ( ) | ( ) | | |
| pH METER | ( ) | ( ) | | |

D. Indicator Kits

| | Task(s) | Location | Frequency |
|---|---|---|---|
| pH PAPER | ( ) | | |
| PEROXIDE PAPER | ( ) | | |
| CHLOR-N-OIL KIT | ( ) | | |
| HAZARD CATAGORIZING KIT | ( ) | | |
| ASBESTOS TEST KIT | ( ) | | |

G. Work Location Instrument Readings

Location

% LEL _____ % $O_2$ _____ PID $_{ppm}$ _____

FID $_{ppm}$ ___ ___ ___ Aerosol Monitor $_{mg/M^3}$ _____

GM: Shield Probe/Thin Window - mR/hr_____cpm_____

NaI_____uR/hr; ZnS_____cpm

(Monitox)ppm: ( )_____ ( )_____

( )_____ ( )_____

(Detector Tube)(s): ( )_____ ( )_____;

( )_____ ( )_____ ( )_____

Sound Levels ____dBA; ____dBA; ____dBA; ____dBA; ____dBA, ____dBA; ____dBA. ____dBA

Illumination _____ pH _____ Other_____ ___ Other_____ ___ Other _____ ___

Location_____

% LEL _____, % $O_2$ _____, PID $_{ppm}$ _____

FID $_{ppm}$ ___ ___ ___ Aerosol Monitor $_{mg/M^3}$ _____

GM Shield Probe/Thin Window - mR/hr_____cpm_____

NaI_____uR/hr; ZnS_____cpm

(Monitox)ppm: ( )_____, ( )_____,

( )_____, ( )_____,

(Detector Tube)(s): ( )_____, ( )_____,

( )_____, ( )_____, ( )_____

Sound Levels ___dBA, ___dBA ___dBA ___dBA ___dBA, ___dBA ___dBA ___dBA

Illumination _____ pH _____ Other_____ ___ Other_____ ___ Other _____ ___

## IV DECONTAMINATION PLAN

### 1 Personnel Decontamination

Section III C. lists the tasks and specific levels of protection required for each Consistent with the levels of protection required, step by step procedures for personnel decontamination for each Level of Protection are attached.

### 2. Levels of Protection Required for Decontamination Personnel

The levels of protection required for personnel assisting with decontamination will be [_____ Level B _____ Level C, X Level D]
(CHECK) Modifications include. SARANEX COVERALLS, NITRILE GLOVES, HARD HAT w/ SPLASH SHIELD, BOOT COVERS

### 3 Disposition of Decontamination Wastes

(Provide a description of waste disposition including identification of storage area, hauler, and final disposal site if applicable.)
DRILL RIGS AND OTHER HEAVY EQUIPMENT WILL BE DECONTAMINATED AT THE WESTON DECON PAD LIQUID AND SLUDGE WASTES WILL BE REMOVED BY THE CLIENT DISCARDED PPE WILL BE SCREENED FOR RADIOACTIVITY PRIOR TO LANDFILLING ORI WILL BE WIPED CLEAN ONLY

### 4 Equipment Decontamination

A procedure for decontamination steps required for non-sampling equipment and heavy machinery follows:

5. **Sampling Equipment Decontamination**

**Sampling equipment will be decontaminated in accordance with the following procedure:**
SAMPLING EQUIPMENT WILL BE SCREENED FOR RADIOACTIVITY PRIOR TO LEAVING THE SITE DECONTAMINATION WILL TAKE PLACE AT THE DECON FACILITY

V Contingencies

A Emergency Contacts and Phone Numbers

| Agency | Contact | Phone Number |
|---|---|---|
| Local Medical Emergency Facility | Rocky Flats Medical | (303) 966-2911 |
| WESTON Medical Emergency Contact | AGATHA | (513) 421-3063 |
| WESTON Health and Safety, LAKEWOOD, CO | ~~(215) 430-7106~~ | 303 980 68 |
| Fire Department | ON SITE SERVICE | (303) 966-2911 |
| Police Department | | " |
| On Site Coordinator | TOM GREENWOOD | (303) 966-7041 |
| Site Telephone | | (303) 966 5355 |
| Nearest Telephone | GUARD STATIONS | |

B. LOCAL MEDICAL EMERGENCY FACILITY(S)

1 Primary

Name of Hospital. ST. ANTHONY NORTH

Address: 2551 West 84th Ave. Phone No. 399-1211

Name of Contact Rocky Flats Medical Phone No 966-2911

Type of Service - Physical Trauma only ( ) Chemical Exposure only ( ) Physical Trauma & Chemical Exposure (X) Available 24 Hours (X)

Route to Hospital. (Attach Map)
MEDICAL FACILITIES ARE AVAILABLE ON PLANT SITE, IF FURTHER TREATMENT IS NECESSARY, ROCKY FLATS AMBULANCE WILL BE USED IN AN EXTREME EMERGENCY ST. ANTHONY FLIGHT FOR LIFE HELICOPTER WILL BE USED.
Travel Time From Site (Minutes)
Distance to Hospital (Miles)
Name/No of 24 Hr Ambulance Service. 2911

2 Secondary or Specialty Services Provider

Name of Hospital

Address Phone No

Name of Contact Phone No

Type of Service - Physical Trauma only ( ) Chemical Exposure only ( ) Physical Trauma & Chemical Exposure ( ) Available 24 Hours ( )

Route to Hospital: (Attach Map):

Travel Time From Site (Minutes):
Distance to Hospital (Miles):
Name/No. of 24 Hr. Ambulance Service:

V Contingencies (Continued)

C. Response Plans

1 Medical - General

2. Special First Aid Procedures
Hydrofluide on site (W)Y/N

Cyanides on site (W)Y/N

a. First Aid Kit - Type Location

All field teams are equipped with a basic first aid kit and a field radio for contact with Weston base operations and Rocky Flats emergency service

b Evewash required (W)Y/N

Location Location

c. Safety Shower (N) Y/N

Location Location

3 Plan for Response to Fire/Explosion

Contact Rocky Flats Fire Protection Service

4 Fire extinguisher

a. Type

b. Location

All field teams are equipped with fire extinguishers

5. Plan for Response to Spill/Release

Contact Rocky Flats Haz Mat Response Unit

6. Spill Response Gear

| Description | Location |
| --- | --- |

6. Plan for Response to Security Problems

Contact Rocky Flats Plant Security

## VI. Site Personnel and Certification Status

### A. WESTON

| Name | Title | Task(s) | Medical Current a. | Fit Test Current Qual. b. | Fit Test Current Quant. b. | Training Current c. | Certification Level or Description |
|---|---|---|---|---|---|---|---|
| 1. Bert Hyde | Project Manager | 09 | | | | | B-S |
| 2. Greg Sherman | Geotech Task Mgr | | | | | | |
| 3. Jane Marks | Site Manager | | | | | | B-T |
| 4. Ken Miller | | | | | | | B-T |
| 5. Jeffrey Herrick | | | | | | | B-S |
| 6. Tony Melon | | | | | | | B-T |
| 7 Rick Morrow | | | | | | | B-T |
| 8. Scott Parker | | | | | | | |
| 9. Kathy Keryluk | | | | | | | |
| 10. Kris Hemlein | | | | | | | B-T |
| Site Health and Safety Coordinator (SHSC) Tom Barrett | | | | | | | C-S |
| 11 Scott Yoshino | | | | | | | B-T |

(a) Training All personnel, including visitors, entering the exclusion or contamination reduction zones must have certifications of completion of training in accordance with OSHA 29 CFR 1910 29, CFR 1926/1910 or 20 CFR 1910.120.

(b) Respirator Fit Testing - All persons, including visitors, entering any area requiring the use or potential use of any negative pressure respirator must have had as a minimum, a qualitative fit test, administered in accordance with OSHA 20 CFR 1910.134 or ANSI within the last 12 months. If site conditions require the use of a full face negative pressure, air purifying respirator for protection from Asbestos or Lead, employees must have had a quantitative fit test, administered according to OSHA 20 CFR 1910.1002 or 1025 within the last 6 months.

(c) Medical Monitoring Requirements - All personnel, including visitors, entering the exclusion or contamination reduction zones must be certified as medically fit to work, and to wear a respirator, if appropriate, in accordance with 29 CFR 1910, 20 CFR 1926/1910 or 29 CFR 1910.120.

The Site Health and Safety Coordinator is responsible for verifying all certifications and fit tests.

## VI. Site Personnel and Certification Status

### A. WESTON

| Name | Title | Task(s) | Medical Current a. | Fit Test Current Qual. b. | Fit Test Current Quant. b. | Training Current c. | Certification Level or Description |
|---|---|---|---|---|---|---|---|
| 1. Frank Kabot | | | | | | | C-S/B-T |
| 2. Robert Crayton | | | | | | | B-T |
| 3. | | | | | | | |
| 4. | | | | | | | |
| 5. | | | | | | | |
| 6. | | | | | | | |
| 7. | | | | | | | |
| 8. | | | | | | | |
| 9. | | | | | | | |
| 10. | | | | | | | |
| Site Health and Safety Coordinator (SHSC) | | | | | | | |
| 11. | | | | | | | |

(a) Training - All personnel, including visitors, entering the exclusion or contamination reduction zones must have certifications of completion of training in accordance with OSHA 29 CFR 1910 29, CFR 1926/1910 or 20 CFR 1910.120.

(b) Respirator Fit Testing - All persons, including visitors, entering any area requiring the use or potential use of any negative pressure respirator must have had as a minimum, a qualitative fit test, administered in accordance with OSHA 20 CFR 1910.134 or ANSI within the last 12 months. If site conditions require the use of a full face negative pressure, air purifying respirator for protection from Asbestos or Lead, employees must have had a quantitative fit test, administered according to OSHA 20 CFR 1910.1002 or 1025 within the last 6 months.

(c) Medical Monitoring Requirements - All personnel, including visitors, entering the exclusion or contamination reduction zones must be certified as medically fit to work, and to wear a respirator, if appropriate, in accordance with 29 CFR 1910, 20 CFR 1926/1910 or 29 CFR 1910.120.

The Site Health and Safety Coordinator is responsible for verifying all certifications and fit tests.

B. Subcontractor's Health and Safety Program Evaluation

Name and address of subcontractor:

Boyles Brothers, 15865 West 5th Ave., Golden, CC

Activities to be conducted by subcontractor:

Borehole Drilling & Well Construction

EVALUATION CRITERIA

| Item | Acceptable | Unacceptable | Comments |
|---|---|---|---|
| Medical Program meets OSHA/WESTON Criteria | ( ) | ( ) | |
| Personal Protective Equipment Available: | | | |
| a. meets OSHA criteria, | ( ) | ( ) | |
| b. is as specified in WLHASP | ( ) | ( ) | |
| On-Site Monitoring Equipment Available, Calibrated and Operated Properly | ( ) | ( ) | Weston Supplied |
| Safe Working Procedures Clearly Specified | ( ) | ( ) | Weston HASP |
| Training meets OSHA/WESTON Criteria | ( ) | ( ) | |
| Emergency Procedures | ( ) | ( ) | Weston HASP |
| Decontamination Procedures | ( ) | ( ) | Weston HASP |
| General Health and Safety Program Evaluation | ( ) | ( ) | |

Additional Comments:

Evaluation conducted by: Date:

C. Subcontractor

| Name | Title | Task(s) | Medical Current a. | Fit Test Current Qual. b. | Fit Test Current Quant. b. | Training Current c. | Certification Level or Description |
|---|---|---|---|---|---|---|---|
| 1 Doyle Styles, Drilling Foreman | | | | | | | |
| 2. | | | | | | | |
| 3. | | | | | | | |
| 4. | | | | | | | |
| 5. | | | | | | | |
| 6. | | | | | | | |

B. Subcontractor's Health and Safety Program Evaluation

Name and address of subcontractor:

Salazar, Broomfield CC
8791 Wolff Court, Suite 220

Activities to be conducted by subcontractor:

## EVALUATION CRITERIA

| Item | Acceptable | Unacceptable | Comments |
|---|---|---|---|
| Medical Program meets OSHA/WESTON Criteria | ( ) | ( ) | |
| Personal Protective Equipment Available: | | | |
| a. meets OSHA criteria, | ( ) | ( ) | |
| b. is as specified in WLHASP | ( ) | ( ) | |
| On-Site Monitoring Equipment Available, Calibrated and Operated Properly | ( ) | ( ) | Weston Supplied |
| Safe Working Procedures Clearly Specified | ( ) | ( ) | Weston HASAP |
| Training meets OSHA/WESTON Criteria | ( ) | ( ) | |
| Emergency Procedures | ( ) | ( ) | Weston HASAP |
| Decontamination Procedures | ( ) | ( ) | Weston HASAP |
| General Health and Safety Program Evaluation | ( ) | ( ) | |

Additional Comments:

Evaluation conducted by: Date:

C. Subcontractor

| Name | Title | Task(s) | Medical Current a. | Fit Test Current Qual. b. | Fit Test Current Quant. b. | Training Current c. | Certification Level or Description |
|---|---|---|---|---|---|---|---|
| 1 Brian Pribul | Geotech | C9 | | | | | |
| 2. | | | | | | | |
| 3. | | | | | | | |
| 4. | | | | | | | |
| 5. | | | | | | | |
| 6. | | | | | | | |

B. Subcontractor's Health and Safety Program Evaluation

Name and address of subcontractor:

Chen Associates, 96 South Zuni Street, Denve

Activities to be conducted by subcontractor:

GeoTechnical Support

EVALUATION CRITERIA

| Item | Acceptable | Unacceptable | Comments |
|---|---|---|---|
| Medical Program meets OSHA/WESTON Criteria | ( ) | ( ) | |
| Personal Protective Equipment Available: | | | |
| a. meets OSHA criteria. | ( ) | ( ) | |
| b. is as specified in WLHASP | ( ) | ( ) | |
| On-Site Monitoring Equipment Available, Calibrated and Operated Properly | ( ) | ( ) | Weston Supplied |
| Safe Working Procedures Clearly Specified | ( ) | ( ) | Weston HASP |
| Training meets OSHA/WESTON Criteria | ( ) | ( ) | |
| Emergency Procedures | ( ) | ( ) | Weston HASP |
| Decontamination Procedures | ( ) | ( ) | Weston HASP |
| General Health and Safety Program Evaluation | ( ) | ( ) | |

Additional Comments:

Evaluation conducted by: Date:

C. Subcontractor

| Name | Title | Task(s) | Medical Current a. | Fit Test Current Qual. b. | Fit Test Current Quant. b. | Training Current c. | Certification Level or Description |
|---|---|---|---|---|---|---|---|
| 1 Steve Carpenter, Geologist | | | | | | | 09 |
| 2. | | | | | | | |
| 3. | | | | | | | |
| 4. | | | | | | | |
| 5. | | | | | | | |
| 6. | | | | | | | |

## VII. HEALTH AND SAFETY PLAN APPROVAL/SIGN OFF FORMAT

1. Site Name 881 HILLSIDE 2. WO# 2029 33-09

Work Location Address:

ROCKY FLATS PLANT GOLDEN, CO

I have read, understood, and agreed with the information set forth in this Health and Safety Plan (and attachments) and discussed in the Personnel Health and Safety briefing.

| Name | Signature | Date |
|---|---|---|
| Site Safety Co-ordinator SCOTT T. YOSHINO | Signature | 1-30-90 |
| Francis MacDonald | | 1-30-90 |
| SCOTT PARKER | | 1-30 & 90 |
| Robert Crayton | | 1-30-90 |
| SCOTT T YOSHINO | | 1-30-90 |
| Janet E Moore | | 1-30-90 |
| Paul C Bunkowski | | 1-30-90 |
| Jeffrey F. Herrick | | 1/30/90 |
| [illegible] | | 2-2-90 |
| Arlene Bradley | | 2-5-90 |
| Robert Sengebush | | 2-5-90 |

## VII. HEALTH AND SAFETY PLAN APPROVAL/SIGN OFF FORMAT

1 Site Name 881 HILLSIDE

2. WO# 2029 33.09

**Work Location Address:**

ROCKY FLATS PLANT GOLDEN, CO

**I have read, understood, and agreed with the information set forth in this Health and Safety Plan (and attachments) and discussed in the Personnel Health and Safety briefing.**

| Site Safety Co-ordinator | Signature | Date |
|---|---|---|
| KRIS HINDS | | 2/5/90 |
| MIKE BOYD | | 2-1-90 |
| THOMAS BARRETT | | 02 08 90 |
| | | |
| THOMAS J LUTHERER | | 2-2-90 |
| Kimberly Harris | | 2-8-90 |
| | | 2/22/90 |
| SCOTT A. TUTTLE | | 2/22/90 |
| C.H. Robinson | | 3-20-90 |
| | | |

Name / Signature / Date

## VII. HEALTH AND SAFETY PLAN APPROVAL/SIGN OFF FORMAT

1. Site Name 881 HILLSIDE 2. WO# 2029 33-09

Work Location Address:

ROCKY FLATS PLANT GOLDEN, CO

I have read, understood, and agreed with the information set forth in this Health and Safety Plan (and attachments) and discussed in the Personnel Health and Safety briefing.

| Site Safety Co-ordinator | Signature | Date |
|---|---|---|
| Name | Signature | Date |
| Name | Signature | Date |
| Name | Signature | Date |
| Name | Signature | Date |
| Name | Signature | Date |
| Name | Signature | Date |
| Name | Signature | Date |
| Name | Signature | Date |
| Name | Signature | Date |
| Name | Signature | Date |

## VIII. Training and Briefing Topics

The following items will be covered at the site specific training meeting, daily or periodically.

| Site Specific Training Meeting | Daily | Periodically | |
|---|---|---|---|
| X | | | Site characterization and analysis, Sec. 3.0, 29 CFR 1910.120 i. |
| X | | | Physical hazards, Table 3.2. |
| | | | Chemical hazards, Table 3.1. |
| | | | Animal bites, stings and poisonous plants. |
| | | | Etiologic (Infectious) agents. |
| | | | Site contro, Sec. 8.0, 29 CFR 1910.120 d. |
| X | | | Engineering controls and work practices, Sec. 8 5; 29 CFR 1910.120 g. |
| X | | | Heavy machinery. |
| | | | Forklift |
| | | | Backhoe |
| | | | Equipment |
| X | | | Tools |
| | | | Ladder 29 CFR 1910.27 d. |
| | | | Overhead and underground utilities |
| | | | Scaffolds |
| | | | Structural Integrity |
| | | | Unguarded openings - wall, floor, ceilings (?). |
| | | | Pressurized Air Cylinders |
| X | | | Personnel protective equipment, Sec. 5.0; 29 CFR 1910.120 g; 29 CFR 1910.134. |
| X | | | Respiratory Protection Sec. 5.8; 29 CFR 1910 120 g; Z88.2-1980. |

| Site Specific Training Meeting | Daily | Periodically | |
|---|---|---|---|
| | | | Level A |
| | | | Level B |
| ✓ | | | Level C |
| ✓ | | | Level D |
| | | | Monitoring, Sec. 7.0; 29 CFR 1910.120 h. |
| ✓ | | | Decontamination, Sec. 9.0; 29 CFR 1910.120 k. |
| ✓ | | | Emergency Response, Sec. 10.0; 29 CFR 1910.120 l. |
| | | | Elements of an Emergency Response, Sec 100, 29 CFR 1910 120 l |
| ✓ | | | Procedures for Handling Site Emergency Incidents, Sec. 10.0, 29 CFR 1910.120 l. |
| ✓ | | | Off-site emergency response, 29 CFR 1910.120 l. |
| | | | Handling drums and containers, 29 CFR 1910.120 j. |
| | | | Opening Drums and Containers |
| | | | Electrical Material Handling Equipment. |
| ✓ | | | Radioactive Waste |
| | | | Shock sensitive waste |
| | | | Laboratory waste packs. |
| | | | Sampling drums and containers |
| | | | Shipping and transport, 49 CFR 172.101 |
| | | | Tank and vault procedures |
| | | | Illumination, 29 CFR 1910.120 m. |
| | | | Sanitation, 29 CFR 1910.120 n. |

Attachment 1. Level D/Modified Level D Decontamination
[Check indicated Functions or add steps as necessary]

| STEP | FUNCTION | DESCRIPTION OF PROCESS, SOLUTION AND CONTAINER |
|---|---|---|
| (1) | Segregated equipment drop | |
| ( ) | Boot cover and glove wash | |
| ( ) | Boot cover and glove rinse | |
| (2) | Tape removal - outer glove and boot | |
| (3) | Boot cover removal | |
| (4) | Outer glove removal | |
| ----------HOT-LINE---------- | | |
| ( ) | Suit/safety boot wash | |
| ( ) | Suit/boot/glove rinse | |
| ( ) | Safety boot removal | |
| (5) | Suit Removal | |
| ( ) | Inner glove wash | |
| ( ) | Inner glove rinse | |
| ( ) | Inner glove removal | |
| ( ) | Inner clothing removal | |
| ----------CRC/SAFE ZONE BOUNDARY---------- | | |
| ( ) | Field wash | |
| ( ) | Redress | |

DISPOSAL PLAN: PPE will be bagged and brought to Weston trailer
END OF DAY: for storage until screened and landfilled.

END OF WEEK: Discharged PPE will be screened prior to disposal at Rocky Flats Disposal site.

END OF PROJECT.

Attachment 2. LEVEL C DECONTAMINATION
[Check indicated Functions or add steps as necessary]

| STEP | FUNCTION | DESCRIPTION OF PROCESS. SOLUTION AND CONTAINER |
|---|---|---|
| (1) | Segregated equipment drop | |
| (2) | Boot cover and glove wash | |
| (3) | Boot cover and glove rinse | |
| (4) | Tape removal - outer glove/boot | |
| (5) | Boot cover removal | |
| (6) | Outer glove removal | |

----------HOT-LINE----------

| | | |
|---|---|---|
| ( ) | Suit/safety boot wash | |
| ( ) | Suit/boot/glove rinse | |
| ( ) | Safety boot removal | |
| (7) | Suit Removal | |
| ( ) | Inner glove wash | |
| ( ) | Inner glove rinse | |
| (8) | Face piece removal | |
| (9) | Inner glove removal | |
| ( ) | Inner clothing removal | |

----------CRC/SAFE ZONE BOUNDARY----------

| | | |
|---|---|---|
| ( ) | Field wash | |
| ( ) | Redress | |

DISPOSAL PLAN: Same as modified Level D
END OF DAY:

END OF WEEK:

END OF PROJECT.

PHASE I RIFS WORK PLAN

# ROCKY FLATS PLANT

ATTACHMENT

1

JANUARY, 1990

VOLUME I

(Chrysemys picta) and the western plains garter snake (Thamnophis radix) are found in and around many of the ponds (U.S. DOE, 1980).

## 1.4 881 HILLSIDE SITE LOCATIONS AND DESCRIPTIONS

This RI/FS Work Plan addresses the 881 Hillside Area located on the south side of the Rocky Flats Plant security area. These sites were designated high priority sites because of their suspected relationship to ground-water contamination (U.S. DOE, 1987a). Several sites are included in the area because of their physical proximity to each other. Figure 1-5 shows the location of the 881 Hillside Area and presents the site locations within the area.

Twelve sites are located within the 881 Hillside Area. These sites are:

- Oil Sludge Pit Site (SWMU Ref. No. 102);
- Chemical Burial Site (SWMU Ref. No. 103);
- Liquid Dumping Site (SWMU Ref. No. 104);
- Out-of-service Fuel Oil Tank Sites (SWMU Ref Nos. 105 1 and 105 2);
- Outfall Site (SWMU Ref. No. 106);
- Hillside Oil Leak Site (SWMU Ref No 107);
- Multiple Solvent Spill Sites (SWMU Ref. Nos. 119.1 and 119 2),
- Radioactive Site - 800 Area Site #1 (SWMU Ref. No. 130),
- Sanitary Waste Line Leak Site (SWMU Ref. No. 145); and
- Building 885 Drum Storage Site (SWMU Ref. No. 177).

The site descriptions presented in the following sections are taken from the Rocky Flats Plant CEARP Phase I Report (U.S. DOE, 1986), the RCRA Part B Operating Permit Application (Rockwell International, 1987c), and the Phase II Remedial Investigation Report for High Priority Sites (Rockwell International, 1988a). The following descriptions are also based on a more recent review of historical aerial photography.

### 1.4.1 Oil Sludge Pit Site (SWMU Ref. No. 102)

Approximately 30 to 50 drums of oil sludge were emptied into a pit south of Building 881 in the late 1950s, and the pit was later covered (Rockwell International, 1987c). The sludge was reportedly collected during cleaning of the two No. 6 fuel oil tanks south of Building 881 (SWMU Ref. Nos. 105.1 and 105.2) in 1958 based on interviews with Plant personnel (Rockwell International, 1987c). However, the pit appears to have been in existence in 1955 based on aerial photography of the area. In the 1955 photos, the oil sludge pit is located approximately 500 feet south of Building 881 and measures approximately 40 feet by 70 feet in dimension. The pit appears to contain oily liquids and seepage from the pit is evident Also apparent on the 1955 photo is a small pond adjacent to Woman Creek (labeled former retention pond on Figure 1-5). Drainage from the Oil Sludge Pit Site appears directed toward this pond. The oil sludge pit was covered after its use (Rockwell International, 1987c), and it is no longer visible on 1963 aerial photographs.

### 1.4.2 Chemical Burial Site (SWMU Ref. No. 103)

An area south of Building 881 was reportedly used to bury unknown chemicals (U. S. DOE, 1986). The exact location, dates of use, and contents of the site are unknown. This site was originally thought to be located in the same area as the Oil Sludge Pit Site (Rockwell International, 1987c). However, a pit apparently filled with liquid is evident approximately 150 feet southeast of Building 881 on 1963 aerial photographs. This pit is roughly circular on the photos and measures approximately 50 feet in diameter.

### 1.4.3 Liquid Dumping Site (SWMU Ref. No. 104)

An area east of Building 881 was reportedly used for disposal of unknown liquids and for disposing of empty drums prior to 1969 (U. S. DOE, 1986). A pit was reported with plan dimensions of approximately 50 by 50 feet based on 1965 aerial photographs (Rockwell International, 1987c). However, further review of these historical aerial photos indicates the

identified "pit" may be a shadow on the photo. The Liquid Dumping Pit Site is likely the same location as the Chemical Burial Site; however, the area originally identified as the Liquid Dumping Pit will also undergo additional investigation to verify its absence.

### 1.4.4 Out-of-Service Fuel Tank Sites (SWMU Ref. Nos. 105.1 and 105.2)

Two out-of-service No. 6 fuel oil tanks are located immediately south of Building 881. Asbestos was placed in the two tanks and they were later filled with concrete (U. S. DOE, 1986). The exact dates of these activities are unknown; however, they apparently occurred subsequent to use of the fuel oil storage tanks (1958 through 1976) (Rockwell International, 1987c).

### 1.4.5 Outfall Site (SWMU Ref. No. 106)

A six-inch diameter vitrified clay pipe outfall existed south of Building 881 which discharged water in December 1977. Previous reports indicated that this was a cleanout pipe for an overflow line from the Building 881 cooling tower (Rockwell International, 1987c). However, review of construction drawings during the Phase II RI indicated that the pipe is an overflow line from the sanitary sewer sump in Building 887

### 1.4.6 Hillside Oil Leak Site (SWMU Ref. No. 107)

In May 1973, an oil leak was discovered on the hillside south of Building 881. The source of the oil was believed to be the two No. 6 fuel oil tanks (SWMUs 105.1 and 105.2) south of the building; however, pressure testing of the tanks and associated lines did not reveal any leaks (Rockwell International, 1987c). The oil spill was contained with straw, and the straw and soil were removed and disposed of in the present landfill north of the Plant (Rockwell International, 1987c).

It was later discovered that the oil had emerged through the Building 881 footing drain outfall A ditch and concrete skimming pond were built below the footing drain outfall to contain the oil (Owen and Steward, 1973). These structures are still present, although no oil has been observed in the outfall since 1973 (Rockwell International, 1987c).

### 1.4.7 Multiple Solvent Spill Site (SWMU Ref. Nos. 119.1 and 119.2)

Beginning in 1967, two areas east of Building 881 and along the southern perimeter road were used as barrel storage areas. The barrels contained unknown quantities and types of solvents and wastes. The two facilities were expanded between 1967 and 1971, with major expansion occurring in 1969. Barrel storage in these areas was discontinued, and all barrels were removed by 1972. The exact types and quantities of solvents stored at this facility are unknown (Rockwell International, 1987c). SWMU 119.1 is the larger western barrel storage area, and SWMU 119.2 is the eastern barrel storage area. The site boundaries shown on Figure 1-5 represent the extent of soil disturbance associated with the sites. Actual barrel storage areas within each site are also shown.

### 1.4 8 Radioactive Site - 800 Area #1 (SWMU Ref. No. 130)

An area east of Building 881 and northwest of SWMU 119 1 was used between 1969 and 1972 to dispose of soil and asphalt contaminated with low levels of plutonium. The materials at this site were derived from three sources on Plant site.

In September 1969 approximately 320 tons [250 cubic yards (Illsley, 1978)] of plutonium contaminated soil and asphalt were removed from the west side of Building 776 and placed on the 881 Hillside (Owen and Steward, 1973). The soil and asphalt were contaminated during the May 11, 1969, fire in building 776, and had an estimated average plutonium activity of 7.4 disintegrations per minute per gram (dpm/g). The total plutonium concentration of this material was estimated to be 14 milligrams (mg) (Putzier, 1970). Material from the 1969 fire was buried under one to two feet of fill dirt (Owen and Steward, 1973).

In August 1970, a section of the Central Avenue roadway between Eighth and Tenth Streets was removed and placed on the 881 Hillside at SWMU 130 (Owen and Steward, 1973). This stretch of road was radioactively contaminated in June 1968 by a leaking drum in transit from the 903 Drum Storage Site to Building 774 (Owen and Steward, 1973). The exact quantity and radioactivity of the material removed from Central Avenue are unknown.

The third episode of soil disposal at SWMU 130 occurred in 1972 (Owen and Steward, 1973). Approximately 60 cubic yards of plutonium contaminated soil were removed from around the Building 774 process waste tanks and placed on the 881 Hillside (Owen and Steward, 1973). The soil was deposited on top of previously deposited soils at SWMU 130 and covered with approximately three feet of fill dirt (Illsley, 1978). The estimated total long lived alpha activity of this soil is less than 250 dpm/g (Illsley, 1978).

### 1.4.9 Sanitary Waste Line Leak Site (SWMU Ref. No. 145)

The four-inch cement-asbestos sanitary sewer line located south of Building 881 leaked in January 1981. An earthen dike was constructed to prevent the spill from entering the South Interceptor Ditch, and the line was repaired. The line conveyed sanitary wastes to the sanitary treatment plant and did not carry hazardous or radioactive materials. Conveyance of laundry wastewater, which may have contained low levels of radioactive materials, was discontinued in 1973 (Rockwell International, 1987c). Review of Building 881 construction drawings indicates that the only sanitary waste lines presently located south of the building are the six-inch overflow line from Building 887 (SWMU 106) and an eight-inch vitrified clay pipe which runs east-west into Building 887.

### 1.4.10 Building 885 Drum Storage Site (SWMU Ref. No. 177)

Building 885, immediately south of Building 881, is currently used for satellite collection and 90-day accumulation of RCRA regulated wastes. The building will be closed under RCRA Interim Status (40 CFR 265). Complete information on this solid waste

TABLE 2-1 (cont.)

BACKGROUND GROUND-WATER (ROUND 1)
TOLERANCE INTERVAL UPPER LIMITS
OR MAXIMUM DETECTED VALUE

| Analyte | Units | Rocky Flats Alluvium (11 Samples) | Colluvium (2 Samples) | Valley Fill Alluvium (8 Samples) | Weathered Claystone (4 Samples) | Weathered Sandstone (2 Samples) | Unweathered Sandstone (7 Samples) |
|---|---|---|---|---|---|---|---|
| **Other** | | | | | | | |
| Total Dissolved Solids | mg/l | 352 | 520* | 947 | 320* | 170* | 1761 |
| Carbonate | mg/l | ND | ND | ND | ND | ND | 49 |
| Bicarbonate | mg/l | 436 | 470* | 719 | 400* | 140* | 412 |
| Chloride | mg/l | 15.6 | 20* | 40.29 | 11* | 15* | 607 |
| Sulfate | mg/l | 45.1 | 86* | 150 | 44* | 16* | 950 |
| Nitrate | mg/l | 2.98 | 0 18* | 0.69* | 0.58* | 1.6* | 0.610 |
| Cyanide | mg/l | .0038* | ND | ND | 0.0036* | ND | ND |
| pH | ---- | 8 6 (5 98) | 7 4* (7.1)** | 8 68 (6.12) | 8.2* (7.4)** | 7 5* (7 2)** | 10 57 (7.43) |
| **Dissolved Radionuclides** | | | | | | | |
| Gross Alpha | pCi/l | 12.543 | 27* | 13.515 | 12* | 7* | 13* |
| Gross Beta | pCi/l | 14.570 | 12* | 18.530 | 7* | 2* | 15* |
| Uranium 233, 234 | pCi/l | 1.647 | 11* | 6.481 | 5.8* | 1.1* | 12.936 |
| Uranium 235 | pCi/l | 0.000 | 0.3* | 0.232 | 0.2* | 0* | 0.135 |
| Uranium 238 | pCi/l | 0.195 | 7.7* | 5.084 | 3.2 | 0.6* | 3.3507 |
| Strontium 89, 90 | pCi/l | 0.552 | 0.1* | 0.078 | 0.1 | -0.1* | 0.2* |
| Plutonium 239, 240 | pCi/l | 0.009 | 0* | 0.012 | 0.03 | 0.01* | 0.000 |
| Americium 241 | pCi/l | 0.000 | 0* | 0.012 | 0 | 0.01* | 0.019 |
| Cesium 137 | pCi/l | 0 603 | 0.2* | 0.776 | 0.4 | 0.3* | 0.7* |
| Tritium | pCi/l | 309 | 100* | 505 | 100 | 100* | 731 |

* - Maximum Detected Value
** - Minimum Detected Value
ND - Not Detected at Contract Required Detection Limit
() - Tolerance Interval Lower Limit for Two-Sided Parameter

TABLE 2-2 (cont.)

BACKGROUND SURFACE WATER (ROUNDS 1 and 2)
TOLERANCE INTERVAL UPPER LIMITS
OR MAXIMUM DETECTED VALUE

| Analyte | Units | Round 1 (9 samples) Total | Round 1 (9 samples) Dissolved | Round 2 (7 samples) Total | Round 2 (7 samples) Dissolved |
|---|---|---|---|---|---|
| **Other** | | | | | |
| Total Dissolved Solids | mg/l | 329.52 | NA | 365.15 | NA |
| Carbonate | mg/l | ND | NA | ND | NA |
| Bicarbonate | mg/l | 389.72 | NA | 344.21 | NA |
| Chloride | mg/l | 89.11 | NA | 82.56 | NA |
| Sulfate | mg/l | 50.20 | NA | 65.30 | NA |
| Nitrate | mg/l | 2.45 | NA | 2.1* | NA |
| Cyanide | mg/l | ND | NA | 0.0043* | NA |
| pH | ---- | 9 02 (5.89) | NA | 8.3 (6.44) | NA |
| **Radionuclides** | | | | | |
| Gross Alpha | pCi/l | 266 | 5 805 | 106 | NA |
| Gross Beta | pCi/l | 213 | 9 335 | 79 | NA |
| Uranium 233, 234 | pCi/l | 1.250 | 3 684 | 1.326 | NA |
| Uranium 235 | pCi/l | 0.106 | 0 364 | 0.000 | NA |
| Uranium 238 | pCi/l | 0.937 | 2 311 | 0.977 | NA |
| Strontium 89, 90 | pCi/l | 2.160 | 1 452 | 1.243 | NA |
| Plutonium 239, 240 | pCi/l | 1.066 | 0.017 | 0.112 | NA |
| Americium 241 | pCi/l | 0.111 | 0.014 | 0.014 | NA |
| Cesium 137 | pCi/l | 12.788 | 0 591 | 1.059 | NA |
| Tritium | pCi/l | 266 | NA | 863 | NA |

NA - Not Analyzed
ND - Not Detected
* - Maximum Detected Value
() - Tolerance Interval Lower Limit for Two-Sided Parameter

TABLE 2-3 (cont.)

BACKGROUND SEDIMENT
TOLERANCE INTERVAL UPPER LIMITS
OR MAXIMUM DETECTED VALUE

| Analyte | Units | Upper Limit (9 Samples) |
|---|---|---|
| **Other** | | |
| Nitrate | mg/l | ND |
| pH | ---- | 9.03 (8.77) |
| **Total Radionuclides** | | |
| Gross Alpha | pCi/l | 60 |
| Gross Beta | pCi/l | 50 |
| Uranium 233, 234 | pCi/l | 1 669 |
| Uranium 235 | pCi/l | 0.176 |
| Uranium 238 | pCi/l | 1.755 |
| Strontium 89, 90 | pCi/l | 1.390 |
| Plutonium 239, 240 | pCi/l | 0.096 |
| Americium 241 | pCi/l | 0.029 |
| Cesium 137 | pCi/l | 1.578 |
| Tritium | pCi/l | 0.408 |

ND - Not Detected
* - Maximum Detected Value
() - Tolerance Interval Lower Limit for Two-Sided Parameter

TABLE 2-4 (cont.)

BACKGROUND GEOLOGIC MATERIALS
TOLERANCE INTERVAL UPPER LIMITS
OR MAXIMUM DETECTED VALUE

| Analyte | Units | Rocky Flats Alluvium (70 Samples) | Colluvium (28 Samples) | Weathered Claystone (17 Samples) | Weathered Sandstone (4 Samples) |
|---|---|---|---|---|---|
| **Other** | | | | | |
| Sulfide | mg/l | 13* | 5* | 5* | 2* |
| Nitrate | mg/l | 4.3* | 4.274 | 2.0* | 1 9* |
| pH | ---- | 9.64 (6.06) | 9.48 (6.96) | 10.14 (7.04) | 9.2* (8 0)** |
| **Total Radionuclides** | | | | | |
| Gross Alpha | pCi/l | 37.108 | 51 710 | 52.302 | 37 |
| Gross Beta | pCi/l | 36.886 | 35.135 | 35.743 | 29 |
| Uranium 233, 234 | pCi/l | 1.491 | 1 759 | 1.985 | 0.8 |
| Uranium 235 | pCi/l | 0.087 | 0.169 | 0.258 | 0.1 |
| Uranium 238 | pCi/l | 1.353 | 1.675 | 1.643 | 1.0 |
| Strontium 89, 90 | pCi/l | 0.768 | 0 776 | 0.786 | 0.4 |
| Plutonium 239, 240 | pCi/l | 0.017 | 0 023 | 0.020 | 0.01 |
| Americium 241 | pCi/l | 0.018 | NR | NR | NR |
| Cesium 137 | pCi/l | 0.082 | 0 113 | ND | 0 0 |
| Tritium | pCi/l | 0.410 | 0 299 | 0.322 | 0.39 |

ND - Not Detected
NR - Data Not Received
* - Maximum Detected Value
** - Minimum Detected Value
() - Tolerance Interval Lower Limit for Two-Sided Parameter

Volatile chlorinated hydrocarbon contamination is apparently not extensive. It occurred in soils from only 3 of the 23 boreholes [(BH01-87 (SWMUs 107 and 177), BH57-87 (SWMU 119.1), and BH58-87 (SWMU 119.2)]. The highest concentrations detected were tetrachloroethene (PCE) at 190 micrograms per kilogram (µg/kg) in BH01-87, trichloroethene (TCE) at 150 µg/kg in BH57-87, and 1,1,1-trichoroethane (1,1,1-TCA) at 110 µg/kg in BH57-87.

Boreholes will be drilled and samples collected from all SWMUs for organic analysis during the Phase III RI. The single most important reason for this activity is that previous volatile organic data have been rejected. The collection of these additional data is necessary to determine whether methylene chloride, acetone, and phthalates are soil contaminants. However, additional soil sampling is also needed to verify SWMU locations; to assess the vertical and horizontal distribution of organic contamination; and to identify maximum concentrations of contaminants in suspected "hot spots".

2.3.2.2 Metals

In general, metal concentrations in soil samples from Rocky Flats Alluvium, colluvium and claystone were within background levels. Trace metals which occurred above background in these three materials include: antimony (3.4%), arsenic (30.3%), mercury (5.6%), cadmium (60.7%), manganese (1.1%), and barium (6.7%). Parenthesis indicate percent of the samples exceeding the background range. These metal concentrations occurred randomly throughout the 881 Hillside soils, and did not exceed a factor of two of the upper limit of the background tolerance interval or range. The upper limit of background for cadmium is based on a maximum detected value rather than a tolerance interval. Thus, the cadmium concentrations in 881 Hillside colluvium and claystone may actually be statistically insignificant relative to background.

### 2.3.2.3 Radionuclides

Radionuclide concentrations have been compared to the upper limit of the background tolerance interval or background range as appropriate. However, this comparison requires consideration of the following information regarding error terms.

Radionuclides are analyzed by counting sub-atomic particle emissions, which is a random function. Since radioactive disintegration is a statistical process and therefore has a probability distribution, results are reported as a measured value with an associated two standard deviation propagated error term following the measured value. Radionuclide concentrations where the error term is larger than the measured value can be considered not statistically different from background because of the significant overlap of the probability distributions. On the other hand, if the measured value minus the error term for a sample is greater than the measured value plus the error term for the upper limit of the background range, it can be considered statistically different from background.

Table 2-7 presents the percent of samples for each radionuclide detected above background at the surface and in the subsurface. Plutonium and americium were only detected above background in surface soils (maximum concentrations were 0.91 ± 0.38 picoCuries per gram (pCi/g) and 0.15 ± 0.13 pCi/g, respectively) The origin of this contamination is likely the 903 Pad Area resulting from wind dissemination of plutonium/americium contaminated dust. Because surface samples are 12 to 24 inch composites, actual near surface concentrations are much higher. More recently collected data for plutonium, uranium 238, and uranium 233 + 234 concentrations in surface scrape samples are presented in Table 2-8 (U. S. DOE, 1989). Sample locations are shown in Figure 2-7. It can be seen that plutonium concentrations were as high as 4.8 pCi/g in surface soils at the 881 Hillside Area. These concentrations are typical of surface plutonium concentrations in this vicinity and to the east within the Plant boundary based on sampling performed by Rockwell International's Health, Safety and Environment Department (Rockwell International, 1987b). High uranium

## TABLE 2-7

## PERCENT OF SOIL SAMPLES WITH RADIONUCLIDES ABOVE BACKGROUND

| Radionuclide | Percent of Surface Samples Above Background | Percent of Subsurface Samples Above Background |
|---|---|---|
| Uranium (Total) | 6 | 6 |
| Plutonium 239 + 240 | 11 | 0 |
| Americium 241 | 6 | 0 |
| Cesium 137 | 17 | 7 |
| Tritium | 6 | 3 |

## TABLE 2-8

## 881 HILLSIDE 1988 SURFACE SCRAPE SAMPLING RESULTS

### RADIONUCLIDE CONCENTRATION IN pCI/g

| Sample No. | Uranium 233 + 234 | Uranium 238 | Plutonium |
|---|---|---|---|
| 881-1 | 0.56±0.26 | 0.6±0.15 | 4.3±0.5 |
| 881-2 | 0.78±0.26 | 0.86±0.15 | 2.4±0.2 |
| 881-3 | 0.82±0.26 | 0.91±0.15 | 4.8±0.5 |
| 881-4 | 1.0±0.3 | 0.97±0.2 | 0.18±0.006 |
| 881-5 | 0.86±0.26 | 0.88±0.15 | 0.59±0.008 |
| 881-6 | 1.5±0.3 | 5.5±0.5 | 2.2±0.2 |
| 881-7 | 0.74±0.26 | 0.75±0.15 | 0.63±0.09 |
| 881-8 | 0.86±0.26 | 0 82±0 15 | 1.8±0.2 |
| 881-9 | 3.1±0.3 | 1.0±0 2 | 0.47±0.006 |
| 881-10 | 1.1±0.3 | 0.98±0.2 | 3.5±0.4 |
| 881-11 | 1.0±0.3 | 1.3±0.2 | 2.6±0.3 |
| 881-12 | 0.93±0.26 | 1.4±0.2 | 0.4±0.06 |
| 881-13 | 0.94±0.26 | 1.3±0.2 | 0.16±0.06 |
| 881-14 | 1.1±0.3 | 1.0±0.2 | 3.0±0.4 |
| 881-15 | 2.0±0.3 | 1.5±0.16 | 0.01±0.06 |
| 881-16 | 50±190 | 1300±100 | 0.3±0.06 |
| 881-17 | 19±74 | 590±70 | 0.78±0.19 |
| 881-18 | 60±230 | 3000±300 | 0.42±0.08 |
| 881-19 | 10±740 | 550±60 | 0.09±0.06 |

SSP, not on map

Data from: U. S. DOE, 1989

concentrations occurred in samples 16 through 19. Depleted uranium which is used at the Rocky Flat Plant has a uranium 233 + 234 to uranium 238 activity ratio of 0.38, whereas natural uranium has a ratio of 1.11. The uranium isotope ratios for these surface soils indicate the uranium is depleted (low ratio). The contamination presumably resulted from drums that had leaked in the past, or from past spills. They were initially discovered during a FIDLER survey of the area during the Phase II RI. Each contaminated area is small (less than ten square feet in area).

Referring again to Table 2-7, uranium, cesium, and tritium occur infrequently above background and occur at depth (Appendix A). None of these radionuclides were present above background by more than a factor of two above the upper tolerance interval. The uranium 233 + 234 to uranium 238 activity ratios are greater than one indicating the uranium is natural. Because there has never been a criticality at Rocky Flats Plant, the cesium 137 is presumed to be due to fallout (Rockwell International, _____). This suggests that these radionuclide concentrations may represent natural variations outside the background tolerance intervals.

### 2.3 3 Ground Water

Ground water at the 881 Hillside occurs in alluvium, colluvium, valley fill alluvium, and weathered and unweathered bedrock. The discussion of ground-water quality is subdivided by SWMU groupings. Ground water at or downgradient of SWMUs 102, 103, 105, 106, 107 and 145 is discussed first. These SWMUs are in close proximity to each other. A discussion of ground water at or downgradient of SWMUs 119.1, 119.2 and 130 follows.

Within each SWMU grouping, the discussion of chemistry has been subdivided into ground water in surficial material (Rocky Flats Alluvium, colluvium and valley fill alluvium) and weathered bedrock (unconfined flow system), and ground water in unweathered bedrock

69-89, these wells were either dry or contained insufficient water for chemical analysis during first quarter 1988. Although wells 1-87 and 68-86 are upgradient of these SWMUs, ground-water quality in these wells is occasionally above background with respect to certain major ions, trace metals and organics as discussed below. Ground-water quality in these wells may be affected by Plant activities upgradient of 881 Hillside, and additional wells will be installed upgradient of the 881 Hillside Area.

Of the wells downgradient from these SWMUs, organics were not detected during the second quarter 1989; however, it is noted that wells 52-87 and 2-87 had detectable volatile organics during first quarter 1989. PCE was estimated below detection limits in both wells at concentrations of 2J micrograms per liter (µg/l) and 35J µg/l, respectively. TCE was also estimated below detection limits in well 2-87 at a concentration of 2J µg/l. With the exception of well 69-86, the remaining wells were dry during first quarter and second quarter 1989.

Ground-water quality data from wells 52-87, 69-86, and 2-87 indicate inorganic contamination exists. Total dissolved solids (TDS) and major ion (calcium magnesium, sodium, chloride, sulfate, and bicarbonate) concentrations were higher than background during the first quarter 1988. Wells 69-86 and 2-87 also had nitrate levels present above background. Wells 2-87 and 52-87 contained elevated manganese; wells 2-87 and 69-86 contained elevated zinc; and wells 52-87 and 69-86 contained elevated strontium. Selenium was also above background in well 69-86. Gross alpha, gross beta, uranium 233 + 234, uranium 235, and uranium 238 were above background in wells 1-87 and 52-87, and uranium 235 and 238 were above background in well 69-86. Total uranium concentrations in these wells were in the range of 8 to 15 picoCuries per liter (pCi/l). Although metals and other inorganics data do not exist for well 1-87, the elevated uranium in this "upgradient" well suggests the general inorganics contamination and low level organic contamination in this area may not be from these SWMUs. There are no wells directly downgradient of these SWMUs in the valley fill alluvium. Just upgradient of the 881 Hillside in the valley fill alluvium, wells 58-86 and 68-86 were dry.

TABLE 2-11
CHEMICAL SPECIFIC ARARs
FOR COMPOUNDS AND ELEMENTS DETECTED
AT THE 881 HILLSIDE AREA

| Chemical | Maximum in 881 Hillside Area Alluvial Ground Water[a] | ARAR (ug/l) | Detection Limit (ug/l) | Standard Criteria or Guidance | Comment |
|---|---|---|---|---|---|
| Organic Compounds | | | | | |
| Acetone | 19 | 50 | 10 | RCRA LDR is relevant and appropriate (R&A) | ARAR is not exceeded |
| Carbon Tetrachloride | 2400J | 5 | 5 | CDH Surface Water; Drinking Water Standard is applicable | ARAR is exceeded |
| 1,1 Dichloroethane | 180J | 5U | 5 | RCRA Subpart F, Appendix IX Substance is TBC | TBC is exceeded |
| 1,2 Dichloroethane | 17J | 5 | 5 | CDH Surface Water; Drinking Water Standard is applicable | ARAR is exceeded |
| 1,1 Dichloroethene | 7900J | 7 | 5 | CDH Surface Water; Drinking Water Standard is applicable | ARAR is exceeded |
| Methylene Chloride | 17B | 5U | 5 | RCRA Subpart F is R&A | ARAR is exceeded |
| Tetrachloroethene | 5900J | 10 | 5* | CDH Surface Water; Fish and Water Ingestion Standard is applicable | ARAR is exceeded |
| Toluene | 5J | 2420 | 5 | CDH Surface Water; Drinking Water Standard is applicable | ARAR is not exceeded |
| 1,1,1 Trichloroethane | 15,000 | 200 | 5 | CDH Surface Water; Drinking Water Standard is applicable | ARAR is not exceeded |
| 1,1,2 Trichloroethane | 47J | 10 | 5* | CDH Surface Water; Fish and Water Ingestion Standard is applicable | ARAR is exceeded |
| Trichloroethene | 11,000 | 5 | 5 | CDH Surface Water; Drinking Water Standard is applicable | ARAR is exceeded |
| Carbon Disulfide | 3J | 5U | 5 | CDH Surface Water; Drinking Water Standard is applicable | ARAR is not exceeded |

TABLE 2-11 (cont'd)
CHEMICAL SPECIFIC ARARs
FOR COMPOUNDS AND ELEMENTS DETECTED
AT THE 881 HILLSIDE AREA

| Chemical | Maximum in 881 Hillside Area Alluvial Ground Water[a] | ARAR (ug/l) | Detection Limit (pCi/l) | Standard Criteria or Guidance | Comment |
|---|---|---|---|---|---|
| **Radionuclides** | | | | | |
| Gross Alpha | 319 | 7 | 2 | CDH Surface Water Standard is applicable | ARAR is exceeded |
| Gross Beta | 286 | 5 | 4 | CDH Surface Water Standard applicable | ARAR is exceeded |
| $Pu^{238,239,240}$ | <0 01[c] | 0 05 | 0.01 | CDH Surface Water Standard is applicable | ARAR is not exceeded |
| $Am^{241}$ | <0.01[c] | 0.05 | 0.01 | CDH Surface Water Standard is applicable | ARAR is not exceeded |
| $H^3$ | 777 | 500 | 400 | CDH Surface Water Standard is applicable | ARAR is exceeded |
| $Sn^{89,90}$ | 5.6 | 8 | 1 | CDH Surface Water Standard is applicable | ARAR is not exceeded |
| $Uranium^{total}$ | 58 9 | 5 | 1.8 | CDH Surface Water Standard is applicable | ARAR is exceeded |

(a) - Maximum compound concentrations determined from first and second quarter 1989 data.
(b) - Maximum compound concentrations determined from 1987 and 1988 database.
U - Detection limit
J - Estimated below detection limit
B - Compound also present in blank
TBC - To be considered
(c) - Below minimum detectable activity (MDA)
* - Detection limit exceeds ARARs

# Attachment 2

# CARBON TETRACHLORIDE

## Summary

Carbon tetrachloride is used as a industrial solvent and chemical intermediate It is an animal carcinogen causing liver tumors in mice rats and hamsters Carbon tetrachloride also causes liver and kidney damage in animals and humans

Chemical Formula $CCl_4$

IUPAC Name Tetrachloromethane

Important Synonyms and Trade Names Tetrachoromethane perchloromethane

## Chemical and Physical Properties

Molecular Weight 153 8

Boiling Point 76 7°C

Melting Point 22 9°C

Specific Gravity 1 59 at 20°C (liquid)
5 3 vapor (gas) specific gravity

Solubility in Water 800 mg/liter

Solubility in Organics Miscible with alcohol benzene chloroform ether and carbon disulfide

Log Octanol/Water Partition Coefficient 2 64

Vapor Pressure 90 mm Hg at 20°C

Vapor Density 5 32

## Transport and Fate

Carbon tetrachloride has a high vapor pressure and therefore volatilizes rapidly into the atmosphere from surface water and probably from soil It is relatively soluble in water and therefore would be expected to be transported in groundwater Because of its high specific gravity it may move independently from the groundwater as a nonaqueous phase liquid

## Health Effects

Carbon tetrachloride was carcinogenic in mice rats and hamsters in all cases liver tumors were induced In addition mice also displayed a high incidence of tumors of the adrenal gland Studies discussed by EPA (1980) on the mutagenic and teratogenic effects of carbon tetrachloride and its impact on reproduction are inconclusive Carbon tetrachloride also causes both liver and kidney damage in animals and humans One study in which guinea pigs were repeatedly exposed to carbon tetrachloride vapor for several months provided evidence of damage to the optic nerve and degeneration of the myelin sheath of the sciatic nerve

## Regulations and Standards

Ambient Water Quality Criteria (U S EPA)

### Aquatic Life

The available data are not adequate for establishing criteria However EPA did report the lowest values known to cause toxicity in aquatic organisms

Freshwater

Acute toxicity 35 200 ug liter
Chronic toxicity No available data

Saltwater

Acute toxicity 50 000 ug liter
Chronic toxicity No available data

### Human Health

Estimates of the carcinogenic risks associated with lifetime exposure to carbon tetrachloride at various concentrations in water are

| Risk | Concentration |
|---|---|
| $10^{-5}$ | 4 0 ug/liter |
| $10^{-6}$ | 0 4 ug/liter |
| $10^{-7}$ | 0 04 ug/liter |

CAG Unit Risk (U S EPA) $1\ 3 \times 10^{-1}$ (mg/kg/day)$^{-1}$

OSHA Standard (air) 10 ppm TWA
25 ppm Ceiling Level

ACGIH Threshold Limit Value 5 ppm Skin

# 1 1-DICHLOROETHANE

## Summary

1 1 Dichloroethane is quite volatile and probably is not very persistent in aquatic environments Inhalation exposure to high doses causes central nervous system depression in humans and may cause hepatotoxicity In animals high doses cause liver and kidney damage and retard fetal development

CAS Number 75-34-3

Chemical Formula $CH_3CHCl_2$

IUPAC Name 1 1-Dichloroethane

Important Synonyms and Trade names Ethylidene chloride ethylidene dichloride

## Chemical and Physical Properties

Molecular Weight 98 96

Boiling Point 57 3°C

Melting Point 97 0°C

Specific Gravity 1 1776 at 20°C

Solubility in Water 5 g/liter

Solubility in Organics Miscible in alcohol

Log Octanol Water Partition Coefficient 1 79

Vapor Pressure 180 mm Hg at 20°C

## Transport and Fate

1 1-Dichloroethane disperses from surface water primarily by volatilization into the troposphere where it is subsequently broken down by hydroxylation No studies on adsorption were found in the literature reviewed, but because of its water solubility and relatively low log octanol water partition coefficient 1 1 dichloroethane potentially could move through soil and enter the groundwater

## Health Effects

Limited toxicological testing of 1 1 dichloroethane has been conducted although the literature indicates that 1 1 dichloroethane is one of the least toxic of the chlorinated ethanes An NCI bioassay on 1 1 dichloroethane was limited by poor survival of test animals but some marginal tumorigenic effects were seen Inhalation exposure to high doses of 1 1-dichloroethane (over 16 000 mg m ) caused retarded fetal development in rats 1 1-Dichloroethane was not found to be mutagenic using the Ames assay 1 1-Dichloroethane causes central nervous system depression when inhaled at high concentrations and evidence suggests that the compound is hepatotoxic in humans Kidney and liver damage was seen in animals exposed to high levels of 1 1-dichloroethane The oral $LD_{50}$ value in the rat is 725 mg kg

## Regulations and Standards

Ambient Water Quality Criteria (U S EPA)

The available data were inadequate for establishing criteria

OSHA Standard (air) 400 mg $m^3$ TWA

ACGIH Threshold Limit Value 810 mg $m^3$ TWA - 200 ppm

# 1 2 DICHLOROETHANE

## Summary

1 2 Dichloroethane (ethylene dichloride) is a volatile organic solvent and volatilization and percolation into groundwater may be significant routes of transport It has a low solubility in water and may be a component in nonaqueous phase liquids 1 2 Dichloroethane is carcinogenic in animals and mutagenic in bacterial test systems It is a suspected human carcinogen

**CAS Number** 107 06-02

**Chemical Formula** $CH_2ClCH_2Cl$

**IUPAC Name** 1 2 Dichloroethane

**Important Synonyms and Trade Names** Ethylene dichloride glycol dichloride

## Chemical and Physical Properties

**Molecular Weight** 98 96

**Boiling Point** 83-84°C

**Melting Point** -35 4°C

**Specific Gravity** 1 253 at 20°C

**Solubility in Water** 8 g liter

**Solubility in Organics** Miscible with alcohol chloroform and ether

**Log Octanol/Water Partition Coefficient** 1 48

**Vapor Pressure** 61 mm Hg at 20°C

**Flash Point** 15°C (closed cup)

## Transport and Fate

The primary method of dispersion from surface water for 1 2 dichloroethane is volatilization In the atmosphere 1 2-dichloroethane is rapidly broken down by hydroxylation although some may be absorbed by atmospheric water and return to the earth by precipitation No studies on the adsorption of 1 2 dichloroethane onto soil were reported in the literature examined However 1 2 dichloroethane has a low octanol/water partition coefficient is slightly soluble in water and therefore leaching through the soil into the groundwater is an expected route of dispersal

## Health Effects

1 2 Dichloroethane is carcinogenic in rats and mice producing a variety of tumors When administered by gavage it produced carcinomas of the forestomach and hemangiosarcomas of the circulatory system in male rats adenocarcinomas of the mammary gland in female rats lung adenomas in male mice and lung adenomas mammary adenocarcinomas and endometrial tumors in female mice It is mutagenic when tested using bacterial test systems Human exposure by inhalation to 1 2 dichloroethane has been shown to cause headache dizziness nausea and liver and kidney dysfunction Dermatitis may be produced by skin contact In severe cases leukocytosis (an excess of white blood cells) may be diagnosed and internal hemorrhaging and pulmonary edema leading to death may occur Similar effects are produced in experimental animals

## Regulations and Standards

Ambient Water Quality Criteria (U S EPA)

### Aquatic Life

The available data are not adequate for establishing criteria However EPA did report the lowest values known to be toxic in aquatic organisms

**Freshwater**

Acute toxicity 118 mg liter
Chronic toxicity 20 mg liter

**Saltwater**

Acute toxicity 113 mg liter
Chronic toxicity No available data

### Human Health

Estimates of the carcinogenic risks associated with lifetime exposure to various concentrations of 1 2-dichloroethane in water are

| Risk | Concentration |
|---|---|
| $10^{-5}$ | 9 4 ug, liter |
| $10^{-6}$ | 0 94 ug/liter |
| $10^{-7}$ | 0 094 ug/liter |

# 1 1-DICHLOROETHYLENE

## Summary

1 1 Dichloroethylene (VDC vinylidene chloride) caused kidney tumors (in males only) and leukemia in one study of mice exposed by inhalation but the results of other studies were equivocal or negative 1 1 Dichloroethylene is mutagenic and it caused adverse reproductive effects when administered to rats and rabbits by inhalation Chronic exposure causes liver damage and acute exposure to high doses produces nervous system damage

CAS Number 75 35-4

Chemical Formula $CH_2CCl_2$

IUPAC Name 1 1 Dichloroethene

Important Synonyms and Trade Names vinylidene chloride VDC 1 1 dichloroethene 1 1 DCE

## Chemical and Physical Properties

Atomic Weight 96 94

Boiling Point 37°C

Melting Point 122 1°C

Specific Gravity 1 218 at 20°C

Solubility in Water 400 mg liter at 20°C

Solubility in Organics. Sparingly soluble in alcohol ether acetone benzene and chloroform

Log Octanol/Water Partition Coefficient 1 48

Vapor Pressure 500 mm Hg at 20°C

Vapor Density 3 25

## Transport and Fate

Volatilization appears to be the primary transport process for 1,1-dichloroethylene (VDC) and its subsequent photooxidation in the atmosphere by reaction with hydroxyl radicals is apparently the predominant fate process. Information on other transport and fate mechanisms was generally lacking for 1,1-dichloroethylene. However, by inference from related compounds, hydrolysis, sorption, bioaccumulation, biotransformation, and biodegradation probably all occur but at rates too slow to be of much significance.

## Health Effects

1,1-Dichloroethylene caused kidney tumors in males and leukemia in males and females in one study of mice exposed by inhalation; gave equivocal results in other inhalation studies and gave negative results in rats and mice following oral exposure and in hamsters following inhalation exposure. VDC was mutagenic in several bacterial assays. 1,1-Dichloroethylene did not appear to be teratogenic but did cause embryotoxicity and fetotoxicity when administered to rats and rabbits by inhalation. Chronic exposure to oral doses of VDC as low as 5 mg/kg/day caused liver changes in rats. Acute exposure to high doses causes central nervous system depression, but neurotoxicity has not been associated with low-level chronic exposure. The oral $LD_{50}$ value for the rat is 1,500 mg/kg and for the mouse it is 200 mg/kg.

## Regulations and Standards

Ambient Water Quality Criteria (U.S. EPA)

### Aquatic Life

The available data are inadequate for establishing criteria. However, EPA did report the lowest values known to cause toxicity in aquatic organisms.

Freshwater

Acute toxicity: 11,600 ug/liter
Chronic toxicity: No available data

Saltwater

Acute toxicity: 224,000 ug/liter
Chronic toxicity: No available data

## Human Health

Estimates of the carcinogenic risks associated with lifetime exposure to various concentrations of 1,2-dichloroethane in water are

| Risk | Concentration |
|---|---|
| $10^{-}$ | 0.33 ug/liter |
| $10^{-6}$ | 0.033 ug/liter |
| $10^{-}$ | 0.0033 ug/liter |

CAG Unit Risk (U.S. EPA) 1.16 (mg/kg/day)$^{-1}$

ACGIH Threshold Limit Value 5 ppm TWA
20 mg/m$^3$ TWA
485 mg/m$^3$ STEL

# METHYLENE CHLORIDE

## Summary

Methylene chloride increased the incidence of lung and liver tumors and sarcomas in rats and mice It was found to be mutagenic in bacterial test systems In humans methylene chloride irritates the eyes mucous membranes and skin Exposure to high levels adversely affects the central and peripheral nervous systems and the heart In experimental animals, methylene chloride is reported to cause kidney and liver damage convulsions, and paresis

CAS Number 75-09-2

Chemical Formula. $CH_2Cl_2$

IUPAC Name Dichloromethane

Important Synonyms and Trade names Methylene dichloride methane dichloride

## Chemical and Physical Properties

Molecular Weight· 84 93

Boiling Point. 40°C

Melting Point -95 1°C

Specific Gravity 1 3266 at 20°C

Solubility in Water· 13 200-20 000 mg/liter at 25°C

Solubility in Organics: Miscible with alcohol and ether

Log Octanol/Water Partition Coefficient 1 25

Vapor Pressure 362.4 mm Hg at 20°C

Vapor Density 2 93

## Transport and Fate

Volatilization to the atmosphere appears to be the major mechanism for removal of methylene chloride from aquatic systems and its primary environmental transport process Photooxidation in the troposphere appears to be the dominant environmental fate of methylene chloride Once in the troposphere, the compound is attacked by

hydroxyl radicals, resulting in the formation of carbon dioxide and to a lesser extent carbon monoxide and phosgene. Phosgene is readily hydrolyzed to HCl and $CO_2$. About one percent of tropospheric methylene chloride would be expected to reach the stratosphere where it would probably undergo photodissociation resulting from interaction with high energy ultraviolet radiation. Aerial transport of methylene chloride is partly responsible for its relatively wide environmental distribution. Atmospheric methylene chloride may be returned to the earth in precipitation.

Photolysis, oxidation, and hydrolysis do not appear to be significant environmental fate processes for methylene chloride, and there is no evidence to suggest that either adsorption or bioaccumulation are important fate processes for this chemical. Although methylene chloride is potentially biodegradable, especially by acclimatized microorganisms, biodegradation probably only occurs at a very slow rate.

## Health Effects

Methylene chloride is currently under review by the National Toxicology Program. Preliminary results indicate that it produced an increased incidence of lung and liver tumors in mice and mammary tumors in female and male rats. In a chronic inhalation study, male rats exhibited an increased incidence of sarcomas in the ventral neck region. However, the authors suggested that the relevance and toxicological significance of this finding were uncertain in light of available toxicity data. Methylene chloride is reported to be mutagenic in bacterial test systems. It also has produced positive results in the Fisher rat embryo cell transformation test. However, it has been suggested that the observed cell-transforming capability may have been due to impurities in the test material. There is no conclusive evidence that methylene chloride can produce teratogenic effects.

In humans, direct contact with methylene chloride produces eye, respiratory passage, and skin irritation. Mild poisoning due to inhalation exposure produce somnolence, lassitude, numbness and tingling of the limbs, anorexia, and lightheadedness followed by rapid and complete recovery. More severe poisoning generally involve correspondingly greater disturbances of the central and peripheral nervous systems. Methylene chloride also has acute toxic effects on the heart, including the induction of arrhythmia. Fatalities reportedly due to methylene chloride exposure have been attributed to cardiac injury and heart failure. Methylene chloride is metabolized to carbon monoxide in vivo, and levels of carboxyhemoglobin in the blood are elevated after acute exposures. In experimental animals, methylene chloride is reported to cause kidney and liver damage, convulsions, and distal paresis. An oral $LD_{50}$ value of 2 136 mg/kg, and an inhalation $LC_{50}$ value of 88 000 mg/m$^3$/30 min are reported for the rat.

## Regulations and Standards

Ambient Water Quality Criteria (U S EPA)

### Aquatic Life

The available data are not adequate for establishing criteria.

## Human Health

Criterion 12.4 mg/liter (for protection against the noncarcinogenic effects of methylene chloride)

CAG Unit Risk (U.S. EPA) $1.4 \times 10^{-2}$ (mg/kg/day)[1]

NIOSH Recommended Standards

261 mg/m$^3$ TWA in the presence of no more than 9.9 mg/m$^3$ of CO
1,737 mg/m$^3$/15 min Peak Concentration

OSHA Standard 1,737 mg/m$^3$ TWA
3,474 mg/m$^3$ Ceiling Level
6,948 mg/m$^3$ Peak Concentration (5 min in any 3 hr)

ACGIH Threshold Limit Value 350 mg/m$^3$ TWA
100 ppm TWA
1,740 mg/m$^3$ STEL
500 ppm STEL

# TETRACHLOROETHYLENE

## Summary

Tetrachloroethylene (PCE perchloroethylene) induced liver tumors when administered orally to mice and was found to be mutagenic using a microbial assay system Reproduction toxicity was observed in pregnant rats and mice exposed to high concentrations Animals exposed by inhalation to tetrachloroethylene exhibited liver kidney and central nervous system damage

CAS Number 127-18-4

Chemical Formula $C_2Cl_4$

IUPAC Name Tetrachloroethene

Important Synonyms and Trade Names Perchloroethylene PCE

## Chemical and Physical Properties

Molecular Weight 165 83

Boiling Point 121°C

Melting Point -22 7°C

Specific Gravity 1 63

Solubility in Water 150 to 200 mg/liter at 20°C

Solubility in Organics. Soluble in alcohol, ether and benzene

Log Octanol/Water Partition Coefficient 2 88

Vapor Pressure 14 mm Hg at 20°C

## Transport and Fate

Tetrachloroethylene (PCE) rapidly volatilizes into the atmosphere where it reacts with hydroxyl radicals to produce HCl, CO $CO_2$, and carboxylic acid This is probably the most important transport and fate process for tetrachloroethylene in the environment PCE will leach into the groundwater, especially in soils of low organic content In soils with high levels of organics, PCE adsorbs to these materials and can be bioaccumulated to some degree However it is unclear if tetrachloroethylene bound to organic material can be degraded by microorganisms or must be desorbed to be destroyed. There is some evidence that higher organisms can metabolize PCE

## Health Effects

Tetrachloroethylene was found to produce liver cancer in male and female mice when administered orally by gavage Unpublished gavage studies in rats and mice performed by the National Toxicology Program (NTP) showed hepatocellular carcinomas in mice and a slight statistically insignificant increase in a rare type of kidney tumor NTP is also conducting an inhalation carcinogenicity study Elevated mutagenic activity was found in Salmonella strains treated with tetrachloroethylene Delayed ossification of skull bones and sternebrae were reported in offspring of pregnant mice exposed to 2 000 mg/m$^3$ of tetrachloroethylene for 7 hours day on days 6-15 of gestation Increased fetal resorptions were observed after exposure of rats to tetrachloroethylene Renal toxicity and hepatotoxicity have been noted following chronic inhalation exposure of rats to tetrachloroethylene Renal toxicity and hepatotoxicity have been noted following chronic inhalation exposure of rats to tetrachloroethylene levels of 1 356 mg/m$^3$ During the firs 2 weeks of a subchronic inhalation study exposure to concentrations of 1 6222 ppm (10 867 mg/m$^3$) of tetrachloroethylene produced signs of central nervous system depression and cholinergic stimulation was observed among rabbits monkeys rats and guinea pigs

## Regulations and Standards

Ambient Water Quality Criteria (US EPA)

### Aquatic Life

The available data are not adequate for establishing criteria However EPA did report the lowest values known to be toxic in aquatic organisms

Freshwater

Acute toxicity 5,280 ug/liter
Chronic toxicity 840 ug/liter

Saltwater

Acute toxicity 10 200 ug/liter
Chronic toxicity 450 ug/liter

### Human Health

Estimates of the carcinogenic risks associated with lifetime exposure to various concentrations of tetrachloroethylene in water are

| Risk | Concentration |
|---|---|
| $10^{-5}$ | 8 0 ug/liter |
| $10^{-6}$ | 0 8 ug/liter |
| $10^{-7}$ | 0 08 ug/liter |

CAG Unit Risk (U S EPA) $5.1 \times 10^{-2}$ (mg/kg/day)$^{-1}$

NIOSH Recommended Standards (air)

335 mg/m$^3$ TWA
670 mg/m$^3$ 15-min Ceiling Level

OSHA Standard (air)

670 mg/m$^3$ TWA
1,340 mg/m$^3$ Ceiling Level
2,010 mg/m$^3$ for 5 min every 3 hr Peak Concentration

ACGIH Threshold Limit Value

50 ppm TWA
335 mg/m$^3$ TWA
200 ppm STEL
1,340 mg/m$^3$ STEL

# TOLUENE

## Summary

Toluene has been shown to be embryotoxic in experimental animals and the incidence of cleft palate increased in the offspring of dosed mice Chronic inhalation exposure to high levels of toluene caused cerebellar degeneration and an irreversible encephalopathy in animals In humans acute exposure depressed the central nervous system and caused narcosis

CAS Number 108-88-3

Chemical Formula $C_6H_5CH_3$

IUPAC Name Methylbenzene

Important Synonyms and Trade Names Toluol phenylmethane

## Chemical and Physical Properties

Molecular Weight 92 13

Boiling Point· 110 6°C

Melting Point -95°C

Specific Gravity 0 8669 at 20°C

Solubility in Water· 534 8 mg/liter

Solubility in Organics. Soluble in acetone, ligroin and carbon disulfide miscible with alcohol, ether, benzene, chloroform, glacial acetic acid and other organic solvents

Log Octanol/Water Partition Coefficient 2.69

Vapor Pressure· 28 7 mm Hg at 25°C

Vapor Density· 3 14

Flash Point 4 4°C

## Transport and Fate

Volatilization appears to be the major route of removal of toluene from aquatic environments and atmospheric reactions of toluene probably subordinate all other fate processes Photooxidation is the primary atmospheric fate process for toluene and benzaldehyde is reported to be the principal organic product Subsequent precipitation or dry deposition can deposit toluene and its oxidation products into aquatic and terrestrial systems Direct photolytic cleavage of toluene is energetically improbable in the troposphere and oxidation and hydrolysis are probably not important as aquatic fates

The log octanol/water partition coefficient of toluene indicates that sorption processes may be significant. However no specific environmental sorption studies are available, and the extent to which adsorption by sedimentary and suspended organic material may interfere with volatilization is unknown Bioaccumulation is probably not an important environmental fate process Although toluene is known to be degraded by microorganisms and can be detoxified and excreted by mammals the available data do not allow estimation of the relative importance of biodegradation/biotransformation processes Almost all toluene discharged to the environment by industry is in the form of atmospheric emissions

## Health Effects

There is no conclusive evidence that toluene is carcinogenic or mutagenic in animals or humans. The National Toxicological Program is currently conducting an inhalation carcinogenicity bioassay in rats and mice

Oral administration of toluene at doses as low as 260 mg/kg produced a significant increase in embryonic lethality in mice Decreased fetal weight was observed at doses as low as 434 mg/kg, and an increased incidence of cleft palate was seen at doses as low as 867 mg/kg However other researches have reported that toluene is embryotoxic but not teratogenic in laboratory animals There are no accounts of a teratogenic effect in humans after exposure to toluene

Acute exposure to toluene at concentrations of 375-1 500 mg/kg produces central nervous system depression and narcosis in humans However even exposure to quantities sufficient to produce unconsciousness fail to produce residual organ damage The rat oral $LD_{50}$ value and inhalation $LC_{LO}$ value are 5 000 mg/kg and 15 000 mg/m$^3$ respectively Chronic inhalation exposure to toluene at relatively high concentrations produces cerebellar degeneration and an irreversible encephalopat in mammals.

Toluene in sufficient amounts appears to have the potential to alter significantly the metabolism and resulting bioactivity of certain chemicals For example, coadministration of toluene along with benzene or styrene has been shown to suppress the metabolism of benzene or styrene in rats

## Regulations and Standards

Ambient Water Quality Criteria (U S EPA)

### Aquatic Life

The available data are not adequate for establishing criteria However EPA did report the lowest values known to cause toxicity in aquatic organisms

Freshwater

Acute toxicity 17 500 ug/liter
Chronic toxicity No available data

Saltwater

Acute toxicity 6 300 ug liter
Chronic toxicity 5 000 ug liter

### Human Health

Criterion 14 3 mg/liter

NIOSH Recommended Standards 375 $mg/m^3$ TWA
560 $mg/m^3$ STEL

OSHA Standards 750 $mg/m^3$ TWA
1.120 $mg/m^3$ Ceiling Level

ACGIH Threshold Limit Value. 100 ppm TWA
375 $mg/m^3$ TWA
150 ppm STEL
560 $mg/m^3$ STEL

# 1.1.1-TRICHLOROETHANE


## Summary

Preliminary results suggest that 1 1 1 trichloroethane (1 1 1-TCA) induces liver tumors in female mice It was shown to be mutagenic using the Ames assay and it causes transformation in cultured rat embryo cells Inhalation exposure to high concentrations of 1.1.1-TCA depressed the central nervous system affected cardiovascular function, and damaged the lungs, liver and kidneys in animals and humans Irritation of the skin and mucous membranes has also been associated with human exposure to 1.1.1-trichloroethane


CAS Number 71-55-6

Chemical Formula $CH_3CCl_3$

IUPAC Name 1 1 1-Trichloroethane

Important Synonyms and Trade Names Methyl chloroform chlorothene 1 1 1 TCA

## Chemical and Physical Properties

Molecular Weight 133 4

Boiling Point 74 1°C

Melting Point -30 4°C

Specific Gravity 1 34 at 20°C (liquid)

Solubility in Water: 480-4 400 mg/liter at 20°C (several divergent values were reported in the literature)

Solubility in Organics: Soluble in acetone, benzene, carbon tetrachloride methanol, ether, alcohol, and chlorinated solvents

Log Octanol/Water Partition Coefficient 2 17

Vapor Pressure 123 mm Hg at 20°C

Vapor Density: 4 63

## Transport and Fate

1 1 1-Trichloroethane (1 1 1-TCA) disperses from surface water primarily by volatilization Several studies have indicated that 1 1 1-trichloroethane may be adsorbed onto organic materials in the sediment but this is probably not an important route of elimination from surface water 1 1 1-Trichloroethane can be transported in the groundwater but the speed of transport depends on the composition of the soil

Photooxidation by reaction with hydroxyl radicals in the atmosphere is probably the principal fate process for this chemical

## Health Effects

1 1 1-Trichloroethane was retested for carcinogenicity because in a previous study by NCI early lethality precluded assessment of carcinogenicity Preliminary results indicate that 1 1 1-TCA increased the incidence of combined hepatocellular carcinomas and adenomas in female mice when administered by gavage There is evidence that 1 1 1-trichloroethane is mutagenic in Salmonella typhimurium and causes transformation in cultured rat embryo cells These data suggest that the chemical may be carcinogenic.

Other effects of 1 1,1-TCA are seen only at concentrations well above those likely in an open environment The most notable toxic effects of 1 1 1-trichloroethane in humans and animals are central nervous system depression, including anesthesia at very high concentrations and impairment of coordination, equilibrium, and judgment at lower concentrations (350 ppm and above), cardiovascular effects, including premature ventricular contractions, decreased blood pressure, and sensitization to epinephrine-induced arrhythmia, and adverse effects on the lungs, liver and kidneys Irritation of the skin and mucous membranes resulting from exposure to 1 1,1-trichloroethane has also been reported The oral $LD_{50}$ value of 1 1 1-trichloroethane in rats is about 11,000 mg/kg

## Regulations and Standards

Ambient Water Quality Criteria (U S EPA)

### Aquatic Life

The available data are not adequate for establishing criteria However EPA did report, the lowest values of the two trichloroethanes (1 1,1 and 1 1,2) known to be toxic in aquatic organisms.

Freshwater

Acute toxicity 18 mg/liter
Chronic toxicity 8 4 mg/liter

# TRICHLOROETHYLENE

## Summary

Trichloroethylene (TCE) induced hepatocellular carcinomas in mice and was mutagenic when tested using several microbial assay systems Chronic inhalation exposure to high concentrations caused liver kidney and neural damage and dermatological reactions in animals.

CAS Number· 79-01-06

Chemical Formula $C_2HCl_3$

IUPAC Name Trichloroethene

Important Synonyms and Trade Names Trichloroethene TCE and ethylene trichloride

## Chemical and Physical Properties

Molecular Weight 131.5

Boiling Point· 87°C

Melting Point -73°C

Specific Gravity· 1 4642 at 20°C

Solubility in Water 1 000 mg/liter

Solubility in Organics. Soluble in alcohol. ether acetone and chloroform

Log Octanol/Water Partition Coefficient 2 29

Vapor Pressure· 60 mm Hg at 20°C

Vapor Density 4 53

## Transport and Fate

Trichloroethylene (TCE) rapidly volatilizes into the atmosphere where it reacts with hydroxyl radicals to produce hydrochloric acid carbon monoxide. carbon dioxide and carboxylic acid. This is probably the most important transport and fate process for trichloroethylene in surface water and in the upper layer of soil TCE adsorbs to organic materials and can be bioaccumulated to some degree However it is unclear whether trichloroethylene bound to organic materiaL can be degraded by

Saltwater

Acute toxicity 31.2 mg/liter
Chronic toxicity No available data

Human Health

Criterion 18.4 mg/liter

NIOSH Recommended Standard 350 ppm (1 910 mg/m$^3$)/15 min Ceiling Level

OSHA Standard· 350 ppm (1 910 mg/m$^3$) TWA

ACGIH Threshold Limit Value 350 ppm TWA
1 400 mg/m$^3$ TWA
450 ppm STEL
2 450 mg/m$^3$ STEL

# 1.1.2-TRICHLOROETHANE

## Summary

1 1 2 Trichloroethane induced liver tumors and pheochromocytomas in mice It caused liver and kidney damage in dogs

CAS Number: 79-00-5

Chemical Formula $CH_2ClCHCl_2$

IUPAC Name: 1.1.2-Trichloroethane

Important Synonyms and Trade Names Vinyl trichloride, ethane trichloride

## Chemical and Physical Properties

Molecular Weight 133 41

Boiling Point 133 8°C

Melting Point: -36.5°C

Specific Gravity 1 4397 at 25°C

Solubility in Water 4 500 mg/liter at 20°C

Solubility in Organics. Soluble in alcohol ether and chloroform

Log Octanol/Water Partition Coefficient 2 17

Vapor Pressure 19 mm Hg at 20°C

Vapor Density: 4 63

## Transport and Fate

Volatilization and subsequent photooxidation in the troposphere are probably the primary transport and fate processes for 1.1.2-trichloroethane Some sorption, bioaccumulation, and biodegradation may occur, but these processes are probably not very important processes for trichloroethane transport or fate

1 1 2-Trichloroethane induced heptacellular carcinomas and pheochromocytoma of the adrenal gland in male and female mice but did not produce a significant increase in tumor incidence in male or female rats It was not mutagenic when tested using the Ames assay No information was found concerning the reproductive toxicity or

teratogenicity of 1 1 2-trichloroethane No chronic studies were found on the toxicity of 1 1 2-trichloroethane but single doses as low as 400 mg/kg caused liver and kidney damage in dogs The oral $LD_{50}$ value for 1 1 2 trichloroethane in rats is 835 mg/kg

## Regulations and Standards

Ambient Water Quality Criteria (U S EPA)

### Aquatic Life

The available data are not sufficient for establishing criteria However EPA did report the lowest values known to be toxic in aquatic organisms

Freshwater

Acute toxicity 18 000 ug/liter
Chronic toxicity 9 400 ug/liter

Saltwater

Acute toxicity No available data
Chronic toxicity No available data

### Human Health

Estimates of the carcinogenic risks associated with lifetime exposure to various concentrations of 1 1,2-trichloroethane in water are

| Risk | Concentration |
|---|---|
| $10^{-5}$ | 6 0 ug/liter |
| $10^{-6}$ | 0 6 ug/liter |
| $10^{-7}$ | 0 06 ug/liter |

CAG Unit Risk (U S EPA) $5\ 7 \times 10^{-2}$ (mg/kg/day) [1]

ACGIH Threshold Limit Value 10 ppm TWA (skin)
45 mg/m$^3$ TWA (skin)

microorganisms or must be desorbed to be destroyed. There is some evidence that higher organisms can metabolize TCE Trichloroethylene leaches into the groundwater fairly readily, and it is a common contaminant of groundwater around hazardous waste sites

## Health Effects

Trichloroethylene is carcinogenic to mice after oral administration producing hepatocellular carcinomas. It was found to be mutagenic using several microbial assay systems Trichloroethylene does not appear to cause reproductive toxicity or teratogenicity TCE has been shown to cause renal toxicity hepatotoxicity neurotoxicity and dermatological reactions in animals following chronic exposure to levels greater than 2.000 mg/m$^3$ for 6 months Trichloroethylene has low acute toxicity; the acute oral $LD_{50}$ value in several species ranged from 6 000 to 7 000 mg/kg

## Regulations and Standards

Ambient Water Quality Criteria (U S EPA)

### Aquatic Life

The available data are not adequate for establishing criteria However, EPA did report the lowest values known to have toxic effects in aquatic organisms

Freshwater

Acute toxicity 45 mg/liter
Chronic toxicity No available data

Saltwater

Acute toxicity 2 mg/liter
Chronic toxicity No available data

### Human Health

Estimates of the carcinogenic risks associated with lifetime exposure to various concentrations of trichloroethylene in water are:

| Risk | Concentration |
|---|---|
| $10^{-5}$ | 27 ug/liter |
| $10^{-6}$ | 2.7 ug/liter |
| $10^{-7}$ | 0.27 ug/liter |

CAG Unit Risk (U S EPA) 1 1 x $10^{-2}$ (mg/kg/day) [1]

NIOSH Recommended Standards (air)
540 mg/$m^3$ TWA
760 mg/$m^3$ 10-min Ceiling Level

OSHA Standard (skin) 540 mg/$m^3$ TWA
1 075 mg/$m^3$, 15-min Ceiling Level
1 620 mg/$m^3$ for 5 min every 3 hr Peak Concentration

ACGIH Threshold Limit Values 50 ppm TWA
270 mg/$m^3$ TWA
200 ppm STEL
1 080 mg/$m^3$ STEL

Onsite Samplers for February 1990

| Sampler | No. of Samples | Total Air Volume | Total Plutonium (pCi/m3) | Total Error (pCi/m3) |
|---|---|---|---|---|
| S-01 | ~~2~~ 1 | 37000 | 0.000333 | 0.000000 |
| S-02 | ~~2~~ 1 | | | |
| S-03 | ~~2~~ 1 | 8000 | 0.000010 | 0.000014 |
| S-04 | ~~2~~ 1 | 27000 | 0.000012 | 0.000006 |
| S-05 | 2 | 32000 | 0.000110 | 0.000023 |
| S-06 | 2 | 26000 | 0.000039 | 0.000018 |
| S-07 | 2 | 33000 | 0.000091 | 0.000022 |
| S-08 | 2 | 37000 | 0.000046 | 0.000011 |
| S-09 | 2 | 38000 | 0.000325 | 0.000056 |
| S-10 | ~~2~~ 1 | 33000 | 0.000007 | 0.000004 |
| S-11 | ~~2~~ 1 | 33000 | 0.000005 | 0.000004 |
| S-12 | ~~2~~ 1 | 33000 | 0.000022 | 0.000006 |
| S-13 | ~~2~~ 1 | 34000 | 0.000001 | 0.000003 |
| S-14 | ~~2~~ 1 | 29000 | 0.000002 | 0.000003 |
| S-15 | ~~2~~ 1 | 31000 | 0.000003 | 0.000003 |
| S-16 | ~~2~~ 1 | 35000 | 5.154865e-07 | 0.000003 |
| S-17 | ~~2~~ 1 | 9000 | 0.000007 | 0.000012 |
| S-18 | ~~2~~ 1 | 33000 | 0.000040 | 0.000009 |
| S-19 | ~~2~~ 1 | 34000 | 0.000036 | 0.000008 |
| S-20 | ~~2~~ 1 | 34000 | 0.000032 | 0.000007 |
| S-21 | ~~2~~ 1 | 36000 | 0.000012 | 0.000005 |
| S-22 | ~~2~~ 1 | 30000 | 0.000005 | 0.000004 |
| S-23 | ~~2~~ 1 | 33000 | 0.000003 | 0.000004 |
| ·24 | ~~2~~ 1 | 43000 | 0.000002 | 0.000003 |
| S-81 | 1 | 24000 | -1.329188e-07 | 0.000004 |

No error factor from lab

find out what going on

No Data on 2, 40, 58 & 61

Carmencity

no of samples

Air Volume Input

| Sampler | TOTAL AIR VOLUME | Total Plutoniu (pCi/m3) | Total Error (pCi/m3) |
|---|---|---|---|
| S-51 | 49000 | -0.000000 | 0.000002 |
| S-52 | 56000 | 0.000002 | 0.000002 |
| S-53 | 47000 | -0.000000 | 0.000002 |
| S-54 | 52000 | -0.000001 | 0.000002 |
| S-55 | 49000 | -0.000001 | 0.000002 |
| S-56 | 52000 | 0.000001 | 0.000002 |
| S-57 | 46000 | -0.000000 | 0.000002 |
| S-58 | | | |
| S-59 | 53000 | 0.000000 | 0.000003 |
| S-60 | 52000 | 0.000000 | 0.000002 |
| S-61 | | | |
| S-62 | 16000 | -0.000002 | 0.000006 |
| S-63 | | | |
| S-64 | | | |
| S-65 | | | |
| S-66 | | | |
| S-67 | | | |
| S-68 | 57000 | 0.000002 | 0.000003 |
| S-69 | | | |
| S-70 | | | |
| S-71 | | | |
| S-72 | | | |
| S-73 | 40000 | -0.000001 | 0.000002 |

Perimeter



No of Samples

Air Volume Input

| Sampler | TOTAL AIR VOLUME | Total Plutoniu (pCi/m3) | Total Error (pCi/m3) |
|---|---|---|---|
| S-31 | 17000 | -0.000000 | 0.000006 |
| S-32 | 51000 | -0.000000 | 0.000002 |
| S-33 | 49000 | 0.000000 | 0.000002 |
| S-34 | 32000 | -0.000001 | 0.000003 |
| S-35 | 53000 | 0.000000 | 0.000002 |
| S-36 | 52000 | 0.000003 | 0.000003 |
| S-37 | 47000 | 0.000002 | 0.000003 |
| S-38 | 50000 | 0.000001 | 0.000002 |
| S-39 | 51000 | -0.000001 | 0.000002 |
| S-40 | 25000 | -0.000000 | 0.000004 |
| S-41 | 51000 | 0.000000 | 0.000002 |
| S-42 | 49000 | 0.000001 | 0.000002 |
| S-43 | 41000 | -0.000000 | 0.000002 |
| S-44 | 49000 | -0.000000 | 0.000002 |

# OPERATIONAL SAFETY ANALYSIS (OSA)

Title Remedial Investigation Drilling & Sampling Program No. 250 002

## OPERATION

This OSA describes procedures and guidelines to be followed during the drilling and ground water sampling for the Remedial Investigations (RI) Programs. The Environmental Restoration Program (ERP) health and safety plans outlines general health and safety controls. Specific procedures related to Plant permits, personnel, procedures and waste handling as well as job responsibilities are addressed in this OSA.

## RESPONSIBILITY

| Greg Litus | Sr. Env. Eng. | RCRA/CERCLA |
|---|---|---|
| (Name) | (Position) | (Organization) |

is responsible for this operation. It is his/her responsibility to ensure that this operation is carried out in accordance with this OSA and that all employees who perform this operation are familiar with this document.

## CHANGES

No changes will be made in this OSA without coordinating the change through the HS&E Area Engineer who will determine if additional reviews and/or approvals are necessary.

## CONCURRENCE

Director, Personnel Protection — Concurrence Date 1/5/90

## APPROVAL AUTHORITY

Director, Plutonium Operations
(Name and Title of Approving Authority)

is the final Approval Authority for this OSA.

Approval Signature — Approval Date 1/5/90

Reviewed for Classification by:

1-4-90

## OPERATIONAL SAFETY ANALYSIS (OSA)

JOB TITLE: Remedial Investigation Drilling and Sampling Program

OPERATION: This OSA describes procedures and guidelines to be followed during the drilling and ground water sampling for the Remedial Investigations (RI) Program. The Health and Safety Plan for the Environmental Restoration Program (ERP) outlines the general procedures of health and safety control. Specific procedures related to plant permits, personnel, procedures and waste handling, as well as job responsibilities, are provided in this OSA.

| Basic Jobs/Responsibility | Potential Hazard | Hazard Control |
|---|---|---|
| 1. Work permits, excavation, Land Use Permits and Buffer Zone Log use.<br><br>Construction Coordinator, Environmental Management are responsible. | Unauthorized access, underground utilities, power lines, flame control, general land use. | Inspection of each drilling/worksite by Construction Management. Inspections are for listed hazard identification and general safety regulations and to monitor buffer zone activity to minimize environmental impacts and security. All individuals entering the Buffer Zones must log out and in of the exterior guard posts. |
| 2. Coordinate overall job safety. ERP Health and Safety Coordinator is responsible for the implementation of the ERP Health and Safety Plan. | Personnel exposure to radioactive and/or hazardous wastes and bodily injury. | The ERP Health and Safety Coordinator is responsible for implementation and auditing of the requirements in the ERP Health and Safety Plan. The Coordinator is also responsible for the coordination of passive charcoal dosimeters to assess organic exposure levels. |
| 3. Restrict access to drilling operations. The ERP Health and Safety Coordinator and the Subcontractor Health and Safety Coordinator are responsible. | Contaminant contact. Minimize contact by wearing appropriate designated protective clothing. | Designated contaminated sites are those areas delineated with a barbless fence. The restricted access boundary (exclusion zone) is extended |

| Basic Job/Responsibility | Potential Hazard | Hazard Control |
|---|---|---|
| | | outward to include any drilling operations within 30 feet or inside of a barbless fence. All personnel, visitors included, must wear white coveralls and booties prior to entering a designated contaminated site. Personnel entering drill rig exclusion zones (a physically delineated boundary approximately 30 feet around the working area of each rig) must wear personal protective clothing and equipment specified by the ERP Health and Safety Coordinator. Reconnaissance inspections i.e., staking locations must follow to the above procedures. |
| 4. Radiation surveys of Personnel and Equipment.<br><br>Radiation Monitoring is responsible for surveying and releasing personnel and equipment from contaminated work sites. The site geologist or the subcontractor Health and Safety Coordinator will notify radiation monitoring when needed. | Contamination migration from control area to clean areas. | All personnel, samples, drilling core and equipment will be surveyed by radiation monitoring and must meet plant requirements before being released from the area. Less than 20 dpm/100cm$^2$ alpha removable, less than detectable alpha activity fixed, ambient background activity using the fiddler and less than 1,000 dpm/100cm$^2$ beta activity. |
| 5. Radiation Survey of drilling location. Construction Coordinator and Radiation Monitoring are responsible. | Radionuclide resuspension and impact assessment. | Full time radiation monitoring may be required when near or within a designated contaminated site<br>A pre-drilling survey using a fiddler will be |

| Basic Job Responsibility | Potential Hazard | Hazard Control |
|---|---|---|
| | | performed to determine the baseline for each location near designated contaminant sites or within the plant perimeter fence. A post survey will also be performed to assess any impacts at the end of each day. If radiation monitoring determine cutting radioactive activity over background, particulate control must be used, (e.g., water or coherex). Environmental Management will be notified when such conditions are encountered. |
| 6. Special High Volume Air Samples. ERP Health and Safety Coordinator and the Subcontractor Site Health and Safety Coordinator will coordinate with Environmental Management. | Contaminant resuspension. | Special air sampling (with high volume air samplers) may be required only where the potential for the resuspension of radioactive particulates exists. The need for special air sampling will be determined separately for each site by Environmental Management. Environmental Management is responsible for coordinating the sampling and filter analysis using the "Special Air Sampling Guidance" Document. |

| Basic Job/Responsibility | Potential Hazard | Hazard Control |
|---|---|---|
| 7. Restrict vehicular access. Subcontractor site manager are responsible for implementation. Construction Coordinator is responsible for coherex and gravel application. | Contaminant resuspension and environmental impacts. | Access paths which will encounter heavy vehicular traffic prepared with gravel and/or soil stabilizer (coherex) as determined necessary by Environmental Management. This will reduce erosion and soil resuspension. Vehicular traffic in the vicinity of the 903 Pad area will be restricted to only prepared surfaces. These road surfaces must be built ON TOP OF the present ground cover of the area <u>without</u> cutting or scraping the present ground surface. |
| 8. Drill Cutting Handling. Determine if drill cuttings are "contaminated" (see Reference: Operational Safety Analysis No. RFOSA (Sept. 7, 1984). Radiation Monitoring is responsible. The drill rig geologist will coordinate with the ERP's Health and Safety Coordinator and the Subcontractor Site Manager on containment of drill cuttings. The ERP Health & Safety | Potential contamination of otherwise non-contaminated areas and limit personnel exposure. | If drill cuttings at a drill site exceed background (approximately 250 cpm using a Fiddler as references in OSA1) as determined by Radiation Monitors, cuttings will be placed in designated half-boxes. If radioactivity is below background (approximately 250 cpm), cuttings will be distributed on the surface of the immediate area. If organic contaminants are continually detected above background during drilling by the rig geologist's by direct reading instruments, the drill cuttings will be boxed. If the drilling core is over |

| Basic Job/Responsibility | Potential Hazard | Hazard Control |
| --- | --- | --- |
| | | background (approximately 250 cpm), the core will also be contained in the designated half-boxes. If above background reading of contaminants are detected, all drilling fluid contained in the sediment basins from rotary drilling will be decanted into a tanker (see Step 9). The remaining cuttings/sludge will be mixed with absorbent material (vermiculite and cement) and placed into a half-box. |
| 9. Fluid Handling. The ERP Health & Safety Coordinator & Subcontractor Site Manager are responsible for contacting the onsite laboratory for sampling. Liquid Waste Operations for any sludge. A sample from each tanker truck shipment will be taken prior to its transfer to Liquid Waste Processing. In addition, Radiation Monitoring must be contacted to survey all containers before exiting the site. Handling & transportation of the liquid to Liquid Waste Ops. | Surface sediment contamination. | Fluids used at drilling locations which have above background concentrations of radioactivity and/or organics as determined from the drill cuttings, will be contained (see Step 8). Fluids will be collected in decontamination troughs. The liquid in these troughs will be decanted into a tanker truck. Care must be taken in preventing sample sediments from entering the tanker. The remaining solids left in the troughs will be mixed with absorbent material (vermiculite and cement) and placed in a half-box (see Step 8). If any volatile organic compounds detected 1.0 ppm above background in the headspace of each well, the ground water |

| Basic Job/Responsibility | Potential Hazard | Hazard Control |
| --- | --- | --- |
| | | will be contained. Headspace analyses will be performed by the samplers using a HNu photoionization detector. Ground water generated from well development and purging will be contained and processed by the samplers. If no volatile organic compounds are found, the water will be disposed of on the ground surface in the immediate area. If above background radionuclide activity is detected during drilling in the zone of well completion the ground water will be contained. |
| 10. Trash Generation. Drill site workers are responsible for collection and containment of solid trash in designated containers. Construction Coordinator and the Subcontractor Site Manager are responsible for contacting Waste Operations for transfer of solid waste trash drums. | Wind blown contaminated debris. | Trash generated within the exclusion areas of each drilling rig operating must be contained. This trash is to be placed in black and white "skunk" drums. Care must be taken to segregate non-contaminated trash from potentially contaminated trash. Non-contaminated trash will be disposed of in sanitary dumpsters. All personal outer protective clothing (e.g. gloves, tyvex disposable booties, rags) used in exclusion zones must be placed in garbage bags. These bags are then to be placed into double vinyl lined bags designated for drums. |

| Basic Job/Responsibility | Potential Hazard | Hazard Control |
|---|---|---|
| | | Final disposition of drums will be determined by Waste Operations Coordinator. |
| 11. Proper labeling of Waste Containers. Solid and Liquid Waste Operations management are responsible for proper labeling. | Illegal or unsafe storage, treatment, and disposal. | Waste Operations will determine appropriate labels for radioactive and hazardous waste constituents generated from the drilling program. |
| 12. Field Activities Near Rifle and Pistol Ranges. ERP Health and Safety Coordinator and the Subcontractor Health and Safety Coordinator are responsible. | Bodily injury due to gunshot wound. | All personnel operating south of excess road east of the perimeter fence and west of Pond C-2. Call Dispatcher x-2444. Reference: OSA: Firearms & Ammunition Storage. No 121.1. |
| 13. Off-site Shipping of Samples. The RCRA and subcontracting site managers are responsible. | Proper shipping containers and labels to ensure proper handling and response in case of accidents. | Samples which have been determined to meet the definitions of hazardous materials in Part 173 or Title 49 of the Code of Federal Regulations (49 CFR) will be packaged, marked, labeled, described and transported in compliance with the requirements of 49 CFR Parts 171 through 178.<br><br>Environmental samples which are not subject to the above 49 CFR parts will be transported in accordance with 40 CFR (d)(2)(ii)(A)and (B).<br><br>Property Pass Form RF-39900 is to be used for |

| Basic Job/Responsibility | Potential Hazard | Hazard Control |
| --- | --- | --- |
| | | transferring Rockwel or DOE property of Plant site. Materia Transfer Tags ar required for th transfer of sample from security areas t other areas on Plan site. Prior to shippin samples a screenin sample is sent to the 881 Laboratory. The result of the screenin sample will dictate which laboratory will perform the analysis.<br><br>For more informatio call Traffic at ext. 2377 or ext. 2378. |
| Hazard control associated with the physical dangers of operating drill equipment. | Bodily injury from unexpected movement or failure of drill equipment. | Only experienced drillers employed by the subcontractor will operate the drill rigs. Hard hats, steel toed boots, and class I eye protection will be worn by all personnel working wwithin 30 feet of the drill rig. The "buddy system" will always be employed so no individual will work the drill rig alone. |

O. S. A

R.I. DRILLING AND SAMPLING PROGRAM

REFERENCE LIST OF INDIVIDUAL CONTACTS
AND RESPONSIBILITIES

| FOR BASIC JOBS/RESPONSIBILITY | CONTACT | EXT.&/OR PAGE |
|---|---|---|
| 1. CONSTRUCTION COORDINATION | "DOC" MATHEWS | X - 2210 |
| 2. CEARP HEALTH & SAFETY COORDINATOR | TODD LEWIS | X - 4089 |
| 3. SUBCONTRACTOR HEALTH & SAFETY CONTACT COORDINATOR | TBA | X - 5355 |
| 4. AMBIENT AIR SAMPLERS | ANN LONG | X - 4158 |
| 5. TRUCKING | MYRON JONES | X - 2505 |
| 6. DRILL CUTTING HANDLING | | |
| RADIATION SURVEY FOR HANDLING PROCEDURES | J. A. RAY<br>ERNIE ENGLISH | X - 2238<br>X - 4915 |
| HALF BOXES FOR DRILL CUTTINGS AND CORE TRANSFER | WASTE OPERATIONS | X - 2411 |
| TRUCKING | MYRON JONES | X - 2505 |
| WASTE INSPECTOR | BRIAN HERMANN OR D594 | X - 7858 |
| DECONTAMINATION WORKERS | ANDY BLAZON OR D263 | X - 2411 |
| 7. FLUID HANDLING | | |
| TRUCKING | MYRON JONES | X - 2505 |
| FLUID SAMPLING - 881 LABS | TIM ELMONT | X - 4959 |
| FLUID TREATMENT & TRANSPORTATION | GARVIN HEWITT | X - 4753 |
| 8. NUCLEAR MATERIALS CONTROL "MIXED" SOLID WASTE | TERRY WATSON | D857 |
| 9. LABELS FOR SOLID AND LIQUID WASTE CONTAINERS | BILL REYNOLDS - SOLID<br>GARVIN HEWITT - LIQUID OR D422 | X - 7368<br>X - 4753 |

## R.I. DRILLING AND SAMPLING PROGRAM

## REFERENCE LIST OF INDIVIDUAL CONTACTS AND RESPONSIBILITIES

| FOR BASIC JOBS/RESPONSIBILITY | CONTACT | EXT.&/OR PAGE |
|---|---|---|
| 10. RADIATION SURVEY<br>ERNIE ENGLISH | J. A. RAY<br>X - 4915 | X - 2238 |
| 11. PLANT PROTECTION | R. L. NEWBY | X - 7332 |

EG&G ROCKY FLATS

# INTEROFFICE CORRESPONDENCE

DATE January 4, 1990 OSA2-90

TO J. Majestic, Personnel Protection

FROM G.W. Litus

SUBJECT ANNUAL OSA REVIEW, OSA 250.002

OSA 250.002, "Remedial Investigation Drilling and Sampling Program" has been reviewed as required in HS&E 2.03. The title page has been updated for the current approval authority.

After your review, concurrence and sign-off, please forward the OSA to the designated Approval Authority. When the Director has signed-off, please return the OSA to J.D. Weaver, Area Management, Building 750.

dkf

Greg W. Litus
Environmental Restoration

Kirk B. McKinley, Director
Environmental Restoration

G.D. Shearer
Area Management

cc:
K.B. McKinley
G.D. Shearer

OSA COMMENT REVIEW SHEET

Operating OSA Title DRILLING OSA
Operating OSA Number 250 002
Author BREWT LEWIS EXT 7041

REVIEW DISCIPLINE

[ ] Criticality Engineering
[ ] Fire Department
[ ] I&SSE
[ ] Medical
[ ] Safety Analysis
[ ] Environmental Management
[ ] Industrial Hygiene
[ ] HS&E Area Management
[ ] Operational Health Physics
[ ] Radiological Monitoring

Please review the attached copy of the subject OSA and indicate any changes, additions, comments, or your approval in the areas provided.

[ ] It will not be necessary to schedule a meeting. Please return your comments by 10-18-89 (Date).

[ ] A Safety Team Review meeting is scheduled for _____ (Time/Date) in _____ (Building/Room) to discuss the OSA. If you cannot attend the meeting, please send an alternate.

GARY D. SHEARER (HS&E Area Engineer) T441-A 10-12-89 (Date)

[ ] The OSA is acceptable; no comments.
[X] My comments are as follows:

Radiation Monitoring Change to Radiation Protection Tech. RPTs Title change
Radiation Protection Tech.

✓ P 3 bottom of page 3 to page 4 Something is left out.

(Discipline's Signature) 10-16-89 (Date)

Comments [X] Incorporated [ ] Resolved

Gary D. Shearer
(HS&E Area Engineer)
John Ray

RECEIVED
OCT 1 2 1989
SAFETY ANALYSIS

# OSA COMMENT REVIEW SHEET

Operating OSA Title DRILLING OSA
Operating OSA Number 250 002
Author BRENT LEWIS EXT 7041

## REVIEW DISCIPLINE

[ ] Criticality Engineering
[ ] Fire Department
[ ] I&SSE
[ ] Medical
[ ] Safety Analysis
[ ] Environmental Management
[ ] Industrial Hygiene
[ ] HS&E Area Management
[ ] Operational Health Physics
[ ] Radiological Monitoring

Please review the attached copy of the subject OSA and indicate any changes, additions, comments, or your approval in the areas provided.

[ ] It will not be necessary to schedule a meeting. Please return your comments by 10-16-89 (Date).

[ ] A Safety Team Review meeting is scheduled for _____ (Time/Date) in _____ (Building/Room) to discuss the OSA. If you cannot attend the meeting, please send an alternate.

GARY D. SHEARER (HS&E Area Engineer) 10-12-89 (Date)
T441-A

[ ] The OSA is acceptable; no comments.
[x] My comments are as follows:

See Attached comments in text.

Stephen M. Vista SAE (Discipline's Signature) 10/16/89 (Date)

Comments [X] Incorporated [ ] Resolved

Gary D. Shearer (HS&E Area Engineer)

OSA COMMENT REVIEW SHEET

Operating OSA Title DRILLING OSA
Operating OSA Number 250.002
Author BRENT LEWIS EXT 7041

REVIEW DISCIPLINE

[ ] Criticality Engineering
[ ] Fire Department
[ ] I&SSE
[ ] Medical
[ ] Safety Analysis
[ ] Environmental Management
[ ] Industrial Hygiene
[ ] HS&E Area Management
[ ] Operational Health Physics
[ ] Radiological Monitoring

Please review the attached copy of the subject OSA and indicate any changes, additions, comments, or your approval in the areas provided.

[ ] It will not be necessary to schedule a meeting. Please return your comments by 10-18-89 (Date).

[ ] A Safety Team Review meeting is scheduled for _____ (Time/Date) in _____ (Building/Room) to discuss the OSA. If you cannot attend the meeting, please send an alternate.

GARY D. SHEARER (HS&E Area Engineer) 10-12-89 (Date)

[ ] The OSA is acceptable; no comments. T441-A
[X] My comments are as follows:

Page #1, #3 - HAZARD CONTROL - ALL personnel (incomplete sentence
Page #2, #5 - HAZARD CONTROL - WITHIN THE (incomplete sentence.
OSA - DOES NOT ADDRESS SAFETY REQUIREMENTS - BASIC JOB STEPS, IN SETTING UP DRILLING RIGS - CAUTIONS TO OBSERVE. - OVERHEAD HAZARDS, HARD HATS, GLOVES, ETC.

see sections

J.M. ORTIZ (Discipline's Signature) 10/16/89 (Date)

I.d Safety
x 4594

Comments [X] Incorporated [X] Resolved

Gary D. Shearer (HS&E Area Engineer)

J. ORTIZ understood the problem & said final decision would be up to new Area Engineer.

OSA COMMENT REVIEW SHEET

Operating OSA Title DRILLING OSA
Operating OSA Number 250 002
Author BRENT LEWIS EXT 7041

REVIEW DISCIPLINE

[ ] Criticality Engineering
[ ] Fire Department
[ ] I&SSE
[ ] Medical
[ ] Safety Analysis
[ ] Environmental Management
[ ] Industrial Hygiene
[ ] HS&E Area Management
[ ] Operational Health Physics
[ ] Radiological Monitoring

Please review the attached copy of the subject OSA and indicate any changes, additions, comments, or your approval in the areas provided.

[ ] It will not be necessary to schedule a meeting. Please return your comments by 10-16-89 (Date).

[ ] A Safety Team Review meeting is scheduled for _____ (Time/Date) in _____ (Building/Room) to discuss the OSA. If you cannot attend the meeting, please send an alternate.

GARY D. SHEARER (HS&E Area Engineer) 10-12-89 (Date)

T441-A

[✓] The OSA is acceptable; no comments.
[ ] My comments are as follows:

(Discipline's Signature) 10-16-89 (Date)

Comments [X] Incorporated [ ] Resolved

(HS&E Area Engineer)

OSA COMMENT REVIEW SHEET

Operating OSA Title DRILLING OSA
Operating OSA Number 250 002
Author BRENT LEWIS EXT 7041

REVIEW DISCIPLINE

[ ] Criticality Engineering
[ ] Fire Department
[ ] I&SSE
[ ] Medical
[ ] Safety Analysis
[ ] Environmental Management
[ ] Industrial Hygiene
[ ] HS&E Area Management
[ ] Operational Health Physics
[ ] Radiological Monitoring

Please review the attached copy of the subject OSA and indicate any changes, additions, comments, or your approval in the areas provided.

[ ] It will not be necessary to schedule a meeting. Please return your comments by 10-18-89 (Date).

[ ] A Safety Team Review meeting is scheduled for _____ (Time/Date) in _____ (Building/Room) to discuss the OSA. If you cannot attend the meeting, please send an alternate.

GARY D. SHEARER (HS&E Area Engineer) 10-12-89 (Date)

T441-A

[ ] The OSA is acceptable; no comments.
[X] My comments are as follows:

See marked copy - Paragraph 4 needs rewrite.

R Hawe (Discipline's Signature) 10-13-89 (Date)

Comments [X] Incorporated [ ] Resolved

Gary D. Shearer (HS&E Area Engineer)

OSA COMMENT REVIEW SHEET

Operating OSA Title DRILLING OSA
Operating OSA Number 250 002
Author BRENT LEWIS EXT 7041

REVIEW DISCIPLINE

[ ] Criticality Engineering
[ ] Fire Department
[ ] I&SSE
[ ] Medical
[ ] Safety Analysis
[ ] Environmental Management
[ ] Industrial Hygiene
[ ] HS&E Area Management
[ ] Operational Health Physics
[ ] Radiological Monitoring

Please review the attached copy of the subject OSA and indicate any changes, additions, comments, or your approval in the areas provided.

[ ] It will not be necessary to schedule a meeting. Please return your comments by 10-18-89 (Date).

[ ] A Safety Team Review meeting is scheduled for _____ (Time/Date) in _____ (Building/Room) to discuss the OSA. If you cannot attend the meeting, please send an alternate.

GARY D. SHEARER (HS&E Area Engineer) T441-A 10-12-89 (Date)

[X] The OSA is acceptable; no comments.
[ ] My comments are as follows:

F.P. (Discipline's Signature) 10-12-89 (Date)

Comments [X] Incorporated [ ] Resolved

Gary D. Shearer (HS&E Area Engineer)

OSA COMMENT REVIEW SHEET

Operating OSA Title DRILLING OSA
Operating OSA Number 250 002
Author BRENT LEWIS EXT 7041

REVIEW DISCIPLINE

[ ] Criticality Engineering
[ ] Fire Department
[ ] I&SSE
[ ] Medical
[ ] Safety Analysis
[ ] Environmental Management
[ ] Industrial Hygiene
[ ] HS&E Area Management
[ ] Operational Health Physics
[ ] Radiological Monitoring

Please review the attached copy of the subject OSA and indicate any changes, additions, comments, or your approval in the areas provided.

[ ] It will not be necessary to schedule a meeting. Please return your comments by 10-18-89 (Date).

[ ] A Safety Team Review meeting is scheduled for _____ (Time/Date) in _____ (Building/Room) to discuss the OSA. If you cannot attend the meeting, please send an alternate.

GARY D. SHEARER (HS&E Area Engineer) 10-12-89 (Date)

T441-A

[ ] The OSA is acceptable; no comments.
[X] My comments are as follows:

✓ [illegible]

(1) [illegible]

✓ (2) [illegible]

✓ (3) [illegible]

[illegible] T441 10/18/89
(Discipline's Signature) (Date)

Comments [X] Incorporated [ ] Resolved

Gary D. Shearer
(HS&E Area Engineer)

RECEIVED
OCT 12 1989
NUC/IND SFTY

# OSA COMMENT REVIEW SHEET

Operating OSA Title DRILLING OSA
Operating OSA Number 250 002
Author BRENT LEWIS EXT 7041

## REVIEW DISCIPLINE

[✓] Criticality Engineering
[✓] Fire Department
[✓] I&SSE
[✓] Medical
[✓] Safety Analysis
[✓] Environmental Management
[✓] Industrial Hygiene
[ ] HS&E Area Management
[✓] Operational Health Physics
[ ] Radiological Monitoring

Please review the attached copy of the subject OSA and indicate any changes, additions, comments, or your approval in the areas provided.

[ ] It will not be necessary to schedule a meeting. Please return your comments by 10-18-89 (Date).

[ ] A Safety Team Review meeting is scheduled for _____ (Time/Date) in _____ (Building/Room) to discuss the OSA. If you cannot attend the meeting, please send an alternate.

GARY D. SHEARER (HS&E Area Engineer) T441-A 10-12-89 (Date)

[✓] The OSA is acceptable; no comments.
[ ] My comments are as follows:

(Discipline's Signature) 13 Oct 1989 (Date)

Comments [✓] Incorporated [ ] Resolved

(HS&E Area Engineer)

WR

250.002

- signature page contains instructions, not information

- No mention is made of hazard / hazard control associated with physical dangers with drilling - smashed hands, overhead loads during set up, etc:

OSA does a good job on environmental issues but is weak on OSHA type issues
Richardellas comments addressed + incorporated into OSA.
[illegible]

[illegible] Richardelle
12/26/89

Please address / return
Sharon 1/2

ATTACHMENT CMIC-15a

12/13/1988

# ROCKY FLATS EXCAVATION PERMIT

TION/PROJECT TITLE/WORK DESCRIPTION RCRA TEST BORINGS 881 HILLSIDE

CONTRACTOR WESTON / BOYLES CONTRACT DWG/SHEET NO FIG 4-8

AUTHORIZATION NO 986123 PERMIT NO 14-1-23-90 DRAWING NO 15501-73

CAUTIONS/OBSTRUCTIONS/SPECIAL INSTRUCTIONS Must stay 10' off All Overhead Line OR HAVE LOCKOUT TAG OUT GWD 1-25-90 Contact Western Slope Gas for gas line location

LOCATOR TAPE ISSUED _____ PERMIT LIMITS (DURATION/BOUNDARY) 3-23-90

RADIATION MONITORING SURVEY/RESULTS <250 cpm bkgd [illegible]

APPROVALS

RCRA. [illegible] Contact I.H. leave cuttings in area.

| (PCSE) | PLANT POWER | UTILITIES | ALARMS SUP | TELECOM | COMM SUP | PLANT PROTECTION |
|---|---|---|---|---|---|---|
| [illegible] 1-29-90 | [illegible] 1-24-90 | R.L. Burger 1/24/90 | [illegible] 1-29-90 | [illegible] 1-29-90 | [illegible] 1-29-90 | [illegible] 1-24-90 |

| FIRE DEPT | ENVIRONMENTAL | LIQUID WASTE | IND SAFETY | BLDG. SUPERINTENDENT | INDUSTRIAL HYGIENE | HSE AREA ENGR./ SHIFT SUPER |
|---|---|---|---|---|---|---|
| C.B. Williamson 1-24-90 | [illegible] 1-29-90 | M.D. [illegible] 1-29-90 9:28 AM | S.E. Dorr | N/A | F.C. Shelley 1-29-90 | [illegible] 1-29-90 |

RESPONSIBLE JOB SUPERVISOR X Janet E Monk

OPERATOR X [illegible]

EXCAVATION COORDINATOR Larry Clark DATE 2/2/90

INITIAL INSPECTION BY DATE

DAILY INITIALS DATE

NOTES

*ATTACH DRAWING/SKETCH*

*SEE REVERSE SIDE FOR ADDITIONAL INSTRUCTIONS*

Larry Clark D-1338

DISTRIBUTION

WHITE C M I C FILE

BLUE FE (PCSE)

YELLOW HS&E

CARD JOB SITE

RF-46635 (Rev 7/89) Supersedes Previous Issues

## RADIOLOGICAL/HS&E WORK PERMIT

Instructions and requirements for the use of this form are contained in HS&E 6 05 Radiological/HS&E Work Permit

**SECTION I** - JOB INFORMATION (To be completed by job supervisor or permit initiator)

Name TEST WELLS (WESTON) Auth or WO # 986123

Bldg 881 Hillside Room # OUTSIDE Date 2-6-90 From 7:00 (AM/PM) To 5:00 (AM/PM)

Scope of Work Drill TEST HOLES FOR 881 Hillside FRENCH DRAIN (Continuation)

**SECTION II** - DESCRIPTION OF HAZARDS (To be completed by responsible user)

**MATERIAL HAZARDS**

- ___ $HNO_3$ (Nitric Acid)
- ___ HCl (Hydrochloric Acid)
- ___ $H_2SO_4$ (Sulfuric Acid)
- ___ HF (Hydrofluoric Acid)
- ___ Caustic
- ___ Flammables
- ___ Trichloroethylene
- ___ Beryllium
- ___ Plutonium
- ___ Uranium
- ___ Asbestos

Fire Suppression Interruption? ___ Yes ✓ No

**ELECTRICAL HAZARDS**

Energized System?
- ___ Yes X No
- ___ 120V
- ___ 220V
- ___ 480V
- ___ 600V
- ___ Above 600V
- ___ V
- ___ Laser Involved?
- ___ Microwave Involved?

**HIGH TEMP/HIGH PRESSURE**

- ___ Vacuum
- X Ambient Pressure
- ___ <15 psig
- ___ >15 psig
- ___ psig
- ___ Below Ambient Temp
- ___ °F
- X Ambient Temp
- ___ Above Ambient Temp
- ___ °F
- ___ Steam System
- ___ Hydraulic System

Other hazards and precautions ___

**SECTION III** - RADIOLOGICAL AND NONRADIOLOGICAL SAFETY REQUIREMENTS (To be completed by Radiological Monitoring, and/or HS&E Safety Engineer)

SITE REVIEW REQUIRED ___ Yes ___ No

RADIOLOGICAL MONITORING REQUIRED X YES ___ NO

**PROTECTIVE APPAREL**

- X Coveralls
- X Tyvek Suit
- ___ Plastic Suit
- ___ Acid Suit
- ___ Surgeon's Gloves
- ___ Plastic Gloves
- ___ Rubber Gloves
- ___ Leather Gloves
- ___ Cloth Cap
- ___ Cloth Hood
- ___ Plastic Hood
- X Booties
- X Plastic Booties
- ___ Rubber Boots
- X Safety Glasses
- ___ Goggles
- ___ Face Shield
- X Hard Hat
- X Hearing Protection as needed
- ___ Taped Openings
- ___ Other ___

**CONTAMINATION CONTROL VENTILATION REQUIREMENTS**

- ___ Containment Pen
- ___ Plastic House
- ___ SBA House
- ___ Plastic Sleeve
- ___ Glove Bag
- ___ Air Mover
- ___ Down Draft
- ___ GB Exhaust
- ___ Other ___

**RESPIRATORY REQUIREMENTS**

- ___ Half Mask
- X Full Face IF REQUIRED
- ___ Supplied Breathing Air
- ___ SCBA
- ___ Chemical Canister

**RADIOLOGICAL MONITORING REQUIREMENTS**

- ___ Start of job
- X On call
- ___ Full time

**DOSIMETRY REQUIREMENTS**

- X TLD Dosimeter
- ___ Extremity Dosimeter
- ___ Special Dosimeter

**ELECTRICAL PROTECTION REQUIREMENTS**
(Consult Job Supervisor)

- ___ Insulating Mat
- ___ Insulating Blanket
- ___ Cover up
- ___ High Voltage Sleeves
- ___ High Voltage Gloves
- ___ Class I
- ___ Class II
- ___ Hot Sticks
- ___ TIC Tracer
- ___ Insulated Bucket Truck
- ___ Grounding Cable
- ___ Grounding Stick

**RADIOLOGICAL MONITORING PRE-JOB SURVEY**

Contamination levels and extent ___

Gamma ___
Neutron ___
Limitations ___

Radiological Monitor Signature

**RADIOLOGICAL MONITORING POST-JOB SURVEY**

Contamination levels and extent ___

Gamma ___
Neutron ___

Radiological Monitor Signature

Other Special Requirements ___

## RADIOLOGICAL/HS&E WORK PERMIT - CONTINUED

Auth or WO # 986123 Date 2-6-90

**[SEC]TION IV - PREPARATION FOR THE JOB (To be completed by the responsible user and job supervisor)**

| | | |
|---|---|---|
| The area or equipment is ready to be worked on and is in safe condition | X Yes | |
| The necessary systems have been shutdown, drained, blanked, etc. | ___ Yes | X N/A |
| The necessary systems have been locked out/tagged out. #_____ | ___ Yes | X N/A |
| Voltage checked after lock out. | ___ Yes | X N/A |
| Utilities has been notified of upcoming work and is prepared. | X Yes | ___ N/A |
| The Fire Department has been notified of upcoming work and is prepared. | X Yes | ___ N/A |

**SECTION V - APPROVAL SIGNATURES**

THE ABOVE REQUIREMENTS HAVE BEEN REVIEWED WITH AND ARE UNDERSTOOD BY ALL JOB PERSONNEL

[signatures]

(Job personnel signatures)

The Building Manager (or designee) has been notified of upcoming work JAK
(notifier's initials)

THE SIGNATURES BELOW INDICATE REVIEW AND CONCURRENCE WITH THE WORK PERMIT

[signature] — [signature]
[illegible]onsible User — Job Supervisor

[signature] 4915 D-1506 — [signature] x5355
Radiological Monitoring Foreman (if applicable) — Contractor Supervisor (if applicable)

[signature] — [signature]
HS&E Safety Engineer — Other

**SECTION VI - PERMIT EXTENSION**

WORK PERMIT EXTENDED TO 1-12-90 [initials]

[signature]
HS&E Safety Engineer

Job Supervisor agrees to tour area daily to ensure compliance with HS&E requirements. (Initials required for each day of extension)

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| Dates. | 2-6-90 | 07 FEB | 08 FEB | 09 FEB | 10-11 FEB | 12 FEB | |
| Initials | JAK DAY17 | [initials] | / | [initials] | / | [initials] | |

**DISTRIBUTION**

| | |
|---|---|
| [illegible] Supervisor - | White (retain permanently with job file) |
| [illegible]ponsible User - | Blue (retain for 30 days) |
| [illegible]iological Monitoring - | Yellow (retain for 30 days) |

POST CARD AT JOB SITE

**FIRE AND EMERGENCY - DIAL 2911**

## RADIOLOGICAL/HS&E WORK PERMIT

Instructions and requirements for the use of this form are contained in HS&E 6 05 Radiological/HS&E Work Permit

**SECTION I** - JOB INFORMATION (To be completed by job supervisor or permit initiator)

Name TEST WELLS (WESTON) Auth or WO # 986475

881 HILLSIDE Room # OUTSIDE Date 13 FEB 90 From 07:00 (AM/PM) To 17.00 (AM/PM)

Scope of Work DRILL WELLS & TEST (CONTINUING WORK)

**SECTION II** - DESCRIPTION OF HAZARDS (To be completed by responsible user)

**MATERIAL HAZARDS**

- N/A $HNO_3$ (Nitric Acid)
- ___ HCl (Hydrochloric Acid)
- ___ $H_2SO_4$ (Sulfuric Acid)
- ___ HF (Hydrofluoric Acid)
- ___ Caustic
- ___ Flammables
- ___ Trichloroethylene
- ___ Beryllium
- ___ Plutonium
- ___ Uranium
- ___ Asbestos

**ELECTRICAL HAZARDS**

Energized System?
- ___ Yes ✓ No
- ___ 120V
- ___ 220V
- ___ 480V
- ___ 600V
- ___ Above 600V
- ___ V
- ___ Laser Involved?
- ___ Microwave Involved?

**HIGH TEMP/HIGH PRESSURE**

- ___ Vacuum
- ✓ Ambient Pressure
- ___ <15 psig
- ___ >15 psig
- ___ psig
- ___ Below Ambient Temp °F
- ✓ Ambient Temp
- ___ Above Ambient Temp °F
- ___ Steam System
- ___ Hydraulic System

Fire Suppression Interruption? ___ Yes ✓ No

Other hazards and precautions ___

**SECTION III** - RADIOLOGICAL AND NONRADIOLOGICAL SAFETY REQUIREMENTS (To be completed by Radiological Monitoring, and/or HS&E Safety Engineer)

SITE REVIEW REQUIRED ___ Yes ✓ No

RADIOLOGICAL MONITORING REQUIRED ___ YES X NO

**PROTECTIVE APPAREL**

- ✓ Coveralls
- ✓ Tyvek Suit
- ___ Plastic Suit
- ___ Acid Suit
- ___ Surgeon's Gloves
- ___ Plastic Gloves
- ___ Rubber Gloves
- ___ Leather Gloves
- ___ Cloth Cap
- ___ Cloth Hood
- ___ Plastic Hood
- ✓ Booties
- ✓ Plastic Booties
- ___ Rubber Boots
- ✓ Safety Glasses
- ___ Goggles
- ___ Face Shield
- ✓ Hard Hat
- ✓ Hearing Protection AS REQ'D
- ___ Taped Openings
- ___ Other ___

**CONTAMINATION CONTROL VENTILATION REQUIREMENTS**

- N/A Containment Pen
- ___ Plastic House
- ___ SBA House
- ___ Plastic Sleeve
- ___ Glove Bag
- ___ Air Mover
- ___ Down Draft
- ___ GB Exhaust
- ___ Other ___

**RESPIRATORY REQUIREMENTS**

- N/A Half Mask
- ___ Full Face
- ___ Supplied Breathing Air
- ___ SCBA
- ___ Chemical Canister

**RADIOLOGICAL MONITORING REQUIREMENTS**

- ___ Start of job
- ✓ On call
- ___ Full time

**DOSIMETRY REQUIREMENTS**

- ✓ TLD Dosimeter
- ___ Extremity Dosimeter
- ___ Special Dosimeter

**ELECTRICAL PROTECTION REQUIREMENTS**

(Consult Job Supervisor)

- N/A Insulating Mat
- ___ Insulating Blanket
- ___ Cover up
- ___ High Voltage Sleeves
- ___ High Voltage Gloves
- ___ Class I
- ___ Class II
- ___ Hot Sticks
- ___ TIC Tracer
- ___ Insulated Bucket Truck
- ___ Grounding Cable
- ___ Grounding Stick

**RADIOLOGICAL MONITORING PRE-JOB SURVEY**

Contamination levels and extent ___

Gamma ___

Neutron ___

Limitations ___

Radiological Monitor Signature

**RADIOLOGICAL MONITORING POST-JOB SURVEY**

Contamination levels and extent ___

Gamma ___

Neutron ___

Radiological Monitor Signature

Other Special Requirements ___

## RADIOLOGICAL/HS&E WORK PERMIT - CONTINUED

Auth or WO # 986975 Date 13 FEB 90

**SECTION IV** - PREPARATION FOR THE JOB (To be completed by the responsible user and job supervisor)

| | | |
|---|---|---|
| The area or equipment is ready to be worked on and is in safe condition | ✓ Yes | |
| The necessary systems have been shutdown, drained, blanked, etc. | ___ Yes | ✓ N/A |
| The necessary systems have been locked out/tagged out. #_____ | ___ Yes | ✓ N/A |
| Voltage checked after lock out. | ___ Yes | ✓ N/A |
| Utilities has been notified of upcoming work and is prepared. | ___ Yes | ✓ N/A |
| The Fire Department has been notified of upcoming work and is prepared. | ✓ Yes | ___ N/A |

**SECTION V** - APPROVAL SIGNATURES

THE ABOVE REQUIREMENTS HAVE BEEN REVIEWED WITH AND ARE UNDERSTOOD BY ALL JOB PERSONNEL

(Job personnel signatures)

The Building Manager (or designee) has been notified of upcoming work _____ (notifier's initials)

THE SIGNATURES BELOW INDICATE REVIEW AND CONCURRENCE WITH THE WORK PERMIT

Responsible User

Job Supervisor 4484 / 0231

Radiological Monitoring Foreman (if applicable) 4815 D-1506

Contractor Supervisor (if applicable)

HS&E Safety Engineer

Other

**SECTION VI** - PERMIT EXTENSION

WORK PERMIT EXTENDED TO 20 FEB 90

HS&E Safety Engineer

Job Supervisor agrees to tour area daily to ensure compliance with HS&E requirements. (Initials required for each day of extension)

| Dates | 13 FEB | 14 FEB | 15 FEB | 16 FEB | | | |
|---|---|---|---|---|---|---|---|
| Initials | | | | | | | |

**DISTRIBUTION**

Job Supervisor - White (retain permanently with job file)
Responsible User - Blue (retain for 30 days)
Radiological Monitoring - Yellow (retain for 30 days)

POST CARD AT JOB SITE

**FIRE AND EMERGENCY - DIAL 2911**

VUBS/ON

# RADIOLOGICAL/HS&E WORK PERMIT

Instructions and requirements for the use of this form are contained in HS&E 6 05 Radiological/HS&E Work Permit

**SECTION I - JOB INFORMATION (To be completed by job supervisor or permit initiator)**

Job Name TEST WELLS (WESTON) Auth or WO # 986475

Job 881 HILLSIDE Room # OUTSIDE Date 31 AUG 90 From 07:00 (AM/PM) To 17:00 (AM/PM)

Scope of Work CONTINUE DRILLING WELLS & TESTING

**SECTION II - DESCRIPTION OF HAZARDS (To be completed by responsible user)**

**MATERIAL HAZARDS**

- N/A $HNO_3$ (Nitric Acid)
- ___ HCl (Hydrochloric Acid)
- ___ $H_2SO_4$ (Sulfuric Acid)
- ___ HF (Hydrofluoric Acid)
- ___ Caustic
- ___ Flammables
- ___ Trichloroethylene
- ___ Beryllium
- ___ Plutonium
- ___ Uranium
- ✓ Asbestos

**ELECTRICAL HAZARDS**

Energized System?
- ___ Yes ✓ No
- ___ 120V
- ___ 220V
- ___ 480V
- ___ 600V
- ___ Above 600V
- ___ V
- ___ Laser Involved?
- ___ Microwave Involved?

**HIGH TEMP/HIGH PRESSURE**

- ___ Vacuum
- ✓ Ambient Pressure
- ___ <15 psig
- ___ >15 psig
- ___ psig
- ___ Below Ambient Temp
- ___ °F
- ✓ Ambient Temp
- ___ Above Ambient Temp
- ___ °F
- ___ Steam System
- ___ Hydraulic System

Fire Suppression Interruption? ___ Yes ✓ No

Other hazards and precautions ___

**SECTION III - RADIOLOGICAL AND NONRADIOLOGICAL SAFETY REQUIREMENTS (To be completed by Radiological Monitoring, and/or HS&E Safety Engineer)**

SITE REVIEW REQUIRED ___ Yes ✓ No

RADIOLOGICAL MONITORING REQUIRED ___ YES X NO

**PROTECTIVE APPAREL**

- ✓ Coveralls
- ✓ Tyvek Suit
- ___ Plastic Suit
- ___ Acid Suit
- ___ Surgeon's Gloves
- ___ Plastic Gloves
- ___ Rubber Gloves
- ___ Leather Gloves
- ___ Cloth Cap
- ___ Cloth Hood
- ___ Plastic Hood
- ✓ Booties
- ✓ Plastic Booties
- ___ Rubber Boots
- ✓ Safety Glasses AS REQ'D
- ___ Goggles
- ___ Face Shield
- ✓ Hard Hat
- ✓ Hearing Protection AS REQ'D
- ___ Taped Openings
- ___ Other ___

**CONTAMINATION CONTROL VENTILATION REQUIREMENTS**

- N/A Containment Pen
- ___ Plastic House
- ___ SBA House
- ___ Plastic Sleeve
- ___ Glove Bag
- ___ Air Mover
- ___ Down Draft
- ___ GB Exhaust
- ___ Other ___

**RESPIRATORY REQUIREMENTS**

- N/A Half Mask
- ___ Full Face
- ___ Supplied Breathing Air
- ___ SCBA
- ___ Chemical Canister

**RADIOLOGICAL MONITORING REQUIREMENTS**

- ___ Start of job
- ✓ On call
- ___ Full time

**DOSIMETRY REQUIREMENTS**

- ✓ TLD Dosimeter
- ___ Extremity Dosimeter
- ___ Special Dosimeter

**ELECTRICAL PROTECTION REQUIREMENTS**
(Consult Job Supervisor)

- N/A Insulating Mat
- ___ Insulating Blanket
- ___ Cover up
- ___ High Voltage Sleeves
- ___ High Voltage Gloves
- ___ Class I
- ___ Class II
- ___ Hot Sticks
- ___ TIC Tracer
- ___ Insulated Bucket Truck
- ___ Grounding Cable
- ___ Grounding Stick

**RADIOLOGICAL MONITORING PRE-JOB SURVEY**

Contamination levels and extent ___

Gamma ___
Neutron ___
Limitations ___

Radiological Monitor Signature

**RADIOLOGICAL MONITORING POST-JOB SURVEY**

Contamination levels and extent ___

Gamma ___
Neutron ___

Radiological Monitor Signature

Other Special Requirements ___

## RADIOLOGICAL/HS&E WORK PERMIT - CONTINUED

Auth or WO # 986475 Date 21 FEB 90

**SECTION IV** - PREPARATION FOR THE JOB (To be completed by the responsible user and job supervisor)

| | | |
|---|---|---|
| The area or equipment is ready to be worked on and is in safe condition | ✓ Yes | |
| The necessary systems have been shutdown, drained, blanked, etc. | ___ Yes | ✓ N/A |
| The necessary systems have been locked out/tagged out. #_____ | ___ Yes | ✓ N/A |
| Voltage checked after lock out. | ___ Yes | ✓ N/A |
| Utilities has been notified of upcoming work and is prepared. | ___ Yes | ✓ N/A |
| The Fire Department has been notified of upcoming work and is prepared | ✓ Yes | ___ N/A |

**SECTION V** - APPROVAL SIGNATURES

THE ABOVE REQUIREMENTS HAVE BEEN REVIEWED WITH AND ARE UNDERSTOOD BY ALL JOB PERSONNEL

J Kimberly Harris

Timothy W Merritt

(Job personnel signatures)

The Building Manager (or designee) has been notified of upcoming work _____ (notifier's initials)

THE SIGNATURES BELOW INDICATE REVIEW AND CONCURRENCE WITH THE WORK PERMIT

| | |
|---|---|
| For Brent Lewis<br>Responsible User | 4494/0231<br>Job Supervisor |
| N/A<br>Radiological Monitoring Foreman (if applicable) | Contractor Supervisor (if applicable) |
| HS&E Safety Engineer | Other |

**SECTION VI** - PERMIT EXTENSION

WORK PERMIT EXTENDED TO 28 FEB 90

HS&E Safety Engineer

Job Supervisor agrees to tour area daily to ensure compliance with HS&E requirements. (Initials required for each day of extension)

| Dates | 2-22 | 2-23 | 2-24 | 2-25 | 2-26 | 2-27 | 2-28 |
|---|---|---|---|---|---|---|---|
| Initials | | | | | | | |

**DISTRIBUTION**

Job Supervisor - White (retain permanently with job file)
Responsible User - Blue (retain for 30 days)
Radiological Monitoring - Yellow (retain for 30 days)

POST CARD AT JOB SITE

**FIRE AND EMERGENCY - DIAL 2911**

## RADIOLOGICAL/HS&E WORK PERMIT

Instructions and requirements for the use of this form are contained in HS&E 6 05 Radiological/HS&E Work Permit

**SECTION I - JOB INFORMATION (To be completed by job supervisor or permit initiator)**

Name TEST WELLS - WESTON Auth or WO # 986475

Bldg OUTSIDE Room # 281 HILLSIDE Date 05 MAR 90 From 07:00 (AM/PM) To 16:00 (AM/PM)

Scope of Work CONTINUE DRILLING OF TEST WELLS

**SECTION II - DESCRIPTION OF HAZARDS (To be completed by responsible user)**

**MATERIAL HAZARDS**

- N/A $HNO_3$ (Nitric Acid)
- ___ HCl (Hydrochloric Acid)
- ___ $H_2SO_4$ (Sulfuric Acid)
- ___ HF (Hydrofluoric Acid)
- ___ Caustic
- ___ Flammables
- ___ Trichloroethylene
- ___ Beryllium
- ___ Plutonium
- ___ Uranium
- ✓ Asbestos

**ELECTRICAL HAZARDS**

Energized System?
- ___ Yes ✓ No
- ___ 120V
- ___ 220V
- ___ 480V
- ___ 600V
- ___ Above 600V
- ___ V
- ___ Laser Involved?
- ___ Microwave Involved?

**HIGH TEMP/HIGH PRESSURE**

- ___ Vacuum
- ✓ Ambient Pressure
- ___ <15 psig
- ___ >15 psig
- ___ psig
- ___ Below Ambient Temp
- ___ °F
- ✓ Ambient Temp
- ___ Above Ambient Temp
- ___ °F
- ___ Steam System
- ___ Hydraulic System

Fire Suppression Interruption? ___ Yes ✓ No

Other hazards and precautions ___

**SECTION III - RADIOLOGICAL AND NONRADIOLOGICAL SAFETY REQUIREMENTS (To be completed by Radiological Monitoring, and/or HS&E Safety Engineer)**

SITE REVIEW REQUIRED ___ Yes ✓ No

RADIOLOGICAL MONITORING REQUIRED X YES ___ NO

**PROTECTIVE APPAREL**

- ✓ Coveralls
- ✓ Tyvek Suit
- ___ Plastic Suit
- ___ Acid Suit
- ___ Surgeon's Gloves
- ___ Plastic Gloves
- ___ Rubber Gloves
- ___ Leather Gloves
- ___ Cloth Cap
- ___ Cloth Hood
- ___ Plastic Hood
- ✓ Booties
- ✓ Plastic Booties
- ___ Rubber Boots
- ✓ Safety Glasses AS REQ'D
- ___ Goggles
- ___ Face Shield
- ✓ Hard Hat
- ✓ Hearing Protection AS REQ'D
- ___ Taped Openings
- ___ Other ___

**CONTAMINATION CONTROL VENTILATION REQUIREMENTS**

- N/A Containment Pen
- ___ Plastic House
- ___ SBA House
- ___ Plastic Sleeve
- ___ Glove Bag
- ___ Air Mover
- ___ Down Draft
- ___ GB Exhaust
- ___ Other ___

**RESPIRATORY REQUIREMENTS**

- N/A Half Mask
- ___ Full Face
- ___ Supplied Breathing Air
- ___ SCBA
- ___ Chemical Canister

**RADIOLOGICAL MONITORING REQUIREMENTS**

- ___ Start of job
- ✓ On call
- ___ Full time

**DOSIMETRY REQUIREMENTS**

- ✓ TLD Dosimeter
- ___ Extremity Dosimeter
- ___ Special Dosimeter

**ELECTRICAL PROTECTION REQUIREMENTS**

(Consult Job Supervisor)

- N/A Insulating Mat
- ___ Insulating Blanket
- ___ Cover up
- ___ High Voltage Sleeves
- ___ High Voltage Gloves
- ___ Class I
- ___ Class II
- ___ Hot Sticks
- ___ TIC Tracer
- ___ Insulated Bucket Truck
- ___ Grounding Cable
- ___ Grounding Stick

**RADIOLOGICAL MONITORING PRE-JOB SURVEY**

Contamination levels and extent ___

Gamma ___

Neutron ___

Limitations ___

Radiological Monitor Signature

**RADIOLOGICAL MONITORING POST-JOB SURVEY**

Contamination levels and extent ___

Gamma ___

Neutron ___

Radiological Monitor Signature

Other Special Requirements Staff follow rules as outlined in your contract

## RADIOLOGICAL/HS&E WORK PERMIT - CONTINUED

Auth or WO # 986475 Date 05 MAR 90

**SECTION IV** - PREPARATION FOR THE JOB (To be completed by the responsible user and job supervisor)

| | | |
|---|---|---|
| The area or equipment is ready to be worked on and is in safe condition | ✓ Yes | |
| The necessary systems have been shutdown, drained, blanked, etc. | ___ Yes | ✓ N/A |
| The necessary systems have been locked out/tagged out. #_____ | ___ Yes | ✓ N/A |
| Voltage checked after lock out. | ___ Yes | ✓ N/A |
| Utilities has been notified of upcoming work and is prepared | ___ Yes | ✓ N/A |
| The Fire Department has been notified of upcoming work and is prepared | ___ Yes | ✓ N/A |

**SECTION V** - APPROVAL SIGNATURES

THE ABOVE REQUIREMENTS HAVE BEEN REVIEWED WITH AND ARE UNDERSTOOD BY ALL JOB PERSONNEL

(Job personnel signatures)

The Building Manager (or designee) has been notified of upcoming work _____
(notifier's initials)

THE SIGNATURES BELOW INDICATE REVIEW AND CONCURRENCE WITH THE WORK PERMIT

Responsible User

Job Supervisor 4404/0231

Radiological Monitoring Foreman (if applicable) 4915 D-1506

Contractor Supervisor (if applicable)

HS&E Safety Engineer

Other

**SECTION VI** - PERMIT EXTENSION

WORK PERMIT EXTENDED TO 12 MAR 90

HS&E Safety Engineer

Job Supervisor agrees to tour area daily to ensure compliance with HS&E requirements. (Initials required for each day of extension)

| | | | | | | |
|---|---|---|---|---|---|---|
| Dates 05 MAR | | | | | | |
| Initials | | | | | | |

**DISTRIBUTION**

| | |
|---|---|
| Job Supervisor - | White (retain permanently with job file) |
| sponsible User - | Blue (retain for 30 days) |
| diological Monitoring - | Yellow (retain for 30 days) |

POST CARD AT JOB SITE

**FIRE AND EMERGENCY - DIAL 2911**

## RADIOLOGICAL/HS&E WORK PERMIT

Instructions and requirements for the use of this form are contained in HS&E 6 05 Radiological/HS&E Work Permit

**SECTION I** - JOB INFORMATION (To be completed by job supervisor or permit initiator)

Name TEST WELLS (WESTON) Auth or WO # 986475

Bldg. 881 HILLSIDE Room # — Date 19 JUL 90 From 07:00 (AM/PM) To 17:00 (AM/PM)

Scope of Work CONTINUE DRILLING OF TEST WELLS

**SECTION II** - DESCRIPTION OF HAZARDS (To be completed by responsible user)

**MATERIAL HAZARDS**

- N/A $HNO_3$ (Nitric Acid)
- ___ HCl (Hydrochloric Acid)
- ___ $H_2SO_4$ (Sulfuric Acid)
- ___ HF (Hydrofluoric Acid)
- ___ Caustic
- ___ Flammables
- ___ Trichloroethylene
- ___ Beryllium
- ___ Plutonium
- ___ Uranium
- ___ Asbestos

Fire Suppression Interruption? ___ Yes ✓ No

**ELECTRICAL HAZARDS**

Energized System?
- ___ Yes ✓ No
- ___ 120V
- ___ 220V
- ___ 480V
- ___ 600V
- ___ Above 600V
- ___ V
- ___ Laser Involved?
- ___ Microwave Involved?

**HIGH TEMP/HIGH PRESSURE**

- ___ Vacuum
- ✓ Ambient Pressure
- ___ <15 psig
- ___ >15 psig
- ___ psig
- ___ Below Ambient Temp
- ___ °F
- ✓ Ambient Temp
- ___ Above Ambient Temp
- ___ °F
- ___ Steam System
- ___ Hydraulic System

Other hazards and precautions NONE KNOWN

**SECTION III** - RADIOLOGICAL AND NONRADIOLOGICAL SAFETY REQUIREMENTS (To be completed by Radiological Monitoring, and/or HS&E Safety Engineer)

JOBSITE REVIEW REQUIRED ___ Yes ✓ No

RADIOLOGICAL MONITORING REQUIRED X YES ___ NO

**PROTECTIVE APPAREL**

- ✓ Coveralls
- ✓ Tyvek Suit
- ___ Plastic Suit
- ___ Acid Suit
- ___ Surgeon's Gloves
- ___ Plastic Gloves
- ___ Rubber Gloves
- ___ Leather Gloves
- ___ Cloth Cap
- ___ Cloth Hood
- ___ Plastic Hood
- ✓ Booties
- ✓ Plastic Booties
- ___ Rubber Boots
- ✓ Safety Glasses
- ___ Goggles
- ___ Face Shield
- ✓ Hard Hat
- ✓ Hearing Protection AS REQ'D
- ___ Taped Openings
- ___ Other ___

**CONTAMINATION CONTROL VENTILATION REQUIREMENTS**

- N/A Containment Pen
- ___ Plastic House
- ___ SBA House
- ___ Plastic Sleeve
- ___ Glove Bag
- ___ Air Mover
- ___ Down Draft
- ___ GB Exhaust
- ___ Other ___

**RESPIRATORY REQUIREMENTS**

- N/A Half Mask
- ___ Full Face
- ___ Supplied Breathing Air
- ___ SCBA
- ___ Chemical Canister

**RADIOLOGICAL MONITORING REQUIREMENTS**

- ___ Start of job
- ✓ On call
- ___ Full time

**DOSIMETRY REQUIREMENTS**

- ✓ TLD Dosimeter
- ___ Extremity Dosimeter
- ___ Special Dosimeter

**ELECTRICAL PROTECTION REQUIREMENTS**

(Consult Job Supervisor)

- N/A Insulating Mat
- ___ Insulating Blanket
- ___ Cover up
- ___ High Voltage Sleeves
- ___ High Voltage Gloves
- ___ Class I
- ___ Class II
- ___ Hot Sticks
- ___ TIC Tracer
- ___ Insulated Bucket Truck
- ___ Grounding Cable
- ___ Grounding Stick

**RADIOLOGICAL MONITORING PRE-JOB SURVEY**

Contamination levels and extent ___

Gamma ___

Neutron ___

Limitations ___

Radiological Monitor Signature

**RADIOLOGICAL MONITORING POST-JOB SURVEY**

Contamination levels and extent ___

Gamma ___

Neutron ___

Radiological Monitor Signature

Other Special Requirements Shall comply with safety regulations in keeping with your contract.

## RADIOLOGICAL/HS&E WORK PERMIT - CONTINUED

Auth or WO # 986475 Date 19 MAR 90

**SECTION IV** - PREPARATION FOR THE JOB (To be completed by the responsible user and job supervisor)

| | | |
|---|---|---|
| The area or equipment is ready to be worked on and is in safe condition | ✓ Yes | |
| The necessary systems have been shutdown, drained, blanked, etc. | ___ Yes | ✓ N/A |
| The necessary systems have been locked out/tagged out. #_____ | ___ Yes | ✓ N/A |
| Voltage checked after lock out. | ___ Yes | ✓ N/A |
| Utilities has been notified of upcoming work and is prepared. | ___ Yes | ✓ N/A |
| The Fire Department has been notified of upcoming work and is prepared. | ___ Yes | ✓ N/A |

**SECTION V** - APPROVAL SIGNATURES

THE ABOVE REQUIREMENTS HAVE BEEN REVIEWED WITH AND ARE UNDERSTOOD BY ALL JOB PERSONNEL.

(Job personnel signatures)

The Building Manager (or designee) has been notified of upcoming work _____
(notifier's initials)

THE SIGNATURES BELOW INDICATE REVIEW AND CONCURRENCE WITH THE WORK PERMIT

Responsible User

Job Supervisor 4484 / 0231

Radiological Monitoring Foreman (if applicable) 4915 D-1506

Contractor Supervisor (if applicable)

HS&E Safety Engineer

Other

**SECTION VI** - PERMIT EXTENSION 26 MAR

WORK PERMIT EXTENDED TO: 30 MAR 90

HS&E Safety Engineer

Job Supervisor agrees to tour area daily to ensure compliance with HS&E requirements. (Initials required for each day of extension)

| Dates | 19 MAR | 20 MAR | 21 MAR | 22 MAR | 23 MAR | | |
|---|---|---|---|---|---|---|---|
| Initials | | | | | | | |

**DISTRIBUTION**

Job Supervisor - White (retain permanently with job file)
Responsible User - Blue (retain for 30 days)
Radiological Monitoring - Yellow (retain for 30 days)

POST CARD AT JOB SITE

**FIRE AND EMERGENCY - DIAL 2911**

WESTON
MANAGERS DESIGNERS/CONSULTANTS
215 UNION BOULEVARD
SUITE 600
LAKEWOOD, CO 80228
PHONE: (303) 980-6800

9 February 1990

Mr Mike Freehling
EG&G
Rocky Flats Plant
Building 130
P O Box 464
Golden, CO 80902-0464

# ROCKY FLATS PLANT
# 881 HILLSIDE GEOTECHNICAL INVESTIGATION
# PROGRESS REPORT

| | |
|---|---|
| ROCKWELL CONTRACT NO | BA21354PB |
| WESTON WORK ORDER NO | 2029-33-09 |
| WEEK ENDING. | February 9, 1990 |
| DESCRIPTION | 881 Hillside Geotechnical Investigation Activities |

REPORTING PERIOD ACTIVITIES

ACTIVITIES COMPLETED

- Overburden sampling of Holes B3-001-90 through B3-007-90 totaling 62 feet of auger drilling
- Coring of Holes B3-001-90 and B3-002-90 totaling 36 feet of coring
- Packer testing of Holes B3-001-90 and B3-002-90
- Boyles Brothers second rig arrives on-site February 7, 1990 The drill is converted to enable bedrock coring only
- Meeting with Greg Litus (EG&G) and Greg Sherman (WESTON) on February 6, 1990 to discuss drilling progress. The possibility of preparing a pre-development topographic map of the plant site from recently obtained 1937 aerial photos was presented to Mr. Litus. This map could aid in locating fill areas and other disturbances when compared to existing topography

  Additionally, oriented coring to determine bedrock strike and dip was discussed Mr Litus said he would bring this suggestion to his superiors. The location of the SWMUs and the influent/effluent line was discussed. Mr Litus felt that the pipeline alignment must not either cross any SWMUs or be directly adjacent to them.

- Following a site visit on February 7, 1990 Mr Litus requires triple rinsing of sampling tools and augers with deionized water

- Phone conversations with Mr Mike Freehling (EG&G) and Greg Sherman were held concerning the excavation for drill pads 4, 12, and 13 Also the influent/effluent pipeline alignment and the position of the SWMUs was briefly discussed

ACTIVITIES ANTICIPATED. Week ending February 16, 1990

- Drilling and packer testing along French Drain alignment.

- Continue working with EG&G to get drill pads 4 12 and 13 constructed

- Construct CPM Project Tracking document.

- Continue discussions and review of the alignment of the influent/effluent pipeline and its position in respect to SWMUs 102, 103, 104, and 130.

- Locate and acquire permits for borings BH03, BH05 and BH06 in SWMU 102 sepage and piezometers PZ01, PZ02 and PZ04 as per Tom Greengard

Encountered Problems

- Volclay grout around steel casing does not provide adequate seal for coring

- Boyles brothers does not have second rig on site until February 7

- On February 8 it was determined that Boyles Brothers did not have appropriate documentation of Health and Safety Training and Medical examinations for their employees.

Corrective Actions.

- Cement grout around PVC casing will be used on all French Drain borings.

- Boyles Brothers will have two complete rigs and a packer testing trailer throughout the remainder of the project.

- Boyles Brothers provides Health and Safety information on 3 employees so limited work can continue on February 9, 1990

- Boyles Brothers will provide WESTON with complete Health and Safety documentation by February 13, 1990. This information will be reviewed by WESTON's regional Safety Officer prior to acceptance

WESTON



Schedule/Cost Impact Description

- 1 5 days lost due to Boyles Brothers' lack of Health and Safety documentation.
- 3 days of limited progress due to late arrival of Boyles Brothers second rig.
- Boyles Brothers is to be back charged for all downtime expenses due to Health and Safety issues.

Sincerely,

ROY F WESTON, INC

Bert Q Hyde

Bert Q Hyde
Project Manager

GDS/tms
cc T Greengard (EG&G)
G. Litus (EG&G)
M Anderson (WESTON)
B. Keshian (WESTON)
J Marks (WESTON)
G Sherman (WESTON)

WESTON
MANAGERS DESIGNERS/CONSULTANTS
215 UNION BOULEVARD
SUITE 600
LAKEWOOD, CO 80228
PHONE (303) 980-6800

19 February 1990

Mr Mike Freehling
EG&G
Rocky Flats Plant
Building 130
P O Box 464
Golden, CO 80902-0464

**ROCKY FLATS PLANT**
**881 HILLSIDE GEOTECHNICAL INVESTIGATION**
**PROGRESS REPORT**

| | |
|---|---|
| ROCKWELL CONTRACT NO | BA21354PB |
| WESTON WORK ORDER NO | 2029-33-09 |
| WEEK ENDING | February 16, 1990 |
| DESCRIPTION | 881 Hillside Geotechnical Investigation Activities |

REPORTING PERIOD ACTIVITIES.

**ACTIVITIES COMPLETED**

- Overburden sampling of Holes B3-008-90 through B3-010-90 totaling 50 feet of auger drilling
- Coring of Hole B3-003-90 totaling 31 7 feet of coring.
- Packer testing of Hole B3-003-90 was not conducted due to caving of the cored interval in the boring
- Phone conversation with Greg Litus (EG&G) and Greg Sherman (WESTON) on February 13, 1990 was held giving WESTON approval to construct, from 1937 aerial photography, pre plant topographic map to aid in evaluating slump features along 881 Hillside. Mr Litus also approves using cement bentonite grout to abandon borings. Additionally it was discussed that due to the approximately 2.0 foot upper packer assembly length, testing intervals can begin no closer than 2.0 foot below the casing. This should not be a problem if casing is set close to the bedrock contact.
- WESTON received Health and Safety documentation on Boyles Brothers employees on February 13, 1990 This information was reviewed and approved by WESTON's Regional Safety Officer

**ACTIVITIES ANTICIPATED:** Week ending February 23, 1990

- Drilling and packer testing along French Drain alignment.
- Continue working with EG&G to get drill pads 4, 12 and 13 constructed

- Construct CPM Project Tracking document.
- Continue discussions and review of the alignment of the influent/effluent pipeline and its position in respect to SWMUs 102, 103, 104, and 130
- Locate and acquire permits for borings BH03, BH05 and BH06 in SWMU 102 seepage and piezometers PZ01, PZ02 and PZ04 as per Tom Greengard.
- Acquire film positives for photogrammetric analysis of 881 Hillside.

Encountered Problems:

- On February 12 at approximately noon Ray Martinez (EG&G Safety) shuts down Rig #1 (overburden) due to drillers not having adequate timbering under the wheels on the downhill side of the rig.
- From February 13 through 15 no work permits issued due to wet and cold weather conditions
- All of the cored intervals in boring B3-003-90 caved upon removal of core barrel This prevented any packer testing of the hole.

Corrective Actions:

- Boyles Brothers acquires appropriate timbers for rig set up
- If core recovery and hole caving continue, a change in drilling and packer procedures will be discussed. The area around boring B3-003-90 will be investigated during the overburdened geotechnical phase of the investigation.

Schedule/Cost Impact Description:

- 0 5 days lost due to Boyles Brothers' not having sufficient timber to block rig
- 3 0 days lost due to lack of work permits because of poor weather conditions.

Sincerely,

ROY F WESTON, INC.

Bert Q. Hyde
Project Manager

GDS/cjm

cc T Greengard (EG&G)
G Litus (EG&G)
M Anderson (WESTON)
B Keshian (WESTON)
J Marks (WESTON)
G Sherman (WESTON)

WESTON
MANAGERS DESIGNERS/CONSULTANTS
215 UNION BOULEVARD
SUITE 600
LAKEWOOD, CO 80228
PHONE. (303) 980-6800

19 March 1990

Mr Mike Freehling
EG&G
Rocky Flats Plant
Building 130
P O Box 464
Golden, CO 80902-0464

**ROCKY FLATS PLANT**
**881 HILLSIDE GEOTECHNICAL INVESTIGATION**
**PROGRESS REPORT**

**ROCKWELL CONTRACT NO: BA21354PB**

**WESTON WORK ORDER NO: 2029-33-09**

**WEEK ENDING. March 9, 1990**

**DESCRIPTION: 881 Hillside Geotechnical Investigation Activities**

**REPORTING PERIOD ACTIVITIES.**

**ACTIVITIES COMPLETED:**

- No overburden sampling was completed.
- Coring of holes B3-008-90, B3-012-90, and B3-014-90, totaling 38 feet of core
- Packer testing of holes B3-008-90 was B3-014-90

**ACTIVITIES ANTICIPATED:** WEEK ENDING MARCH 16, 1990

- Drilling and packer testing along French Drain alignment when surface dries sufficiently to allow rig movement.
- Locate and acquire permits for borings BH03, BH05 and BH06 in SWMU 102 and piezometers PZ01, PZ02 and PZ04 as per Tom Greengard.
- Conduct 50% meeting on March 13, 1990

## ENCOUNTER PROBLEMS

- Heavy snow on March 6 shut job down from 3/6/90 to 3/9/90

- Decontamination pad filled with melt water from heavy snowfall WESTON arranged for surface storage of 4,000 gallons in two 2,000 gallon storage tanks. Decontamination water should be transported and treated as soon as possible to remove the potential for future project delays.

## Corrective Actions:

- None

## Schedule/Cost Impact Description:

- Four days lost due to weather delays

- Approximately $600 cost for storage tanks.

Sincerely,

ROY F WESTON, INC.

Bert Q. Hyde FOR
Project Manager

BQH/mlf
cc: T Greengard (EG&G)
G. Litus (EG&G)
M Anderson (WESTON)
B Keshian (WESTON)
J Marks (WESTON)
G. Sherman (WESTON)

WESTON
MANAGERS DESIGNERS/CONSULTANTS
215 UNION BOULEVARD
SUITE 600
LAKEWOOD CO 80228
PHONE (303) 980-6800

Janet Marks

20 March 1990

Mr Mike Freehling
EG&G
Rocky Flats Plant
Building 130
P O Box 464
Golden, CO 80902-0464

**ROCKY FLATS PLANT**
**881 HILLSIDE GEOTECHNICAL INVESTIGATION**
**PROGRESS REPORT**

**ROCKWELL CONTRACT NO: BA21354PB**

**WESTON WORK ORDER NO: 2029-33-09**

**WEEK ENDING. March 16, 1990**

**DESCRIPTION: 881 Hillside Geotechnical Investigation Activities**

**REPORTING PERIOD ACTIVITIES.**

**ACTIVITIES COMPLETED:**

- No overburden sampling was completed.
- No coring was conducted
- No packer testing was completed.
- 50% progress meeting was held on March 13, 1990 Present at this meeting is Mike Freehling and Greg Litus of EG&G and Bert Hyde, Berg Keshian, Janet Marks and Greg Sherman of WESTON. Extrapolation of costs to date indicate that at the completion of the field activities approximately $250,000 to $300,000 (excluding laboratory analysis) will have been spent. Additionally, WESTON estimates that 10 to 15 working days will be required to complete the investigation phase of the study

  Mr Freehling emphasizes that the draft geotechnical report must be completed by May 10, 1990, to meet the interagency agreements' time table. Mr Litus suggested drilling with a third rig or working on weekends. WESTON will review the proposed options if the completion date becomes threatened.

  Packer test results were discussed and evaluated. WESTON recommends evaluating friction loss data for actual field set up and not using standard tables. Additionally, test results that

show no water losses over the test period will be reported as "less than" valves and not "O" permeability. The calibrated bottle packer test method will be utilized if "O" loss intervals appear to dominate the test results.

Greg Litus suggested contacting Mr Jim Langerman (EG&G) considering the use of appropriate soil and rock classification systems (note: Mr Langerman recommends using Wentworth Scale Classification for bedrock and USCS system for soil)

**ACTIVITIES ANTICIPATED:** **WEEK ENDING MARCH 23, 1990**

- Drilling and packer testing along French Drain alignment.
- Locate and acquire permits for borings BH03, BH05 and BH06 in SWMU 102 and piezometers PZ01, PZ02 and PZ04 as per Tom Greengard

**ENCOUNTERED PROBLEMS**

- Heavy snow and muddy surface conditions delay field activities from 3/12/90 through 3/16/90.

**Corrective Actions:**

- None

**Schedule/Cost Impact Description:**

- Five days lost due to weather delays.

Sincerely,

ROY F WESTON, INC.

Bert O. Hyde
Project Manager

BOH/mlf
cc T Greengard (EG&G)
G Litus (EG&G)
M Anderson (WESTON)
B Keshian (WESTON)
J Marks (WESTON)
G Sherman (WESTON)

WESTON
MANAGERS DESIGNERS/CONSULTANTS
215 UNION BOULEVARD
SUITE 600
LAKEWOOD CO 80228
PHONE. (303) 980-6800

27 March 1990

Mr Mike Freehling
EG&G
Rocky Flats Plant
Building 130
P O Box 464
Golden, CO 80902-0464

**ROCKY FLATS PLANT**
**881 HILLSIDE GEOTECHNICAL INVESTIGATION**
**PROGRESS REPORT**

**ROCKWELL CONTRACT NO: BA21354PB**

**WESTON WORK ORDER NO: 2029-33-09**

**WEEK ENDING: March 23, 1990**

**DESCRIPTION: 881 Hillside Geotechnical Investigation Activities**

**REPORTING PERIOD ACTIVITIES:**

**ACTIVITIES COMPLETED:**

- Performed overburden sampling of Holes B3-015-90 through B3-019-90 totaling 100 30 feet of auger drilling.
- Completed coring of Holes B3-012-90, B3-015-90, and B3-016-90 totaling 96 0 feet of core
- Conducted packer testing of Holes B3-012-90, B3-015-90, and B3-016-90
- EPA inspects drilling operation on 3/23/90. Inspection focuses on health and safety issues, with emphasis placed on dust monitoring and abatement procedures.

**ACTIVITIES ANTICIPATED: WEEK ENDING MARCH 30, 1990**

- Drill and perform packer test along French Drain alignment.
- Perform friction loss evaluation of the pipe and hose valves for packer testing.
- Acquire low pressure gauge to allow for utilization of the calibrated bottle test method
- Locate and acquire permits for borings BH03, BH05 and BH06 in SWMU 102 seepage and piezometers PZ01, PZ02 and PZ04 as per Tom Greengard

WESTON



**ENCOUNTERED PROBLEMS**

- On March 21 decon pad nears capacity Greg Litus (EG&G) requests that auger drilling (requiring decontamination) be suspended to allow groundwater sampling to continue If this delay continuous for more than one week, the project completion schedule will be jeopardized.

- Wet surface composition cause difficulty in rig movement.

**Corrective Actions:**

- None

**Schedule/Cost Impact Description:**

- Two days auger drilling lost due to lack of access to decontamination pad

Sincerely,

ROY F WESTON, INC.

Bert Q. Hyde

Bert Q. Hyde
Project Manager

BQH/mlf
cc T Greengard (EG&G)
G. Litus (EG&G)
B. Keshian (WESTON)
J Marks (WESTON)
G. Sherman (WESTON)

# DAILY PROJECT LOG

2029 33 · 04

Project 881 Hillside  Task GEOTECHNICAL INVESTIGATION

Date 3 23-90  Time 09 20

## 1.0 DAILY SITE HEALTH AND SAFETY REQUIREMENTS

| Requirements | Inspected By | Time of Inspection |
|---|---|---|
| Rad Monitoring | EG+G | |
| VOC Monitoring | S. Carpenter (Weston) | Periodic |
| Drilling Safety | " | Continuous |
| | | |
| | | |

Comments Very wet, Dust suppression not necessary

M

## 2.0 CLIMATIC PHYSICAL CONDITIONS

| Condition | Time | Qualitative Reading |
|---|---|---|
| Wind | | Breezy |
| Precip. | | |
| Temp. | | ~10°F |
| Sun (%) | | Cloudy 20% |
| Soil Moisture | | Very Wet |

Comments

## 3.0 SUMMARY OF ENVIRONMENTAL CONTROLS AND MONITORING

| Radiation Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| Ludlum | | | | |
| Pancake | B300090 | | | |
| Fiddler | | | | |
| Smears | | | | |

Comments Radiation monitoring conducted by EG+G. None detected above background

| Organic Vapor Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| PID or FID (Circle one) | B300090 | | Periodic | |

Comments None detected above background as per Geologist's Log

# DAILY PROJECT LOG

Project 881 HILLSIDE

Task GEOTECHNICAL INVESTIGATION 2029-33-09

Date MARCH 22, 1990

Time 0955

## 1.0 DAILY SITE HEALTH AND SAFETY REQUIREMENTS

| Requirements | Inspected By | Time of Inspection |
|---|---|---|
| Rad Monitoring | (Weston) S. Yoshino/EG&G | ~1015 STY |
| VOC Monitoring | S. Yoshino | ~1015 STY |
| Drill Rig Monitoring | S Yoshino | ~1015 STY |
| | | |
| | | |

Comments GROUND SUFFICIENTLY DAMP FROM HEAVY SNOW STORM (3-6-90)

## 2.0 CLIMATIC PHYSICAL CONDITIONS

| Condition | Time | Qualitative Reading |
|---|---|---|
| Wind | 0955 | N. SLIGHT BREEZE |
| Precip. | " | NONE |
| Temp. | " | 50-60°F |
| Sun (%) | " | ~100% |
| Soil Moisture | " | MUDDY |

Comments PREVIOUS DAYS SNOW KEEPS SOIL WET. NO DUST SUPPRESSION NEEDED.

## 3.0 SUMMARY OF ENVIRONMENTAL CONTROLS AND MONITORING

| Radiation Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| Ludlum | B301990 | 50 counts/min | ~1015 | STY |
| Pancake | B302090 | 50 counts/min | ~1015 | STY |
| Fiddler | B301990 | 0 counts/min | ~1320 | STY |
| Smears | B302090 | 0 counts/min | ~1320 | STY |

Comments

| Organic Vapor Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| PID or FID (Circle one) | B301990<br>B302090 | BKG | 1320 | STY |

Comments NO READINGS ABOVE BACKGROUND. PERIODIC MONITORING EVERY CORE TO BEDROCK.

# DAILY PROJECT LOG

Project 881 Hillside

Task 2029 33.04 GEOTECHNICAL INVESTIGATION

Date 3/21/90

Time 08 30

## 1.0 DAILY SITE HEALTH AND SAFETY REQUIREMENTS

| Requirements | Inspected By | Time of Inspection |
|---|---|---|
| Rad Monitor | EG+G | |
| VOC Monitor | S. Campanaro (WESTON) | |
| Drilling Safety | S. Campanaro (WESTON) | |
| | | |
| | | |

Comments Very Wet no dust suppression needed.

## 2.0 CLIMATIC PHYSICAL CONDITIONS

| Condition | Time | Qualitative Reading |
|---|---|---|
| Wind | 08 30 | Breezy |
| Precip. | | None |
| Temp. | | ~ 60% |
| Sun (%) | | ~100% |
| Soil Moisture | | Very wet |

Comments

## 3.0 SUMMARY OF ENVIRONMENTAL CONTROLS AND MONITORING

| Radiation Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| Ludlum | | | | |
| Pancake | B301990 | | | |
| Fiddler | | | | |
| Smears | | | | |

Comments Radiation Monitoring By EG+G. None Detected above background

| Organic Vapor Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| PID or FID (Circle one) | B301990 | | Periodic | |

Comments None Detected above background as per Geologist's Log

# DAILY PROJECT LOG

Project 881 HILLSIDE

Task GEOTECHNICAL INVESTIGATION 2029-33-09

Date MARCH 20, 1990

Time 0900

## 1.0 DAILY SITE HEALTH AND SAFETY REQUIREMENTS

| Requirements | Inspected By | Time of Inspection |
|---|---|---|
| RAD MONITORING | (WESTON) S. YOSHINO/EG&G | 1345 STY |
| VOC MONITORING | S YOSHINO | 1000 STY |
| DRILL RIG MONITORING | S. YOSHINO | 1000 STY |
| | | |
| | | |

Comments GROUND SUFFICIENTLY DAMP FROM HEAVY SNOW (3-6-90)

## 2.0 CLIMATIC PHYSICAL CONDITIONS

| Condition | Time | Qualitative Reading |
|---|---|---|
| Wind | 1000 | 0-5 mph |
| Precip. | 0900 | NONE |
| Temp. | 0900 | 50-60°F |
| Sun (%) | 0900 | ~100% |
| Soil Moisture | 1000 | MUDDY |

Comments PREVIOUS DAYS SNOW KEEPS SOIL WET. NO DUST SUPPRESSION NEEDED.

## 3.0 SUMMARY OF ENVIRONMENTAL CONTROLS AND MONITORING

| Radiation Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| Ludlum | | | | |
| Pancake | 8301890 | 50-75 COUNTS/MIN | PERIODIC | STY |
| Fiddler | 8301990 | | | |
| Smears | | | | |

Comments ALL CORES MUDDY. THE USE OF A FIDLER WAS NOT USED BY WESTON DUE TO MOIST SOIL CONDITIONS. EG&G SURVEYED HOLE CORES (SMEARS) & DETECTED NO READINGS (RADIATION) ABOVE BACKGROUND

| Organic Vapor Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| PID or FID (Circle one) | 8301790 8301890 | BKG. | ~1345 | STY |

Comments NO READINGS ABOVE BACKGROUND. PERIODIC MONITORING ON EVERY CORE TO BEDROCK.

# DAILY PROJECT LOG

Project 881 HILLSIDE

Task GEOTECHNICAL INVESTIGATION 2029-33-09

Date MARCH 19, 1990

Time 0850

## 1.0 DAILY SITE HEALTH AND SAFETY REQUIREMENTS

| Requirements | Inspected By | Time of Inspection |
|---|---|---|
| RAD MONITORING | (WESTON) S. YOSHIMO/EG&G | ~1000 STY |
| VOC MONITORING | (WESTON) S. YOSHIMO | ~1000 STY |
| DRILLRIG MONITORING | S. YOSHIMO | ~1000 STY |
| | | |
| | | |

Comments GROUND SUFFICIENTLY DAMP FROM HEAVY SNOW STORM (3-6-90)

## 2.0 CLIMATIC PHYSICAL CONDITIONS

| Condition | Time | Qualitative Reading |
|---|---|---|
| Wind | 0850 | SLIGHT BREEZE |
| Precip. | " | NONE |
| Temp. | " | 50-60°F |
| Sun (%) | " | ~100% |
| Soil Moisture | " | MUDDY |

Comments PREVIOUS DAYS SNOW KEEPS SOIL MUDDY (WET).

## 3.0 SUMMARY OF ENVIRONMENTAL CONTROLS AND MONITORING

| Radiation Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| Ludlum mR meter | B301590 | 11-12 uR/HR | ~1000 | STY |
| ~~Pancake~~ | B301690 | 10 uR/HR | ~1000 | STY |
| ~~Fiddler~~ | | | | |
| ~~Smears~~ | | | | |

Comments ALL CORES MUDDY. THE USE OF A FIDLER/PANCAKE WAS NOT USED BY WESTON. EG&G SURVEYED HOLES & DETECTED NO RADIATION ABOVE BACKGROUND.

| Organic Vapor Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| PID or FID (Circle one) | B301590 B301690 | BKG | ~1000 | STY |

Comments NO READINGS ABOVE BACKGROUND. PERIODICALLY CHECKED (EVERY CORE TO BEDROCK).

# DAILY PROJECT LOG

Project 881 HILLSIDE

Task GEOTECHNICAL INVESTIGATION 2029-33-09

Date MARCH 16, 1990

Time

## 1.0 DAILY SITE HEALTH AND SAFETY REQUIREMENTS

| Requirements | Inspected By | Time of Inspection |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

Comments NO ACTIVITIES ON 881 HILLSIDE DUE TO SNOW. CANNOT WORK IN AREA DUE TO SNOW COVER.

## 2.0 CLIMATIC PHYSICAL CONDITIONS

| Condition | Time | Qualitative Reading |
|---|---|---|
| Wind | | |
| Precip. | | |
| Temp. | | |
| Sun (%) | | |
| Soil Moisture | | |

Comments

## 3.0 SUMMARY OF ENVIRONMENTAL CONTROLS AND MONITORING

| Radiation Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| Ludlum | | | | |
| Pancake | | | | |
| Fiddler | | | | |
| Smears | | | | |

Comments

| Organic Vapor Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| PID or FID (Circle one) | | | | |

Comments

# DAILY PROJECT LOG

Project 881 HILLSIDE

Task GEOTECHNICAL INVESTIGATION 8029-33-09

Date MARCH 15, 1990

Time

## 1.0 DAILY SITE HEALTH AND SAFETY REQUIREMENTS

| Requirements | Inspected By | Time of Inspection |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

Comments NO ACTIVITIES ON THE 881 HILLSIDE DUE TO SNOW. CANNOT WORK IN AREA DUE TO SNOW COVER.

## 2.0 CLIMATIC PHYSICAL CONDITIONS

| Condition | Time | Qualitative Reading |
|---|---|---|
| Wind | | |
| Precip. | | |
| Temp | | |
| Sun (%) | | |
| Soil Moisture | | |

Comments

## 3.0 SUMMARY OF ENVIRONMENTAL CONTROLS AND MONITORING

| Radiation Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| Ludlum | | | | |
| Pancake | | | | |
| Fiddler | | | | |
| Smears | | | | |

Comments

| Organic Vapor Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| PID or FID (Circle one) | | | | |

Comments

# DAILY PROJECT LOG

Project 881 HILLSIDE

Task GEOTECHNICAL INVESTIGATION 2024-33-09

Date MARCH 14, 1990

Time

## 1.0 DAILY SITE HEALTH AND SAFETY REQUIREMENTS

| Requirements | Inspected By | Time of Inspection |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

Comments NO ACTIVITIES ON THE 881 HILLSIDE DUE TO SNOW CAN NOT GET PERSONNEL OR VEHICLES INTO AREA.

## 2.0 CLIMATIC PHYSICAL CONDITIONS

| Condition | Time | Qualitative Reading |
|---|---|---|
| Wind | | |
| Precip. | | |
| Temp. | | |
| Sun (%) | | |
| Soil Moisture | | |

Comments

## 3.0 SUMMARY OF ENVIRONMENTAL CONTROLS AND MONITORING

| Radiation Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| Ludlum | | | | |
| Pancake | | | | |
| Fiddler | | | | |
| Smears | | | | |

Comments

| Organic Vapor Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| PID or FID (Circle one) | | | | |

Comments

# DAILY PROJECT LOG

Project 881 HILLSIDE

Task GEOTECHNICAL INVESTIGATION 2029-33-09

Date MARCH 13, 1990

Time

## 1.0 DAILY SITE HEALTH AND SAFETY REQUIREMENTS

| Requirements | Inspected By | Time of Inspection |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

Comments NO ACTIVITIES ON THE 881 HILLSIDE DUE TO SNOW CANNOT GET PERSONNEL INTO AREA.

## 2.0 CLIMATIC PHYSICAL CONDITIONS

| Condition | Time | Qualitative Reading |
|---|---|---|
| Wind | | |
| Precip. | | |
| Temp. | | |
| Sun (%) | | |
| Soil Moisture | | |

Comments

## 3.0 SUMMARY OF ENVIRONMENTAL CONTROLS AND MONITORING

| Radiation Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| Ludlum | | | | |
| Pancake | | | | |
| Fiddler | | | | |
| Smears | | | | |

Comments

| Organic Vapor Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| PID or FID (Circle one) | | | | |

Comments

# DAILY PROJECT LOG

Project 881 HILLSIDE

Task GEOTECHNICAL INVESTIGATION 2029-33-09

Date MARCH 12, 1990

Time

## 1.0 DAILY SITE HEALTH AND SAFETY REQUIREMENTS

| Requirements | Inspected By | Time of Inspection |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

Comments NO ACTIVITIES ON THE 881 HILLSIDE DUE TO WEATHER & NOW. CANNOT GET PERSONNEL INTO AREA

## 2.0 CLIMATIC PHYSICAL CONDITIONS

| Condition | Time | Qualitative Reading |
|---|---|---|
| Wind | | |
| Precip. | | |
| Temp. | | |
| Sun (%) | | |
| Soil Moisture | | |

Comments

## 3.0 SUMMARY OF ENVIRONMENTAL CONTROLS AND MONITORING

| Radiation Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| Ludlum | | | | |
| Pancake | | | | |
| Fiddler | | | | |
| Smears | | | | |

Comments

| Organic Vapor Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| PID or FID (Circle one) | | | | |

Comments

# DAILY PROJECT LOG

Project 881 HILLSIDE

Task GEOTECHNICAL INVESTIGATION 2029-33-09

Date MARCH 9, 1990

Time

## 1.0 DAILY SITE HEALTH AND SAFETY REQUIREMENTS

| Requirements | Inspected By | Time of Inspection |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

Comments NO ACTIVITIES ON THE 881 HILLSIDE DUE TO WEATHER CONDITIONS (2 FEET OF HEAVY SNOW). CANNOT GET VEHICLE INTO AREA

## 2.0 CLIMATIC PHYSICAL CONDITIONS

| Condition | Time | Qualitative Reading |
|---|---|---|
| Wind | | |
| Precip | | |
| Temp. | | |
| Sun (%) | | |
| Soil Moisture | | |

Comments

## 3.0 SUMMARY OF ENVIRONMENTAL CONTROLS AND MONITORING

| Radiation Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| Ludlum | | | | |
| Pancake | | | | |
| Fiddler | | | | |
| Smears | | | | |

Comments

| Organic Vapor Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| PID or FID (Circle one) | | | | |

Comments

# DAILY PROJECT LOG

Project 881 HILLSIDE

Task GEOTECHNICAL INVESTIGATION 2029-33-09

Date MARCH 8, 1990

Time

## 1.0 DAILY SITE HEALTH AND SAFETY REQUIREMENTS

| Requirements | Inspected By | Time of Inspection |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

Comments NO ACTIVITIES ON THE 881 HILLSIDE DUE TO WEATHER CONDITIONS (HEAVY SNOW). CANNOT GET VEHICLES INTO AREA.

## 2.0 CLIMATIC PHYSICAL CONDITIONS

| Condition | Time | Qualitative Reading |
|---|---|---|
| Wind | | |
| Precip | | |
| Temp. | | |
| Sun (%) | | |
| Soil Moisture | | |

Comments

## 3.0 SUMMARY OF ENVIRONMENTAL CONTROLS AND MONITORING

| Radiation Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| Ludlum | | | | |
| Pancake | | | | |
| Fiddler | | | | |
| Smears | | | | |

Comments

| Organic Vapor Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| PID or FID (Circle one) | | | | |

Comments

# DAILY PROJECT LOG

Project 881 HILLSIDE

Task GEOTECHNICAL INVESTIGATION 2029-33-09

Date MARCH 7, 1990

Time

## 1.0 DAILY SITE HEALTH AND SAFETY REQUIREMENTS

| Requirements | Inspected By | Time of Inspection |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

Comments NO ACTIVITIES ON 881 HILLSIDE DUE TO WEATHER CONDITIONS (HEAVY SNOW).

## 2.0 CLIMATIC PHYSICAL CONDITIONS

| Condition | Time | Qualitative Reading |
|---|---|---|
| Wind | | |
| Precip. | | |
| Temp. | | |
| Sun (%) | | |
| Soil Moisture | | |

Comments

## 3.0 SUMMARY OF ENVIRONMENTAL CONTROLS AND MONITORING

| Radiation Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| Ludlum | | | | |
| Pancake | | | | |
| Fiddler | | | | |
| Smears | | | | |

Comments

| Organic Vapor Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| PID or FID (Circle one) | | | | |

Comments

# DAILY PROJECT LOG

Project 881 HILLSIDE

Task GEOTECHNICAL INVESTIGATION 2029-33-09

Date MARCH 6, 1990

Time

## 1.0 DAILY SITE HEALTH AND SAFETY REQUIREMENTS

| Requirements | Inspected By | Time of Inspection |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

Comments NO DRILLING ACTIVITIES ON THE 881 HILLSIDE DUE TO WEATHER CONDITIONS (HEAVY SNOW).

## 2.0 CLIMATIC PHYSICAL CONDITIONS

| Condition | Time | Qualitative Reading |
|---|---|---|
| Wind | | |
| Precip. | | |
| Temp. | | |
| Sun (%) | | |
| Soil Moisture | | |

Comments

## 3.0 SUMMARY OF ENVIRONMENTAL CONTROLS AND MONITORING

| Radiation Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| Ludlum | | | | |
| Pancake | | | | |
| Fiddler | | | | |
| Smears | | | | |

Comments

| Organic Vapor Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| PID or FID (Circle one) | | | | |

Comments

# DAILY PROJECT LOG

Project 881 HILLSIDE

Task GEOTECHNICAL INVESTIGATION 2029-33-09

Date MARCH 5, 1990

Time 0800

## 1.0 DAILY SITE HEALTH AND SAFETY REQUIREMENTS

| Requirements | Inspected By | Time of Inspection |
|---|---|---|
| RAD MONITORING | S. YOSHIND (WESTON)/EG&G | ~0934 STY |
| VOC MONITORING | S. YOSHIND (WESTON) | ~0934 STY |
| DRILL RIG MONITORING | S. YOSHIND (WESTON) | ~0934 STY |
| | | |
| | | |

Comments GROUND SUFFICIENTLY DAMP DUE TO SNOW COVER.

## 2.0 CLIMATIC PHYSICAL CONDITIONS

| Condition | Time | Qualitative Reading |
|---|---|---|
| Wind | | |
| Precip. | 0800 | NONE |
| Temp. | 0800 | 45°F |
| Sun (%) | 0800 | 50% |
| Soil Moisture | 0800 | DAMP |

Comments SOIL DAMP FROM SNOW.

## 3.0 SUMMARY OF ENVIRONMENTAL CONTROLS AND MONITORING

| Radiation Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| Ludlum | | | | |
| Pancake | | | | |
| Fiddler | | | | |
| Smears | | | | |

Comments RADIATION MONITORING BY EG&G. NONE (RADIATION) DETECTED ABOVE BACKGROUND

| Organic Vapor Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| (PID) or FID (Circle one) | | | | |

Comments NONE DETECTED ABOVE BACKGROUND AS PER GEOLOGIST'S LOG.

# DAILY PROJECT LOG

Project 881 Hillside

Task 0029.33.09 Geotechnical Investigation

Date 03 02 90

Time 07 50

## 1.0 DAILY SITE HEALTH AND SAFETY REQUIREMENTS

| Requirements | Inspected By | Time of Inspection |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

Comments No Activity on 881 Hillside today

## 2.0 CLIMATIC PHYSICAL CONDITIONS

| Condition | Time | Qualitative Reading |
|---|---|---|
| Wind | | |
| Precip. | | |
| Temp | | |
| Sun (%) | | |
| Soil Moisture | | |

Comments

## 3.0 SUMMARY OF ENVIRONMENTAL CONTROLS AND MONITORING

| Radiation Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| Ludlum | | | | |
| Pancake | | | | |
| Fiddler | | | | |
| Smears | | | | |

Comments

| Organic Vapor Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| PID or FID (Circle one) | | | | |

Comments

# DAILY PROJECT LOG

2009.33.04

Project 881 Hillside

Task GEOTECHNICAL INVESTIGATION

Date 3 01 90

Time 08:00

## 1.0 DAILY SITE HEALTH AND SAFETY REQUIREMENTS

| Requirements | Inspected By | Time of Inspection |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

Comments No ACTIVITY ON 881 Hillside TODAY

## 2.0 CLIMATIC PHYSICAL CONDITIONS

| Condition | Time | Qualitative Reading |
|---|---|---|
| Wind | | |
| Precip. | | |
| Temp. | | |
| Sun (%) | | |
| Soil Moisture | | |

Comments

## 3.0 SUMMARY OF ENVIRONMENTAL CONTROLS AND MONITORING

| Radiation Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| Ludlum | | | | |
| Pancake | | | | |
| Fiddler | | | | |
| Smears | | | | |

Comments

| Organic Vapor Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| PID or FID (Circle one) | | | | |

Comments

# DAILY PROJECT LOG

Project 881 Hillside

Task 2029 33.09 GEOTECHNICAL INVESTIGATION

Date 2 28 90

Time 0725

## 1.0 DAILY SITE HEALTH AND SAFETY REQUIREMENTS

| Requirements | Inspected By | Time of Inspection |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

Comments No ACTIVITIES on 881 Hillside TODAY

## 2.0 CLIMATIC PHYSICAL CONDITIONS

| Condition | Time | Qualitative Reading |
|---|---|---|
| Wind | | |
| Precip. | | |
| Temp. | | |
| Sun (%) | | |
| Soil Moisture | | |

Comments

## 3.0 SUMMARY OF ENVIRONMENTAL CONTROLS AND MONITORING

| Radiation Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| Ludlum | | | | |
| Pancake | | | | |
| Fiddler | | | | |
| Smears | | | | |

Comments

| Organic Vapor Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| PID or FID (Circle one) | | | | |

Comments

# DAILY PROJECT LOG

Project 881 Hillside

Task 2009.53.09 GEOTECHNICAL INVESTIGATION

Date 2/27/90

Time 0705

## 1.0 DAILY SITE HEALTH AND SAFETY REQUIREMENTS

| Requirements | Inspected By | Time of Inspection |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

Comments NO ACTIVITIES ON 881 HILLSIDE THIS DAY

## 2.0 CLIMATIC PHYSICAL CONDITIONS

| Condition | Time | Qualitative Reading |
|---|---|---|
| Wind | 0705 | BREEZY |
| Precip. | | |
| Temp. | | ~35°F |
| Sun (%) | | ~50% |
| Soil Moisture | | |

Comments

## 3.0 SUMMARY OF ENVIRONMENTAL CONTROLS AND MONITORING

| Radiation Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| Ludlum | | | | |
| Pancake | | | | |
| Fiddler | | | | |
| Smears | | | | |

Comments

| Organic Vapor Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| PID or FID (Circle one) | | | | |

Comments

# DAILY PROJECT LOG

Project 881 Hillside

Task 2029 33.04 Geotechnical Investigation

Date 8/26/90

Time

## 1.0 DAILY SITE HEALTH AND SAFETY REQUIREMENTS

| Requirements | Inspected By | Time of Inspection |
|---|---|---|
| Rad Monitor | EG+G | |
| VOC Monitor | S. Clarkson (Weston) | Periodic |
| Drilling Safety | S. Clarkson (Weston) | Continuous |
| | | |
| | | |

Comments Dust suppression not required due to soil moisture

## 2.0 CLIMATIC PHYSICAL CONDITIONS

| Condition | Time | Qualitative Reading |
|---|---|---|
| Wind | 09:15 | Breezy |
| Precip. | | |
| Temp | | 30-40°F |
| Sun (%) | | ~30% |
| Soil Moisture | | Damp |

Comments

## 3.0 SUMMARY OF ENVIRONMENTAL CONTROLS AND MONITORING

| Radiation Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| Ludlum | | | | |
| Pancake | B300490 | | | |
| Fiddler | | | | |
| Smears | | | | |

Comments Radiation Monitoring By EG+G. None detected above background

| Organic Vapor Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| PID or FID (Circle one) | B300490 | | Periodic | |

Comments None detected above background as per Geologist's log.

# DAILY PROJECT LOG

Project 881 Hillside

Task GEOTECHNICAL INVESTIGATION 2029-33-09

Date 2-23 90

Time

## 1.0 DAILY SITE HEALTH AND SAFETY REQUIREMENTS

| Requirements | Inspected By | Time of Inspection |
|---|---|---|
| Rad Monitoring | EG+G | |
| VOC Monitoring | S. Carpenter (Weston) | Periodic |
| Drilling Safety | S. Carpenter (Weston) | Continuous |
| | | |
| | | |

Comments Soil moist enough not to warrant dust suppression

## 2.0 CLIMATIC PHYSICAL CONDITIONS

| Condition | Time | Qualitative Reading |
|---|---|---|
| Wind | | Slight Breeze |
| Precip. | | None |
| Temp. | | 40°F + |
| Sun (%) | | ~90% |
| Soil Moisture | | Moist |

Comments

## 3.0 SUMMARY OF ENVIRONMENTAL CONTROLS AND MONITORING

| Radiation Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| Ludlum | B301190 | | | |
| Pancake | | | | |
| Fiddler | | | | |
| Smears | | | | |

Comments Radiation Monitoring by EG+G. None detected above background.

| Organic Vapor Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| PID or FID (Circle one) | B301190 | | Periodic | |

Comments None detected above background as per Geologist's log

# DAILY PROJECT LOG

Project 881 Hillside  Task Geotechnical Investigation 2029 33 04

Date 2-22-90  Time 07[30]

## 1.0 DAILY SITE HEALTH AND SAFETY REQUIREMENTS

| Requirements | Inspected By | Time of Inspection |
|---|---|---|
| Rad Monitoring | EG+G | |
| Vor Monitoring | S. Carpenter (Weston) | Periodic |
| Drilling Safety | S. Carpenter (Weston) | Continuous |
| | | |
| | | |

Comments Soil is sufficiently damp to preclude need for dust suppression

## 2.0 CLIMATIC PHYSICAL CONDITIONS

| Condition | Time | Qualitative Reading |
|---|---|---|
| Wind | | Slight breeze from west |
| Precip. | | None |
| Temp | | 30° + |
| Sun (%) | | ~60% |
| Soil Moisture | | Damp |

Comments

## 3.0 SUMMARY OF ENVIRONMENTAL CONTROLS AND MONITORING

| Radiation Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| Ludlum | B301190 | | | |
| Pancake | | | | |
| Fiddler | | | | |
| Smears | | | | |

Comments Radiation monitoring by EG+G. None detected above background

| Organic Vapor Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| PID or FID (Circle one) | B301190 | | Periodic | |

Comments None detected above background as per Geologist's Log.

# DAILY PROJECT LOG

Project 881 Hillside  Task Geotechnical Investigation 2029 33 07

Date 2/21/90  Time

## 1.0 DAILY SITE HEALTH AND SAFETY REQUIREMENTS

| Requirements | Inspected By | Time of Inspection |
|---|---|---|
| Rad Monitoring | EG+G | |
| VOC Monitoring | S. Carpenter (Weston) | Periodic |
| Drilling Safety | S. Carpenter (Weston) | Continuous throughout day |
| | | |
| | | |

Comments Dust suppression not necessary due to previous day's snow.

## 2.0 CLIMATIC PHYSICAL CONDITIONS

| Condition | Time | Qualitative Reading |
|---|---|---|
| Wind | | Westerly breeze |
| Precip. | | |
| Temp. | | ~40° F |
| Sun (%) | | ~50% |
| Soil Moisture | | Wet |

Comments Previous day's snow keeps soil wet

## 3.0 SUMMARY OF ENVIRONMENTAL CONTROLS AND MONITORING

| Radiation Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| Ludlum | | | | |
| Pancake | B300490 | | | |
| Fiddler | | | | |
| Smears | | | | |

Comments Radiation monitoring by EG+G. None detected above background

| Organic Vapor Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| PID or FID (Circle one) | B300490 | | Periodic | |

Comments None detected above background as per Geologist's Log

# DAILY PROJECT LOG

Project 881 HILLSIDE

Task GEOTECHNICAL INVESTIGATION 2029-33-09

Date FEBRUARY 20, 1990

Time 0800

## 1.0 DAILY SITE HEALTH AND SAFETY REQUIREMENTS

| Requirements | Inspected By | Time of Inspection |
|---|---|---|
| RAD MONITORING | (WESTON) S. YOSHINO/EG&G | ~0800 STY |
| VOC MONITORING | S. YOSHINO | ~0800 STY |
| DRILL RIG MONITORING | S. YOSHINO | ~0800 STY |
| | | |
| | | |

Comments GROUND SUFFICIENTLY DAMP DUE TO SNOW COVER. DUST SUPPRESSION IS NOT NECESSARY

## 2.0 CLIMATIC PHYSICAL CONDITIONS

| Condition | Time | Qualitative Reading |
|---|---|---|
| Wind | 0800 | |
| Precip. | " | SNOWING |
| Temp. | " | 30°F |
| Sun (%) | " | OVERCAST |
| Soil Moisture | " | DAMP |

Comments SOIL DAMP DUE TO SNOW COVER.

## 3.0 SUMMARY OF ENVIRONMENTAL CONTROLS AND MONITORING

| Radiation Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| Ludlum | | | | |
| Pancake | B301090 | | | |
| Fiddler | B300590 | | | |
| Smears | | | | |

Comments RADIATION NOT DETECTED ABOVE BACKGROUND. SURVEY CONDUCTED BY EG&G.

| Organic Vapor Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| PID or FID (Circle one) | B301090 B300590 | BKG. | PERIODIC | STY |

Comments NO READINGS ABOVE BACKGROUND.

# DAILY PROJECT LOG

Project 881 Hillside

Task Geotechnical Investigation 2029 38 04

Date 2/19/90

Time 07 30

## 1.0 DAILY SITE HEALTH AND SAFETY REQUIREMENTS

| Requirements | Inspected By | Time of Inspection |
|---|---|---|
| Rad Monitoring | EG+G | |
| VOC Monitoring | S. Carpenter (Weston) | Continuous — Periodic throughout day |
| Drilling Safety | S. Yoshino (Weston) | 09 33 |
| | | |
| | | |

Comments Soil still damp from last week's snow. Dust suppression not necessary

## 2.0 CLIMATIC PHYSICAL CONDITIONS

| Condition | Time | Qualitative Reading |
|---|---|---|
| Wind | | No breeze |
| Precip. | | |
| Temp | | ~30°F |
| Sun (%) | | ~50% |
| Soil Moisture | | Very wet |

Comments Soil very wet from snow

## 3.0 SUMMARY OF ENVIRONMENTAL CONTROLS AND MONITORING

| Radiation Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| Ludlum | | | | |
| Pancake | | | | |
| Fiddler | | | | |
| Smears | | | | |

Comments Radiation monitored by EG&G. None detected above background

| Organic Vapor Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| PID or FID (Circle one) | B301090 | | Continuous, Periodic | |

Comments None detected above background as per Geologist's log.

# DAILY PROJECT LOG

Project 881 HILLSIDE

Task GEOTECHNICAL INVESTIGATION 2029-33-09

Date FEBRUARY 16, 1990

Time 0800

## 1.0 DAILY SITE HEALTH AND SAFETY REQUIREMENTS

| Requirements | Inspected By | Time of Inspection |
|---|---|---|
| RAD MONITORING | S. YOSHINO (WESTON) / EG&G | ~0900 STY |
| VOC MONITORING | S. YOSHINO (WESTON) | ~0900 STY |
| DRILL RIG MONITORING | S. YOSHINO (WESTON) | ~0900 STY |
| | | |
| | | |

Comments GROUND SUFFICIENTLY DAMP DUE TO SNOW COVER. DUST SUPPRESSION NOT NECESSARY.

## 2.0 CLIMATIC PHYSICAL CONDITIONS

| Condition | Time | Qualitative Reading |
|---|---|---|
| Wind | 0900 | SLIGHT BREEZE |
| Precip. | " | NO PRECIP. |
| Temp. | " | 10°-20° |
| Sun (%) | " | ~100% |
| Soil Moisture | " | DAMP (MUDDY) |

Comments SOIL DAMP

## 3.0 SUMMARY OF ENVIRONMENTAL CONTROLS AND MONITORING

| Radiation Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| Ludlum | | | | |
| Pancake | B301090 | NOT USED BY WESTON | | |
| Fiddler | B301090 | NOT USED BY WESTON | | |
| Smears | | | | |

Comments RADIATION NOT DETECTED ABOVE BACKGROUND. SURVEY CONDUCTED BY EG&G.

| Organic Vapor Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| PID or FID (Circle one) | B301090 | BKG. | ~0900 | STY |

Comments NO READINGS ABOVE BACKGROUND.

# DAILY PROJECT LOG

Project 881 Hillside  Task GEOTECHNICAL INVESTIGATION 2029 33 09

Date 2/15/90  Time 08:00

## 1.0 DAILY SITE HEALTH AND SAFETY REQUIREMENTS

| Requirements | Inspected By | Time of Inspection |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

Comments NO DRILLING ACTIVITIES ON 881 HILLSIDE DUE TO SNOW

## 2.0 CLIMATIC PHYSICAL CONDITIONS

| Condition | Time | Qualitative Reading |
|---|---|---|
| Wind | | |
| Precip. | | |
| Temp. | | |
| Sun (%) | | |
| Soil Moisture | | |

Comments

## 3.0 SUMMARY OF ENVIRONMENTAL CONTROLS AND MONITORING

| Radiation Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| Ludlum | | | | |
| Pancake | | | | |
| Fiddler | | | | |
| Smears | | | | |

Comments

| Organic Vapor Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| PID or FID (Circle one) | | | | |

Comments

# DAILY PROJECT LOG

Project 881 HILLSIDE

Task GEOTECHNICAL INVESTIGATION 2029-33-09

Date FEBRUARY 14, 1990

Time 0800

## 1.0 DAILY SITE HEALTH AND SAFETY REQUIREMENTS

| Requirements | Inspected By | Time of Inspection |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

Comments NO DRILLING ACTIVITIES ON 881 HILLSIDE DUE TO SNOW.

## 2.0 CLIMATIC PHYSICAL CONDITIONS

| Condition | Time | Qualitative Reading |
|---|---|---|
| Wind | | |
| Precip. | | |
| Temp | | |
| Sun (%) | | |
| Soil Moisture | | |

Comments

## 3.0 SUMMARY OF ENVIRONMENTAL CONTROLS AND MONITORING

| Radiation Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| Ludlum | | | | |
| Pancake | | | | |
| Fiddler | | | | |
| Smears | | | | |

Comments

| Organic Vapor Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| PID or FID (Circle one) | | | | |

Comments

# DAILY PROJECT LOG

Project 881 HILLSIDE

Task GEOTECHNICAL INVEST 2029-33-09

Date FEBRUARY 13, 1990

Time 08:30

## 1.0 DAILY SITE HEALTH AND SAFETY REQUIREMENTS

| Requirements | Inspected By | Time of Inspection |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

Comments NO DRILLING ACTIVITIES ON 881 HILLSIDE DUE TO SNOW

## 2.0 CLIMATIC PHYSICAL CONDITIONS

| Condition | Time | Qualitative Reading |
|---|---|---|
| Wind | | |
| Precip. | | |
| Temp | | |
| Sun (%) | | |
| Soil Moisture | | |

Comments

## 3.0 SUMMARY OF ENVIRONMENTAL CONTROLS AND MONITORING

| Radiation Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| Ludlum | | | | |
| Pancake | | | | |
| Fiddler | | | | |
| Smears | | | | |

Comments

| Organic Vapor Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| PID or FID (Circle one) | | | | |

Comments

# DAILY PROJECT LOG

Project 881 HILLSIDE

Task GEOTECHNICAL INVESTIGATION 2029-33-09

Date FEBRUARY 12, 1990

Time 0740

## 1.0 DAILY SITE HEALTH AND SAFETY REQUIREMENTS

| Requirements | Inspected By | Time of Inspection |
|---|---|---|
| RAD MONITORING | S. YOSHINO (WESTON) / EG&G | ~0915 STY |
| VOC MONITORING | S. YOSHINO (WESTON) | ~0915 STY |
| DRILL RIG MONITORING | S. YOSHINO (WESTON) | ~0915 STY |
| | | |
| | | |

Comments GROUND SUFFICIENTLY DAMP. DUST SUPPRESSION DOES NOT NEED TO BE DONE.

## 2.0 CLIMATIC PHYSICAL CONDITIONS

| Condition | Time | Qualitative Reading |
|---|---|---|
| Wind | 0945 | SLIGHT BREEZE |
| Precip. | " | NONE |
| Temp. | " | 50-60°F |
| Sun (%) | " | ~90% |
| Soil Moisture | " | DAMP |

Comments SOIL DAMP TO TOUCH. NO DUST GENERATED

## 3.0 SUMMARY OF ENVIRONMENTAL CONTROLS AND MONITORING

| Radiation Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| Ludlum | | | | |
| Pancake | B300890 | 85-100 COUNTS/MIN | ~0915 | STY |
| Fiddler | B300890 | 0 COUNTS/MIN | ~0915 | STY |
| Smears | | | | |

Comments NO RADIATION WAS DETECTED ABOVE BACKGROUND ON RADIATION INSTRUMENTS. SURVEY CONDUCTED BY WESTON & EG&G.

| Organic Vapor Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| PID or FID (Circle one) | B300890 | 0.2 PPM (BKG) | ~0915 | STY |

Comments NO ORGANIC VAPOR READINGS ABOVE BACKGROUND.

# DAILY PROJECT LOG

Project 881 Hillside

Task GEOTECHNICAL INVESTIGATION 8029-33-09

Date 2/9/90

Time 09:45

## 1.0 DAILY SITE HEALTH AND SAFETY REQUIREMENTS

| Requirements | Inspected By | Time of Inspection |
|---|---|---|
| DRILLING SAFETY | J.E. MARES (WESTON) | 09:15 |
| | | |
| | | |
| | | |
| | | |

Comments PACKER TESTING TODAY ON A HOLE PREVIOUSLY SURVEYED FOR VOC & RADIATION

## 2.0 CLIMATIC PHYSICAL CONDITIONS

| Condition | Time | Qualitative Reading |
|---|---|---|
| Wind | 09:00 | WEST |
| Precip. | | NONE |
| Temp. | | ~40°-50°F |
| Sun (%) | | ~90% |
| Soil Moisture | | MOIST |

Comments

## 3.0 SUMMARY OF ENVIRONMENTAL CONTROLS AND MONITORING

| Radiation Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| Ludlum | | | | |
| Pancake | | | | |
| Fiddler | | | | |
| Smears | | | | |

Comments RADIATION MONITORING CONDUCTED BY EG&G NONE DETECTED ABOVE BACKGROUND

| Organic Vapor Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| PID or FID (Circle one) | | | | |

Comments NOT REQUIRED FOR THIS DAY'S ACTIVITIES

# DAILY PROJECT LOG

Project 881 HILLSIDE

Task GEOTECHNICAL INVESTIGATION 2029-33-09

Date FEBRUARY 7, 1990

Time 0740

## 1.0 DAILY SITE HEALTH AND SAFETY REQUIREMENTS

| Requirements | Inspected By (WESTON) | Time of Inspection |
|---|---|---|
| RAD MONITORING | S. YOSHIMO/EGIG | ~1300 STY |
| VOC MONITORING | S. YOSHIMO (WESTON) | ~1300 STY |
| DRILL RIG MONITORING | S. YOSHIMO (WESTON) | ~1300 STY |
| | | |
| | | |

Comments GROUND SUFFICIENTLY DAMP. DUST SUPPRESSION IS NOT NECESSARY.

## 2.0 CLIMATIC PHYSICAL CONDITIONS

| Condition | Time | Qualitative Reading |
|---|---|---|
| Wind | 0740 | |
| Precip | " | NONE |
| Temp | " | 50°F |
| Sun (%) | " | ~100% |
| Soil Moisture | " | DAMP |

Comments SOIL DAMP FROM LAST WEEKS SNOW

## 3.0 SUMMARY OF ENVIRONMENTAL CONTROLS AND MONITORING

| Radiation Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| Ludlum | | | | |
| Pancake | B300390 | 60-100 COUNTS/MIN | ~1300 | STY |
| Fiddler | B300390 | 0 COUNTS/MIN | ~1300 | STY |
| Smears | | | | |

Comments NO READINGS (RADIATION) DETECTED ABOVE BACKGROUND.

| Organic Vapor Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| PID or FID (Circle one) | B300390 | 0.2 ppm (BKG) | ~1300 | STY |

Comments NO ORGANIC VAPORS DETECTED ABOVE BACKGROUND.

# DAILY PROJECT LOG

Project 881 Hillside

Task Geotechnical Investigation 2029-53 09

Date 05 February 1990

Time 09 00

## 1.0 DAILY SITE HEALTH AND SAFETY REQUIREMENTS

| Requirements | Inspected By | Time of Inspection |
|---|---|---|
| Rad Monitoring | S Yoshino | 09 00 STY |
| VOC Monitoring | " | " STY |
| Drill Rig Safety | " | " STY |
| | | |
| | | |

Comments Ground sufficiently wetted, No dust suppression required.

## 2.0 CLIMATIC PHYSICAL CONDITIONS

| Condition | Time | Qualitative Reading |
|---|---|---|
| Wind | | Slight from East |
| Precip. | | None |
| Temp. | | Cool ~40°F Clear |
| Sun (%) | | ~100% |
| Soil Moisture | | Damp |

Comments Soil Damp from last week's snow

## 3.0 SUMMARY OF ENVIRONMENTAL CONTROLS AND MONITORING

| Radiation Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| Ludlum | | | | |
| Pancake | B300290 | 75 cpm (x1) | 1254 | STY |
| Fiddler | B300290 | " | | |
| Smears | | | | |

Comments No radiation detected above background (75 cpm).

| Organic Vapor Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| PID or FID (Circle one) | B300290 | 0.9 (0.9 units) | 12:54 | STY |

Comments None detected above background

# DAILY PROJECT LOG

Project 881 Hillside

Task Geotechnical Investigation 2005 33.07

Date 2/8/90

Time

## 1.0 DAILY SITE HEALTH AND SAFETY REQUIREMENTS

| Requirements | Inspected By | Time of Inspection |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

Comments No Activity today on Hillside TEM

## 2.0 CLIMATIC PHYSICAL CONDITIONS

| Condition | Time | Qualitative Reading |
|---|---|---|
| Wind | | |
| Precip. | | |
| Temp. | | |
| Sun (%) | | |
| Soil Moisture | | |

Comments

## 3.0 SUMMARY OF ENVIRONMENTAL CONTROLS AND MONITORING

| Radiation Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| Ludlum | | | | |
| Pancake | | | | |
| Fiddler | | | | |
| Smears | | | | |

Comments

| Organic Vapor Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| PID or FID (Circle one) | | | | |

Comments

# DAILY PROJECT LOG

Project 881 Hillside  Task Geotechnical Investigation 2029 33.09

Date 2/6/90  Time 0750

## 1.0 DAILY SITE HEALTH AND SAFETY REQUIREMENTS

| Requirements | Inspected By | Time of Inspection |
|---|---|---|
| Rad Monitoring | S. Yoshino (Nelson) EG&G | ~1500 STY |
| VOC Monitoring | S. Yoshino (Nelson) | ~1500 STY |
| Drill Rig Monitoring | S. Yoshino (Nelson) | ~1500 STY |
| | | |
| | | |

Comments Ground Sufficiently Damp - No Dust Suppression Required

## 2.0 CLIMATIC PHYSICAL CONDITIONS

| Condition | Time | Qualitative Reading |
|---|---|---|
| Wind | | |
| Precip. | 0750 | None |
| Temp. | " | 40-50°F |
| Sun (%) | " | ~100% |
| Soil Moisture | " | Damp |

Comments

## 3.0 SUMMARY OF ENVIRONMENTAL CONTROLS AND MONITORING

| Radiation Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| Ludlum | | | | |
| Pancake | | | | |
| Fiddler | | | | |
| Smears | | | | |

Comments Radiation not detected above background survey conducted by EG&G

| Organic Vapor Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| PID or FID (Circle one) | | | | |

Comments This day's activities do not require VOC monitoring

# DAILY PROJECT LOG

Project 881 HILLSIDE

Task GEOTECHNICAL INVESTIGATION 2029-33-09

Date FEBRUARY 7, 1990

Time 0725

## 1.0 DAILY SITE HEALTH AND SAFETY REQUIREMENTS

| Requirements | Inspected By | Time of Inspection |
|---|---|---|
| RAD MONITORING | S. YOUNG (WESTON) / EG&G | ~1000 STY |
| ORGANIC VAPOR MONITORING | S. YOUNG | ~1000 STY |
| DRILL RIG MONITORING | S. YOUNG | ~1000 STY |
| | | |
| | | |

Comments GROUND SUFFICIENTLY DAMP FROM SNOW. DUST SUPPRESSION NOT NECESSARY.

## 2.0 CLIMATIC PHYSICAL CONDITIONS

| Condition | Time | Qualitative Reading |
|---|---|---|
| Wind | | |
| Precip. | 0730 | SNOWING (WET SNOW) |
| Temp. | " | 20-30°F |
| Sun (%) | " | OVERCAST (0%) |
| Soil Moisture | 0915 | MUDDY SOIL MOIST FROM SNOW |

Comments SOIL MOIST

## 3.0 SUMMARY OF ENVIRONMENTAL CONTROLS AND MONITORING

| Radiation Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| Ludlum | | | | |
| Pancake | B300190 | 50 COUNTS/MIN | ~1000 | STY |
| Fiddler | B300190 | 0 COUNTS/MIN | ~1000 | STY |
| Smears | | | | |

Comments NO READING ABOVE BACKGROUND DETECTED. DRILLED 2 FEET

| Organic Vapor Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| PID or FID (Circle one) | B300190 | 0.1 | ~1000 | STY |

Comments NO READINGS ABOVE BACKGROUND. DRILLED 2 FEET. USED AN OVA DUE TO HIGH HUMIDITY FROM SNOW & COOL TEMPERATURES.

# DAILY PROJECT LOG

Project 881 HILLSIDE

Task GEOTECHNICAL INVESTIGATION 2029-33-09

Date FEBRUARY 1, 1990

Time 0800

## 1.0 DAILY SITE HEALTH AND SAFETY REQUIREMENTS

| Requirements | Inspected By | Time of Inspection |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

Comments NO DRILLING TODAY ON THE 881 HILLSIDE DUE TO LACK OF WORK PERMITS

## 2.0 CLIMATIC PHYSICAL CONDITIONS

| Condition | Time | Qualitative Reading |
|---|---|---|
| Wind | | |
| Precip. | | |
| Temp. | | |
| Sun (%) | | |
| Soil Moisture | | |

Comments

## 3.0 SUMMARY OF ENVIRONMENTAL CONTROLS AND MONITORING

| Radiation Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| Ludlum | | | | |
| Pancake | | | | |
| Fiddler | | | | |
| Smears | | | | |

Comments

| Organic Vapor Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| PID or FID (Circle one) | | | | |

Comments

# DAILY PROJECT LOG

Project 881 HILLSIDE

Task GEOTECHNICAL INVESTIGATION 2009-33-09

Date JANUARY 31, 1990

Time 0730

## 1.0 DAILY SITE HEALTH AND SAFETY REQUIREMENTS

| Requirements | Inspected By | Time of Inspection |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

Comments NO DRILLING ACTIVITIES DUE TO LACK OF WORK PERMITS

## 2.0 CLIMATIC PHYSICAL CONDITIONS

| Condition | Time | Qualitative Reading |
|---|---|---|
| Wind | | |
| Precip. | | |
| Temp. | | |
| Sun (%) | | |
| Soil Moisture | | |

Comments

## 3.0 SUMMARY OF ENVIRONMENTAL CONTROLS AND MONITORING

| Radiation Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| Ludlum | | | | |
| Pancake | | | | |
| Fiddler | | | | |
| Smears | | | | |

Comments

| Organic Vapor Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| PID or FID (Circle one) | | | | |

Comments

# DAILY PROJECT LOG

Project 881 Hillside

Task Geotechnical Investigation 2029-33-09

Date January 30, 1990

Time 0730

## 1.0 DAILY SITE HEALTH AND SAFETY REQUIREMENTS

| Requirements | Inspected By | Time of Inspection |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

Comments No Drilling on the Hillside Due to Lack of Work Permits.

## 2.0 CLIMATIC PHYSICAL CONDITIONS

| Condition | Time | Qualitative Reading |
|---|---|---|
| Wind | | |
| Precip. | | |
| Temp. | | |
| Sun (%) | | |
| Soil Moisture | | |

Comments

## 3.0 SUMMARY OF ENVIRONMENTAL CONTROLS AND MONITORING

| Radiation Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| Ludlum | | | | |
| Pancake | | | | |
| Fiddler | | | | |
| Smears | | | | |

Comments

| Organic Vapor Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| PID or FID (Circle one) | | | | |

Comments

# DAILY PROJECT LOG

Project 881 HILLSIDE

Task GEOTECHNICAL INVESTIGATION 2029-33-09

Date JANUARY 29, 1990

Time 0840

## 1.0 DAILY SITE HEALTH AND SAFETY REQUIREMENTS

| Requirements | Inspected By | Time of Inspection |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |

Comments NO DRILLING ACTIVITIES DUE TO LACK OF WORK PERMITS.

## 2.0 CLIMATIC PHYSICAL CONDITIONS

| Condition | Time | Qualitative Reading |
|---|---|---|
| Wind | | |
| Precip. | | |
| Temp. | | |
| Sun (%) | | |
| Soil Moisture | | |

Comments

## 3.0 SUMMARY OF ENVIRONMENTAL CONTROLS AND MONITORING

| Radiation Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| Ludlum | | | | |
| Pancake | | | | |
| Fiddler | | | | |
| Smears | | | | |

Comments FRANK KAGOT, DENVER'S REGIONAL SAFETY OFFICER ATTEMPTS TO GET RADIATION INSTRUMENT CALIBRATION SOURCES TO WESTON TRAILER. FRANK KAGOT DOES NOT HAVE PROPER FORMS & IS STOPPED AT GATE. FRANK KAGOT IS TO WRITE LETTER TO GET SOURCES ON SITE.

| Organic Vapor Monitoring | Location | Reading | Time | Initials |
|---|---|---|---|---|
| PID or FID (Circle one) | | | | |

Comments

Rcvd 2/19/90

# LOG OF BOREHOLE

QA BY/DATE JEM 2/8/90
LOCATION ~~Foxtail Drainage~~ ; 903 Well Site
COORDINATES
TOTAL DEPTH 10.0 ; 28.4

DRILLING COMPANY Boyles Bros.
DATE DRILLED 2-2/5-90 ; 2-7-90
DRILLING METHOD Hollow Stem Auger ; NX Core
LOGGED BY SP Carpenter ; R. Sengebush
GEOLOGIST

BOREHOLE/WELL NO B3001~~#~~90
GROUND SURFACE ELEVATION
WATER LEVEL ENCOUNTERED none
STATIC
DRILLER D. Styles HELPER A. Bodey
DRILLING FLUID None ; Water
CHECKED BY
SITE MANAGER
CEARP MANAGER

COMMENTS Surface casing set on 2-5-90 to ~~total depth~~ 7 100'

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED |
|---|---|---|---|---|
| 0 | Sandy gravelly clay | | 0.0-2.0 SAMPLE<br>Recovered 1.2/2.0' = 60% TOPSOIL<br>0.0-0.7: ~~SANDY GRAVELLY~~ SANDY GRAVELLY CLAY: dusky yellowish brown (10YR 4/2); fine to very coarse grained sand, 1 to 6 cm gravels; clayey; silty; poor sorting; subrounded to subangular quartzose; low plasticity; medium dense; moist | Hnu Background: 0.0<br>OVA Background 0.0<br>All readings in auger, in circulating zone, on core in cuttings, 0.0, unless otherwise noted below. |
| 1 | | 1.2 | | |
| 2 | | | ROCKY FLATS COLLUVIUM<br>0.7'-1.2': SANDY GRAVELLY CLAY: same as above; moderate yellowish brown (10YR 5/4) | TRIP BLANK SAMPLE<br>TB0202901<br>TB0205901<br>0.0-1.2 SAMPLE (VOAs only)<br>B3001900002 |
| 3 | Silty sandy clay | | 2.0-4.0' SAMPLE<br>Recovered 1.8'/2.0' = 90%<br>SILTY SANDY CLAY: light brown (5YR 5/6), moderate yellowish brown (10YR 5/4), grading to yellowish gray (5Y 7/2); nonstratified; very fine to very coarse grained sand, some 1-3 cm gravels; poor sorting; subangular quartzose; low to medium plasticity; calcareous grading to caliche; stiff, moist to damp (in lower zone) | 0.0-6.0 SAMPLE<br>B3001900006<br>B3001900006D<br>2.0-3.8 SAMPLE (VOAs only)<br>B3001900204 |
| 4 | | 1.8 | | |
| 5 | Clayey sandy silt | | | 4.0-6.0 SAMPLE (VOAs only)<br>B3001900406<br>B3001900406D |

BHLOGLMB

WELL NO B3001A90

# LOG OF BOREHOLE



| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED |
|---|---|---|---|---|
| 5 | CLAYEY SANDY SILT | | 4.0-6.0' SAMPLE<br>Recovered 2.0'/2.0'=100%<br>CLAYEY SANDY SILT: medium dark gray (N4/0), light olive gray (5Y6/1), grading to moderate yellowish brown (10YR5/4), dark yellowish orange (10YR6/6); mottled to banded, non-stratified; very fine to some medium grained sand; inclusions of claystone; very calcareous; some root hairs, iron staining; low to medium plasticity; dense to medium dense, damp | 6.0-8.0 SAMPLE (VOAS ONLY) B3001900608<br>8.0-9.9 SAMPLE (VOAS ONLY) B3001900810 |
| 6 | | | | |
| 7 | SILTY CLAYEY SANDSTONE | | | |
| | | | BED ROCK<br>6.0-8.0' SAMPLE<br>Recovered 2.0'/2.0'=100%<br>SILTY CLAYEY SANDSTONE: very light gray (N8/0), grayish orange (10YR7/4), light brown (5YR5/6), mottled to banded; lensed with silty claystone at 6.8 to 7.0 and 7.4 to 7.6; very fine to trace medium grained sand; moderate to well sorted, subrounded quartzose, low to medium plasticity in claystone lenses; iron stained; trace caliche lenses; slightly cemented; weathered, medium hard to hard, damp | |
| 8 | | | | |
| 9 | | | | |
| 9.9 | | | | |
| 10 | | Not Sampled | | |
| 11 | | | 8.0-10.0' SAMPLE<br>Recovered 1.9'/2.0'=95%<br>SILTY CLAYEY SANDSTONE: same as above, medium gray (N5/0), very light gray (N8/0), olive gray (5Y4/1); claystone lens at 9.0 to 9.4 | |
| 12 | | | Total Depth 10.0' | |
| 13 | | | | |

BHLOG2.MB

1 of 5

1st QA
2-26-90
BW

# GEOTECHNICAL DATA

QA BY/DATE
LOCATION 881 Hillside
COORDINATES
TOTAL DEPTH 28.0'

DRILLING COMPANY Boyles Bros
DATE DRILLED ; 2-7-90
DRILLING METHOD ; NX B-56
LOGGED BY ; R. Sengebush
GEOLOGIST

BOREHOLE/WELL NO. B300190
GROUND SURFACE ELEVATION
WATER LEVEL ENCOUNTERED
STATIC
DRILLER ; Doyle HELPER
DRILLING FLUID
CHECKED BY
SITE MANAGER
CEARP MANAGER

COMMENTS

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED & Road Detects | FIELD SCREEN RAD | FIELD SCREEN VOA |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | |
| 1 | | | | | | | | | |
| 2 | | | | | | | | | |
| 3 | | | | | | | | | |
| 4 | | | | | | | | | |
| 5 | | | | | | | | | |

PAGE 1 OF 8

Line outlines column only

# GEOTECHNICAL DATA

WELL NO. 8300190



| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED | FIELD SCREEN RAD | FIELD SCREEN VOA |
|---|---|---|---|---|---|---|---|---|---|
| 5 | | | | | | | | | |
| 6 | | | | | | | | | |
| 7 | | | | | | | | | |
| 8 | | | | | | | | | |
| 9 | | | | | | | | | |
| 10 | | | | | | | | | |
| 11 | | | | | | 100-12.5 | Fractures | | |
| | Clayey Siltstone | Clayey Coring | | [illegible] | 0 | ~~11.0-12.5~~ : Sample ← core | 11.2 45° | | |
| | | | | | | Recovered 1.0/2.5' | 11.4 45° | | |
| | | | | | | RQD = 0 ← core | 11.6 45° | | |
| 12 | | | | | | Clayey siltstone : Dark yellowish orange (10YR 6/6) | 11.8 45° | | |
| | | | | | | mottled with gray and patches | 12.0 45° | | |
| | Siltstone and Silty | | | 100 | 64 | of white clay to 2.5cm | Fractures | | |
| 13 | | | | | | in diameter (irregular shapes) | 12.8 45° | | |
| | | | | | | | 13.0 45° | | |

# GEOTECHNICAL DATA

WELL NO. B300190



| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED | FIELD SCREEN RAD | FIELD SCREEN VOA |
|---|---|---|---|---|---|---|---|---|---|
| 13 | | | | | | ~~11.0-12.5 continued:~~ blocky; indistinct bedding; very well sorted; abundant muscovite grains; heavily weathered; stiff to hard; damp. | 13.2 45° | | |
| 14 | | | | | | 12.5-15.0': Sample | | | |
| 15 | | | | | | Recovered 2.5/2.5' | 14.8 45° | | |
| | | | | 90 | 64 | RQD = 1.6/2.5, 12.5-13.0: Siltstone and silty claystone dark yellowish orange (10 YR 6/6); blocky; broken at 0.5' intervals; siltstone; very well sorted, with abundant muscovite and limonite (limonite to 10%); iron nodules to 0.17' long and 0.08' diameter at 12.5', 12.9' and 13.0'; nodules are very hard; heavily weathered; stiff to hard; damp. | Fractures 15.2 45°; 15.4 45°; 15.6 45°; 16.3 45°; 16.4 45°; 16.6 45°; 17.1 45°; 17.3 45° | | |
| 16 | | | | | | | | | |
| 17 | | | | | | | | | |
| 18 | | 18.6 | | | | 13.0-15.0: Claystone thinly laminated. | 18.4 45° | | |
| 19 | | | | | | 15.0-19.0': Sample | | | |
| | | | | 100 | 73 | Recovered 3.6/4.0' RQD = 2.3/3.6' Clayey Siltstone: Pale Yellowish brown (10 YR 6/2) and light olive gray (5Y 5/2); 10% orange iron oxide-limonite stain; ~~clayey siltstone is very well sorted; trace of~~ sand lenses | 19.2 45° 30 = 45°; 19.4 45° "; 19.5 45° "; 20.3 45° " | | |
| 20 | | | | | | | | | |
| 21 | | | | | | | | | |

# GEOTECHNICAL DATA

WELL NO. B300190



| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED | FIELD SCREEN RAD | FIELD SCREEN VOA |
|---|---|---|---|---|---|---|---|---|---|
| 21 | | | | | | ~~15.0 - 19.0' Continued~~ to 0.17' thick ~~Some~~ sand very fine grained; ~~very well sorted~~; ~~quartzose~~ silt ~~with~~ abundant muscovite grains; trace of gravel ~~in~~ lenses 0.17' thick; ~~0.08' apart~~; clasts are siltstone, gray to reddish brown; | 21.3 30 45° | | |
| 22 | | | | | | | 21.7 30 45° | | |
| | | | | | | | 22.4 30 45° | | |
| 23 | | 230 | | 100 | 80 | 3mm to 1 cm in diameter; subrounded to ~~subangular~~ rounded; bladed; ~~very hard~~; ~~not calcareous~~; ~~trace are composed of iron oxide (in nodules)~~; stiff to hard damp | limonite - 10 - 20% in gravel zone; 23.4 45°; 23.6 45°; 23.8 45°; heavily weathered; 24.3 45° | | |
| 24 | clayey to silty siltstone | Coring | | | | 19.0 - 23.0': Sample - caps | | | |
| 25 | | | | | | Recovered 4.0/4.0' RQD = 2.9/4.0 | 25.1 45°; 25.3 45° | | |
| 26 | | | | | | Clayey siltstone caps AND CLAYSTONE: dark yellowish orange (10YR 6/6) and medium dark gray (N4/R) ~~mottled and~~ interlayered beds, 0.05' thick; as described in 10.0-12.5'; gravel lenses to 0.17' thick; clasts are siltstone, 0.01 to 0.1' in diameter, subrounded to subangular, one iron nodule; very hard; not calcareous ~~(do not effervesce in HCl)~~. | 25.7 45°; 26.3 45°; very well sorted; 26.5 45°; 0.08' apart; 27.0 45° | | |
| 27 | clayey siltstone | 270 | | 100 | 0 | | 27.2 45°; 27.4 45°; 27.6 45°; 27.8 45°; 28.0 45° | | |
| 28 | | | | | | 23.0 - 27.0, Sample - caps | | | |
| 29 | | | | | | Recovered 4.0'/4.0 RQD = 3.2/4.0' Clayey Siltstone caps: As described in 19.0 to 23.0'; ~~but with~~ mottled gray and orange no gravels; moderately weathered | | | |

WELL NO. B300190

# GEOTECHNICAL DATA



| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED | FIELD SCREEN RAD | FIELD SCREEN VOA |
|---|---|---|---|---|---|---|---|---|---|
| 29 | | | | | | 27.0-28.0' Sample - core | | | |
| | | | | | | Recovered 1.0/1.0 | | | |
| 30 | | | | | | RQD = 0/1.0' core | | | |
| | | | | | | Clayey siltstone; moderate yellowish brown (10YR5/4); ~~mottled with dark~~ limonite to 10% - dark | | | |
| 31 | | | | | | ~~yellowish orange (10YR6/6)~~; yellowish orange (10YR 6/6); blocky; broken; iron oxide nodules to 0.08', thick in | | | |
| | | | | | | 3 zones, ~~[illegible]~~ some well cemented with limonite | | | |
| 32 | | | | | | moderately weathered; stiff to hard; damp. | | | |
| | | | | | | TD = 28.0' | | | |
| 33 | | | | | | | | | |
| 34 | | | | | | | | | |
| 35 | | | | | | | | | |
| 36 | | | | | | | | | |
| 37 | | | | | | | | | |

1st QA 2-26-90 BJ

Rcvd 7/1/90

# LOG OF BOREHOLE

QA BY/DATE JEM 2/8/90
LOCATION ~~Fremont Bro.~~ RFP; [illegible] Hillside
COORDINATES
TOTAL DEPTH 10.0, 28.0

DRILLING COMPANY Boyles Bros.
DATE DRILLED 2-5-90; 2-6-90, 2-7-90
DRILLING METHOD Hollow Stem Auger; NX Core
LOGGED BY SP Carpenter; RM Sengebosh
GEOLOGIST

BOREHOLE/WELL NO. B3002490
GROUND SURFACE ELEVATION
WATER LEVEL ENCOUNTERED None
STATIC
DRILLER D. Styles HELPER A. Boday
DRILLING FLUID None; Water
CHECKED BY
SITE MANAGER
CEARP MANAGER

COMMENTS

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED |
|---|---|---|---|---|
| 0 | gravelly sandy clay | 04 | 0.0-2.0 SAMPLE<br>Recovered 1.0/2.0=50% TOPSOIL<br>0.0-0.4 GRAVELLY SANDY CLAY<br>ROCKY FLATS COLLUVIUM<br>0.4-1.0 GRAVELLY SANDY CLAY; pale brown (5YR 5/2), moderate brown (5YR 4/4); nonstratified; fine to very coarse grained sand; 1 to 5cm gravels; poor sorting, subangular; sand ~~stone to~~ quartzose; low plasticity, stiff; damp ← OK [illegible] | Hnu Background 0.0<br>OVA Background 0.0<br>All readings in auger, in breathing zone, on core, and in cuttings 0.0; unless otherwise noted below.<br>0.0-1.0 SAMPLE (VOAS ONLY) B3002900002<br>0.0-3.1 SAMPLE B3002900004<br>2.0-3.1 SAMPLE (VOAS ONLY) B3002900204<br>4.0-5.9 SAMPLE (VOAS ONLY) B3002900406<br>4.0-7.5 SAMPLE B3002900408 |
| 1 | | | | |
| 2 | | | 2.0-4.0 SAMPLE<br>Recovered 1.1/2.0=55%<br>SANDY CLAY; grayish orange (10YR 7/4), dark yellowish brown (10YR 4/2); mottled; nonstratified; fine to very coarse grained sand; some 1 to 3 cm gravels; some silt, scattered claystone pieces less than 1cm, poor sorting; subangular; quartzose, medium plasticity, calcareous; very stiff, damp to dry | |
| 3 | Sandy clay | | | |
| 4 | | | | |
| 5 | SILTY SANDY CLAY | | | |

BHLOG1.MB

WELL NO B3002490

# LOG OF BOREHOLE



| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED |
|---|---|---|---|---|
| 5 | SILTY SANDY CLAY | | 4.0-6.0 SAMPLE<br>Recovered 1.9/2.0 = 95%<br>SILTY SANDY CLAY: pale brown (5YR 5/2), dusky yellow (5Y 6/4), light olive gray (5Y 5/2); very mottled; nonstratified; reworked claystone, some sand to sandy; trace gravels; very calcareous to caliche zones; medium plasticity; very stiff; damp | 6.0-7.5 SAMPLE<br>(VOA'S ONLY)<br>B3002900608<br>8.0-10.0 SAMPLE<br>(VOA'S ONLY)<br>B3002900810 |
| 5.9 | | 6.0 | | |
| 6 | SILTY SANDSTONE | | BEDROCK<br>6.0-8.0' SAMPLE<br>Recover 1.5/2.0' = 75% | |
| 7 | Claystone | | 6.0-7.0 SILTY SANDSTONE: yellowish gray (5Y 7/2); dusky yellow (5Y 6/4); mottled; non-stratified; fine to medium grained sand; well sorted; round; quartzose; scattered claystone inclusions; very fractured; scattered iron staining; low non plasticity; weathered; firm; damp | |
| | | 7.5 | | |
| 8 | | 8.0 | | |
| | SILTY CLAYSTONE | | 7.0-7.5: CLAYSTONE olive gray (5Y 6/4); non-stratified, blocky, silty; very fractured with iron staining; some caliche, medium plasticity; weathered, firm, damp to moist | very calcareous, |
| 9 | | | | |
| 10 | 10.0' | | 8.0-10.0' SAMPLE<br>Recovered 2.0'/2.0' = 100%<br>SILTY CLAYSTONE: light olive gray (5Y 6/1); medium dark gray (N 4/0); blocky; medium plasticity; fractured; filled with iron staining and occasional caliche; slightly weathered; hard; damp | |
| 11 | | Coring | | |
| 12 | | | Total Depth 10.0' | |
| 13 | | | | |

BHLOG2A.MB

1st QA
2-26-90
RW

1 of 3

# GEOTECHNICAL DATA

QA BY/DATE
LOCATION 881 Hillside
COORDINATES
TOTAL DEPTH 28.0'

DRILLING COMPANY Boyles Brothers
DATE DRILLED 2-6-90, 2-7-90
DRILLING METHOD NX Core
LOGGED BY R. Sengebush
GEOLOGIST

BOREHOLE/WELL NO. B300290
GROUND SURFACE ELEVATION
WATER LEVEL ENCOUNTERED
STATIC
DRILLER B. Styles HELPER A. Boday
DRILLING FLUID
CHECKED BY
SITE MANAGER
CEARP MANAGER

COMMENTS

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED @ Road Detector | FIELD SCREEN RAD | FIELD SCREEN VOA |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | |
| 1 | | | | | | | | | |
| 2 | | | | | | | | | |
| 3 | | | | | | | | | |
| 4 | | | | | | | | | |
| 5 | | | | | | | | | |

GROUND

PAGE 1 OF

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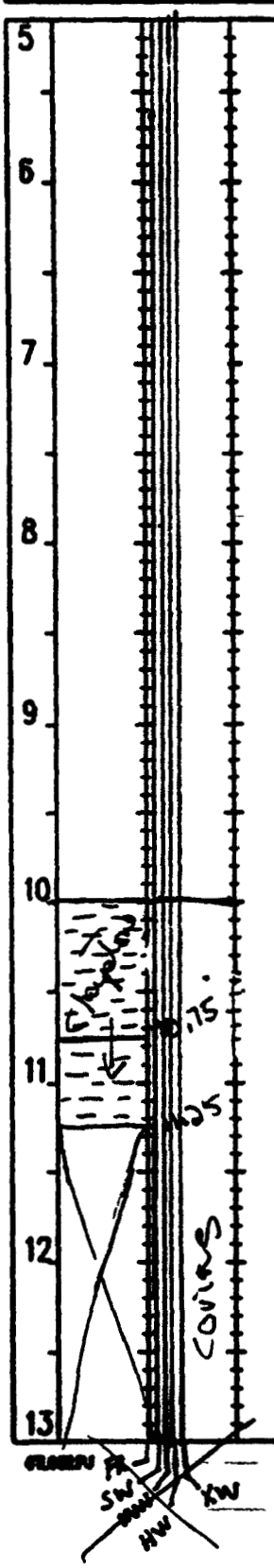
# GEOTECHNICAL DATA

WELL NO. B300290



| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED OR ROCK DEFECTS | FIELD SCREEN RAD | FIELD SCREEN VOA |
|---|---|---|---|---|---|---|---|---|---|
| 5 | | | | | | | | | |
| 6 | | | | | | | | | |
| 7 | | | | | | | | | |
| 8 | | | | | | | | | |
| 9 | | | | | | | | | |
| 10 | | | | 100 | 0 | 10.0-10.75': Sample Recovered 0.75'/0.75' RQD=0/0.75 Claystone: brownish gray (5YR4/1); slightly blocky; all clay - homogeneous; trace orange iron oxide stain in fractures; heavily weathered; stiff; low plasticity; damp to dry. | -10.2 vertical -10.4 vertical -10.6 vertical Fractures are near vertical; irregular; limonite filled; 1%. | | |
| 11 | | | | 15 | 0 | | | | |
| 12 | | | | | | | | | |
| 13 | | | | | | | | | |



# GEOTECHNICAL DATA

WELL NO. B300290 PAGE 3 OF 5

| DEPTH FT | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED Rock Defects | FIELD SCREEN RAD | FIELD SCREEN VOA |
|---|---|---|---|---|---|---|---|---|---|
| 13 | | | | | | Note: drill cuttings only recovered on first run of interval 10.75-14.0'. Second run of this interval recovered core. | | | |
| 14 | silty claystone | | | 100 | 100 | 10.75 - 14.0': Sample - cap<br>Recovered 0.5/3.25'<br>RQD = 0%/0.5' cap<br>Claystone: light olive gray (5Y 5/2), no structure or bedding; pieces up to 0.17' long mixed with smaller chunks; heavily weathered; firm; damp. | No apparent natural fractures | | |
| 15 | | | | | | | | | |
| 16 | | 16.0 | | 83 | ~~91~~ 92 | 14.0-16.0': sample - cap<br>Recovered 2.0/2.0'<br>RQD = 2.0/2.0 cap<br>Silty claystone: light olive gray (5Y 5/2) with a trace of iron oxide stain ~~of~~ dark yellowish orange (10YR 6/6), trace white (N 9/0), mottled, slightly banded; thinly laminated or varved; all clay size; limonite 1-2 %; trace of black (N 1/0) manganese oxide or carbonaceous debris; moderately weathered; stiff, not plastic, damp to dry. | | | |
| 17 | claystone | Pinos | | | | | | | |
| 18 | | 18.5 | | | | | Fractures: 18.3 10° | | |
| 19 | silty claystone | | | 78 | 93 | 16.0-19.0'. Sample - cap<br>Recovered 2.5/3.0'<br>RQD = 2.5/2.5 | Fractures 20.4 ~~Vertical~~ | 10° | |
| 20 | | | | | | | | | |
| 21 | | | | | | | ~~21.0 10°~~ | | |

WELL NO. B300290

# GEOTECHNICAL DATA



| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED | FIELD SCREEN RAD | FIELD SCREEN VOA |
|---|---|---|---|---|---|---|---|---|
| 21 | Silty Claystone | 22.5 | | | ~~16.0-19.0 - continued.~~ Claystone (caps): light olive gray (5Y 5/2); trace to some iron oxide ~~of~~ dark yellowish orange (10YR 6/6), mottled with trace carbon (?)-black (N1/0); laminated or varved; blocky fracture when broken; moderately weathered; stiff to hard; damp to dry. | 21.0' Iron-vertical fracture; manganese nodule to 1" diameter | | |
| 22 | | | | | | 22.2 10° | | |
| 23 | | | | | | trace limonite | | |
| 24 | Silty Claystone | coring | | 100 | 19.0 - 23.5': Sample - caps<br>Recovered 3.5/4.5'<br>RQD ~~3.5 - 0.2~~ 3.2 ~~[illegible]~~ 3.5'<br>Silty Claystone (caps): light olive gray (5Y 5/2) with trace to some iron oxide stain ~~of~~ dark yellowish orange (10YR 6/6) and trace black (N1/0) manganese stain; thinly laminated; blocky fracture when broken; moderately weathered; hard-cemented; dry. | Water Loss at 24' | | |
| 25 | | | | | | Fractures | | |
| 26 | | | | | | 25.4 10° | | |
| 27 | | | | 100 | 23.5-26.5': Sample - caps<br>Recovered 3.0/3.0'<br>RQD - 3.0/3.0'<br>Silty Claystone (caps): light olive gray (5Y 5/2) with orange and black (as in 19.0-23.5); thinly laminated clay and silty clay; | 26.2 10°<br>Fractures<br>27.0 10°<br>27.5 10° | | |
| 28 | | | | | | | | |
| 29 | | | | | | | | |

# GEOTECHNICAL DATA

WELL NO. B300290



| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED | FIELD SCREEN RAD | FIELD SCREEN VOA |
|---|---|---|---|---|---|---|---|---|---|
| 29 | | | | | | ~~23.5-26.5 continued~~; possible flame structures or bioturbation in bedding; (0.08-0.17' thick); siltstone nodules to 1 cm in diameter; (calcareous - effervesces in HCl); moderately weathered; stiff to hard; dry; | | | |
| 30 | | | | | | | | | |
| 31 | | | | | | 26.5-28.0. Sample ← core<br>Recovered 1.5/1.5'<br>RQD = ~~1.5/1.5'~~ core<br>Silty claystone: Same as in 23.5 to 26.5' | | | |
| 32 | | | | | | TD at 28.0' | | | |
| 33 | | | | | | | | | |
| 34 | | | | | | | | | |
| 35 | | | | | | | | | |
| 36 | | | | | | | | | |
| 37 | | | | | | | | | |

Rcvd [illegible]

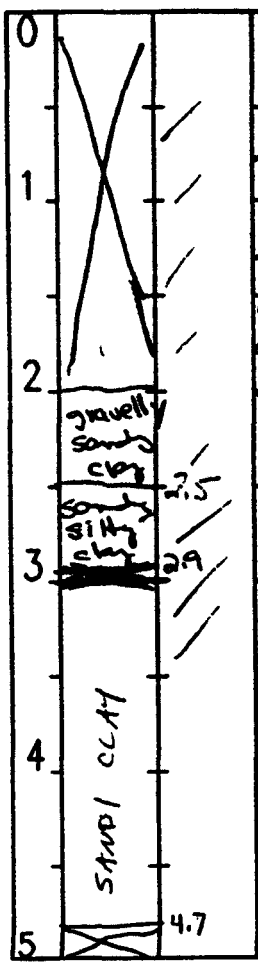
# LOG OF BOREHOLE

QA BY/DATE JEM 2/14/90
LOCATION French Drain, [illegible]
COORDINATES
TOTAL DEPTH 13.0'; 31.7

DRILLING COMPANY Boyles Bros
DATE DRILLED 2-7-90; 2-12-90
DRILLING METHOD Hollow Stem Auger; NX Core
LOGGED BY SP Carpenter; R.M Sengebush
GEOLOGIST

BOREHOLE/WELL NO. B3003 90
GROUND SURFACE ELEVATION
WATER LEVEL ENCOUNTERED NONE
STATIC NA
DRILLER D. Styles HELPER A. Bodcup
DRILLING FLUID NONE; water
CHECKED BY
SITE MANAGER
CEARP MANAGER

COMMENTS Set 4" PVC casing to 13.0 below ground surface.



| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED |
|---|---|---|---|---|
| 0 | | | 0.0-2.0' SAMPLE<br>Recovered 0.0/2.0' = 0%<br>~~ROCKY FLATS~~ COLLUVIUM<br>2.0-3.0' SAMPLE<br>Recovered 0.9/1.0 = 90%<br>2.0-2.5' GRAVELLY SANDY CLAY; grayish brown (5YR3/2); nonstratified; fine to very coarse grained sand, gravels to cobbles; some silt, poor sorting; subangular; granitic to quartzose; low to medium plasticity; stiff, damp<br>2.5-2.9' SANDY SILTY CLAY; dark yellowish orange (10YR 6/6) moderate brown (5YR4/9); mottled, nonstratified; fine to trace coarse grained sand; poor sorting; subround; quartzose; medium plasticity; calcareous claystone inclusions; stiff, damp | H.U Background = 0.0<br>All readings in auger; in breathing zone; on core, and in cuttings: 0.0, unless otherwise noted below.<br>TRIP BLANK SAMPLE<br>TB0207901<br>2.0-2.9' SAMPLE (VOAS ONLY)<br>B3003900203<br>2.0-4.0' SAMPLE<br>B3003900004<br>3.0-4.7' SAMPLE (VOAS ONLY)<br>B3003900305<br>4.0-6.3' SAMPLE<br>B3003900408 |
| 1 | | | | |
| 2 | gravelly sandy clay | 2.5 | | |
| | sandy silty clay | 2.9 | | |
| 3 | | | | |
| 4 | SANDY CLAY | | | |
| 5 | | 4.7 | | |

BHLOG1.MB

WELL NO B3003 90

# LOG OF BOREHOLE



| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED |
|---|---|---|---|---|
| 5 | CLAY | 5.4 | 3.0-5.0' SAMPLE<br>Recovered 1.7/2.0'=85%<br>SANDY CLAY: moderate brown (5YR 4/4); yellowish gray (5Y 7/2); banded; stratified; fine to very coarse grained sand, some gravels; poor sorting; subrounded; quartzose; claystone inclusion at 3.6-4.2'; calcareous; low to medium plastic; stiff, damp. | 5.0-6.3' SAMPLE<br>(VOAS ONLY)<br>B3003900507 |
| | CLAYEY SAND | 5.6 | | |
| 6 | SANDY CLAY | 6.3 | | 8.0-10.0' SAMPLE<br>B3003900810<br>(VOAS AND COMPS) |
| 7 | | | 5.0-7.0' SAMPLE<br>Recovered 1.3/2.0=65%<br>5.0-5.4': CLAY: yellowish gray (5Y 7/2), light olive gray (5Y 5/2), dusky yellow (5Y 6/4), mottled; nonstratified; reworked claystone; calcareous; stiff, damp | |
| 8 | | | | |
| 9 | Sandy clay | | 5.4-5.6': CLAYEY SAND: moderate yellowish brown (10YR 5/4), fine to very coarse grained sand; some silt; poor sorting; subrounded; quartzose; low plasticity; medium dense; moist | |
| 10 | | coarse but weak | 5.6-6.3': SANDY CLAY: moderate yellowish brown (10YR 5/4); nonstratified; fine to very coarse grained sand; trace gravel; some silt; poor sorting; subrounded; quartzose, medium plasticity, very stiff; moist | |
| 11 | SILTY CLAYSTONE | | 7.0-8.0 SAMPLE<br>Recovered 0.0/1.0=0% | |
| 12 | | 11.7 | | |
| 13 | Silty claystone | | | |

BHLOG2A.MB

WELL NO B300-90

# LOG OF BOREHOLE



| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED |
|---|---|---|---|---|
| 13 | X | not Sampled | 8.0-10.0' SAMPLE<br>Recovered 2.0/2.0'=100%<br>SANDY CLAY: light olive gray (5Y5/2), dark yellowish orange (10YR 6/6), medium gray (N5/0); mottled; nonstratified; fine to coarse grained sand; trace gravel; moderate to poor sorting, subround; quartzose and granitic; medium plasticity; reworked claystone in parts; calcareous in parts; trace iron staining; very stiff; damp | |
| 14 | | | | |
| 15 | | | | |
| 16 | | | 10.0-10.5' NO SAMPLE TAKEN<br>Drilled with center bit<br>BEDROCK<br>10.5-12.0 SAMPLE<br>Recovered 1.2/1.5'=80%<br>SILTY CLAYSTONE: light brown (5YR5/6); moderate brown (5YR3/4); olive gray (5Y4/1); blocky; 1 to 3 cm iron nodules; medium plasticity; very weathered; firm; damp | |
| 17 | | | | |
| 18 | | | 12.0-13.0' SAMPLE<br>Recovered 1.0/1.0'=100%<br>SILTY CLAYSTONE: same as above; olive gray (5Y4/1); yellowish gray (5Y7/2) | |
| 19 | | | Total Depth Augered = 13.0' | |
| 20 | | | | |
| 21 | | | | |

BHLOG3A.MB

# GEOTECHNICAL DATA

1 of 5

QA BY/DATE JEM 2/16/90
LOCATION 881 Hillside
COORDINATES
TOTAL DEPTH 31.7'

DRILLING COMPANY Boyles Bros
DATE DRILLED 2-12-90
DRILLING METHOD Hollow Stem Auger & NX core
LOGGED BY R. Sengebush
GEOLOGIST

BOREHOLE/WELL NO. B300390
GROUND SURFACE ELEVATION
WATER LEVEL ENCOUNTERED
STATIC
DRILLER HELPER
DRILLING FLUID
CHECKED BY
SITE MANAGER
CEAP MANAGER

COMMENTS

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | PID % | LITHOLOGIC DESCRIPTION | SAMPLES OBTAINED OR OTHER TESTS PERFORMED | [illegible] |
|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | |
| 1 | | | | | | | | |
| 2 | | | | | | | | |
| 3 | | | | | | | | |
| 4 | | | | | | | | |
| 5 | | | | | | | | |

GRAPHIC

PAGE 1 OF [illegible]

Jim Watkins column only

# GEOTECHNICAL DATA

B300390



| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | SIP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES CONFORMED OR OTHER TESTS PERFORMED | FIELD SCREEN RAD | FIELD SCREEN VOA |
|---|---|---|---|---|---|---|---|---|---|
| 13 | | | | | | | | | |
| 14 | | | | | | 14.5'-18.7': Sample (caps) | | | |
| | | | | 60 | 88 | Recovered 2.5'/4.2'<br>RQD = 2.2'/2.5'<br>Claystone (caps): light olive gray (5 Y 5/2); blocky, no apparent bedding; all clay size; trace of gravel at 15.5'-15.6' & 16.8; clasts to 2cm in diameter; siltstone; subangular to subrounded; nodules at 16.5' to 1 cm in diameter; trace of limonite stain in fractures, dark yellowish orange (10YR 6/6); trace of iron oxide nodules to 2cm in diameter; loose, not cemented together; moderately weathered; stiff to hard; damp. | Fractures<br>15.5 30° iron oxide<br>16.5 45° iron oxide and nodules<br>16.8 45° iron oxide and gravel. | | |
| 15 | Claystone | | | | | | | | |
| 16 | | | | | | | | | |
| 17 | | | | | | | | | |
| 18 | | Coring | | | | | | | |
| 19 | Claystone | | | 63 | 76 | 18.7'-22.7'. Sample (caps) | Fractures<br>19.0 30°<br>19.4 10° | | |
| 20 | | | | | | Recovered 2.5/4.0<br>RQD = 1.9/2.5<br>Claystone (caps): light olive gray (5Y 5/2) and dark yellowish orange (10 YR 6/6); | gravel and iron nodules<br>21.0 30°<br>21.17 | | |
| 21 | | | | | | | | | |

# GEOTECHNICAL DATA

WELL NO. B300390 PAGE 4 OF 5

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | SPT N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES CONTAINED OR OTHER TESTS PERFORMED | FIELD SCREEN RAD | FIELD SCREEN VOA |
|---|---|---|---|---|---|---|---|---|---|
| 21 | 0.000 | 21.2 | | | | ~~18.7'-22.7' continued~~; blocky; ~~all clay on the claystone~~; trace gravel at 21.0' to 21.10'; ~~siltstone~~ subangular to subrounded; loosely compacted with no cement. 0.5 cm to 3 cm in diameter; limonite to 5-10% in clay and in nodules to 3 cm in diameter; moderately weathered; stiff to hard; damp. | ~~21.2 30°~~ ~~iron nodules~~ | | |
| 22 | | 22.7 | | | | | | | |
| 23 | claystone | | | 27 | 0 | | Fractures 23.0 45° 23.1 45° 23.3 45° Note: iron oxide in all fractures; calcareous gravel in 23.3. | | |
| 24 | | 23.5 | | | | | | | |
| 25 | | 25.7 | | | | 22.7'-25.7': Sample (cap) Recovered 0.8'/3.0' RQD = 0.0/0.8 Claystone (cap): light olive gray (5Y 5/2) and dark yellowish orange (10YR 6/6) in fractures; ~~all claystone~~; blocky; no apparent bedding; trace gravel; siltstone and iron oxide nodules; 0.1 to 4 cm in diameter; sorting and shape etc. as in 18.7'-22.7'; one 4 cm clast is hard and calcareous effervesces in HCl; stiff to hard; moderately weathered; stiff to hard; damp. | | | |
| 26 | claystone | 26 | | 15 | 0 | | Fractures 25.8 45° 26.0, 45°. trace of siltstone gravel ~~at 26.0~~ Note: lost 1.7' of core; ~~driller does not know why~~; loosing water in hole | | |
| 27 | | 27.7 | | | | | | | |
| 28 | claystone | 28.3 | | 60 | 100 | | No Fractures | | |
| | | 28.7 | | | | 25.7'-27.7': Sample (cap) Recovered 0.3'/2.0' | | | |
| 29 | claystone | | | 83 | 96 | | Fractures 28.8 45° iron oxide | | |

gravel

Coring

WELL NO. B300390

# GEOTECHNICAL DATA



| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED | FIELD SCREEN RAD | FIELD SCREEN VOA |
|---|---|---|---|---|---|---|---|---|---|
| 29 | claystone | | | | | ~~25.7'-27.7' continued~~ RQD = 0.0/0.3' | | | |
| 30 | | Coring | | | | ~~Claystone~~ cap: as same interval 22.7'-25.7'; with trace of gravel; stiff; damp. | Fractures extremely weathered; 30.4 45° | | |
| 31 | | ~~31.2~~ 31.2 | | | | 27.7'-28.7' Sample cap<br>Recovered 0.6'/1.0'<br>RQD = 0.6'/0.6' cap | 31.1 45° | | |
| 32 | | 31.7 | | | | Claystone: light olive gray (5Y 5/2) with a trace of dark yellowish orange (10YR 6/6); mottled; claystone is as in 22.7'-25.7'; trace of iron oxide nodules to 2 cm in diameter, moderately weathered; stiff; damp. | | | |
| 33 | | | | | | | | | |
| 34 | | | | | | 28.7-31.7': Sample cap<br>Recovered 2.5'/3.0'<br>RQD = 2.4'/2.5' cap<br>Claystone: As in 22.7'-25.7' except no gravel; thinly laminated from 28.7' to 29.3' ~~(0.6')~~; moderately weathered; stiff; damp. | | | |
| 35 | | | | | | | | | |
| 36 | | | | | | TD = 31.7' | | | |
| 37 | | | | | | | | | |

# LOG OF BOREHOLE

QA BY/DATE VFM / 2/15/90
LOCATION French Drain, 881 Hillside
COORDINATES ,
TOTAL DEPTH 10.0'; 30.0'

DRILLING COMPANY Boyles Bros.
DATE DRILLED 2-4-90; 2-21-90
DRILLING METHOD Hollow Stem Auger; NX core
LOGGED BY SP Carpenter
GEOLOGIST

BOREHOLE/WELL NO B300490
GROUND SURFACE ELEVATION
WATER LEVEL ENCOUNTERED None
STATIC None
DRILLER D. Styles HELPER T. Merritt
DRILLING FLUID None; Water
CHECKED BY
SITE MANAGER
CEARP MANAGER

COMMENTS set 4" P/C casing to 10.0' below ground surface.

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED |
|---|---|---|---|---|
| 0 | SILTY SANDY CLAY | 50 | ~~Rocky Flats Colluvium~~ COLLUVIUM<br>**0.0-2.0' SAMPLE**<br>Recovered 1.0/2.0' ~~50%~~<br>SILTY SANDY CLAY: dusky brown (5YR 2/2), grading to moderate yellowish brown (10YR 5/4); banded; nonstratified, fine to very coarse grained sand; some gravels; poor sorting; subangular; quartzose; low plasticity; roots and grasses in topsoil at 0.0' to 0.6'; medium stiff; moist | Hill Body and 0.0 Alloy readings in manager, in breathing zone, on core; and in cuttings 0.0, unless otherwise noted below<br>TRIPBLANK SAMPLE<br>TB0204901<br>0.0-1.0' SAMPLE (VOAS ONLY)<br>B3004900002<br>0.0-3.8' SAMPLE<br>B3004900004 |
| 1 | | | | |
| 2 | | | | |
| | | 90 | **2.0-4.0' SAMPLE**<br>Recovered 1.8/2.0' ~~90%~~<br>SANDY CLAY: pale yellowish brown (10YR 6/2), moderate yellowish brown (10YR 5/4); nonstratified; fine to very coarse grained sand; trace fine gravels; some silt; poor sorting; subangular to subrounded; quartzose and granitic; medium plasticity; reworked claystone; calcareous in part; rootlets; stiff; moist | 2.0-3.8' SAMPLE (VOAS ONLY)<br>B3004900204 |
| 3 | SANDY CLAY | 38 | | |
| 4 | SANDY CLAY | 4.8 | | |
| 5 | SILTY CLAY | | | |

BHL001.MB

WELL NO B300490

# LOG OF BOREHOLE



| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED |
|---|---|---|---|---|
| 5 | SILTY CLAY | 5.4 | 4.0-6.0' SAMPLE<br>Recovered 1.9/2.0' ~~[illegible]~~ | 4.0-5.4' SAMPLE<br>(VOAS ONLY)<br>B3004900406 |
| | | 70 | 4.0-4.8': SANDY CLAY: same as above, | |
| 6 | Silty Clay | | 4.8-5.4: SILTY CLAY; light olive gray (5Y5/2), light brown (5YR5/6); nonstratified; trace to some fine to coarse grained sand; trace very fine gravel; moderate sorting; subround to subangular; quartzose and granite; medium plastic; reworked claystone; iron staining; calcareous in part, hard, damp | 4.0-7.7' SAMPLE<br>B3004900408 |
| 7 | | | 6.0-7.0' SAMPLE | |
| | | 100 | Recovered 1.0/1.0' ~~[illegible]~~ | 6.0-7.0' SAMPLE<br>(VOAS ONLY)<br>B3004900607 |
| | | 77 | SILTY CLAY: same as above | |
| 8 | CLAYSTONE | | 7.0-9.0' SAMPLE | |
| | | 75 | Recovered 1.5/2.0' ~~[illegible]~~ | 7.0-8.5' SAMPLE<br>(VOAS ONLY)<br>B3004900709 |
| | | | 7.0-7.7 SILTY CLAY: same as above; no gravel; trace sand | |
| 9 | Claystone | | BEDROCK | |
| | | | 7.7-8.5: CLAYSTONE: light olive gray (5Y5/2); blocky; some silt to silty in part; medium to high plasticity; weathered; very fractured; iron staining; manganese oxide staining; hard to medium hard; damp | |
| 10 | | | 9.0-10.0 SAMPLE | |
| 11 | | 100 | Recovered 1.0/1.0 ~~[illegible]~~ | |
| | | | CLAYSTONE: same as above | |
| | | | Total Augered Depth: 10.0' | |
| 12 | | | | |
| 13 | | | | |

BHLOG2A.WB

# LOG OF BOREHOLE/GEOTECHNICAL DATA

QA BY/DATE
LOCATION French Drain, Hillside
COORDINATES
TOTAL DEPTH 30.0'

DRILLING COMPANY Boyles Bros.
DATE DRILLED 2-21-90
DRILLING METHOD NX CORE
LOGGED BY SPCarpenter
GEOLOGIST

BOREHOLE/WELL NO. B300490
GROUND SURFACE ELEVATION
WATER LEVEL ENCOUNTERED None
STATIC None
DRILLER D. Styles HELPER T. Merritt
DRILLING FLUID WATER
CHECKED BY
SITE MANAGER

PROJECT MANAGER

COMMENTS

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | SPT N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED OR ROCK DEFECTS |
|---|---|---|---|---|---|---|---|
| 0 | | | | | | | |
| 1 | | | | | | | |
| 2 | | | | | | | |
| 3 | | | | | | | |
| 4 | | | | | | | |
| 5 | | | | | | | |

GRLOGLPJ

PAGE 1 OF

# LOG OF BOREHOLE/GEOTECHNICAL DATA

WELL NO B300490 PAGE ____ OF ____

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED OR ROCK DEFECTS |
|---|---|---|---|---|---|---|---|
| 5 | | | | | | | |
| 6 | | | | | | | |
| 7 | | | | | | | |
| 8 | | | | | | | |
| 9 | | | | | | | |
| 10 | | | | | | BEGIN CORING AT 10.0' | |
| | | CORE | | 0 | 0 | 10.0-12.0' SAMPLE<br>Recovered 0.0/2.0 ~~=0%~~<br>RQD = 0.0/10.0 ~~=0%~~ | |
| 11 | | | | | | | |
| 12 | | | | | | | |
| | CLAYSTONE | CORE | | 83 | 86 | 12.0 - 15.0' SAMPLE<br>Recovered 2.85/3.0' ~~=85%~~<br>RQD = 2.45/2.85 ~~=86%~~ | 12.0-12.5; mechanical damage<br>12.6; 70°, healed, iron oxide<br>12.75, 65°, healed, iron oxide<br>12.95, 90°, healed, iron oxide |
| 13 | | | | | | | |

next pg

GTL002PJ

# LOG OF BOREHOLE/GEOTECHNICAL DATA

WELL NO. B300490 PAGE ____ OF ____

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED OR ROCK DEFECTS |
|---|---|---|---|---|---|---|---|
| 13 | | | | | | CLAYSTONE: olive gray (5Y4/1); dusky yellow (5Y6/4); blocky; silty grading to some silt; medium to high plasticity; iron staining, weathered; medium hard; damp | 13.3, 45°, healed; iron oxide<br>13.7; 60°, healed; iron oxide<br>13.95; 70°, healed; iron oxide<br>14.5, 90°, healed; iron oxide |
| 14 | | | | | | | |
| 15 | | | | | | | |
| 16 | CLAY-STONE | CORE | | 97 | 84 | 13.0-18.0 SAMPLE<br>Recovered 2.9/3.0' = ~~97%~~<br>RQD = 2.45/2.9 = ~~84%~~<br>CLAYSTONE: same as above; light olive gray (5Y6/1); olive gray (5Y4/1); trace silt | 15.6, 45°-60°, healed, iron and manganese oxide<br>15.75, 60°, healed, iron oxide<br>16.1, 80°, healed, iron oxide<br>16.3; 50°, healed; iron oxide<br>16.6-17.1; 5°-5°, healed, iron oxide<br>17.2-17.3; 20°-20°-60°, healed; iron ox<br>17.6-17.75; 50°-50°-90°, healed, iron oxide |
| 17 | | | | | | | |
| 18 | | | | | | | |
| 19 | CLAY-STONE | CORE | | 96 | 94 | 18.0-23.0 SAMPLE<br>Recovered 4.8/5.0 = ~~96%~~<br>RQD = 4.5/4.8 = ~~94%~~<br>CLAYSTONE: same as above; medium gray (N5/0), dusky yellow (5Y6/4); medium dark gray (N4/0); abundant iron staining w/ th iron nodules | 18.0-18.3; mechanical damage<br>18.4; 60°, healed; iron oxide<br>18.5, 80°, healed; iron oxide<br>18.6, 90°, healed; iron oxide<br>18.7-18.8, 90°-80°, healed; iron oxide<br>19.1; 75°, healed; iron oxide with no<br>19.25; 50°-70°, healed-open; filled w/ iron oxide and nodules<br>19.4, possible leached vuggy pores<br>19.5-19.8; 40°-35°, healed; iron oxi<br>19.8-20.0; multiple 70°-90° microfra healed; iron oxide<br>20.0-20.4, 20°-30°, healed; iron<br>20.5-20.7, 30°, healed, iron ox. |
| 20 | | | | | | | |
| 21 | | | | | | | |

CTL003

# LOG OF BOREHOLE/GEOTECHNICAL DATA

WELL NO. B300490 PAGE ____ OF ____

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | SPT N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED OR ROCK DEFECTS |
|---|---|---|---|---|---|---|---|
| 21 | | | | | | | 20.8-21.1; 0°-50°-45°; healed; iron oxide<br>21.3; 50°; healed; iron oxide<br>21.6; 60°; leached open; iron nodules<br>21.7-21.9; microfracture sets with packets of iron nodules<br>22.0; 45°; healed; iron oxide<br>22.3-22.7; 20°-70°-40°; healed iron oxide |
| 22 | | | | | | | |
| 23 | CLAYSTONE | CORE | | 40 | 85 | 23.0-28.0 SAMPLE<br>Recovered 20/5.0 ~~30%~~<br>RQD = 1.7/20 ~~85%~~<br>CLAYSTONE: same as above | 23.15-23.35; 50°-25°; healed; iron oxide<br>23.65; mechanical damage<br>24.2-24.7; microfractures with abundant iron concretions and nodules<br>24.7; 70°; leached open; iron concretions |
| 24 | | | | | | | |
| 25 | | | | | | | |
| 26 | | | | | | | |
| 27 | | | | | | | 26.9; 45°; healed, iron oxide<br>27.05; 45°; healed; iron oxide<br>27.2; 55°; healed; iron oxide<br>27.5; 70°; healed; iron oxide<br>27.6-27.7; 50°-40°; healed; iron<br>27.8; 85°; healed; iron oxide |
| 28 | CLAY-STONE | | | 105 | 92 | 28.0-30.0 SAMPLE<br>Recovered 3.7/2.0 ~~185%~~<br>RQD 3.4/3.7 ~~92%~~<br>CLAYSTONE: same as above; light olive gray (5Y6/1); olive gray (5Y4/1); decreased iron staining with scattered iron concretions | 28.3; 85°; leached open; iron oxide with iron concretions<br>28.4-28.6; 35°-30°-60°; healed; iron oxide<br>28.65-28.85; 45°; healed; iron oxide<br>28.9; 60°; healed; iron oxide |
| 29 | | | | | | | |

GTL004

# LOG OF BOREHOLE/GEOTECHNICAL DATA

WELL NO B300490 PAGE ____ OF ____

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | SPT N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED OR ROCK DEFECTS |
|---|---|---|---|---|---|---|---|
| 29 | | | | | | | 29.2; 50°; healed; iron oxide<br>29.3; 90°; healed; iron oxide<br>29.4-29.5; 50°-40°; healed; iron oxide<br>29.85; 90°; healed; iron oxide |
| 30 | | | | | | Total Depth Cored = 30.0' | |
| 31 | | | | | | | |
| 32 | | | | | | | |
| 33 | | | | | | | |
| 34 | | | | | | | |
| 35 | | | | | | | |
| 36 | | | | | | | |
| 37 | | | | | | | |

CTL005

# LOG OF BOREHOLE

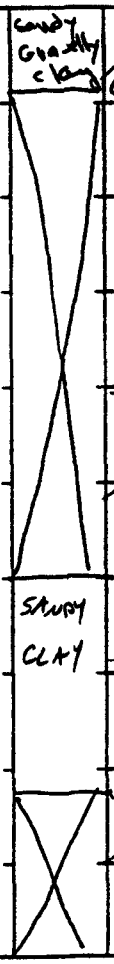
QA BY/DATE JEM / 2/18/90
LOCATION French Drain; 881 Hillside
COORDINATES /
TOTAL DEPTH 7.0'; 27.5'

DRILLING COMPANY Boyles Bros
DATE DRILLED 2-4-90; 2-19-90
DRILLING METHOD Hollow Stem Auger; NX core
LOGGED BY SPCarpenter; JK Harriz
GEOLOGIST

BOREHOLE/WELL NO. B300590
GROUND SURFACE ELEVATION
WATER LEVEL ENCOUNTERED None
STATIC None
DRILLER DStiles; P Bush HELPER T Merritt; M. Boyd
DRILLING FLUID None; Water
CHECKED BY
SITE MANAGER

CEARP MANAGER

COMMENTS Set 4" PVC casing to 7.0' below ground surface
Augered Borehole to 7.0' below ground surface;



| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED |
|---|---|---|---|---|
| 0 | Sandy Gravelly clay | 0.4 | RUBBY FLATS COLLUVIUM<br>0.0-3.0' SAMPLE<br>Recovered 0.4/3.0' = 13%<br>SANDY GRAVELLY CLAY: grayish brown (5YR 3/2); nonstratified; Fine to very coarse grained sand; 1 to 4cm gravels; poor sorting, subangular; quartzose, low plasticity; roots & grasses; medium stiff; moist | Hnd Background: 0.0<br>All readings in auger, in breathing zone, on core, and in cuttings: 0.0, unless otherwise noted below.<br>TB0209901<br>0.0-0.4 SAMPLE (VOAS ONLY)<br>B3005900003 |
| 1 | | | | |
| 2 | | | 3.0-5.0' SAMPLE<br>Recovered 12/20' = 60%<br>SANDY CLAY: moderate yellowish brown (10YR 5/4) grading to medium dark gray (N4/0); nonstratified; Fine to very coarse grained sand; some gravel; poor sorting; subangular; quartzose; medium plasticity; calcareous iron staining, claystone inclusions; very stiff, damp | 0.0-5.2 SAMPLE<br>B300590005 |
| 3 | SANDY CLAY | | | 3.0-4.2 SAMPLE (VOAS ONLY)<br>B3005900305 |
| 4 | | 4.2 | | |
| 5 | | | | |

BHLOG1.MB

WELL NO B300590

# LOG OF BOREHOLE



| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED |
|---|---|---|---|---|
| 5 | SANDY CLAY | 5.2' | 5.0-7.0' SAMPLE<br>Recovered 2.0/2.0 = 100%<br>5.0-5.2' SANDY CLAY: same as above<br>5.2-7.0' CLAY: medium dark gray (N4/0), light olive gray (5Y 5/2), trace silt; medium to high plasticity, fractured with calcareous filling; iron staining; some manganese staining; root casts, very stiff; , damp<br>~~Total Augered Depth 7.0'~~ | |
| 6 | CLAY | | | |
| 7 | | | | |
| 8 | | | | |
| 9 | | | | |
| 10 | | | | |
| 11 | | | | |
| 12 | | | | |
| 13 | | | | |

top mang 16

BHLOG2A.NB

# LOG OF BOREHOLE/GEOTECHNICAL DATA

QA BY/DATE SPC / 2-27-90
LOCATION
COORDINATES
TOTAL DEPTH 27.5'

DRILLING COMPANY
DATE DRILLED 2/19/90
DRILLING METHOD mud rotary, NX Core
LOGGED BY J. K. HARRIZ
GEOLOGIST

BOREHOLE/WELL NO. B300590
GROUND SURFACE ELEVATION
WATER LEVEL ENCOUNTERED
STATIC
DRILLER P Bushkorski HELPER M. Boyd
DRILLING FLUID water
CHECKED BY
SITE MANAGER

PROJECT MANAGER

COMMENTS

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED OR ROCK DEFECTS |
|---|---|---|---|---|---|---|---|
| 0 | | | | | | | |
| 1 | | | | | | | |
| 2 | | | | | | | |
| 3 | | | | | | | |
| 4 | | | | | | | |
| 5 | | | | | | | |

GRLOGLPJ

# LOG OF BOREHOLE/GEOTECHNICAL DATA

WELL NO B300590 PAGE ____ OF ____

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED OR ROCK DEFECTS |
|---|---|---|---|---|---|---|---|
| 5 | | | | | | | |
| 6 | | | | | | | |
| 7 | | | | | | 7.0'-9.5' SAMPLE | |
| | | | | 0 | | Recovered, 0/2.5' | |
| 8 | | | | | | | |
| 9 | | | | | | | |
| | SILTY CLAY | | | | | 9.5'-14.0' SAMPLE | |
| | | | | 62 | | Recovered 7.8'/4.5' | |
| 10 | SANDY CLAY | | | | | 9.5-10.0. SILTY CLAY: greyish orange (10YR7/4); slightly mottled, weakly laminated; 100% medium plastic fines, occasional medium grains; subangular to subrounded, moderate plasticity; firm, damp | |
| 11 | | | | | | | |
| | SILTY CLAY STONE | | | | | 10.0-11.5' SANDY CLAY: moderate yellowish brown (10YR5/4); no apparent structure, (60-70%) slightly to medium plastic fines, (40-30%) fine to medium grained sand, occasional gravel; moderately sorted, angular, quartzite, firm to stiff, damp | |
| 12 | | | | | | | |
| 13 | | | | | | | |

DOC

GTL002PJ

# LOG OF BOREHOLE/GEOTECHNICAL DATA

WELL NO _____ PAGE _____ OF _____

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED OR ROCK DEFECTS |
|---|---|---|---|---|---|---|---|
| | | | | | | Bedrock Contact at 11.5' | |
| 13 | | CORE | | | | 11.5-12.3: SILTY CLAYSTONE: greyish orange (10YR 7/4) slightly mottled, weakly laminated, 100% medium plastic fines, firm; damp | |
| 14 | SILTY CLAY-STONE | | | 35 | 100 | 14.0'-18.0' SAMPLE<br>Recovered 1.4'/4.0'<br>RQD 1.4'/1.4' | fine limonite filled fractures at |
| 15 | | | | | | SILTY CLAYSTONE: pale yellowish brown (10YR 6/2) mottled, iron staining on some surfaces and along fine fractures, light brown (5YR 5/4), trace to occasional medium to coarse-grained sand, subangular, moderate plasticity, highly weathered, firm; damp | 14.5-14.62, 50°<br>~~14.72-14.79~~, 50°<br>14.85-14.91, 65°<br>15.05-15.2, (3), 90°<br>v indistinct<br>15.3-15.4, (2), 45° |
| 16 | | | | | | | |
| 17 | | | | | | | |
| 18 | SILTY CLAY-STONE | | | 80 | 63 | 18.0'-20.0' SAMPLE<br>Recovered 1.6'/2.0'<br>RQD 1.0/1.6' | limonite filled fractures |
| 19 | IRON NODULE | | | | | 18.0'-18.5'- SILTY CLAYSTONE, dark yellowish brown (10YR 4/2) as above, slightly less weathered, gradual change to. | 18.1-18.22, 60°<br>18.4 90°<br>18.2-18.5 (4-6) other fine fractures; difficult to measure angle |
| 20 | IRON NODULE | | | | | 18.5'-19.6': IRON NODULE moderate brown (5YR 4/4) to dusky brown 5YR 2/2 - lots of color variation, non plastic fines but may be some fine sand percentage; highly weathered caliche, very brittle, incompetent, hard, wet | 18.5-19.6'<br>brittle pieces, highly fractured |
| 21 | SILTY CLAY-STONE | | | 100 | 90 | | |

GTL083

# LOG OF BOREHOLE/GEOTECHNICAL DATA

WELL NO _____ PAGE _____ OF _____

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED OR ROCK DEFECTS |
|---|---|---|---|---|---|---|---|
| 21 | SILTY CLAY-STONE | | | | | 20.0'-22.0' SAMPLE<br>Recovered 2.0'/2.0'<br>RQD 1.8/2.0'<br>20.0-20.2. IRON NODULE. Same as above sand mixed with silty clay | Fine limonite filled fractures<br>20.75-20.9 50°, 45°, 0°<br>20.9-21.14, 0°, other small not measurable<br>21.15° + caliche along horizontal plane |
| 22 | | | | 0 | 0 | 20.2-22.0 SILTY CLAYSTONE same as 14.0-18.0', very firm | 21.27 60°<br>21.15°-21.28 60°<br>21.75°-21.55° (6) 60°<br>21.8-22.0 (2) 70°, (1) 0 |
| 23 | | | | | | 22.0'-24.0' SAMPLE<br>Recovered 0'/2.0'<br>RQD 0/0 | |
| 24 | | | | 100 | 100 | 24.0'-26.0' SAMPLE<br>Recovered 2.0'/2.0'<br>RQD 2.0'/2.0'<br>SILTY CLAYSTONE same as at 14.0'-18.0', very firm<br>24.2-24.6 heavily limonitized, no distinct fractures. | Fine limonite filled fractures<br>24.65-24.7, 70°<br>24.7-24.55, 60°<br>24.8-24.85, 70° changes angle at 24.85-24.95 to 40°<br>24.9-25.2, 55° several faint traces parallel to other fractures |
| 25 | SILTY CLAY-STONE | ZONE | | | | | 25.25 and 25.27, 50°<br>25.7-26.0, 50° and 55° less distinct parallel fractures |
| 26 | | | | 73 | 100 | 26.0-27.5' SAMPLE<br>Recovered 1.1'/1.5'<br>RQD 1.1'/1.1'<br>SILTY CLAYSTONE same as 14.0'-18.0', very firm | fine limonite filled fractures<br>26.0-26.3 (2) 60° one also w/ caliche<br>other small transverse fractures indistinct |
| 27 | | | | | | | |
| 28 | | | | | | Total Depth = 27.5 | 26.35-26.5 40°, 60°<br>26.7-26.8 70°<br>other v indistinct/some traces between 26.35 & 26.8<br>26.9-27.1, 0° (3) several indistinct traces with curved surface |
| 29 | | | | | | | |

GRL004

# LOG OF BOREHOLE

QA BY/DATE JEM; 2/18/90
LOCATION French Drain, 881 Hill
COORDINATES
TOTAL DEPTH 6.0'; 31.2'

DRILLING COMPANY Boyles Bros
DATE DRILLED 2-4-90; 2-21-90
DRILLING METHOD Hollow Stem Auger; NX Core
LOGGED BY SPC; Porter; Y.K. Harris
GEOLOGIST

BOREHOLE/WELL NO. B300690
GROUND SURFACE ELEVATION
WATER LEVEL ENCOUNTERED None
STATIC None
DRILLER D. Styles; P Bus; HELPER Const. T. Mers; H. Ba
DRILLING FLUID None
CHECKED BY
SITE MANAGER
CERCLA MANAGER

COMMENTS Set 4" PVC Casing from 0.0'-6.0' below ground surface
Tagged to 6.0' below ground surface

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED |
|---|---|---|---|---|
| 0<br>1<br>2<br>3<br>4<br>5 | Sandy silty gravel<br>GRAVELLY SAND AND CLAY<br>Gravelly sand and clay<br>CLAYSTONE | 0.4<br>1.8<br>2.6<br>Center Bit | 0.0-2.0' SAMPLE<br>Recovered 1.8/2.0 = 90% TOPSOIL<br>0.0-0.4' ~~Topsoil~~ SANDY SILTY GRAVELLY CLAY; moderate brown (5YR3/4); nonstratified; fine to very coarse grained sand; 1 to 7cm gravels; poor sorting; subangular; quartzose; low to medium plasticity; roots and grasses; medium stiff, moist<br>~~[illegible]~~ COLLUVIUM<br>0.4-1.8' GRAVELLY SAND AND CLAY; moderate yellowish brown (10YR5/4) light brown (5YR5/6); nonstratified; fine to very coarse grained sand; 1 to 5cm gravels; poor sorting; subangular, quartzose and granite; low plasticity, stiff, damp<br>2.0-2.6' SAMPLE<br>Recovered 0.6/0.6' = 100%<br>GRAVELLY SAND AND CLAY. same as above<br>2.6-4.0' NO SAMPLE TAKEN<br>CENTER BIT RUN | Hand Background: 0.0<br>All readings in auger; in breathing zone; on core; and in cuttings: 0.0; unless otherwise noted below, TB0209901<br>0.0-1.8' SAMPLE (VOAS only)<br>B300690002<br>2.0-2.6' SAMPLE (VOAS only)<br>B300690203<br>0.0-2.6' SAMPLE<br>B300690003 |

WELL NO. B300640

# LOG OF BOREHOLE



| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED |
|---|---|---|---|---|
| 5 | CLAYSTONE | | BEDROCK | |
| | | | 4.0-6.0' SAMPLE | |
| | | | Recovered 1.7/2.0' = 85% | |
| 6 | | 5.7 | CLAYSTONE: medium dark gray (N4/0), moderate yellowish brown (10YR 5/4); blocky; trace to some silt; medium to high plasticity; calcareous pockets; some iron staining; weathered; firm to medium hard; damp | |
| 7 | | | Total Augered Depth - 7.0' | |
| 8 | | | | |
| 9 | | | | |
| 10 | | | | |
| 11 | | | | |
| 12 | | | | |
| 13 | | | | |

GH
2-26-90
BW

# LOG OF BOREHOLE/GEOTECHNICAL DATA

QA BY/DATE BW 2-26-90
LOCATION
COORDINATES
TOTAL DEPTH ; 31.2'

DRILLING COMPANY
DATE DRILLED ; 21 February 1990
DRILLING METHOD
LOGGED BY ; J. Kimberly Harris
GEOLOGIST

BOREHOLE/WELL NO. B300690
GROUND SURFACE ELEVATION
WATER LEVEL ENCOUNTERED
STATIC
DRILLER ; Paul Bushkowski HELPER ; Mike Boyd
DRILLING FLUID
CHECKED BY
SITE MANAGER
PROJECT MANAGER

COMMENTS

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED OR ROCK DEFECTS |
|---|---|---|---|---|---|---|---|
| 0 | | | | | | | |
| 1 | | | | | | | |
| 2 | | | | | | | |
| 3 | | | | | | | |
| 4 | | | | | | | |
| 5 | | | | | | | |

GTLOGI.PJ

# LOG OF BOREHOLE/GEOTECHNICAL DATA

WELL NO B300690 PAGE ____ OF ____

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED OR ROCK DEFECTS |
|---|---|---|---|---|---|---|---|
| 5 | | | | | | | |
| 6 | SILTY CLAY | CORE | | 100% | | **6.0'-8.0' SAMPLE**<br>Recovered 2.0'/2.0'<br>SILTY CLAY: ~~100% medium plastic~~ pale yellowish brown – dark yellowish brown (10YR6/2 – 10YR4/2); 100% medium plastic fines; limonite stains (mottling) throughout; caliche in small amounts throughout, very firm; damp | 6.5-6.7: fracture; 70° dip; very indistinct; infilled with iron oxide<br>7.2-7.4: lens/block of limonite stained clay may be zone of weakness or slightly coarser |
| 7 | | | | | | | |
| 8 | SILTY CLAY and GRAVEL | | | 44% | | **8.0'-12.5' SAMPLE**<br>Recovered 2.2'/4.5'<br>8.0'-9.0' SILTY CLAY AND GRAVEL: dark yellowish brown (10YR4/2); (50%) gravel; poorly sorted, angular to subangular grains; quartzite and siltstone, maximum size 1 cm; minimum size 1mm; (50%) medium plastic fines, soft; moist – damp. | |
| 9 | SILTY CLAY | | | | | | |
| 10 | SILTY CLAYSTONE | | | | | ~~[illegible]~~<br>9.0'-10.1' SILTY CLAY: moderate yellowish brown to dark yellowish orange (10YR5/4 – 10YR4/6), (85-95%) plastic fines; (5-15%) gravel; poorly sorted; angular grains; quartzite; maximum size 3cm; indistinct horizontal laminae delineated by color variations, nothing caliche scattered throughout; firm; damp<br>BEDROCK<br>10.1 – 10.2 SILTY CLAYSTONE: grayish brown – dusky brown (5YR3/2 – 5YR2/2). 100% medium plastic fines; fairly uniform texture; firm; damp. | |
| 11 | | | | | | | |
| 12 | | | | | | | |
| 13 | | | | | | | |

bedrock

GTL002PJ

# LOG OF BOREHOLE/GEOTECHNICAL DATA

WELL NO B300690 PAGE ____ OF ____

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED OR ROCK DEFECTS |
|---|---|---|---|---|---|---|---|
| 13 | SILTY CLAYSTONE | CORE | | 0.6 | 100 | 12.5' - 14.5' SAMPLE | |
| | CLAYEY SILTSTONE | | | | | 12.5-13.2' SILTY CLAYSTONE: as above<br>13.2-13.7' CLAYEY SILTSTONE: pokish yellow brown (10YR6/2); (100%) non plastic fines; caliche at base (13.7') along horizontal plane; hard; damp. | 13.4' indistinct fracture 90° angle, infilled w/ limonite; saturated surface |
| 14 | | | | | | Recovered 1.2'/2.0'<br>RQD 1.2/1.2' | |
| | SILTY CLAYSTONE | | | 50 | 80 | | |
| 15 | | | | | | 14.5 - 18.5' SAMPLE<br>Recovered 2.0/4.0'<br>RQD 1.6/2.0' | |
| | | | | | | 14.5-16.0' SILTY CLAYSTONE in pale yellowish brown to dark yellowish brown (10YR6/2 - 10YR4/2), indistinct lamina based on subtle color variations most likely due to slight grain size variation; 100% medium plastic fines; silt content variable (to 30%?); firm to very firm; damp-moist. | 15.0-15.5' fine fracture, 0°, infilled with limonite |
| 16 | SILTY, SANDY CLAYSTONE | | | | | | 16.0-16.1' 3 indistinct fine fractures, 90° infilled with limonite on of caliche. |
| 17 | | | | | | 16.0-18.5' SILTY, SANDY CLAYSTONE: moderate yellowish brown (10YR5/4); uniform structure; (80-90%) slightly plastic fines, (20-10%) very fine - fine grained sand, moderately sorted; quartzose; soft to moderately soft; moist. | |
| 18 | | | | | | | |
| | CLAYEY, SILTY SANDSTONE | | | 100 | 100 | | |
| 19 | | | | | | 18.5 - 20.0' SAMPLE<br>Recovered 1.5'/1.5'<br>RQD 1.5/1.5' | |
| | | | | | | CLAYEY, SILTY SANDSTONE. moderate yellowish brown (10YR5/4), inter-laminated (indistinctly) with SILTY CLAYSTONE (as 14.5-16.0), Sandstone is (60%+) very fine to fine grained sand; well sorted. subangular to subrounded; quartzose (40%-) non to slightly plastic fines; medium soft; moist | |
| 20 | SILTY SANDSTONE | | | | | | |
| 21 | | | | | | | |

GIL003

# LOG OF BOREHOLE/GEOTECHNICAL DATA

WELL NO BS00690 PAGE ____ OF ____

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED OR ROCK DEFECTS |
|---|---|---|---|---|---|---|---|
| 21 | | | | 32 | 100 | 20.0 - 22.5' SAMPLE<br>Recovered 0.8/2.5'<br>RQD 0.0/0.8 | |
| 22 | | | | | | 20.0 - 20.8' SILTY SANDSTONE: as at 18.5 - 20.0', slightly greater percentage of sand (70%); laminated w/ SILTY CLAYSTONE from 20.6' - 20.8' | |
| 23 | SILTY SAND-STONE | | | 100 | 30 | 22.5 - 24.5' SAMPLE<br>Recovered 2.0'/2.0'<br>RQD 0.6'/2.0' | |
| | SILTY CLAY-STONE | | | | | 22.5 - 23.3' SILTY SANDSTONE: as at 18.5 - 20.0' | |
| 24 | | | | | | 23.3' - 24.5' SILTY CLAYSTONE: moderate yellowish brown (10YR5/4), interlaminated with CLAYEY SILTSTONE layers as at 13.2 - 13.4' (90%) slightly to medium plastic fines, (5%) very fine - fine grained sand; moderately well sorted; subrounded; quartzose, caliche at base; occasional limonite staining; iron oxide nodule 3cm at 23.6', firm, damp. | crumbled at base 24.0 - 24.5' |
| | CLAY-STONE | CORE | | 100 | 25 | | |
| 25 | | | | | | | |
| 26 | | | | | | | |
| | silty CLAYSTONE | | | | | 24.5' - 26.5' SAMPLE<br>Recovered 2.0/2.0'<br>RQD 0.5/2.0' | |
| | silty CLAY-STONE | | | 100 | 85 | | |
| 27 | | | | | | 24.5' - 26.3' CLAYSTONE: pale yellowish brown (10YR6/2); 100% medium plastic fines; lower silt percentage than previous claystones (<10%), discontinuous lenses and pockets of iron oxide (limonite) from 26.0 - 26.3, firm (25.5 - 26.0) soft (24.5 - 25.0); soft (26.0 - 26.5), moist - damp | Fine Fractures; ~~at laminate folded~~ at<br>24.6 - 60°<br>24.7 - 55°<br>24.8 - 50°<br>25.0 - 50°<br>24.6 - 24.8 may have been induced by coring<br>26.0 limonite filled |
| | SILTY CLAY-STONE | | | | | | |
| 28 | | | | | | | |
| | SILTY CLAY STONE | | | 33 | 100 | | |
| 29 | | | | | | | |

GRL004

# LOG OF BOREHOLE/GEOTECHNICAL DATA

WELL NO ~~B30096~~ B300670 PAGE ____ OF ____

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED OR ROCK DEFECTS |
|---|---|---|---|---|---|---|---|
| 29 | SILTY CLAYSTONE | CORE | | | | 26.3 - 26.5' SILTY CLAYSTONE: as above at 24.5-26.3 except greater silt concentration (20%?) and alternating with limonite stained laminations and horiz. laminations of caliche; very firm; moist-wet | none |
| 30 | | | | | | | |
| 31 | | | | | | 26.5-28.5' SAMPLE<br>Recovered 2.0'/2.0'<br>RQD 1.7'/2.0' | |
| | | | | | | 26.5 - 27.6 - SILTY CLAYSTONE as at 26.3-26.5; laminations less frequent | Fine Fracture - 27.1'; 0°; limonite filled may be more fractures from 27.1-27.6' but broken in pieces and not distinguishable |
| 32 | | | | | | 27.6-28.5 - SILTY CLAYSTONE, pale yellowish brown (10YR6/2); relatively uniform (homogeneous). silt and clay content equal (50/50%); 100% non to slightly plastic fines; limonite in veins (thin); very firm; damp. | no distinct fractures 27.6-28.5' |
| 33 | | | | | | | |
| 34 | | | | | | 28.5'-31.2' SAMPLE<br>Recovered 0.9'/2.7'<br>RQD 0.9/0.9 | Fine Fractures infilled with limonite 28.5-28.9', 30%° 29.1-29.1', 90%° |
| 35 | | | | | | SILTY CLAYSTONE: pale yellowish brown (10YR6/2); 100% nonplastic to slightly plastic fines; large silt percentage (50%?), fine veins of limonite throughout, very firm; damp. | |
| 36 | | | | | | | |
| 37 | | | | | | | |

GTL005

ok

# LOG OF BOREHOLE

QA BY/DATE JEM 2/18/90
LOCATION ~~French Drain~~; Hillside
COORDINATES
TOTAL DEPTH ;

DRILLING COMPANY Bagles Bros
DATE DRILLED 2-9-90; 2-22-90
DRILLING METHOD Hollow Stem Auger; NX Core
LOGGED BY SP Carpenter; J K Harriz
GEOLOGIST

BOREHOLE/WELL NO. B300790
GROUND SURFACE ELEVATION
WATER LEVEL ENCOUNTERED NONE
STATIC NONE
DRILLER D. Styles; P. Bugl HELPER T. Merritt; M. Bo
DRILLING FLUID none, water
CHECKED BY
SITE MANAGER
CEARP MANAGER

COMMENTS Set 4" PVC casing from 0.0-6.0' below ground surface
Augered Borehole to 6.0' below ground surface;

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED |
|---|---|---|---|---|
| | | Rec | | |
| 0 | GRAVELLY SANDY CLAY | 0.5 | ~~Rocky~~ FLATS COLLUVIUM<br>0.0-2.0' SAMPLE<br>Recovered 0.5/2.0' ~~25%~~<br>GRAVELLY SANDY CLAY: dusky brown (5YR 2/2); non stratified, fine to very coarse grained sand; 1 to 6 cm gravels; poor sorting; subangular; quartzose; low plasticity; roots and grass; medium stiff; moist | Hull Background: 0.0<br>All readings in auger; in breathing zone; on core; and in cuttings: 0.0; unless otherwise noted below. TB0209901<br>0.0-0.5 SAMPLE (VOAS ONLY)<br>B3007900002<br>B3007900002D |
| 1 | | 25 | | |
| 2 | | | | |
| | SANDY CLAY | 95 | 2.0-4.0' SAMPLE<br>Recovered 1.9/2.0' ~~95%~~<br>2.0-3.7' SANDY CLAY: dusky yellow (5Y 6/4); medium light gray (N 5/0), non stratified; fine to coarse grained sand; trace fine gravels; moderate to poor sorting; subround; quartzose and granite; medium plasticity; calcareous; iron staining; root hairs; very stiff, damp | 2.0-3.9 SAMPLE (VOAS ONLY)<br>B3007900204<br>0.0-3.7 SAMPLE<br>B3007900004<br>B3007900004D |
| 3 | | | | |
| 3.9 | | 3.7 | | |
| 4 | Silty Clay Stone | | | |
| | Silty Clay Stone | 60 | | B3007900004FB |
| 5 | | | | |

SHLOGLMB

WELL NO. B300790

# LOG OF BOREHOLE



| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED |
|---|---|---|---|---|
| 5 | silty clay soil | SA | BEDROCK | |
| | | | 3.7-3.9': SILTY CLAYSTONE: medium gray (N5/0) to light olive gray (5Y6/1-5/2); blocky; medium plasticity; rootlets; trace iron staining; slightly calcareous; weathered; firm; damp | |
| 6 | | | 4.0-6.0 SAMPLE | |
| 7 | | | Recovered 1.2/2.0 = 60% | |
| | | | SILTY CLAYSTONE. same as above | |
| 8 | | | ~~Total Augered Depth: 6.0'~~ | |
| 9 | | | | |
| 10 | | | | |
| 11 | | | | |
| 12 | | | | |
| 13 | | | | |

# LOG OF BOREHOLE/GEOTECHNICAL DATA

QA BY/DATE SPC/2-27-90
LOCATION
COORDINATES
TOTAL DEPTH, 23 0'

DRILLING COMPANY
DATE DRILLED, 2/22/90
DRILLING METHOD, Mud Rotary, NX Core
LOGGED BY, J. K. Haeiz
GEOLOGIST

BOREHOLE/WELL NO, B300790
GROUND SURFACE ELEVATION
WATER LEVEL ENCOUNTERED
STATIC
DRILLER, P Bushkovsk. HELPER; M Boud
DRILLING FLUID, water
CHECKED BY
SITE MANAGER

PROJECT MANAGER

COMMENTS

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED OR ROCK DEFECTS |
|---|---|---|---|---|---|---|---|
| 0 | | | | | | | |
| 1 | | | | | | | |
| 2 | | | | | | | |
| 3 | | | | | | | ✓ |
| 4 | | | | | | | |
| 5 | | | | | | | |

CTLOG.PJ

# LOG OF BOREHOLE/GEOTECHNICAL DATA

WELL NO B300790 PAGE ____ OF ____

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED OR ROCK DEFECTS |
|---|---|---|---|---|---|---|---|
| 5 | | | | | | | |
| | | | | | | 6.0 - 10.0' SAMPLE<br>Recovered 0.9'/4.0'<br>RQD: 0/0.9' | |
| 6 | SILTY CLAYEY SAND-STONE | | | 23 | 0 | SILTY, CLAYEY SANDSTONE. pale yellowish brown (10YR6/2), very indistinctly laminated, slightly mottled predominately (60-70%) very fine to fine grained sand, moderately well sorted, subrounded, quartz, (40-30%) non plastic to slightly plastic fines, firm to stiff, damp | 6.2 - Fracture infilled with calcite, 80°∡<br>6.35 Break; 80°∡ open<br>6.6 Break; 90°∡, open<br>above 2 breaks may be mechan end |
| 7 | | | | | | | |
| 8 | | | | | | | |
| 9 | | | | | | | |
| | | | | | | 10.7-13.0' SAMPLE<br>Recovered 3.7/3.0'<br>RQD - 2.4/3.7' | |
| | SILTY CLAYEY SAND-STONE | | | | | 9.3-10.0 SILTY CLAYEY SANDSTONE: same as above, distrubed, wet. | |
| 10 | INTERL SILTY CLAYEY SANDSTONE AND CLAYSTONE | | | 123 | 65 | | |
| | SILTY SANDSTONE | | | | | 10.0-10.4' SILTY CLAYEY SANDSTONE: interlaminated with SILTY CLAYSTONE. dark yellowish orange (10YR6/6) to moderate yellowish brown (10YR5/4) mottled, lighter in sandy layers; darker in clayey layers; -SANDSTONE as above; SILTY CLAYSTONE 100% medium plastic fines, firm to stiff, damp | |
| 11 | INTERL SILTY SANDSTONE AND CLAYSTONE | | | | | | |
| 12 | SILTY CLAY-STONE | | | | | 10.4-11.2 SILTY SANDSTONE (10YR6/6) dark yellowish orange (70%+) very fine to fine grained sand, moderately well sorted, subrounded quartzose, (30%) non to slightly plastic fines, soft, incompetent, moist | |
| 13 | | | | | | | |

GTL002PJ

# LOG OF BOREHOLE/GEOTECHNICAL DATA

WELL NO. B300790 PAGE ____ OF ____

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED OR ROCK DEFECTS |
|---|---|---|---|---|---|---|---|
| 13 | SILTY CLAY-STONE | CORE | | 50 | 100 | 11.2-11.8' ± SILTY SANDSTONE interlaminated with SILTY CLAYSTONE as at 10.0-10.4 firm to stiff, gradual increase in CLAYSTONE percentage toward base (11.8) Caliche in lamina at 11.8' | |
| 14 | | | | | | 11.8-13.0': SILTY CLAYSTONE moderate yellowish brown (10YR 5/4) (100%) medium plastic fines; firm to stiff, damp; several small caliche nodules at 12.5' | Fine limonite filled fractures at 11.9 - 45° 11.95 - 45° 12.05-12.35 - 20° 12.30-12.5 - 20° 12.6 - 90° Open (mechanically) breaks 11.5'-12.10.3' - 90° |
| 15 | SILTY CLAY-STONE | | | 95 | 100 | 13.0'-15.0' SAMPLE Recovered - 1.0/2.0' RQD - 1.0/1.0' | |
| 16 | SILTY CLAY-STONE interlaminated with CLAYEY SILTSTONE; CLAYEY SILT-STONE | | | | | 13.0-13.4': SILTY CLAYSTONE dark yellowish brown (10YR 4/2); uniform texture (100%) medium plastic fines, low silt percentage, moldable, soft-firm | 13.3 - open break 90° probably mechanical 13.61-13.62, 3 fine limonite veins, 90° |
| 17 | CLAYEY SILT-STONE | | | 73 | 91 | 13.4-14.0' - SILTY CLAYSTONE dark yellowish brown (10YR 4/2) finely laminated (100%) non-slightly plastic fines, lamina vary in silt percentage between approximately 10% SILT to 50% SILT; caliche along horizontal lamina throughout, damp | 13.7, 13.74 limonite in horizontal lamina (0.5cm wide) patches of healed fractures 13.85-14.0' fine fracture infilled with limonite 0° |
| 18 | | | | | | 15-17.0' SAMPLE Recovered - 1.9'/2.0' RQD - 1.9/1.9' | |
| 19 | | | | | | 15.0-15.7': SILTY CLAYSTONE dark yellow brown (10YR 4/2) pale yellowish brown (10YR 6/2) uniform texture; firm to stiff, limonite in pockets (0.5cm) at 16.1, 15.25, 15.62, damp | suture-like limonite veins throughout; no distinct fracture traces |
| 20 | SILT-STONE | | | 100 | 100 | 15.7'-16.05': SILTY CLAYSTONE interlaminated with CLAYEY SILTSTONE, silty CLAYSTONE as at 15.0' | 13.7 - limonite in suture lamina |
| 21 | | | | | | | |

GTL003

# LOG OF BOREHOLE/GEOTECHNICAL DATA

WELL NO. B300790 PAGE ____ OF ____

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED OR ROCK DEFECTS |
|---|---|---|---|---|---|---|---|
| 21 | SILT-STONE | CORE | | | | 15.7'-16.05' (continued) CLAYEY SILTSTONE, pale yellowish brown, (100%) non-plastic to slightly plastic fines; possible trace very fine grained sand; stiff; damp | 16.0-16.1' fine fracture infilled with limonite 80° |
| 22 | | | | | | 16.05'-16.90' - CLAYEY SILTSTONE as at 15.7 (no interlaminations of claystone) | 16.2-16.4 limonite pockets (1cm) 16.2 - calcite nodules 16.6 (2cm) - calcite nodule "fine limonite filled fractures — 16.5-16.6, 50° 16.65-16.85 35° 16.7-16.9, 0° |
| 23 | | | | | | 17.0' - 20.0' SAMPLE Recovered - 2.2'/3.0' RQD - 2.0'/2.2' | fine limonite filled fractures: |
| 24 | | | | | | CLAYEY SILTSTONE as at 16.05' greater percentage of very fine grained sand (18-25%), stiff, drains out quickly, very indistinctly laminated | 17.1-17.25 (1), 50° 17.35-17.55 (2), 0° 17.55 (1), 90° calcite on surface; core broke along this plane 17.7 (1) 90° 17.73 (1) 90° 17.78 (1) 90° 17.82-17.98 (1) curved, 0° 18.25 limonite nodule 18.32-18.34, 75° 18.45-18.5, 90° broke along this line 18.55-18.8, 45° 18.7-18.85, 0° 18.95 - calcite on laminae |
| 25 | | | | | | | |
| 26 | | | | | | | |
| 27 | | | | | | 20.0-23.0' SAMPLE Recovered - 3.0'/3.0' RQD - 3.0/3.0' | Many fine limonite filled fractures |
| 28 | | | | | | SILTSTONE as above at 16.0' Same notes as at 17.0, greater sand percentage (20%), clay (10%) | 20.1-20.15, 80° 20.2-20.23, curved; 0° 20.3-20.4, 65° 20.42-20.46, 75° 20.5-20.6, 60° 20.66-20.8, 45° 20.73, 90° 21.0-21.5, (6) 45°, 21.78-21. 21.85-22.45 (9) 90° 22.8-22.85 (2) 65° calcite small nodule 1cm 27.65 calcite on small nodule (1cm) |
| 29 | | | | | | Total Depth = 23.0' | |

GTL004

# LOG OF BOREHOLE

QA BY/DATE 2/13/90 JEM
LOCATION Rocky Flats Plant 881 Hillside
COORDINATES
TOTAL DEPTH 14.0'; 29.5'

DRILLING COMPANY Boyles Brothers
DATE DRILLED 2-12-90; 03-5-90
DRILLING METHOD Hollow Stem Augers; NX core
LOGGED BY T. R. Allen; J.E. Marks
GEOLOGIST

BOREHOLE/WELL NO. B 300890
GROUND SURFACE ELEVATION
WATER LEVEL ENCOUNTERED None
STATIC
DRILLER D. Styles; P.Bush HELPER T. Merrill; M. Gill
DRILLING FLUID None; Water
CHECKED BY
SITE MANAGER
CERAP MANAGER

COMMENTS Surface casing set to 14.0' on 2-12-90

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED |
|---|---|---|---|---|
| 0 | Gravelly | | Topsoil | HNU background 0.0 ppm. All readings on core, on cuttings and in breathing zone 0.0, unless otherwise noted below |
| | Clay | | 0.0-2.0' Sample<br>Recovered 1.0/2.0 = 50%<br>Gravelly clay dusky brown (5YR 2/2); non-laminated, 1-3cm broken gravel; quartzose ~~and little~~, organics; roots; medium plasticity, damp | TB0312901<br>~~B300890014FB~~<br>0.0-1.0 Sample ← core<br>VOA only<br>B300890002 |
| 1 | | | | |
| 2 | | | ~~Alluvium~~ Colluvium | |
| | Silty | | 2.0-4.0': Sample<br>Recovered 1.4/2.0 = 70%<br>Silty clay moderate brown (10YR 5/4) to grayish orange (10YR 7/4) non-laminated, mottled, silty, trace very fine grained sand; medium plasticity, iron staining, stains, trace to some caliche, pinkish white (5B 9/1), strong HCl reaction, reworked claystone; damp. | 2.0-3.4' Sample core<br>VOA only<br>B300890204 |
| 3 | Clay | | | 0.0-3.4' Sample core<br>B300890004 |
| 4 | | | | |
| | | | 4.0-6.0' Sample<br>Recovered 1.8/2.0 = 90% | 4.0-5.8' Sample core<br>VOA only<br>B300890406 |
| 5 | | | | |

BMGGLIB

WELL NO. B300890

# LOG OF BOREHOLE



| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED |
|---|---|---|---|---|
| 5 | Silty clay | | Silty Clay: Same as above, some fractures, no calcite; reworked claystone, trace iron nodules, dry — corps | |
| 6 | | | 6.0-8.0' ~~SAMPLE~~ Recovered 2.0/2.0' = 100% Silty Clay — corps same as above, trace very fine to fine grained sand, trace 3-5mm lithic gravels, slightly calcareous, slight HCl reaction, trace fractures | 6.0-8.0' Sample — corps VOA only B3008900608; 4.0-8.0' Sample — corps B3008900408 |
| 7 | | | | |
| 8 | | | 8.0-10.0' ~~SAMPLE~~ Recovered 2.0/2.0' = 100% ~~Silty Clay~~ Same as above, trace gravels to cobbles, 9.7-10.0' moderately calcareous, moderate HCl reaction | 8.0-10.0' Sample ← corps VOA only B3008900810 |
| 9 | Silty clay | | | |
| 10 | | | 10.0-12.0' Sample — corps Recovered 2.0/2.0' = 100% Silty Clay — corps. Same as above, some gravels, trace iron concretions | 10.0-12.0' Sample ← corps VOA only B3008901012; 8.0-12.0' Sample ← corps B3008900812 |
| 11 | | | | |
| 12 | Silty Clayey Sand stone | | 12.0-14.0' Sample — corps Recovered 2.0/2.0' Sample — corps 12.0-12.1' = Silty Clay. Same as above 12.1-14.0' = Bed Rock Silty Clayey Sandstone very — corps | |
| 13 | | | | |

WELL NO. B 300890

# LOG OF BOREHOLE



| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED |
|---|---|---|---|---|
| 13 | Silty clayey sandstone | | pale orange (10 YR 8/2) to dark yellowish orange (10 YR 6/6); ~~non-laminated~~ mottled; silty; very fine to fine grained sand; subangular to subrounded quartzose; clayey; non to low plasticity; firm, moderately consolidated; slightly calcareous; slight HCl reaction; damp at times grading to silty sandy claystone | |
| 14 | | | | |
| 15 | | | | |
| 16 | | | | |
| 17 | | | | |
| 18 | | | | |
| 19 | | | | |
| 20 | | | | |
| 21 | | | | |

Total Depth: 14.0'

# LOG OF BOREHOLE/GEOTECHNICAL DATA

QA BY/DATE 3-6-90/SPC
LOCATION 881 Hillside ; French Drain
COORDINATES
TOTAL DEPTH 29.5'

DRILLING COMPANY Boylan Brothers
DATE DRILLED ; 03-05-90
DRILLING METHOD ; NX core
LOGGED BY ; JE Marks
GEOLOGIST

BOREHOLE/WELL NO B360890
GROUND SURFACE ELEVATION
WATER LEVEL ENCOUNTERED none
STATIC
DRILLER ; P. Bushkinsky HELPER ; M. Boyd
DRILLING FLUID ; water
CHECKED BY
SITE MANAGER

PROJECT MANAGER

COMMENTS Surface casing set to 14.0'

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED OR ROCK DEFECTS |
|---|---|---|---|---|---|---|---|
| 0 | | | | | | | |
| 1 | | | | | | | |
| 2 | | | | | | | |
| 3 | | | | | | | |
| 4 | | | | | | | |
| 5 | | | | | | | |

GILOGI.PJ

# LOG OF BOREHOLE/GEOTECHNICAL DATA

WELL NO _____ PAGE _____ OF _____

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED OR ROCK DEFECTS |
|---|---|---|---|---|---|---|---|
| 13 | | | | | | | |
| 14 | | | | | | BEGIN CORE AT 14.5' | |
| | CLAY-STONE | CORE | | 75 | 100 | 14.5–18.5' SAMPLE<br>Recovered 3.0/4.0'<br>RQD 3.0/3.0<br>CLAYSTONE: light olive gray (5Y6/1); medium gray (N5/0); pale yellowish brown (10YR 6/2); mottled; blocky, trace to some silt, medium to high plasticity; abundant iron staining; weathered; medium hard; damp | 14.[illegible]: 90°; healed, iron oxi[illegible]<br>[illegible]<br>16.4–16.6; 75°–80°; healed iron oxide abundant discontinuous micro fractures. |
| 15 | | | | | | | |
| 16 | | | | | | | |
| 17 | | | | | | 18.5–19.0' SAMPLE<br>Recovered 0.5/0.5<br>RQD 0.5/0.5<br>CLAYSTONE. Same as above; light olive gray (5Y5/2), [illegible] olive brown (5Y5/6), 1 cm. silt lenses to inclusions at 18.5–18.7' | |
| 18 | | | | | | | 18.75, 90°, healed, iron oxi[illegible] |
| | CLAY-STONE | CORE | | 100 | 100 | | |
| 19 | SILTY CLAYSTONE | 19.3<br>19.4 | | 60 | 0 | 19.0–19.5' SAMPLE<br>Rec 0.3/0.5<br>RQD 0.0/0.3 | 19.0–19.3' trace vertical fractures, iron stained, healed |
| | SILTY CLAYSTONE | | | 105 | 19 | SILTY CLAYSTONE: pale yellowish brown (10YR 6/2); trace iron stain - light brown (5YR 5/6), slightly mottled; non stratified; low-medium plasticity; firm, damp | |
| 20 | Clayey Sandy Siltstone | CORE | | | | | 19.4–20.2: mechanical fractured throughout; open; vertical to horizontal |
| 21 | | | | | | | |

GTL003

# LOG OF BOREHOLE/GEOTECHNICAL DATA

WELL NO _____ PAGE _____ OF _____

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED OR ROCK DEFECTS |
|---|---|---|---|---|---|---|---|
| 21 | clayey sandy siltstone | | | | | 19.5 - 21.5' SAMPLE<br>Recovered 2.1/2.0<br>RQD 0.4/2.1 | |
| | sandy clayey siltstone | | | 60 | 33 | 19.4 - 20.2': SILTY CLAYSTONE: pale yellowish brown (10YR 6/2), broken, fractured throughout; high plasticity, soft; dry to damp | 20.2 - 21.5', abundant fractures, 60-90°, iron stained |
| 22 | | | | | | | 21.6', mechanical fracture<br>21.9', " 90° "<br>22.1 "<br>22.2' " |
| 23 | | | | | | 20.2 - 21.5' CLAYEY SANDY SILTSTONE: pale yellowish brown (10YR 6/2); trace to abundant iron staining throughout - dark yellowish orange (10YR 6/6); sand - very fine grained, well sorted, subrounded quartz, pale very sandy; semiconsolidated to unconsolidated weathered; moderately soft to soft, damp throughout | |
| 24 | | Core | | 0 | 0 | | |
| | silty claystone | | | 100 | 60 | 21.5 - 23.5' SAMPLE<br>Recovered 1.2/2.0<br>RQD = 0.4/1.2' | 22.2 - 22.4' 0-15° fracture, trace iron stained, healed |
| 25 | | | | 110 | 50 | SANDY CLAYEY SILTSTONE: pale yellowish brown (10YR 6/2), some coarse, less sand in places, trace iron stain - dark yellowish orange (10YR 6/6); caliche nodules, trace to medium plasticity, moderately hard, damp | 22.3' mechanical fracture; 90°<br>22.4' " " |
| 26 | silty claystone | | | | | 23.5 - 24.5' SAMPLE<br>Recovered 0.0/1.0 ← RQD 0.0/0.0 | |
| 27 | | | | 0 | 0 | 24.5 - 25.0' SAMPLE<br>Recovered: 0.5/0.5<br>RQD = 0.4/0.5 | 24.5 - 25.0': Abundant fractures 0-30°; iron stained, filled |
| 28 | | | | | | SILTY CLAYSTONE: pale yellowish brown (10YR 6/2); mottled, abundant iron staining - dark yellowish orange (10YR 6/6); trace black carbonaceous specks (10YR 6/6), trace plasticity; highly weathered; soft, damp | |
| | silty claystone | | | 90 | 56 | | |
| 29 | | | | | | | |

CTL004

# LOG OF BOREHOLE/GEOTECHNICAL DATA

WELL NO _____ PAGE ____ OF ____

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | SPT N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED OR ROCK DEFECTS |
|---|---|---|---|---|---|---|---|
| 29 | silty claystone | | | | | 25.0-27.0' SAMPLE<br>Recovered 2.0/2.0'<br>RQD = 1.1/2.0' | 25.0-25.7': Abundant mechanical fractures; 80-90° |
| 30 | | | | | | SILTY CLAYSTONE: pale yellowish brown (10YR 6/2); blocky texture; trace very fine grained sand in places; quartzose, more sandy toward bottom; carbonaceous at 25.4-25.5' - olive gray (5Y 4/1), trace iron stain in places - dark yellowish orange (10YR 6/6), low to no plasticity, abundant caliche cement at 26.8-27.0', consolidated; unweathered; moderately hard; damp | |
| 31 | | | | | | | |
| 32 | | | | | | | |
| | | | | | | 27.0-28.5': SAMPLE<br>Recovered 0.0/1.5'<br>RQD 0.0/0.0 | |
| 33 | | | | | | 28.5-29.5' SAMPLE<br>Recovered 0.9/1.0'<br>RQD 0.5/0.9' | 28.7' mechanical fracture; close to 90° |
| 34 | | | | | | SILTY CLAYSTONE: dusky yellow (5Y 6/4), sandy in part, very fine grained, trace to some iron staining - light olive brown (5Y 5/6), trace black carbonaceous specks (N 1/0), trace plasticity; weathered; moderately soft; damp | 28.7-28.9': numerous 90° fractures |
| 35 | | | | | | Total Depth = 29.5' | |
| 36 | | | | | | | |
| 37 | | | | | | | |

GRLOGS

Rcvd 3/0

# LOG OF BOREHOLE

QA BY/DATE 2/14/90 JGM
LOCATION
COORDINATES Rocky Flats Plant (881 Hillsite)
TOTAL DEPTH 14.0' ; 29.3

DRILLING COMPANY Boyles Brothers
DATE DRILLED 2-12-90 ; 2-26-90
DRILLING METHOD Hollow Stem Augers ; NX core
LOGGED BY T.A. Brothers ; SP Carpenter
GEOLOGIST

BOREHOLE/WELL NO. B300990
GROUND SURFACE ELEVATION
WATER LEVEL ENCOUNTERED None
STATIC Bushkouski
DRILLER D. Styles ; P. HELPER T. Moretz
DRILLING FLUID None ; WATER
CHECKED BY
SITE MANAGER
CEARP MANAGER

COMMENTS Surface casing set to 14.0' on 2-12-90

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED |
|---|---|---|---|---|
| 0 | Gravelly Silty Clay | | ~~TOP SOIL~~<br>0.0 - 2.0 ~~SAMPLE~~ cop<br>Recovered 17/2.0 = 85%<br>0.0-1.0' Gravelly Silty Clay: moderate brown (5YR 3/4) to light brown (5R 5/6); organics; non-laminated, mottled; 1-5cm subrounded to broken gravels; lithic, trace very fine grained sand; ~~silty, clayey~~, low to medium plasticity; calcite; light gray (N 8/0); strong HCl reaction, dry.<br>~~Rocky Flats~~ ~~Colluvium~~ ← cop<br>1.0-1.7' Gravelly Silty Clay: light brown (5YR 5/6) to moderate brown (5YR 4/4); same as above; iron staining ~~dry~~.<br>2.0 - 4.0' Sample ← cops<br>~~Recovered 17/2.0 = 85%~~<br>Gravelly Silty Clay ~~same~~ as above, iron concretions; moderately calcareous; moderate to strong HCl reaction; trace to some | HNU background 0.0 ppm<br>All readings on core; on cuttings and in breathing zone: 0.0, unless otherwise noted below<br>TB0212901<br>0.0-1.7' Sample ← cop<br>VOA only<br>B3009900002<br>B3009900014FB<br>2.0-3.7' Sample ← cops<br>VOA only<br>B3009900204<br>0.0-3.7' Sample ← cop<br>B3009900004 |
| 1 | | | | |
| 2 | | | | |
| 3 | | | | |
| 4 | Gravelly Sandy Clay | | | |
| 5 | | | | |

ENLOGLIB

WELL NO. B300990 LOG OF BOREHOLE PAGE 2 OF 3

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED |
|---|---|---|---|---|
| 5 | Gravelly Sandy Clay | | fine to medium grained sand; quartzose and feldspathic, grading to Gravelly Sandy Clay. | |
| 6 | | | 4.0-6.0' Sample ← core<br>Recovered 1.7/2.0' = 85%<br>Gravelly Sandy Clay: Same as above; Sand, same as above; subangular to subrounded. | 4.0-5.7' Sample ← core<br>VOA only<br>B300900906 |
| 7 | | | 6.0-8.0' Sample ← core<br>Recovered 2.0/2.0' = 100%<br>Gravelly Sandy Clay: Same as above | 6.0-8.0' Sample ← core<br>VOA only<br>B300900908 |
| 8 | | | | 4.0-8.0' Sample ← core<br>B300900908 |
| 9 | Gravelly Sandy Clay | | 8.0-10.0' Sample ← core<br>Recovered 2.0/2.0' = 100%<br>Gravelly Sandy Clay: Same as above moderate brown (5YR 4/4) | 8.0-10.0' Sample ← core<br>VOA only<br>B300900810 |
| 10 | | | 10.0-12.0' Sample core<br>Recovered 1.0/2.0' = 50%<br>Gravelly Sandy Clay: Same as above, at times grading to Gravelly Clayey Sand; fine to medium grained sand; quartzose; 1-4mm gravels; subrounded; calcareous, strong HCl reaction, firm; clayey; rounded claystone; moist. | 10.0-11.0' Sample ← core<br>VOA only<br>B300990 1012 |
| 11 | | | | 8.0-11.0' Sample ← core<br>B300900812 |
| 12 | Silty Clay stone | | BEDROCK<br>12.0-14.0' Sample ← core<br>Recovered 2.0/2.0'<br>Silty Claystone: grayish orange (10YR 7/4) to light brown (5YR 4/4) | |
| 13 | | | | |

WELL NO. B300989 LOG OF BOREHOLE PAGE 3 OF 3

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED |
|---|---|---|---|---|
| 13 | Silty clay stone | | non-laminated, mottled; trace iron concretions; trace sand; as above; ~~silty~~, ~~clayey~~; low plasticity; iron staining; trace fractures; moderately consolidated; firm; dry (iron staining) | |
| 14 | | | Total Depth: 14.0' | |
| 15 | | | | |
| 16 | | | | |
| 17 | | | | |
| 18 | | | | |
| 19 | | | | |
| 20 | | | | |
| 21 | | | | |

# LOG OF BOREHOLE/GEOTECHNICAL DATA

WELL NO. B300990 PAGE ____ OF ____

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED OR ROCK DEFECTS |
|---|---|---|---|---|---|---|---|
| 13 | | | | | | | |
| 14 | | | | | | | |
| | CLAY-STONE | CORE | | 30 | 100 | 14.3-16.3' SAMPLE<br>Recovered 0.6/2.0'<br>RQD 0.6/0.6'<br>CLAYSTONE: pale yellowish brown (10YR 6/2); medium gray (N5/0); mottled; blocky; trace to some silt; medium to high plasticity; calcareous deposits; iron staining; weathered; damp | |
| 15 | | 14.9 | | | | | |
| 16 | | | | | | | |
| | CLAY-STONE | CORE | | 70 | 81 | 16.3-19.3' SAMPLE<br>Recovered 2.1/3.0'<br>RQD 1.7/2.1<br>CLAYSTONE: same as above; light olive gray (5Y 6/1); dusky yellow (5Y 6/4); no calcareous deposits. | 16.3-16.6; mechanical damag<br>16.6-16.8; 30°, healed, iron ox<br>16.8; 50°, healed; iron oxide<br>17.2-17.3, 50°, healed, iron ox<br>17.4-17.5; 65°, healed, iron o<br>17.6-17.8; 60° crossed by a 20°; healed; iron oxide<br>17.9-18.0; 75°; healed; iron ox |
| 17 | | | | | | | |
| 18 | | 18.4' | | | | | |
| 19 | | | | | | | |
| | CLAY-STONE | CORE | | 50 | 100 | 19.3-20.3' SAMPLE<br>Recovered 0.8/1.0'<br>RQD. 0.8/0.8<br>CLAYSTONE; same as above | 19.5-19.7; 10°; healed; iron ox<br>19.7, 45°, healed; iron oxide<br>19.8-20.0, 40°; healed; iron ox |
| 20 | | 20.1 | | | | | |
| | CLAY-STONE | CORE | | 55 | 0 | 20.3-22.3' SAMPLE<br>Recovered 1.1/2.0<br>RQD 0.0/1.1<br>CLAYSTONE: same as above | 20.4-20.5; 50°; mechanical dam<br>20.5-20.6; 60°, mechanical dam<br>20.6-21.0; 0°; mechanical dam |
| 21 | | | | | | | |

GTL003

# LOG OF BOREHOLE/GEOTECHNICAL DATA

WELL NO B300990 PAGE ____ OF ____

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED OR ROCK DEFECTS |
|---|---|---|---|---|---|---|---|
| 21 | | 21.9 | | | | | Following fractures intersect the above 20.6-21.0 0° fracto<br>20.7; 70°; mechanical damage<br>20.8; 70°-60°-65°; mechanical damage<br>20.9; 60°; mechanical dama.<br>21.0; 90°-80°-55°-45°; mechan. damage |
| 22 | | | | | | | |
| | CLAY-STONE | CORE | | 70 | 57 | 22.3-24.3' SAMPLE<br>Recovered 1.4/2.0 ~~70%~~<br>RQD: 0.8/1.4 ~~57%~~<br>CLAYSTONE: same as above; medium gray (N5/0); light olive gray (5Y 5/2) | 22.3-22.9; mechanical dama<br>23.0-23.1; 50°; healed; iron ox.<br>23.1; 75°; healed; iron oxide<br>23.3-23.5; 30°; healed; iron oxide<br>23.6-23.7; 40°; healed; iron oxide |
| 23 | | | | | | | |
| | | 23.7 | | | | | |
| 24 | | | | | | | |
| | CLAY-STONE | CORE | | 100 | 100 | 24.3-25.3 SAMPLE<br>Recovered 1.0/1.0 ~~100%~~<br>RQD 1.0/1.0 ~~100%~~<br>CLAYSTONE: same as above; light olive gray (5Y 6/1); pale yellowish brown (10YR 6/2); grayish orange (10YR 7/4); trace carbonaceous debris | 24.4-24.8; 5°; healed; iron ox.<br>24.6-24.8; 30°; healed; iron oxide |
| 25 | | | | | | | |
| | CLAY-STONE | CORE | | 100 | 100 | 25.3-27.3' SAMPLE<br>Recovered 2.0/2.0 ~~100%~~<br>RQD 2.0/2.0 ~~100%~~<br>CLAYSTONE: Same as above; dusky yellow (5Y 6/4); light olive gray (5Y 6/1); medium gray (N5/0); increasing silt to silty at 25.3 to 26.5; no carbonaceous debris | 25.3-25.5; 20°; healed; iron oxide<br>25.9-26.3; 20°; healed; iron oxide<br>26.0-26.1; 50°-35°; healed; iron ox<br>26.3-26.5; 35°; healed; iron oxide<br>26.4-26.5; 30°; healed; iron oxide<br>26.7-27.2; 0°; healed; iron oxide |
| 26 | | | | | | | |
| 27 | | | | | | | |
| | CLAY-STONE | CORE | | 75 | 100 | 27.3-29.3' SAMPLE<br>Recovered 1.5/2.0 ~~75%~~<br>RQD 1.5/1.5 ~~100%~~<br>CLAYSTONE: same as above; light olive gray (5Y 6/1); medium gray (N5/0); trace silt | 27.3-27.4; 55°; healed; iron oxide<br>27.3-27.6; 0°; healed; iron oxide<br>27.5-27.8; 0°; healed; iron oxide<br>27.8-28.0; 30°; healed; iron oxide<br>27.8-28.3; 20°; healed; iron ox.<br>28.5-28.7; 60°-75°; healed; iron o |
| 28 | | | | | | | |
| 29 | | | | | | | |

GTL004

# LOG OF BOREHOLE/GEOTECHNICAL DATA

WELL NO B300990 PAGE ____ OF ____

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED OR ROCK DEFECTS |
|---|---|---|---|---|---|---|---|
| 29 | | | | | | | |
| | | | | | | TOTAL DEPTH = 29.3' | |
| 30 | | | | | | | |
| 31 | | | | | | | |
| 32 | | | | | | | |
| 33 | | | | | | | |
| 34 | | | | | | | |
| 35 | | | | | | | |
| 36 | | | | | | | |
| 37 | | | | | | | |

GRLOGS

Rev 11-8-90

# LOG OF BOREHOLE

QA BY/DATE JEM 2/28/90
LOCATION Rocky Flats Plant (881 Hillside)
COORDINATES
TOTAL DEPTH 22.0; 42.5

DRILLING COMPANY Boyles Brothers
DATE DRILLED 12-12-90; 12-16-90; 2-19-90
DRILLING METHOD Hollow Stem Augers; NX Core
LOGGED BY T. A. Sathers; S.P. Carpenter
GEOLOGIST

COMMENTS

BOREHOLE/WELL NO. B301090
GROUND SURFACE ELEVATION
WATER LEVEL ENCOUNTERED 14.0
STATIC
DRILLER D. Styless HELPER T. Merritt
DRILLING FLUID None; Water
CHECKED BY
SITE MANAGER
CEARP MANAGER

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED |
|---|---|---|---|---|
| 0<br>1<br>2<br>3<br>4<br>5 | Silty Clay<br>Silty Clayey Gravel | 0.0<br>Center Bit<br>Cuttings | Topsoil — CARP<br>0.0-2.0' Sample — CARP<br>Recovered 0.6/2.0=30%<br>SILTY CLAY: dusky brown (5YR 2/2); laminated; mottled, organics; silty; trace sand, fine to medium grained, subangular to subrounded; quartzose; low to medium plasticity, dense, damp<br><br>2.0-3.0' Interval: CARP drilled with Center Bit ~~Rocky Flats~~ Colluvium inferred by drillers due to gravels under bit.<br><br>3.0-6.0' Interval: CARP drilled with Center Bit.<br>Lithology from Cuttings: SILTY CLAYEY GRAVEL, 90% gravels; 2-5 cm, subrounded to broken; quartzose and basalt, 10% silty clay, moderate yellowish brown (10YR 5/4), trace fine to medium | HNU background 0.0 ppm. All readings on core; in cuttings and in breathing zone: 0.0, unless otherwise noted below<br><br>TB021290 1<br>TB021690 1 |

WELL NO. B301090

# LOG OF BOREHOLE



| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED |
|---|---|---|---|---|
| 5 | Silty Clayey Gravel | Cuttings | grained sand; quartzose; low plasticity, stiff; dry | |
| 6 | Gravelly Silty Sand | Cuttings | 6.0-7.0' Sample, core<br>Recovered 6/10' = 60%<br>GRAVELLY SILTY SAND: grayish orange (10YR 7/4), non-laminated, gravels, 2-4 cm, broken, lithic, fine to coarse grained sand; subangular to subrounded, quartzose and feldspathic; silty; trace clay; non-plastic, very stiff, dry. | 6.0-6.6' Sample, core<br>VOA only<br>B3010900607 |
| 7 | | Cuttings center bit | 7.0-7.5 Interval drilled with center bit | |
| 7.5 | | | | |
| 8 | Gravelly Silty Sand | | 7.5-8.0' Sample, core<br>Recovered 0.5/0.5' = 100%<br>GRAVELLY SILTY SAND: same as above | 7.5-8.0' Sample, core<br>VOA only<br>B3010900708 |
| 9 | | | 8.0-10.0' Sample, core<br>Recovered 12/2.0' = 60%<br>GRAVELLY SILTY SAND: same as above. trace to some caliche; light gray (N8/0), slight to moderate HCl reaction | 0.0-8.0' Sample, core<br>B3010900008 |
| 9.2 | | | | |
| 10 | | | | 8.0-9.2' Sample, core<br>VOA only<br>B3010900810 |
| 11 | | | 10.0-12.0' Sample, core<br>Recovered 0.0/2.0' = 0% | |
| 12 | | cuttings center bit | 12.0-12.5 Interval drilled with center bit | 12.5-~~14.0~~ 13.6' Sample, core<br>VOA only<br>B3010901314 |
| 12.5 | Gravelly | | 12.5-14.0' Sample, core<br>Recovered 11/2.0' = 55% | |
| 13 | | | | |

WELL NO. B 301090

# LOG OF BOREHOLE



| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED |
|---|---|---|---|---|
| 13 | Clayey Sand | 13.6 | GRAVELLY CLAYEY SAND light brown (5YR 6/4) to moderate brown (5YR 4/4), non-laminated; mottled; 1-3cm gravels, broken to subrounded, lithic; fine to coarse grained sand; subangular to subrounded; quartzose; trace to some silt, clayey; low plasticity, stiff; damp, locally grading to GRAVELLY SANDY CLAY | 8.0-13.6 Sample - COP<br>B3010900814 |
| 14 | Gravelly clayey Sand | | | |
| 15 | | | 14.0-15.0' Sample - COP<br>Recovered 1.0/1.0' = 100% | 14.0-15.0' Sample - COP<br>VOA only<br>B3010901415 |
| 16 | Clay | | GRAVELLY CLAYEY SAND: light brown (5YR 5/6) to grayish orange (10YR 7/4) non-laminated; mottled; 2-3cm gravels, subrounded to broken, lithic; fine to medium grained sand, subangular to subrounded, quartzose and feldspathic; trace to some silt; clayey, low plasticity, wet; caliche at 14.5. very pale orange (10YR 8/2) strong HCl reaction | 14.0-18.0' Sample - COP<br>B3010901418 |
| 16.3 | | | | |
| 17 | Clay | | | |
| 18 | | | 15.0-17.0' Sample - COP<br>Recovered 1.3/2.0' = 65% | 15.0-16.3' Sample - COP<br>VOA only<br>B3010901517 |
| | Gravel | 18.5<br>18.7 | | |
| 19 | Clay | | 15.0-16.0' GRAVELLY CLAYEY SAND: same as above<br>16.0-16.3' CLAY: pale yellowish brown (10YR 6/2) to moderate yellowish brown (10YR 5/4); non-laminated; mottled; trace to some silt; reworked claystone, low to medium plasticity; dense; dry; caliche. bluish white (5B 9/1), strong HCl reaction | |
| 20 | | | 17.0-19.0' Sample - COP<br>Recovered 2.0/2.0 = 100% | 17.0-19.0' Sample - COP<br>VOA only<br>B3010901719 |
| 21 | | | | |

WELL NO. B301090 LOG OF BOREHOLE PAGE 4 OF 4

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED |
|---|---|---|---|---|
| 21 | Sandy silty clay stone | | 17.0 CLAY Same as above, caliche, same as above<br>18.5-18.7' GRAVEL 3-6cm; ~~gravels~~, subrounded, lithic.<br>18.7-19.0: CLAY: Same as 17.0-18.5<br>19.0-21.0' Sample<br>Recovered: 2.0/2.0' = 100%<br>CLAY Same as above<br>BEDROCK<br>21.0-22.0' Sample, core<br>Recovered 1.0/1.0' = 100%<br>SANDY SILTY CLAYSTONE light brown (5Y 5/6) to grayish orange (10YR 7/4); non-laminated; mottled; trace to some very fine to fine grained sand; subangular to subrounded; trace caliche; moderate HCl reaction; low to medium plasticity, dense, at times grading to SILTY CLAYEY SANDSTONE; silty, clay. | 19.0-21.0' Sample, core<br>VOA only<br>B301090 1921<br>18.0-21.0' Sample core<br>B301090 1821 |
| 22 | | | | |
| 23 | | | | |
| 24 | | | | slightly to |
| 25 | | | | |
| 26 | | | | |
| 27 | | | | |
| 28 | | | | |
| 29 | | | | |

# LOG OF BOREHOLE/GEOTECHNICAL DATA

WELL NO. B301090 PAGE ____ OF ____

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED OR ROCK DEFECTS |
|---|---|---|---|---|---|---|---|
| 21 | | | | | | | |
| | | | | | | START CORE AT 22.0' | |
| 22 | | Run #1 | | 0 | 0 | 22.0-24.0' SAMPLE<br>Recovered 0.0/2.0 = 0%<br>RQD = 0.0<br>(LOSS OF CORE DUE TO MISLATCHING OF CORE BARREL) | |
| 23 | | Core | | 0 | 0 | | |
| 24 | | Run #2 | | 0 | 0 | 24.0-25.0' SAMPLE<br>Recovered 0.0/1.0' = 0%<br>RQD: 0.0<br>(LOSS OF CORE DUE TO MISLATCHING OF CORE BARREL) | |
| | | Core | | 0 | 0 | | |
| 25 | ~~Sample~~ CLAYSTONE | Run #3 | | 113 | 87 | 25.0-29.0' SAMPLE<br>Recovered 4.5/4.0' = 100%<br>RQD ~~0.0~~ 3.9/4.5<br>CLAYSTONE: light olive gray (5Y5/2), blocky; silty to some silt; fine to coarse gravels at ~~4.2~~ 28.7' to ~~4.35~~ 28.9', poor sorting; subangular; siltstones; medium to high plasticity; iron staining to scattered concretions; weathered; medium hard; moist to damp | 24.8-25.0'<br>~~25.3-25.5~~; 0°; healed, iron oxide<br>25.1-25.3'<br>~~25.6-25.8~~ 25°, healed, iron oxide,<br>25.4-25.7<br>~~26.1-26.2~~, 25°-90°-65°, healed, iron oxide<br>25.8-26.0'<br>~~26.3-26.5~~; 70°-80°-60°, healed, iron oxide<br>26.2'<br>~~26.7~~ 85°, healed; iron oxide<br>26.5'<br>~~27.0~~; 90°-90°-85°, healed, iron oxide<br>27.0-27.3'<br>~~27.5-27.8~~; 30°, healed iron oxide |
| 26 | | Core | | | | | |
| 27 | | | | 100% | 87.6% | | |
| 28 | | | | | | | |
| 29 | | | | | | | |

GTL004

# LOG OF BOREHOLE/GEOTECHNICAL DATA

WELL NO B301090 PAGE ____ OF ____

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED OR ROCK DEFECTS |
|---|---|---|---|---|---|---|---|
| 29 | CLAYSTONE | Rotary | | 94 | 94 | 29.0 - 34.0' SAMPLE<br>Recovered 4.7/5.0'<br>RQD = 4.4/4.7'<br>CLAYSTONE: same as above; light olive gray (5Y 5/2); medium dark gray (N4/0); sandy lens at 33.0', no gravel lenses. | 29.0-29.3' 55°-65°, healed; iron oxide<br>29.5', 85°, healed, iron oxide<br>29.7', 90°, healed; iron oxide<br>29.7-30.0', 15°; healed; iron oxide<br>30.4', 80°, healed, iron oxide<br>30.55', 50°, healed, iron oxide<br>30.7', 70°, healed, iron oxide<br>30.9', 80°, healed, iron oxide<br>30.9-31.2', 50°-40°-35°-35°, healed; iron oxide<br>31.2-31.5', 35°-30°-45°-60°, healed; iron oxide<br>31.8', 40°, healed, iron oxide<br>33.0', 60°-90°, healed, iron oxide a calcium carbonate sandy-<br>33.65', 75°, healed, iron oxide |
| 30 | | | | | | | |
| 31 | | | | | | | |
| 32 | | Core | | 94% | 94% | | |
| 33 | | | | | | | |
| 34 | | | | | | | |
| 35 | CLAYSTONE | Rotary | | 100 | 72 | 34.0 - 39.0' SAMPLE<br>Recovered 5.0/5.0'<br>RQD = 3.6/5.0'<br>CLAYSTONE: same as above, light olive gray (5Y 5/2); medium dark gray (N4/0); yellowish gray (5Y 7/2), trace calcite nodules at 38.2', no sand or gravel lenses. | 34.4-34.65', 40°-40°-65°-90°-90°-90°; healed; iron oxide<br>34.75', 80°-75°; healed; iron oxide<br>34.8-34.9', 90°-70°, mechanically damaged; iron oxide<br>35.0', 90°, mechanically damaged, iron oxide<br>35.1', 55°, healed; iron oxide<br>35.4', 50°-50°-75°-75°, healed, iron oxide<br>35.8', 60°, mechanically damaged, iron oxide<br>36.1', 80°-80°-80°, healed, iron oxide<br>36.8', 70°, mechanically damaged, healed; iron oxide |
| 36 | | Core | | 100% | 72% | | |
| 37 | | | | | | | |

GTLOGS

# LOG OF BOREHOLE/GEOTECHNICAL DATA

WELL NO. B301090 PAGE ____ OF ____

| DEPTH FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED OR ROCK DEFECTS |
|---|---|---|---|---|---|---|---|
| 37 | | | | | | | 37.3-37.7, 5°-90°, healed; iron ox |
| 38 | | | | | | | 38.1-39.0, CORE IS MECHANICALL DAMAGED |
| 39 | CLAYSTONE | Rand 6 | | 94 | 97 | 39.0-42.5 SAMPLE<br>Recovered 3.3/3.5' = 94%<br>RQD ~~3%~~ 3.2/3.3<br>CLAYSTONE same as above, black carbonaceous deposit at 41.4 to 41.5', no calcite nodules, ~~no sand or gravel~~ lenses | 39.5, 65°, healed, iron oxide |
| 40 | | | | | | | 40.0-40.1; 55°-70°-70°; healed; iron oxide, |
| | | | | 94% | 92% | | 40.4-40.6; 20°-75°; healed; iron oxide |
| 41 | | Core | | | | | 41.4-41.5; 90°-90°-55°-90°; healed, iron oxide; black carbonaceous deposit |
| 42 | | | | | | | |
| | | | | | | TOTAL DEPTH CORED = 42.5' | |
| 43 | | | | | | | |
| 44 | | | | | | | |
| 45 | | | | | | | |

CTLOG 6

QA
2-27-90
BW

# LOG OF BOREHOLE/GEOTECHNICAL DATA

QA BY/DATE
LOCATION French Drain; Est/Hillside
COORDINATES
TOTAL DEPTH 22.5; 43.0

DRILLING COMPANY Boyles Bros
DATE DRILLED 2-22/23-90
DRILLING METHOD Hollow Stem Auger / NX core
LOGGED BY S P Carpenter
GEOLOGIST

BOREHOLE/WELL NO. B301190
GROUND SURFACE ELEVATION
WATER LEVEL ENCOUNTERED None
STATIC None
DRILLER D. Styles HELPER T. Merritt
DRILLING FLUID NONE to 22.5 then WATER
CHECKED BY
SITE MANAGER

PROJECT MANAGER

COMMENTS Surface casing set to 22.5 below ground surface

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED OR ROCK DEFECTS |
|---|---|---|---|---|---|---|---|
| 0 | TOP SOIL | | | | | TOPSOIL | Hnd Background: 0.0 |
| | .4 SANDY CLAY | | | 100 | | 0.0-2.0 SAMPLE<br>Recovered 2.0/2.0 ~~100%~~<br>0.0-0.4; SANDY CLAY; grayish brown (5YR 3/2); nonstratified; fine to very coarse grained sand; some 1 to 3 cm gravels; poor sorting; subangular; quartzose; low to medium plasticity; organics; medium stiff; moist | All readings in auger; in breathing zone; on core; and in cuttings: 0.0; unless otherwise noted below<br>TRIP BLANK SAMPLE<br>TB0222901<br>0.0-2.0 SAMPLE (VOAS ONLY)<br>B3011900002<br>B3011900002D |
| 1 | | | | | | | |
| 2 | | | | | | COLLUVIUM<br>0.4-2.0; SANDY CLAY; same as above; pale brown (5YR 5/2); moderate brown (5YR 4/4); stiff | |
| | | | | | | 2.0-4.0 SAMPLE<br>Recovered 1.5/2.0 ~~75%~~ | 0.0-3.5 SAMPLE<br>B3011900009<br>B3011900009D |
| 3 | | | | 75 | | SANDY CLAY; same as above; some 1 to 5 cm gravels; hard | 2.0-3.5 SAMPLE (VOAS ONLY)<br>B3011900204 |
| 4 | | | | 100 | | 4.0-6.0 SAMPLE<br>Recovered 2.0/2.0 ~~100%~~<br>SANDY CLAY; same as above; moderate brown (5YR 4/4); light brown (5YR 5/6); slightly calcareous as calcareous veining; no organics | 4.0-6.0 SAMPLE (VOAS ONLY)<br>B3011900406<br>4.0-8.0 SAMPLE<br>B3011900408 |
| 5 | | | | | | | |

GRLOGLPJ

# LOG OF BOREHOLE/GEOTECHNICAL DATA

WELL NO B301190



| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED OR ROCK DEFECTS |
|---|---|---|---|---|---|---|---|
| 5 | SANDY CLAY | | | | | | |
| | | | | 100 | | 6.0-8.0 SAMPLE<br>Recovered 2.0/2.0 ~~100%~~<br>SAND AND CLAY; same as above; trace fine gravels; increased calcareous deposits; trace carbonaceous specks | 6.0-8.0 SAMPLE (VOAS ONLY) B301190 0608 |
| 6 | SAND AND CLAY | | | | | | |
| 7 | | | | | | | |
| | | | | 100 | | 8.0-10.0 SAMPLE<br>Recovered 2.0/2.0 ~~100%~~<br>SILTY CLAY AND SAND, moderate brown (5YR 4/4); light brown (5YR 5/6); non stratified; fine to trace coarse grained sand; moderate sorting; subround; quartzose; low to medium plasticity; calcareous in part; medium dense; damp to dry | 8.0-10.0 SAMPLE (VOAS ONLY) B301190 0810<br>8.0-12.0 SAMPLE B301108 12 |
| 8 | SILTY CLAY AND SAND | | | | | | |
| 9 | | | | | | | |
| | | | | 100 | | 10.0-12.0 SAMPLE<br>Recovered 2.0/2.0 ~~100%~~<br>SILTY CLAY AND SAND: same as above; trace fine gravels; decreasing calcareous deposits | 10.0-12.0 SAMPLE (VOAS ONLY) B301190 1012 |
| 10 | | | | | | | |
| 11 | | | | | | | |
| | | | | 100 | | 12.0-14.0 SAMPLE<br>Recovered 2.0/2.0 ~~100%~~<br>SILTY CLAYEY SAND: same as above; increasing gravel size and percentage with depth; low to no plasticity; dense; moist | 12.0-14.0 SAMPLE (VOAS ONLY) B301190 1214 |
| 12 | SILTY CLAYEY SAND | | | | | | |
| 13 | | | | | | | |

GTL002PJ

# LOG OF BOREHOLE/GEOTECHNICAL DATA

WELL NO. B301190



| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | SPT N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED OR ROCK DEFECTS |
|---|---|---|---|---|---|---|---|
| 13 | SILTY CLAYEY SAND | | | | | | 12.0 – 15.1 SAMPLE<br>B301190 1216 |
| 14 | SILTY GRAVELLY SAND | | | 55 | | 14.0–16.0 SAMPLE<br>Recovered 1.1/2.0 ~~55%~~<br>SILTY GRAVELLY SAND: medium brown (5YR 4/4); light brown (5YR 5/6); some clay; fine to coarse grained sand; 1 to 5cm gravels; poor sorting; subangular; quartzose; low to no plasticity; dense; moist | 14.0 – 15.1 SAMPLE<br>(VOAS ONLY)<br>B301190 1416 |
| 15 | | | | | | | |
| 16 | GRAVELLY SANDY CLAY | | | 45 | | 16.0–18.0 SAMPLE<br>Recovered 0.9/2.0 ~~45%~~<br>GRAVELLY SANDY CLAY; moderate brown (5YR 4/4-3/4); nonstratified; fine to very coarse grained sand; gravels to cobbles; poor sorting; subangular; quartzose; low to medium plasticity; very stiff; moist | 16.0–16.9 SAMPLE<br>(VOAS ONLY)<br>B301190 1618<br>16.0 – 18.6 SAMPLE<br>B301190 1620 |
| 17 | | | | | | | |
| 18 | | | | 35 | | 18.0–20.0 SAMPLE<br>Recovered 0.7/2.0 ~~35%~~<br>18.0–18.6: GRAVELLY SANDY CLAY: same as above<br>BED ROCK | 18.0 – 18.7 SAMPLE<br>(VOAS ONLY)<br>B301190 1820 |
| 19 | 18.6 SILTY SANDSTONE | | | | | 18.6–18.7: SILTY SANDSTONE: dark yellowish orange (10YR 6/6); dusky yellow (5Y 6/4); yellowish gray (5Y 7/2); nonstratified; fine to medium grained sand; some clay; moderate sorting; subround; quartzose; low plasticity; weathered; medium hard; moist | |
| 20 | | | | | | 20.0–20.5 SAMPLE<br>NO SAMPLE TAKEN: CENTER BIT USED | |
| 21 | | | | | | | |

GTL003

# LOG OF BOREHOLE/GEOTECHNICAL DATA

WELL NO B301190



| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED OR ROCK DEFECTS |
|---|---|---|---|---|---|---|---|
| 21 | SILTY SANDSTONE | | | 47 | | 20.5-22.0 SAMPLE<br>Recovered 0.7/1.5 ~~=47%~~<br>SILTY SANDSTONE: same as above | |
| 22 | | | | | | 22.0-22.5 SAMPLE<br>NO SAMPLE TAKEN: CENTER BIT USED | |
| 23 | | | | 0 | 0 | 22.5-23.0 SAMPLE<br>Recovered 0.0/0.5 ~~=0%~~ | |
| 24 | SILTY SANDY CLAYSTONE<br>SILTY SANDSTONE<br>SILTY SANDY CLAYSTONE | | | 80 | 100 | 23.0-25.0 SAMPLE<br>Recovered 1.6/2.0 ~~=80%~~<br>RQD = 1.6/1.6 ~~=100%~~<br>23.0-23.6: SILTY SANDY CLAYSTONE: moderate yellowish brown (10YR5/4); nonstratified; fine grained sand; well sorted; subround; quartzose; medium plasticity; heavy iron staining; weathered; medium hard; moist | |
| 25 | | | | | | | 25.5; 70°; healed; iron oxide w/ iron nodules |
| 26 | SILTY CLAYSTONE | | | 80 | 100 | 23.6-24.1: SILTY SANDSTONE: light gray (N7/0); dusky yellow (5Y6/4); nonstratified; fine grained sand; trace clay; well sorted; subround; quartzose; no plasticity; iron staining; weathered; noncemented; medium hard; moist<br>24.1-24.6: SILTY SANDY CLAYSTONE: same as 23.0-23.6, moderate yellowish brown (10YR5/4); light brown (5YR5/6); manganese oxide deposits | 25.7; 80°; healed; iron oxide<br>26.0-26.3, 35°; healed; iron oxide<br>26.3-26.5; 60°; leached open; iron oxide with iron nodules<br>26.8; 55°; healed; iron oxide<br>26.9; 55°; healed; iron oxide |
| 27 | | | | | | | |
| 28 | SILTY CLAYSTONE | | | 80 | 100 | 25.0-28.0 SAMPLE<br>Recovered 2.4/3.0 ~~=80%~~<br>RQD = 2.4/2.4 ~~=100%~~<br>SILTY CLAYSTONE: same as above, moderate yellowish brown (10YR5/4); light brown (5YR5/6), light olive gray (5Y6/1); mottled; inclusions of sandy claystone at 26.1 to 26.3 and 26.8 to 27.2; heavy iron staining with carbonate and iron oxide concretions and iron cementing along fracture surfaces. | 28.6-28.7; 55°; healed; iron oxide |
| 29 | | | | | | | |

CR004

# LOG OF BOREHOLE/GEOTECHNICAL DATA

WELL NO. B301190 PAGE 5 OF 6

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | SPT N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED OR ROCK DEFECTS |
|---|---|---|---|---|---|---|---|
| 29 | | | | 40 | 50 | 28.0-30.0 SAMPLE<br>Recovered 0.8/2.0 ~~40%~~<br>RQD 0.4/0.8 ~~50%~~<br>SILTY CLAYSTONE: Same as above; silty sandstone lens at 28.3-28.5 same as 23.6 to 24.1. | |
| 30 | SILTY CLAYEY SANDSTONE | | | 17 | 100 | 30.0-33.0 SAMPLE<br>Recovered 0.5/3.0 ~~17%~~<br>RQD 0.5/0.5 ~~100%~~<br>SILTY CLAYEY SANDSTONE: light gray (N7/10); moderate yellowish brown (10YR 5/4); grayish orange (10YR 7/4); nonstratified; fine grained; well sorted; round; quartzose; moto medium plasticity; iron staining; non cemented; medium hard; moist | |
| 31 | | | | | | | |
| 32 | | | | | | | |
| 33 | | | | | | | |
| 34 | SILTY SANDY CLAY-STONE | | | 140 | 100 | 33.0-35.0 SAMPLE<br>Recovered 2.8/2.0 ~~140%~~<br>RQD = 2.8/2.8 ~~100%~~<br>SILTY SANDY CLAYSTONE: grayish orange (10YR 7/4); light brown (5YR 5/6); mottled; gradational with degree of sand percentage; with lenses of clayey sandstone; fine grained sand; well sorted; round; quartzose; low to medium plasticity; heavy iron staining; trace manganese staining; medium hard; moist | |
| 35 | | | | | | | |
| 36 | SILTY SANDY CLAY-STONE | | | 100 | 100 | 35.0-38.0 SAMPLE<br>Recovered 3.0/3.0 ~~100%~~<br>RQD 3.0/3.0 ~~100%~~<br>SILTY SANDY CLAYSTONE: Same as above; grading to light gray (N7/0); olive gray (5Y 4/1); fine grained sand decreasing with depth; iron staining decreasing with depth; scattered 0.5 to 1.00cm lenses of silty sandstone, medium hard; moist. | 35.2; 70°-70°; healed; iron oxide<br>35.3-35.4; 45°; healed; iron ox<br>35.4-35.5; 75°-75°; healed; iron<br>35.8-36.0; multiple 30°-35°; hea iron oxide<br>36.0-36.2; 35°-80°-80°; healed iron oxide<br>36.5-36.6; 90°-90°; healed; iron oxide<br>36.85; 75°; healed; iron ox |

ORL005

# LOG OF BOREHOLE/GEOTECHNICAL DATA

WELL NO. B301190



| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER ILSIS PERFORMED OR ROCK DEFECTS |
|---|---|---|---|---|---|---|---|
| 37 | SILTY SANDY CLAY-STONE | | | | | | 37.0; 80°; healed; iron oxide |
| 38 | CLAY-STONE | | | 100 | 82 | 38.0-43.0 SAMPLE<br>Recovered 5.0/5.0 ~~100%~~<br>RQD 4.1/5.0 ~~82%~~<br>CLAYSTONE: medium gray (N5/0); dusky yellow (5Y6/4); brownish gray (5YR4/1); mottled; blocky; nonstratified; trace silt; medium to high plasticity; iron and manganese staining; slightly weathered; hard; moist | 38.3-38.4; 90°-60°; mechanical damage; iron oxide<br>38.65-38.9; 45°; healed; iron oxide<br>38.9-39.1; 35°; healed; iron oxide<br>39.5; 90°; healed; iron oxide<br>39.7; 20°-60°; healed; iron oxide<br>39.8-40.1; 15°; healed; iron oxide<br>40.2; 65°; healed; iron oxide<br>40.8; 25°; healed; iron oxide<br>41.3-41.4; 40°; healed; iron oxide<br>41.8; 40°; healed; iron oxide<br>41.9-42.1; 20°; healed; iron oxide<br>42.3-42.5; 80°-40°-80°; healed; iron oxide |
| 39 | | | | | | | |
| 40 | | | | | | | |
| 41 | | | | | | | |
| 42 | | | | | | | |
| 43 | | | | | | | |
| | | | | | | Total Depth = 43.0' | |
| 44 | | | | | | | |
| 45 | | | | | | | |

CTLOG 6

# LOG OF BOREHOLE/GEOTECHNICAL DATA

QA BY/DATE SPC/2-28-90
LOCATION
COORDINATES
TOTAL DEPTH 80', 24.5'

DRILLING COMPANY Boyles Brothers
DATE DRILLED 2/27/90; 3-5-90
DRILLING METHOD Hollow Stem Auger; NX Core
LOGGED BY J.K. Harris; ~~[illegible]~~; SP Carpenter
GEOLOGIST

BOREHOLE/WELL NO.: B301290
GROUND SURFACE ELEVATION
WATER LEVEL ENCOUNTERED None
STATIC
DRILLER D. Styles; J.B. Boyd; Gaski HELPER A Boday; M. Boyd
DRILLING FLUID None; Water ~~[illegible]~~ 8.00
CHECKED BY
SITE MANAGER
PROJECT MANAGER

COMMENTS Surface casing set to 8.0' below ground surface

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED OR ROCK DEFECTS |
|---|---|---|---|---|---|---|---|
| 0 | CLAYEY SILT | | | 48 | – | **00-20' SAMPLE**<br>Recovered 0.95/2.0'<br>CLAYEY SILT: very dark grayish brown (10YR3/2), (95%) nonplastic to slightly plastic fines; (5%) fine-grained sand, (<1%) trace gravel, moderately well sorted, subangular, maximum size 2cm, firm to stiff, damp, rooted throughout | HNU background 0.0<br>Rad background 20.0<br>All readings on cuttings, in breathing zone, on core, and in augers are background unless otherwise noted.<br>TRIP BLANK SAMPLE<br>TB0226901<br>0.0-0.95' SAMPLE (VOA only)<br>B3012900002 |
| 1 | | | | | | | |
| 2 | Sandy Clayey SILT | | | 80 | – | **2.0'-4.0' SAMPLE**<br>Recovered 1.6'/2.0'<br>SANDY, CLAYEY SILT: brown (10YR5/3), (50-60%) non plastic - slightly plastic fines, (50-40%) very fine to fine-grained sand, occasional ~~very coarse sand~~; subangular; ~~[illegible]~~: very stiff; damp - dry, limonite rims - mottling at base, brownish yellow (10YR6/8); (@ 5%) caliche throughout white (10YR8/1), occasional roots (very fine) | 0.0-3.6' SAMPLE<br>B3012900004<br>2.0-3.6' SAMPLE (VOA only).<br>B3012900204 |
| 3 | | | | | | | |
| 4 | Sandy Clayey SILT | | | 100 | – | **4.0'-6.0' SAMPLE**<br>Recovered 2.0/2.0'<br>4.0-4.4 SANDY, CLAYEY SILT (as at 2.0') not rooted; light yellowbrown (10YR 6/4) | 4.0-6.0' SAMPLE (VOA only)<br>B3012900406 |
| | SILTY CLAYSTONE | | | | | | |
| 5 | | | | | | | |

GTLOGLPJ

# LOG OF BOREHOLE/GEOTECHNICAL DATA

WELL NO. B301290

PAGE ____ OF ____

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED OR ROCK DEFECTS |
|---|---|---|---|---|---|---|---|
| 5 | SILTY CLAY-STONE | | | | | 4.4-4.55 SANDY, CLAYEY SILT (as at 2.0') except dark yellowish brown (10YR4/6); fine roots and fine caliche stringers along roots | 4.0'-4.55' SAMPLE B301290 0406 |
| | | | | | | BEDROCK | |
| 6 | | | | 100 | – | 4.55-5.7' SILTY CLAYSTONE dark greyish brown (2.5Y 4/2), blocky, 100% medium plastic fines; very stiff, several fine limonite filled fractures, occasional caliche pockets, mottled, occasional black (10YR2/1) (carbon?) discoloration in pockets (1cm) and stringers, clay percentage increases to base, damp | |
| 7 | | | | | | | |
| 8 | | | | | | 5.7-6.0' SILTY CLAYSTONE as at 4.55' except color change to dark greyish brown (10YR4/2), slight increase in silt percentage, finely laminated | |
| | | | | | | 6.0'-8.0' SAMPLE | |
| 9 | | | | | | Recovered 2.0'/2.0' | |
| | | | | | | SILTY CLAYSTONE: highly weathered, dark greyish brown to greyish brown (10YR4/2-10YR5/2), blocky, 100% medium plastic fines; fine limonite veins throughout (fine fractures) - predominately horizontal and vertical, occasional caliche along layers; very stiff, damp | |
| 10 | | | | | | | |
| 11 | | | | | | | |
| 12 | | | | | | | |
| 13 | | | | | | | |

GEO02PJ

QA
BW
4-2-90

# LOG OF BOREHOLE/GEOTECHNICAL DATA

QA BY/DATE
LOCATION 881 Hillside
COORDINATES
TOTAL DEPTH 24.5'

DRILLING COMPANY Boylan Brothers
DATE DRILLED ; 3-5-90 /
DRILLING METHOD ; Nx core
LOGGED BY ; JE Marks / SP Carpenter
GEOLOGIST

BOREHOLE/WELL NO B301290
GROUND SURFACE ELEVATION
WATER LEVEL ENCOUNTERED None
STATIC
DRILLER ; P. Bushkrack HELPER ; M. Boyd
DRILLING FLUID None ; Water
CHECKED BY
SITE MANAGER

PROJECT MANAGER

COMMENTS

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED OR ROCK DEFECTS |
|---|---|---|---|---|---|---|---|
| 0 | | | | | | | |
| 1 | | | | | | | |
| 2 | | | | | | | |
| 3 | | | | | | | |
| 4 | | | | | | | |
| 5 | | | | | | | |

GTLOGI.PJ

# LOG OF BOREHOLE/GEOTECHNICAL DATA

WELL NO. _____ PAGE _____ OF _____

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED OR ROCK DEFECTS |
|---|---|---|---|---|---|---|---|
| 5 | | | | | | | |
| 6 | | | | | | | |
| 7 | | | | | | | |
| 8 | SILTY CLAY | CORE | | 73 | 82 | 8.0-9.5' SAMPLE<br>Recovered 1.1/1.5'<br>RQD 0.9/1.1'<br>SILTY CLAY: pale yellowish brown (10YR 6/2), moderate brown (5YR 4/4); dark gray (N 3/0); mottled; trace very fine grained gravel up to 5mm; angular; quartzite; trace sand; poorly sorted; feldspathic; some caliche zones - effervesces with HCl; highly weathered; consolidated; soft; damp | |
| 9 | CLAYEY SANDSTONE | | | 60 | 73 | | |
| 10 | SILTY CLAYSTONE | | | | | BEDROCK<br>9.5-12.0' SAMPLE<br>Recovered 1.5/2.5'<br>RQD 1.1/1.5'<br>9.5-9.9'. CLAYEY SANDSTONE; light gray (N 7/0) to dusky yellow (5Y 6/4); mottled; very fine grained sand, well sorted; quartzose; weathered; soft; damp<br>9.9-11.0'. SILTY CLAYSTONE light olive gray (5Y 5/2) to moderate brown (5YR 4/4), mottled, abundant iron and caliche nodules up to 2cm, trace plasticity; very weathered, moderately soft; damp | |
| 11 | | | | | | | |
| 12 | | | | 0 | 0 | | |
| 13 | | | | | | | |

CTL002PJ

# LOG OF BOREHOLE/GEOTECHNICAL DATA

WELL NO _____ PAGE _____ OF _____

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED OR ROCK DEFECTS |
|---|---|---|---|---|---|---|---|
| 13 | | | | 0 | 0 | 12.0 - 13.0' SAMPLE<br>Recovered 0.0/0.0' | |
| | CLAY-STONE | | | 70 | 86 | 13.0 - 13.5' SAMPLE<br>Recovered 0.0/0.0' | |
| 14 | | | | | | 13.5 - 14.5' SAMPLE<br>Recovered 0.7/1.0'<br>RQD = .6/.7' | 14.1; 70°; healed to open; slicken side |
| | CLAY-STONE | | | 40 | 67 | CLAYSTONE: light olive gray (5Y 6/1); light gray (N 7/0); stained dark yellowish orange (10YR 6/6); blocky; some to trace silt; iron staining; medium to high plasticity; weathered; Firm; damp | |
| 15 | | | | | | | |
| 16 | | | | | | 14.5 - 17.5' SAMPLE<br>Recovered 1.2/3.0'<br>RQD = .8/1.2' | |
| 17 | | | | | | CLAYSTONE: same as above; iron nodules at 14.8 to 14.9'; scattered laminations of iron staining 1 to 3mm; | |
| | CLAY-STONE | | | 75 | 87 | | |
| 18 | | | | | | 17.5 - 19.5' SAMPLE<br>Recovered 1.5/2.0'<br>RQD = 1.3/1.5' | |
| | SILTY SANDY CLAY-STONE | | | | | | |
| 19 | | | | | | 17.8 - 18.5' CLAYSTONE: same as above; dark yellowish orange (10YR 6/6); medium gray (N 5/0); light brownish gray (5YR 6/1); blocky; some to trace silt; micro laminations to mottled iron staining throughout; medium to high plasticity; weathered; Firm, damp | |
| | | | | 0 | 0 | | |
| 20 | | | | | | | |
| 21 | | | | | | | |

GTL083

# LOG OF BOREHOLE/GEOTECHNICAL DATA

WELL NO _____ PAGE _____ OF _____

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED OR ROCK DEFECTS |
|---|---|---|---|---|---|---|---|
| 21 | | | | | | 18.5-19.0: SILTY SANDY CLAYSTONE: medium gray (N5/0); light brownish gray (5YR6/1); non stratified; very fine to fine grained sand, moderate sorting; subround; quartzose; medium plastic; firm; damp | |
| 22 | | | | 0 | 0 | | |
| | silty sandy claystone | | | 25 | 0 | | |
| 23 | | | | | | 19.5-21.5' SAMPLE<br>Recovered 0.0/0.0<br>RQD 0.0/0.0 | |
| 24 | | | | | | 21.5-22.5' SAMPLE<br>Recovered 0.0/0.0<br>RQD 0.0/0.0 | |
| 25 | | | | | | 22.5-24.5' SAMPLE<br>Recovered 0.5/2.0<br>RQD = 0.0/0.5<br>SILTY SANDY CLAYSTONE: moderate yellowish brown (10YR5/4); dark yellowish orange (10YR6/6); non stratified; very fine grained sand, well sorted; calcium carbonate to iron cement in part, hard at 22.9-23.0'; low plasticity; moderately soft; damp | |
| 26 | | | | | | | |
| 27 | | | | | | | |
| 28 | | | | | | | |
| 29 | | | | | | | |

GTLOG4

# LOG OF BOREHOLE/GEOTECHNICAL DATA

QA BY/DATE SPC/2-28-90
LOCATION
COORDINATES
TOTAL DEPTH

DRILLING COMPANY Boyles Brothers
DATE DRILLED 4/27/90;
DRILLING METHOD Hollow Stem Auger;
LOGGED BY J.K. Harris;
GEOLOGIST

BOREHOLE/WELL NO B301390
GROUND SURFACE ELEVATION
WATER LEVEL ENCOUNTERED
STATIC
DRILLER D. Styles; HELPER A Boday;
DRILLING FLUID None;
CHECKED BY
SITE MANAGER

PROJECT MANAGER

COMMENTS

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED OR ROCK DEFECTS |
|---|---|---|---|---|---|---|---|
| 0 | CLAYEY SILT | | | 35 | | 0.0'-2.0' SAMPLE<br>RECOVERED 0.7/2.0'<br>0.0-0.5: CLAYEY SILT: very dark grayish brown (10YR3/2); (95%) non to slightly plastic fines; (5%) fine grained sand; occasional very coarse sand, subangular, soft, rooted throughout, dry-damp | Hole background 0.0<br>Rad background 2.0<br>All readings on cuttings, in breathing zone, in core and in augers, 0.0, 2.0, unless otherwise noted below |
| 1 | SILTY CLAY | | | | | 0.5-0.7: SILTY CLAY: dark yellowish brown (10YR4/4), 100% medium plastic fines, soft, moldable, occasional roots, damp | TRIP BLANK SAMPLE<br>TB0226901 |
| 2 | | | | | | | 0.0'-0.7' SAMPLE (VOAs only)<br>B3013900002 |
| | SANDY CLAY | | | 100 | | 2.0'-4.0' SAMPLE<br>Recovered 2.0/2.0'<br>SANDY CLAY: dark yellowish brown (10YR4/4), laminated (45°∠) lamina delineated by Mottling, (70-80%) medium plastic fines, (20-30%) fine grained sand; moderately well sorted, subrounded, quartz, slightly Sandier toward 4.0' occasional very coarse sand; scattered fine traces of carbonaceous material (black) and scattered fine rootlets, firm, damp | |
| 3 | | | | | | | 0.0'-4.0' SAMPLE<br>B3013900004 |
| 4 | CLAYEY SAND | | | 45 | | | 2.0'-4.0' SAMPLE (VOAs ONLY)<br>B3013900204 |
| | | | | | | 4.0'-6.0' SAMPLE<br>Recovered 0.9'/2.0'<br>CLAYEY SAND yellowish brown (10YR5/6), no structure, (70-60%) fine grained sand | |
| 5 | | | | | | | |

GRLOGI.PJ

# LOG OF BOREHOLE/GEOTECHNICAL DATA

WELL NO B301390 PAGE ____ OF ____

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | SPT N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED OR ROCK DEFECTS |
|---|---|---|---|---|---|---|---|
| 5 | | | | | | (30-40%) medium plastic fines (10%-trace) gravel; moderately well sorted, subrounded to subangular quartzite, maximum size 3cm, mottled, decaying leaf fine rootlets, firm, damp | 4.0'-4.9' SAMPLE (VOAs only) B301390 0406 |
| 6 | SILTY CLAY | | | 40 | | 6.0'-8.0' SAMPLE Recovered 0.8'/2.0' SILTY CLAY light yellowish brown (10YR6/4) to brownish yellow (10YR6/6), no structure to weakly laminated, (95%) plastic fines, (5%) gravel, subrounded, quartz and granitic; occasional fine grained sand in several lamina, mottled limonite stains at base, firm, moist. | 4.0'-11.5' SAMPLE B301390 0412 |
| 7 | | | | | | | 6.0'-6.8' SAMPLE (VOAs ONLY) B301390 0608 |
| 8 | CLAYEY SILT | | | 10 | | 8.0-10.0' SAMPLE Recovered 0.2'/2.0' CLAYEY SILT. pale brown (10YR6/3) - brownish yellow (10YR6/8), weakly laminated; (95%) slightly plastic fines, (5%) very fine-grained - fine-grained sand, moderately well sorted, quartz, limonite in bands throughout; mottled, firm, damp | |
| 9 | | | | | | | |
| 10 | CLAYEY SILT | | | 0 | | 10.0-12.0' SAMPLE Recovered partial part of core CLAYEY SILT pale brown (10YR6/3) to brownish yellow (10YR6/8), as above except occasional gravel, subrounded; quartz, maximum size 1cm; black carbonaceous spots (MnOX?) throughout | |
| 11 | | | | | | | |
| 12 | | | | | | 12.0-13.0' SAMPLE NO SAMPLE RECOVERED. CENTER BIT USED. | |
| 13 | | | | | | | |

GTL002PJ

# LOG OF BOREHOLE/GEOTECHNICAL DATA

WELL NO B301390 PAGE ____ OF ____

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED OR ROCK DEFECTS |
|---|---|---|---|---|---|---|---|
| | | | | | | BEDROCK | |
| 13 | SILTY CLAY-STONE | | | 100 | | 13.0' – 14.6' SAMPLE<br>Recovered 1.6'/1.6'<br>SILTY CLAYSTONE brown (10YR 4/3), blocky; highly weathered (100%) medium plastic fines; scattered caliche veins/pockets, limonite in fine veins, stiff-firm, damp | |
| 14 | | | | | | | |
| 15 | | | | | | | |
| 16 | | | | | | | |
| 17 | | | | | | | |
| 18 | | | | | | | |
| 19 | | | | | | | |
| 20 | | | | | | | |
| 21 | | | | | | | |

GTL003

# LOG OF BOREHOLE/GEOTECHNICAL DATA

QA BY/DATE
LOCATION
COORDINATES
TOTAL DEPTH 18.0'; 40.0'

DRILLING COMPANY Boyles Drilling
DATE DRILLED 2/26/90; 3-5-90
DRILLING METHOD Hollow Stem Auger.
LOGGED BY J. K Harris; R. Senjebash
GEOLOGIST

BOREHOLE/WELL NO. B301490
GROUND SURFACE ELEVATION
WATER LEVEL ENCOUNTERED
STATIC
DRILLER D. Styles HELPER A Bordey
DRILLING FLUID None; water used after 18.0'
CHECKED BY
SITE MANAGER
PROJECT MANAGER

COMMENTS Surface casing set to 18.0 below ground surface

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED OR ROCK DEFECTS |
|---|---|---|---|---|---|---|---|
| 0 | | | | 0 | | 0.0-2.0' SAMPLE<br>Recovered 0'/2.0' | HNU background - 0.0<br>OVAR meter background 20.0<br>All readings in cuttings, in breathing zone, in core, and in augers; backgr. unless noted<br>TRIP BLANK SAMPLE<br>TB0226901<br>FIELD BLANK SAMPLE<br>B301490016FB |
| 1 | | | | | | | |
| | | | | | | 2.0-3.0' SAMPLE<br>No sample recovered<br>Center bit used. | |
| 2 | | | | 0 | | | |
| 3 | SILTY CLAY | | | 90 | | 3.0'-4.0' SAMPLE<br>Recovered 0.9'/10'<br>SILTY CLAY: dark yellowish brown (10YR4/4) mottled, no structure; 80% medium plastic fines; 10%; fine grained sand (10%, gravel, moderately sorted, subrounded quartzite, ~~maximum size 3cm~~, (stiff-firm) fine rootlets, damp. | up to 3 cm<br>3.0'-3.9' SAMPLE (VOCs only)<br>B301490004<br>0.0'-3.9' SAMPLE<br>B301490004 |
| 4 | SILTY CLAY | | | 65 | | | |
| 5 | | | | | | | |

GTLOGLPJ

# LOG OF BOREHOLE/GEOTECHNICAL DATA

WELL NO B301490 PAGE ____ OF ____

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED OR ROCK DEFECTS |
|---|---|---|---|---|---|---|---|
| 5 | SILTY CLAY | | | | | **40'-60' SAMPLE** Recovered 1.3'/2.0' SILTY CLAY - same as above, except slightly greater sand (15?%), gravel to 45cm; occasional caliche and 1mm-2mm black brittle grains (MnOx), occasional fine rootlets | |
| 6 | SILTY SANDY CLAY | | | 100 | | **6.0'-8.0' SAMPLE** Recovered 2.0'/2.0' SILTY, SANDY, CLAY - dark yellowish brown (10YR4/4), mottled, 70% medium plastic fines; 20% fine grained sand; 10%, gravel up to 2cm poorly sorted, subrounded, quartzite ~~maximum size 3cm~~, limonite stains throughout, occasional caliche, damp | 4.0'-5.3' SAMPLE (VOAs only) B3014900406 |
| 7 | | | | | | | 4.0'-8.0' SAMPLE B3014900408 |
| 8 | SANDY CLAYEY SILT | | | 85 | | **8.0'-10.0 SAMPLE** Recovered 1.7'/2.0' SANDY, CLAYEY, SILT yellowish brown (10YR5/4), mottled 70% medium plastic fines; 20% fine-grained sand, 10% gravel up to 1cm poorly sorted, subrounded quartzite ~~maximum size 1cm~~, limonite stains caliche throughout (10% of pore space) much greater percentage than previous intervals, gradually slightly less sandy at 9.7', stiff firm, damp | 6.0'-8.0' SAMPLE (VOAs only) B3014900608 |
| 9 | | | | | | | |
| 10 | SILTY CLAY | | | 95 | | | |
| 11 | | | | | | | 8.0-9.7' SAMPLE (VOAs only) B3014900808 B3014900810D |
| | | | | | | **10.0'-12.0' SAMPLE** Recovered 1.9'/2.0' 10.0'-10.7': SILTY CLAY - brown (10YR5/3), 95% medium plastic fines, 5% gravel up to 1cm subrounded quartzite ~~maximum size 1cm~~, caliche throughout, firm-stiff, damp | |
| 12 | SILTY CLAY | | | 85 | | 10.7': caliche infilled fracture, 80°∡ | 8.0'-11.9' SAMPLE B3014900812 B3014900812D |
| 13 | Clay and silty sand | | | | | | |

CTL002PJ

# LOG OF BOREHOLE/GEOTECHNICAL DATA

WELL NO B301490 PAGE ____ OF ____

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED OR ROCK DEFECTS |
|---|---|---|---|---|---|---|---|
| 13 | clay and SILTY SAND | | | | | 10.7-11.9: SILTY CLAY: brown (10YR5/3) 95% medium plastic fines; varies trace-5% very fine to fine-grained sand; occasional gravel, up to 1cm subangular, quartzite maximum ~~gravel size 1cm~~, caliche throughout (<1%), ~~mottled~~ limonite veins; firm to stiff, damp | 10.0'-11.9' SAMPLE (VOAs only) B301490 1012 |
| 14 | SANDY CLAY | | | 80 | | | |
| | clayey GRAVEL | | | | | 12.0'-14.0' SAMPLE<br>Recovered 1.7'/2.0' | |
| 15 | SILTY CLAY | | | | | 12.0'-12.4': SILTY CLAY: same as above<br>12.4': caliche in lamina, gravel to 4cm<br>12.4'-13.7': CLAY AND SAND interbedded with SILTY SAND: strong yellowish brown (7.5YR5/6), CLAY and SAND 50% medium-slightly plastic fines; 50% fine grained sand, moderately sorted, subrounded, quartzose occasional gravel, ~~maximum size~~ up to 4cm, caliche veins throughout. firm, damp. SILTY SAND: 80% medium-fine grained, moderately well sorted, subrounded quartzose, 20% slightly plastic fines, loose, damp | brown (10YR5/3); 12.0'-13.7' SAMPLE (VOAs only) B301490 1214 |
| 16 | ~~clayey gravel~~ | | | 100 | 100 | | |
| 17 | SILTY CLAY-STONE | | | | | 13.7: 6cm quartzite cobble at base | |
| 18 | CLAYSTONE | CORE | | 77 | 100 | 14.0'-16.0' SAMPLE<br>Recovered 1.6'/2.0' | 12.0-15.6' SAMPLE B301490 1216 |
| 19 | | | | | | 14.0'-14.4': SANDY CLAY: brown (10YR5/3) mottled, 60% medium plastic fines, 30% fine grained sand; moderately well sorted subrounded: quartzose: trace very coarse sand, maximum size 2mm, caliche veins, firm; damp | |
| 20 | CLAYSTONE | | | 100 | 100 | 14.4'-14.7': CLAYEY GRAVEL brown (10YR5/3), ~~gravel maximum size~~ up to 4cm in clay matrix. CLAY is ~~silty and~~ 90% medium plastic fines; 10% fine grained sand; damp<br>14.7'-15.6': SILTY CLAY: brown (10YR5/3), mottled; 90% medium plastic fines, 5% fine grained sand; 5% gravels, subrounded, quartzose, up to 3cm | 14.0'-15.6' SAMPLE (VOAs only) B301490 1416 |
| 21 | | | | | | | |

CTL003

# LOG OF BOREHOLE/GEOTECHNICAL DATA

WELL NO B301490 PAGE ____ OF ____

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED OR ROCK DEFECTS |
|---|---|---|---|---|---|---|---|
| 21 | CLAYSTONE | | | | | ~~Maximum size 3cm~~; caliche in veins throughout, firm, damp. stiff; | |
| | | | | | | 16.0'–18.0' SAMPLE ← ~~BEDROCK CONTACT AT 16.1'~~ | |
| | | | | | | Recovered 2.0'/2.0' CLAYEY GRAVEL: | |
| | | | | | | 16.0'–16.1': as above at 14.4'–14.7 BEDROCK | |
| 22 | | | | | | 16.1'–18.0' SILTY CLAYSTONE: grayish brown (2.5Y5/2); blocky 99% medium plastic fines, 1% very coarse sand; well sorted, subrounded, quartzose, scattered caliche in pockets and veins, very stiff, damp | |
| | CLAYSTONE | | | 125 | 100 | | |
| 23 | | | | | | | |
| | SANDSTONE | | | | | 18.0–19.5' Sample | |
| | | | | | | Recovered 0.4/1.5' RQD 0.4/0.4 | |
| 24 | | | | | | 18.0–18.4': Claystone; Pale yellowish brown (10YR6/2) with a trace of light brown (5YR 6/4), (all clay); Trace of limonite in minute veinlets to 0.5mm in width (randomly oriented); stiff to hard; damp. | |
| 25 | | | | | | 19.5–22.5' Sample | |
| | | | | | | Recovered 3.0/3.0 RQD 3.0/3.0 | No Fractures |
| | | | | | | Claystone; as in 18.0–18.4'; trace of limonite in oval patches to 2 cm in diameter; very stiff; damp; | |
| 26 | CLAYSTONE | | | 2 | 100 | 19.5 – 21.5' is mottled with gray spots of olive gray (5Y 3/2); 21.5–22.0' is more evenly colored but shows apparently incipient iron nodule formation in oval patches with concentric orange banding (light brown, 5YR6/4) to 2 cm in diameter; Stiff to hard; damp. | |
| 27 | | | | | | | |
| | SILTY CLAYSTONE | | | | | 22.5 – 24.5' Sample | Fractures (WRT Core Axis) |
| | | | | | | Recovered 2.5/2.0' RQD 2.5/2.5 | 23.2' 90°; open, iron oxide |
| 28 | | | | | | 22.5–23.3': Claystone: (all clay) as in 18.0–18.4'; Trace of limonite stain in closed, randomly oriented veinlets to 0.5mm in width (core is not broken on these veinlets) | 24.1' 90°, open; iron oxide |
| | | | | 350 | 100 | Prominent veinlet at 24.0'; | |
| 29 | | | | | | 23.5–24.5': Sandstone; grayish yellow (5Y 8/4) | |

GTL004

# LOG OF BOREHOLE/GEOTECHNICAL DATA

WELL NO. _____ PAGE _____ OF _____

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED OR ROCK DEFECTS |
|---|---|---|---|---|---|---|---|
| 29 | claystone | | | | | very fine grained; very well sorted; quartzose; soft (not cohesive); damp. | Fractures |
| | | | | 100 | 92 | 24.5-28.5 - Sample<br>Recovered 0.1'/4.0' RQD 0/0.1<br>Claystone: as in 18.0-18.4'. | 26.9' 90°; open, iron oxide |
| 30 | | | | | | 28.5'-29.5' - Sample<br>Recovered 3.5'/1.0 RQD 3.5/3.5 | |
| 31 | CLAYSTONE | | | | | 26.0-26.3: Claystone; pale yellowish brown (10YR 6/2) mottled olive gray (5Y 3/2), stiff to hard; damp<br>26.3-29.0': silty claystone; trace of limonite in oval patch to 2cm in diameter at 27.4; stiff to hard; damp | Fractures |
| 32 | | | | | | 29.0-29.5': Claystone: pale yellowish brown (10YR 6/2); blocky, with 3cm diameter limonite nodule at 29.2'; stiff; damp. | 29.0' 45°; open; iron oxide |
| 33 | | | | | | 29.5-34.5' - Sample<br>Recovered 5.0'/5.0' RQD 4.6/5.0 | Fractures<br>29.7' 45°; open; iron o<br>31.5' 90°; open; iron ox<br>32.3' 45°, open; iron ox |
| 34 | | | | | | 29.5-34.3': Claystone; grayish orange (10YR 7/4); mottled with limonite-filled veinlets to 1mm in width, mostly vertical, jagged and irregular patterns; very stiff; damp. | 32.5 45°; open; iron oxide<br>32.7' 45°; open; iron ox |
| | SILTY CLAYSTONE | | | | | | |
| | | | | 82 | 100 | 34.3-34.5'. Silty Claystone: medium gray (N5); well sorted; stiff; damp to dry. | |
| 35 | | | | | | | |
| 36 | CLAYSTONE | | | | | | |
| 37 | | | | | | | |

GRL005

# LOG OF BOREHOLE/GEOTECHNICAL DATA

WELL NO. _____ PAGE _____ OF _____

| DEPTH (FT) | GRAPHIC LOG | SAMPLE TYPE & # | STP N-VALUE | REC % | RQD % | LITHOLOGIC DESCRIPTION | SAMPLES COLLECTED OR OTHER TESTS PERFORMED OR ROCK DEFECTS |
|---|---|---|---|---|---|---|---|
| 37 | | | | | | | |
| 38 | CLAYSTONE | | | | | 34.5 – 38.5' - Sample<br>Recovered 3.3'/4.0' RQD 3.3/3.3<br>Claystone: yellowish gray (5Y 7/2) with trace of light brown (looks orange) (5 YR 5/6); trace of limonite stained veinlets to 1.0 mm wide, mostly vertical, closed; no apparent bedding structure; very stiff; damp. | Fractures<br>37.9' 90°; open; iron ox |
| 39 | CLAYSTONE | | | 93 | 100 | | |
| 40 | | | | | | 38.5 - 40.0' - Sample<br>Recovered 1.4'/1.5' RQD 1.4/1.4<br>Claystone: yellowish gray (5Y 7/2); blocky when broken; trace of limonite veinlets (closed), near vertical and irregular; very stiff; damp.<br>TD = 40.0' | Fractures<br>38.8' 45°; open; iron oxic<br>39.2' 90°, open; iron ox |
| 41 | | | | | | | |
| 42 | | | | | | | |
| 43 | | | | | | | |
| 44 | | | | | | | |
| 45 | | | | | | | |

GTLOG 6

WESTON
MANAGERS DESIGNERS/CONSULTANTS

5301 CENTRAL AVENUE, N.E.
SUITE 1000
ALBUQUERQUE, NM 87108
PHONE (505) 255-1445

# CERTIFICATE OF CALIBRATION

Customer WESTON - DENVER
Order No. 2029-33-09
Mfg. LUDLUM Model 3 Serial No. 46214
Mfg. LUDLUM Detector Model 44-9 Serial No. PR032950
Cal. Date 3-17-90 Cal. Due 3-17-91 Temperature 79°
Cal. Interval _____ Procedure: In accordance with Mfg. Spec. Humidity ____ %

**INSTRUMENT RECEIVED**

- [x] Within tolerance + — 10%
- [ ] Out of tolerance
- [ ] 10%-20%
- [ ] Requiring repair
- [ ] New instrument

**OPERATING PARAMETERS**

- [ ] Threshold Dial Setting _____
- [ ] Det. Oper. voltage _____ V.
- [x] Input sensitivity 29 mV
- [ ] Det. performance check only

COMMENTS: LUDLUM PULSER MODEL 500
SER # 50803 CAL. DATE → 12-13-89

| RANGE MULTIPLIER | REFERENCE CALIBRATION POINT | INSTRUMENT DIAL READING | INSTRUMENT RECEIVED "AS FOUND" READING |
|---|---|---|---|
| x 100 | 400 000 cpm | 4000 | ± 10% |
| " | 100 000 " | 1000 | ± 10% |
| x 10 | 40 000 " | 4000 | ± 10% |
| " | 10 000 " | 1000 | ± 10% |
| x 1 | 4000 " | 4000 | ± 10% |
| " | 1000 " | 1000 | ± 10% |
| x 0.1 | 400 " | 4000 | ± 10% |
| " | 100 " | 1000 | ± 10% |
| | | | |
| | | | |

ALL Range(s) Calibrated with Ludlum Model 500 Pulser

**CALIBRATION—NBS TRACEABLE**

- [ ] Cs137 Gamma
- [ ] Neutron Am-241/Be
- [ ] Alpha _____
- [ ] Beta _____
- [ ] Other _____
- [x] ELECTRONIC CALIBRATION

Calibrator Stephen B. Schafer
Date 3/17/90 Quality Control _____

WESTON
MANAGERS DESIGNERS/CONSULTANTS
5301 CENTRAL AVENUE, N.E.
SUITE 1000
ALBUQUERQUE, NM 87108
PHONE. (505) 255-1445

# CERTIFICATE OF CALIBRATION

Customer: WESTON

Order No.:

Mfg. LUDLUM Model 12 Serial No. 58348

Mfg. LUDLUM Detector Model 44-9 Serial No. PR 5764

Cal. Date 3-17-90 Cal. Due 3-17-91 Temperature 79 °

Cal. Interval 1 year Procedure: In accordance with Mfg. Spec. Humidity ——— %

**INSTRUMENT RECEIVED**

- [x] Within tolerance + — 10%
- [ ] 10%-20%
- [ ] New Instrument
- [ ] Out of tolerance
- [ ] Requiring repair

**OPERATING PARAMETERS**

- [ ] Threshold Dial Setting
- [x] Det. Oper. voltage 950 v.
- [x] Input sensitivity 28 mV
- [ ] Det. performance check only

COMMENTS: LUDLUM MODEL 500 PULSER
SER.# 50803 → CAL. DATE 12/13/89

| RANGE MULTIPLIER | REFERENCE CALIBRATION POINT | INSTRUMENT DIAL READING | INSTRUMENT RECEIVED "AS FOUND" READING |
|---|---|---|---|
| x 1000 | 400000 cpm | 400 | ± 10% |
| " | 100000 " | 100 | ± 10% |
| x 100 | 40000 " | 400 | ± 10% |
| " | 10000 " | 100 | ± 10% |
| x 10 | 4000 " | 400 | ± 10% |
| " | 1000 " | 100 | ± 10% |
| x 1 | 400 " | 400 | ± 10% |
| " | 100 " | 100 | ± 10% |
| | | | |
| | | | |
| | ALL | | Range(s) Calibrated with Ludlum Model 500 Pulser |

**CALIBRATION—NBS TRACEABLE**

- [ ] Cs137 Gamma
- [ ] Neutron Am-241/Be
- [ ] Alpha
- [ ] Beta
- [ ] Other

[x] ELECTRONIC CALIBRATION

Calibrator [signature]

Date 3/13/90 Quality Control

**CERTIFICATE OF CALIBRATION**

WESTON
MANAGERS DESIGNERS/CONSULTANTS
5301 CENTRAL AVENUE, N.E.
SUITE 1000
ALBUQUERQUE, NM 87108
PHONE. (505) 255-1445

BENCH TEST DATA FOR DETECTOR LUDLUM 44-9 S/N PR032950

CUSTOMER: WESTON - DENVER Order No. 2029-33-09

Counter LUDLUM MODEL 12 S/N 46214 Distance-Source to Detector

Count Time 1 MINUTE Counter Input Sensitivity 29 mV

Other

| High Volt | Background | Isotope TC-99 S#4366 Size 27,800 dpm | Isotope Size | Isotope Size |
|---|---|---|---|---|
| 500 | <1 | <1 | | |
| 600 | 10 | 950 | | |
| 700 | 30 | 3600 | | |
| 800 | 50 | 3800 | | |
| * 900 | 50 | 4100 | | |
| 1000 | 60 | 4100 | | |
| 1100 | 80 | 4500 | | |
| 1200 | 100 | 4800 | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |
| | | | | |

Date 3-17-90 Signature Stephen B. Schafer

Form 4

* OPERATING VOLTAGE

WESTON

SHEET 2 of 2

ECT WESTON - DENVER W.O. NO. 2029-33-09

IPTION LUDLUM 44-9 (SER# PR032950) PLATEAU TASK NO. 0010 TC-99

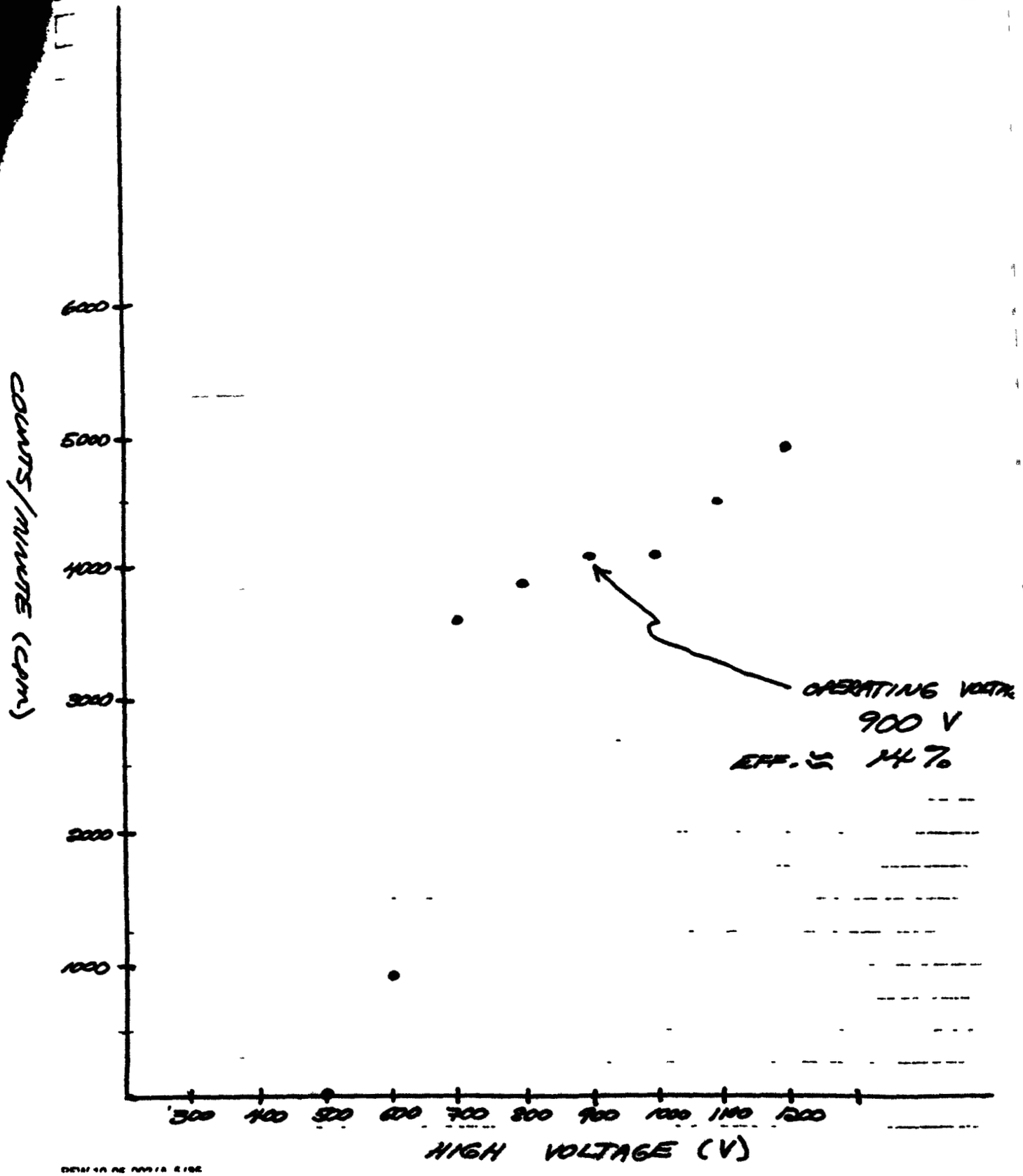
D BY S. SHAFER DEPT 1581 DATE 3-17-90

HECK BY _____ DEPT _____ DATE _____

D REV BY _____ DEPT _____ DATE _____

APPROVED BY _____

DEPT _____ DATE _____



# FRENCH DRAIN SHUTDOWN SCHEDULE

| Time Interval | Comments |
|---|---|
| 1/29 | Project start up |
| 1/30 to 2/1 | Drilling permits were not issued as anticipated Mr Ernie English of Radiation Protection would not support the job until he received a description of work which delayed excavation and work permitting. On 1/31/90 we provided 15 copies of the QA/QC Health and Safety Plan (Revision 1) dated January 1989, to EG&G. Excavation and a work permits were obtained on 2/2/90 |
| 2/2 | WESTON arrived on site, snow forced shutdown. Resumed work on 2/5/90 |
| 2/8 | WESTON determined that Boyles Brothers did not have complete documentation of Health and Safety training and medical examinations for their employees. The WESTON Site Safety Officer and Site Manager shut down the project. An estimate of expense WESTON incurred as a result of this shutdown has been submitted to Boyles Bros. for reimbursement Project resumed on 2/9/90 Project resumed on 2/9/90 |
| 2/12 | During an EG&G safety audit, Roy Martinez of EG&G Health and Safety shut down rig #1 because the drill rig was on a steep slope and the driller did not have adequate timbers for stability under the wheels on the downhill side of the rig. |
| 2/13 to 2/15 | Construction Management declined to issue a work permit because of freezing rain, snow and cold weather. Work resumed on 2/16/90. |
| 2/27 to 3/3 | Unable to use the east access road to the 881 Hillside. Plant security indicated that WESTON was not allowed to work on the 881 Hillside at all. In reality, the access problem involved the 903 Lip/East Trenches area. EG&G's Environmental Restoration Department wrote an inner-office memo to plant security stating the 881 Hillside is not part of the secured zone. Issue was resolved on 3/2/90 and work resumed on 3/5/90 |
| 3/6 to 3/17 | WESTON was unable to work due to heavy snowfall on 3/6, and another storm happened on 3/13/90. A shutdown over the entire period occurred. |
| 3/23 | EPA/CDH audit |
| 3/26 to present | EG&G temporarily shut down operations on the 881 Hillside. |

# *Roy F. Weston, Inc.*

2920

*This certifies that*

**JANET MARKS**

*has completed the*

**8 HOUR REFRESHER TRAINING COURSE**
**(RFW 1180.4)**

**Denver, Colorado**
**June 1, 1989**

Corporate Health and
Safety Director

06/01/89
Date

ENVIRONMENTAL SCIENCE AND ENGINEERING, INC.

# CERTIFICATE OF TRAINING

This is to Certify that

Janet E. Marks

has Successfully Completed

REFRESHER TRAINING

in

## Hazardous Materials & Site Investigations

IN COMPLIANCE WITH OSHA 29 CFR 1910.120

June, 1988

Instructor

HST

# CERTIFICATE OF TRAINING

THIS CERTIFIES THAT

Janet C. Marks

has successfully completed 40 hours of instruction in

## WASTE SITE WORKER PROTECTION

Prepared and conducted by the
Hygiene, Safety and Training Company
to comply with OSHA 1910.120(e)(2)

Jack M. Peterson

Jack M. Peterson
CSP, CIH

October 2, 1987
Date of Completion

© GOES 462-1/2

LITHO IN U.S.A.

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NAME: J. R. MARKS

IS CERTIFIED FOR LEVEL B-T

| | | | |
|---|---|---|---|
| MEDICAL EXPIRES | 07/15/90 | FIRST AID EXPIRES | 11/05/91 |
| FIT TEST EXPIRES | 09/21/90 | CPR EXPIRES | 10/27/89 |
| REFRESHER TRAINING EXPIRES | 06/01/90 | BASIC TRAINING DATE | 10/02/87 |

KNOWN MEDICATIONS:

KNOWN ALLERGIES: PENICILLIN

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2545

# Roy F. Weston, Inc.

*This certifies that*

SCOTT T. YOSHINO

*has completed the*

**REMEDIAL RESPONSE HEALTH AND SAFETY TRAINING COURSE (RFW 1180.8)**

**West Chester, Pennsylvania**
**January 31, thru February 1, 2, and 3, 1989**

**3.0 CONTINUING EDUCATION UNITS (CEUs) AWARDED**

Corporate Health and Safety Director

2/03/89
Date

---

3783

# Roy F. Weston, Inc.

*This certifies that*

SCOTT T. YOSHINO

*has completed the*

**8 HOUR REFRESHER TRAINING COURSE**
**(RFW 1180.4 )**

**DENVER, COLORADO**
**JANUARY 15, 1990**

Corporate Health & Safety Director

1/15/90
Date

# Certificate of Completion

Urie Environmental Health, Inc.
Hereby Certifies that

GREG SHERMAN

Has Successfully Met the Requirements of the

8 Hour Supervisor Training Course

on this 2 Day of June, 1989.

Course Director

# Certificate of Completion

Urie Environmental Health, Inc.
Hereby Certifies that

GREG D. SHERMAN

Has Successfully Met the Requirements of the
40 Hour Hazardous Waste Site Health and Safety Course

on this 4th Day of May, 1989.

Page deleted contained personally identifiable information

NAME: J. F. [redacted]

IS CERTIFIED FOR LEVEL: B-5

| | | | |
|---|---|---|---|
| MEDICAL EXPIRES | 06/16/90 | FIRST AID EXPIRES | 10/29/91 |
| FIT TEST EXPIRES | 09/15/90 | CPR EXPIRES | 10/21/90 |
| REFRESHER TRAINING EXPIRES | 06/26/90 | BASIC TRAINING DATE | 07/16/88 |

KNOWN MEDICATIONS: [redacted]

KNOWN ALLERGIES: [redacted]

*Roy. F. Weston, Inc.*

**HAZARDOUS MATERIALS**
**FIELD OPERATIONS**

24 HOUR WESTON EMERGENCY NUMBER: (215) 692-3030

24 HOUR MEDICAL EMERGENCY NUMBER: (513) 421-3063

CORPORATE HEALTH & SAFETY DIRECTOR

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3582

# Roy F. Weston, Inc.

*This certifies that*

KIM HARRIZ

*has completed the*

8 HOUR REFRESHER TRAINING COURSE
(RFW 1180.4)

West Chester, Pennsylvania
October 13, 1989

Corporate Health & Safety Director

10/13/89
Date

This certifies that
J. Kimberly Harriz
has completed the ADULT CPR
course of instruction
at Roy F. Weston INc.
3-3-8
Date course completed

Chairman, American Red Cross

2201

# Roy F. Weston, Inc.

*This certifies that*

J. KIMBERLY HARRIZ

*has completed the*

SITE HEALTH AND SAFETY COORDINATORS
TRAINING COURSE (RFW 1180.9)

West Chester, Pennsylvania
August 12, 1988

Corporate Health & Safety Director

08/12/88
Date

This certifies that
J. Kimberly Harriz
has completed the
STANDARD FIRST AID
course of instruction
at Roy F. Weston Inc.
3-3-89
Date course completed

Chairman, American Red Cross

3582

# Roy F. Weston, Inc.

*This certifies that*

KIM HARRIZ

*has completed the*

8 HOUR REFRESHER TRAINING COURSE
(RFW 1180.4)

West Chester, Pennsylvania
October 13, 1989

George M Crawford CIH
Corporate Health & Safety Director

10/13/89
Date

This certifies that
J. Kimberly Harriz
has completed the AMERI CPR
course of instruction
at Roy F. Weston INc.
3-3-89
Date course completed

2201

# Roy F. Weston, Inc.

*This certifies that*

J. KIMBERLY HARRIZ

*has completed the*

SITE HEALTH AND SAFETY COORDINATORS
TRAINING COURSE (RFW 1180.9)

West Chester, Pennsylvania
August 12, 1988

George M Crawford CIH
Corporate Health & Safety Director

08/12/88
Date

This certifies that
J. Kimberly Harriz
has completed the
STANDARD FIRST AID
course of instruction
at Roy F. Weston Inc.
3-3-89
Date course completed

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Page deleted contained personally identifiable information

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2590

# Roy F. Weston, Inc.

*This certifies that*

KRISTEN J. HINDS

*has completed the*

REMEDIAL RESPONSE HEALTH AND SAFETY
TRAINING COURSE (RFW 1180.8)

West Chester, Pennsylvania
February 20, 21, 22, 23, and 24, 1989

3.0 CONTINUING EDUCATION UNITS (CEUs) AWARDED

Corporate Health and
Safety Director

2/24/89
Date

NAME: K. J. HINDS

NAME:

E. J. [illegible]

IS CERTIFIED FOR LEVEL: [illegible]

| | | | |
|---|---|---|---|
| MEDICAL EXPIRES | [illegible] | FIRST AID EXPIRES | / / |
| FIT TEST EXPIRES | [illegible] | CPR EXPIRES | / / |
| [illegible] TRAINING EXPIRES | [illegible] | RADIO TRAINING DATE | [illegible] |

KNOWN MEDICATIONS: NONE

KNOWN ALLERGIES:

NONE

NAME R. H. SEUGEBUSH

B-T

IS CERTIFIED FOR LEVEL

| | | | |
|---|---|---|---|
| MEDICAL EXPIRES | 07/21/90 | FIRST AID EXPIRES | 12/20/91 |
| FIT TEST EXPIRES | 10/04/90 | CPR EXPIRES | 11/16/90 |
| REFRESHER TRAINING EXPIRES | 10/06/90 | BASIC TRAINING DATE | 10/06/88 |

KNOWN MEDICATIONS

KNOWN ALLERGIES

Page deleted contained personally identifiable information

CHEN-NORTHERN, INCORPORATED

# CERTIFICATE OF TRAINING

This certifies that Steve Carpenter has completed the 8-hour Hazardous Waste Site Safety Refresher Course and Hazardous Waste Site Supervisor Safety Course (as required under 29 CFR 1910.120) presented by Chen-Northern, Inc. on October 13, 1989 in Denver, Colorado

Course Director

Paula J. Ross
Training Coordinator

# CERTIFICATION FOR HAZARDOUS WASTE AND RESPIRATOR USE

I have, according to Federal Standard 29CFR 1910.134 and/or 29CFR 1910.120, physically examined on 11-03-89 and reviewed the medical data of Steve Carpenter an employee of Chen Northern.

This employee:

X can wear a NIOSH approved negative or positive pressure respirator without producing cardiopulmonary stress dangerous to his/her health.

____ cannot wear a NIOSH approved negative or positive pressure respirator without producing cardiopulmonary stress that may endanger the health of this employee.

Based upon my examination, I certify that this employee:

X has no medical contraindications to full participation in hazardous materials/hazardous waste handling, when conducted under the conditions of adequate training and a health and safety plan.

____ has medical limitations which restrict full participation in hazardous waste work. Describe work function limitations (i.e. lifting, temporary limitation, pending medical follow-up work, etc.).

X This employee has been notified of the results

Comments: _____

James E. McKinley MD
Signature Examining Physician

11-14-89
Date

**TRIDEM Services, Ltd.**
Occupational and Environmental Medicine
1660 S. Albion Street, Suite 916
Denver, Colorado 80222
(303) 758-1488
Fax (303) 758-1544

Rupert C. Burton, M.D., M.P.H., D.P.H.
President

# CERTIFICATION FOR HAZARDOUS WASTE AND RESPIRATOR USE

I have, according to Federal Standard 29CFR 1910.134 and/or 29CFR 1910.120, physically examined on 3-15-90 and reviewed the medical data of Brian J. Bribyl an employee of Salazar Associates.

This employee:

X can wear a NIOSH approved negative or positive pressure respirator without producing cardiopulmonary stress dangerous to his/her health.

____ cannot wear a NIOSH approved negative or positive pressure respirator without producing cardiopulmonary stress that may endanger the health of this employee.

Based upon my examination, I certify that this employee:

X has no medical contraindications to full participation in hazardous materials/hazardous waste handling, when conducted under the conditions of adequate training and a health and safety plan.

____ has medical limitations which restrict full participation in hazardous waste work. Describe work function limitations (i.e. lifting, temporary limitation, pending medical follow-up work, etc.).

X This employee has been notified of the results

Comments: _____

James E. McKinley MD
Signature Examining Physician

3/22/90
Date

TRIDEM Services, Ltd.
Occupational and Environmental Medicine
1600 S. Albion Street, Suite 916
Denver, Colorado 80222
(303) 759-1482
Fax (303) 759-1844

Rupert C. Burton, M.D., M.P.H., D.P.H.
President

# Front Range Community College

This is to certify that

**Thomas A. Lutherer**

has successfully completed **40** Hours of training in

## Environmental Health & Safety for Hazardous Waste Site Operations

(OSHA Regulation 29CFR1910.120)

This **17th** day of **March**, **1989**

Coordinator of Training

Chair of Environment Biotechnology
Coordinator of HAZMATT Program

American Heart Association

Cardiopulmonary Resuscitation and Emergency Cardiac Care

THOMAS A. LUTHERER

has successfully completed the national cognitive and skills examinations in accordance with the Standards of the American Heart Association for

Adult Heartsaver

3-15-89 Date of Issue

3-15-91 Date of Expiration

Name of Heart Association: Colorado HA

Instructor's Name: John W. Webb

Instructor's [redacted]

Signature: [illegible]

This [illegible] is subject to the provisions and limitations of applicable state statutes and [illegible].

©1987, American Heart Association

American Heart

DIAMOND CORE DRILLING
ROTARY DRILLING
GROUPING
FOUNDATION TESTING
DIRECTIONAL DRILLING
CORE ORIENTATION
ENVIRONMENTAL DRILLING
MONITOR WELLS

CARL HIGH
DISTRICT MANAGER

Boyles Bros.
DRILLING COMPANY
A CBS COMPANY

15555 West 5th Avenue
Golden, Colorado 80401
(303) 279-7913
FAX 279-7915

GENERAL OFFICE:
P.O. BOX [illegible]
SALT LAKE CITY, [illegible]
PHONE [illegible]
FAX [illegible]

DISTRICT OFFICES:
ANCHORAGE, ALASKA
PHOENIX, ARIZONA
GOLDEN, COLORADO
SPARKS, NEVADA
READING, PENN.
MURFREESBORO, TENN.
SALT LAKE CITY, UTAH
SPOKANE, WASHINGTON
SANTIAGO, CHILE
LIMA, PERU

January 23, 1990

Roy F. Weston, Inc.
215 Union Blvd., Suite 600
Lakewood, Colorado 80228

Attention: Tom Barrett

SUBJECT: Safety Program for Employees assigned to Hazardous Sites

Dear Tom:

Boyles Bros. safety procedures for drilling on hazardous waste sites will vary depending on level of exposure on a particular site, however, in general all of our employees are trained and instructed to comply with all Federal, State, Company and Project safety policies and procedures:

1. All employees must receive 40 hours of the required OSHA training before job assignment. Certificates of completion are issued to each employee successfully completing the course.

We presently have on our staff a Safety Engineer qualified to conduct all in-house training programs.

2. All employees must attend an 8 hour refresher training class on a yearly basis. Our last updated refresher training was conducted in Golden, Colorado on 1/12/90.

3. Tool Box Safety Meetings are normally required at the beginning of each shift.

4. All employees shall receive a complete physical yearly. This will vary, depending on the number of hours of exposure for employees working in the higher levels, which could require physicals every 400 hours of exposure.

5. Depending on project requirements we may require physicals at start up, completion or reassignments.

Roy F. Weston, Inc.
Attention: Tom Barrett
January 23, 1990
Page Two

6. Various Rose Medical Centers in the immediate Denver area have been contacted by us and are staffed to handle most of our emergencies.

7. Boyles Bros. is equipped to provide safety clothing and supplies, including purified compressed air up through Level B. Most of our safety suppliers are local with our main source being Henrys Safety Supply Company.

I trust this will provide the information you need, if not, please give me a call.

Regards,

Carl D. High
District Manager

CDH:mmv

cc: Jerry Culp

Inter-Office Memorandum

To: Greg Sherman

From: Janet Marks Date: 08 Feb 90

Project: 881 HS Geotechnical W.O. No: 2029-33-09-0020

Subject: Boyles Brothers' Physicals

On January 23, 1990 Carl High, of Boyles Brothers, wrote and signed a letter to Weston stating that all his employees had current physicals, 40 hour OSHA training, 8 hour refresher course and had current fit tests. I phoned all our subcontractors on Jan 25 to let them know Weston needed xerox copies of all this data. Carl High informed me that his employees would have the documentation with them on Monday January 29, the kick-off day of this project. No documentation was ever received by Weston. Late in the afternoon of February 7, 1990 it was learned that several of Boyles Brothers employees were not current on their physicals. Appointments were made by Boyles Brothers for February 8. All drilling was called off on the morning of February 8 because of this omission.

A meeting was held with Mike Anderson, Greg Sherman, Janet Marks and Carl High to discuss this problem. It was determined that Boyles Brothers would have a full crew ready and certified for drilling by at least Tuesday, February 13. The results of the blood chemistry of Boyles Brothers employees would be obtained no later than Monday, February 12. It was agreed that Boyles Brothers would pay per diem and salary for all down time associated with this neglect. If these requirements are not met, it was determined that Weston would subcontract with another drilling company.

DIAMOND CORE DRILLING
ROTARY DRILLING
GROUTING
FOUNDATION TESTING
DIRECTIONAL DRILLING
CORE ORIENTATION
ENVIRONMENTAL DRILLING
MONITOR WELLS

CARL HIGH
DISTRICT MANAGER

Bovles Bros.
DRILLING COMPANY
A CBC COMPANY

15885 West 5th Avenue
Golden, Colorado 80401
(303) 279-7913
FAX 279-7915

GENERAL OFFICE
P.O. BOX [illegible]
SALT LAKE CITY UTAH [illegible]
PHONE [illegible]
FAX [illegible]

DISTRICT OFFICES:
ANCHORAGE, ALASKA
PHOENIX, ARIZONA
GOLDEN, COLORADO
SPARKS, NEVADA
READING, PENN
MURFREESBORO TENN
SALT LAKE CITY UTAH
SPOKANE, WASHINGTON
SANTIAGO CHILE
LIMA, PERU

February 8, 1990

Roy F. Weston, Inc.
215 Union Blvd., Suite 600
Lakewood, Colorado 80228

Attention: Gregg Sherman

Dear Gregg:

Enclosed please find the Hazardous Waste/Emergency Response Certificates on the following employees currently working at the Rocky Flats project.

These employees also attended an 8 hour Refresher course on 1/12/90, however, these certificates are in our office in Salt Lake City, I will forward them to you, when we receive them. I have enclosed the certificates for the previous 8 hour Refresher on 12/3/88.

| | 40 HOURS | REFRESHER |
|---|---|---|
| Arlene Boday | 12/19/86 | 12/3/88 |
| Michael Boyd | 6/8/89 | |
| Paul Bushkovski | 6/12/87 | 12/3/88 |
| Jeffrey Keim | 6/8/89 | |
| Timothy Merritt | 12/19/86 | 12/3/88 |
| Pete Mesa | 6/12/87 | 12/3/88 |
| Brian O'Connor | 6/8/89 | |
| Kirby Parker | 12/3/86 | 12/3/88 |
| Doyle Styles | 8/8/86 | 12/3/88 |

If you require additional information, please do not hesitate to contact us.

Very truly yours,

Carl D. High

Carl D. High
District Manager

CDH:mmv
Enclosures

cc: Jerry Culp
06-0139-05
06-0206-05

## CERTIFICATION

This is to certify that JEREMY KIAR has successfully completed a training course in compliance with OSHA Standard 29CFR 1910.120 subparagraph e(1)

- ☐ 40 hours initial worker training (29CFR 1910.120 e(2))
- ☐ 8 hours supervisor training (29CFR 1910.120 e(3))

Date 1-12-90 [signature]

## CERTIFICATION

This is to certify that PETE MASA has successfully completed a training course in compliance with OSHA Standard 29CFR 1910.120 subparagraph e(1)

- ☐ 40 hours initial worker training (29CFR 1910.120 e(2))
- ☑ 8 hours supervisor training (29CFR 1910.120 e(3))

Date 1-12-90 [signature]

## CERTIFICATION

This is to certify that KIRBY PARKER has successfully completed a training course in compliance with OSHA Standard 29CFR 1910.120 subparagraph e(1)

- ☐ 40 hours initial worker training (29CFR 1910.120 e(2))
- ☑ 8 hours supervisor training (29CFR 1910.120 e(3))

Date 1-12-90 [signature]

## CERTIFICATION

This is to certify that DOYLE STYLES has successfully completed a training course in compliance with OSHA Standard 29CFR 1910.120 subparagraph e(1)

- ☐ 40 hours initial worker training (29CFR 1910.120 e(2))
- ☐ 8 hours supervisor training (29CFR 1910.120 e(3))

Date 1-12-90 [signature]

1-12-90

## CERTIFICATION

This is to certify that TIM MERRIT has successfully completed a training course in compliance with OSHA Standard 29CFR 1910.120 subparagraph e(1)

- ☐ 40 hours initial worker training (29CFR 1910.120 e(2))
- ☑ 8 hours supervisor training (29CFR 1910.120 e(3))

Date 1-12-90 [signature]

## CERTIFICATION

This is to certify that BRYAN O'CONNER has successfully completed a training course in compliance with OSHA Standard 29CFR 1910.120 subparagraph e(1)

- ☐ 40 hours initial worker training (29CFR 1910.120 e(2))
- ☑ 8 hours supervisor training (29CFR 1910.120 e(3))

Date 1-12-90 [signature]

## CERTIFICATION

This is to certify that PAUL BUSHKOVSKI has successfully completed a training course in compliance with OSHA Standard 29CFR 1910.120 subparagraph e(1)

- ☐ 40 hours initial worker training (29CFR 1910.120 e(2))
- ☑ 8 hours supervisor training (29CFR 1910.120 e(3))

Date 1-12-90 [signature]

## CERTIFICATION

This is to certify that ARLENE BOBAY has successfully completed a training course in compliance with OSHA Standard 29CFR 1910.120 subparagraph e(1)

- ☐ 40 hours initial worker training (29CFR 1910.120 e(2))
- ☑ 8 hours supervisor training (29CFR 1910.120 e(3))

Date 1-12-90 [signature]

## CERTIFICATION

This is to certify that MIKE BOYD has successfully completed a training course in compliance with OSHA Standard 29CFR 1910.120 subparagraph e(1)

- ☐ 40 hours initial worker training (29CFR 1910.120 e(2))
- ☐ 8 hours supervisor training (29CFR 1910.120 e(3))

MEDICAL CENTER OF GOLDEN
1224 ARAPAHOE STREET
GOLDEN, COLORADO 80401
(303) 277-0780

February 15, 1990

Mr. Carl High
Boyles Brothers Drilling
15865 W. 5th Ave.
Golden, Co. 80401

Mr. High,

The following are the verbal results of the heavy metal screens you requested.

| | |
|---|---|
| Boday, Arlene | Lead 20.8 mcg per DL<br>Mercury less then 1 ng per ML<br>Arsenic less then 5 ng per ML<br>Cadmium 4.0 ng per ML |
| O'Conner, Brian | Lead 16.0 mcg per DL<br>Mercury less then 1 ng per ML<br>Arsenic less then 5 ng per ML<br>Cadmium 2.4 ng per ML |
| Styles, Doyle | Lead 14.4 mcg per DL<br>Mercury less then 1 ng per ML<br>Arsenic less then 5 ng per ML<br>Cadmium 3.8 ng per ML |
| Boyd, Michael | Lead 24 mcg per DL<br>Mercury less then 1 ng per ML<br>Arsenic less then 5 ng per ML<br>Cadmium 3.6 ng per ML |
| Normal ranges: | Lead less then 40 mcg per DL<br>Mercury less then 5 ng per ML<br>Arsenic less then 70 ng per ML<br>Cadmium less then 5 ng per ML |

The above mentioned have been examined, the heavy metals and spirometry are normal for the age and size of these patients.

The final lab copies will be sent as soon as they are received.

If you have any questions, please feel free to call.

Sincerely,

John R. McInerney, M.D.

/ajt

Bevles Bros
DRILLING COMPANY

# Certified
# OSHA
# Hazardous Waste/Emergency Response
# Training

*This is to certify that*

Michael Boyd

*has completed a formal 40 hour course of classroom instruction (offsite) and practical training in hazardous waste operation and emergency response activities. This training was developed in fulfillment of the requirements of 29CFR 1910.120, "Hazardous Waste Operations and Emergency Response."*

6-8-89
**Date**

40 hours

Charles T Booker
**Instructor**

Boyles Bros
DRILLING COMPANY

# Certified
# OSHA
# Hazardous Waste/Emergency Response
# Training REFRESHER

*This is to certify that*

PAUL C. BUSHKOWSKI

*has completed a formal 40 hour course of classroom instruction (offsite) and practical training in hazardous waste operation and emergency response activities. This training was developed in fulfillment of the requirements of 29CFR 1910 120, 'Hazardous Waste Operations and Emergency Response.'*

12/3/88
**Date**

Charles T. Booher
**Instructor**

*Deuel and Associates, Inc.*

# Certified
# OSHA
# Hazardous Waste/Emergency Response Training

*This is to certify that*

PAUL C. BUSHKOWSKI

With Distinction

*has completed a formal 40 hour course of classroom instruction (offsite) and practical training in hazardous waste operation and emergency response activities. This training was developed in fulfillment of the requirements of 29CFR 1910.120, "Hazardous Waste Operations and Emergency Response"*

June 12, 1987
**Date**

**Instructor**

**Certified:** *Jamieson K. Deuel, President*

Page deleted contained personally identifiable information

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Bovies Bros
DRILLING COMPANY

# Certified
# OSHA
# Hazardous Waste/Emergency Response
# Training

*This is to certify that*

Jeffrey Keim

*has completed a formal 40 hour course of classroom instruction (offsite) and practical training in hazardous waste operation and emergency response activities. This training was developed in fulfillment of the requirements of 29CFR 1910.120, 'Hazardous Waste Operations and Emergency Response.'*

6-8-89
**Date**

40 hours

Charles T Booker
**Instructor**

MEDICAL CENTER OF GOLDEN
1224 ARAPAHOE STREET
GOLDEN, COLORADO 80401
(303) 277 0780

Employee Jeffrey W Keim
Date of Exam 8-29-89

**Physical Examination**

✓ Within normal limits

_____ Not within normal limits

**Chest x-ray**

✓ Within normal limits

_____ Not within normal limits

**Pulmonary Function Test**

✓ Within normal limits

_____ Not within normal limits

✓ This patient is fit to use a respirator

_____ This patient is not fit to use a respirator

Comments

Physician

Date

Page deleted contained personally identifiable information

Davies Bros
DRILLING COMPANY

# Certified
# OSHA
# Hazardous Waste/Emergency Response
# Training REFRESHER

*This is to certify that*

TIMOTHY W MERRITT

*has completed a formal 40 hour course of classroom instruction (offsite) and practical training in hazardous waste operation and emergency response activities. This training was developed in fulfillment of the requirements of 29CFR 1910.120, 'Hazardous Waste Operations and Emergency Response.'*

12/3/88
**Date**

Charles Booher
**Instructor**

ENVIRONMENTAL SCIENCE AND ENGINEERING, INC.

# CERTIFICATE OF TRAINING

This is to Certify that

Tim Merritt

has Successfully Completed

## THE EMPLOYEE DEVELOPMENT COURSE

in

## Hazardous Materials

## &

## Site Investigations

12/19/86

Director of Human Resources

Instructor

40 hours

Page deleted contained personally identifiable information

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RESPIRATOR TESTING

11. Make and model tested: _____
Usual one used? ___Yes ___No
Personal one assigned? ___Yes ___No

12. Qualitative fit testing: ___Peppermint oil ___Banana oil
___Passed ___Problem due to _____
Occlusion inhalation fit test: ___Passed ___Problem due to _____

13. Stair climbing exertion test with respirator on:
___Tolerated ___ flights without difficulty
___Problems after ___ flights due to _____

---

RECOMMENDATIONS Tim Merritt

X A. No restrictions in respirator usage.

___B. Respirator usage approved with the following restrictions.

_____

___C. No respirator usage approved due to _____

Signed, Douglas C Scott M.D.
1/6/89

OCCUPATIONAL HEALTH
SPECIALTY CLINIC

ROSE MEDICAL CENTER AT PEORIA
4955 PEORIA STREET
SUITE C
DENVER, COLORADO 80239
PHONE 375-0363

ENVIRONMENTAL SCIENCE AND ENGINEERING, INC.

# CERTIFICATE OF TRAINING

This is to Certify that

Arlene Boday

has Successfully Completed

## THE EMPLOYEE DEVELOPMENT COURSE

in

## Hazardous Materials

&

## Site Investigations

12/19/86

Director of Human Resources

Instructor

Bovles Bros
DRILLING COMPANY

# Certified
# OSHA
# Hazardous Waste/Emergency Response
# Training REFRESHER

*This is to certify that*

ARLENE L. BODDY

*has completed a formal 40 hour course of classroom instruction (offsite) and practical training in hazardous waste operation and emergency response activities. This training was developed in fulfillment of the requirements of 29CFR 1910.120, 'Hazardous Waste Operations and Emergency Response.'*

12/3/88
**Date**

Charles T. Booth
**Instructor**

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Bevles Bros
DRILLING COMPANY

# Certified
# OSHA
# Hazardous Waste/Emergency Response
# Training

*This is to certify that*

Brian O'Connor

*has completed a formal 40 hour course of classroom instruction (offsite) and practical training in hazardous waste operation and emergency response activities. This training was developed in fulfillment of the requirements of 29CFR 1910.120, 'Hazardous Waste Operations and Emergency Response.'*

6-8-89 — 40 hours

**Date**

Charles T. Booker

**Instructor**

Page deleted contained personally identifiable information

Bovles Bros
DRILLING COMPANY

# Certified
# OSHA
# Hazardous Waste/Emergency Response
# Training REFRESHER

*This is to certify that*

KIRBY L. PARKER

*has completed a formal 40 hour course of classroom instruction (offsite) and practical training in hazardous waste operation and emergency response activities. This training was developed in fulfillment of the requirements of 29CFR 1910.120, "Hazardous Waste Operations and Emergency Response."*

12/3/88
**Date**

Charles T Booher
**Instructor**

ENVIRONMENTAL SCIENCE AND ENGINEERING, INC.

# CERTIFICATE OF TRAINING

This is to Certify that

Kirby L. Parker

has Successfully Completed

## THE EMPLOYEE DEVELOPMENT COURSE

in

## Hazardous Materials

## &

## Site Investigations

12/1-3, 1986

Director of Human Resources

Instructor

Page deleted contained personally identifiable information

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SENT BY:BOYLES ROCKY MTN ; 3-30-90 11:55AM ; 2797815→ 3039801622;# 2

Boyles Bros. DRILLING COMPANY

# Certified
# OSHA
# Hazardous Waste/Emergency Response Training REFRESHER

*This is to certify that*

CHARLES A. ROBINSON

*has completed a formal 40 hour course of classroom instruction (offsite) and practical training in hazardous waste operation and emergency response activities. This training was developed in fulfillment of the requirements of 29CFR 1910.120, 'Hazardous Waste Operations and Emergency Response.'*

12/3/88
**Date**

Charles T. Booker
**Instructor**

SENT BY:BOYLES ROCKY MTN ; 3-30-90 11:57AM ; 2797915- 2039801522:# 2

Boyles Bros
Drilling Company

# Certified
# OSHA
# Hazardous Waste/Emergency Response Training

*This is to certify that*

Scott Tuttle

*has completed a formal 40 hour course of classroom instruction (offsite) and practical training in hazardous waste operation and emergency response activities. This training was developed in fulfillment of the requirements of 29CFR 1910.120, "Hazardous Waste Operations and Emergency Response."*

6-8-89
**Date**

40 hours

Charles T Booker
**Instructor**

SENT BY:BOYLES ROCKY MTN , 3-30-90 11:31AM ; 2797915 ; 3039801622;# 2

## Certificate of Training — U.S. Department of Labor
### Mine Safety and Health Administration

This certificate is required under Public Law 91-173 as amended by Public Law 95-164. Failure to comply may result in penalties and other sanctions as provided by sections 108 and 110, Public Law 91-173 as amended by Public Law 95-164.

Issue Certificate Immediately Upon Completion of Training [redacted]

1. Print Full Name of Person Trained (first, [redacted]

C. A. Robinson

2. Check Type of Approved Training Received:
- [ ] New Miner
- [x] Annual Refresher
- [ ] Newly Employed, Experienced
- [ ] New Task (specify)
- [x] Hazard Training
- [ ] Other (specify)

3. Check Type of Operation and Related Industry:
- A. [x] Surface
- [x] Construction
- [x] Underground
- [ ] Shaft & Slope
- B. [x] Coal
- [x] Metal
- [ ] Nonmetal

4. Date Training Requirements Completed
1-12-90
- [ ] Check if not completed and go to item 5, below.
- If completed, go to item 6, below.

5A. Date Training Requirements Partially Completed

5B. Check Subjects Completed (use only for partially completed training):
- [x] Introduction to Work Environment
- [x] Electrical Hazards
- [x] Hazard Recognition
- [x] First Aid
- [x] H&S Aspects of Tasks Assigned
- [x] Mine Gases
- [x] Statutory Rights of Miners
- [ ] Explosives
- [x] Self-Rescue & Respiratory Devices
- [x] Prevention of Accidents
- [ ] Transport & Communication Systems
- [ ] Other (specify)
- [x] Roof/Ground Control & Ventilation
- [x] Right to Know
- [x] Health
- [ ]

6. False certification is punishable under section 110 (a) and (f) of the Federal Mine Safety & Health Act (P.L. 91-173 as amended by P.L. 95-164).

I certify that the above training has been completed (signature of person responsible for training)

C T Booker
034-26-4070

7. Mine Name, ID, & Location of Training (if institution, give name & address)

Boyles Bros Drilling #60
[redacted]

8. Date
1-12-90

[redacted] training

C A Robinson

MSHA Form 5000-23, Nov 78

Part I (for employer's records)

## Certificate of Training — U.S. Department of Labor
### Mine Safety and Health Administration

This certificate is required under Public Law 91-173 as amended by Public Law 95-164. Failure to comply may result in penalties and other sanctions as provided by sections 108 and 110, Public Law 91-173 as amended by Public Law 95-164.

Issue Certificate Immediately Upon Completion of Training [redacted]

1. Print Full Name of Person Trained (first, [redacted]

Scott A. Tuttle

2. Check Type of Approved Training Received:
- [ ] New Miner
- [x] Annual Refresher
- [ ] Newly Employed, Experienced
- [ ] New Task (specify)
- [ ] Hazard Training
- [ ] Other (specify)

3. Check Type of Operation and Related Industry:
- A. [x] Surface
- [x] Construction
- [x] Underground
- [ ] Shaft & Slope
- B. [ ] Coal
- [x] Metal
- [x] Nonmetal

4. Date Training Requirements Completed
1-12-90
- [ ] Check if not completed and go to item 5, below
- If completed, go to item 6, below.

5A. Date Training Requirements Partially Completed

5B. Check Subjects Completed (use only for partially completed training):
- [x] Introduction to Work Environment
- [x] Electrical Hazards
- [x] Hazard Recognition
- [x] First Aid
- [x] H&S Aspects of Tasks Assigned
- [x] Mine Gases
- [x] Statutory Rights of Miners
- [ ] Explosives
- [x] Self-Rescue & Respiratory Devices
- [x] Prevention of Accidents
- [x] Transport & Communication Systems
- [ ] Other (specify)
- [x] Roof/Ground Control & Ventilation
- [ ] Right to Know
- [x] Health
- [ ]

6. False certification is punishable under section 110 (a) and (f) of the Federal Mine Safety & Health Act (P.L. 91-173 as amended by P.L. 95-164).

I certify that the above training has been completed (signature of person responsible for training)

C T Booker
[redacted]

7. Mine Name, ID, & Location [redacted] (if institution, give name & address)

Boyles Bros. Drilling
Golden Col [redacted]

8. Date
1-12-90

I verify that I [redacted] (signature of person [redacted])

Scott [signature]

MSHA Form 5000-23, Nov 78

Part I (for employer's records)

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Bovies Bros
DRILLING COMPANY

# Certified
# OSHA
# Hazardous Waste/Emergency Response
# Training REFRESHER

*This is to certify that*

DOYLE V. STYLES

*has completed a formal 40 hour course of classroom instruction (offsite) and practical training in hazardous waste operation and emergency response activities. This training was developed in fulfillment of the requirements of 29CFR 1910.120, 'Hazardous Waste Operations and Emergency Response.'*

12/3/88
**Date**

Charles T Booker
**Instructor**

0703

# Roy F. Weston, Inc.

*This certifies that*

DOYLE STYLES

*has completed the*

TWO-DAY LEVEL "C"
HEALTH AND SAFETY TRAINING COURSE

Denver, Colorado
August 7 & 8, 1986

Corporate Health & Safety Director

08/08/86
Date

20 hours

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RESPIRATOR TESTING

11. Make and model tested: _____
    Usual one used? ___Yes ___No
    Personal one assigned? ___Yes ___No

12. Qualitative fit testing: ___Peppermint oil ___Banana oil
    ___Passed ___Problem due to _____
    Occlusion inhalation fit test: ___Passed ___Problem due to _____

13. Stair climbing exertion test with respirator on:
    ___Tolerated ___ flights without difficulty
    ___Problems after ___ flights due to _____

---

RECOMMENDATIONS

____A. No restrictions in respirator usage.

____B. Respirator usage approved with the following restrictions:

_____

____C. No respirator usage approved due to _____

Signed, _____ M.D.

OCCUPATIONAL HEALTH
SPECIALTY CLINIC

ROSE MEDICAL CENTER AT PEORIA
4955 PEORIA STREET
SUITE C
DENVER, COLORADO 80239
PHONE: 375-0363

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# SITE MANAGER'S LOGBOOK

Projects (continued)

Peg Beaty Stockton 209-957-3405

Eberline 505-345-3461 Art Revst
Assoc Tom Balka 423-2766

Universal Engineering 233-7202

IH Karen-Seeley 2780
Fred Kerchner 5204
Brian Smith 7781

JTM 3

1-24-90 cold, snowed "
0725 leave house in 21134 Volkswagon
0755 arrive at north E gate get a EG+G sticker for my RF badge
0800 arrive at Western trailer
245 get ready to go stake holes for the 881 HS French Drain
0920 at 881 HS with Ken Miller
1045 finish Influent + Effluent Line
only one line - think it is the western line that had been staked engineering - Sunrise
the eastern line had not been staked
1050 Start on the western edge of the French Drain
1130 stake FD-8 leave for trailer
1200 John Munoz - has Fiddlered the Hill side several time maybe able to get a full time monitor to do rad screening on the hill - Harry Ray maybe will let us

2 JEM

1-24-90

1200 Greg Lidus
VOA's - use the special sampler
Ken going to get the special sampler
get tapleon between the sample
1205 head to contact Carl High
3 [illegible] Stainless Steel
1225 back at 881 HS to finish staking
1345 Finished staking 881 HS
French drain location
Head to trailer
1405 leave trailer
1410 looking for parking space so I can go change my dosimeter
1425 leave bldg 123 after getting dosimeter change
leave for Weston office
1455 Arrive at Weston office
21191 miles

3

1-26-90

0750 Pick up bronco from Barry's
0820 Arrive at Weston office
0900 Give list for Jeff Herrick and Lisa Gildein to pick up supplies

1000 Rig #1 Steve Carpenter
Jeff Herrick (1wk)

Rig #2 Bob Crayton (2wk-2wk)
Brian Pribyl (2wk)
406-586-7682

JEM

1210 ~~24-89 - have go ahead from Larry~~
~~17-87 E yard shack~~ JEM
clark

JEM

4 JEM

1-29-90

0615 Arrive at office at 0615
0745 Arrive at RFP
0830 Source Registry
Ce - source
HSE - need to contact
Ron Mitchell - Plant Protection
4904
need procedure manual
0840 called E+W gate to warn them of Frank Kabat coming in with Cesium Source

0900 FB - 1/20
1 liter Amber Pest / PCB
3 gal rad HCl
2 liter Amber BNA
1 liter plastic metal HNO3
none - inorganic
100 ml tritium amber glass
2 40 ml glass VOA

1/20 - based on the VOA sample

JEM 5

1-29-90
TB - every day
TB012990

0910 breathing zone - let vent for 15 min - if does not dissipate upgrade to level C
anything above background > 5ppm - B

0925 protech holes - heated
- can we take BNAs / Pest / PCB

0935 Chains 001 - Stockton
002 - Eberline
003 - Accutals

0935 001 - VOAs, metal, BNA / Pest
002 - Rad
003 - Ac - Inorganic

0935 Complete - BNA - Francis
talked with Peg Beatty - thinks it is OK
0950 leave for dull site at 881 HS
0955 log out at gate for 881 HS

1-29-90

1000 Arrive at 881 to look at the drill holes
FD 21 will be dificult to drill not level
Greg Litus arrived
1055 Log out at E gate

1100 Back at trailer
100 Larry Clark - to get drilling permit ~~2565~~ JEM 2097
7215 400 area construction management
Al Kinkad - work permits also ask about full time rad monitoring ~~7673~~ 7604 JEM
1120 Greg Litus said to use the Distilled water for Field Blanks

Lean of the Steel Casing is not important as long as we have taken the geochem samples before we set it
GWL - Greg Litus



1-29-90

1140 Leave for Weston office
1210 Arrive at Weston office
1505
Left message with Shannon to Larry Clark - she is going to page him & have him call me regarding the drilling permit
1510 Also left message with Al Kincaid ...
1400 Rad & Instrument training with Frank Kabot
1600 Called Larry Clark - got OK
Earnie English 4915
Rad Monitoring
1506 - digital page
4000 - 1506 - 5355 (drilling)
will deliver the work permit tomorrow after they check out the gas location
will have full time Industrial Hygienics on site
Al Kincaid - work permit will be delivered tomorrow
1700 Leave for home

8 JEM

1/30/90 Cold, clear

0725 Arrive at Egate

730 Arrive at Weston trailer

Scott Yoshino STY

Steve Carpenter SPC

Brian Pribyl

Bob Crayton BFC

Jeff Herrick JFH

get them set up for drilling

Boyles still needs to decon rig - (Kirby & Arlene)

Doyle & Paul go to Boyles office

0855 Al Kincaid - Project called off

Rod Moulong not support job until he gets some job analysis of how we are going to do the job

Wanda Busby or Brent Lewis

0900 Called Burt Hyde

Mike Frelling 7743 principal contact

Greg Litus - technical support

said to use proposal to give to Al Kincaid / job analysis of how we are going to do the job

JEM 9

1/30/90

0800 Ken informs me that Kirby & Arlene are going to drill for his project and not my project

0910 Burt asks who at Rod Mon need to talk to - maybe Al Kincaid

SOP, 881 Work Plan

operational safety Analysis (OSA)

Brent

0910 tried to call Earnie English 4915

0915 tried Larry Clark - not there

page 4000-1338 return

Al Kincaid pager

4000-0413

0917 Bob Labort - called office

said it was cancelled

phone with Larry Clark & Al Kincaid

Wandy Busby - is working on this report 5603

1-30-90 took Bob Labord place

0930 Larry Clark - ask if can approve
use the existing excavation
permit for Tom Lutherer
RCRA drilling - need to contact

0950 don't need to Rod Mon Fiddler the
hole that Tom Lutherer (24-89)
is on - Larry Clark on phone
way out in buffer zone - not near
any SWMU area

1020 H Kincaid took Doc Mathews job stopped by trailer
with work permit for
681 (T690) and for East of Fence
(24-89)
Still need Excavation permit
from Larry Clark

1050 tried to call Larry Clark again
about Excavation permit for
Egate drilling

1115 I page Larry Clark
the geologist are organizing
the trailer - have shelves

1210 Greg Litus here - concerned
about 24-89



1-30-90

1415 Talked with Brent Lewis
he said that Howard Ron Ellis
5020 would know about the report

1330 Fannie English stopped by
trailer
said they will not have a full
time monitor out there - they
do not have personell for that
he stopped the drilling on the 881
HS because he did not have
the proper documentation - he
needs a report on what work
we are planning to perform,
H+S
he took a map of where we are planning
on drilling
he said Wanda Busby was in
charge of the report

1500 2029-3309-0020
talk with Greg Sherman
they are to switch to expenses
rather than per diem

1510 Called Wanda Busby left message
to have her call me about this
drilling report

12 JEM

1515 1-30-90
tried calling Greg Litus
about the report ..
he needs to talk with Tom G.
and will call me back .
1540 Litus never calls back
leave for Weston office
1615 Arrive at Weston office

1620 Greg Shipman talked with
Greg Litus - no go for
tomorrow - hopefully thurs
1625 Talk with Doyle on phone
Liquid Filled Gauges $146
>>0 $ more than
tell him about not being
able to drill tomorrow
1640 Wanda Bosby called
she was working on the report
higher levels than her are
involved and are calling
the shots
other problems but she does not
know what they are
H-Kincaid - no decision yet
No drilling tomorrow
1700 Leave Weston office

VEM 13

1-30-90
1000 Call KEM discuss today
activities - not coming to site
because of not getting the report
2010 also call Brian & Steve
2020 call Jeff Herrick

JEM

4 JEM

1-31-90

0750 Arrive at Weston office

0810 Scott Yoshino leaves me a message that Bill Bruninga (5017) is calling for Ron Ellis

0810 leave Bill Bruninga a message on his recorder

0830 Bill Bruninga calls back

he is with Facilities Project Management

his group helps RCRA/CERCLA get things started

Rad monitoring needs a procedure - written discription of what they are supposed to do

Tom Greengard - should be pulling this together

Vague - to Bill Bruninga - to his understanding rad monitoring (Earnie English) needs a step by step list of instructions of what they are supposed to do

his group has not talked with JEM TG only Wanda Busby

1-31-90

0840 talked with Tom Greengard

he thinks the 1989 H+S plan would be good enough - get from Janell

he is not working on this

he thinks someone other than Wanda Busby in Mike Hundt's group is working on it

Wanda Busby is doing an air monitoring plan

I should get a copy of the 89 H+S plan from Janell + our 1990 H+S plan and bring it down to Mike Anderson's office

0850 talk with Janell

1989 H+S plan has nothing on what Rad monitoring is supposed to do

they tell us what they are going to do - not the other way around

0900 talk with MHA + TG

tom G thinks it is in the H+S plan for the RCRA fall 88

0910 look in Frank Kabots file find H+S Plan 10/31/88

2027-33-01

1 16 JFM

1/31/90

0910 Nothing on H+S Rad Monitoring procedures

0920 Call Scott at trailer to see if his H+S plan has Rad Monitoring Procedure in it — no

0925 Call Dee at RCRA/CERCLA

0930 talk with Brent Lewis to get Mike Hrudt's phone #

Brent doesn't know what Rad Mon. wants or is talking about

they already have procedures

Greg Whitus is going to find what procedure will be needed

Rad Mon. has forms — always tells us what to do not visa-versa

meeting with Big Wigs

probably will not be drilling this week

0945 Operational Safety Analysis — Weston will be ready to drill next week — hopefully they will be ready

FM 17

1/31/90

950 talk with Bert Hyde & Greg Sherman — tell them the status of what BRL said

1000 trying to work on slug tests with lots of interruptions

1300 tom Greengard calls

says he has two H+S plans with Jan 1989 date

one has revision one

sec 3 — totally different in the two plans

sec 3.3.1 old and new are different specific response

new — HS+E procedure

RI ER Program

need to revise the footer & table of cont

revision 1 — send 10 copies to them with Mike Anderson to RFP by 1000 tomorrow

want to order for computer

if have questions call Wanda Busby

1315 Wanda Busby calls

15 copies 1 - unbound copy

JB JEM

1-31-90

1400 MAA and I look in the Rockwell files under 2029-33-03 found under 2029-33-02 there is not a revision 1 for the H+S Plan there is a revision 1 for the QA/QC Program

1420 call TG - not there - I talk with Brent - to JEM I told him the delima about 15 copies by tomorrow morning when Mike Anderson goes out to the site he is going to call me back

1330 in the Rocky Flats ERP Jan 1989 (Revision 0) H+S Plan assoc. with QA/QC plan - learned from Janell

1425 Brent calls back Fig 3-1 H+S Organization this chart is new in revision 1 revision 0 does not have this. Was CERP instead of HS+E

JAMA

1-31-90

1425 we have the new copy but the footer at the bottom of the page should be Rev 1 not Revision 0 want 15 copies 1 file copy

-00 Wanda Calls - returns my call - they are still working on this report - upper level people at E&G are going to meet on this at 1100 tomorrow

1730 Word Processing finishes getting a hard copy for me with Revision 1 Footer

I decide to stay and reproduce the 15 copies cause the production room looked like I would never get it done by 0930 tomorrow morning

1920 leave for home

JEM

2-1-90

1450 talked with Greg Litus
he does not know what the hold up was - he felt that we were ready to go on Tuesday morning
He believes that all that needs to be done is have the work permit from Al Kincaid delivered to Earnie English - and have his sign it

1450 I call Al Kincaid - he said that Earnie English has signed it and that he called Thes morning to tell Al Kincaid not to issue it to us All things were signed and ready to go Tuesday morning ...
He is going to call Earnie English and get back with me on this

1505 Al Kincaid calls back - we have the go ahead
he will bring the work permit to the trailer around 0800

1510 Harry Clark - I called
he will have excavation permit by 0800

2-1-90

1505 Al Kincaid - work permit are needed every week - he will start working on the one for next week (need on Feb-6th - Thes)

1515 Wanda Busby calls
says we have the go ahead
Earnie English will sign it tomorrow and we have the go ahead
if we need full time Rad Men - need to get in advance

1520 Call Carl High to let him know we can start tomorrow - he will call me back

1530 Carl calls back - they will be ready tomorrow at 0800

1530 leave message with Steve's phone recorder + Brain's son for starting work tomorrow

1540 ~~tried to~~ call Earnie English to make ammends - he said we can start in the morning - his guys are going to Fiddler tonight on the line we showed him (and gave him the map on Tuesday) - they will keep a log book of the survey areas

2/2/90 cold, snowy, foggy
0725 Arrive at no accumulation
Egate
0730 Arrive at Weston trailer
0800 Larry Clark calls - he is
running late but he is on
his way
called Shamrock for cotton
gloves
0805 Al Kincaid arrives - rves us the
830 work permit
0830 Larry Clark brings the
excavation permit
he needs Doyle to sign
Industrial Hygiene st JFK
is waiting for us to go
0915 leave Weston trailer
0920 tell Industrial Hygiene
that we are ready
log in to 881 FS inner Egate
0925 Arrive at Borehole
B300190
Steve Carpenter - geologist
Jeff Herrick - helper
Doyle Styles - driller
Paul Buskovski - helper

2-2-90 Snowing hard
.040 Make decision to quit
drilling
started ≈ 10.00
can't write cause of snow
tape for VOA's not sticking
tephlon sheets rip when
put red plastic caps on
drilled to 0-6 ft
slippery radscreen can't monitor
can't log - snow covers core
before you can get color
HNu's not working - also the
Alpha scintillometer
1055 log out at Egate
1100 Drop Mary/ the IH off at
200 area
1130 talk with Jonell about only
drilling to 6 ft
we will take a dup of the 0-6 ft
for the composite
we will take 1 FB
you do not need to do the FB
and composite dup at the
same time as the VOA dup
it makes it easier to keep
track of however

29 JEM

2/2/90

1200 call Greg Litus
want to discuss some VOA
sampling problems
with him
he is to call me back

1300 Greg Litus calls back
he said he had no problem
with tephlon tape
maybe we have too thin
a gauge ephlon
twist it as you put it on

electrical tape - put it on the
dashboard to warm it up
should probably be put on
in the field but not
entirely necessary

1315 Steve + Jeffery back after
sampling

1400 I run over to 881 Lab
trailer L or J to deliver rad
screen sample

00 Finished with the samples

B300190 JEM

2-2-90

1500 they took a 0-6 ft sample

B 3001900006
00006D
inorganics, rad
metals/Pest/PCB/BNA
TB0202901

VOA
B3001900002
0204
0406
0406D

Field Blank
0006FB

1530 leave RFP trailer for Weston
office

1700 leave for home

JEM

B3001 0

2-4-90
2000-2200 - Organize thoughts
for Monday
work on Weekly report

2-5-90 cool, clear
0730 Arrive at Weston trailer
0735 Only one Boyle Brothers
rig
Paul + Arlene
0805 Brian + Steve leave for
drill rig
0810 Call Carl High about having
only one drill rig today
he said tomorrow we will be
able to have to rigs
0820 Called Greg Sherman
told him about Boyles Broth
needed to know if Bob Crayton
coming out - no
0825 two guys from stockton arrive
Rob Sengebush
Kris Hinds
0845 in H+S P Sen
Paul comes in - they think
they have hit bedrock
0950 Called Greg Sherman
need to decon rig between holes
try to stay on hole through
coring

28 JEM

2-5-90 windy, cold, clear

1130 Call Greg Sherman on the phone
Greg wants to start coring right
after set the sfc casing
Doyle believes the 200 lb of
pressure will wash out
the grout during coring
Doyle thinks it is cheaper to
move we have standby
4 or so hours/day to
let the grout cure
We will get one auger rig
and one core rig and
one packer rig
1045 Back at drill site - need
Rad Monitoring to screen
core before we can go decon
1055 Catch John Munoz
he will go screen the core
evidently they have to do all
more rad monitoring screening
and paper work - Scaggs
is involved with Fidding
and our screening
this will take longer to perform
this is why we didn't get our
permits on this

B300290 JEM 29

2-5-90
1130 Doyle arrives for decon out of water
1200 Called Ron Mitchell 2444
No cellular phone
1205 Water truck for decon of rig

1215 Back at drill site
B300290 with auger rig
Spud the hole
1305 Sue from Ebasco arrives

Bedrock is at 7.5' - Steve called Jack
1325 Call Ken to have him call
Rad Monitoring
was not able to contact him (Sue)
on the mobile phone - was
able to get the Weston trailer
1330 Sue suggested we put plastic
decon on the bumper JEM tail gate
so don't contaminate utincils
when put them down
Also - we need to not put things
down on the ground unless
we put them on plastic
1350 Rad Mon comes to screen
1355 Al Kincaid arrives
He will issue the work permit
just before 0800 tomorrow

30 JEM

2-5-90

1410 Arrive at Weston trailer
decide with Doyle and Greg
Sherman (on phone) to start
with a core rig

1430 Check logs of 881HS
86 + 87 hit bedrock at less
than 10 feet for the most part
it seems like the lack of
caliche + gravel is a good
indicator
more massive in the bedrock
- blocky texture

1500 Checking how French
drain alignment goes
with the contamination
Near SWMU 107, 102 + 104 we are
going to have to be very
careful

1530 Call Al Kincaid to warn
him about bds being near
the gas line
- the guy who is to check it is off
tomorrow
we will check if first thing on
wed

1615 Leave site

B300290 JEM 31

070690 clear, cold

0655 Arrive at Inner Egate
going to meet Rob Sengebush
here to go over some drilling
details and give him
some supplies

710 Rob + Kris arrive
show them bottles - labels
ogging characteristic
order

1725 Steve Carpenter Arrive
B300190 6 ft bedrock 10'10
B300290 6 ft bedrock 10'10

140 Al Kincaid Arrive with
work permit

1800 Arrive at Drill site
B300290
they are setting up to core with
the Auger rig
Rob Sengebush is to log the hole
Steve C. to help
Brian P. - to also help
only one drill rig
Kris Hinds - to help Tom Luther
with his hole
Doyle - driller Paul - helper

32 JEM B300290

2-6-90

945 Start coring the volclay grout in the casing

0955 Put core barrel on for core sampling

1020 the volcay grout is coming out of the hole - washing up only 6" below the bottom of the casing

Doyle thinks we should go with cement + schedule 80 PVC

1025 Talk with Greg Sherman on prem

Don't need to decon rig between hole - GWLitus

should use PVC and cement or just leave augers in the hole cause it is so shallow

Summit glove 151 - orange thin collar 1.90/pair

1035 back at Borehole

Doyle decides that PVC better than using augers as sfc casing

JEM 3

2-6-90

when you shut the pump off water goes through the joint of the augers - loosens up the borehole

then the cuttings, borehole wall etc goes down in the area we want to packer test

if use cement / PVC schedule 80 4" casing we will have a clean hole to packer test

1035 Paul + Nancy leave to go back to Boyles Brothers to pick up the 2nd rig, some PVC casing and some cement so we can put the casing in the hole

1300 Greg Sherman + Ken Miller arrive for visit to observe operations

1425 Doyle + Paul back with the second rig

Scott back for health + safety

150 Working on putting the PVC casing in B300290 I leave Brian, Scott + Rob out there and head into the tractor

34 JEM

2-6-90

1500 talk with KEM
we get the VOA sampler SS sleeves
red endcaps, + tepholon
100 ft - from Bob Twiddy

1515 Al Kincaid - asked about no IH
Tom Griffith ~~2538~~ JEM
Dana Luke - IH 2073
4484 page 0231
not at 2538 anymore - 4484
Dana Luke not available
probably need to let them know
we are drilling every day
she will get back with me on
this

Ed Coates 2474 - he is the one who
is deanning our SS drilling
sleeves for VOAs

Brunson instrument co 023-4385
protractors 2895 N 8th Ave

1630 Rob comes into trailer
they are finished ~~drilling~~ JEM
setting the casing
1640 leave for home

JEM 5

2-6-90

0800-1000 - work on organizing
packer test ideas

2-7-90 clear, mild
0725 Arrive at Weston trailer
0736 Called Tom Griffith
he will check into needing this
industrial hygienist and
will get back to me
0800 Boyles brothers has 4 people
to work the rig
however - they need to wait
for a T-bar for the 2nd rotary JEM
rig 1 - so can return the
water to the tank
and waiting for a side mount
so rig 2 can do auger rig
drilling

810 talk with Leon & Bill about
T° of GW in the 881HS area
their highest is ≃ 13°C
we want our T° of water used for
Packer testing to be above the T°
of the GW - to preclude the creation
of air bubbles - thus making the
hydraulic conductivity appear lower

2-7-90

0820 2660 - page
called Lee Ann Issaian (2406)
She is not in - she is with
Industrial Hygiene

0825 Larry Clark - here at trailer
- he is going to go down on the HS
and make sure we are off
the gas line, 3-900 lb pressure
going through there
need to be 10 feet off the line
he will let me know if our
state is ok

0825 979-1094 - Greg Sherman
not at the office today
leave message on his home
recorder

0830 Try calling Burt Hyde
no answer either

0835 both calibrated bottle method
- hi high cylinder - grad
cylinder
and - pump

-7-90

845 GS calls back
T's probably not a problem of
the packer water
should get a thermometer

GL said that we don't need to
decon rig between holes
don't need to decon core barrels
and packer test equipment
- we are not making piezometers
and we have already taken
chem samples in colluvium

0855 talked with Jonell
the packer test program that SSP
wrote is good - gives print out
of your results

0900 Greg L. - busy - has been
several times this morning

0905 Carl High - told him we
would be ready for packer testing
tomorrow - he said all
should be out here except
for rig - working on hydraulic
lines - certification & calibration
data is out here - Paul has

JEM

2-7-90

0915 Fred Kirchner
IH - need support
they are going to be here with
on IH - we need to have
them when drilling - yet it is
not on our drilling permit
he wants us to shuttle them back
and forth
- they need to drive their
own vehicle - I have
too many things to
worry about than
contacting them every
morning and shuttling
them up & down

0920 talked with Greg Libus about
Ra 226 + 228 he will get
back with me
0845 GS cont. he also said GL
said they are getting new
radios out here in 1-2 months
they will not be buying any more
because of this
maybe we could rent some radios

JEM 39

2-7-90 Warm Sunny

1935 Fred Kirchner 5204
Brian Smith 7781
Karen 2780 - secretary

we will see if we need a full time
IH after looking over
the 881 HS
0945 GL calls back
Ra - need to check for

0950 Art Rust from Eberline
told him about doing Ra 226 + 228
in our Soil / FB Samples
1020 leave for 881

1035 At B300290 - Doyle & Hrlene
have silty claystone at the bottom
TD at 28' Kris + Rob
Sue asks me whether to call
it clay or claystone
I said claystone
I told her that we did not need to decon
the core barrel in the bedrock
but we do in the colluvium
1100 Larry Clark told Doyle that we could
3300390 go ahead with the next hole near the gas line

2-7-90

1115 Sue from Ebasco leave
start coring in the casing
on B300190
Paul + Mike Woods on rig 2
Kris Hinds Rob Sangebush
Doyle + Irlene - on rig 1 with
Steve + Brian - going to
change back to auger
Kig and go to B300390

.30 Greg Litus + KEM arrive at
881 HS
-L says his decon in bedrock
don't have to worry about putting
things on the ground - they
do when they water sample
but not drilling
GL - need to have final rinse
of di water over augers and
samplers in the colluvium
EPA to start monitoring us
1240 Tom Griffith comes & signs
work permit - he is concerned
about IH - told him they
were confused about excavation
vs geotech sampling



2-7-90

1240 also confused about us drilling
through SWMUs
told him I thought it was
taken care of
1300 Sue arrive
1305 GL + KEM leave
leave for trailer
1310 At trailer Burt + Greg not
in the office
.315 GS at home - leave a message
on his recorder about water
+ water level gauge for packer test
is out of scope for our contract

Ever Clear 294-0311
Hinckey-Schmitt
Weston still needs to pay its
bill
1335 Back at Rigs - ready
for Rad Mon
call Fannie English
He will send somebody down
as quick as possible
340 Steve C. B300390
10.5' - bedrock 13-TD.
center bit in to 10.5

2-7-90

1415 leave 881 HS with Rad Screen
Rad Mon still not arrived
yet

1425 Drop off of Rad Screen at
T690J

1530 Kris Hinds moves to
trailer - Rad Mon
still not here
call Eamie

1600 Discovered (rumors) that Boyles not current on physicals
home phone 667-6807 - Kabot
page for Kabot 230-1934

1650 leave for office

1900 After collecting supplies
talking with Frank Kabot
about HTS issues I
leave for home

2100-2200 QA Rob Sangebush's
log



2-8-90

0715 Arrive at trailer

0800 talk with Frank Kabot on phone
need Fit test result
from medical
boyles [illegible] 8 hour refresher
individual by individual

actual certification signed
by the physician

0800 Shut down the work because
no medical info from Boyles
they evidently are all expired

0910 leave for office with Greg Shorman

0945 Arrive at Weston office

1000 Talk with Mike Anderson
about Boyles lacking physical
and not having a rigs with crew
on time

1100 Meeting with Carl High,
MAA, GS I me at Weston office
they are to provide us with
full crew by Tuesday
morning and pay per diem
and salary for our employees
related to this down time
because
JEM

JEM

2-8-90

1100 they are having physicals today - expect to get blood chemistry data on Monday

1200 I write a memo to this effect

1330 leave for RFP

1355 Arrive at RFP looking at core

relog on borehole B300290 with Rob Sengebush & Greg Sherman

1600 go with Greg Sherman to look at packer test set up

Doyle calls trailer - we are ready to work tomorrow

1615 Call Steve & Brian to let them know we are working tomorrow

1630 talk with Paul about Packer tests

Friction on the hose & pipe needs to be calculated

3/4" length - look at graph

1700 leave for home

2000 - 2130 QA loop

B300190 JEM 15

2-9-90

0645 Stop to get gas

0705 Arrive at E gate of RFP to meet a man from Summit Glove for a supply demonstration - He sells personal protective equipment

0720 Finish talking with Robbie

0730 Arrive at office

Don't have documentation on all the Drillers

0800 talk with Marge about the documentation

Kirby Parker

Tim Marrot

Paul Bushkovski

Jeff Keim

Doyle Styles

only ones who can work until we get the results of their blood chemistry

said they can start working.

0915 leave for 881 HS

0920 Arrive at B300190

2 1/6" from ground level

- Depth to bottom of hole

5 6" - DT water from bottom

1910 - DTW

46 JEM B300190

2-9-90

1955 Greg Sherman here
pretty ready to run (set up)
the first packer test

Paul Bushkovski for Boyles
Brothers

31' of hose 3/4" hose
rubber hose
sft packer interval

1000 have certification of gages
from Paul

1015 inflate packers above the ground
to check for leakage

11.8' to bottom of casing
1" sfc casing 0.4' stickup
set top at 13' of casing

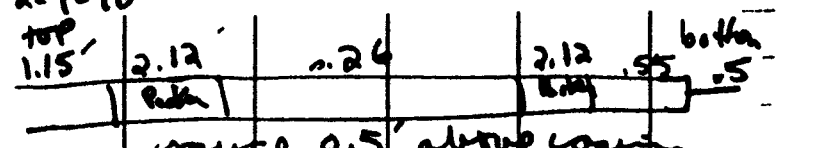
DTW - 19' - won't need to calculate
for water
exegs does not want us to put water
in the hole it will raise the
WL and affect the formation
around the hole

JEM 47

2-9-90

top 1.15' 2.12' .26 2.12 .55 bottom .5

Packer Bottom



gauge 0.5' above casing

1035 3/4" galvanized 10.00'
3/4" galvanized 5.32'
1.15 + 2.12 + 10.0 + 5.32 - 0.4 = ~~18.59~~ 18.19
stickup 4.20 of galvanized
pipe

1.15 + 2.12 + 10.0 + 5.32 - 4.20 - 0.4 stickup = 13.99

1055 100 psi - packer inflation
142 psi packer inflation

1100 vent up to 5 psi - then blow
test 1 0 - can't get any pressure
test 2 10 psi - go
19 gal
top packer blown or water
coming around the packer

test 3 - lower it 2 more feet
stick up to 2.08' top of
casing
packers set at 100 psi
103 psi
18.19 + 2.08 = 16.11' top of test interval

JEM

2-9-90

1105 going to 5 psi
blew it out again

170 psi on packers
water still bubbling
up the hole

180 psi regulator maxed
out
if packer is leaking - you
would get bubbled
must be leaking around
the packers -

1120 lower 2 more feet
0' stickup
8.19 - 0 = 18.19' = top of packer interval

1125 the hole is mushy - hard to
push the pipe down 2 more
feet ~~[illegible]~~ JEM
blew the formation
193 psi in packer
cale 5' off put 10' on

JEM 49

2-9-90

1135 20 - 4.45' = 15.55' [test 4]
1.15
4.45 stickup 2.12
18.82
top of packer interval

1140 2.82
198 psi

| | | |
|---|---|---|
| 4.7 psi | 30.7 gal | 1 min |
| 4.8 psi | 30.8 | 1 min |
| 4.9 psi | 30.8 | 1 min |
| 5.0 psi | 30.8 | ~~1 min~~ JEM |

1148 start 5 min intervals

seems like water going down
- may be losing water
to formation in the
gravel zone that we
blew out

5.0 psi 30.8 gal 1 min
increased P to [test 5]
~~[illegible]~~ 7.0 psi blew out before 1 minute
15 sec 30

1155 finished in this hole

2-9-90 B300290 Test

NX rod used to dule the hole

1210 move to B300290 for packer tests

1230 25.5' TD of hole [test 1]
dry hole
2 ft of casing in the hole
.5' stickup of casing
11.5' - bottom of casing below ground sfc

245 5' rod on top of packer
load down the hole

set top of packer at 13'

5' + 1' + 10' = 16' uses tinsite
5.32 + 1.15 + 10 + 2.12 - 0.5 = 18.09
out 3' stickup
measure 3.1' stickup
18.09 - 3.1' = 14.95 - top of test interval

1255 gauge 1' above ground sfc

inflating the packer

B300290 1

2-9-90
1210 85 psi 32.3 gal open valve
packer

open up the water

19.65 gal pressure dropped

out of water
3 psi 1 tm 53.0 gal
3.5 psi 1 min
3.5 59.5 gal
3 psi

320 open up psi - to look for fracture permeability

1220 gal → 158 gal 36 gal water loss

in 5 min

5 psi pressure.

previous test put on log sheet first [test 1]

62 gal 90 5 min 3 psi
90 118.6 gal 5 min

53.6 gal/10 min at 3 psi

OEM B300290 packer

2-9-90

1345 Scott arrives
Sue from Ebasco arrives

test 3

1350 '5+1 · 16' · no stickup
10+5.32+1.15+2.12+-0.5 = 18.09 - top of test interval
16-22 test interval
no 18.09 - 24.35

1355 inflating the packers

packer 186 psi

3.2 psi
167.5 gal → 174.2 1 min

174.2 → 180.5 gal 1 m

3.2 psi - gauge

1400 180.5 gal → 212.5 5 min

test 4

1405 up to 5 psi same test interval
221.8 gal → 229.5 gal 1 m.

1410 229.5 gal → 267.5 3 min
267.5 → 5 min

OEM

2-9-90

1415 308.7 gal

test 5

1420 up to 10 psi
26.4 gal → 336.8 gal 1 min

336.8 → 357.5 gal 2 min

425 357.5 gal → 399.1 4

-0 finished breaking everything down
set up to grout

1500 back at trailer
1600 in Doyles Dailys

1600 discuss with Doyle how best to do this
he is 4 holes ahead with the Hunger
4 holes/day
Rotary 2 holes/day
Packer - slowest 2 holes/day

1735 leave for home

2-10-90
0900 - work on weekly report
0 00 packer test calculations
1 00 review what is needed to complete report
review daily's from Boyles
1200 notes for Monday's meeting
1300 Quit

2-11-90
0700 - 0900
organize for tomorrow
Ken's last day - lots of questions
thoughts about weekly report
supplies needed
Steve C. to go to Weston office tomorrow
getting close to SWMU's below
881 - need IH + RM full time perhaps
all holes on French drain B3.....
I will log the auger holes
make color chart for tomorrow



2-12-90 sunny, warm
0720 Arrive at RFP
organize for drilling
0730 Ian Kaatz - 460 area to decon SS sleeves
2566
0745 Tom Lutherer is to take Steve carpenter place Steve is checking into Weston today
Brian Bribyl is going to be 30 min late today
the water truck is occupied by the Chem samplers - we need to decon Augers
#7 - look for Tom
[illegible]5 Start Drilling at B300890
1000 Leave for trailer
Tom + Brian on rig 1 Doyle + Tim
Rob + Kris on rig 2 Paul +
1015 talk with Jarrell about changing the two Salazar employees

56 JEM

2-12-90 Hot, calm, sunny

1040 called SSP about extra work on 881HS - she is going to leave me a copy of the 881HS sampling plan

1045 called Carl High about getting a 4' perforated pipe so we can really be testing a 5' interval

also about Heavy Metal Blood Chemistry for Arlene + Mike Boyd

100 get bottles for Field Blank

1120 talked with Bert about personnel

1130 called Bob Twiddy, ordered another roll of tephlon for the SS sleeves

Carpenter, Brian

Jeff Herrick

need chem for 3 more week

1135 leave message with GL about volclay vs cement grout to abandon holes

make medical - Whole body

Cont 4172 for Rob

JEM 57

2-12-90

1200 leave for 881 HS

because Kris staying longer

1220 Tom is ready for rad monitoring

he has drilled 3 holes

1225 call rad monitoring from trailer

1240 Tom Griffith - si pres work permit

Safety glasses

and need to check wheels when park on slope

Ray Martinez of Health & Safety

1300 Drop Guy Shannon off at Access Control

1420 Rad Mon Finally comes

| | |
|---|---|
| B300890 | 20' of 5 fc coarse |
| B300990 | 20' |
| B3007 - B3001 | 10' |

1440 Drop off 3 Samples at Rad Screen

1300 after I left the 881HS - Ray Martinez shut down rig #1 (at 14 feet)

B301090 because not having timbers under the rig on hilly site

8 JEM

2-12-90

0410 3300890 14 TD 12 BR

009 14 TD 12.10 BR

010 12 - no TD

because no timbers for keeping rig level

1640 Help Tom + Brian with sample labels

1710 Leave for the house

JEM



2-13-90 freezing rain, cold

0720 on the road

5 mph on indiana

probably will not work today

0735 Arrive at Weston trailer

not many here

Kris, Rob, Hank

0800 people slowly trickling in

I call Tom Griffith - he said they had a meeting and then he was going to go down on the 881 HS so check out the condition

he will let me know in ≈ ½ hour

0810 talk with Janell - tell her we probably will not be working

I will probably have Kris & Rob tracing some of the SWMU's on the airphoto

0825 Rob $\boxed{B300390}$

TD 31.7'

caved in when pulled the casing to 19.0

Clean out - opened to 26

pulled off - may have caved in again

60 JEM

2-13-90 Surveying Hand

0855 talk with Burt about the mini Ram

Scott Yoshimo Hiwe

0 he said they are on Janell's project

0905 tried to call Tom Griffith

he is still in a meeting

we do not have our work permit to work

0910 Tom Griffith calls back

considering the weather

we will not be working

I will call him tomorrow

0930 Tom Lutherer works on log

0945 unload water

1010 Tom Lutherer leaves

1015 I leave for the office

QA logs

work on weekly report

1510 Call Tom Griffith - he said it is really bad out there - probably will not be working tomorrow either

JEM-1

2-13-90

1600 leave for home

0700-0930

QA RMS's log

JEM

-2 JEM

2-14-90 snowed, very cold

0715 QA logs at home

1000 At office - work on getting RMS up to speed on his log

talk with Marie about the cad drilling log format

1100 update our logging form to incorporate geotech + overburden data

1230 QA more logs

1430 Call Tom Griffith to see about drilling tomorrow - supposed to snow 6-8 more inches tonight

he took ½ day vacation today

Bob Laborde is going to call me back and let me know

1500 Packer Test Friction Loss Calculation on B300290

31' 3/4" hose - rubber

test 1

5.36 gpm

31 + 14.95' = 45.95'

JEM

2-14-90

1520 Bob Laborde calls

should show up and make the decision tomorrow

~~5+1.15~~ JEM

5.32 + 1.15 + 10 + 2.12 = 18.59'

18.59 + 31 = 49.59' ft of 3/4" hose

5.36 gpm → 0.48

$\frac{0.75 \times 49.59'}{100'}$ = ~~0.38~~ JEM 0.24

test 2 7.2 gpm →

$\frac{0.88 \times 49.59'}{100'}$ = 0.44

test 3 6.43 gpm →

$\frac{0.70 \times 49.59}{100}$ × 0.35

test 4 7.90 gpm →

$\frac{1.1 \times 49.59}{100}$ = 0.55

~~0~~ JEM

test 5 10.39 gpm →

$\frac{1.8 \times 49.59}{100}$ = ~~8.93~~ JEM .89

1735 leave for home

JEM

2-15-90

0600 Talk with Doyle
We did not get the 6-8" of snow
we were supposed to receive
left it that I would call Tom
Griffith - he would tell me
if we could work
if so - we could call everyone
and be ready to work
around 1½ hr later
I 9 O'clock

0735 Talk with Tom Griffith
he said it was snowing out
at the Flat
high today expected to be 10-15°
Said we cannot work today
I asked him about tomorrow
He said we shall see
supposed to get about 35°
Good for the drillers if it is
above freezing
however the 5-6" of snow will
melt & it will be slippery
out on the hillside - may not
let us work
I will call him this afternoon
to confirm either way

JEM 65

2-15-90

0800 Stop By Universal Engineering
to pick up steel tape, protractor
triangle etc

0900 Make sure we have the log form
right with Marie & Pam

1000 Janell
Kim Harris - from West
Chester is coming out to
work on the project

1550 talked to Tom Griffith

he gave work permit to Hank
Kontact Bob Labarard
if have questions
Said - go ahead
be careful
call Doyle & tell him yes
for tomorrow

1745 Leave for home

2-16-90 cold, calm, clear

0720 Arrive at REP
problem with personnel on
Monday
Steve Carpenter not avail
on Monday because of
H+S considerations
needs results of medical
maybe 2 weeks

8000 Doyle doesn't have everyone
here
he could not get in touch with
Tim Merritt B300890
they are going to Hunger and
then move over to the
B300370 to packer test
only Paul + Doyle
Arlene also - she has
to stay off the site
- no medical data

900 QA in trailer, fuck dutting
Doyle + Paul - on B301090
Tom + Brian
1130 call Rad Monitoring
Hart talks with BRL - we are to
abandon holes with cement + 10%
volclay



2-16-90
1130 Arrive down on 881 HS
Cuby + Arlene down here also

B56 - B300390
1170 started Rig 2
Paul + Arlene

035 Tom Griffith comes
to sign work permit
1240 Paul Broke a fitting on
the packer
we discussed using one
packer for the bottom packer
test (before the packer fitting
broke)
1330 pull off bottom
caving in
7' off bottom of the hole

pull completely out of the
hole
measure bottom 3" below
the casing
cave in
no packer test - they are going
to cement up the hole

2-16-90

1400 talk with Doyle about water truck
Chen has been using it to decon
- filled it up after Paul had emptied it on Tuesday morning
it is frozen solid - we can't decon
- maybe blew out some fittings

1430 call Jonell - tell her of this problem
also discuss Steve Carpenter's ability to work on Monday she is mad because I had Kim H. call George Crafford

1500 Tom Griffith - will not be able to pull out Boyles vehicles

1515 Joney's - Mirian Jones at trucking will pull out stuck rigs free of charge
- Pete Foldger - said this ← EBTG

1620 Rob arrives at trailer
grouted holes 1, 2 + 3

1710 leave after signing charlies

2-18-90

1200 Work on weekly report
QA logs, Pocket Hat calculations

1730 leave for home

1900 all more logs
2130 Jim Quit

Training Kim Harris

2-19-90 Cold, clear

0725 Arrive at E gate
Kim Harris > Rig #2
myself
on + Brian - Rig #1 B301090 - coring

0850 Move to B300590 - they will

0825 Arrive at 881HS
- 1 up to drill

1000 3Y background - Rad instrument
10.2 HNu 94.8 ppm iso-
9.8 span → 53 ppm bottle [illegible]

70 JEM B300590

2-19-90

1050 waiting on water truck
Frozen from Chem samples
- used when we had
down time - never emptied
the truck
Paul had emptied it before
Boyles left site on Tues morning

1100 Arrive at Weston trailer
Scott has talked to Greg S.
He has HAS info on Arlene
& Mike
need to talk on phone - occupied

1110 talk with Francis about
TB020990 - it exists
also - I want a copy of the
Chains for my CA

1130 Back at B300590
Rotary is spinning

"D of hole at 7'
need to drill 20 below the
auger drilling
so 7-27'

1310 Latch box not working
pull out of hole

JEM 71

2-19-90

1355 Steve C. comes over from Reg #1
they are ready for Rad
monitoring

1405 Call Earnie English

1430 John arrives to Sclen
our core

1530 Call Bob LaBonde - to get work
permit

1555 Call Carl High about
Packer Test fitting
it is in

1600 leave RFP for Weston Office

1635 stop at office

1625 get gas
talk with GS about weekly report;
Packer test results; progress
of day
Xerox log forms for borehole
- our new form
turn in expense form

1715 leave for home

JEM

2-20-90 snowed, cool
0725 Arrived at RFP
0790 call Bob LaBorde
the work permit is good
through today
0750 B301090 - 42'
B300590 27.5'

0800 lightly snowing
0815 leave for 881 HS after
picking up supplies
0835 waiting on drillers - they
need to refill water truck
because cold - empty
every night
0915 Scott arrives at site, tells me
Doyle called - he is at Boyles
picking up the part
Mike called Lauler from Boyles
about whether we are working
or not - why did he not bring
out the part?

0920 Steve here - Paul working at
B301090 - Paul is worried
about moving the rig because



-20-90 cold snowing a bit
of the snow and incline of the
hole (this is the one that we
were shut down because
of lack of timbers

Hole caved 8.5' after pulling
out 33.5' from 42'
water ≈ 6-7'

0930 go and talk with Paul
he does not want to move it
maybe the whole fitting for
the double packer did not
come in - that is why Doyle
went to the office
0945 Doyle arrives - has the packer
fitting - he had to make one from a
packer in the shop
he doesn't think we should move
off of this hole either
we are going to packer test it
first (B301090)
0950 Greg Litus arrives
yes - use 5% volclay cement
to abandon the boreholes

74 JEM

2/20/90

0950 discuss single packer tests with him - EPA initially wanted us to do this - we thought it would be too slow & expensive
Maybe will need to since this hole caved in
GL - Mike Freehling wants some packer test data & borehole
esp faxed to him ASAP
told him it would be a day or so

1010 send Steve to the office to check in at Weston - never signed all of his papers

1030 go to trailer
Call Janell - discuss Kim not been here longer than 2 weeks
Rob S next two
Jeffery H. next two - through March

1110 Back at B301090

B301090 Packer test

J2 475

2/20/90

2.12 + 1.14 = 3.26'

12' - TD
33.5 - caved into
21'.0 bedrock
22.0' - Stfc Casing

1125 17.1 TOC DTW
17.1 - 0.4 = 16.7' - DTW to gpc
31.0' - TOC - caved up to

stick-up 0.4'
gauge height 2.2 + 0.4 = 2.6' above ground

1135 0.12 gal pipe
0.09 - galvanized pipe 3/4"
3.26
23.47
0.4 stick up of casing
23.07 total pipe
-10 stick up of gal pipe above casing
22.07 top packer depth

76 JEM B301090 PT

2/20/90 getting cold, overcast

22.07 + 5.27 = 27.34' - bottom packer

1140 inflate the packers to 180 psi

1145 start test

40.63 → 40.66 gal 1 min

5 - gauge pressure psi 4 min, '5

40.66 → 40.79 gal

40.79 → 40.89 gal 5, '10

all gal loss [illegible]

1200 up the pressure to 10 psi

test 2 105

the test area has blown the packer not sealed

maybe was coming around time

[illegible] test

the packer is 2.12' wide (long)

going to cover the packers ≈ 3 feet

test 3 5.06 - gal rod just added

23.07 + 5.06 = 28.13' total pipe above packer

3 stick up in the [illegible] of gal pipe

28.13 - 3.1 = 25.03' to top packer

25.03 + 5.27 = 30.30' - bottom packer

B300590 JEM 77

2-20-90 Packer test

1215 going to fill the hole with water good idea - can tell if packer is leaking around the formation is JEM

inflate packers to 185 psi

test 3 - packers

1215 5 psi - gauge pressure leaked around the packer no test

1220 Break down the packer test

1230 Move to B300590

1240 Paul B. & Mike Boyd removes the drill rod casing from B300590

OT Bottom 24.5' measure with plopper

OT Bottom - drilled 27.5'

BR contact 5.0'

Casing set to 7.0

Stick up 0.3' of sfc casing

TW - 17.0' below casing

17 - 16.7' below ground

1310 gauge height 1.9 ft above casing

gauge height = 2.2' above ground etc

2-20-90

1320 9.92 3/4" gal pipe
3.26
13.18"

stickup 3.17 of pipe - top of casing
0.3 stickup of casing
3.47 up

13.18 - 3.47 = 9.71 from ground

9.71 - top of packer set at
14.98 - bottom of packer test

1325 inflate packer to 180 psi
test 1
fill water up to top of casing

9.71 - 14.98 packer interval
41.24 - gal 2 min
5.6 psi gauge press
no change in water

1335 having trouble keeping a constant pressure on the gauge
Paul uses the idle on the pump



2-20-90

test 2 15 psi
41.255 gal →
2 min no change

1340 test 3 up the psi to 20 - gauge pressure
41.265 gal → 41.265
2 min

test 4 up the gauge pressure to 25 psi 2 min
41.275 → 41.275 gal
next formation - no change in the water

1355 lower the packer interval
5.05' + 13.18 = 18.23'
18.23 - 3.17 = 15.06'
15.06 - 0.3 = 14.76"
14.76 = top of packer
20.03 = bottom of packer

1420 pressurize the packer 182
test # 5
10 psi - gauge
41.24 gal 2 min
→ no change in water

1400 test #6
up to 15 psi gauge no change in water
41.25 → 15.71 JEM 5 min

2-20-90

1405 up to 25 JEM 23 states taking water

pressure dropped but the water not coming up in the hole

test 7 24.5 psi taking water

41.88 gal → 43.48 min

43.48 gal → 45.91 3/5

psi up to 26 psi Push the pressure down one with valve

1415 49.74 gal after 10 min

5/10 min

back the pressure to 10 psi

1415 test 8 50.34 gal 10 psi

→ 50.75 gal 2 min

50.75 → 51.31 3/5

51.31 → 52.19 5/10

cumulative time total

1430 lower the packer ≃ 3'

trying to test the broken iron oxide nodule area

≃ 19-20.5



2-20-90

1435 18.23 − 0.2 = 18.03'

0.2 - stickup of gal. pipe

18.03 − 0.3 (stickup of casing

= 17.73' top of packer

23.00 bottom of packer

test 9

1440 they ran out of water

Mike leaves to get some water

now slough in the hole

- the seal could have been broken on the bottom with water going around it

since where we had the bottom packer set was near that iron oxide zone

bottom packer @ 23.0'

1.05

2.12

3.17 - below the packer interval

23 + 3.17 = 26.17 - not really much slough

NX - 3.032" rod hole diameter

JEM

-20-90

1455 back with water
inflate pressure - packer piston
pushed up off the sloy's

1500 raise the packer up
0.7 stick up

17.23' — 22.5' test interval
inflate packer — 17 psi
section on bottom of packer is pushing the ass
raised the packer a bit more
17.13 — 22.4 0.8' stickup

test 1

10 psi

1505 52.23 gal → 52.23
no change 2 min

test 10 up the pressure to

15 psi

1507 52.27 gal → 52.42
taking a little 2 min

52.42 → 52.59 3/5 min

1515 52.59 → 52.97 5/10

B300590 JEM

-20-90

test 10 up to 25 psi

53.76 ← 53.25 gal 2 min
53.76 → 54.80 gal 3/5 min
54.80 → 56.89 5/10

test 12 back to 15 psi

56.93 gal → 57.17 gal 2 min
57.17 → 57.52 3/5
57.52 → 58.10 gal 5/10

embly up

1540 test 13 back to 10 psi
it is taking a little
58.13 → 58.225 2 min
58.225 → 58.42 gal 3/5
58.42 → 58.76 5/10

1550 quit testing
1600 talk with Doyle
think it is best to stick with
2 crews or the third crew
would be on standby all
1610 leave for trailer
1630 sign Paul's chairs
1655 leave for home
2030-2200 QA Kims log

2-21-90 ...nny, cold

0725 Arrive @ RFP
Discuss with Hank our supplies
Water samplers have been using them

0800 talk with Steve & Kim about their core logs

Hank & Steve - we don't have a work Permit
Tom Gibson vacation
Bob LaBarde is supposed to be doing it
send Steve over to check on it

0810 Steve Back - Bob L. has delegated the job to Issac - he didn't know he had the job - will be at least 9 o'clock before we get it Steve signed the construction manager's line to get the bale rolling

0815 Sue Sobczak arrives to find out what we are to be working

JEM 85

2-21-90

0820 Work on Packer test calculations
Steve & Tom go get Doyle & Paul to haul garbage and build concrete pads around existing wells

0835 Reg 1 has hydraulic leak - Steve back - not going to haul trash

0855 - Doyle goes to get part for the hydraulic leak

Kirby - fixing his clutch

0900 Brian Priby/ calls again he is about to leave to come to RFP
I have Steve & Kim cut up the tephlon sheet
/Isaac

0920 IKeDuran 7602 .339 - page arrives with work permit

0930 Send Kim & Steve down to the 88 HS to start drilling

2-21-90

0935 Work on Rockertest calculations
1135 leave for xerox
1140 leave for 881 HS
1150 talk with Kim at B300690
she said Steve is measuring angles of fracture wrt vertical - the SOP says wrt horizontal
Steve said that the industry does it his way (B300490)
I am going to call Greg/Janell and ask
1225 leave for trailer
1230 call Greg S. - not in office
talk with Janell - she says to measure wrt the JEM vertical
document whether you use V or H and H will be OK
1250 go back down ~~the~~ to the hillside
1255 Arrive at B300690 - coring
Kim - geol
Paul - Mike



2-21-90

1255 Joe S. - here also discuss with Steve to document J or H - need to clarify with GS
1305 need to call Read Mon call from ground house all Earnie + page John
1315 back at B300690
not in Bedroom - hitting gravel
B300490 - drilled to 30' measured - caved in 22'
1330 Rad Monitoring comes to Screen B300490 core
1340 unable to take a chemistry sample on the colluvium because we have not been deconning the core barrels (also not near as much core and no VOA)
1350 Doyle is re-entering the B300490 - maybe will not cave in

CEW

B3[illegible]

2-21-90

1350 Kim is calling
BP at 10.2' for B300690

1400 talk with Doyle - they are
leaving the rod in the hole
for a bit - let it set up - maybe
it will not cave
Paul has a rock bit - slow in
concrete
Doyle has a graphite bit
Paul pulls out of the hole slow
- this rig slow has it geared
down so don't suck in
the hole (cause caving)
when pulling out

1420 Doyle reamed B300490
now it has caved to
5' below the casing (15')
tell him to try one more time
need to discuss with GS this
problem
1520 still helping Kim
drill B300690

Jan 89

2-21-90

1520 talk with Steve
they pulled off for the third
time and it caved in
to 4.5' below casing
they are going to abandon
the hole B300490
and B300590 - no packer data
have 3' rod + 3.17' below
the packer interval
+ the piston expands at
the bottom
need ≈ 7 feet to do a packer test
TD 31.0

1610 leave B300690 for office
1615 gate locked - they have
been firing in the firing range
walk up to the guard house
the gate is not really locked
need to shut it when we log out
1620 check the lock - not locked
need to log in & out
1630 Arrive at trailer
call Greg Sherman
ask lots of questions
we may try single packer test
1720 leave for Home

90 JEM

2-21-90
1900 - 2200
QA core log of Kim + Steve
005 / 010
Calculated packer test results

2-22-90
0725 Arrive at RFP
Discuss with Geologists
about logging in at
inner E gate
also checking in at trailer
before leave site
go over logs with Steve
and
0810 Geologist leave
Discuss with Hank diverses
distilled for field blank
recently changed to distilled
0825 Call Greg L.
he not available - neither
is Brent
0830 Call Janell - yes ≈ 2 days

JEM 41

2-26-90
ago they changed to distilled
0840 Paul comes in to use the phone
Mike Boyd not here
he is broke down in Colorado
Springs
0850 Log in at inner East gate
0900 Arrive at B300690
going to do packer tests without
Mike Boyd
0905 tell Steve about Distilled
verses DI water
0915 Have all sign work permit
0930 Paul getting pretty near
for packer testing
go back to trailer for phone calls
0935 Call Carl High to get a
replacement for Mike Boyd

don't really have today
try - if not out by noon we are
not going to have anybody

0940 Call Greg L. - not in
talk with Pete Foldger - get
the word that we can use
distilled water

2-22-90

0945 call Brent L.
discuss fracture orientation
he said to do it wrt the core
axis (generally vertical)
that makes 0° - vertical
90° - horizontal
opposite of our SOP on bedding
as long as we document either
way it will be OK

0950 call Rob Sengebush
he was doing his wrt horizontal
the old logging had directions
that he was following
we'll look in his logbook he
also documented it

0955 older watch from Dave Q
of Hinkley-Schmidt

11:05 back at B300690
Paul + Kim have started
packer testing

1015 10.175.37'
blow out the packer around



2-22-90

the formation at 25 psi

1020 Paul lowers the interval
hits a bridge
when inflate packer it
comes out of the hole a bit

1030 14.98 - 20.25' - next interval
not taking water as the previous
interval did

Start taking water at ≈ 19 psi

sand was from 18.5 - 23.3

1135 able to break the bridge
and lower the packer
20.1 - 25.37'
at 25 psi - begins to take a little
a driller helper arrives for Paul (Tuttle)

1210 Finish packer test
Greg S. arrives
Hank arrives

1215 Hank leave after discussing
tape measure without
duct tape

1225 need to call rod monitors

JEM

2-22-90 warm, sunny

1250 call RM at trailer

1305 Nelson O'Connor at Merrick
C.B. Boiewienga
neither are available
will try later or they will
call me back

1315 leave for 881 HS

1400 Rod Mon comes to the HS
1405 discuss single packer test
with GDS and Doyle
1430 back at trailer
picking out geotech samples
with GS

1450 3300390 - geotech samples

15.2 - 15.8' GTB3003901
29.5 - 30.0 GTB3003902

JEM

2-22-90

1450 B300290
16.9 - 17.2' GTB3002901
24.5' - 25.0' GTB3002903
26.7 - 27.0 GTB3002904
19.9 - 20.5' GTB3002902

1505 B300190

0.5 - 10.8 GTB3001901
16.8 - 17.3 GTB3001902
23.0 - 23.4 GTB3001903
27.1 - 27.7 GTB3001904

1530 Go back down to 881 HS
Paul drilling B300790
BR 4.0'
TD Auger 6.0'
Lack of recovery in first
run 6.0-10.0
tremie the cement with JEM
measured hole inside
of hole - cement at ≈6'
have sand in the run 10-13'
run ... top for the day

1740 - leave drill site

#90

1645 log out at inner east gate
1650 stop by trailer - merrick will be available at the end of next week for surveying

1710 leave for home

0730 Steve B301140
Augered the hole - hit a rock - put center bit in drilled 5' into bedrock
kept trying to push out of way

Cook at dullers dailys

23-90

0730 Arrive at Weston trailer
Brian not here today
Steve - asked for day off in advance
B301190
a 2.5' - TD of augers
≈ 18.6' bedrock contact
Sand below the contact
silty sandstone
got only 8.9' of recovery
had to use center bit to push a rock out of the hole

0805 Work on packer test data
Call Mary with mine + Steve's hours
0855 sign in at inner E gate
0900 Arrive at 881 HS
3300790
packer test (single packer)
0905 8.12 - 13' single packer
blows out at 6 psi
the lowest we could get
had Paul lower the idel of the pump

3-90

0915 10.12-13'
apt won't take water
5 psi tight

0925 going to dull deeper

Steve over at the rig
coring B301198
hit SS at contact - had to put
centerbit in for 3 feet
was a bit of sand in 23.6-24.1'
well then to drill on if hit
a 2' or greater sand they
should stop and packer
otherwise keep going
don't want them to be wanting
on our packer system

0960 back at B300790
drilled from 13-18' - looks
like silty claystone - at
least not sand

1005 Stop to packer test
single packer

1010 work on packer calculations

2-23-90

1105 Steve comes to visit
possible SS - lack of recovery
go to his rig
gap in recovery - wait and
they are able to pick up a
bit extra in two runs..
Still unsure of where the
sand is coming from
Doyle informs me that they
are going to switch out
the Rig #2 (B-56) with
one that is now in the
shop

1145 back at B300790
getting good recovery
no sands

1200 Tom L. arrives - wants
to use grout plant for
making a well
We need it soon for Doyle's
hole - but will let them
borrow it

1220 doing final packer test
interval

1225 finished with packer testing
Paul takes grout plant to Kirby

2-23-90
1235 call Radition Protection
1240 tried to call Janell
Frank, Bert - lunch hour

1310 Back at 881 B30190 -
Rad Mon down here scaling

Casing 23.0' → 42'.5'
hilled to 43' - caved
in 1/2 foot

sounds start at 28 feet

23-28' packer
28-33' SS
33-38' packer SS JEM
Slaptons interval

1340 back with grout plant
set up to packer

1355 23.0 - 28 3 psi - no water taken
5 psi - blew around the packer

1358 lower it to 23.5'
3 - didn't take water



2-23-90
1405 blew at ≈ 7 psi JEM
lower to 28' blows at 9 psi

1420 34-39' 5 psi - no water loss
10 psi would not take any pressure
blew out the top packer
(around the packer)

1445 Back at Weston trailer
1450 Call Janell - discuss
having someone help me QA

1515 go Xerox Packer test data
1530 talk with Steve about
packer test calculations
1600 discuss packer test data
& calculations with
Kim
1640 leave Weston trailer
log out at inner last gate

2-24-90

0900 work on weekly report

1015 stop

1100 arrive at Rwestor office
give QA to Janell
logs to Kim
QA & data entry to Francis
read mail
x error weekly report for GS
talk with Frank about H+S
concerns

1330 leave for home



2-26-90

0725 Arrive at RFP
discuss switching Kim with
Steve
Kim - augering, sampling
Steve - coring

0745 talk with HGB about decon pad
may be full in 1 week
may need to shut down
takes a transportation permit

0800 GWL - CDH will be out
here today watching
coring and augering
& sampling

switch sampling equipment
around from different
trucks
have Kim switch from ten
Blazer → Red Ford Truck

0830 Call Janell
confirm switching trucks
with her
discuss driver sheets with
Francis & Janell

104 JEcm
2-26-90
0840 Arrive at E guard
log in
0845 on 881 HS

Kim Brian Doyle - Arlene
on B301290
auger + sample

Steve Paul - Tim
on B300990
coring
accidently skipped B300890
will need to go back

0910 GWL arrives at B300990
0925 I leave to go get core blocks
and core boxes
0940 Back at 881 HS
1000 talk with GWS
need: a drill deeper in BR
when the holes are thick
BR is shallow
need rack for decon
1 gal jug also

JEcm 105

2-26-90
1030 over at B300990
1050 ready to do a packer test
single packer to it
1100 come up to get gal jugs for
decon on the auger rig
give Scott the QA work
for Becky SPC wells
BH 004 + 011
BR A+BR
1105 Travis Canon of Ebasco - they
have been shut down due
to FBI investigation
areal reconnaissance - high
Pu levels in the soil (E
trenches area) /B301390
1115 Deliver the water jugs to Arlene
Brent & CDH at the Packer
Rig B300990

1130 go to B300990

P Maxwell
CDH - blue badge
P. Corbetta (Patty) CDH
T. Owens (DOB)
B Lewis + G. Litus

106 JEM 2-26-90

1145 COH, DOE + EG + G leave

1200 Discuss with SPC the packer test pressures
25 50 75
25 may be too much to start with
were doing 12.5 25 50

SOP 33% + 67%
Decide to be consistent we should do it 15% 33% + 67%

1230 Greg Sherman arrives
discuss logs, SS, geotech samples collected
going to take lots of geotech samples
also discuss packer test

to calculate %
get head pressure * .433 x top packer depth
+ the gauge pressure
= total pressure

use depth to upper packer
1 psi / ft of overburden = 100%

JEM 107

2-26-90

1330 Tom Griffith stops by
signs permit
need to wear hard hat + safety glasses

1360 $\boxed{B301490}$ — Kim + Brian
at 14', still haven't hit BR

they are close

1410 Call Earnie English
emergency may not be able to get to us today

page John Money

Call Francis about when we are collecting samples
Call Jarell - let her know that we need to get our extra rod bad gas in

1430 Back at 881 - John here screening
Sue Subcheck auditing at B301490

1440 leave with Rod Screen Bolts

2/26/90

1450 Drop off 3 Rad Screen bottles for 881 Lab
B30 #290, 13, 14

1505 Back at 881 HS after xerox of chain for Kim

1520 Organize notes & truck
Make stakes for new holes

1600 Help Kim & Brian with samples

1630 Make FB with Brian
Sue still around

1655 leave for Weston trailer

1725 leave RFP in tan Blazer for Bamp
Switching tan Blazer to Jewell's job
Red Ford Pickup to mine

1800 leave Bamp for home

VEM



2-27-90 overcast, cold

0715 Stop for gas in tan Blazer

1725 Arrive at RFP — Bill Bennerson - GWL

0735 We are not allowed to use the East Road down to the 881 HS because of FBI investigation results
need to drive all the way around to the West side
Hank B. not here
Brian Pribyl not here either

0840 Call Bert Hyde about H+S
out of office until tomorrow
try Scott Y~~ostine~~
unavailable
who has not been out here since 2/19/90 (last Monday)

0845 Call Kathy from 881 Lab (7799)
unavailable
call Jim Schoen (5217) - he has not recieved the results of the decon Pad from Kathy
note here said she sent them to him on Friday 2/23 we need to get a copy

110 JEM

2-27-90

0855 try calling Tom Griffith to find out which badges are missing

0900 Brian Priby 1 called
his son took a real bad spill off a fence - at Kaiser today
he is going to get him home and then head over here

0900 Kathy calls back - yes they had sent the results over to Jim Schone

0900 Jim calls - he has not recieved them yet - stuck in inter-office mail

0905 call Hank - need permit from the traffic council first
will need the screening results then - no big hurry on the screening results

0915 go xerox chains for Kim
0920 drop them off at trailer
0930 sign in at inner E gate

JEM 111

2-27-90

0940 guard at inner east gate called the Lutenant Milligan and Cpt [illegible]
he said we were unable to work down there at all
they are down there working already on the 881 HS
the guards would go pull them off
we used the West entrance

0950 talk with Kim through the fence to warn her
give her the work permit

0955 talk with guard - he is trying to find out our status
they are doing air monitoring - the less dust the better

1000 call GWL - not avail
call BRL - not available either - leave him a message of the situation

1010 in the inner east gate guard house gate 9 - Denny 4109
he is now unclear of if we can work or not

1020 Back at Weston trailer
all are back here on standby

JEM

2-27-89

1025 Call Pete Foldger
relay the problem
BRL calls - he is going to
check with the guards
to see if we can work
EPA + CDH are to be out there
today

1035 Bill has pulled all the water
samplers off the south side

1040 tell Janell the scoop
we may need to soil sample
these areas - we are
on Standby

1050 Call US - tell him the scoop

1125 Still waiting for BRL to call
up back

140 Due from Ebasco informs
me that Brent needs to
write a inter office memo
to the Security group
will take over night
maybe not even tomorrow

1150 Call BRL - yes this is true
should show up tomorrow to
see if we can tomorrow

JEM

2-27-90

1150 It is based on FBI investigation
flew an aerial radiometric
helicopter survey
were some hot spots - not real
hot but they want to be conservative
took them 8 months to get the
data back - that rubs
me the wrong way

Bill - not supposed to water sample
east of the access road
below the trench area
between highway south
to Woman Creek & E
of access road

Josh - our workers have seen out
there working this whole
time

1200 Call Janell - we are to come
into the office

1210 Call Rad Monitoring for
Scott Parker
Kim is going to wait for them
to come to screen coolers

117 JEM
2-27-90
1230 set up whole body count for Kim at 0915

1245 sink once/week
$105/month

BFI
300 wash/empty
inside 10-15 gal
ordered one

305 leave Weston trailer
log out at inner East gate

1340 Arrive at Office

QA log
talk with Cadd / Word Processing

1600 Jonell + Linda we probably
will not be drilling tomorrow

1730 leave for home

JEM

5

2-28-90 slight ice storm, cold, overcast
1730 Arrive at RFP trailer
0740 GL at trailer - can't
drill today need letter
from EG+G to DOE to
let us drill
Brian + I leave to go buy paint
gun
0805 stop at HM Woods
they do not have the paint gun
maybe a speciality item

0815 Builders Square
no luck in finding
this item
0835 Back at Weston trailer
call McGuckins
they have magic markers
"not write in paint
do not pump on the bottom

0840 Send Tom + Brian off to buy
these

Dan Ackerman 5217
need to call about Decon pad
results

JEM

2-28-90

Judy B Lain 5218

0920 Jim Schone 7421

he still does not have the results of the decon pad

0925 Kim informs me that she lost her temporary badge sign a paper

0930 Lig Hallonardo - of Rad Monitoring

will not check the garbage with Tyvek - low level waste

0950 Johnny Ray - need to call to get a rectangular container

Waste Management

664 Bldg

7399 0267 page Lou Abila

0955 Pete Folger calls - the meeting is back on for 1000

Have Brian (Tom back from McGuckin) run over to access control to get Hand for the meeting

2-28-90

0955 tell Pete our problems about tyvek waste

1004 leave message with Lou Abila

1000 Tom Griffith says we need to make a list of our people

1010 Pete Folger called

discussed the waste management problem

if they want to call it low level waste - need to rad screen every tyvek suit

need to call John Ray of Rad monitoring - want a written description of their screening procedure

do we need to screen every tyvek before we put in low level waste Boxes

1015 Steve Carpenter comes back after whole body count

7-28/90

1018 He has detectable plutonium in his body - but below ~~detectable~~ their acceptable level - normal

1035 Brent Lewis calls
one of their field instruments can pickup environmental concentrations
is going to follow threw on this written procedure with Johnny Ray

1040 Bob Shanks 5512 calls
1066 - page.
bldg RCRA Coordination
664
if consider our trash low level waste then our core, drills sampling equipment etc - considered Hazardous Waste

1130 Call Brent - meeting over at Wind site
Janell + Hank had left the site

2-28-90

1220 Janell Calls
Tom & Brian are supposed to work with Kim + Hank
Staking holes

1225 Kim + Hank arrive
they were picking up supplies for soil scrapes

1300 QA loop with Steve

1520 leave Weston trailer to go pickup results of decon pad water - rinsate

1550 BRL called - no drilling tomorrow
3 paragraph letter saying it is ok to work down there

1610 Doyle call him
tell him that we are not working tomorrow

279-7611 - Holiday Inn

1630 leave for home

11 JEM

3-1-90

0715 Stop to get gas in red Bronco

0730 Arrive at Weston trailer

0800 Brian Pribyl called

0810 Scott Yoshino calls
he is still working on his report

0820 C.J. Boeinga calls of Merrick
Wants a map of the hillside to know where they are to survey
I told him we were unable to work in the area
He will come out on March 8th unless he hears from me

0830 go Xerox map for Merrick

0840 try to locate [illegible] [illegible] [illegible] [illegible]
soil samplers can use my decon brush

0910 Soil samplers leave

JEM 121

3-1-90

0920 Hinkley Schmidt arrives - 60 for water samplers 20 for the drilling

0940 Soil samplers back
they cannot get access to the sampling area

1000 Soil samplers leave

1020 Pete Foldger calls - wanting to make sure that Hank & the teams are wearing tyvek, booties etc - I said they were planning on it
asked about Low level waste we are generating and about us being able to drill to morrow
he will check and get back to me on this

1100 guy comes to fix Chen's steam cleaner

1050 talk with Tamell about how drillers get paid and our sub-contractors
they go standby (the drillers) our sub we send home

JEM

3-19-90

1205 Bill needs to run antifreeze through the steam cleaner - every night. Brent, the repairman, has to go pick up a part

1210 Chen Y calls, wants to run a field blank after purging but before sampling - they are going to decon the bailer so start the FB - I gave them the go ahead on that

1230 Pete Foldger calls
Hank need to call him.

1240 Pete calls again - need to try and reach him on the radio - they need to take a rad screen sample ≈ 50 grams - need ≤ 4 oz

1245 unable to reach Hank on radio, find the samples labels & drive over there

JEM 123

3-1-90

1250 relay the message to Hank
gave Hank my radio and sample pair

1320 talk with Darell

need copy of notebook
Ce, Th & K40 - canceled

isotopes, Am 241, Pu 239
need to keep Bottom two copies of the chains
probably going to 371 or 881
not sure yet
need paperwork documenting what the samples & labels are
need to fill out JEM out 2 chains
one for rad screen
one for lab
call Pete when get in to know what to do next
need to fill out soil sample sheets (soil scrape sheet)
one for each sample, one for the drop

JEM

2-1-90

1330 she wants paperwork, chain and xerox of notebook ASAP when finish the job

1400 Work on Weekly report

1420 Pete Foldger calls they are getting phone calls about the Soil Scrape Samplers driving across need to park on the road I leave to go tell them

1445 Back at trailer, message that GWL called - not drilling tomorrow

1450 Janell calls - we are not drilling the security guards run the place ← GWL told Janell

1505 call GWL about drilling he is still not sure if we are drilling or not

1505 Brian took off after turning in the 3rd Screen sample going by the office

JEM

3-1-90

1530 Soil Scrape Samplers are in

1540 No drilling tomorrow after talking to Pete Foldger (Via Janell)

1600 GWL calls - no drilling trucks we could get a permit by 3/10/91 but it would not be worth it

optomistic for monday

1610 call Doyle - let him know I am to call him Sunday night about monday

1620 talk with Rob Sangebush discuss leaving the truck at the Sheridan for him (Kim is going to)

1625 GWL - got the OK to drill tomorrow he was kind and said if we could not get it together & would be OK

1630 Call Janell - what to do have already let everyone know we are not worrys

126 m

3-1-90

1630 remembered that we have an expired work permit
no way could we get it together

1635 call GWL - let him know our situation of the work permit - after 4 - never be able to get it started

1640 Call Doyle - let him know we are on for Monday
not to worry about tomorrow

1645 tried to call Greg Sherman to let him know the situation

1700 leave weston trailer for home

2000 Work on weekly report

2045 Quit working

2-2-90

1750 Arrive at weston office + talk with Greg Sherman
error logs for him
talk with Kim + Marie Nortlop
discuss situation with Steve Carpenter.

1015 leave for whole body count

1045 Arrive at RFP - whole body count

1130 leave WBS

1135 arrive at truck
leave RFP

1630 leave for home

120 ve

3-5-90 sunny, cool

0725 Arrive at RFP

0735 Can't go through the E gate access road - need to drive around

Rob Sengebush is here to replace Kim Harriz will be on Doyles Rig

Steve Carpenter sick today I will use himself to replace him

0745 Receive work permit - Brian Pajbyl went to get it.

0815 Begin at inner East gate drive around to the west side

0830 Arrive as B300890

I am the geologist during coring & packer testing

TD is 14 feet BR 12.0

Paul Buchkowski

Mike Boyd

14.5 - 19.5 5'

3-5-90

Paul informs me that Steve drilled from 14.5 - 19.0 last tuesday before we got sales off

1900 19.0 - 19.5 Sample

Rec 3/.5

RQD 3/.5

Silty Claystone pl yel brn

10YR 6/2

trace non stain - lt brn

5YR 5/6 Sli mottled

low-med plast

non stratified

trace fractures - vertical healed non stain in whole core

brin, damp 0.0-0.3'

910 Set up for packer testing.

Steve cored 14.5-19.0.

very little omit

0915 17.99 - 1.73 stickup = 16.26'

top packer depth

3-[illegible]-90 [illegible] cool

0920 [illegible] height = 2.4'
Measuring with the pump

6.06 — 16 psi max
≈ 8 psi column

| | test | | | packer at 120 psi |
|---|---|---|---|---|
| 0925 | 2 psi | 1 | 893.1 gal | [illegible] min |
| | 4 psi | 2 | 893.2 gal | [illegible] min |
| | | | no change | |
| 0930 | 8 psi | 3 | 893.4 gal | 2 min |
| | 12 psi | 4 | 893.6 | 2 min |

0936 no water loss
0940 Back to coring
1000 Scott & Hart arrive at dull rig
Scott has no intention of getting out at the site and dress out
H&S makes me feel real secure
1005 leave dull site HGB 154
Paul still coring

1020 2' sample

JEM 131

3-5-90

19.5 - 21.5 Sample
2.1 / 2.0 RQD
0.4 / 2.1 Rec
note on 32
broken fractured throughout
soft
Silty Claystone brown — pale yellow 10YR 6/2

0.0 - 0.8 dry to damp
~~9.5~~ — JEM high plasticity
trace about non stain - dk yel org 10YR 6/6 throughout
top 0.8 - fracture throughout ~~not healed~~ JEM open - [illegible] vertical to horizontal
0.8 - 2.1 - soft, semiconsol - [illegible] fracture horizontal to 30° (60°) [illegible] damp throughout
0.8 - 2.1 sandy [illegible] siltstone pale yellow brown 10YR 6/3
very fn grained sand, well sorted, subrnd qtz mod soft - soft
Parts very sandy, non stain throughout
weathered

132 VEM
3-5-90
after looking at the core
consider the top 1 foot to
be slough
RQD 0.4/2.1
Rec 2.1/2.0
19.4 - 20.2 Silty claystone
20.2 - 21.5 Clayey Sandy Siltstone
trc abndt iron stain

1050 Tom Griffith comes to
stop work permit

discuss 50 some badges
issued to Weston project
they are checking with
access control on who
has returned they
hopefully must have turned in
also guards discussed the
fact that we have some
Boyles Brothers people
still on day passes

8300890 VEM 133
3-5-90
1055 21.5 - 23.5 : SAMPLE
1 / 20
.1 / .2 RQD
mechanical fractures near horizontal
.1, .4, .6, .7, .8, .9

pale yellowish brn (10 YR 6/2)
Clayey Sandy Siltstone
aa
10YR6/6
trace iron stain dk yel
org in healed
0-15° wrt fractures .7-.9
less sand in places
caliche nodule
sand aa
mod hard, damp
trc - med plasticity

1110 23.5 - 24.5 : SAMPLE
no recovery

24.5 - 25.0 : SAMPLE
1120 no recovery
Set up to Packer test

3-5-90

1125 22.5' total pipe above bottom of upper packer

3.0 sticking from ground sfc
19.5' - depth to bottom of upper packer

1130 test 5 packer set at 120 PSI

| | | | | |
|---|---|---|---|---|
| | 3psi | 893.6 | no Δ | 2 min |
| test 6 | 6psi | 893.7 | no Δ | 2 min |
| 7 | 10 psi | 893.8 | no Δ | 2 min |
| 8 | 14psi | 893.9 | no Δ | 2 min |

1140 finish packer testing. no water loss

1150 Start coring again

1155 Scott Y here for 2 min

Hand visits to double bag our trash also call & trash - not possible low level waste

1200 Mike points to core that was in the bit

going to take instruments back to calibrate in the office



3-5-90

1200 0.0 - 0.5' Sample

24.5 - 25.0' not in core barrel from bit

looks consol

0.5/0.5 Rec

0.4/0.5 RQD

pl yel brn - 10YR 6/2 mottled

Silty claystone

trace black V 1/0 carbonaceous specks

highly weathered

abndt iron stain dk yel org 10YR 6/6

abndt fractures near vertical

0-30° iron stain filled

soft, damp trc plastic

1205 25.0 - 27.0' SAMPLE

2.2/2.0 Rec

1.1/2.2 RQD

abndt horizontal fractures mechanical 80-90°

0-0.7'

unweathered

136 JEM B300890

3-5-90

1210 Silty Claystone

olive gray 5Y 4/1 to
pl yel brown 10YR 6/2

trace non stain - dk yl org
10YR6/6 in places
blocky texture
consolidated
mod hard, damp
low to no plasticity
trace very fn grained sand
in places qtz
non sandy forward bottom
26.8-27.0' - abndt caliche
cement
carbonaceous 0.6-0.7'

1225 27.0 - 28.5' : SAMPLE

No recovery

1235 28.5 - 29.5' SAMPLE
0.1/1.0 Rec
0.5/0.9 RQD
mechan frac - near horizontal
at 0.2

3-5-90

1240 0.2 - 0.4 numerous
horizontal fracture

Silty Claystone
dusky yellow 5Y6/4
weathered
trace black carbonaceous
specks N1/0
trace plast
mod ~~soft~~ ~~tem~~ soft
damp

trace to some non staining
lt olive brn 5Y5/6
Sandy in part vfn grn
TD = 29.5'

1250 Set packer to 24.5'
1255 120 psi on packer

| | | | | |
|---|---|---|---|---|
| 9 ~~to~~ | 5 psi | 893.7 | [illegible] | 2m |
| 10 | 8 psi | 893.8 | 894.0 | 2 |
| | | 894.0 | 894.1 | 2/ |
| | | 894.1 | 894.3 | 2 |
| | | 894.3 | 894.5 | 2/ |
| | | 894.5 | 894.7 | 2 |
| | | 894.7 | 894.85 | 2/ |

138
3-5-90

1310 12psi test 11
895.1 psi
895.4 — 2 min

1315 895.4 → 895.6 gal — 2 min/9
895.6 — 895.9 — 2/6
895.9 — 896.1 — 2/8
896.1 — 896.3 — 2/10
896.3 → 896.6 — 2/12

1322 test 12 8psi
896.6 → 896.8 gal — 2
896.8 → 896.95 — 2/4

1327 Sue of Chasco comes over to the rig - asks about packer testing of B301490

896.95 → 897.05 gal — 2/6
1330 897.05 → 897.15 — 2/8
897.15 → 897.28 — 2/10
897.28 → 897.45 — 2/12

1340 Finish packer tests
1345 John of RM arrives
1405 leave to help Roo M.S.
do packer tests on B301490

B301490 Am 139

3-5-90 overcast cool
1410 Sue arrives
1440 Paul comes - he's ready to drill B301290
8' Casing depth
7' - can measure cement
1445 Above to start coring
1455 1.5' - TD
1500 8-9.5' SAMPLE
1/1.5
0.9/1.1
Silty Clay pl yel brn 10YR 6/2, mod brn 5 YR 4/4 dk grey N3/0.
trace qty gravel
mottled
not in Bedrock yet
abnd vfn grained gravel
angular up to 5 mm
some caliche zones - fiss with HCL
tvc sand poorly sorted
feldspathic
silt, consol damp
highly weathered

3-5-90
1510 9.5 - 12.0 SAM PLF
1.5 / 2.5 Rec
1.1 / 1.5 RQD
Bedrock

Sandy siltstone JFM
clay sandstone JFM
9.5 - 9.9
vfn grn well sorted
qtz.
lt gray N7/0 to dusky
yellow 5Y 6/4
weathered mottled
soft damp

9.9 - Silty claystone
very weathered mottled
rbndt iron nodules + caliche mod
up to 2cm
trc plasticity
lt olive gray 5Y 5/2 to
mod brn 5YR 4/4
mod soft damp

3-5-90
1520 Sue arrives
1525 12.0 - 13.0 No recovery
13.0 - 13.5 No recovery
1530 Going to set up to packer test
packer fitting broken
won't be able to packer test
today
1540 Sue leaves
1600 leave site
1620 back at trailer
1635 Double bag the trash
unload Rad Mon. core
1705 Leave Weston trailer
2000 Work on log + packer
sheets
2130 Stop working
JFM

142 JKLM

3-6-90 snowing hard, blowing

0720 Arrive at RFP

0730 Probably not going to work

0740 Paul + Kirby - only ones here

0750 Tom + Steve

Tom Griffith he is going to let I be my call on working

tiver, safety gloves + boots

steel toed boot + safety glasses - no respiratory protection needed

0800 Call Doyle

4' 2" core 1" → 3" total

5' - 3' core - Rob S.

27' ft of rod 8' stickup

22' → 19'

0810 Rob + Brian not here

0830 go Xerox

0900 leave for Weston office

143

3-7-90 — 3-12-90

Shut down due to upslope

12" or more of snow

3-12-90 Monday can't work

0730 Arrive at Weston office

Set up 50% meeting with GWL

+ Mike Freeling for 3/13/90

at 1400 Weston office

need to buy decon tank for $563 + tax 2000 gal

need for decon pad or we will be shut down

1500 get approval of work permit from Tom Griffith for tomorrow

he asked about radio contact

no communication - Ray Martinez suggested to Tom that this is a mandatory requirement

if rent - need to set up with plant protection so we can bring it onsite

510 Tell EDS - it has been more than documented that we need radios

1730 leave for home 2000-2145 paperwork

144 JEM

3-13-90 Snowing hard

0600 Wakeup - call Doyle
Steve & Brian
not going to try & work today

0745 Arrive at Weston office

call Tom Griffith - let him know about our situation

1300 Meeting with GWL, GDS, Me, BGH, Mike Freehberg & Berg Keshian

worried about deadline
may need to go to 3 rigs, overtime and/or work weekends

May 10 - French Drain Report
Engineering Science - will design the FD

need to calculate time to get K to $10^{-8}$ $10^{-7} = 1''$/year

going to try calibrated kettle
100th / 1000th of gal losses

JEM 145

3-18-90

discussed potech sampling
basal P permeability
grain size (hydrometer/sieve)
moisture density
tri axial - direct shears
need to talk with Jim Longman
sedimentologist at 4081
to get exact grain size to call
SS, S-stone & gravel
discussed piezometers - want a
constant slope of the FD
GINT - software program
recorded water problem
904 - Pondcrete - priority
Jim Coffer - SWMU guru 4081

radio problem - maybe get cellular phone - (I have already tired with plant security)
weather problem - probably start drilling on Mon (3-19)

Extra work in SWMU 102 - out of scope
- GWL said they will pay extra for that

146
3-14-90

Talk with Jim Langeman (4081)
sed person

Bedrock - use Wentworth Scale
230 sieve SS/SLS
10 sieve 2mm g/SS

Alluvium / Colluvium USCS

200 sieve SS/SLS
4 sieve g/SS

Pettyjohn - Krumbine 1938-1966

geologist - Wentworth
geometric series

engineers - USCS
no geometric series

147

3-15-90
0745 Arrive at REP
talk with Drillers about
truck snow situation
0830 Sign dailys
0900 Go down on 881 Hillside to
see snow conditions
to see if we need a snowplow
to get us in there
Doesn't look too bad
0950 Stop to see Tom Griffith
not there - talked with
Bob LaBorde
said we were going to try and
drill on Monday Mar 19
if he could get someone to
plow our road parrallel
to the 881 Fence it would
be helpful
he said they do not normally
do that but maybe
they can in this instance
1000 Back at trailer - discuss
this with Hank
1010 Leave for Weston Office
1035 Stop to get gas

148 UEM

3-15-90

1045 Arrive at Weston office
discuss with GDS the
snow situation
trying to get Bob LaBorde to
get a snowplow for us

Calculate time needed to get
$10^{-8}$ permeability
≃ 320 min
$10^{-7}$ 132 min
$10^{-6}$ 13.2 min

UEM/49

3-19-90

0725 Arrive at Weston trailer
0745 talk with Tom Griffith -
we do have a work permit
training Jeffery Hunter
Steve on Rig #2
0805 leave trailer
Brian called - going to be late
called Scott he is coming out
later? - sent rad
instruments to KBO for
calibration
- we were not in the field for
2 2 weeks and he sends
them away last Friday
0810 try to log at inner east gate
said I should try to log in
at inner West gate
0820 told I needed to log in
at outer West gate or
inner east gate to go
in the buffer zone
0825 Back at inner east gate
log in
0840 finally arrive at 881HS
they did not plow the road

15th JEM
3-19-90
0895 Brian is down on 881 HS

Jeff B3 590 (auger Rig)
Steven B301290 core

1130 Scott Y arrives at 881
0950 Water truck stuck on hill
by the 881 fence curve

1000 unstuck getting ready
to drill on B301590

1115 BR at 13.5'
TD at 15.5'
I drive up to the trailer to
get some sample label
& chains
1130 arrive at trailer
Back at 881 HS
Kirby stuck bad - need
to call Frank in loader
1245 at B301690
BR at 20.0'
TD at 22.0'

3-19-90
1320 Back at Weston trailer

Greg L. 5747 - busy
Pete F.
Rad Mon 4915
2235
Scott Stailey 0336-pg
1325 Myron Jones towing on site
2505
will help me out
1105 At B301290
at 22.5'
need to drill to 24.0'
to TD
work in SPC's book
he has a dentist appt
1420 Steve leave
1540 Finish packer testing
Help Brian & Jeffrey with
composite samples
1600 Steve Jeffrey & BRP
leave site
1620 leave site
1630 back at trailer
1730 log out at inner & gate

152 JEM

3-20-90

0655 Arrive at RFP
B301590 13.5 bedrock
B301690 20.0 bedrock

0730 Call Jim Schone
talk with Don about Road Screen
Fred Stripling 7494
need to have them by 3 - need
to dry out the samples over
night before run in the meter

0755 try to get someone to work overtime
Ed Broski 2883 881 lab
can't afford to have someone
work overtime

'805 Order Stakes from Scott Parker

0810 Books for Janell

08 Me
09 Herrick

'820 talk to Ken about the
people who have had
red badges
need to get a badge for
Brian O'Connor +
Mike Boyde
order tephlon tape + tevek
Env. Inst. Shamrock

JEM 15:

3-20-90

0830 CJ Biewienga of Merrick
not in - leave a message

0840 Call Everclear to get water
order the water from secretary

0840 Hand [illegible] Paul is stuck
Kirby informs
call Myron Jones 2505
to help pull him out

0905 leave for 881 HS

0920 arrive at 881 HS
front end loader moving
Paul B. rig

'0930 going to jump to B301590
strip B301390 stuck again
and B301590

0950 moving to B301690.
B301790 17.0 dt bedrock
19.5 total
depth of
Broke bumper off of Paul's Rig
Doyle only wants to go onto
B301890 - thinks beyond
that is impossible
in this wet ground

X64 JEM
3-20-90

0955 - not worth tearing up his equipment

need to warn GDS of this problem one more time
should maybe work on I-E line

1010 20.5 - BRon B301690
measured bottom of hole at 22.8' need to change log accordingly

1015 Walking the line with BVP
B301890 - Doyle setting up on
FD05

put hole near ridge B301900
B302090 - ridge top
needs to be dry to drive to

F303 - no way can they get in here

3-20-90

1020 FD#2 - can get to
FD#1 can't get to
put on top of ridge

move #1 NW and #2
SE on ridge

#1 - no way

1050 need to decon augers
Rod screened this morning
by John Murray

1130 Help Jeffery make FB
have Brian & Steve go pound
stakes in the ground for
Merrick
still need to have cement poured
into B301690 & B301790
before Steve can drill

1300 leave 881 drillsite Travis arrives

1310 meet Doyle with Augers
coming down to the hillside
he called Carl High about pulling
the bumper off the rig

156 JEM

3-20-90

CH - wants to shut us down
is there any holes they can do
other than continue W on
the French Drain - let it
dry off
can do 8 holes on I-E line
or the 4 piezometers - piezo.
may not be much better
however
if switch to I+E line - need
drive samples. will talk
to GS

1315 Speak of the Devil - GDS and
RW drive up - I tell him
about getting stuck

1320

| | | |
|---|---|---|
| 3-87 | 45.4 | 1/20 |
| 54-87 | 5.08 | 1/20 |
| [illegible]-67 | 15.69 | 1/20 |

talk with Bill B. about water
leaking wells below 881HS

1315 GS - he was going to check out
the hillside - talk with
Doyle about problem

VEWIS

3-20-90

1315 we can go to I-E holes
tomorrow

1325 Call RM at trailer
they are going to SEND a RM
down to the hillside

1330 go to decon pad with KFM
he said to keep decoming
getting close to overflowing

400 log out at inner E gate
4109 - I can call and they will
log me out by phone
inner east gate phone #

1430 Arrive at office for
ONES meeting

1700 leave for Sherlow

JEM

158 KEM

3-21-90 sunny, warm beautiful

0645 Pick KEM up at house

0705 Arrive at Weston trailer
Doyle not going to be in today
He & Helene have Flu bug
Kirby going to work on Hinge rig

GS told Steve to do one hole at
the base of ridge
one on ridge plywood road
none in gully
2 on 2nd ridge near fence
and none in gully on Western
edge of the French Drain

may not start I-E line till
tomorrow
B301890 - dulled to 18.0'

0740 John Freshwater IT
0755 Brian O'Connor arrives
0755 Nonnike Boyd

0810 10-15 sheets of plywood
to build road
GS - 3 I-E borehole

159

3-21-90

0800 Paul heads down to the Hillside
with Brian O'Connor

0810 call access control
asked a bunch of questions
then proceeded to tell me
that Tom Griffith
needs to make the appt

0815 leave message with
Tom Griffith to call

0820 TG calls back
he needs the paper work before
he can make an appt
needs birth certificate to
make appt
will get Scott Parker on this

0830 Call GWL
we need to shut us down
the dulling if it gets to the
overflow point
he will call Ely for us

0835 left message with
CJ Brienza at Merrick for
surveying

NO JEM

3-21-90

0930 BT130 – Jim Koffler
SMCWD – talk to him
when I complete
my map
working with Jeffery on
his logs and driver
sheet info
JK – in trying to get more footwash
0940 Waste logs on river
0945 talk with Jarell about
what todo about Boyle
Kirby Paul + Brian here
Doyle, Helene + Mike – not here

don't let them charge for
thaving today
do not back charge for the
geologist/helper not
working
–DS – with Jarell – and
agrees

# CURVE TABLES

## HOW TO USE CURVE TABLES

Table I contains Tangents and Externals to a 1° curve. Tan and Ext to any other radius may be found nearly enough, by dividing the Tan or Ext. opposite the given Central Angle by the given degree of curve

To find Deg of Curve, having the Central Angle and Tangent Divide Tan opposite the given Central Angle by the given Tangent.

To find Deg of Curve, having the Central Angle and External Divide Ext. opposite the given Central Angle by the given External

To find Nat. Tan and Nat Ex Sec. for any angle by Table I Tan. or Ext. of twice the given angle divided by the radius of a 1° curve will be the Nat. Tan. or Nat. Ex Sec.

***EXAMPLE***

Wanted a Curve with an Ext of about 12 ft Angle of Intersection or I P = 23° 20' to the R at Station 542+72

Ext in Tab. I opposite 23° 20' = 120.87
120.87 ÷ 12 = 10.07 Say a 10° Curve

Tan. in Tab. I opp. 23° 20' = 1183.1
1183.1 ÷ 10 = 118.31.

Correction for A 23° 20' for a 10° Cur = 0.16
118.31 + 0.16 = 118.47 = corrected Tangent

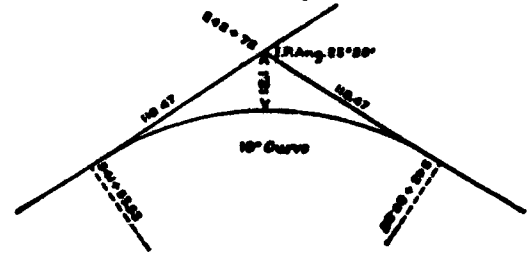
(If corrected Ext is required find in same way)
Ang 23° 20' = 23.33° ÷ 10 = 2.3333 = L. C

| | | | | |
|---|---|---|---|---|
| 2° 19⅓' = def for sta | 542 | I P = sta | 542+72 |
| 4° 49⅓' = " " " | +50 | Tan = | 1 18.47 |
| 7° 19⅓' = " " " | 543 | B C = sta | 541+53.53 |
| 9° 49⅓' = " " " | +50 | L. C = | 2 33.33 |
| 11° 40' = " " " | 543+ 36.86 | E C. = Sta | 543+86.86 |

100 – 53.53 = 46.47 × 3' (def for 1 ft of 10° Cur) = 139.41' = 2° 19⅓' = def. for sta 542.

Def for 50 ft = 2° 30' for a 10° Curve.

Def for 36.86 ft = 1° 50⅓' for a 10° Curve.



3-21-90

1000 talk with Janell earlier
IT moving into Water Sampler
trailer on 4/1/90 (3/30/90)
IT taking over this trailer
on 5/1/90
we water trailer, BFI
should all be transferred
to IT as of 3/30/90
Ken, Bill & Diane will be involved
they will take all our supplies
that we are not going to
need for the FD
make list of things leaving to
EG&G in the trailer
take phone
want to make sure we take maps,
notes, chain of custody
sheets etc
1010 Tony Arrives with Boyle & Hot
reads H&S plan Robinson
said he is up to speed on the
proposal
1035 leave trailer for 881 HS
Tony followed
1050 arrive at 881 HS

yesterday

JEM

3-21-90

2100 Rig #1 Finally Starts going

Kirby + Brian B301890

Paul + Tony B301690

1140 B301890 BR 20.0'

hit water at — 15'-18'

damp all the way down

no distinct zone

walk line with Kirby

plan to set up on next hole

below the ridge

1145 measure hole to get exact

depth

the weight on the probe

broke off and fell in the

Borehole on the way

down

1150 Kirby drills 1/2 ft to clog

up the bottom of the auger

hopefully when they pull

out of the hole they

will have it

1210 look at auger - clogged

use mirror to see the

rebar probe - it is in there

3-21-90

Water with mirror in Borehole

near bottom of hole

1215 move to B301990

1230 Organize thoughts

Drilling at B301990

1310 ± leave to go call RM,

get core boxes, call

Menick etc

1355 Back at trailer

call RM

John said that he came

down to 881HS yesterday

morning & yest afternoon

make several phone calls

to GDS, Jewell, Menick

- no luck

1500 Back at 881HS

Steve has physical therapy

for his neck - need to

leave early

B301690 Stu said [illegible] did not come yesterday [illegible]

1515 packer keeps blowing around

the formation

going to raise it one more time

in SS - need to pack in the

discrete zone

3-21-90
1602 Finish Packer testing
1620 getting ready to leave drill site
1635 Arrive at Weston trailer
talk with Greg Litus about changing gloves between opening sample bottles
best to open — put sample in and shut the lid quickly

We need to shut down drilling — no more decon when finished with clean augers — that is it
only 4 tanks will fit in the beam
1700 Help Jeffrey with sample drains
1725 leave site



3-22-90 sunny beautiful
0700 Arrive at RFP
0720 KEM calls, he will not be in until noon
Brian calls — his wife needs blood taken for surgery
Doyle not going to be here
Paul said he sounded real bad on the phone
0800 talk with Greg Sherman on the phone
tell him of decon pad situation
he is going to call GWL
extending deadline
maybe be able to do the I-E lines
coming only, auger on FD to shut down in day or so
Kirby — have enough augers for 1 more hole
0830 leave for 881 HS
0845 Arrive at B301990
0910 John Munoz of RM comes to screen cores, said he will come back this afternoon
Tom Griffith signs war permit

3 22-90
0925 Still no Brian Priby/
or Scott Yoshino
Kirby still having trouble
putting sampler on bottom
of augers
crooked hole

1010 Kirby need to pull augers
1015 Scott arrives
1115 Brian arrives at site
Steve
1145 B301690 37.8 ft

finished B301990

1250 Steve on B301590
packer testing with calibration
cylinder
we are defeating the purpose
trying to get to smaller
permeabilities
$10^{-8}$
the pressure gauge used on this
method ~~[illegible]~~ in 5 Em
starts reading at 10 psi

3-22-90
10 15 20 25 psi
KPa - Kilopascal
starts at 80 KPa
200 300 400 KPa
other gauge could read
to 0.5 psi

also the cylinder leaked around
the threads - need some new
epoxy - going to go back to
the old method

1310 at B302090 Jeffrey Hensel
upon little ridge

1425 Top Soil again at ≈ 17-18'
we are about that high upon
a ridge
1455 Drop off rad screen samples
1500 Call C.J. Brianza of Merrick
screw will come tomorrow
1505 Call GDS
EPA coming out tomorrow
between 09-11
1515 Call Carl High to try and order [illegible]
for calibrated [illegible]

3-22-90
1530 go back to 881
1545 arrive at B302090
Bedrock at 25.0
TD ≈ 27.0
up on 15-20' ridge
hit topsoil at 17-18'?
1620 leave 881 HS
1640 back at trailer
1645 call GDS - we can
core with Rig 1 tomorrow

1730 leave site

Area drying up
nicely - much easier
to get around

0730 work on paperwork
0915 Quit

3-23-90 sleeting, overcast, cold
0655 Stop to get gas
0715 Arrive at RFP
0145 talk with Tom Griffith
we are going to try and drill
Kirby - set surface casing
Paul - finish coring/packing
B301590
0800 go over logs with Jeffrey
0815 Brian Priby/ - calls he is on his
way

0830 Merrick arrives
believe they can work in
the fog & weather
0845 talk with Travis Canon
about Packer tests
0900 call in hours Brian Parrish
QA logs
0915 Scott Y arrives
1000 Brian back at Trailer - said
EPA already down on the hillside
1005 leave for 881
1010 Arrive at 881 HS

10 JEM

3-23-90

Jim Wolff PRC
Mark Hestman EPA
331-4850 Patty Corbetta CDH
Brent Lewis
Tom Olsen DOE
Paul Singh
Tom Griffith - signed work permit

1135 EPA leaves

1045 Jeffrey - talked with EPA concerns
have we been wetting to ground
lack of dust
if not - where is documentation of soil conditions being
traffic wet enough don't need to spray
rod screening - how do I
wind speed speed we shut down
high volume sampler - air
1110 leave 881 HS
1125 back at trailer
QA log - go over with JFA

3-23-90

1250 Back at 881 HS
steve packer testing B301590
sleeting / snowing
very cold
breeze 5-10 mph
Sue from Ebasco there
1405 next sample keep getting
SS - need to see
1410 Sue leaves
1440 have Kirby & are the grant plant to set sta closing in 18, 19 & 20
they are in charge on B301590
- decide to wait and packer on Monday
getting really cold & windy
1510 Back at weston trailer
showing hand
talk with Bill B. about water levels

| Well # | DTW (TOC) | 3/22/90 @ 1530 |
|---|---|---|
| 53-87 | 3.45 | |
| 54-87 | 2.30 | |
| 01-87 | 11.30 | |

that means water at ground level or 1.5' below ground sta

1d JEM
3-23-90
1600 Steve & Brian arrive back
1630 Work on Weekly dailys of the 881 HS
1730 leave for home

3-26-90
0620 Arrive at Weston office
deliver weekly report
0650 leave for RFP
0715 Arrive at RFP

0730 4700 - 4000 gal
12"
phone#
1854
Joe Velasquez
liquid waste within
foreman in 374 bldg
1165 - page Tango-2
0735 Arlene still sick
Paul, Kirby & Doyle - only ones here
0755 Brian O'Connor here
4 Boyle
2 - Cole / Packer
2 - Decon Pad
they are on their way
0805 Joe calls need to call him when tanker full
Doyle & Kirby on standby to empty the decon pad
0810 Tom Griffith calls
needs old permits - EPA upset
wants all documentation

14 JEN

3-26-90

told him that Bill Benneman
needs a work permit for
surface water in the
questionable area at
Rue 903-E trenches
talk about missing red Dodge
list - he will get it for us

0815 Scott Yoshino calls - he will
be at office for another hour or
two

0820 Steve - Paul - Brian O'Conner
Rig #2 Packer test
finish on 8301590
then will move
Jeffrey - & Brian Priby1 - will
watch to see how Steve
does Packer / coming
Doyle - Kirby - Decon Pad
Mike Boyde - not here
Helene - sick

0830 Tom Griffith comes
picks up old work permits
said I should talk to Shana
about using xerox machine
talks with Bill about SFC water
stations below E trench

15

3-26-90

0845 Manuel arrives
send them down on the bridge
and do horizontal of the
FD boreholes
need work permit to survey
in soil scraps

talk with Doyle & Kirby
still no water truck

0910 Water truck arrives
0915 Tom Griffith calls
we are to shut down all drilling
activities on the 881 HS
maybe couple of hours
maybe several days
0920 try to call BRL, GWL

0945 Mike Freehling calls
wants
Health & Safety measures
daily logs
equip calibration
0945 BRL all supporting documentation
drilling HNu calibration
Tom Olsen - DOE

-20-90

0950 Have Brian deliver the info
HNu cal, call Scott Y - he has
his notebook
rad screen results

'0.05 Call Joe
truck full
truck king will be over
right away

1000 Mike Freehling comes to
trailer
tell him about BRL delivery
from Brian
& takes the original H+S
plan
notice - continuous air monitoring
meeting at 1330

'015 Tom Griffith
tell him what I know about EPA
can't go in E trenches, 903 lip
then or E spaaf field
Tom thought meeting was at
1130 - maybe that is
a pre-meeting



3-26-90

water samplers to avoid
all those areas listed
above

1040 Frank Kabat calls [2109]
dust suppression
documentation of engineering
control of dust

1045 STY - going to deliver
his notebook

Boyles H+S documentation
H+S ~~[illegible]~~ JEM sign in sheets
rad equipment calibration
1050 leave to deliver to BRL
1110 give to Pete Foldger
1120 back at Weston trailer
the truck ~~[illegible]~~ has been removed
from Dixon pad

1130 GDS calls, tell him the
EPA story
unsure of how long it will be
should call Carl High about
gauge for the calibration

1' 18 JEM

3-26-90

1140 SPC leaves for the office

1150 call Tom Griffith - discuss work permits for surveyors are unable to work in that zone until EPA situation resolved probably

1210 call Carl High - at lunch he will call back wrt gauge

1245 Joe Velasquez calls needs rec # on the Gus Linda report - don't have

1305 Joe comes pick up the reports he will bring them back

1315 Jeffrey is leaving to go to the ~~FTC~~ VEM Weston office

1300 talk with GWL - he does not know anything about the EPA shut down

3-26-90

1330 Guslinda Compton 5267
Interplastic 7799 Kathy Haggins
881 HS ground house

1340 Joe back with reports
We have him till the work is complete

1330 Carl High calls back
the gauge is out there already
talk with Doyle - the gauge is the spsi incinerator gauge

1350 Surveyors - only could do to holes
P219989
B220489

- 690 - control on 881 HS will get stuck
24-89 - will get stuck
B320589-881HS

1400 BPL calls - asked how much more work do we have
2-3 full weeks

1415 take decon pad sample from tank #3

20 [illegible]
3-26-90

1500 Call Joe
their pump is acting up - will probably not be able to get it fixed - need to contact maintainance

1600 He calls back - definitely not going to get the water truck back to us

1630 leave Weston trailer for home

UEM

3-27-90

0715 Greglitus 5971

Brent Lewis - not in yet
he wants Dissolved O2 meter from office
he wants ken a Bill to call

0725 GWL - shut down for the week - should have them do some clean up work around here

0740 call Joe Velasquez 4854
trucking on his way

0810 Arrive at Tom Griffiths office with Mike Boyds naturalization papers, SS card & passport

0820 Tom not there
Sharon will not accept the naturalization papers - need the certificate

0840 Ray Martinez at trailer wondering about trash
Roger Wisehart need to put in rectangular box

72 JEM

3-27-90

0850 4553 Access control

they need to check into Mike Boyd's papers
will get back with me around 0930

0905 Contact Joe (Tango 4) on radio - ready to have trucking to pick up the truck

0920 Tom Griffith - wants to look at Mike Boyd's papers
EPA - problem - maybe pat Weston problem
8G-TG maybe didn't teach us procedure

0925 7621 Joe Finch Access control calls

0925 TG our problem, not our responsibility
maybe not given all the guidance of procedure
just his opinion

JEM 2

3-27-90

0935 Joe - picking up the truck - when we get 2 full tanks - call him
may take 3 days to get coordinated

0940 BRL told Tom Griffith one week
Mike should not stay on site
he may be an infraction of the rules

0955 Joe Finch calls back
if has letter saying he is naturalized citizen
he should be alright to be on site - confusion - thought Blue Badges

1005 Joe Finch needs to contact Pat Backus

1010 Tom Griffith calls
10 o'clock monday
will be able to get a Dosimeter for Brian O'Connor

1010 leave RFP for office

24 JEM
3-27-90
B15

orange book STP calb
H+S sign in sheets
calibration logs
cal - rad monitoring

still have yellow logbook
rad screening results

# SITE HEALTH AND SAFETY COORDINATOR'S LOGBOOK

Property of _____

Address _____

Telephone _____

This Book is manufactured of a High Grade 50% Rag Paper having a Water Resisting Surface, and is sewed with Nylon Waterproof Thread

INDEX

2029-33-09

0020

881 HS-90-06

Scott Yoshino

STY 1-30-90 1 -30-90 2

0700 SCOTT T. YOUNG (STY) ARRIVED AT WESTON TRAILER TO CONDUCT SITE SAFETY COORDINATOR RESPONSIBILITIES.

0800 PERSONNEL ONSITE WAS GIVEN H&S MEETING. THOSE INVOLVED WITH THE FRENCH DRAIN PROJECT WERE GIVEN ORIENTATION (SAFETY & HEALTH). REVIEW OF THE HASP WAS GIVEN BY STY. PERSONNEL INFORMED ON PP (PERSONAL PROTECTION) MONITORING & HAZARDS INVOLVED WITH THIS TASK.

NO PERMITS TO DRILL SB1 SO NO WORK IS BEING DONE. WEATHER PRETTY CLOUDY COOL (40-50°F). STY

STY AT 1245 TRANSFERS SITE SAFETY COORDINATORS RESPONSIBILITIES TO JEFF HERRICK FOR 1/30/90.

AT 1245 WATER SAMPLERS ARE OUT & ONE DRILL RIG DRILLING OUT AT LOCATION 2489. AT THIS TIME NO INCIDENCES NO INJURIES & NO EXPOSURES.

1400 Unpacked + checked all fire Extinguishers. All working

1540 To this point no accidents or exposures have been reported. Western office/trailer has been rearranged and stored supplies have been sorted. Shelves have been installed. Access to supplies and movement around trailer has been enhanced.

1550 Water sampling crews begin to arrive, back from days efforts.

1650 All sampling crews back. No injuries or incidents reported.

1700 All Western and contractors for Western are off site. J.T.H.

1-31-90
STY
3

0745 STY ARRIVES AT ROCKY FLATS
FRENCH DRAIN PROJECT IS DELAYED
WILL NOT START TODAY
KEN MILLER IS SITE MANAGER
ONE DRILL RIG RUNNING AT
HOLE 2489. TOM LUTHER
IS WATCHING THE RIG.
OTHER ACTIVITIES
WELL DEVELOPMENT CHEM CREW
& WATER SAMPLING.

PERSONNEL
CARL LIPP
REX KLEINSASSER
RAY MICHAEL
ARON SPICES
LEON KLOTZ
D. KENBURY
E. DALGO
CURRIE GARSN
RAYMOND SCHEEN
K. PARKER
T. LUTHER
B. P. O'CONNY

1-31-90

4

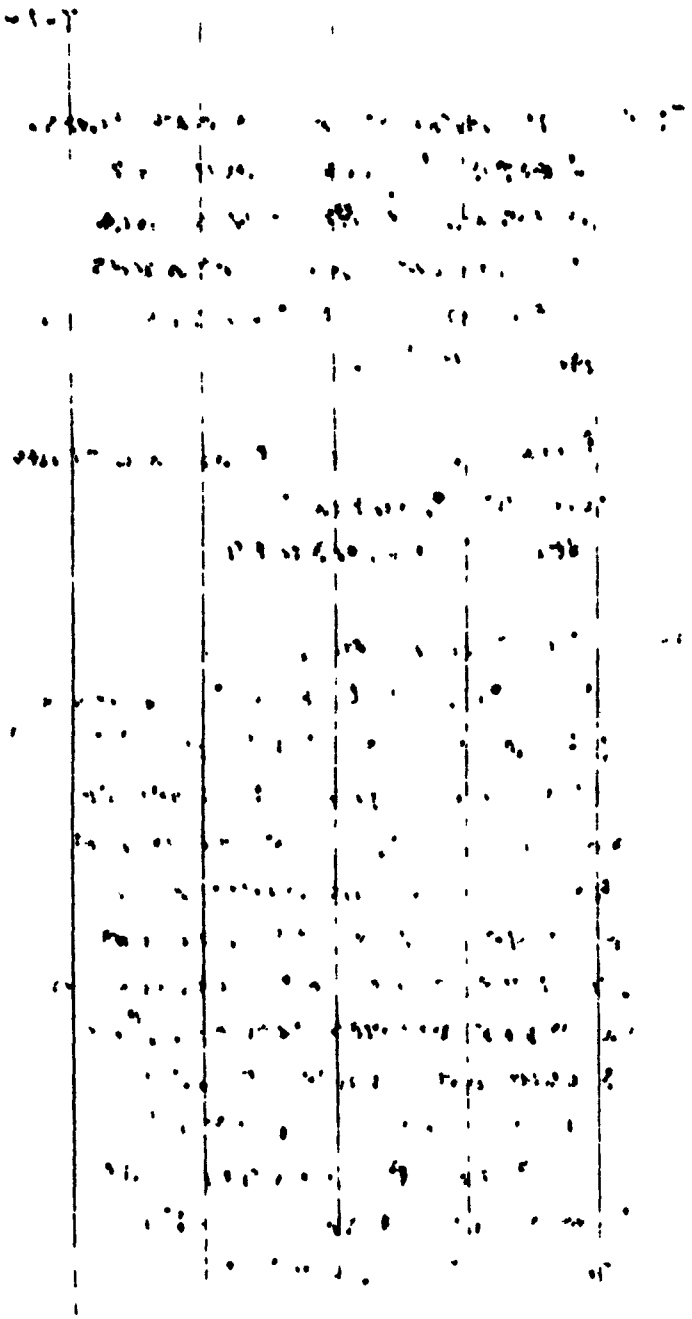
1530 - NO EXPOSURES NO ACCIDENTS
ALL PERSONNEL CAME IN
& STY LEAVE THE SITE

STY
1-31/90

0830 STY ARRIVES AT ROCKY FLATS.
KENNY MILLER GAVE H&S
MEETING & AT THIS TIME
NO INJURY NO EXPOSURES.
WEATHER COOL PARTLY CLOUDY
ABOUT 40°F.

ONE DRILL RIG RUNNING TODAY
WATER SAMPLING
WELL DEVELOPMENT

0900 KEN MILLER ASKED STY TO
GO OUT TO RIG 2-T. LUNDE
& KIRK RIG AT HOLE B219989
TELL THEM THAT IF THEY GET
ANYTHING ON THE HOLE THEY
ARE TO CONTAINERIZE IT.
AT THE TIME OF ARRIVAL
AT THE HOLE ALL PERSONNEL
IN TYVEK BOOTIES GLOVES. ONE
FLIGHT WAS DONE 5'. NO
HITS. SUE SORCZAK
OF EG&G AUDITOR WAS
WATCHING OPERATION. SHE
ASK FOR STY NAME. STY





GAVE IT TO HER. STY LEAVE
DRILL AREA 0905.

1130 STY & K. MILLER GO OUT
17 FT STARTED. P219989
20' 120 PPM EQUIVALENT HNU 10.2 EV
EAST MOUNDS. T. LUTHER
KIRBY - DRILLER. SUE SOBCZAK
EBASCO. K. MILLER SAYS TO DRILLERS
~~LET VENT~~ STY & GEOLOGIST T. LUTHER
TO LET VENT FOR A LITTLE (15 MIN)
LONGER. POSSIBLE EXPOSURE
T. LUTHER. WILL INCREASE TO
LEVEL C IF HNU IS ABOVE BACKGROUND
IF ABOVE 5 UNITS IN BZ WILL GO
LEVEL B. STY ~~INSTRUCT~~ ASK. STY ~~OUT~~ HOLE
PERSONNEL TO HAVE QUANTITATIVE
FIT TEST. ONLY DRILLER IS
PROPERLY FIT TESTED. STY ASK TO GET
AN OVA.
STY RETURN TO BASE CALIBRATE
OVA BRING IT OUT TO
P219989. ~~PUT~~ STY STY
PUT ON TYVEK, GLOVES, BOOTS & TAKES
OVA TO HOLE. MONITOR AT

2-1-90
STY
7

20' & FWD NOTED STY ORGANICS (READINGS) ON EITHER HNU OR OVA. PUT DUST MORE 5' AUGER ON. AT APPROXIMATELY 22' DUST & STEAM START TO RISE FROM HOLE. HNU WAS NOT MONITORING BUT STY WAS MONITORING WITH OVA. AT APPROX. 2' DEEP THE GROUND STY HAD A READING OF 1.5 PPM EQUIVALENT ON THE OVA. STY STOPPED OPERATION & everyone CLEARED AREA. AFTER FURTHER DISCUSSION W/ K. MILLER THE HOLE WILL BE FURTHER MONITORED IN LEVEL D (MODIFIED) IF READING IN THE BZ WILL DISCONTINUE & INCREASE TO LEVEL C. STY OVAS BATTERIES DIE. STY & K MILLER GO GET NEW OVA.

1300 STY & K. MILLER ARRIVE AT HOLE & MONITOR HOLE 24'. NO READINGS IN BZ. ONE READING AT

2-1-90
STY 8

23' IN SOIL BOREHOLE 9.0 PPM (DVA). REPEAT NOTHING IN BREATHING ZONE. MODIFIED LEVEL D WAS WORN DURING THIS ACTIVITY. 24' END DRILLING. WILL CONT. MONITORING UNTIL HOLE IS COMPLETE BY T. LUTHER OR SALAZAR. K. MILLER & STY COME BACK TO BASE 1330. PERSONNEL AT HOLE P219989 WERE

T. LUTHER
K. PARKER
B. O'CONNOR
K. MILLER
S. SOBCZAK
S. YOSHIWO

STEAM & DUST OF HOLE P219989 APPEARED VELCOWHAT TIME OF READINGS.

2-1-90
STY
4

1545 STY & K. MILLER GO OUT TO WIND SITE TO OUT NOW OSA. 881 HILL SIDE (OSA). SUPPOSEDLY, 881 FRENCH DRAIN PROJECT WILL START TOMORROW 2-2-90.
T.S. STY

1600 PERSONNEL IN THE FIELD WELL SAMPLERS COMING IN OUT OF FIELD. WELL DEVELOPERS ARE DECONING.
WESTON PERSONNEL & SUB CONTRACTORS IN. STY LEAVE SITE.

STY 2-1-90

2-2-90
SN
10

0730 - STY ARRIVE AT LICKY FLATS.
FRENCH DRAIN IS SUPOSEDLY
SITTING TODAY. IN THE
OFFICE PERSONNEL FOR
FRENCH DRAIN.
J. HERRICK
J. MARKS
S. CARPENTER
S. YOSHINO

WEATHER TODAY IS COOL CLOUDY
& SNOWING. TEMP. APPROX. 20-30°F.

0915 J. HERRICK & STY HEAD OUT
TO SKI HILLSIDE.
APPROX. 0935 WE BEGIN
SET UP RIG HOLE B300190
BACK GROUND READINGS
W/ HNU 0.1-0.2
W/ OVA 0.1
PERSONNEL ONSITE
INCLUDE
J. HERRICK
J. MARKS
S. CARPENTER

SIP
2-2-80
71

MERLE ? - OCCUSAFE IN
SIP

PAUL
DOYCE
SNOWING NO WIND.
SNOW IS VERY WET.
30-31°F.

BACKGROUND
GM PANCAKE 50 COUNTS/MIN
2 SCINNTILATOR 0 COUNTS/MIN
6 INCH CORE - GM = 50 COUNTS/MIN
2 S = 0 COUNTS/MIN

2 FOOT CORE - GM = 50 COUNTS/MIN
2 S = 0 COUNTS/MIN

AT APPROX. 1030 J. MARKS CALLED THE DRILLING DUE TO HEAVY SNOW. THE GEOLOGIST S. CARPENTER COULD NOT WRITE IN LOG BOOK.

MERLE W/ OCCUSAFE HAD 1 HNU 10.2 eV INSTRUMENT MALFUNCTIONED AT BEGINNING OF PROJECT.

1100 ARRIVE BACK AT WESTON BASE. STY, J. HERRICK, S. CARPENTER, J. MARKS, P. B. (BOYLES DRILLER), & DOYLE (BOYLES DRILLER) IN FROM SITE. SNOW AT THIS TIME IS STILL HEAVY.

1150 J. HERRICK & S. CARPENTER HEAD BACK OUT TO HOLE B300190 TO LOG CORE & TAKE SAMPLES.

1250 STY TAKE A SAMPLE TO 864 FOR THE LAB. SAMPLE HAD CHAIN OF CUSTODY & CUSTODY SEAL. STY RELINQUISHED SAMPLE TO LAB (EG&G).

1336 MOST OF THE WATER SAMPLERS ARE COMING IN. WATER SAMPLERS HAD NO INJURIES & NO EXPOSURES.

1500 WATER SAMPLERS WELL DEVELOPERS IN. WESTON EMPLOYEES IN. NO INJURIES, NO ACCIDENTS, NO EXPOSURES.

2-2-90
SFY
13

1530 GTY LOUNGE FLATS

SFY 2-2-90

2-2-90
STY
14

0900 STY ARRIVE AT FLATS.
JANET MARKS IN OFFICE
KEN MILLER ALSO IN OFFICE.
THERE IS 2 RIGS GOING
TODAY. 1 RIG 'FRENCH
DRAIN' 1 RIG 'RI 89'.
NO INCIDENTS OCCURRED
TODAY. H & S MEETING
HELD BY K. MILLER.
WEATHER COOL 40°F
CLEAR. FORECAST
AFTERNOON SNOW.
STY IS GOING DOWN TO
RIG 1 FRENCH DRAIN
WELL B300190. NEW
PERSONNEL FROM STOCKTON
ARRIVED TODAY TO ASSIST
IN FRENCH DRAIN OPERATION.
STY CALIBRATE HNU 10.2 eV
& CHECKS RAD MONITORING.

0930 STY ARRIVE AT B300190
MONKS DRILLING IS COMPLETE
& HOLES ARE CAPPED.

2-2-90
STY 15

1050 STY MEETS W/ J. MARKS.
SHE INFORMS STY GOING
TO BE A WHILE BEFORE
THEY START DRILLING AGAIN.
STY GOES BACK TO BASE.
1254 B300290 STY GOES OUT
TO HOLE B300290. AT
4-6 FT. MONITOR W/
HNU 10.2EV - AT BACKGROUND
0.1 0-20 RANGE

4-6 GM PANCAKE - 75 CPM X1
CORE & SCINTILLATOR - 0 CPM X0.01

6-8 HNU 10.2EV 0.2 0-20 RANGE
BKG IN HOLE

GM PANCAKE - 15 CPM X1
& SCINTILLATOR - 0 CPM X0.01

8-10 HNU 10.2EV
AT HOLE GROUND 0.2 0-20 RANGE
BREATHING ZONE 0.1-0.2 0-20 RANGE

STY
2-2-90
16

1310 AFTER THOUGHT. AT 0930
MET CHRIS HIND &
ROB SAGEBISH OF
WESTON AT B300190
STY GAVE THEM H & S
ORIENTATION. THEY READ
& UNDERSTOOD HASP
& SIGNED.

AT 1311 SUE SOBCEAK ~~AND~~ STY OF
EBASCO COME DOWN AND
MEET PERSONNEL AT HOLE
B300290.

HNU 10.2eV 0-20 RANGE
10-12' AT SOIL 0.2 BKG
OZ 0.2 BKG

1330 RIG 2 AT HOLE B300290
IS FINISHED & IS WAITING
FOR DURON RAD MONITORING.
THERE WAS NO INDICATION OF
RAD IN CORE ETHER ATTAIN
BKG. & THE HOLE ~~WAS~~ STY DID

2-2-90
STY
17

NOT SHOW ANY INDICATION
OF VAPORS WITH MNT. STY
HEAD BACK TO BASE AT 1350

1340 STY ARRIVE BACK TO WESTON
BASE & CHECK IN INSTRUMENTS
CLEAN & WORKING. THESE
INSTRUMENTS USED FOR THE
FLOWER DRAIN. WEATHER
35-40°F MOSTLY CLOUDY
SLIGHT WIND FROM THE
EAST.

1530 STY - MET PERSONNEL FROM
FIELD MET IN. STY
ALONG THE FLATS.

STY 2-2-90

2-6-90
STY 18

0750 STY ARRIVE AT FLATS & J. MARKS
K. MILLER, C. HINDS, T. LUTHER
AT OFFICE.
J. MARKS FRENCH DRAIN WILL
BE CORING B300290.
WEATHER IS MODERATE 40°F - 50°F
SUNNY DAY. NO THREAT OF HEAT OR
COLD STRESS.
STY GOES OUT TO B300290
PERSONNEL AT FINAL STY SITE
J. CARPENTER
J. MARK
B. PRYBIL
R. SAGEBUSH
DOYLE

0855 NO ACTIVITY BEING PERFORMED
AT B300290
COMMUNICATION - PORTABLE TELEPHONE

1110 AT APPROX. 1030 HOLE B300290
BLEW GOLCLAY. DECIDED TO WAIT
FOR WORRI APPROVAL ON NEW
SYSTEM TO GET BEDROCK BORE HOLE
CORE. J. MARK SHUT DOWN OR

2-6-91
STY
19

HOLD ON BOREHOLES. STY HEADS BACK TO BASE

2.75 OR 1415 STY HEAD DOWN TO HOLE 0300290 TO WATER GROUTING OPERATION.

3687

AT 1530 STY WAS NOTIFIED ABOUT SOME READINGS AT WELL 3687 W/ HNU IN BZ. STY ARRIVE & SAMPLERS IN MODIFIED LEVEL D.
BRIAN SIMMONS
ARRON SPICES OF CHEM WERE WATER SAMPLERS. WHEN PUMPING SEDIMENTS PERGED THE HNU 10.2CV IN HOLE. BZ WAS 0.6 RANGE 0-20. ~~DELON ASTY~~
STY INSTRUCTS WATER SAMPLERS TO WAIT UNTIL TOMORROW TO FINISH & PROCEED IN LEVEL C.

1630 ALL PERSONNEL IN. STY CHECK IN INSTRUMENTS. LEAVE FLATS

STY 2-6-90

2-7-90
STY
TO

0740 STY ARRIVE AT FLATS WESTON BASE
J. MARKS, K. MILLER, T. LUTHER
IN OFFICE. K. MILLER GAVE
H & S MEETING. STY
WEATHER CLEAR SUNNY
50°F.
FRENCH DRAIN TWO RIGS
RUNNING TODAY

0940 STY ARRIVE OUT TO WELL 3687
WHERE BRIAN SIMMONS &
AARON SPIGGS ARE DEVELOPING
WELL. AT ARRIVAL THEY
JUST BEGAN PUMPING WELL.
NO READING IN THE BREATHING
ZONE RW/HNU/O2 CEV. THE
WELL DEVELOPERS ALSO HAVE
A OVA & WILL CONTINUALLY
MONITOR THIS WELL TODAY
(POSSIBLE LEVEL C).
STY PROCEEDS TO 881 HILLSIDE
WHERE CORE OF BED ROCK WILL
BE TAKEN BY BOYLES & WESTON.
B300190 & B300298 WILL BOTH

STY
2-7-90
4

BE DONE TODAY. BOTH HOLES WERE CLEAN AT THE TIME OF DRILLING. OCCATIONAL MONITORING WILL BE PERFORMED USING HNU'S 10.2 CV. ALL INSTRUMENTS CALIBRATED & IN WORKING CONDITION. PERSONNEL ON SITE AT 881 HILL SIDE INCLUDE

S. CARPENTER
B. PRYBIL
K. HINDS
R. SUGEBUSH
DOYLE (BOYLES) DRILLER
PAUL (BOYLES DRILLER
2 HELPERS. MIKE WOODS (BOYLE)
ARLENE BODAY (BOYLE)

1030 STY WAS REQUESTED BY R. SUGEBUSH WESTON TO SCREEN THE CORE ON HOLE B300290. STY BROUGHT OUT 3 RAD MONITORING EQUIPMENT

A MR METER, A GM PANCAKE & A α SCINTILATOR. ALL INSTRUMENT READINGS WERE AT BKG.
ALSO PRESENT AT B300290 WAS EBASCO MONITOR JUE SOBECZEK.
CREW WEARING PPE MODIFIED LEVEL D.
B300190 STY WILL RAD MONITOR CORES & PERIODICALLY CHECK HOLE WITH HNU 10.2eV

1215 AT B30039 STY WILL MONITOR HOLE WITH HNU 10.2eV & RAD MONITOR CORES.
SET UP READY TO GO AT 1216

AT 0-6" NO READINGS IN HNU 10.2eV 1-20 RANGE (0.2 UNITS)
CORE NO RADIATION ABOVE BKG USING α SCINTILATOR & GM PANCAKE.
AT 1'-2' NO READINGS ABOVE BKG ON HNU 10.2eV RANGE 1-20 (0.2u)
RADIATION MONITORING

STY
2-7-90
27

1220 α SCINTILATOR X0.1 = 0 CPM
GM PANCAKE X1 = 100 CPM
≥1-2' CORE = 3-5' CORE

5-6'
HNU 10.2 eV
NO READING IN HOLE OR BZ ABOVE
BKG (0.2 UNITS) 0

α SCINTILATOR SMEAR X1 = 0 CPM
GM PANCAKE X1 = 60 CPM

7-9'
HNU 10.2 eV 1-20 RANGE
GROUND 0.2 UNITS
BZ 0.2 UNITS

1240 6 REG LITIS OF EG & G CAMP
OUT W/ K. MILLER TO RIG
B300 & 90. G. LITIS NO TYVEK NO
BOOTIES NO HARDS HAT

7-9'
α SCINTILATOR SMEAR X0.1 = 0 CPM
PANCAKE GM X1 = 60-65 CPM

STY
2-7-90
24

10-12' HRU IN HOLE = 0.2 UNITS
BZ = 0.2 UNITS
0.2 = BKG

RAD α SCINT. = 0 CPM
BM = 75-80 CPM

1430 STY COME BACK TO WESTON
BASE. 881 IS DONE W/
B300890 & DONE CORING
B300190.
STY LEAVE FLATS.

STY 2-7-90

STY
2-12-90
25

0740 STY ARRIVE AT FLATS
PERSONNEL
DOYLE - BOYLES
T. LUTHER - SALAZAR
J. MARKS - WESTON
K. HUNT - WESTON
R. SUGOSHI - WESTON
P. BUTKOWSKI - BOYLES

STY CALIBRATE HNU & LOOK AT RAD EQUIPMENT. ARRIVE AT HOLE B300690
CLEAR SUNNY FORECAST 60'S & BREEZY.
T. LUTHER IS GEOLOGIST FOR THIS HOLE.
MONITORING
PC = PANCAKE
α = α SCINTILLATOR
HNU = 10.2 eV RANGE 0-20

0-2'
PC = 85-100 CPM
α = 0 CPM
HNU = 0.1

STY
2-12-90
26

2-4' - PC = 85-100 CPM
α = 0 CPM
HNV = 0.2 BKG BZ 0.2 HOLE

4-6' - PC = 85-100 CPM
α = 0 CPM
HNV = 0.2 BK BZ & HOLE

6-8' = PC = 85-100 CPM
α = 0 CPM
HNV = 0.2 BKg BZ & HOLE

6-10' = PC = 85-100 CPM
α = 0 CPM
HNV = 0.2 BKg BZ & HOLE

10-12' = PC = 85-100 CPM
α = 0 CPM
HNV = 0.2 BKg BZ & HOLE

HOLE B300990
0-2' = PC =
α =
HNV = 0.2 BKG BZ & HOLE

2-12-90
27

2-4' HNU = 0.2 BKL BZ & HOLE
PC = 100 CPM
α =

4-6' HNU = 0.2 BK BZ & HOLE
PC = 85 - 100 CPM
α =

6'-8' HNU = 0.2 BK BZ & HOLE
PC = 85 - 100 CPM
α =

8-10' HNU = 0.2 BK BZ & HOLE BZ
PC = 60 - 100 CPM
α =

10-12' HNU = 0.2 BK & HOLE BZ
PC =
α =

12-14 HNU = 0.2 BKG BZ & HOLE
PC =
α =

STY
2-12-90
28

B3001090

0-2'
HNU ROCK
PC =
α =

2' ROCK
HNU 0.2 BKg BZ & HOLE
PC = 80 CPM
α = 0 CPM

10' HNU 0.2
PC = 70 CPM
α = 0 CPM

12-15' HNU 0.2 BKg BZ & HOLE

AT APPROX. 1330 HOLE B301090
IS STOPPED DUE TO RIG CHALKING
1400 STY GO BACK TO TRAILER
1430 STY BACK AT SITE
NO INCIDENTS NO EXPOSURES.

1640 STY LEAVE FLATS

STY 2-13-90

STY
2-NOV-02

0830 STY ARRIVES AT FLATS.
NO DRILLING TODAY
DUE TO SNOW & COLD!
OVERALL BAD WEATHER.
WATER SAMPLERS ARE
OUT & TRYING TO COLLECT
SAMPLES. STY WILL STAY
IN CASE OF POSSIBLE
INCIDENTS. WATER SAMPLERS
WERE GIVEN H&S MEETING.
HNU'S ARE BEING USED IN
FIELD. ~~HOOKE~~ STY

1200 STY & HANK BIENKOWSKI
SET OFF TO FIND WATER
SAMPLING CREW TO WATCH
THEIR ACTIVITIES. 1337
FOUND CREW - WITH DOUG & ROD
THEY ARE JUST CONCLUDING
VOA SAMPLES. THE WATER
SAMPLERS HAD THEIR THICK
BOOTIES & OVER GLOVES ON.
THE WEATHER IS VERY COLD

2-13-90
SV
30

1650 STY LEAVE FLATS NO INCIDENTS & NO ACCIDENTS OR EXPOSURES. ALL PERSONNEL SAFELY IN.

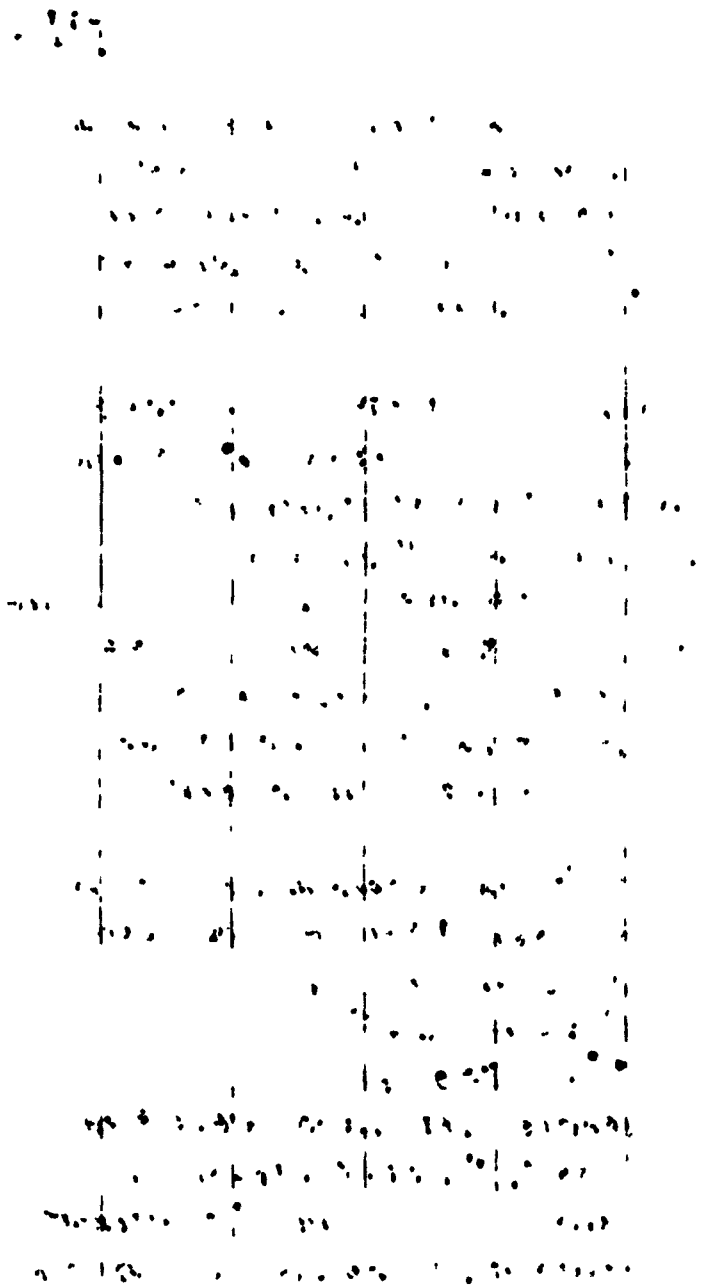
SVI
2-13-90

STY
2-19-90
31

0800 STY ARRIVES AT FLATS. WATER SAMPLERS ONLY PERSONNEL WORKING TODAY. VERY COLD 15°F W/ SLIGHT BREEZE. H & S MOVING SLOW ON COLD.

AT APPROX. 1015 STY IS INFORMED OF POSSIBLE INCIDENT ON NORTH PLATEAU - WATER SAMPLERS. STY RUN A 1" BAILER TO CHAN 2 LOCATED ON EST HILLSIDE.
1030 STY ASKS CHAN 1 IF HE NEEDS ASSISTANCE. NO ASSISTANCE, HOWEVER AN INCIDENT DID OCCUR.

1035 STY WAS INFORMED OF ACCIDENT IN CHAN VEHICLE. PERSONNEL INVOLVED INCLUDE
CURTIS GADSON
RAY SCHOEN
VEHICLE SLED INTO WELL HEAD CASING. APPROX. SPEED OF IMPACT 15-20MPH. NO INJURIES HOWEVER, DAMAGE TO VEHICLE



2-14-90
32

RIGHT FRONT END DAMAGE
WELL # 3489 LOCATED ON THE
NORTH PLATEAU. STY
CALL K. MILLER - KEN MILLER
SAYS TO CALL EAST GATE
A WRECKER. BACK GROUND AREA
EAST GATE ASK HIM IF THEY
NEED A PROPERTY PASS IF
LEAVE SITE. FILE AN INCIDENT
REPORT. MAY WANT TO TAKE
PICTURES BEFORE LEAVE.
STY INFORMED HANK BIENKOWSKI
& BILL BETTERMAN OF WESTON CHEN. HANK
CALLS EAST GATE OF SITUATION.
HANK BIENKOWSKI TAKES RESPONSIBILITY
OF THE SITUATION & CALLS GUARD HOUSE.
THEY RETURN CALL & REPORT OUT
AT WESTON TRAILER AT 1300.
NO OTHER INCIDENTS OCCURRED.
STY GIVE RESPONSIBILITY OF SSC TO
HANK FOR THE AFTERNOON.
STY LEAVE 1330.

STY 2-14-90

2/15/90
[illegible] 53

0800 5° and light snow. Water samplers only. H&S meeting on cautions of cold and slippery conditions.

1042 HANK BIENKOWSKI & I visited field ground water samplers in 2 locations. ALL WELL.

1145 RETURNED TO TRAILER.

1630 all samplers in no incidents or exposures.

[illegible]
2/15/90

STY
2-16-80
34

0800 10°-20° slight. Breeze Clear sky.
Water samplers out. Drilling on
the Hillside today existing hole.
(881)
Will be drilling R&D well later
this afternoon. Waiting for Drill
to arrive.

0900 STY & KHRIS HINDE GO DOWN
TO 881 HILLSIDE WELL B301090
TO MONITORE W/ HNU & OVA.
THIS HOLE WAS PREVIOUSLY MONITORED
FROM 0'-14' BUT STY & KH
MONITORED AT 14' TO 16'.
NO READINGS ON EITHER THE HNU
& OVA IN BREATHING ZONE OF
HOLE. H&S MEETING WAS HELD
DURING EARLY MORNING BY KH

1200 STY LEAVE SITE TO GET GAS.
STY RETURNS AT 1215 KH
TALK TO GEORGE CRAWFORD TO
TRY TO GET STEVE CARPENTER
CLEARED FOR FIELD WORK.

2-16-90
STY
35

1246 STY & KH ARRIVE AT SEI HILLSIDE GEOLOGISTS LEFT. ONLY ONE DIG WORKING AT HOLE B300690 ~~FAL~~ STY STY TALKED TO BRIAN PRYBIL WHO MONITORED WITH HNU AT HOLE B300690 & SAID HE ENCOUNTERED A STRANGE ODOR WHEN PUT CASING IN HOLE. IT SMELLED LIKE PVC (PLASTIC) HE THINKS IT WAS FROM CASING HEATING UP. NO READINGS ON HNU WAS RECORDED.

1330 STY & K. HINDS GO OUT TO WATER WELL ON NORTH PLATEAU TO CHECK OUT CHEW CREW GROUND WATER SAMPLING THE CREW WAS IN MODIFIED LEVEL D. SUE SOBCEECK W/ EBASCO WAS ~~BOTT~~ THE WELL PERFORMING OVERSIGHT

1600 ALL PERSONNEL IN. STY DEPARTS NO EXPOSURE NO ACCIDENTS.

STY 2-16-90

SFT
2-19-90
36

0730 OTT ARRIVE AT FLATS TO GIVE BRIEF ORIENTATION TO NEW PEOPLE WHO WILL BE WORKING ON THE FRENCH DRAIN PROJECT. TODAY'S FORECAST: PARTLY CLOUDY MORNING HIGH -30°F THIS AFTERNOON SNOW HIGH -20°F

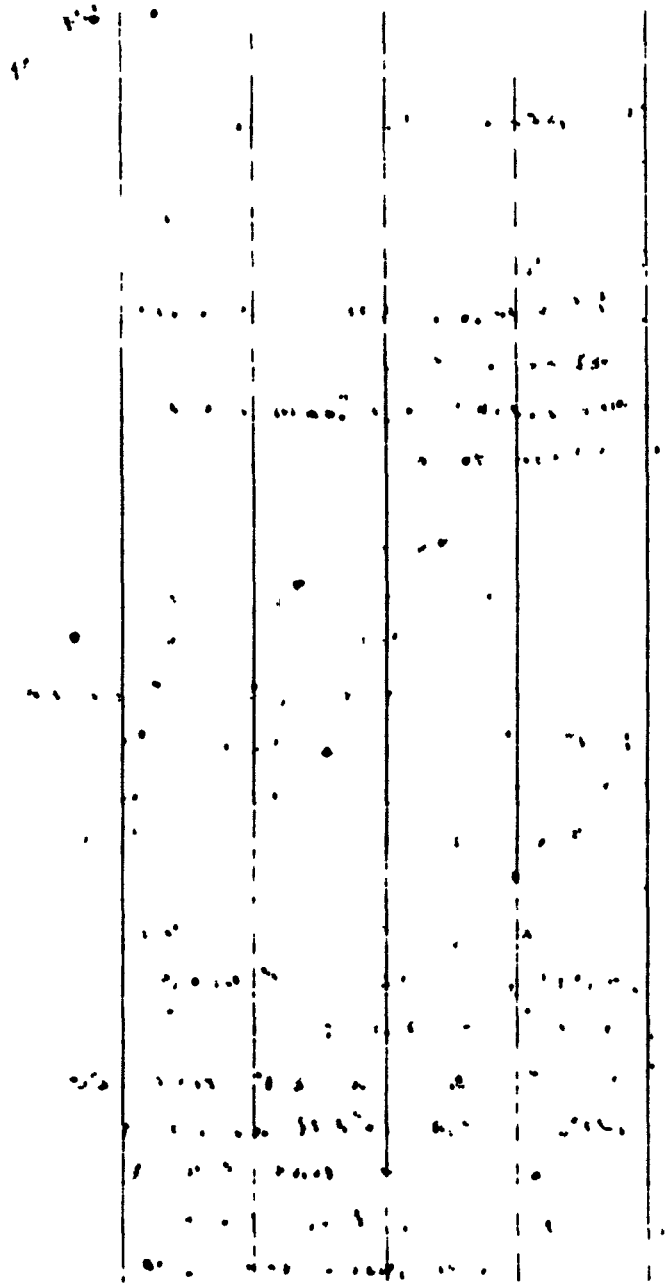
COLD CONDITIONS EXIST. OTT GIVE H&S MEETING ON PHYSICAL HAZARD & MONITORING. KIM WOODS FROM WEST CHESTER 95 GIVEN ORIENTATION IN ROCKY FLATS & EG&G & OUR H&S PLAN. SFT CALIBRATE HNU/0.2 EV & SFT GO DOWN TO 881 AT APPROX. 0933. OTT HAD NO EXPOSURE NO ACCIDENTS. SFT NEED TO LEAVE SITE ~~[illegible]~~ 1430.

OTT 2-19-90

0800 STY ARRIVE AT FLATS. DRILLING IS GOING TO BE ATTEMPTED ON 881 HILLSIDE. WEATHER COLD OVER CAST SNOWING.
H&S MEETING SHEETS SIGNED H&S MEETING GIVEN.
HANK BIENKOWSKI & JANET MARKS SITE MANAGERS.

0930 STY GO DOWN TO 881 HILLSIDE TALK TO JANET. DRILL RIG ONE ON HOLE B301090 WILL NOT RIG DOWN DUE TO WEATHER (SLIPS TRIPS) DANGEROUS ANGLE MAY ROLL INTO DITCH. RIG 2 PACKER TEST IS NOT GOING ON.

0945 GREG LITES - EG&G COME DOWN & MEET W/ JANET DISCUSS OPERATIONS OUT AT 881. NO WORK ON 881 HILLSIDE IS BEING PERFORMED AT THIS TIME. GREG LITES WAS ESCORTED DOWN BY HANK BIENKOWSKI OF WESTON - WATER TRUCK [illegible] WELL



SJY
2-20-90
38

DRILLING.

1:00 NO INCIDENTS NO ACCIDENTS NO EXPOSURES

SJY 2-20-90

STY
3-5-90
39

0800 STY ARRIVE AT FLATS
WEATHER FAIRLY SUNNY
WARM 85°F H & S MEETING
GIVEN BY HANK BIELKOWSKI &
JANET MARKS NEW PERSON
OUT FROM WESTON NEEDS
TO LOOK AT H & S PLAN

0934 STY & H.B. HEAD DOWN TO
881 HILLSIDE TO OBSERVE
WELL DEVELOPMENT &
FRENCH DRAIN OPERATIONS.
PERSONNEL DID NOT HAVE
MONITORING EQUIPMENT
ON SITE. STY HAD HNU 10.2 EV
CALIBRATED 3-5-90 & GIVE TO
FRENCH DRAIN OPERATIONS.
NO DRILLING TODAY HOWEVER,
CORING. THE HOLES CORED
TODAY HAVE ALREADY BEEN
MONITORED. GO BACK TO TRAILER

1145 STY & HB GO BACK DOWN TO
881 TO OBSERVE ACTIVITIES.
NO DIFFERENCE IN ACTIVITIES

3-5-90
STY
40

PERIODIC MONITORING BEING DONE AT B301190. GO BACK TO TRAILER 1220.

1310 STY ARRIVE AT 881 HILLSIDE TO OBSERVE ACTIVITIES.
B300890 FINISH WITH CORING.
B301190 NOT WORKING.
WELL INSTALL ATTOON NOT WORKING WHEN ~~COMING~~ STY OUT.
B300890 NO ACTIVITY MOVING BACKER EQUIPMENT TO B301190. 1411 STY RETURN TO BASE

1445 HB REQUESTS STY TO GO GET ANTIFREEZE FOR STEAM JET. STY LEAVES SITE.
1510 STY ARRIVE BACK AT FLAG W/ 3 GALLONS OF ANTIFREEZE. STY PLACES ANTIFREEZE NEXT TO JET SPRAYER BY OCEAN PAD.

3-5-90
STY
41

1511 STY HEADS BACK DOWN TO 881 HILLSIDE TO CHECK PROGRESS. BASE (TRAILER) TRASH IS BEING DOUBLE BAGGED & TAGGED W/ APPROPRIATE SINAGE FOR PROPER DISPOSAL. STY IS BLOCKED AT ROAD 881 HILLSIDE. WATCH FROM ROAD. CREWS (DRILL) ARE SETTING UP ON NEW BORING HOLE (B30P090) B30H90 IS NOT READY FOR FACTOR TEST. STY OBSERVE UNTIL 1530. WEATHER IS GETTING COLD & OVERCAST. POSSIBLE SHOWERS.

1535 ALL CREWS IN. NO ACCIDENTS NO EXPOSURES. STY LEAVE SITE.

STY
3-5-90

STY
3-8-90
#2

0830 STY ARRIVE AT FLATS TO OBSERVE SAMPLING OPERATIONS. WEATHER MILD FROM 30-50°F SNOW 2 & 1 H & S MEETING GIVEN ON SNOW SLIPPAGE & NOT TO GO IN AREAS WHERE THEY CAN'T GET IN & OR OUT OF. H. BIENKOWSKI AT PLANT AS SITE MANAGER. NO FRENCH DRAIN OPERATIONS TODAY DUE TO WEATHER.

0834 H. BIENKOWSKI ASK STY TO GO OUT TO SOLAR PONDS W/ HIM. STY & HANK TAKE TRUCK (WESTON) TO PONDS. SCOPE OF WORK AT SOLAR PONDS. MAKE OBSERVATIONS OF PONDS & SUBSEQUENT RECOMMENDATIONS TO E&G. OBSERVATIONS REQUIRED ACCESSIBILITY. ETC.
H.B. ~~LEAVE~~ STY & STY WAVE TRAILER
0930. HB HEADS TO COPY SOME MAPS AT TOWN TRAILER.

0945 STY & HB GO BACK TO WESTON TRAILER TO GET SOME OTHER MAPS. STY & HB NEED TO GO BACK TO T610M TO XEROX.

1000 HB INFORMS STY TO TAKE TONY MELLON S-10 (WESTON) VEHICLE BACK TO OFFICE. STY LEAVE SITE AT 10:30 ARRIVE BACK AT WESTON OFFICE 11:00. LEAVE WESTON AT 11:00. STY & SCOTT PARKER ARRIVE AT FLATS (WINDSITE). 11:30 STY & SCOTT PARKER DELIVER DOCUMENT & HEAD BACK TO WESTON TRAILER.

1150 STY & SCOTT PARKER ARRIVE AT WESTON TRAILER. WHILE STY WAS GONE NO INCIDENTS. STY FINDS OUT WHAT CREWS ARE DOING. SAMPLING IN 903 PAD (TENTS). TWO WELLS. WELL DEVELOPMENT BY EAST GATE (FIRST) (PLANT). MANY CREWS CAN'T GET

STY
3-8-90
44

TO WELLS DUE TO SNOW.

1210 HANK BRONKOWSKI & BILL BITTERMAN GO OUT TO LOCATE WELLS WHICH DID NOT HAVE IDENTIFICATION.

1235 STY & HB GO DOWN TO POND AREA TO OBSERVE THE ACCESSIBILITY ON POND & STREET (ROAD). ONE DIRT ROAD PLOWED TO TWO PONDS & 94 IS BLOCKED FROM ACCESS DUE TO SNOW.

1300 ARRIVE BACK TO TRAILER.

1530 STY LEAVE SITE.

STY 3-8-90

STY
3-9-90
4S

0800 STY ARRIVE AT PLATS.
H&S MEETING SHEET SIGNED
WEATHER CLEAR SUNNY EXPECTED
TEMP. 55°-60°F. 45°F AT THIS
TIME. HNU'S CALIBRATED.
ATTEMPT ON SAMPLING
3 PEOPLE TO THE PSZ
1 GROUP SURFACE WATER
1 GROUP LANDFILL & TENTS 103 PAD
H. B. GOING TO WIND SITE (4081)
TO DO SOME ERRANDS.

0850 STY IS REQUESTED TO OBSERVE
SAMPLING OF POND B-5 BEING
PERFORMED BY CHEM CREW:
STY HEADS DOWN AT 0855.
STY WATCH CALL & BILL ESTES (WATCH)
HEAD DOWN TO B-5. THEY HAVE SAMPLE
FROM SHORE. STABLE FOOTING
WAS OBSERVED. OPERATION LASTS
UNTIL STY FOR 0920. STY LEAVE POND SITE

NYLON TIE WRAPS 100 TIE WRAPS
ROPE <3/4 POLY PROPYLENE 7 100 [illegible]
2029-33-06-[illegible]

STY 3-9-90 46

1000 STY LEAVE SITE TO PICK UP SOME MATERIAL FOR THE WATER SAMPLING OPERATIONS TO TAKE PLACE NEXT WEEK. ARRIVE AT PRE HOLDING 1015 ARRIVE BACK ON SITE 1045

1230 STY TAKES DECON SAMPLE TO 881 LAB. H. BIENKOWSKI LEAVES FOR WESTON OFFICE. STY & BILL BITTERMAN TO WATCH THE FORT. BILL BITTERMAN LEAVE SITE 1230 TO PICK UP MATERIALS. SCOTT PARKER ARRIVES WHILE STY TAKE SAMPLE OVER TO 881 S. PARKER MAINTAINS COMMUNICATIONS AT TRAILER.

1300 STY ARRIVE BACK TO BASE

1501 STY, BILL BITTERMAN, & BILL ESTES GO OUT TO LANDFILL AREA TO OBSERVE PSZ SAMPLING. OBSERVE STY CONCLUDING OPERATIONS HOWEVER, VEHICLES

STY
5-9-90
47

LOOK LIKE THEY MIGHT GOT STUCK. OBSERVE UNTIL 1512. LEAVE AREA 1314. ARRIVE-BACK AT BASE 1320.

1330 STY RECEIVE CALL FROM OPERATIONAL HT PHYSICS E6 & 6. STY TALK TO ELLIOT ELES? ABOUT SAMPLES WHICH WERE SENT TO T690J - & WERE SUPOSE TO BE SENT TO 371. STY RELAY MESSAGE TO BILL BITTERMAN & JANELLE BERGMAN OF WESTON. JANELLE IS CALLING ELLIOT BACK - H. BIENKOWSKI IS ON HIS WAY BACK TO FLATS.

1630 ALL CREWS ARE BACK IN NO ONE FOUND VOLATILE ORGANIC LEVELS ABOVE BACKGROUND. NO INJURIES. STY LEAVE 1632

STY
5-9-90

STY-
3-12-90
4f

1300 STY ARRIVES AT FLATS
STEVE CARPENTER IN OFFICE.
H&S MEETING GIVEN.
W. SAMPLING & SOIL SAMPLING
TAKING PLACE. WEATHER
IS SUNNY 50°F. NO INCIDENTS
OCCURRED WHILE STY WAS GONE.

1355 STEVE CARPENTER & STY NOTICE
DRILLERS (EBASCO) USING THE
FULL (TEMP) DECON FACILITY.
STEVE & STY GO OVER TO DECON
PAD & INFORM THAT THEY CAN'T
WORK (DECON) BECAUSE THE PAD
IS FULL. THEY OBLIGE & ~~QUIT~~ STY
QUIT ACTIVITY.

1430 STY TALKS TO TOM BARRETT OF WESTON
ABOUT STABILIZING CABLES FOR
TWO NEW DECON TANKS. TOM
INFORMS STY ABOUT CALLING CONSTRUCTION.
STY TALKS TO JANNELLE BERGMAN
OF WESTON. SHE WANTS STY TO
LOOK AT CABLE HOOK UP & SEE IF

STY
5-12-90
49

WE CAN DO IT OURSELVES.

1600 STEVE CARPENTER IS STAYING OUT AT SITE UNTIL TANKS ARE DELIVERED. SOME CREWS ARE ARRIVING BACK AT BASE & LEAVING SITE.

1645 NOT ALL CREWS ARE IN. REX OF CHEW ~~TELL~~ STY INFORMS STY OF MINOR CAR ACCIDENT WITH CHEW VEHICLE. CURZIE GADSON BECAME STUCK ON A WELL. THE VEHICLE WAS JACKED UP & REMOVED FROM PREMISE. NO ONE INJURED. NO DAMAGE TO WELL. MINOR BUMPER DAMAGE TO VEHICLE.

1707 - STY CALL JANELLE CONCERNING TAKING TANKS OFF TRUCK. STY MAKES DECISION NOT TO TAKE ~~THE~~ STY OFF THE TRUCK. JANELLE ~~SHE~~ STY AGREES.

STY
3-12-90
30

1710 STY TAKES BOYLES PERSONNEL
BACK TO BOYLES. CREWS ARE
IN EXCEPT FOR ONE.
STY LEAVES SITE.

STY 3-12-90

STY
3-13-90
51

STY 1210 STY ARRIVES AT FLATS.
STY CHECKS H & S MEETING
SHEET FOR PERSONNEL ON SITE.
CHEW CREWS IN
CALL UPP
BRIAN SIMMONS
BILL BITTERMAN
RAY SCHOEN
REX KLEINSASSER
RAY MICHAEL
ROD PERKINS
LEON KLOTZ
DOUG IKENBERRY

WESTON PERSONNEL PRESENT
KAREN HOLLIWAY
BILL ESTES
ROB SONGERBUSH
SCOTT PARKS
STEVE CARPENTER
HANK BIENKOWSKI
WEATHER CLOUDY SNOWING 30-35°F
WET CONDITIONS
STY GOES OVER TO BILL BITTERMAN
TRAILER FOR CREW CHECK.

1220 BILL BITTERMAN IS OFF SITE. HANK & STEVE ARE AT DECON PAD PUMPING WATER INTO DECON TANKS. ALL WATER SAMPLING CREWS ARE ATTEMPTING TO SAMPLE. WEATHER IS COLD & WET.

1330 STY NOTICES BOXES IN TRAILER. ASK SCOTT PARKER WHAT THEY ARE. SCOTT PARKER INFORMS STY THAT THEY ARE FROM UNC-GEOTECH & GREG LITTLES (EE&G) TOLD UNC-GEOTECH TO SEND THEM TO OUR (WESTON) TRAILER. THE BOXES CONTAIN LOW LEVEL RADIOACTIVE SOIL SAMPLES. SCOTT PARKER ALSO INFORMED STY THAT HANK BIENKOWSKI IS TAKING CARE OF THE SAMPLES SITUATION. HANK BIENKOWSKI HAS TALKED TO GREG LITTLE ABOUT THEM. THE RADIOACTIVE MATERIAL IS PACKED IN PLASTIC BAGS THEN PLACED IN CARDBOARD BOXES. STY MONITORS FOR RADIOACTIVE ISOTOPES W/

PANCAKE PROBE. READINGS WERE ABOVE 100 C/MIN. 200 COUNTS/MIN. α PROBE INDICATED 1 C/MIN

1354 STY GOES OUT TO FIND SAMPLING CREW. MEET CHEM CREW BY LANDFILL AT WELL 486 : PERSONNEL AT SITE ROD PERKINS & DOUG IKENBERRY OF CHEM & SUE SOBCHEK OF EBASCO. CHEM CREW WEARING MODIFIED LEVEL D PERSONNEL PROTECTION.

1410 STY RETURNS TO BASE. STY TALK TO H. BIENKOWSKI (HB) HB INFORMS STY THAT THE SAMPLES MUST BE STORED IN THE CONTAINMENT STY AREA BY DECON PAD IN A GREY DRUM

1600 STY ASSIST IN DEPOSING THE DRUMS ~~NEAR SITE~~ AT DECON AREA. STY MONITORS SAMPLE BOXES & CONTENTS BEFORE ALLOWING. ANY PROCEDURES OR ACTIVITIES TO CONTINUE. SOME BOXES HAD READINGS

SFY
3-13-90
54

OF 150 COUNTS/MIN PANCAKE PROBE
& SCINTILLATOR NO COUNTS/MIN

1610 BILL BITTERMAN INFORMS STUDENTS
ALL CREWS ARE IN & GOING HOME.

SFY
3-13-90

STY
3-14-90
55

0920 STY ARRIVES AT FLATS TO CHECK ON OPERATIONS.
PERSONNEL ON SITE
CHEN
B. SIMMONS
D. IKENBERRY
R. KLEINSASSER
C. LIPP
RAP SCHOEN
RAY MACHAEL
LEON KLOTZ
CURTIS GADDON
R. PERKINS
WESTON
H. BIENKOWSKI
K. HOLLOWAY
S. YOSHINO

WEATHER IS CLEAR SUNNY WITH STRONG BREEZE APPROX. 30MPH TEMP 35°F.
~~ONLY~~ STY
WATER SAMPLING & GROUND WATER SAMPLING.

STY
3-14-90
56

1030 STY LEAVE SITE AFTER CHECKING CALIBRATION LOGS & H2S MONITING. AT TIME OF LEAVING SITE, NO INCIDENTS.

STY
3-14-90

SSY
3-1690
57

1043 SSY ARRIVE AT FLATS
TO OBSERVE M&S PROGRAM.
ACTIVITIES BEING PERFORMED
TODAY INCLUDE SURFACE
AND GROUND WATER SAMPLING.
PERSONNEL PRESENT:
CHEN
CURTIS GADSON
RAY MICHAEL
BILL BITTERMAN
RAY SCHOEN
DOUG KEMBERLY
RON KLEINSASSER
ROD PERKINS
CARL LIPP
LEON KUTE
BRIAN SIMMONS

NORTON
HANK BONKOWSKI
KAREN HOLLINGER
BILL ESTES
DIANE SPRAGUE
RON SENGEBUSH
KENNY MILLER

STY
3-16-90
58

BOYLES
KIRBY PARKER
SALAZAR
TOM LUTHERER
BRIAN PERBIL

WEATHER SUNNY - 45°-50°F GROUND STILL HAVE SNOW, BUT MUDDY CONDITIONS.

HAWK, BINNINGTON, TOM LUTHERER & ~~BRIAN PE~~ STY IS SOIL SAMPLES.

INSTRUMENTS HNU 10.2eV 4 INSTRUMENTS OUT ALL CALIBRATED IN LOG BOOK.

PERSONNEL GIVEN H&S MEETING BY KENNY MILLER.
ALL CREWS OUT

1148 STY RETURNS FROM DOING AN ERRAND
NO INCIDENTS AT THIS TIME.

1300 STY & GEN MILLER GO OUT TO DECON DRUM CONTAINMENT AREA TO PERFORM DRUM INVENTORY FINISH 1445.

1510 STY LEAVE SITE. NO INCIDENTS MOST CLEAN IN.

STY 3/16/90

STY
3-19-90
60

0850 STY ARRIVE AT FLATS. HAVE TWO SETS OF INSTRUMENTS AN HNU & RAD MONITORING EQUIPMENT. RAD MONITORING EQUIPMENT CONSISTS OF ONE α SCINTILLATOR & ONE μR METER. THE PANCAKE PROBE IS BEING CALIBRATED IN ALBUQUERQUE N.M. BY STEVE SHAFER OF WESTON. THE HNU WAS CALIBRATED BY STY. OTHER HNUS IN FIELD CALIBRATED. PERSONNEL

WESTON:

HANK BIENKOWSKI — TENE CARPENTER
JANET MARKS — ANTHONY MELLON
KEN MILLER — JEFF HERRICK
SCOTT YOSHINO

CHEW:

CURTIS GADSON — BRIAN SIMMONS
RAY MICHAEL
BILL BITTERMAN
RAY SCHOEN
D. IKENBERRY
R. KLEINSTESSER
R. PERKINS
C. LITT
VAN RUTZ

STY
3-19-90
61

SALAZAR
TOM LUTHER
BRIAN PRYBIL

BOYLES
PAUL BUSHKOWOSKI
KIRBY PARKER
BOYLE

WEATHER SUNNY WARM PLEASANT TEMP 50-60°F. GROUND IS WET MOIST FROM SNOW. STILL SNOW VISIBLE.
FRENCH DRAIN OPERATIONS SCHEDULED TODAY. STY GOES DOWN TO 881 HILLSIDE TO OBSERVE OPERATIONS. STY WILL MONITOR [illegible] WITH RED & ORGEN IN VAPOR MONITORING.
1000 STY DOWN ON 881. ATTEMPTING TO DRILL AT HOLE B301590
STY MONITORS W/ HNU & MR METER MOIST (& WILL BE SUPPRESSED).
NO JUST.

3-19-90
62

Micro R Meter Model 19
RFW03821
Background 8 uR/HR
BY HOLE B301590 = 11 uR/HR
0-6' = 11 uR/HR
[illegible] = [illegible] uR/HR
11' = 11-12 uR/HR
13' = 12' uR/HR
15' = 11 uR/HR

HOLE B301690
Micro R Meter RFW03821
0 - 2' = 10 uR/HR
2 - 4' = 10 uR/HR
4'-6' = 10 uR/HR
6'-8' = 10 uR/HR
8'-10' = 10 uR/HR
10'-12' = 10 uR/HR
12'-14' = 10 uR/HR
14'-16' = 10 uR/HR
16 - 18' = 10 uR/HR
18-20' = 10 uR/HR
20-22' = 10 uR/HR

SR/
3-19-90
63

HNU 10.2eV RFW 05999 PROBE
RFW 02849
CALIBRATED TO 64 PPM ISOBUTYLENE
AT 9.8 SPAN 0-20 RANGE
B301590 0' = 0.2
6" = 0.2
7' = 0.4 NEW HNU 10.2eV
SN A01017
CALIBRATED 66 PPM
9.8 SPAN

NBO HNU RFW 02849 LAMP IS OUT USE
NEW HNU.
11' = 0.4
13' = 0.2-0.4
15' = 0.2

HOLE B301690
HNU 10.2eV 9.8 SPAN SN A01017
0-2' = 0.2
2'-4' = 0.2
4'-6' = 0.2
6-8 = 0.2
8-10' = 0.3
10-12' = 0.2
12-14 = 0.2
14-16 = 0-2
16'-18' = 0.2
18'-20' = 0.2
20-22' = 0.2

3-19-90
STY
64

1445 STY & Ken Miller go assist
Chew 5 who is not stuck
in the PSZ.
Chew 5 personnel
Carl Lipp
Tony Melon
Vehicle Chew 5 stuck to axle.
K. Miller attempt to unstuck
Vehicle with Weston truck
K. Miller pulls Chew 5 out.
No accidents no incidents

1516 STY & K. Miller head down
to 881 hillside to check
out progress waiting for
Rad Scaton not starting new
holes. STY & K. Miller head back
to trailer.

1720 ~~STY & K~~ STY STY. No incidents
no accidents no exposures
All crews in. STY leave site.

STY 3-19-90

STY
3-20-90
65

0900 STY ARRIVE AT FLATS
WEATHER SUNNY 50-60°F
PERSONNEL PRESENT
CHEN
BILL BITTERMAN
CURTIS GADSON
REX KLEINSASSER
LEON KOOTE
CARL LIPP
DOUG IKENBERRY

WESTON
KEN MILLER — JEFF HERRICK
SCOTT YOSHINO
BILL ESTES
JANET MARKS
STEVE CARPENTER
BOYLES
ARLENE BODEY
DOYLE STYLES
KIRBY PARKER
PAUL BUSH KWOLSKI
SALAZAR
TIM LUTER
BRIAN PRYER

STY
3-20-90
66

0930 STY CALIBRATE HNU'S & TAKE HNU'S & RAD EQUIPMENT DOWN TO 881 HILLSIDE FOR FRENCH DRAIN OPERATIONS.

000 STY ARRIVE AT B3017 STY 90 881 HILLSIDE. WHEN STY ARRIVE THEY HAVE COMPLETED HOLE. BREEZE 0-5 MPH SW STY MEASURE ORGANIC LEVELS WITH HNU WHILE AUGER RUNNING 0.2 PPM. BACKGROUND. VERY WET MUDDY NO RAD MONITORING DONE AT THIS HOLE. STANDBY UNTIL 1345

1345 START HOLE B3018 90
HNU 10.2 EV 9.8 SPAN
CALIBRATED TO 64 PPM AO 1817
PANCAKE MODEL 44-9 PR 5764
BACKGROUND HNU 0.2
BACKGROUND PANCAKE 50 C/PMIN

STY 3-20-90

STV
3-20-90
STV

1530

MONITOR HOLE B501890

HNU 10.2

| | |
|---|---|
| 0-2' | 0.2 |
| 2-4' | 0.2 |
| 4-6' | 0.2 |
| 6-8' | 0.2 |
| 8-10 | 0.2 |
| 10-12' | 0.2 |
| 12-14' | 0.2 |
| 14-16' | 0.2 |

TOP DRILLING 3-20-90

| | |
|---|---|
| 16-18' | 0.2 |
| 18'-20' | 0.2 |
| 20'-21' | 0.2 |

STV
3-21-90

3-20-90
SH 68

PANCAKE ~~#6~~-9
0-2' 75 CPM
2-4' 75 CPM
4-6' 75 CPM
6-8' 75 CPM
8-10' 75 CPM
10-12' 75 CPM
12-14' 75 CPM
14-16' 50 CPM
OF DRILLING
16-18 50 CPM
18-20 50 CPM
20-21 50 CPM

SEY
3-21-90

STP
3-20-90
STP

1500 TAKE RAD JARS CHAIN & BOTTLE
PINK TAKE EVERYTHING ELSE
T690 JOE L SAMPLE B3017900019
RECEIVED CHAIN CUSTODY RETURN
TO WESTON BASE

1616 STY ALL CREWS IN. STY LEAVE
SITE.

STY 3-20-90

3-21-90
STY

0830 STY ARRIVE AT FLATS.
WEATHER SUNNY 60°F
SAMPLING CREWS OUT. CALIBRATION
OF HNU'S PERFORMED BY SAMPLING
CREWS. FRENCH DRAIN PERSONNEL
HAS NOT STARTED. CALIBRATED
HNU'S FOR FRENCH DRAIN PROJECT.

0935 STY RETURN FROM GETTING
FUEL FOR WESTON VEHICLE.
LEFT AT 0920.

1100 STY GO DOWN TO 881 TO ASSIST
WITH MONITORING HOLE B301890
FROM 3-20-90. PLEASE REFER
TO 3-20-90 FOR SAMPLING
RESULTS.

1225 START NEW HOLE
B301990.
MONITOR WITH HNU N.2ER
& RAD MONITORING WITH
PANCAKE.

3-21-90 STY 71 STD

HNU 10.2 eV 9.8 SPAN
A01017 CALIBRATE TO 84 PPM.
0-25 ft BACKGROUND 0.2 ppm
0-2 0.2 ppm
2-4 0.2 ppm
4-6 0.2 ppm
6-8 0.3 ppm
8-10 0.2 ppm
8-10 OUT OF AUGERS STEAM 1.5 PPM
0.2 IN BREATHING ZONE
SLIGHT BREEZE FROM SW 0-3 MPH
STOP DUE TO AUGER PROBLEM 3-21-90
AT 1945.
18-19 0.2
20 0.2

SIT
3-21-90
8972

PANCAKE MODEL 44-9
MODEL 12

BACKGROUND 50-100

0-2 75 CPM
2-4 75 CPM
4-6 75 CPM
6-8 75 CPM

STOP DURING AUGER PROBLEMS 3-21-90
AT 1345

18-22' 50 CPM

STY
3-21-90

1452 STY LEAVES SITE. JEFF HOLLICK
SUE SOBOCHAK (LEASCO) & BRIAN BRYBIC
PREPARING SAMPLES. NO ACCIDENTS
NO EXPOSURES KNOWN.

1458 STY TALK TO SANDY MALIK INFORM
USE OF DRILLING OPERATIONS.

1510 STY RETURN TO WESTON BASE.

1550 STY LEAVE SITE.

STY
3-21-90

STY
3-22-90 74

0955 STY ARRIVE WESTON BASE AT FLATS. PERSONNEL WORKING CHOW WATER SAMPLING CREWS WORKING. FRENCH DRAIN WORKING. H&S MEETING GIVEN BY K. MILLER & J. MARKS. WEATHER SUNNY 50-60°F. SLIGHT breeze FROM NORTH. INSTRUMENTS CALIBRATED IN MORNING BY CHOW CREWS & J. MARKS.

1015 STY ARRIVE AT FRENCH DRAIN 881 HILLSIDE. AT HOLE B301990 CONTINUE DRILLING FROM 3-21-90. J. MARKS BROUGHT DOWN HNU 10.2ev REFER TO 3-21-90 FOR HOLE B301990 SAMPLING RESULTS

1210 START NEW HOLE B302090 SET. STY GOES BACK TO BASE FOR EQUIPMENT. RETURN TO BASE 1255

1320 STY RETURNS TO HOLE B302090 AT 6'.

3-5 5-22-90 75

HNU (A01017) (10.2eV) CALIBRATED AT 66 ppm.
BACKGROUND 0.2ppm

| | |
|---|---|
| 6' | 0.2 |
| 14' | 0.2 |
| 16' | 0.2-0.3 |
| 18' | 0.2-0.3 |
| 27' | 0.2 WINNT BEDROCK |

STP.

3-22-90
STY 76
STY 74

RAD
MONITORING MODEL 3 DC SCINTILLATOR
PC03814
BACKGROUND 0C/MIN

6' 0C/MIN
14' 0C/MIN
16' 0C/MIN
18' 0C/MIN

STY 3-22-90

3-22-90
STP 27
5575

RAD MONITORING MODEL 12
PANCAKE MODEL 44-9 PR 5764
BACKGROUND 50-100 CPM

| | |
|---|---|
| 6' | 50 CPM |
| 14' | 50 CPM |
| 16' | 50 CPM |
| 18' | 50 CPM |

STP
3-22-90

STY
3-22-90
STY 76

AT 1630 STOP DRILLING HOLE
B302090 DUE TO LACK OF CLEAN
AUGERS. KIRBY PARKER & BRIAN M.
OF BOXLES GO OUT NEW AUGERS.
STY WAITS UNTIL 1700. JEFF HERCUR
& BRIAN DRYBIL PREPARE SAMPLES
FOR BOTH B301990 & B302090
1520 KIRBY RETURNS WITH AUGERS
MONITOR HOLE UNTIL 27' AT BUD ROCK
STOP DRILLING OPERATIONS AT
1607. AT 1612 STACKING UP.
STY LEAVES 881 HILLSIDE.
1650 ALL CREWS IN. STY
LEAVE SITE.

STY
3-22-90

3-23-90 9
STY

0920 STY ARRIVE ON SITE AT PLAIS.
FRENCH DRAIN OPERATIONS
CORING. H&S MEETING GIVEN
BY K. MILLER & W. MARKS.
CALIBRATE HNU 10.2 EV A01017.
PERSONNEL PRESENT
CHEN
WESTON
BOYLES
SALAZAR
WEATHER COLD 30°F OVERCAST SLIGHT
BREEZE 5-10 MPH. MUDDY TO FROZEN CONDITIONS.
0945 STY HEAD DOWN TO 881 HILLSIDE.

1010 STY ARRIVE AT 881 HILLSIDE.
SEVERAL (6) PEOPLE FROM EPA
HERE INVESTIGATING OPERATIONS
INFORM E&G BRENT LEWIS
THAT EPA MUST BE AT LEAST
A MAST AWAY WHILE RIG IS
RUNNING. EPA IN LEVEL D. NO
SAFETY GLASSES NO HARD HATS NO [illegible]
STEEL TOE BOOTS.
KIRBY PARKER & BRIAN [illegible]
BOYLES PLACED SURFACE CASING AT

STY 3-23-90 80 STY 8

WELL # B302090 & CEASED OPERATIONS. JEFF HERRICK CONVERSATION WITH EPA. EPA WANT TO KNOW WHEN WET GROUND WHEN WE DRIVE ACROSS IT. WANT TO KNOW WHY HI-VOLUME SAMPLING WAS DONE. DOCUMENTATION OF THE SOILMOISTURE CONDITIONS. RETURN TO BASE 1100. STY CALL FRANK KABOT. STY INFORM FRANK KABOT OF EG&G EPA INSPECTION. HE FEELS THAT WESTON IS FOLLOWING WESTON'S H&S PLAN THAT WE ARE NOT IN VIOLATION. 1145 LEAVE SITE. STY RETURN 1230.

1320 STY GO DOWN TO 841 FOR H&S OVERSIGHT. VERY COLD WEATHER WET SLEET MIXED WITH SNOW. GROUND IS MUDDY. PERSONNEL PRESENT JEFF HERRICK, STEVE CARPENTER, JANET MARKS, BRIAN PRYBR, PAUL DUSHKOWSKI, MIKE [illegible] OF BOARDS, KIRBY PARKER & BRIAN OCONNER. TEMP. APPROXIMATELY 10°F WITH HUMIDITY & WIND CHILL. PERSONNEL MAINLY DRESSED. [illegible] AT SITE

STY 3-23-90

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 1 1 | 700 | 19.015 | 23.108 | 10 968 | 1 944 | 294 7 | 0 |
| 1 1 | 715 | 18.724 | 25 099 | 11.274 | 2.6061 | 290.6 | 0 |
| 1 1 | 730 | 13.744 | 18.947 | 7.8944 | 2 0625 | 281 4 | 0 |
| 1 1 | 745 | 12.453 | 17.426 | 6.9705 | 2.2571 | 274.4 | 0 |
| 1 1 | 800 | 12 981 | 17.426 | 8 2008 | 1 7158 | 262 7 | 0 |
| 1 1 | 815 | 10.76 | 17.113 | 5.8967 | 2.1878 | 273.9 | 0 |
| 1 1 | 830 | 7.4671 | 12.348 | 1.2863 | 1.4473 | 259.4 | 0 |
| 1 1 | 845 | 8.0778 | 11.887 | 4.512 | 1.4876 | 260.3 | 0 |
| 1 1 | 900 | 8.3463 | 14 498 | 5 4337 | 2.1431 | 251 6 | 0 |
| 1 1 | 915 | 8.3127 | 12.726 | 5.7424 | 1.1051 | 234.4 | 0 |
| 1 1 | 930 | 8.4805 | 11.579 | 4.8185 | 1.4585 | 227.2 | 0 |
| 1 1 | 945 | 5.2234 | 8.0443 | 3 2817 | .92612 | 214.9 | 0 |
| 1 1 | 1000 | 3.7157 | 10.65 | .21028 | 1.8187 | 233.7 | 0 |
| 1 1 | 1015 | 12 364 | 22 616 | 5.7357 | 3.0289 | 213 7 | 0 |
| 1 1 | 1030 | 11.315 | 20.625 | 3.8924 | 3.3935 | 215.9 | 0 |
| 1 1 | 1045 | 6.966 | 14.782 | 2 5122 | 2.322 | 208 1 | 0 |
| 1 1 | 1100 | 3.6374 | 10.483 | 05816 | 2.4674 | 212 7 | 0 |
| 1 1 | 1115 | 4 0915 | 17.225 | -.55478 | 4.0848 | .513 | 0 |
| 1 1 | 1130 | 13.317 | 23 041 | 4.9594 | 3.9282 | 302.3 | 0 |
| 1 1 | 1145 | 16.956 | 25.479 | 7.8698 | 2.9014 | 304 9 | 0 |
| 1 1 | 1200 | 16.867 | 23.623 | 9.5498 | 2.8164 | 306.3 | 0 |
| 1 1 | 1215 | 11.033 | 21.184 | 3.4271 | 3.9528 | 288 | 0 |
| 1 1 | 1230 | 6.3687 | 13.23 | .21251 | 3.0021 | 213 2 | 0 |
| 1 1 | 1245 | 6.9839 | 11.849 | 2.2034 | 2.1878 | 187 3 | 0 |
| 1 1 | 1300 | 7.9615 | 13.23 | 4.1944 | 1 4943 | 174.2 | 0 |
| 1 1 | 1315 | 8.4894 | 12.31 | 4.4986 | 1.586 | 175.1 | 0 |
| 1 1 | 1330 | 4.6261 | 8.9413 | 2.0491 | 1 5033 | 164 2 | 0 |
| 1 1 | 1345 | 3.823 | 6 6439 | .97757 | 1.293 | 136 7 | 0 |
| 1 1 | 1400 | 2.4294 | 5.5724 | 21251 | 1.3109 | 131.7 | 0 |
| 1 1 | 1415 | 3.6128 | 8.174 | 82322 | 1.7247 | 45.87 | 0 |
| 1 1 | 1430 | 4 955 | 7.1025 | 2.8142 | .72255 | 28.19 | 0 |
| 1 1 | 1445 | 4.5277 | 7.8675 | 1.7426 | 1.369 | 80.1 | 0 |
| 1 1 | 1500 | 4 4651 | 6.6417 | 1.897 | .9552 | 111 6 | 0 |
| 1 1 | 1515 | 3.6172 | 6.4895 | 1.284 | 1.0738 | 103.7 | 0 |
| 1 1 | 1530 | 3.02 | 4.4986 | 1.4362 | .70018 | 149 6 | 0 |
| 1 1 | 1545 | 3 5076 | 6 1831 | 1.284 | .9977 | 109.4 | 0 |
| 1 1 | 1600 | 2 5658 | 4 3443 | .6711 | .92835 | 93.1 | 0 |
| 1 1 | 1615 | 4.5187 | 7 1002 | 2.5077 | 1.0917 | 145 5 | 0 |
| 1 1 | 1630 | 4.644 | 6.9481 | 2 0491 | .99099 | 184 9 | 0 |
| 1 1 | 1645 | 5.0333 | 6 9504 | 3 1206 | .69347 | 196 | 0 |
| 1 1 | 1700 | 5 9616 | 6 9526 | 4.9594 | 35345 | 217 2 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 1 2 | 700 | 8 9055 | 11 288 | 5 5925 | 1.3288 | 235 7 | 0 |
| 1 2 | 715 | 9.9793 | 12.673 | 5 9012 | 1 1856 | 246 3 | 0 |
| 1 2 | 730 | 7 8273 | 11.131 | 4.3622 | 1.7046 | 253 5 | 0 |
| 1 2 | 745 | 6 9571 | 10.279 | 1.7471 | 2.4316 | 277 9 | 0 |
| 1 2 | 800 | 5.9146 | 10.362 | 1.9015 | 1.8947 | 171 6 | 0 |
| 1 2 | 815 | 4.5389 | 10.055 | 21028 | 2.6285 | 269.5 | 0 |
| 1 2 | 830 | 2.4697 | 4 6709 | 05592 | 1.0827 | 325 1 | 0 |
| 1 2 | 845 | 3 8611 | 9.1292 | 1.1319 | 1.5212 | 342.8 | 0 |
| 1 2 | 900 | 6.975 | 9 8987 | 3.2839 | 1.2505 | 339.5 | 0 |
| 1 2 | 915 | 8.5118 | 12 816 | 5.1294 | 1 7851 | 333.3 | 0 |
| 1 2 | 930 | 4.9818 | 8.6639 | 1 8992 | 1.5346 | 323.5 | 0 |
| 1 2 | 945 | 7.995 | 15.883 | .21028 | 2 6061 | 275.4 | 0 |
| 1 2 | 1000 | 7.5655 | 13 567 | 4.5098 | 1.2773 | 186.4 | 0 |
| 1 2 | 1015 | 7.0577 | 11.72 | 4 3532 | 1.3847 | 159 | 0 |
| 1 2 | 1030 | 7.1181 | 11.104 | 3 8924 | 1.4205 | 131 6 | 0 |
| 1 2 | 1045 | 5.1787 | 8.3395 | 1 7449 | 1 2527 | 102.2 | 0 |
| 1 2 | 1100 | 4 9013 | 8 7981 | .6711 | 1 9954 | 98 1 | 0 |
| 1 2 | 1115 | 2.4965 | 6.0354 | - 55478 | 1.642 | 139 4 | 0 |
| 1 2 | 1130 | 5 9952 | 8.948 | 2 3578 | 1.3086 | 134.4 | 0 |
| 1 2 | 1145 | 8.0443 | 12.623 | 1 4362 | 2.5435 | 125.6 | 0 |
| 1 2 | 1200 | 8.1897 | 11.7 | 4 8073 | 1.17 | 149 5 | 0 |
| 1 2 | 1215 | 9.1851 | 13.538 | 4.653 | 1.9932 | 153.4 | 0 |
| 1 2 | 1230 | 9 6258 | 14.916 | 6 031 | 1.718 | 163 | 0 |
| 1 2 | 1245 | 9.08 | 12 769 | 4.3465 | 1.5301 | 159 1 | 0 |
| 1 2 | 1300 | 7.5633 | 10.778 | 4 3465 | 1.255 | 172.8 | 0 |
| 1 2 | 1315 | 8.9122 | 13 075 | 5.1115 | 1.4921 | 167.9 | 0 |
| 1 2 | 1330 | 10.109 | 14.301 | 6.1853 | 1.6084 | 157.2 | 0 |
| 1 2 | 1345 | 12.111 | 15.681 | 8 3284 | 1 2751 | 140 8 | 0 |
| 1 2 | 1400 | 10.232 | 13 995 | 6 031 | 1 6263 | 142 9 | 0 |
| 1 2 | 1415 | 7.4828 | 10.778 | 4.653 | 1.123 | 155 9 | 0 |
| 1 2 | 1430 | 7.0421 | 9 8607 | 3.8879 | 1 4071 | 150 1 | 0 |
| 1 2 | 1445 | 6.8564 | 9 8607 | 2 9685 | 1 2259 | 136 6 | 0 |
| 1 2 | 1500 | 6.0958 | 8.6348 | 2.9685 | .99994 | 121 | 0 |
| 1 2 | 1515 | 6 022 | 8 6348 | 3 4271 | .98428 | 127.5 | 0 |
| 1 2 | 1530 | 5 7916 | 8.174 | 3.4271 | .84111 | 123.3 | 0 |
| 1 2 | 1545 | 5.8095 | 10.471 | 2.2012 | 2.284 | 192.2 | 0 |
| 1 2 | 1600 | 4 4651 | 9.8607 | 1 897 | 1.7091 | 254.8 | 0 |
| 1 2 | 1615 | 9.118 | 12.312 | 6 031 | 1.0715 | 255.6 | 0 |
| 1 2 | 1630 | 10 521 | 16.599 | 7 1047 | 1 6039 | 238 1 | 0 |
| 1 2 | 1645 | 7.8877 | 12.165 | 2 8164 | 2.0513 | 234 8 | 0 |
| 1 2 | 1700 | 4 8275 | 9 2545 | 2 3578 | 1 463 | 155.6 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 1 3 | 700 | 7 5969 | 11.297 | 4.6753 | 1.1901 | 161 7 | 0 |
| 1 3 | 715 | 7.192 | 9.2947 | 4 3666 | 1.0268 | 166 3 | 0 |
| 1 3 | 730 | 7.3418 | 9.2947 | 5 4449 | .74045 | 154 6 | 0 |
| 1 3 | 745 | 8.0599 | 10.373 | 6 2166 | .80532 | 157 | 0 |
| 1 3 | 800 | 8.1539 | 12.375 | 5 5992 | 1.4406 | 142 1 | 0 |
| 1 3 | 815 | 10.677 | 14.684 | 6 6774 | 1.3713 | 141.3 | 0 |
| 1 3 | 830 | 9.5833 | 12.221 | 6.6774 | 1.0894 | 147 9 | 0 |
| 1 3 | 845 | 8.7333 | 10.679 | 6.2144 | .92164 | 149 | 0 |
| 1 3 | 900 | 9.1247 | 12 066 | 5 5992 | 1.378 | 138 5 | 0 |
| 1 3 | 915 | 7 2703 | 10.219 | 4 2123 | 1.1901 | 153 7 | 0 |
| 1 3 | 930 | 5.7782 | 8.523 | 3.2884 | 1.029 | 156.5 | 0 |
| 1 3 | 945 | 5.1966 | 9.7556 | 2.9797 | .94401 | 154.4 | 0 |
| 1 3 | 1000 | 5.4807 | 8.6348 | 1 595 | 1.1207 | 127 7 | 0 |
| 1 3 | 1015 | 5.946 | 8.8317 | 3.5949 | 1.0984 | 135.8 | 0 |
| 1 3 | 1030 | 5.7379 | 8.8294 | 2 8253 | 1.0693 | 140.3 | 0 |
| 1 3 | 1045 | 6.6349 | 10.062 | 3.2884 | 1.4675 | 140 | 0 |
| 1 3 | 1100 | 6.1652 | 9 2903 | 2 3645 | 1 6912 | 143.9 | 0 |
| 1 3 | 1115 | 6.4605 | 11.442 | 3 5949 | 1 4697 | 149 8 | 0 |
| 1 3 | 1130 | 7 8094 | 10.67 | 4 21 | 1.114 | 142.9 | 0 |
| 1 3 | 1145 | 8.561 | 11.899 | 4 0557 | 1.6017 | 140 9 | 0 |
| 1 3 | 1200 | 9.9368 | 13.283 | 6 0533 | 1.3601 | 159 6 | 0 |
| 1 3 | 1215 | 8.6706 | 12.359 | 4 5165 | 1.501 | 140.2 | 0 |
| 1 3 | 1230 | 9.2701 | 13.59 | 5 7469 | 1 642 | 134.5 | 0 |
| 1 3 | 1245 | 8.1226 | 12.82 | 4.0557 | 1.6778 | 143 | 0 |
| 1 3 | 1300 | 7.2076 | 13.129 | 2.8253 | 2 2929 | 137.8 | 0 |
| 1 3 | 1315 | 6.9571 | 12.514 | 2.5166 | 1.7091 | 159.8 | 0 |
| 1 3 | 1330 | 5.673 | 8.9771 | 2.3623 | 1.3221 | 147.6 | 0 |
| 1 3 | 1345 | 3.6418 | 7.438 | 1.1319 | 1 3579 | 136.5 | 0 |
| 1 3 | 1400 | 3.0535 | 5.899 | .51675 | 1.17 | 108.4 | 0 |
| 1 3 | 1415 | 3.4785 | 6.5141 | 1.1319 | 1.0827 | 122 2 | 0 |
| 1 3 | 1430 | 2.5233 | 4.6686 | 82545 | .78295 | 115.1 | 0 |
| 1 3 | 1445 | 3.5814 | 6 8229 | .21028 | 1 5704 | 141 | 0 |
| 1 3 | 1500 | 4.0848 | 6.6685 | 6711 | 1 4339 | 129.2 | 0 |
| 1 3 | 1515 | 2.7582 | 4.9773 | .21028 | 1.0917 | 139.9 | 0 |
| 1 3 | 1530 | 3.5278 | 5.5925 | .97757 | 96638 | 66.81 | 0 |
| 1 3 | 1545 | 2 4227 | 4.823 | .82545 | 84111 | 83.4 | 0 |
| 1 3 | 1600 | 2.9171 | 8.9771 | 1.1319 | 1 2415 | 102 9 | 0 |
| 1 3 | 1615 | 2.747 | 4.6709 | 51675 | 8769 | 163 5 | 0 |
| 1 3 | 1630 | 6.0019 | 7 9011 | 3 4405 | .88361 | 180 6 | 0 |
| 1 3 | 1645 | 8 9592 | 14.207 | 5 5925 | 1.5704 | 177 5 | 0 |
| 1 3 | 1700 | 8 2724 | 9 4401 | 7 1316 | 45187 | 186 3 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 1 4 | 700 | 3.2168 | 7 7624 | 05369 | 1.8276 | 346 4 | 0 |
| 1 4 | 715 | 2 4003 | 4.5255 | 05369 | 1 161 | 324.6 | 0 |
| 1 4 | 730 | 4.4494 | 6 9929 | 1 9037 | 1.1185 | 308 5 | 0 |
| 1 4 | 745 | 4.2414 | 6.8385 | 82545 | 1 2438 | 338 2 | 0 |
| 1 4 | 800 | 2 4383 | 5.1429 | 05369 | 1 3892 | 286 5 | 0 |
| 1 4 | 815 | 3.9841 | 11.154 | -.66663 | 2.2191 | 235.6 | 0 |
| 1 4 | 830 | 5.465 | 8.2255 | 2 3668 | 1.586 | 175.7 | 0 |
| 1 4 | 845 | 4 2033 | 6.8363 | 1.1342 | 1 0469 | 168 3 | 0 |
| 1 4 | 900 | 5.4717 | 6.9906 | 3.5993 | .66663 | 197.5 | 0 |
| 1 4 | 915 | 6.3531 | 11.762 | 2.058 | 2.2728 | 198 6 | 0 |
| 1 4 | 930 | 4 4941 | 8.0644 | 20804 | 1.9551 | 307 4 | 0 |
| 1 4 | 945 | 3.738 | 7.136 | 1 1319 | 1.5234 | 42.47 | 0 |
| 1 4 | 1000 | 2.322 | 5.7469 | .21028 | 1.1879 | 76.8 | 0 |
| 1 4 | 1015 | 5.2816 | 7 5901 | 2.2079 | 1.0872 | 107 9 | 0 |
| 1 4 | 1030 | 4 4986 | 9.1225 | 1 2863 | 1.6151 | 97 4 | 0 |
| 1 4 | 1045 | 7.9414 | 12 042 | 4.0512 | 1 4473 | 28 72 | 0 |
| 1 4 | 1100 | 6.3799 | 9 4267 | 3.2817 | 1.2908 | 15 12 | 0 |
| 1 4 | 1115 | 5.597 | 9 5788 | 2 5144 | 1.5212 | 24 65 | 0 |
| 1 4 | 1130 | 4.9751 | 9.4245 | .21028 | 1.897 | .115 | 0 |
| 1 4 | 1145 | 4.4315 | 8 655 | 51675 | 1.68 | 356.4 | 0 |
| 1 4 | 1200 | 4.9326 | 8.655 | 2 2057 | 1.3265 | 348 9 | 0 |
| 1 4 | 1215 | 3.6732 | 8.5006 | .21028 | 1 7091 | .142 | 0 |
| 1 4 | 1230 | 3 1654 | 6 8117 | 21028 | 1.6174 | 17 59 | 0 |
| 1 4 | 1245 | 4.1116 | 8.3463 | .97757 | 1.6688 | 13 68 | 0 |
| 1 4 | 1300 | 7.0376 | 10.342 | 3 1273 | 1.2393 | 34.24 | 0 |
| 1 4 | 1315 | 6.031 | 10.8 | 2.5122 | 1 7426 | 22.54 | 0 |
| 1 4 | 1330 | 6.7155 | 10.033 | 3 1273 | 1 2259 | 24.36 | 0 |
| 1 4 | 1345 | 5 6954 | 10.646 | .97757 | 1.9484 | 6.181 | 0 |
| 1 4 | 1400 | 2.9707 | 6.9615 | 82545 | 1.0201 | 295 9 | 0 |
| 1 4 | 1415 | 4.87 | 7.8832 | 97757 | 1.4429 | 184 1 | 0 |
| 1 4 | 1430 | 4 5143 | 8.3418 | 2 0513 | 1.4048 | 174 | 0 |
| 1 4 | 1445 | 2.9707 | 6.6551 | .05816 | 1 7583 | 80 6 | 0 |
| 1 4 | 1500 | 3.7403 | 7.4201 | 05816 | 1.7314 | 152 2 | 0 |
| 1 4 | 1515 | 2 4741 | 5.2726 | 05816 | 1.2102 | 110.8 | 0 |
| 1 4 | 1530 | 2.246 | 5 427 | .05816 | 1 2639 | 35.43 | 0 |
| 1 4 | 1545 | 2 9842 | 11.713 | -.55701 | 2 3846 | 299.3 | 0 |
| 1 4 | 1600 | 6.8497 | 14.934 | 82545 | 2.2303 | 263 3 | 0 |
| 1 4 | 1615 | 4 1832 | 8 1852 | 05816 | 1 9328 | 122.4 | 0 |
| 1 4 | 1630 | 4 3532 | 12 326 | 1 4384 | 2.1654 | 85 2 | 0 |
| 1 4 | 1645 | 4.682 | 9 1068 | 05816 | 2 3712 | 242.3 | 0 |
| 1 4 | 1700 | 4 1519 | 10 183 | .82545 | 1 982 | 344 8 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 1 5 | 700 | 9.7511 | 13.905 | 6 8273 | 1.718 | 296.4 | 0 |
| 1 5 | 715 | 9 4737 | 13.596 | 6 0578 | 1 7113 | 300.5 | 0 |
| 1 5 | 730 | 7.2591 | 10.827 | 4 9796 | 1.3064 | 307.4 | 0 |
| 1 5 | 745 | 6.6998 | 9.9054 | 4.5187 | 1 0917 | 304 | 0 |
| 1 5 | 800 | 7.9346 | 9.5967 | 4.6731 | 76282 | 319.8 | 0 |
| 1 5 | 815 | 7 8675 | 9.9054 | 4.9796 | 1.0022 | 317.4 | 0 |
| 1 5 | 830 | 6.711 | 8.9816 | 4.9796 | .84782 | 328 1 | 0 |
| 1 5 | 845 | 5.8453 | 8.0577 | 4.0557 | .72926 | 331.2 | 0 |
| 1 5 | 900 | 6.9683 | 10.67 | 3.9013 | 1.4384 | 322.6 | 0 |
| 1 5 | 915 | 5.9482 | 9 816 | 3.1318 | 1 3534 | 340.3 | 0 |
| 1 5 | 930 | 5.503 | 8.5118 | 2.9775 | 1.123 | 337.1 | 0 |
| 1 5 | 945 | 3.7179 | 5.8967 | 1 2863 | .77848 | 301.4 | 0 |
| 1 5 | 1000 | 2.3511 | 4.512 | .82545 | .86124 | 322.6 | 0 |
| 1 5 | 1015 | 3.9259 | 8.8093 | .21028 | 2.1721 | 36 75 | 0 |
| 1 5 | 1030 | 5.6887 | 10.19 | .21028 | 1.8791 | 40 91 | 0 |
| 1 5 | 1045 | 5.3755 | 10.798 | 2.36 | 1 501 | 60.89 | 0 |
| 1 5 | 1100 | 3.445 | 6.8072 | 21028 | 1.2617 | 91.1 | 0 |
| 1 5 | 1115 | 2.7001 | 6.3464 | .05816 | 1.3265 | 149.4 | 0 |
| 1 5 | 1130 | 2 1296 | 5 8856 | .05816 | 1.1118 | 165.8 | 0 |
| 1 5 | 1145 | 3.7783 | 8 0286 | 1.1319 | 1.3623 | 85.7 | 0 |
| 1 5 | 1200 | 5.2749 | 9.8696 | 1.1319 | 1.642 | 102.1 | 0 |
| 1 5 | 1215 | 6.9772 | 13.854 | .97757 | 2.8052 | 108.3 | 0 |
| 1 5 | 1230 | 8.5073 | 14.312 | 3.738 | 1.8299 | 114.8 | 0 |
| 1 5 | 1245 | 7.4179 | 12.013 | 3 2772 | 1.7717 | 110 7 | 0 |
| 1 5 | 1300 | 10.08 | 14 315 | 5 5768 | 1.7516 | 120.7 | 0 |
| 1 5 | 1315 | 8.3172 | 13.547 | 1.897 | 2.2952 | 116 | 0 |
| 1 5 | 1330 | 8.7064 | 15 547 | 2.6643 | 2.7694 | 111.4 | 0 |
| 1 5 | 1345 | 6.9638 | 11 406 | 1.897 | 1.8276 | 110 | 0 |
| 1 5 | 1400 | 6.0824 | 10.333 | 1.7449 | 1 7874 | 93 8 | 0 |
| 1 5 | 1415 | 4.6507 | 8 9525 | 1.284 | 1.6666 | 84.9 | 0 |
| 1 5 | 1430 | 5.9124 | 11.863 | 97757 | 2.2504 | 64.31 | 0 |
| 1 5 | 1445 | 6.3106 | 11.25 | 1.5905 | 1.6867 | 62.85 | 0 |
| 1 5 | 1500 | 6 3934 | 10 785 | 2.6643 | 1.4541 | 55.58 | 0 |
| 1 5 | 1515 | 5.125 | 8 6438 | 1.284 | 1.5681 | 62.17 | 0 |
| 1 5 | 1530 | 4 4807 | 7.1114 | 1.5905 | 1.2572 | 69.94 | 0 |
| 1 5 | 1545 | 3.7067 | 7.4179 | 1.284 | 1.114 | 69.1 | 0 |
| 1 5 | 1600 | 2 6866 | 4.8118 | 1.284 | 68005 | 77.9 | 0 |
| 1 5 | 1615 | 2 1408 | 3.2772 | 97757 | 51451 | 80.5 | 0 |
| 1 5 | 1630 | 1.4585 | 2.6643 | .05816 | .64202 | 122 5 | 0 |
| 1 5 | 1645 | 3.7828 | 6 5007 | .97757 | 1.5704 | 201.4 | 0 |
| 1 5 | 1700 | 5.7044 | 6 5007 | 4 5053 | .34226 | 220 9 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 1 6 | 700 | 3.6128 | 5.4449 | 2.3645 | .68005 | 220 | 0 |
| 1 6 | 715 | 3 6418 | 6 8318 | 1 7493 | 1.1811 | 197.8 | 0 |
| 1 6 | 730 | 4 7156 | 6.6774 | 2 3645 | 8769 | 285.1 | 0 |
| 1 6 | 745 | 4.0065 | 6.5231 | 1.4406 | 80756 | 342 | 0 |
| 1 6 | 800 | 2.577 | 4.521 | 97981 | .7919 | 253 1 | 0 |
| 1 6 | 815 | 2 9484 | 5.2905 | .82545 | 98875 | 186 2 | 0 |
| 1 6 | 830 | 2.8589 | 4 5187 | 1 2863 | .58162 | 176 5 | 0 |
| 1 6 | 845 | 7.6103 | 11.129 | 2.8253 | 1.4093 | 237.9 | 0 |
| 1 6 | 900 | 7.3262 | 9.7444 | 5 2838 | .79861 | 188 9 | 0 |
| 1 6 | 915 | 5.0601 | 7 8966 | 2.2079 | .97757 | 181.4 | 0 |
| 1 6 | 930 | 3.3712 | 6.5074 | 1 2863 | .92164 | 316.9 | 0 |
| 1 6 | 945 | 2.0245 | 3 5882 | 21028 | .71584 | 150.8 | 0 |
| 1 6 | 1000 | 1.888 | 2 8186 | .21028 | .47424 | 305.2 | 0 |
| 1 6 | 1015 | 1.3131 | 3.5837 | - 55701 | .84559 | 348.9 | 0 |
| 1 6 | 1030 | 3.908 | 7 5678 | 2 2034 | 1 0805 | 21 18 | 0 |
| 1 6 | 1045 | 5.5053 | 10.785 | 1.5905 | 2.2527 | 31 74 | 0 |
| 1 6 | 1100 | 2.841 | 4 8073 | .21251 | 1 0782 | 96 9 | 0 |
| 1 6 | 1115 | 3.1229 | 5.8766 | .51898 | 1.1409 | 137.6 | 0 |
| 1 6 | 1130 | 5.7983 | 8.1718 | 3 2727 | 1.1185 | 148.9 | 0 |
| 1 6 | 1145 | 6.1227 | 8 0174 | 3.5792 | 80979 | 144 9 | 0 |
| 1 6 | 1200 | 6.5365 | 9.5498 | 3.8857 | 1.1386 | 164.8 | 0 |
| 1 6 | 1215 | 5.0802 | 7.8653 | 2.0491 | 97309 | 155.8 | 0 |
| 1 6 | 1230 | 3.9617 | 6.4873 | .6711 | 1.076 | 156.9 | 0 |
| 1 6 | 1245 | 3.7403 | 6.7915 | 82322 | 1.2818 | 137.4 | 0 |
| 1 6 | 1300 | 4.7581 | 8 476 | 1 4362 | 1 3377 | 136.9 | 0 |
| 1 6 | 1315 | 2.6039 | 4.955 | .21251 | .9977 | 118.9 | 0 |
| 1 6 | 1330 | 4.8073 | 10.615 | .21251 | 2.4562 | 60.92 | 0 |
| 1 6 | 1345 | 5.9638 | 10.308 | 2.2012 | 1 5122 | 42 83 | 0 |
| 1 6 | 1400 | 4.4382 | 6 4828 | 2.3533 | .78742 | 49.48 | 0 |
| 1 6 | 1415 | 2.9707 | 5 8721 | 82322 | 1 3154 | 51 24 | 0 |
| 1 6 | 1430 | 1.557 | 6.1764 | .21251 | 1 4116 | 146 | 0 |
| 1 6 | 1445 | 3.3891 | 5.2592 | 1 1297 | .78966 | 157.9 | 0 |
| 1 6 | 1500 | 5.9661 | 15 657 | .6711 | 3.4204 | 305.6 | 0 |
| 1 6 | 1515 | 10.324 | 15.657 | 5.8699 | 1.4943 | 286 5 | 0 |
| 1 6 | 1530 | 9 8092 | 14.279 | 5 7178 | 1.803 | 285.6 | 0 |
| 1 6 | 1545 | 10.283 | 15.046 | 5 8699 | 1.6554 | 289.6 | 0 |
| 1 6 | 1600 | 13.617 | 20 245 | 7.8608 | 2 3623 | 294 6 | 0 |
| 1 6 | 1615 | 16.196 | 24.092 | 10 31 | 2.5122 | 291.8 | 0 |
| 1 6 | 1630 | 13 762 | 21.184 | 8 1695 | 2 7627 | 305.1 | 0 |
| 1 6 | 1645 | 12.384 | 18 276 | 7.5611 | 2 2974 | 342 | 0 |
| 1 6 | 1700 | 8.599 | 20.894 | 2.2034 | 3.6105 | 311 7 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 1 7 | 700 | 8.1181 | 16.643 | 2.3623 | 2 1184 | 332 7 | 0 |
| 1 7 | 715 | 7 4828 | 13.185 | 1 8992 | 2.0469 | 16 55 | 0 |
| 1 7 | 730 | 5 9862 | 13 576 | 82545 | 2 2773 | 348 9 | 0 |
| 1 7 | 745 | 10.917 | 29.103 | 82545 | 5.1652 | 316 1 | 0 |
| 1 7 | 800 | 16.285 | 30.625 | 8 1986 | 4.0646 | 287 | 0 |
| 1 7 | 815 | 17.739 | 28.164 | 6.664 | 4.3129 | 294 5 | 0 |
| 1 7 | 830 | 17.404 | 26 933 | 7 8899 | 3.5031 | 289 | 0 |
| 1 7 | 845 | 17.672 | 28 634 | 10.807 | 3.4472 | 297.5 | 0 |
| 1 7 | 900 | 14.447 | 31 229 | 3 8969 | 5.6484 | 307.4 | 0 |
| 1 7 | 915 | 15.628 | 35 971 | 4 6641 | 6 0063 | 303 6 | 0 |
| 1 7 | 930 | 21.475 | 36.597 | 10.492 | 4.6574 | 315 5 | 0 |
| 1 7 | 945 | 21.967 | 35.188 | 11.104 | 4.4293 | 330 7 | 0 |
| 1 7 | 1000 | 16.285 | 35.031 | 6.6528 | 4.4852 | 328 8 | 0 |
| 1 7 | 1015 | 15 433 | 27.828 | 6.3441 | 3.9327 | 300.6 | 0 |
| 1 7 | 1030 | 10.011 | 19.059 | 1.7449 | 3.5837 | 300.7 | 0 |
| 1 7 | 1045 | 12.306 | 21 99 | 5 4247 | 3.2929 | 300 5 | 0 |
| 1 7 | 1100 | 10.635 | 20 29 | 4 5031 | 3.2772 | 278 | 0 |
| 1 7 | 1115 | 8.1472 | 17.068 | 2 2034 | 2 6419 | 303 5 | 0 |
| 1 7 | 1130 | 8.4223 | 26.732 | .21028 | 5 9281 | 294.1 | 0 |
| 1 7 | 1145 | 19.596 | 37.291 | 9.1001 | 5.371 | 274.2 | 0 |
| 1 7 | 1200 | 17 985 | 29.797 | 6 494 | 4.483 | 289.5 | 0 |
| 1 7 | 1215 | 16 062 | 27.18 | 8.0264 | 3.9036 | 284.6 | 0 |
| 1 7 | 1230 | 15.972 | 26 732 | 4.9617 | 4.1586 | 290 8 | 0 |
| 1 7 | 1245 | 13 869 | 24.115 | 3.2772 | 3.8521 | 275.5 | 0 |
| 1 7 | 1300 | 18 299 | 31.631 | 3 5837 | 5 9929 | 283.4 | 0 |
| 1 7 | 1315 | 25.01 | 39.461 | 13 547 | 4.2928 | 297.2 | 0 |
| 1 7 | 1330 | 22.594 | 36.396 | 11.402 | 4 6619 | 293.7 | 0 |
| 1 7 | 1345 | 25.3 | 37.47 | 15.704 | 3.9192 | 298 | 0 |
| 1 7 | 1400 | 29.439 | 49 572 | 15.236 | 5.9773 | 299.8 | 0 |
| 1 7 | 1415 | 26.531 | 44 964 | 13.091 | 6.3934 | 307 1 | 0 |
| 1 7 | 1430 | 19.618 | 35.926 | 9 7175 | 5 1339 | 305 2 | 0 |
| 1 7 | 1445 | 28.678 | 47.894 | 16 934 | 5.0154 | 295 2 | 0 |
| 1 7 | 1500 | 25.054 | 35.926 | 12.478 | 4.4427 | 297.1 | 0 |
| 1 7 | 1515 | 27.784 | 39.148 | 14 78 | 4.0848 | 292 6 | 0 |
| 1 7 | 1530 | 23.444 | 35 792 | 13 55 | 4.1854 | 289.1 | 0 |
| 1 7 | 1545 | 25 569 | 41.004 | 13.863 | 4.7984 | 282 9 | 0 |
| 1 7 | 1600 | 24.943 | 36.553 | 15.549 | 4.0758 | 288 7 | 0 |
| 1 7 | 1615 | 23.019 | 38 566 | 11.409 | 4 568 | 282 | 0 |
| 1 7 | 1630 | 20.894 | 34 584 | 11 102 | 4 4002 | 286 7 | 0 |
| 1 7 | 1645 | 20 245 | 27.985 | 9 8764 | 3 1989 | 290 2 | 0 |
| 1 7 | 1700 | 19 417 | 28.902 | 9 4178 | 3.6418 | 291 5 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 1 8 | 700 | 41 407 | 63 016 | 24 473 | 6.6461 | 282 3 | 0 |
| 1 8 | 715 | 45.545 | 71.45 | 28.007 | 8 2076 | 289 7 | 0 |
| 1 8 | 730 | 40.154 | 63.307 | 23 846 | 7.8273 | 295.4 | 0 |
| 1 8 | 745 | 50.78 | 78.496 | 29 081 | 8 3105 | 283 3 | 0 |
| 1 8 | 800 | 52.793 | 86.952 | 32.75 | 9 4088 | 281.8 | 0 |
| 1 8 | 815 | 51.294 | 77.557 | 30 132 | 9.1695 | 279 | 0 |
| 1 8 | 830 | 43.51 | 64 358 | 26 307 | 6.9079 | 277 7 | 0 |
| 1 8 | 845 | 43 733 | 69.571 | 23 377 | 7.7065 | 271 6 | 0 |
| 1 8 | 900 | 45.612 | 69.392 | 24.137 | 8 7937 | 272.1 | 0 |
| 1 8 | 915 | 47.872 | 80 286 | 28.276 | 8 2903 | 272.5 | 0 |
| 1 8 | 930 | 42 391 | 75.521 | 25 815 | 7 7423 | 275 9 | 0 |
| 1 8 | 945 | 42.414 | 62 793 | 25.815 | 6 5209 | 273 3 | 0 |
| 1 8 | 1000 | 40.669 | 64.47 | 21.229 | 7.4515 | 268 3 | 0 |
| 1 8 | 1015 | 36.732 | 54 493 | 24.294 | 5.2883 | 258.2 | 0 |
| 1 8 | 1030 | 29 484 | 45 143 | 16.464 | 4.8856 | 245.7 | 0 |
| 1 8 | 1045 | 26.956 | 43 465 | 13.095 | 5.1473 | 249.7 | 0 |
| 1 8 | 1100 | 26.083 | 38 7 | 13.706 | 5 078 | 256.1 | 0 |
| 1 8 | 1115 | 24 54 | 41 452 | 12 326 | 4.4718 | 248.5 | 0 |
| 1 8 | 1130 | 17.247 | 31.34 | 7 1114 | 5.2212 | 266.1 | 0 |
| 1 8 | 1145 | 12 572 | 29 797 | 3 8924 | 5 4493 | 272.8 | 0 |
| 1 8 | 1200 | 22.348 | 46.037 | 1.7449 | 7.8854 | 275 6 | 0 |
| 1 8 | 1215 | 19.283 | 42.212 | 4 8096 | 8 1024 | 290.3 | 0 |
| 1 8 | 1230 | 25.703 | 48 498 | 12 321 | 6 7021 | 275.1 | 0 |
| 1 8 | 1245 | 26 397 | 44.964 | 12.321 | 6.2256 | 275 3 | 0 |
| 1 8 | 1300 | 30.468 | 53.397 | 13.241 | 8.1382 | 266.1 | 0 |
| 1 8 | 1315 | 38.544 | 64.895 | 15.838 | 9.552 | 266 5 | 0 |
| 1 8 | 1330 | 28.097 | 44.203 | 15.08 | 5.2122 | 278 7 | 0 |
| 1 8 | 1345 | 31.765 | 53 845 | 17.225 | 8.0868 | 295 | 0 |
| 1 8 | 1400 | 27.739 | 46 798 | 12.471 | 6 9123 | 287 1 | 0 |
| 1 8 | 1415 | 31.229 | 57.536 | 12.01 | 8.8831 | 302.7 | 0 |
| 1 8 | 1430 | 34 405 | 75 924 | 17 225 | 9 7735 | 292.7 | 0 |
| 1 8 | 1445 | 34.137 | 53 688 | 17.068 | 6.5768 | 287.2 | 0 |
| 1 8 | 1500 | 30.871 | 54.314 | 13 236 | 8 6482 | 283.3 | 0 |
| 1 8 | 1515 | 31.184 | 52 614 | 14.156 | 7.9212 | 278.8 | 0 |
| 1 8 | 1530 | 26.665 | 47 402 | 12.01 | 6 6864 | 284 4 | 0 |
| 1 8 | 1545 | 29.238 | 53.084 | 8.4872 | 6.9862 | 293 5 | 0 |
| 1 8 | 1600 | 46.507 | 71 025 | 23.667 | 7 5633 | 288.2 | 0 |
| 1 8 | 1615 | 40 713 | 73.933 | 23 354 | 7 6796 | 282 | 0 |
| 1 8 | 1630 | 40.221 | 71 025 | 24 585 | 7 1629 | 276 | 0 |
| 1 8 | 1645 | 43 599 | 62 144 | 23 063 | 6.5499 | 274 9 | 0 |
| 1 8 | 1700 | 41 966 | 67 848 | 23 981 | 8 1874 | 277 8 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 1 9 | 700 | 22.661 | 41.206 | 6 6573 | 6.8385 | 331 1 | 0 |
| 1 9 | 715 | 22.907 | 48.878 | 8 6527 | 6 9146 | 324 3 | 0 |
| 1 9 | 730 | 20.849 | 47 961 | 3.8946 | 8.1472 | 305 | 0 |
| 1 9 | 745 | 17.091 | 53.643 | 2.0536 | 8.1181 | 311.1 | 0 |
| 1 9 | 800 | 22.638 | 38 432 | 7 579 | 6 0735 | 306 | 0 |
| 1 9 | 815 | 31.094 | 57.312 | 11.261 | 8.6684 | 306.7 | 0 |
| 1 9 | 830 | 29.305 | 47 782 | 12.028 | 7.3374 | 304 | 0 |
| 1 9 | 845 | 23 623 | 44.718 | 9.1113 | 6 3687 | 291 4 | 0 |
| 1 9 | 900 | 27.716 | 46.082 | 13.1 | 5.1988 | 293.9 | 0 |
| 1 9 | 915 | 24.674 | 36.732 | 15 093 | 4.5903 | 302.3 | 0 |
| 1 9 | 930 | 22.236 | 35.345 | 13.404 | 3 6732 | 299.9 | 0 |
| 1 9 | 945 | 20 357 | 50 69 | 6.192 | 6.7311 | 295.7 | 0 |
| 1 9 | 1000 | 11.653 | 24.294 | 3.1251 | 3.7157 | 322.7 | 0 |
| 1 9 | 1015 | 20.648 | 34 875 | 7.881 | 5.2279 | 318.8 | 0 |
| 1 9 | 1030 | 11.442 | 25 054 | 3.4316 | 4 1653 | 317 6 | 0 |
| 1 9 | 1045 | 20.692 | 38.23 | 7 7244 | 6.6685 | 322.9 | 0 |
| 1 9 | 1100 | 26.106 | 42.816 | 12.628 | 5.4829 | 319.5 | 0 |
| 1 9 | 1115 | 17.024 | 38.834 | 4.3487 | 5 3308 | 326.4 | 0 |
| 1 9 | 1130 | 16.039 | 27.784 | 5.116 | 3.9707 | 332.2 | 0 |
| 1 9 | 1145 | 12 516 | 19.372 | 5.4203 | 2.6934 | 330.9 | 0 |
| 1 9 | 1200 | 11.675 | 22.415 | 4.8073 | 3.7224 | 354.8 | 0 |
| 1 9 | 1215 | 13.053 | 25.166 | 4.9594 | 4 7671 | 317.1 | 0 |
| 1 9 | 1230 | 16.822 | 24.875 | 5.8788 | 3 1967 | 305 9 | 0 |
| 1 9 | 1245 | 21 721 | 32.056 | 9.8585 | 4.1765 | 287.6 | 0 |
| 1 9 | 1300 | 21.654 | 31.9 | 11 693 | 3 6955 | 293.9 | 0 |
| 1 9 | 1315 | 18.075 | 28.835 | 7.5611 | 4.3197 | 309 5 | 0 |
| 1 9 | 1330 | 13.666 | 25.927 | 3.8857 | 4.0713 | 315.8 | 0 |
| 1 9 | 1345 | 14.46 | 26.397 | 6 0287 | 3.8857 | 318.4 | 0 |
| 1 9 | 1400 | 13.977 | 24.406 | 6.9481 | 4.04 | 311.3 | 0 |
| 1 9 | 1415 | 13.25 | 30 669 | 4 3443 | 5.5724 | 309.3 | 0 |
| 1 9 | 1430 | 15.406 | 32.056 | 6.796 | 4.4561 | 302.4 | 0 |
| 1 9 | 1445 | 13.31 | 30 826 | 4.04 | 5.7536 | 317 7 | 0 |
| 1 9 | 1500 | 10.38 | 19 059 | .82322 | 3.2034 | 326.6 | 0 |
| 1 9 | 1515 | 13.375 | 24.249 | 1 029 | 3.6329 | 326 9 | 0 |
| 1 9 | 1530 | 13.63 | 25.479 | 4 5008 | 3 7112 | 303 | 0 |
| 1 9 | 1545 | 13.299 | 23.198 | 1.4362 | 4 0534 | 313.1 | 0 |
| 1 9 | 1600 | 13.203 | 28.097 | 7.4112 | 3.1094 | 307.3 | 0 |
| 1 9 | 1615 | 14.093 | 31.318 | 5.8811 | 5 1026 | 298 4 | 0 |
| 1 9 | 1630 | 10.317 | 23 802 | 2 9707 | 3.8879 | 294 4 | 0 |
| 1 9 | 1645 | 8 6796 | 16.912 | .6711 | 3.3219 | 285 5 | 0 |
| 1 9 | 1700 | 8.2501 | 22 281 | 36463 | 4.125 | 311 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 1 10 | 700 | 10.415 | 26 598 | 1 1319 | 5.3688 | 208 5 | 0 |
| 1 10 | 715 | 14 807 | 35.635 | 1 4384 | 6.2054 | 200 1 | 0 |
| 1 10 | 730 | 17.068 | 34.114 | 1 4384 | 6.1093 | 214 1 | 0 |
| 1 10 | 745 | 16 934 | 38.566 | 4 5053 | 5.2212 | 235 6 | 0 |
| 1 10 | 800 | 14.297 | 25.815 | .6711 | 3.9886 | 218 7 | 0 |
| 1 10 | 815 | 16.285 | 39 93 | 05816 | 7.1785 | 219.5 | 0 |
| 1 10 | 830 | 12.129 | 26 732 | 21028 | 4.8789 | 202 2 | 0 |
| 1 10 | 845 | 20 357 | 44 069 | 2.5122 | 6.2569 | 237 6 | 0 |
| 1 10 | 900 | 19 372 | 38.387 | 6.9571 | 5.9594 | 237.3 | 0 |
| 1 10 | 915 | 25 815 | 47 424 | 14 775 | 6.0108 | 252 | 0 |
| 1 10 | 930 | 26.329 | 46 955 | 11.704 | 6 3777 | 260 4 | 0 |
| 1 10 | 945 | 24.316 | 45 277 | 14.614 | 5.031 | 267 3 | 0 |
| 1 10 | 1000 | 21.386 | 37 582 | 8.4849 | 5.8677 | 264 1 | 0 |
| 1 10 | 1015 | 21.923 | 37.738 | 8.7892 | 4.7156 | 266 1 | 0 |
| 1 10 | 1030 | 25.614 | 45.545 | 7 4089 | 6.9951 | 280 | 0 |
| 1 10 | 1045 | 28.723 | 46.149 | 12.767 | 5 8296 | 275 | 0 |
| 1 10 | 1100 | 27.448 | 45.523 | 13.686 | 6.0444 | 278 1 | 0 |
| 1 10 | 1115 | 32 75 | 55 164 | 11.997 | 7.2792 | 274.7 | 0 |
| 1 10 | 1130 | 31.184 | 51 496 | 16 889 | 6.4247 | 277.1 | 0 |
| 1 10 | 1145 | 27.94 | 49.661 | 15 059 | 5 503 | 269.9 | 0 |
| 1 10 | 1200 | 26.397 | 50.109 | 14 138 | 6.4112 | 278.8 | 0 |
| 1 10 | 1215 | 34.159 | 64 336 | 14 903 | 9.1516 | 279 | 0 |
| 1 10 | 1230 | 41 362 | 61.741 | 22.706 | 7.3262 | 280 1 | 0 |
| 1 10 | 1245 | 42.324 | 66.014 | 20.558 | 8.2456 | 283 7 | 0 |
| 1 10 | 1300 | 44.136 | 69 392 | 23.019 | 9 0106 | 280 4 | 0 |
| 1 10 | 1315 | 44.047 | 68.475 | 26.687 | 7.7445 | 279 1 | 0 |
| 1 10 | 1330 | 47.178 | 84.402 | 25.614 | 8.2277 | 279.8 | 0 |
| 1 10 | 1345 | 37.984 | 59.75 | 20.871 | 7 8631 | 283.3 | 0 |
| 1 10 | 1400 | 34.785 | 59 124 | 16 129 | 7.9212 | 280.1 | 0 |
| 1 10 | 1415 | 36.485 | 54.56 | 16.442 | 6 192 | 278 4 | 0 |
| 1 10 | 1430 | 40 624 | 64.806 | 21 341 | 7.6036 | 281.2 | 0 |
| 1 10 | 1445 | 41 608 | 67.557 | 22 862 | 7.6125 | 281.2 | 0 |
| 1 10 | 1500 | 35 837 | 58 677 | 20 111 | 6.7848 | 273 3 | 0 |
| 1 10 | 1515 | 37 246 | 74 917 | 21 788 | 8.3552 | 273 | 0 |
| 1 10 | 1530 | 35.233 | 58.99 | 14 753 | 7.4649 | 276 | 0 |
| 1 10 | 1545 | 38.79 | 60 824 | 18.88 | 7.0689 | 270 3 | 0 |
| 1 10 | 1600 | 39 662 | 64.962 | 21.184 | 7 6505 | 272 6 | 0 |
| 1 10 | 1615 | 41 004 | 66.193 | 20.871 | 8 5319 | 272 9 | 0 |
| 1 10 | 1630 | 44 807 | 71.562 | 23 779 | 8.8071 | 266 6 | 0 |
| 1 10 | 1645 | 39 058 | 65 745 | 19 954 | 7 8742 | 271 3 | 0 |
| 1 10 | 1700 | 38 655 | 73 418 | 18 276 | 7.9212 | 270 4 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 1 11 | 700 | 11.693 | 22.616 | 5.5813 | 3 1967 | 320.5 | 0 |
| 1 11 | 715 | 12 852 | 25 077 | 2 5122 | 3 4696 | 318 5 | 0 |
| 1 11 | 730 | 12.306 | 24 294 | 4 814 | 3 9327 | 312 | 0 |
| 1 11 | 745 | 12.905 | 24.45 | 5 1205 | 3 5703 | 313 | 0 |
| 1 11 | 800 | 13.066 | 25 681 | 3.5859 | 4 5277 | 314 4 | 0 |
| 1 11 | 815 | 14.35 | 26 151 | 7 5767 | 3 6687 | 331 2 | 0 |
| 1 11 | 830 | 17.158 | 31 363 | 9.2634 | 4.1273 | 325 9 | 0 |
| 1 11 | 845 | 16 822 | 31.967 | 8.8026 | 4.1675 | 329.7 | 0 |
| 1 11 | 900 | 22.37 | 30.736 | 14.784 | 3.1452 | 352.4 | 0 |
| 1 11 | 915 | 23 242 | 29.059 | 15.704 | 2.7761 | 350 6 | 0 |
| 1 11 | 930 | 22.325 | 30.893 | 14 326 | 3.1005 | 352.4 | 0 |
| 1 11 | 945 | 15 704 | 23.22 | 8.3418 | 3.0781 | 3.513 | 0 |
| 1 11 | 1000 | 14.968 | 21.386 | 9 7242 | 1 8276 | 1 94 | 0 |
| 1 11 | 1015 | 11.849 | 16 487 | 6 8094 | 1.9372 | 5.003 | 0 |
| 1 11 | 1030 | 11.917 | 17.091 | 6.966 | 1.7135 | 551 | 0 |
| 1 11 | 1045 | 9.8898 | 14 796 | 5 7379 | 1.6599 | 9.1 | 0 |
| 1 11 | 1100 | 8.8608 | 12.802 | 4.9706 | 1.5413 | 10.96 | 0 |
| 1 11 | 1115 | 7.3933 | 12 648 | 2.2057 | 1.9932 | 35 63 | 0 |
| 1 11 | 1130 | 4.8767 | 8 6572 | .97757 | 1 8411 | 15.34 | 0 |
| 1 11 | 1145 | 4.8342 | 10.346 | 82545 | 1.8836 | 6.763 | 0 |
| 1 11 | 1200 | 4.7044 | 9.4245 | 2.2057 | 1.5167 | 51.53 | 0 |
| 1 11 | 1215 | 5.767 | 10.496 | 1.4384 | 1 9909 | 23.47 | 0 |
| 1 11 | 1230 | 5.6954 | 9.2679 | 2.2057 | 1.4406 | 30.79 | 0 |
| 1 11 | 1245 | 5.1652 | 9.7265 | 1 1319 | 1.7359 | 39 32 | 0 |
| 1 11 | 1300 | 4 6038 | 9 7242 | 21028 | 2.0894 | 39 61 | 0 |
| 1 11 | 1315 | 4 8901 | 10.183 | 1 1319 | 1 8478 | 51.57 | 0 |
| 1 11 | 1330 | 4.4606 | 8.3418 | .21028 | 1.5413 | 33.99 | 0 |
| 1 11 | 1345 | 3.7805 | 8.4939 | .05816 | 1 8567 | 36.27 | 0 |
| 1 11 | 1400 | 3.709 | 7 7244 | 51675 | 1.5413 | 88.6 | 0 |
| 1 11 | 1415 | 3.0513 | 8.0331 | .05816 | 1.8746 | 84.2 | 0 |
| 1 11 | 1430 | 4 4248 | 8 6438 | .21028 | 1.6957 | 79.5 | 0 |
| 1 11 | 1445 | 5.1451 | 9.2589 | -.09843 | 1.7829 | 137.6 | 0 |
| 1 11 | 1500 | 3.993 | 8.0308 | 05816 | 1.595 | 98.3 | 0 |
| 1 11 | 1515 | 3 9886 | 7 4179 | 6711 | 1.284 | 131.8 | 0 |
| 1 11 | 1530 | 3 7022 | 9 4111 | .05816 | 2.0111 | 147 5 | 0 |
| 1 11 | 1545 | 4.304 | 8 183 | 1 4384 | 1.5391 | 122.3 | 0 |
| 1 11 | 1600 | 4.0713 | 7 57 | .05816 | 1.34 | 134.5 | 0 |
| 1 11 | 1615 | 3 6911 | 5 7312 | 1 4384 | 9373 | 151 5 | 0 |
| 1 11 | 1630 | 4.0713 | 5 4247 | 1.7449 | .51227 | 158.1 | 0 |
| 1 11 | 1645 | 3.7045 | 4 8118 | 2 2057 | .57491 | 146 | 0 |
| 1 11 | 1700 | 3 1631 | 4 6597 | 1 4384 | .64426 | 83 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 1 12 | 715 | 6 6014 | 7 6013 | 5 7536 | 29976 | 196.7 | 0 |
| 1 12 | 730 | 7 9391 | 8 9883 | 6 5231 | 44293 | 178 3 | 0 |
| 1 12 | 745 | 7.3374 | 8.2165 | 6.5231 | .35121 | 180.8 | 0 |
| 1 12 | 800 | 6.4694 | 7 1383 | 5 5992 | .21028 | 182.8 | 0 |
| 1 12 | 815 | 5.9102 | 6 5231 | 4.6753 | 27739 | 190 | 0 |
| 1 12 | 830 | 2 4182 | 5 1362 | 05592 | 1 5637 | 176 | 0 |
| 1 12 | 845 | 1.3086 | 3.134 | -.66439 | .63307 | 222.2 | 0 |
| 1 12 | 900 | 2.0223 | 3.134 | 51675 | 46306 | 217 | 0 |
| 1 12 | 915 | 1.6353 | 3 2862 | 21028 | .65768 | 242.8 | 0 |
| 1 12 | 930 | 3 1251 | 5.8967 | .97757 | 1 0313 | 334.7 | 0 |
| 1 12 | 945 | 3 8946 | 6 0489 | 1 8992 | .89927 | 356.6 | 0 |
| 1 12 | 1000 | 4.9796 | 8 042 | 2.2079 | 1.1453 | 21.67 | 0 |
| 1 12 | 1015 | 5.5209 | 7 4268 | 3 2794 | .94178 | 34.44 | 0 |
| 1 12 | 1030 | 5.5366 | 8 0353 | 2.2057 | 1 1453 | 33.15 | 0 |
| 1 12 | 1045 | 5 7223 | 7 8832 | 2 973 | 93507 | 35.56 | 0 |
| 1 12 | 1100 | 5.4046 | 8 4939 | 2 8186 | 1.0156 | 30 03 | 0 |
| 1 12 | 1115 | 4 3264 | 7 7266 | 36463 | 1 4608 | 39.24 | 0 |
| 1 12 | 1130 | 4 0602 | 6.9593 | 82545 | 1 17 | 29.96 | 0 |
| 1 12 | 1145 | 4.0915 | 8.4894 | 05816 | 1 5212 | 25.97 | 0 |
| 1 12 | 1200 | 5.2391 | 8 9502 | 1.897 | 1.1811 | 29.31 | 0 |
| 1 12 | 1215 | 5.6082 | 10.941 | 82545 | 2 2728 | 27.48 | 0 |
| 1 12 | 1230 | 5 5813 | 9.1001 | 2.2034 | 1 3131 | 27.31 | 0 |
| 1 12 | 1245 | 5 588 | 10.328 | 1 5905 | 1.7583 | 36.67 | 0 |
| 1 12 | 1300 | 5.4314 | 10.939 | 2 2034 | 1 6442 | 33 58 | 0 |
| 1 12 | 1315 | 6 4761 | 10.02 | 2 8164 | 1 4362 | 9.42 | 0 |
| 1 12 | 1330 | 7.2009 | 12.165 | 1 897 | 2.1565 | 355.2 | 0 |
| 1 12 | 1345 | 8.4357 | 12.778 | 4.1944 | 1.5972 | 3.01 | 0 |
| 1 12 | 1400 | 8.3261 | 12.623 | 3 2772 | 1.4809 | 346.9 | 0 |
| 1 12 | 1415 | 7 3732 | 10 02 | 4 5031 | 1 2572 | 343.7 | 0 |
| 1 12 | 1430 | 6.8586 | 9 8652 | 4.5031 | 1 1297 | 359.6 | 0 |
| 1 12 | 1445 | 6.9839 | 9.5587 | 4 0423 | 1.1923 | 4 73 | 0 |
| 1 12 | 1500 | 6.7289 | 9.7131 | 3.2772 | 1 2259 | 8.2 | 0 |
| 1 12 | 1515 | 7.0667 | 10.785 | 4 5031 | 1 1856 | 353.8 | 0 |
| 1 12 | 1530 | 6 6528 | 9 5609 | 3 2772 | 1 1834 | 3.153 | 0 |
| 1 12 | 1545 | 6.069 | 8.1807 | 3 4293 | 1.0715 | 10.03 | 0 |
| 1 12 | 1600 | 5.7223 | 7 7221 | 3 738 | .70018 | 2.44 | 0 |
| 1 12 | 1615 | 4 8006 | 6.1898 | 3 5859 | 40266 | .697 | 0 |
| 1 12 | 1630 | 4 6216 | 6 0377 | 3 1251 | 35121 | 348.8 | 0 |
| 1 12 | 1645 | 4 5322 | 5.7312 | 2 9707 | 66215 | 319.9 | 0 |
| 1 12 | 1700 | 3 8723 | 4 6597 | 2 5122 | 28186 | 301.5 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 1 13 | 700 | 4.9371 | 7 8877 | 1 5927 | 1.2706 | 261 8 | 0 |
| 1 13 | 715 | 2 6061 | 5 7379 | 21028 | 1.2863 | 275.3 | 0 |
| 1 13 | 730 | 13.241 | 24.473 | 1.4384 | 4.2011 | 311.9 | 0 |
| 1 13 | 745 | 16.8 | 29.081 | 9 4245 | 3.3533 | 311 9 | 0 |
| 1 13 | 800 | 19.149 | 30.625 | 10.192 | 4.2749 | 318.4 | 0 |
| 1 13 | 815 | 15.816 | 32 302 | 6.1987 | 5.2323 | 329.9 | 0 |
| 1 13 | 830 | 8.3843 | 18 03 | 2.36 | 3.8342 | 266.4 | 0 |
| 1 13 | 845 | 3.7358 | 9.1158 | 1.1319 | 1.4966 | 29.92 | 0 |
| 1 13 | 900 | 3.1833 | 9.7242 | .21028 | 2.0469 | 64.22 | 0 |
| 1 13 | 915 | 8.1964 | 15.245 | 1.8992 | 3.7492 | 137.6 | 0 |
| 1 13 | 930 | 6.9705 | 10.178 | 2.5099 | 1.6017 | 181.1 | 0 |
| 1 13 | 945 | 9.7153 | 13.552 | 2.9707 | 1.9261 | 146.8 | 0 |
| 1 13 | 1000 | 7 0779 | 14.16 | 05816 | 3.445 | 116 6 | 0 |
| 1 13 | 1015 | 10.876 | 15.232 | 5.116 | 1.8455 | 102.2 | 0 |
| 1 13 | 1030 | 10.794 | 16.442 | 5.4203 | 2.3287 | 97.2 | 0 |
| 1 13 | 1045 | 10.594 | 16.912 | 4.1944 | 2.7828 | 93.5 | 0 |
| 1 13 | 1100 | 8.9167 | 16.151 | 5.1138 | 2.6262 | 87 | 0 |
| 1 13 | 1115 | 8.9167 | 17.203 | 4.3487 | 2.8768 | 88 6 | 0 |
| 1 13 | 1130 | 9 6459 | 15 838 | 4.5008 | 2.4316 | 81.5 | 0 |
| 1 13 | 1145 | 8.2031 | 14.303 | 4 3465 | 2.2146 | 85.8 | 0 |
| 1 13 | 1200 | 7 6707 | 13.536 | 3.5814 | 2.0648 | 88.5 | 0 |
| 1 13 | 1215 | 7.8787 | 13.995 | 4.04 | 2.0021 | 85.6 | 0 |
| 1 13 | 1230 | 6.2278 | 12.004 | .21251 | 2.3869 | 79 8 | 0 |
| 1 13 | 1245 | 7.8787 | 15.838 | 2.0491 | 2.1184 | 84.9 | 0 |
| 1 13 | 1300 | 10.919 | 17.963 | 4.9572 | 2.3802 | 72.1 | 0 |
| 1 13 | 1315 | 7.7445 | 17.046 | 1.284 | 3.266 | 64 85 | 0 |
| 1 13 | 1330 | 9 7533 | 17.672 | 5.5701 | 2.4741 | 82 5 | 0 |
| 1 13 | 1345 | 7.8273 | 14.294 | 2.3556 | 2.4115 | 70.8 | 0 |
| 1 13 | 1400 | 8.353 | 16 285 | 2 3556 | 3.0043 | 344 | 0 |
| 1 13 | 1415 | 11.165 | 19.797 | 4.1899 | 2.8455 | 269.2 | 0 |
| 1 13 | 1430 | 11 702 | 19.954 | 6.1808 | 2.4316 | 311 | 0 |
| 1 13 | 1445 | 12.755 | 21.028 | 5.1093 | 3.3108 | 279.7 | 0 |
| 1 13 | 1500 | 14.008 | 21.945 | 6.7915 | 2.8231 | 276.4 | 0 |
| 1 13 | 1515 | 15.015 | 21.341 | 8 7825 | 2.8231 | 265 8 | 0 |
| 1 13 | 1530 | 20.603 | 37.089 | 10.313 | 4.5724 | 277.8 | 0 |
| 1 13 | 1545 | 20.715 | 31.743 | 12.151 | 3.1497 | 289.9 | 0 |
| 1 13 | 1600 | 27.09 | 37.716 | 14.905 | 3.9528 | 284 4 | 0 |
| 1 13 | 1615 | 30.826 | 42.637 | 18.433 | 4.0356 | 285.4 | 0 |
| 1 13 | 1630 | 32.929 | 47 849 | 17 068 | 5.9571 | 284.9 | 0 |
| 1 13 | 1645 | 31.743 | 44 337 | 18.589 | 4.7894 | 284 8 | 0 |
| 1 13 | 1700 | 25 457 | 36.687 | 16 755 | 3 615 | 283 2 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 1 14 | 700 | 7 8787 | 22.169 | .21028 | 3.8454 | 184.7 | 0 |
| 1 14 | 715 | 11.462 | 22.325 | .36463 | 4.682 | 175 5 | 0 |
| 1 14 | 730 | 9.1874 | 15.57 | .36463 | 3.1967 | 163 3 | 0 |
| 1 14 | 745 | 8.6773 | 17.874 | .21028 | 3.8007 | 139 | 0 |
| 1 14 | 800 | 10.087 | 22.795 | 2.5144 | 3 7895 | 212.1 | 0 |
| 1 14 | 815 | 8.5431 | 16.956 | .21028 | 3.7828 | 205.6 | 0 |
| 1 14 | 830 | 10 134 | 25.39 | 2.0536 | 4.1116 | 203.9 | 0 |
| 1 14 | 845 | 8.2098 | 24.943 | .21028 | 6.031 | 144 6 | 0 |
| 1 14 | 900 | 8.3418 | 27.851 | -.27739 | 5.8117 | 141.4 | 0 |
| 1 14 | 915 | 8.268 | 25.547 | 36463 | 4 3308 | 161 9 | 0 |
| 1 14 | 930 | 20 961 | 36.575 | 7.8832 | 5.3062 | 275 5 | 0 |
| 1 14 | 945 | 26.285 | 43.018 | 15 397 | 5 2055 | 276 7 | 0 |
| 1 14 | 1000 | 25.793 | 39.796 | 13.556 | 4.776 | 277.4 | 0 |
| 1 14 | 1015 | 29.976 | 50 377 | 16.778 | 5.0668 | 280 6 | 0 |
| 1 14 | 1030 | 28.768 | 42.861 | 16.308 | 5.4091 | 275.3 | 0 |
| 1 14 | 1045 | 28.186 | 50 511 | 16.621 | 5.9034 | 279.5 | 0 |
| 1 14 | 1100 | 30.2 | 44 382 | 18.768 | 5 1227 | 277 | 0 |
| 1 14 | 1115 | 33.644 | 45.299 | 21.677 | 4 5926 | 269 4 | 0 |
| 1 14 | 1130 | 35 635 | 48 521 | 23.22 | 4.597 | 268.4 | 0 |
| 1 14 | 1145 | 34.427 | 47 603 | 21.073 | 4.8588 | 266.9 | 0 |
| 1 14 | 1200 | 33.801 | 48.364 | 19.999 | 5.7536 | 267.2 | 0 |
| 1 14 | 1215 | 31 05 | 43 152 | 16 621 | 5 04 | 273.8 | 0 |
| 1 14 | 1230 | 29.573 | 44 516 | 16.912 | 4.3979 | 273.2 | 0 |
| 1 14 | 1245 | 25.86 | 39.617 | 14.317 | 4.6552 | 276.8 | 0 |
| 1 14 | 1300 | 27.873 | 38 23 | 15.704 | 4.6216 | 265 4 | 0 |
| 1 14 | 1315 | 23.466 | 36 083 | 13.397 | 3.9752 | 278 | 0 |
| 1 14 | 1330 | 26.844 | 37.626 | 14.623 | 4.597 | 265 | 0 |
| 1 14 | 1345 | 30.826 | 43 443 | 16.934 | 4.9304 | 257.9 | 0 |
| 1 14 | 1400 | 26.755 | 38.857 | 16.308 | 4.1295 | 252 9 | 0 |
| 1 14 | 1415 | 23.131 | 39.148 | 8 6438 | 5.5321 | 253.7 | 0 |
| 1 14 | 1430 | 18.008 | 30 11 | 9.1024 | 4.125 | 285.6 | 0 |
| 1 14 | 1445 | 13.894 | 23 667 | 4.8096 | 3.7492 | 327 9 | 0 |
| 1 14 | 1500 | 14.827 | 25.972 | 3.5837 | 5.3442 | 327 8 | 0 |
| 1 14 | 1515 | 10.903 | 21 363 | 82545 | 4.2078 | 279.5 | 0 |
| 1 14 | 1530 | 17.27 | 25 658 | 7 1092 | 3.4562 | 258 2 | 0 |
| 1 14 | 1545 | 15.106 | 22 728 | 8.0286 | 2.445 | 263.1 | 0 |
| 1 14 | 1600 | 14.162 | 23 198 | 7.7221 | 3.1721 | 274 | 0 |
| 1 14 | 1615 | 10.919 | 18.299 | 4 5031 | 2 5166 | 278.8 | 0 |
| 1 14 | 1630 | 8.9659 | 14 773 | 3.2772 | 2 029 | 256 8 | 0 |
| 1 14 | 1645 | 9.4871 | 19 372 | 3 4293 | 3 6172 | 235 8 | 0 |
| 1 14 | 1700 | 9 7578 | 20 446 | 5 7312 | 2 416 | 230 7 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 1 15 | 700 | 8 353 | 9.9054 | 6 8273 | 774 | 235 3 | 0 |
| 1 15 | 715 | 8 2523 | 10.214 | 6.3665 | .60846 | 240 7 | 0 |
| 1 15 | 730 | 7.3911 | 9 1359 | 5 7491 | 77176 | 246 | 0 |
| 1 15 | 745 | 7.4224 | 10.366 | 4 6731 | 1.3467 | 259 | 0 |
| 1 15 | 800 | 5.0959 | 6.8273 | 3 4405 | .65544 | 254 5 | 0 |
| 1 15 | 815 | 7.0018 | 8.6751 | 3.5949 | 1 0424 | 239.5 | 0 |
| 1 15 | 830 | 6.2032 | 7.4425 | 4.5187 | .63531 | 242 | 0 |
| 1 15 | 845 | 3.6799 | 5.9034 | 1.9015 | .8523 | 234 7 | 0 |
| 1 15 | 900 | 2.7895 | 4.3622 | 6711 | .88361 | 245 4 | 0 |
| 1 15 | 915 | 2.5614 | 5.4382 | .21028 | 1.2617 | 145 9 | 0 |
| 1 15 | 930 | 3 1564 | 5.1272 | 1.2863 | .78519 | 122.6 | 0 |
| 1 15 | 945 | 3.3309 | 5 5858 | 1.1319 | .95072 | 124 5 | .04 |
| 1 15 | 1000 | 2.8276 | 4.9706 | .21028 | .97309 | 157 6 | .01 |
| 1 15 | 1015 | 3.0132 | 6.6551 | .21028 | 1.4116 | 62.73 | 0 |
| 1 15 | 1030 | 2.029 | 6.6461 | .05816 | 1.3176 | 55.65 | 0 |
| 1 15 | 1045 | 2 369 | 6.6394 | - 70689 | 1 4272 | 89.1 | 0 |
| 1 15 | 1100 | 3.9505 | 8 9256 | - 70465 | 1 7203 | 102.6 | 0 |
| 1 15 | 1115 | 3 8991 | 9.8473 | 97757 | 1 8142 | 60.41 | 0 |
| 1 15 | 1130 | 5.2749 | 9.5453 | 1.7426 | 1.7024 | 15.98 | 0 |
| 1 15 | 1145 | 3.3756 | 5.8744 | .21251 | 1.6755 | 32.93 | 0 |
| 1 15 | 1200 | 3.2213 | 7.4067 | -.09395 | 1.3422 | 104.9 | 0 |
| 1 15 | 1215 | 5.5388 | 9 5498 | 1.5905 | 1.9708 | 53.66 | 0 |
| 1 15 | 1230 | 5.6999 | 12.458 | 1.7426 | 1.9372 | 34.1 | 0 |
| 1 15 | 1245 | 5.1406 | 9.0889 | 21251 | 1.7001 | 16.56 | 0 |
| 1 15 | 1300 | 6.2994 | 10.008 | 1.284 | 1.9104 | 42.44 | 0 |
| 1 15 | 1315 | 6.749 | 12.151 | 1.5905 | 2.3242 | 53 95 | 0 |
| 1 15 | 1330 | 6.0019 | 10.16 | 2.2012 | 1.6889 | 43.48 | 0 |
| 1 15 | 1345 | 7.2456 | 13.681 | 1.5905 | 2.5793 | 38 01 | 0 |
| 1 15 | 1400 | 6.7065 | 13.142 | 2.0491 | 2.1811 | 8 37 | 0 |
| 1 15 | 1415 | 9.0084 | 13.069 | 5.418 | 1.3847 | 3 445 | 0 |
| 1 15 | 1430 | 9.4178 | 14.142 | 5.5701 | 1.4831 | 356.6 | 0 |
| 1 15 | 1445 | 8.9995 | 12.612 | 5 2637 | 1.4406 | 350 | 0 |
| 1 15 | 1500 | 9.2209 | 12.308 | 5.2637 | 1.4362 | .637 | 0 |
| 1 15 | 1515 | 7 8586 | 11.084 | 4.9594 | 1.2013 | 1 37 | 0 |
| 1 15 | 1530 | 8.4424 | 11.395 | 4 9594 | 1.3154 | .006 | 0 |
| 1 15 | 1545 | 9.165 | 12.317 | 5.2681 | 1.5905 | 8.54 | 0 |
| 1 15 | 1600 | 5 9191 | 10.022 | 3.2772 | 1.3377 | 4.115 | 0 |
| 1 15 | 1615 | 6.0846 | 9.1024 | 3 4316 | 98652 | 11 18 | 0 |
| 1 15 | 1630 | 5.975 | 7.57 | 4.351 | 53912 | 359 5 | 0 |
| 1 15 | 1645 | 4 1921 | 6 0377 | 2 5122 | .69794 | 352 8 | 0 |
| 1 15 | 1700 | 7 1897 | 8 646 | 4 0445 | 73374 | 334 9 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 1 16 | 700 | 8.4111 | 12 827 | 2 671 | 2 7851 | 113.3 | 0 |
| 1 16 | 715 | 9.1471 | 14.52 | 5 4404 | 1 9932 | 130 3 | 0 |
| 1 16 | 730 | 5.031 | 8.0577 | 2 2102 | 1.1543 | 116 2 | 0 |
| 1 16 | 745 | 3.1229 | 8 0577 | 05592 | 1 8657 | 184 5 | 0 |
| 1 16 | 800 | 2 9752 | 5.5947 | - 66439 | 1.6822 | 99.2 | 0 |
| 1 16 | 815 | 3.653 | 7.9011 | 1.1319 | 1.463 | 110 3 | 0 |
| 1 16 | 830 | 1.8522 | 5.5522 | 21028 | 1.2192 | 128.3 | 0 |
| 1 16 | 845 | 3.2705 | 5.2838 | 1.4406 | 82545 | 85 5 | 0 |
| 1 16 | 900 | 6.8497 | 13.431 | 82545 | 2.6374 | 86 8 | 0 |
| 1 16 | 915 | 8.2545 | 14 35 | 2 8231 | 2.5189 | 98.2 | 0 |
| 1 16 | 930 | 8.5453 | 11.735 | 3.436 | 2.0827 | 101.1 | 0 |
| 1 16 | 945 | 5.9795 | 10 196 | 2 9752 | 1.6397 | 91 8 | 0 |
| 1 16 | 1000 | 5.1876 | 9.118 | 2.9752 | 1.3422 | 85.1 | 0 |
| 1 16 | 1015 | 4.8476 | 8.9614 | 1.7449 | 1.3623 | 75 4 | 0 |
| 1 16 | 1030 | 4.823 | 9 8808 | 1 7449 | 1.671 | 93.1 | 0 |
| 1 16 | 1045 | 6.9683 | 12.18 | 2.5122 | 2.1811 | 96 1 | 0 |
| 1 16 | 1100 | 7.2099 | 11.874 | 1.7449 | 2.6441 | 109.3 | 0 |
| 1 16 | 1115 | 8.6102 | 12 791 | 4.9661 | 1.3333 | 134 1 | 0 |
| 1 16 | 1130 | 7.2568 | 11.409 | 1.8992 | 2 0088 | 123.1 | 0 |
| 1 16 | 1145 | 8.08 | 13.402 | .05816 | 2.624 | 126.8 | 0 |
| 1 16 | 1200 | 6.1428 | 11.409 | 1.4384 | 2.2325 | 118 3 | 0 |
| 1 16 | 1215 | 4.8946 | 8.646 | 2.0513 | 1.2908 | 59.58 | 0 |
| 1 16 | 1230 | 5.069 | 8.9502 | .51675 | 1.5592 | 100 6 | 0 |
| 1 16 | 1245 | 5 4695 | 9.7153 | 1 7449 | 1.7024 | 96 1 | 0 |
| 1 16 | 1300 | 6.06 | 10.174 | 2 0513 | 1.5435 | 171 1 | 0 |
| 1 16 | 1315 | 6.154 | 11 706 | 1.8478 | 2 029 | 143.8 | 0 |
| 1 16 | 1330 | 5.4941 | 10.787 | .6711 | 2.2303 | 142 3 | 0 |
| 1 16 | 1345 | 5.1384 | 10.939 | 1.4384 | 1.8455 | 107 7 | 0 |
| 1 16 | 1400 | 4.606 | 8.3328 | 1.284 | 1 7449 | 93.2 | 0 |
| 1 16 | 1415 | 3.2884 | 6.8005 | .21251 | 1.6509 | 72 2 | 0 |
| 1 16 | 1430 | 4.9214 | 10.628 | .21251 | 2.6866 | 124.2 | 0 |
| 1 16 | 1445 | 2.7895 | 7.1047 | .21251 | 1.5525 | 308 2 | 0 |
| 1 16 | 1500 | 12.245 | 25.479 | .21251 | 4.9438 | 302 6 | 0 |
| 1 16 | 1515 | 11.12 | 18.903 | 3.4293 | 3.1273 | 305 6 | 0 |
| 1 16 | 1530 | 17.538 | 27 336 | 8.0264 | 3.275 | 304.6 | 0 |
| 1 16 | 1545 | 14 74 | 19 059 | 9.1001 | 1.9059 | 304.4 | 0 |
| 1 16 | 1600 | 13.319 | 21.363 | 5.729 | 3.0244 | 304.6 | 0 |
| 1 16 | 1615 | 14.655 | 24 294 | 8 9525 | 2 662 | 310 8 | 0 |
| 1 16 | 1630 | 14.192 | 19.686 | 8 3418 | 2 5323 | 303 5 | 0 |
| 1 16 | 1645 | 15.681 | 20 759 | 10.335 | 1 8612 | 302.6 | 0 |
| 1 16 | 1700 | 14 406 | 22 146 | 7 8832 | 2.6464 | 298 9 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 1 17 | 700 | 5 4449 | 7.7512 | 3 4405 | .93954 | 254 5 | 0 |
| 1 17 | 715 | 2 5905 | 6.8273 | 05592 | 1.3355 | 281.7 | 0 |
| 1 17 | 730 | 2.5077 | 5.2883 | .51675 | 91046 | 287 6 | 0 |
| 1 17 | 745 | 4.295 | 7.5991 | 1 9015 | 1.2572 | 256.1 | 0 |
| 1 17 | 800 | 2.6508 | 5 7513 | .05592 | 1.0447 | 267.7 | 0 |
| 1 17 | 815 | 8.2411 | 14.983 | 1.2863 | 3.4584 | 288 8 | 0 |
| 1 17 | 830 | 11.462 | 17.292 | 6 3643 | 1.859 | 287.6 | 0 |
| 1 17 | 845 | 11.984 | 16.509 | 6.362 | 1.8232 | 299.8 | 0 |
| 1 17 | 900 | 8.8272 | 13.746 | 5.1317 | 1.378 | 325 3 | 0 |
| 1 17 | 915 | 9.1874 | 12.97 | 5 7446 | 1.5435 | 341.1 | 0 |
| 1 17 | 930 | 9 0017 | 13.737 | 4 8207 | 1.6957 | 349.8 | 0 |
| 1 17 | 945 | 9.071 | 14.037 | 4.0512 | 1.8209 | 29.76 | 0 |
| 1 17 | 1000 | 6 9123 | 10.657 | 2.6687 | 1.8701 | 62.14 | 0 |
| 1 17 | 1015 | 5.4359 | 9.8853 | 2 0536 | 1 5413 | 90 7 | 0 |
| 1 17 | 1030 | 4.6865 | 8 8071 | 1 8992 | 1.4898 | 70 8 | 0 |
| 1 17 | 1045 | 2.8969 | 8.1919 | .05816 | 1.8053 | 42.98 | 0 |
| 1 17 | 1100 | 4.4226 | 9.4155 | 6711 | 1.6464 | 42.62 | 0 |
| 1 17 | 1115 | 5.6529 | 10.796 | 1 7449 | 1 9238 | 62 85 | 0 |
| 1 17 | 1130 | 8.1494 | 11 1 | 4.9661 | 1 3869 | 32 53 | 0 |
| 1 17 | 1145 | 8.4424 | 12.787 | 4.8118 | 1.4787 | 33.43 | 0 |
| 1 17 | 1200 | 8.8921 | 12.48 | 6.0377 | 1.2617 | 36.89 | 0 |
| 1 17 | 1215 | 8.7064 | 12.628 | 4 0445 | 1.7359 | 33.91 | 0 |
| 1 17 | 1230 | 9.1158 | 13.623 | 5.1183 | 1.4652 | 31.21 | 0 |
| 1 17 | 1245 | 10 76 | 14.317 | 5.5768 | 1.4496 | 32.45 | 0 |
| 1 17 | 1300 | 10.223 | 14.471 | 6.9571 | 1.293 | 40 57 | 0 |
| 1 17 | 1315 | 9.7981 | 14.013 | 5 7312 | 1.6509 | 31 87 | 0 |
| 1 17 | 1330 | 10.342 | 14.78 | 6 0377 | 1 7628 | 30.53 | 0 |
| 1 17 | 1345 | 8.6706 | 12 939 | 4 351 | 1.7314 | 30 09 | 0 |
| 1 17 | 1400 | 9.7667 | 13.706 | 4.8118 | 1.9909 | 349.4 | 0 |
| 1 17 | 1415 | 10.411 | 14.473 | 6 0399 | 1.4048 | 343.5 | 0 |
| 1 17 | 1430 | 9.1091 | 12.941 | 5 1183 | 1.5368 | 351 3 | 0 |
| 1 17 | 1445 | 10 885 | 15 397 | 6 0399 | 1.6464 | 343.7 | 0 |
| 1 17 | 1500 | 10.892 | 14.174 | 7 4201 | 1.1789 | 351.1 | 0 |
| 1 17 | 1515 | 9.9278 | 12.791 | 6 1965 | 1 3914 | 353.9 | 0 |
| 1 17 | 1530 | 9.1829 | 12.8 | 5 8923 | 1.425 | 357.7 | 0 |
| 1 17 | 1545 | 9.8316 | 12 65 | 7.1226 | 1.0805 | 352.9 | 0 |
| 1 17 | 1600 | 10.398 | 12 963 | 7.277 | 1.0581 | 355 | 0 |
| 1 17 | 1615 | 9.1516 | 12 04 | 6.3553 | 1 0559 | 351.2 | 0 |
| 1 17 | 1630 | 9.6952 | 12 811 | 6 8184 | 1.0335 | 350 1 | 0 |
| 1 17 | 1645 | 9 4894 | 12 35 | 6 5097 | 1 0648 | 342.3 | 0 |
| 1 17 | 1700 | 9 8764 | 11 89 | 7 8944 | .82993 | 339.2 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 1 18 | 700 | 3.6642 | 4.984 | 1.595 | 75834 | 174.6 | 0 |
| 1 18 | 715 | 2 5524 | 3 5971 | 1 2863 | 47424 | 155 4 | 0 |
| 1 18 | 730 | 1.0536 | 2.3645 | .05592 | .66663 | 143.7 | 0 |
| 1 18 | 745 | .84335 | 3.5971 | - 71584 | .84559 | 277.4 | 0 |
| 1 18 | 800 | 2 4137 | 4.0602 | 1.4406 | 45411 | 14 57 | 0 |
| 1 18 | 815 | 1.5122 | 1.9037 | 97981 | .1812 | 35.01 | 0 |
| 1 18 | 830 | .9127 | 3 2906 | 05592 | 97533 | 67.21 | 0 |
| 1 18 | 845 | 1.2796 | 3.2906 | - 82098 | 97533 | 13.37 | 0 |
| 1 18 | 900 | 1.5659 | 2.2102 | 05592 | .32436 | 357 2 | 0 |
| 1 18 | 915 | 1.6509 | 2 5189 | 6711 | .33108 | 328 6 | 0 |
| 1 18 | 930 | 2.0111 | 3.4427 | 82545 | .72255 | 1.063 | 0 |
| 1 18 | 945 | 3.0222 | 4.8297 | 97981 | .91046 | 357.6 | 0 |
| 1 18 | 1000 | 4.134 | 5.5992 | 2 3645 | .6532 | 334 6 | 0 |
| 1 18 | 1015 | 3.0669 | 5.2905 | 1.4406 | .75387 | 323 3 | 0 |
| 1 18 | 1030 | 1 9686 | 3.5971 | 05592 | .79861 | 317.6 | 0 |
| 1 18 | 1045 | 2.1229 | 4.0579 | 05592 | .99546 | 300.5 | 01 |
| 1 18 | 1100 | 2.1274 | 4 8275 | .6711 | 96415 | 294 | 0 |
| 1 18 | 1115 | 2.5524 | 4.3644 | 21028 | .95296 | 277 7 | 0 |
| 1 18 | 1130 | 3.4137 | 5.4404 | 1 9015 | 68452 | 196.3 | 0 |
| 1 18 | 1145 | 5.2525 | 8.6706 | 2.3623 | 1.199 | 187 5 | 01 |
| 1 18 | 1200 | 4.9818 | 7.5924 | 1.7471 | 1.3713 | 198 1 | 0 |
| 1 18 | 1215 | 5 3375 | 8.6706 | 1.7471 | 1.2572 | 193.6 | 0 |
| 1 18 | 1230 | 2.9327 | 6.0556 | 6711 | 1.0939 | 155.5 | 0 |
| 1 18 | 1245 | 3.6776 | 6.0533 | .82545 | 1 1118 | 87 5 | 01 |
| 1 18 | 1300 | 5.078 | 6.6685 | 3.2862 | .69123 | 20.83 | .02 |
| 1 18 | 1315 | 3.4316 | 5.2838 | 1.4406 | .86572 | 13.25 | 02 |
| 1 18 | 1330 | 4.8901 | 6.8229 | 2.0558 | .91046 | 36.52 | 0 |
| 1 18 | 1345 | 5.7648 | 8.8205 | 2.2079 | 1.369 | 38.85 | 0 |
| 1 18 | 1400 | 6.6528 | 8.8205 | 3.747 | .89927 | 49.07 | 0 |
| 1 18 | 1415 | 4.9527 | 7.7445 | 1 7471 | 1.2281 | 53.19 | 0 |
| 1 18 | 1430 | 3.6911 | 6.0533 | 1 9015 | .8523 | 70.2 | 0 |
| 1 18 | 1445 | 3.0692 | 4.6709 | 1 5927 | 71808 | 55.2 | 0 |
| 1 18 | 1500 | 4 4069 | 6 362 | 2.8253 | .81203 | 24 23 | 0 |
| 1 18 | 1515 | 2.8745 | 5.4382 | 1.4406 | 72926 | 20 36 | 0 |
| 1 18 | 1530 | 1.9641 | 3.2862 | .6711 | .4899 | 14.46 | 0 |
| 1 18 | 1545 | 1.6755 | 2 5166 | 36239 | 38029 | 56 62 | 0 |
| 1 18 | 1600 | 2.445 | 4 5165 | 21028 | .92388 | 48.41 | 0 |
| 1 18 | 1615 | 3.3622 | 4.5165 | 1.595 | 56372 | 31 71 | 0 |
| 1 18 | 1630 | 4.0602 | 5 5947 | 2 0558 | .58386 | 33 45 | 0 |
| 1 18 | 1645 | 3.2414 | 5.2883 | 1 595 | 74492 | 39 79 | 0 |
| 1 18 | 1700 | 1.9686 | 3 134 | 82545 | 55925 | 78 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 1 19 | 700 | 8.7154 | 11.453 | 5 6015 | 1 0492 | 346.8 | 0 |
| 1 19 | 715 | 9 6057 | 12 686 | 7 1405 | 1.0134 | 353 9 | 0 |
| 1 19 | 730 | 7 9369 | 10.684 | 4 6753 | .93283 | 2 277 | 0 |
| 1 19 | 745 | 6 9794 | 8.9883 | 4.0602 | .83887 | 351.6 | 0 |
| 1 19 | 800 | 7 2904 | 9.9144 | 5 1384 | 91717 | 345.3 | 0 |
| 1 19 | 815 | 6.9437 | 10 067 | 4.8297 | 92388 | 343 4 | 0 |
| 1 19 | 830 | 7.7602 | 9.4513 | 5 7536 | 77848 | 341.1 | 0 |
| 1 19 | 845 | 6 7982 | 8 5274 | 4.8297 | .70689 | 346.1 | 0 |
| 1 19 | 900 | 8.4805 | 10.53 | 5.9079 | .86796 | 351 7 | 0 |
| 1 19 | 915 | 7.4313 | 9.76 | 5.1384 | 1.0246 | 352 | 0 |
| 1 19 | 930 | 7 0242 | 8.5274 | 4.8297 | .74045 | 350 2 | 0 |
| 1 19 | 945 | 8 1382 | 10.53 | 5 4471 | .90598 | 344.2 | 0 |
| 1 19 | 1000 | 8.8115 | 11.297 | 6 3687 | .9977 | 344.7 | 0 |
| 1 19 | 1015 | 8.5498 | 11 76 | 5 7536 | 1.0715 | 348 | 0 |
| 1 19 | 1030 | 9.4222 | 13.147 | 6.5231 | 1.1565 | 353 3 | 0 |
| 1 19 | 1045 | 11.433 | 14.992 | 7.447 | 1 3198 | 350.8 | 0 |
| 1 19 | 1100 | 12.29 | 15 299 | 8.6773 | 1.2505 | 351.5 | 0 |
| 1 19 | 1115 | 9.8227 | 14.068 | 6.5209 | 1.3646 | 349.6 | 0 |
| 1 19 | 1130 | 9.892 | 13.603 | 6.8296 | 1.3512 | 355.4 | 0 |
| 1 19 | 1145 | 9 7891 | 12.064 | 6.5209 | .93283 | 357 1 | 0 |
| 1 19 | 1200 | 10.219 | 12 525 | 6 8273 | 1.1946 | 3.432 | 0 |
| 1 19 | 1215 | 10.478 | 12.831 | 7.136 | 1.0917 | 3.535 | 0 |
| 1 19 | 1230 | 9.7421 | 11.908 | 6.3665 | 1.1453 | 2.691 | 0 |
| 1 19 | 1245 | 9.212 | 10.984 | 6.5186 | 86572 | 4.332 | 0 |
| 1 19 | 1300 | 8 1472 | 9.9054 | 6.0578 | .78071 | 359.6 | 0 |
| 1 19 | 1315 | 8.004 | 9 4424 | 5 9034 | .63754 | 13.23 | 0 |
| 1 19 | 1330 | 8.4245 | 10.518 | 5 7491 | .7919 | 17.41 | 0 |
| 1 19 | 1345 | 9.2232 | 11 597 | 6.5186 | .8344 | 12.61 | 0 |
| 1 19 | 1400 | 7.6058 | 10.055 | 5 1339 | .94625 | 14.35 | 0 |
| 1 19 | 1415 | 8.1874 | 9.7489 | 5.5947 | .76058 | 355 9 | 0 |
| 1 19 | 1430 | 7.9212 | 9.7489 | 5.4404 | .79637 | 351.9 | 0 |
| 1 19 | 1445 | 8 91 | 10.364 | 6.3643 | .86348 | 2.37 | 0 |
| 1 19 | 1500 | 8.6997 | 10.67 | 6.362 | .96638 | 15.28 | 0 |
| 1 19 | 1515 | 9 4222 | 11.288 | 6 3643 | 99994 | 11.26 | 0 |
| 1 19 | 1530 | 9.3618 | 11.594 | 6.5186 | .92388 | 9.65 | 0 |
| 1 19 | 1545 | 9.6795 | 11 442 | 6.9794 | .92388 | 7.69 | 0 |
| 1 19 | 1600 | 10.145 | 13.292 | 7.4425 | .97757 | 2.252 | 0 |
| 1 19 | 1615 | 10.901 | 13.292 | 7 7512 | 1.1118 | 355.2 | 0 |
| 1 19 | 1630 | 13.418 | 17.449 | 9.7511 | 1.246 | 346.7 | 0 |
| 1 19 | 1645 | 13 328 | 17.135 | 10.366 | 1.1901 | 347.2 | 0 |
| 1 19 | 1700 | 12.988 | 16.218 | 8 5207 | 1 4652 | 354 2 | 0 |

NOTE Precip gauge inoperable until 1630.

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 1 20 | 700 | 7.2278 | 9.4536 | 5 6015 | .97309 | 206 2 | 0 |
| 1 20 | 715 | 5.5657 | 6.834 | 4.5232 | .55701 | 191.9 | 0 |
| 1 20 | 730 | 5 4583 | 6 6797 | 4.3689 | 59728 | 210.4 | 0 |
| 1 20 | 745 | 5.257 | 7.1427 | 3.5993 | 1 0782 | 255 | 0 |
| 1 20 | 800 | 5.7469 | 8.221 | 3.5993 | 95967 | 277.8 | 0 |
| 1 20 | 815 | 4.3197 | 5.2927 | 3.445 | .29081 | 241 2 | 0 |
| 1 20 | 830 | 1.3042 | 4 0602 | 05592 | 1.3377 | 226.8 | 0 |
| 1 20 | 845 | 1.7583 | 6.0623 | -.66663 | 1 2706 | 5.086 | 0 |
| 1 20 | 900 | .41161 | 1.2863 | -.66663 | 41832 | 174 2 | 0 |
| 1 20 | 915 | 2.5658 | 4 0579 | -.40713 | .8165 | 200.9 | 0 |
| 1 20 | 930 | 2.7336 | 3.7492 | 1.595 | .47201 | 187.9 | 0 |
| 1 20 | 945 | 2.3735 | 3.9036 | .82545 | 74716 | 175.2 | 0 |
| 1 20 | 1000 | 2.2057 | 4.5165 | .21028 | .9373 | 188.4 | 0 |
| 1 20 | 1015 | 5.6395 | 7.7445 | 2.8231 | 1.1565 | 233.3 | 0 |
| 1 20 | 1030 | 6 6439 | 7.4358 | 5 7446 | 34673 | 222.3 | 0 |
| 1 20 | 1045 | 6.0735 | 6.6663 | 5.588 | .20804 | 200 | 0 |
| 1 20 | 1100 | 7.3664 | 8.1986 | 5.7424 | 43174 | 193.1 | 0 |
| 1 20 | 1115 | 8.7847 | 9.8853 | 6.8139 | .64426 | 199.8 | 0 |
| 1 20 | 1130 | 8.0018 | 9.5766 | 6.3508 | .75387 | 191 9 | 0 |
| 1 20 | 1145 | 8 0666 | 9.2657 | 6.3508 | 54806 | 197.4 | 0 |
| 1 20 | 1200 | 8.5476 | 9.7242 | 7.1159 | .45635 | 202.8 | 0 |
| 1 20 | 1215 | 7.8206 | 8.957 | 6 3464 | .47872 | 192.9 | 0 |
| 1 20 | 1230 | 7.0309 | 9.1068 | 5.1205 | 72479 | 165.2 | 0 |
| 1 20 | 1245 | 7.8877 | 11 25 | 4.9661 | 1.3512 | 173.2 | 0 |
| 1 20 | 1300 | 9.3171 | 10 485 | 7.5722 | .54806 | 185.8 | 0 |
| 1 20 | 1315 | 8.5274 | 10.791 | 6.0377 | 1.038 | 186.7 | 0 |
| 1 20 | 1330 | 8.0129 | 9 5632 | 6.1898 | .52569 | 176.8 | 0 |
| 1 20 | 1345 | 8 8921 | 10.328 | 5.729 | .71137 | 185.8 | 0 |
| 1 20 | 1400 | 9.939 | 12.017 | 7 8765 | 81203 | 192.7 | 0 |
| 1 20 | 1415 | 10.8 | 12.015 | 9.8696 | .45187 | 190.9 | 0 |
| 1 20 | 1430 | 9.8473 | 11 25 | 8.183 | .56372 | 194.6 | 0 |
| 1 20 | 1445 | 10.462 | 12.015 | 8.0308 | 67557 | 197.7 | 0 |
| 1 20 | 1500 | 8.8921 | 10.863 | 7.1114 | .774 | 187.9 | 0 |
| 1 20 | 1515 | 7.1204 | 9.7175 | 3.4316 | 1.2348 | 174.9 | 0 |
| 1 20 | 1530 | 5.4046 | 8.6438 | .97757 | 1.5883 | 176 7 | 0 |
| 1 20 | 1545 | 2.7068 | 6 4985 | .05816 | 1.4876 | 192.8 | 0 |
| 1 20 | 1600 | 2.6643 | 6.3441 | 05816 | 1.5368 | 266.7 | 0 |
| 1 20 | 1615 | 6.5276 | 13.397 | 3.2772 | 2.0401 | 293.7 | 0 |
| 1 20 | 1630 | 11.044 | 15.704 | 6.4985 | 1.8567 | 311.5 | 0 |
| 1 20 | 1645 | 12.89 | 15.86 | 9.8719 | 1.0715 | 312.1 | 0 |
| 1 20 | 1700 | 14.424 | 18.612 | 10.026 | 1.6979 | 313.7 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 1 21 | 700 | 16.576 | 26 352 | 5.899 | 4.6888 | 295 7 | 0 |
| 1 21 | 715 | 10 899 | 22 034 | 2 8231 | 4.8073 | 282 9 | 0 |
| 1 21 | 730 | 9 4312 | 18.053 | 3 747 | 2.3914 | 271.4 | 0 |
| 1 21 | 745 | 6.5209 | 14.355 | 1 2863 | 2.7806 | 261.9 | 0 |
| 1 21 | 800 | 8.8764 | 16.352 | 4 6686 | 2.3019 | 267 4 | 0 |
| 1 21 | 815 | 11.453 | 17.739 | 5 7446 | 2.3175 | 285.4 | 0 |
| 1 21 | 830 | 13.829 | 23.108 | 6.0511 | 3.5188 | 271 6 | 0 |
| 1 21 | 845 | 16.912 | 24 025 | 9.7399 | 3.2437 | 262 4 | 0 |
| 1 21 | 900 | 11.576 | 22 952 | 3.7447 | 4.8811 | 275.3 | 0 |
| 1 21 | 915 | 7.2568 | 13.422 | 3.5904 | 1.9842 | 279 | 0 |
| 1 21 | 930 | 5.6551 | 12.5 | 2.5144 | 1.7739 | 279.7 | 0 |
| 1 21 | 945 | 3.8096 | 9.1135 | 82545 | 1.7314 | 276.1 | 0 |
| 1 21 | 1000 | 3.6888 | 8.1897 | 1 4384 | 1.501 | 272 6 | 0 |
| 1 21 | 1015 | 11.621 | 22.594 | 2.5122 | 4.5344 | 299 3 | 0 |
| 1 21 | 1030 | 14.111 | 21.363 | 7.57 | 2.9282 | 304.5 | 0 |
| 1 21 | 1045 | 15.1 | 21.363 | 7.107 | 2.5301 | 306.6 | 0 |
| 1 21 | 1100 | 16.352 | 22.728 | 11.243 | 1.9954 | 300 1 | 0 |
| 1 21 | 1115 | 14.936 | 24 875 | 8.4849 | 2.9305 | 286 6 | 0 |
| 1 21 | 1130 | 17.046 | 27.627 | 9 7108 | 3.4472 | 278 3 | 0 |
| 1 21 | 1145 | 20.759 | 29.64 | 13.386 | 3 1117 | 286 1 | 0 |
| 1 21 | 1200 | 20.558 | 31.475 | 12.01 | 3.8745 | 279 1 | 0 |
| 1 21 | 1215 | 24.137 | 34 987 | 14 614 | 3.4114 | 284.5 | 0 |
| 1 21 | 1230 | 21.207 | 30.088 | 11.091 | 4.0199 | 294.5 | 0 |
| 1 21 | 1245 | 19.797 | 26.262 | 11.704 | 2.8678 | 300.1 | 0 |
| 1 21 | 1300 | 21.095 | 30.871 | 12.165 | 4.0266 | 306 3 | 0 |
| 1 21 | 1315 | 24.898 | 34.226 | 16.151 | 3 3152 | 302 7 | 0 |
| 1 21 | 1330 | 24.16 | 32.862 | 15.23 | 3.6911 | 301 3 | 0 |
| 1 21 | 1345 | 22.102 | 32.392 | 13.849 | 3 6239 | 297.8 | 0 |
| 1 21 | 1400 | 19.708 | 26.262 | 13.239 | 2.3153 | 299 8 | 0 |
| 1 21 | 1415 | 18.925 | 26.576 | 12.78 | 2.7291 | 305 8 | 0 |
| 1 21 | 1430 | 18.836 | 28.41 | 11.4 | 2.6195 | 301.3 | 0 |
| 1 21 | 1445 | 18.746 | 24.898 | 12.167 | 2.2817 | 296.8 | 0 |
| 1 21 | 1500 | 19.507 | 27.045 | 12.78 | 2.5345 | 295.2 | 0 |
| 1 21 | 1515 | 22.437 | 32.392 | 13.545 | 3.7067 | 290 8 | 0 |
| 1 21 | 1530 | 27.649 | 42.056 | 16.778 | 4.7961 | 293.7 | 0 |
| 1 21 | 1545 | 25.904 | 36.083 | 14.775 | 4 1675 | 301 3 | 0 |
| 1 21 | 1600 | 29.215 | 39.148 | 19.529 | 3.7671 | 302 9 | 0 |
| 1 21 | 1615 | 24.898 | 35.166 | 14.932 | 4.0311 | 305.2 | 0 |
| 1 21 | 1630 | 26.844 | 37 626 | 15.86 | 3.5233 | 296.9 | 0 |
| 1 21 | 1645 | 26.262 | 36.262 | 16.151 | 3 7649 | 302 5 | 0 |
| 1 21 | 1700 | 20.536 | 34 405 | 11 257 | 3 8454 | 311 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 1 22 | 700 | 3.8521 | 7 277 | 2 0536 | 1.1811 | 174 7 | 0 |
| 1 22 | 715 | 8.4536 | 10.505 | 4 3577 | 1.0268 | 151.6 | 0 |
| 1 22 | 730 | 6 0578 | 9 4312 | 2.2079 | 1.4876 | 217 7 | 0 |
| 1 22 | 745 | 4.0423 | 10.353 | .21028 | 2.4853 | 258 2 | 0 |
| 1 22 | 800 | 4 6888 | 10 044 | 1.7471 | 2.331 | 294.1 | 0 |
| 1 22 | 815 | 3 8521 | 9.2746 | 1.1319 | 2 1878 | 294.9 | 0 |
| 1 22 | 830 | 3.1833 | 8 353 | 21028 | 2.1431 | 3.373 | 0 |
| 1 22 | 845 | 5.0489 | 9 5811 | - 27739 | 2.3645 | 94.1 | 0 |
| 1 22 | 900 | 7.6528 | 13.415 | 2.6687 | 2.7023 | 304 7 | 0 |
| 1 22 | 915 | 6.8229 | 13 259 | 97757 | 2 5233 | 275 6 | 0 |
| 1 22 | 930 | 9.1314 | 10 8 | 6.8117 | .75834 | 217 3 | 0 |
| 1 22 | 945 | 4.0892 | 9.9502 | 05816 | 2.3265 | 353.6 | 0 |
| 1 22 | 1000 | 4.9281 | 12.626 | 05816 | 3 181 | 333 3 | 0 |
| 1 22 | 1015 | 4.9729 | 13.08 | 97757 | 2.6732 | 275 3 | 0 |
| 1 22 | 1030 | 4.7178 | 7.8675 | 2 3556 | 1.2192 | 318.1 | 0 |
| 1 22 | 1045 | 4 257 | 6 031 | 1.7426 | 1.1767 | 317.7 | 0 |
| 1 22 | 1100 | 4.4047 | 6.4895 | 2.5077 | 1.1498 | 322 2 | 0 |
| 1 22 | 1115 | 2.7851 | 7.5611 | .21251 | 1.5212 | 252 2 | 0 |
| 1 22 | 1130 | 1.5435 | 2.5077 | .21251 | .44293 | 216 3 | 0 |
| 1 22 | 1145 | 1 8701 | 4.1899 | -.09172 | 1.0917 | 325 6 | 0 |
| 1 22 | 1200 | 4.2816 | 6.7893 | 2.0469 | 1.1834 | 260 1 | 0 |
| 1 22 | 1215 | 3.1721 | 5 4113 | .21251 | 1.2684 | 181.6 | 0 |
| 1 22 | 1230 | 4.9952 | 11.677 | 21251 | 3.0557 | 132.3 | 0 |
| 1 22 | 1245 | 5 0198 | 10 147 | .21251 | 2.2728 | 158.2 | 0 |
| 1 22 | 1300 | 5.38 | 8 1606 | 2.964 | 1.2661 | 164 3 | 0 |
| 1 22 | 1315 | 7.1517 | 11 981 | 1 1297 | 2 8209 | 173 5 | 0 |
| 1 22 | 1330 | 6.6282 | 9.9972 | 0604 | 1 8679 | 163.4 | 0 |
| 1 22 | 1345 | 7 4336 | 12 292 | 4.0356 | 2 1453 | 197 7 | 0 |
| 1 22 | 1400 | 5 8117 | 8.9301 | 1.8947 | 1 17 | 238.8 | 0 |
| 1 22 | 1415 | 4 0356 | 8.9301 | 1.5883 | 1.7583 | 235.3 | 0 |
| 1 22 | 1430 | 2.3242 | 6.0265 | 21251 | 1.3981 | 251 9 | 0 |
| 1 22 | 1445 | 3 1161 | 7.7109 | 21251 | 1.8992 | 349 3 | 0 |
| 1 22 | 1500 | 2.2191 | 5 1093 | 21251 | 1 114 | 100 4 | 0 |
| 1 22 | 1515 | 2 6016 | 4 8051 | 21251 | 1.0961 | 119 | 0 |
| 1 22 | 1530 | 8 174 | 13.99 | 2.662 | 3 0267 | 3.088 | 0 |
| 1 22 | 1545 | 7.0488 | 17.046 | 1.897 | 2.8589 | 270.9 | 0 |
| 1 22 | 1600 | 12.699 | 20.111 | 6.031 | 3.398 | 290 3 | 0 |
| 1 22 | 1615 | 16 599 | 23 802 | 12 002 | 2.0894 | 298 8 | 0 |
| 1 22 | 1630 | 17 024 | 29 305 | 8.174 | 4 2883 | 289.2 | 0 |
| 1 22 | 1645 | 16.218 | 32.369 | 5 1138 | 4.1608 | 281 | 0 |
| 1 22 | 1700 | 14 599 | 33 913 | 4 8073 | 3 9573 | 279 5 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 1 23 | 700 | 37.201 | 52.637 | 21 117 | 5 3576 | 274.1 | 0 |
| 1 23 | 715 | 36.374 | 54.024 | 20 804 | 6 107 | 275 | 0 |
| 1 23 | 730 | 37 157 | 56.932 | 22 504 | 5.5634 | 275 | 0 |
| 1 23 | 745 | 33.891 | 49.706 | 20 044 | 5.6842 | 278 7 | 0 |
| 1 23 | 800 | 33.04 | 50 333 | 19 126 | 5.465 | 277 | 0 |
| 1 23 | 815 | 30.58 | 44 941 | 18 813 | 4.9729 | 279.9 | 0 |
| 1 23 | 830 | 32.459 | 48.789 | 17 739 | 5 286 | 274.3 | 0 |
| 1 23 | 845 | 31.631 | 45.098 | 18.5 | 5.1406 | 275.8 | 0 |
| 1 23 | 900 | 34.338 | 50.176 | 18.5 | 5 8721 | 275 | 0 |
| 1 23 | 915 | 32.258 | 47.693 | 20.491 | 4.5031 | 281.1 | 0 |
| 1 23 | 930 | 32.034 | 42.794 | 20.2 | 4.2973 | 275.4 | 0 |
| 1 23 | 945 | 34.383 | 47.089 | 19.73 | 4.9505 | 274.4 | 0 |
| 1 23 | 1000 | 31.05 | 45.814 | 19.73 | 5 0556 | 274.2 | 0 |
| 1 23 | 1015 | 28.678 | 45.836 | 17.717 | 4.2816 | 286 | 0 |
| 1 23 | 1030 | 27.135 | 39 55 | 15.726 | 4.4874 | 294.9 | 0 |
| 1 23 | 1045 | 24.853 | 36 15 | 15.417 | 4.1206 | 295.2 | 0 |
| 1 23 | 1100 | 22.325 | 31.542 | 14 033 | 3 2414 | 298 3 | 0 |
| 1 23 | 1115 | 19.641 | 27.537 | 13 263 | 2.794 | 298.9 | 0 |
| 1 23 | 1130 | 16.397 | 25.547 | 9.118 | 3.1698 | 308 2 | 0 |
| 1 23 | 1145 | 14.86 | 22.169 | 6 6573 | 2.841 | 317 5 | 0 |
| 1 23 | 1200 | 14.527 | 28.455 | 7.7333 | 3.9416 | 305.6 | 0 |
| 1 23 | 1215 | 11.556 | 21 855 | 6.0444 | 2.8231 | 289.8 | 0 |
| 1 23 | 1230 | 13.818 | 20.021 | 7.7311 | 2 4204 | 283.8 | 0 |
| 1 23 | 1245 | 18.12 | 35.031 | 4 6597 | 6.7602 | 279.4 | 0 |
| 1 23 | 1300 | 17.829 | 30.132 | 9 2634 | 4.2346 | 273.2 | 0 |
| 1 23 | 1315 | 17.314 | 31.05 | 3 7403 | 4 6552 | 275.7 | 0 |
| 1 23 | 1330 | 18.455 | 35.501 | 8.6482 | 4.7849 | 295 2 | 0 |
| 1 23 | 1345 | 20.424 | 33.801 | 12.637 | 4.0691 | 288.4 | 0 |
| 1 23 | 1400 | 18 634 | 35.501 | 9 2634 | 4.7245 | 290 2 | 0 |
| 1 23 | 1415 | 12.97 | 23 846 | 4.6597 | 4.0579 | 292.3 | 0 |
| 1 23 | 1430 | 15 23 | 25 681 | 7 7311 | 3 6821 | 276 2 | 0 |
| 1 23 | 1445 | 13.937 | 26.151 | 4.6597 | 4.2324 | 242.1 | 0 |
| 1 23 | 1500 | 14.265 | 21.699 | 7.4246 | 3.105 | 265.2 | 0 |
| 1 23 | 1515 | 12.187 | 20 938 | 4 5076 | 3.266 | 255.3 | 0 |
| 1 23 | 1530 | 14.431 | 24 316 | 6 6573 | 3.9461 | 246 3 | 0 |
| 1 23 | 1545 | 13.921 | 24.92 | 6.503 | 3.8879 | 255 | 0 |
| 1 23 | 1600 | 12.646 | 25 547 | 4.049 | 4 2011 | 249 4 | 0 |
| 1 23 | 1615 | 6.8027 | 15.726 | 2.2057 | 2.7247 | 262.8 | 0 |
| 1 23 | 1630 | 8 9502 | 15.102 | 2.5122 | 3.1698 | 262.1 | 0 |
| 1 23 | 1645 | 6 2323 | 15.565 | 2 5144 | 2.6576 | 287 | 0 |
| 1 23 | 1700 | 10.896 | 19 395 | 6 3508 | 2 4339 | 250 8 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 1 24 | 700 | 20 603 | 35.479 | 9.2947 | 5.0355 | 316 5 | 0 |
| 1 24 | 715 | 17.963 | 33.466 | 9.4491 | 4.9796 | 301.9 | 0 |
| 1 24 | 730 | 18.567 | 30.848 | 10.067 | 4.1004 | 306.6 | 0 |
| 1 24 | 745 | 16.643 | 24.853 | 8.6796 | 2.5144 | 305.9 | 0 |
| 1 24 | 800 | 13.72 | 23.466 | 5.7536 | 3.9259 | 314 | 0 |
| 1 24 | 815 | 11.174 | 22.079 | 6.3687 | 2.5726 | 317.6 | 0 |
| 1 24 | 830 | 19.305 | 29.461 | 11 145 | 3.7291 | 303.8 | 0 |
| 1 24 | 845 | 20.737 | 30.557 | 12.223 | 3.3823 | 297.7 | 0 |
| 1 24 | 900 | 22.862 | 32.548 | 12.836 | 3 4897 | 295 7 | 0 |
| 1 24 | 915 | 24.294 | 33.622 | 14 684 | 3 445 | 298 6 | 0 |
| 1 24 | 930 | 18.903 | 28.544 | 10.986 | 3.2973 | 304.6 | 0 |
| 1 24 | 945 | 17.605 | 29.774 | 7.5991 | 4 1698 | 303.2 | 0 |
| 1 24 | 1000 | 14.612 | 28.231 | 8.0577 | 3.5501 | 299.5 | 0 |
| 1 24 | 1015 | 8.5431 | 16.062 | 4.0557 | 2 5994 | 315.5 | 0 |
| 1 24 | 1030 | 6.0824 | 14.209 | .21028 | 3.2794 | 315.9 | 0 |
| 1 24 | 1045 | 4.3375 | 10.518 | .21028 | 2.1274 | 5.85 | 0 |
| 1 24 | 1100 | 6 0265 | 12 816 | 1.5927 | 2.2616 | 306 3 | 0 |
| 1 24 | 1115 | 8 1114 | 18.5 | 1.5927 | 3.9573 | 282.3 | 0 |
| 1 24 | 1130 | 11.178 | 21.878 | 4.6664 | 3.4181 | 300 | 0 |
| 1 24 | 1145 | 17.225 | 33 085 | 6 0466 | 5.4851 | 303 | 0 |
| 1 24 | 1200 | 15.306 | 36.62 | 21028 | 6 1361 | 318 2 | 0 |
| 1 24 | 1215 | 20.469 | 35.367 | 9.2724 | 5.1473 | 320.4 | 0 |
| 1 24 | 1230 | 19.037 | 34.763 | 9.2679 | 4.351 | 309 7 | 0 |
| 1 24 | 1245 | 16.509 | 25.054 | 7.8787 | 3.4338 | 319.9 | 0 |
| 1 24 | 1300 | 20.871 | 36.866 | 10.943 | 4.2212 | 307 3 | 0 |
| 1 24 | 1315 | 19.015 | 33.958 | 8.957 | 5.3643 | 307.9 | 0 |
| 1 24 | 1330 | 18.791 | 34.741 | 6.1965 | 5.4225 | 318 6 | 0 |
| 1 24 | 1345 | 24.406 | 35.993 | 13.72 | 4.3532 | 308.4 | 0 |
| 1 24 | 1400 | 24.696 | 46.127 | 5 5858 | 5.4918 | 290.8 | 0 |
| 1 24 | 1415 | 25.166 | 41 362 | 15.726 | 4.427 | 291.4 | 0 |
| 1 24 | 1430 | 23.198 | 38 924 | 10.964 | 5.2234 | 288 4 | 0 |
| 1 24 | 1445 | 26.173 | 39 237 | 15.268 | 4.8319 | 296.4 | 0 |
| 1 24 | 1500 | 23.198 | 40.311 | 12.35 | 4.8565 | 300.9 | 0 |
| 1 24 | 1515 | 24.45 | 44.002 | 12.35 | 4.8252 | 300 9 | 0 |
| 1 24 | 1530 | 31.475 | 45.098 | 18.813 | 4.7626 | 289.8 | 0 |
| 1 24 | 1545 | 30.356 | 43.398 | 18.03 | 5.2659 | 285.7 | 0 |
| 1 24 | 1600 | 24.764 | 40.49 | 10.201 | 6.3039 | 294.8 | 0 |
| 1 24 | 1615 | 20.871 | 43.577 | 9.5878 | 5.7155 | 295.9 | 0 |
| 1 24 | 1630 | 19 171 | 30.2 | 9.59 | 4.172 | 310 5 | 0 |
| 1 24 | 1645 | 20.469 | 29.439 | 10.975 | 3.4226 | 313 8 | 0 |
| 1 24 | 1700 | 20.513 | 33 6 | 10 975 | 4 8767 | 314 2 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 1 25 | 700 | 37.157 | 53.934 | 21 296 | 5.8162 | 290 8 | 0 |
| 1 25 | 715 | 34.987 | 51 787 | 19.149 | 5.2905 | 288 3 | 0 |
| 1 25 | 730 | 35.613 | 58 386 | 19.596 | 6.6126 | 291 4 | 0 |
| 1 25 | 745 | 32.101 | 46.552 | 18.075 | 6.1048 | 288.4 | 0 |
| 1 25 | 800 | 32.996 | 49.93 | 18.075 | 6.3083 | 294 8 | 0 |
| 1 25 | 815 | 31.631 | 47.156 | 14 216 | 4.9527 | 296 2 | 0 |
| 1 25 | 830 | 30.289 | 46.216 | 18 522 | 5.4113 | 300.1 | 0 |
| 1 25 | 845 | 26.956 | 43 912 | 15.29 | 5.72 | 312.7 | 0 |
| 1 25 | 900 | 30.423 | 52 838 | 18.053 | 6 5522 | 306.3 | 0 |
| 1 25 | 915 | 34.763 | 53.733 | 19.283 | 5.5187 | 305.6 | 0 |
| 1 25 | 930 | 39.125 | 55.567 | 22.974 | 6.0511 | 299.3 | 0 |
| 1 25 | 945 | 36.754 | 52.637 | 23.444 | 5.1719 | 306 7 | 0 |
| 1 25 | 1000 | 34 763 | 51.719 | 21.274 | 5.8229 | 309.3 | 0 |
| 1 25 | 1015 | 32.772 | 53.084 | 13.894 | 5.6104 | 315 9 | 0 |
| 1 25 | 1030 | 31.788 | 48 946 | 14.507 | 6.0242 | 313.8 | 0 |
| 1 25 | 1045 | 29.081 | 49.393 | 13.274 | 6.5634 | 315.8 | 0 |
| 1 25 | 1100 | 29.842 | 55.232 | 13.89 | 7.608 | 308 9 | 0 |
| 1 25 | 1115 | 26.956 | 47.536 | 12.811 | 6.0377 | 302.3 | 0 |
| 1 25 | 1130 | 25.166 | 43.241 | 12.655 | 5.975 | 292.3 | 0 |
| 1 25 | 1145 | 14.552 | 32.481 | 4 6664 | 5.7357 | 301.5 | 0 |
| 1 25 | 1200 | 16.778 | 36.307 | 2 5144 | 7.3105 | 277.2 | 0 |
| 1 25 | 1215 | 19.238 | 38.767 | 9.2746 | 4.8856 | 267.3 | 0 |
| 1 25 | 1230 | 22.996 | 46.462 | 4.8185 | 7.579 | 285.2 | 0 |
| 1 25 | 1245 | 23.041 | 37.85 | 12 503 | 4.9706 | 273.8 | 0 |
| 1 25 | 1300 | 20.804 | 30.938 | 9.429 | 4 0042 | 269 5 | 0 |
| 1 25 | 1315 | 14 247 | 24.025 | 7.8921 | 2.9752 | 280 5 | 0 |
| 1 25 | 1330 | 13.912 | 27 873 | 6 0489 | 4.4024 | 254 | 0 |
| 1 25 | 1345 | 20.066 | 35 233 | 10.811 | 4.5143 | 274 | 0 |
| 1 25 | 1400 | 21.945 | 37.089 | 11.733 | 5.2838 | 281.9 | 0 |
| 1 25 | 1415 | 21.699 | 47.536 | 4.8185 | 7.3329 | 272.5 | 0 |
| 1 25 | 1430 | 23.645 | 39.998 | 11.27 | 4.8207 | 273.5 | 0 |
| 1 25 | 1445 | 19.999 | 37.85 | 9.4267 | 5.3666 | 267.1 | 0 |
| 1 25 | 1500 | 14.704 | 30.311 | 6 201 | 4 606 | 271 | 0 |
| 1 25 | 1515 | 11.391 | 28.007 | 2.2079 | 5 3979 | 274 6 | 0 |
| 1 25 | 1530 | 11.304 | 23 869 | 3 5904 | 4.2593 | 286 1 | 0 |
| 1 25 | 1545 | 13.08 | 26 173 | 5.5858 | 4.3711 | 290 | 0 |
| 1 25 | 1600 | 21.252 | 37 224 | 10 194 | 5 1809 | 277.1 | 0 |
| 1 25 | 1615 | 26.083 | 40 915 | 13.572 | 5.0109 | 277.1 | 0 |
| 1 25 | 1630 | 20 916 | 30 311 | 11.883 | 3.4383 | 275 8 | 0 |
| 1 25 | 1645 | 21.296 | 34 002 | 11.576 | 4 2928 | 282 9 | 0 |
| 1 25 | 1700 | 26.441 | 47 67 | 11 883 | 6 2882 | 262 7 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 1 26 | 700 | 10.749 | 18.813 | 2 2079 | 2.888 | 246 9 | 0 |
| 1 26 | 715 | 10.8 | 13.272 | 8 2008 | 1.1722 | 207.3 | 0 |
| 1 26 | 730 | 11.178 | 15 883 | 5 2816 | 2.8097 | 182 5 | 0 |
| 1 26 | 745 | 7.1696 | 16 509 | 21028 | 3.8544 | 216 | 0 |
| 1 26 | 800 | 6.0511 | 11.735 | .21028 | 2.7672 | 163.9 | 0 |
| 1 26 | 815 | 8.608 | 11.581 | 5.4359 | 1.3444 | 185 5 | 0 |
| 1 26 | 830 | 7.2971 | 10.505 | 5 4337 | 1.1856 | 203 | 0 |
| 1 26 | 845 | 3.823 | 7 2792 | 2.0536 | 1.3064 | 184.1 | 0 |
| 1 26 | 900 | 2.841 | 4.3577 | 21028 | 1 0827 | 187.5 | 0 |
| 1 26 | 915 | 5.9862 | 13.724 | .21028 | 4.1899 | 180.6 | 0 |
| 1 26 | 930 | 11.858 | 16 487 | 7.4268 | 1.9686 | 180 1 | 0 |
| 1 26 | 945 | 10.21 | 17.717 | 3 7403 | 3 2772 | 165 2 | 0 |
| 1 26 | 1000 | 3 6687 | 7.1159 | 97757 | 1.4473 | 164.6 | 0 |
| 1 26 | 1015 | 2.445 | 5.1183 | 05816 | 1.3333 | 203.8 | 0 |
| 1 26 | 1030 | 6.1406 | 8 7981 | 3.1251 | 1.331 | 132.9 | 0 |
| 1 26 | 1045 | 3.0065 | 6.3419 | 1.1319 | 1.0178 | 105 4 | 0 |
| 1 26 | 1100 | 7.579 | 11 395 | 2 2034 | 1.8187 | 126.2 | 0 |
| 1 26 | 1115 | 9.4021 | 13.23 | 5 2637 | 1.5905 | 114 8 | 0 |
| 1 26 | 1130 | 8.6617 | 14.451 | 4.4986 | 2 3466 | 86.6 | 0 |
| 1 26 | 1145 | 8.1158 | 12.919 | 4.1921 | 2.0133 | 76 | 0 |
| 1 26 | 1200 | 8.3619 | 13.071 | 4.1921 | 2.2146 | 77 7 | 0 |
| 1 26 | 1215 | 6.9504 | 11.386 | 3.4271 | 2 0155 | 79.4 | 0 |
| 1 26 | 1230 | 7.7534 | 10.928 | 3.7336 | 1 17 | 59.51 | 0 |
| 1 26 | 1245 | 9 7399 | 12.919 | 4.4986 | 1.3333 | 51.51 | 0 |
| 1 26 | 1300 | 10.261 | 13.684 | 4.3443 | 1 6464 | 64.91 | 0 |
| 1 26 | 1315 | 7.9615 | 14.142 | 2.662 | 2.5211 | 79 8 | 0 |
| 1 26 | 1330 | 6.2054 | 10 926 | 2.8142 | 1.8836 | 90 6 | 0 |
| 1 26 | 1345 | 6.2122 | 10.928 | 1.5905 | 2.3511 | 89 7 | 0 |
| 1 26 | 1400 | 9.4916 | 15.972 | 2.2012 | 2.9707 | 114 8 | 0 |
| 1 26 | 1415 | 8.306 | 13.836 | 2 9685 | 2 5435 | 125.3 | 0 |
| 1 26 | 1430 | 5.5142 | 10.928 | 1.8947 | 1.8455 | 133.5 | 0 |
| 1 26 | 1445 | 5 2346 | 7.8653 | 2.5077 | 1.161 | 151.4 | 0 |
| 1 26 | 1500 | 2.9372 | 8.1718 | 21251 | 2 0536 | 152.7 | 0 |
| 1 26 | 1515 | 2.6307 | 7.4067 | - 24831 | 2.275 | 23.64 | 0 |
| 1 26 | 1530 | 2 0223 | 4 9572 | - 24831 | 1.4787 | 153 5 | 0 |
| 1 26 | 1545 | 4.9102 | 10.008 | 1.284 | 1.9305 | 51.46 | 0 |
| 1 26 | 1600 | 4.257 | 9 5498 | 1 8947 | 1.5659 | 43 75 | 0 |
| 1 26 | 1615 | 4.1698 | 5.8766 | 82322 | .97981 | 55 46 | 0 |
| 1 26 | 1630 | 4 3375 | 6.9481 | 1 5905 | 1.3243 | 17 4 | 0 |
| 1 26 | 1645 | 5.6708 | 7.2546 | 3 4271 | .77848 | 358 6 | 0 |
| 1 26 | 1700 | 4 3912 | 6 1853 | 1 7426 | .98204 | 2.761 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 1 27 | 700 | 16.688 | 31.184 | 7 1427 | 4.3174 | 316 | 0 |
| 1 27 | 715 | 14 218 | 23 936 | 4.984 | 3 5837 | 327 5 | 0 |
| 1 27 | 730 | 13 426 | 23.466 | 5.2927 | 3 7693 | 327 8 | 0 |
| 1 27 | 745 | 14 449 | 26.866 | 5.4471 | 4.0579 | 319 3 | 0 |
| 1 27 | 800 | 16.218 | 32.258 | 8.8362 | 4.1429 | 309.9 | 0 |
| 1 27 | 815 | 15.726 | 30 871 | 6.0623 | 4.5366 | 305 8 | 0 |
| 1 27 | 830 | 14 272 | 33.644 | 5.1384 | 5 3308 | 312 5 | 0 |
| 1 27 | 845 | 14.755 | 30.401 | 4.6753 | 4.3868 | 314.4 | 0 |
| 1 27 | 900 | 12 458 | 26.553 | 5 2905 | 4.1944 | 307.7 | 0 |
| 1 27 | 915 | 11.518 | 23.31 | 5.2905 | 2.841 | 306 2 | 0 |
| 1 27 | 930 | 13.225 | 25 77 | 3 9036 | 4.0825 | 321 | 0 |
| 1 27 | 945 | 15.216 | 30.378 | 6.673 | 4 2011 | 302 5 | 0 |
| 1 27 | 1000 | 13 728 | 26.531 | 6.2099 | 3.3913 | 306.3 | 0 |
| 1 27 | 1015 | 12.04 | 24.987 | 3 4405 | 4.4583 | 310 1 | 0 |
| 1 27 | 1030 | 16.039 | 27 895 | 3 9013 | 4.8744 | 309 5 | 0 |
| 1 27 | 1045 | 20.536 | 37.895 | 8.6684 | 5.6193 | 306 8 | 0 |
| 1 27 | 1100 | 19.44 | 31 273 | 9 4357 | 4.2973 | 318 7 | 0 |
| 1 27 | 1115 | 23 779 | 35.121 | 12.818 | 5.0019 | 317 3 | 0 |
| 1 27 | 1130 | 20.513 | 35 255 | 6.0511 | 4.9594 | 311 6 | 0 |
| 1 27 | 1145 | 18.12 | 34 942 | 7 2814 | 5.7558 | 305.3 | 0 |
| 1 27 | 1200 | 14.932 | 27.269 | 4.0534 | 3 9796 | 311 | 0 |
| 1 27 | 1215 | 9.0822 | 23.735 | 36463 | 4.6194 | 309 | 0 |
| 1 27 | 1230 | 9 1135 | 22 638 | 82545 | 5.5209 | 325 | 0 |
| 1 27 | 1245 | 9.4178 | 22.482 | 21028 | 4.9125 | 353.1 | 0 |
| 1 27 | 1300 | 5.682 | 12.35 | 51675 | 2.331 | 348 2 | 0 |
| 1 27 | 1315 | 7 7087 | 24.943 | - 55701 | 5.9146 | 287.2 | 0 |
| 1 27 | 1330 | 14.037 | 31.229 | 4.0512 | 5.0512 | 328 2 | 0 |
| 1 27 | 1345 | 12.988 | 28.32 | 3 7425 | 4 5322 | 305 6 | 0 |
| 1 27 | 1400 | 12.321 | 27 247 | 1 5927 | 6.0623 | 337 5 | 0 |
| 1 27 | 1415 | 14 095 | 26.016 | 2.9752 | 4.6888 | 316.5 | 0 |
| 1 27 | 1430 | 16 308 | 28 768 | 6.0466 | 4.3733 | 315.8 | 0 |
| 1 27 | 1445 | 18 724 | 30.625 | 8 6572 | 3.662 | 311 9 | 0 |
| 1 27 | 1500 | 19.976 | 34.763 | 7.7356 | 5.5634 | 285 | 0 |
| 1 27 | 1515 | 21.967 | 36 307 | 10.961 | 4.5143 | 283.7 | 0 |
| 1 27 | 1530 | 22 929 | 32 772 | 9.4267 | 5 1585 | 285 2 | 0 |
| 1 27 | 1545 | 25.435 | 37 067 | 13.422 | 5.3218 | 288 2 | 0 |
| 1 27 | 1600 | 29.394 | 41.385 | 18.03 | 4 3062 | 290 5 | 0 |
| 1 27 | 1615 | 26 889 | 39 975 | 16.8 | 3.9103 | 279 2 | 0 |
| 1 27 | 1630 | 26 799 | 36 329 | 18 343 | 3.2638 | 270 9 | 0 |
| 1 27 | 1645 | 30 155 | 44 941 | 18 657 | 4 6888 | 265 3 | 0 |
| 1 27 | 1700 | 30 49 | 42 346 | 18 813 | 4 1452 | 259 8 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 1 28 | 700 | 18.836 | 28 701 | 10 373 | 3 6105 | 274.9 | 0 |
| 1 28 | 715 | 20.916 | 28 701 | 12 682 | 3.1161 | 272 7 | 0 |
| 1 28 | 730 | 20.938 | 32.079 | 11.912 | 4.096 | 274.7 | 0 |
| 1 28 | 745 | 21.654 | 33.779 | 13.145 | 4.3554 | 268 8 | 0 |
| 1 28 | 800 | 22.415 | 35.009 | 11.912 | 4.1608 | 268.6 | 0 |
| 1 28 | 815 | 18.724 | 32.079 | 8 8317 | 4 5523 | 268.5 | 0 |
| 1 28 | 830 | 20.513 | 33.466 | 11.912 | 3.9684 | 271.6 | 0 |
| 1 28 | 845 | 18.679 | 32.548 | 10.832 | 3.6463 | 280.6 | 0 |
| 1 28 | 900 | 24.115 | 36.374 | 14 988 | 3.794 | 272 7 | 0 |
| 1 28 | 915 | 25.502 | 41 765 | 13.755 | 4 7111 | 272 6 | 0 |
| 1 28 | 930 | 23.31 | 38.365 | 13.753 | 4.9035 | 276 6 | 0 |
| 1 28 | 945 | 23.265 | 35.904 | 12.52 | 4.3331 | 272 | 0 |
| 1 28 | 1000 | 21.699 | 33.6 | 9.5923 | 4.1385 | 277.8 | 0 |
| 1 28 | 1015 | 21.05 | 35.277 | 12.055 | 4.1519 | 279.2 | 0 |
| 1 28 | 1030 | 19.999 | 32 504 | 9 4379 | 4.0467 | 276 1 | 0 |
| 1 28 | 1045 | 18.925 | 31.743 | 11.436 | 4.2123 | 297.1 | 0 |
| 1 28 | 1100 | 16.912 | 28.499 | 10 051 | 4 0892 | 286.7 | 0 |
| 1 28 | 1115 | 22.638 | 38 79 | 13 279 | 4.4762 | 286 5 | 0 |
| 1 28 | 1130 | 20.983 | 34.181 | 7 5879 | 5.1921 | 291 9 | 0 |
| 1 28 | 1145 | 17.985 | 41.563 | 5.1272 | 7.7109 | 302 6 | 0 |
| 1 28 | 1200 | 21.162 | 38.924 | 8 0487 | 6.5477 | 312.6 | 0 |
| 1 28 | 1215 | 22.527 | 37.85 | 5.4359 | 5.8721 | 306.3 | 0 |
| 1 28 | 1230 | 22.527 | 36.307 | 11 429 | 4.5277 | 297.5 | 0 |
| 1 28 | 1245 | 24 518 | 44.002 | 13 731 | 4.7201 | 297.1 | 0 |
| 1 28 | 1300 | 22.392 | 36 933 | .6711 | 5.7267 | 296.8 | 0 |
| 1 28 | 1315 | 24.987 | 44 002 | 12 503 | 5.4986 | 286 6 | 0 |
| 1 28 | 1330 | 20.737 | 37.537 | 9.2746 | 5.5388 | 294.2 | 0 |
| 1 28 | 1345 | 21.609 | 35.859 | 10.196 | 4.3375 | 293 5 | 0 |
| 1 28 | 1400 | 22.057 | 37.85 | 10 809 | 4.8409 | 300 5 | 0 |
| 1 28 | 1415 | 19.73 | 38.007 | 6.8161 | 5.9348 | 297.9 | 0 |
| 1 28 | 1430 | 20.648 | 36.776 | 8.353 | 4.1631 | 295.3 | 0 |
| 1 28 | 1445 | 19 82 | 34 763 | 9.2746 | 4.7939 | 298.7 | 0 |
| 1 28 | 1500 | 22.348 | 38.767 | 9 4267 | 6.0198 | 314.3 | 0 |
| 1 28 | 1515 | 20.044 | 36 933 | 8.5051 | 4 984 | 319.6 | 0 |
| 1 28 | 1530 | 18.612 | 32 772 | 9.8875 | 3.7761 | 312 2 | 0 |
| 1 28 | 1545 | 17 158 | 27 403 | 8.1986 | 3.0222 | 315.5 | 0 |
| 1 28 | 1600 | 19.82 | 49 684 | 10.348 | 5 1563 | 316 5 | 0 |
| 1 28 | 1615 | 19.395 | 31.385 | 12.346 | 3 9908 | 309.4 | 0 |
| 1 28 | 1630 | 16 151 | 26 173 | 9 1203 | 2 9417 | 304 2 | 0 |
| 1 28 | 1645 | 16.42 | 27.403 | 9.1203 | 3.2571 | 306.1 | 0 |
| 1 28 | 1700 | 19.529 | 35 546 | 12 04 | 3 8141 | 308 1 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 1 29 | 700 | 27 112 | 42 167 | 16 352 | 4 87 | 278.5 | 0 |
| 1 29 | 715 | 24.943 | 36.016 | 13.735 | 3.8767 | 276.6 | 0 |
| 1 29 | 730 | 26.061 | 37 246 | 15.12 | 3 8566 | 281.5 | 0 |
| 1 29 | 745 | 32.28 | 46.932 | 19.887 | 4 6507 | 283 | 0 |
| 1 29 | 800 | 34 427 | 50.623 | 20 044 | 5.6641 | 284 | 0 |
| 1 29 | 815 | 36 597 | 47 693 | 23 578 | 4.9169 | 284 | 0 |
| 1 29 | 830 | 37.47 | 56.775 | 23.869 | 5 5679 | 284 3 | 0 |
| 1 29 | 845 | 36.888 | 54 918 | 22.952 | 5.7066 | 285 4 | 0 |
| 1 29 | 900 | 37.134 | 49.393 | 22 638 | 5.1227 | 285 | 0 |
| 1 29 | 915 | 35.166 | 48 453 | 24.182 | 4.8588 | 287.6 | 0 |
| 1 29 | 930 | 30.244 | 47.066 | 18.5 | 4.6373 | 284.9 | 0 |
| 1 29 | 945 | 27.023 | 42.302 | 15 883 | 4 8028 | 276.3 | 0 |
| 1 29 | 1000 | 32.347 | 41.675 | 18 791 | 4.0087 | 271.7 | 0 |
| 1 29 | 1015 | 33.712 | 45.366 | 22 638 | 4.0199 | 272 | 0 |
| 1 29 | 1030 | 30.088 | 42 906 | 18.791 | 4.2615 | 272.7 | 0 |
| 1 29 | 1045 | 25.211 | 34 606 | 15 411 | 3.3958 | 272.8 | 0 |
| 1 29 | 1100 | 19.193 | 29 372 | 10 037 | 3.5524 | 273.5 | 0 |
| 1 29 | 1115 | 18.836 | 25.547 | 11 572 | 2.4428 | 261 6 | 0 |
| 1 29 | 1130 | 20 021 | 25 233 | 13.565 | 2.2907 | 250 | 0 |
| 1 29 | 1145 | 20.983 | 26 307 | 14.793 | 2 1341 | 248 7 | 0 |
| 1 29 | 1200 | 17 203 | 23.533 | 11.415 | 2.4473 | 242.3 | 0 |
| 1 29 | 1215 | 14.028 | 23.69 | 6.8094 | 2.8947 | 242.9 | 0 |
| 1 29 | 1230 | 17.292 | 29 685 | 5.7379 | 4.5747 | 272.3 | 0 |
| 1 29 | 1245 | 13.635 | 24 16 | 6 3508 | 3.7336 | 278.8 | 0 |
| 1 29 | 1300 | 8.3865 | 16 174 | 3.8946 | 2.067 | 271.1 | 0 |
| 1 29 | 1315 | 13.022 | 38.879 | 4 0467 | 6 3665 | 271 1 | 0 |
| 1 29 | 1330 | 19.082 | 35.971 | 8.0375 | 4.8856 | 283.9 | 0 |
| 1 29 | 1345 | 11.588 | 25 077 | 1.5927 | 3.9371 | 280 8 | 0 |
| 1 29 | 1400 | 15 558 | 25 547 | 2.973 | 3.823 | 285.9 | 0 |
| 1 29 | 1415 | 16.845 | 32 593 | 6.9638 | 6.0041 | 278.3 | 0 |
| 1 29 | 1430 | 15.927 | 26.911 | 6.3508 | 4.3107 | 283.6 | 0 |
| 1 29 | 1445 | 16.464 | 28 455 | 7.7311 | 3.8275 | 281.6 | 0 |
| 1 29 | 1500 | 13 187 | 25.681 | 3 1273 | 4.4852 | 309.4 | 0 |
| 1 29 | 1515 | 12.151 | 23.69 | 2.36 | 4 3353 | 329.4 | 0 |
| 1 29 | 1530 | 11 143 | 20 155 | 4 6619 | 3.1251 | 348.1 | 0 |
| 1 29 | 1545 | 8.5811 | 19 395 | 2.973 | 3.181 | 324 4 | 0 |
| 1 29 | 1600 | 21.229 | 36 597 | 7 2725 | 5 7491 | 293 | 0 |
| 1 29 | 1615 | 22.392 | 34 584 | 13.717 | 3.7157 | 291 | 0 |
| 1 29 | 1630 | 13.509 | 25 703 | 7 1204 | 3 9036 | 280 4 | 0 |
| 1 29 | 1645 | 9.9524 | 13 878 | 6.5074 | 1.5771 | 298 1 | 0 |
| 1 29 | 1700 | 7 2568 | 9 8048 | 3.7425 | 1.0626 | 298 9 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 1 30 | 700 | 5.0288 | 14.523 | 1.1319 | 3.7626 | 137 7 | 0 |
| 1 30 | 715 | 4 1452 | 10.521 | 05592 | 2.3802 | 99 8 | 0 |
| 1 30 | 730 | 7 5969 | 22.213 | .21028 | 4.0736 | 285 5 | 0 |
| 1 30 | 745 | 7.1696 | 12.214 | 2.3645 | 1.7091 | 203 9 | 0 |
| 1 30 | 800 | 7 9391 | 11 29 | 5 1339 | 1.4384 | 234 | 0 |
| 1 30 | 815 | 6.3218 | 8.8272 | 4.0557 | 1.0559 | 232 7 | 0 |
| 1 30 | 830 | 5.6641 | 9.7511 | 2 2102 | 1 6688 | 199.6 | 0 |
| 1 30 | 845 | 7.0242 | 9.7466 | 3.4405 | 1 3042 | 181 5 | 0 |
| 1 30 | 900 | 5.3106 | 8.8205 | 1 9015 | 1.4898 | 141.5 | 0 |
| 1 30 | 915 | 8.08 | 12.507 | 4.5143 | 1.7605 | 169.1 | 0 |
| 1 30 | 930 | 10.919 | 14.655 | 4.9751 | 1.7158 | 175 2 | 0 |
| 1 30 | 945 | 10.724 | 15.111 | 5.5858 | 1.5927 | 177.2 | 0 |
| 1 30 | 1000 | 10.628 | 14 648 | 6.3553 | 1.9059 | 174 6 | 0 |
| 1 30 | 1015 | 11.791 | 15.256 | 7.7333 | 1.4138 | 165 | 0 |
| 1 30 | 1030 | 12.941 | 17.717 | 9.1135 | 1 5972 | 173 3 | 0 |
| 1 30 | 1045 | 11.27 | 16.174 | 5.5836 | 2.1766 | 174.8 | 0 |
| 1 30 | 1100 | 10 181 | 14.485 | 5 5836 | 1.6084 | 158.7 | 0 |
| 1 30 | 1115 | 12.556 | 18.478 | 7 1181 | 2.4294 | 131.6 | 0 |
| 1 30 | 1130 | 13 221 | 17.404 | 8.4984 | 1.7628 | 121.5 | 0 |
| 1 30 | 1145 | 12.516 | 18.612 | 6.6551 | 2.4361 | 128.5 | 0 |
| 1 30 | 1200 | 6.9302 | 10.026 | 3.4316 | 1.3355 | 128 8 | 0 |
| 1 30 | 1215 | 8.0018 | 14.015 | 3.8924 | 2.1699 | 117 | 0 |
| 1 30 | 1230 | 9.0889 | 15.089 | 3.4316 | 2.4831 | 147 6 | 0 |
| 1 30 | 1245 | 7.1763 | 12.017 | 2.9707 | 1.7091 | 112.5 | 0 |
| 1 30 | 1300 | 6.2345 | 10.024 | 1 7449 | 1.7471 | 113 8 | 0 |
| 1 30 | 1315 | 7.0376 | 18.612 | 1 1319 | 3 3041 | 178.4 | 0 |
| 1 30 | 1330 | 8.8541 | 15.995 | .82545 | 3.3913 | 138.8 | 0 |
| 1 30 | 1345 | 10.451 | 14.773 | 2.8164 | 2.0849 | 130 3 | 0 |
| 1 30 | 1400 | 10.706 | 14.771 | 4 6552 | 1.8433 | 117.7 | 0 |
| 1 30 | 1415 | 11.429 | 17.829 | 5.116 | 2.794 | 122 4 | 0 |
| 1 30 | 1430 | 6.1585 | 15.995 | .97757 | 2.6687 | 72 2 | 0 |
| 1 30 | 1445 | 12.368 | 20.29 | 7 7199 | 2.0312 | 37.19 | 0 |
| 1 30 | 1500 | 7.6707 | 15.227 | 2 9685 | 2.3533 | 26.43 | 0 |
| 1 30 | 1515 | 9.675 | 20.29 | 2.2034 | 3.4987 | 35.41 | 0 |
| 1 30 | 1530 | 4.3689 | 13.541 | .21251 | 2.2348 | 346 | 0 |
| 1 30 | 1545 | 8.8496 | 25 949 | 1.1297 | 5.2167 | 124 2 | 0 |
| 1 30 | 1600 | 11 022 | 24.562 | .21251 | 5.7245 | 179 5 | 0 |
| 1 30 | 1615 | 7.8787 | 17.829 | 1 1297 | 2.3936 | 167.6 | 0 |
| 1 30 | 1630 | 5.3599 | 19.193 | .21251 | 3.2884 | 235 2 | 0 |
| 1 30 | 1645 | 6 9258 | 17.068 | 1 5905 | 2.3399 | 283.2 | 0 |
| 1 30 | 1700 | 10 61 | 19.82 | 4 3487 | 2.9103 | 159 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 1 31 | 700 | 7.6953 | 15.59 | 1 595 | 3.8365 | 160.9 | 0 |
| 1 31 | 715 | 12.435 | 19 126 | 7 1316 | 2.5815 | 190 | 0 |
| 1 31 | 730 | 15.283 | 24.518 | 7.5924 | 3.3309 | 182 8 | 0 |
| 1 31 | 745 | 12.57 | 19 887 | 4 3622 | 2.8052 | 176 7 | 0 |
| 1 31 | 800 | 10.914 | 16.509 | 4.6686 | 2.3086 | 177 2 | 0 |
| 1 31 | 815 | 8.1874 | 15.905 | 2.9775 | 2.5658 | 178 9 | 0 |
| 1 31 | 830 | 4.4718 | .27739 | .21028 | 1 4854 | 26.04 | 0 |
| 1 31 | 845 | 2.8365 | 4.6686 | 1 2863 | .83887 | 24 | 0 |
| 1 31 | 900 | 2 9036 | 6.6663 | 21028 | 1.4563 | 77 9 | 0 |
| 1 31 | 915 | 4.2279 | 6.664 | 1 5927 | 1 1565 | 109.2 | 0 |
| 1 31 | 930 | 2.9886 | 5.8923 | 82545 | .91493 | 99.5 | 0 |
| 1 31 | 945 | 2.8589 | 5 7379 | 51675 | 1.1275 | 80.3 | 0 |
| 1 31 | 1000 | 2.5815 | 5.2749 | 05816 | 1.2348 | 20 14 | 0 |
| 1 31 | 1015 | 3.5658 | 6.4985 | 1.284 | 1.0424 | 20.11 | 0 |
| 1 31 | 1030 | 5.1764 | 9 1046 | 2 5099 | 1.076 | 40.92 | 0 |
| 1 31 | 1045 | 4.4762 | 7.7221 | 1.284 | 1.5368 | 57.16 | 0 |
| 1 31 | 1100 | 5.7759 | 11.395 | 1.897 | 1.803 | 28.72 | 0 |
| 1 31 | 1115 | 5.5254 | 11 852 | 1 7426 | 2.3645 | 48.23 | 0 |
| 1 31 | 1130 | 7.3709 | 14.757 | 2.0491 | 3.3421 | 98.5 | 0 |
| 1 31 | 1145 | 7.9302 | 12.002 | 2 8142 | 2.1095 | 105.3 | 0 |
| 1 31 | 1200 | 6 6215 | 11.082 | 2 3556 | 1.8903 | 107 5 | 0 |
| 1 31 | 1215 | 10.371 | 14.449 | 4 9572 | 1.9149 | 114.3 | 0 |
| 1 31 | 1230 | 8.0599 | 13 071 | 2.662 | 2 0804 | 104.8 | 0 |
| 1 31 | 1245 | 8.9279 | 13.073 | 4.1921 | 1 9194 | 107.2 | 0 |
| 1 31 | 1300 | 7 9346 | 15.523 | 3.4271 | 2.5122 | 79.5 | 0 |
| 1 31 | 1315 | 7.013 | 13 995 | 3.275 | 2 3108 | 87.2 | 0 |
| 1 31 | 1330 | 6.1853 | 13.688 | 2.9685 | 1 944 | 82.3 | 0 |
| 1 31 | 1345 | 6.0578 | 11.545 | 2.5099 | 1.6979 | 71.9 | 0 |
| 1 31 | 1400 | 8.2008 | 13.997 | 3 5814 | 2.0223 | 93 8 | 0 |
| 1 31 | 1415 | 6.6059 | 11.393 | 2 5099 | 1 803 | 82 1 | 0 |
| 1 31 | 1430 | 5.975 | 12.467 | 2 0491 | 1 9059 | 91.6 | 0 |
| 1 31 | 1445 | 5.2816 | 11 241 | 1 7426 | 1.6263 | 87 6 | 0 |
| 1 31 | 1500 | 5.4874 | 12.623 | 2 2034 | 2.029 | 65 9 | 0 |
| 1 31 | 1515 | 9.7399 | 12.469 | 7.107 | 1.1834 | 34 95 | 0 |
| 1 31 | 1530 | 7.6617 | 13.545 | 4 1966 | 1.9283 | 29 | 0 |
| 1 31 | 1545 | 6.8027 | 10 328 | 2 5099 | 1 5189 | 39.11 | 0 |
| 1 31 | 1600 | 8.1337 | 12.478 | 4.6574 | 1.5972 | 54 39 | 0 |
| 1 31 | 1615 | 5.9549 | 8.7959 | 2 8186 | 1.2125 | 34 27 | 0 |
| 1 31 | 1630 | 6.5231 | 9 7175 | 3 8924 | .99546 | 54 | 0 |
| 1 31 | 1645 | 4.2033 | 6 9593 | 1.897 | 1.0805 | 36.66 | 0 |
| 1 31 | 1700 | 4 0624 | 6.1898 | 1.85 | 1 114 | 304 3 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 2 1 | 700 | 6.0332 | 8.3709 | 4.8297 | .75834 | 295 8 | 0 |
| 2 1 | 715 | 7 7199 | 10.221 | 5 4449 | .95967 | 304.7 | 0 |
| 2 1 | 730 | 7.4738 | 10 221 | 4 521 | 1.6263 | 331 3 | 0 |
| 2 1 | 745 | 5.1652 | 9 4513 | .82545 | 2 2236 | 341 7 | 0 |
| 2 1 | 800 | 3.9483 | 6.6797 | 1 7493 | 1.1185 | 312.6 | 0 |
| 2 1 | 815 | 4.0512 | 6.6774 | 1.595 | .99546 | 319 5 | 0 |
| 2 1 | 830 | 5.5097 | 7.91 | 2.8276 | 1.2214 | 335 7 | 0 |
| 2 1 | 845 | 5.9102 | 8.6773 | 3 4427 | .92164 | 332 4 | 0 |
| 2 1 | 900 | 6 4247 | 8 3664 | 3 2884 | .96415 | 343 6 | 0 |
| 2 1 | 915 | 7 1427 | 9.5945 | 3.9013 | 1.0559 | 338.9 | 0 |
| 2 1 | 930 | 6 9369 | 9.2858 | 2 5166 | 1.1744 | 345.3 | 0 |
| 2 1 | 945 | 5.04 | 7.4358 | 2.3623 | .83216 | 356.7 | 0 |
| 2 1 | 1000 | 5.5209 | 8.5096 | 2.5166 | 1.3064 | 3.621 | 0 |
| 2 1 | 1015 | 5.9392 | 9 1225 | 2 5144 | 1.3198 | 357.5 | 0 |
| 2 1 | 1030 | 5.3621 | 7.8899 | 1 8992 | 96638 | 24.71 | 0 |
| 2 1 | 1045 | 5 4739 | 8.9637 | 1.8992 | 1.4809 | 24.29 | 0 |
| 2 1 | 1100 | 4.4337 | 8.3463 | .82545 | 1 3847 | 709 | 0 |
| 2 1 | 1115 | 3.3555 | 6.8072 | 36463 | 1.3534 | 22 88 | 0 |
| 2 1 | 1130 | 4 5232 | 7.5745 | 1.1319 | 1.3914 | 48.61 | 0 |
| 2 1 | 1145 | 6.6707 | 10.794 | 2.0513 | 1.7359 | 32.7 | 0 |
| 2 1 | 1200 | 6.6148 | 10.485 | 2 9707 | 1.4541 | 15 22 | 0 |
| 2 1 | 1215 | 6 5343 | 10.639 | 2 0513 | 1.6039 | 352,1 | 0 |
| 2 1 | 1230 | 7.5342 | 13 55 | .82545 | 2.5077 | .252 | 0 |
| 2 1 | 1245 | 6.6931 | 11.404 | 2.5099 | 1.9954 | 359.9 | 0 |
| 2 1 | 1300 | 6.4493 | 11.4 | 1.5905 | 1.9663 | 10 83 | 0 |
| 2 1 | 1315 | 7.1271 | 12.476 | 2.9707 | 2.0827 | 12 83 | 0 |
| 2 1 | 1330 | 7.2591 | 10.787 | 3.2772 | 1.3869 | 11.32 | 0 |
| 2 1 | 1345 | 6.4001 | 9.8696 | 2.6643 | 1.6263 | 359.1 | 0 |
| 2 1 | 1400 | 8 684 | 12.476 | 4 5031 | 1.6643 | 347.3 | 0 |
| 2 1 | 1415 | 9.8875 | 12.628 | 5.4225 | 1.1006 | 346.7 | 0 |
| 2 1 | 1430 | 9.7421 | 12.628 | 6.3441 | 1.0514 | 343.8 | 0 |
| 2 1 | 1445 | 9.6683 | 12.937 | 5.8833 | 1.2975 | 2.273 | 0 |
| 2 1 | 1500 | 11.087 | 14.626 | 7.5722 | 1.4518 | 2.386 | 0 |
| 2 1 | 1515 | 11.684 | 14 628 | 7.4179 | 1.2371 | 356 9 | 0 |
| 2 1 | 1530 | 12 74 | 17.091 | 8.0331 | 1 7292 | 355.5 | 0 |
| 2 1 | 1545 | 14.068 | 18.612 | 9.4133 | 1.8634 | 353 8 | 0 |
| 2 1 | 1600 | 12 621 | 17.247 | 7.7288 | 1.8433 | 354.1 | 0 |
| 2 1 | 1615 | 12.064 | 16 174 | 7 579 | 1.6554 | 358 4 | 0 |
| 2 1 | 1630 | 13 151 | 16 487 | 8.6527 | 1.5816 | 2.717 | 0 |
| 2 1 | 1645 | 12 916 | 16 934 | 8.655 | 1.2594 | 356.6 | 0 |
| 2 1 | 1700 | 10.706 | 12.959 | 8.042 | .9552 | 355 6 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 2 2 | 700 | 4 9482 | 6.5253 | 2 9819 | .64426 | 347.2 | 0 |
| 2 2 | 715 | 5 5612 | 7 7579 | 3.2906 | .77176 | 312 4 | 0 |
| 2 2 | 730 | 8.4044 | 13.919 | 3.1363 | 2 2079 | 308.6 | 0 |
| 2 2 | 745 | 11.785 | 15.927 | 8 8362 | 1.1834 | 333 6 | 0 |
| 2 2 | 800 | 12 071 | 14.686 | 8.5274 | 1.2013 | 333.3 | 0 |
| 2 2 | 815 | 10.959 | 14 532 | 8.2187 | 1.1364 | 329.2 | 0 |
| 2 2 | 830 | 10.67 | 14.225 | 8.2187 | 1.0559 | 331.8 | 0 |
| 2 2 | 845 | 11.418 | 15 771 | 8.0622 | 1.416 | 330.7 | 0 |
| 2 2 | 900 | 11.257 | 15 453 | 7.9078 | 1.3086 | 333 1 | 01 |
| 2 2 | 915 | 10.23 | 12 988 | 7 1383 | 1 0693 | 339 9 | 0 |
| 2 2 | 930 | 10.27 | 13 912 | 6 2144 | 1.6666 | 338.3 | .01 |
| 2 2 | 945 | 8.5274 | 11.449 | 5.597 | 1.1767 | 347 | 0 |
| 2 2 | 1000 | 11.288 | 17.135 | 5 1362 | 2.9842 | 19 92 | .01 |
| 2 2 | 1015 | 12.402 | 16.822 | 8.0599 | 1.4809 | 18.83 | .01 |
| 2 2 | 1030 | 11.999 | 15 138 | 8.6751 | 1 0827 | 1 383 | 0 |
| 2 2 | 1045 | 11.248 | 14.523 | 8 0577 | 1.1722 | 342.9 | .01 |
| 2 2 | 1100 | 10.109 | 13.444 | 6 673 | 1.2214 | 329.8 | 01 |
| 2 2 | 1115 | 9.9435 | 14 06 | 7 2882 | 1 2125 | 332 2 | 0 |
| 2 2 | 1130 | 11.568 | 15 051 | 7.749 | 1.3154 | 353.5 | 01 |
| 2 2 | 1145 | 9.3954 | 13 903 | 5 7491 | 1.6599 | 352.7 | .01 |
| 2 2 | 1200 | 7.4917 | 10.825 | 4 6709 | 1.0514 | 335.3 | 0 |
| 2 2 | 1215 | 8.1091 | 11.44 | 5 1317 | 1.4004 | 344.6 | .01 |
| 2 2 | 1230 | 7.8563 | 13.898 | 4.823 | 1.6733 | 9.51 | 01 |
| 2 2 | 1245 | 13.18 | 16 666 | 9.1292 | 1 4294 | 30.76 | 0 |
| 2 2 | 1300 | 9.6728 | 14.203 | 4.9773 | 2.1453 | 20.21 | 0 |
| 2 2 | 1315 | 8.0957 | 12 97 | 5 2838 | 1.255 | 20.28 | 0 |
| 2 2 | 1330 | 9.6571 | 12.97 | 5.899 | 1.5547 | 7 05 | 0 |
| 2 2 | 1345 | 9.2813 | 13.585 | 6.2054 | 1.3981 | 2.556 | 0 |
| 2 2 | 1400 | 7 8385 | 10 818 | 4.6686 | 1 1879 | 357.3 | 0 |
| 2 2 | 1415 | 6.4895 | 8.8183 | 4.3599 | .77176 | 338.2 | 0 |
| 2 2 | 1430 | 5.7916 | 7.1271 | 4 0534 | .52793 | 324.9 | 0 |
| 2 2 | 1445 | 4 6284 | 6.3598 | 2.3623 | .78295 | 312.7 | 0 |
| 2 2 | 1500 | 3 6732 | 5 4359 | 1.1319 | .85006 | 333.7 | 0 |
| 2 2 | 1515 | 3 4271 | 6.0511 | .21028 | 1.2057 | 346.9 | 0 |
| 2 2 | 1530 | 3.1922 | 5.5903 | 1.5927 | .82322 | 358.2 | 0 |
| 2 2 | 1545 | 2.5815 | 4.512 | .6711 | .69347 | 316.1 | 0 |
| 2 2 | 1600 | 2 2057 | 3 436 | 97757 | .49661 | 285.5 | 0 |
| 2 2 | 1615 | 2 3354 | 4 2056 | .82545 | .65097 | 277 7 | 0 |
| 2 2 | 1630 | 94178 | 2 9752 | 21028 | .74716 | 231 4 | 0 |
| 2 2 | 1645 | .44516 | 1 7471 | - 1029 | .38253 | 136.1 | 0 |
| 2 2 | 1700 | 1 0313 | 2.9752 | -.1029 | .84782 | 62.47 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 2 3 | 700 | 9 0554 | 12.071 | 6.0623 | 1.2818 | 291 1 | 0 |
| 2 3 | 715 | 8 7713 | 12.223 | 4.984 | 1.2415 | 288 4 | 0 |
| 2 3 | 730 | 7.438 | 10.375 | 5.1384 | 1.1006 | 282 8 | 0 |
| 2 3 | 745 | 8.3328 | 13.301 | 6 0623 | 1.3109 | 268.3 | 0 |
| 2 3 | 800 | 11.257 | 13.61 | 6 6797 | 1.1879 | 256.5 | 0 |
| 2 3 | 815 | 10.382 | 14.377 | 6.8318 | 1.4048 | 252.2 | 0 |
| 2 3 | 830 | 5.758 | 10.527 | 3.5971 | 1.6084 | 267.9 | 0 |
| 2 3 | 845 | 4.1273 | 6.0578 | 2.2102 | .72479 | 262 | 0 |
| 2 3 | 900 | 5.2592 | 7.2859 | 2.3645 | 1.0022 | 222 1 | 0 |
| 2 3 | 915 | 5.0265 | 6.6707 | 3.5926 | 55701 | 240.6 | 0 |
| 2 3 | 930 | 4.0132 | 5.4382 | .21028 | .94625 | 228 | 0 |
| 2 3 | 945 | 1.8299 | 4.8207 | 21028 | 1.0313 | 301.6 | 0 |
| 2 3 | 1000 | 1.5995 | 2.8209 | 05816 | .55254 | 314.4 | 0 |
| 2 3 | 1015 | 81874 | 2.3578 | -.55701 | 62189 | 18.8 | 0 |
| 2 3 | 1030 | 1.7784 | 3.8901 | .21028 | .86124 | 132.9 | 0 |
| 2 3 | 1045 | 3.6732 | 5 5724 | 2.2034 | 72479 | 171.2 | 0 |
| 2 3 | 1100 | 2 8522 | 4.9594 | 1 284 | .76282 | 207 8 | 0 |
| 2 3 | 1115 | 3 5904 | 4.9572 | 2 0491 | 5928 | 194 1 | 0 |
| 2 3 | 1130 | 4.1071 | 7.098 | 2.2012 | 1.1409 | 155.8 | 0 |
| 2 3 | 1145 | 6.286 | 7 8608 | 4.3443 | .61294 | 150 | 0 |
| 2 3 | 1200 | 5.9012 | 7.4022 | 3.4249 | .74492 | 176 6 | 0 |
| 2 3 | 1215 | 3.8723 | 6.1786 | 1 7426 | .93059 | 206.9 | 0 |
| 2 3 | 1230 | 4.8297 | 6.3307 | 3.577 | .51898 | 196 | 0 |
| 2 3 | 1245 | 5.1563 | 7.7087 | 2.5077 | 1.0782 | 175 | 0 |
| 2 3 | 1300 | 6.3531 | 8 0152 | 4.1899 | .6711 | 171 4 | 0 |
| 2 3 | 1315 | 5.984 | 8.0174 | 3.7313 | .90598 | 185 4 | 0 |
| 2 3 | 1330 | 5.8945 | 8.3239 | 3.8857 | .84111 | 178.8 | 0 |
| 2 3 | 1345 | 7.1741 | 9.2433 | 4 0378 | .85901 | 166 1 | 0 |
| 2 3 | 1400 | 6.758 | 9.3976 | 4.3443 | .93283 | 165.3 | 0 |
| 2 3 | 1415 | 7.0779 | 10.011 | 4.1921 | .97309 | 155 3 | 0 |
| 2 3 | 1430 | 8.0465 | 10.317 | 5.2637 | .98652 | 150.4 | 0 |
| 2 3 | 1445 | 7.4201 | 10.778 | 4.653 | .94849 | 149.8 | 0 |
| 2 3 | 1500 | 6.145 | 8.174 | 4.4986 | .77848 | 158.7 | 0 |
| 2 3 | 1515 | 5.5455 | 7.4089 | 3.7336 | .66439 | 140.8 | 0 |
| 2 3 | 1530 | 5.6484 | 7.5633 | 4.1944 | .64202 | 140.3 | 0 |
| 2 3 | 1545 | 5.2256 | 6.9504 | 3 4271 | .71808 | 144.7 | 0 |
| 2 3 | 1600 | 4.6328 | 6.7982 | 2.8164 | 96638 | 154.1 | 0 |
| 2 3 | 1615 | 2.841 | 4.3465 | 2.0491 | .44069 | 160 | 0 |
| 2 3 | 1630 | 3.2302 | 5.8788 | 1.1297 | 1.4518 | 208 | 0 |
| 2 3 | 1645 | 4.1161 | 5.5724 | 3 1229 | .387 | 219 4 | 0 |
| 2 3 | 1700 | 4 3219 | 5.2681 | 2 9685 | .55925 | 219 8 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 2 4 | 700 | 9 7399 | 11.442 | 7 4403 | .72031 | 230.6 | 0 |
| 2 4 | 715 | 9 127 | 10.673 | 7 4425 | .70018 | 221.4 | 0 |
| 2 4 | 730 | 7.664 | 10.366 | 5 4404 | .8523 | 219.7 | 0 |
| 2 4 | 745 | 9.3126 | 11 751 | 6 3643 | 1 0603 | 217.3 | 0 |
| 2 4 | 800 | 10.342 | 12 981 | 7.2882 | 1.2863 | 245 | 0 |
| 2 4 | 815 | 10.579 | 11.905 | 8 8272 | 72031 | 245 | 0 |
| 2 4 | 830 | 7 4313 | 11.288 | 1 9015 | 3.1833 | 272 | 0 |
| 2 4 | 845 | 3 3018 | 5.7469 | 21028 | 1.3355 | 340 4 | 0 |
| 2 4 | 900 | 4.0333 | 7.1293 | - 09843 | 1.1789 | 199 4 | 0 |
| 2 4 | 915 | 2.5949 | 4.2056 | 1.4406 | .54583 | 273.4 | 0 |
| 2 4 | 930 | 2.6464 | 4.9706 | 51675 | 1.0134 | 191.9 | 0 |
| 2 4 | 945 | 3.6441 | 6.9638 | - 25054 | 1.4854 | 178.4 | 0 |
| 2 4 | 1000 | 6.4068 | 9.2612 | 3 4338 | 1.2908 | 196 | 0 |
| 2 4 | 1015 | 9.6079 | 12.172 | 6 4985 | 1.1386 | 194.1 | 0 |
| 2 4 | 1030 | 10.156 | 12.321 | 7 1114 | .93954 | 193.5 | 0 |
| 2 4 | 1045 | 10.615 | 13.545 | 7.2613 | 1.1453 | 186.8 | 0 |
| 2 4 | 1100 | 11.552 | 14 001 | 8.0264 | 1.1879 | 186.9 | 0 |
| 2 4 | 1115 | 10.297 | 14 001 | 5.1138 | 1.7516 | 181 | 0 |
| 2 4 | 1130 | 8.9972 | 12.008 | 3.8879 | 1.3198 | 164 9 | 0 |
| 2 4 | 1145 | 6.0958 | 11.089 | 1.4362 | 2 4987 | 140.6 | 0 |
| 2 4 | 1200 | 3 3443 | 6.4918 | .21251 | 1.2706 | 136.3 | 0 |
| 2 4 | 1215 | 4.691 | 8.3261 | 2.0491 | 1.0738 | 148.1 | 0 |
| 2 4 | 1230 | 8.4134 | 12.46 | 5.2637 | 1.5212 | 162.7 | 0 |
| 2 4 | 1245 | 8.6639 | 12.764 | 5 1093 | 1 5077 | 148.8 | 0 |
| 2 4 | 1300 | 9.6392 | 12.916 | 5 7223 | 1 5256 | 164.4 | 0 |
| 2 4 | 1315 | 7 5633 | 9.7019 | 4 6507 | 1.0492 | 179 6 | 0 |
| 2 4 | 1330 | 5.333 | 9.2433 | 1.8947 | 1.7314 | 188.2 | 0 |
| 2 4 | 1345 | 3.9215 | 6.3352 | 2 2012 | .79861 | 165.3 | 0 |
| 2 4 | 1400 | 6.588 | 9.2433 | 4 6507 | .80979 | 152.7 | 0 |
| 2 4 | 1415 | 6 9034 | 9.2433 | 5 2637 | .76282 | 163.6 | 0 |
| 2 4 | 1430 | 7 5297 | 10.163 | 5.1115 | 1.1028 | 174.9 | 0 |
| 2 4 | 1445 | 6.1495 | 8.9368 | 4.1921 | .86796 | 158.7 | 0 |
| 2 4 | 1500 | 5.9348 | 9.0912 | 3.4271 | 1.1834 | 156.4 | 0 |
| 2 4 | 1515 | 3.445 | 5.5701 | .21251 | 1.0603 | 151.7 | 0 |
| 2 4 | 1530 | 3 7693 | 5.8744 | 1 284 | .98652 | 160 3 | 0 |
| 2 4 | 1545 | 2 3623 | 4.4964 | .21251 | 82545 | 184 1 | 0 |
| 2 4 | 1600 | 1 9507 | 3.7313 | .36463 | .70242 | 142.7 | 0 |
| 2 4 | 1615 | 2.1028 | 3.4249 | .21251 | 96415 | 35 13 | 0 |
| 2 4 | 1630 | 2.7403 | 7.4022 | 21251 | 1.633 | 51 07 | 0 |
| 2 4 | 1645 | 4.0691 | 5 72 | 1 284 | 1 0335 | 278 1 | 0 |
| 2 4 | 1700 | 3.2705 | 7.4022 | 1 7426 | 1.3556 | 217 3 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 2 5 | 700 | 11.711 | 13.29 | 9.288 | 72031 | 240 6 | 0 |
| 2 5 | 715 | 10.961 | 13 136 | 9 1337 | .689 | 238 3 | 0 |
| 2 5 | 730 | 11.514 | 13.905 | 8.212 | .89927 | 237 | 0 |
| 2 5 | 745 | 12.158 | 14 06 | 9 5967 | .689 | 235 8 | 0 |
| 2 5 | 800 | 10.919 | 13.596 | 8.3641 | 81874 | 236 2 | 0 |
| 2 5 | 815 | 9 0621 | 12.518 | 3 9013 | 2.2638 | 220.2 | 0 |
| 2 5 | 830 | 6.6864 | 8.9793 | 3.5949 | 1.2102 | 183.4 | 0 |
| 2 5 | 845 | 7.5991 | 13.438 | 3.1318 | 2 8007 | 147 5 | 0 |
| 2 5 | 900 | 13.429 | 17.292 | 9.1314 | 1.7203 | 146.1 | 0 |
| 2 5 | 915 | 12.136 | 15 587 | 8.514 | 1.4272 | 159.5 | 0 |
| 2 5 | 930 | 13.67 | 17.583 | 8.9726 | 1.5704 | 155.7 | 0 |
| 2 5 | 945 | 14.523 | 18 187 | 9.2791 | 1.7986 | 146 2 | 0 |
| 2 5 | 1000 | 15.194 | 21.117 | 8.9704 | 2.3556 | 140.9 | 0 |
| 2 5 | 1015 | 18.701 | 25.882 | 11.89 | 3.134 | 146.9 | 0 |
| 2 5 | 1030 | 20.267 | 27 09 | 12.809 | 2.5524 | 153.6 | 0 |
| 2 5 | 1045 | 19.395 | 27.403 | 12.348 | 2.5972 | 147.6 | 0 |
| 2 5 | 1100 | 18.567 | 25 099 | 9 7354 | 2.6486 | 151.6 | 0 |
| 2 5 | 1115 | 17.359 | 24.182 | 9.1203 | 2.9126 | 145 7 | 0 |
| 2 5 | 1130 | 14.346 | 20.782 | 8 1964 | 2.4137 | 136.1 | 0 |
| 2 5 | 1145 | 13.252 | 19 261 | 7.2747 | 2 2213 | 139.6 | 0 |
| 2 5 | 1200 | 11.834 | 21.565 | 6.1987 | 2.3578 | 130.3 | 0 |
| 2 5 | 1215 | 12.411 | 18.03 | 6 966 | 2.4383 | 138.1 | 0 |
| 2 5 | 1230 | 12.33 | 16.8 | 3.7403 | 2.7291 | 111.6 | 0 |
| 2 5 | 1245 | 12.203 | 17.717 | 6.1965 | 2.0111 | 115.2 | 0 |
| 2 5 | 1300 | 11.438 | 15 726 | 5.89 | 1.7762 | 128 9 | 0 |
| 2 5 | 1315 | 10.778 | 16.934 | 7.1181 | 1.7605 | 133 1 | 0 |
| 2 5 | 1330 | 9.4961 | 12.95 | 4.3554 | 1.5256 | 136 2 | 0 |
| 2 5 | 1345 | 9.4379 | 14.945 | 4.9684 | 1.7471 | 133 | 0 |
| 2 5 | 1400 | 11.292 | 14.641 | 7 1181 | 1.4294 | 125.4 | 0 |
| 2 5 | 1415 | 9.9837 | 14 641 | 5.7379 | 1 8008 | 142 7 | 0 |
| 2 5 | 1430 | 9.6952 | 12.952 | 6.0444 | 1.3869 | 123 7 | 0 |
| 2 5 | 1445 | 8.5901 | 11.572 | 5 7379 | 1.076 | 119.5 | 0 |
| 2 5 | 1500 | 8.8563 | 12.339 | 5 1227 | 1.2706 | 125.7 | 0 |
| 2 5 | 1515 | 8.8966 | 11.726 | 5.1227 | 1.0872 | 117.6 | 0 |
| 2 5 | 1530 | 9.3372 | 11.881 | 5.5858 | 1.0313 | 117.6 | 0 |
| 2 5 | 1545 | 7.8183 | 11.268 | 3.5904 | 1.3019 | 112 4 | 0 |
| 2 5 | 1600 | 7.7512 | 10.194 | 3.8969 | 1 1006 | 112 5 | 0 |
| 2 5 | 1615 | 7.6953 | 10 503 | 3.8969 | 1.34 | 116 | 0 |
| 2 5 | 1630 | 6.7021 | 8 9659 | 4.3577 | .94401 | 121.3 | 0 |
| 2 5 | 1645 | 4 8744 | 7 4313 | 2.5144 | 1.0738 | 127.9 | 0 |
| 2 5 | 1700 | 5 4918 | 7 1248 | 3 2839 | 70689 | 136 9 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 2 6 | 700 | 11.823 | 21.744 | 6.6685 | 2.6508 | 287 4 | 0 |
| 2 6 | 715 | 9.9368 | 16.979 | 4.2078 | 2 3354 | 309 7 | 0 |
| 2 6 | 730 | 6.0063 | 8 514 | 3.747 | .96415 | 313.2 | 0 |
| 2 6 | 745 | 8 6885 | 12.512 | 4.823 | 1.6353 | 321.4 | 0 |
| 2 6 | 800 | 6 8743 | 11 894 | 6711 | 2.36 | 119 | 0 |
| 2 6 | 815 | 3.6642 | 9.8943 | 1.9015 | 1 2483 | 143 | 0 |
| 2 6 | 830 | 6.5007 | 9.7399 | 3 5926 | 1.2236 | 163 6 | 0 |
| 2 6 | 845 | 6.6685 | 9.892 | 3.4383 | 1.3892 | 187.7 | 0 |
| 2 6 | 900 | 6 7021 | 10.044 | 3 7425 | 1.1453 | 152.2 | 0 |
| 2 6 | 915 | 4.0177 | 6.3128 | 1 1319 | .91046 | 150.6 | 0 |
| 2 6 | 930 | 6 6193 | 10.496 | 3 1273 | 1 9283 | 132.3 | 0 |
| 2 6 | 945 | 7.1606 | 10.802 | 2.0536 | 1.8903 | 136.8 | 0 |
| 2 6 | 1000 | 8.5722 | 13.406 | 5.4292 | 1.5793 | 129.3 | 0 |
| 2 6 | 1015 | 8.2836 | 15.247 | 3.1251 | 2.3041 | 113 | 0 |
| 2 6 | 1030 | 6.8922 | 13.86 | 05816 | 3.8432 | 107 8 | 0 |
| 2 6 | 1045 | 6.7356 | 15.089 | 1.897 | 2.8119 | 132.8 | 0 |
| 2 6 | 1100 | 7.0152 | 10 639 | 3 2772 | 1.2639 | 147.4 | 0 |
| 2 6 | 1115 | 6 9123 | 10.635 | 2 0513 | 1.6084 | 137.8 | 0 |
| 2 6 | 1130 | 5.3778 | 8 7937 | 1.897 | 1.5256 | 122.1 | 0 |
| 2 6 | 1145 | 6 0645 | 11 091 | 1.284 | 1.9775 | 128.6 | 0 |
| 2 6 | 1200 | 8.693 | 12.317 | 4.9617 | 1.2483 | 133.5 | 0 |
| 2 6 | 1215 | 6.6707 | 11.091 | 2 9685 | 1.6778 | 132.9 | 0 |
| 2 6 | 1230 | 7.881 | 11.089 | 3 1229 | 1.5592 | 108.1 | 0 |
| 2 6 | 1245 | 9.9032 | 13.386 | 5 7267 | 1 6196 | 117 9 | 0 |
| 2 6 | 1300 | 8.2568 | 11.393 | 3.275 | 1.3355 | 124 | 0 |
| 2 6 | 1315 | 4.0557 | 8.1762 | .21251 | 1.6867 | 82.2 | 0 |
| 2 6 | 1330 | 4.5769 | 9.4021 | .51898 | 1.9059 | 72.8 | 0 |
| 2 6 | 1345 | 7.4246 | 10.778 | 3.4271 | 1.3109 | 39.92 | 0 |
| 2 6 | 1400 | 5.8811 | 8.9391 | 2.2012 | 1.5883 | 55.09 | 0 |
| 2 6 | 1415 | 5.5858 | 9.3976 | 2.5077 | 1.5077 | 70 8 | 0 |
| 2 6 | 1430 | 5 4874 | 8 4782 | 2.2012 | 1.2863 | 57.89 | 0 |
| 2 6 | 1445 | 3.9215 | 8.0196 | 21251 | 1.5995 | 42.02 | 0 |
| 2 6 | 1500 | 5.7178 | 9.5498 | 2.5077 | 1.2885 | 40.15 | 0 |
| 2 6 | 1515 | 5.6395 | 8.1718 | 3 2727 | .81203 | 42 86 | 0 |
| 2 6 | 1530 | 6.06 | 8.3239 | 2 5077 | .82545 | 34.19 | 0 |
| 2 6 | 1545 | 5.8609 | 8.7825 | 2 9663 | 1.0424 | 49.53 | 0 |
| 2 6 | 1600 | 5.2726 | 7.5588 | 3 4271 | .82545 | 34 68 | 0 |
| 2 6 | 1615 | 5 1943 | 6.6417 | 3.1206 | .54359 | 12 87 | 0 |
| 2 6 | 1630 | 3.6486 | 4.8051 | 2.3556 | .44516 | 341.3 | 0 |
| 2 6 | 1645 | 5 0601 | 7.2546 | 2.3556 | 1.2169 | 311 3 | 0 |
| 2 6 | 1700 | 5.0869 | 6 4895 | 2 662 | 60399 | 289 2 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 2 7 | 700 | 8 08 | 10.666 | 4 823 | .99099 | 135 7 | 0 |
| 2 7 | 715 | 7 5119 | 9.8965 | 5.2838 | .75611 | 163 9 | 0 |
| 2 7 | 730 | 4.5769 | 8.3597 | .21028 | 2.2258 | 263.9 | 0 |
| 2 7 | 745 | 4 3801 | 8.2053 | .21028 | 1.9216 | 280.6 | 0 |
| 2 7 | 800 | 4.5859 | 7.8989 | .21028 | 1 9619 | 249.3 | 0 |
| 2 7 | 815 | 3.9304 | 6.2054 | 1.2863 | 1.0424 | 261.7 | 0 |
| 2 7 | 830 | 3.7492 | 8 2031 | .21028 | 2 2929 | 249 | 0 |
| 2 7 | 845 | 3.2996 | 5.8945 | 21028 | 1.1252 | 198.4 | 0 |
| 2 7 | 900 | 4.3197 | 7.4291 | 1.1319 | 1.3758 | 129 9 | 0 |
| 2 7 | 915 | 6.7982 | 11.726 | 2.36 | 1.9372 | 140.7 | 0 |
| 2 7 | 930 | 5.6909 | 11.72 | .05592 | 2.4495 | 139.4 | 0 |
| 2 7 | 945 | 8.0577 | 13.25 | 82545 | 3.4517 | 137 7 | 0 |
| 2 7 | 1000 | 10.071 | 23.377 | 2 2057 | 2.7784 | 143.3 | 0 |
| 2 7 | 1015 | 9.7645 | 16.151 | 3 5837 | 2.2929 | 151.5 | 0 |
| 2 7 | 1030 | 11.037 | 20.894 | 2 8164 | 3.8029 | 182.2 | 0 |
| 2 7 | 1045 | 12.843 | 23.511 | 1.5905 | 3.577 | 196.2 | 0 |
| 2 7 | 1100 | 6.8251 | 18.455 | .21028 | 4.002 | 174.9 | 0 |
| 2 7 | 1115 | 7.4447 | 18.903 | .21251 | 3 4204 | 182 4 | 0 |
| 2 7 | 1130 | 7.6483 | 16.151 | .21251 | 2 8432 | 168 | 0 |
| 2 7 | 1145 | 7.2837 | 14.608 | .21251 | 3.5501 | 172.9 | 0 |
| 2 7 | 1200 | 17.426 | 33.6 | 6.3374 | 3.879 | 238 | 0 |
| 2 7 | 1215 | 21.833 | 33.13 | 11.082 | 4 6977 | 263.4 | 0 |
| 2 7 | 1230 | 22.034 | 32.369 | 11 386 | 3.908 | 262.7 | 0 |
| 2 7 | 1245 | 16.375 | 25 323 | 6 4895 | 3.6463 | 254.5 | 0 |
| 2 7 | 1300 | 16.688 | 34.047 | 7.1002 | 4.5456 | 274 4 | 0 |
| 2 7 | 1315 | 20.379 | 31.296 | 10.011 | 3.8901 | 261.2 | 0 |
| 2 7 | 1330 | 15.169 | 28.074 | 5.5701 | 4.5098 | 258.6 | 0 |
| 2 7 | 1345 | 19.193 | 33.287 | 5 1115 | 5.8654 | 256.6 | 0 |
| 2 7 | 1400 | 19.35 | 29.461 | 10.165 | 4.1004 | 255.2 | 0 |
| 2 7 | 1415 | 18.008 | 25.166 | 9.8585 | 3.5993 | 259 2 | 0 |
| 2 7 | 1430 | 17.158 | 25.323 | 9.8585 | 2.9953 | 267.6 | 0 |
| 2 7 | 1445 | 17.068 | 24.562 | 9.552 | 3.1497 | 263 7 | 0 |
| 2 7 | 1500 | 16.308 | 25.01 | 8.7869 | 3.2481 | 266.6 | 0 |
| 2 7 | 1515 | 17.247 | 25.927 | 9.3976 | 3.2369 | 269.8 | 0 |
| 2 7 | 1530 | 16.845 | 24.249 | 7.8698 | 3 4226 | 263.9 | 0 |
| 2 7 | 1545 | 16.867 | 26.866 | 8.3306 | 3.879 | 273.8 | 0 |
| 2 7 | 1600 | 13.286 | 19.507 | 8 0241 | 2.1609 | 270.8 | 0 |
| 2 7 | 1615 | 14.538 | 24.875 | 7.7177 | 3 8901 | 253.7 | 0 |
| 2 7 | 1630 | 13.789 | 23 645 | 4 9617 | 3.0401 | 237 7 | 0 |
| 2 7 | 1645 | 7 1539 | 24.115 | .21251 | 4.266 | 160 3 | 0 |
| 2 7 | 1700 | 6.6864 | 13 541 | 2 5099 | 2 3198 | 151.6 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 2 8 | 700 | 9.1292 | 12.375 | 5.7536 | 1.5681 | 176 7 | 0 |
| 2 8 | 715 | 11.603 | 15.927 | 7.2926 | 1.6397 | 177 6 | 0 |
| 2 8 | 730 | 8.9167 | 12 529 | 4 984 | 1.4675 | 182.2 | 0 |
| 2 8 | 745 | 9.7354 | 12 838 | 5 5992 | 1.2348 | 180 6 | 0 |
| 2 8 | 800 | 12.4 | 16.375 | 7 7557 | 1.6174 | 179 7 | 0 |
| 2 8 | 815 | 12.912 | 16.062 | 8.8317 | 1.4093 | 179.9 | 0 |
| 2 8 | 830 | 11.82 | 15 905 | 6.9839 | 1.7292 | 184.8 | 0 |
| 2 8 | 845 | 11.279 | 13.449 | 7 1383 | 1.3355 | 183.1 | 0 |
| 2 8 | 900 | 10.377 | 13.14 | 6.5209 | 1.2952 | 176.3 | 0 |
| 2 8 | 915 | 8.7825 | 12.371 | 4 5187 | 1.5033 | 157.3 | 0 |
| 2 8 | 930 | 7.8027 | 10.518 | 3.5949 | 1.1655 | 169 | 0 |
| 2 8 | 945 | 7.8452 | 10.518 | 4.8252 | 1.1028 | 168.1 | 0 |
| 2 8 | 1000 | 9.2791 | 12.514 | 5.5925 | 1.1677 | 163.6 | 0 |
| 2 8 | 1015 | 9.9636 | 13.435 | 6.0533 | 1.34 | 165 8 | 0 |
| 2 8 | 1030 | 10.767 | 14.359 | 6.362 | 1.3914 | 157.1 | 0 |
| 2 8 | 1045 | 12.216 | 15.279 | 8.3597 | 1 3243 | 149.9 | 0 |
| 2 8 | 1100 | 13.476 | 16 666 | 9.4357 | 1.2773 | 148 4 | 0 |
| 2 8 | 1115 | 11.881 | 15.279 | 7.1293 | 1.4183 | 141 5 | 0 |
| 2 8 | 1130 | 10.201 | 22.974 | 1.9015 | 3 2839 | 137 | 0 |
| 2 8 | 1145 | 11.834 | 20.961 | .36463 | 4.134 | 289.7 | 0 |
| 2 8 | 1200 | 20.469 | 31.721 | 8.2031 | 4.3957 | 249 4 | 0 |
| 2 8 | 1215 | 17 851 | 27.403 | 8.5073 | 3.9013 | 241.6 | 0 |
| 2 8 | 1230 | 22.862 | 41.541 | 10.964 | 5.38 | 236.9 | 0 |
| 2 8 | 1245 | 23.802 | 40.445 | 11.268 | 5.729 | 227 9 | 0 |
| 2 8 | 1300 | 22.527 | 41.519 | 4.5098 | 7.4537 | 226 1 | 0 |
| 2 8 | 1315 | 20 692 | 42.883 | 2.36 | 9.4648 | 265.6 | 0 |
| 2 8 | 1330 | 7.3732 | 19.082 | 1.1319 | 3.7313 | 225.6 | 0 |
| 2 8 | 1345 | 12.543 | 26 755 | 1.8992 | 5.7267 | 272 7 | 0 |
| 2 8 | 1400 | 16.263 | 30.289 | 6.6551 | 4.7335 | 268 9 | 0 |
| 2 8 | 1415 | 14.995 | 36.575 | 2 973 | 7.23 | 285.6 | 0 |
| 2 8 | 1430 | 12.603 | 31 206 | 1.284 | 5.3912 | 280 7 | 0 |
| 2 8 | 1445 | 16.017 | 35.658 | 4.6597 | 6 3016 | 284 4 | 0 |
| 2 8 | 1500 | 18 254 | 38 118 | 6.5007 | 5.9504 | 287 | 0 |
| 2 8 | 1515 | 17.65 | 36.262 | 8.3418 | 5.1317 | 294.9 | 0 |
| 2 8 | 1530 | 21.766 | 36 105 | 12.333 | 4.2257 | 285 2 | 0 |
| 2 8 | 1545 | 20.648 | 44.874 | 10.8 | 5.2972 | 303.9 | 0 |
| 2 8 | 1600 | 25.122 | 37.962 | 10.339 | 4.2525 | 283 7 | 0 |
| 2 8 | 1615 | 24.294 | 41 161 | 13.872 | 4.3599 | 283 1 | 0 |
| 2 8 | 1630 | 17.538 | 35.367 | 8.6527 | 4.3577 | 288 9 | 0 |
| 2 8 | 1645 | 20.267 | 38 141 | 7 579 | 4 5411 | 276 9 | 0 |
| 2 8 | 1700 | 19.104 | 36 911 | 9 1135 | 5 0668 | 278 6 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 2 9 | 700 | 10.919 | 28 209 | 97981 | 5.7871 | 290.8 | 0 |
| 2 9 | 715 | 13 142 | 35 121 | 3 2862 | 5.1652 | 223 8 | 0 |
| 2 9 | 730 | 14 377 | 31.586 | 82545 | 4.9527 | 265 4 | 0 |
| 2 9 | 745 | 21.923 | 35.277 | 10.516 | 4.7514 | 288 | 0 |
| 2 9 | 800 | 19.484 | 30 669 | 10.516 | 3.9908 | 288 8 | 0 |
| 2 9 | 815 | 21.475 | 31 743 | 12.514 | 3.4137 | 294 9 | 0 |
| 2 9 | 830 | 24 696 | 35.881 | 13 898 | 3.7716 | 293 2 | 0 |
| 2 9 | 845 | 23.69 | 35 277 | 13 894 | 4 0087 | 292.1 | 0 |
| 2 9 | 900 | 21.609 | 30.177 | 13.892 | 3.2862 | 289 6 | 0 |
| 2 9 | 915 | 20.938 | 30 177 | 12.816 | 2.6419 | 290 | 0 |
| 2 9 | 930 | 18.947 | 27 403 | 9.892 | 3.2392 | 287.9 | 0 |
| 2 9 | 945 | 19 618 | 29.103 | 12 042 | 3.1318 | 286.3 | 0 |
| 2 9 | 1000 | 22.974 | 35 546 | 11.579 | 3.8342 | 294.1 | 0 |
| 2 9 | 1015 | 19.976 | 28.924 | 9 2724 | 3.8253 | 290 | 0 |
| 2 9 | 1030 | 18 075 | 26.173 | 10.959 | 3.0871 | 287 3 | 0 |
| 2 9 | 1045 | 20.446 | 29.238 | 9.7287 | 3.3689 | 283.3 | 0 |
| 2 9 | 1100 | 19.976 | 29 528 | 11 724 | 3.4897 | 291 3 | 0 |
| 2 9 | 1115 | 20.625 | 32.593 | 10.342 | 3.5322 | 290 4 | 0 |
| 2 9 | 1130 | 22.773 | 32 906 | 11.109 | 4.4762 | 295 3 | 0 |
| 2 9 | 1145 | 21.99 | 32.437 | 12.487 | 3.8141 | 297.8 | 0 |
| 2 9 | 1200 | 22.079 | 33 04 | 11 413 | 3.9394 | 294 2 | 0 |
| 2 9 | 1215 | 20.58 | 32.437 | 10.644 | 4.1765 | 293.4 | 0 |
| 2 9 | 1230 | 21.9 | 33.04 | 12.18 | 3.3533 | 296.6 | 0 |
| 2 9 | 1245 | 21.967 | 28 902 | 13.254 | 2.8813 | 302 3 | 0 |
| 2 9 | 1300 | 23 354 | 33 197 | 14.637 | 3.219 | 294 2 | 0 |
| 2 9 | 1315 | 22.75 | 30 893 | 15.093 | 3.058 | 294.7 | 0 |
| 2 9 | 1330 | 20.222 | 28.902 | 12.482 | 3.2548 | 289 | 0 |
| 2 9 | 1345 | 21.073 | 34.271 | 10 337 | 3.7738 | 291.4 | 0 |
| 2 9 | 1400 | 25.189 | 38 879 | 13.1 | 4.2906 | 297.6 | 0 |
| 2 9 | 1415 | 29.417 | 38.722 | 15 4 | 3 6083 | 288 | 0 |
| 2 9 | 1430 | 25.39 | 34 875 | 13.867 | 4 2593 | 293.5 | 0 |
| 2 9 | 1445 | 28.097 | 42.1 | 15.091 | 4.7603 | 287.8 | 0 |
| 2 9 | 1500 | 29.036 | 44.091 | 19 529 | 4.0534 | 297 | 0 |
| 2 9 | 1515 | 24.339 | 34.718 | 14 171 | 3.9684 | 294.9 | 0 |
| 2 9 | 1530 | 19.574 | 34.897 | 11.102 | 4.7514 | 296 8 | 0 |
| 2 9 | 1545 | 20.491 | 33 801 | 9.5699 | 4.8677 | 298.9 | 0 |
| 2 9 | 1600 | 22 571 | 33 197 | 12 026 | 3.823 | 291 7 | 0 |
| 2 9 | 1615 | 21 9 | 33 823 | 12 183 | 4.2346 | 289.9 | 0 |
| 2 9 | 1630 | 23.019 | 35.68 | 10.802 | 4 8655 | 295.7 | 0 |
| 2 9 | 1645 | 25 636 | 38.275 | 12.798 | 5 1406 | 289 9 | 0 |
| 2 9 | 1700 | 27.47 | 39 349 | 16 643 | 4 3622 | 292 1 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 2 10 | 700 | 37.917 | 56 462 | 19 104 | 6.626 | 303 6 | 0 |
| 2 10 | 715 | 38.834 | 55 679 | 22.034 | 6 5634 | 300.4 | 0 |
| 2 10 | 730 | 41.877 | 57.379 | 23.712 | 5.673 | 300.6 | 0 |
| 2 10 | 745 | 39.573 | 53.688 | 21.878 | 5.5254 | 298 2 | 0 |
| 2 10 | 800 | 39.013 | 59.683 | 23.265 | 6.4157 | 294 3 | 0 |
| 2 10 | 815 | 38.476 | 52.458 | 25.569 | 5.0422 | 288.1 | 0 |
| 2 10 | 830 | 37 761 | 52.748 | 20.334 | 5.5925 | 287.9 | 0 |
| 2 10 | 845 | 37.38 | 59.213 | 21.565 | 5.5164 | 290.7 | 0 |
| 2 10 | 900 | 30.647 | 53.218 | 16.33 | 5.7491 | 297 4 | 0 |
| 2 10 | 915 | 27.224 | 41 832 | 14 496 | 5.0064 | 304.7 | 0 |
| 2 10 | 930 | 28 969 | 43.062 | 15.415 | 4.9013 | 294 5 | 0 |
| 2 10 | 945 | 30.2 | 46 127 | 16.643 | 5.2077 | 292 1 | 0 |
| 2 10 | 1000 | 31.877 | 46.888 | 18.791 | 5.3889 | 292 8 | 0 |
| 2 10 | 1015 | 31 407 | 46 574 | 19.082 | 4 5836 | 293.7 | 0 |
| 2 10 | 1030 | 29.103 | 47.648 | 17.717 | 4 7693 | 290 5 | 0 |
| 2 10 | 1045 | 29.551 | 41.653 | 17.695 | 4.3443 | 292.8 | 0 |
| 2 10 | 1100 | 28.32 | 40 423 | 15 556 | 4.9326 | 288.3 | 0 |
| 2 10 | 1115 | 28.969 | 40.423 | 15.404 | 4 6418 | 288.6 | 0 |
| 2 10 | 1130 | 27.851 | 39.483 | 18.634 | 4.0042 | 281.4 | 0 |
| 2 10 | 1145 | 27.336 | 38.118 | 15.25 | 3.8745 | 281.4 | 0 |
| 2 10 | 1200 | 28.634 | 41.787 | 17.851 | 4.0781 | 282.9 | 0 |
| 2 10 | 1215 | 30.602 | 43.331 | 20.469 | 3.8588 | 284 | 0 |
| 2 10 | 1230 | 27.873 | 38 118 | 16 017 | 4 0669 | 287 6 | 0 |
| 2 10 | 1245 | 29.17 | 41.631 | 19 529 | 4.5724 | 283.6 | 0 |
| 2 10 | 1300 | 28.857 | 41.027 | 18 612 | 4.3689 | 281.8 | 0 |
| 2 10 | 1315 | 25.502 | 37.179 | 16.017 | 3.8969 | 281 | 0 |
| 2 10 | 1330 | 20.804 | 30 893 | 12 943 | 3.4785 | 283 6 | 0 |
| 2 10 | 1345 | 22.996 | 35.031 | 12 791 | 4.002 | 281.1 | 0 |
| 2 10 | 1400 | 24 07 | 36 575 | 10 796 | 4 823 | 277.3 | 0 |
| 2 10 | 1415 | 26.195 | 40.557 | 16.778 | 4.6664 | 276.5 | 0 |
| 2 10 | 1430 | 29.417 | 45.612 | 11.715 | 5 8609 | 273 5 | 0 |
| 2 10 | 1445 | 30.423 | 44.852 | 18 164 | 4.8767 | 271.5 | 0 |
| 2 10 | 1500 | 32.437 | 48.834 | 18.612 | 5 8878 | 277.4 | 0 |
| 2 10 | 1515 | 33.063 | 44 852 | 21.386 | 4 5814 | 279.9 | 0 |
| 2 10 | 1530 | 32.19 | 49 438 | 18.455 | 5.3934 | 281 8 | 0 |
| 2 10 | 1545 | 31.855 | 45.143 | 14.939 | 5.4717 | 290.9 | 0 |
| 2 10 | 1600 | 25 726 | 38.253 | 15.86 | 4.2794 | 306.5 | 0 |
| 2 10 | 1615 | 28.813 | 44 539 | 12 946 | 5.5388 | 293 4 | 0 |
| 2 10 | 1630 | 28.723 | 45.926 | 17 695 | 5 3666 | 294 1 | 0 |
| 2 10 | 1645 | 30.557 | 43.018 | 19 686 | 4 2391 | 303 1 | 0 |
| 2 10 | 1700 | 34.047 | 51.921 | 19.999 | 5 427 | 297 5 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 2 11 | 700 | 7 5857 | 16 956 | 2 36 | 3 4517 | 341 7 | 0 |
| 2 11 | 715 | 5 5254 | 13.111 | 36463 | 2 3556 | 169.9 | 0 |
| 2 11 | 730 | 8 7713 | 16.956 | 1.8992 | 3.2414 | 148 5 | 0 |
| 2 11 | 745 | 7 4895 | 11.729 | -.4049 | 2.7963 | 176 4 | 0 |
| 2 11 | 800 | 9.6907 | 15.109 | 5.2793 | 1.9238 | 233.4 | 0 |
| 2 11 | 815 | 4.2257 | 7.1204 | 1 2863 | 1 2684 | 356 2 | 0 |
| 2 11 | 830 | 3.4047 | 5.2771 | 1.4384 | 91493 | 51 72 | 0 |
| 2 11 | 845 | 1.7583 | 6.3508 | 05592 | 1.3512 | 30.64 | 0 |
| 2 11 | 900 | 4 5903 | 9.8764 | - 10066 | 2 4003 | 110 4 | 0 |
| 2 11 | 915 | 5.3755 | 9.2634 | 1.284 | 1.5368 | 258 2 | 0 |
| 2 11 | 930 | 4.1921 | 6.805 | 2 0513 | 1.0134 | 30.93 | 0 |
| 2 11 | 945 | 5.1227 | 8.7959 | 1.5905 | 1.7449 | 102.3 | 0 |
| 2 11 | 1000 | 7.098 | 12 317 | 2.2034 | 2.199 | 122 | 0 |
| 2 11 | 1015 | 6.0175 | 9 2478 | 2.662 | 1 2617 | 129 | 0 |
| 2 11 | 1030 | 5.814 | 9 8607 | 2.5099 | 1 1923 | 131 5 | 0 |
| 2 11 | 1045 | 6.418 | 10.776 | .82322 | 2.0491 | 122 4 | 0 |
| 2 11 | 1100 | 6.7043 | 10.467 | 2.0491 | 1.7225 | 129.2 | 0 |
| 2 11 | 1115 | 7.3016 | 12.301 | 1.8947 | 2.0088 | 128 | 0 |
| 2 11 | 1130 | 11.046 | 15.816 | 6 333 | 1.6979 | 135.6 | 0 |
| 2 11 | 1145 | 9.9815 | 14.133 | 2.9663 | 1 9037 | 126.2 | 0 |
| 2 11 | 1200 | 10.948 | 16 576 | 4.1899 | 2.4271 | 126 | 0 |
| 2 11 | 1215 | 10.02 | 15 659 | 4.6485 | 2 0044 | 121.5 | 0 |
| 2 11 | 1230 | 10 194 | 17.493 | 4.1899 | 2.4562 | 105 | 0 |
| 2 11 | 1245 | 7 9906 | 13.673 | 97757 | 2.4741 | 109.4 | 0 |
| 2 11 | 1300 | 6.2793 | 11.073 | 2.9663 | 1 7717 | 99.4 | 0 |
| 2 11 | 1315 | 6.2122 | 11.532 | 2.3533 | 1.9082 | 116 2 | 0 |
| 2 11 | 1330 | 5.456 | 9.8495 | 1.4362 | 1.9887 | 88.6 | 0 |
| 2 11 | 1345 | 4 5299 | 9.2343 | .21251 | 2.1431 | 54.07 | 0 |
| 2 11 | 1400 | 5.4986 | 12.599 | .21251 | 3 2504 | 19.81 | 0 |
| 2 11 | 1415 | 16.352 | 23.757 | 5.5634 | 4.1116 | 348.8 | 0 |
| 2 11 | 1430 | 17.672 | 23.757 | 12.29 | 2.2549 | 349.3 | 0 |
| 2 11 | 1445 | 15.285 | 19 618 | 8.3149 | 2.0759 | 353.9 | 0 |
| 2 11 | 1500 | 12.514 | 17.404 | 7.2456 | 1.8411 | .406 | 0 |
| 2 11 | 1515 | 10 467 | 14 048 | 5.1048 | 1 5927 | 11 19 | 0 |
| 2 11 | 1530 | 7.8877 | 11.834 | 4 6463 | 1.2908 | 11 88 | 0 |
| 2 11 | 1545 | 5.456 | 10.458 | 2.2012 | 1.6554 | 33 52 | 0 |
| 2 11 | 1600 | 3.8588 | 6.7893 | 1.4362 | 1.1275 | 7 28 | 0 |
| 2 11 | 1615 | 3 8946 | 9.2343 | .21251 | 1 9059 | 30.94 | 0 |
| 2 11 | 1630 | 4.8677 | 9.3865 | 21251 | 2 7605 | 121.6 | 0 |
| 2 11 | 1645 | 5 4382 | 8.4693 | 3.8812 | .8769 | 142 1 | 0 |
| 2 11 | 1700 | 4.3622 | 6.9392 | 2 3533 | 1.1767 | 145 8 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 2 12 | 700 | 5.0825 | 8 8093 | 1.7449 | 1.4943 | 294.8 | 0 |
| 2 12 | 715 | 6.6774 | 8.8093 | 4 049 | .85901 | 318 4 | 0 |
| 2 12 | 730 | 4 5478 | 7 4268 | 1 4384 | .98204 | 309 3 | 0 |
| 2 12 | 745 | 8.259 | 15.413 | 3.436 | 2 3981 | 308 1 | 0 |
| 2 12 | 800 | 9.9748 | 17.874 | 4.3577 | 2 9909 | 293 4 | 0 |
| 2 12 | 815 | 13.999 | 20 334 | 9.2701 | 1.9865 | 309.9 | 0 |
| 2 12 | 830 | 13.487 | 18.947 | 9.118 | 1.6778 | 307.8 | 0 |
| 2 12 | 845 | 13.57 | 20.334 | 7 2725 | 2.6464 | 309 4 | 0 |
| 2 12 | 900 | 13.243 | 18.791 | 6 8117 | 2.4585 | 308.1 | 0 |
| 2 12 | 915 | 10.087 | 17.091 | 2.36 | 3.1765 | 288.2 | 0 |
| 2 12 | 930 | 6.7311 | 10.955 | 3.8946 | 1.2975 | 229 3 | 0 |
| 2 12 | 945 | 4.1474 | 8.4961 | 1.5927 | 1.4272 | 219.1 | 0 |
| 2 12 | 1000 | 4.6955 | 8.3418 | 1 4384 | 1 4429 | 180.8 | 0 |
| 2 12 | 1015 | 5.8207 | 10 485 | .21028 | 2.36 | 176.8 | 0 |
| 2 12 | 1030 | 5.5097 | 10.63 | 1.284 | 1.9194 | 152.6 | 0 |
| 2 12 | 1045 | 6.4873 | 10.628 | 1.897 | 1.6889 | 155.9 | 0 |
| 2 12 | 1100 | 4.1094 | 9.0934 | 21251 | 1.8634 | 147.9 | 0 |
| 2 12 | 1115 | 7.2904 | 11.08 | 3.1206 | 1.6442 | 155.8 | 0 |
| 2 12 | 1130 | 5.9102 | 9.8518 | 1.7426 | 1.9238 | 175.3 | 0 |
| 2 12 | 1145 | 4.3085 | 8.1695 | .97757 | 1.7158 | 158 | 0 |
| 2 12 | 1200 | 4.6619 | 8.4715 | .21251 | 1.8321 | 141.2 | 0 |
| 2 12 | 1215 | 5.7648 | 10.917 | .51898 | 2.2102 | 111.8 | 0 |
| 2 12 | 1230 | 8.9659 | 17.024 | 1.7426 | 3.4987 | 349.8 | 0 |
| 2 12 | 1245 | 11.431 | 18.724 | 4.7984 | 3.1519 | 323.6 | 0 |
| 2 12 | 1300 | 4.1071 | 11 373 | 21251 | 2.6665 | 321.5 | 0 |
| 2 12 | 1315 | 9.2612 | 16.42 | 1 5883 | 3.266 | 130.4 | 0 |
| 2 12 | 1330 | 9.3663 | 14 887 | 3.1161 | 2.7314 | 103 6 | 0 |
| 2 12 | 1345 | 9.7421 | 18.567 | -.24607 | 4.5053 | 113.8 | 0 |
| 2 12 | 1400 | 10.899 | 16.285 | 4.8028 | 2.3735 | 126.3 | 0 |
| 2 12 | 1415 | 11.697 | 17.807 | 5.5679 | 2.199 | 137.7 | 0 |
| 2 12 | 1430 | 13.263 | 22 706 | 6.9459 | 2.8298 | 127.9 | 0 |
| 2 12 | 1445 | 13.109 | 17 963 | 7 8653 | 1.9372 | 125.2 | 0 |
| 2 12 | 1500 | 14.505 | 19 193 | 9 5498 | 2.0401 | 117.7 | 0 |
| 2 12 | 1515 | 14.118 | 20.871 | 6.796 | 2.9931 | 102.3 | 0 |
| 2 12 | 1530 | 13.341 | 19.35 | 6.6417 | 2.624 | 98 | 0 |
| 2 12 | 1545 | 14.936 | 19.037 | 6 4895 | 1.6934 | 106.6 | 0 |
| 2 12 | 1600 | 11.597 | 18.12 | 6.3352 | 2.407 | 110.2 | 0 |
| 2 12 | 1615 | 9.9502 | 14.145 | 6 031 | 1.5413 | 121.4 | 0 |
| 2 12 | 1630 | 6.8833 | 12.46 | 2 2012 | 2 2236 | 105 6 | 0 |
| 2 12 | 1645 | 3.9863 | 7.5611 | 1.5905 | 1.1789 | 96 8 | 0 |
| 2 12 | 1700 | 5.7536 | 10.011 | 2 9685 | 1 4764 | 82 3 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 2 13 | 700 | 12.972 | 18 366 | 7 9078 | 1 8411 | 355 8 | 0 |
| 2 13 | 715 | 11.402 | 15.748 | 7 5991 | 1.727 | 357 | 0 |
| 2 13 | 730 | 11.556 | 14.992 | 7.6013 | 1.4988 | 357.4 | 0 |
| 2 13 | 745 | 11.74 | 15.147 | 7.7534 | 1.5301 | 2.761 | 0 |
| 2 13 | 800 | 13.169 | 16 845 | 8 0622 | 1.4921 | 357.6 | 0 |
| 2 13 | 815 | 12.46 | 15.455 | 7.7557 | 1.5077 | 353.3 | 0 |
| 2 13 | 830 | 9.3641 | 12.529 | 5.9079 | 1.0671 | 16 7 | 0 |
| 2 13 | 845 | 7.4358 | 10.751 | 4.521 | 1.1923 | 46.39 | 0 |
| 2 13 | 900 | 6.8094 | 9.76 | 2.8276 | 1.0268 | 60.92 | 0 |
| 2 13 | 915 | 5 9773 | 8.5274 | 2 6732 | 1 4004 | 67 52 | 0 |
| 2 13 | 930 | 5.0288 | 8.0644 | 2.3645 | 1.4362 | 77.3 | 0 |
| 2 13 | 945 | 4.8409 | 9 6057 | 2.058 | 1.6129 | 80.6 | 0 |
| 2 13 | 1000 | 6.3978 | 11.762 | 2.2124 | 1.982 | 94.9 | 0 |
| 2 13 | 1015 | 6.0198 | 10.993 | 2.5189 | 2.1565 | 95.5 | 0 |
| 2 13 | 1030 | 8.3731 | 12.223 | 3 2906 | 1 6084 | 109 | 0 |
| 2 13 | 1045 | 6.1003 | 10.375 | 2.3645 | 1.8433 | 92.8 | 0 |
| 2 13 | 1100 | 5.4918 | 10.53 | 2.3645 | 1.595 | 87 1 | 0 |
| 2 13 | 1115 | 5.2793 | 9.9144 | 2 3645 | 1.9015 | 91.2 | 0 |
| 2 13 | 1130 | 4.7961 | 10 375 | 2.058 | 1.6688 | 81 2 | 0 |
| 2 13 | 1145 | 5.2637 | 9.297 | 1.9037 | 1.6017 | 74.5 | 0 |
| 2 13 | 1200 | 5.3912 | 8.9883 | 2.5189 | 1.5525 | 76.9 | 0 |
| 2 13 | 1215 | 5.6976 | 10.067 | 2.3645 | 1.7941 | 80 | 0 |
| 2 13 | 1230 | 5.7871 | 9.6034 | 2.8276 | 1 3758 | 77.2 | 0 |
| 2 13 | 1245 | 5.9079 | 8.3709 | 2.5189 | 1.369 | 72 3 | 0 |
| 2 13 | 1300 | 5.9348 | 9.2947 | 2.2102 | 1 2259 | 62.94 | 0 |
| 2 13 | 1315 | 6.4269 | 8.8339 | 3.4427 | 76505 | 51 74 | 0 |
| 2 13 | 1330 | 6.3822 | 9.2947 | 3 5971 | 1.0424 | 53.66 | 0 |
| 2 13 | 1345 | 6.6797 | 9.6012 | 4.521 | 1.0984 | 50.16 | 0 |
| 2 13 | 1400 | 7.2434 | 10.219 | 4.8297 | 1 1521 | 42 42 | 0 |
| 2 13 | 1415 | 6.7088 | 8.6773 | 4.3666 | .78071 | 49.71 | 0 |
| 2 13 | 1430 | 6.2703 | 7.9078 | 3.7515 | .77848 | 48.97 | 0 |
| 2 13 | 1445 | 6.6752 | 9.7556 | 2 9819 | 1 1565 | 51.83 | 0 |
| 2 13 | 1500 | 6.0846 | 8.5252 | 2.6732 | 1 1431 | 61 12 | 0 |
| 2 13 | 1515 | 5.1071 | 7 5991 | 2.5189 | 90598 | 60.91 | 0 |
| 2 13 | 1530 | 5.333 | 7.2904 | 2.8276 | 99546 | 46.54 | 0 |
| 2 13 | 1545 | 6.3307 | 8.523 | 4.2123 | .88809 | 42.1 | 0 |
| 2 13 | 1600 | 5 4628 | 8.0622 | 3.4427 | .93507 | 39.64 | 0 |
| 2 13 | 1615 | 5.984 | 7.9078 | 4.0579 | .77176 | 43 38 | 0 |
| 2 13 | 1630 | 5.2122 | 7.7534 | 2.9797 | 1 0447 | 36 5 | 0 |
| 2 13 | 1645 | 7.7356 | 9 2947 | 3.2884 | .84335 | 37.83 | 0 |
| 2 13 | 1700 | 7.2792 | 10 219 | 4 8297 | 1 0492 | 39 21 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 2 14 | 700 | 7.2345 | 8.8541 | 4 6843 | .75163 | 356 2 | 0 |
| 2 14 | 715 | 6 8743 | 8.391 | 4.993 | 68452 | 359 5 | 0 |
| 2 14 | 730 | 6.7289 | 8.2366 | 4 8386 | .66886 | 15 51 | 0 |
| 2 14 | 745 | 6.541 | 7.9279 | 4.8386 | .5682 | 19.47 | 0 |
| 2 14 | 800 | 5.5836 | 7.0018 | 4.0669 | 57267 | 9 93 | 0 |
| 2 14 | 815 | 5.6932 | 7.0018 | 4 0669 | .56372 | 359 | 0 |
| 2 14 | 830 | 5.8028 | 7 3105 | 3.6038 | .68005 | 357.7 | 0 |
| 2 14 | 845 | 6 0891 | 8 0823 | 3.6038 | .77176 | 3.026 | 0 |
| 2 14 | 900 | 5.257 | 6.6931 | 3.1408 | .66886 | 15.22 | 0 |
| 2 14 | 915 | 5.1764 | 6.5365 | 2.9864 | .56372 | 19.14 | 0 |
| 2 14 | 930 | 5.0019 | 6 0735 | 3 2951 | .53241 | 14 88 | 0 |
| 2 14 | 945 | 5.0042 | 6.2278 | 3.6038 | .57491 | 11.9 | 0 |
| 2 14 | 1000 | 5.6887 | 7 3038 | 3 7559 | .59952 | 13 57 | 0 |
| 2 14 | 1015 | 6.5567 | 8.693 | 4 5277 | .76729 | 4 579 | 0 |
| 2 14 | 1030 | 7.3799 | 9.9233 | 5.4493 | .88585 | 1 885 | 0 |
| 2 14 | 1045 | 7.6841 | 9.9211 | 4 3689 | .99099 | 12 62 | 0 |
| 2 14 | 1100 | 7.5767 | 10.073 | 4.8319 | .90375 | 18 77 | 0 |
| 2 14 | 1115 | 7.6617 | 10.069 | 4.3689 | .92612 | 12 31 | 0 |
| 2 14 | 1130 | 7.5655 | 9.76 | 4 8297 | .96415 | 10.33 | 0 |
| 2 14 | 1145 | 8 2747 | 10.527 | 6.06 | .8769 | 13.3 | 0 |
| 2 14 | 1200 | 7 5007 | 10.525 | 4.8275 | 1.1722 | 9 29 | 0 |
| 2 14 | 1215 | 7.9302 | 10.523 | 5.1362 | 1.1677 | 357.2 | 0 |
| 2 14 | 1230 | 9.0889 | 11.29 | 6.2122 | .81203 | 356 8 | 0 |
| 2 14 | 1245 | 8.5856 | 10 827 | 5 2883 | 1.0044 | 4.379 | 0 |
| 2 14 | 1300 | 9.2321 | 11 597 | 5.1339 | 1.0223 | 10.34 | 0 |
| 2 14 | 1315 | 8.212 | 10 981 | 5.4404 | 1.1319 | 2.87 | 0 |
| 2 14 | 1330 | 7.91 | 10.825 | 4.6709 | 1.0805 | 8.38 | 0 |
| 2 14 | 1345 | 6.7848 | 9.9032 | 3.2862 | 1.2236 | 1.921 | 0 |
| 2 14 | 1400 | 6.6394 | 9.7511 | 3.9013 | 1.1342 | 348.2 | 0 |
| 2 14 | 1415 | 8.0107 | 10 521 | 5 9034 | .86796 | 351 1 | 0 |
| 2 14 | 1430 | 7.4962 | 9.2903 | 4 9796 | .82545 | 4.207 | 0 |
| 2 14 | 1445 | 7.5432 | 10.521 | 5.4426 | .97981 | 359.1 | 0 |
| 2 14 | 1500 | 8.863 | 11.908 | 6.2122 | .92612 | 359.8 | 0 |
| 2 14 | 1515 | 8.0331 | 10.523 | 5.597 | .97309 | 2.167 | 0 |
| 2 14 | 1530 | 8.7713 | 11.603 | 5.2905 | 1.0917 | 359 2 | 0 |
| 2 14 | 1545 | 9.5229 | 11.912 | 5.4449 | .98204 | 356.2 | 0 |
| 2 14 | 1600 | 9.9591 | 12.838 | 6.5231 | 1.2863 | 355.4 | 0 |
| 2 14 | 1615 | 11.509 | 14 071 | 7.6013 | 1.2147 | 358.9 | 0 |
| 2 14 | 1630 | 13.057 | 14 997 | 8.9883 | .97981 | 2.724 | 0 |
| 2 14 | 1645 | 12 093 | 15.462 | 8 221 | 1.2751 | 358.6 | 0 |
| 2 14 | 1700 | 12.574 | 16.084 | 7.7602 | 1.3489 | 355.3 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 2 15 | 700 | .30423 | 1.1342 | -.25502 | .34897 | 218.8 | 0 |
| 2 15 | 715 | 1.6218 | 2.369 | 36239 | .32213 | 292.7 | 0 |
| 2 15 | 730 | 2.5726 | 3.7604 | 1.2885 | .49438 | 328 6 | 0 |
| 2 15 | 745 | 1 7113 | 2 8343 | 6711 | .33108 | 353 5 | 0 |
| 2 15 | 800 | 2 1609 | 3.2973 | 1.1342 | .35792 | 19.75 | 0 |
| 2 15 | 815 | 1.0492 | 2.6777 | .05369 | .68005 | 60.09 | 0 |
| 2 15 | 830 | 67781 | 2.2146 | 05369 | .54806 | 145.1 | 0 |
| 2 15 | 845 | .48095 | 1.4429 | -.82322 | .43845 | 197.4 | 0 |
| 2 15 | 900 | 1.34 | 2.369 | .05592 | .46306 | 198.4 | 0 |
| 2 15 | 915 | 3.0088 | 4.5299 | 1.5972 | .5928 | 207.3 | 0 |
| 2 15 | 930 | 3.2414 | 4.5299 | 1 7516 | .52569 | 229.4 | 0 |
| 2 15 | 945 | 3.9998 | 4.9908 | 2 5233 | .5078 | 218.8 | 0 |
| 2 15 | 1000 | 4.6395 | 5.9169 | 3.1385 | .62412 | 192.5 | 0 |
| 2 15 | 1015 | 5.4337 | 6.6886 | 4.0646 | .48767 | 193.7 | 0 |
| 2 15 | 1030 | 5.5947 | 6.6864 | 4.0646 | .51004 | 194 4 | 0 |
| 2 15 | 1045 | 5.3017 | 6.6864 | 3.7559 | 61741 | 190.8 | 0 |
| 2 15 | 1100 | 4.5948 | 5.7603 | 3.6016 | .39819 | 188 9 | 0 |
| 2 15 | 1115 | 4.4919 | 5 4516 | 3.2929 | .37134 | 180.5 | 0 |
| 2 15 | 1130 | 3.3868 | 4.5255 | 2.058 | .54583 | 172.2 | 0 |
| 2 15 | 1145 | 4.1541 | 5 4493 | 2.6755 | .53017 | 180.3 | 0 |
| 2 15 | 1200 | 3.6038 | 4.8319 | 2.3668 | .45635 | 176.8 | 0 |
| 2 15 | 1215 | 3.8566 | 5.1384 | 2.5189 | .47201 | 184.6 | 0 |
| 2 15 | 1230 | 2.832 | 4.2145 | 1.595 | .57938 | 195.2 | 0 |
| 2 15 | 1245 | 1.3534 | 2.2102 | .20804 | .36016 | 187.9 | 0 |
| 2 15 | 1300 | .54359 | 1.4406 | 05592 | .41161 | 40.69 | 0 |
| 2 15 | 1315 | 1.8411 | 4.21 | -.09843 | 1.3176 | 45.81 | 0 |
| 2 15 | 1330 | 3.8186 | 5.2883 | 2.0558 | .4899 | 29.5 | 0 |
| 2 15 | 1345 | 2.7336 | 4.5165 | 1.4406 | .69794 | 20.13 | 0 |
| 2 15 | 1400 | .89704 | 2.5166 | .05592 | .65768 | 46 31 | 0 |
| 2 15 | 1415 | .90375 | 2.0558 | -.66439 | .44516 | 137 2 | 0 |
| 2 15 | 1430 | 2.3779 | 5.5903 | .6711 | 1.1252 | 87.8 | 0 |
| 2 15 | 1445 | 3.2929 | 5 1294 | 1.5927 | .65991 | 155.8 | 0 |
| 2 15 | 1500 | 4.3129 | 5.5903 | 2.2079 | .74716 | 153.7 | 0 |
| 2 15 | 1515 | 4.3443 | 6.9727 | 2 2079 | .8523 | 145.5 | 0 |
| 2 15 | 1530 | 6.0824 | 8.0487 | 4 5143 | .67781 | 147.4 | 0 |
| 2 15 | 1545 | 7.0197 | 9.4334 | 4.9751 | .83664 | 144.3 | 0 |
| 2 15 | 1600 | 8.6661 | 10.509 | 6.5119 | .82993 | 141.8 | 0 |
| 2 15 | 1615 | 8.3328 | 12 509 | 5 4359 | .91493 | 136.9 | 0 |
| 2 15 | 1630 | 10.109 | 13.433 | 7.4358 | 1 4943 | 136.3 | 0 |
| 2 15 | 1645 | 8 9391 | 12.051 | 5 1317 | 1.1028 | 153.6 | 0 |
| 2 15 | 1700 | 10.109 | 13.898 | 1.595 | 2 3645 | 159 1 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 2 16 | 700 | 20.044 | 29.797 | 12 693 | 3.3801 | 285 1 | 0 |
| 2 16 | 715 | 16.8 | 29 327 | 8 8384 | 4.2682 | 298.1 | 0 |
| 2 16 | 730 | 13.482 | 21.475 | 8.0689 | 2.6822 | 310 8 | 0 |
| 2 16 | 745 | 11.254 | 17.628 | 5 1406 | 1.9104 | 333.8 | 0 |
| 2 16 | 800 | 7.4291 | 12 999 | 2.5211 | 1 5502 | 355 | 0 |
| 2 16 | 815 | 5.333 | 7.7602 | 3.2906 | 84782 | 358.7 | 0 |
| 2 16 | 830 | 2.9752 | 5.1384 | 05369 | 1.3333 | 39.75 | 0 |
| 2 16 | 845 | 3.4226 | 7.1405 | 05592 | 1.3556 | 118 6 | 0 |
| 2 16 | 900 | 4.3935 | 9.4491 | 1 2863 | 1.7829 | 72 2 | 0 |
| 2 16 | 915 | 9.3574 | 12.682 | 6.3687 | 1.5972 | 169 9 | 0 |
| 2 16 | 930 | 8.8742 | 12.06 | 6.3665 | .94178 | 158.9 | 0 |
| 2 16 | 945 | 5.9817 | 11.599 | 1.4406 | 2.2728 | 193.9 | 0 |
| 2 16 | 1000 | 3.5233 | 6.6707 | .82545 | 1.1744 | 255.6 | 0 |
| 2 16 | 1015 | 6.1361 | 8.3619 | 2.671 | 1.0089 | 184 1 | 0 |
| 2 16 | 1030 | 7.3284 | 11.59 | 4 823 | 1 208 | 163 | 0 |
| 2 16 | 1045 | 7.7669 | 10.203 | 5 5903 | 8344 | 181.6 | 0 |
| 2 16 | 1100 | 7.1047 | 9.4312 | 5 1272 | 82993 | 190.1 | 0 |
| 2 16 | 1115 | 5.9817 | 8.3552 | 3.8969 | .86124 | 190 6 | 0 |
| 2 16 | 1130 | 6.3262 | 9 2746 | 3.8969 | 1.1543 | 191 9 | 0 |
| 2 16 | 1145 | 7.1226 | 9.4267 | 4.8185 | .8344 | 187.5 | 0 |
| 2 16 | 1200 | 8.4894 | 11.113 | 5.2771 | 1 17 | 163 | 0 |
| 2 16 | 1215 | 9.373 | 11.266 | 7 1204 | .74939 | 165.5 | 0 |
| 2 16 | 1230 | 10.053 | 12.339 | 6.0444 | .97981 | 169.5 | 0 |
| 2 16 | 1245 | 9.9726 | 12.339 | 6 9683 | .98652 | 180 | 0 |
| 2 16 | 1300 | 8 7802 | 11.724 | 6 0444 | .95967 | 181 3 | 0 |
| 2 16 | 1315 | 7.2703 | 9.5766 | 4.9706 | 1.0715 | 182.2 | 0 |
| 2 16 | 1330 | 6.6797 | 9.2679 | 3.8946 | 1.0469 | 172.3 | 0 |
| 2 16 | 1345 | 5.2681 | 8.1941 | 3.1273 | 1.0693 | 164 7 | 0 |
| 2 16 | 1400 | 4.7559 | 7.4246 | 2.0536 | 98652 | 138.9 | 0 |
| 2 16 | 1415 | 4.3443 | 6.3508 | 1.4384 | .97086 | 84.1 | 0 |
| 2 16 | 1430 | 3.9103 | 6 3508 | 1.5927 | 1.17 | 78 9 | 0 |
| 2 16 | 1445 | 2 4428 | 4.6597 | 97757 | .64873 | 85 4 | 0 |
| 2 16 | 1500 | 4.0848 | 7.268 | 1.1319 | 1.4831 | 130 | 0 |
| 2 16 | 1515 | 3.3533 | 6.192 | .05816 | 1.7001 | 172 4 | 0 |
| 2 16 | 1530 | 1.51 | 4.6597 | -.70913 | 1.2415 | 74.3 | 0 |
| 2 16 | 1545 | 3.0446 | 5 5791 | .82545 | 1.1252 | 70.4 | 0 |
| 2 16 | 1600 | 5.6484 | 12.791 | 2.0513 | 2.9461 | 71 | 0 |
| 2 16 | 1615 | 2.5837 | 4 5053 | 05816 | 1 0067 | 169 3 | 0 |
| 2 16 | 1630 | 3.6843 | 8.4939 | 05816 | 2 5636 | 43.09 | 0 |
| 2 16 | 1645 | 3.9416 | 7.4201 | .6711 | 2 0223 | 77.8 | 0 |
| 2 16 | 1700 | 2 0312 | 4.9661 | .05816 | 1 2684 | 226 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 2 17 | 700 | 15 391 | 21.274 | 9 8987 | 1.7874 | 196.8 | 0 |
| 2 17 | 715 | 12.033 | 15 435 | 8.3619 | 1.3444 | 199.4 | 0 |
| 2 17 | 730 | 10.261 | 13.438 | 8.5163 | .88585 | 204.4 | 0 |
| 2 17 | 745 | 8.8429 | 12.362 | 5.5925 | 1.7874 | 220 6 | 0 |
| 2 17 | 800 | 8.4492 | 11 286 | 6.362 | 90151 | 213.6 | 0 |
| 2 17 | 815 | 10.288 | 14.205 | 6.0533 | 1.8545 | 204 1 | 0 |
| 2 17 | 830 | 11.865 | 14.357 | 9.2836 | .95967 | 197.9 | 0 |
| 2 17 | 845 | 12.14 | 17.583 | 8.8205 | 1.3512 | 190.1 | 0 |
| 2 17 | 900 | 13.919 | 18.343 | 8.6639 | 1.9686 | 184 3 | 0 |
| 2 17 | 915 | 13.456 | 20.491 | 8.0465 | 2.3489 | 183.5 | 0 |
| 2 17 | 930 | 13.019 | 17.56 | 7.1226 | 2.1386 | 183.6 | 0 |
| 2 17 | 945 | 11.791 | 16.196 | 8 6572 | 1.3198 | 178 | 0 |
| 2 17 | 1000 | 10.93 | 16.8 | 5.125 | 2.7023 | 172 8 | 0 |
| 2 17 | 1015 | 11.923 | 17.404 | 7.4246 | 1.8522 | 172.1 | 0 |
| 2 17 | 1030 | 12.225 | 18.008 | 6 0421 | 2.4875 | 181 1 | 0 |
| 2 17 | 1045 | 11.431 | 18.478 | 5.7357 | 2.4875 | 174 3 | 0 |
| 2 17 | 1100 | 12.612 | 16 778 | 8.0375 | 1.8276 | 172.4 | 0 |
| 2 17 | 1115 | 9.7175 | 14.174 | 5.4292 | 1.6576 | 176.3 | 0 |
| 2 17 | 1130 | 8 0331 | 12.335 | 4.9684 | 1.586 | 171.9 | 0 |
| 2 17 | 1145 | 12.693 | 27.515 | 4.5076 | 5.1719 | 196 1 | 0 |
| 2 17 | 1200 | 19.999 | 34.875 | 11.872 | 4.2033 | 230.8 | 0 |
| 2 17 | 1215 | 16.352 | 35.188 | 4.9661 | 6.418 | 291.8 | 0 |
| 2 17 | 1230 | 14.621 | 28 432 | 1.5927 | 6.1025 | 289 1 | 0 |
| 2 17 | 1245 | 15.207 | 31.497 | 2.5122 | 6.5522 | 267.7 | 0 |
| 2 17 | 1300 | 16.084 | 37.022 | 3.1251 | 6.3419 | 237.1 | 0 |
| 2 17 | 1315 | 23.287 | 36.418 | 7 7288 | 5.7737 | 254.3 | 0 |
| 2 17 | 1330 | 20.782 | 36.575 | 11.565 | 4.9169 | 247.7 | 0 |
| 2 17 | 1345 | 17.359 | 36.575 | 7.268 | 5.6797 | 235 6 | 0 |
| 2 17 | 1400 | 22.258 | 34.897 | 8 3418 | 4.738 | 256.7 | 0 |
| 2 17 | 1415 | 19.507 | 35 188 | 7 4201 | 6.3441 | 253.6 | 0 |
| 2 17 | 1430 | 21.162 | 39.64 | 8.6505 | 5.8095 | 265.6 | 0 |
| 2 17 | 1445 | 12.684 | 21.542 | 5.7357 | 3.4718 | 260.3 | 0 |
| 2 17 | 1500 | 5 9996 | 14 4 | 2.2057 | 2.2213 | 237.4 | 0 |
| 2 17 | 1515 | 8.5744 | 16.778 | .51675 | 3.5814 | 246.8 | 0 |
| 2 17 | 1530 | 14 455 | 25 994 | 5.7334 | 4 2883 | 229 7 | 0 |
| 2 17 | 1545 | 16 33 | 26.128 | 10.181 | 3.4853 | 226 6 | 0 |
| 2 17 | 1600 | 17.001 | 30.423 | 7.881 | 5.1272 | 224 2 | 0 |
| 2 17 | 1615 | 21.99 | 35.949 | 10.796 | 5.3956 | 221 3 | 0 |
| 2 17 | 1630 | 18 634 | 28 902 | 10.487 | 3 9975 | 232 8 | 0 |
| 2 17 | 1645 | 14 064 | 26 128 | 7 268 | 3.1654 | 218 6 | 0 |
| 2 17 | 1700 | 10 892 | 20.312 | 4.9661 | 3.1408 | 251 8 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 2 18 | 700 | 8.5028 | 9.6079 | 6.371 | 62189 | 193.5 | 0 |
| 2 18 | 715 | 8.1785 | 9.2992 | 7.1427 | 4899 | 201 | 0 |
| 2 18 | 730 | 8 0375 | 9 4536 | 6.371 | 6107 | 206 7 | 0 |
| 2 18 | 745 | 7.8563 | 9.76 | 5 7558 | .86796 | 210 9 | 0 |
| 2 18 | 800 | 6.9973 | 11 145 | 3 5993 | 1.6666 | 154 1 | 0 |
| 2 18 | 815 | 8.8048 | 12.223 | 5.1384 | 1 4406 | 140 5 | 0 |
| 2 18 | 830 | 9.9435 | 14.068 | 6.06 | 1.6666 | 147 4 | 0 |
| 2 18 | 845 | 11.46 | 15.294 | 6.8296 | 1.6442 | 153.3 | 0 |
| 2 18 | 900 | 12.402 | 15.905 | 7.2882 | 1.9082 | 158.9 | 0 |
| 2 18 | 915 | 11.811 | 15 444 | 7.5946 | 1.5637 | 155.3 | 0 |
| 2 18 | 930 | 12.84 | 16.666 | 9.4401 | 1.4116 | 162 1 | 0 |
| 2 18 | 945 | 13.046 | 16 979 | 7 1316 | 1 6129 | 168 | 0 |
| 2 18 | 1000 | 12.905 | 17 583 | 6 975 | 1 727 | 166.7 | 0 |
| 2 18 | 1015 | 13.702 | 18.209 | 7.4358 | 2 1498 | 160.7 | 0 |
| 2 18 | 1030 | 12.858 | 16.822 | 8.8183 | 1.6487 | 159 1 | 0 |
| 2 18 | 1045 | 12.688 | 16.8 | 7.8944 | 1.765 | 161 7 | 0 |
| 2 18 | 1100 | 12.218 | 17.426 | 6.8184 | 2.1721 | 163 5 | 0 |
| 2 18 | 1115 | 10.503 | 16.196 | 5 4337 | 2.1923 | 163 | 0 |
| 2 18 | 1130 | 11.809 | 19.73 | 5.1272 | 2.9797 | 156 7 | 0 |
| 2 18 | 1145 | 12.212 | 17.27 | 6.9683 | 1.8768 | 159 8 | 0 |
| 2 18 | 1200 | 9.8786 | 14.954 | 5 2793 | 1.8053 | 158 4 | 0 |
| 2 18 | 1215 | 9.288 | 15.57 | 4.2033 | 2.6464 | 164 2 | 0 |
| 2 18 | 1230 | 10.058 | 16.33 | 3.5882 | 1.9596 | 140 7 | 0 |
| 2 18 | 1245 | 7.9906 | 13.263 | 3 2817 | 1.7918 | 157.1 | 0 |
| 2 18 | 1300 | 9.3082 | 14 185 | 5.4314 | 2.0715 | 144 9 | 0 |
| 2 18 | 1315 | 9.5833 | 16.017 | 3.2817 | 2.2102 | 163.7 | 0 |
| 2 18 | 1330 | 3.6843 | 12.648 | .21028 | 2.9327 | 283.4 | 0 |
| 2 18 | 1345 | 7.2345 | 20.334 | .21028 | 4.5657 | 140 1 | 0 |
| 2 18 | 1400 | 6.8609 | 12.65 | 2 9752 | 1 6151 | 130.6 | 0 |
| 2 18 | 1415 | 6.7692 | 11.116 | 2 6687 | 1 8992 | 150.5 | 0 |
| 2 18 | 1430 | 4.6977 | 8 9659 | 1 7471 | 1.8321 | 154.9 | 0 |
| 2 18 | 1445 | 5.8811 | 14.802 | 21028 | 3 4651 | 150 2 | 0 |
| 2 18 | 1500 | 7.6953 | 14.033 | 2.0536 | 2.8499 | 199.6 | 0 |
| 2 18 | 1515 | 4.0423 | 7.1204 | 1.1319 | 1.3646 | 179.4 | 0 |
| 2 18 | 1530 | 2.2594 | 5.5858 | .21028 | 1 076 | 184 4 | 0 |
| 2 18 | 1545 | 2.1677 | 5 4314 | .05592 | 1 1364 | 112.7 | 0 |
| 2 18 | 1600 | 2.6262 | 6.5052 | .05592 | 1.9015 | 185.5 | 0 |
| 2 18 | 1615 | 3.275 | 6.503 | .21028 | 1 3825 | 80.5 | 0 |
| 2 18 | 1630 | 4.8364 | 8 9592 | 1 7449 | 1 8701 | 71 4 | 0 |
| 2 18 | 1645 | 8.2769 | 11.259 | 3.7403 | 1 2281 | 56 69 | 0 |
| 2 18 | 1700 | 5.3084 | 8.344 | 2.36 | 1 3064 | 75 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 2 19 | 700 | 3 5054 | 4 2167 | 2 8298 | .29528 | 259.6 | 0 |
| 2 19 | 715 | 3.5501 | 4.5255 | 2 2124 | 48543 | 243.4 | 0 |
| 2 19 | 730 | 3.6508 | 4 8319 | 1.4429 | 45635 | 262.2 | 0 |
| 2 19 | 745 | 1 5883 | 3 1385 | 05369 | .66439 | 268.1 | 0 |
| 2 19 | 800 | 1 9261 | 2.8298 | 97981 | 44069 | 283 3 | 0 |
| 2 19 | 815 | 2 4271 | 4 6776 | .6711 | .91046 | 332 | 0 |
| 2 19 | 830 | 5.4001 | 6.6774 | 3.2906 | .70018 | 348 2 | 0 |
| 2 19 | 845 | 4.7849 | 6.2144 | 2.3645 | .75611 | 352 9 | 0 |
| 2 19 | 900 | 3 5501 | 4.6731 | 2.3645 | .4295 | 359.1 | 0 |
| 2 19 | 915 | 2 9998 | 4 8252 | 82545 | 73821 | 30 83 | 0 |
| 2 19 | 930 | 1.8925 | 3.8991 | .21028 | .84782 | 47.16 | 0 |
| 2 19 | 945 | 2.7627 | 4.512 | .21028 | .79413 | 68.81 | 0 |
| 2 19 | 1000 | 2.7739 | 4.6641 | 51675 | 83887 | 83.5 | 0 |
| 2 19 | 1015 | 1.8209 | 3.8969 | .21028 | 1.038 | 107 2 | 0 |
| 2 19 | 1030 | 1.3937 | 4.049 | .05592 | 1.0313 | 130 9 | 0 |
| 2 19 | 1045 | 1.8813 | 5.1205 | 05816 | 1.2348 | 110.4 | 0 |
| 2 19 | 1100 | 2.0245 | 4.814 | .05816 | 1.0961 | 113.4 | 0 |
| 2 19 | 1115 | 2.8745 | 6.3464 | .51675 | 1.2169 | 136.5 | 0 |
| 2 19 | 1130 | 4.0937 | 7.7244 | .51675 | 1.5614 | 133.3 | 0 |
| 2 19 | 1145 | 4.1742 | 7.4179 | .6711 | 1 5592 | 136.3 | 0 |
| 2 19 | 1200 | 4.7067 | 9.4111 | .05816 | 1.9775 | 145 1 | 0 |
| 2 19 | 1215 | 4.8901 | 9.4133 | .82545 | 1.8321 | 126.4 | 0 |
| 2 19 | 1230 | 4.4136 | 8.0308 | .97757 | 1.4675 | 176.8 | 0 |
| 2 19 | 1245 | 3.058 | 7 8765 | 05816 | 1.9261 | 128.2 | 0 |
| 2 19 | 1300 | 3.351 | 9 2567 | .05816 | 1.9104 | 205 7 | 0 |
| 2 19 | 1315 | 2.0916 | 4 8118 | 05816 | 1.2952 | 174.1 | 0 |
| 2 19 | 1330 | 4.0579 | 11 404 | 05816 | 2.8186 | 65 72 | 0 |
| 2 19 | 1345 | 8.8652 | 13 704 | 4.351 | 1 7918 | 16.61 | 0 |
| 2 19 | 1400 | 10.194 | 14.471 | 6.3441 | 1.463 | 27 84 | 0 |
| 2 19 | 1415 | 8.2143 | 11.863 | 3.738 | 1.5905 | 13.78 | 0 |
| 2 19 | 1430 | 7.0667 | 12.017 | 2.9707 | 1.9484 | 11.83 | 0 |
| 2 19 | 1445 | 7.277 | 11.404 | 2.8186 | 1.6531 | 21.32 | 0 |
| 2 19 | 1500 | 6.7893 | 10.791 | 2.0513 | 1.8522 | 13.24 | 0 |
| 2 19 | 1515 | 7 4067 | 11.25 | 2.6643 | 1.6845 | 8 24 | 0 |
| 2 19 | 1530 | 8.2657 | 12.63 | 3.4316 | 1 8433 | 358.6 | 0 |
| 2 19 | 1545 | 10.4 | 14 015 | 6.8072 | 1 3288 | 1.634 | 0 |
| 2 19 | 1600 | 10 474 | 12.941 | 6.4985 | 1.0738 | 356 7 | 0 |
| 2 19 | 1615 | 9 1538 | 12 176 | 5 5791 | 1 2438 | 358 5 | 0 |
| 2 19 | 1630 | 10.138 | 12 948 | 6 9615 | 1 17 | 353 2 | 0 |
| 2 19 | 1645 | 9.9927 | 12.791 | 7 1159 | 99546 | 355 4 | 0 |
| 2 19 | 1700 | 9.3395 | 12 183 | 6 3486 | 1 1879 | 349 2 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 2 20 | 700 | 4.6418 | 6.06 | 2 9819 | 6107 | 350 6 | 0 |
| 2 20 | 715 | 4.8453 | 6.9839 | 3 134 | .80979 | 2.544 | 0 |
| 2 20 | 730 | 3.5143 | 6.8296 | 97981 | 1.4966 | 46.76 | 0 |
| 2 20 | 745 | 1.8679 | 3.4427 | 05592 | 1.0044 | 62 65 | 0 |
| 2 20 | 800 | 2.1744 | 4 0579 | 82545 | 57267 | 13 1 | 0 |
| 2 20 | 815 | 3.011 | 4.2123 | 1.4406 | .63083 | 312 2 | 0 |
| 2 20 | 830 | 4.3152 | 6.3687 | 2.3645 | 85453 | 355.9 | 0 |
| 2 20 | 845 | 6.06 | 8.5252 | 3.4427 | .94178 | 357.3 | 0 |
| 2 20 | 900 | 3.3175 | 5.9057 | 1 2863 | .96638 | 69.27 | 0 |
| 2 20 | 915 | 3.483 | 5.597 | 2 0558 | .76505 | 153 | 0 |
| 2 20 | 930 | 4.1989 | 6.8296 | 1 4406 | .88361 | 183.7 | 0 |
| 2 20 | 945 | 1 5055 | 2.9797 | .05592 | .70913 | 301.5 | 0 |
| 2 20 | 1000 | 1.0559 | 2.5189 | .05592 | 61741 | 340.7 | 0 |
| 2 20 | 1015 | 2.6844 | 5.7513 | 05592 | 1.161 | 314.5 | 0 |
| 2 20 | 1030 | 5.3218 | 7.9056 | 2 9797 | 1.0715 | 313 5 | 0 |
| 2 20 | 1045 | 7.3978 | 9.1359 | 5 4426 | .80979 | 340 5 | 0 |
| 2 20 | 1100 | 6.4269 | 8 5185 | 3.7492 | 1.161 | 336 6 | 0 |
| 2 20 | 1115 | 6.201 | 8.5185 | 2.9797 | 1.0961 | 29 32 | 0 |
| 2 20 | 1130 | 5.814 | 8.2076 | 3.5949 | .93507 | 39 93 | 0 |
| 2 20 | 1145 | 3.0222 | 5.286 | .6711 | 1.0492 | 98.8 | 0 |
| 2 20 | 1200 | 4.3532 | 7.1293 | .82545 | 1.5525 | 207.2 | 0 |
| 2 20 | 1215 | 7.5342 | 10.051 | 4 5165 | 1.3176 | 184.1 | 0 |
| 2 20 | 1230 | 5.8363 | 7.2837 | 4.0534 | .65991 | 199.3 | 0 |
| 2 20 | 1245 | 3 1833 | 6 0533 | .21028 | 1.1342 | 250 5 | 0 |
| 2 20 | 1300 | 2.3108 | 5.5903 | .21028 | 1.1163 | 74.8 | 0 |
| 2 20 | 1315 | 3.8901 | 7.277 | 1 4384 | 1.2147 | 93 9 | 0 |
| 2 20 | 1330 | 3.5904 | 6.5074 | .82545 | 1.1453 | 57.86 | 0 |
| 2 20 | 1345 | 3.8297 | 6.6596 | 1.5927 | 1.0357 | 71 1 | 0 |
| 2 20 | 1400 | 2.4629 | 5 1227 | .82545 | .79861 | 96.9 | 0 |
| 2 20 | 1415 | 5.0601 | 7.8854 | 1 5927 | 1.4004 | 119 9 | 0 |
| 2 20 | 1430 | 3.3712 | 8.3463 | 1.1319 | 1 4541 | 78.3 | 0 |
| 2 20 | 1445 | 3.568 | 5.5813 | 82545 | .89033 | 77 6 | 0 |
| 2 20 | 1500 | 3.3823 | 5.7357 | 21028 | 1.0246 | 32 | 0 |
| 2 20 | 1515 | 5.6932 | 8.8048 | .97757 | 1.4966 | 5.117 | 0 |
| 2 20 | 1530 | 6.9235 | 11.109 | 4.6619 | 1.1565 | 8.18 | 0 |
| 2 20 | 1545 | 7.3374 | 13.104 | 2.5122 | 2 152 | 350 6 | 0 |
| 2 20 | 1600 | 8.8898 | 12 644 | 4.5076 | 1.4451 | 7.67 | 0 |
| 2 20 | 1615 | 6.7625 | 11.722 | 2.5122 | 1.8366 | 7 57 | 0 |
| 2 20 | 1630 | 6.2703 | 9.7287 | 2 8209 | 1.425 | 16 35 | 0 |
| 2 20 | 1645 | 6.1674 | 12 798 | 2.8209 | 1.671 | 63 82 | 0 |
| 2 20 | 1700 | 10.167 | 13 261 | 6.966 | 1 3869 | 69.34 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 2 21 | 700 | 15 793 | 21 587 | 10.205 | 1.8478 | 304.1 | 0 |
| 2 21 | 715 | 18.164 | 26 039 | 9 7444 | 2.7985 | 312.9 | 0 |
| 2 21 | 730 | 16.778 | 23.421 | 10.512 | 2.5681 | 313.1 | 0 |
| 2 21 | 745 | 16.151 | 22.034 | 10 972 | 2.2974 | 313 2 | 0 |
| 2 21 | 800 | 15.153 | 21.744 | 9 8965 | 2.0312 | 321.1 | 0 |
| 2 21 | 815 | 13.006 | 20.804 | 7.4358 | 2 2415 | 322 | 0 |
| 2 21 | 830 | 12.113 | 16.666 | 6 6663 | 1.6688 | 352.6 | 0 |
| 2 21 | 845 | 11 134 | 15 585 | 7.1271 | 1.7941 | 325.8 | 0 |
| 2 21 | 900 | 10.232 | 14 966 | 6 5119 | 1.7695 | 313.9 | 0 |
| 2 21 | 915 | 14.952 | 21.43 | 7.74 | 1 9797 | 311 | 0 |
| 2 21 | 930 | 12.881 | 19 73 | 8.353 | 2.1811 | 305.6 | 0 |
| 2 21 | 945 | 13.013 | 20 021 | 7 5834 | 1.9104 | 297.9 | 0 |
| 2 21 | 1000 | 15.111 | 20.491 | 9.8875 | 1.7695 | 294 | 0 |
| 2 21 | 1015 | 12.977 | 19.73 | 6.6618 | 2 4227 | 302.2 | 0 |
| 2 21 | 1030 | 16.464 | 21.095 | 9.7354 | 2.1609 | 296.6 | 0 |
| 2 21 | 1045 | 15.073 | 22.952 | 9 7332 | 2.1498 | 311.5 | 0 |
| 2 21 | 1100 | 15.341 | 23 869 | 8 6572 | 3.7246 | 346.8 | 0 |
| 2 21 | 1115 | 15 659 | 24 943 | 9 4222 | 3 2862 | 39 33 | 0 |
| 2 21 | 1130 | 13.778 | 19.551 | 7 7333 | 2.7538 | 31 11 | 0 |
| 2 21 | 1145 | 15.511 | 20 782 | 8 9614 | 2 114 | 38.97 | 0 |
| 2 21 | 1200 | 15.1 | 20.938 | 9.5766 | 2 2348 | 13.86 | 0 |
| 2 21 | 1215 | 13.966 | 19.395 | 8.655 | 1.9529 | 2.78 | 0 |
| 2 21 | 1230 | 10.393 | 14 713 | 4.5098 | 1.7874 | 10.08 | 0 |
| 2 21 | 1245 | 8.5901 | 14.18 | 1.7449 | 2.6218 | 353.6 | 0 |
| 2 21 | 1300 | 8.2769 | 13.411 | 2.6665 | 2.1654 | 2.59 | 0 |
| 2 21 | 1315 | 6.5835 | 13.558 | 05816 | 2.7291 | 18.05 | 0 |
| 2 21 | 1330 | 9.5811 | 16 308 | 4 6597 | 2.4003 | 36.97 | 0 |
| 2 21 | 1345 | 9 5028 | 17.225 | 2 8186 | 2.9439 | 31.04 | 0 |
| 2 21 | 1400 | 9.9726 | 15 086 | 4 6574 | 2 322 | 23.88 | 0 |
| 2 21 | 1415 | 11.14 | 17.225 | 2.5122 | 2.6195 | 29 63 | 0 |
| 2 21 | 1430 | 10.695 | 15.704 | 7.1114 | 1 8321 | 40 56 | 0 |
| 2 21 | 1445 | 11.559 | 15.86 | 6 8072 | 1.5972 | 45.8 | 0 |
| 2 21 | 1500 | 11.462 | 15.243 | 7.5722 | 1 4697 | 49 91 | 0 |
| 2 21 | 1515 | 9.9524 | 13.865 | 6 3464 | 1.7135 | 41 04 | 0 |
| 2 21 | 1530 | 10.597 | 15.093 | 6.5007 | 1.8343 | 47.22 | 0 |
| 2 21 | 1545 | 10.798 | 14.48 | 6 8094 | 1 4317 | 43 1 | 0 |
| 2 21 | 1600 | 11.145 | 14 787 | 7.1181 | 1 4048 | 39.63 | 0 |
| 2 21 | 1615 | 7.7579 | 11.109 | 4 814 | 1.2169 | 42 55 | 0 |
| 2 21 | 1630 | 6.2368 | 10.339 | 3.5882 | 1.2908 | 49 79 | 0 |
| 2 21 | 1645 | 5 1988 | 7 4246 | 3.1273 | 76953 | 55.12 | 0 |
| 2 21 | 1700 | 3 2906 | 5 5836 | 1.284 | .8769 | 70 8 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 2 22 | 700 | 8.8719 | 13.592 | 6 6707 | 1.5234 | 312 9 | 0 |
| 2 22 | 715 | 10.943 | 15 285 | 7 2859 | 1.4898 | 307 2 | 0 |
| 2 22 | 730 | 11 29 | 16.352 | 6.9772 | 1.5458 | 306 | 0 |
| 2 22 | 745 | 11.122 | 16.352 | 7.1316 | 1.6487 | 306.4 | 0 |
| 2 22 | 800 | 10.16 | 15.285 | 6 6707 | 1.7605 | 301.2 | 0 |
| 2 22 | 815 | 8.6997 | 12.977 | 3 4405 | 1.4697 | 329 5 | 0 |
| 2 22 | 830 | 10.675 | 15.435 | 5.286 | 2.1162 | 353.3 | 0 |
| 2 22 | 845 | 8.1628 | 11.59 | 3.747 | 1.4362 | 354.9 | 0 |
| 2 22 | 900 | 4.984 | 9.2836 | 1.9015 | 1.3646 | 39 17 | 0 |
| 2 22 | 915 | 7.3374 | 12.048 | 1.1319 | 2.633 | 122.6 | 0 |
| 2 22 | 930 | 9.7175 | 12.198 | 6.2054 | 1.1163 | 152.8 | 0 |
| 2 22 | 945 | 10.109 | 12.348 | 6.9705 | .97981 | 154 4 | 0 |
| 2 22 | 1000 | 10.427 | 14.496 | 6.8161 | 1.5167 | 152.7 | 0 |
| 2 22 | 1015 | 11.245 | 15.111 | 7.5834 | 1.3579 | 145.5 | 0 |
| 2 22 | 1030 | 11 87 | 15.413 | 6.9683 | 1.3422 | 149.1 | 0 |
| 2 22 | 1045 | 11.695 | 15.726 | 7.7333 | 1.4473 | 159.8 | 0 |
| 2 22 | 1100 | 11.004 | 15.558 | 6.8117 | 1.8947 | 141 3 | 0 |
| 2 22 | 1115 | 10.881 | 16.33 | 6.8094 | 1.8187 | 136.5 | 0 |
| 2 22 | 1130 | 9.9569 | 15.86 | 3.2794 | 2.5233 | 130 | 0 |
| 2 22 | 1145 | 7.834 | 13.715 | 3 1273 | 2.199 | 126 | 0 |
| 2 22 | 1200 | 7.5566 | 14.478 | 1 8992 | 2.6039 | 119 | 0 |
| 2 22 | 1215 | 5.7894 | 11.867 | .6711 | 2.3175 | 95.7 | 0 |
| 2 22 | 1230 | 4.6328 | 10.183 | 1.284 | 1.9283 | 87 | 0 |
| 2 22 | 1245 | 5.2033 | 11.715 | 05816 | 2.3981 | 153 1 | 0 |
| 2 22 | 1300 | 4.0736 | 8 4917 | 05816 | 1.9194 | 144.9 | 0 |
| 2 22 | 1315 | 2.9685 | 7.1114 | .05816 | 1.7337 | 91 8 | 0 |
| 2 22 | 1330 | 4.8185 | 9.5632 | .21028 | 1.7941 | 140.2 | 0 |
| 2 22 | 1345 | 5.4091 | 10.635 | 1.284 | 2 02 | 136 6 | 0 |
| 2 22 | 1400 | 6.8855 | 12 01 | 2.3578 | 1 9686 | 110 8 | 0 |
| 2 22 | 1415 | 6.6551 | 17 538 | 1.897 | 2 9126 | 112 | 0 |
| 2 22 | 1430 | 8.6863 | 15.681 | 3.7358 | 2.1095 | 130.1 | 0 |
| 2 22 | 1445 | 7.5253 | 11 856 | 1 7426 | 2.1095 | 126 4 | 0 |
| 2 22 | 1500 | 6 9615 | 11.856 | 2.5099 | 2.0401 | 131 9 | 0 |
| 2 22 | 1515 | 9.5677 | 14.614 | 3.7358 | 1.7762 | 118 2 | 0 |
| 2 22 | 1530 | 9.203 | 15 534 | 3.275 | 2.633 | 96.7 | 0 |
| 2 22 | 1545 | 7.7803 | 15.681 | 3.4293 | 2.3131 | 90.8 | 0 |
| 2 22 | 1600 | 6.2435 | 12.165 | 1.1319 | 2.5077 | 93 6 | 0 |
| 2 22 | 1615 | 7.4693 | 11.398 | 2.9707 | 1 7024 | 111 5 | 0 |
| 2 22 | 1630 | 8.221 | 10.941 | 4.6552 | 1.0201 | 119 8 | 0 |
| 2 22 | 1645 | 8.1852 | 11.248 | 3.5837 | 1.4697 | 120.2 | 0 |
| 2 22 | 1700 | 9 033 | 11.25 | 6 3419 | 1 0268 | 135 6 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 2 23 | 700 | 17.963 | 25.412 | 10.657 | 3.0088 | 291 3 | 0 |
| 2 23 | 715 | 18 679 | 28.79 | 11.272 | 3.181 | 289 5 | 0 |
| 2 23 | 730 | 19.73 | 29 238 | 12.503 | 2.8477 | 291 6 | 0 |
| 2 23 | 745 | 18 366 | 25.547 | 11.579 | 2 6419 | 297 | 0 |
| 2 23 | 800 | 14 865 | 22.325 | 10.04 | 2.5681 | 310 9 | 0 |
| 2 23 | 815 | 15.516 | 23.086 | 9.5788 | 2.0804 | 302.6 | 0 |
| 2 23 | 830 | 16.979 | 24.943 | 10.807 | 2.8186 | 301 | 0 |
| 2 23 | 845 | 17 381 | 24.473 | 11.878 | 2 4965 | 305 9 | 0 |
| 2 23 | 900 | 20.133 | 26.464 | 14.024 | 2.5278 | 303 | 0 |
| 2 23 | 915 | 20.603 | 27.224 | 14.328 | 2.36 | 300 1 | 0 |
| 2 23 | 930 | 19.753 | 26.755 | 12.791 | 2.5614 | 301.1 | 0 |
| 2 23 | 945 | 17.292 | 23.846 | 10.031 | 2.888 | 300.8 | 0 |
| 2 23 | 1000 | 15.444 | 21.99 | 9.2612 | 2.3824 | 308.6 | 0 |
| 2 23 | 1015 | 15.659 | 23.063 | 8.3395 | 2.4965 | 306.7 | 0 |
| 2 23 | 1030 | 14 487 | 19.999 | 8.646 | 2.2057 | 305 8 | 0 |
| 2 23 | 1045 | 13 292 | 18.612 | 7.7221 | 2 0401 | 308 3 | 0 |
| 2 23 | 1100 | 13 825 | 18.903 | 8.6415 | 2.0737 | 316.6 | 0 |
| 2 23 | 1115 | 14.478 | 20 737 | 5.8811 | 2.9171 | 317 1 | 0 |
| 2 23 | 1130 | 12.491 | 18 903 | 6 494 | 2.6262 | 313 | 0 |
| 2 23 | 1145 | 9.8629 | 15.995 | 3.7358 | 2 8231 | 308 | 0 |
| 2 23 | 1200 | 10.48 | 17.068 | 5.1138 | 2.331 | 310.4 | 0 |
| 2 23 | 1215 | 10 214 | 16.285 | 4 653 | 2.6195 | 304.5 | 0 |
| 2 23 | 1230 | 12.06 | 16.733 | 5.2614 | 2.1654 | 306 8 | 0 |
| 2 23 | 1245 | 9 5319 | 16.733 | 3.7313 | 2.9059 | 301 5 | 0 |
| 2 23 | 1300 | 10.254 | 19 641 | 3.1206 | 3.0625 | 291 5 | 0 |
| 2 23 | 1315 | 9.8339 | 18.88 | 3.7313 | 2.9663 | 329.2 | 0 |
| 2 23 | 1330 | 9.8182 | 18.724 | 2.8142 | 3.0535 | 46 82 | 0 |
| 2 23 | 1345 | 10.221 | 17.359 | 4.1899 | 2.624 | 91 | 0 |
| 2 23 | 1400 | 7.8832 | 13.373 | 3.5792 | 2 0916 | 88.8 | 0 |
| 2 23 | 1415 | 8.3932 | 14 905 | 2 9663 | 2 7403 | 89 | 0 |
| 2 23 | 1430 | 6.7871 | 12.304 | 2.8142 | 1.8612 | 90 6 | 0 |
| 2 23 | 1445 | 7 7691 | 13.681 | 3.7313 | 2.114 | 93 6 | 0 |
| 2 23 | 1500 | 7.655 | 13.681 | 3.5792 | 2.4048 | 93 1 | 0 |
| 2 23 | 1515 | 7 6058 | 13.375 | 3.7313 | 2.0424 | 94 6 | 0 |
| 2 23 | 1530 | 8 3507 | 13 532 | 4 04 | 2.1967 | 96.7 | 0 |
| 2 23 | 1545 | 8.0174 | 11 386 | 2.3556 | 1.8075 | 107 5 | 0 |
| 2 23 | 1600 | 7 447 | 11 541 | 3.4271 | 1.6688 | 137.8 | 0 |
| 2 23 | 1615 | 5.8408 | 8 9391 | 2.5077 | 1.2102 | 141.1 | 0 |
| 2 23 | 1630 | 6 4291 | 11 389 | 2 9685 | 1.8947 | 145 8 | 0 |
| 2 23 | 1645 | 6.5276 | 10 011 | 2 2012 | 1.3802 | 142 | 0 |
| 2 23 | 1700 | 7 4716 | 9.8585 | 4 9594 | 1 0492 | 155 5 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 2 24 | 700 | 7.4 | 11 118 | 2.3623 | 1.7471 | 34.17 | 0 |
| 2 24 | 715 | 6.4001 | 11 118 | 1.1319 | 1.7113 | 19.7 | 0 |
| 2 24 | 730 | 5.9817 | 8.5073 | 3 5904 | .89927 | 19 73 | 0 |
| 2 24 | 745 | 6.4761 | 9.1225 | 4.512 | .86796 | 1.565 | 0 |
| 2 24 | 800 | 4.087 | 6.2032 | 1.7471 | .74716 | 89 1 | 0 |
| 2 24 | 815 | 3.7447 | 6.0466 | 1.7471 | 8523 | 97 | 0 |
| 2 24 | 830 | 3.483 | 6.201 | 1.5927 | .83664 | 142 8 | 0 |
| 2 24 | 845 | 2.3377 | 4.5098 | 05592 | .80532 | 118 2 | 0 |
| 2 24 | 900 | 2.8813 | 5.5836 | .97757 | .8523 | 92 | 0 |
| 2 24 | 915 | 4.3554 | 6.6551 | 1.284 | 1.1521 | 58.56 | 0 |
| 2 24 | 930 | 4.7648 | 7.268 | 2 6643 | 1.0268 | 39.45 | 0 |
| 2 24 | 945 | 2.8947 | 6.3464 | .05816 | 1.369 | 39.94 | 0 |
| 2 24 | 1000 | 2.8499 | 6 6506 | .21028 | 1.4787 | 18.5 | 0 |
| 2 24 | 1015 | 2.6218 | 5.5768 | .05816 | 1.3489 | 42.14 | 0 |
| 2 24 | 1030 | 2.9484 | 6.8005 | .21028 | 1.548 | 12.49 | 0 |
| 2 24 | 1045 | 3.5099 | 7.2568 | .21251 | 1.6599 | 4.131 | 0 |
| 2 24 | 1100 | 2 633 | 7.1047 | .21251 | 1.5435 | 346.2 | 0 |
| 2 24 | 1115 | 3.4249 | 6.6417 | 1.1297 | 1 2661 | 5 704 | 0 |
| 2 24 | 1130 | 3.7693 | 7.8653 | .21251 | 1.7695 | 4 326 | 0 |
| 2 24 | 1145 | 3.3376 | 8.7802 | .21251 | 1.7382 | 356 | 0 |
| 2 24 | 1200 | 3.6486 | 10.004 | 21251 | 2.5032 | 17 48 | 0 |
| 2 24 | 1215 | 3.2973 | 8 127 | 21251 | 1.5905 | 53.09 | 0 |
| 2 24 | 1230 | 5.6686 | 12.14 | .21251 | 3.4204 | 50.69 | 0 |
| 2 24 | 1245 | 6.3419 | 12.599 | 1.2818 | 2.756 | 44 | 0 |
| 2 24 | 1300 | 5.5343 | 9.0845 | 2 0469 | 1.3444 | 36.1 | 0 |
| 2 24 | 1315 | 5 6507 | 8.4715 | 3 2705 | .9977 | 35.21 | 0 |
| 2 24 | 1330 | 4.7067 | 7.7087 | 1.284 | 1.3355 | 16.2 | 0 |
| 2 24 | 1345 | 5.758 | 8.9346 | 2.5077 | 1.0089 | 39 1 | 0 |
| 2 24 | 1400 | 5.4493 | 7.5588 | 2.9663 | .90375 | 44 3 | 0 |
| 2 24 | 1415 | 6.2233 | 8.1718 | 4 0378 | .88585 | 35 07 | 0 |
| 2 24 | 1430 | 5.4538 | 8 174 | 3.275 | 74939 | 33 78 | 0 |
| 2 24 | 1445 | 5.5813 | 7 8698 | 3.4271 | .8523 | 12 01 | 0 |
| 2 24 | 1500 | 6.23 | 8.6348 | 2.8164 | 1.1879 | 6.54 | 0 |
| 2 24 | 1515 | 7.4559 | 11 243 | .16777 | 1.4585 | 8 36 | 0 |
| 2 24 | 1530 | 8.3015 | 11.704 | 4.9617 | 1.2661 | 10.86 | 0 |
| 2 24 | 1545 | 7.3933 | 9.1001 | 4.9617 | .81427 | 1.727 | 0 |
| 2 24 | 1600 | 8.6729 | 11.554 | 5 2704 | 1.4966 | 353.2 | 0 |
| 2 24 | 1615 | 9.7421 | 12.782 | 6.3441 | 1.2236 | 1 334 | 0 |
| 2 24 | 1630 | 8 7668 | 11 556 | 5 5768 | 1.3937 | 355 6 | 0 |
| 2 24 | 1645 | 7 9346 | 11 098 | 3 738 | 1.1565 | 354 | 0 |
| 2 24 | 1700 | 7.6259 | 10 178 | 4 6574 | 1 2102 | 346 2 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 2 25 | 700 | 2.5099 | 4.2078 | 21028 | 1.0626 | 297 8 | 0 |
| 2 25 | 715 | 2.3757 | 3 747 | 36463 | .72926 | 296 4 | 0 |
| 2 25 | 730 | 1.6196 | 4.3599 | - 25054 | 1.1789 | 311 7 | 0 |
| 2 25 | 745 | .85901 | 1.9015 | 05592 | .51451 | 317 1 | 0 |
| 2 25 | 800 | 1.51 | 3.5926 | 21028 | 1.0402 | 122 7 | 0 |
| 2 25 | 815 | 1.8411 | 4.6664 | 21028 | 1 1498 | 85.4 | 0 |
| 2 25 | 830 | 2.7761 | 5.7401 | .97757 | 1.1297 | 81 | 0 |
| 2 25 | 845 | 1.944 | 4.5098 | 05592 | .89033 | 93.3 | 0 |
| 2 25 | 900 | 4.0758 | 7.4246 | 1.284 | 1.4004 | 62.94 | 0 |
| 2 25 | 915 | 4.1362 | 7 7311 | 1 1319 | 1.3735 | 101.8 | 0 |
| 2 25 | 930 | 5.72 | 11.1 | 1.1319 | 1 9395 | 120 | 0 |
| 2 25 | 945 | 6 1875 | 14 473 | 2 0513 | 2.7045 | 129.8 | 0 |
| 2 25 | 1000 | 5.6574 | 8.6438 | 2.3578 | 1.2952 | 92.3 | 0 |
| 2 25 | 1015 | 5 6775 | 9.4088 | 2 5099 | 1.4048 | 85 4 | 0 |
| 2 25 | 1030 | 4.3398 | 8.7937 | 1.284 | 1.5234 | 90.8 | 0 |
| 2 25 | 1045 | 5.7357 | 12.621 | 82322 | 2.2594 | 110.4 | 0 |
| 2 25 | 1100 | 5.89 | 10.322 | 2.662 | 1.595 | 103 | 0 |
| 2 25 | 1115 | 5.0131 | 9.8607 | 1.284 | 1 4742 | 79.8 | 0 |
| 2 25 | 1130 | 4.9169 | 9.3976 | .6711 | 1.9059 | 94 8 | 0 |
| 2 25 | 1145 | 5.8117 | 13 225 | 1.1297 | 2 5703 | 91 | 0 |
| 2 25 | 1200 | 4.9796 | 11.999 | .21251 | 2.4025 | 80 3 | 0 |
| 2 25 | 1215 | 6.2726 | 15.059 | .82322 | 2.6419 | 84 6 | 0 |
| 2 25 | 1230 | 3.8901 | 9.7019 | .97757 | 1.7449 | 92 5 | 0 |
| 2 25 | 1245 | 5.3062 | 11.23 | .21251 | 2.6151 | 105.8 | 0 |
| 2 25 | 1300 | 5.4292 | 9 3932 | .21251 | 1.7717 | 158 9 | 0 |
| 2 25 | 1315 | 3 7515 | 7 4045 | 21251 | 1.5502 | 98 8 | 0 |
| 2 25 | 1330 | 8.476 | 15.205 | 1.7426 | 3.0848 | 123.6 | 0 |
| 2 25 | 1345 | 11.84 | 18.097 | 6 9414 | 2 1363 | 117.2 | 0 |
| 2 25 | 1400 | 11 145 | 16.42 | 4 1899 | 2.2817 | 113 4 | 0 |
| 2 25 | 1415 | 11.324 | 17.963 | 5.2614 | 2.6934 | 110.6 | 0 |
| 2 25 | 1430 | 8.429 | 15.511 | 2.3533 | 3.058 | 102.4 | 0 |
| 2 25 | 1445 | 7.617 | 13 829 | 2 6598 | 2.0648 | 104 1 | 0 |
| 2 25 | 1500 | 6.418 | 11.688 | 2.8142 | 1 7426 | 67 38 | 0 |
| 2 25 | 1515 | 6.456 | 13 221 | 2.6598 | 2.0044 | 67.51 | 0 |
| 2 25 | 1530 | 8.4715 | 12 762 | 2.8142 | 2 1654 | 58.03 | 0 |
| 2 25 | 1545 | 7 7624 | 12 069 | 2 8142 | 1.7851 | 50 52 | 0 |
| 2 25 | 1600 | 6.3195 | 8 9368 | 4 1921 | .8344 | 42.56 | 0 |
| 2 25 | 1615 | 6.1831 | 9.3976 | 3.7336 | 1.0536 | 26 12 | 0 |
| 2 25 | 1630 | 5.3241 | 8.6326 | 3.5814 | 92835 | 20.55 | 0 |
| 2 25 | 1645 | 4.2995 | 6 1853 | 2.0491 | .77176 | 20.41 | 0 |
| 2 25 | 1700 | 4 21 | 6 6439 | 2 0491 | 74716 | 26 19 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 2 26 | 700 | 5 4337 | 9.118 | 2 8209 | 1.5368 | 173.2 | 0 |
| 2 26 | 715 | 6.5276 | 12.959 | 3.2817 | 2.3242 | 178 7 | 0 |
| 2 26 | 730 | 7.2166 | 11.576 | 2.9752 | 2.3444 | 222.3 | 0 |
| 2 26 | 745 | 7.0488 | 16.039 | 2.5144 | 2.5748 | 232.8 | 0 |
| 2 26 | 800 | 13.124 | 21.408 | 6.6618 | 2.8813 | 252.4 | 0 |
| 2 26 | 815 | 14.735 | 22.482 | 7.8899 | 3.0513 | 268.1 | 0 |
| 2 26 | 830 | 9.4111 | 18.947 | 4.9706 | 2.7873 | 282 | 0 |
| 2 26 | 845 | 9.1404 | 17.404 | 4 8163 | 2 5233 | 308 9 | 0 |
| 2 26 | 900 | 4.3666 | 9.118 | 82545 | 2.0357 | 346.2 | 0 |
| 2 26 | 915 | 7.051 | 14.798 | 3.1273 | 1.8232 | 302.3 | 0 |
| 2 26 | 930 | 8.0174 | 16.8 | 4.3554 | 2.3019 | 351.9 | 0 |
| 2 26 | 945 | 5 9616 | 11.337 | 1.7449 | 1.5704 | 334.1 | 0 |
| 2 26 | 1000 | 3.36 | 7.2725 | 1.4384 | 1.2393 | 8.71 | 0 |
| 2 26 | 1015 | 5 6417 | 19.551 | .82545 | 4.3286 | 327.2 | 0 |
| 2 26 | 1030 | 4.7872 | 12.185 | 1.5927 | 2.4786 | 346.7 | 0 |
| 2 26 | 1045 | 2.0133 | 4.3554 | .05592 | 1.0178 | 158.3 | 0 |
| 2 26 | 1100 | 2.8119 | 4.2011 | .82545 | .78519 | 98.8 | 0 |
| 2 26 | 1115 | 3.4293 | 7.2703 | 1.1319 | 1 2035 | 80.3 | 0 |
| 2 26 | 1130 | 2.9506 | 6.1965 | .51675 | 1.1901 | 47 59 | 0 |
| 2 26 | 1145 | 4.6664 | 8.4984 | .6711 | 1.3355 | 16 71 | 0 |
| 2 26 | 1200 | 2.4003 | 4.9684 | .05816 | 1.3914 | 30.32 | 0 |
| 2 26 | 1215 | 2 577 | 5.7334 | .6711 | 1.0178 | 276.2 | 0 |
| 2 26 | 1230 | 2.4406 | 5.7334 | .05816 | 1.1744 | 64.35 | 0 |
| 2 26 | 1245 | 4.9169 | 8.8026 | 1.284 | 1.6017 | 48 24 | 0 |
| 2 26 | 1300 | 3.1318 | 5.1205 | .97757 | .89256 | 131.9 | 0 |
| 2 26 | 1315 | 4.1228 | 6.8072 | 1.7449 | 1.1364 | 130.7 | 0 |
| 2 26 | 1330 | 5.9616 | 10.641 | 2.0513 | 2.1609 | 146.3 | 0 |
| 2 26 | 1345 | 5.5679 | 9.7242 | 2.2057 | 1.6599 | 112.8 | 0 |
| 2 26 | 1400 | 3.7112 | 8.1897 | .82545 | 1.5033 | 108.4 | 0 |
| 2 26 | 1415 | 1.9663 | 3.8924 | .05816 | .774 | 97.1 | 0 |
| 2 26 | 1430 | 2.8924 | 7.4201 | 1.1319 | 1.1521 | 72.3 | 0 |
| 2 26 | 1445 | 6.5186 | 9 5677 | 3.1251 | 1.4563 | 62.55 | 0 |
| 2 26 | 1500 | 5.6037 | 10.796 | 2.0513 | 1.8858 | 73 | 0 |
| 2 26 | 1515 | 8.2903 | 18 925 | 2.2057 | 4.5344 | 68 | 0 |
| 2 26 | 1530 | 11.467 | 16 017 | 5.5791 | 1.7337 | 61.24 | 0 |
| 2 26 | 1545 | 8.4111 | 12.482 | 4.814 | 1 5614 | 56.65 | 0 |
| 2 26 | 1600 | 7.4895 | 12.637 | 2.8186 | 1.7851 | 41.29 | 0 |
| 2 26 | 1615 | 10.386 | 17.538 | 4.6597 | 2.9953 | 46 91 | 0 |
| 2 26 | 1630 | 13.767 | 18.612 | 8.3418 | 2.0894 | 61 83 | 0 |
| 2 26 | 1645 | 12.089 | 16.464 | 8.1897 | 1.7024 | 48.21 | 0 |
| 2 26 | 1700 | 8.5274 | 13 558 | 4 6619 | 2 0469 | 39.46 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 2 27 | 700 | 9 6191 | 13.29 | 6.9794 | 1.1811 | 348 1 | 0 |
| 2 27 | 715 | 9.4066 | 13.29 | 6.3643 | 1.1632 | 353.9 | 0 |
| 2 27 | 730 | 11.883 | 16.979 | 6 5186 | 1.9596 | 353.5 | 0 |
| 2 27 | 745 | 10.959 | 14.52 | 7.749 | 1.2259 | 351 | 0 |
| 2 27 | 800 | 11.937 | 15.905 | 8 3641 | 1.416 | 349.9 | 0 |
| 2 27 | 815 | 12.27 | 15.748 | 8.212 | 1.5077 | 347.5 | 0 |
| 2 27 | 830 | 10.867 | 13.596 | 7.749 | 1.1767 | 348.9 | 0 |
| 2 27 | 845 | 10.266 | 13.29 | 6.8273 | 1.2125 | 348 4 | 0 |
| 2 27 | 900 | 10.216 | 12.827 | 5.9034 | 1.1476 | 345.9 | 0 |
| 2 27 | 915 | 9 4088 | 11.751 | 6.2099 | 1 0469 | 350 6 | 0 |
| 2 27 | 930 | 8.8898 | 11.597 | 5.2883 | .99323 | 355 5 | 0 |
| 2 27 | 945 | 9.2053 | 11.903 | 6 3643 | 1.1028 | 353.9 | 0 |
| 2 27 | 1000 | 8.6169 | 11.903 | 5.1339 | 1.2169 | 355.2 | 0 |
| 2 27 | 1015 | 8.8317 | 13.903 | 5 1339 | 1.3355 | .265 | 0 |
| 2 27 | 1030 | 7.268 | 10.362 | 3.5949 | 1.1632 | 358.6 | 0 |
| 2 27 | 1045 | 6.5835 | 9.4401 | 2 9775 | 1.0715 | 356.2 | 0 |
| 2 27 | 1100 | 8 608 | 13.59 | 4.9773 | 1 4764 | 12.79 | 0 |
| 2 27 | 1115 | 10.364 | 13.435 | 6 0533 | 1.3735 | 11 48 | 0 |
| 2 27 | 1130 | 11.371 | 14.972 | 7.8989 | 1.3086 | 3.475 | 0 |
| 2 27 | 1145 | 10 606 | 14.511 | 5.4382 | 1 6353 | 7 12 | 0 |
| 2 27 | 1200 | 12.346 | 17.27 | 7.7445 | 1 7605 | 9.42 | 0 |
| 2 27 | 1215 | 13.163 | 18.97 | 4.823 | 2.1609 | 357.9 | 0 |
| 2 27 | 1230 | 14.037 | 19.574 | 8.6639 | 1 9954 | 359.9 | 0 |
| 2 27 | 1245 | 16.621 | 21.565 | 10.049 | 2 3399 | 358.9 | 0 |
| 2 27 | 1300 | 17.896 | 23 108 | 9.5855 | 2.624 | 359.1 | 0 |
| 2 27 | 1315 | 17.583 | 22.191 | 10.816 | 2 1565 | 352 | 0 |
| 2 27 | 1330 | 16.755 | 21.878 | 10.814 | 2 0759 | 351.7 | 0 |
| 2 27 | 1345 | 17.65 | 23 265 | 12.966 | 1 9887 | 351.3 | 0 |
| 2 27 | 1400 | 17.65 | 22.348 | 9.1225 | 2.2415 | 359 2 | 0 |
| 2 27 | 1415 | 17.695 | 23.578 | 10.505 | 2 5636 | 358.3 | 0 |
| 2 27 | 1430 | 19.037 | 24.495 | 12 505 | 2.0983 | 355.9 | 0 |
| 2 27 | 1445 | 17 829 | 24.652 | 11 892 | 2 0267 | 358 2 | 0 |
| 2 27 | 1500 | 18.97 | 24.339 | 12.044 | 2.4025 | 353.1 | 0 |
| 2 27 | 1515 | 17.426 | 22.817 | 10.816 | 2.2437 | 349.5 | 0 |
| 2 27 | 1530 | 16.979 | 23.891 | 10.509 | 2.5368 | 346.3 | 0 |
| 2 27 | 1545 | 14.769 | 21.721 | 9.5878 | 2.3332 | 341 | 0 |
| 2 27 | 1600 | 15.816 | 21.43 | 10.203 | 1.7896 | 335.9 | 0 |
| 2 27 | 1615 | 14.894 | 18.343 | 10.664 | 1.5033 | 338 | 0 |
| 2 27 | 1630 | 15.279 | 19 887 | 10 203 | 1.8209 | 343 3 | 01 |
| 2 27 | 1645 | 14 218 | 18 366 | 9 1292 | 1 7135 | 344 7 | 0 |
| 2 27 | 1700 | 13.241 | 17 135 | 8 8205 | 1.4652 | 345 1 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 2 28 | 700 | 1.1923 | 1.9037 | .05592 | .43845 | 61 41 | 0 |
| 2 28 | 715 | .22146 | 1.4406 | .05592 | .39595 | 69 33 | 0 |
| 2 28 | 730 | .43174 | 1.595 | -.81874 | .52122 | .144 | 0 |
| 2 28 | 745 | 69794 | 1.2863 | -.09843 | .29528 | 342.5 | 0 |
| 2 28 | 800 | .58833 | 1.2863 | - 56149 | 38476 | 335.1 | 0 |
| 2 28 | 815 | .06711 | 21028 | - 7136 | 07606 | 86 1 | 0 |
| 2 28 | 830 | .53241 | 1.4406 | -.7136 | .5682 | 56.56 | 0 |
| 2 28 | 845 | 1.1163 | 1.9037 | .05592 | .37358 | 31.41 | 0 |
| 2 28 | 900 | .10961 | 36239 | - 66439 | .09619 | 65.14 | 0 |
| 2 28 | 915 | .10738 | .21028 | - 66439 | .09395 | 213 9 | 0 |
| 2 28 | 930 | .12975 | .21028 | -.7136 | .1029 | 214.3 | 0 |
| 2 28 | 945 | .16777 | .21028 | -.7136 | 09172 | 187.5 | 0 |
| 2 28 | 1000 | 18567 | .21028 | -.66439 | .08277 | 167 | 0 |
| 2 28 | 1015 | 2.1431 | 4.0557 | -.66439 | 1.2147 | 154.2 | 0 |
| 2 28 | 1030 | 3.0065 | 5 4382 | 1.2863 | .62189 | 163.6 | 0 |
| 2 28 | 1045 | 2 7761 | 4.9773 | 1.4406 | 68676 | 169.1 | 0 |
| 2 28 | 1100 | .97086 | 3.4383 | .21028 | .95072 | 129 3 | 0 |
| 2 28 | 1115 | 1.1968 | 2 8231 | .21028 | .64873 | 126 | 0 |
| 2 28 | 1130 | .62636 | 2.6687 | -.1029 | .62636 | 23.81 | 0 |
| 2 28 | 1145 | 1.0693 | 2.3623 | -.1029 | .58609 | 183 4 | 0 |
| 2 28 | 1200 | 1.7493 | 4.6664 | .21028 | 1.029 | 131.7 | 0 |
| 2 28 | 1215 | 3.0043 | 5.8945 | -.1029 | 1.0939 | 132 9 | 0 |
| 2 28 | 1230 | 2.5927 | 5.4337 | 97757 | .82993 | 144.8 | 0 |
| 2 28 | 1245 | 2.6665 | 4.8185 | 1 2863 | .90822 | 163 6 | 0 |
| 2 28 | 1300 | 2.0938 | 4.6641 | 05592 | 1.1096 | 129 | 0 |
| 2 28 | 1315 | 1.68 | 5.125 | .05592 | 1.2572 | 96.9 | 0 |
| 2 28 | 1330 | 1.8947 | 4.049 | .21028 | .50556 | 37 4 | 0 |
| 2 28 | 1345 | 2.6374 | 5.4314 | 21028 | .88585 | 78 3 | 0 |
| 2 28 | 1400 | 4.3286 | 7.4291 | 1.7471 | 1.3355 | 75 5 | 0 |
| 2 28 | 1415 | 4 4427 | 6.3553 | 2.0536 | 1.0805 | 67 36 | 0 |
| 2 28 | 1430 | 4.9863 | 7.1226 | 2.6687 | .78071 | 53.33 | 0 |
| 2 28 | 1445 | 4.3152 | 7.4313 | 1 7471 | 1.0067 | 64 01 | 0 |
| 2 28 | 1500 | 3.1654 | 4.512 | 1.7471 | .53912 | 40 65 | 0 |
| 2 28 | 1515 | 5.1294 | 7.2792 | 2.5144 | 1.0469 | 27.02 | 0 |
| 2 28 | 1530 | 6 3576 | 8.2031 | 2.9775 | .93507 | 17.44 | 0 |
| 2 28 | 1545 | 6 5768 | 8 2031 | 4 6664 | .73821 | 24.61 | 0 |
| 2 28 | 1600 | 5.9415 | 7.8966 | 4.2056 | .75611 | 29.59 | 0 |
| 2 28 | 1615 | 5.635 | 7.1293 | 3.7447 | 60623 | 31.46 | 0 |
| 2 28 | 1630 | 5 2458 | 6.5141 | 3.5926 | 56372 | 34 9 | 0 |
| 2 28 | 1645 | 4.9214 | 6.2077 | 3.2862 | .59504 | 36.34 | 0 |
| 2 28 | 1700 | 4 8498 | 6.2077 | 3 4383 | .55701 | 23.56 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 3 1 | 700 | 2 9103 | 4.5187 | 97981 | 61965 | 193.2 | 0 |
| 3 1 | 715 | 4 1071 | 6.5209 | 2.0558 | 75611 | 197 3 | 0 |
| 3 1 | 730 | 5.0937 | 6 3665 | 2.6732 | 63531 | 185.1 | 0 |
| 3 1 | 745 | 5.7066 | 6 6752 | 3 9036 | 52569 | 179 6 | 0 |
| 3 1 | 800 | 5.9996 | 8.5207 | 3.2884 | 1.0782 | 174 | 0 |
| 3 1 | 815 | 6.3911 | 9.288 | 3 4405 | 1 1543 | 179.7 | 0 |
| 3 1 | 830 | 7.0622 | 9 288 | 4 3644 | 91493 | 179 4 | 0 |
| 3 1 | 845 | 5.8453 | 8.6706 | 2 3623 | 1.34 | 182.1 | 0 |
| 3 1 | 900 | 6.286 | 8.6684 | 3 2839 | 83216 | 174.7 | 0 |
| 3 1 | 915 | 5.4449 | 8.3574 | 3 1296 | 1.1096 | 173.5 | 0 |
| 3 1 | 930 | 4.0713 | 7 1271 | 1.4384 | 1.0469 | 191.1 | 0 |
| 3 1 | 945 | 3.1698 | 6 0489 | .21028 | 1.3512 | 158.9 | 0 |
| 3 1 | 1000 | 2.7605 | 5.7379 | .21028 | .89704 | 168 8 | 0 |
| 3 1 | 1015 | 4.0602 | 7.579 | 1 7449 | 1.2236 | 179 4 | 0 |
| 3 1 | 1030 | 5.8162 | 8.957 | 2.973 | 1.3489 | 178.7 | 0 |
| 3 1 | 1045 | 6 8229 | 10.335 | 3.8924 | 1.2505 | 161.8 | 0 |
| 3 1 | 1100 | 7 7892 | 11.1 | 4.8118 | 1 293 | 156.5 | 0 |
| 3 1 | 1115 | 7 6841 | 11 865 | 4.5053 | 1 378 | 145 | 0 |
| 3 1 | 1130 | 7.0443 | 11.711 | 2.6643 | 1 7605 | 137 1 | 0 |
| 3 1 | 1145 | 5.257 | 9.4111 | .21028 | 2 2012 | 131 9 | 0 |
| 3 1 | 1200 | 5.8699 | 10.941 | 1.284 | 2.3712 | 112 4 | 0 |
| 3 1 | 1215 | 4.2883 | 9.8674 | .21028 | 1.9283 | 115.3 | 0 |
| 3 1 | 1230 | 3.8409 | 10 941 | .82545 | 1.6867 | 88.1 | 0 |
| 3 1 | 1245 | 2.8745 | 8.7937 | 21028 | 1 7739 | 74.6 | 0 |
| 3 1 | 1300 | 3.1542 | 7.872 | .21251 | 1.7001 | 12 31 | 0 |
| 3 1 | 1315 | 3.4271 | 6.9526 | .21251 | 1.472 | 29.27 | 0 |
| 3 1 | 1330 | 3.9349 | 8.4827 | .21251 | 1.727 | 56 2 | 0 |
| 3 1 | 1345 | 5.286 | 11.545 | .6711 | 2.4137 | 34.42 | 0 |
| 3 1 | 1400 | 6.5074 | 12.308 | 1 4362 | 2.322 | 43.19 | 0 |
| 3 1 | 1415 | 7.5186 | 12.764 | 36463 | 2.4093 | 42.46 | 0 |
| 3 1 | 1430 | 8.2769 | 13.377 | 3 8857 | 2.0245 | 34 7 | 0 |
| 3 1 | 1445 | 10.118 | 13 988 | 5.7223 | 1 8075 | 40.8 | 0 |
| 3 1 | 1500 | 8.7176 | 12.458 | 4.1921 | 1.7918 | 36.09 | 0 |
| 3 1 | 1515 | 8 6326 | 13 834 | 5.2637 | 1.3221 | 18.18 | 0 |
| 3 1 | 1530 | 7.617 | 10 621 | 4 3443 | 1 1722 | 15 04 | 0 |
| 3 1 | 1545 | 8.3172 | 11.847 | 4.4986 | 1 2371 | 39 34 | 0 |
| 3 1 | 1600 | 7.7333 | 11.389 | 3.4271 | 1.5883 | 51.07 | 0 |
| 3 1 | 1615 | 6.6707 | 10 165 | 3.275 | 1 378 | 58 4 | 0 |
| 3 1 | 1630 | 5.8453 | 8.7892 | 4 0423 | .83216 | 57.99 | 0 |
| 3 1 | 1645 | 4.6977 | 6 1875 | 3.5814 | 59728 | 51 51 | 0 |
| 3 1 | 1700 | 2.7716 | 4.1944 | 1.5905 | 64426 | 29 86 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 3 2 | 700 | 3 9573 | 6 8251 | .36239 | 1.331 | 157 1 | 0 |
| 3 2 | 715 | 5 3084 | 7 2859 | 2 3645 | 1.1834 | 139 7 | 0 |
| 3 2 | 730 | 2 0871 | 6.9794 | 05592 | 2 0066 | 131.9 | 0 |
| 3 2 | 745 | 1.51 | 5 2838 | -.66439 | 1.0961 | 108 8 | 0 |
| 3 2 | 800 | 4 568 | 6 8206 | 2 3623 | .774 | 129.9 | 0 |
| 3 2 | 815 | 6 0556 | 8 2031 | 3.5926 | 98652 | 116 | 0 |
| 3 2 | 830 | 6.579 | 8.6617 | 3.7447 | .98204 | 118.3 | 0 |
| 3 2 | 845 | 4 8163 | 6.9683 | 2.0536 | .90598 | 111 | 0 |
| 3 2 | 900 | 4.6977 | 6 0444 | 2.9752 | 59504 | 120 3 | 0 |
| 3 2 | 915 | 5 3755 | 7.579 | 2 5144 | .8523 | 107.6 | 0 |
| 3 2 | 930 | 5 2838 | 8.0375 | 2 36 | .93283 | 108 1 | 0 |
| 3 2 | 945 | 5 5254 | 8.1874 | 2.2057 | 1.1319 | 105.7 | 0 |
| 3 2 | 1000 | 7.0331 | 9.5654 | 4 0445 | 1.114 | 111.9 | 0 |
| 3 2 | 1015 | 6 0556 | 9 2567 | 2 8186 | 1 4406 | 117 | 0 |
| 3 2 | 1030 | 6.277 | 10.635 | 2.6643 | 1.4004 | 125.7 | 0 |
| 3 2 | 1045 | 5 8967 | 10 785 | 1.4384 | 1.8254 | 117 8 | 0 |
| 3 2 | 1100 | 7 4447 | 13 082 | 2 3556 | 2 1565 | 122.9 | 0 |
| 3 2 | 1115 | 7 2792 | 13.693 | 2 3556 | 2.0558 | 113 5 | 0 |
| 3 2 | 1130 | 5 9169 | 11 393 | 1.7426 | 1 7516 | 88 | 0 |
| 3 2 | 1145 | 5.9996 | 12 462 | 1 4362 | 2.2795 | 80.3 | 0 |
| 3 2 | 1200 | 7 664 | 13.536 | 1.1297 | 2.5815 | 91.9 | 0 |
| 3 2 | 1215 | 7.315 | 14.451 | 2.662 | 2.6777 | 126.4 | 0 |
| 3 2 | 1230 | 8 0196 | 14 912 | 97757 | 2.671 | 134.2 | 0 |
| 3 2 | 1245 | 7 2591 | 13.073 | 1.284 | 2 7582 | 139.3 | 0 |
| 3 2 | 1300 | 8.1539 | 16.129 | 2 9685 | 2.4607 | 116.4 | 0 |
| 3 2 | 1315 | 6 8027 | 19.193 | 21251 | 4.5187 | 114.2 | 0 |
| 3 2 | 1330 | 9.9457 | 16.889 | 2.9685 | 3.2593 | 108.1 | 0 |
| 3 2 | 1345 | 8.2344 | 14 449 | 2.3556 | 2.6576 | 118 3 | 0 |
| 3 2 | 1400 | 7.7915 | 15.52 | 2 8142 | 2.4137 | 113.6 | 0 |
| 3 2 | 1415 | 7 4917 | 13 834 | 1.7426 | 2.445 | 112 4 | 0 |
| 3 2 | 1430 | 5.899 | 12.916 | 1 284 | 2.7582 | 125.5 | 0 |
| 3 2 | 1445 | 8.0152 | 14 753 | 1 1297 | 3.1363 | 110.7 | 0 |
| 3 2 | 1500 | 5.4583 | 11.08 | 1 1297 | 2 4361 | 127.8 | 0 |
| 3 2 | 1515 | 7 4157 | 13 679 | 1 4362 | 2.5479 | 114.2 | 0 |
| 3 2 | 1545 | 6 4851 | 11.536 | 1 7426 | 2.0961 | 129.8 | 0 |
| 3 2 | 1600 | 3 2414 | 8.6281 | .21251 | 1.8903 | 84.8 | 0 |
| 3 2 | 1615 | 5 2279 | 12.151 | 2 2012 | 1.6755 | 84.7 | 0 |
| 3 2 | 1630 | 2 8477 | 5.8744 | 1.284 | 8344 | 68.58 | 0 |
| 3 2 | 1645 | 5 1496 | 10 467 | 1 7426 | 1.9484 | 93 | 0 |
| 3 2 | 1700 | 4 6552 | 8 1718 | 2 0491 | 1 6241 | 70.1 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 3 3 | 700 | 10.972 | 13.122 | 8.0487 | 1.1319 | 225 8 | 0 |
| 3 3 | 715 | 7.7378 | 8 9726 | 6 0511 | .74268 | 227 5 | 0 |
| 3 3 | 730 | 8 6013 | 10.664 | 6.5119 | .74268 | 232 9 | 0 |
| 3 3 | 745 | 6.4336 | 8 9726 | 3.8991 | 1.2214 | 229 6 | 0 |
| 3 3 | 800 | 4.1385 | 5.7424 | 2 8231 | .61294 | 208 6 | 0 |
| 3 3 | 815 | 6.1808 | 8.8138 | 3.5904 | 1.0603 | 167 1 | 0 |
| 3 3 | 830 | 7.6058 | 10.807 | 4.8163 | 1 0201 | 151.2 | 0 |
| 3 3 | 845 | 7.693 | 11.724 | 4 6619 | 1 4272 | 162 | 0 |
| 3 3 | 900 | 8.3664 | 12.183 | 4 0467 | 1 6621 | 159.3 | 0 |
| 3 3 | 915 | 8.8473 | 12.333 | 4 814 | 1.5256 | 148 5 | 0 |
| 3 3 | 930 | 9 5565 | 12.33 | 6.192 | 1.0693 | 133 4 | 0 |
| 3 3 | 945 | 8.297 | 11.713 | 4 8118 | 1.1834 | 147 6 | 0 |
| 3 3 | 1000 | 7.1405 | 10.637 | 2.6643 | 1.548 | 120.4 | 0 |
| 3 3 | 1015 | 5.3442 | 11.708 | 1 5905 | 2.0827 | 109.4 | 0 |
| 3 3 | 1030 | 5 4247 | 12.321 | 2.6643 | 1 7538 | 101.1 | 0 |
| 3 3 | 1045 | 5.2838 | 10.478 | 82322 | 2.2616 | 100 8 | 0 |
| 3 3 | 1100 | 4.7245 | 10.934 | 21251 | 2.0245 | 97 6 | 0 |
| 3 3 | 1115 | 5.8229 | 11.089 | .97757 | 2.2728 | 96 | 0 |
| 3 3 | 1130 | 4.1317 | 12.925 | .21251 | 2.9372 | 87 | 0 |
| 3 3 | 1145 | 2.2281 | 5 7245 | .21251 | 1 2706 | 273 | 0 |
| 3 3 | 1200 | 3.6016 | 7.7154 | -.09395 | 1 7091 | 64 52 | 0 |
| 3 3 | 1215 | 4.5791 | 8 0219 | .21251 | 1.8791 | 327 6 | 0 |
| 3 3 | 1230 | 2.9461 | 6.031 | .21251 | 1.3377 | 297.9 | 0 |
| 3 3 | 1245 | 3.4853 | 13 073 | 21251 | 2 7112 | 185 | 0 |
| 3 3 | 1300 | 6.9258 | 12.308 | 3.1206 | 1 51 | 185 1 | 0 |
| 3 3 | 1315 | 4.2346 | 9.8562 | .21251 | 2.3668 | 166.3 | 0 |
| 3 3 | 1330 | 3.9819 | 6.6417 | 1 5905 | 1.0268 | 136.4 | 0 |
| 3 3 | 1345 | 2 7716 | 5.5299 | .21251 | 1.1498 | 171 | 0 |
| 3 3 | 1400 | 4 1519 | 8.4805 | .82322 | 1.9417 | 341 2 | 0 |
| 3 3 | 1415 | 3 6575 | 10.778 | .21251 | 2.4674 | 317.9 | 0 |
| 3 3 | 1430 | 7.6886 | 14.147 | 3 5814 | 2.5905 | 296.5 | 0 |
| 3 3 | 1445 | 8.3731 | 12.619 | 4 1944 | 1.9261 | 311 1 | 0 |
| 3 3 | 1500 | 6.456 | 13.69 | 2.2034 | 2 7224 | 318 3 | 0 |
| 3 3 | 1515 | 6 6819 | 9.8607 | 3.5814 | 1.331 | 6 504 | 0 |
| 3 3 | 1530 | 3 917 | 7 7177 | 1 1297 | 1.4048 | 4 23 | 0 |
| 3 3 | 1545 | 3.492 | 5.7267 | 1.1297 | 1.0782 | 36 54 | 0 |
| 3 3 | 1600 | 6 4739 | 8.6371 | 3 7358 | 1 3288 | 36 43 | 0 |
| 3 3 | 1615 | 7.4537 | 9 25 | 5.2659 | .76058 | 25 72 | 0 |
| 3 3 | 1630 | 6 3352 | 8.9458 | 4 0423 | 1 1163 | 20 9 | 0 |
| 3 3 | 1645 | 4.1385 | 5.1138 | 2.5099 | .37582 | 45 57 | 0 |
| 3 3 | 1700 | 3 0692 | 4 6552 | 1 284 | .81874 | 106 9 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 3 4 | 700 | 10.015 | 14 498 | 7.1248 | 1.2371 | 298 2 | 0 |
| 3 4 | 715 | 5.9795 | 10.505 | 2.0536 | 1 8433 | 305.2 | 0 |
| 3 4 | 730 | 6 4918 | 19.261 | 1.5927 | 3.2705 | 316.8 | 0 |
| 3 4 | 745 | 16.956 | 32.011 | 4 0512 | 5.635 | 308.2 | 0 |
| 3 4 | 800 | 18.925 | 27.694 | 10.346 | 3.4897 | 307.6 | 0 |
| 3 4 | 815 | 10.986 | 24.943 | 3.436 | 3.4181 | 331.9 | 0 |
| 3 4 | 830 | 8.5207 | 19.238 | 3.436 | 3.2481 | 349.9 | 0 |
| 3 4 | 845 | 10.169 | 20.625 | 3.8946 | 3.6016 | 339.3 | 0 |
| 3 4 | 900 | 8.6997 | 19.082 | 3.5882 | 3.4472 | 327 1 | 0 |
| 3 4 | 915 | 4 4941 | 10.187 | 82545 | 1.8388 | 340.6 | 0 |
| 3 4 | 930 | 5.0042 | 8.4984 | 2.36 | 1.4429 | 354 | 0 |
| 3 4 | 945 | 6.5231 | 12.948 | 2.2057 | 2.4003 | 351.4 | 0 |
| 3 4 | 1000 | 5.72 | 11.259 | 82545 | 1.8388 | 349.9 | 0 |
| 3 4 | 1015 | 3.0848 | 8.0353 | .05816 | 2.19 | 252.8 | 0 |
| 3 4 | 1030 | 2 3802 | 5.427 | .05816 | 1.161 | 57.61 | 0 |
| 3 4 | 1045 | 4.8498 | 9.1091 | 1.7449 | 1.633 | 206 2 | 0 |
| 3 4 | 1100 | 2.6822 | 5 427 | .05816 | 1.2415 | 82.7 | 0 |
| 3 4 | 1115 | 2 4518 | 6 6528 | 05816 | 1.4697 | 70 8 | 0 |
| 3 4 | 1130 | 3.011 | 8.8026 | .6711 | 1.548 | 125.5 | 0 |
| 3 4 | 1145 | 4.4404 | 10.487 | 05816 | 2.7403 | 101.1 | 0 |
| 3 4 | 1200 | 7 7624 | 14.319 | 3.1251 | 2.2527 | 66.35 | 0 |
| 3 4 | 1215 | 7.6617 | 15.086 | 2.5122 | 2 7112 | 77.9 | 0 |
| 3 4 | 1230 | 5 6238 | 11.404 | 97757 | 2.3041 | 61.91 | 0 |
| 3 4 | 1245 | 6.9929 | 11.556 | 1 897 | 1.5995 | 43.64 | 0 |
| 3 4 | 1300 | 6.409 | 9.5632 | 2 9707 | 1.3154 | 29.48 | 0 |
| 3 4 | 1315 | 8.1382 | 11.861 | 4 5031 | 1.4227 | 24 7 | 0 |
| 3 4 | 1330 | 7.2904 | 13.084 | 2 6643 | 2.4249 | 327 | 0 |
| 3 4 | 1345 | 4.5031 | 12 317 | .21028 | 2.7739 | 6.872 | 0 |
| 3 4 | 1400 | 10.811 | 18.299 | 5.2659 | 2.4227 | 323 3 | 0 |
| 3 4 | 1415 | 9.0174 | 20.267 | 2 662 | 2.9775 | 9.38 | 0 |
| 3 4 | 1430 | 11.809 | 21 498 | 4.8051 | 3.0848 | 19.67 | 0 |
| 3 4 | 1445 | 10.921 | 18.12 | 5 2637 | 2 1721 | 21 66 | 0 |
| 3 4 | 1500 | 11.357 | 17.963 | 5 1093 | 2.416 | 17 69 | 0 |
| 3 4 | 1515 | 12.156 | 15 972 | 6.4873 | 1.8724 | 23.24 | 0 |
| 3 4 | 1530 | 10.637 | 14.905 | 4 8028 | 2.0021 | 36.14 | 0 |
| 3 4 | 1545 | 9 2455 | 13 988 | 3.8857 | 2.1207 | 62 01 | 0 |
| 3 4 | 1600 | 7.8496 | 16 755 | 2 5077 | 2 6061 | 82.4 | 0 |
| 3 4 | 1615 | 8 6684 | 17.046 | 3 5792 | 2.3981 | 88 6 | 0 |
| 3 4 | 1630 | 10.138 | 20 111 | 3.5792 | 3 7179 | 96 8 | 0 |
| 3 4 | 1645 | 9.4469 | 16.285 | 4 3465 | 2 7381 | 99.4 | 0 |
| 3 4 | 1700 | 7.4313 | 10 932 | 2 9685 | 1.7247 | 104 9 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 3 5 | 700 | 5.7737 | 6 8273 | 4.8252 | .48319 | 340 5 | 0 |
| 3 5 | 715 | 5 4449 | 6.9817 | 3 5949 | .75611 | 334 1 | 0 |
| 3 5 | 730 | 5 8856 | 9.4424 | 4.0557 | .9552 | 352.9 | 0 |
| 3 5 | 745 | 8.2948 | 10.518 | 5.4404 | .93507 | 3.381 | 0 |
| 3 5 | 800 | 6 9683 | 9.288 | 4 5165 | 77848 | 4 163 | 0 |
| 3 5 | 815 | 5.6193 | 7.438 | 3.747 | .64873 | 7 33 | 0 |
| 3 5 | 830 | 5.5768 | 8 3597 | 3.1318 | .80532 | 356 1 | 0 |
| 3 5 | 845 | 6.2569 | 8.5118 | 4.0534 | 1.0402 | 8.9 | 0 |
| 3 5 | 900 | 5.5299 | 7.2814 | 3 2839 | 76953 | 12.56 | 0 |
| 3 5 | 915 | 4.9102 | 7 74 | 1.5927 | 1.1319 | 354 9 | 0 |
| 3 5 | 930 | 4 6709 | 7.7378 | 2.5144 | 1.0223 | 13.08 | 0 |
| 3 5 | 945 | 3.5859 | 6.6618 | 82545 | 1.0559 | 8 6 | 0 |
| 3 5 | 1000 | 3.105 | 5.8923 | .97757 | .98652 | 47.61 | 0 |
| 3 5 | 1015 | 2.633 | 5.7379 | 05592 | 1.123 | 54 58 | 0 |
| 3 5 | 1030 | 3.2884 | 6.1965 | 05592 | 1.2818 | 21 55 | 0 |
| 3 5 | 1045 | 2.4048 | 4.6619 | 05816 | .92612 | 110 1 | 0 |
| 3 5 | 1100 | 3.7515 | 6.1965 | 51675 | 1.2617 | 344 9 | 0 |
| 3 5 | 1115 | 3 5434 | 8 8026 | 05816 | 2.0961 | 105 8 | 0 |
| 3 5 | 1130 | 5.0802 | 10.026 | 1.284 | 1.9484 | 104 1 | 0 |
| 3 5 | 1145 | 3.5367 | 9.1046 | 05816 | 1 8947 | 69.71 | 0 |
| 3 5 | 1200 | 4 1385 | 7.7221 | 05816 | 1.6375 | 111.5 | 0 |
| 3 5 | 1215 | 2 718 | 8.4782 | 05816 | 1.8343 | 75 6 | 0 |
| 3 5 | 1230 | 4.0646 | 8.9346 | 82322 | 1.6934 | 59 37 | 0 |
| 3 5 | 1245 | 4 9863 | 10.773 | 1.284 | 1.8813 | 71 | 0 |
| 3 5 | 1300 | 3 7805 | 7.7132 | .6711 | 1.51 | 70 5 | 0 |
| 3 5 | 1315 | 4.9997 | 10 163 | 21251 | 2.3175 | 117 3 | 0 |
| 3 5 | 1330 | 2.8455 | 7.1025 | 21251 | 1 5368 | 44 47 | 0 |
| 3 5 | 1345 | 3.9103 | 10.165 | -.27291 | 2.0804 | 65.56 | 0 |
| 3 5 | 1400 | 7.74 | 11.849 | 2.8142 | 1 5726 | 11.01 | 0 |
| 3 5 | 1415 | 8 3574 | 11 391 | 5.7245 | 1 0693 | 357.6 | 0 |
| 3 5 | 1430 | 8.3753 | 12.619 | 4 1944 | 1.7449 | 6.912 | 0 |
| 3 5 | 1445 | 7 9078 | 11 702 | 3 7358 | 1.4205 | 351 | 0 |
| 3 5 | 1500 | 7 5141 | 11.245 | 2.9685 | 1.8008 | 351.9 | 0 |
| 3 5 | 1515 | 8.769 | 13.084 | 4.3487 | 1.4921 | 356.8 | 0 |
| 3 5 | 1530 | 9.3372 | 13.236 | 4.8096 | 1.3914 | 357.4 | 0 |
| 3 5 | 1545 | 10 986 | 13.545 | 7.8742 | 1.2639 | .337 | 0 |
| 3 5 | 1600 | 10 807 | 13.702 | 7.57 | 1 1677 | 5.003 | 0 |
| 3 5 | 1615 | 8.9972 | 12.63 | 6.4985 | 1.1856 | 354 | 0 |
| 3 5 | 1630 | 9 1024 | 11 559 | 5.7312 | 1 0536 | 348 1 | 0 |
| 3 5 | 1645 | 6.4605 | 10.335 | 4 3532 | 1.2393 | 331 9 | 0 |
| 3 5 | 1700 | 7 306 | 12 333 | 3 2794 | 1.8343 | 333 4 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 3 6 | 700 | 23.131 | 28 969 | 16 822 | 2.3981 | 348 3 | 0 |
| 3 6 | 715 | 23 466 | 29 909 | 17.896 | 2.0446 | 347 4 | 01 |
| 3 6 | 730 | 26.128 | 34.204 | 18.366 | 2.9417 | 349.6 | 0 |
| 3 6 | 745 | 27.985 | 35.121 | 20.357 | 2.8477 | 349 8 | 01 |
| 3 6 | 800 | 27.761 | 36.664 | 20.513 | 2 8499 | 351.6 | 01 |
| 3 6 | 815 | 26.933 | 36.06 | 17.583 | 3.5792 | 353.1 | 0 |
| 3 6 | 830 | 24.853 | 31.139 | 18.209 | 2.5144 | 354 3 | 02 |
| 3 6 | 845 | 24.473 | 31.43 | 19.126 | 2.445 | 353 3 | 01 |
| 3 6 | 900 | 25.099 | 32.504 | 18.053 | 2.7493 | 353 5 | 0 |
| 3 6 | 915 | 24.607 | 30.669 | 18.209 | 2.2527 | 354 | 01 |
| 3 6 | 930 | 22.437 | 28.365 | 16.352 | 2 3802 | 357 | 01 |
| 3 6 | 945 | 21.609 | 26 665 | 17.135 | 1.8545 | 356 | 01 |
| 3 6 | 1000 | 22.057 | 28.522 | 15.748 | 2 2281 | 354.5 | 02 |
| 3 6 | 1015 | 23.421 | 30.826 | 16.822 | 2.5256 | 358.5 | 01 |
| 3 6 | 1030 | 28.276 | 40.669 | 18.209 | 4.5366 | 359 3 | .01 |
| 3 6 | 1045 | 31.967 | 38.969 | 22 974 | 2.8074 | 352.4 | 02 |
| 3 6 | 1100 | 33.555 | 42.503 | 25.122 | 3.0893 | 352.8 | 03 |
| 3 6 | 1115 | 30 311 | 38.521 | 23 287 | 2.6598 | 352.6 | 01 |
| 3 6 | 1130 | 29 439 | 37.134 | 20.513 | 3.6575 | 351.9 | 02 |
| 3 6 | 1145 | 27.314 | 36.978 | 18.209 | 3.0915 | 349 | 01 |
| 3 6 | 1200 | 28.052 | 36.351 | 18.836 | 3.5949 | 350.6 | .01 |
| 3 6 | 1215 | 28.589 | 39.438 | 21.274 | 2.8835 | 348.6 | 0 |
| 3 6 | 1230 | 27.537 | 35.143 | 20.2 | 2.8656 | 348.3 | 01 |
| 3 6 | 1245 | 27.649 | 36.351 | 20 67 | 2.709 | 350.6 | 0 |
| 3 6 | 1300 | 27.247 | 36.821 | 19.909 | 3.3041 | 352.4 | 02 |
| 3 6 | 1315 | 29.394 | 37 895 | 21.43 | 2.8723 | 350.8 | 0 |
| 3 6 | 1330 | 28.522 | 38.969 | 21.14 | 3.3152 | 348.4 | 01 |
| 3 6 | 1345 | 32.235 | 40 355 | 24.518 | 2.8813 | 352.6 | .02 |
| 3 6 | 1400 | 30.557 | 38.655 | 23 287 | 3.3331 | 354 | 0 |
| 3 6 | 1415 | 29 439 | 43 599 | 18.679 | 3.6553 | 354 2 | 01 |
| 3 6 | 1430 | 30.647 | 41.273 | 21.587 | 3.8342 | 353.8 | 02 |
| 3 6 | 1445 | 29.707 | 41 452 | 18.366 | 4.0803 | 357.9 | 0 |
| 3 6 | 1500 | 32.19 | 46.172 | 21.744 | 4.3375 | 354.1 | 0 |
| 3 6 | 1515 | 32.235 | 44 829 | 22.974 | 3.9013 | 353 2 | 0 |
| 3 6 | 1530 | 32.526 | 44.203 | 21.9 | 3.9036 | 353.1 | 0 |
| 3 6 | 1545 | 33.108 | 45.143 | 23.757 | 3.8365 | 353.2 | 01 |
| 3 6 | 1600 | 30 58 | 41 295 | 21.587 | 3.2906 | 353 7 | 01 |
| 3 6 | 1615 | 27.985 | 40 065 | 18 522 | 3.8924 | 356.4 | .02 |
| 3 6 | 1630 | 30.021 | 40 065 | 20.826 | 3.8544 | 356.2 | 01 |
| 3 6 | 1645 | 27.761 | 38.521 | 20 2 | 2.9707 | 355 8 | 01 |
| 3 6 | 1700 | 27.963 | 37 917 | 20.513 | 3 1408 | 354.8 | 01 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 3 7 | 700 | 4.7961 | 5 6015 | 3 2906 | 41832 | 176.9 | 0 |
| 3 7 | 715 | 4.8588 | 5.7536 | 3.5971 | .41161 | 175 8 | 0 |
| 3 7 | 730 | 4.7335 | 5.9079 | 3 4427 | .48543 | 161.2 | 0 |
| 3 7 | 745 | 4.5702 | 6.2166 | 3.2906 | 67557 | 152 6 | 0 |
| 3 7 | 800 | 3.6821 | 5.2927 | 2 5189 | .54359 | 155 8 | 0 |
| 3 7 | 815 | 2.5099 | 3.4427 | 1 2863 | 48319 | 164 | 0 |
| 3 7 | 830 | 2.7269 | 3.2906 | 1 595 | 27068 | 197.5 | 0 |
| 3 7 | 845 | 3.6754 | 4 521 | 1 9037 | .46753 | 196.2 | 0 |
| 3 7 | 900 | 3.9617 | 5.1384 | 2 8276 | 46977 | 196.3 | 0 |
| 3 7 | 915 | 3.2079 | 4.0579 | 2 2102 | 33555 | 187 2 | 0 |
| 3 7 | 930 | 3.0334 | 4.0579 | 2.0558 | .38029 | 163.1 | 0 |
| 3 7 | 945 | 4.4561 | 5 4426 | 2.0558 | .55254 | 147 | 0 |
| 3 7 | 1000 | 4.2973 | 5.597 | 3.2884 | 49885 | 163 | 0 |
| 3 7 | 1015 | 4.0557 | 4.9796 | 2 3645 | .42727 | 181.8 | 0 |
| 3 7 | 1030 | 4.1944 | 5.4404 | 2.8253 | 47648 | 189.8 | 0 |
| 3 7 | 1045 | 5.0914 | 6.9772 | 3 1318 | .86348 | 174.4 | 0 |
| 3 7 | 1100 | 5.7021 | 6.9772 | 4.3622 | .49214 | 163.9 | 0 |
| 3 7 | 1115 | 5.7357 | 7.1293 | 4 0534 | .57491 | 161 | 0 |
| 3 7 | 1130 | 5.4024 | 7.1293 | 3 4383 | 67557 | 128.6 | 0 |
| 3 7 | 1145 | 3.8454 | 7.7423 | .82545 | 1 7807 | 110.7 | 0 |
| 3 7 | 1200 | 2.6464 | 3.8991 | .38924 | .689 | 61 17 | 0 |
| 3 7 | 1215 | 2.5233 | 3 7447 | 1 1319 | .41384 | 46.79 | 0 |
| 3 7 | 1230 | 3.1318 | 6.6573 | .6711 | 1.0648 | 64.34 | 0 |
| 3 7 | 1245 | 3.219 | 6.0444 | 6711 | 1 3333 | 67.73 | 0 |
| 3 7 | 1300 | 2.3041 | 4.2011 | 36463 | 1.0402 | 72.1 | 0 |
| 3 7 | 1315 | 2.4137 | 5.2726 | .36463 | 1.0872 | 97.9 | 0 |
| 3 7 | 1330 | 3.4338 | 5 4247 | .05816 | 1.0939 | 58 6 | 0 |
| 3 7 | 1345 | 4.7067 | 6.3441 | 3.1251 | .86796 | 37.5 | 0 |
| 3 7 | 1400 | 4.2704 | 6.6506 | 3 1229 | .76282 | 30.98 | 0 |
| 3 7 | 1415 | 3.5345 | 4 8096 | 2.0513 | .54806 | 28.35 | 0 |
| 3 7 | 1430 | 3.3376 | 4 351 | 2.5099 | .38924 | 32.41 | 0 |
| 3 7 | 1445 | 1.3981 | 2 9707 | 05816 | 69794 | 59.37 | 0 |
| 3 7 | 1500 | 1.5368 | 3.2772 | .05816 | .8948 | 71.3 | 0 |
| 3 7 | 1515 | 2.8388 | 3.738 | 1 7449 | .38476 | 53.51 | 0 |
| 3 7 | 1530 | 1.7471 | 3.738 | .05816 | 1.0156 | 52.22 | 0 |
| 3 7 | 1545 | .82769 | 2.2057 | - 70913 | .52122 | 69 79 | 0 |
| 3 7 | 1600 | 1.3422 | 2.5122 | 05816 | .61741 | 73.2 | 0 |
| 3 7 | 1615 | 2.1856 | 4.0445 | 21028 | .90151 | 96.4 | 0 |
| 3 7 | 1630 | 3.568 | 4.5053 | 2 5122 | .37134 | 148.7 | 0 |
| 3 7 | 1645 | 4.4695 | 5.7357 | 2 5122 | .51004 | 144 8 | 0 |
| 3 7 | 1700 | 5 6932 | 7 7311 | 3.5882 | 72255 | 144 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 3 8 | 700 | 5 371 | 14 062 | 21028 | 2.5614 | 116.9 | 0 |
| 3 8 | 715 | 5 6283 | 10 21 | 21028 | 2 0804 | 114.1 | 0 |
| 3 8 | 730 | 6.0377 | 14.359 | 1 1319 | 2.2102 | 51.48 | 0 |
| 3 8 | 745 | 4 7894 | 14 974 | 21028 | 3 0759 | 80.9 | 0 |
| 3 8 | 800 | 8.3507 | 25.412 | 21028 | 7.3664 | 222.4 | 0 |
| 3 8 | 815 | 23 556 | 46 776 | 9 7399 | 6 9772 | 253 7 | 0 |
| 3 8 | 830 | 24.294 | 48 744 | 11.581 | 7.7646 | 275.3 | 0 |
| 3 8 | 845 | 13.263 | 27.56 | 5.588 | 3.9237 | 288.1 | 0 |
| 3 8 | 900 | 3 709 | 11.189 | 21028 | 2 4987 | 342.7 | 0 |
| 3 8 | 915 | 5.2659 | 12.652 | 21028 | 2.4943 | 8.48 | 0 |
| 3 8 | 930 | 6.3934 | 11.576 | 2 0536 | 2 5837 | 71.4 | 0 |
| 3 8 | 945 | 8 5185 | 14.185 | 3 1273 | 2.5211 | 97.7 | 0 |
| ** | | | | | | | |
| 3 8 | 1015 | 9.0375 | 12 035 | - 71137 | 2.0379 | 121 6 | 0 |
| 3 8 | 1030 | 9 6034 | 12.802 | 7 2747 | 1 3825 | 126.5 | 0 |
| 3 8 | 1045 | 7.6819 | 11.42 | 4 049 | 1.8232 | 130.3 | 0 |
| 3 8 | 1100 | 7 0868 | 10.344 | 4.049 | 1.4854 | 157.1 | 0 |
| 3 8 | 1115 | 4.0266 | 6.3508 | 2 0536 | 76505 | 160.2 | 0 |
| 3 8 | 1130 | 3.1117 | 5 89 | 36463 | 1.1856 | 133.9 | 0 |
| 3 8 | 1145 | 7.7512 | 10.494 | 3.2794 | 2.1542 | 121.9 | 0 |
| 3 8 | 1200 | 6.6573 | 8 6527 | 2 2057 | 1.4608 | 134.2 | 0 |
| 3 8 | 1215 | 5 7938 | 8.0375 | 2.5122 | 1 3064 | 169.7 | 0 |
| 3 8 | 1230 | 7.353 | 10 492 | 4.5076 | 1.199 | 164.6 | 0 |
| 3 8 | 1245 | 8.4357 | 12 333 | 4.6597 | 1 4048 | 176.2 | 0 |
| 3 8 | 1300 | 7.5454 | 11 717 | 4.0467 | 1.7113 | 186 2 | 0 |
| 3 8 | 1315 | 9 382 | 11.717 | 7.8832 | .73597 | 187.7 | 0 |
| 3 8 | 1330 | 10.516 | 12.943 | 7.7288 | 1.0201 | 192.8 | 0 |
| 3 8 | 1345 | 11 147 | 15 552 | 6.9615 | 1 3512 | 198.3 | 0 |
| 3 8 | 1400 | 9.08 | 11.563 | 7.1159 | .92612 | 203.4 | 0 |
| 3 8 | 1415 | 7 9548 | 11 259 | 5.427 | 1 2035 | 197.1 | 0 |
| 3 8 | 1430 | 9.08 | 10.489 | 7 5745 | 6107 | 189.6 | 0 |
| 3 8 | 1445 | 9.7108 | 11 872 | 7 7266 | .84111 | 183 6 | 0 |
| 3 8 | 1500 | 8 9256 | 11.257 | 6 3464 | 1 1476 | 212.8 | 0 |
| 3 8 | 1515 | 8.5655 | 12 019 | 5 5791 | 1.557 | 204.1 | 0 |
| 3 8 | 1530 | 7.9794 | 10.485 | 6.1898 | .90375 | 195.4 | 0 |
| 3 8 | 1545 | 8 0241 | 9.8652 | 6 1898 | .76058 | 193 4 | 0 |
| 3 8 | 1600 | 7.0488 | 10.478 | 4 6552 | 1.2751 | 186 7 | 0 |
| 3 8 | 1615 | 4 738 | 6.3397 | 3 275 | 62412 | 200 7 | 0 |
| 3 8 | 1630 | 3.6553 | 5.2659 | 1 7426 | 7136 | 218.4 | 0 |
| 3 8 | 1645 | 5 0064 | 7 5633 | 2 5099 | 1 2617 | 223 7 | 0 |
| 3 8 | 1700 | 6 843 | 10 322 | 4 1944 | 1 5816 | 229 | 0 |

**Data missing due to maintenance on tower.

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 3 9 | 700 | 6 4336 | 8 6661 | 4 5143 | 1 0067 | 256.9 | 0 |
| 3 9 | 715 | 10.25 | 12 355 | 6 5141 | 1 2326 | 242.9 | 0 |
| 3 9 | 730 | 13.966 | 16 822 | 10 664 | 1 2371 | 250.4 | 0 |
| 3 9 | 745 | 10 451 | 13 124 | 6 3598 | 1 7739 | 254.9 | 0 |
| 3 9 | 800 | 8.995 | 13 279 | 5 1294 | 2 4025 | 247 2 | 0 |
| 3 9 | 815 | 6.1048 | 8.6639 | 3 5926 | 1 0447 | 237.6 | 0 |
| 3 9 | 830 | 3 5054 | 5 2838 | 1 9015 | 98204 | 208.5 | 0 |
| 3 9 | 845 | 4.6932 | 10 196 | 1.9015 | 1 463 | 190.5 | 0 |
| 3 9 | 900 | 7.3396 | 12 346 | 4 6664 | 1 6106 | 193 3 | 0 |
| 3 9 | 915 | 8.8876 | 11 729 | 4 8185 | 1.7292 | 192.6 | 0 |
| 3 9 | 930 | 6.5477 | 9.8048 | 4.8163 | 1 0201 | 213.1 | 0 |
| 3 9 | 945 | 6.6797 | 9 118 | 4.8163 | .74492 | 194.5 | 0 |
| 3 9 | 1000 | 6.0444 | 8.0398 | 2.9752 | 1 3579 | 200.3 | 0 |
| 3 9 | 1015 | 4.1631 | 5 5836 | 2 6665 | .56149 | 213 7 | 0 |
| 3 9 | 1030 | 3.0647 | 6.1965 | 51675 | 1 1946 | 214.9 | 0 |
| 3 9 | 1045 | 4 5612 | 8 0375 | .36463 | 1.935 | 316.6 | 0 |
| 3 9 | 1100 | 4.9304 | 8.0353 | 2 8186 | 1 1767 | 295 | 0 |
| 3 9 | 1115 | 6.928 | 8.4917 | 5 2726 | 7136 | 274.4 | 0 |
| 3 9 | 1130 | 4.5389 | 6 192 | 2 5099 | .88138 | 308.7 | 0 |
| 3 9 | 1145 | 2.1609 | 4.1966 | .82545 | .83664 | 313.8 | 0 |
| 3 9 | 1200 | 2 6285 | 3 7358 | 36463 | .70913 | 2.246 | 0 |
| 3 9 | 1215 | 7 749 | 18.299 | 51675 | 4.5568 | 20.92 | 0 |
| 3 9 | 1230 | 7.4917 | 12.467 | 4 3465 | 2.4227 | 13 8 | 0 |
| 3 9 | 1245 | 8 3865 | 13 384 | 4.5008 | 2.2996 | 329.1 | 0 |
| 3 9 | 1300 | 7.6953 | 9 0956 | 6 6439 | .47648 | 342.1 | 0 |
| 3 9 | 1315 | 8.4917 | 10.628 | 6 7982 | 64202 | 349.6 | 0 |
| 3 9 | 1330 | 10 46 | 13.69 | 5.4203 | 1 6062 | 305.3 | 0 |
| 3 9 | 1345 | 10 29 | 15 223 | 3 5814 | 2 7202 | 286 3 | 0 |
| 3 9 | 1400 | 5.6015 | 7 7177 | 3 275 | 86572 | 277.8 | 0 |
| 3 9 | 1415 | 2.9148 | 4 8073 | .51898 | 1.0089 | 299.5 | 0 |
| 3 9 | 1430 | 3 5568 | 5 7267 | 1.5905 | 91717 | 288 7 | 0 |
| 3 9 | 1445 | 3 2034 | 8 9458 | 21251 | 2.4875 | 265.6 | 0 |
| 3 9 | 1500 | 4.1631 | 9 5587 | 05816 | 2.2281 | 340.7 | 0 |
| 3 9 | 1515 | 5 4471 | 8 6393 | - 09619 | 1 8791 | 342.5 | 0 |
| 3 9 | 1530 | 9.9904 | 14 623 | 4 351 | 2 9372 | 348 6 | 0 |
| 3 9 | 1545 | 7 9816 | 13 091 | 3 8901 | 2 7068 | 329.2 | 0 |
| 3 9 | 1600 | 6 1518 | 9 1046 | 2 3578 | 1 4943 | 336.2 | 0 |
| 3 9 | 1615 | 3 7693 | 5 2726 | 2 2034 | 60175 | 308.2 | 0 |
| 3 9 | 1630 | 3.2012 | 7 7244 | 1 7449 | 89256 | 347.7 | 0 |
| 3 9 | 1645 | 5 8453 | 8 0308 | 3 738 | 80085 | 263 6 | 0 |
| 3 9 | 1700 | 5 1876 | 7 8787 | 3 2772 | 97533 | 259 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 3 10 | 700 | 4.6999 | 8.816 | 1.2863 | 2.1005 | 98 3 | 0 |
| 3 10 | 715 | 4.3241 | 9.429 | .97757 | 1 8053 | 92 2 | 0 |
| 3 10 | 730 | 5.3308 | 11.272 | 36463 | 2 4093 | 162 5 | 0 |
| 3 10 | 745 | 7.1808 | 8.8138 | 4.9706 | .99546 | 133 | 0 |
| 3 10 | 800 | 5.5455 | 8 0443 | 2.36 | 1.0581 | 131 6 | 0 |
| 3 10 | 815 | 4.172 | 5.89 | 1.8992 | .75387 | 137 6 | 0 |
| 3 10 | 830 | 5.5164 | 6.9638 | 2.973 | .55701 | 145 3 | 0 |
| 3 10 | 845 | 4.4136 | 6.0399 | 2.8186 | .81874 | 213.9 | 0 |
| 3 10 | 900 | 5.2614 | 6.8072 | 3.4316 | .70465 | 211 6 | 0 |
| 3 10 | 915 | 5.6954 | 6.6506 | 4.6574 | .46753 | 188 9 | 0 |
| 3 10 | 930 | 5.6507 | 7.2613 | 3.8901 | .53688 | 191 2 | 0 |
| 3 10 | 945 | 6.6976 | 8.1807 | 5.2681 | .40266 | 190 1 | 0 |
| 3 10 | 1000 | 7.6349 | 9.0956 | 5.7267 | .57491 | 185.1 | 0 |
| 3 10 | 1015 | 6.6864 | 8.0219 | 5.5724 | 53017 | 201.4 | 0 |
| 3 10 | 1030 | 7 7915 | 8.6326 | 6 796 | 38253 | 198.4 | 0 |
| 3 10 | 1045 | 7.8989 | 8.7847 | 6.1831 | .36239 | 196.1 | 0 |
| 3 10 | 1100 | 7.4403 | 8.3261 | 6.4873 | .34226 | 188 4 | 0 |
| 3 10 | 1115 | 6.7334 | 8.7825 | 5.4158 | 63754 | 181.2 | 0 |
| 3 10 | 1130 | 5.0467 | 6.0265 | 3.2727 | 54583 | 177 2 | 0 |
| 3 10 | 1145 | 6.5209 | 9.5453 | 3.1184 | 1.5435 | 183 1 | 0 |
| 3 10 | 1200 | 10.427 | 11.225 | 8 3194 | .6711 | 190 6 | 0 |
| 3 10 | 1215 | 10.465 | 11.684 | 7.4 | 70242 | 191 4 | 0 |
| 3 10 | 1230 | 10.075 | 11.223 | 5.7178 | 93507 | 203.9 | 0 |
| 3 10 | 1245 | 9.2634 | 10.228 | 8.4715 | 34002 | 203.2 | 0 |
| 3 10 | 1300 | 8.4961 | 9.543 | 7 0958 | .74716 | 196.6 | 0 |
| 3 10 | 1315 | 6.9369 | 7.7065 | 5 4135 | .51227 | 196 4 | 0 |
| 3 10 | 1330 | 6.6886 | 8.6259 | 4.4941 | .8948 | 202.6 | 0 |
| 3 10 | 1345 | 8.5588 | 9 6952 | 7.4022 | 63307 | 190.4 | 0 |
| 3 10 | 1400 | 9.1001 | 10.154 | 7.2479 | .61965 | 204.4 | 0 |
| 3 10 | 1415 | 7.7244 | 9.2366 | 6 0242 | .95967 | 210 4 | 0 |
| 3 10 | 1430 | 6.7625 | 7.8608 | 5 8721 | 57715 | 222.9 | 0 |
| 3 10 | 1445 | 6.7826 | 7.7065 | 5.1071 | .69347 | 230 3 | 0 |
| 3 10 | 1500 | 5.0355 | 5.5657 | 4.1899 | .26173 | 228.1 | 0 |
| 3 10 | 1515 | 4 5948 | 5.4135 | 4 0356 | .3266 | 216 5 | 0 |
| 3 10 | 1530 | 5.4829 | 7.4022 | 4 1899 | 55925 | 218.5 | 0 |
| 3 10 | 1545 | 6.3128 | 7.2501 | 4.955 | .48095 | 226.3 | 0 |
| 3 10 | 1600 | 6.8497 | 7.7087 | 5.5657 | .41161 | 227 3 | 0 |
| 3 10 | 1615 | 7.5253 | 8 4738 | 6.4851 | 41161 | 210 7 | 0 |
| 3 10 | 1630 | 5 8856 | 7.7109 | 3 8857 | 1.0715 | 196 7 | 0 |
| 3 10 | 1645 | 2 8723 | 4.0378 | 1.284 | 73374 | 209 9 | 0 |
| 3 10 | 1700 | 3 5031 | 5.8766 | 51898 | 1.6934 | 262 7 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 3 11 | 700 | 7 8317 | 14.664 | 3.9013 | 2.1319 | 352.5 | 0 |
| 3 11 | 715 | 8.1695 | 12 051 | 1.1319 | 1.85 | 340 1 | 0 |
| 3 11 | 730 | 8 2747 | 12.664 | 4.2078 | 1.8321 | 353 2 | 0 |
| 3 11 | 745 | 4.984 | 8.3574 | .36463 | 1.3444 | 125.1 | 0 |
| 3 11 | 800 | 3.275 | 7 4336 | 1 1319 | 1 5927 | 165.3 | 0 |
| 3 11 | 815 | 5.0243 | 6.8161 | 2.9752 | 71137 | 244 | 0 |
| 3 11 | 830 | 5.3308 | 8.0443 | 2.36 | 1.029 | 279 | 0 |
| 3 11 | 845 | 2.8388 | 5 8923 | .21028 | 1 7113 | 141.7 | 0 |
| 3 11 | 900 | 2.1878 | 7.1159 | .05816 | 1.4116 | 154.6 | 0 |
| 3 11 | 915 | 6.0287 | 7.7266 | 4.5053 | .81427 | 227 | 0 |
| 3 11 | 930 | 4.4651 | 5.4247 | 3.2794 | .46753 | 205 | 0 |
| 3 11 | 945 | 3.7872 | 5.8811 | 1.897 | .91717 | 162 8 | 0 |
| 3 11 | 1000 | 5.6507 | 7.7177 | 3.4293 | .9552 | 168.5 | 0 |
| 3 11 | 1015 | 5.767 | 8 3261 | 3.4271 | .86348 | 166.9 | 0 |
| 3 11 | 1030 | 6.4649 | 8.1718 | 3.5792 | 1.1879 | 188.6 | 0 |
| 3 11 | 1045 | 6 9996 | 8.4738 | 5.8744 | .59057 | 197.4 | 0 |
| 3 11 | 1100 | 8 8004 | 10.004 | 7.5544 | .43621 | 219.9 | 0 |
| 3 11 | 1115 | 8 2993 | 9.543 | 7.2479 | .5682 | 234.4 | 0 |
| 3 11 | 1130 | 7 4224 | 9 543 | 6 0242 | 1.1006 | 238.6 | 0 |
| 3 11 | 1145 | 6 7736 | 7.8608 | 5.8721 | .37358 | 237.2 | 0 |
| 3 11 | 1200 | 7 3374 | 8 4715 | 5 1071 | .76282 | 235.8 | 0 |
| 3 11 | 1215 | 5 1697 | 6.7893 | 3.7313 | .85453 | 228 | 0 |
| 3 11 | 1230 | 4 7022 | 5.7178 | 4.0356 | .31542 | 229 5 | 0 |
| 3 11 | 1245 | 3 5971 | 4.342 | 2 2012 | .36687 | 247 2 | 0 |
| 3 11 | 1300 | 3 1452 | 4 1877 | 1.8947 | 42279 | 293.1 | 0 |
| 3 11 | 1315 | 3 3868 | 4 1877 | 2 6598 | .30647 | 331 1 | 0 |
| 3 11 | 1330 | 2 6285 | 4.0356 | 1.5883 | .64649 | 350 7 | 0 |
| 3 11 | 1345 | 1.4809 | 2.964 | .21251 | 1.0201 | 351 7 | 0 |
| 3 11 | 1400 | 3.5747 | 4 3375 | 1.7404 | .35121 | 321.3 | 0 |
| 3 11 | 1415 | 3.0669 | 4.3375 | 1.4339 | .55701 | 7.64 | 0 |
| 3 11 | 1430 | 2.4629 | 3.7246 | 1.4339 | .44069 | 356.5 | 0 |
| 3 11 | 1445 | 3 2392 | 4 3353 | 1 7404 | 54583 | 349 6 | 0 |
| 3 11 | 1500 | 3.7649 | 4.7917 | 2.8074 | .33555 | 340 5 | 0 |
| 3 11 | 1515 | 4 0781 | 4.9438 | 3.266 | 31094 | 330 3 | 0 |
| 3 11 | 1530 | 5.1652 | 6.1629 | 3.7224 | 33779 | 352 7 | 0 |
| 3 11 | 1545 | 5 6015 | 6 4694 | 4 0266 | .44516 | 342 3 | 0 |
| 3 11 | 1600 | 8 9927 | 11.201 | 5.5545 | 1.4026 | 338 5 | 0 |
| 3 11 | 1615 | 9 7981 | 11 357 | 7 9973 | .5503 | 342 7 | 0 |
| 3 11 | 1630 | 7 7579 | 9.3753 | 5.8632 | .8523 | 341 1 | 0 |
| 3 11 | 1645 | 5.7558 | 6 9325 | 4 6418 | .34673 | 327.4 | 0 |
| 3 11 | 1700 | 5 5455 | 6 6305 | 4.7961 | .33331 | 321 7 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 3 12 | 700 | 8.9234 | 12 512 | 4.823 | 1.6308 | 319.5 | 0 |
| 3 12 | 715 | 6.6417 | 12.666 | 1 5927 | 2.888 | 341 | 0 |
| 3 12 | 730 | 4.2682 | 7.7445 | .6711 | 1.4362 | 51.48 | 0 |
| 3 12 | 745 | 3 7268 | 8.5118 | .21028 | 2.0424 | 201 6 | 0 |
| 3 12 | 800 | 8.2031 | 12 044 | 4.3599 | 1 4854 | 170.2 | 0 |
| 3 12 | 815 | 7 3508 | 10.503 | 4 0512 | 1.4205 | 191.2 | 0 |
| 3 12 | 830 | 5.8632 | 10.809 | 2.9752 | 1.9261 | 221 5 | 0 |
| 3 12 | 845 | 6.9929 | 13.724 | 3.1273 | 2.4831 | 296 9 | 0 |
| 3 12 | 900 | 12.438 | 18.008 | 5.2771 | 2.3533 | 292.2 | 0 |
| 3 12 | 915 | 14.192 | 19.082 | 9 1135 | 1.727 | 289 7 | 0 |
| 3 12 | 930 | 12.928 | 17.091 | 8.3418 | 1.6039 | 307 9 | 0 |
| 3 12 | 945 | 13.353 | 18.164 | 7.5745 | 1.7404 | 313.7 | 0 |
| 3 12 | 1000 | 12.286 | 19.238 | 7 268 | 2 2594 | 8.92 | 0 |
| 3 12 | 1015 | 9.505 | 15.245 | 5.8856 | 1.3646 | 339.9 | 0 |
| 3 12 | 1030 | 7.4291 | 9.8696 | 4.8118 | 1.0961 | 8.88 | 0 |
| 3 12 | 1045 | 9.514 | 12.321 | 6.3441 | 1 1588 | 33.12 | 0 |
| 3 12 | 1100 | 7.9682 | 10.635 | 6.1898 | 8769 | 48.67 | 0 |
| 3 12 | 1115 | 7.3508 | 9.5609 | 3 4293 | 1 0782 | 50 28 | 0 |
| 3 12 | 1130 | 7.0555 | 9.5587 | 4 8096 | .90151 | 51.49 | 0 |
| 3 12 | 1145 | 6 5947 | 10.324 | 3 7358 | 1.0447 | 58.63 | 0 |
| 3 12 | 1200 | 5.6551 | 7.872 | 2.662 | 1.2527 | 45.56 | 0 |
| 3 12 | 1215 | 5.0579 | 6.9526 | 3 3309 | .6532 | 50 71 | 0 |
| 3 12 | 1230 | 4.1742 | 7.2591 | 1 284 | 1.1163 | 67.61 | 0 |
| 3 12 | 1245 | 2.3131 | 4.6552 | 82322 | .88585 | 74 3 | 0 |
| 3 12 | 1300 | 3.879 | 5.7267 | 2.3556 | 66663 | 66.99 | 0 |
| 3 12 | 1315 | 5.0131 | 6.796 | 3 4853 | .60846 | 42.71 | 0 |
| 3 12 | 1330 | 7.1584 | 9.3976 | 4.04 | 1 2952 | 27 57 | 0 |
| 3 12 | 1345 | 5.9057 | 8.1718 | 3 2727 | 1.1297 | 21 09 | 0 |
| 3 12 | 1400 | 4 6865 | 6.1808 | 2 662 | 69123 | 26 56 | 0 |
| 3 12 | 1415 | 6.0511 | 7.8631 | 4.0378 | .89256 | 20.39 | 0 |
| 3 12 | 1430 | 5.6372 | 8.3216 | 3.2727 | 1.2125 | 22 02 | 0 |
| 3 12 | 1445 | 5.7804 | 8.1673 | 2 8119 | 1.0514 | 4.111 | 0 |
| 3 12 | 1500 | 5.6842 | 8 4715 | 4.0378 | .89927 | 353.5 | 0 |
| 3 12 | 1515 | 7.3732 | 10.615 | 4.6485 | 1.255 | 359.6 | 0 |
| 3 12 | 1530 | 6 8944 | 8.4738 | 5.2592 | .75611 | 349 7 | 0 |
| 3 12 | 1545 | 5.9773 | 7.4022 | 4 8028 | .53241 | 350 4 | 0 |
| 3 12 | 1600 | 5.3599 | 6 4851 | 3.5792 | .49885 | 338 2 | 0 |
| 3 12 | 1615 | 5.7871 | 6.4851 | 5 1093 | .25949 | 337.9 | 0 |
| 3 12 | 1630 | 5.9146 | 7 098 | 4 955 | .46753 | 336 3 | 0 |
| 3 12 | 1645 | 6 4537 | 7 7109 | 5.2614 | 57938 | 335 4 | 0 |
| 3 12 | 1700 | 5 9146 | 7 1002 | 4 6507 | 48543 | 336 3 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 3 13 | 700 | 7 9011 | 12 064 | 4 8275 | 1 6263 | 20 59 | 0 |
| 3 13 | 715 | 8 2501 | 11 295 | 5.9057 | 1 2639 | 20.31 | 0 |
| 3 13 | 730 | 8.1226 | 12.988 | 6 06 | 1 4026 | 23.58 | 0 |
| 3 13 | 745 | 10.445 | 12.834 | 8 3686 | 88585 | 21.15 | 0 |
| 3 13 | 800 | 10.004 | 11.91 | 8 0622 | .88585 | 15.08 | 0 |
| 3 13 | 815 | 11.201 | 14.066 | 7.9078 | 1 51 | 18.52 | 0 |
| 3 13 | 830 | 11 682 | 14.679 | 8.6751 | 1.2572 | 11.26 | 0 |
| 3 13 | 845 | 12.456 | 16.062 | 9.599 | 1 5279 | 6.486 | 0 |
| 3 13 | 900 | 14.158 | 18.075 | 11.292 | 1.4809 | 3 974 | 0 |
| 3 13 | 915 | 12.509 | 16 218 | 8.8294 | 1 5838 | 3.951 | 0 |
| 3 13 | 930 | 12.95 | 16.062 | 10.521 | 1.2483 | 352 | 0 |
| 3 13 | 945 | 14.529 | 17.762 | 10 829 | 1.3265 | 354.2 | 0 |
| 3 13 | 1000 | 15.382 | 18 992 | 11.136 | 1.284 | 356.6 | 0 |
| 3 13 | 1015 | 15.95 | 18.366 | 11.905 | 1.1632 | 357 7 | 0 |
| 3 13 | 1030 | 14.563 | 18.522 | 10 825 | 1.6957 | .337 | 0 |
| 3 13 | 1045 | 14 239 | 16.979 | 11.44 | 1.0178 | 356 5 | 0 |
| 3 13 | 1100 | 13.511 | 15.59 | 10 823 | 98875 | 359.2 | 0 |
| 3 13 | 1115 | 13 048 | 16 666 | 9 2836 | 1 1252 | 357.8 | 0 |
| 3 13 | 1130 | 13.357 | 17 135 | 9.1292 | 1 7986 | 11.07 | 0 |
| 3 13 | 1145 | 12.91 | 15.585 | 10.357 | 1.0067 | .536 | 0 |
| 3 13 | 1200 | 12.357 | 15 276 | 9 8965 | 1.2594 | 1.497 | 0 |
| 3 13 | 1215 | 12 619 | 15.429 | 10.049 | 1 1096 | .999 | 0 |
| 3 13 | 1230 | 12 304 | 15 035 | 10 044 | 81203 | 2.415 | 0 |
| 3 13 | 1245 | 12 301 | 15.726 | 8 816 | 1 3914 | 16 06 | 0 |
| 3 13 | 1300 | 9.93 | 12.574 | 7 74 | .95296 | 11.69 | 0 |
| 3 13 | 1315 | 10.254 | 12 196 | 7 4336 | .92164 | 2.619 | 0 |
| 3 13 | 1330 | 10.74 | 13 118 | 7.8944 | 87467 | 359.5 | 0 |
| 3 13 | 1345 | 10.14 | 12.655 | 7 8921 | .93283 | 4.739 | 0 |
| 3 13 | 1400 | 10.715 | 14.346 | 7 8921 | 1.2796 | 11.67 | 0 |
| 3 13 | 1415 | 9.2836 | 12.192 | 6 5074 | 1 199 | 25 76 | 0 |
| 3 13 | 1430 | 10 988 | 14 344 | 8 1986 | 1.1722 | 27.6 | 0 |
| 3 13 | 1445 | 10 011 | 12.655 | 7.2792 | 9977 | 23.05 | 0 |
| 3 13 | 1500 | 10 717 | 14.196 | 7 4336 | 1.0648 | 23.1 | 0 |
| 3 13 | 1515 | 12.458 | 16.956 | 8 9704 | 1.5189 | 20.85 | 0 |
| 3 13 | 1530 | 12.668 | 15.118 | 9 892 | .95296 | 23.28 | 0 |
| 3 13 | 1545 | 11 615 | 16.509 | 8.6639 | 1 0872 | 23 03 | 0 |
| 3 13 | 1600 | 11.485 | 17.27 | 7 1271 | 1 5972 | 37 3 | 0 |
| 3 13 | 1615 | 13 033 | 16 666 | 9 7399 | 1 4116 | 34.13 | 0 |
| 3 13 | 1630 | 11 351 | 15.583 | 8 9726 | 1 4406 | 34 98 | 0 |
| 3 13 | 1645 | 10.827 | 14 046 | 8 2053 | 1 0402 | 17 74 | 0 |
| 3 13 | 1700 | 9 3663 | 12.203 | 6 6663 | 1.0514 | 14 02 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 3 14 | 700 | 5.0869 | 20.379 | .05592 | 4.1228 | 104 | 0 |
| 3 14 | 715 | 5.3889 | 16.375 | .05592 | 3.1072 | 60.7 | 0 |
| 3 14 | 730 | 11.404 | 25.323 | .05592 | 4.3666 | 298.3 | 0 |
| 3 14 | 745 | 3.9148 | 15.905 | -.11185 | 2.8857 | 94.4 | 0 |
| 3 14 | 800 | 5.5858 | 9.9077 | 1 1319 | 2.1923 | 80.2 | 0 |
| 3 14 | 815 | 9.0174 | 21.14 | 1.1319 | 4.9147 | 304.1 | 0 |
| 3 14 | 830 | 9.4648 | 25.435 | 1.1319 | 4.8521 | 311.4 | 0 |
| 3 14 | 845 | 7.4626 | 24.048 | .21028 | 5.2726 | 333.1 | 0 |
| 3 14 | 900 | 5.89 | 15.279 | .82545 | 3.1743 | 44.07 | 0 |
| 3 14 | 915 | 10.919 | 23.891 | .21028 | 4.9952 | 270 | 0 |
| 3 14 | 930 | 8.5252 | 19.887 | 1.9015 | 4.295 | 322.7 | 0 |
| 3 14 | 945 | 5.6238 | 12.503 | .97757 | 2.1856 | 335.7 | 0 |
| 3 14 | 1000 | 17.739 | 30.625 | 4.6641 | 4.7313 | 323.7 | 0 |
| 3 14 | 1015 | 21.9 | 33.376 | 12.187 | 4.0423 | 322 | 0 |
| 3 14 | 1030 | 17.18 | 26.777 | 7.579 | 3.7671 | 319 | 0 |
| 3 14 | 1045 | 17.068 | 25.703 | 10.65 | 3.219 | 318 | 0 |
| 3 14 | 1100 | 14.549 | 26.911 | 6.966 | 4.6485 | 330.2 | 0 |
| 3 14 | 1115 | 11.559 | 20.469 | 6.5052 | 2.2706 | 354.6 | 0 |
| 3 14 | 1130 | 9.3775 | 17.717 | 3.1273 | 2.9036 | 21.44 | 0 |
| 3 14 | 1145 | 5.635 | 9.2657 | 1.7449 | 1.2952 | 35.45 | 0 |
| 3 14 | 1200 | 5.8341 | 8.8026 | 2.973 | 1.3019 | 37.69 | 0 |
| 3 14 | 1215 | 8.7243 | 10.641 | 6.6528 | .82769 | 41.73 | 0 |
| 3 14 | 1230 | 8.4469 | 11.098 | 5.8856 | .94625 | 15.33 | 0 |
| 3 14 | 1245 | 7.0421 | 9.5654 | 3.5859 | 1.3288 | 333.1 | 0 |
| 3 14 | 1300 | 4.4136 | 6.0377 | 2.6643 | .72479 | 336.3 | 0 |
| 3 14 | 1315 | 3.6911 | 5.5746 | 2.2034 | .76953 | 314.3 | 0 |
| 3 14 | 1330 | 2.5815 | 5.1093 | .21251 | 1.1789 | 262.1 | 0 |
| 3 14 | 1345 | 3.4808 | 7.8675 | .97757 | 1.0357 | 188.4 | 0 |
| 3 14 | 1400 | 2.8388 | 7.5611 | .05816 | 1.4317 | 276.8 | 0 |
| 3 14 | 1415 | 12.751 | 20.111 | 1.7426 | 3.2571 | 289.8 | 0 |
| 3 14 | 1430 | 18.343 | 26.285 | 10.172 | 3.4383 | 306.6 | 0 |
| 3 14 | 1445 | 15.793 | 26.441 | 7.5745 | 3.2929 | 304 | 0 |
| 3 14 | 1500 | 15.364 | 23.086 | 8.6527 | 2.7806 | 311.5 | 0 |
| 3 14 | 1515 | 20.2 | 28.298 | 12.95 | 2.7291 | 318.2 | 0 |
| 3 14 | 1530 | 20.737 | 30.915 | 13.874 | 2.879 | 331.6 | 0 |
| 3 14 | 1545 | 15.681 | 23.399 | 9.4222 | 3.3331 | 328.8 | 0 |
| 3 14 | 1600 | 18.03 | 25.233 | 12.798 | 2.4697 | 321.8 | 0 |
| 3 14 | 1615 | 10.955 | 18.791 | 6.1965 | 2.2012 | 353.2 | 0 |
| 3 14 | 1630 | 15.529 | 22.773 | 10.19 | 2.8723 | 323.8 | 0 |
| 3 14 | 1645 | 14.384 | 24.16 | 10.342 | 2.3265 | 330.3 | 0 |
| 3 14 | 1700 | 12.169 | 17 404 | 7.4268 | 1.9484 | 312.7 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 3 15 | 700 | 12.156 | 16.531 | 7.7534 | 1.5413 | 290 | 0 |
| 3 15 | 715 | 11.116 | 15 748 | 6 3665 | 2.1162 | 300.2 | 0 |
| 3 15 | 730 | 8.7623 | 14.677 | 4.8275 | 2.0446 | 313.3 | 0 |
| 3 15 | 745 | 7.0689 | 13.138 | 4.8275 | 1.2706 | 325.6 | 0 |
| 3 15 | 800 | 8.2881 | 11.44 | 4.9796 | 1.2684 | 309.8 | 0 |
| 3 15 | 815 | 14.572 | 22.974 | 6.6707 | 3.1497 | 298.8 | 0 |
| 3 15 | 830 | 14.332 | 18.97 | 10.051 | 1.6666 | 306.9 | 0 |
| 3 15 | 845 | 13.373 | 18.97 | 8.3574 | 2.1609 | 301.5 | 0 |
| 3 15 | 900 | 15.136 | 20 491 | 8 9704 | 2.3153 | 307.3 | 0 |
| 3 15 | 915 | 16.151 | 25.412 | 11.427 | 2.501 | 307.5 | 0 |
| 3 15 | 930 | 16.867 | 24.786 | 10.196 | 2.8499 | 312.7 | 0 |
| 3 15 | 945 | 15.883 | 22.012 | 10.653 | 2.2504 | 308.8 | 0 |
| 3 15 | 1000 | 11.988 | 19.551 | 8.0398 | 2.1498 | 312.8 | 0 |
| 3 15 | 1015 | 12.107 | 18.947 | 7.7333 | 1.9619 | 316.4 | 0 |
| 3 15 | 1030 | 9.9099 | 14.18 | 5.2749 | 1.8634 | 309.2 | 0 |
| 3 15 | 1045 | 10.885 | 19.395 | 4.3532 | 3.5524 | 320.1 | 0 |
| 3 15 | 1100 | 10.476 | 17.091 | 5.427 | 1.8478 | 24.82 | 0 |
| 3 15 | 1115 | 6.749 | 8.7981 | 4.5053 | .83664 | 70.6 | 0 |
| 3 15 | 1130 | 5.7938 | 7.7177 | 3.7313 | .76282 | 50.46 | 0 |
| 3 15 | 1145 | 5.2189 | 12.14 | .21251 | 2.2348 | 5.627 | 0 |
| 3 15 | 1200 | 5.8654 | 14.268 | .6711 | 2.8074 | 352 | 0 |
| ** | | | | | | | |
| 3 15 | 1245 | 7.8228 | 19.059 | -1.4742 | 6.758 | 332.7 | 0 |
| 3 15 | 1300 | 10.21 | 17.203 | 4.5008 | 2.8455 | 310.2 | 0 |
| 3 15 | 1315 | 12.435 | 19.663 | 6.6461 | 2.4697 | 304.7 | 0 |
| 3 15 | 1330 | 12.576 | 18.746 | 6.6506 | 2.3354 | 301.5 | 0 |
| 3 15 | 1345 | 14.01 | 23.22 | 6.9571 | 2.7918 | 286 | 0 |
| 3 15 | 1400 | 13.695 | 19.372 | 7.8765 | 2.3332 | 290.2 | 0 |
| 3 15 | 1415 | 16.509 | 24.898 | 10.026 | 3.3801 | 297.8 | 0 |
| 3 15 | 1430 | 18.545 | 26.285 | 9.7198 | 3.2817 | 288.6 | 0 |
| 3 15 | 1445 | 19.216 | 29.193 | 10.181 | 3.4942 | 291.2 | 0 |
| 3 15 | 1500 | 17.829 | 27.963 | 8 1874 | 3.4472 | 290.1 | 0 |
| 3 15 | 1515 | 14.668 | 20.916 | 8.9547 | 2.4853 | 287.7 | 0 |
| 3 15 | 1530 | 13.997 | 25.837 | 7.1137 | 3.577 | 283.6 | 0 |
| 3 15 | 1545 | 15.86 | 23.69 | 8.4961 | 3.0535 | 292.7 | 0 |
| 3 15 | 1600 | 14.921 | 24.764 | 8.1897 | 2.9305 | 302.9 | 0 |
| 3 15 | 1615 | 12.95 | 19.999 | 7.2703 | 2.4495 | 298.2 | 0 |
| 3 15 | 1630 | 12.726 | 24.473 | 6.9638 | 3.0513 | 288.7 | 0 |
| 3 15 | 1645 | 21.117 | 33.063 | 13.72 | 3 4427 | 285.7 | 0 |
| 3 15 | 1700 | 19.261 | 28.611 | 10 957 | 2.9484 | 291.9 | 0 |

**Data missing due to maintenance on tower.

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 3 16 | 700 | 11.053 | 14.205 | 7.438 | 1.4116 | 309.5 | 0 |
| 3 16 | 715 | 8.438 | 11.744 | 6.0533 | 1.0424 | 312 | 0 |
| 3 16 | 730 | 8.4245 | 11.744 | 5.7469 | 1.1252 | 310.6 | 0 |
| 3 16 | 745 | 11.59 | 15.129 | 7.7467 | 1.3131 | 318.2 | 0 |
| 3 16 | 800 | 9.8249 | 13.435 | 6.975 | 1.2729 | 322.5 | 0 |
| 3 16 | 815 | 7.1875 | 10.205 | 4.6686 | 1.1856 | 313.7 | 0 |
| 3 16 | 830 | 4.4136 | 8.514 | 2.8231 | .88585 | 305.6 | 0 |
| 3 16 | 845 | 3.6687 | 6.3576 | 1.7471 | .76729 | 286.5 | 0 |
| 3 16 | 900 | 9.1896 | 12.194 | 3.1296 | 1.7896 | 318.9 | 0 |
| 3 16 | 915 | 8.2747 | 14.037 | 4.6641 | 2.1609 | 318.2 | 0 |
| 3 16 | 930 | 4.7849 | 6.966 | .36463 | 1.2125 | 301.6 | 0 |
| 3 16 | 945 | .92164 | 2.36 | -.55701 | .72702 | 50.63 | 0 |
| 3 16 | 1000 | 3.7671 | 6.9593 | .21028 | 2.0401 | 64.15 | 0 |
| 3 16 | 1015 | 3.6441 | 6.3441 | 1.1319 | 1.1655 | 81.4 | 0 |
| 3 16 | 1030 | 4.5098 | 8.948 | 2.5099 | 1.4317 | 86.6 | 0 |
| 3 16 | 1045 | 6.0623 | 10.02 | 2.0513 | 1.9082 | 84.1 | 0 |
| 3 16 | 1100 | 4.5232 | 7.7199 | 1.897 | 1.369 | 77.1 | 0 |
| 3 16 | 1115 | 3.1072 | 6.3397 | 1.7426 | .94178 | 86.5 | 0 |
| 3 16 | 1130 | 4.7514 | 6.9526 | 2.2034 | .99546 | 105.6 | 0 |
| 3 16 | 1145 | 5.6529 | 9.0956 | 2.3556 | 1.425 | 103.1 | 0 |
| 3 16 | 1200 | 8.6057 | 11.854 | 6.0332 | 1.1677 | 142.4 | 0 |
| 3 16 | 1215 | 3.747 | 7.5655 | .05816 | 1.7113 | 124.4 | 0 |
| 3 16 | 1230 | 4.8588 | 8.1785 | 1.284 | 1.4921 | 145.5 | 0 |
| 3 16 | 1245 | 3.7179 | 7.2591 | .21251 | 1.7426 | 165.3 | 0 |
| 3 16 | 1300 | 2.8432 | 7.4112 | .21251 | 1.7113 | 258.4 | 0 |
| 3 16 | 1315 | 4.1989 | 8.0219 | 36463 | 1.6666 | 75.8 | 0 |
| 3 16 | 1330 | 5.937 | 12.46 | 2.0491 | 1.595 | 97.9 | 0 |
| 3 16 | 1345 | 5.7312 | 10.011 | 2.3556 | 1.6934 | 90.7 | 0 |
| 3 16 | 1400 | 4.9348 | 8.3261 | 1.5905 | 1.6979 | 94.8 | 0 |
| 3 16 | 1415 | 6.2099 | 10.776 | 2.9685 | 1.9037 | 91.2 | 0 |
| 3 16 | 1430 | 4.8207 | 7.4089 | 2.3556 | 1.0492 | 75.8 | 0 |
| 3 16 | 1445 | 4.4047 | 6.4895 | 1.897 | .94401 | 53.89 | 0 |
| 3 16 | 1500 | 4.0221 | 8.3284 | 21251 | 1.9686 | 51.24 | 0 |
| 3 16 | 1515 | 9.1918 | 22.124 | 1.284 | 3.9416 | 323 | 0 |
| 3 16 | 1530 | 10.865 | 21.341 | 2.9685 | 3.8991 | 341.3 | 0 |
| 3 16 | 1545 | 11.064 | 26.866 | 1.7449 | 5.2055 | 338.1 | 0 |
| 3 16 | 1600 | 14.925 | 28.253 | 4.3487 | 5.4225 | 316.9 | 0 |
| 3 16 | 1615 | 12.415 | 22.594 | 5.5768 | 3.0267 | 334.2 | 0 |
| 3 16 | 1630 | 12.234 | 22.885 | 6.9548 | 3.4383 | 328.6 | 0 |
| 3 16 | 1645 | 11.921 | 19.686 | 6.4963 | 2.0469 | 321.1 | 0 |
| 3 16 | 1700 | 15.274 | 21.52 | 10 176 | 1.9865 | 312.9 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 3 17 | 700 | 4.5814 | 6.5097 | 2 5144 | .86124 | 161.4 | 0 |
| 3 17 | 715 | 4.1698 | 6.8184 | .21028 | 1.4451 | 186 9 | 0 |
| 3 17 | 730 | 8.8697 | 13.272 | 3.1296 | 2.2392 | 187 | 0 |
| 3 17 | 745 | 7.8631 | 10.966 | 5.588 | 1.4093 | 187.9 | 0 |
| 3 17 | 800 | 6.9437 | 12.809 | 2.8231 | 2.4271 | 169.1 | 0 |
| 3 17 | 815 | 7.4224 | 10.042 | 5.5858 | .87914 | 156 | 0 |
| 3 17 | 830 | 6.8564 | 9.4245 | 4.049 | 1.0559 | 134.1 | 0 |
| 3 17 | 845 | 5.3509 | 8.1964 | 1.5927 | 1.8232 | 106.4 | 0 |
| 3 17 | 900 | 5.2816 | 8.0398 | 1.7449 | 1.548 | 86.3 | 0 |
| 3 17 | 915 | 3.4114 | 8.4984 | .05816 | 1.859 | 21.9 | 0 |
| 3 17 | 930 | 2.9014 | 6.5007 | 05816 | 1.9529 | 19.49 | 0 |
| 3 17 | 945 | 4.597 | 8.0353 | 2.0513 | 1.5301 | 234.2 | 0 |
| 3 17 | 1000 | 2.9819 | 6.1943 | .05816 | 1.2013 | 172 | 0 |
| 3 17 | 1015 | 5.3196 | 18.321 | .05816 | 4.0736 | 229.7 | 0 |
| 3 17 | 1030 | 15.972 | 25.837 | 8.8026 | 3.0848 | 282.5 | 0 |
| 3 17 | 1045 | 14.149 | 22.146 | 8.1897 | 2.7985 | 274 | 0 |
| 3 17 | 1100 | 16.554 | 27.515 | 10.798 | 3.0692 | 259.6 | 0 |
| 3 17 | 1115 | 15.578 | 24.764 | 9.4155 | 2.5144 | 270.5 | 0 |
| 3 17 | 1130 | 16.576 | 28.298 | 8.6505 | 3.9774 | 271.7 | 0 |
| 3 17 | 1145 | 18.232 | 30.58 | 10.8 | 2.8052 | 274.7 | 0 |
| 3 17 | 1200 | 14.702 | 23.22 | 7.4224 | 3.0781 | 275.7 | 0 |
| 3 17 | 1215 | 11.196 | 17.091 | 5.7357 | 2.3645 | 277.6 | 0 |
| 3 17 | 1230 | 14.617 | 24.45 | 6.503 | 3.5188 | 303.3 | 0 |
| 3 17 | 1245 | 19.529 | 36.262 | 10.8 | 4.1161 | 305.5 | 0 |
| 3 17 | 1300 | 17.963 | 28.745 | 8.6505 | 4.2145 | 301.9 | 0 |
| 3 17 | 1315 | 19.283 | 33.667 | 10.337 | 4.6977 | 280.8 | 0 |
| 3 17 | 1330 | 21.408 | 31.05 | 11.874 | 3.7962 | 276.2 | 0 |
| 3 17 | 1345 | 23.735 | 34.584 | 14.943 | 3.4249 | 283.6 | 0 |
| 3 17 | 1400 | 19.238 | 28.455 | 11.874 | 3.3219 | 280.9 | 0 |
| 3 17 | 1415 | 19.126 | 27.985 | 10.952 | 3.6374 | 280 | 0 |
| 3 17 | 1430 | 19.305 | 28.298 | 9.1113 | 3.747 | 275.6 | 0 |
| 3 17 | 1445 | 9.4871 | 19.842 | 3.1273 | 3.3846 | 357.6 | 0 |
| 3 17 | 1500 | 10.445 | 14.787 | 7.268 | 1.8097 | 1 | 0 |
| 3 17 | 1515 | 10.641 | 14.019 | 5.5813 | 1.6643 | 15.7 | 0 |
| 3 17 | 1530 | 11.576 | 14.326 | 8.0375 | 1.2169 | 12.24 | 0 |
| 3 17 | 1545 | 11.505 | 14.634 | 7.7311 | 1.6151 | 15.54 | 0 |
| 3 17 | 1600 | 9.0129 | 12.487 | 4.814 | 1.4541 | 347 | 0 |
| 3 17 | 1615 | 8.6013 | 11.261 | 5.89 | 1.0447 | 340.1 | 0 |
| 3 17 | 1630 | 7.4045 | 9.7265 | 4.049 | 1.1767 | 338.2 | 0 |
| 3 17 | 1645 | 7.4403 | 9.7265 | 4.8163 | .94625 | 340.8 | 0 |
| 3 17 | 1700 | 6.6752 | 10.035 | 3.5882 | 1.2796 | 266 2 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 3 18 | 700 | 13.102 | 17.449 | 9.4401 | 1.6487 | 19.5 | .01 |
| 3 18 | 715 | 12.268 | 15.288 | 8.6706 | 1.2975 | 39.6 | 0 |
| 3 18 | 730 | 11.178 | 14.364 | 8.5163 | 1.1834 | 25.68 | .01 |
| 3 18 | 745 | 11.87 | 15.594 | 7.4403 | 1.6039 | 5.828 | 0 |
| 3 18 | 800 | 11.487 | 14.364 | 8.5185 | 1.1051 | 6.744 | .01 |
| 3 18 | 815 | 9.7108 | 11.749 | 7.4403 | .86572 | 9.31 | 0 |
| 3 18 | 830 | 8.5386 | 11.594 | 5.4404 | 1.2594 | 5.981 | 0 |
| 3 18 | 845 | 6.7893 | 8.3641 | 5.1317 | .66215 | .89 | 0 |
| 3 18 | 900 | 5.2883 | 7.1316 | 3.5949 | .57267 | 352 | 0 |
| 3 18 | 915 | 4.8632 | 6.5164 | 3.4405 | .7919 | 345.8 | 0 |
| 3 18 | 930 | 2.8611 | 3.9013 | 1.9015 | .43845 | 332.2 | 0 |
| 3 18 | 945 | 1.5189 | 2.3623 | .21028 | .35792 | 4.244 | 0 |
| 3 18 | 1000 | 1.2751 | 2.2079 | .21028 | .47201 | 35.21 | 0 |
| 3 18 | 1015 | .57491 | 1.7471 | .05592 | .47424 | 78.3 | 0 |
| 3 18 | 1030 | 3.1631 | 8.9659 | .21028 | 2.1319 | 90.2 | .01 |
| 3 18 | 1045 | 7.0734 | 8.6572 | 5.4314 | .61965 | 125.5 | 0 |
| 3 18 | 1100 | 7.8273 | 10.037 | 4.3577 | 1.3579 | 133.9 | 0 |
| 3 18 | 1115 | 7.9056 | 10.346 | 5.1227 | .90151 | 137.9 | 0 |
| 3 18 | 1130 | 8.3149 | 11.111 | 5.8923 | .88361 | 134.2 | 0 |
| 3 18 | 1145 | 8.259 | 10.344 | 5.2771 | 1.0111 | 136.8 | 0 |
| 3 18 | 1200 | 7.6886 | 10.037 | 4.5098 | 1.0134 | 137 | 0 |
| 3 18 | 1215 | 6.1495 | 8.9614 | 3.7425 | .9977 | 140.7 | 0 |
| 3 18 | 1230 | 6.9973 | 9.4222 | 4.9706 | .83664 | 140.9 | 0 |
| 3 18 | 1245 | 6.3755 | 8.9614 | 3.2817 | 1.0894 | 146.5 | 0 |
| 3 18 | 1300 | 6.069 | 8.8093 | 3.4338 | 1.1744 | 141.9 | 0 |
| 3 18 | 1315 | 5.1384 | 8.0398 | 2.36 | 1.1632 | 147.4 | 0 |
| 3 18 | 1330 | 5.333 | 8.0398 | 2.8209 | 1.1118 | 137 | 0 |
| 3 18 | 1345 | 5.5903 | 7.8877 | 2.8209 | .96638 | 135.6 | 0 |
| 3 18 | 1400 | 5.5746 | 7.8877 | 2.9752 | 1.0178 | 133.4 | 0 |
| 3 18 | 1415 | 4.0848 | 6.966 | 1.4384 | .92835 | 171.5 | 0 |
| 3 18 | 1430 | 4.2839 | 6.5052 | 2.36 | .78966 | 164.4 | 0 |
| 3 18 | 1445 | 5.6015 | 7.579 | 3.5882 | .84111 | 151.1 | 0 |
| 3 18 | 1500 | 4.9639 | 7.1181 | 3.1273 | .85453 | 157.8 | 0 |
| 3 18 | 1515 | 5.8967 | 7.4224 | 3.4338 | .68676 | 187.2 | 0 |
| 3 18 | 1530 | 6.5902 | 8.3418 | 4.9684 | .6711 | 194.7 | 0 |
| 3 18 | 1545 | 5.4449 | 7.268 | 3.4338 | .84111 | 194.4 | 0 |
| 3 18 | 1600 | 5.0937 | 7.1159 | 3.5859 | .64649 | 186.6 | 0 |
| 3 18 | 1615 | 4.2324 | 5.5791 | 3.1251 | .49885 | 186.6 | 0 |
| 3 18 | 1630 | 2.9886 | 4.814 | 1.5927 | .76282 | 196.2 | 0 |
| 3 18 | 1645 | 3.4785 | 5.2749 | 2.2057 | .6107 | 202.8 | 0 |
| 3 18 | 1700 | 3.1475 | 4.5053 | 1.8992 | .51451 | 214.4 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 3 19 | 700 | 4.2995 | 5.4449 | 3.134 | .54806 | 241.1 | 0 |
| 3 19 | 715 | 5.0959 | 6.3665 | 3.4427 | .80532 | 236.4 | 0 |
| 3 19 | 730 | 7.1517 | 9.1381 | 4.8275 | 1.2013 | 233.1 | 0 |
| 3 19 | 745 | 6.8743 | 8.5207 | 5.597 | .48095 | 223.5 | 0 |
| 3 19 | 800 | 4.8521 | 7.1338 | 3.2862 | .83664 | 216.6 | 0 |
| 3 19 | 815 | 5.6954 | 7.7445 | 3.5949 | .82993 | 203.8 | 0 |
| 3 19 | 830 | 7.2121 | 7.8989 | 6.6663 | .25054 | 200.5 | 0 |
| 3 19 | 845 | 9.0308 | 10.044 | 6.8206 | .57043 | 200 | 0 |
| 3 19 | 900 | 7.8608 | 8.9681 | 6.8161 | .47872 | 196.2 | 0 |
| 3 19 | 915 | 6.6014 | 7.5834 | 5.5836 | .54135 | 190.6 | 0 |
| 3 19 | 930 | 5.8699 | 6.9638 | 4.3554 | .4653 | 180.5 | 0 |
| 3 19 | 945 | 6.6707 | 8.4961 | 3.8946 | .97533 | 179.1 | 0 |
| 3 19 | 1000 | 7.8742 | 9.2634 | 6.1943 | .68676 | 188.7 | 0 |
| 3 19 | 1015 | 8.4111 | 10.026 | 5.5791 | .80532 | 173.6 | 0 |
| 3 19 | 1030 | 7.5588 | 10.026 | 5.5791 | .8948 | 159.8 | 0 |
| 3 19 | 1045 | 7.8921 | 10.791 | 5.4247 | 1.17 | 170.2 | 0 |
| 3 19 | 1100 | 9.203 | 13.089 | 5.5768 | 1.3333 | 162.7 | 0 |
| 3 19 | 1115 | 10.409 | 14.469 | 6.6484 | 1.3668 | 152.1 | 0 |
| 3 19 | 1130 | 9.1113 | 12.626 | 5.4225 | 1.4876 | 158.5 | 0 |
| 3 19 | 1145 | 8.5588 | 11.245 | 5.5768 | .91493 | 157.6 | 0 |
| 3 19 | 1200 | 7.7266 | 10.939 | 4.8096 | 1.2415 | 168 | 0 |
| 3 19 | 1215 | 7.9906 | 11.398 | 5.7267 | 1.2281 | 164.5 | 0 |
| 3 19 | 1230 | 5.7066 | 9.0979 | 2.8164 | 1.472 | 159.7 | 0 |
| 3 19 | 1245 | 6.4023 | 8.6371 | 3.7336 | 1.2773 | 178.7 | 0 |
| 3 19 | 1300 | 5.3084 | 7.4112 | 3.275 | .88138 | 182.1 | 0 |
| 3 19 | 1315 | 6.5231 | 8.7869 | 4.653 | .72926 | 181.4 | 0 |
| 3 19 | 1330 | 6.3598 | 8.9391 | 4.3465 | .89927 | 181.3 | 0 |
| 3 19 | 1345 | 6.664 | 8.4805 | 4.8051 | .85901 | 179.4 | 0 |
| 3 19 | 1400 | 4.0333 | 6.1831 | 2.2012 | .774 | 183.4 | 0 |
| 3 19 | 1415 | 4.1675 | 5.4158 | 2.3556 | .49438 | 184.2 | 0 |
| 3 19 | 1430 | 3.8432 | 5.2614 | 2.5077 | .56372 | 176.1 | 0 |
| 3 19 | 1445 | 4.3085 | 6.9437 | 1.7426 | 1.4406 | 176.1 | 0 |
| 3 19 | 1500 | 5.3688 | 7.5544 | 3.1184 | .94625 | 178.1 | 0 |
| 3 19 | 1515 | 5.4493 | 7.8608 | 3.577 | .85901 | 158.5 | 0 |
| 3 19 | 1530 | 5.1675 | 7.8608 | 3.4249 | 1.0178 | 157 | 0 |
| 3 19 | 1545 | 5.2033 | 7.8608 | 2.964 | .78742 | 172.3 | 0 |
| 3 19 | 1600 | 3.8611 | 5.4135 | 2.3533 | .47201 | 172.1 | 0 |
| 3 19 | 1615 | 5.5097 | 8.778 | 2.6598 | 1.3131 | 182.7 | 0 |
| 3 19 | 1630 | 7.3441 | 8.9301 | 5.1071 | .96191 | 207 8 | 0 |
| 3 19 | 1645 | 7.5029 | 8 4738 | 5.8721 | .68005 | 202.8 | 0 |
| 3 19 | 1700 | 9.0151 | 9.5498 | 7.7087 | .25502 | 191.4 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 3 20 | 700 | 7.0421 | 11.572 | 4.2033 | 1.3646 | 280.6 | 0 |
| 3 20 | 715 | 4.3465 | 7.5812 | .05592 | 1.8903 | 291.2 | 0 |
| 3 20 | 730 | 4.3241 | 8.3463 | .82545 | 1.7091 | 344.1 | 0 |
| 3 20 | 745 | 6.1428 | 9.42 | 3.7403 | .84782 | 356.8 | 0 |
| 3 20 | 800 | 4.0803 | 7.8832 | 2.5122 | .96862 | 337.2 | 0 |
| 3 20 | 815 | 4.7492 | 8.1874 | 1.5905 | 1.8433 | 351.1 | 0 |
| 3 20 | 830 | 1.6912 | 5.729 | -.55478 | .90375 | 343.7 | 0 |
| 3 20 | 845 | 3.5926 | 8.1807 | .21251 | 1.5704 | 348.6 | 0 |
| 3 20 | 900 | 4.5143 | 10.169 | .36463 | 2.5032 | 294.1 | 0 |
| 3 20 | 915 | 5.6596 | 11.695 | 1.4362 | 2.7716 | 328.6 | 0 |
| 3 20 | 930 | 7.5722 | 12.919 | 3.1206 | 2.5726 | 307.4 | 0 |
| 3 20 | 945 | 9.8383 | 16.576 | 4.8028 | 2.5435 | 303.5 | 0 |
| 3 20 | 1000 | 10.686 | 18.12 | 4.955 | 2.3578 | 293 | 0 |
| 3 20 | 1015 | 8.3843 | 16.576 | 2.5077 | 2.9976 | 286.5 | 0 |
| 3 20 | 1030 | 6.8698 | 12.451 | 3.577 | 1.6576 | 291.4 | 0 |
| 3 20 | 1045 | 6.6014 | 12.451 | 2.5077 | 1.9507 | 305.8 | 0 |
| 3 20 | 1100 | 9.7421 | 15.203 | 4.8006 | 1.7046 | 317.5 | 0 |
| 3 20 | 1115 | 8.3843 | 15.355 | 4.6485 | 1.8947 | 309.2 | 0 |
| 3 20 | 1130 | 4.2391 | 8.9301 | .6711 | 2.1341 | 218.5 | 0 |
| 3 20 | 1145 | 6.7446 | 9.3887 | 1.7426 | 1.8746 | 186.1 | 0 |
| 3 20 | 1200 | 3.8879 | 7.8586 | 1.5883 | 1.2639 | 133.9 | 0 |
| 3 20 | 1215 | 5.1429 | 9.08 | 2.2012 | 1.293 | 137.1 | 0 |
| 3 20 | 1230 | 1.6464 | 5.7178 | .21251 | 1.4563 | 156.2 | 0 |
| 3 20 | 1245 | .61965 | 3.5747 | -.55254 | 1.1252 | 123.9 | 0 |
| 3 20 | 1300 | 2.3936 | 8.9234 | -.55254 | 2.1967 | 152 | 0 |
| 3 20 | 1315 | 3.3018 | 8.9234 | -.5503 | 2.3153 | 240 | 0 |
| 3 20 | 1330 | 4.2593 | 6.324 | 2.0469 | .74268 | 185 | 0 |
| 3 20 | 1345 | 2.5278 | 5.2525 | -.5503 | 1.2304 | 170 4 | 0 |
| 3 20 | 1400 | 4.0266 | 5.8632 | 2.8097 | .63754 | 166.1 | 0 |
| 3 20 | 1415 | 3.615 | 6.0153 | 1.4339 | 1.3019 | 188.3 | 0 |
| 3 20 | 1430 | 5.0623 | 10.447 | 2.5032 | 1.463 | 249.5 | 0 |
| 3 20 | 1445 | 2.718 | 5.1026 | -.24607 | 1.0447 | 175 | 0 |
| 3 20 | 1500 | 4.6127 | 15.493 | .6711 | 2.2907 | 218.5 | 0 |
| 3 20 | 1515 | 3.19 | 9.5341 | -.55254 | 2.2102 | 199 | 0 |
| 3 20 | 1530 | 5.4046 | 8.467 | 1.5883 | 1.4026 | 264.3 | 0 |
| 3 20 | 1545 | 6.7423 | 11.375 | 3.4226 | 1.6039 | 228.9 | 0 |
| 3 20 | 1600 | 8.1807 | 18.724 | 4.6463 | 3.2146 | 256.2 | 0 |
| 3 20 | 1615 | 14.605 | 20.871 | 7.5544 | 2.4674 | 285.4 | 0 |
| 3 20 | 1630 | 12.424 | 16.889 | 7.7087 | 1.9328 | 290.1 | 0 |
| 3 20 | 1645 | 13 494 | 19.193 | 8.0152 | 2.0513 | 299.4 | 0 |
| 3 20 | 1700 | 12.48 | 17.203 | 7.8653 | 1.7426 | 312.4 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 3 21 | 700 | 4.6619 | 6.5074 | 2.36 | 1.0111 | 232.9 | 0 |
| 3 21 | 715 | 3.7962 | 5.4314 | 1.8992 | .73821 | 187.9 | 0 |
| 3 21 | 730 | 3.53 | 4.3577 | 2.9752 | .25949 | 166.3 | 0 |
| 3 21 | 745 | 3.3891 | 5.2771 | .05592 | 1.3825 | 148.8 | 0 |
| 3 21 | 800 | .94178 | 2.36 | .05816 | .74268 | 1.597 | 0 |
| 3 21 | 815 | 3.1027 | 6.6528 | .05816 | 2.0625 | 158 | 0 |
| 3 21 | 830 | 4.9684 | 6.8072 | 2.9707 | .90151 | 162.5 | 0 |
| 3 21 | 845 | 4.4941 | 6.3441 | 2.8186 | .69347 | 187.1 | 0 |
| 3 21 | 900 | 5.6619 | 8.0264 | 4.0423 | .73374 | 167.1 | 0 |
| 3 21 | 915 | 8.3239 | 10.934 | 5.116 | 1.2729 | 155.5 | 0 |
| 3 21 | 930 | 8.1024 | 11.241 | 5.2659 | 1.2483 | 158.5 | 0 |
| 3 21 | 945 | 8.8943 | 11.239 | 6.031 | 1.0447 | 164.3 | 0 |
| 3 21 | 1000 | 9.0621 | 12.156 | 6.3374 | .91046 | 165.4 | 0 |
| 3 21 | 1015 | 8.9614 | 11.697 | 5.8788 | 1.0738 | 169.5 | 0 |
| 3 21 | 1030 | 6.6372 | 9.7063 | 2.5077 | 1.4787 | 167.6 | 0 |
| 3 21 | 1045 | 2.5681 | 6.1831 | -.55478 | 1.5547 | 210.7 | 0 |
| 3 21 | 1100 | 4.4181 | 10.776 | .21251 | 2.2057 | 187.6 | 0 |
| 3 21 | 1115 | 2.9349 | 11.538 | -.55254 | 2.7224 | 142.4 | 0 |
| 3 21 | 1130 | 6.6663 | 19.641 | -.24607 | 3.9617 | 206.1 | 0 |
| 3 21 | 1145 | 15.098 | 26.061 | 1.4362 | 4.1653 | 273.1 | 0 |
| 3 21 | 1200 | 14.545 | 22.102 | 8.3216 | 2.4428 | 256.3 | 0 |
| 3 21 | 1215 | 17.471 | 28.969 | 7.5566 | 3.9259 | 259.6 | 0 |
| 3 21 | 1230 | 11.328 | 25.927 | .21251 | 5.5836 | 258.6 | 0 |
| 3 21 | 1245 | 7.2837 | 13.986 | -.55254 | 3.2504 | 333.4 | 0 |
| 3 21 | 1300 | 10.136 | 16.442 | 1.8947 | 3.3958 | 3.213 | 0 |
| 3 21 | 1315 | 7.5342 | 12.151 | 1.8947 | 2.1967 | 32.24 | 0 |
| 3 21 | 1330 | 3.9394 | 11.232 | .21251 | 2.2124 | 355.7 | 0 |
| 3 21 | 1345 | 13.29 | 28.522 | 1.5905 | 4.9348 | 304.7 | 0 |
| 3 21 | 1400 | 15.567 | 26.844 | 6.0265 | 4.2682 | 315.8 | 0 |
| 3 21 | 1415 | 18.88 | 38.767 | 6.7915 | 6.7982 | 288.2 | 0 |
| 3 21 | 1430 | 24.473 | 35.233 | 15.205 | 3.6664 | 304.2 | 0 |
| 3 21 | 1445 | 14.99 | 27.918 | 7.7109 | 4.1183 | 316.2 | 0 |
| 3 21 | 1500 | 17.18 | 34.964 | 5.4158 | 6.2524 | 313.4 | 0 |
| 3 21 | 1515 | 11.102 | 23.489 | .21251 | 4.7603 | 318.8 | 0 |
| 3 21 | 1530 | 16.397 | 27.761 | 3.8857 | 4.2548 | 297.7 | 0 |
| 3 21 | 1545 | 14.657 | 24.562 | 5.1115 | 3.8723 | 295.7 | 0 |
| 3 21 | 1600 | 13.975 | 35.568 | 4.6507 | 6.7982 | 296.5 | 0 |
| 3 21 | 1615 | 27.918 | 43.085 | 14.907 | 5.5097 | 294.8 | 0 |
| 3 21 | 1630 | 26.844 | 49.505 | 13.992 | 6.6573 | 288.4 | 0 |
| 3 21 | 1645 | 27.426 | 42.615 | 16.129 | 5.1429 | 275.8 | 0 |
| 3 21 | 1700 | 26.911 | 39 259 | 15.373 | 4.8163 | 285 9 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 3 22 | 700 | 3.5389 | 4.6686 | 2.0558 | .66886 | 205 5 | 0 |
| 3 22 | 715 | 4.1116 | 5.7446 | 2.8231 | .52793 | 205.6 | 0 |
| 3 22 | 730 | 5.3666 | 7.8966 | 2.5166 | 1.246 | 178.5 | 0 |
| 3 22 | 745 | 5.767 | 8.816 | 3.2839 | .93954 | 173.1 | 0 |
| 3 22 | 800 | 8.1226 | 10.966 | 5.1272 | 1.2483 | 177.2 | 0 |
| 3 22 | 815 | 10.637 | 13.728 | 6.9705 | 1.1521 | 173.8 | 0 |
| 3 22 | 830 | 10.16 | 13.422 | 6.3531 | 1.416 | 174.4 | 0 |
| 3 22 | 845 | 7.6908 | 10.655 | 3.8969 | 1.2706 | 181 | 0 |
| 3 22 | 900 | 7.7177 | 13.104 | 3.2817 | 2.2885 | 171.4 | 0 |
| 3 22 | 915 | 9.0979 | 12.646 | 4.3554 | 1.4585 | 174.5 | 0 |
| 3 22 | 930 | 7.6416 | 11.107 | 4.5076 | 1.4026 | 172.8 | 0 |
| 3 22 | 945 | 3.1519 | 6.1943 | 97757 | 1.0089 | 179.5 | 0 |
| 3 22 | 1000 | 5.4337 | 8.8004 | .97757 | 1.6129 | 144.1 | 0 |
| 3 22 | 1015 | 5.4739 | 8.4917 | 2.2034 | 1.2192 | 153.3 | 0 |
| 3 22 | 1030 | 6.4269 | 11.556 | 1.5905 | 2.5278 | 147.1 | 0 |
| 3 22 | 1045 | 3.2794 | 6.4963 | .21251 | 1.2863 | 141.9 | 0 |
| 3 22 | 1100 | 4.5098 | 9.0956 | 1.897 | 1.633 | 99.2 | 0 |
| 3 22 | 1115 | 4.1027 | 8.1762 | .51898 | 1.7024 | 47.11 | 0 |
| 3 22 | 1130 | 5.1876 | 9.3976 | .21251 | 1.6778 | 43.11 | 0 |
| 3 22 | 1145 | 9.5587 | 14.449 | 4.1921 | 2.1386 | 8.81 | 0 |
| 3 22 | 1200 | 9.7086 | 15.681 | 4.1921 | 1.9059 | 5.975 | 0 |
| 3 22 | 1215 | 7.5387 | 11.386 | 2.2012 | 1.7717 | .851 | 0 |
| 3 22 | 1230 | 6.409 | 10.619 | 1.8947 | 1.8858 | 16.61 | 0 |
| 3 22 | 1245 | 6.4963 | 10.006 | .21251 | 1.7762 | 20.09 | 0 |
| 3 22 | 1300 | 4.5903 | 9.3932 | .51898 | 1.7024 | 6.616 | 0 |
| 3 22 | 1315 | 6.0421 | 10.923 | 2.8142 | 1.7225 | 34.77 | 0 |
| 3 22 | 1330 | 4.3845 | 8.7802 | .21251 | 1.9328 | 52.65 | 0 |
| 3 22 | 1345 | 4.8207 | 9.3887 | .21251 | 2.1766 | 15.51 | 0 |
| 3 22 | 1400 | 3.747 | 8.4715 | .21251 | 1.7001 | 66.5 | 0 |
| 3 22 | 1415 | 5.7088 | 9.8473 | 2.0469 | 1.6218 | 52.78 | 0 |
| 3 22 | 1430 | 7.7669 | 11.221 | 4.0356 | 1.4183 | 54 37 | 0 |
| 3 22 | 1445 | 8.8317 | 14.585 | 2.3533 | 2.6352 | 55.46 | 0 |
| 3 22 | 1500 | 8.5453 | 13.972 | 4.1877 | 1.8679 | 43.97 | 0 |
| 3 22 | 1515 | 8.9704 | 12.746 | 4.4941 | 1.9551 | 33.43 | 0 |
| 3 22 | 1530 | 8.1897 | 11.677 | 5.1048 | 1.6531 | 24.97 | 0 |
| 3 22 | 1545 | 8.4335 | 14.583 | 4.0356 | 2.5636 | 29.98 | 0 |
| 3 22 | 1600 | 12.699 | 17.18 | 7.8563 | 2.2124 | 359.8 | 0 |
| 3 22 | 1615 | 14.245 | 17.807 | 9.9994 | 1.4831 | 354 | 0 |
| 3 22 | 1630 | 12.14 | 15.659 | 8.7802 | 1.246 | 351 | 0 |
| 3 22 | 1645 | 10.127 | 12.914 | 6.9437 | 1.2371 | 346 9 | 0 |
| 3 22 | 1700 | 14.59 | 24.562 | 10.619 | 3.2414 | 4.329 | 0 |

| DATE | TIME | AUG. WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 3 23 | 700 | 2.0938 | 3.5971 | .6711 | .53464 | 71.2 | 0 |
| 3 23 | 715 | 2.2325 | 3.9058 | .97981 | .56596 | 65.15 | 0 |
| 3 23 | 730 | 2.7828 | 4.3666 | 1.4406 | .50556 | 43.65 | 0 |
| 3 23 | 745 | 2.275 | 3.4427 | 1.1342 | .46082 | 39.74 | 0 |
| 3 23 | 800 | 3.1408 | 4.8297 | 1.1342 | .54806 | 32.08 | 0 |
| 3 23 | 815 | 2.8142 | 4.3666 | 1.595 | .43845 | 18.71 | 0 |
| 3 23 | 830 | 2.888 | 4.2123 | 1.1342 | .65097 | 26.02 | 0 |
| 3 23 | 845 | 2.803 | 4.6753 | 1.1342 | .60399 | 26.37 | 0 |
| 3 23 | 900 | 2.331 | 4.0602 | .05592 | .80532 | 17.16 | 0 |
| 3 23 | 915 | 3.8387 | 5.1384 | 2.3645 | .64426 | 359.9 | 0 |
| 3 23 | 930 | 4.0445 | 6.2144 | 2.058 | .70242 | 7.55 | 0 |
| 3 23 | 945 | 4.568 | 6.2144 | 2.8276 | .62412 | 1.004 | 0 |
| 3 23 | 1000 | 4.8386 | 6.5231 | 2.6732 | .70018 | 12.71 | 0 |
| 3 23 | 1015 | 5.1719 | 6.6774 | 2.6732 | .55254 | 12.53 | 0 |
| 3 23 | 1030 | 5.2458 | 7.2904 | 3.5971 | .66663 | 2.678 | 0 |
| 3 23 | 1045 | 4.8275 | 6.2144 | 2.9797 | .60399 | 5.673 | 0 |
| 3 23 | 1100 | 4.691 | 6.06 | 2.3645 | .55478 | 9.16 | 0 |
| 3 23 | 1115 | 4.7178 | 6.2144 | 2.9797 | .63978 | 355.6 | 0 |
| 3 23 | 1130 | 4.7022 | 5.7513 | 2.8276 | .58833 | 2.944 | 0 |
| 3 23 | 1145 | 5.4247 | 7.2904 | 3.2884 | .66663 | 13.51 | 0 |
| 3 23 | 1200 | 4.3622 | 5.9057 | 2.8253 | .59728 | 1.729 | 0 |
| 3 23 | 1215 | 3.709 | 5.2905 | 2.5189 | .47872 | 355.4 | 0 |
| 3 23 | 1230 | 3.6396 | 4.9818 | 2.3645 | .60623 | 359.3 | 0 |
| 3 23 | 1245 | 4.1832 | 5.4449 | 2.9797 | .44516 | 8.46 | 0 |
| 3 23 | 1300 | 4.6239 | 6.2122 | 2.9797 | .68228 | 350.6 | 0 |
| 3 23 | 1315 | 4.5993 | 5.9057 | 2.5189 | .65097 | 359.5 | 0 |
| 3 23 | 1330 | 4.0736 | 5.597 | 2.6732 | .55925 | 3.34 | 0 |
| ** | | | | | | | |
| 3 23 | 1500 | 7.787 | 10.366 | 5.7491 | .82322 | 357.2 | 0 |
| 3 23 | 1515 | 6.3374 | 8.5207 | 4.21 | .75834 | 353.2 | 0 |
| 3 23 | 1530 | 4.6373 | 6.3665 | 3.134 | .76729 | 1.878 | 0 |
| 3 23 | 1545 | 3.2951 | 4.3644 | 2.2102 | .45187 | 22.39 | 0 |
| 3 23 | 1600 | 2.2594 | 3.7492 | .97981 | .66439 | 54 | 0 |
| 3 23 | 1615 | 2.2996 | 3.2884 | 1.1319 | .50109 | 54.19 | 0 |
| 3 23 | 1630 | .65544 | 1.595 | .05592 | .42727 | 105.3 | 0 |
| 3 23 | 1645 | 3.2951 | 5.4404 | .36239 | .91717 | 2.976 | 0 |
| 3 23 | 1700 | 5.1362 | 6.673 | 3.4405 | .57938 | 356.7 | 0 |

**Data missing due to maintenance on tower.

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 3 24 | 700 | 1.1677 | 1.5972 | .36239 | .18791 | 41 55 | 0 |
| 3 24 | 715 | 1.4876 | 2.058 | .51675 | .21699 | 47.93 | 0 |
| 3 24 | 730 | 2.0603 | 2.6755 | 1.2885 | .21028 | 40.51 | 0 |
| 3 24 | 745 | 2.0961 | 2.6755 | 1.1342 | .25502 | 30.47 | 0 |
| 3 24 | 800 | 1.5995 | 2.058 | 1.1342 | .21028 | 14.66 | 0 |
| 3 24 | 815 | 1.2169 | 1.5972 | .6711 | .2058 | 11.16 | 0 |
| 3 24 | 830 | .2237 | 1.1342 | 05369 | .32213 | 12.57 | 0 |
| 3 24 | 845 | .06264 | .20804 | -.56149 | .06935 | 88.5 | 0 |
| 3 24 | 900 | .12527 | .20804 | -.56149 | .09619 | 92.7 | 0 |
| 3 24 | 915 | .14093 | .20804 | -.56149 | .09619 | 57.07 | 0 |
| 3 24 | 930 | .14317 | .21028 | -.56149 | .09619 | 45.92 | 0 |
| 3 24 | 945 | .20133 | .21028 | -.56149 | .06711 | 35.46 | 0 |
| 3 24 | 1000 | .20357 | .21028 | -.55925 | .06487 | .65 | 0 |
| 3 24 | 1015 | .20357 | .21028 | -.7136 | .07829 | 333.6 | 0 |
| 3 24 | 1030 | .20357 | .21028 | -.7136 | .07382 | 294 | 0 |
| 3 24 | 1045 | .20357 | .36463 | -.71137 | .07382 | 277.8 | 0 |
| 3 24 | 1100 | .25502 | 1.2863 | -.55701 | .2058 | 354.3 | 0 |
| 3 24 | 1115 | 1.2281 | 4.2033 | .05592 | .98204 | 61.66 | 0 |
| 3 24 | 1130 | 1.123 | 3.4338 | .05592 | .90151 | 36.32 | 0 |
| 3 24 | 1145 | 1.8232 | 6.503 | -.71137 | 1.8075 | 91.4 | 0 |
| 3 24 | 1200 | 2.5054 | 6.8094 | .05816 | 1.7158 | 142.5 | 0 |
| 3 24 | 1215 | 2.4249 | 6.3508 | .05816 | 1.718 | 145.9 | 0 |
| 3 24 | 1230 | 5.3442 | 8.6527 | 1.5927 | 1.6733 | 142.3 | 0 |
| 3 24 | 1245 | 5.6976 | 10.498 | 1.4384 | 1.6643 | 135.6 | 0 |
| 3 24 | 1300 | 6.2435 | 10.65 | 3.5882 | 1.3086 | 131.8 | 0 |
| 3 24 | 1315 | 5.843 | 9.8853 | 2.9752 | 1.5771 | 132.8 | 0 |
| 3 24 | 1330 | 5.8565 | 8.6594 | 2.36 | 1.17 | 138.9 | 0 |
| 3 24 | 1345 | 6.2994 | 9.7377 | 3.2839 | 1.3154 | 133.2 | 0 |
| 3 24 | 1400 | 5.6753 | 8.9704 | 1.7471 | 1.3825 | 144.9 | 0 |
| 3 24 | 1415 | 3.7358 | 6.9727 | .82545 | 1.2997 | 130.2 | 0 |
| 3 24 | 1430 | 3.6172 | 6.5141 | 1.7471 | .77176 | 152.1 | 0 |
| 3 24 | 1445 | 4.1944 | 7.2814 | 1.4406 | 1.2639 | 140.4 | 0 |
| 3 24 | 1500 | 3.8655 | 6.3598 | 1.2863 | 1.0089 | 146.8 | 0 |
| 3 24 | 1515 | 3.2369 | 6.6685 | .05592 | 1.3601 | 123 | 0 |
| 3 24 | 1530 | 2.4585 | 5.4382 | .21028 | 1.1521 | 126 | 0 |
| 3 24 | 1545 | 1.8858 | 4.5165 | .05592 | .95967 | 154 | 0 |
| 3 24 | 1600 | 1.6845 | 5.286 | -.4049 | 1.3467 | 136.9 | 0 |
| 3 24 | 1615 | 1.8299 | 4.6709 | -.7136 | 1.1118 | 122.4 | 0 |
| 3 24 | 1630 | 1.1006 | 3.4405 | - 7136 | .86124 | 60.12 | 0 |
| 3 24 | 1645 | 1.944 | 4.5165 | -.7136 | 1.0827 | 56.6 | 0 |
| 3 24 | 1700 | 2.7426 | 4.9796 | .05592 | 1.0939 | 56.25 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 3 25 | 700 | 3.2235 | 4.6753 | 2.2124 | .55701 | 303.4 | 0 |
| 3 25 | 715 | 3.1631 | 4.0602 | 1.9037 | .39595 | 293.1 | 0 |
| 3 25 | 730 | 3.1408 | 4.3666 | 1.9037 | .50332 | 311.6 | 0 |
| 3 25 | 745 | 3.9461 | 5.7513 | 1.2863 | .80085 | 344.7 | 0 |
| 3 25 | 800 | 4.5903 | 6.2122 | 2.9797 | .68228 | 356.3 | 0 |
| 3 25 | 815 | 4.0624 | 6.5164 | 2.0558 | .89033 | .198 | 0 |
| 3 25 | 830 | 5.0154 | 7.7445 | 2.671 | 1.0469 | 1.398 | 0 |
| 3 25 | 845 | 5.5209 | 8.2053 | 1.4406 | 1.2729 | 3.424 | 0 |
| 3 25 | 900 | 5.3822 | 7.8944 | 2.6687 | 1.0738 | 359.6 | 0 |
| 3 25 | 915 | 5.3487 | 10.044 | 2.5144 | 1.3758 | 357.6 | 0 |
| 3 25 | 930 | 4.4852 | 7.5812 | .82545 | 1.3869 | 344.2 | 0 |
| 3 25 | 945 | 4.3711 | 8.042 | .6711 | 1.2214 | 354.2 | 0 |
| 3 25 | 1000 | 5.0512 | 7.7333 | 2.0513 | 1.3042 | 14.31 | 0 |
| 3 25 | 1015 | 4.7939 | 8.0375 | 82545 | 1.6464 | 25.79 | 0 |
| 3 25 | 1030 | 4.172 | 8.4984 | .05816 | 2.1274 | 2.325 | 0 |
| 3 25 | 1045 | 4.0691 | 7.268 | .05816 | 1.7158 | 41.54 | 0 |
| 3 25 | 1100 | 2.7873 | 7.5745 | .05816 | 2.1967 | 21.83 | 0 |
| 3 25 | 1115 | 4.1228 | 9.4133 | 05816 | 2.2594 | 19.72 | 0 |
| 3 25 | 1130 | 4.7917 | 12.632 | .05816 | 2.4428 | 43.12 | 0 |
| 3 25 | 1145 | 6.1652 | 11.252 | 2.5122 | 2.02 | 41.93 | 0 |
| 3 25 | 1200 | 6.1629 | 11.406 | 1.7449 | 2.0782 | 49.25 | 0 |
| 3 25 | 1215 | 6.2793 | 15.86 | 1.4384 | 2.6352 | 56.45 | 0 |
| 3 25 | 1230 | 11.042 | 14.78 | 5.8856 | 1.812 | 29.35 | 0 |
| 3 25 | 1245 | 11.013 | 16.778 | 5.8856 | 2.2661 | 37.19 | 0 |
| 3 25 | 1300 | 9.552 | 15.089 | 4.9661 | 2.114 | 34.79 | 0 |
| 3 25 | 1315 | 7.5163 | 13.25 | 2.973 | 1.8612 | 20.29 | 0 |
| 3 25 | 1330 | 9.0822 | 15.86 | 1.8992 | 3.0759 | 26.65 | 0 |
| 3 25 | 1345 | 10.371 | 15.86 | 4.3532 | 2.6173 | 26.77 | 0 |
| 3 25 | 1400 | 10.163 | 15.402 | 2.0513 | 2.5927 | 25.15 | 0 |
| 3 25 | 1415 | 9.5095 | 13.561 | 5.7334 | 1.3802 | 8.97 | 0 |
| 3 25 | 1430 | 7.1852 | 10.955 | 3.2794 | 1.7896 | 8.8 | 0 |
| 3 25 | 1445 | 7.957 | 15.102 | 3.8946 | 2.4518 | 9.27 | 0 |
| 3 25 | 1500 | 11.767 | 16.33 | 6.966 | 1.944 | 357 | 0 |
| 3 25 | 1515 | 9.4178 | 14.028 | 4.8163 | 1.7896 | 6.425 | 0 |
| 3 25 | 1530 | 9.6661 | 13.418 | 5.8923 | 1.2952 | 7.04 | 0 |
| 3 25 | 1545 | 8.57 | 12.035 | 5.4314 | 1.1543 | 22.14 | 0 |
| 3 25 | 1600 | 7.2568 | 11.883 | 4.049 | 1.4876 | 20.67 | 0 |
| 3 25 | 1615 | 6.9123 | 9.5811 | 4.2033 | 1.0223 | 26 26 | 0 |
| 3 25 | 1630 | 10.06 | 18.03 | 5.4337 | 3.3398 | 21.88 | 0 |
| 3 25 | 1645 | 13.52 | 18 187 | 9.429 | 1.6733 | 13.01 | 0 |
| 3 25 | 1700 | 11.438 | 14.655 | 7.2792 | 1.4652 | 7.39 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 3 26 | 700 | .92612 | 3.5971 | 05592 | .83664 | 20.51 | 0 |
| 3 26 | 715 | 2.1744 | 4.521 | 05592 | 1.2661 | 23.87 | 0 |
| 3 26 | 730 | 2.9461 | 4.521 | 1.4406 | .53688 | 18.38 | 0 |
| 3 26 | 745 | 3.653 | 5.597 | .82545 | .8948 | 15.13 | 0 |
| 3 26 | 800 | 2.8678 | 5.4449 | 05592 | 1.2684 | 10.88 | 0 |
| 3 26 | 815 | 2.1542 | 4.5187 | .05592 | .9552 | 318.2 | 0 |
| 3 26 | 830 | 2.3175 | 4.5187 | .05592 | 1.0022 | 17.01 | 0 |
| 3 26 | 845 | 3.4338 | 6.5209 | .97981 | .88138 | 19.03 | 0 |
| 3 26 | 900 | 2.7157 | 5.597 | .05592 | 1.4317 | 350.9 | 0 |
| 3 26 | 915 | 1.7337 | 5.9057 | .05592 | 1.1118 | 350.5 | 0 |
| 3 26 | 930 | 2.4808 | 5.1339 | -.40713 | 1.1386 | 15.59 | 0 |
| 3 26 | 945 | 2.3936 | 4.3644 | .36239 | .8523 | 342.2 | 0 |
| 3 26 | 1000 | 1.1521 | 3.5949 | -.55925 | .83664 | 251.8 | 0 |
| 3 26 | 1015 | 2.2437 | 5.1317 | .05592 | 1.1386 | 86.4 | 0 |
| 3 26 | 1030 | 2.2258 | 5.7469 | .05592 | 1.4473 | 4.982 | 0 |
| 3 26 | 1045 | 2.2303 | 6.9772 | .05592 | 1.557 | 340.3 | 0 |
| 3 26 | 1100 | 3.2839 | 6.362 | -.25278 | 1.1476 | 42.99 | 0 |
| 3 26 | 1115 | 3.2414 | 6.6685 | .21028 | 1.4048 | 326.9 | 0 |
| 3 26 | 1130 | 2.5569 | 4.823 | .05592 | 1.0268 | 11.59 | 0 |
| 3 26 | 1145 | 2.8388 | 7.74 | .21028 | 1.4048 | 135.9 | 0 |
| 3 26 | 1200 | 3.5568 | 7.74 | .21028 | 1.7046 | 132.1 | 0 |
| 3 26 | 1215 | 2.7269 | 6.3553 | .21028 | 1.3042 | 99.6 | 0 |
| 3 26 | 1230 | 2.3936 | 6.0466 | .05592 | 1.4764 | 79.5 | 0 |
| 3 26 | 1245 | 2.7627 | 6.1965 | .05592 | 1.4854 | 85.8 | 0 |
| 3 26 | 1300 | 6.1383 | 9.5721 | 2.2057 | 1.5368 | 40.54 | 0 |
| 3 26 | 1315 | 4.729 | 8.6482 | .21028 | 1.7382 | 39.26 | 0 |
| 3 26 | 1330 | 5.1004 | 9.2612 | 1.4384 | 1.3333 | 39.19 | 0 |
| 3 26 | 1345 | 4.691 | 9.5677 | .82545 | 1.7493 | 26.76 | 0 |
| 3 26 | 1400 | 5.2995 | 11.863 | .6711 | 2.0961 | 45.89 | 0 |
| 3 26 | 1415 | 5.2346 | 9.4111 | 1.1319 | 1.9909 | 33.34 | 0 |
| 3 26 | 1430 | 5.5858 | 9.8696 | 1.4384 | 1.7203 | 37.84 | 0 |
| 3 26 | 1445 | 4.8946 | 8 3351 | 1.284 | 1.4406 | 14 88 | 0 |
| 3 26 | 1500 | 5.7804 | 9.4088 | 2.0513 | 1.4675 | 359.5 | 0 |
| 3 26 | 1515 | 5.7625 | 9.5632 | 2.6643 | 1.1744 | 358.4 | 0 |
| 3 26 | 1530 | 5.4717 | 9.2567 | 2.2034 | 1.4294 | 355 | 0 |
| 3 26 | 1545 | 7.221 | 11.248 | 3.1229 | 1.4585 | .158 | 0 |
| 3 26 | 1600 | 3.6262 | 8.0286 | .82545 | 1.6285 | 357.1 | 0 |
| 3 26 | 1615 | 1.7874 | 4.351 | .05816 | .84111 | 64.96 | 0 |
| 3 26 | 1630 | 1.6375 | 5.4247 | .05816 | 1.284 | 74.6 | 0 |
| 3 26 | 1645 | 3.6217 | 5 1183 | 2.2057 | .5682 | 25 45 | 0 |
| 3 26 | 1700 | 3.011 | 6.9593 | .05816 | 1.6666 | 25 55 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 3 27 | 700 | 2.19 | 4.823 | .36463 | .89704 | 211.5 | 0 |
| 3 27 | 715 | .8948 | 2.9775 | .21028 | .89256 | 290.3 | 0 |
| 3 27 | 730 | 2.0155 | 3.7447 | - 55925 | .70242 | 214.3 | 0 |
| 3 27 | 745 | 3.1519 | 5.2838 | 1.2863 | .86796 | 340.2 | 0 |
| 3 27 | 800 | 2.6911 | 4.5143 | .21028 | 1.2483 | 282.2 | 0 |
| 3 27 | 815 | 2.1811 | 3.1296 | 1.1319 | .45187 | 293.6 | 0 |
| 3 27 | 830 | 1.6599 | 2.6687 | .21028 | .55701 | 322.7 | 0 |
| 3 27 | 845 | 2.794 | 4.8185 | .82545 | .73821 | 49.7 | 0 |
| 3 27 | 900 | 3.2123 | 4.8185 | 1.2863 | .76729 | 11.16 | 0 |
| 3 27 | 915 | 3.7224 | 5.8923 | 1.5927 | .80756 | 17.54 | 0 |
| 3 27 | 930 | 4.4024 | 7.8854 | 2.9752 | .87467 | 359.2 | 0 |
| 3 27 | 945 | 4.0937 | 7.2725 | 1.1319 | 1.4317 | 25.19 | 0 |
| 3 27 | 1000 | 4.2525 | 6.1965 | .82545 | .9373 | 33.7 | 0 |
| 3 27 | 1015 | 3.4137 | 5.8878 | .97757 | .90822 | 27.68 | 0 |
| 3 27 | 1030 | 1.8701 | 3.8946 | .05816 | .92164 | 48.29 | 0 |
| 3 27 | 1045 | 1.5279 | 3.1251 | -.70913 | .61965 | 306.6 | 0 |
| 3 27 | 1100 | 1.7717 | 4.9661 | .05816 | 1.2483 | 308.9 | 0 |
| 3 27 | 1115 | 2.5211 | 5.8833 | -.70913 | 1.5234 | 21.76 | 0 |
| 3 27 | 1130 | 3.4137 | 6.4963 | .97757 | 1.1632 | 53.16 | 0 |
| 3 27 | 1145 | 4.6731 | 9.5587 | 1.4384 | 1.2594 | 29.52 | 0 |
| 3 27 | 1200 | 5.7871 | 9.5587 | 2.2034 | 1.4898 | 46.99 | 0 |
| 3 27 | 1215 | 7.1852 | 10.937 | 2.3556 | 1.718 | 99.5 | 0 |
| 3 27 | 1230 | 5.9862 | 10.017 | 2.5099 | 1.6599 | 98.5 | 0 |
| 3 27 | 1245 | 5.0086 | 8.1785 | 1.897 | 1.3959 | 84.3 | 0 |
| 3 27 | 1300 | 5.6865 | 8.4849 | 2.0491 | 1.1185 | 11.73 | 0 |
| 3 27 | 1315 | 6.7893 | 10.782 | 3.4293 | 1.7135 | 1.358 | 0 |
| 3 27 | 1330 | 9.1918 | 12.928 | 5.4203 | 1.5525 | .116 | 0 |
| 3 27 | 1345 | 7.6259 | 11.856 | 3.1229 | 1.8254 | 32.38 | 0 |
| 3 27 | 1400 | 8.3306 | 11.55 | 5.5746 | 1.1073 | 8.87 | 0 |
| 3 27 | 1415 | 5.4762 | 9.2522 | 1.897 | 1.2975 | 24.28 | 0 |
| 3 27 | 1430 | 4.7335 | 8.7914 | 1.5905 | 1.4384 | 49.53 | 0 |
| 3 27 | 1445 | 4.4539 | 10.628 | .05816 | 2.5032 | 42.71 | 0 |
| 3 27 | 1500 | 8.6304 | 11.241 | 4.0423 | 1.34 | 41.37 | 0 |
| 3 27 | 1515 | 10.252 | 14.151 | 4.1944 | 1.6174 | 18.62 | 0 |
| 3 27 | 1530 | 10.169 | 13.999 | 5.7267 | 1.6599 | 8.09 | 0 |
| 3 27 | 1545 | 12.263 | 15.995 | 8.1785 | 1.4026 | 358.6 | 0 |
| 3 27 | 1600 | 12.874 | 18.903 | 7.4112 | 2.1699 | 344.2 | 0 |
| 3 27 | 1615 | 9.8473 | 13.847 | 6.1875 | 1.6755 | 18.61 | 0 |
| 3 27 | 1630 | 9.845 | 13.391 | 5.8811 | 1 3265 | 30.57 | 0 |
| 3 27 | 1645 | 7.4716 | 9.7131 | 4.5031 | .99099 | 39.72 | 0 |
| 3 27 | 1700 | 6.3665 | 9.4066 | 1.4384 | 2 0379 | 44.22 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 3 28 | 700 | 9.0531 | 11.438 | 6.2099 | .91046 | 356.5 | 0 |
| 3 28 | 715 | 10.333 | 12.977 | 7.1316 | 1.1409 | 358.2 | 0 |
| 3 28 | 730 | 9.0599 | 12.516 | 6.0556 | 1.4227 | 356.8 | 0 |
| 3 28 | 745 | 7.7825 | 10.21 | 5.9012 | .82993 | 356 | 0 |
| 3 28 | 800 | 7.3575 | 9.4401 | 5.4404 | .84335 | 357 | 0 |
| 3 28 | 815 | 6.4247 | 8.3619 | 4.9773 | .6532 | 355 | 0 |
| 3 28 | 830 | 6.5813 | 8.3619 | 4.21 | .89256 | 357.4 | 0 |
| 3 28 | 845 | 7.8049 | 9.901 | 5.1317 | .84559 | 1.169 | 0 |
| 3 28 | 900 | 7.4962 | 10.055 | 5.286 | .89256 | 19.92 | 01 |
| 3 28 | 915 | 7.2568 | 9.2858 | 5.4404 | .68005 | 27.41 | 0 |
| 3 28 | 930 | 7.8675 | 9.2836 | 5.4382 | .66886 | 22.38 | 0 |
| 3 28 | 945 | 7.6774 | 9.2836 | 5.9012 | .63307 | 15.99 | 0 |
| 3 28 | 1000 | 7.4067 | 8.9748 | 4.823 | .83887 | 12.18 | 0 |
| 3 28 | 1015 | 7.8049 | 9.2813 | 5.899 | .59952 | 5.335 | 0 |
| 3 28 | 1030 | 6.8385 | 8.3574 | 4.6686 | .63307 | 9.43 | .01 |
| 3 28 | 1045 | 6.9996 | 8.5118 | 4.6686 | .76953 | 8.18 | 0 |
| 3 28 | 1100 | 5.7379 | 7.2792 | 3.7447 | .74045 | .668 | 0 |
| 3 28 | 1115 | 6.2233 | 7.8944 | 3.8991 | .64202 | 4.688 | 0 |
| 3 28 | 1130 | 6.1115 | 8.2008 | 3.8991 | .72479 | 6.325 | 0 |
| 3 28 | 1145 | 5.4829 | 8.2008 | 3.5904 | .68676 | 11.88 | 0 |
| 3 28 | 1200 | 5.5164 | 7.5857 | 2.8231 | .88809 | 25.02 | 0 |
| 3 28 | 1215 | 6.3106 | 8.353 | 4.512 | .8165 | 18.77 | 0 |
| 3 28 | 1230 | 7.2613 | 9.7354 | 4.512 | 1.076 | 17.81 | 0 |
| 3 28 | 1245 | 6.4336 | 8.0465 | 3.8969 | .75611 | 17.75 | 0 |
| 3 28 | 1300 | 5.5746 | 8.1986 | 3.8969 | .80085 | 25.51 | 0 |
| 3 28 | 1315 | 5.1115 | 7.1248 | 2.5144 | .84111 | 23.99 | 0 |
| 3 28 | 1330 | 8.9256 | 11.427 | 4.6664 | 1.5368 | 11.14 | 0 |
| 3 28 | 1345 | 8.8652 | 11.272 | 5.2793 | 1.1252 | 18.4 | 0 |
| 3 28 | 1400 | 7.6461 | 10.505 | 5.7401 | .93954 | 25.73 | 0 |
| 3 28 | 1415 | 7.5499 | 9.892 | 4.9729 | 1.1185 | 19.86 | 0 |
| 3 28 | 1430 | 6 8385 | 8.6617 | 4.512 | .8344 | 23.98 | 0 |
| 3 28 | 1445 | 6.3687 | 8.5096 | 4.3599 | .68005 | 14 74 | 0 |
| 3 28 | 1500 | 5.5746 | 7.8944 | 3.4383 | .9373 | 3.81 | 0 |
| 3 28 | 1515 | 3.8387 | 5.8967 | 1.7471 | .94849 | 9.82 | 0 |
| 3 28 | 1530 | 4.5836 | 6.5119 | 2.9775 | .6286 | 17.82 | 0 |
| 3 28 | 1545 | 4.823 | 6.5119 | 2.9775 | .71808 | 11.98 | 0 |
| 3 28 | 1600 | 8.0689 | 10.201 | 5.2838 | .88809 | 4.898 | 0 |
| 3 28 | 1615 | 8.4805 | 9.8943 | 6.5119 | .68005 | .668 | 0 |
| 3 28 | 1630 | 7.6282 | 10.049 | 4.6686 | 1.1051 | 1.029 | 0 |
| 3 28 | 1645 | 7.5879 | 9.8943 | 5.2838 | .84782 | 14.51 | 0 |
| 3 28 | 1700 | 7.9525 | 10 97 | 5.4359 | 1.0246 | 27 17 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 3 29 | 700 | 4.1452 | 5.5947 | 2.3645 | .70018 | 337.3 | 0 |
| 3 29 | 715 | 4.4606 | 5.5947 | 3.2862 | .44516 | 344.1 | 0 |
| 3 29 | 730 | 3.9304 | 5.2883 | 2.8253 | .47648 | 339.9 | 0 |
| 3 29 | 745 | 3.9148 | 5.1339 | 2.5166 | .51675 | 350.3 | 0 |
| 3 29 | 800 | 4.1586 | 5.286 | 2.671 | .45187 | 355 | 0 |
| 3 29 | 815 | 3.6799 | 4.9796 | 2.0558 | .49885 | 354.8 | 0 |
| 3 29 | 830 | 4.1295 | 6.3643 | 2.671 | .61741 | 4.991 | 0 |
| 3 29 | 845 | 4.653 | 5.9012 | 3.4405 | .46753 | 2.162 | 0 |
| 3 29 | 900 | 4.474 | 5.5925 | 3.4405 | .4295 | 356.8 | 0 |
| 3 29 | 915 | 4.0109 | 5.7469 | 2.671 | .46753 | 8.41 | 0 |
| 3 29 | 930 | 4.7805 | 6.0556 | 2.9775 | .69571 | 6.102 | 0 |
| 3 29 | 945 | 5.3241 | 6.2077 | 4.0557 | .46082 | .863 | 0 |
| 3 29 | 1000 | 4.9035 | 6.0533 | 3.2862 | .47872 | 354.8 | 0 |
| 3 29 | 1015 | 4.8655 | 5.899 | 3.2862 | .53912 | 4.831 | 0 |
| 3 29 | 1030 | 4.9773 | 6.3598 | 3.1318 | .46306 | 4.204 | 0 |
| 3 29 | 1045 | 5.1652 | 6.5141 | 3 4383 | .62636 | 9.58 | 0 |
| 3 29 | 1100 | 5.4091 | 6.8206 | 3.4383 | .73597 | 16.11 | 0 |
| 3 29 | 1115 | 4.7492 | 5.899 | 2.9775 | .50556 | 18.41 | .01 |
| 3 29 | 1130 | 4.3622 | 5.8967 | 2.8231 | .58609 | 21.8 | 0 |
| 3 29 | 1145 | 4.2078 | 5.7446 | 2.8231 | .55478 | 10.58 | 0 |
| 3 29 | 1200 | 4.823 | 6.664 | 2.6687 | .79413 | 5.95 | 0 |
| 3 29 | 1215 | 5.0623 | 7.2792 | 2.8231 | .75387 | 6.255 | 0 |
| 3 29 | 1230 | 5.6976 | 8.6617 | 3.2839 | .97533 | 353.4 | 0 |
| 3 29 | 1245 | 4.9236 | 6.664 | 3.5904 | .50332 | 22.53 | 0 |
| 3 29 | 1300 | 5.7894 | 7.277 | 4.0512 | .57491 | 37.6 | 0 |
| 3 29 | 1315 | 4.8521 | 7 277 | 3.2839 | .86348 | 39.32 | 0 |
| 3 29 | 1330 | 5.2368 | 6.8161 | 3.1296 | .71137 | 47.62 | 0 |
| 3 29 | 1345 | 5.1652 | 6.3553 | 3 7447 | .47201 | 51.72 | 0 |
| 3 29 | 1400 | 4.7044 | 6.2032 | 3.436 | .44516 | 56.93 | 0 |
| 3 29 | 1415 | 4.1564 | 5.8967 | 2.3623 | .60399 | 52.2 | 0 |
| 3 29 | 1430 | 3.0289 | 4.8207 | 1.5927 | .59504 | 42.56 | 0 |
| 3 29 | 1445 | 3.2683 | 5.1272 | 1.5927 | .70913 | 28.97 | 0 |
| 3 29 | 1500 | 3.4405 | 4.8207 | 2 2079 | .56596 | 8.46 | 0 |
| 3 29 | 1515 | 4.5389 | 6.3576 | 2.3623 | 1.029 | 347.5 | 0 |
| 3 29 | 1530 | 6.2524 | 8.0465 | 3.436 | 1.0022 | 332.1 | 0 |
| 3 29 | 1545 | 6.7356 | 8.5073 | 4.512 | .69347 | 338.8 | 0 |
| 3 29 | 1600 | 7.2345 | 8.6617 | 5.4337 | .66886 | 344.4 | 0 |
| 3 29 | 1615 | 6.418 | 8.0465 | 4.8207 | .58609 | 4.005 | 0 |
| 3 29 | 1630 | 5.6887 | 7.2792 | 3.5904 | .67334 | 25.61 | 01 |
| 3 29 | 1645 | 6.4314 | 8.816 | 3.5904 | 1.1811 | 17.37 | 01 |
| 3 29 | 1700 | 4.3018 | 5.8967 | 2 8231 | 57491 | 16.9 | .01 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 3 30 | 700 | 1.2729 | 3.2862 | .05592 | .53017 | 81.6 | 0 |
| 3 30 | 715 | 1.0648 | 1.595 | .05592 | .29976 | 37.87 | 0 |
| 3 30 | 730 | .23488 | 1.4406 | -.7136 | .25725 | 13.01 | 0 |
| 3 30 | 745 | 1.4697 | 2.5166 | .21028 | .47201 | 45.73 | 0 |
| 3 30 | 800 | 1.6778 | 2.9775 | .6711 | .44964 | 76 | 0 |
| 3 30 | 815 | 2.2706 | 5.1317 | .6711 | .689 | 80.9 | 0 |
| 3 30 | 830 | 3.1519 | 5.4404 | 1.4406 | 1.1028 | 90.5 | 0 |
| 3 30 | 845 | 2.5278 | 4.5165 | .97981 | .57715 | 82.7 | 0 |
| 3 30 | 900 | 2.6464 | 5.286 | 1.1319 | .96415 | 91.9 | 0 |
| 3 30 | 915 | 3.4875 | 4.6686 | 1.7471 | .52569 | 133 | 0 |
| 3 30 | 930 | 3.9148 | 5.7446 | 2.5166 | .52346 | 140.8 | 0 |
| 3 30 | 945 | 5.1227 | 7.2814 | 2.671 | .78295 | 145.4 | 0 |
| 3 30 | 1000 | 5.3442 | 6.975 | 3.2839 | .6711 | 136.6 | 0 |
| 3 30 | 1015 | 4.4091 | 5.7446 | 2.8231 | .57267 | 143.6 | 0 |
| 3 30 | 1030 | 4.5948 | 6.2054 | 3.2839 | .54135 | 140.2 | 0 |
| 3 30 | 1045 | 3.7022 | 4.9751 | 2.3623 | .5503 | 143.4 | 0 |
| 3 30 | 1100 | 4.1407 | 5.588 | 2.5144 | .689 | 143.4 | 0 |
| 3 30 | 1115 | 4.6105 | 6.8161 | 2.6687 | .74045 | 142.1 | 0 |
| 3 30 | 1130 | 3.917 | 5.2793 | 2.0536 | .6286 | 153.7 | 0 |
| 3 30 | 1145 | 3.5278 | 4.8185 | 2.2079 | .55478 | 166.8 | 0 |
| 3 30 | 1200 | 2.4831 | 4.049 | .97757 | .71137 | 191.1 | 0 |
| 3 30 | 1215 | 2.3332 | 3.8946 | 1.1319 | .57491 | 228.3 | .01 |
| 3 30 | 1230 | 1.9507 | 4.2011 | .05592 | .76505 | 250.8 | 0 |
| 3 30 | 1245 | 2.9059 | 4.0467 | 1.4384 | .53688 | 229 | 0 |
| 3 30 | 1300 | 1.4406 | 2.8186 | .05816 | .59504 | 213.7 | 0 |
| 3 30 | 1315 | 1.2304 | 2.6665 | .05816 | .61517 | 152.9 | 0 |
| 3 30 | 1330 | .57938 | 1.7449 | -.55701 | .49885 | 151.1 | 0 |
| 3 30 | 1345 | .92164 | 2.6665 | - 55701 | .69123 | 177.2 | 0 |
| 3 30 | 1400 | 1.7471 | 3.5859 | - 09619 | .77176 | 61.24 | 0 |
| 3 30 | 1415 | 2.832 | 4.9684 | 1.4384 | .71584 | 72.6 | 0 |
| 3 30 | 1430 | 3.1788 | 5.5813 | .97757 | .86572 | 84.8 | 0 |
| 3 30 | 1445 | 2.4115 | 4.0467 | .97757 | 74492 | 76 | 0 |
| 3 30 | 1500 | 2.4831 | 4.0467 | .97757 | 5928 | 72.6 | 0 |
| 3 30 | 1515 | 1.5391 | 3.1273 | .05592 | .774 | 18 | 0 |
| 3 30 | 1530 | 3.0647 | 4.5098 | .97757 | .61294 | 38.27 | 0 |
| 3 30 | 1545 | 4.0803 | 5.8923 | 2.6665 | .47424 | 42.03 | 0 |
| 3 30 | 1600 | 3.2079 | 4.9706 | 1.7471 | .67557 | 14.64 | 0 |
| 3 30 | 1615 | 2.2348 | 3.7425 | 1.2863 | .49214 | 349.9 | 0 |
| 3 30 | 1630 | 2.9976 | 5.125 | .97757 | .95744 | 346.1 | 0 |
| 3 30 | 1645 | 3.0244 | 4.512 | 1.7471 | 51227 | 325.8 | 0 |
| 3 30 | 1700 | 2.6665 | 4.0512 | 1.1319 | .49438 | 342.2 | 0 |

| DATE | TIME | AUG WS | MAX WS | MIN WS | SD WS | WD | PRECIP |
|---|---|---|---|---|---|---|---|
| 3 31 | 700 | 7.4134 | 10.055 | 4 8252 | 1.3825 | 315.9 | 0 |
| 3 31 | 715 | 6.5723 | 8.8227 | 4.21 | 1.038 | 296 | 0 |
| 3 31 | 730 | 6.6998 | 8.6684 | 2.9775 | 1.0402 | 238.1 | 0 |
| 3 31 | 745 | 4.1675 | 6.3598 | 1.1319 | 1.2975 | 254.6 | 0 |
| 3 31 | 800 | 4.4941 | 7.1271 | 1.9015 | 1.1207 | 219.5 | 0 |
| 3 31 | 815 | 5.1138 | 6 5097 | 3.2839 | .69794 | 207.9 | 0 |
| 3 31 | 830 | 5.8609 | 7.2747 | 4.2033 | .57715 | 190.2 | 0 |
| 3 31 | 845 | 5.4158 | 7.8877 | 3.1273 | .84335 | 166.5 | 0 |
| 3 31 | 900 | 3.5255 | 5.7357 | .51675 | .97309 | 151 | 0 |
| 3 31 | 915 | 3.6776 | 6.6528 | .97757 | 1.2035 | 150 2 | 0 |
| 3 31 | 930 | 3.964 | 7.7266 | 1.284 | 1.208 | 149.4 | 0 |
| 3 31 | 945 | 3.6664 | 8.0308 | .05816 | 1.7829 | 172.9 | 0 |
| 3 31 | 1000 | 5.0176 | 7.1092 | 2.2034 | .94625 | 169.3 | 0 |
| 3 31 | 1015 | 3.436 | 6.3419 | .21028 | 1.5458 | 200.4 | 0 |
| 3 31 | 1030 | 1.6218 | 4.9594 | - 70689 | 1.0715 | 276.5 | 0 |
| 3 31 | 1045 | 2.5412 | 7.8698 | .05816 | 1.0492 | 211.5 | 0 |
| 3 31 | 1100 | 1.6174 | 4.04 | - 70689 | 1.1498 | .012 | 0 |
| 3 31 | 1115 | 4 3756 | 8.174 | .21251 | 2.1274 | 168.9 | 0 |
| 3 31 | 1130 | 4.6127 | 9.7019 | .36463 | 2.4182 | 159.1 | 0 |
| 3 31 | 1145 | 5.7692 | 9.2411 | 1.7426 | 1.4809 | 157.5 | 0 |
| 3 31 | 1200 | 3.9394 | 8.476 | .51898 | 1.2102 | 231.5 | 0 |
| 3 31 | 1215 | 3.6799 | 7.098 | .97757 | 1.246 | 161.6 | 0 |
| 3 31 | 1230 | 4.3018 | 8.0152 | 1.8947 | 1.2326 | 76 | 0 |
| 3 31 | 1245 | 3.7358 | 9.0867 | .36463 | 1.7717 | 81.9 | 0 |
| 3 31 | 1300 | 3.058 | 10.158 | .21251 | 2.0648 | 104.7 | 0 |
| 3 31 | 1315 | 5.4113 | 10.769 | 1.7426 | 1.6129 | 97.5 | 0 |
| 3 31 | 1330 | 4.3174 | 8.6281 | .36463 | 1.5391 | 150.2 | 0 |
| 3 31 | 1345 | 5.6417 | 10.31 | 2.3533 | 1.5816 | 90.9 | 0 |
| 3 31 | 1400 | 2.7605 | 9 5453 | .21251 | 1.7314 | 84.2 | 0 |
| 3 31 | 1415 | 4.0288 | 8.7802 | .21251 | 1.9574 | 166.5 | 0 |
| 3 31 | 1430 | 6.031 | 9.3932 | 2.0491 | 1.6487 | 76.5 | 0 |
| 3 31 | 1445 | 4.8028 | 8.6259 | 1.1297 | 1.51 | 74.3 | 0 |
| 3 31 | 1500 | 6.8743 | 12.91 | 2.8119 | 1.973 | 115.8 | 0 |
| 3 31 | 1515 | 3.1094 | 6.333 | .21251 | 1.5279 | 99.6 | 0 |
| 3 31 | 1530 | 2.7314 | 8.4738 | .05816 | 1.6062 | 55 41 | 0 |
| 3 31 | 1545 | 3.4584 | 10.158 | .21251 | 2.2348 | 59.04 | 0 |
| 3 31 | 1600 | 3.7492 | 7.7087 | 1.1297 | 1.3847 | 89 3 | 0 |
| 3 31 | 1615 | 4.6641 | 10.769 | .05816 | 2.9663 | 131 | 0 |
| 3 31 | 1630 | 3.4338 | 8.9346 | .21251 | 2.5905 | 118.6 | 0 |
| 3 31 | 1645 | 3.9819 | 8.1695 | 1.5883 | 1.4317 | 104.1 | 0 |
| 3 31 | 1700 | 4.729 | 6.7915 | 2 8142 | .70913 | 154 7 | 0 |

Inst USED

BICRON: analyst

Cal Date - 1-22-90 / DUE Date: 7-90

ON X 10 scale

By R.P.T. J. Munoz 508892 2-1-90

Counts per minute-

| | BKGD | SCALER | METER |
|---|---|---|---|
| 1 | 2500 | 1904 | 2200 |
| 2 | | 1589 | 1700 |
| 3 | | 1732 | 2000 |
| 4 | | 1775 | 2000 |
| 5 | | 1793 | 2100 |
| 6 | | 1755 | 2000 |
| 7 | | 1840 | 2100 |
| 8 | | 1796 | 2000 |
| 9 | | 1674 | 1900 |
| 10 | | 2021 | 2400 |
| 11 | | 1873 | 2100 |
| 12 | | 2217 | 2700 |
| 13 | | 1921 | 2300 |
| 14 | | 2074 | 2400 |
| 15 | | 1916 | 2300 |
| 16 | | 1946 | 2200 |
| 17 | | 2032 | 2400 |
| 18 | | 1741 | 2000 |
| 19 | | 1900 | 2200 |
| 20 | | 1878 | 2100 |

| | BKGD | SCALER | METER |
|---|---|---|---|
| 21. | 2500 | 1791 | 1900 |
| 22. | ↓ | 1577 | 1700 |
| 23. | | 1902 | 2200 |
| 24 | | 1852 | 2100 |
| 25. | | 3710 | 3600 |
| 26. | | 4311 | 4500 |

All readings above ? preceding page are for Weston's borehole locations.
For French Drain Collection - ~~hrs~~
Taken on 2-1-90 P.M.'s Before drilling!

| Date | Hole # | (Core Samples) c/m Ludlum 31 | (Core samples) c/m Ludlum 12B | (Hole) after drilling Eichler: BKGD 2500 c/m | (Core samples) Smear: d/m |
|---|---|---|---|---|---|
| 2-5-90 | #22 | BKGD <250 <250 | <250 50c/m actual | scaler: 1580 meter: 1700 | 1.0 d/m 2.3 d/m |
| 2-5-90 | #21 | BKGD <250 <250 | <250 100 c/m actual | scaler: 1652 meter: 1900 | 1 0 d/m 2.3 d/m |
| 2-7-90 | #20 | BKGD <250 <250 | <250 c/m 50c/m actual | scaler 1605 meter. 2100 | 1 3 d/m 3 3 d/m 2.0 d/m 4 0 d/m |
| | | | | | |
| 2-9-90 | #19 | BKGD <250 <250 | <250 50c/m actual | scaler 1900 meter: 2200 | 1 5 d/m 2 0 d/m |
| 2-9-90 | #18 | BKGD <250 <250 | <250 100c/m actual | scaler: 1900 meter: 2000 | 1 0 d/m 2 0 d/m |
| 2-9-90 | #17 | BKGD <250 <250 | <250 100c/m actual | scaler: 2000 meter: 2400 | 1 0 d/m 2 3 d/m |
| 2-9-90 | #16 | BKGD <250 <250 | <250 100 c/m actual | scaler: 1950 meter: 2200 | 1 0 d/m 2.3 d/m |
| | | | | | |
| 2-19-90 | #13 | BKGD <250 <250 | <250 50c/m actual | scaler: 1955 meter: 2300 | 1. 0 d/m 3. 3 d/m 2.0 d/m 4.0 d/m |
| | | | | | |
| 2-22-90 | #12 | BKGD <250 <250 | <250 100 c/m actual | scaler 2300 meter: 2000 | 1 0 d/m 3 0 d/m 5.3 d/m 2 3 d/m 4 0 d/m 6.3 d/m |

(Core samples)

| Date: | Hole# | Ludlum 31 c/m | Ludlum 12-1A c/m | Fiddler: | (Core) Smear: c/m |
|---|---|---|---|---|---|
| 2-26-90 | #11 | BKGD<br><250 c/m | <250<br>100 c/m | | 1 0 3 3 5 0<br>2 3 4 3 6.6 |
| | #10 | BKGD<br><250 c/m | <250<br>100 c/m | | 1 0 3 3<br>2 3 4 3 |
| | #9 | BKGD<br><250 c/m | <250<br>100 c/m | | 1 3 3 0<br>2 3 4.0 |
| 2/28/90 | | BKGD<br><250 c/m | <250<br>1 | - | 1. 0/2 0<br>3 6/4, 6 |
| 3/1/90 | | BKGD<br><250 c/m | <250 | | 1 0/2 6<br>3.3/4.6<br>5. 0/6.0 |
| 3-5-90 | #13 | BKGD<br><200 c/m | <250<br>100 c/m | | 1 0 3 3 5 0<br>2.0 4 3 6 0 |
| 3-5-90 | #14 | BKGD<br><200 c/m | <250<br>100 c/m | | 1.0 3.3 5.0<br>2.0 4 3 6.0 |
| 3-20-90 | #8 | BKGD<br><200 c/m | <250 c/m<br>100 c/m | | 1.0 3 0<br>2.0 4.0 |
| 3-20-90 | #7 | BKGD<br><200 c/m | <250<br>100 c/m | | 1 0 3 0<br>2.0 4.3 |
| 3-20-90 | #6 | BKGD<br><200 c/m | <250<br>100 c/m | | 1 3 3 3<br>2.0 4 0 |
| 3-22-90 | #5 | BKGD<br><200 c/m | <250<br>100 c/m | | 1.3 3 0 5 3<br>2 3 4 0 6 0 |
| 3-22-90 | #4 | BKGD<br><200 c/m | <250<br>100 c/m | | 1 3 3 0 5.3<br>2 6 4 0 6.3 |
| 3-23-90 | #3 | BKGD<br><250 c/m | <250<br>100 c/m | | 1 0 3 0<br>2 3 4 0 |
| 3-23-90 | #2 | BKGD<br><250 c/m | <250<br>100 c/m | | 1 3 3 3<br>2 3 4 0 |

c/m

3 3 c/m
1 0 c/m

3 c/m 5 0 c/m
0 c/m 6 3 c/m

BLDG. MGR.
H.P.
FILE

Control No. Special

**RADIOLOGICAL MONITORING**
**Contamination Survey**

E.A. English
506940
2-23-90

Taken by: J Munoz, Jr. Empl[redacted] Reviewed by: _____ Emply# _____

Taken by: _____ Emply# _____ Reviewed by: _____ Emply# _____

Taken by: _____ Emply# _____ Reviewed by: _____ Emply# _____

Date: 2-5-90 Building: _____

Time: 1300 Room #: _____

Shift: Day

Survey Description: 881 Hillside South #21, Weston borehole location, French drain collection

**Instrumentation Used**

**SMEAR COUNTERS**

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Eberline | 2. Eberline | 3. Eberline | 4. Eberline | 5. Eberline |
| Model: | 1. SAC - 4 | 2. SAC - 4 | 3. SAC - 4 | 4. SAC - 4 | 5. SAC - 4 |
| Serial #: | 1. 892 | 2. 818 | 3. | 4. | 5. |
| Date Per. CK: | 1. 2-5-90 | 2. 2-5-90 | 3. | 4. | 5. |
| Cal. Due Date: | 1. 4-90 | 2. 10-90 | 3. | 4. | 5. |

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Ludlum | 2. Ludlum | 3. Ludlum | 4. Ludlum | 5. Ludlum |
| Model: | 1. 31 | 2. 31 | 3. 31 | 4. 31 | 5. 31 |
| Serial #: | 1. 01630 | 2. | 3. | 4. | 5. |
| Date Per. CK. | 1. 2-5-90 | 2. | 3. | 4. | 5. |
| Cal. Due Date: | 1. 2-5-90 | 2. | 3. | 4. | 5. |

**OTHER INSTRUMENTS**

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Ludlum | 2. Ludlum | 3. Ludlum | 4. Ludlum | 5. Ludlum |
| Model: | 1. 12 - 1A | 2. 12 - 1A | 3. 12 - 1A | 4. 12 - 1A | 5. 12 - 1A |
| Serial #: | 1. 56071 | 2. | 3. | 4. | 5. |
| Date Calib'd | 1. 2-5-90 | 2. | 3. | 4. | 5. |
| Date Calib'd DUE | 1. 3-90 | 2. | 3. | 4. | 5. |

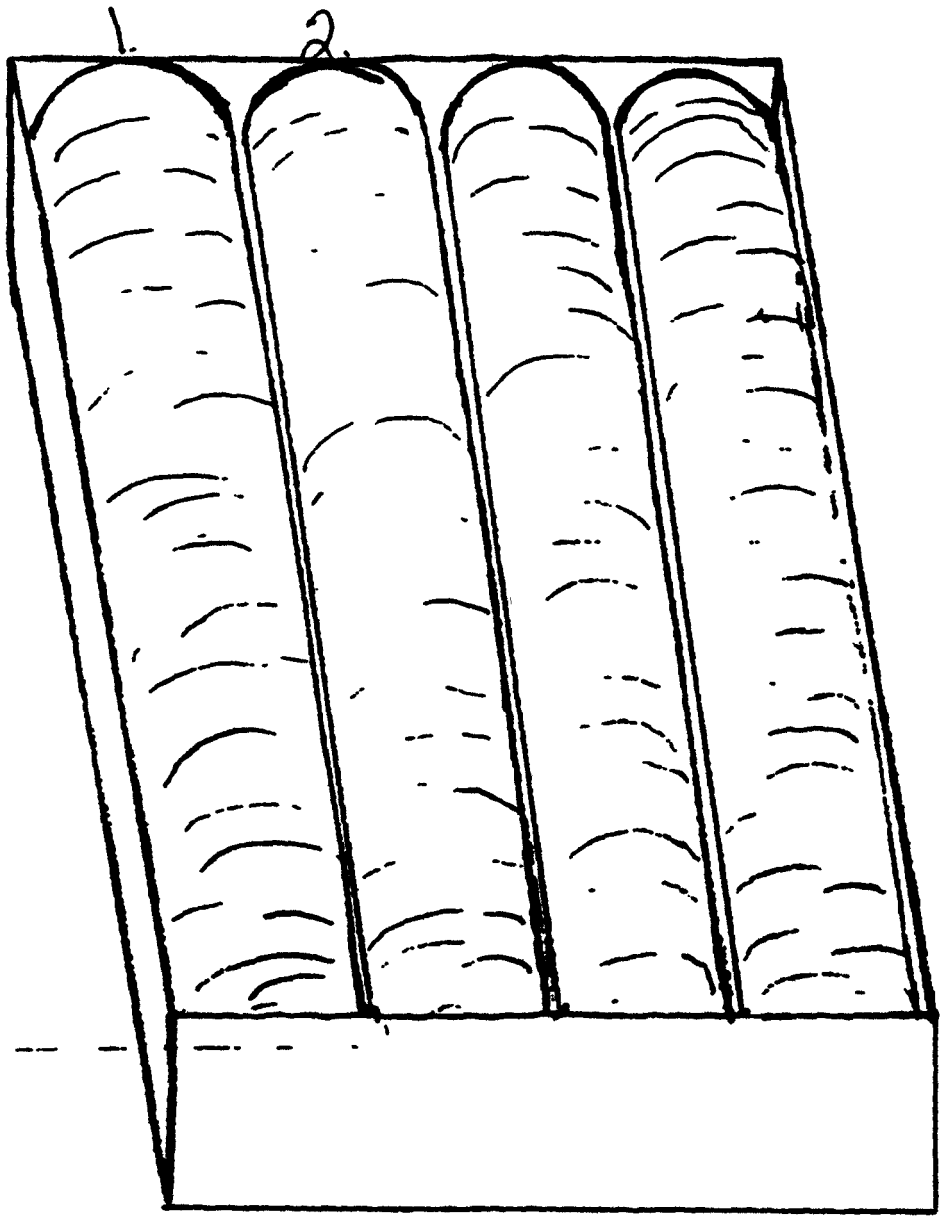
**COMMENTS**

1 Box Core Samples

RADIOLOGICAL MONITORING Control No. _____

Area or Equipment Drawing Showing Survey Points

CORE SAMPLES



Control No _____

**RADIOLOGICAL MONITORING**
**Contamination Survey**

**RESULTS**

| | Initial | | | | Resurvey | | |
|---|---|---|---|---|---|---|---|
| | CPM Removable (Swipe) | CPM Direct | DPM/100cm2 Removable (Smear) | | CPM Removable (Swipe) | CPM Direct | DPM/100cm2 Removable (Smear) |
| | | Ludlum 12-1 \| 31 | | | | | |
| 1. | | <250 \| 13460 | 0 | 1. | | | |
| 2. | | <250 \| 13460 | 3 | 2. | | | |
| 3. | | | | 3. | | | |
| 4. | | | | 4. | | | |
| 5. | | | | 5. | | | |
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| 30. | | | | 30. | | | |
| 31. | | | | 31. | | | |
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| 43. | | | | 43. | | | |
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| 45. | | | | 45. | | | |

BLDG. MGR.
H.P.
FILE

Control No. Special

**RADIOLOGICAL MONITORING**
**Contamination Survey**

E. A. English
506940
2-23-90

Taken by: J. Johnson, Jr. Emply# [redacted] Reviewed by: _____ Emply# _____

Taken by: _____ Emply# _____ Reviewed by: _____ Emply# _____

Taken by: _____ Emply# _____ Reviewed by: _____ Emply# _____

Date: 2-5-90 Building: _____

Time 1300 Room #: _____

Shift: Day

Survey Description: 881 Hillside, South #22, Weston borehole location, French drain Collection/

**Instrumentation Used**

**SMEAR COUNTERS**

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Eberline | 2. Eberline | 3. Eberline | 4. Eberline | 5. Eberline |
| Model: | 1. SAC - 4 | 2. SAC - 4 | 3. SAC - 4 | 4. SAC - 4 | 5. SAC - 4 |
| Serial #: | 1. 892 | 2. 8K | 3. | 4. | 5. |
| Date Per. CK: | 1. 2-5-90 | 2. 2-5-90 | 3. | 4. | 5. |
| Cal. Due Date: | 1. 4-90 | 2. 7-90 | 3. | 4. | 5. |

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Ludlum | 2. Ludlum | 3. Ludlum | 4. Ludlum | 5. Ludlum |
| Model: | 1. 31 | 2. 31 | 3. 31 | 4. 31 | 5. 31 |
| Serial #: | 1. 61630 | 2. | 3. | 4. | 5. |
| Date Per. CK: | 1. 2-5-90 | 2. | 3. | 4. | 5. |
| Cal. Due Date: | 1. 2-8-90 | 2. | 3. | 4. | 5. |

**OTHER INSTRUMENTS**

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Ludlum | 2. Ludlum | 3. Ludlum | 4. Ludlum | 5. Ludlum |
| Model: | 1. 12 - 1A | 2. 12 - 1A | 3. 12 - 1A | 4. 12 - 1A | 5 12 - 1A |
| Serial #: | 1. 56041 | 2. | 3. | 4. | 5. |
| Date Calib'd | 1. 2-5-90 | 2. | 3. | 4. | 5. |
| Date Calib'd DUE | 1. 3-90 | 2. | 3. | 4. | 5 |

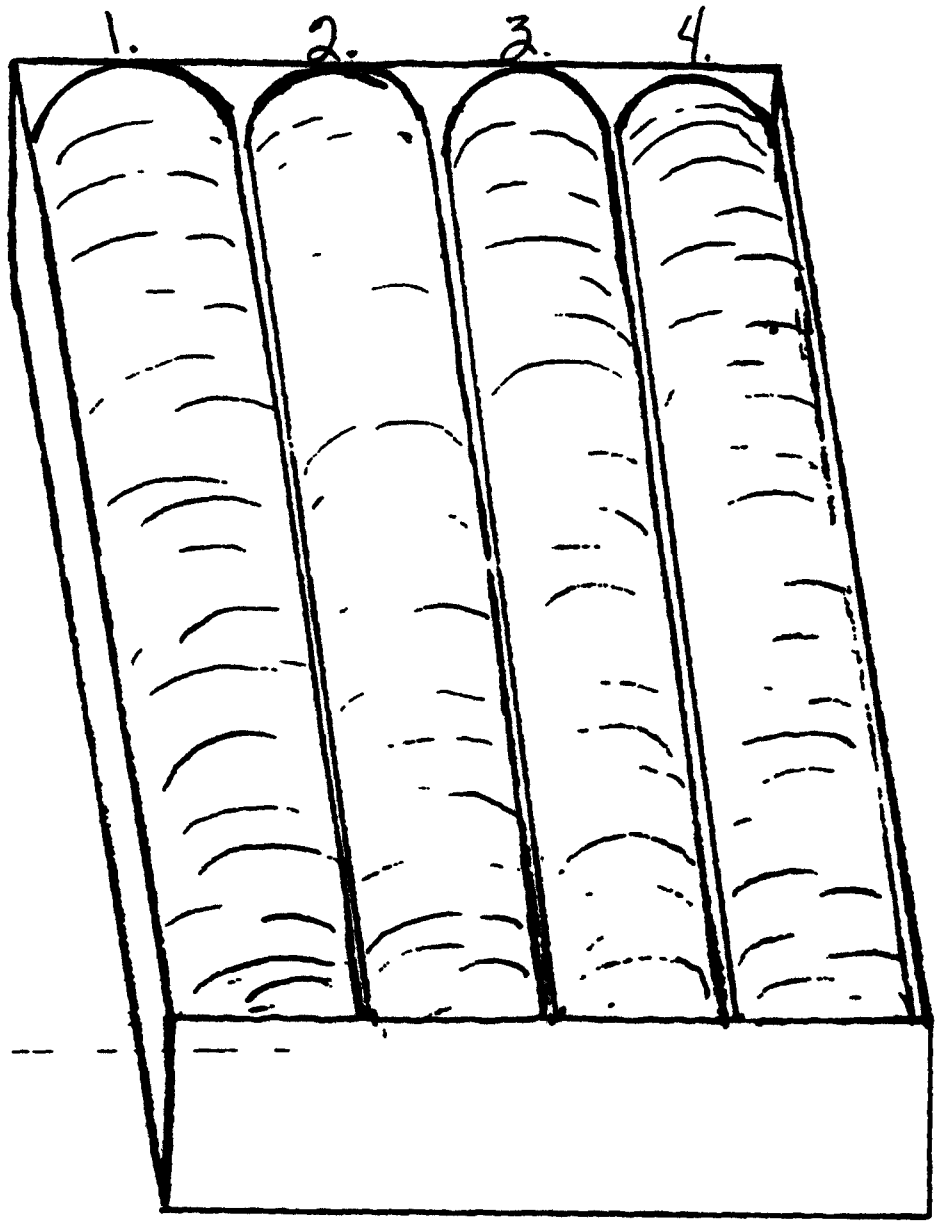
**COMMENTS**

1 Box core Samples

RADIOLOGICAL MONITORING Control No. _____

Area or Equipment Drawing Showing Survey Points

CORE SAMPLES



Control No _____

**RADIOLOGICAL MONITORING**
**Contamination Survey**

**RESULTS**

| | Initial | | | | Resurvey | | |
|---|---|---|---|---|---|---|---|
| | CPM Removable (Swipe) | CPM Direct Ludlum 124 / 31 | DPM/100cm2 Removable (Smear) | | CPM Removable (Swipe) | CPM Direct | DPM/100cm2 Removable (Smear) |
| 1. | | 5250 / 8460 | 0 | 1. | | | |
| 2. | | 5250 / 8460 | 3 | 2. | | | |
| 3. | | | | 3. | | | |
| 4. | | | | 4. | | | |
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| 44. | | | | 44. | | | |
| 45. | | | | 45. | | | |

BLDG. MGR.
H.P.
FILE

Control No. Special

**RADIOLOGICAL MONITORING**
**Contamination Survey**

E. A. English
506940
2-23-90

Taken by: J Muñoz, Jr Emply [redacted] Reviewed by: _____ Emply# _____

Taken by. _____ Emply# _____ Reviewed by: _____ Emply# _____

Taken by: _____ Emply# _____ Reviewed by: _____ Emply# _____

Date: 2-7-90 Building: _____

Time: 1300 Room #: _____

Shift: Day

Survey Description: 881 Hillside: South #20, Weston borehole location, French drain Collection

**Instrumentation Used**

**SMEAR COUNTERS**

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Eberline | 2. Eberline | 3. Eberline | 4. Eberline | 5. Eberline |
| Model: | 1. SAC - 4 | 2. SAC - 4 | 3. SAC - 4 | 4. SAC - 4 | 5. SAC - 4 |
| Serial #: | 1. 842 | 2. 818 | 3. | 4. | 5. |
| Date Per. CK: | 1. 2-7-90 | 2. 2-7-90 | 3. | 4. | 5. |
| Cal. Due Date: | 1. 4-90 | 2. 10-90 | 3. | 4. | 5. |

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Ludlum | 2. Ludlum | 3. Ludlum | 4. Ludlum | 5. Ludlum |
| Model: | 1. 31 | 2. 31 | 3. 31 | 4. 31 | 5. 31 |
| Serial #: | 1. 61630 | 2. | 3. | 4. | 5. |
| Date Per. CK: | 1. 2-7-90 | 2. | 3. | 4. | 5 |
| Cal. Due Date: | 1. 2-7-90 | 2. | 3. | 4. | 5. |

**OTHER INSTRUMENTS**

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Ludlum | 2. Ludlum | 3. Ludlum | 4. Ludlum | 5. Ludlum |
| Model: | 1. 12 - 1A | 2. 12 - 1A | 3. 12 - 1A | 4. 12 - 1A | 5 12 - 1A |
| Serial #: | 1. 56071 | 2. | 3. | 4. | 5. |
| Date Calib'd | 1. 2-7-90 | 2. | 3. | 4. | 5. |
| Date Calib'd DUE | 1. 3-90 | 2. | 3. | 4. | 5 |

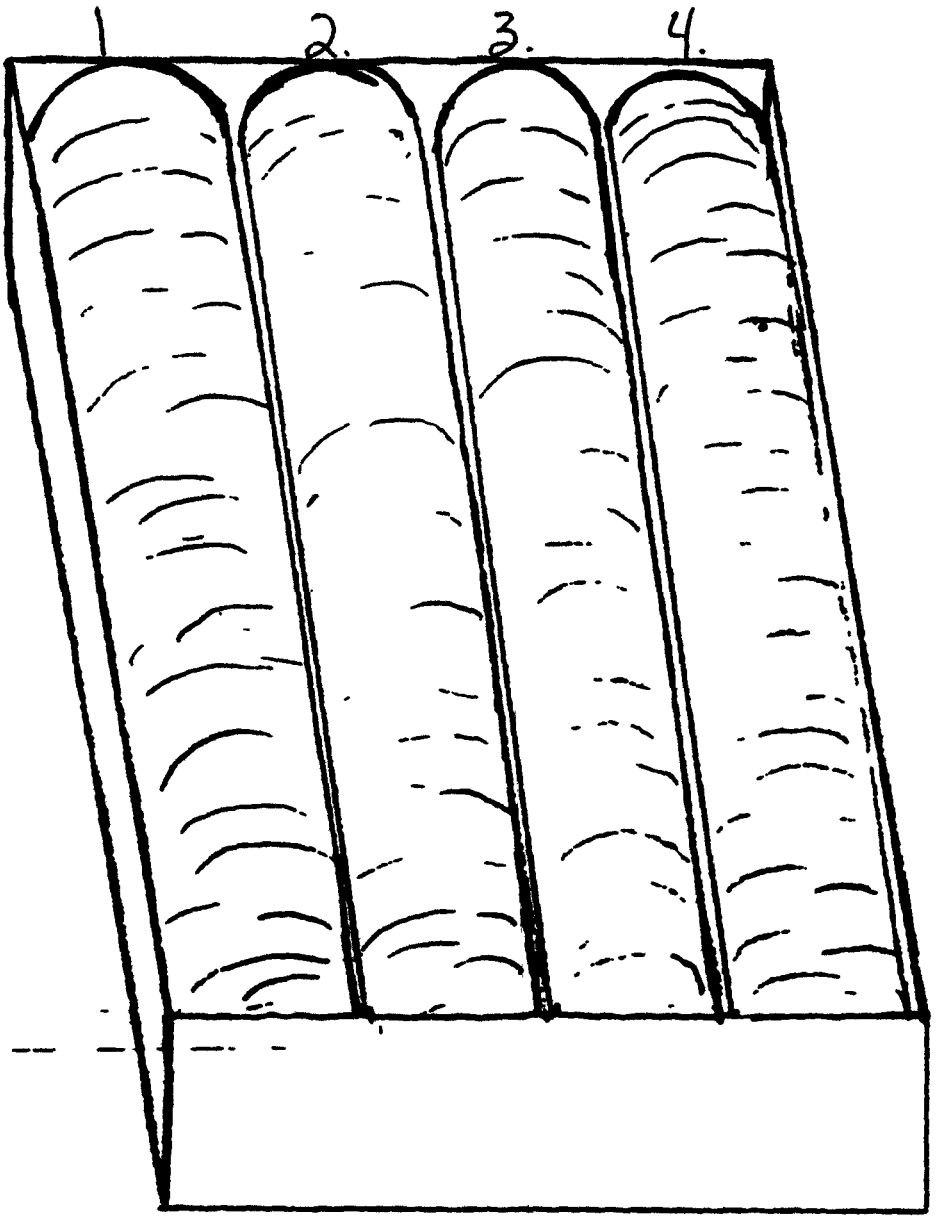
**COMMENTS**

1 Box Core Samples

RADIOLOGICAL MONITORING Control No. _____

Area or Equipment Drawing Showing Survey Points

CORE SAMPLES



Control No _____

**RADIOLOGICAL MONITORING**
**Contamination Survey**

**RESULTS**

| | Initial CPM Removable (Swipe) | Initial CPM Direct Ludlum 12-1 / 31 | Initial DPM/100cm2 Removable (Smear) | Resurvey CPM Removable (Swipe) | Resurvey CPM Direct | Resurvey DPM/100cm2 Removable (Smear) |
|---|---|---|---|---|---|---|
| 1. | | ~~4250 / 13460~~ | 3 | | | |
| 2. | | ~~4200 / 13460~~ | 0 | | | |
| 3. | | ~~4200 / 13460~~ | 3 | | | |
| 4. | | ~~4200 / 13460~~ | 0 | | | |
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| 45. | | | | | | |

BLDG. MGR.
H.P.
FILE

Control No. special

**RADIOLOGICAL MONITORING**
**Contamination Survey**

E. A. English
506940
2-23-90

Taken by: J Munoz, Jr Emply [redacted] Reviewed by: _____ Emply# _____

Taken by: _____ Emply# _____ Reviewed by: _____ Emply# _____

Taken by: _____ Emply# _____ Reviewed by: _____ Emply# _____

Date: 2-9-90 Building: _____

Time 1300 Room #: _____

Shift: Day

Survey Description: 881 Hillside: South #16, Weston borehole location, French drain collection

**Instrumentation Used**

**SMEAR COUNTERS**

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Eberline | 2. Eberline | 3. Eberline | 4. Eberline | 5 Eberline |
| Model: | 1. SAC - 4 | 2. SAC - 4 | 3. SAC - 4 | 4. SAC - 4 | 5. SAC - 4 |
| Serial #: | 1. 842 | 2. 818 | 3. | 4. | 5. |
| Date Per. CK: | 1. 2-9-90 | 2. 2-9-90 | 3. | 4. | 5. |
| Cal. Due Date: | 1. 4-90 | 2. 10-90 | 3. | 4. | 5. |

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Ludlum | 2. Ludlum | 3. Ludlum | 4. Ludlum | 5 Ludlum |
| Model: | 1. 31 | 2. 31 | 3. 31 | 4. 31 | 5. 31 |
| Serial #: | 1. 61630 | 2. | 3. | 4. | 5. |
| Date Per. CK: | 1. 2-9-90 | 2. | 3. | 4. | 5. |
| Cal. Due Date: | 1. 2-8-90 | 2. | 3. | 4. | 5. |

**OTHER INSTRUMENTS**

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Ludlum | 2. Ludlum | 3. Ludlum | 4. Ludlum | 5 Ludlum |
| Model: | 1. 12 - 1A | 2. 12 - 1A | 3. 12 - 1A | 4. 12 - 1A | 5 12 - 1A |
| Serial #: | 1. 56071 | 2. | 3. | 4. | 5. |
| Date Calib'd | 1. 2-9-90 | 2. | 3. | 4. | 5. |
| Date Calib'due | 1. 3-90 | 2. | 3. | 4. | 5. |

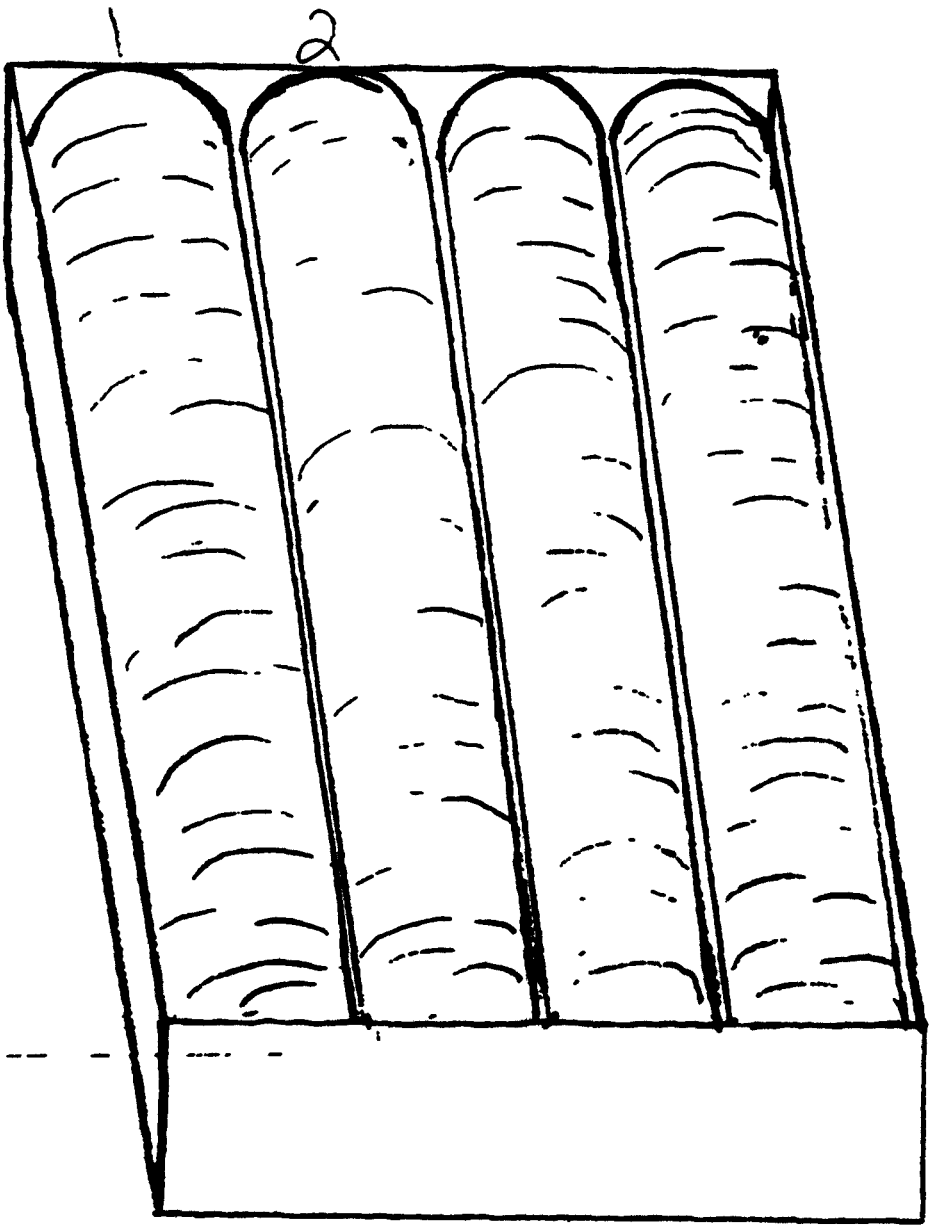
**COMMENTS**

1 Box Core Samples

RADIOLOGICAL MONITORING Control No. _____

Area or Equipment Drawing Showing Survey Points

CORE SAMPLES



Control No _____

**RADIOLOGICAL MONITORING**
**Contamination Survey**

**RESULTS**

| | Initial CPM Removable (Swipe) | Initial CPM Direct (columns 12-1 / 3) | Initial DPM/100cm2 Removable (Smear) | Resurvey CPM Removable (Swipe) | Resurvey CPM Direct | Resurvey DPM/100cm2 Removable (Smear) |
|---|---|---|---|---|---|---|
| 1. | | 5250 / 8460 | C | | | |
| 2. | | 5250 / 8460 | 3 | | | |
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| 4. | | | | | | |
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BLDG. MGR.
H.P.
FILE

Control No. Special

**RADIOLOGICAL MONITORING**
**Contamination Survey**

E.A. English 506940 2-23-90

Taken by: J Muñoz, Jr Emply# [redacted] Reviewed by: _____ Emply# _____

Taken by: _____ Emply# _____ Reviewed by: _____ Emply# _____

Taken by: _____ Emply# _____ Reviewed by: _____ Emply# _____

Date: 2-9-90 Building: _____

Time: 1300 Room #: _____

Shift: Day

Survey Description: 881 Hillside: South #17, Weston borehole location, French drain collection

**Instrumentation Used**

**SMEAR COUNTERS**

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Eberline | 2. Eberline | 3. Eberline | 4. Eberline | 5. Eberline |
| Model: | 1. SAC - 4 | 2. SAC - 4 | 3. SAC - 4 | 4. SAC - 4 | 5. SAC - 4 |
| Serial #: | 1. 842 | 2. 818 | 3. | 4. | 5. |
| Date Per. CK: | 1. 2-9-90 | 2. 2-9-90 | 3. | 4. | 5. |
| Cal. Due Date: | 1. 4-90 | 2. 10-90 | 3. | 4. | 5. |

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Ludlum | 2. Ludlum | 3. Ludlum | 4. Ludlum | 5. Ludlum |
| Model: | 1. 31 | 2. 31 | 3. 31 | 4. 31 | 5. 31 |
| Serial #: | 1. 61636 | 2. | 3. | 4. | 5. |
| Date Per. CK: | 1. 2-9-90 | 2. | 3. | 4. | 5. |
| Cal. Due Date: | 1. 8-90 | 2. | 3. | 4. | 5. |

**OTHER INSTRUMENTS**

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Ludlum | 2. Ludlum | 3. Ludlum | 4. Ludlum | 5. Ludlum |
| Model: | 1. 12 - 1A | 2. 12 - 1A | 3. 12 - 1A | 4. 12 - 1A | 5. 12 - 1A |
| Serial #: | 1. 36071 | 2. | 3. | 4. | 5. |
| Date Calib'd | 1. 2-9-90 | 2. | 3. | 4. | 5. |
| Date Calib'd DUE | 1. 3-90 | 2. | 3. | 4. | 5. |

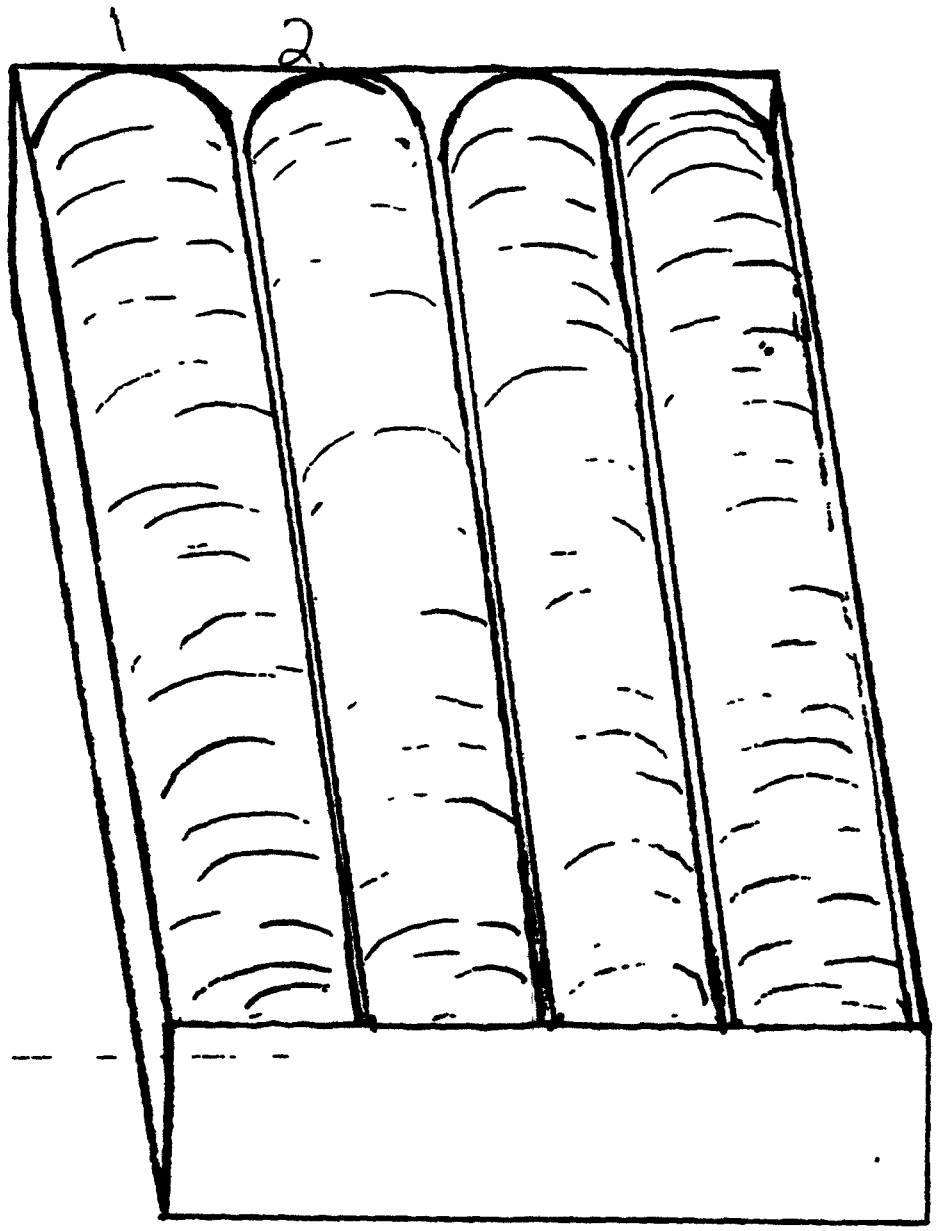
**COMMENTS**

1 Box Core Samples

**RADIOLOGICAL MONITORING** Control No. _____

Area or Equipment Drawing Showing Survey Points

**CORE SAMPLES**



Control No _____

**RADIOLOGICAL MONITORING**
**Contamination Survey**

**RESULTS**

| | Initial | | | Resurvey | | |
|---|---|---|---|---|---|---|
| | CPM Removable (Swipe) | CPM Direct | DPM/100cm2 Removable (Smear) | CPM Removable (Swipe) | CPM Direct | DPM/100cm2 Removable (Smear) |
| | | LOCUMS 12-1 31 | | | | |
| 1. | | 5250 B460 | 0 | | | |
| 2. | | 5250 B460 | 3 | | | |
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BLDG. MGR.
H.P.
FILE

Control No. Special

**RADIOLOGICAL MONITORING**
**Contamination Survey**

E.A. English
506940
2-28-90

Taken by: J. Munoz, Jr. Emply [redacted] Reviewed by: _____ Emply# _____

Taken by: _____ Emply# _____ Reviewed by: _____ Emply# _____

Taken by: _____ Emply# _____ Reviewed by: _____ Emply# _____

Date: 2-9-90 Building: _____

Time 1300 Room #: _____

Shift: Day

Survey Description: 881 Hillside: South #18, Weston borehole location, French drain collection

**Instrumentation Used**

**SMEAR COUNTERS**

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Eberline | 2. Eberline | 3. Eberline | 4. Eberline | 5. Eberline |
| Model: | 1. SAC - 4 | 2. SAC - 4 | 3. SAC - 4 | 4. SAC - 4 | 5. SAC - 4 |
| Serial #: | 1. 892 | 2. 818 | 3. | 4. | 5. |
| Date Per. CK: | 1. 2-9-90 | 2. 2-9-90 | 3. | 4. | 5. |
| Cal. Due Date: | 1. 4-90 | 2. 10-90 | 3. | 4. | 5. |

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Ludlum | 2. Ludlum | 3. Ludlum | 4. Ludlum | 5. Ludlum |
| Model: | 1. 31 | 2. 31 | 3. 31 | 4. 31 | 5. 31 |
| Serial #: | 1. 16630 | 2. | 3. | 4. | 5. |
| Date Per. CK: | 1. 2-9-90 | 2. | 3. | 4. | 5. |
| Cal. Due Date: | 1. 2-90 | 2. | 3. | 4. | 5. |

**OTHER INSTRUMENTS**

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Ludlum | 2. Ludlum | 3. Ludlum | 4. Ludlum | 5. Ludlum |
| Model: | 1. 12 - 1A | 2. 12 - 1A | 3. 12 - 1A | 4. 12 - 1A | 5. 12 - 1A |
| Serial #: | 1. 56071 | 2. | 3. | 4. | 5. |
| Date Calib'd | 1. 2-9-90 | 2. | 3. | 4. | 5. |
| Date Calib'd DUE | 1. 3-90 | 2. | 3. | 4. | 5 |

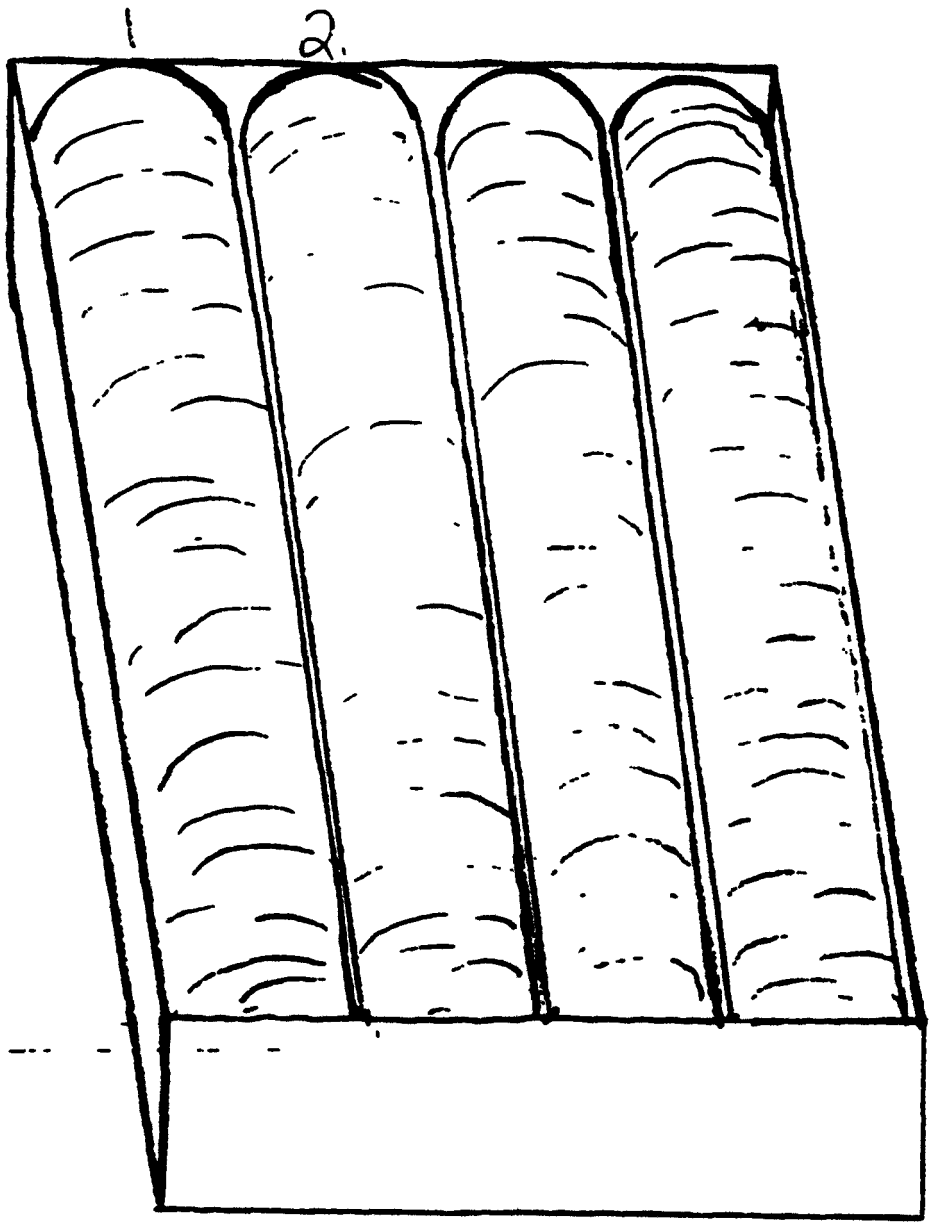
**COMMENTS**

1 Box Core Samples

RADIOLOGICAL MONITORING Control No. _____

Area or Equipment Drawing Showing Survey Points

CORE SAMPLES



Control No _____

**RADIOLOGICAL MONITORING**
**Contamination Survey**

**RESULTS**

| | Initial | | | | Resurvey | | |
|---|---|---|---|---|---|---|---|
| | CPM Removable (Swipe) | CPM Direct | DPM/100cm2 Removable (Smear) | | CPM Removable (Swipe) | CPM Direct | DPM/100cm2 Removable (Smear) |
| | | Ludlums 12-1 \| 31 | | | | | |
| 1. | | 5200 \| 13460 | 0 | 1. | | | |
| 2. | | 5200 \| 13460 | 0 | 2. | | | |
| 3. | | | | 3. | | | |
| 4. | | | | 4. | | | |
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BLDG. MGR.
H.P.
FILE

Control No. Special

**RADIOLOGICAL MONITORING**
**Contamination Survey**

E.A. English
506940
2-23-90

Taken by: J Munoz, Jr. Emply# [redacted] Reviewed by: _____ Emply# _____

Taken by: _____ Emply# _____ Reviewed by: _____ Emply# _____

Taken by: _____ Emply# _____ Reviewed by: _____ Emply# _____

Date: 2-9-90 Building: _____

Time 1300 Room #: _____

Shift: Day

Survey Description: 881 Hillside: South #19, Weston borehole location, French drain collection

**Instrumentation Used**

**SMEAR COUNTERS**

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Eberline | 2. Eberline | 3. Eberline | 4. Eberline | 5. Eberline |
| Model: | 1. SAC - 4 | 2. SAC - 4 | 3. SAC - 4 | 4. SAC - 4 | 5. SAC - 4 |
| Serial #: | 1. 892 | 2. 818 | 3. | 4. | 5. |
| Date Per. CK: | 1. 2-9-90 | 2. 2-9-90 | 3. | 4. | 5. |
| Cal. Due Date: | 1. 4-90 | 2. 10-90 | 3. | 4. | 5. |

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Ludlum | 2. Ludlum | 3. Ludlum | 4. Ludlum | 5. Ludlum |
| Model: | 1. 31 | 2. 31 | 3. 31 | 4. 31 | 5. 31 |
| Serial #: | 1. 61630 | 2. | 3. | 4. | 5. |
| Date Per. CK: | 1. 2-9-90 | 2. | 3. | 4. | 5. |
| Cal. Due Date: | 1. 2-90 | 2. | 3. | 4. | 5. |

**OTHER INSTRUMENTS**

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Ludlum | 2. Ludlum | 3. Ludlum | 4. Ludlum | 5. Ludlum |
| Model: | 1. 12 - 1A | 2. 12 - 1A | 3. 12 - 1A | 4. 12 - 1A | 5. 12 - 1A |
| Serial #: | 1. 56071 | 2. | 3. | 4. | 5. |
| Date Calib'd | 1. 2-[illegible] | 2. | 3. | 4. | 5. |
| Date Calib'due | 1. 2-90 | 2. | 3. | 4. | 5. |

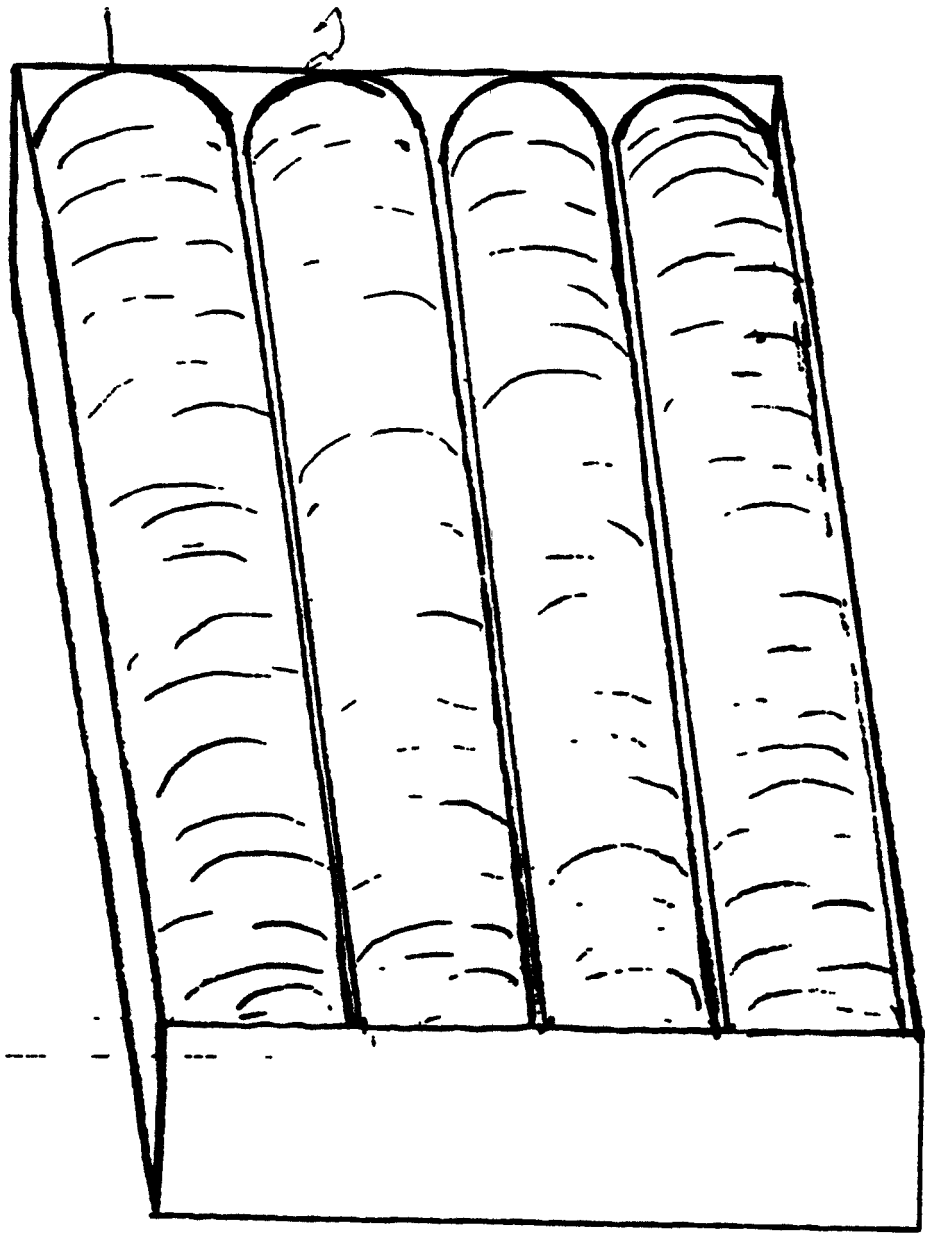
**COMMENTS**

1 Box Samples Core

RADIOLOGICAL MONITORING Control No. _____

Area or Equipment Drawing Showing Survey Points

CORE SAMPLES



Control No _____

**RADIOLOGICAL MONITORING**
**Contamination Survey**

**RESULTS**

| | Initial | | | Resurvey | | |
|---|---|---|---|---|---|---|
| | CPM Removable (Swipe) | CPM Direct | DPM/100cm2 Removable (Smear) | CPM Removable (Swipe) | CPM Direct | DPM/100cm2 Removable (Smear) |
| | | Lucium 121 / 31 | | | | |
| 1. | | 4250 / 8690 | 3 | | | |
| 2. | | 4250 / 8690 | 0 | | | |
| 3. | | | | | | |
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BLDG. MGR.
H.P.
FILE

Control No. Special

**RADIOLOGICAL MONITORING**
**Contamination Survey**

E. A. English
506940
2-23-90

Taken by: J. Munoz, Jr. Empl[redacted] Reviewed by: _____ Emply# _____

Taken by _____ Emply# _____ Reviewed by: _____ Emply# _____

Taken by: _____ Emply# _____ Reviewed by: _____ Emply# _____

Date: 2-19-90 Building: _____

Time 1300 Room #: _____

Shift: Day

Survey Description: 881 Hillside: South #13, Western Borehole Location, French Drain Collection

**Instrumentation Used**

**SMEAR COUNTERS**

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Eberline | 2. Eberline | 3. Eberline | 4. Eberline | 5 Eberline |
| Model: | 1. SAC - 4 | 2. SAC - 4 | 3. SAC - 4 | 4. SAC - 4 | 5. SAC - 4 |
| Serial #: | 1. 842 | 2. 818 | 3. | 4. | 5. |
| Date Per. CK: | 1. 2-19-90 | 2. 2-19-90 | 3. | 4. | 5. |
| Cal. Due Date: | 1. 4-90 | 2. 10-90 | 3. | 4. | 5. |

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Ludlum | 2. Ludlum | 3. Ludlum | 4. Ludlum | 5. Ludlum |
| Model: | 1. 31 | 2. 31 | 3. 31 | 4. 31 | 5. 31 |
| Serial #: | 1. 61635 | 2. | 3. | 4. | 5. |
| Date Per. CK: | 1. 2-19-90 | 2. | 3. | 4. | 5. |
| Cal. Due Date: | 1. 2-90 | 2. | 3. | 4. | 5. |

**OTHER INSTRUMENTS**

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Ludlum | 2. Ludlum | 3. Ludlum | 4. Ludlum | 5. Ludlum |
| Model: | 1. 12 - 1A | 2. 12 - 1A | 3. 12 - 1A | 4. 12 - 1A | 5 12 - 1A |
| Serial #: | 1. 56071 | 2. | 3. | 4. | 5. |
| Date Calib'd | 1. 2-19-90 | 2. | 3. | 4. | 5. |
| Date Calib'd DUE | 1. 3-90 | 2. | 3. | 4. | 5. |

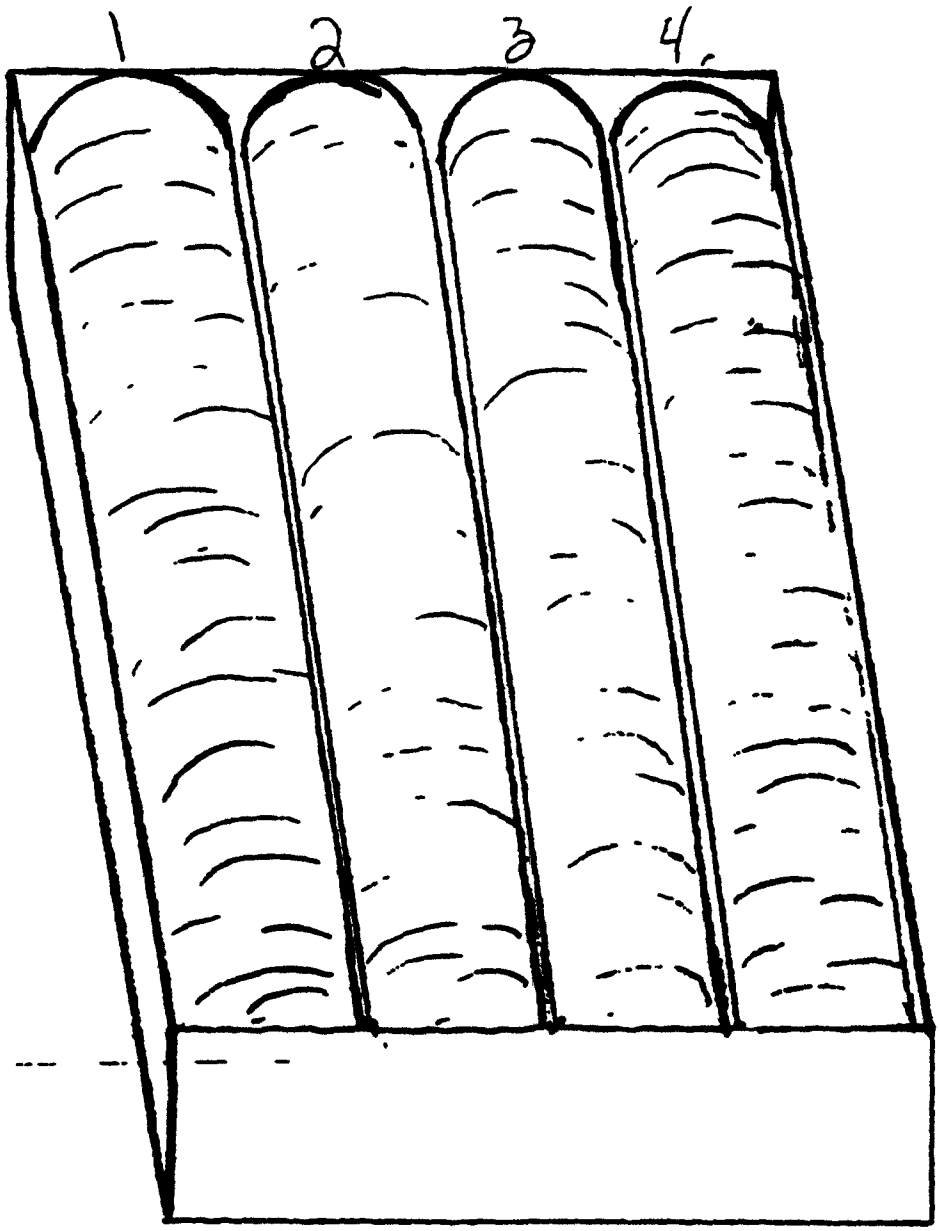
**COMMENTS**

1 1/2 Boxes Core Samples

RADIOLOGICAL MONITORING Control No. _____

Area or Equipment Drawing Showing Survey Points

CORE SAMPLES



Control No _____

**RADIOLOGICAL MONITORING**
**Contamination Survey**

**RESULTS**

| | Initial | | | Resurvey | | |
|---|---|---|---|---|---|---|
| | CPM Removable (Swipe) | CPM Direct Ludlums 12 / 31 | DPM/100cm2 Removable (Smear) | CPM Removable (Swipe) | CPM Direct | DPM/100cm2 Removable (Smear) |
| 1. | | 5250 / 13460 | 0 | | | |
| 2. | | 5250 / 13460 | 0 | | | |
| 3. | | 5250 / 13460 | 3 | | | |
| 4. | | 5250 / 13460 | 0 | | | |
| 5. | | 5250 / 13460 | 0 | | | |
| 6. | | 5250 / 13460 | 3 | | | |
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BLDG. MGR.
H.P.
FILE

Control No Special

**RADIOLOGICAL MONITORING**
**Contamination Survey**

E. A. English
506940
2-23-90

Taken by: J. Muoz Jr Emply# [redacted] Reviewed by: _____ Emply# _____

Taken by: _____ Emply# _____ Reviewed by: _____ Emply# _____

Taken by: _____ Emply# _____ Reviewed by: _____ Emply# _____

Date: 2-22-90 Building: _____

Time: 1300 Room #: _____

Shift: Day

Survey Description: 881 Hills de South #12, Weston borehole location, French drain Collection

**Instrumentation Used**

**SMEAR COUNTERS**

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Eberline | 2. Eberline | 3. Eberline | 4. Eberline | 5. Eberline |
| Model: | 1. SAC - 4 | 2. SAC - 4 | 3. SAC - 4 | 4. SAC - 4 | 5. SAC - 4 |
| Serial #: | 1. 892 | 2. 818 | 3. | 4. | 5. |
| Date Per. CK: | 1. 2-22-90 | 2. 2-22-90 | 3. | 4. | 5. |
| Cal. Due Date: | 1. 4-90 | 2. 10-90 | 3. | 4. | 5. |

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Ludlum | 2. Ludlum | 3. Ludlum | 4. Ludlum | 5. Ludlum |
| Model: | 1. 31 | 2. 31 | 3. 31 | 4. 31 | 5. 31 |
| Serial #: | 1. 61630 | 2. | 3. | 4. | 5. |
| Date Per. CK: | 1. 2-22-90 | 2. | 3. | 4. | 5. |
| Cal. Due Date: | 1. 8-90 | 2. | 3. | 4. | 5. |

**OTHER INSTRUMENTS**

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Ludlum | 2. Ludlum | 3. Ludlum | 4. Ludlum | 5. Ludlum |
| Model: | 1. 12 - 1A | 2. 12 - 1A | 3. 12 - 1A | 4. 12 - 1A | 5 12 - 1A |
| Serial #: | 1. 56071 | 2. | 3. | 4. | 5. |
| Date Calib'd | 1. 2-22-90 | 2. | 3. | 4. | 5. |
| Date Calib'd DUE | 1. 3-90 | 2. | 3. | 4. | 5 |

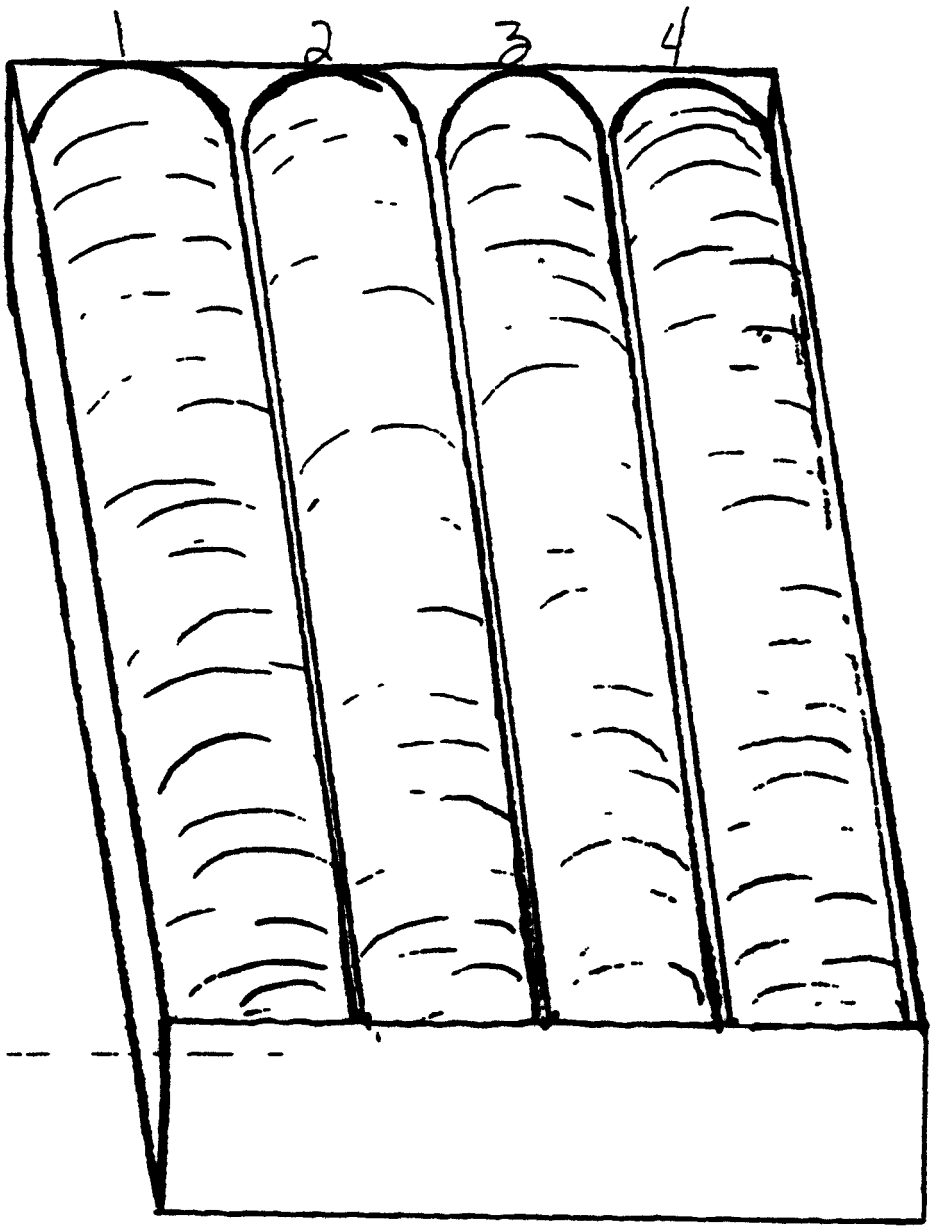
**COMMENTS**

1½ boxes Core Samples

RADIOLOGICAL MONITORING Control No. _____

Area or Equipment Drawing Showing Survey Points

CORE SAMPLES



Control No _____

**RADIOLOGICAL MONITORING**
**Contamination Survey**

**RESULTS**

| | Initial | | | | Resurvey | | |
|---|---|---|---|---|---|---|---|
| | CPM Removable (Swipe) | CPM Direct | DPM/100cm2 Removable (Smear) | | CPM Removable (Swipe) | CPM Direct | DPM/100cm2 Removable (Smear) |
| | | Ludlums 12-1 / 3 | | | | | |
| 1. | | S250 / B460 | 0 | 1. | | | |
| 2. | | S250 / B460 | 3 | 2. | | | |
| 3. | | S250 / B460 | 0 | 3. | | | |
| 4. | | S250 / B460 | 0 | 4. | | | |
| 5. | | S250 / B460 | 3 | 5. | | | |
| 6. | | S250 / B460 | 3 | 6 | | | |
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| 45. | | | | 45 | | | |

BLDG. MGR.
H.P.
FILE

Control No. Special

**RADIOLOGICAL MONITORING**
**Contamination Survey**

E. A. English
506940
3-11-90

Taken by: J Munoz Jr Empl[redacted] Reviewed by: _____ Emply# _____

Taken by. _____ Emply# _____ Reviewed by: _____ Emply# _____

Taken by: _____ Emply# _____ Reviewed by: _____ Emply# _____

Date: 2-26-90 Building: _____

Time 1300 Room #: _____

Shift: Day

Survey Description: 881 Hillside South #9, Weston borehole location, French drain collection

**Instrumentation Used**

**SMEAR COUNTERS**

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Eberline | 2. Eberline | 3. Eberline | 4. Eberline | 5. Eberline |
| Model: | 1. SAC - 4 | 2. SAC - 4 | 3. SAC - 4 | 4. SAC - 4 | 5. SAC - 4 |
| Serial #: | 1. 892 | 2. 818 | 3. | 4. | 5. |
| Date Per. CK: | 1. 2-26-90 | 2. 2-26-90 | 3. | 4. | 5. |
| Cal. Due Date: | 1. 4-90 | 2. 10-90 | 3. | 4. | 5. |

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Ludlum | 2. Ludlum | 3. Ludlum | 4. Ludlum | 5 Ludlum |
| Model: | 1. 31 | 2. 31 | 3. 31 | 4. 31 | 5. 31 |
| Serial #: | 1. 61630 | 2. | 3. | 4. | 5. |
| Date Per. CK: | 1. 2-26-90 | 2. | 3. | 4. | 5. |
| Cal. Due Date: | 1. 8-90 | 2. | 3. | 4. | 5. |

**OTHER INSTRUMENTS**

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Ludlum | 2. Ludlum | 3. Ludlum | 4. Ludlum | 5. Ludlum |
| Model: | 1. 12 - 1A | 2. 12 - 1A | 3. 12 - 1A | 4. 12 - 1A | 5. 12 - 1A |
| Serial #: | 1. 56071 | 2. | 3. | 4. | 5. |
| Date Calib'd | 1. 2-26-90 | 2. | 3. | 4. | 5. |
| Date Calib'dUE | 1. 3-90 | 2. | 3. | 4. | 5 |

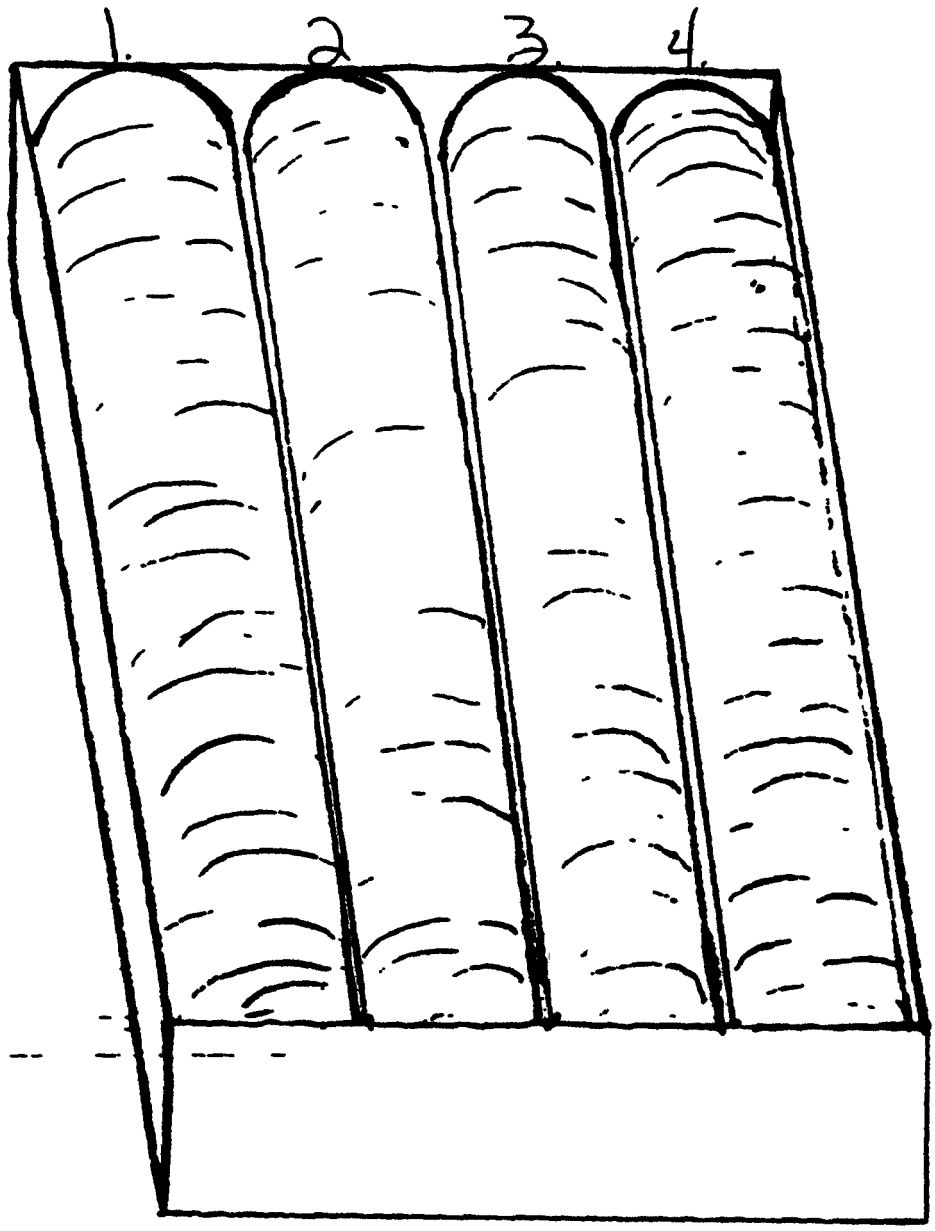
**COMMENTS**

1 Box Core Samples

**RADIOLOGICAL MONITORING** Control No. _____

Area or Equipment Drawing Showing Survey Points

CORE SAMPLES



Control No _____

**RADIOLOGICAL MONITORING**
**Contamination Survey**

**RESULTS**

| | Initial CPM Removable (Swipe) | Initial CPM Direct (counts 12-1 / 3) | Initial DPM/100cm2 Removable (Smear) | Resurvey CPM Removable (Swipe) | Resurvey CPM Direct | Resurvey DPM/100cm2 Removable (Smear) |
|---|---|---|---|---|---|---|
| 1. | | 4250 / 13460 | 3 | | | |
| 2. | | 4350 / 13460 | 3 | | | |
| 3. | | 4250 / 13460 | 0 | | | |
| 4. | | 4250 / 13460 | 0 | | | |
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BLDG. MGR.
H.P.
FILE

Control No Special

**RADIOLOGICAL MONITORING**
**Contamination Survey**

E. A. English
506940
3-14-90

Taken by J Munoz, Jr Emply# [redacted] Reviewed by: _____ Emply# _____

Taken by _____ Emply# _____ Reviewed by: _____ Emply# _____

Taken by: _____ Emply# _____ Reviewed by: _____ Emply# _____

Date: 2-26-90 Building: _____

Time: 1320 Room #: _____

Shift: Day

Survey Description: SSH Hillside South #10, Weston Borehole location, French drain collection

**Instrumentation Used**

**SHEAR COUNTERS**

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Eberline | 2. Eberline | 3. Eberline | 4. Eberline | 5. Eberline |
| Model: | 1. SAC - 4 | 2. SAC - 4 | 3. SAC - 4 | 4. SAC - 4 | 5. SAC - 4 |
| Serial #: | 1. 943 | 2. 818 | 3. | 4. | 5. |
| Date Per. CK: | 1. 2-26-90 | 2. 2-26-90 | 3. | 4. | 5. |
| Cal. Due Date: | 1. 4-90 | 2. 10-90 | 3. | 4. | 5. |

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Ludlum | 2. Ludlum | 3. Ludlum | 4. Ludlum | 5 Ludlum |
| Model: | 1. 31 | 2. 31 | 3. 31 | 4. 31 | 5. 31 |
| Serial #: | 1. 61630 | 2. | 3. | 4. | 5. |
| Date Per. CK: | 1. 2-26-90 | 2. | 3. | 4. | 5. |
| Cal. Due Date: | 1. 2-8-90 | 2. | 3. | 4. | 5. |

**OTHER INSTRUMENTS**

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Ludlum | 2. Ludlum | 3. Ludlum | 4. Ludlum | 5. Ludlum |
| Model: | 1. 12 - 1A | 2. 12 - 1A | 3. 12 - 1A | 4. 12 - 1A | 5. 12 - 1A |
| Serial #: | 1. 5697 | 2. | 3. | 4. | 5. |
| Date Calib'd | 1. 2-26-90 | 2. | 3. | 4. | 5. |
| Date Calib'd DUE | 1. 3-90 | 2. | 3. | 4. | 5 |

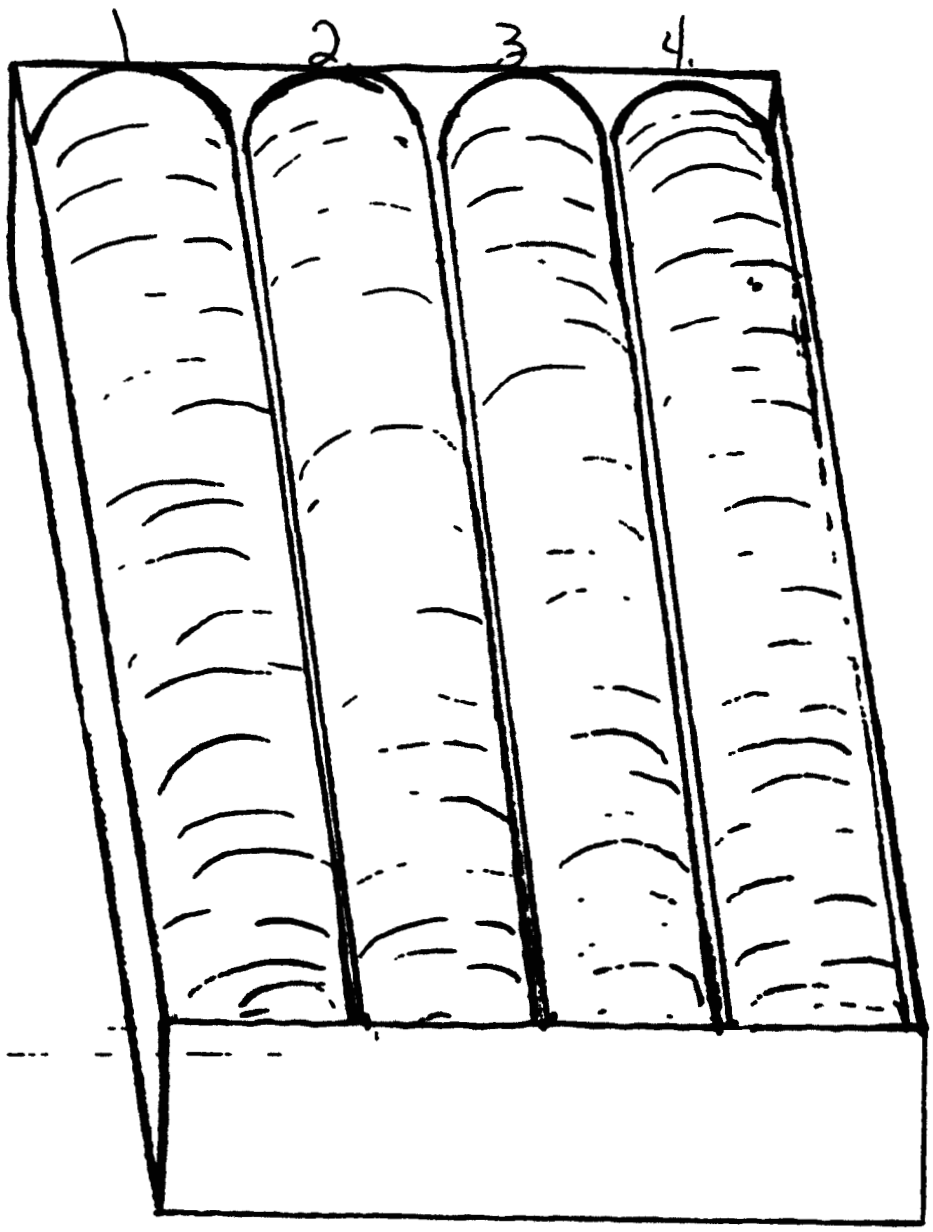
**COMMENTS**

1 Box Core Samples

**RADIOLOGICAL MONITORING** Control No _____

Area or Equipment Drawing Showing Survey Points

CORE SAMPLES



Control No _____

**RADIOLOGICAL MONITORING**
**Contamination Survey**

**RESULTS**

| | Initial CPM Removable (Swipe) | Initial CPM Direct Ludlums 12-1 | Initial CPM Direct Ludlums 31 | Initial DPM/100cm2 Removable (Smear) | Resurvey CPM Removable (Swipe) | Resurvey CPM Direct | Resurvey DPM/100cm2 Removable (Smear) |
|---|---|---|---|---|---|---|---|
| 1. | | 4250 | 3160 | 0 | | | |
| 2. | | 4250 | 3160 | 3 | | | |
| 3. | | 4250 | 3160 | 3 | | | |
| 4. | | 4250 | 3160 | 3 | | | |
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BLDG. MGR.
H.P.
FILE

Control No. Special

**RADIOLOGICAL MONITORING**
**Contamination Survey**

E. A. English
506940
3-11-94

Taken by: J. Muñoz, J. Emp[redacted] Reviewed by: _____ Emply# _____

Taken by: _____ Emply# _____ Reviewed by: _____ Emply# _____

Taken by: _____ Emply# _____ Reviewed by: _____ Emply# _____

Date: 2-26-90 Building: _____

Time 1300 Room #: _____

Shift: Day

Survey Description: 881 Hillside South #11, Weston borehole location, French drain collection

**Instrumentation Used**

**SMEAR COUNTERS**

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Eberline | 2. Eberline | 3. Eberline | 4. Eberline | 5. Eberline |
| Model: | 1. SAC - 4 | 2. SAC - 4 | 3. SAC - 4 | 4. SAC - 4 | 5. SAC - 4 |
| Serial #: | 1. 592 | 2. 515 | 3. | 4. | 5. |
| Date Per. CK: | 1. 2-26-90 | 2. 2-26-90 | 3. | 4. | 5. |
| Cal. Due Date: | 1. 4-90 | 2. 10-90 | 3. | 4. | 5. |

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Ludlum | 2. Ludlum | 3. Ludlum | 4. Ludlum | 5. Ludlum |
| Model: | 1. 31 | 2. 31 | 3. 31 | 4. 31 | 5. 31 |
| Serial #: | 1. 61630 | 2. | 3. | 4. | 5. |
| Date Per. CK: | 1. 2-26-90 | 2. | 3. | 4. | 5. |
| Cal. Due Date: | 1. 8-90 | 2. | 3. | 4. | 5 |

**OTHER INSTRUMENTS**

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Ludlum | 2. Ludlum | 3. Ludlum | 4. Ludlum | 5. Ludlum |
| Model: | 1. 12 - 1A | 2. 12 - 1A | 3. 12 - 1A | 4. 12 - 1A | 5. 12 - 1A |
| Serial #: | 1. 56071 | 2. | 3. | 4. | 5. |
| Date Calib'd | 1. 2-26-90 | 2. | 3. | 4. | 5. |
| Date Calib'd DUE | 1. 3-90 | 2. | 3. | 4. | 5 |

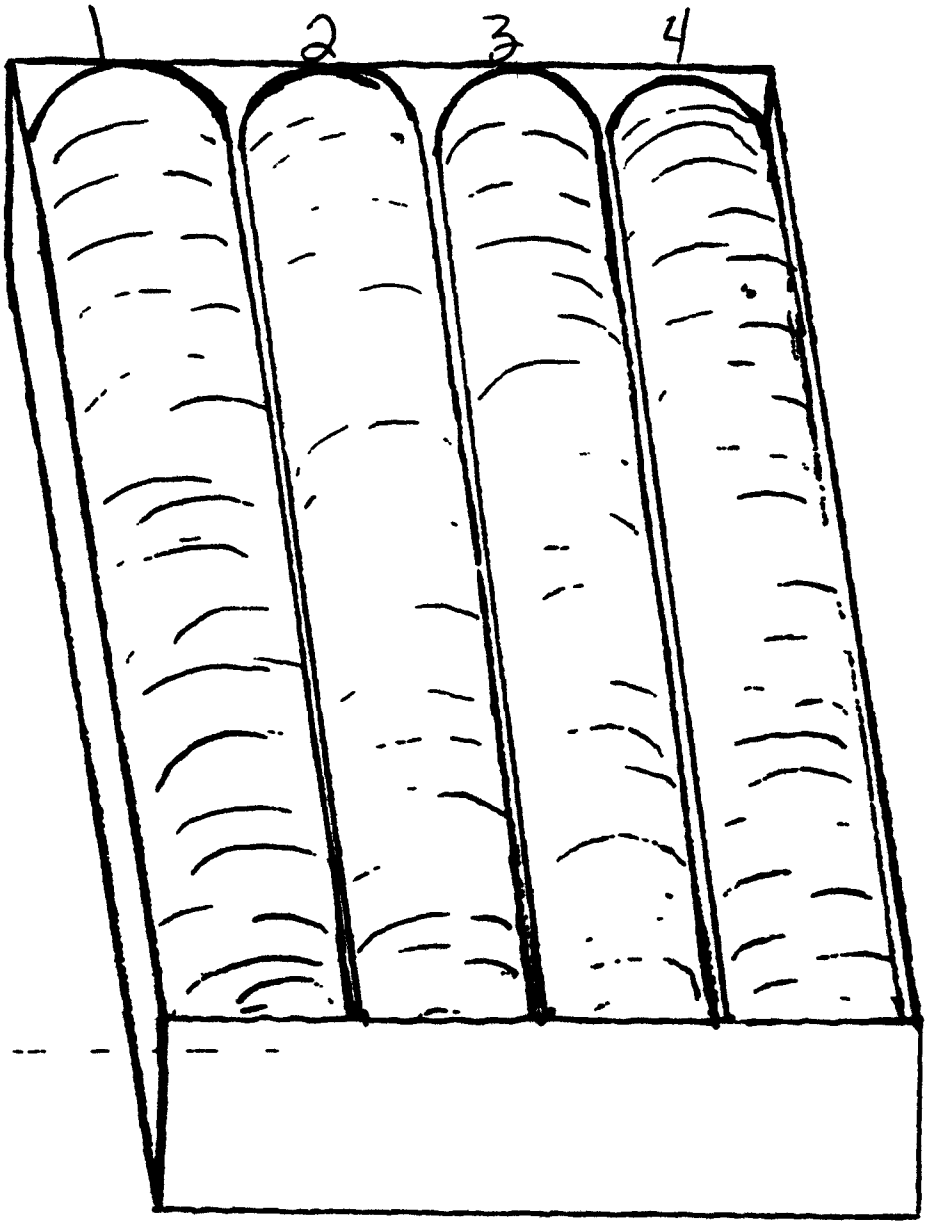
**COMMENTS**

1½ Boxes Core Samples

RADIOLOGICAL MONITORING Control No. _____

Area or Equipment Drawing Showing Survey Points

CORE SAMPLES



Control No _____

**RADIOLOGICAL MONITORING**
**Contamination Survey**

**RESULTS**

| | Initial CPM Removable (Swipe) | Initial CPM Direct Ludlums 1,2,4 | Initial CPM Direct Ludlums 3 | Initial DPM/100cm2 Removable (Smear) | Resurvey CPM Removable (Swipe) | Resurvey CPM Direct | Resurvey DPM/100cm2 Removable (Smear) |
|---|---|---|---|---|---|---|---|
| 1. | | 4250 | 3460 | 0 | | | |
| 2. | | 4250 | 3460 | 3 | | | |
| 3 | | 4250 | 3460 | 3 | | | |
| 4. | | 4250 | 3460 | 3 | | | |
| 5. | | 4250 | 3460 | 0 | | | |
| 6. | | 4250 | 3460 | 6 | | | |
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Control No SPECIAL

**RADIOLOGICAL MONITORING**
**Contamination Survey**

E. A. English
506940
3-11-90

Taken by: J Munoz, Jr Empl [redacted] Reviewed by: _____ Emply# _____

Taken by: _____ Emply# _____ Reviewed by: _____ Emply# _____

Taken by: _____ Emply# _____ Reviewed by: _____ Emply# _____

Date: 3-5-90 Building: _____

Time 1300 Room #: _____

Shift: Day

Survey Description: 951 Hillside South #14, Weston borehole location French drain collection

**Instrumentation Used**

**SMEAR COUNTERS**

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Eberline | 2. Eberline | 3. Eberline | 4. Eberline | 5. Eberline |
| Model. | 1. SAC - 4 | 2. SAC - 4 | 3. SAC - 4 | 4. SAC - 4 | 5. SAC - 4 |
| Serial #: | 1. 842 | 2. 816 | 3. | 4. | 5. |
| Date Per. CK: | 1. 3-5-90 | 2. 3-5-90 | 3. | 4. | 5. |
| Cal. Due Date: | 1. 4-90 | 2. 6-90 | 3. | 4. | 5. |

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Ludlum | 2. Ludlum | 3. Ludlum | 4. Ludlum | 5. Ludlum |
| Model: | 1. 31 | 2. 31 | 3. 31 | 4. 31 | 5. 31 |
| Serial #: | 1. 61630 | 2. | 3. | 4. | 5. |
| Date Per. CK: | 1. 3-5-90 | 2. | 3. | 4. | 5. |
| Cal. Due Date: | 1. 2-8-90 | 2. | 3. | 4. | 5. |

**OTHER INSTRUMENTS**

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Ludlum | 2. Ludlum | 3. Ludlum | 4. Ludlum | 5. Ludlum |
| Model: | 1. 12 - 1A | 2. 12 - 1A | 3. 12 - 1A | 4. 12 - 1A | 5 12 - 1A |
| Serial #: | 1. 56071 | 2. | 3. | 4. | 5. |
| Date Calib'd: | 1. 3-5-90 | 2. | 3. | 4. | 5. |
| Date Calib'due | 1. 3-90 | 2. | 3. | 4. | 5 |

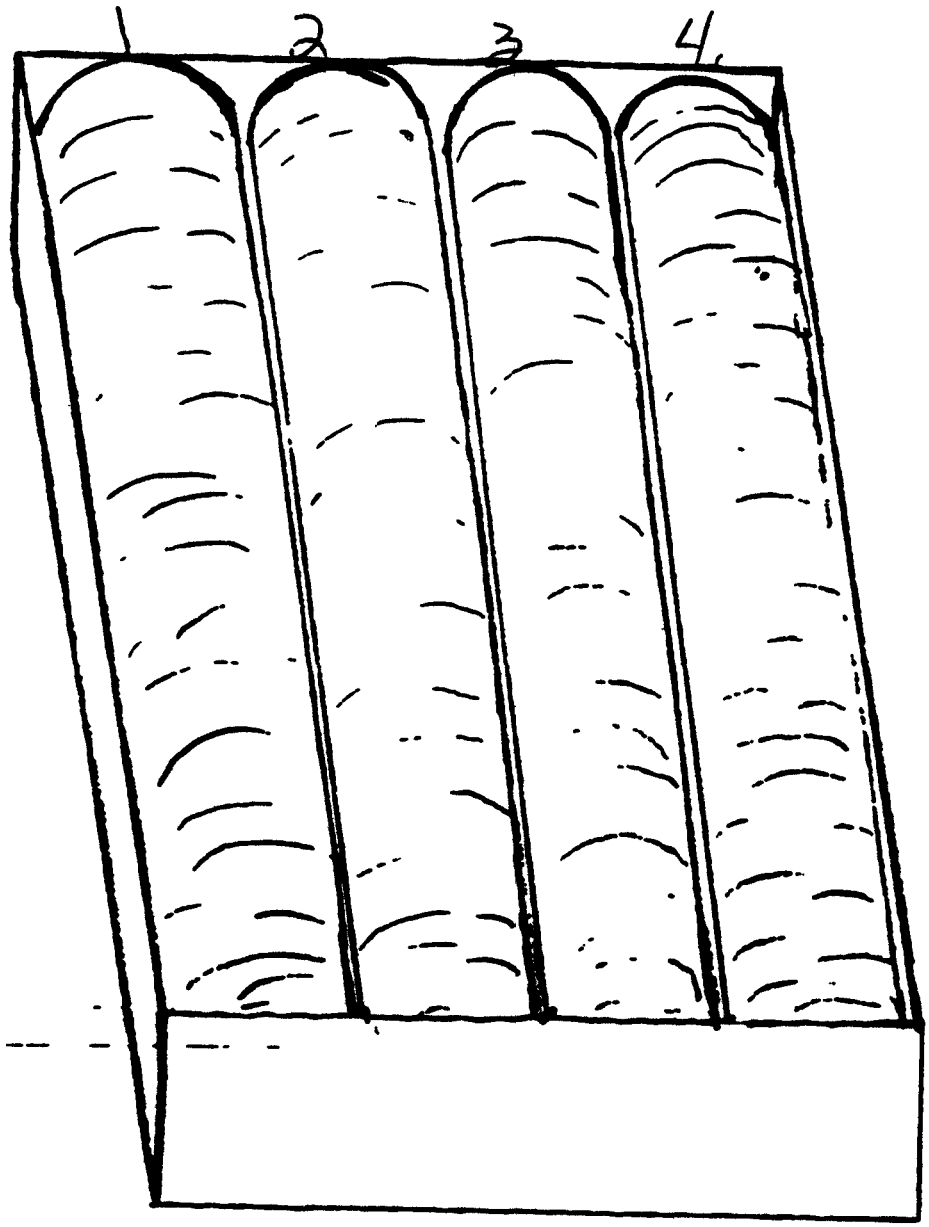
**COMMENTS**

1½ Boxes Core Samples

RADIOLOGICAL MONITORING Control No _____

Area or Equipment Drawing Showing Survey Points

CORE SAMPLES



Control No _____

**RADIOLOGICAL MONITORING**
**Contamination Survey**

**RESULTS**

| | Initial CPM Removable (Swipe) | Initial CPM Direct Ludlums 12-1/31 | Initial DPM/100cm2 Removable (Smear) | Resurvey CPM Removable (Swipe) | Resurvey CPM Direct | Resurvey DPM/100cm2 Removable (Smear) |
|---|---|---|---|---|---|---|
| 1. | | <250/BKGD | 0 | | | |
| 2. | | <250/BKGD | 0 | | | |
| 3. | | <250/BKGD | 3 | | | |
| 4. | | <250/BKGD | 3 | | | |
| 5. | | <250/BKGD | 0 | | | |
| 6. | | <250/BKGD | 0 | | | |
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BLDG. MGR.
H.P.
FILE

Control No Special

**RADIOLOGICAL MONITORING**
**Contamination Survey**

E. A. English
506940
3-11-90

Taken by: J Munoz, J. Emply [redacted] Reviewed by: _____ Emply# _____

Taken by: _____ Emply [redacted] Reviewed by: _____ Emply# _____

Taken by: _____ Emply# _____ Reviewed by: _____ Emply# _____

Date: 3-5-90 Building: _____

Time 1300 Room #: _____

Shift: Day

Survey Description: S.S. Hillside South #15, Weston borehole location, French drain collection

**Instrumentation Used**

**SMEAR COUNTERS**

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Eberline | 2. Eberline | 3. Eberline | 4. Eberline | 5. Eberline |
| Model: | 1. SAC - 4 | 2. SAC - 4 | 3. SAC - 4 | 4. SAC - 4 | 5. SAC - 4 |
| Serial #: | 1. 892 | 2. 818 | 3. | 4. | 5. |
| Date Per. CK: | 1. 3-5-90 | 2. 3-5-90 | 3. | 4. | 5. |
| Cal. Due Date: | 1. 4-90 | 2. 10-90 | 3. | 4. | 5. |

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Ludlum | 2. Ludlum | 3. Ludlum | 4. Ludlum | 5. Ludlum |
| Model: | 1. 31 | 2. 31 | 3. 31 | 4. 31 | 5. 31 |
| Serial #: | 1. 6630 | 2. | 3. | 4. | 5. |
| Date Per. CK: | 1. 3-5-90 | 2. | 3. | 4. | 5. |
| Cal. Due Date: | 1. 8-90 | 2. | 3. | 4. | 5. |

**OTHER INSTRUMENTS**

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Ludlum | 2. Ludlum | 3. Ludlum | 4. Ludlum | 5 Ludlum |
| Model: | 1. 12 - 1A | 2. 12 - 1A | 3. 12 - 1A | 4. 12 - 1A | 5 12 - 1A |
| Serial #: | 1. 56071 | 2. | 3. | 4. | 5. |
| Date Calib'd | 1. 3-5-90 | 2. | 3. | 4. | 5. |
| Date Calib'd DUE | 1. 3-90 | 2. | 3. | 4. | 5 |

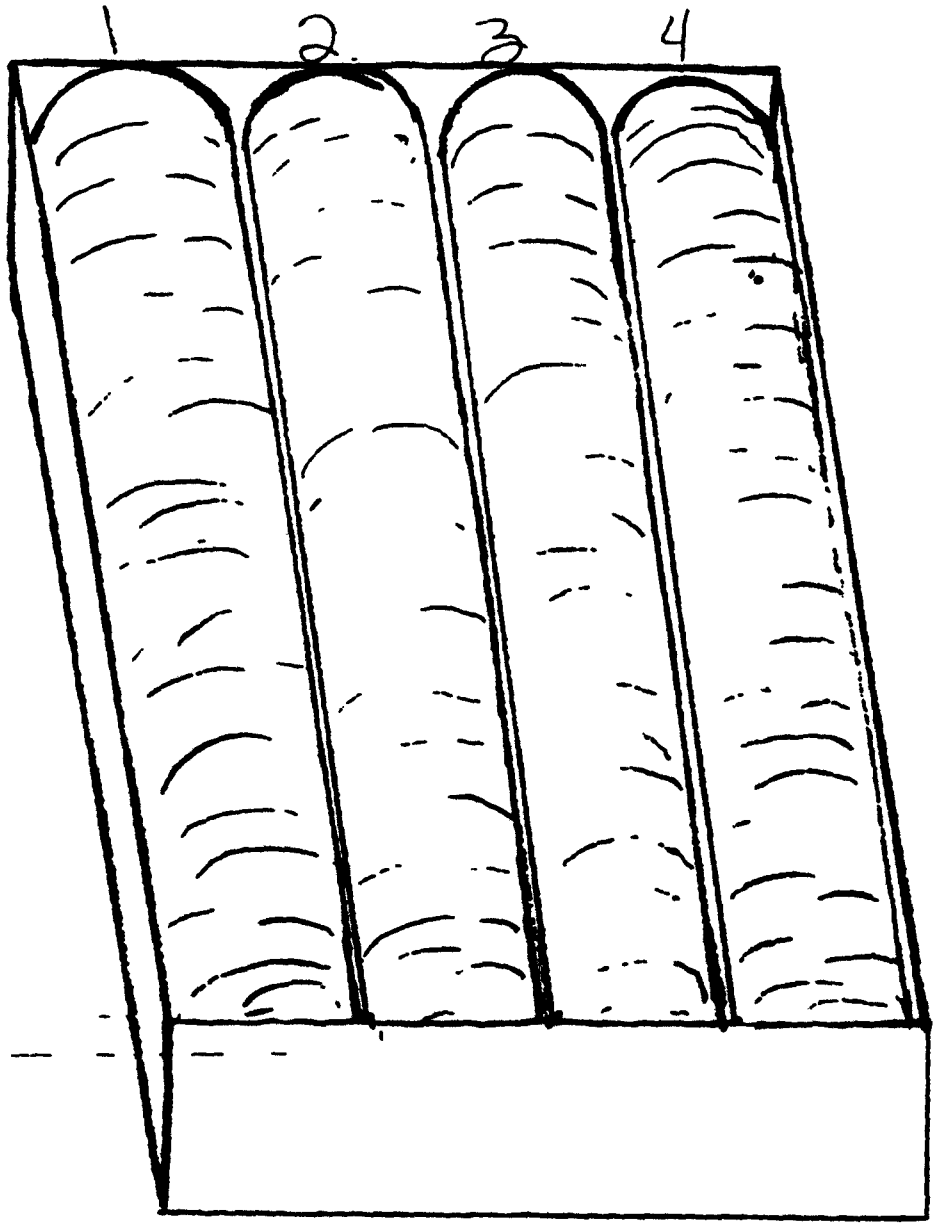
**COMMENTS**

1½ Boxes Core Samples

**RADIOLOGICAL MONITORING** Control No. _____

Area or Equipment Drawing Showing Survey Points

CORE SAMPLES



Control No _____

**RADIOLOGICAL MONITORING**
**Contamination Survey**

**RESULTS**

| | Initial CPM Removable (Swipe) | Initial CPM Direct LOCIONS 12-1 | Initial CPM Direct LOCIONS 31 | Initial DPM/100cm2 Removable (Smear) | Resurvey CPM Removable (Swipe) | Resurvey CPM Direct | Resurvey DPM/100cm2 Removable (Smear) |
|---|---|---|---|---|---|---|---|
| 1. | | 5250 | 3460 | 0 | | | |
| 2. | | 5250 | 3460 | 0 | | | |
| 3 | | 5250 | 3460 | 3 | | | |
| 4. | | 5250 | 3460 | 3 | | | |
| 5. | | 5250 | 3460 | 0 | | | |
| 6. | | 5250 | 3460 | 0 | | | |
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| | CPM Removable (Swipe) | Resurvey CPM Direct | Resurvey DPM/100cm2 Removable (Smear) |
|---|---|---|---|
| 1. | | | |
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BLDG. MGR.
H.P.
FILE

Control No. SPECIAL

**RADIOLOGICAL MONITORING**
**Contamination Survey**

E.A. English
506940
3-25-90

Taken by: J Munoz, Jr Empl[redacted] Reviewed by: _____ Emply# _____

Taken by. _____ Emply# _____ Reviewed by: _____ Emply# _____

Taken by: _____ Emply# _____ Reviewed by: _____ Emply# _____

Date: 3-20-90 Building: _____

Time. 1300 Room #: _____

Shift: Day

Survey Description: #6 Hole: Weston borehole, French Drain Collection 881 Hillside, South

**Instrumentation Used**

**SMEAR COUNTERS**

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Eberline | 2. Eberline | 3. Eberline | 4. Eberline | 5. Eberline |
| Model: | 1. SAC - 4 | 2. SAC - 4 | 3. SAC - 4 | 4. SAC - 4 | 5. SAC - 4 |
| Serial #: | 1. 890 | 2. 818 | 3. | 4. | 5. |
| Date Per. CK: | 1. 3-20-90 | 2. 3-20-90 | 3. | 4. | 5. |
| Cal. Due Date: | 1. 4-90 | 2. 10-90 | 3. | 4. | 5. |

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Ludlum | 2. Ludlum | 3. Ludlum | 4. Ludlum | 5. Ludlum |
| Model: | 1. 31 | 2. 31 | 3. 31 | 4. 31 | 5. 31 |
| Serial #: | 1. 61030 | 2. | 3. | 4. | 5. |
| Date Per. CK: | 1. 3-20-90 | 2. | 3. | 4. | 5. |
| Cal. Due Date: | 1. 6-90 | 2. | 3. | 4. | 5. |

**OTHER INSTRUMENTS**

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Ludlum | 2. Ludlum | 3. Ludlum | 4. Ludlum | 5. Ludlum |
| Model: | 1. 12 - 1A | 2. 12 - 1A | 3. 12 - 1A | 4. 12 - 1A | 5. 12 - 1A |
| Serial #: | 1. 50069 | 2. | 3. | 4. | 5. |
| Date Calib'd | 1. 3-20-90 | 2. | 3. | 4. | 5. |
| Date Calib'd DUE | 1. 2-91 | 2. | 3. | 4. | 5 |

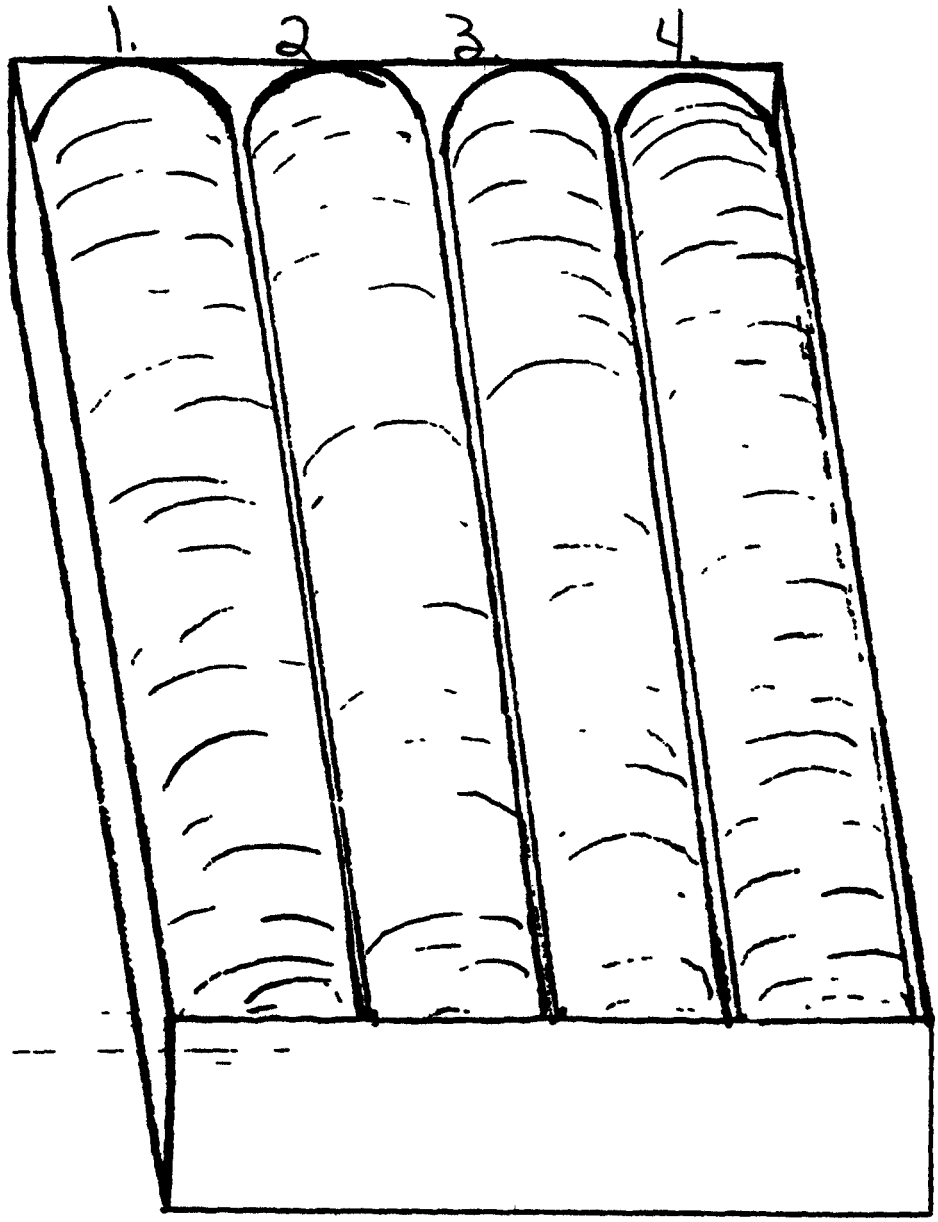
**COMMENTS**

1 Box Core Samples

**RADIOLOGICAL MONITORING** Control No. _____

Area or Equipment Drawing Showing Survey Points

CORE SAMPLES



Control No _____

**RADIOLOGICAL MONITORING**
**Contamination Survey**

**RESULTS**

| | Initial CPM Removable (Swipe) | Initial CPM Direct Ludlum 12-1 | Initial CPM Direct Ludlum 31 | Initial DPM/100cm2 Removable (Smear) | Resurvey CPM Removable (Swipe) | Resurvey CPM Direct | Resurvey DPM/100cm2 Removable (Smear) |
|---|---|---|---|---|---|---|---|
| 1. | | <250 | B/60 | 3 | | | |
| 2. | | <250 | [illegible] | 0 | | | |
| 3. | | <250 | [illegible] | 3 | | | |
| 4. | | <250 | B/60 | 0 | | | |
| 5. | | | | | | | |
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BLDG. MGR.
H.P.
FILE

Control No. Special

**RADIOLOGICAL MONITORING**
**Contamination Survey**

E. A. English
506940
3-25-90

Taken by: J Munoz, Jr Empl [redacted] Reviewed by: _____ Emply# _____

Taken by: _____ Emply# _____ Reviewed by: _____ Emply# _____

Taken by: _____ Emply# _____ Reviewed by: _____ Emply# _____

Date: 3-20-90 Building: _____

Time: 1300 Room #: _____

Shift: Day

Survey Description: #7 Hole: Weston borehole, French Drain Collection 881 Hillside, South

**Instrumentation Used**

**SMEAR COUNTERS**

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Eberline | 2. Eberline | 3. Eberline | 4. Eberline | 5 Eberline |
| Model: | 1. SAC - 4 | 2. SAC - 4 | 3. SAC - 4 | 4. SAC - 4 | 5. SAC - 4 |
| Serial #: | 1. 892 | 2. 818 | 3. | 4. | 5. |
| Date Per. CK: | 1. 3-20-90 | 2. 3-20-90 | 3. | 4. | 5. |
| Cal. Due Date: | 1. 9-90 | 2. 10-90 | 3. | 4. | 5. |

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Ludlum | 2. Ludlum | 3. Ludlum | 4. Ludlum | 5. Ludlum |
| Model: | 1. 31 | 2. 31 | 3. 31 | 4. 31 | 5. 31 |
| Serial #: | 1. 6630 | 2. | 3. | 4. | 5. |
| Date Per. CK: | 1. 3-20-90 | 2. | 3. | 4. | 5. |
| Cal. Due Date: | 1. 8-90 | 2. | 3. | 4. | 5. |

**OTHER INSTRUMENTS**

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Ludlum | 2. Ludlum | 3. Ludlum | 4. Ludlum | 5. Ludlum |
| Model: | 1. 12 - 1A | 2. 12 - 1A | 3. 12 - 1A | 4. 12 - 1A | 5. 12 - 1A |
| Serial #: | 1. 56069 | 2. | 3. | 4. | 5. |
| Date Calib'd | 1. 3-20-90 | 2. | 3. | 4. | 5. |
| Date Calib'due | 1. 3-91 | 2. | 3. | 4. | 5. |

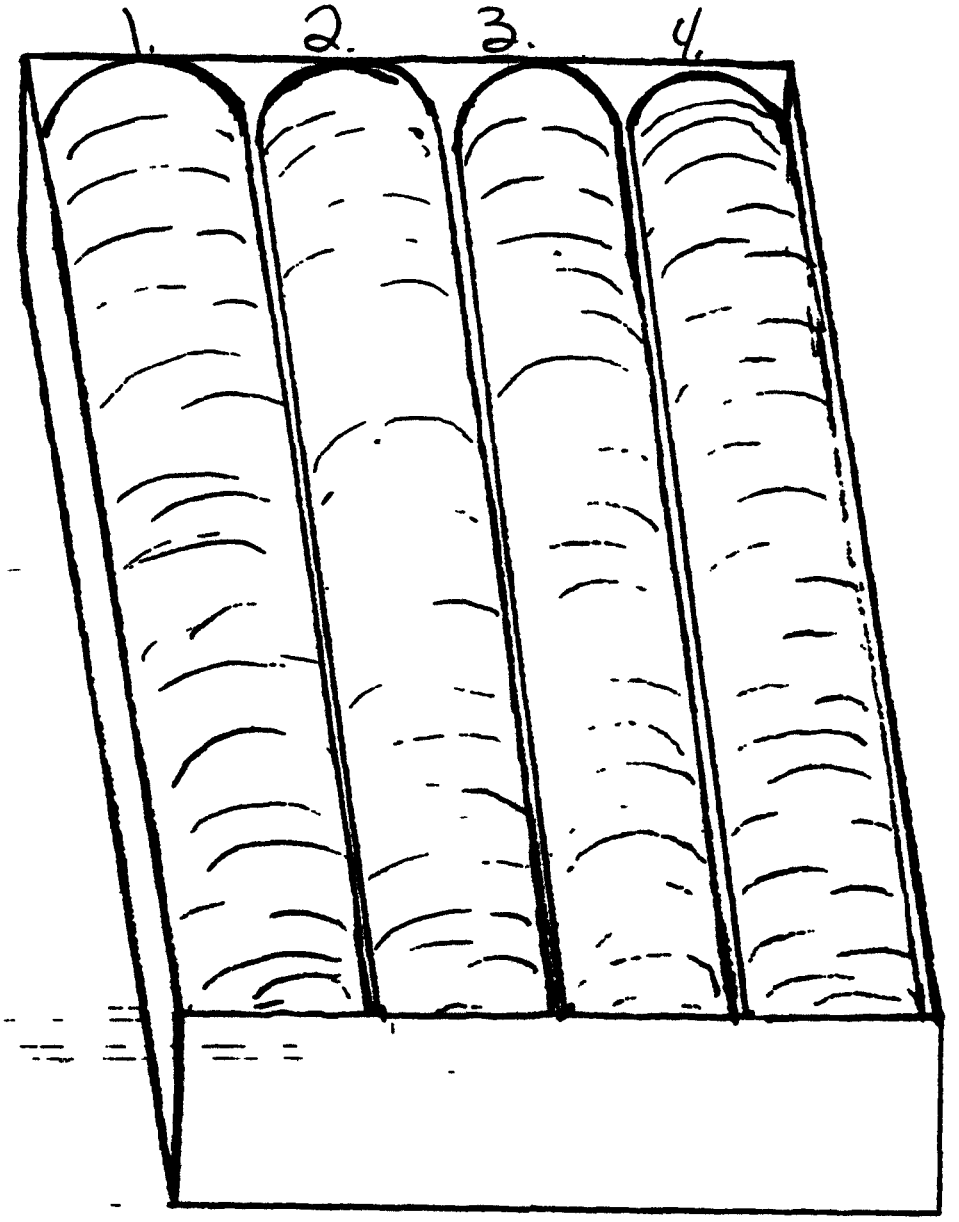
**COMMENTS**

1 Box Cores Samples

**RADIOLOGICAL MONITORING** Control No. _____

Area or Equipment Drawing Showing Survey Points

CORE SAMPLES



Control No _____

**RADIOLOGICAL MONITORING**
**Contamination Survey**

**RESULTS**

| | Initial | | | Resurvey | | |
|---|---|---|---|---|---|---|
| | CPM Removable (Swipe) | CPM Direct Ludlum 12-1 31 | DPM/100cm2 Removable (Smear) | CPM Removable (Swipe) | CPM Direct | DPM/100cm2 Removable (Smear) |
| 1. | | <250 BKG0 | 0 | | | |
| 2. | | <250 BKG0 | 0 | | | |
| 3. | | <250 BKG0 | 0 | | | |
| 4. | | <250 BKG0 | 3 | | | |
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BLDG. MGR.
H.P.
FILE

Control No. Special

**RADIOLOGICAL MONITORING**
**Contamination Survey**

E.A. English 506940 3-25-90

Taken by: J Muñoz, Jr Emply# [redacted] Reviewed by: _____ Emply# _____

Taken by: _____ Emply# _____ Reviewed by: _____ Emply# _____

Taken by: _____ Emply# _____ Reviewed by: _____ Emply# _____

Date: 3-20-90 Building: _____

Time: 1300 Room #: _____

Shift: Day

Survey Description: #8 Hole: Weston borehole, French Drain Collection 881 Hillside; South

**Instrumentation Used**

**SMEAR COUNTERS**

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Eberline | 2. Eberline | 3. Eberline | 4. Eberline | 5. Eberline |
| Model: | 1. SAC - 4 | 2. SAC - 4 | 3. SAC - 4 | 4. SAC - 4 | 5. SAC - 4 |
| Serial #: | 1. 892 | 2. 818 | 3. | 4. | 5. |
| Date Per. CK: | 1. 3-20-90 | 2. 3-20-90 | 3. | 4. | 5. |
| Cal. Due Date: | 1. 4-90 | 2. 10-90 | 3. | 4. | 5. |

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Ludlum | 2. Ludlum | 3. Ludlum | 4. Ludlum | 5. Ludlum |
| Model: | 1. 31 | 2. 31 | 3. 31 | 4. 31 | 5. 31 |
| Serial #: | 1. 61630 | 2. | 3. | 4. | 5. |
| Date Per. CK: | 1. 3-20-90 | 2. | 3. | 4. | 5. |
| Cal. Due Date: | 1. 8-90 | 2. | 3. | 4. | 5 |

**OTHER INSTRUMENTS**

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Ludlum | 2. Ludlum | 3. Ludlum | 4. Ludlum | 5. Ludlum |
| Model: | 1. 12 - 1A | 2. 12 - 1A | 3. 12 - 1A | 4. 12 - 1A | 5. 12 - 1A |
| Serial #: | 1. 55069 | 2. | 3. | 4. | 5. |
| Date Calib'd | 1. 3-20-90 | 2. | 3. | 4. | 5. |
| Date Calib'd DUE | 1. 2-91 | 2. | 3. | 4. | 5 |

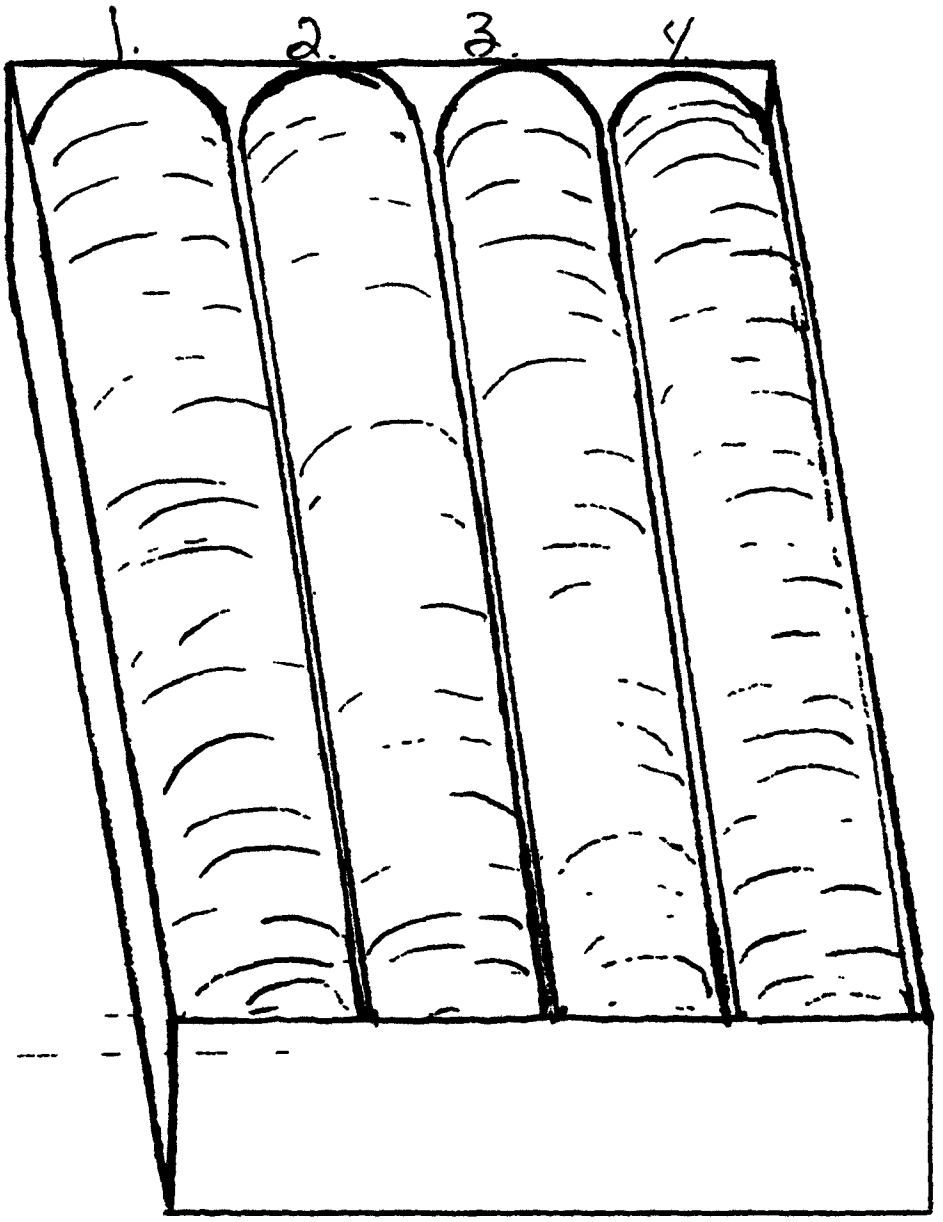
**COMMENTS**

1 Box Core Samples

**RADIOLOGICAL MONITORING** Control No. _____

Area or Equipment Drawing Showing Survey Points

CORE SAMPLES



Control No _____

**RADIOLOGICAL MONITORING**
**Contamination Survey**

**RESULTS**

| | Initial | | | Resurvey | | |
|---|---|---|---|---|---|---|
| | CPM Removable (Swipe) | CPM Direct Ludlum 12-1 / 31 | DPM/100cm2 Removable (Smear) | CPM Removable (Swipe) | CPM Direct | DPM/100cm2 Removable (Smear) |
| 1. | | 5250 / BK60 | 0 | | | |
| 2. | | 5250 / BK60 | 0 | | | |
| 3. | | 5250 / BK60 | 0 | | | |
| 4. | | 5250 / BK60 | 0 | | | |
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BLDG. MGR.
H.P.
FILE

Control No. SPECIAL

**RADIOLOGICAL MONITORING**
**Contamination Survey**

E.A. English
506940
3-25-90

Taken by: J Munoz, Jr. Emply# [redacted] Reviewed by: _____ Emply# _____

Taken by: _____ Emply# _____ Reviewed by: _____ Emply# _____

Taken by: _____ Emply# _____ Reviewed by: _____ Emply# _____

Date: 3-20-90 Building: _____

Time: 1300 Room #: _____

Shift: Day

Survey Description: #4 Hole: Weston borehole French Drain Collection, 881 Hillside, South

**Instrumentation Used**

**SMEAR COUNTERS**

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Eberline | 2. Eberline | 3. Eberline | 4. Eberline | 5. Eberline |
| Model: | 1. SAC - 4 | 2. SAC - 4 | 3. SAC - 4 | 4. SAC - 4 | 5. SAC - 4 |
| Serial #: | 1. 890 | 2. XIX | 3. | 4. | 5. |
| Date Per. CK: | 1. 3-20-90 | 2. 3-20-90 | 3. | 4. | 5. |
| Cal. Due Date: | 1. 4-90 | 2. 10-90 | 3. | 4. | 5. |

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Ludlum | 2. Ludlum | 3. Ludlum | 4. Ludlum | 5. Ludlum |
| Model: | 1. 31 | 2. 31 | 3. 31 | 4. 31 | 5. 31 |
| Serial #: | 1. 60630 | 2. | 3. | 4. | 5. |
| Date Per. CK: | 1. 3-20-90 | 2. | 3. | 4. | 5. |
| Cal. Due Date: | 1. 4-8-90 | 2. | 3. | 4. | 5. |

**OTHER INSTRUMENTS**

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Ludlum | 2. Ludlum | 3. Ludlum | 4. Ludlum | 5. Ludlum |
| Model: | 1. 12 - 1A | 2. 12 - 1A | 3. 12 - 1A | 4. 12 - 1A | 5. 12 - 1A |
| Serial #: | 1. 56061 | 2. | 3. | 4. | 5. |
| Date Calib'd | 1. 3-20-90 | 2. | 3. | 4. | 5. |
| Date Calib'd DUE | 1. 3-91 | 2. | 3. | 4. | 5. |

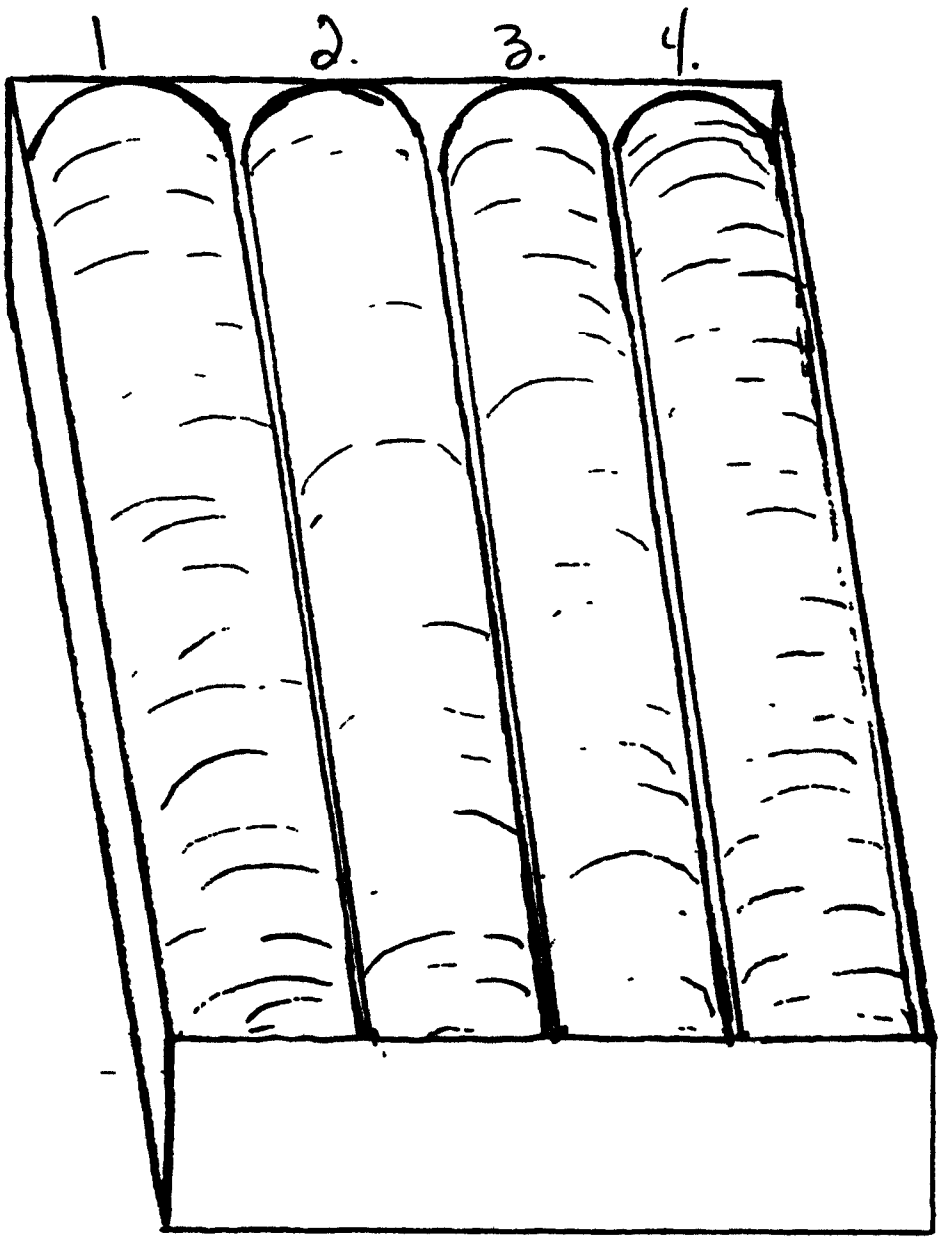
**COMMENTS**

1½ boxes Core Samples

**RADIOLOGICAL MONITORING** Control No. _____

Area or Equipment Drawing Showing Survey Points

**CORE SAMPLES**



Control No _____

**RADIOLOGICAL MONITORING**
**Contamination Survey**

**RESULTS**

| | Initial CPM Removable (Swipe) | Initial CPM Direct (31 / 12-1) | Initial DPM/100cm2 Removable (Smear) | Resurvey CPM Removable (Swipe) | Resurvey CPM Direct | Resurvey DPM/100cm2 Removable (Smear) |
|---|---|---|---|---|---|---|
| 1. | | 4250 | 3 | | | |
| 2. | | 4250 | 6 | | | |
| 3. | | 4250 | 0 | | | |
| 4. | | 4250 | 0 | | | |
| 5. | | 4250 | 3 | | | |
| 6. | | 4250 | 3 | | | |
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BLDG. MGR.
H.P.
FILE

Control No. SPECIAL

**RADIOLOGICAL MONITORING**
**Contamination Survey**

E.A. English 506940 7-25-90

Taken by: J Nunez, Jr. Emply [redacted] Reviewed by: _____ Emply# _____

Taken by _____ Emply# _____ Reviewed by: _____ Emply# _____

Taken by: _____ Emply# _____ Reviewed by: _____ Emply# _____

Date: 3-22-90 Building: _____

Time: 1300 Room #: _____

Shift: Day

Survey Description: #5 Hole: Weston borehole, French Drain Collection 887 Hillside, South

**Instrumentation Used**

**SMEAR COUNTERS**

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Eberline | 2. Eberline | 3. Eberline | 4. Eberline | 5. Eberline |
| Model: | 1. SAC - 4 | 2. SAC - 4 | 3. SAC - 4 | 4. SAC - 4 | 5. SAC - 4 |
| Serial #: | 1. 883 | 2. KK | 3. | 4. | 5. |
| Date Per. CK: | 1. 3-22-90 | 2. 3-22-90 | 3. | 4. | 5. |
| Cal. Due Date: | 1. 4-90 | 2. 10-90 | 3. | 4. | 5. |

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Ludlum | 2. Ludlum | 3. Ludlum | 4. Ludlum | 5. Ludlum |
| Model: | 1. 31 | 2. 31 | 3. 31 | 4. 31 | 5. 31 |
| Serial #: | 1. 6630 | 2. | 3. | 4. | 5. |
| Date Per. CK: | 1. 3-22-90 | 2. | 3. | 4. | 5. |
| Cal. Due Date: | 1. 2-8-9 | 2. | 3. | 4. | 5. |

**OTHER INSTRUMENTS**

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Ludlum | 2. Ludlum | 3. Ludlum | 4. Ludlum | 5. Ludlum |
| Model: | 1. 12 - 1A | 2. 12 - 1A | 3. 12 - 1A | 4. 12 - 1A | 5. 12 - 1A |
| Serial #: | 1. 3669 | 2. | 3. | 4. | 5. |
| Date Calib'd | 1. 3-22-90 | 2. | 3. | 4. | 5. |
| Date Calib'due | 1. 2-91 | 2. | 3. | 4. | 5. |

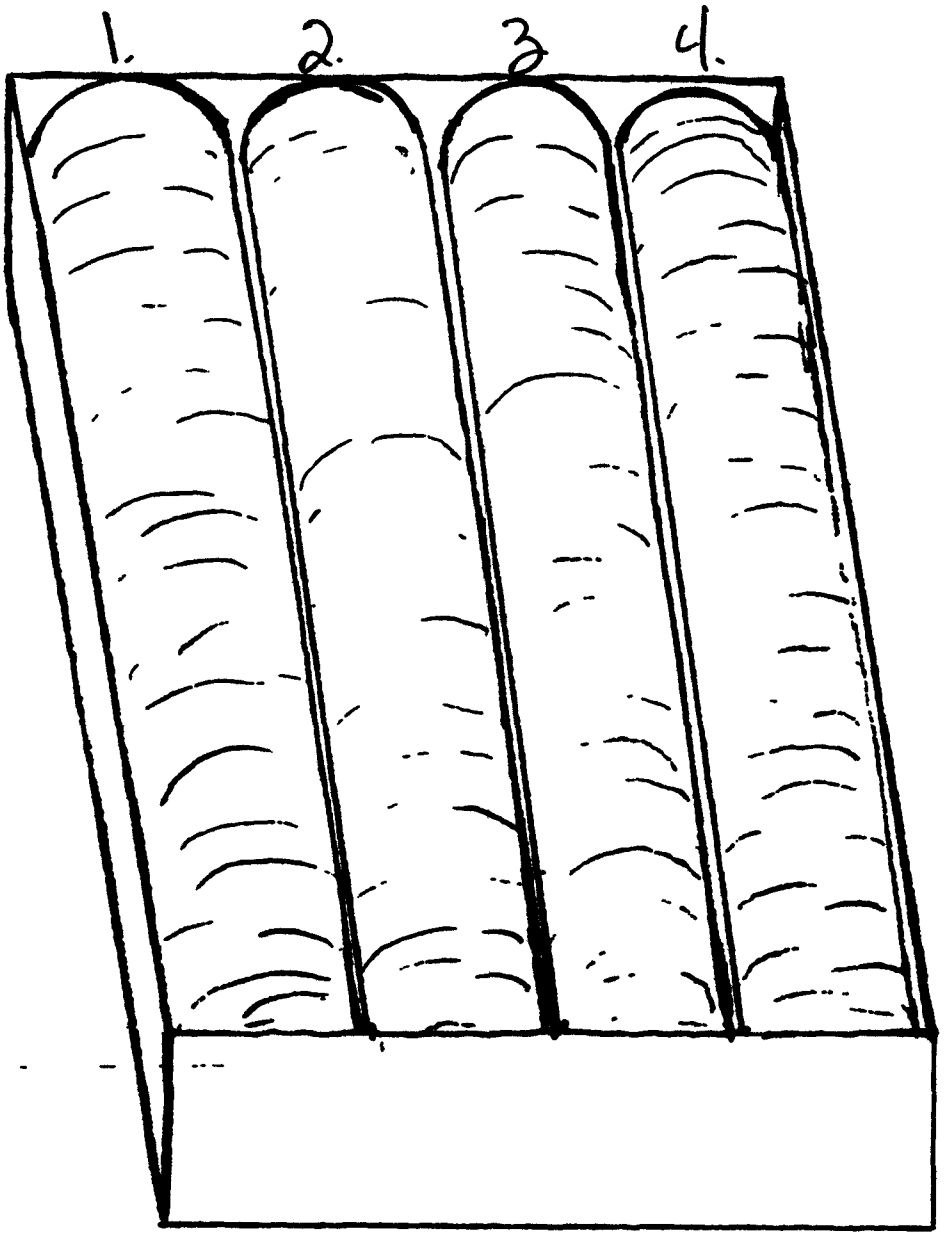
**COMMENTS**

1½ boxes Core Samples

**RADIOLOGICAL MONITORING** Control No. _____

Area or Equipment Drawing Showing Survey Points

**CORE SAMPLES**



Control No._____

**RADIOLOGICAL MONITORING**
**Contamination Survey**

**RESULTS**

| | Initial | | | | Resurvey | | |
|---|---|---|---|---|---|---|---|
| | CPM Removable (Swipe) | CPM Direct Ludlum 31/12-1 | DPM/100cm2 Removable (Smear) | | CPM Removable (Swipe) | CPM Direct | DPM/100cm2 Removable (Smear) |
| 1. | | 8160 / 4250 | 3 | 1. | | | |
| 2. | | 8160 / 4250 | 0 | 2. | | | |
| 3. | | 8160 / 4250 | 0 | 3. | | | |
| 4. | | 8160 / 4250 | 0 | 4. | | | |
| 5. | | 8160 / 4250 | 3 | 5. | | | |
| 6. | | 8160 / 4250 | 0 | 6. | | | |
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BLDG. MGR.
H.P.
FILE

Control No. Special

**RADIOLOGICAL MONITORING**
**Contamination Survey**

E.A. English 506940 3-95

Taken by: J Munoz, Jr. Emply# [redacted] Reviewed by: _____ Emply# _____

Taken by: _____ Emply# _____ Reviewed by: _____ Emply# _____

Taken by: _____ Emply# _____ Reviewed by: _____ Emply# _____

Date: 3-23-90 Building: _____

Time 1400 Room #: _____

Shift: Day

Survey Description: #2 Hole: Weston borehole, French Drain Collection 881 Hillside, South

**Instrumentation Used**

**SMEAR COUNTERS**

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Eberline | 2. Eberline | 3. Eberline | 4. Eberline | 5. Eberline |
| Model: | 1. SAC - 4 | 2. SAC - 4 | 3. SAC - 4 | 4. SAC - 4 | 5. SAC - 4 |
| Serial #: | 1. 892 | 2. 818 | 3. | 4. | 5. |
| Date Per. CK: | 1. 3-23-90 | 2. 3-23-90 | 3. | 4. | 5. |
| Cal. Due Date: | 1. 4-90 | 2. 10-90 | 3. | 4. | 5. |

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Ludlum | 2. Ludlum | 3. Ludlum | 4. Ludlum | 5 Ludlum |
| Model: | 1. 31 | 2. 31 | 3. 31 | 4. 31 | 5. 31 |
| Serial #: | 1. 61620 | 2. | 3. | 4. | 5. |
| Date Per. CK: | 1. 3-23-90 | 2. | 3. | 4. | 5 |
| Cal. Due Date: | 1. 8-90 | 2. | 3. | 4. | 5. |

**OTHER INSTRUMENTS**

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Ludlum | 2. Ludlum | 3. Ludlum | 4. Ludlum | 5. Ludlum |
| Model: | 1. 12 - 1A | 2. 12 - 1A | 3. 12 - 1A | 4. 12 - 1A | 5. 12 - 1A |
| Serial #: | 1. 36089 | 2. | 3. | 4. | 5. |
| Date Calib'd | 1. 3-23-90 | 2. | 3. | 4. | 5. |
| Date Calib'due | 1. 2-91 | 2. | 3. | 4. | 5 |

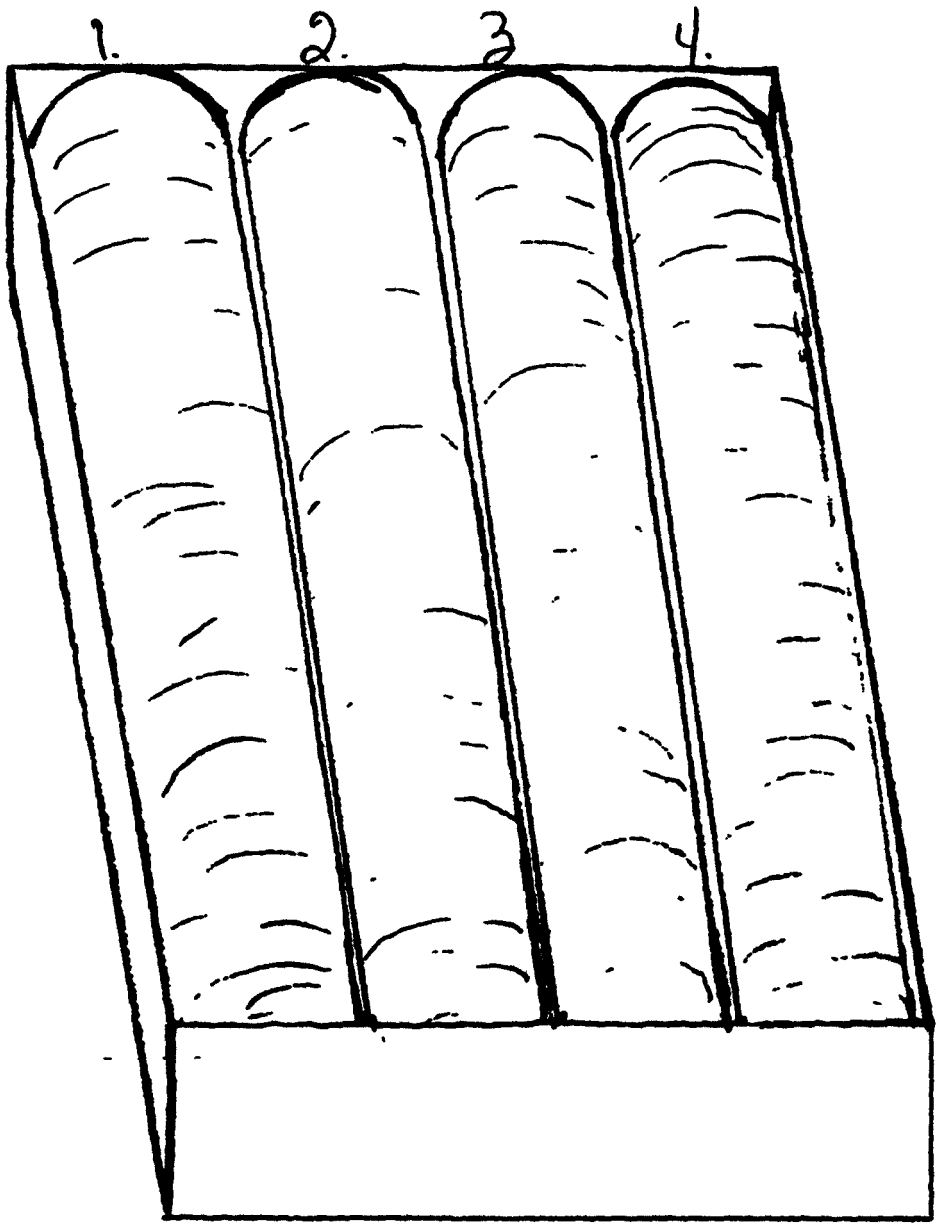
**COMMENTS**

1 Box Core Sample

**RADIOLOGICAL MONITORING** Control No. _____

Area or Equipment Drawing Showing Survey Points

**CORE SAMPLES**



Control No._____

**RADIOLOGICAL MONITORING**
**Contamination Survey**

**RESULTS**

| | Initial | | | Resurvey | | |
|---|---|---|---|---|---|---|
| | CPM Removable (Swipe) | CPM Direct Ludlum 31 121 | DPM/100cm2 Removable (Smear) | CPM Removable (Swipe) | CPM Direct | DPM/100cm2 Removable (Smear) |
| 1. | | B160 \| 5250 | 3 | | | |
| 2. | | B160 \| 5250 | 3 | | | |
| 3. | | B160 \| 5250 | 3 | | | |
| 4. | | B160 \| 5250 | 0 | | | |
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BLDG. MGR.
H.P.
FILE

Control No. Special

**RADIOLOGICAL MONITORING**
**Contamination Survey**

E.A. English
506940
3-25-90

Taken by: J. Munoz, Jr. Emply [redacted] Reviewed by: _____ Emply# _____

Taken by _____ Emply# _____ Reviewed by: _____ Emply# _____

Taken by: _____ Emply# _____ Reviewed by: _____ Emply# _____

Date: 3-23-90 Building: _____

Time: 1400 Room #: _____

Shift: Day

Survey Description: #3 Hole: Weston borehole French Drain Collection 881 Hillside, South

**Instrumentation Used**

**SMEAR COUNTERS**

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Eberline | 2. Eberline | 3. Eberline | 4. Eberline | 5. Eberline |
| Model: | 1. SAC - 4 | 2. SAC - 4 | 3. SAC - 4 | 4. SAC - 4 | 5. SAC - 4 |
| Serial #: | 1. 842 | 2. 818 | 3. | 4. | 5. |
| Date Per. CK: | 1. 3-23-90 | 2. 3-23-90 | 3. | 4. | 5. |
| Cal. Due Date: | 1. 4-90 | 2. 10-90 | 3. | 4. | 5. |

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Ludlum | 2. Ludlum | 3. Ludlum | 4. Ludlum | 5 Ludlum |
| Model: | 1. 31 | 2. 31 | 3. 31 | 4. 31 | 5. 31 |
| Serial #: | 1. 6630 | 2. | 3. | 4. | 5. |
| Date Per. CK: | 1. 3-23-90 | 2. | 3. | 4. | 5. |
| Cal. Due Date: | 1. 8-9 | 2. | 3. | 4. | 5. |

**OTHER INSTRUMENTS**

| | | | | | |
|---|---|---|---|---|---|
| Mfg: | 1. Ludlum | 2. Ludlum | 3. Ludlum | 4. Ludlum | 5. Ludlum |
| Model: | 1. 12 - 1A | 2. 12 - 1A | 3. 12 - 1A | 4. 12 - 1A | 5. 12 - 1A |
| Serial #: | 1. 50051 | 2. | 3. | 4. | 5. |
| Date Calib'd | 1. 3-23-90 | 2. | 3. | 4. | 5. |
| Date Calib'd DUE | 1. 2-91 | 2. | 3. | 4. | 5 |

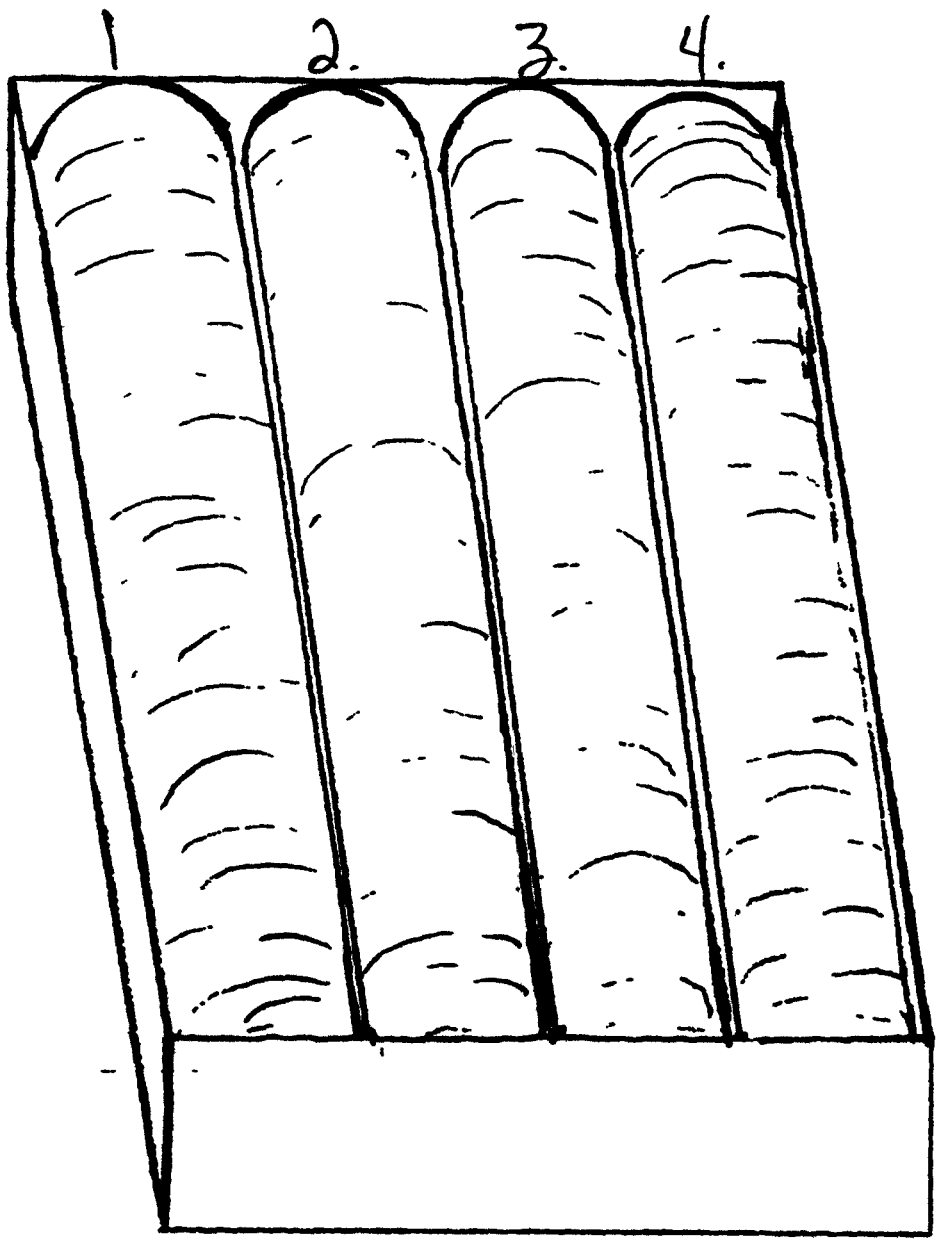
**COMMENTS**

1 Box Core Samples

RADIOLOGICAL MONITORING Control No. _____

Area or Equipment Drawing Showing Survey Points

CORE SAMPLES



Control No _____

**RADIOLOGICAL MONITORING**
**Contamination Survey**

## RESULTS

| | Initial | | | | Resurvey | | |
|---|---|---|---|---|---|---|---|
| | CPM Removable (Swipe) | CPM Direct | DPM/100cm2 Removable (Smear) | | CPM Removable (Swipe) | CPM Direct | DPM/100cm2 Removable (Smear) |
| | | Lodion 31 / 12-1 | | | | | |
| 1. | | B460 / 4250 | 0 | 1. | | | |
| 2. | | B460 / 4250 | 3 | 2. | | | |
| 3 | | B460 / 4250 | 0 | 3. | | | |
| 4. | | B460 / 4250 | 0 | 4. | | | |
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EG&G ROCKY FLATS

EG&G ROCKY FLATS, INC.
ROCKY FLATS PLANT, P O. BOX 464, GOLDEN, COLORADO 80402-0464 • (303) 966-7000

Date 2/22/90

Francie McDonald
R. F. Weston Co.
215 Union Boulevard
Suite 600
Lakewood, Colorado 80228

ANALYTICAL REPORT

The following VOA samples were screened for radioactivity and were found to be below 50 pCi/g.

B 3001900006
B 3001900610
B 3002900008
B 3003900010
B 3004900009
B 3005900005
B 3006900003

J. M. Schoen
Analytical Specialist II

rjc

EG&G ROCKY FLATS

EG&G ROCKY FLATS, INC.
ROCKY FLATS PLANT, P.O. BOX 464, GOLDEN, COLORADO 80402-0464 • (303) 966-7000

Date 2/22/90

Francie McDonald
R. F. Weston Co.
215 Union Boulevard
Suite 600
Lakewood, Colorado 80228

ANALYTICAL REPORT

The following VOA samples were screened for radioactivity and were found to be below 50 pCi/g.

B30079000 04
B30080012
B30090012
B30100014
B3010901422

J. M. Schoen
Analytical Specialist II

rjc