National Aeronautics and
Space Administration

Lyndon B. Johnson Space Center
White Sands Test Facility
P.O. Box 20
Las Cruces, NM 88004-0020

January 30, 2013

Reply to Attn of: RE-13-013

New Mexico Environment Department
Attn: Mr. John E. Kieling, Chief
Hazardous Waste Bureau
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505

Subject: NASA WSTF 200 Area Investigation - Phase I Status Report

The 200 Area Closure Investigation Work Plan (IWP) originally submitted to NMED on March 28, 2012 presented a phased investigation approach that was prepared in accordance with the WSTF Hazardous Waste Permit (NMED, 2009) Section V.B.6.b. On May 22, 2012, NMED issued a disapproval, requesting that NASA submit a separate IWP for each of the two proposed phases of the investigation. NASA submitted the 200 Area Phase I IWP that proposed a more comprehensive investigation of the 200 Area on June 20, 2012. The Phase I IWP was approved by NMED on June 28, 2012.

The Phase I Status Report is intended to provide an abbreviated investigation report focusing on the results of the Phase I field activities. The Hazardous Waste Permit Attachment 20 (Section 20.1) requires the submittal of a request for variation if a proposed report format differs from that required by the Permit. NASA submitted an alternate report format outline for the Phase I Status Report on December 13, 2012, which was approved by NMED on December 21, 2012. This Phase I Status Report summarizes the results of the Phase I investigation and presents NASA's interpretation of those results.

The Executive Summary is included as Enclosure 1, a bound paper copy of the main body of the report (pages i-83) as Enclosure 2, and a CD-ROM containing the entire report and including all appendices as Enclosure 3.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for known violations. If you

have any questions or comments concerning this submittal, please contact Tim Davis at 575–524–5024.

Michael Zygmond

for Radel Bunker-Farrah
Chief, Environmental Office

3 Enclosures

cc:
Mr. Dan Comeau
Hazardous Waste Bureau
New Mexico Environment Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505

Executive Summary

The National Aeronautics and Space Administration (NASA) submitted an Investigation Work Plan (IWP) for the current 200 Area Closure Investigation on March 28, 2012 in accordance with Section V.B.6.b of the Hazardous Waste Permit issued by the New Mexico Environment Department (NMED) for the NASA White Sands Test Facility (WSTF; NMED, 2009). NMED issued a disapproval of the 200 Area IWP on May 22, 2012 and requested that NASA submit each of the two planned phases as a separate IWP. NASA resubmitted the 200 Area IWP for Phase I of the investigation on June 20, 2012. NMED approved the Phase I 200 Area IWP on June 28, 2012.

Phase I of the 200 Area Closure Investigation included resistivity and shallow seismic refraction surveys. Thirteen geophysical lines were completed, with a combined length of approximately 23,581 ft (7,187.14 m). Eleven lines were oriented perpendicular to the primary northeast structural grain and the remaining two lines were oriented parallel to the structural grain, with one traversing the 200 Area building complex. Interpretation of the electrical resistivity survey indicated that the majority of groundwater migration is controlled by a dense network of fractures and solution cavities in the limestone. The surface of the bedrock was also reinterpreted using results from the geophysical surveys.

The geophysical surveys showed pervasive fracturing beneath the WSTF 200 Area, predominantly on an orthogonal system, with one fracture set trending northeast – southwest and the other fracture set trending northwest – southeast. Three relatively prominent subparallel normal faults striking from northeast to southwest are identified across the 200 Area as follows: the 200 East Fault (approximately coincident with the location of Gardner Spring Arroyo [GSA]); the Apollo Boulevard Fault (located directly below to immediately west of Apollo Boulevard); and the 200 West Fault (coincident with the arroyo located approximately 1,500 feet northwest of Apollo Boulevard). Two additional structural features were also identified: the 200-D Graben that is oriented northwest-southeast perpendicular to the trend of prominent faulting and extends to the southeast through the 200-D well cluster; and the north-northwest Road G Offset which crosses Apollo Boulevard close to the Road G intersection.

A shallow soil vapor survey was also performed to evaluate volatile organic compounds (VOCs) in the shallow subsurface. The survey was conducted in two phases across the entire 200 Area and portions of the adjacent 100, 600, and 800 Areas, including the adjacent fault systems and surface drainage features that surround the 200 Area. The initial (Phase I [a]) grid had dimensions of approximately 1,800 ft by 4,500 ft (548.61 m by 1,371.53 m) with 144 individual shallow soil vapor survey points generally located on 250-ft (76.20 m) centers. An additional 26 survey points were selected within the grid to target specific features such as the underground storage tanks (USTs) and solid waste management units (SWMUs) as identified in the Permit (NMED, 2009), and other areas of interest (AOIs) identified in the IWP and Historical Information Summary (HIS; NASA, 2012 [b]). Shallow soil vapor survey samples were collected using GORE® Modules that are designed to provide a semi-quantitative evaluation of VOCs in the soil vapor within the 200 Area vadose zone.

The geophysical survey and shallow soil vapor survey results were evaluated concurrently in order to locate any additional AOIs. Specific bedrock features identified during the geophysical survey, groundwater contaminant contours, and the potentiometric surface were transposed onto the basemaps used to present VOC mass results from the shallow soil vapor survey.

The results of the geophysical survey and Phase I (a) shallow soil vapor survey were used to identify four additional areas of interest (AOIs I, II, III, and IV). The four AOIs were further investigated using 38 supplemental (Phase I [b]) shallow soil vapor survey points that were located between the existing grid nodes to refine and add detail to the results derived from Phase 1(a). The primary VOCs used to delineate the AOIs were trichloroethene (TCE); tetrachloroethene (PCE); trichlorofluoromethane (Freon 11); 1,1,2-trichloro-1,2,2-trifluoroethane (Freon 113); and total petroleum hydrocarbons (TPH).

AOI I is located on the southeast edge of the shallow soil vapor grid and was identified through relatively elevated mass of TCE and Freon 113. This area is located upgradient of known historical operations and

the groundwater plume. AOI II corresponds to the northwest extension of the well 200-D Graben on the west side of Apollo Boulevard. The location of this AOI is also supported by relatively elevated mass of Freon 113 in soil vapor. AOI III is located to the northeast of the 200-D well cluster adjacent to the east side of Apollo Boulevard Fault. This area was identified through increased mass of TCE, PCE, and Freon 113. AOI IV is located north of the former 200 Area Clean Room UST and Clean Room Discharge Pipe SWMU adjacent to the west side of the Apollo Boulevard Fault and on the north side of Road L. This area was identified through increased mass of TCE, PCE, Freon 11, and Freon 113.

The four AOIs identified during the Phase I investigation warrant further study as a component of the Phase II 200 Area Closure Investigation. A total of five soil borings installed to the depth of the alluvium-bedrock contact are recommended to further investigate the four AOIs. These borings are recommended in addition to nine previously located soil borings originally proposed for the Phase II investigation (NASA, 2012 [a]) for a total of 14 soil borings.

National Aeronautics and
Space Administration

200 Area Phase I Status Report

January 2013

NM8800019434
NASA Johnson Space Center White Sands Test Facility
12600 NASA Road Las Cruces, New Mexico 88012

200 Area Phase I Status Report

January 2013

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

For Radel Bunker-Farrah
Chief, NASA Environmental Office

1/30/13
Date

Executive Summary

The National Aeronautics and Space Administration (NASA) submitted an Investigation Work Plan (IWP) for the current 200 Area Closure Investigation on March 28, 2012 in accordance with Section V.B.6.b of the Hazardous Waste Permit issued by the New Mexico Environment Department (NMED) for the NASA White Sands Test Facility (WSTF; NMED, 2009). NMED issued a disapproval of the 200 Area IWP on May 22, 2012 and requested that NASA submit each of the two planned phases as a separate IWP. NASA resubmitted the 200 Area IWP for Phase I of the investigation on June 20, 2012. NMED approved the Phase I 200 Area IWP on June 28, 2012.

Phase I of the 200 Area Closure Investigation included resistivity and shallow seismic refraction surveys. Thirteen geophysical lines were completed, with a combined length of approximately 23,581 ft (7,187.14 m). Eleven lines were oriented perpendicular to the primary northeast structural grain and the remaining two lines were oriented parallel to the structural grain, with one traversing the 200 Area building complex. Interpretation of the electrical resistivity survey indicated that the majority of groundwater migration is controlled by a dense network of fractures and solution cavities in the limestone. The surface of the bedrock was also reinterpreted using results from the geophysical surveys.

The geophysical surveys showed pervasive fracturing beneath the WSTF 200 Area, predominantly on an orthogonal system, with one fracture set trending northeast – southwest and the other fracture set trending northwest – southeast. Three relatively prominent subparallel normal faults striking from northeast to southwest are identified across the 200 Area as follows: the 200 East Fault (approximately coincident with the location of Gardner Spring Arroyo [GSA]); the Apollo Boulevard Fault (located directly below to immediately west of Apollo Boulevard); and the 200 West Fault (coincident with the arroyo located approximately 1,500 feet northwest of Apollo Boulevard). Two additional structural features were also identified: the 200-D Graben that is oriented northwest-southeast perpendicular to the trend of prominent faulting and extends to the southeast through the 200-D well cluster; and the north-northwest Road G Offset which crosses Apollo Boulevard close to the Road G intersection.

A shallow soil vapor survey was also performed to evaluate volatile organic compounds (VOCs) in the shallow subsurface. The survey was conducted in two phases across the entire 200 Area and portions of the adjacent 100, 600, and 800 Areas, including the adjacent fault systems and surface drainage features that surround the 200 Area. The initial (Phase I [a]) grid had dimensions of approximately 1,800 ft by 4,500 ft (548.61 m by 1,371.53 m) with 144 individual shallow soil vapor survey points generally located on 250-ft (76.20 m) centers. An additional 26 survey points were selected within the grid to target specific features such as the underground storage tanks (USTs) and solid waste management units (SWMUs) as identified in the Permit (NMED, 2009), and other areas of interest (AOIs) identified in the IWP and Historical Information Summary (HIS; NASA, 2012 [b]). Shallow soil vapor survey samples were collected using GORE® Modules that are designed to provide a semi-quantitative evaluation of VOCs in the soil vapor within the 200 Area vadose zone.

The geophysical survey and shallow soil vapor survey results were evaluated concurrently in order to locate any additional AOIs. Specific bedrock features identified during the geophysical survey, groundwater contaminant contours, and the potentiometric surface were transposed onto the basemaps used to present VOC mass results from the shallow soil vapor survey.

The results of the geophysical survey and Phase I (a) shallow soil vapor survey were used to identify four additional areas of interest (AOIs I, II, III, and IV). The four AOIs were further investigated using 38 supplemental (Phase I [b]) shallow soil vapor survey points that were located between the existing grid nodes to refine and add detail to the results derived from Phase 1(a). The primary VOCs used to delineate

The use of trademarks or names of manufacturers is for accurate reporting and does not constitute an official endorsement either expressed or implied of such products or manufacturers by the National Aeronautics and Space Administration.

the AOIs were trichloroethene (TCE); tetrachloroethene (PCE); trichlorofluoromethane (Freon 11); 1,1,2-trichloro-1,2,2-trifluoroethane (Freon 113); and total petroleum hydrocarbons (TPH).

AOI I is located on the southeast edge of the shallow soil vapor grid and was identified through relatively elevated mass of TCE and Freon 113. This area is located upgradient of known historical operations and the groundwater plume. AOI II corresponds to the northwest extension of the well 200-D Graben on the west side of Apollo Boulevard. The location of this AOI is also supported by relatively elevated mass of Freon 113 in soil vapor. AOI III is located to the northeast of the 200-D well cluster adjacent to the east side of Apollo Boulevard Fault. This area was identified through increased mass of TCE, PCE, and Freon 113. AOI IV is located north of the former 200 Area Clean Room UST and Clean Room Discharge Pipe SWMU adjacent to the west side of the Apollo Boulevard Fault and on the north side of Road L. This area was identified through increased mass of TCE, PCE, Freon 11, and Freon 113.

The four AOIs identified during the Phase I investigation warrant further study as a component of the Phase II 200 Area Closure Investigation. A total of five soil borings installed to the depth of the alluvium-bedrock contact are recommended to further investigate the four AOIs. These borings are recommended in addition to nine previously located soil borings originally proposed for the Phase II investigation (NASA, 2012 [a]) for a total of 14 soil borings.

The use of trademarks or names of manufacturers is for accurate reporting and does not constitute an official endorsement either expressed or implied of such products or manufacturers by the National Aeronautics and Space Administration.

Table of Contents

Executive Summary iii
Table of Contents v
List of Figures and Tables vii
List of Acronyms and Abbreviations viii
1.0 Introduction 1
1.1 Facility Location and Description 1
1.2 Regulatory Requirements 2
1.3 200 Area Closure Location and Description 2
1.4 Previous Investigations 2
1.4.1 Geophysical Survey 3
1.4.2 Shallow Soil Vapor Survey 3
2.0 Scope of Activities 4
2.1 Data Quality Objectives 4
2.1.1 Problem and Objectives 4
2.1.2 Decision Inputs 4
2.1.3 Spatial Extent of Investigation 5
2.1.4 Decision Rule 5
2.2 Geophysical Survey 5
2.2.1 Rationale and Background for Geophysics 5
2.2.2 Purpose 6
2.2.3 Overview of Geophysical Survey Lines 7
2.2.4 Survey Line Field Preparation and Installation 8
2.2.5 Electromagnetic Induction Anomaly Mapping 9
2.2.6 Electrical Resistivity Characterization 9
2.2.7 Seismic Refraction 9
2.3 Shallow Soil Vapor Survey 9
2.3.1 Overview of Soil Sampling Grid 10
2.3.2 Soil vapor Grid Field Preparation and Installation 11
2.3.3 Soil vapor Field Sampling Techniques 12
2.3.4 Sample Management 13
2.3.5 Soil Vapor Data Processing 14
3.0 Field Investigation Results 16
3.1 Geophysical Survey Results 16
3.1.1 Electromagnetic Induction Anomaly Mapping 16
3.1.2 Electrical Resistivity Characterization 16
3.1.3 Seismic Refraction 18

3.2 Shallow Soil Vapor Survey Results 18
3.2.1 Initial Survey Grid Points 18
3.2.2 Supplemental Survey Grid Points 21
4.0 Regulatory Criteria 21
4.1 Sample Data Evaluation 22
5.0 Conclusions 22
5.1.1 Geophysical Survey 22
5.1.2 Shallow Soil Vapor Survey 23
6.0 Recommendations 23
7.0 References 25
Figures 27
Tables 45
Appendix A Photographic Documentation A-1
Appendix B Geophysical Survey Results Report by HGI B-1
Appendix C Soil Vapor Analytical Results C-1

List of Figures and Tables

Figure 1.1 WSTF Location Map 28
Figure 1.2 200 Area Location, Buildings, and SWMUs 29
Figure 1.3 200 Area Additional Areas of Interest 30
Figure 2.1 WSTF Alluvial Thickness Map 31
Figure 2.2 200 Area Potentiometric Surface Elevations 32
Figure 2.3 WSTF Bedrock Lithologies 33
Figure 2.4 Aerial Photograph of the 200 Area 34
Figure 2.5 WSTF 200 Area Geophysical Survey Lines 35
Figure 2.6 WSTF 200 Area Shallow Soil Vapor Grid 36
Figure 3.1 200 and 600 Area Bedrock Elevations with Geophysical Input 37
Figure 3.2 TCE Soil Vapor Analytical Contour Map 38
Figure 3.3 PCE Soil Vapor Analytical Contour Map 39
Figure 3.4 Freon 11 Soil Vapor Analytical Contour Map 40
Figure 3.5 Freon 113 Soil Vapor Analytical Contour Map 41
Figure 3.6 TPH Soil Vapor Analytical Contour Map 42
Figure 3.7 WSTF 200 Area Supplemental Shallow Soil Vapor Grid Points 43
Figure 6.1 WSTF 200 Area Proposed Soil Borings 44
Table 1.1 WSTF 200 Area SWMUs 46
Table 2.1 Summary of Shallow Soil Vapor Survey Points for Gore Module Installations 47
Table 2.2 Summary of Field Installation and Retrieval Log for Gore Modules 48
Table 3.1 Summary of Gore Module Analtyical Results for Anomalous VOCs 49

List of Acronyms and Abbreviations

µg	Microgram
µm	Micrometer
AOI	Area of interest
AWD	Accelerated weight drop
bgs	Below ground surface
CAP	Corrective action process
CoC	Chain-of-custody
COC	Contaminant of concern
DQO	Data quality objectives
EPA	Environmental Protection Agency
ERC	Electrical resistivity characterization
Freon 11	Trichlorofluoromethane
Freon 113	1,1,2-trichloro-1,2,2-trifluoroethane
GCI	Geosyntec Consultants, Inc.
GPS	Global Positioning System
GSA	Gardner Spring Arroyo
HGI	HydroGEOPHYSICS, Inc.
HIS	Historical Information Summary
HWMU	Hazardous waste management unit
ID	Identification
ISO	International Organization for Standardization
IWP	Investigation Work Plan
MSVM	Multi-port soil vapor monitoring
MSVGM	Multi-port soil vapor and groundwater monitoring
NASA	National Aeronautics and Space Administration
ND	Non- detect
NMED	New Mexico Environment Department
P&A	Plugged and abandoned
PCC	Post closure care
PCE	Tetrachloroethene
RBC	Risk-based concentration
RCRA	Resource Conservation and Recovery Act
RFI	RCRA Facility Investigation
SAM	San Andres Mountains
SVOC	Semi-volatile organic compound
SWMU	Solid Waste Management Unit
T-C	Time – concentration
TCE	Trichloroethene
TPH	Total petroleum hydrocarbons
UPE	Unresolved peak envelope
UST	Underground storage tank
VOC	Volatile organic compound
WBFZ	Western Boundary Fault Zone
WSTF	White Sands Test Facility

1.0 Introduction

The National Aeronautics and Space Administration (NASA) Johnson Space Center White Sands Test Facility (WSTF; Environmental Protection Agency [EPA] Identification Number [ID] NM8800019434) has supported testing of space flight equipment and hazardous materials for nearly 50 years. The facility contains five closed hazardous waste management units (HWMUs) at the 200, 300, 400, and 600 Areas that are under post-closure care (PCC). PCC requirements are specified by the NASA WSTF Hazardous Waste Permit (Permit) issued by the New Mexico Environment Department (NMED) in 2009 (NMED, 2009). The Permit requires investigations to assess historical releases of hazardous waste or hazardous constituents to the subsurface, and to determine whether the soils beneath the closed HWMUs are continuing sources of groundwater contamination. This status report specifically addresses the WSTF 200 Area.

A 200 Area Closure Investigation Work Plan (IWP; NASA, 2012[a]) presented a phased approach that was prepared in accordance with the WSTF Hazardous Waste Permit (NMED, 2009) Section V.B.6.b, and was submitted to NMED on March 28, 2012. On May 22, 2012, NMED issued a disapproval, requesting that NASA submit a separate IWP for each of two proposed phases of the investigation (NMED, 2012[b]). NASA submitted the 200 Area Phase I IWP on June 20, 2012 (NASA, 2012[b]), which was approved by NMED on June 28, 2012 (NMED, 2012[c]). Field and laboratory activities related to the site investigation were conducted from September 2012 through January 2013. This report summarizes the results of the Phase I investigation and presents NASA's interpretation of those results.

1.1 Facility Location and Description

WSTF is located in Doña Ana County, New Mexico, 18 miles northeast of Las Cruces, New Mexico, and 65 miles north of El Paso, Texas (Figure 1.1). WSTF was constructed in a remote location adjacent to the San Andres Mountains (SAM). The land occupied by WSTF is owned by the Department of the Army, and is used by NASA under a land use agreement with the Army. Access to the site is provided by a paved road that intersects U.S. Highway 70 one mile west of Organ, New Mexico. The primary activities at WSTF in support of the space program are:

- Development, qualification, refurbishment, and testing of spacecraft propulsion systems, subsystems, and ground support equipment.
- Investigation of flight hardware anomalies.
- Testing of materials and components.
- Performance of hazard and failure analyses.

The industrial areas of WSTF and general facilities within each area are listed below.

- 100 Area: Administrative offices and site support facilities, including firefighting, vehicle maintenance, and warehousing facilities.
- 200 Area: Laboratories, clean rooms, hardware fabrication and various testing facilities, including materials, oxygen, detonation, and hypervelocity impact testing facilities.
- 300 Area: Altitude chambers, engine test stands, and former wastewater treatment impoundment (a closed HWMU).
- 400 Area: Altitude chambers, engine test stands, and former wastewater treatment impoundment (a closed HWMU).
- 500 Area: Two separate areas with cryogenic gas storage, breathing air generation, and fuel, oxidizer, and waste fuel storage.

- 600 Area: Groundwater supply wells, groundwater monitoring and remediation systems, wastewater treatment lagoons, and a closed HWMU.
- 700 Area: Closed landfill and high energy blast facilities.
- 800 Area: Hazardous fluids and materials test cells.

1.2 Regulatory Requirements

As part of the Resource Conservation and Recovery Act (RCRA) corrective action process (CAP), the Permit (NMED, 2009) requires that NASA investigate and address historical releases of hazardous waste and hazardous constituents that may have occurred at sites throughout WSTF. The CAP consists of investigation, characterization, and if necessary, cleanup.

NASA is currently implementing interim corrective measures to address groundwater contamination and is conducting RCRA Facility Investigations (RFIs) for specific HWMUs, solid waste management units (SWMUs), and areas of concern in the industrial areas. This Phase I study combines the investigation of:

- Two closed 200 Area HWMUs.
- Five 200 Area SWMUs 4, 5, 6, 7, and 9 (Table 1.1).
- Six additional areas of interest (AOI) identified in the 200 Area Historical Information Summary (HIS) submitted in conjunction with the 200 Area IWP (NASA, 2012[a]).

1.3 200 Area Closure Location and Description

The 200 Area is located in Section 35 of T.20.S, R.3.E., and Section 2 of T.21.S, R.3.E. The two closed HWMUs are referred to as the 200 Area East and 200 Area West Closures. The 200 Area East Closure is located in the parking lot east of Building 203. This closure caps the location of the historical steel Chemistry Laboratory underground storage tank (UST) and the historical concrete Chemistry Laboratory Acid UST or Sump. The 200 Area West Closure is located under the current extension of Building 200 (referred to as LabCon), which was constructed in 1989-1990 over the Closure cap for the historical Clean Room USTs. Figure 1.2 shows the locations of the Closures. Refer to the 200 Area HIS for further details of the 200 Area USTs and their subsequent closures (NASA, 2012[a]).

The five SWMUs within the 200 Area addressed in this investigation are SWMUs 4, 5, 6, 7, and 9: the Clean Room discharge pipe, the Scape Room discharge pipe, the Building 203 discharge pipes, the South Highbay discharge pipe, and the 200 Area main burn pit. The pipes were located at buildings 200, 201, and 203, and the 200 Area main burn pit was located southwest of the South Highbay (Figure 1.2).

In addition, six historical AOIs identified in the 200 Area HIS were targeted for this investigation. These AOIs include a third discharge pipe from Building 203, a discharge pipe from the Chemistry Laboratory Acid UST, the historical Chemical Storage Building 253 area, the 270 Area Military Transport Vehicle Fire Suppression Test Area, two additional burn pits located in the 200 Area, and the 250 Area possible septic tank drainage source. Figure 1.3 shows the location of these additional AOIs.

1.4 Previous Investigations

Several previous investigations have been performed in the 200 Area and adjacent areas to target historical contaminant releases to the vadose zone. These include a seismic reflection survey (Reynolds, 1988), shallow soil vapor investigation (GCL, 1986), shallow soil boring investigations (Phase I: 1986 – 1987 [NASA, 1987]; Phase II: 1994-1995 [NASA, 1996]), and the installation of soil vapor wells 200-SG-1, 200-SG-2, 200-SG-3, and 200-SG- 4 in 1997 (NASA, 2004).

Conventional groundwater monitoring wells 200-B-240, 200-D-109, and 200-D-240 and Westbay®[1] multi-port groundwater monitoring wells 200-F, 200-G, 200-H, and 200-I were also installed in the 200 Area during the 1987 to 1997 timeframe as part of the WSTF groundwater and PCC monitoring programs. Multiport soil vapor and groundwater monitoring well 200-JG-110 was installed in 2011 to assist with investigation of the vadose zone and shallow aquifer in the Gardner Spring Arroyo (GSA) between the WSTF 200 and 600 Areas. The location of soil vapor points, soil borings, and wells installed as part of previous investigations and a summary of each of the individual investigations along with data summary tables are provided in the 200 Area Closure Investigation Work Plan (NASA, 2012 [b]).

The geophysical and shallow soil vapor surveys performed as part of this investigation follow similar historical surveys performed from 1985 to 1988. The geophysical investigation for this report was designed to add more detailed resolution of the bedrock surface and delineation of structural features in bedrock. The shallow soil vapor survey was perfomed to provide current data relative to shallow soil vapor anomalies. Brief summaries of the historical surveys are provided below.

1.4.1 Geophysical Survey

Approximately 42 line miles of local shallow seismic reflection data were collected at WSTF in the mid- to late 1980s. Seismic reflection traverses included the 200 Area and immediately adjacent areas to the east. Geophysical data were collected at WSTF to enhance the interpretation of the subsurface bedrock structure and present a synthesis of the WSTF structural geology within the Draft RFI (NASA, 1996) and for subsequent investigation reports submitted to NMED. Gravity and density models developed by Maciejewski (1996, 1998) were used to provide information where seismic data coverage is less reliable, and this was tied in to regional data from a previously published model (Gilmer, et. al., 1986).

1.4.2 Shallow Soil Vapor Survey

A previous shallow soil vapor survey was performed at WSTF that encompassed the 200 Area. This survey was performed in 1986 in order to evaluate soil contamination and assist with the design of Closure caps to be installed over HWMUs within the 200, 300, 400, and 600 Areas.

A total of 63 soil vapor samples were initially collected in the 200 Area from 1 – 5 ft (1.52 m) bgs, depending on subsurface soil conditions. The samples were obtained by hydraulically driving a 0.75-inch diameter hollow galvanized steel probe into the ground and evacuating 5 to 10 liters of soil vapor with a vacuum pump. The samples were analyzed immediately using a gas chromatograph in a field vehicle. Samples were collected based on a rectangular grid with 100-ft (30.48 m) centers and additional points selected based on source location and initial soil vapor results. For the 200 Area, the shallow soil vapor investigation defined an elongate northeast-southwest oriented groundwater plume composed of selected volatile organic compounds (VOCs) best represented by 1,1,2-trichloro-1,2,2-trifluoroethane (Freon 113) detections, which displayed the highest and most widespread concentrations. The VOC plume was located adjacent to and east of the 200 Area buildings and was approximately coincident with GSA (Figure 1.2). The primary inferred mechanisms for contaminant transport consisted of downward solvent migration and lateral discharge of solvent-contaminated surface runoff. Solvent migration along the bedrock surface or solvent runoff to the east of the 200 Area may have entered the GSA and been transported southwest toward the 200-D well cluster area.

Phase II of the 1986 shallow soil vapor investigation consisted of an expanded investigation. Eighty-one additional soil vapor points (for a total of 144) were analyzed for halocarbons in the 200 Area using the

[1] Westbay® is a registered trademark of Westbay Instruments Inc.

same methodology. Phase II findings for the original analytes (Freon 113, 1,1,1-trichloroethane, trichloroethene [TCE], and tetrachloroethene [PCE]) were also within Phase I concentration ranges. The additional soil vapor data also showed a slightly more extensive soil vapor plume in the 200 Area. A more detailed summary of the survey along with the analytical results and maps is provided within the amended 200 Area IWP and HIS (2012 [b]). The results of the historical investigation provided the first indications of the distribution of the groundwater plume in the late 1980's, which was later evaluated in more detail using monitoring wells.

2.0 Scope of Activities

The scope of activities was determined using the data quality objectives (DQOs) process as established in "Guidance on Systematic Planning Using the DQO Process" (EPA, 2006) and other requirements of Permit Attachment 17. The strategy and techniques applied to the Phase I field investigation were presented by NASA in the IWP (NASA, 2012[b]) and subsequently approved by NMED (2012[c]). The outline for this report was also presented by NASA (2012[e]) and subsequently approved by NMED (2012[d]).

2.1 Data Quality Objectives

DQOs for the 200 Area Phase I Investigation, as presented in the 200 Area Phase I IWP, are summarized in the following sections.

2.1.1 Problem and Objectives

The problem statement summarized in the Permit (NMED, 2009; Section V.B.6.a.i) states that the IWP *shall address investigation of contamination that was historically released to the subsurface and that potentially is a source of on-going groundwater contamination.* The primary decision is whether additional corrective actions are warranted in the 200 Area due to the presence of a residual contamination source or sources. Alternative actions for the decisions include:

- Consider a "Corrective Action Complete" status determination.
- If needed, perform a corrective measures evaluation to identify remedial options for mitigation of source(s) of continuing contamination or human health risk.

2.1.2 Decision Inputs

Concentrations of contaminants of concern (COCs) measured in vadose zone soil, soil vapor, and groundwater are primary inputs to the decision. COCs for this investigation have been identified using two primary information sources:

- Detailed information pertinent to the operational history and use of chemicals documented in the 200 Area HIS (NASA, (2012[b]) through a variety of historical documents and reports, personnel interviews, and personnel questionnaires.
- Comprehensive analytical data sets for samples collected from previous 200 Area investigations that include soil, soil vapor, and groundwater. Analytical methods selected for this investigation will be used to quantify COC concentrations at or below NMED soil screening levels whenever possible (NMED, 2012[a]).

2.1.3 Spatial Extent of Investigation

This investigation addresses and is limited to the vadose zone (i.e., the unsaturated area between ground surface and the water table) beneath and immediately surrounding the 200 Area Closed HWMUs, SWMUs, and adjacent areas. Information acquired during the performance of this investigation will be evaluated in conjunction with existing data derived from previous investigations that include groundwater monitoring well analytical results.

2.1.4 Decision Rule

The purpose of the 200 Area investigation is to measure vadose zone contamination within the 200 Area and to determine if observed concentrations exceed levels of concern. Phase I uses a semi-quantitative technique in the form of shallow soil vapor to map individual AOIs that can be targeted for the Phase II soil borings and soil vapor wells. The associated strategy was to comprehensively address the industrialized portion of the 200 Area and adjacent areas, with a focus on the locations known to have the greatest potential for contamination.

2.2 Geophysical Survey

2.2.1 Rationale and Background for Geophysics

The WSTF groundwater plume consists of low concentrations at the parts per billion (ppb) level of dissolved-phase VOCs including TCE, PCE, and several Freons, in addition to n-nitrosodimethylamine (NDMA) that originates from the WSTF 200, 300, and 400 Areas and extends west for approximately three miles. NDMA is primarily confined to the WSTF 300 and 400 Area sources, whereas the highest TCE concentrations on site have historically been reported in the 200 Area. The contaminant releases occurred shortly after the site became operational in 1964 and continued through the early 1990s. Based on the distribution of TCE concentration gradients in groundwater in addition to historical information reported in the 200 Area HIS (NASA, 2012[a]), it is believed that most of the TCE originated from the vicinity of the 200 Area buildings.

Except at its downgradient (leading) edge, the site-wide groundwater plume is contained within a fractured bedrock pediment slope that originates at the base of the SAM in the east and stretches to the edge of the regional Jornada del Muerto Basin (JDMB) structural graben (defined by the Western Boundary Fault Zone [WBFZ]) in the west. The pediment slope is overlain by 15 to 500 ft (4.57 to 152.39 m) of alluvium (thickening from east to west [Figure 2.1]), and the potentiometric surface of the aquifer (Figure 2.2) is beneath the top of bedrock. For most of its length, the groundwater contaminant plume migrates through fractures and bedding planes in sedimentary bedrock, and through fractures in volcanic bedrock. The predominant bedrock in the 200 Area is Permian limestone. From the western portion of the 200 Area to the edge of the WBFZ (approximately 1,000 ft [304.79 m] east of the plume front), the aquifer matrix is Tertiary intermediate to silicic volcanic rocks (andesite and rhyolite).

Contaminated groundwater may have followed anisotropic patterns during migration, as indicated by the distribution of TCE in groundwater samples from the 200 Area monitoring wells. Historically the highest TCE concentrations have been detected in samples from monitoring well 200-B-240 and the three other wells in the 200-D cluster (200-D-109, 200-D-240, and 200-SG-1). Given the slope of the potentiometric surface in the 200 and 600 Areas (typically 0.05 ft/ft [Figure 2.2]), if the TCE and other VOCs originated from the 200 Area Buildings and migrated in the isotropic flow paths typical of porous media, it would also be expected to be present in wells 200-F and 200-SG-2, which contain significantly lower concentrations (one to two orders of magnitude) than the 200-D well cluster.

One possible explanation for the anisotropy in the 200 Area is the potential existence of depressions in the top of bedrock and bedrock fractures that direct groundwater migration along discrete pathways. Identification of those pathways would lead to more focused targets for investigation (and if necessary, remediation). The goal of the geophysical investigation was to find evidence of those pathways and delineate their nature and locations.

In preparation for and support of the 200 Area Phase I Investigation, previous geophysical studies were reviewed, top of bedrock was reviewed, and a map of the distribution of different bedrock lithologies across WSTF (Figure 2.3) was produced. Based on a study of these maps, two features of potential relevance to this study were identified.

The first geologic feature of interest is a relatively abrupt drop in the top of bedrock elevation beneath GSA south of the 200 Area building complex. The offset trends northeast and drops approximately 100 ft (30.48 m) to the northwest. This feature represents a northeast-striking normal fault and is identified as the 200 East Fault. This significant fault corresponds to the 200 East Fault identified in previous documents (e.g. Maciejewski, 1996). The displacement and strike of this fault have been defined more accurately for this study based on the geophysical survey techniques used.

The second potentially relevant feature is a 9,000-ft-long (2,743.07 m) contact between Permian limestone to the southeast and Tertiary andesite to the northwest (Figure 2.3). This northeast trending feature is located parallel to and approximately 1,400 ft (426.70 m) northwest of Apollo Boulevard. It is referred to in this report as the 200 West Fault. The 200 West Fault corresponds to a fault identified in Maciejewski (1996) that is located in the same approximate position with the same strike and dip direction. It does not correspond to the formerly identified fault with the same name (200 West Fault, Maciejewski [1996]) that represents a linear structure with the same strike and dip, but runs in a location approximately coincident with Apollo Boulevard. The nature of the 200 West Fault is also undetermined. The trend of the Offset is approximately perpendicular to the trend of both the Hardscrabble Hill Fault and the Western Boundary Fault zone (Figure 2.3). It is sub-parallel to the trend of the 200 East Fault. Extensile terrains (e.g. the Rio Grande Rift area) can contain strike-slip faults that trend perpendicular to the regional normal faults and can offset those normal faults by miles (Greg Mack, personal communication 2012). If the 200 West Fault is a strike-slip fault off-setting the Hardscrabble Hill Fault, the offset could have been a channel for contaminant migration from the 300 Area.

Some of the groundwater contamination is believed to have originated from several drain pipes which discharged industrial wastewater, historically including Freons and TCE, southeast of the 200 Area buildings (Figure 1.2). Releases from these pipes reportedly flowed down the southern slope into the GSA (NASA, 2012[a]). Figure 2.4 is an aerial photograph of the 200 Area buildings taken from the south. It shows the slope with two lines of vegetation facilitated by the periodic releases of the contaminated water. Once the contaminated water reached the alluvial surface in the GSA, it would have infiltrated vertically through the alluvium to the bedrock and merged with the groundwater in the surficial aquifer. Fractures (potentially enhanced by the presence of the 200 East Fault) and solution channels in the bedrock could have directed this contaminated water towards the 200-D well cluster.

2.2.2 Purpose

The purpose of the geophysical survey was to improve understanding of three factors which may exert control over the direction of groundwater movement and contaminant migration in the 200 Area: 1) the topography of the bedrock surface; 2) location and orientation of offsets within the bedrock; and 3) location and orientation of any dominant fluid-filled channels that might be present.

HydroGEOPHYSICS Inc. (HGI) performed the geophysics field work from September 4 through September 27, 2012. An electromagnetic induction anomaly mapping study, an electrical resistivity characterization, and a seismic refraction study were conducted primarily in the WSTF 200 and 800 Areas, with extensions into the northeast portions of the 100 and 600 Areas.

The surveys were conducted along 13 lines in order to identify possible subsurface interference features (such as piping and concrete rebar), map subsurface structural features, determine the depth to bedrock, and map the three-dimensional shape of the top of the buried bedrock surface. Figure 2.5 shows a map of the geophysical survey lines, Appendix A provides photographic documentation of the geophysical field activities, and Appendix B contains the final geophysical report, including descriptions of the theory, equipment, procedures, fieldwork, and interpretation of results provided by HGI.

2.2.3 Overview of Geophysical Survey Lines

The location and orientation of the geophysical survey lines were selected to maximize the possibility that features of interest (i.e., bedrock, offsets in bedrock, and fluid-filled channels in bedrock) would be intercepted and identified. Geological features are most readily imaged when the geophysical traverses are executed perpendicular to their trend. As the majority of the potential features of interest in the 200 Area trend northeast-southwest, the majority of the survey lines were oriented northwest-southeast (Figure 2.5). Two lines (K and L) were oriented northeast-southwest to observe antithetic features.

Initially 12 lines (A through L) were proposed (refer to the 200 Area IWP; NASA, 2012[a]). Subsequently, one additional line (M) was added to examine the projection of any 200 Area geological features towards the 600 Area HWMU Closure a. Other factors for locating geophysical survey lines included the following:

1) The 11 northwest trending lines were designed to be parallel and separated by approximately the same distance (400 ft; 121.91 m) with the exception of the two end lines (J on the northeast [separated by 750 ft; 228.59 m] and M on the southwest [separated by 850 ft; 259.07 m]). This reduced the possibility of omitting important structural features. The gap between Lines I and J was necessary due to the infeasibility of conducting a geophysical survey through the 200 Area building complex. Line M was located in an area of significant interest relative to the 600 Area Investigation, between surface features that include the 600 Area Closure and 600 Area Overflow Lagoons.

2) Wherever possible, the lines were situated to pass over or near locations where borings have been advanced and monitoring wells have been installed. The boring logs and supplemental information (e.g., downhole geophysics, depth to the potentiometric surface, etc.) contained important information (e.g., depth to top of bedrock, changes in the alluvium with depth) that provided control when interpreting the geophysical field data.

3) Adjacent traverses were designed to begin and end in the same locations relative to the dominant, northeast-trending geological features. This improved the likelihood that the projection of a feature identified in one line would be observed in neighboring line(s).

The locations of the geophysical lines as the surveys were performed in the field are shown in Figure 2.5. Compared to the layout prior to beginning the survey (as presented in the approved IWP (NASA, 2012 [b]), the following deviations were required:

1) Line A was shifted to the northwest approximately 300 ft (91.44 m) so that it would completely overlap the extension of any northeast trending features detected at Line M.

2) Two of the existing lines (F and I) were extended to the northwest to intersect and investigate the nature of the 200 West Fault.

3) The portion of Line K in the 800 Area was reoriented a few degrees to the south to avoid the dense infrastructure (e.g., electrical grounding mats under structures) in the industrialized portion of that area.

4) Line M was added to extend the survey into the vicinity of the 600 Area to support the interpretation of the relationship between perched groundwater and the bedrock surface, if possible.

In all, the total length of all 13 survey lines was 23,581 ft (7,187.14 m). Each of the three geophysical surveys was conducted over this entire line length. Electromagnetic induction anomaly mapping was performed first, followed by electrical resistivity characterization (ERC) and then seismic refraction. In order to ensure maximum comparability between the data from different geophysical methods, all three types of surveys were run along the same survey lines with measurements taken at the same data points.

Data stations were primarily located at approximately 10-ft (3 m) intervals. However, in some cases increasing the maximum depth of imaging was desirable. This was particularly the case for the lines in the southwestern portion of the study area, where the alluvium was thickest. In those areas, the spacing between adjacent stations was doubled to approximately 20 ft (6 m). This increased the depth of imaging, but resulted in the loss of some detail for individual bedrock features.

2.2.4 Survey Line Field Preparation and Installation

WSTF personnel surveyed the location of each of the lines using Global Positioning System (GPS) equipment. A Trimble R8 GNSS satellite tracking system equipped with a Trimble NetR9 receiver and a Trimble TSC3 controller were used to locate and store grid point locations in the field to an accuracy of approximately 8 millimeters (mm; 0.3 in.) horizontally and 15 mm (0.59 in.) vertically. Trimble software was used to transfer the field data to points on the 200 Area basemap. The accuracy of this data transfer surpassed that of previous geophysical investigations. Northing and easting coordinates of points on each line were used to identify the locations of the lines in the field. Green painted stakes (Appendix A, Photograph A1) and green flagging tape were installed at the beginning of each line, at 300-ft (91.44 m) intervals along the line, and at the end of each line to aid in identification during the geophysical field work.

As the geophysical field work progressed, pink pin flags were placed at each data station along each line to ensure that the measurements from different types of surveys were taken at the same locations (Appendix A, Photograph A2). Once the pin flags were installed, the location of every data station was surveyed using GPS. This enabled HGI to accurately locate geophysical data of interest relative to surface features and display that data on figures incorporating the features. Figure 4-1 in the HGI report (Appendix B) illustrates the actual layout with some data points shown.

Since 11 of the geophysical survey lines crossed Apollo Boulevard, the only paved access to the 200, 300, and 400 Areas at WSTF, it was important to protect the geophysical cables crossing the road while minimizing disruption to site traffic. The solution was to utilize road crossing guards (Appendix A, Photographs A3, A4, and A5), which were made of interlocking 3-ft (0.91 m) sections. These guards could be expeditiously installed and removed and protected the cables from all types of vehicles.

Additionally, some survey lines were located in high traffic areas adjacent to the 200 Area buildings. Appendix A (Photograph A6) shows the location of Line I adjacent to the South Highbay. These surveys

were conducted on weekends to minimize disruption to 200 Area operations while also reducing the danger of traffic to the field crews.

2.2.5 Electromagnetic Induction Anomaly Mapping

The main objective for the electromagnetic induction survey that was performed first was to detect and map the location of buried metallic infrastructure and debris. Metal in the subsurface (e.g., a metal-cased pipe) will produce a noticeable anomaly in the electromagnetic data. An anomaly would appear as a high electrical conductivity spike. In this way, both known and unknown buried utilities were identified. These results were used to support the interpretation of the electrical resistivity survey.

2.2.6 Electrical Resistivity Characterization

The main objective for the electrical resistivity survey was to identify fluid-filled fractures. The ERC testing was conducted, and the data was collected utilizing an Advanced Geosciences Super Sting R8 resistivity unit. Electrodes (Appendix A, Photograph A7) were installed in the ground at each data station to a depth of approximately eleven inches. The surrounding soil was then hydrated to improve the electrical conductivity (Appendix A, Photograph A8).

A total of 84 electrodes at a time were connected to a central cable (Appendix A, Photograph A9) which was attached to the test instrument. The Super Sting resistivity unit was programmed to send electrical energy to each electrode in sequence. This made the electrode a low-amperage current transmitter. Simultaneously, the Super Sting resistivity unit measured the current being received using the nearby electrodes. Two cables were employed in series to ensure that sufficient data overlap occurred. The data control and recording equipment are shown in Appendix A (Photograph A10).

Two locations of seven electrodes each were installed at “infinity” to provide background resistance values. These were used to calibrate the Super Sting resistivity unit results. One infinity electrode location was placed approximately 4,000 ft (1,219.14 m) east of the WSTF site in an arroyo at the base of Quartzite Peak. The other was placed approximately 3,500 ft (1,066.75 m) to the south of the 200 Area. Electrode wire was run from each “infinity” electrode to the Super Sting resistivity unit.

2.2.7 Seismic Refraction

Seismic refraction techniques were used for determining depth to bedrock and bedrock structure. The seismic energy was generated by a PEG 40 Accelerated Weight Drop (AWD) propelled energy generator (Appendix A, Photograph A11). This device accelerated a 16 pound sledge hammer onto a steel plate placed on the ground. The AWD was mounted on an all-terrain vehicle for ease of moving it from station to station along each line across the desert.

A Geode Ultra-Light Exploration Seismograph with 24 channels was used to record the seismic refraction data. Seismic geophones (Appendix A, Photograph A12) were installed at the same stations as those used for the electrical resistivity testing. The geophones were installed 2-3 inches into the ground, with a cable linking them to the seismograph. As with the electrical resistivity, two cables were placed in series to ensure continuous readings during the testing.

2.3 Shallow Soil Vapor Survey

The shallow soil vapor survey was performed using a grid configuration (Figure 2.6) to evaluate a broad area centered on the 200 Area Closures. The survey grid incorporated areas of known HWMUs (UST Closures), SWMUs, additional AOIs identified in the HIS, and the adjacent drainages to the northwest

and southeast (which incorporated parts of the WSTF 100, 600, and 800 Areas). Photographic documentation of the shallow soil vapor survey field activities is provided in Appendix A, and Appendix C provides the final analytical reports provided by the sample module contactor Gore®[2] Surveys.

The passive soil vapor survey approach was determined to be the most suitable application for this investigation due to the potential multiple sources of contaminants released over an extended period of time (1964–1991) within a highly permeable vadose zone alluvium (with porosities up to 40%). The passive soil vapor collection technique can be more effective at relatively low contaminant concentrations due to an extended exposure or sampling period as opposed to the discrete volume/one time sampling strategy that soil vapor well sampling provides.

The survey was used to screen for VOCs that may indicate the presence of residual contaminant mass in the vadose zone. The objective was to provide reliable semi-quantitative data in order to locate additional AOIs that may qualify for further study during the Phase II soil boring and multi-port soil vapor monitoring (MSVM) well installation and sampling program. Elevated soil vapor contaminant mass may indicate potential residual soil contamination in the vadose zone and support definition of the position of the groundwater plume that has historically been associated with 200 Area soil vapor concentrations (NASA, 2011[a]; NASA, 2012[d]).

2.3.1 Overview of Soil Sampling Grid

The dimensions of the shallow soil vapor grid were approximately 1,800 ft (548.61 m) along the short (northwest) axis by 4,500 ft (1,371.53 m) along the long (northeast) axis (Figure 2.6). The shallow passive soil vapor survey grid incorporated the WSTF 200 Area and portions of the adjacent 100, 600, and 800 Areas, including areas of known historical UST and SWMU releases. From a geological and topographical perspective, the grid covers the area that surrounds the shallow and well-defined 200 Area bedrock block that trends northeast below the 200 Area buildings, as well as the adjacent drainages to the northwest and southeast (coincident with the 200 West Fault and 200 East Fault) that may have been the recipients of surface VOC discharges. The grid initially utilized a spacing of 250 ft (76.20 m) between grid nodes. The initial soil vapor grid was composed of eight nodes (short axis; A-H) by 19 nodes (long axis, 1-19), labeled as A1 through H19. Eight of the survey grid points were not collected due to inaccessibility or rock outcrop (E19; F18; F19; G18; G19; H17; H18; and H19). All of these grid points were located within the northeast corner of the grid (Figure 2.6).

A total of 239 soil vapor sampling modules were deployed during two phases of sampling (Phase I [a] - October 16 – 31, 2012, and Phase I [b] - December 14 – 27, 2012; Table 2.1). These points are summarized below:

[2] GORE® is a registered trademark of W.L. Gore & Associates, Inc.

- 144 – initial grid points (Phase I [a] installed in October).
- 26 – UST/SWMU/AOI sample points (Phase I [a] installed in October).
- 38 – supplemental grid points based on the results of initial sampling (Phase I [b] installed in December).
- 13 – conventional groundwater monitoring well sample points (data collected in October).
- 18 – trip blanks (collected in October and December with both sample sets).

As described in the approved Phase I Work Plan (NASA, 2012[b]), 26 additional soil vapor survey points were attempted (in pairs) as part of the initial grid in the vicinity of each of the two HWMU (UST Closure) locations, the five SWMU locations, and six new AOIs identified in the 200 Area HIS (NASA, 2012[a]) to provide increased definition in these areas (Figures 1.2 and 1.3; Table 2.1).

The additional survey point pairs were installed at all of the HWMUs, SWMUs, and AOIs with the following exceptions:

- Adjacent to the Scape Room Discharge Pipe SWMU, one of the borings (SR-1) intercepted a compressed air line at two ft (0.61 m) bgs that shut down installation operations for several hours. Due to the density of subsurface utilities in this area, another shallow boring was not attempted and only boring SR-2 was installed.
- Adjacent to the 270 Area Military Transport Vehicle AOI, the location of one of the existing grid nodes installed (H14) corresponded to a paired survey point (OS-2); therefore, only one additional point was installed (OS-1).

As part of the initial investigation, 13 conventional monitoring wells (all screened across the uppermost contaminated groundwater table) were equipped with soil vapor sampling modules as a control to compare shallow soil vapor results to a sampling environment where known groundwater contaminant concentrations exist through offgassing (Table 2.1). Analytical results for the sample modules installed within monitoring wells were not included within the shallow soil vapor survey contoured dataset. These sample modules were suspended inside the upper 2 ft (0.61 m) of monitoring well casing and the well sealed with a cap. All wells were designed with the top of their screened intervals located at between 109 to 240 ft (33.22 to 73.15 m) bgs. The monitoring well results were utilized for comparative purposes as they provide a direct conduit to the groundwater table. Contamination in these wells is verified through periodic sampling as part of the WSTF groundwater monitoring program, and from soil vapor monitoring within a select group of multip-port soil vapor groundwater monitoring (MSVGM) wells

2.3.2 Soil vapor Grid Field Preparation and Installation

GPS coordinates were recorded for the individual soil vapor sampling locations and for the start- and end-points of each grid line using teh survey methodology previously described. To ensure complete coverage of the 200 Area, the principal (long) axis of the soil vapor grid was oriented northeast-southwest, subparallel to the 200 Area East Fault within GSA. Individual soil vapor grid traverses were oriented perpendicular to the principal axis in a northwest-southeast direction (Figure 2.6). Each grid point was staked and flagged in the field in preparation for shallow boring installation. Each grid survey location was assigned an alpha-numeric location number (A1 through H19) to distinguish them from each other. Grid locations targeting HWMUs, SWMUs, or AOIs were given descriptive alpha-numeric identifications pertinent to each location.

A four-wheel-drive vehicle was used in the field to access shallow soil boring locations. Borings were installed using a Dewalt D25712K SDS max rotary hammer drill powered by a generator and 100-ft length extension cord. Each boring was drilled in two stages.

- Soils near the ground surface were characterized by loose and unconsolidated windblown sands. To prevent boring collapse, a modified ¾-in. diameter by 16-in. carbide hammer bit fitted with a drive collar was used to advance a ¾-in. inside-diameter by 15-in. length section of stainless steel conduit pipe into the ground with four in. of conduit stickup (Appendix A, Photograph A13). Each length of conduit pipe was decontaminated prior to installation using detergent wash and potable rinse water.
- The borings were subsequently drilled to a total depth of 32 in. using a $^{5}/_{8}$-in. diameter by 36-in. carbide hammer bit (Appendix A, Photographs A14 and A15). Soil vapor points located on asphalt surfaces were cored using the ¾-in. diameter carbide hammer bit. The depth of the soil boring was confirmed using a measuring rod prior to moving to the next soil boring location (Appendix A, Photograph A16). The soil borings were temporarily protected at surface by covering the conduit pipe with a plastic bag secured in place with electrical tape (Appendix A, Photographs A17 and A18). The rotohammer bit and the measuring rod were cleaned of any solid soil material and rinsed with de-ionized water between each boring installation.

Some adjustment of soil vapor grid point locations was necessary during staking and flagging where borings could not initially be advanced to the target depth due to the presence of roads, buildings, underground utilities, cultural resources, bedrock outcrop, cobble-sized obstructions within the alluvial gravel formation, or other field conditions. All modified locations were subsequently re-surveyed in the field and the locations imported to the grid basemap.

Following evaluation of sample results from the initial (Phase I [a]) soil vapor grid and points adjacent to known HWMUs, SWMUs, and AOIs, additional soil vapor sampling (Phase I [b]) was performed. A total of 38 supplemental soil vapor survey points targeted AOIs identified during evaluation of Phase I (a) data. At each of these areas, an additional set of Phase I (b) soil vapor borings and modules were placed between the existing grid nodes to supplement and refine areas where the initial soil vapor survey results indicated anomalous concentrations.

2.3.3 Soil vapor Field Sampling Techniques

The soil vapor screening survey was performed using Gore Modules (formerly Gore-Sorbers) during the two sampling phases.The use of Gore Modules for soil vapor sampling and screening surveys have been the subject of an EPA environmental technology verification report (EPA, 1998). The EPA indicated that the technology can provide useful, cost effective data for environmental problem solving.

Gore Modules are passive soil vapor samplers that collect a broad range of VOCs and SVOCs. Gore Module analyses include the suite of chlorinated solvents and chlorofluorocarbons previously identified in the 200 Area and surrounding areas. Each Gore Module contains two passive collection units called sorbers. Each sorber contains an equal amount of sorbent materials (polymeric and carbonaceous resins). These granular adsorbent materials are used because of their affinity for a broad range of VOCs and SVOCs. The sorbers are constructed of inert, hydrophobic, microporous GORE-TEX expanded polytetrafluoroethane that allows vapors to move freely across the membrane and onto the sorbent material. The microporous structure also protects the granular adsorbents from physical contact with water and soil particulates. Gore Modules are installed to a depth of between two to three ft (0.61 to 0.91 m) bgs. Samplers were manually inserted into each boring using a stainless steel push rod. The samplers were retrieved by hand using an attached string or cord, and analyzed by W. L. Gore & Associates facility in Elkton, MD.

The passive soil vapor collection technique can be more effective in identifying lower soil vapor contaminant concentrations due to the increased exposure time as compared to a one-time sampling strategy where a discreet volume of soil vapor is collected (for example SUMMA canister samples collected from WSTF MSVGM wells). The 200 Area HIS (NASA, 2012[a]) presents evidence of multiple potential sources of contaminants over the period between 1964 and 1991. The subsurface soils in the 200 Area consist of silty to sandy alluvial gravels with porosities typically between 30 to 40 percent. Because of the considerable amount of time that has transpired since vadose zone releases occurred, and the significant depth to the water table in excess of 100 ft (30.48 m) bgs, soil vapor concentrations in the vadose zone were anticipated to be low relative to concentrations that would characterize a continuing source or a single and more recent point source. The passive soil vapor collection technique therefore employed an extended exposure time of 13 days (a duration confirmed and approved by the W. L. Gore Laboratory).

The soil vapor grid, HWMU/SWMU/AOI sample points, and supplemental sample point designations were recorded along with the serial number of the individual Gore Module installed at each location on a Gore Survey Installation and Retrieval log (Table 2.2). Dedicated chemical resistant gloves (latex or nitrile) were worn by field personnel while installing and retrieving the modules. Each sampling location depth was measured prior to Gore Module installation. Any collapse incurred within the boring was recorded during the module emplacement; however, all borings remained open to a minimum depth of 20 in. bgs. Each module was taken from a correspondingly numbered glass vial and inserted into the base of the boring using a ¼-in. diameter stainless steel rod. The module serial number, corresponding field ID, sample type, date and time, observations, sample environment, soil type, etc. were recorded in the field logbook as a module was installed at each location.

Each Gore Module was suspended on a length of string inside the boring to facilitate retrieval. Each boring opening was then sealed at the surface with a cork that fit snugly into the ¾-in. conduit pipe at the sample location. The Gore Modules were installed within the borings for 13 days to maximize the exposure time and potential for detection of low level soil vapor contaminant concentrations. After the 13 day residence time, the sampling modules were retrieved and placed into the corresponding glass vial that they were shipped in. The time and date of Gore Module retrieval were recorded at each sample location. In order to keep the residence time constant, the Gore Modules were removed in the identical order and at a similar rate as they were emplaced. Chain-of-custody (CoC) seals were placed on each glass vial after it was sealed. The modules were then shipped to the W. L. Gore laboratory for analysis. Supplemental Phase I (b) samplers were deployed in the same manner and for the same duration as Phase I(a) samplers following receipt and evaluation of the Phase I (a) samples.

When all sampling was complete, the ¾-in steel conduit was removed from the borings. Soil vapor borings installed directly in soil were backfilled with a small volume of native soils following retrieval of the sampling modules and the completion of sampling. Borings installed through asphalt were backfilled with bentonite chips where necessary and capped with a cold patch asphalt plug.

2.3.4 Sample Management

Sample management techniques specific to the Gore Survey Laboratory were applied to the Gore Module samplers utilized for this investigation. Procedures presented in WSTF internal instructions for environmental sample management were followed during sample management operations wherever possible.

Sample modules were shipped to WSTF in a single batch by the laboratory on September 14, 2012. Individual sample modules were contained separately within 40 mL glass vials. The Gore Survey Laboratory specified that the sample modules could be used within three months of receipt, and that the

modules could be returned within individual shipments as long as they were used within this timeframe. Sample modules for this investigation were shipped in two batches: Phase I (a) on October 31, 2012; and Phase I (b) on December 14, 2012.

Sample modules were stored within a controlled office environment at a temperature of approximately 70º Fahrenheit prior to installation in the field. Trip blanks remained with the other modules during storage and travel to and from the field. During the period of field exposure between installation and collection, trip blanks were stored in the office. Each sample module and glass vial container was labeled with a unique serial number and sealed with a custody seal. The modules were deployed and retrieved as previously described. Each module was resealed in the glass vials provided and placed in the protective sampling boxes provided by the manufacturer.

The sample module shipments were returned by overnight carrier for laboratory analysis. Gore Surveys indicated that placing modules on ice after collection was not required. Samples were managed using an external CoC form provided by the laboratory. The CoC form recorded custody of the sample modules from the time of shipment from the laboratory, sample collection, and return delivery of the shipment. Upon receipt of the sample modules by the laboratory, the external CoC form was signed by the designated Gore Surveys representative (Appendix C).

Following shipment of the sample modules, an Installation and Retrieval e-Log (summarized in Table 2.2) was sent directly to the Project Manager at Gore Surveys. The e-Log listed the module serial numbers, installation and retrieval dates and times, soil information, GPS coordinates, and comments. Gore Surveys requested that the e-Log be completed electronically and sent via email.

2.3.5 Soil Vapor Data Processing

Gore Module serial numbers, field IDs, sample types, installation dates and times, retrieval dates and times, observations, sample environment, evidence for hydrocarbons/water, soil type, porosity, and moisture content were recorded where possible in the field installation and retrieval log (Table 2.2). Gore Module serial numbers were also noted in the field on a grid base map to confirm the installation locations for each module.

A summary of analytical quality assurance and soil vapor sampling were included with the Gore Surveys laboratory report (Appendix C). W. L. Gore & Associates operates under the guidelines of its International Organization for Standardization (ISO) accreditation, and its quality assurance (QA) manual, operating procedures, and methods. The Gore Modules were analyzed at the laboratory using thermal desorption-gas chromatography/mass spectrometry instrumentation following U. S. EPA Method 8260. Gore Surveys laboratory instrumentation consists of gas chromatographs with mass selective detectors and automated thermal desorption units. Sample preparation involves removing the tip of the bottom of the Gore Module, and transferring the sorbers to a thermal desorption tube for analysis. The insertion/retrieval cord prevents soil, water and other interferences from contacting the adsorbent. Data are archived and stored in a secure manner as per the Gore Surveys Quality Assurance Program.

For soil vapor sampling, soil vapor mass migrates through the open spaces of the soil and diffuses through the sampler membrane for sorption by the hydrophobic adsorbents within the membrane tube. During the migration of soil vapor from the source to the Gore Module, the vapors are subject to a variety of attenuation factors. Soil vapor signals reported by this analytical method cannot be correlated specifically to soil, groundwater, or free-phase contamination as the signal from the Gore Module may evolve from a combination of sources. Differentiation between soil and groundwater can be inferred based on prior knowledge of the site history. In the case of the 200 Area, both the direct discharge of

contaminants to the soil and the resultant contamination of the aquifer below are both known to have occurred.

2.3.5.1 Quality Assurance

The Gore Surveys Products Group laboratory operates under the guidelines of its ISO Standard 17025, DoD National Environmental Laboratory Accreditation Program (NELAP) accreditation, and its quality assurance manual, operating procedures, and methods (SPG-SOP-0462). For this project, the analytical method, results, and observations reported fall within the scope of the W. L. Gore ISO 17025 accreditation.

The Gore Modules were analyzed at a fixed laboratory using thermal desorption-gas chromatography/mass spectrometry (TD-GC/MS) instrumentation following U.S. EPA Method 8260 (SPG-WI-0292) which includes the following.

- Tuning Frequency: A tune is analyzed at the start of each analytical run and after every 30 samples.
- Initial Calibration: A minimum of a five point calibration curve is analyzed prior to the analysis of samples.
- Linearity of Target Compounds: If the relative standard deviation of any target analyte is less than or equal to 25% the average response factor can be used for quantitation. If the deviation exceeds 25% for a target compound, a regression equation can be used for quantitation.
- Continuing Calibration Verification: After every 10 samples and at the end of each analytical batch, a second-source reference standard is analyzed near the midpoint of the calibration curve. The acceptance criteria for all target analytes in the reference standards are +/- 50% of the true value.
- Method Blank: Analyzed prior to the analysis of field samples and every 30 samples.

2.3.5.2 Quality Control

All Phase I samples were received by the Gore Surveys with the tamper seals intact and the CoCs in place. The Phase I (a) samples were reveived on November 1, 2012, and the Phase I (b) samples were received on December 28, 2012. Analytical quality assurance/quality control was performed at the Gore Surveys laboratory. Data are archived and stored in a secure manner as per the Gore Quality Assurance Program.

A total of 18 trip blanks (16 during Phase I [a] and two during Phase I [b]) were collected to document potential exposures that were not part of the signal of interest (e.g., impact during sampler shipment, installation or retrieval, and storage). The trip blanks were identical to the modules installed in the field, and remained unopened during all phases of the project. No contaminant levels were reported on any of the trip blanks and no potential impact to the modules was indicated.

A total of five laboratory duplicates were analyzed during Phase I (b) sampling. Laboratory duplicate sampling was performed as a quality control check on the performance of the Gore Surveys laboratory. For field duplicates, a second set of adsorbent housed in the Gore Module was analyzed. The modules which required duplicate analysis were noted on the electronic installation and retrieval log (Table 2.2). The results of the five laboratory duplicate samples indicated that precision, as measured by the relative percentage difference of the duplicate results, was within the standard quality assurance objective of 50 percent for all target analytes. Method precision therefore also was assessed to be acceptable.

Total ion chromatograms are included with the Gore Survey Laboratory Reports (Appendix C). The eight-digit serial number of each module is incorporated in the total ion chromatogram ID (e.g., 12345678.D represents GORE Module 12345678).

3.0 Field Investigation Results

The field investigations for the geophysical and shallow soil vapor surveys were performed during the September through December 2012 timeframe. Geophysical survey activities were performed in September and October, and soil vapor survey activities were performed October through December. The coordinated overlap between field activities minimized any impact of the work on 200 Area testing activities and allowed the work to be completed before the onset of colder weather in January.

The results for the geophysical data have been summarized in part from the geophysical survey report provided in Appendix B. The results for the shallow soil vapor survey were interpreted fom the analytical data obtained from the Phase I (a) and Phase I (b) Gore Survey Laboratory Reports provided in Appendix C. Observations for the geophysical survey that are pertinent to the potential distribution of contamination are incorporated into the dicussions and figures for the soil vapor survey. In this way, both sets of data were considered with respect to the recommendation of additional soil boring locations for the Phase II 200 Area Closure Investigation.

3.1 Geophysical Survey Results

3.1.1 Electromagnetic Induction Anomaly Mapping

The results of the electromagnetic induction anomaly mapping are provided in the HGI report (Appendix B, Figures 2-5 and 2-6). As anticipated, the electromagnetic anomalies that were induced by infrastructure were concentrated in the vicinity of the 200 Area buildings. In the aggregate, these anomalies precluded interpretation of the resistivity data from the northern half of Line J, a 600-ft (182.87 m) segment of Line I, and an 800-ft (243.83 m) segment of Line K (Appendix B, Figure 5-10).

3.1.2 Electrical Resistivity Characterization

The ERC provided the majority of information to further define the subsurface in the study area. The data were presented in two dimensional plots of each geophysical traverse using “hot” colors (yellow, orange, red, brown) for areas of high resistance and “cool” colors (green, blue, violet) for areas of low resistance. The results are presented in Appendix A of the HGI report (Appendix B).

The bedrock lithology is primarily limestone, which is generally deficient in conductive minerals. The alluvium includes clasts of Tertiary volcanic rocks, which are more likely to contain minerals that transmit electrical currents. For these reasons, the general interpretation was that bedrock would have higher resistance than alluvium. ERC data on many of the traverses showed localized, discontinuous patches of high resistivity material immediately below the surface. The explanation for this feature is uncertain. It may indicate patches of near-surface caliche, which are known to occur in the study area. ERC results for specific survey lines are provided below. Bedrock elevation contours and specific structural features identified utilizing the geophysical data that are considered pertinent to the distribution of soil vapor are provided in Figure 3.1.

- Lines A and B: These two lines were at the southwestern end of the study area. Much of their length is believed to be underlain by andesite bedrock, which is unusual for the study. Unlike most of the lines further northeast, there were no areas of particularly high resistance. Assuming the andesite contains modest amounts of metallic or magnetic minerals that are common within

this type of lithology, this could explain that difference. Both lines exhibited lateral discontinuities in the patterns of resistance which could indicate fracturing.

- Line M: This line is presented out of alphabetic sequence because it represents the only line southwest of Line A. With the exception of a small area at the southern end, the entire line traversed materials of low resistance. Monitoring wells within this area adjacent to the 600 Area Closure all intercept relatively fresh and non-fractured andesite bedrock.
- Line C: This line intersected Apollo Boulevard where GSA crosses from east to west underneath, just west of the Road G Offset. This was the first line where higher resistivity material was observed (at the southeastern end of the line).
- Lines D and E: These lines were the first where most or all of the traverses were underlain by limestone bedrock. Much of the southeastern traverses were performed in areas of bedrock outcrop on the low hill southeast of GSA, and the high resistivity response in those areas is readily apparent. Line E illustrated the down-dropped area beneath GSA which was previously inferred from top-of-bedrock elevation data. The down-drop was not as apparent on Line D. Both lines indicated a second offset which is down-dropped to the northwest beneath Apollo Boulevard (referred to as the "Apollo Boulevard Fault"). The 200 East and Apollo Boulevard faults are subparallel in orientation a similar strike and displacement direction to the northwest. Together they define the 200 Area block. The 200 East Fault has a displacement of approximately 80 to 100 ft (24.38 to 30.48 m) and the Apollo Boulevard Fault is inferred to have a displacement of approximately 40 to 60 ft (12.19 to 18.19 m).
- Lines F and I: These lines were considered together because they were extended far enough to the northwest to intercept the 200 West Fault. The portion of Line F south of Apollo Boulevard was similar to Lines D and E. This was also true of Line I; however, for a distance of 700 ft (213.35 m) southeast of Apollo Boulevard, subsurface infrastructure interfered with the ERC data. North of Apollo Boulevard, the resistivity patterns were somewhat divergent. On Line F, a high resistivity pattern near the surface was underlain by a lower resistance zone. On Line I, there was a high resistivity zone which extended to depth from approximately 1,600 ft (487.66 m) to approximately 2,600 ft (792.44 m). This feature may possibly represent an elevated horst block in bedrock. A similar feature can be identified beneath the 200 Area buildings. At the northern end of this horst feature, a lower resistivity deep layer begins at approximately the location where the 200 West Fault would be extrapolated.
- Lines G and H: These lines were similar to each other and contained some similarities to Lines D, E, and the southern portion of Line F. Line G was shorter than Line H because Line G terminated at the southern end of the 200 Area Wastewater Lagoon. Noticeable in both lines, but especially Line H, was the zone of lower resistance in the northwestern end.
- Line J: This line extended just northwest of the 200 Area buildings and just southeast of the 800 Area buildings. Electrical infrastructure and vibrational noise made it impossible to interpret the northwestern half of the line. The southeastern half of Line J is interpreted to begin with bedrock outcrops and become a trough filled with alluvium, starting just south of the GSA and extending north as far as the data could be interpreted.
- Line K: At 5,300 ft (1,615.36 m), this was the longest traverse of the survey. It extended from the northeastern end of the 800 Area to Apollo Boulevard near the 600 Area Wastewater Lagoon. It was virtually perpendicular to lines A through J and intersected them all. For approximately 800 ft (243.83 m) adjacent to the 200 Area buildings, the ERC data for Line K was compromised by subsurface infrastructure. From its northeastern end until its intersection with Line E, Line K is interpreted to show that bedrock is at or near the surface. Just southwest of Line E, a noticeable depression in bedrock between two inferred juxtaposed northwest-trending faults forms a graben

(oriented to the northwest) that is cut into the bedrock. This feature extends to the southeast of Line J to incorporate the 200-D well cluster area and is referred to as the "200-D Graben". This graben feature could have channeled contaminated groundwater to the northwest towards well BW-4 and prevented its migration southwest towards the 100 and 600 Areas. Just before intersecting Line C, the zone of high resistivity on Line K plunges off the bottom of the cross-section. This is the Road G Offset described previously and is inferred to indicate the contact of limestone to the northeast with andesite to the southwest.

- Line L: This line was located parallel to and southeast of Line K but was much shorter in length. The northeastern end of the line is interpreted to show the near surface bedrock which is apparent in outcrop on this traverse. The bedrock can be observed in the bottom of the arroyo just northeast of well 200-C. The high resistivity patterns are interpreted to indicate that bedrock is down-dropped near well 200-C (which is consistent with the top of bedrock map). Approximately 600 ft (182.87 m) further southwest is the major decline in high resistivity readings which was noted in the Road G Offset and which was also observed in Line K. While it is believed that limestone is on both sides of the offset on Line L, the resistivity data indicates a definite drop in the top of bedrock elevation (Figure 3.1).

3.1.3 Seismic Refraction

The seismic refraction survey produced consistent data exhibiting a clean first break in seismic velocities (Appendix B, Appendix A of the HGI report). Initially, it was thought that this represented the transition from unconsolidated alluvium to bedrock. However, in approximately half of the locations, the depth of the change in seismic velocity was above the depth to the top of bedrock as indicated in soil boring records and downhole geophysical logs for monitoring wells (especially natural gamma ray records).

Examination of the boring logs suggests a possible explanation. The change in seismic velocity appears to correspond to a change in the nature of the alluvium. Above the seismic velocity change, the alluvium is primarily fine-grained material (fine-grained sand and smaller particles). Below the seismic velocity change, there appears to be a higher proportion of cobbles and larger materials in a "rubble zone."

The northern half of Line J, which was located adjacent to the North Highbay in the 200 Area, produced results that could not be reliably interpreted, even though the work was performed on a weekend. It is believed that the vibrational energy from air conditioning units in the vicinity degraded the results.

3.2 Shallow Soil Vapor Survey Results

Shallow soil vapor survey results were reported for two sets of Gore Module analyses. Gore Surveys laboratory reports are provided in Appendix C. The Phase I (a) survey for 170 Gore Modules that were deployed into the vadose zone and collected between October 16, 2012 and October 31, 2012 are provided in a Gore Survey laboratory report dated November 28, 2012. The Phase I (b) report for 38 Gore Modules deployed into the vadose zone and collected between December 14, 2012 and December 27, 2012 are provided in a Gore Survey laboratory report dated January 16, 2013.

3.2.1 Initial Survey Grid Points

The initial shallow soil vapor Phase I (a) survey incorporated the 250-ft (76.20 m) center grid sample points across the 200 Area and adjacent portions of the 100, 600, and 800 Areas in conjunction with target-specific sample points installed in pairs adjacent to known HWMUs, SWMUs, and additional AOIs. Analytical results including analytical data tables, concentration calculation methods, and total ion chromatograms are provided in Appendix C.

A total of 45 VOCs were analyzed for each sample module using EPA Method 8260 (Appendix C, analytical results tables for November 28, 2012 and January 16, 2013 reports). The results for the majority of compounds within the majority of samples as presented in the tables were either below the reporting limit (compound was observed at a level below the reporting limit) or non-detect ([ND] compound not detected at any level).

Five VOCs showed relatively consistent mass detections in the vadose zone and groundwater monitoring well locations: TCE; PCE; trichlorofluoromethane [Freon 11]; Freon 113; and,TPH. Four of the five compounds represent known contaminants that were historically discharged at surface in the 200 Area, or have been identified as a contaminant within the groundwater plume (TCE, PCE, Freon 11, and Freon 113). TPH was not one of the contaminants originally considered for evaluation, but was included because it represents one of the five VOCs for which detections were reported on a relatively consistent basis. Analytical results for the five VOCs are summarized in Table 3.1. Other VOCs included in the suite for soil vapor analysis that have also been identified within the groundwater plume at the WSTF 200 Area were not contoured due to the lack of any significant detections (Freon 123 and Freon 123A).

The analytical data for the five VOCs showing consistent detections were plotted using Surfer 9 contouring software by the Gore Surveys Laboratory. The analytical contour maps were then georeferenced to the WSTF basemap for the 200 Area and surrounding areas using the coordinates for existing groundwater monitoring wells in the area. Geophysical line locations, the location of pertinent geophysical structures (e.g. the northwest-trending 200-D Graben), the position of groundwater contaminant contours based on available monitoring well data, and potentiometric surface contours were also georeferenced to the soil vapor analytical data for interpretive purposes. Individual analytical contour maps for VOC mass were plotted for TCE (Figure 3.2), PCE (Figure 3.3), Freon 11 (Figure 3.4), Freon 113 (Figure 3.5), and TPH (Figure 3.6).

Four primary AOIs were identified for additional shallow soil vapor survey points using the Phase I (a) data. These areas were subsequently targeted during the Phase I (b) supplemental shallow soil vapor investigation for further evaluation. The individual VOC shallow soil vapor maps are discussed in the following sections with specific reference to the four AOIs identified.

3.2.1.1 TCE

The mean mass of TCE for all soil vapor samples collected in the vadose zone (excluding well samples) was the second highest of the five VOCs addressed in this report (2.02 µg). TCE soil vapor mass in the shallow vadose zone for the Phase I (a) survey ranged from ND (< 0.02 µg) to a maximum value of 39.45 µg at Point B15, which is located adjacent to the 200-D well cluster where the highest concentrations of TCE in WSTF groundwater have historically been detected. The module suspended in well 200-D-109 provided the highest analytical mass of TCE within any module (169.25 µg). The analytical contour map for TCE (Figure 3.2) identified three areas where elevated TCE mass, relative to the rest of the grid, were observed. Supplemental soil vapor points were subsequently assigned to these areas. The areas consisted of the following locations:

- AOI I – Point H5 (6.56 µg).
- AOI III – Points D7 (5.62 µg), D8 (4.52 µg), E7 (20.23 µg), and E8 (17.14 µg).
- AOI IV – Points B14 (8.45 µg), B15 (39.45 µg), C14 (10.36 µg), and D13 (7.13 µg).

3.2.1.2 PCE

PCE soil vapor mass in the shallow vadose zone ranged between ND ((< 0.02 µg) to a maximum value of 4.89 µg at Point C12, which is located northwest of the South Highbay and adjacent to the west side of Apollo Boulevard. The module suspended in well 200-D-109 provided the highest analytical mass of PCE within any module (130.06 µg). The mean mass of PCE in all soil vapor samples collected within the vadose zone (excluding well samples) was 0.25 µg.

The analytical contour map for PCE data (Figure 3.3) identified two areas where elevated PCE mass, relative to the rest of the grid, were observed. Supplemental soil vapor points were then assigned to these areas. Additional soil vapor points were not assigned to Point C12 due to the proximity of this area to the Clean Room UST that will be targeted as part of the Phase II investigation. In addition, the mass of PCE in soil vapor were low relative to the four other primary VOCs:

- AOI III - Points E7 (1.68 µg) and E8 (1.47 µg).
- AOI IV - Point B15 (4.73 µg).

3.2.1.3 Freon 11

The mean mass of Freon 11 in all soil vapor samples collected in the vadose zone (excluding well samples) was the lowest of the five VOCs discussed in this section (0.23 µg). Soil vapor mass in the shallow vadose zone for Freon 11 ranged from ND ((< 0.05 µg) to a maximum value of 3.03 µg at Point B17, which is located northwest of the South Highbay adjacent to the west side of Apollo Boulevard. The second highest result was 2.92 µg at Point CL-2, located above the location of the former Chemistry Lab UST. The module suspended in well 200-B-240 provided the highest analytical mass within any module at 50.34 µg.

The analytical contour map for Freon 11 data (Figure 3.4) supported the identification of one additional AOI where elevated Freon 11 mass was observed and supplemental soil vapor points were assigned. Additional soil vapor points were not assigned to Point CL-2 (Chemistry Lab UST) because this area will be targeted as part of the Phase II investigation.

- AOI IV - Point B17 (4.73 µg).

3.2.1.4 Freon 113

The mean mass of Freon 113 in all soil vapor samples collected in the vadose zone (excluding monitoring wells) was the highest of the five VOCs addressed in this report (11.14 µg). Freon 113 soil vapor mass in the shallow vadose zone ranged from ND (< 0.05 µg) to a maximum value of 99.83 µg at Point D8, which is located adjacent and west of Apollo Boulevard and to the northeast of the 200-D Graben. The next two highest values were Points C4 (60.63 µg) and C5 (53.26 µg), located west of Apollo Boulevard on the 200-D Graben. These points correlate well with the position of the 200-D Graben identified from the geophysical data. The module suspended in well 200-D-109 provided the highest analytical mass of Freon 113 (130.33 µg). The Freon 113 analytical contour map (Figure 3.5) identified all four AOIs listed in Section 3.2.4 where elevated mass, relative to the rest of the grid, were observed. Supplemental soil vapor points were subsequently assigned to these areas.

- AOI I - Point G5 (19.01 µg);
- AOI II – Points D8 (99.83 µg), C4 (60.63 µg), and C5 (53.26 µg);
- AOI III - Point D9 (38.66 µg); and,

- AOI IV - Point C14 (18.01 µg).

3.2.1.5 TPH

TPH soil vapor mass in the shallow vadose zone ranged from ND (< 0.5 µg) to a maximum value of 9.17 µg at Point B10, which is located adjacent to the 200-D well cluster where the highest concentrations of the contaminant TCE have been historically detected in groundwater. The module suspended in well 600-C-173 provided the highest TPH analytical mass (37.46 µg). The mean mass of TPH in all soil vapor samples collected from the vadose zone (excluding monitoring wells) was 0.42 µg. The five highest values for TPH were all identified within modules that were suspended in groundwater monitoring wells. The analytical contour map for TPH data (Figure 3.6) did not identify any AOIs where elevated TPH mass was observed relative to the rest of the grid.

3.2.2 Supplemental Survey Grid Points

A total of 38 Phase I (b) supplemental survey points were added to the original soil vapor grid based on the results of the Phase I (a) survey. A discussion of the installation strategy for the Phase I (b) grid points is provided in Section 2.3 of this report. The Phase I (b) points were used to provide further delineation of the four additional AOIs identified in Section 3.2.4 of this report. The supplemental points were generally installed midway between the existing 250-ft (76.20 m) grid notes, yielding localized grid node separations of 125 ft (38.10 m). Figure 3.7 shows the location of the supplemental grid points added with respect to the AOIs identified using the Phase I (a) shallow soil vapor data. Sample installation and collection techniques, Gore Module exposure time, and analytical methods utilized for the Phase I (b) sample points were identical to those used during Phase I (a).

The same five compounds as observed for the Phase I (a) survey again showed consistent detections: TCE (maximum value 68.28 µg [Point S23]); PCE (maximum value 5.41 µg [Point S23]) ; Freon 11 (maximum value 0.80 µg [Point S11]); Freon 113 (maximum value 86.32 µg [Point S20]); and, TPH (maximum value 5.14 µg [Point S22]). The Phase I (b) analytical results from the vadose zone for these contaminants are included in Table 3.1. Only the maximum value for TCE for the Phase I (b) survey exceeded the maximum value in the vadose zone reported for Phase I (a). The elevated TCE at points S23 (68.28 µg) and S25 (59.22 µg) exceeded the Phase I (a) maximum and were both located in Area III adjacent to the 200-D well cluster where TCE concentrations in soil gas and groundwater (from MSVGM wells) are known to be the highest on-site at WSTF.

The analytical data for the Phase I (b) sample points were combined with data from the Phase I (a) sample points by the Gore Surveys laboratory and all of the data were incorporated into the individual analytical contour maps (Figures 3.2 through 3.6). The supplemental Phase I (b) sample point mass results were compatible in value with the results obtained from the Phase I (a) survey. The supplemental points were effectively integrated with the original data to effectively improve delineation of the four AOIs identified.

4.0 Regulatory Criteria

The data generated during the Phase I investigation described in this report are not comparable to regulatory criteria. Data generated during the geophysical surveys are qualitative in nature and served to refine NASA's understanding of the subsurface environment in the 200 Area. The soil vapor concentrations derived from the Gore Module samplers are reported as a total mass of analyte absorbed onto the sample cartridge. Results are not quantitative and cannot be statistically compared to soil vapor analytical results obtained from sampling a single point, nor can they be compared to regulatory criteria. Regulatory criteria do not currently exist for soil vapor, though site-specific soil vapor levels have been proposed for use at WSTF (NASA, 2012[c]).

NASA expects to generate data during and following the Phase II investigation that can be directly compared to the applicable regulatory criteria, which are expected to consist of NMED soil action levels and site-specific regulatory criteria for soil vapor, once established.

4.1 Sample Data Evaluation

The soil vapor concentrations derived from the Gore® Module samplers are reported as a total mass of analyte absorbed onto the sample cartridge. Results are not quantitative and cannot be statistically compared to soil vapor samples collected, for example, from MSVM wells where soil vapor sampling method data is reported as a mass of analyte detected per liter of air; however, the shallow soil vapor survey point results for the Phase I investigation can be compared to each other. The comparison is enhanced by keeping the installation and collection techniques and other parameters such as the exposure time consistant.

The Phase I shallow soil vapor survey data was were used to locate additional AOIs for soil borings within the 200 Area. The regulatory criteria that will be applied to the 200 Area Phase II investigation will comprise NMED soil action levels and RBCs for soil vapor, once established.

5.0 Conclusions

The geophysical survey resulted in the improved resolution of the shallow bedrock surface and the identification of several primary structures, some of which are inferred to have a potential influence on the migration of contaminants within the vadose zone and groundwater. Selected structures identified during evaluation of the geophysical survey data were incorporated into the interpretation of the shallow soil vapor survey results and used to support the development of conclusions and recommendations for this phase of the investigation.

5.1.1 Geophysical Survey

Based on interpretation of the geophysical data, the following conclusions are made.

- There is pervasive bedrock fracturing beneath the 200 Area. Figure 5-10 in the final report by HGI (Appendix B) indicates the locations of the fractures interpreted from the survey data.
- Primarily, those fractures are part of an orthogonal system, with one fracture set trending northeast–southwest (parallel to primary faulting) and the other fracture set trending northwest–southeast (parallel to the northern projection of the Hardscrabble Hill fault).
- The primary faults identified from southeast to northwest are the 200 East Fault, Apollo Boulevard Fault, and 200 West Fault. All strike northeast–southwest. The other primary feature identified in Line K is the 200-D Graben that is defined by two subparallel faults that strike northwest–southeast perpendicular to the primary structural grain.
- A new offset running northwest–southeast (i.e., subparallel to the Hardscrabble Hill Fault extension) was detected in Lines K and L. This offset is near the location of a limestone–andesite boundary having the same orientation. Given the confirmation from different lines of evidence, this feature was incorporated in the reinterpretation of the top of bedrock elevation for the 200–600 Area (Figure 3.1) following the conclusion of the geophysical survey. Because it crosses Apollo Boulevard close to the Road G intersection, it is called the Road G Offset in this report.
- Lines D through I include a series of resistivity offsets in the vicinity of the 200 East Fault. These are consistent in location and trend with the displacement.

- Lines D through H indicate a displacement at or just north of Apollo Boulevard (Apollo Boulevard Fault). This is consistent with a fault mapped in that area by Maciejewski (1996).
- Lines F and I crossed the projection of the 200 West Fault. Line I exhibited a strong offset in that area, while the data from Line F is more equivocal. This supports the hypothesized offset, but further work would be needed to confirm it.
- The ERC data was not interpreted to indicate that major fluid-filled fractures control the bulk of the migrating groundwater. Rather, the data was interpreted to indicate that a dense network of fractures and solution cavities in the limestone promote migration of contaminated groundwater.

5.1.2 Shallow Soil Vapor Survey

The shallow soil vapor survey was performed in two phases (Phase I [a] and Phase I [b]). Four primary AOIs were identified using the Phase I (a) shallow soil vapor survey data. The four AOIs were subsequently evaluated in more detail using Phase I (b) supplemental shallow soil vapor survey points. The four AOIs are provided in Figures 3.2 through 3.6. Selected geophysical data was also used to support definition of these areas. A summary of the four areas is provided below.

- AOI I is located on the southeast edge of the grid and centered on points H5, H6, and H7. This area was identified through increased concentrations of TCE and Freon 113. Although the soil vapor concentrations are low relative to the other anomalous areas, this area is isolated and located upgradient relative to the known historical operations and the groundwater plume and therefore warranted further evaluation with Phase I (b) soil vapor sampling. Rock outcroppings within this area are common, and the depth to bedrock is inferred to be from 0–3 ft (0–0.91 m) bgs based on field observations and shallow soil boring installation activities.
- AOI II is located in the area that corresponds to the northwest trending 200-D Graben, identified by the geophysical survey. The definition of this area was also supported by the increased concentration of Freon 113 in the shallow soil vapor. This area is centered on grid points C5 and C6 located within the 200-D Graben on the west side of Apollo Boulevard. Bedrock is inferred to be located at a depth of approximately 150 ft (45.72 m) bgs in this area.
- AOI III is located in the area to the northeast of the 200-D well cluster adjacent to the location of the Apollo Boulevard Fault identified by the geophysical survey. This area was identified through increased concentrations of TCE, PCE, and Freon 113. The area is centered on grid points E7 and E8 and is located adjacent and north of existing MSVGM wells 200-SG-1 and 200-SG-2. Bedrock is inferred to be located at a depth of approximately 80 ft (24.38 m) bgs based on geophysical survey data and adjacent well installations.
- AOI IV is located north of the 200 Area Clean Room and Clean Room Discharge Pipe SWMU on the west side of Apollo Boulevard and north of Road L. This area was identified through increased concentrations of TCE, PCE, Freon 11, and Freon 113, and is potentially related to the Apollo Boulevard fault identified during the geophysical survey. The area is centered on grid points B14, B15, and C14 within an area of shallow bedrock of approximately 15 ft (4.57 m) bgs based on the geophysical survey and SWMU historical soil borings installed adjacent to the Clean Room Discharge Pipe (NASA, 1996).

6.0 Recommendations

The results of the geophysical and shallow soil vapor surveys were used to identify four additional AOIs that warrant additional investigation as part of the 200 Area Closure Phase II Investigation. The recommendations provided in this section are made based on an evaluation of:

- Results of the geophysical surveys.
- The revised top-of-bedrock map.
- Bedrock lithologies and contacts inferred for the 200 and 600 areas.
- The results of the shallow soil vapor survey coupled with VOC groundwater analytical contour lines and potentiometric surface contours for the 200 and adjacent areas.

A total of nine soil borings (borings 200-SB-1 to 200-SB-9) were originally recommended for the Phase II investigation in the 200 Area Closure IWP (NASA, 2012[a]) with the condition for additional boring locations based on the Phase I investigation. Of the nine original borings, two borings were located in the vicinity of the two former UST locations (total four borings) and one soil boring in the vicinity of each of the five identified SWMUs in the WSTF Permit (four of which have been previously investigated with soil borings). The borings were designed to be installed to within 2 ft (0.61 m) of the alluvium–bedrock contact. NMED subsequently disapproved this IWP on May 22, 2012 (NMED, 2012[b]) with the request that the Phase I and Phase II IWPs be submitted separately and that the Phase II IWP include the exact number and locations of additional Phase I AOI soil borings. NASA recommends installing the nine originally proposed borings as indicated in the 200 Area Phase II IWP, submitted concurrently with this report under separate cover.

NASA also recommends the installation of a soil boring in each of the AOIs identified during the Phase I investigation, for an additional five borings. Figure 6.1 shows the proposed location of five additional soil borings to the alluvium-bedrock contact (borings 200-SB-10 to 200-SB-14). The rationale for each of the additional soil boring locations is summarized below.

- Boring 200-SB-10 targets the maximum concentration soil vapor point identified within AOI I. The soil boring is located on the southeast edge of the shallow soil survey grid adjacent to point H5. This area is characterized by increased concentrations of TCE and Freon 113, although these are relatively low compared to the other AOIs identified. This soil boring is located upgradient from any reported historical operations and the groundwater plume and is of interest relative to the identification of a potentially upgradient release target.
- Boring 200-SB-11 is located in AOI II and is intended to investigate the 200-D Graben. This bedrock graben was identified by the geophysical survey and contains increased concentrations of Freon 113 identified in the shallow soil vapor survey. The soil boring is located between points C5 and C6 that define the 200-D Graben on the west side of Apollo Boulevard adjacent to the Apollo Boulevard Fault.
- Boring 200-SB-12 is found in AOI II at the location that defines the center of the Freon 113 shallow soil vapor plume. This area also coincides with the Apollo Boulevard Fault that runs parallel to, and just to the west of Apollo Boulevard. The soil boring is located between points D7 and D8 adjacent to Apollo Boulevard.
- Boring 200-SB-13 targets the primary TCE soil vapor plume located within AOI III. This location was also characterized by increased concentrations of PCE and Freon 113. The boring is located adjacent to soil vapor point E7.
- Boring 200-SB-14 is located within AOI IV, which was the only area identified through increased concentrations of four VOCs; TCE, PCE, Freon 11, and Freon 113.The soil boring is located adjacent to soil vapor point B15.

7.0 References

EPA. "Environmental Technology Verification Report – Soil vapor Sampling Technology – W.L Gore & Associates, Inc. GORE-SORBER Screening Survey." EPA/600/R-98/095. August, 1998.

EPA Guidance on Systematic Planning Using the DQO Process, 2006

GCL. "Shallow Soil Gas Investigation at the NASA-Johnson Space Center White Sands Test Facility Interim Report." Geoscience Consultants, Ltd. Albuquerque, New Mexico, December 22, 1986.

Gilmer, A. L., Mauldin, R. A., and Keller, G. R. A gravity study of the Jornada del Muerto and Palomas Basins. New Mexico Geological Society, Guidebook 37, p. 131 – 134, 1986.

HGI. "Geophysical Characterization of the National Aeronautics and Space Administration's White Sands Test Facility: 200 Area and Adjacent Portions of the 100, 600 and 800 Areas Las Cruces, NM." HydroGEOPHYSICS, Inc. Tucson, Arizona, December 2012.

Maciejewski, T.J. Integrated Geophysical Interpretation of Bedrock Geology, San Andres Mountains, New Mexico, University of Texas at El Paso Masters Thesis, December 1996.

Maciejewski, T. J. Geophysical Interpretation of subsurface Geology, Pediment of the San Andres Mountains to the Jornada del Muerto Basin, New Mexico. New Mexico Geological Society Guidebook, 49th Field Conference, Las Cruces Country II, 1998.

NASA. "Shallow Soil Boring Investigation NASA-Johnson Space Center White Sands Test Facility." NASA-JSC, Las Cruces, New Mexico. September 22, 1987.

NASA. "Draft RCRA Facility Investigation and Corrective Measures Study Reports NASA White Sands Test Facility." NASA Johnson Space Center White Sands Test Facility, Las Cruces, NM. March 1996.

NASA. "Well 200-D Area Vadose Zone Investigation Report NASA White Sands Test Facility." NASA Johnson Space Center White Sands Test Facility, Las Cruces, NM. May 19, 2004.

NASA. "White Sands Test Facility Job Instruction ENV-0084.A Environmental Sample Management". NASA White Sands Test Facility, Las Cruces, NM. January 28, 2010.

NASA. 200/600 Area Soil vapor and Groundwater Data Evaluation Report. NASA White Sands Test Facility, Las Cruces, NM. March 30, 2011(a).

NASA. "NASA White Sands Test Facility (WSTF) 200 Area Investigation Work Plan and 200 Area Historical Information Summary." NASA Johnson Space Center White Sands Test Facility, Las Cruces, New Mexico. March 28, 2012(a).

NASA. "Response to NMED Disapproval – NASA White Sands Test Facility (WSTF) 200 Area Investigation Work Plan and 200 Area Historical Information Summary." NASA Johnson Space Center White Sands Test Facility, Las Cruces, New Mexico. June 20, 2012(b).

NASA. "Development of Site-specific Risk-based Regulatory Criteria for Soil Vapor at White Sands Test Facility." NASA Johnson Space Center White Sands Test Facility, Las Cruces, New Mexico. June 2012(c).

NASA. “200/600 Area Semi-Annual Soil Vapor and Groundwater Data for NASA White Sands Test Facility – June 2012 Data.” NASA Johnson Space Center White Sands Test Facility, Las Cruces, New Mexico. November 5, 2012(d).

NASA. “NASA WSTF 200 Area Investigation Phase I Status Report – Proposed Alternate Format.” NASA Johnson Space Center White Sands Test Facility, Las Cruces, New Mexico. December 13, 2012(e).

NMED. “Hazardous Waste Permit, EPA ID No. NM8800019434, to United States National Aeronautics and Space Administration for the White Sands Test Facility Located in Doña Ana County, New Mexico”, Issued by the New Mexico Environment Department Hazardous Waste Bureau, Santa Fe, New Mexico. November 2009.

NMED. “Risk Assessment Guidance for Site Investigations and Remediation.” New Mexico Environment Department, Santa Fe, New Mexico. February 2012(a).

NMED. Disapproval 200 Area Closure Investigation Work Plan and 200 Area Historical Information Summary National Aeronautics Space Administration (NASA) Johnson Space Center White Sands Test Facility (WSTF) Doña Ana County, New Mexico EPA ID #NM08800019434 HWB-NASA-12-005. New Mexico Environment Department Hazardous Waste Bureau, Santa Fe, New Mexico. May 22, 2012(b).

NMED. Approval 200 Area Closure Investigation Work Plan National Aeronautics Space Administration (NASA) Johnson Space Center White Sands Test Facility (WSTF) Doña Ana County, New Mexico EPA ID #NM08800019434 HWB-NASA-12-005. New Mexico Environment Department Hazardous Waste Bureau, Santa Fe, New Mexico. June 28, 2012(c).

NMED. “Approval of Alternate Investigation Report Format” National Aeronautics Space Administration (NASA) Johnson Space Center White Sands Test Facility (WSTF) Doña Ana County, New Mexico EPA ID #NM08800019434. New Mexico Environment Department Hazardous Waste Bureau, Santa Fe, New Mexico. December 21, 2012(d).

Reynolds, C. B. Final Report – Shallow Seismic Reflection Survey NASA Lyndon B. Johnson Test Facility Area, Dona Ana County, New Mexico. On file at NASA White Sands Test Facility. December 30, 1988.

Figures

Figure 1.1 **WSTF Location Map**

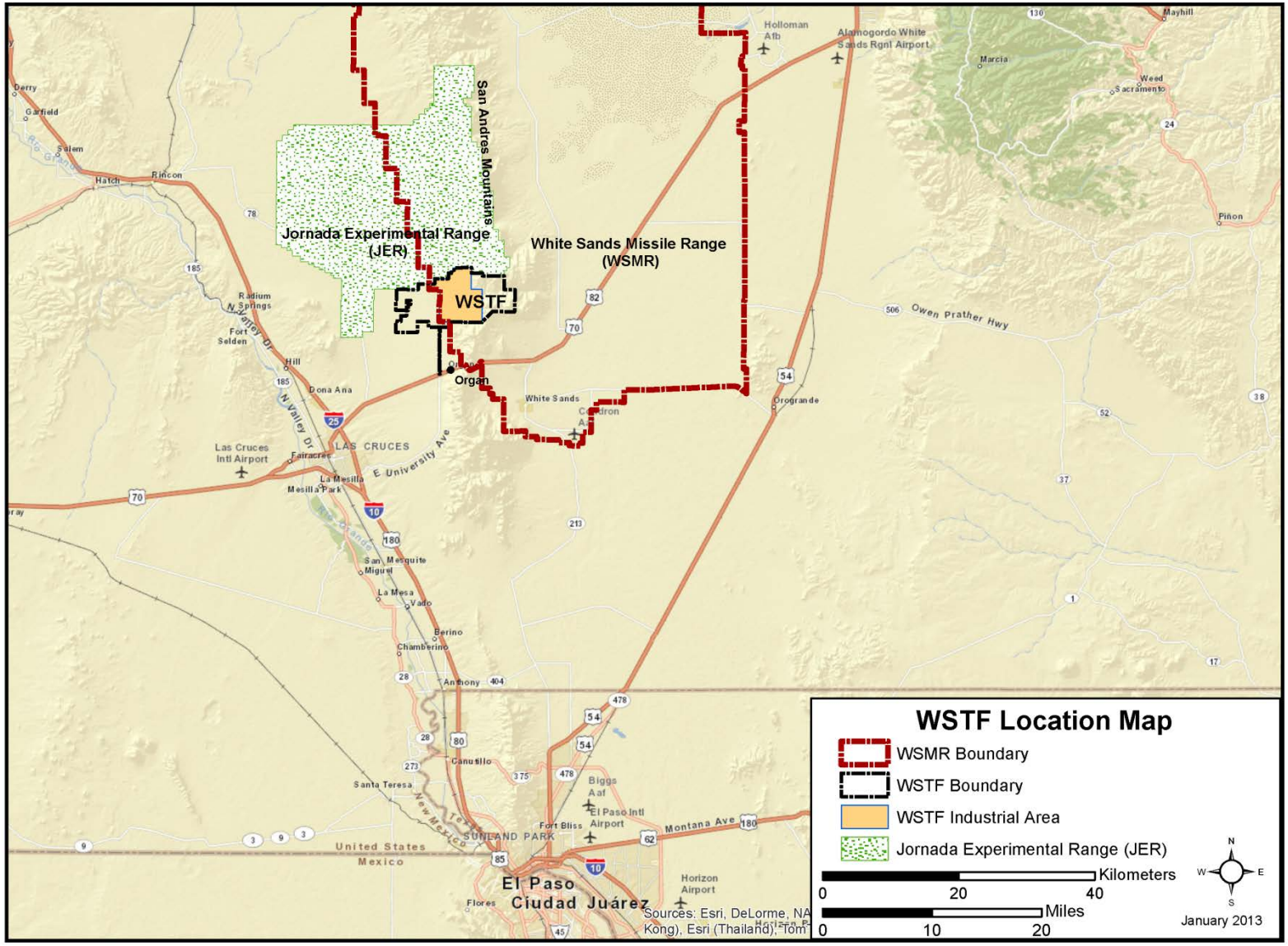


Figure 1.2 200 Area Location, Buildings, and SWMUs

SEE NEXT PAGE

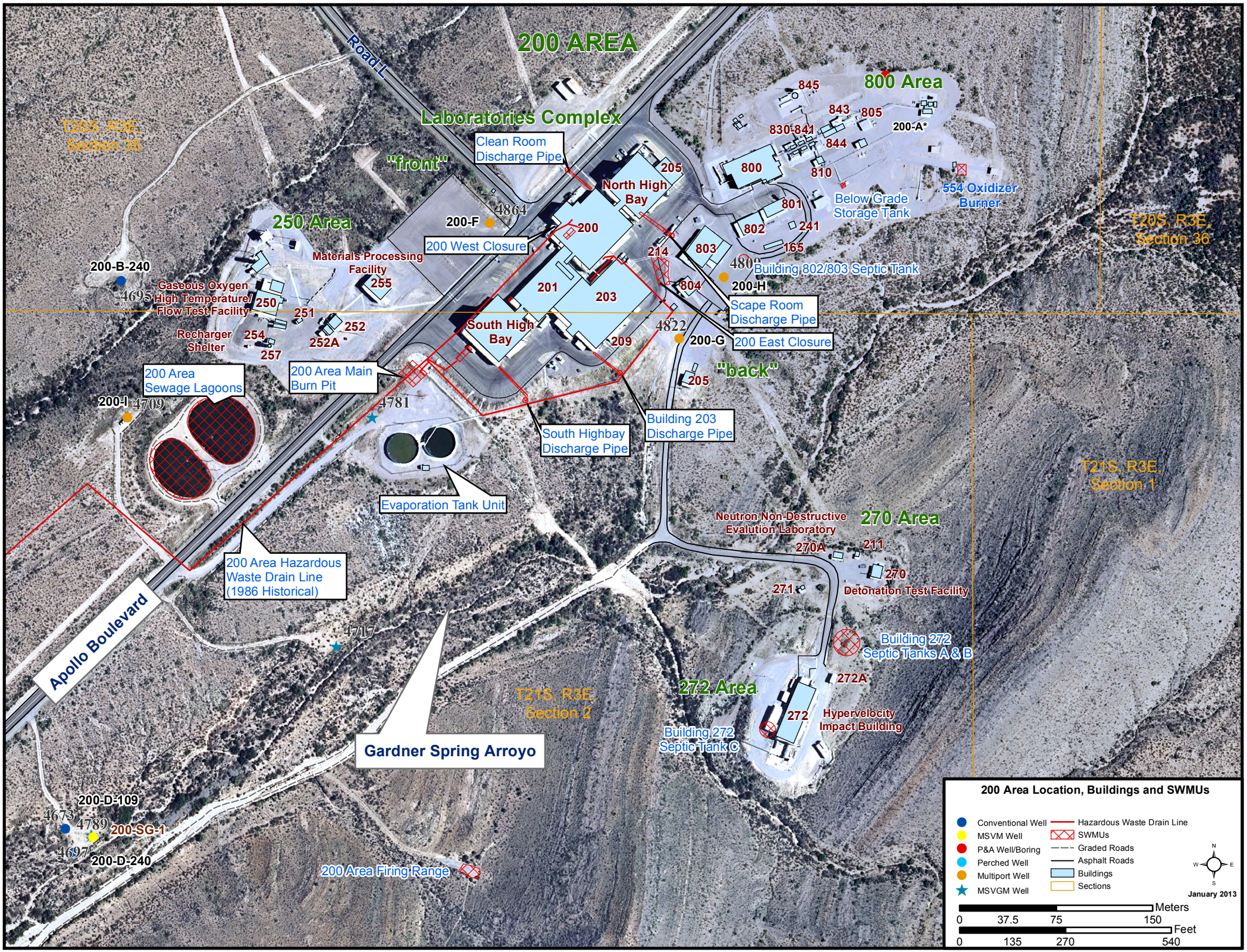

200 AREA
Road L
Laboratories Complex
"front"
Clean Room Discharge Pipe
North High Bay
205
200
200-F
4864
200 West Closure
250 Area
Materials Processing Facility
255
Gaseous Oxygen High Temperature Flow Test Facility
250
251
252
252A
254
257
Recharger Shelter
200-B-240
4695
201
203
South High Bay
209
214
803
804
4809
200-H
Building 802/803 Septic Tank
Scape Room Discharge Pipe
4822
200-G
200 East Closure
"back"
205
200 Area Main Burn Pit
4781
200 Area Sewage Lagoons
200-I
4709
South Highbay Discharge Pipe
Building 203 Discharge Pipe
Evaporation Tank Unit
200 Area Hazardous Waste Drain Line (1986 Historical)
Apollo Boulevard
4717
Gardner Spring Arroyo
T20S, R3E, Section 35
T20S, R3E, Section 36
T21S, R3E, Section 1
T21S, R3E, Section 2
800 Area
845
843
805
830
841
844
810
800
200-A*
801
802
241
165
Below Grade Storage Tank
554 Oxidizer Burner
Neutron Non-Destructive Evalution Laboratory
270 Area
270A
211
270
Detonation Test Facility
271
Building 272 Septic Tanks A & B
272A
272 Area
272
Hypervelocity Impact Building
Building 272 Septic Tank C
200-D-109
4673
4789
200-SG-1
4697
200-D-240
200 Area Firing Range
200 Area Location, Buildings and SWMUs
Conventional Well
MSVM Well
P&A Well/Boring
Perched Well
Multiport Well
MSVGM Well
Hazardous Waste Drain Line
SWMUs
Graded Roads
Asphalt Roads
Buildings
Sections
N
W
E
S
January 2013
Meters
0
37.5
75
150
Feet
0
135
270
540

Figure 1.3 **200 Area Additional Areas of Interest**

Figure 2.1 **WSTF Alluvial Thickness Map**

SEE NEXT PAGE

Location Name	Alluvial Thickness
100-A-182	87
100-B(2)*	185
100-B*	195
100-C-365	233
100-D-176	176
100-E-261	145
100-F-358	150
100-G-223	31
100-HG-139	117
200-A*	70
200-B-240	145
200-C	35
200-D-109	115
200-D-240	95
200-E*	150
200-F	17
200-G	55
200-H	75
200-I	130
200-JG-110	79
200-SG-1	92
200-SG-2	90
200-SG-3	80
300-A-120	115
300-A-170	102
300-B-166	110
300-C-128	92
300-D-153	75
300-E	95
300-F-175	39
400-A-151	170
400-B*	> 60
400-C-118	150
400-C-143	147
400-D	145
600-C*	
600-C-173	
600-C-210	
600-C-437*	
600-D	
600-E	
600-G-138	146
600-SG-2	
600-SG-3	
600-SG-4	
600-SG-5	
600-SG-6	
600-SG-7	
600-SG-8	
600-SG-9	
600-SVE-1	
600-PZ-1*	
600-PZ-2*	
700-A-253	149
700-B-510	285
700-D-186	180
700-E-458	285
700-F-455	305
700-G*	260
700-H	200
700-J-200	110
BLM-1-435	457
BLM-10-517	> 568
BLM-11*	253
BLM-12*	255
BLM-13-300	220
BLM-14-327	270
BLM-15*	
BLM-15-305	256
BLM-16*	307
BLM-17-493	500
BLM-17-550	500
BLM-18-430	375
BLM-2-482	
BLM-2-630	648
BLM-21-400	304
BLM-22-570	325
BLM-23-431	350
BLM-24-656	310
BLM-24-Deep*	306
BLM-25-455	305
BLM-26-404	310
BLM-27-270	230
BLM-28	300
BLM-29*	370
BLM-3-182	
BLM-30	380
BLM-31	192
BLM-32	378
BLM-33*	328
BLM-34*	360
BLM-35*	370
BLM-36	325
BLM-37	> 1,020
BLM-38	310
BLM-39	360
BLM-4*	
BLM-5-527	363
BLM-6-488	350
BLM-7-509	> 557
BLM-8-418	418
BLM-9-419	340
BW-2*	234
BW-3-180	171
BW-4	230

Location Name	Alluvial Thickness
BW-1-268	185
BW-5-295	224
BW-6-355	238
BW-7-211	175
IS-1	304
J-PZ-1+	
J-PZ-2+	
J-PZ-3+	
J-PZ-4+	
J-PZ-5+	
JER-1	560
JER-2	394
JP-1-424	
JP-2-447	
JP-3	
MPE-1	250
MPE-10	235
MPE-11	310
MPE-2	264
MPE-3	355
MPE-4	375
MPE-5	340
MPE-6	352
MPE-7	340
MPE-8	
MPE-9	
NASA 1	
NASA 10	95
NASA 2	
NASA 3	110
NASA 4	125
NASA 5	100
NASA 6	
NASA 7	
NASA 8	
NASA 9	
PFE-1	652
PFE-2	
PFE-3	
PFE-4	660
PFE-4A	
PFE-5	520
PFE-6	498
PFE-7	> 720
PFI-1	> 1,020
PFI-2	> 1,020
PFI-3	> 1,020
PFI-4	890
Pilot 1*	400
Pilot 3*	350
Pilot 4*	
PL-1-486	> 537
PL-10	> 1,020
PL-2-504	
PL-3-453	
PL-4-464	
PL-5	1,007
PL-6	
PL-6*	
PL-7	> 804
PL-8	
PL-9*	
PT-PZ-1*	
PT-PZ-2*	
PT-PZ-3*	
PT-PZ-4*	
ST-1-473	
ST-1-541	
ST-1-630	609
ST-2-466	
ST-3-486	
ST-3-586	586
ST-3-666	595
ST-3-735	610
ST-4-481	
ST-4-589	
ST-4-690	
ST-5	> 1,210
ST-5-481	
ST-6	> 1,010
ST-7	> 1,020
WB-1	
WB-14	280
WB-15*	308
WB-2	
WB-3	
WB-4	277
WB-5	160
WB-6*	270
WB-7*	220
WB-8	195
WB-9	129
Well I	
Well J	
Well K	
WW-1-452	
WW-2	> 1,020
WW-3	> 1,025
WW-4	> 1,020
WW-5	> 1,020

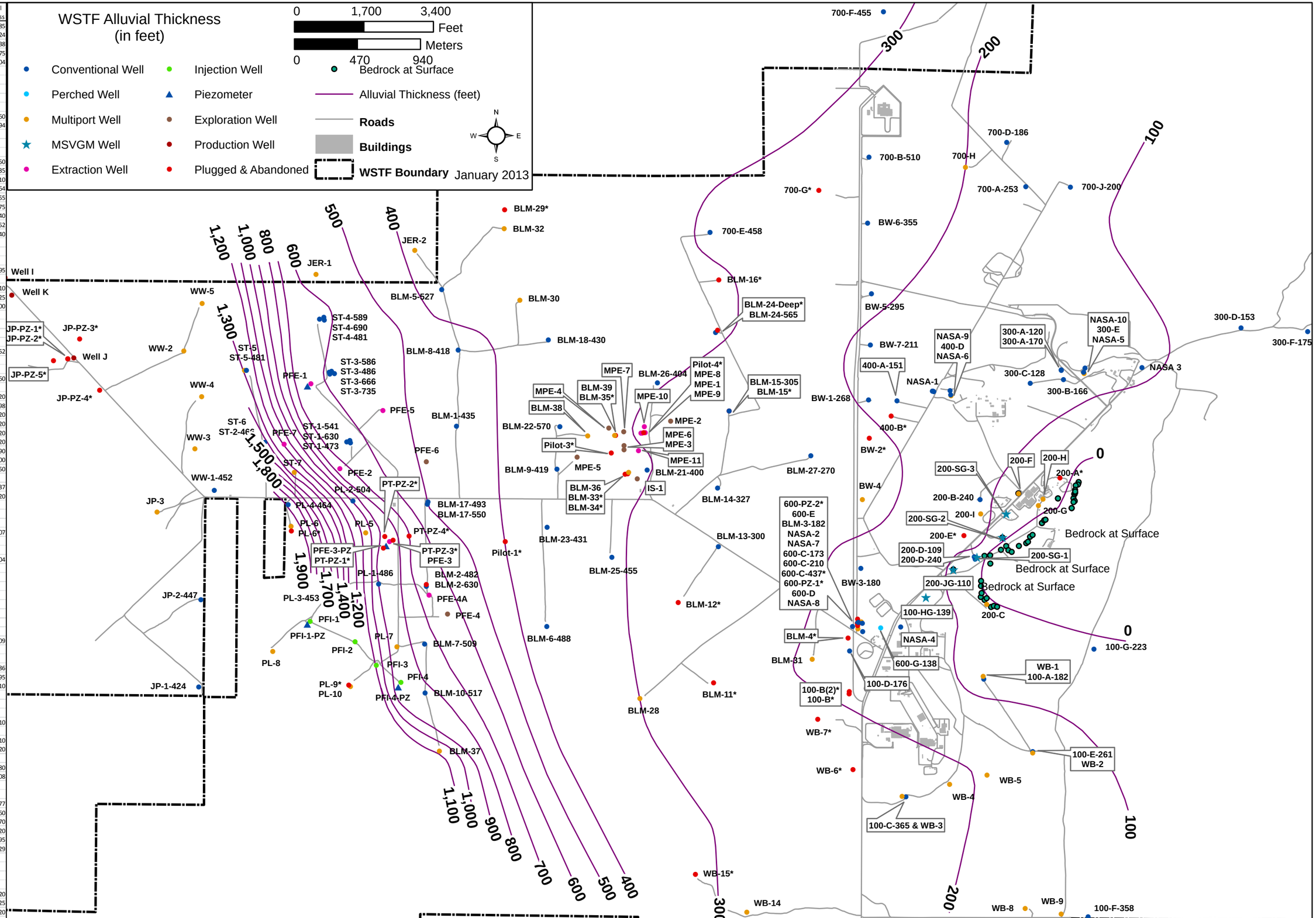


Figure 2.2 200 Area Potentiometric Surface Elevations

SEE NEXT PAGE

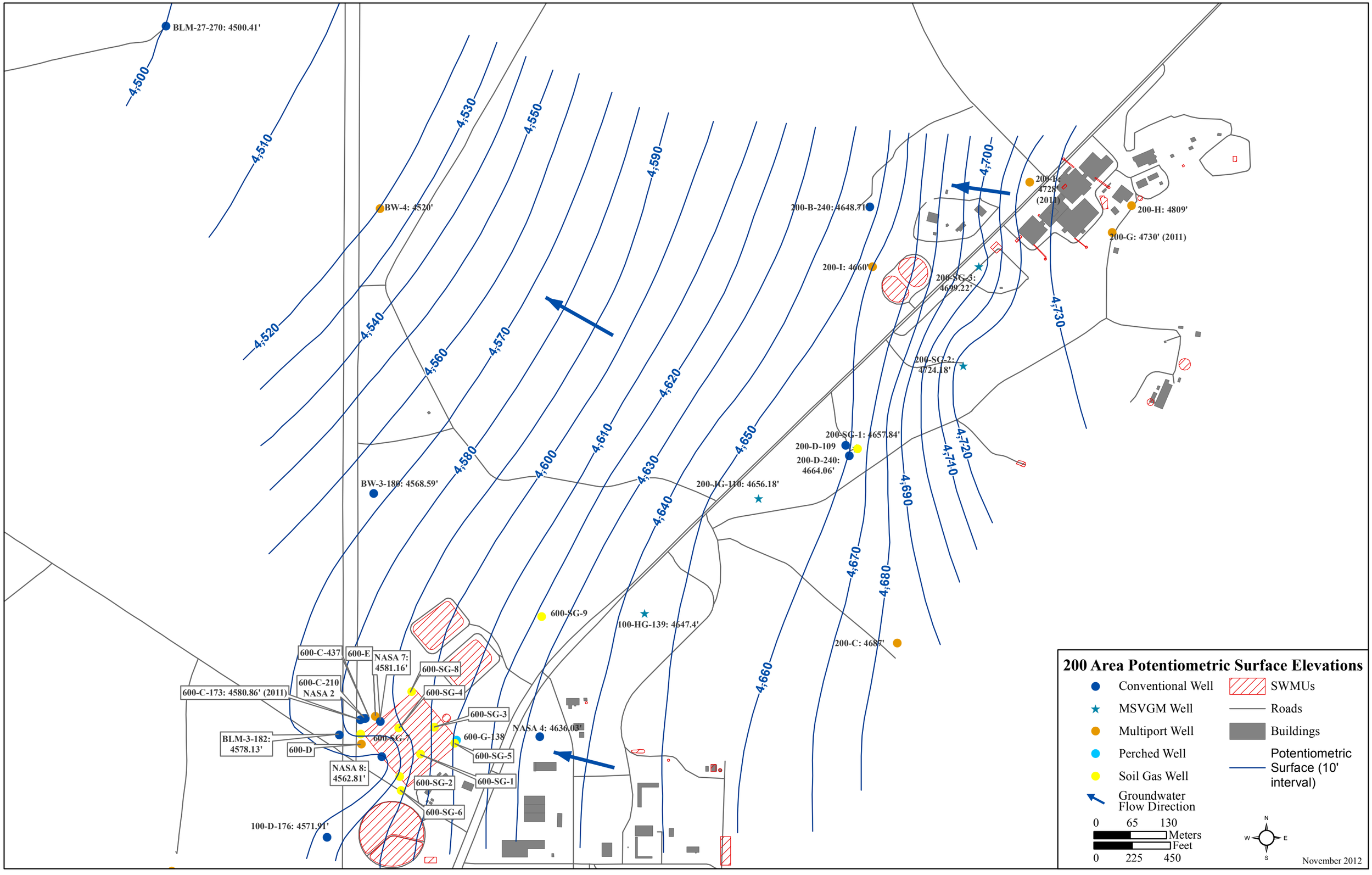

200 Area Potentiometric Surface Elevations
Conventional Well
MSVGM Well
Multiport Well
Perched Well
Soil Gas Well
Groundwater Flow Direction
SWMUs
Roads
Buildings
Potentiometric Surface (10' interval)
0 65 130 Meters
0 225 450 Feet
N
S
E
W
November 2012
4,500
4,510
4,520
4,530
4,540
4,550
4,560
4,570
4,580
4,590
4,600
4,610
4,620
4,630
4,640
4,650
4,660
4,670
4,680
4,690
4,700
4,710
4,720
4,730
BLM-27-270: 4500.41'
BW-4: 4520'
BW-3-180: 4568.59'
200-B-240: 4648.71'
200-I: 4660'
200-SG-3: 4699.22'
200-SG-2: 4724.18'
200-SG-1: 4657.84'
200-D-109
200-D-240: 4664.06'
200-JG-110: 4656.18'
200-F: 4728' (2011)
200-H: 4809'
200-G: 4730' (2011)
600-SG-9
100-HG-139: 4647.4'
200-C: 4687'
600-C-437
600-E
NASA 7: 4581.16'
600-SG-8
600-C-210 NASA 2
600-C-173: 4580.86' (2011)
600-SG-4
600-SG-3
NASA 4: 4636.03'
BLM-3-182: 4578.13'
600-D
600-SG-7
600-G-138
600-SG-5
NASA 8: 4562.81'
600-SG-2
600-SG-1
600-SG-6
100-D-176: 4571.91'

Figure 2.3 **WSTF Bedrock Lithologies**

SEE NEXT PAGE

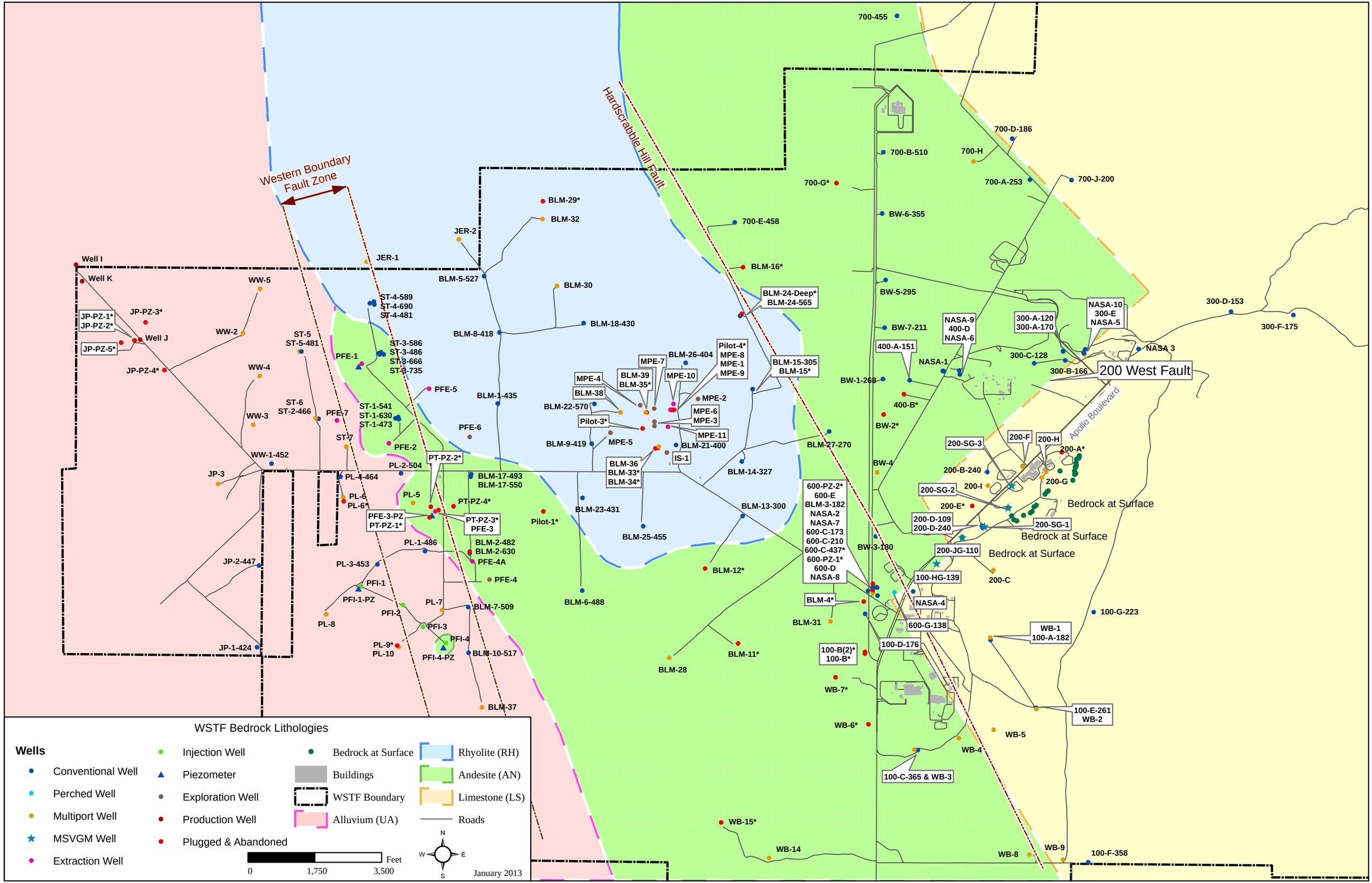

Western Boundary Fault Zone
Hardscrabble Hill Fault
200 West Fault
Apollo Boulevard
Bedrock at Surface
Bedrock at Surface
Bedrock at Surface
Well I
Well K
Well J
JP-PZ-1*
JP-PZ-2*
JP-PZ-3*
JP-PZ-4*
JP-PZ-5*
JP-3
JP-2-447
JP-1-424
WW-1-452
WW-2
WW-3
WW-4
WW-5
ST-5
ST-5-481
ST-6
ST-2-466
ST-7
ST-4-589
ST-4-690
ST-4-481
ST-3-586
ST-3-486
ST-3-666
ST-3-735
ST-1-541
ST-1-630
ST-1-473
PFE-1
PFE-2
PFE-3
PFE-4
PFE-4A
PFE-5
PFE-6
PFE-7
PL-2-504
PL-4-464
PL-5
PL-6
PL-6*
PL-7
PL-8
PL-9*
PL-10
PL-1-486
PL-3-453
PFI-1
PFI-1-PZ
PFI-2
PFI-3
PFI-4
PFI-4-PZ
PT-PZ-2*
PT-PZ-3*
PT-PZ-4*
PFE-3-PZ
PT-PZ-1*
PFE-3
JER-1
JER-2
BLM-29*
BLM-32
BLM-5-527
BLM-30
BLM-18-430
BLM-8-418
BLM-1-435
BLM-17-493
BLM-17-550
BLM-2-482
BLM-2-630
BLM-7-509
BLM-10-517
BLM-37
BLM-9-419
BLM-22-570
BLM-38
BLM-39
BLM-35*
MPE-4
MPE-7
MPE-10
BLM-26-404
Pilot-4*
MPE-8
MPE-1
MPE-9
MPE-2
MPE-6
MPE-3
MPE-11
Pilot-3*
MPE-5
BLM-21-400
IS-1
BLM-36
BLM-33*
BLM-34*
BLM-23-431
BLM-25-455
Pilot-1*
BLM-6-488
BLM-14-327
BLM-13-300
BLM-12*
BLM-11*
BLM-28
BLM-31
BLM-4*
BLM-27-270
BLM-15-305
BLM-15*
BLM-24-Deep*
BLM-24-565
BLM-16*
700-E-458
700-G*
700-455
700-B-510
BW-6-355
BW-5-295
BW-7-211
400-A-151
BW-1-268
400-B*
BW-2*
BW-4
BW-3-180
600-PZ-2*
600-E
BLM-3-182
NASA-2
NASA-7
600-C-173
600-C-210
600-C-437*
600-PZ-1*
600-D
NASA-8
NASA-1
NASA-9
400-D
NASA-6
NASA-4
600-G-138
100-D-176
100-B(2)*
100-B*
WB-7*
WB-6*
WB-5
WB-4
100-C-365 & WB-3
WB-15*
WB-14
WB-8
WB-9
100-F-358
100-E-261
WB-2
WB-1
100-A-182
100-G-223
100-HG-139
200-C
200-JG-110
200-D-109
200-D-240
200-SG-1
200-E*
200-SG-2
200-I
200-B-240
200-SG-3
200-F
200-H
200-A*
200-G
300-A-120
300-A-170
300-C-128
300-B-166
NASA-10
300-E
NASA-5
NASA 3
300-D-153
300-F-175
700-D-186
700-H
700-A-253
700-J-200
WSTF Bedrock Lithologies
Wells
Conventional Well
Perched Well
Multiport Well
MSVGM Well
Extraction Well
Injection Well
Piezometer
Exploration Well
Production Well
Plugged & Abandoned
Bedrock at Surface
Buildings
WSTF Boundary
Alluvium (UA)
Rhyolite (RH)
Andesite (AN)
Limestone (LS)
Roads
0
1,750
3,500
Feet
N
S
E
W
January 2013

Figure 2.4 Aerial Photograph of the 200 Area

(July 1972) – view to the north

This photograph shows the increased vegetation growth on the slope behind the 200 Area complex and into Gardner Spring Arroyo as a result of historical industrial water discharges (including small amounts of Freon and TCE).

Figure 2.5 WSTF 200 Area Geophysical Survey Lines

SEE NEXT PAGE

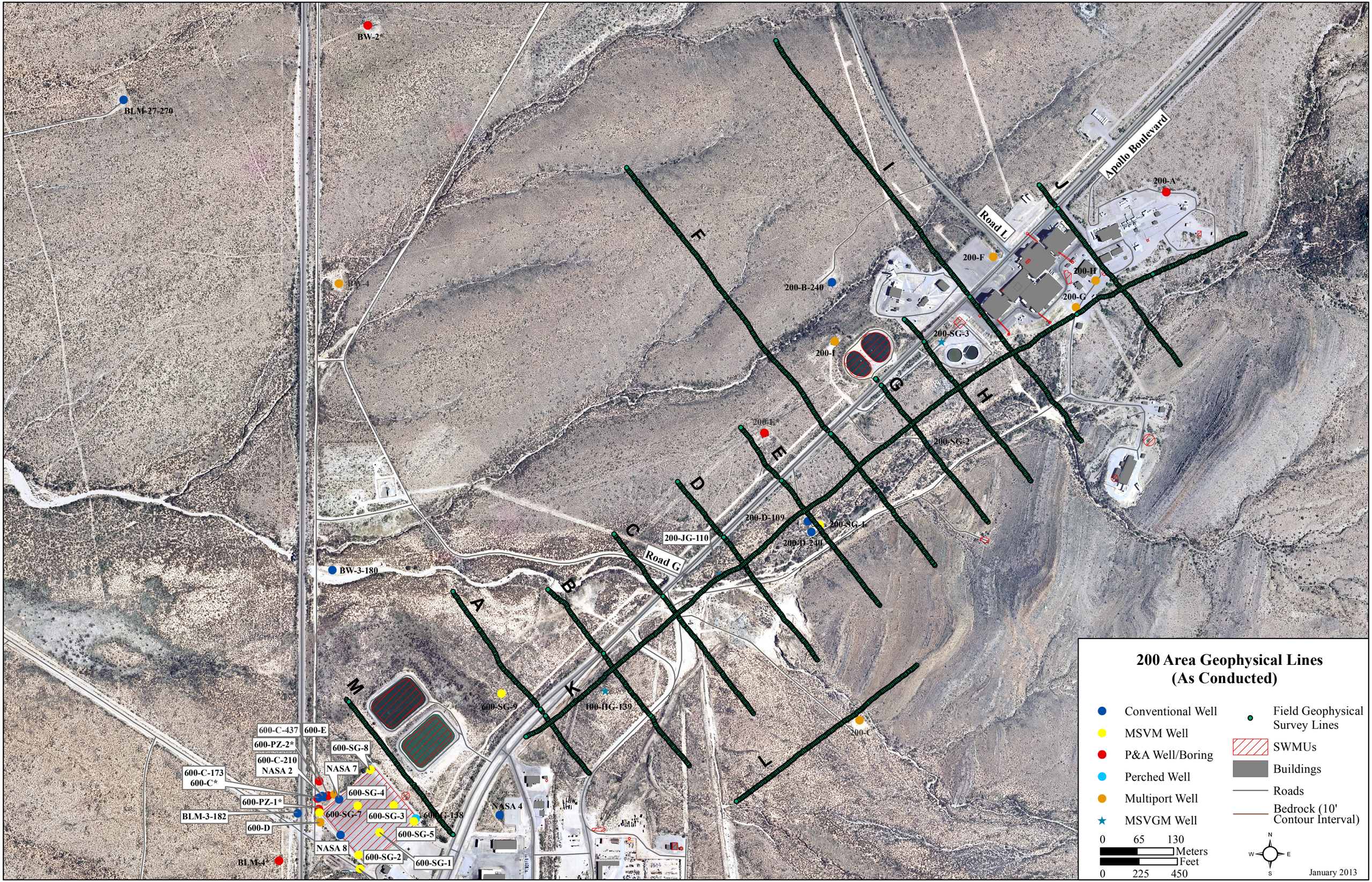

200 Area Geophysical Lines
(As Conducted)
Conventional Well
MSVM Well
P&A Well/Boring
Perched Well
Multiport Well
MSVGM Well
Field Geophysical Survey Lines
SWMUs
Buildings
Roads
Bedrock (10' Contour Interval)
0 65 130
Meters
Feet
0 225 450
N
W
E
S
January 2013
A
B
C
D
E
F
G
H
I
J
K
L
M
Road L
Road G
Apollo Boulevard
BW-2*
BLM-27-270
BW-4
BW-3-180
BLM-4*
200-A*
200-F
200-H
200-G
200-B-240
200-SG-3
200-I
200-E*
200-SG-2
200-D-109
200-SG-1
200-D-240
200-JG-110
200-C
600-SG-9
100-HG-139
600-C-437
600-E
600-PZ-2*
600-SG-8
600-C-210
NASA 2
NASA 7
600-C-173
600-C*
600-SG-4
600-PZ-1*
600-SG-7
600-SG-3
600-JG-138
BLM-3-182
600-D
600-SG-5
NASA 8
600-SG-2
600-SG-1
NASA 4

Figure 2.6 WSTF 200 Area Shallow Soil Vapor Grid

SEE NEXT PAGE

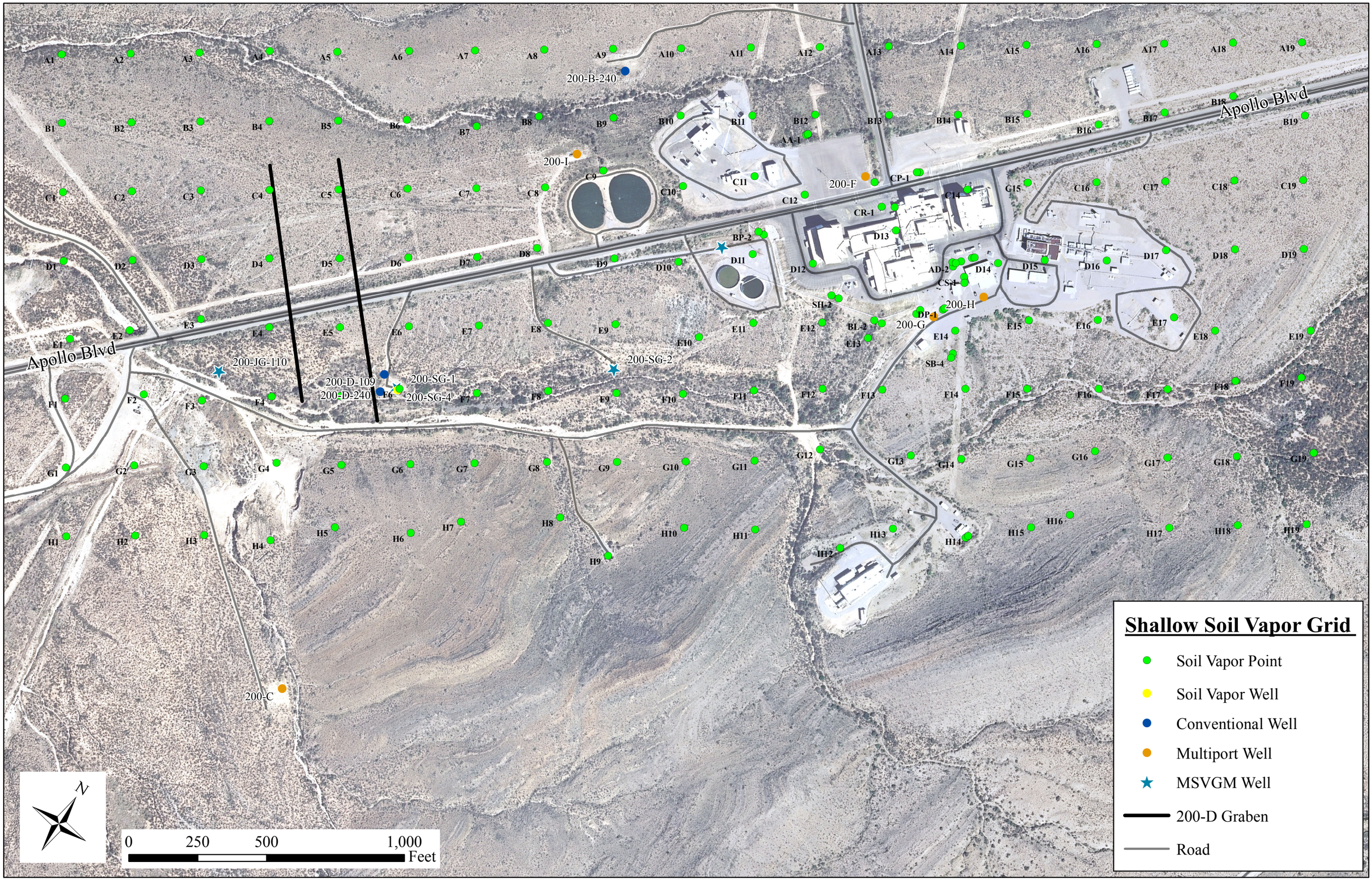

Shallow Soil Vapor Grid
Soil Vapor Point
Soil Vapor Well
Conventional Well
Multiport Well
MSVGM Well
200-D Graben
Road
Apollo Blvd
Apollo Blvd
200-B-240
200-I
200-F
CP-1
CR-1
BP-2
AA-1
AD-2
CS-1
SH-2
DP-1
200-H
200-G
BL-2
SB-4
200-JG-110
200-D-109
200-D-240
200-SG-1
200-SG-4
200-SG-2
200-C
N
0
250
500
1,000
Feet

Figure 3.1 200 and 600 Area Bedrock Elevations with Geophysical Input

SEE NEXT PAGE

Location Name	Surface Elevation (ft)	Bedrock Elevation (ft)	Bedrock Lithology
100-D-176	4750.36	4574.36	Andesite
100-HG-139	4773.07	4656.07	Andesite
200-A	4893.77	4823.77	Limestone
200-B-240	4839.71	4694.71	Limestone
200-C	4812.80	4777.80	Limestone
200-D-109	4787.91	4672.91	Limestone
200-D-240	4787.37	4692.37	Limestone
200-E	4820.42	4670.42	Limestone
200-F	4880.94	4863.94	Limestone
200-G	4876.82	4821.82	Limestone
200-H	4883.56	4808.56	Limestone
200-I	4839.27	4709.27	Limestone
200-JG-110	4774.30	4695.30	Limestone
200-SG-1	4788.84	4696.84	Limestone
200-SG-2	4807.40	4717.40	Limestone
200-SG-3	4861.01	4781.01	Limestone
600-C-173	4745.90	4590.90	Andesite
600-C-210	4746.27	4598.27	Andesite
600-C-437	4747.05	4602.05	Andesite
600-D	4749.38	4589.38	Andesite
600-E	4747.95	4595.95	Andesite
600-G-138	4759.43	4613.43	Andesite
600-SG-2	4757.69	4597.69	Andesite
600-SG-3	4755.40	4613.40	Andesite
600-SG-4	4752.01	4605.01	Andesite
600-SG-5	4756.34	4608.34	Andesite
600-SG-6	4754.66	4598.66	Andesite
600-SG-7	4745.22	4587.22	Andesite
600-SG-8	4746.66	4593.66	Andesite
600-SG-9	4760.49	4628.49	Andesite
600-SVE-1	4762.04	4613.04	Rhyolite
600-PZ-1	4747.55	4595.55	Andesite
600-PZ-2	4744.56	4607.56	Andesite
BR 1	4798.12	4798.12	Limestone
possible BR	4802.66	4802.66	Limestone
BR 3	4811.74	4811.74	Limestone
BR 4	4819.80	4819.80	Limestone
BR 5	4825.15	4825.15	Limestone
BR 6	4812.10	4812.10	Limestone
BR 7	4807.51	4807.51	Limestone
BR 8	4812.82	4812.82	Limestone
BR 9	4813.71	4813.71	Limestone
BR 10	4812.43	4812.43	Limestone
BR 11	4794.64	4794.64	Limestone
BR 12	4801.92	4801.92	Limestone
BR 15	4806.59	4806.59	Limestone
BR 16	4814.85	4814.85	Limestone
BR 17	4822.99	4822.99	Limestone
BR 18	4829.66	4829.66	Limestone
BR 19	4837.24	4837.24	Limestone
BR 20	4837.82	4837.82	Limestone
BR 21	4832.18	4832.18	Limestone
BR 22	4829.14	4829.14	Limestone
BR 23	4842.31	4842.31	Limestone
BR 24	4842.29	4842.29	Limestone
BR 25	4850.92	4850.92	Limestone
BR 26	4849.97	4849.97	Limestone
BR 27	4860.66	4860.66	Limestone
BR 29	4863.93	4863.93	Limestone
BR 30	4869.13	4869.13	Limestone
BR 31	4892.13	4892.13	Limestone
BR 32	4895.87	4895.87	Limestone
BR 33	4887.89	4887.89	Limestone
BR 34	4887.61	4887.61	Limestone
BR 35	4877.45	4877.45	Limestone
BR 36	4872.67	4872.67	Limestone
BR 37	4873.02	4873.02	Limestone
BR 38	4867.94	4867.94	Limestone
BR 39	4873.71	4873.71	Limestone
BLM-3-182	4745.83	4583.83	Andesite
BLM-31	4728.94	4536.94	Andesite
BW-3-180	4735.89	4564.89	Andesite
BW-4	4752.68	4522.68	Andesite
NASA 2	4745.80	4595.80	Andesite
NASA 4	4772.31	4647.31	Andesite
NASA 7	4749.60	4604.60	Andesite
NASA 8	4753.37	4568.37	Andesite

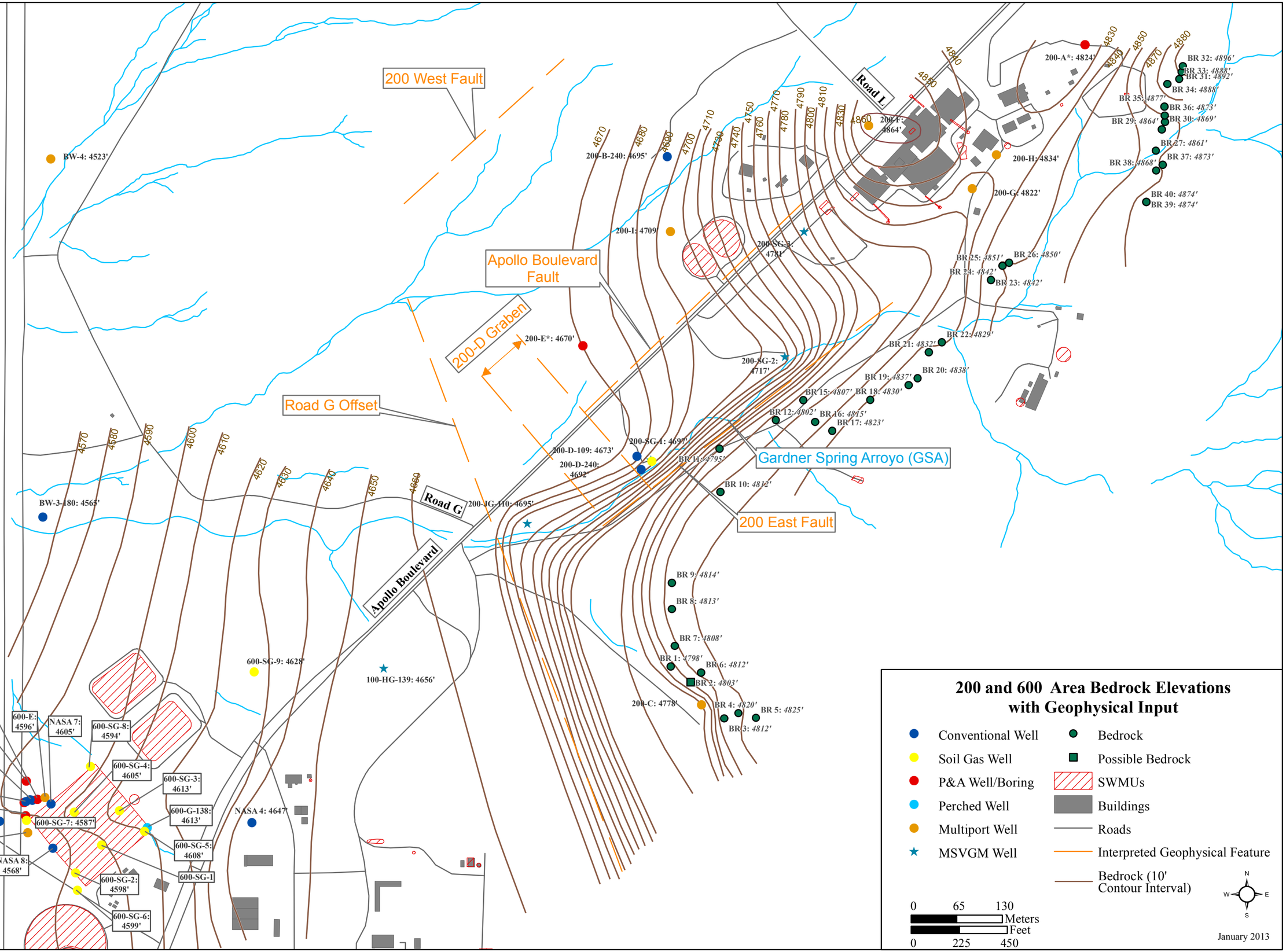


Figure 3.2 TCE Soil Vapor Analytical Contour Map

SEE NEXT PAGE

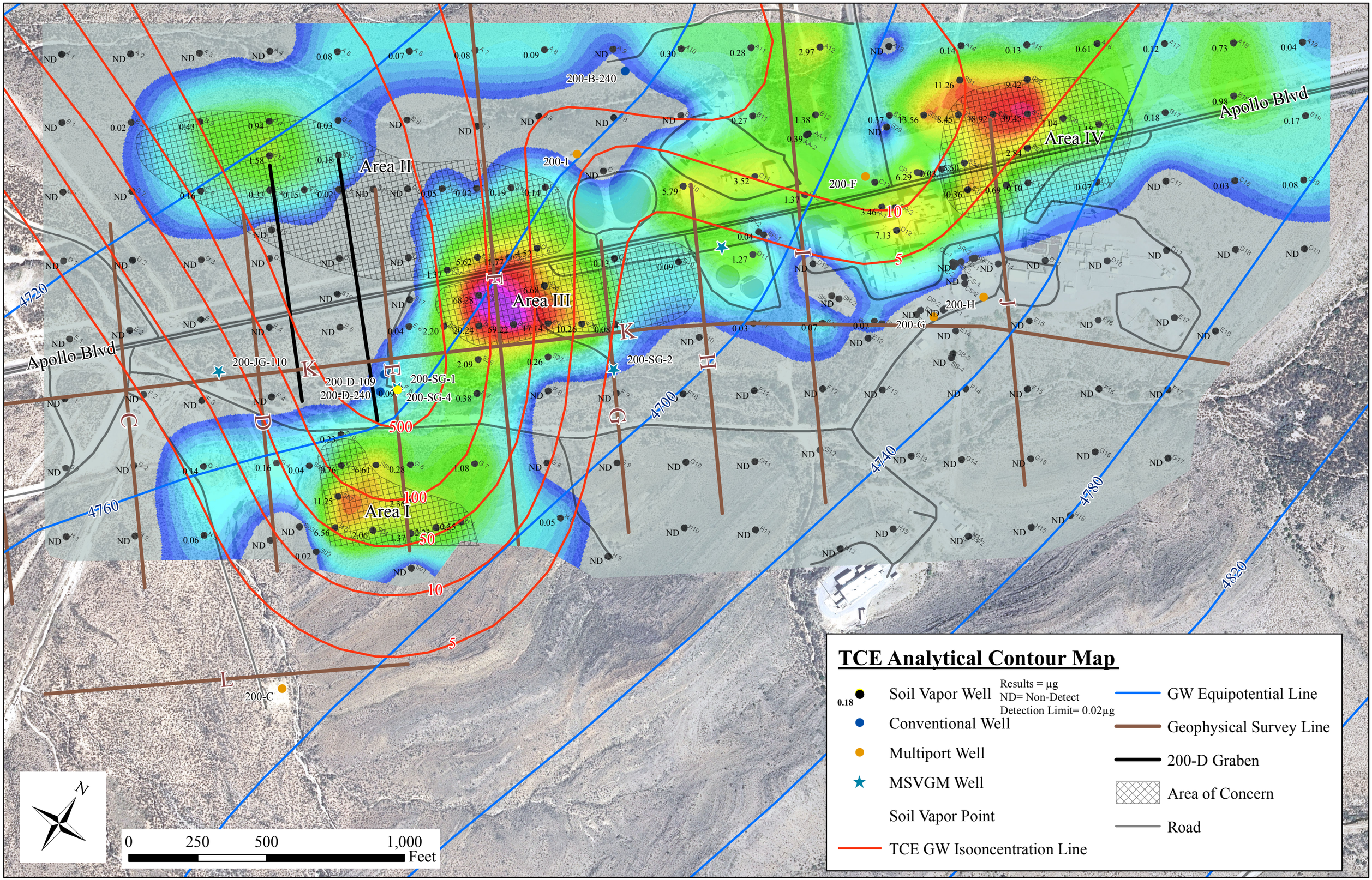

TCE Analytical Contour Map
Soil Vapor Well
Results = µg
ND= Non-Detect
Detection Limit= 0.02µg
Conventional Well
Multiport Well
MSVGM Well
Soil Vapor Point
TCE GW Isooncentration Line
GW Equipotential Line
Geophysical Survey Line
200-D Graben
Area of Concern
Road
Area I
Area II
Area III
Area IV
Apollo Blvd
200-B-240
200-I
200-F
200-H
200-G
200-JG-110
200-D-109
200-D-240
200-SG-1
200-SG-4
200-SG-2
200-C
500
100
50
10
5
4720
4700
4740
4760
4780
4820
0
250
500
1,000
Feet
N

Figure 3.3 PCE Soil Vapor Analytical Contour Map

SEE NEXT PAGE

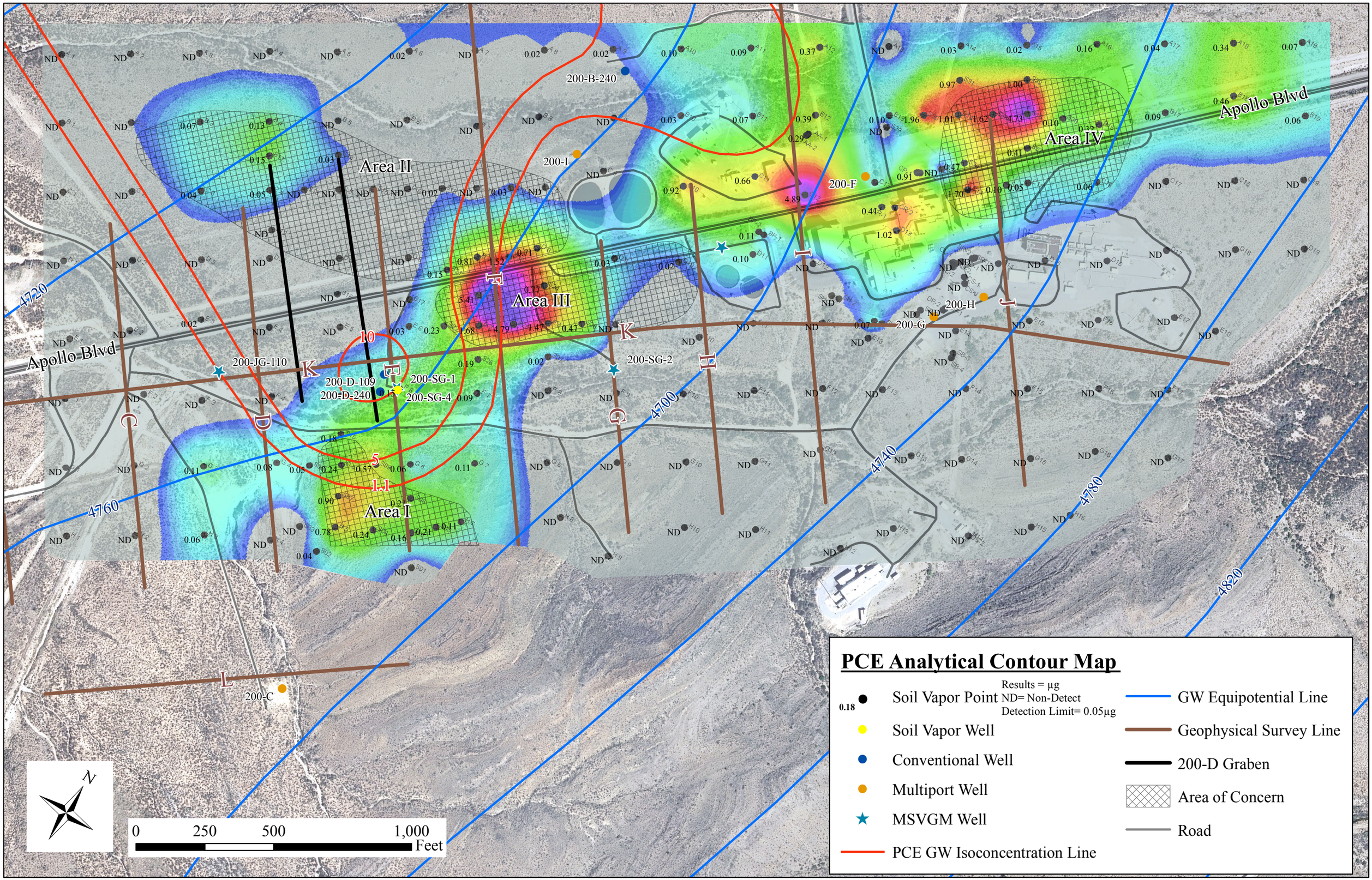

PCE Analytical Contour Map
Results = µg
ND= Non-Detect
Detection Limit= 0.05µg
Soil Vapor Point
Soil Vapor Well
Conventional Well
Multiport Well
MSVGM Well
PCE GW Isoconcentration Line
GW Equipotential Line
Geophysical Survey Line
200-D Graben
Area of Concern
Road
Area I
Area II
Area III
Area IV
Apollo Blvd
200-B-240
200-I
200-F
200-H
200-G
200-JG-110
200-D-109
200-D-240
200-SG-1
200-SG-4
200-SG-2
200-C
10
5
1.1
4720
4700
4740
4760
4780
4820
0
250
500
1,000
Feet
N

Figure 3.4 Freon 11 Soil Vapor Analytical Contour Map

SEE NEXT PAGE

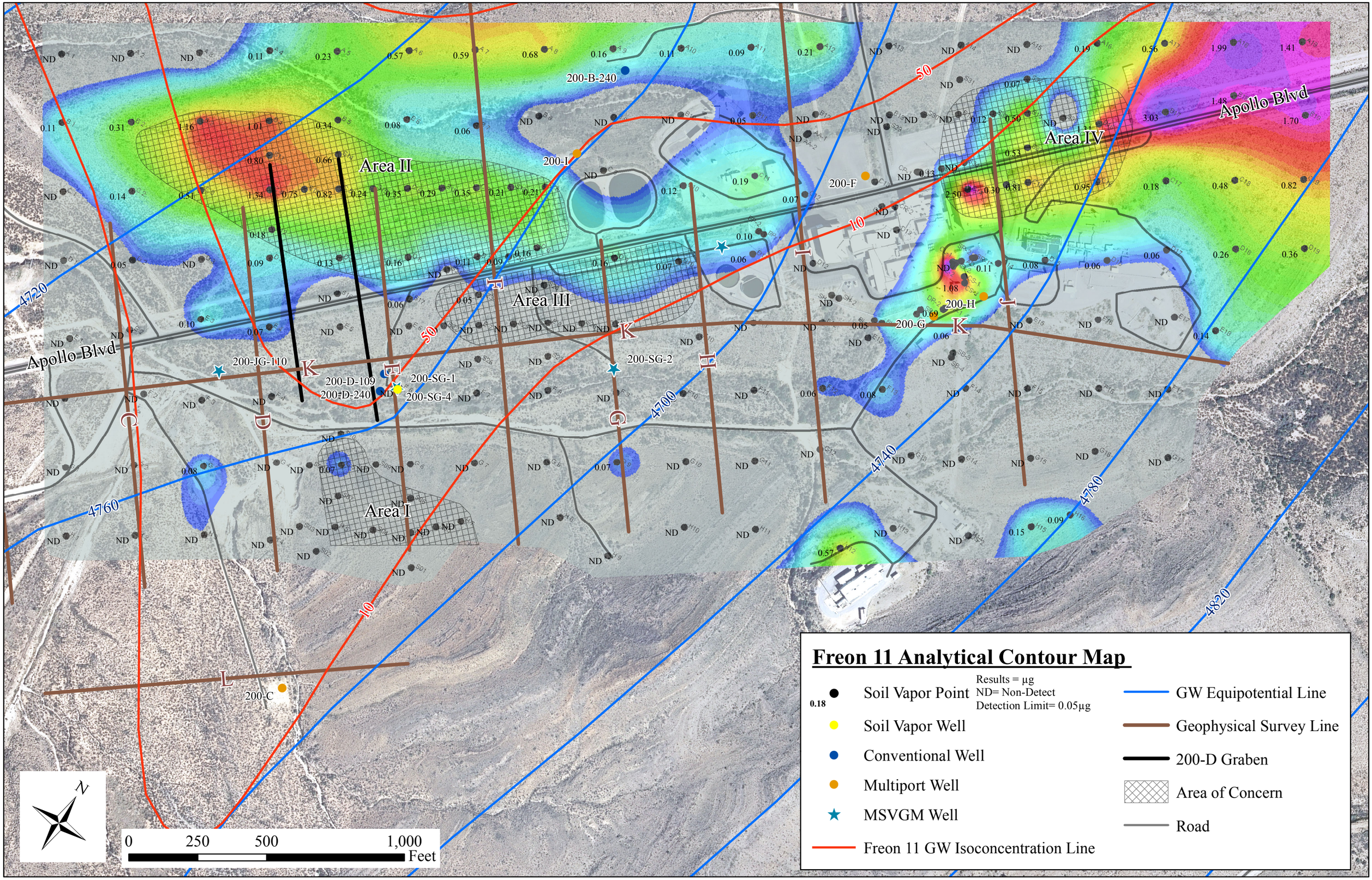

Freon 11 Analytical Contour Map
Soil Vapor Point
Results = µg
ND= Non-Detect
Detection Limit= 0.05µg
0.18
Soil Vapor Well
Conventional Well
Multiport Well
MSVGM Well
Freon 11 GW Isoconcentration Line
GW Equipotential Line
Geophysical Survey Line
200-D Graben
Area of Concern
Road
Area I
Area II
Area III
Area IV
Apollo Blvd
Apollo Blvd
200-B-240
200-I
200-F
200-H
200-G
200-JG-110
200-D-109
200-D-240
200-SG-1
200-SG-4
200-SG-2
200-C
4720
4700
4740
4760
4780
4820
50
10
0
250
500
1,000
Feet
N

Figure 3.5 Freon 113 Soil Vapor Analytical Contour Map

SEE NEXT PAGE

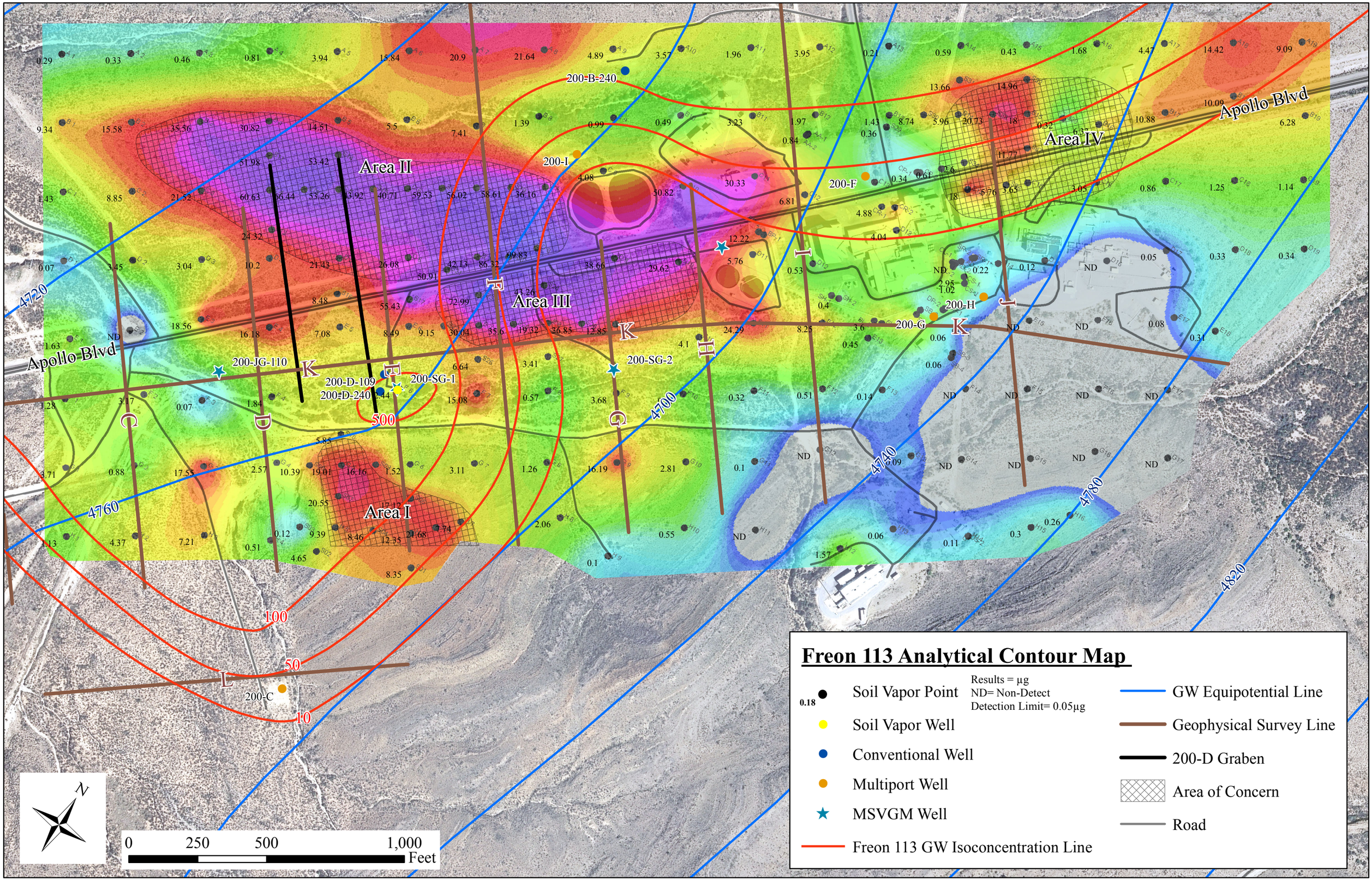

Freon 113 Analytical Contour Map
Results = µg
ND= Non-Detect
Detection Limit= 0.05µg
Soil Vapor Point
Soil Vapor Well
Conventional Well
Multiport Well
MSVGM Well
Freon 113 GW Isoconcentration Line
GW Equipotential Line
Geophysical Survey Line
200-D Graben
Area of Concern
Road
Area I
Area II
Area III
Area IV
Apollo Blvd
200-B-240
200-I
200-F
200-H
200-G
200-JG-110
200-D-109
200-D-240
200-SG-1
200-SG-2
200-C
500
100
50
10
4720
4700
4740
4760
4780
4820
0
250
500
1,000
Feet
N

Figure 3.6 TPH Soil Vapor Analytical Contour Map

SEE NEXT PAGE

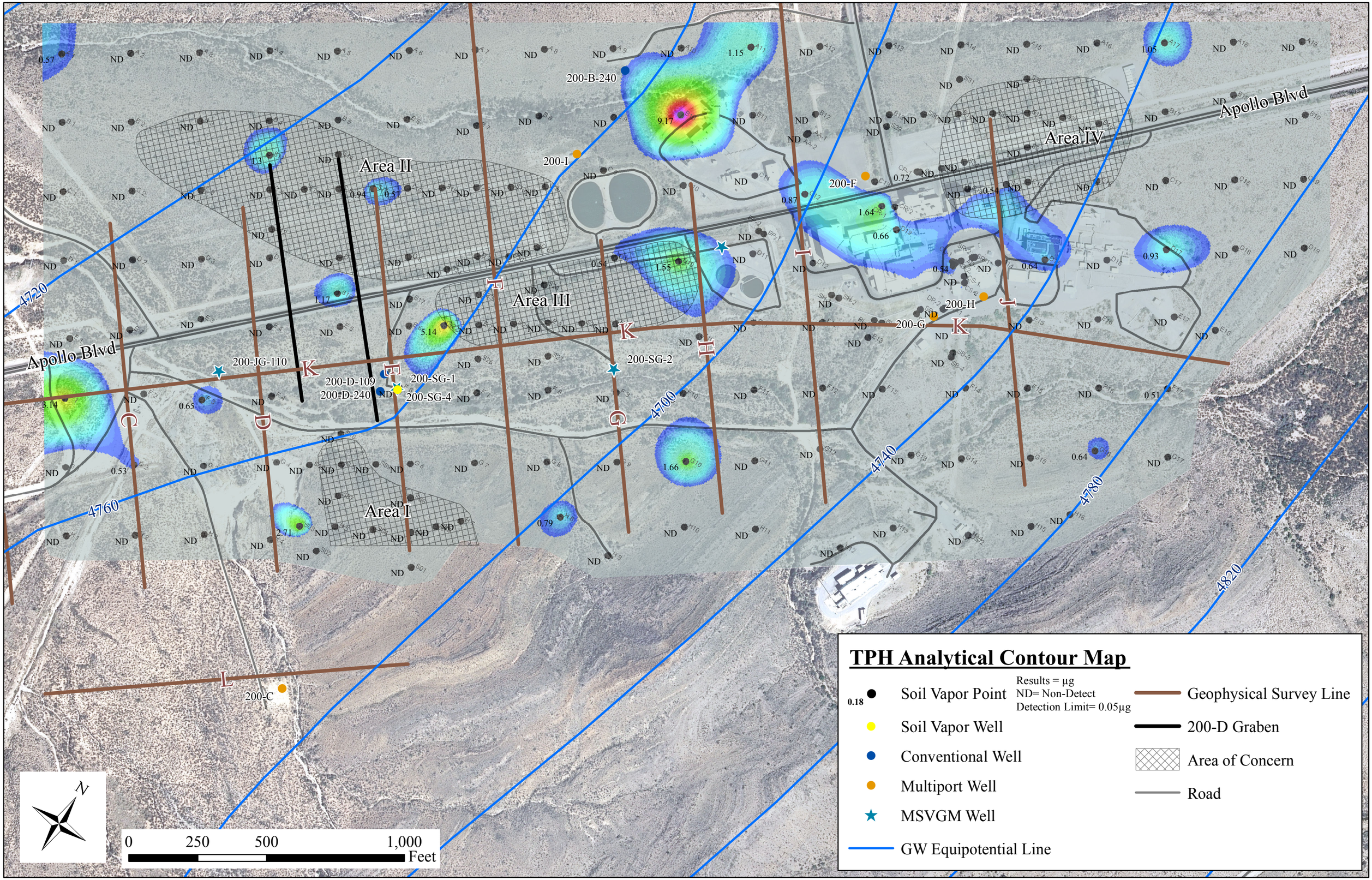

TPH Analytical Contour Map
Results = µg
ND= Non-Detect
Detection Limit= 0.05µg
Soil Vapor Point
Soil Vapor Well
Conventional Well
Multiport Well
MSVGM Well
GW Equipotential Line
Geophysical Survey Line
200-D Graben
Area of Concern
Road
Area I
Area II
Area III
Area IV
Apollo Blvd
200-B-240
200-I
200-F
200-H
200-G
200-JG-110
200-D-109
200-D-240
200-SG-1
200-SG-2
200-SG-4
200-C
4720
4700
4740
4760
4780
4820
0 250 500 1,000 Feet
N

Figure 3.7 WSTF 200 Area Supplemental Shallow Soil Vapor Grid Points

SEE NEXT PAGE

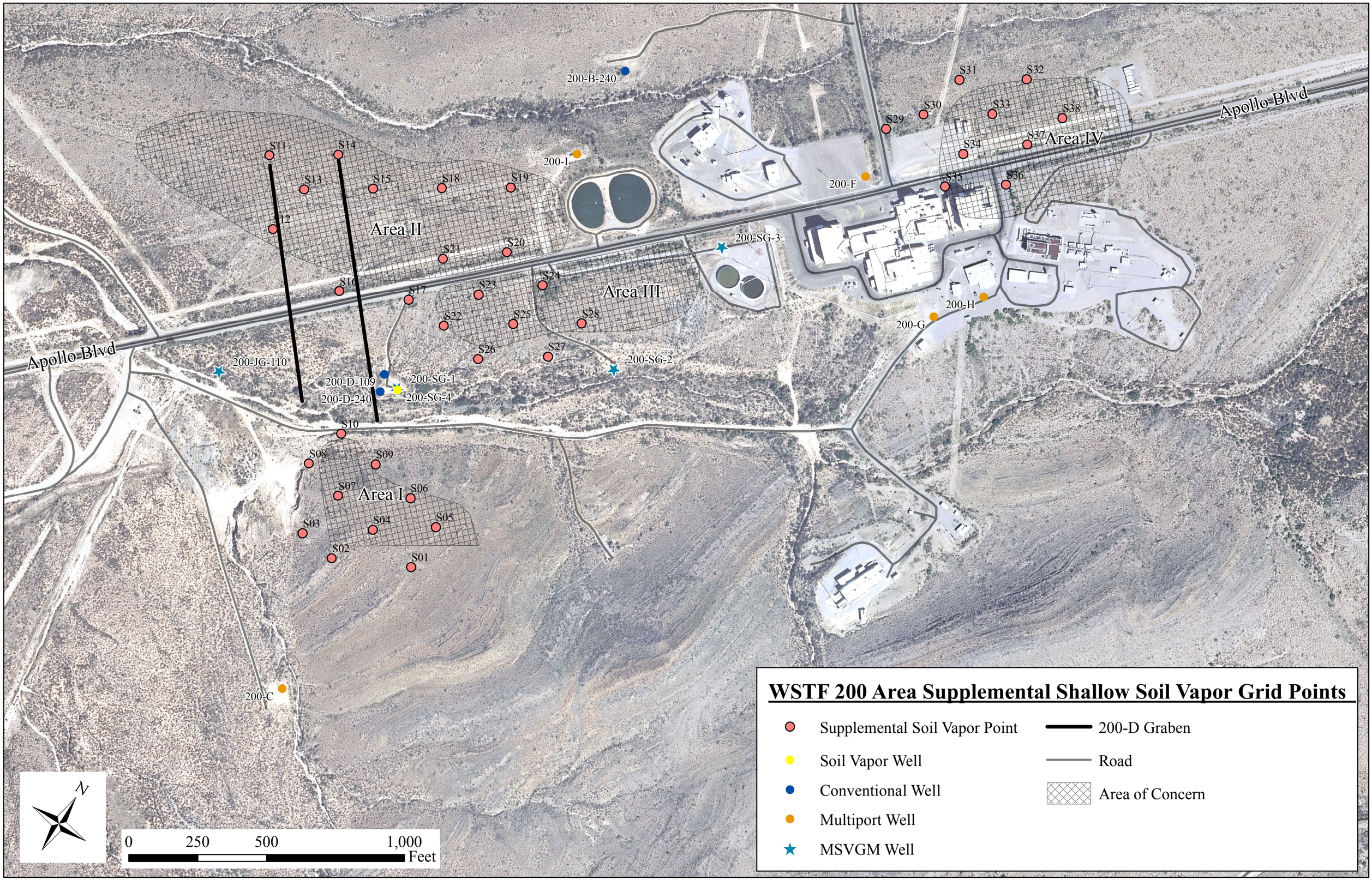
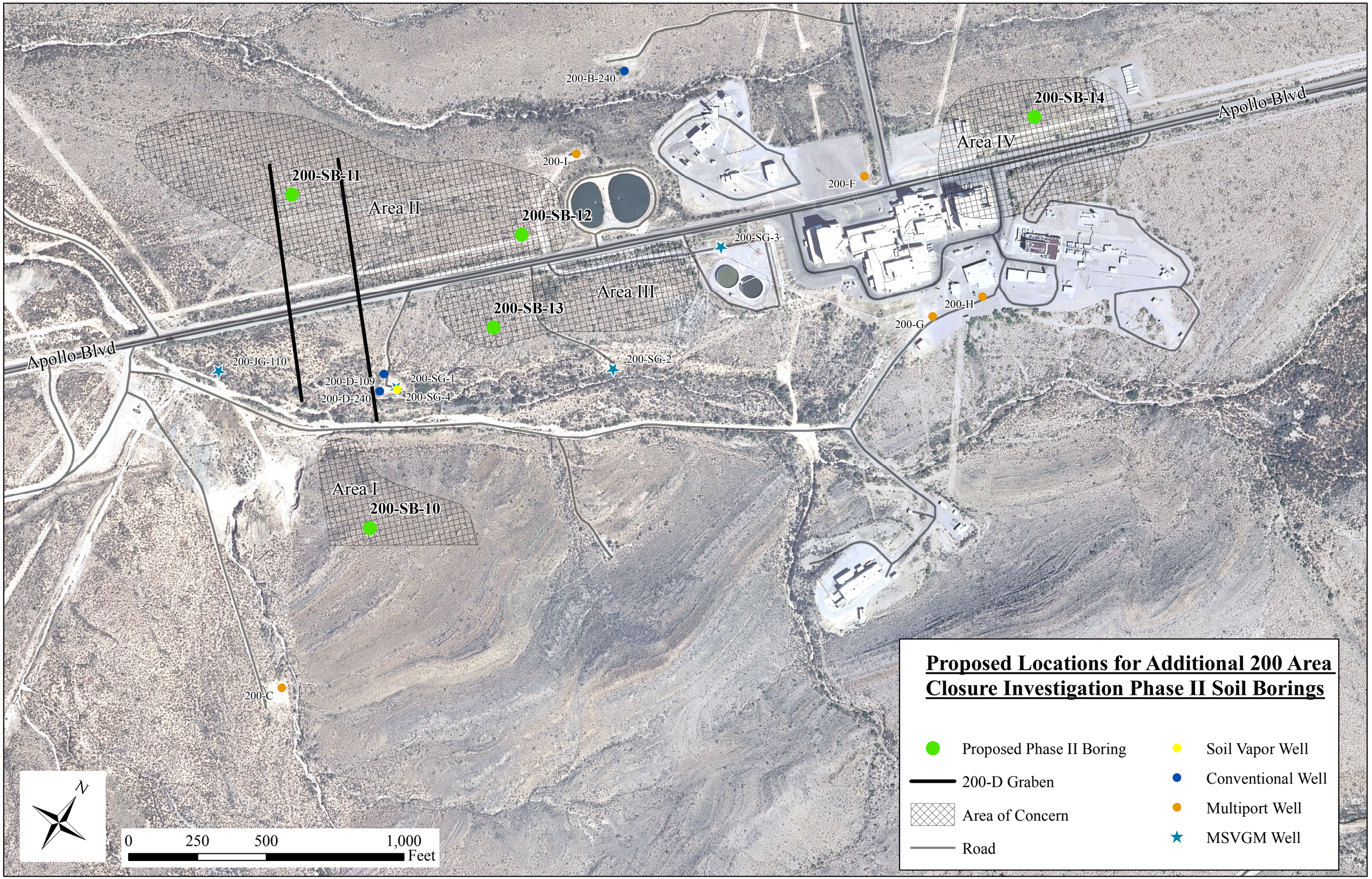

WSTF 200 Area Supplemental Shallow Soil Vapor Grid Points
Supplemental Soil Vapor Point
Soil Vapor Well
Conventional Well
Multiport Well
MSVGM Well
200-D Graben
Road
Area of Concern
Area I
Area II
Area III
Area IV
Apollo Blvd
Apollo Blvd
S01
S02
S03
S04
S05
S06
S07
S08
S09
S10
S11
S12
S13
S14
S15
S16
S17
S18
S19
S20
S21
S22
S23
S24
S25
S26
S27
S28
S29
S30
S31
S32
S33
S34
S35
S36
S37
S38
200-B-240
200-I
200-F
200-SG-3
200-H
200-G
200-SG-2
200-JG-110
200-D-109
200-D-240
200-SG-1
200-SG-4
200-C
N
0
250
500
1,000
Feet

Figure 6.1 WSTF 200 Area Proposed Soil Borings

SEE NEXT PAGE


Proposed Locations for Additional 200 Area Closure Investigation Phase II Soil Borings
Proposed Phase II Boring
200-D Graben
Area of Concern
Road
Soil Vapor Well
Conventional Well
Multiport Well
MSVGM Well
200-SB-10
200-SB-11
200-SB-12
200-SB-13
200-SB-14
Area I
Area II
Area III
Area IV
Apollo Blvd
Apollo Blvd
200-B-240
200-I
200-F
200-SG-3
200-H
200-G
200-SG-2
200-JG-110
200-D-109
200-D-240
200-SG-1
200-SG-4
200-C
N
0
250
500
1,000
Feet

Tables

Table 1.1 WSTF 200 Area SWMUs

Unit ID No.	Unit Type/Description
SWMU 4	200 Area Clean Room Discharge Pipe
SWMU 5	200 Area Scape Room Discharge Pipe
SWMU 6	200 Area Building 203 Discharge Pipes
SWMU 7	200 Area South Highbay Discharge Pipe
SWMU 9	200 Area Burn Pit

Table 2.1 Summary of Shallow Soil Vapor Survey Points for Gore Module Installations

SEE NEXT PAGE

Table 2.1 Summary of Shallow Soil Gas Survey Points					
Survey Point Description	**Alpha-Numerical Designation**	**Survey Target**	**Planned Sample Points**	**Actual Sample Points Installed**	**Comments**
Grid Nodes on 250-foot centers: 8 rows (A-H) x 19 columns (1-19)	A1 through H19[a]	200 Area and surrounding areas (including the adjacent drainages to the northwest and southeast	152	144	[a] 8 planned grid points were inaccessible and/or located on rock outcrop: E19; F18; F19; G18; G19; H17; H18; and H19
Existing USTs identified in Permit (previously investigated)	CR-1 & CR-2	Clean Room Tanks	2	2	USTs previously investigated with 3 shallow soil borings in 1987 (SCB-200-04, SCB-200-05, SCB-200-10; NASA, 1996)
Existing USTs identified in Permit (previously investigated)	CL-1 & CL-2	Chemistry Lab Tanks	2	2	USTs previously investigated with a shallow soil boring in 1987 (SCB-200-07; NASA 1996)
Existing SWMU identified in Permit (previously investigated)	CP-1 & CP-2	Clean Room Discharge Pipe	2	2	SWMU previously investigated with 3 shallow soil borings in 1994 (CR-200-1, CR-200-2, CR-200-3; NASA, 1996)
Existing SWMU identified in Permit (previously investigated)	SR-1[b] & SR-2	Scape Room Discharge Pipe	2	1	SWMU previously investigated with 2 shallow soil borings in 1994 (SR-200-1 & SR-200-2; NASA, 1996) [b] Not collected due to breaching a compressed air line.
Existing SWMU identified in Permit (previously investigated)	BL-1 & BL-2	Building 203 Discharge Pipe	2	2	SWMU previously investigated with 2 shallow soil borings in 1994 (B203-200-1 & B203-200-2; NASA, 1996)
Existing SWMU identified in Permit (previously investigated)	SH-1 & SH-2	South Highbay Discharge Pipe	2	2	SWMU previously investigated with 2 shallow soil borings in 1994 (SH-200-1 & SH-200-2; NASA, 1996)
Existing SWMU identified in Permit (previously investigated)	BP-1 & BP-2	200 Area Primary Burn Pit	2	2	SWMU previously investigated with a MSVGM well in 1997 (200-SGW-3; NASA, 2004)
AOI identified in 200 Area HIS Report	AD-1 & AD-2	Chemistry Laboratory Acid Tank Discharge Pipe	2	2	New survey target under evaluation
AOI identified in 200 Area HIS Report	DP-1 & DP-2	Industrial Discharge Pipe Adjacent to Building 203	2	2	New survey target under evaluation
AOI identified in 200 Area HIS Report	CS-1 & CS-2	Chemical Storage Building 253 and Contaminated Soil Pile	2	2	New survey target under evaluation

Table 2.1 Summary of Shallow Soil Gas Survey Points					
Survey Point Description	**Alpha-Numerical Designation**	**Survey Target**	**Planned Sample Points**	**Actual Sample Points Installed**	**Comments**
AOI identified in 200 Area HIS Report	OS-1 & OS-2[c]	270 Area Military Transport Vehicle Fire Suppression Test Area	2	1	New survey target under evaluation [c] Not collected. Corresponded to grid node H14.
AOIs identified in 200 Area HIS Report	SB-1 – SB-4	2 x 200 Area Additional Burn Pits	4	4	New survey targets under evaluation
AOI identified in 200 Area HIS Report	AA-1 & AA-2	250 Area Possible Septic Tank Drainage Source	2	2	New survey target under evaluation
Phase I(b) Supplemental grid points	S1 – S10	Area I – southwest grid corner (Well 200-C Area)	10	10	Survey refinement – points set at half node distance
Phase I(b) Supplemental grid points	S18 – S28	Area II: southwest of 200 Area Sewage Lagoons	11	11	Survey refinement – points set at half node distance
Phase I(b) Supplemental grid points	S11 – S17	Area III: northwest of well 200-D	7	7	Survey refinement – points set at half node distance. Targets 200-D graben structure identified in the geophysical survey.
Phase I(b) Supplemental grid points	S29 - S38	Area IV: northeast grid corner near Clean Room Discharge Pipe Parking Lot	10	10	Survey refinement – points set at half node distance
Conventional groundwater monitoring wells	Well Designations (See Comments)	Top of conventional well casing with screen at depth across water table	13	13	Conventional wells utilized: 600-G-138, NASA 4, 100-HG-139, 200-JG-110, 200-D-109, 200-D-240, 200-B-240, 600-C-173, 600-C-210, NASA 2, NASA 7, NASA 8, BLM-3-182
Trip Blanks	TB-1 – TB-18		18	18	Trip blanks were transported in the field along with the other soil gas samples collected within the same box
TOTAL			**249**	**239**	**Total number of soil gas modules deployed**

Table 2.2 Summary of Field Installation and Retrieval Log for Gore Modules

SEE NEXT PAGE

Table 2.2 Summary of Field Installation & Retrieval E-Log Submitted to Gore® Laboratories

Phase I (a) Gore® Modules

MODULE SERIAL NO.	FIELD ID	SAMPLE TYPE	INSTALLATION DATE & TIME MM/DD/YYYY	RETRIEVAL DATE & TIME MM/DD/YYYY	SAMPLE TYPE	NOTES	SAMPLE ENVIRONMENT	EVIDENCE OF LIQUID PETROLEUM HYDROCARBONS ?
00696355	A 1	FIELD SAMPLE	10/16/2012 13:00	10/29/2012 13:05	22.0 in.		Sparse desert brush	No
00696356	B 1	FIELD SAMPLE	10/16/2012 13:05	10/29/2012 13:11	25.0 in.		Sparse desert brush	No
00696357	C 1	FIELD SAMPLE	10/16/2012 13:07	10/29/2012 13:17	28.0 in.		Sparse desert brush	No
00696358	D 1	FIELD SAMPLE	10/16/2012 13:31	10/29/2012 13:23	22.0 in.		Sparse desert brush	No
00696359	E 1	FIELD SAMPLE	10/16/2012 13:40	10/29/2012 13:28	31.0 in.		Sparse desert brush	No
00696360	F 1	FIELD SAMPLE	10/16/2012 13:46	10/29/2012 13:32	31.0 in.		Sparse desert brush	No
00696361	G 1	FIELD SAMPLE	10/16/2012 13:51	10/29/2012 13:36	30.0 in.		Gravel road	No
00696362	H 1	FIELD SAMPLE	10/16/2012 14:00	10/29/2012 13:45	27.0 in.		Sparse desert brush	No
00696363	H 2	FIELD SAMPLE	10/16/2012 14:10	10/29/2012 13:48	23.0 in.		Sparse desert brush	No
00696364	G 2	FIELD SAMPLE	10/16/2012 14:16	10/29/2012 13:58	32.0 in.		Sparse desert brush	No
00696365	F 2	FIELD SAMPLE	10/16/2012 14:24	10/29/2012 14:02	32.0 in.		Sparse desert brush	No
00696366	E 2	FIELD SAMPLE	10/16/2012 14:30	10/29/2012 14:06	26.0 in.		Sparse desert brush - adjacent to road	No
00696367	D 2	FIELD SAMPLE	10/16/2012 14:37	10/29/2012 14:10	32.0 in.		Sparse desert brush	No
00696368	C 2	FIELD SAMPLE	10/17/2012 7:58	10/30/2012 7:50	32.0 in.		Sparse desert brush	No
00696369	B 2	FIELD SAMPLE	10/17/2012 8:07	10/30/2012 7:57	27.0 in.		Sparse desert brush	No
00696370	A 2	FIELD SAMPLE	10/17/2012 8:13	10/30/2012 8:00	25.0 in.		Sparse desert brush	No
00696371	A 3	FIELD SAMPLE	10/17/2012 8:19	10/30/2012 8:03	26.0 in.		Sparse desert brush	No
00696372	B 3	FIELD SAMPLE	10/17/2012 8:24	10/30/2012 8:05	27.0 in.		Sparse desert brush	No
00696373	C 3	FIELD SAMPLE	10/17/2012 8:33	10/30/2012 8:12	27.0 in.		Sparse desert brush	No
00696374	D 3	FIELD SAMPLE	10/17/2012 8:38	10/30/12 0817	23.0 in.		Sparse desert brush	No
00696375	E 3	FIELD SAMPLE	10/17/2012 8:44	10/30/2012 9:17	29.0 in.		Sparse desert brush - adjacent to road	No
00696376	F 3	FIELD SAMPLE	10/17/2012 9:05	10/30/2012 9:37	27.0 in.		Sparse desert brush	No
00696377	G 3	FIELD SAMPLE	10/17/2012 9:10	10/30/2012 9:42	30.0 in.		Sparse desert brush	No
00696378	H 3	FIELD SAMPLE	10/17/2012 9:14	10/30/2012 9:46	31:0 in.		Sparse desert brush	No
00696379	H 4	FIELD SAMPLE	10/17/2012 9:18	10/30/2012 9:50	26.0 in.		Sparse desert brush	No
00696380	G 4	FIELD SAMPLE	10/17/2012 9:27	10/30/2012 9:56	28.0 in.		Gravel road	No
00696381	F 4	FIELD SAMPLE	10/17/2012 9:34	10/30/2012 9:58	27.0.in.		Sparse desert brush	No
00696382	E 4	FIELD SAMPLE	10/17/2012 9:40	10/30/2012 10:03	31.0 in.		Sparse desert brush - adjacent to road	No
00696383	D 4	FIELD SAMPLE	10/17/2012 9:50	10/30/2012 10:07	27.0 in.		Sparse desert brush	No
00696384	C 4	FIELD SAMPLE	10/17/2012 9:56	10/30/2012 10:10	29.0 in.		Sparse desert brush	No
00696385	B 4	FIELD SAMPLE	10/17/2012 10:02	10/30/2012 10:15	27.0 in.		Sparse desert brush	No
00696386	A 4	FIELD SAMPLE	10/17/2012 10:10	10/30/2012 10:19	30.0 in.		Sparse desert brush	No
00696387	A 5	FIELD SAMPLE	10/17/2012 10:15	10/30/2012 10:22	23.0 in.		Sparse desert brush	No
00696388	B 5	FIELD SAMPLE	10/17/2012 10:20	10/30/2012 10:25	24.0 in.		Sparse desert brush	No
00696389	C 5	FIELD SAMPLE	10/17/2012 10:36	10/30/2012 10:30	28.0 in.		Sparse desert brush	No
00696390	D 5	FIELD SAMPLE	10/17/2012 10:43	10/30/2012 10:36	29.0 in.		Sparse desert brush	No
00696391	E 5	FIELD SAMPLE	10/17/2012 10:55	10/30/2012 10:40	26.0 in.		Sparse desert brush	No
00696392	F 5	FIELD SAMPLE	10/17/2012 11:01	10/30/2012 10:52	26.0 in.		Sparse desert brush	No
00696393	G 5	FIELD SAMPLE	10/17/2012 13:12	10/30/2012 12:56	27.0 in.		Sparse desert brush	No
00696394	H 5	FIELD SAMPLE	10/17/2012 13:18	10/30/2012 12:58	28.0 in.		Sparse desert brush	No
00696395	H 6	FIELD SAMPLE	10/17/2012 13:22	10/30/2012 13:02	30.0 in.		Sparse desert brush	No
00696396	G 6	FIELD SAMPLE	10/17/2012 13:28	10/30/2012 13:05	25.0 in.		Sparse desert brush	No
00696397	F 6	FIELD SAMPLE	10/17/2012 13:47	10/30/2012 13:22	28.0 in.		Sparse desert brush	No
00696398	E 6	FIELD SAMPLE	10/17/2012 13:52	10/30/2012 13:25	26.0 in.		Sparse desert brush	No
00696399	TB 1	TRIP BLANK			0.0 in.	Trip Blank		
00696400	TB 2	TRIP BLANK			0.0 in.	Trip Blank		
00696401	TB 3	TRIP BLANK			0.0 in.	Trip Blank		
00696402	TB 4	TRIP BLANK			0.0 in.	Trip Blank		
00696403	D 6	FIELD SAMPLE	10/17/2012 14:47	10/30/2012 13:32	29.0 in.		Sparse desert brush	No
00696404	C 6	FIELD SAMPLE	10/17/2012 14:44	10/30/2012 13:25	28.0 in.		Sparse desert brush	No
00696405	B 6	FIELD SAMPLE	10/18/2012 8:00	10/31/2012 8:21	25.0 in.		Sparse desert brush	No
00696406	A 6	FIELD SAMPLE	10/18/2012 8:05	10/31/2012 8:24	28.0 in.		Sparse desert brush	No
00696407	A 7	FIELD SAMPLE	10/18/2012 8:09	10/31/2012 8:27	22.0 in.		Sparse desert brush	No
00696408	B 7	FIELD SAMPLE	10/18/2012 8:23	10/31/2012 8:36	28.0 in.		Sparse desert brush	No
00696409	C 7	FIELD SAMPLE	10/18/2012 8:27	10/31/2012 8:39	27.0 in.		Sparse desert brush	No
00696410	D 7	FIELD SAMPLE	10/18/1934 8:34	10/31/2012 8:43	28.0 in.		Sparse desert brush	No
00696411	E 7	FIELD SAMPLE	10/18/2012 8:45	10/31/2012 8:50	28.0 in.		Sparse desert brush	No
00696412	F 7	FIELD SAMPLE	10/31/2012 9:07	10/31/2012 9:00	21.0 in.		Sparse desert brush	No
00696413	G 7	FIELD SAMPLE	10/18/2012 9:15	10/31/2012 9:03	24.0 in.		Sparse desert brush	No
00696414	H 7	FIELD SAMPLE	10/18/2012 9:20	10/31/2012 9:07	30.0 in.		Sparse desert brush	No
00696415	H 9	FIELD SAMPLE	10/18/2012 9:30	10/31/2012 9:15	27.0 in.		Sparse desert brush	No
00696416	H 8	FIELD SAMPLE	10/18/2012 9:47	10/31/2012 9:20	27.0 in.		Sparse desert brush	No
00696417	G 8	FIELD SAMPLE	10/18/2012 9:55	10/31/2012 9:24	26.0 in.		Sparse desert brush	No
00696418	F 8	FIELD SAMPLE	10/18/2012 10:01	10/31/2012 9:30	27.0 in.		Sparse desert brush	No
00696419	E 8	FIELD SAMPLE	10/18/2012 10:34	10/31/2012 9:39	27.0 in.		Sparse desert brush	No
00696420	D 8	FIELD SAMPLE	10/18/2012 10:47	10/31/2012 9:43	29.0 in.		Sparse desert brush - adjacent to road	No
00696421	C 8	FIELD SAMPLE	10/18/2012 10:53	10/31/2012 9:47	29.0 in.		Sparse desert brush	No
00696422	B 8	FIELD SAMPLE	10/18/2012 11:02	10/31/2012 10:05	28.0 in.		Sparse desert brush	No
00696423	A 8	FIELD SAMPLE	10/18/2012 11:14	10/31/2012 10:12	30:0 in.		Sparse desert brush	No
00696424	A 9	FIELD SAMPLE	10/18/2012 11:20	10/31/2012 10:17	29.0 in.		Sparse desert brush	No
00696425	B 9	FIELD SAMPLE	10/18/2012 11:25	10/31/2012 10:21	29.0 in.		Sparse desert brush	No
00696426	C 9	FIELD SAMPLE	10/18/2012 13:40	10/31/2012 10:27	27.0 in.		Sparse desert brush - adjacent to sewage lagoon	No
00696427	D 9	FIELD SAMPLE	10/18/2012 13:55	10/31/2012 10:30	27.0 in.		Sparse desert brush - adjacent to road	No
00696428	E 9	FIELD SAMPLE	10/18/2012 14:00	10/31/2012 10:34	26.0 in.		Sparse desert brush	No
00696429	F 9	FIELD SAMPLE	10/18/2012 14:09	10/31/2012 10:41	27.0 in.		Sparse desert brush	No
00696430	G 9	FIELD SAMPLE	10/18/2012 14:15	10/31/2012 10:45	28.0 in.		Sparse desert brush	No
00696431	H10	FIELD SAMPLE	10/18/2012 14:10	10/31/2012 11:24	30.0 in.		Sparse desert brush	No

GORE and designs are trademarks of W. L. Gore Associates, Inc.

Phase I (a) Gore® Modules

MODULE SERIAL NO.	FIELD ID	SAMPLE TYPE	INSTALLATION DATE & TIME MM/DD/YYYY	RETRIEVAL DATE & TIME MM/DD/YYYY	SAMPLE TYPE	NOTES	SAMPLE ENVIRONMENT	EVIDENCE OF LIQUID PETROLEUM HYDROCARBONS ?
00696432	G10	FIELD SAMPLE	10/18/2012 14:06	10/31/2012 11:19	20.0 in.	Intercepted boulder	Sparse desert brush	No
00696433	F10	FIELD SAMPLE	10/18/2012 14:01	10/31/2012 11:14	25.0 in.		Sparse desert brush	No
00696434	E10	FIELD SAMPLE	10/18/2012 13:55	10/31/2012 11:10	28.0 in.		Sparse desert brush	No
00696435	D10	FIELD SAMPLE	10/18/2012 13:52	10/31/2012 11:07	20.0 in.	Intercepted boulder	Sparse desert brush	No
00696436	C10	FIELD SAMPLE	10/18/2012 13:45	10/31/2012 11:02	28.0 in.		Gravel parking lot	No
00696437	B10	FIELD SAMPLE	10/18/2012 13:40	10/31/2012 10:59	25.0 in.		Gravel parking lot	No
00696438	A10	FIELD SAMPLE	10/18/2012 13:35	10/31/2012 10:55	26.0 in.		Sparse desert brush	No
00696439	A11	FIELD SAMPLE	10/18/2012 10:57	10/31/2012 10:51	26.0 in.		Sparse desert brush	No
00696450	B11	FIELD SAMPLE	10/18/2012 10:54	10/31/2012 10:45	28.0 in.	Out of sequence	Sparse desert brush	No
00696441	C11	FIELD SAMPLE	10/18/2012 10:50	10/31/2012 10:40	29.0 in.		Gravel parking lot	No
00696442	D11	FIELD SAMPLE	10/18/2012 10:45	10/31/2012 10:33	28.0 in.		Gravel parking lot	No
00696443	E11	FIELD SAMPLE	10/18/2012 10:34	10/31/2012 10:28	28.0 in.		Sparse desert brush	No
00696444	F11	FIELD SAMPLE	10/18/2012 10:29	10/31/2012 10:24	25.0 in.		Sparse desert brush	No
00696445	G11	FIELD SAMPLE	10/18/2012 10:25	10/31/2012 10:21	24.0 in.		Sparse desert brush	No
00696446	H11	FIELD SAMPLE	10/18/2012 10:20	10/31/2012 10:18	29.0 in.		Sparse desert brush	No
00696447	TB5	TRIP BLANK			0.0 in.	Trip Blank		
00696448	TB6	TRIP BLANK			0.0 in.	Trip Blank		
00696449	TB7	TRIP BLANK			0.0 in.	Trip Blank		
00696450	TB8	TRIP BLANK			0.0 in.	Trip Blank		
00696451	H12	FIELD SAMPLE	10/18/2012 10:00	10/31/2012 9:43	27.0 in.		Gravel road	No
00696452	G12	FIELD SAMPLE	10/18/2012 9:54	10/31/2012 9:38	27.0 in.		Sparse desert brush	No
00696459	F12	FIELD SAMPLE	10/18/2012 9:50	10/31/2012 9:35	26.0 in.		Sparse desert brush	No
00696460	E12	FIELD SAMPLE	10/18/2012 9:45	10/31/2012 9:34	26.0 in.		Sparse desert brush	No
00696461	D12	FIELD SAMPLE	10/18/2012 9:40	10/31/2012 9:21	30.0 in.		Asphalt parking lot	Asphalt
00696462	C12	FIELD SAMPLE	10/18/2012 9:35	10/31/2012 9:18	30.0 in.		Gravel parking lot	No
00696463	B12	FIELD SAMPLE	10/18/2012 9:28	10/31/2012 9:15	30.0 in.		Gravel road	No
00696464	A12	FIELD SAMPLE	10/18/2012 9:24	10/31/2012 9:11	30.0 in.		Sparse desert brush	No
00696465	A13	FIELD SAMPLE	10/18/2012 9:10	10/31/2012 9:05	28.0 in.		Sparse desert brush	No
00696466	B13	FIELD SAMPLE	10/18/2012 9:06	10/31/2012 9:00	29.0 in.		Sparse desert brush	No
00696467	C13	FIELD SAMPLE	10/18/2012 9:02	10/31/2012 8:55	28.0 in.		Sparse desert brush	No
00696468	D13	FIELD SAMPLE	10/18/2012 9:00	10/31/2012 8:48	28.0 in.		Asphalt parking lot	Asphalt
00696469	E13	FIELD SAMPLE	10/18/2012 8:50	10/31/2012 8:35	25.0 in.		Sparse desert brush	No
00696470	F13	FIELD SAMPLE	10/18/2012 8:32	10/31/2012 8:25	24.0 in.		Sparse desert brush	No
00696471	G13	FIELD SAMPLE	10/18/2012 8:28	10/31/2012 8:18	24.0 in.		Sparse desert brush	No
00696472	H13	FIELD SAMPLE	10/18/2012 8:25	10/31/2012 8:12	25.0 in.		Gravel clearing	No
00696473	H14	FIELD SAMPLE	10/18/2012 8:12	10/31/2012 8:04	27.0 in.		Gravel clearing	No
00696474	G14	FIELD SAMPLE	10/18/2012 8:08	10/31/2012 8:00	23.0 in.		Sparse desert brush	No
00696475	F14	FIELD SAMPLE	10/18/2012 8:02	10/31/2012 7:54	24.0 in.		Sparse desert brush	No
00696476	E14	FIELD SAMPLE	10/18/2012 7:55	10/31/2012 7:50	29.0 in.		Gravel parking lot	No
00696477	D14	FIELD SAMPLE	10/18/2012 7:50	10/31/2012 7:45	26.0 in.	Borehole driven over in parking lot	Asphalt parking lot	Asphalt
00696478	C14	FIELD SAMPLE	10/17/2012 14:50	10/30/2012 14:06	27.0 in.	Moist on collection/asphalt fragments	Asphalt parking lot	Asphalt
00696479	B14	FIELD SAMPLE	10/17/2012 14:45	10/30/2012 14:04	30.0 in.		Sparse desert brush	No
00696480	A14	FIELD SAMPLE	10/17/2012 14:40	10/30/2012 14:00	24.0 in.	Module cold on collection	Sparse desert brush	No
00696481	A15	FIELD SAMPLE	10/17/2012 14:35	10/30/2012 13:56	26.0 in.	Adjacent to gas line, module cold	Sparse desert brush	No
00696482	B15	FIELD SAMPLE	10/17/2012 14:32	10/30/2012 13:54	30.0 in.		Sparse desert brush	No
00696483	C15	FIELD SAMPLE	10/17/2012 14:20	10/30/2012 13:50	25.0 in.		Sparse desert brush	No
00696484	D15	FIELD SAMPLE	10/17/2012 14:10	10/30/2012 13:38	28.0 in.	Module moist on collection	Asphalt parking lot	Asphalt
00696485	E15	FIELD SAMPLE	10/17/2012 14:04	10/30/2012 13:34	28.0 in.		Sparse desert brush	No
00696486	F15	FIELD SAMPLE	10/17/2012 14:00	10/30/2012 13:30	25.0 in.		Sparse desert brush	No
00696487	G15	FIELD SAMPLE	10/17/2012 13:55	10/30/2012 13:27	28.0 in.		Sparse desert brush	No
00696488	H15	FIELD SAMPLE	10/17/2012 13:50	10/30/2012 13:22	29.0 in.		Sparse desert brush	No
00696489	H16	FIELD SAMPLE	10/17/2012 13:45	10/30/2012 13:18	26.0 in.		Sparse desert brush	No
00696490	G16	FIELD SAMPLE	10/17/2012 13:38	10/30/2012 13:14	25.0 in.		Sparse desert brush	No
00696491	F16	FIELD SAMPLE	10/17/2012 13:34	10/30/2012 13:10	24.0 in.		Sparse desert brush	No
00696492	E16	FIELD SAMPLE	10/17/2012 13:30	10/30/2012 13:05	25.0 in.		Sparse desert brush	No
00696493	D16	FIELD SAMPLE	10/17/2012 13:27	10/30/2012 13:00	29.0 in.		Gravel parking lot	No
00696494	C16	FIELD SAMPLE	10/17/2012 13:22	10/30/2012 12:58	26.0 in.		Sparse desert brush	No
00696495	B16	FIELD SAMPLE	10/17/2012 13:19	10/30/2012 12:54	28.0 in.		Sparse desert brush	No
00696496	A16	FIELD SAMPLE	10/17/2012 13:15	10/30/2012 12:50	27.0 in.		Sparse desert brush	No
00696497	A17	FIELD SAMPLE	10/17/2012 11:07	10/30/2012 10:37	28.0 in.		Sparse desert brush	No
00696498	B17	FIELD SAMPLE	10/17/2012 11:05	10/30/2012 10:35	29.0 in.		Sparse desert brush	No
00696499	C17	FIELD SAMPLE	10/17/2012 11:00	10/30/2012 10:30	29.0 in.		Sparse desert brush	No
00696500	D17	FIELD SAMPLE	10/17/2012 10:55	10/30/2012 10:25	27.0 in.		Gravel parking lot	No
00696501	TB9	TRIP BLANK			0.0 in.	Trip Blank		
00696502	TB10	TRIP BLANK			0.0 in.	Trip Blank		
00696503	TB11	TRIP BLANK			0.0 in.	Trip Blank		
00696504	TB12	TRIP BLANK			0.0 in.	Trip Blank		
00696505	E17	FIELD SAMPLE	10/17/2012 10:28	10/30/2012 10:08	26.0 in.		Gravel parking lot	No
00696506	F17	FIELD SAMPLE	10/17/2012 10:18	10/30/2012 10:05	23.0 in.		Sparse desert brush	No
00696507	G17	FIELD SAMPLE	10/17/2012 10:10	10/30/2012 10:01	27.0 in.		Sparse desert brush	No
00696512	E18	FIELD SAMPLE	10/17/2012 10:02	10/30/2012 9:55	25.0 in.		Sparse desert brush	No
00696513	D18	FIELD SAMPLE	10/17/2012 9:58	10/30/2012 9:50	25.0 in.		Sparse desert brush	No
00696514	C18	FIELD SAMPLE	10/17/2012 9:55	10/30/2012 9:47	25.0 in.		Sparse desert brush	No
00696515	B18	FIELD SAMPLE	10/17/2012 9:50	10/30/2012 9:44	30.0 in.		Sparse desert brush - adjacent to road	No
00696516	A18	FIELD SAMPLE	10/17/2012 9:45	10/30/2012 9:40	29.0 in.		Sparse desert brush	No
00696517	A19	FIELD SAMPLE	10/17/2012 9:40	10/30/2012 9:36	26.0 in.		Sparse desert brush	No

Phase I (a) Gore® Modules

MODULE SERIAL NO.	FIELD ID	SAMPLE TYPE	INSTALLATION DATE & TIME MM/DD/YYYY	RETRIEVAL DATE & TIME MM/DD/YYYY	SAMPLE TYPE	NOTES	SAMPLE ENVIRONMENT	EVIDENCE OF LIQUID PETROLEUM HYDROCARBONS ?
00696518	B19	FIELD SAMPLE	10/17/2012 9:35	10/30/2012 9:32	25.0 in.		Sparse desert brush	No
00696519	C19	FIELD SAMPLE	10/17/2012 9:32	10/30/2012 9:25	24 in.		Sparse desert brush	No
00696520	D19	FIELD SAMPLE	10/17/2012 9:25	10/30/2012 9:20	26.0 in.		Sparse desert brush	No
00696525	BP-1	FIELD SAMPLE	10/16/2012 13:10	10/29/2012 13:00	28.0 in.		Gravel parking lot	No
00696526	BP-2	FIELD SAMPLE	10/16/2012 13:15	10/29/2012 13:02	29.0 in.		Gravel parking lot	No
00696527	SH-1	FIELD SAMPLE	10/16/2012 13:20	10/29/2012 13:07	25.0 in.		Gravel clearing	No
00696528	SH-2	FIELD SAMPLE	10/16/2012 13:25	10/29/2012 13:09	29.0 in.		Gravel clearing	No
00696529	BL-1	FIELD SAMPLE	10/16/2012 13:30	10/29/2012 13:11	27.0 in.		Gravel clearing	No
00696530	BL-2	FIELD SAMPLE	10/16/2012 13:32	10/29/2012 13:14	28.0 in.		Gravel clearing	No
00696531	SB-1	FIELD SAMPLE	10/16/2012 13:34	10/29/2012 13:16	26.0 in.		Gravel clearing	No
00696532	SB-2	FIELD SAMPLE	10/16/2012 13:36	10/29/2012 13:17	25.0 in.		Gravel clearing	No
00696533	SB-3	FIELD SAMPLE	10/16/2012 13:40	10/29/2012 13:20	26.0 in.		Sparse desert brush	No
00696534	SB-4	FIELD SAMPLE	10/16/2012 13:42	10/29/2012 13:22	25.0 in.		Sparse desert brush	No
00696535	DP-1	FIELD SAMPLE	10/16/2012 13:45	10/29/2012 13:24	29.0 in.	Proximal to FO line, module cold on retrieval	Asphalt parking lot	Asphalt
00696536	DP-2	FIELD SAMPLE	10/16/2012 13:48	10/29/2012 13:26	29.0 in.	Proximal to FO line, module cold on retrieval	Asphalt parking lot	Asphalt
00696537	CS-1	FIELD SAMPLE	10/16/2012 13:50	10/29/2012 13:29	29.0 in.		Gravel clearing	No
00696538	CS-2	FIELD SAMPLE	10/16/2012 13:54	10/29/2012 13:31	29.0 in.		Gravel clearing	No
00696539	SR-1*	FIELD SAMPLE				Borehole intercepted a compressed air line		
00696540	TB13	TRIP BLANK			0.0 in.	Trip Blank		
00696541	SR-2	FIELD SAMPLE	10/16/2012 14:00	10/29/2012 13:32	29.0 in.	Run over by bobcat, module moist on retrieval	Gravel ditch	
00696542	AD-1	FIELD SAMPLE	10/16/2012 14:05	10/29/2012 13:34	27.0 in.	Module moist on retrieval	Asphalt parking lot	Asphalt
00696543	AD-2	FIELD SAMPLE	10/16/2012 14:08	10/29/2012 13:35	30.0 in.		Asphalt parking lot	Asphalt
00696544	CL-1	FIELD SAMPLE	10/16/2012 14:10	10/29/2012 13:37	27.0 in.		Asphalt parking lot	Asphalt
00696545	CL-2	FIELD SAMPLE	10/16/2012 14:14	10/29/2012 13:39	27.0 in.		Asphalt parking lot	Asphalt
00696546	CP-1	FIELD SAMPLE	10/16/2012 14:18	10/29/2012 13:43	29.0 in.		Gravel ditch	No
00696547	CP-2	FIELD SAMPLE	10/16/2012 14:20	10/29/2012 13:44	30.0 in.	Module slightly moist on retrieval	Gravel ditch	No
00696548	CR-1	FIELD SAMPLE	10/16/2012 14:25	10/29/2012 13:47	23.0 in.	Module slightly moist on retrieval	Asphalt parking lot	Asphalt
00696549	CR-2	FIELD SAMPLE	10/16/2012 14:28	10/29/2012 13:49	30.0 in.	Sampler cold on retrieval	Asphalt parking lot	Asphalt
00696550	TB14	TRIP BLANK			0.0 in.	Trip Blank		
00696551	TB15	TRIP BLANK			0.0 in.	Trip Blank		
00696552	TB16	TRIP BLANK			0.0 in.	Trip Blank		
00696553	AA-1	FIELD SAMPLE	10/16/2012 14:45	10/29/2012 14:00	29.0 in.		Desert brush	No
00696554	AA-2	FIELD SAMPLE	10/16/2012 14:48	10/29/2012 14:02	30.0 in.		Desert brush	No
00696555	600-G-13	FIELD SAMPLE	10/16/2012 14:55	10/29/2012 14:10	0.0 in.	Module suspended in conventional water well	Suspended 2 feet from TOC using well cap	No
00696556	NASA 4	FIELD SAMPLE	10/16/2012 15:10	10/29/2012 14:15	0.0 in.	Module suspended in conventional water well	Suspended 2 feet from TOC using well cap	No
00696557	100-HG-1	FIELD SAMPLE	10/16/2012 15:15	10/29/2012 14:20	0.0 in.	Module suspended in conventional water well	Suspended 2 feet from TOC using well cap	No
00696558	200-JG-1	FIELD SAMPLE	10/17/2012 7:30	10/30/2012 7:28	0.0 in.	Module suspended in conventional water well	Suspended 2 feet from TOC using well cap	No
00696559	200-D-10	FIELD SAMPLE	10/17/2012 7:55	10/30/2012 7:45	0.0 in.	Module suspended in conventional water well	Suspended 2 feet from TOC using well cap	No
00696560	200-D-24	FIELD SAMPLE	10/17/2012 8:00	10/30/2012 7:50	0.0 in.	Module suspended in conventional water well	Suspended 2 feet from TOC using well cap	No
00696561	200-B-24	FIELD SAMPLE	10/17/2012 8:12	10/30/2012 8:05	0.0 in.	Module suspended in conventional water well	Suspended 2 feet from TOC using well cap	No
00696562	600-C-17	FIELD SAMPLE	10/17/2012 8:20	10/30/2012 8:15	0.0 in.	Module suspended in conventional water well	Suspended 2 feet from TOC using well cap	No
00696563	600-C-21	FIELD SAMPLE	10/17/2012 8:25	10/30/2012 8:20	0.0 in.	Module suspended in conventional water well	Suspended 2 feet from TOC using well cap	No
00696564	NASA 2	FIELD SAMPLE	10/17/2012 8:28	10/30/2012 8:25	0.0 in.	Module suspended in conventional water well	Suspended 2 feet from TOC using well cap	No
00696565	NASA 7	FIELD SAMPLE	10/17/2012 8:32	10/30/2012 8:27	0.0 in.	Module suspended in conventional water well	Suspended 2 feet from TOC using well cap	No
00696566	NASA 8	FIELD SAMPLE	10/17/2012 8:36	10/30/2012 8:30	0.0 in.	Module suspended in conventional water well	Suspended 2 feet from TOC using well cap	No
00696567	BLM-3-18	FIELD SAMPLE	10/17/2012 8:40	10/30/2012 8:36	0.0 in.	Module suspended in conventional water well	Suspended 2 feet from TOC using well cap	No
00696568	OS-1	FIELD SAMPLE	10/18/2012 8:20	10/31/2012 8:18	26.0 in.	Out of sequence	Gravel clearing	No
Phase I (b) Gore® Modules (Supplemental)								
00696508	S1	FIELD SAMPLE	12/14/2012 7:45	12/27/2012 8:49	27.0 in. Raining	Raining	Sparse desert brush	No
00696509	S2	FIELD SAMPLE	12/14/2012 7:50	12/27/2012 8:53	30.0 in. Raining	Raining	Sparse desert brush	No
00696510	S3	FIELD SAMPLE	12/14/2012 7:55	12/27/2012 8:57	20.0 in. Raining	Raining	Sparse desert brush	No
00696511	S4	FIELD SAMPLE	12/14/2012 8:00	12/27/2012 9:00	25.0 in. Raining	Raining	Sparse desert brush	No
00696521	S5	FIELD SAMPLE	12/14/2012 8:04	12/27/2012 9:02	26.0 in. Raining	Raining	Sparse desert brush	No
00696522	S6	FIELD SAMPLE	12/14/2012 8:07	12/27/2012 9:04	26.0 in. Raining	Raining	Sparse desert brush	No
00696523	S7	FIELD SAMPLE	12/14/2012 8:11	12/27/2012 9:07	27.0 in. Raining	Raining	Sparse desert brush	No
00696524	S8	FIELD SAMPLE	12/14/2012 8:15	12/27/2012 9:09	28.0 in. Raining	Raining	Sparse desert brush	No
00696569	S9	FIELD SAMPLE	12/14/2012 8:19	12/27/2012 9:11	28.0 in. Raining	Raining	Sparse desert brush	No
00696570	S10	FIELD SAMPLE	12/14/2012 8:22	12/27/2012 9:16	27.0 in. Raining	Raining	Sparse desert brush	No
00696571	S11	FIELD SAMPLE	12/14/2012 8:37	12/27/2012 9:36	25.0 in. Raining	Raining	Sparse desert brush	No
00696572	S12	FIELD SAMPLE	12/14/2012 8:42	12/27/2012 9:38	26.0 in. Raining	Raining	Sparse desert brush	No
00696573	S13	FIELD SAMPLE *D	12/14/2012 9:38	12/27/2012 9:41	26.0 in. Raining	Raining	Sparse desert brush	No
00696574	S14	FIELD SAMPLE	12/14/2012 9:43	12/27/2012 9:42	25.0 in. Raining	Raining	Sparse desert brush	No
00696575	S15	FIELD SAMPLE	12/14/2012 9:46	12/27/2012 9:44	25.0 in. Raining	Raining	Sparse desert brush	No
00696576	S16	FIELD SAMPLE	12/14/2012 9:48	12/27/2012 9:53	26.0 in. Raining	Raining	Sparse desert brush	No
00696577	S17	FIELD SAMPLE	12/14/2012 9:55	12/27/2012 9:59	28.0 in. Raining	Raining	Sparse desert brush	No

Table 2.2 Summary of Field Installation & Retrieval E-Log Submitted to Gore® Laboratories

Phase I (a) Gore® Modules

MODULE SERIAL NO.	FIELD ID	SAMPLE TYPE	INSTALLATION DATE & TIME MM/DD/YYYY	RETRIEVAL DATE & TIME MM/DD/YYYY	SAMPLE TYPE	NOTES	SAMPLE ENVIRONMENT	EVIDENCE OF LIQUID PETROLEUM HYDROCARBONS ?
00696578	S18	FIELD SAMPLE	12/14/2012 9:59	12/27/2012 9:46	25.0 in. Raining	Raining	Sparse desert brush	No
00696585	S19	FIELD SAMPLE *D	12/14/2012 10:02	12/27/2012 9:49	26.0 in. Raining	Raining	Sparse desert brush	No
00696586	S20	FIELD SAMPLE	12/14/2012 10:05	12/27/2012 10:04	25.0 in. Raining	Raining	Sparse desert brush	No
00696587	S21	FIELD SAMPLE	12/14/2012 10:08	12/27/2012 10:08	27.0 in. Raining	Raining	Sparse desert brush	No
00696588	S22	FIELD SAMPLE	12/14/2012 10:12	12/27/2012 10:08	27.0 in. Raining	Raining	Sparse desert brush	No
00696589	S23	FIELD SAMPLE	12/14/2012 12:55	12/27/2012 10:10	23.0 in. Windy	Windy	Sparse desert brush	No
00696590	S24	FIELD SAMPLE	12/14/2012 13:00	12/27/2012 10:13	27.0 in. Windy	Windy	Sparse desert brush	No
00696591	S25	FIELD SAMPLE *D	12/14/2012 13:03	12/27/2012 10:15	30.0 in. Windy	Windy	Sparse desert brush	No
00696592	S26	FIELD SAMPLE	12/14/2012 13:04	12/27/2012 10:17	29.0 in. Windy	Windy	Sparse desert brush	No
00696593	S27	FIELD SAMPLE	12/14/2012 13:11	12/27/2012 10:19	26.0 in. Windy	Windy	Sparse desert brush	No
00696594	S28	FIELD SAMPLE	12/14/2012 13:14	12/27/2012 10:21	25.0 in. Windy	Windy	Sparse desert brush	No
00696595	S29	FIELD SAMPLE	12/14/2012 13:24	12/27/2012 10:27	25.0 in. Windy	Windy	Sparse desert brush	No
00696596	S30	FIELD SAMPLE	12/14/2012 13:26	12/27/2012 10:29	30.0 in. Windy	Windy	Sparse desert brush	No
00696597	S31	FIELD SAMPLE	12/14/2012 13:28	12/27/2012 10:31	24.0 in. Windy	Windy	Sparse desert brush	No
00696598	S32	FIELD SAMPLE	12/14/2012 13:32	12/27/2012 10:33	26.0 in. Windy	Windy	Sparse desert brush	No
00696599	S33	FIELD SAMPLE *	12/14/2012 13:34	12/27/2012 10:38	25.0 in. Windy	Windy	Sparse desert brush	No
00696600	S34	FIELD SAMPLE	12/14/2012 13:08	12/27/2012 10:40	24.0 in. Windy	Windy	Sparse desert brush	No
00696601	S35	FIELD SAMPLE *D	12/14/2012 13:52	12/27/2012 10:51	26.0 in. Windy	Windy	Sparse desert brush	No
00696602	S36	FIELD SAMPLE	12/14/2012 13:41	12/27/2012 10:43	24.0 in. Windy	Windy	Sparse desert brush	No
00696603	S37	FIELD SAMPLE	12/14/2012 13:43	12/27/2012 10:45	24.0 in. Windy	Windy	Sparse desert brush	No
00696604	S38	FIELD SAMPLE	12/14/2012 13:50	12/27/2012 10:47	26.0 in. Windy	Windy	Sparse desert brush	No
00696605	TB17	TRIP BLANK	N/A	N/A	0.0 in.	Trip Blank		
00696606	TB18	TRIP BLANK	N/A	N/A	0.0 in.	Trip Blank		

Notes: No color/white = Phase I (a) vadose zone modules.
Yellow = Trip blank modules.
Orange = Phase I (a) conventional groundwater monitoring well modules.
Green = Phase I (b) vadose zone modules
Asterisk = Duplicate sample collected.

GORE and designs are trademarks of W. L. Gore Associates, Inc.

Table 3.1 Summary of Gore Module Analtyical Results for Anomalous VOCs

SEE NEXT PAGE

Table 3.1
200 Area Phase I Status Report

Analyte	TCE	PCE	Freon 11	Freon 113	Total Petroleum Hydrocarbons
Method Detection Limit	0.02 µg	0.02 µg	0.05 µg	0.05 µg	0.5 µg
Sample Location					
A1	ND	ND	ND	0.29	0.57
A2	ND	ND	ND	0.33	ND
A3	ND	ND	ND	0.46	ND
A4	ND	ND	0.11	0.81	ND
A5	0.08	ND	0.23	3.94	ND
A6	0.07	0.02	0.57	15.84	ND
A7	0.08	ND	0.59	20.90	ND
A8	0.09	0.02	0.68	21.64	ND
A9	ND	0.02	0.16	4.89	ND
A10	0.30	0.10	0.11	3.57	ND
A11	0.28	0.09	0.09	1.96	1.15
A12	2.97	0.37	0.21	3.95	ND
A13	ND	ND	ND	0.21	ND
A14	0.14	0.03	ND	0.59	ND
A15	0.13	0.02	ND	0.43	ND
A16	0.61	0.16	0.19	1.68	ND
A17	0.12	0.04	0.56	4.47	1.05
A18	0.73	0.34	1.99	14.42	ND
A19	0.04	0.07	1.41	9.09	ND
B1	ND	ND	0.11	9.34	ND
B2	0.02	ND	0.31	15.58	ND
B3	0.43	0.07	1.16	35.56	ND
B4	0.94	0.13	1.01	30.82	ND
B5	0.03	ND	0.34	14.51	ND
B6	ND	ND	0.08	5.50	ND
B7	ND	ND	0.06	7.41	ND
B8	ND	ND	ND	1.39	ND
B9	ND	ND	ND	0.99	ND
B10	ND	0.03	ND	0.49	9.17
B11	0.27	0.07	0.05	3.23	ND
B12	1.38	0.39	ND	1.97	ND
B13	0.37	0.10	ND	1.43	ND
B14	8.45	1.01	ND	5.96	ND
B15	39.45	4.73	0.50	18.00	ND
B16	1.18	0.32	1.31	6.33	ND
B17	0.18	0.09	3.03	10.88	ND
B18	0.98	0.46	1.48	10.09	ND

Table 3.1
200 Area Phase I Status Report

Analyte	TCE	PCE	Freon 11	Freon 113	Total Petroleum Hydrocarbons
Method Detection Limit	0.02 µg	0.02 µg	0.05 µg	0.05 µg	0.5 µg
Sample Location					
B19	0.17	0.06	1.70	6.28	ND
C1	ND	ND	ND	1.43	ND
C2	ND	ND	0.14	8.85	ND
C3	0.16	0.04	0.51	21.52	ND
C4	0.33	0.05	1.34	60.63	ND
C5	0.02	ND	0.82	53.26	ND
C6	ND	ND	0.35	40.71	0.51
C7	0.02	ND	0.35	56.02	ND
C8	0.14	ND	0.21	36.16	ND
C9	ND	ND	ND	4.08	ND
C10	5.79	0.92	0.12	50.82	ND
C11	3.52	0.66	0.19	30.33	ND
C12	1.37	4.89	0.07	6.81	0.87
C13	0.36	0.05	ND	0.26	ND
C14	10.36	1.70	2.50	18.00	ND
C15	0.10	0.05	0.81	3.65	ND
C16	0.07	0.06	0.95	3.05	ND
C17	ND	ND	0.18	0.86	ND
C18	0.03	ND	0.48	1.25	ND
C19	0.08	ND	0.82	1.14	ND
D1	ND	ND	ND	0.07	ND
D2	ND	ND	0.05	3.45	ND
D3	ND	ND	ND	3.04	ND
D4	ND	ND	0.09	10.20	ND
D5	ND	ND	0.13	21.43	ND
D6	ND	ND	0.16	26.08	ND
D7	5.62	0.81	0.11	42.13	ND
D8	4.52	0.71	0.16	99.83	ND
D9	0.13	0.03	0.16	38.66	0.54
D10	0.09	0.02	0.07	29.62	1.55
D11	1.27	0.10	0.06	5.76	ND
D12	ND	ND	ND	0.53	ND
D13	7.13	1.02	ND	4.04	0.66
D14	ND	ND	0.11	0.22	ND
D15	ND	ND	0.08	0.12	0.64
D16	ND	ND	0.06	ND	ND
D17	ND	ND	0.06	0.05	0.93
D18	ND	ND	0.26	0.33	ND

Table 3.1
200 Area Phase I Status Report

Analyte	TCE	PCE	Freon 11	Freon 113	Total Petroleum Hydrocarbons
Method Detection Limit	0.02 µg	0.02 µg	0.05 µg	0.05 µg	0.5 µg
Sample Location					
D19	ND	ND	0.36	0.34	ND
E1	ND	ND	ND	1.63	ND
E2	ND	ND	ND	ND	ND
E3	ND	0.02	0.10	18.56	ND
E4	ND	ND	0.07	16.18	ND
E5	ND	ND	ND	7.08	ND
E6	0.04	0.03	ND	8.49	ND
E7	20.24	1.68	ND	30.04	ND
E8	17.14	1.47	ND	19.32	ND
E9	0.08	ND	ND	12.85	ND
E10	ND	ND	ND	4.10	ND
E11	0.03	ND	ND	24.29	ND
E12	0.07	ND	ND	8.25	ND
E13	ND	ND	ND	0.45	ND
E14	ND	ND	0.06	0.06	ND
E15	ND	ND	ND	ND	ND
E16	ND	ND	ND	ND	ND
E17	ND	ND	ND	0.08	ND
E18	ND	ND	0.14	0.31	ND
F1	ND	ND	ND	1.28	3.14
F2	ND	ND	ND	3.17	ND
F3	ND	ND	ND	0.07	0.65
F4	ND	ND	ND	1.84	ND
F5	ND	0.07	ND	3.41	ND
F6	0.09	0.15	ND	2.44	ND
F7	0.38	0.09	ND	15.08	ND
F8	ND	ND	ND	0.57	ND
F9	ND	ND	ND	3.68	ND
F10	ND	ND	ND	0.91	ND
F11	ND	ND	ND	0.32	ND
F12	ND	ND	0.06	0.51	ND
F13	ND	ND	0.08	0.14	ND
F14	ND	ND	ND	ND	ND
F15	ND	ND	ND	ND	ND
F16	ND	ND	ND	ND	ND
F17	ND	ND	ND	ND	0.51
G1	ND	ND	ND	3.71	ND
G2	ND	ND	ND	0.88	0.53

Table 3.1
200 Area Phase I Status Report

Analyte	TCE	PCE	Freon 11	Freon 113	Total Petroleum Hydrocarbons
Method Detection Limit	0.02 µg	0.02 µg	0.05 µg	0.05 µg	0.5 µg
Sample Location					
G3	0.14	0.11	0.08	17.55	ND
G4	0.16	0.08	ND	2.57	ND
G5	0.76	0.24	0.07	19.01	ND
G6	0.28	0.06	ND	1.52	ND
G7	1.08	0.11	ND	3.11	ND
G8	ND	ND	ND	1.26	ND
G9	ND	ND	0.07	16.19	ND
G10	ND	ND	ND	2.81	1.66
G11	ND	ND	ND	0.10	ND
G12	ND	ND	ND	ND	ND
G13	ND	ND	ND	0.09	ND
G14	ND	ND	ND	ND	ND
G15	ND	ND	ND	ND	ND
G16	ND	ND	ND	ND	0.64
G17	ND	ND	ND	ND	ND
H1	ND	ND	ND	1.13	ND
H2	ND	ND	ND	4.37	ND
H3	0.06	0.06	ND	7.21	ND
H4	ND	ND	ND	0.51	ND
H5	6.56	0.78	ND	9.39	ND
H6	1.37	0.16	ND	12.35	ND
H7	0.55	0.11	ND	7.74	ND
H8	0.05	ND	ND	2.06	0.79
H9	ND	ND	ND	0.10	ND
H10	ND	ND	ND	0.55	ND
H11	ND	ND	ND	ND	ND
H12	ND	ND	0.57	1.57	ND
H13	ND	ND	ND	0.06	ND
H14	ND	ND	ND	0.11	ND
H15	ND	ND	0.15	0.30	ND
H16	ND	ND	0.09	0.26	ND
AA-1	0.39	0.29	ND	0.84	ND
AA-2	0.28	0.31	ND	1.25	ND
AD-1	0.07	ND	0.17	0.23	ND
AD-2	ND	ND	ND	ND	0.54
BL-1	ND	0.02	0.12	2.01	ND
BL-2	0.07	0.07	0.05	3.60	ND
BP-1	ND	ND	0.09	12.00	ND

Table 3.1
200 Area Phase I Status Report

Analyte	TCE	PCE	Freon 11	Freon 113	Total Petroleum Hydrocarbons
Method Detection Limit	0.02 µg	0.02 µg	0.05 µg	0.05 µg	0.5 µg
Sample Location					
BP-2	0.04	0.11	0.10	12.22	ND
CL-1	0.04	ND	1.60	2.19	ND
CL-2	0.11	ND	2.92	2.23	0.64
CP-1	6.29	0.91	ND	0.34	0.72
CP-2	3.16	0.44	ND	0.16	ND
CR-1	3.46	0.41	ND	4.88	1.64
CR-2	2.34	0.93	ND	11.68	ND
CS-1	ND	ND	1.46	2.95	ND
CS-2	ND	ND	1.08	1.02	0.54
DP-1	ND	ND	0.69	0.68	ND
DP-2	ND	ND	0.68	1.27	ND
OS-1	ND	ND	ND	0.09	0.62
SB-1	ND	ND	0.16	5.61	ND
SB-2	ND	ND	0.08	0.12	ND
SB-3	ND	ND	ND	0.13	ND
SB-4	ND	ND	ND	0.06	ND
SH-1	ND	ND	ND	1.08	ND
SH-2	ND	ND	ND	0.40	ND
SR-2	0.04	ND	0.15	0.11	0.69
S1	ND	ND	ND	8.35	ND
S2	0.02	0.04	ND	4.65	ND
S3	ND	ND	ND	0.12	2.71
S4	2.06	0.24	ND	8.46	ND
S5	2.23	0.21	ND	21.68	ND
S6	2.36	0.21	ND	17.12	ND
S7	11.25	0.90	ND	20.55	ND
S8	0.04	0.05	ND	10.39	ND
S9	6.61	0.57	ND	16.16	ND
S10	0.23	0.18	ND	5.85	ND
S11	1.58	0.15	0.80	51.98	1.30
S12	ND	ND	0.18	24.32	ND
S13	0.17	ND	0.75	66.44	ND
S14	0.18	0.03	0.66	53.42	ND
S15	ND	ND	0.24	43.92	0.94
S16	ND	ND	ND	8.48	1.17
S17	ND	ND	0.06	55.43	ND
S18	0.05	0.02	0.29	59.53	ND
S19	0.19	0.03	0.21	58.61	ND

Table 3.1
200 Area Phase I Status Report

Analyte	TCE	PCE	Freon 11	Freon 113	Total Petroleum Hydrocarbons
Method Detection Limit	0.02 µg	0.02 µg	0.05 µg	0.05 µg	0.5 µg
Sample Location					
S20	11.77	1.52	0.09	86.32	ND
S21	1.37	0.15	ND	50.91	ND
S22	2.20	0.23	ND	9.15	5.14
S23	68.28	5.41	0.05	72.99	ND
S24	6.68	0.77	ND	43.26	ND
S25	59.22	4.79	ND	42.66	ND
S26	2.09	0.19	ND	6.64	ND
S27	0.26	0.02	ND	3.41	ND
S28	10.26	0.47	ND	36.85	ND
S29	ND	ND	ND	0.36	ND
S30	13.56	1.96	ND	8.74	ND
S31	11.26	0.97	ND	13.66	ND
S32	9.42	1.00	0.07	14.96	ND
S33	19.06	1.64	0.12	20.73	ND
S34	5.50	0.47	ND	2.60	ND
S35	0.03	ND	0.13	0.68	ND
S36	0.69	0.10	0.30	5.76	0.54
S37	2.84	0.41	0.53	11.77	ND
S38	1.04	0.10	ND	0.32	ND
Mean Value*	**2.02**	**0.25**	**0.23**	**11.14**	**0.42**

Notes
ND = Non-Detect
* Mean value calculated using a value half the detection limit for non-detect samples

Appendix A Photographic Documentation

Photograph A1: Surveyors Stake for Geophysical Line M

Photograph A2: Pin Flags on Geophysical Line C (View to the Southwest)

Photograph A3: Cable Guard for road Crossing at Line A (View to the Northwest)

Photograph A4: Interior of a Cable Guard

Photograph A5: Vehicular Traffic Across Line A (View to the Northeast)

Photograph A6: Pin Flags on Geophysical Line I (View to the Northwest)

Photograph A7: Electrical Resistivity Electrode

Photograph A8: Wetting Electrodes for Better Conductivity

Photograph A9: Electrode Connected to Data Cable

Photograph A10: Electrical Resistivity Control and Recording Equipment

Photograph A11: Seismic Energy Source for Refraction Study on Line A
(View to the North)

Photograph A12: Seismic Geophone with Cable Used for Connection to Seismograph

Photograph A13: Installation of 0.75” x 15” Stainless Steel Conduit for Soil Boring Stability at Point E2

Photograph A14: Inserting 5/8” x 36” Rock Carbide Drill Bit through Stainless Steel Conduit at Point E2

Photograph A15: Drilling Soil Boring to total Depth at Point E2

Photograph A16: Checking Depth of Soil Boring (Post Installation at Point E2)

Photograph A17: Temporary Sealing of Soil Borings at Point E2 Prior to Soil Gas Sampling

Photograph A18: Sealed Soil Boring Adjacent to Surveyors Stake for Point E2

Appendix B Geophysical Survey Results Report by HGI

RPT-2012-021

GEOPHYSICAL CHARACTERIZATION OF THE NATIONAL AERONAUTICS AND SPACE ADMINISTRATION'S WHITE SANDS TEST FACILITY: 200 AREA AND ADJACENT PORTIONS OF THE 100, 600 AND 800 AREAS LAS CRUCES, NM

D. Rucker, Ph.D.
C. Baldyga, M.Sc.
G. Noonan
B. Cubbage

hydroGEOPHYSICS
2302 N. Forbes Blvd, Tucson, AZ 85745 USA

Date Published
December 2012

Prepared for Navarro Research and Engineering, Inc.

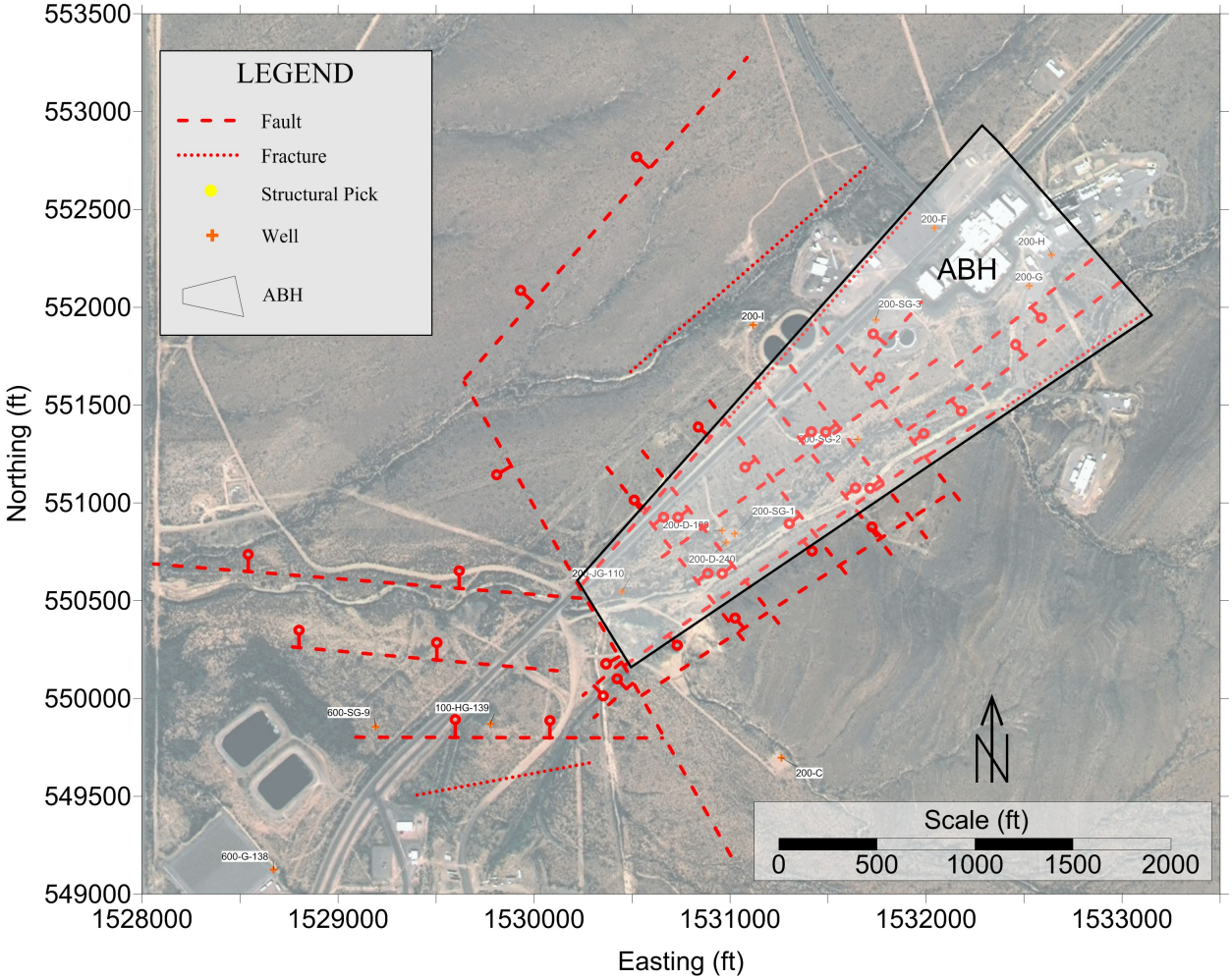
EXECUTIVE SUMMARY

A geophysical survey has been completed by HydroGEOPHYSICS, Inc. at the National Aeronautics and Space Administration White Sands Test Facility. The investigation took place primarily within the 200 Area and extended into adjacent portions of the 100, 600, and 800 Areas. The survey was designed to capture bedrock geology and structural features that could be controlling contaminant movement downgradient from probable source areas. The survey included electrical resistivity and seismic refraction along a set of 13 lines. Using seismic refraction, depth to bedrock was partially confirmed, when bedrock was relatively shallow. The electrical resistivity method highlighted contrasts in electrical properties that were indicative of faults, fractures, and grabens. Faults were identified by an offset in the top of resistive bodies. Grabens were identified to be wide conductive bodies in a relatively resistive matrix, and fractures were indicated by breaks in resistive features, but with no offset. Some fractures were shown to be conductive within an otherwise resistive host, and it was assumed that these fractures were fluid-filled.

When placed in context to previously identified or indicated geological, hydrogeological, and geophysical information, the structural features were consistent across the site. These features are presented in Figure EX-1 and indicate a series of faults and fractures that align with the suspected horst direction below the 200 Area complex, parallel with Apollo Blvd, termed the Apollo Blvd Horst (ABH). Cross-cutting through the ABH are faults and grabens that may ultimately be controlling the direction of contaminant migration.

Although the structural features identified in this survey were broadly consistent among the existing data and internally consistent along adjacent lines, there still remains a moderate amount of uncertainty as to the exact size and type of structural features. Where grabens have been identified, the structures could actually be fluid-filled conductive fracture with a spatially wide influence on the resistivity data. It is recommended that any feature pertinent to flow and transport modeling be verified using additional exploration methods, such as drilling. Additionally, this portion of the White Sands Test Facility could benefit from a tighter survey line spacing with more geophysical data acquisition, which would assist in identifying features smaller than 200 ft, which was the line spacing used in this survey separation.

Figure EX-1. Structural geology interpreted from the geophysical survey



Note: Coordinate system is the New Mexico State Plane (NMSP), Central with a North American Datum of 1983 (NAD83).

TABLE OF CONTENTS

1.0 INTRODUCTION 1-1
1.1 PROJECT DESCRIPTION 1-1
1.2 SITE LOCATION 1-2
1.3 OBJECTIVE OF INVESTIGATION 1-2
1.4 SCOPE OF WORK 1-2

2.0 BACKGROUND 2-1
2.1 BEDROCK GEOLOGY 2-1
2.2 HYDROSTRATIGRAPHY 2-4
2.3 SURVEY AREA INFRASTRUCTURE 2-5
2.4 ELECTROMAGNETIC INDUCTION SURVEY RESULTS 2-6

3.0 GEOPHYSICAL THEORY 3-1
3.1 ELECTROMAGNETIC INDUCTION 3-1
3.2 ELECTRICAL RESITIVITY CHARACTERIZATION 3-1
3.3 SEISMIC REFRACTION 3-3

4.0 METHODOLOGY 4-1
4.1 SURVEY AREA AND LOGISTICS 4-1
4.2 EQUIPMENT 4-1
4.2.1 Equipment for EM 4-1
4.2.2 Equipment for ERC 4-2
4.2.3 Equipment for Seismic Refraction 4-3
4.3 DATA PROCESSING 4-4
4.3.1 Quality Control – Onsite 4-4
4.3.2 Electromagnetic Processing and Plotting 4-4
4.3.3 Resistivity Processing 4-5
4.3.3.1 2D Resistivity Inversion 4-6
4.3.3.2 2D Resistivity Plotting 4-7
4.3.4 Seismic Refraction Processing 4-7
4.3.4.1 Seismic Refraction Modeling 4-8

5.0 RESULTS & INTERPRETATION 5-1
5.1 LINES A & B 5-1
5.2 LINE C 5-2
5.3 LINES D AND E 5-4
5.4 LINES F AND I 5-5
5.5 LINES G AND H 5-6
5.6 LINE J 5-7
5.7 LINE K 5-8
5.8 LINE L 5-9
5.9 LINE M 5-10
5.10 PLAN MAP OF INTERPRETED STRUCTURE 5-11

6.0 CONCLUSIONS 6-1

7.0 REFERENCES 7-1

APPENDICES

A Cross Sections of Two-Dimensional Inversion Results..... A-1

LIST OF FIGURES

Figure 1-1. General Site Map with Geophysical Survey Lines. 1-3
Figure 2-1. Aerial Photo of Site with Geology from Seager (1981) 2-2
Figure 2-2. Model for the Top of Bedrock Elevation Map (Conceptual), Prior to Geophysical Acquisition. 2-3
Figure 2-3. Water Table Elevation, November 2012 2-5
Figure 2-4. Survey Area Infrastructure 2-6
Figure 2-5. EM Survey Results, Lines A through F 2-7
Figure 2-6. EM Survey Results, Lines G through L 2-8
Figure 3-1. Possible Arrays for use in Electrical Resistivity Characterization 3-2
Figure 3-2. Ray Travel for Seismic Refraction Surveying 3-4
Figure 4-1. Detailed Line layout 4-2
Figure 4-2. Example shot record (Line L) showing first break picks. 4-8
Figure 4-3. Example of layer assignments (Line A) 4-8
Figure 5-1. Lines A and B with Interpretation 5-3
Figure 5-2. Line C with Interpretation 5-3
Figure 5-3. Lines D and E with Interpretation 5-4
Figure 5-4. Lines F and I with Interpretation 5-6
Figure 5-5. Lines G and H with Interpretation 5-7
Figure 5-6. Line J with Interpretation 5-8
Figure 5-7. Line K with Interpretation 5-9
Figure 5-8. Line L with Interpretation 5-10
Figure 5-9. Line M with Interpretation 5-11
Figure 5-10. Plan Map with Interpreted Structural Features 5-12
Figure 5-11. Interpreted Structural Features with a Focus on the Eastern Project Area 5-14
Figure 5-12. Plan Map with Structure and TCE 5-15

LIST OF TABLES

Table 4-1. EM Acquisition Dates and Data Count 4-4
Table 4-2. ERC File Names, Acquisition Dates, and Data Count 4-6
Table 4-3. Layer velocities from seismic inversions 4-9

LIST OF TERMS

Conductivity: The ability of a material to conduct an electrical impulse (in Siemen per meter, S/m); reciprocal of resistivity.

Infrastructure: A collective grouping of subsurface structures that are likely to be adverse to resistivity data quality. Infrastructure may include foundations, concrete pads with rebar, railway lines, pipes, utilities, fences, disposal cribs, wells, or any other metallic items.

Inversion: Inversion, or inverse modeling, attempts to reconstruct subsurface features from a given set of geophysical potential measurements, and to do so in a manner that the model response fits the observations according to some measure of error.

Isopleth: A line on a map connecting points at which a given variable has a specified constant value, such as concentration

Resistance: A measure of a material's ability to resist electrical current flow, in ohms

Resistivity: A material property that is measured as its resistance to current per unit length for a uniform cross-section in Ohm-meters.

Tomography: A method of producing a three-dimensional image of a volumetric object by the observation and recording of the differences in the effects on the passage of energy impinging on that object.

LIST OF ABBREVIATIONS AND ACRONYMS

2D	two-dimensional
ABH	Apollo Blvd. Horst
AGI	Advanced Geosciences, Inc.
bgs	below ground surface
COCs	constituents of concern
EM	electromagnetic induction
ERC	electrical resistivity characterization
GPS	Global Positioning System
GSA	Gardner Spring Arroyo
HGI	hydroGEOPHYSICS, Inc.
JDMB	Jornada del Muerto Basin
NAD83	North American Datum of 1983
NASA	National Aeronautics and Space Administration
NMSP	New Mexico State Plane

NDMA	N-Nitrosodimethylamine
QC	quality control
RMS	root mean square
RX	receiver
SAM	San Andres Mountains
TCE	trichloroethene
TX	transmitter
UST	underground storage tank
WSTF	White Sands Test Facility

Units

ft	feet
ft/s	feet per second
kHz	kilohertz
m	meter
mS/m	milliSeimen per meter
ohm-m	Ohm-meters
ppm	parts per million

1.0 INTRODUCTION

1.1 PROJECT DESCRIPTION

At the National Aeronautics and Space Administration (NASA) White Sands Test Facility (WSTF), a series of releases in the 200 Area contaminated the groundwater. The primary constituents of concern (COCs) were trichloroethene (TCE) and various forms of Freon[1]. The releases occurred from the 1960s until the mid-1980s. Detection of these contaminants in groundwater first occurred in the late 1980s.

Beneath the 200 Area complex and the portions of the site where contaminated groundwater occurs the depth to the top of bedrock ranges from 14 feet to more than 150 feet BGS. The bedrock is primarily Paleozoic limestone with lesser amounts of siltstone. The potentiometric surface is at or beneath the alluvium-bedrock interface. On a site-wide scale, groundwater migrates to the west towards the Jornada del Muerto Basin (JDMB) under the influence of a relatively steep hydraulic gradient. However, fractures in bedrock locally exert strong control over the direction of groundwater migration.

The pathways by which the TCE and Freons migrated from release points to groundwater remains uncertain, but the prevailing hypothesis that the contaminants reached the groundwater by migrating vertically through the unsaturated alluvium. Some releases of water containing the COCs from the rear of the buildings within the 200 Area complex were so voluminous that the liquids ran down slope to the Gardner Springs Arroyo (GSA) before pooling. Once in the groundwater, further migration was controlled by structural features including faults, fractures and solution cavities in bedding planes. Therefore, establishing the depth to bedrock and the location/orientation of structural features is necessary in order to identify the primary pathways of contaminant migration and potentially design effective remedial strategies for groundwater cleanup.

As a part of this goal, a geophysical investigation using electrical resistivity characterization (ERC) and seismic refraction was conducted at the 200 Area and extended into the 600 Area. Ancillary information, such as that obtained through an electromagnetic induction (EM) survey, was also used to map anomalies associated with site infrastructure or buried debris that may have influenced the resistivity data.

[1] The trade name Freon® is a registered trademark of E.I. du Pont de Nemours & Company Corporation (DuPont).

1.2 SITE LOCATION

WSTF is located in south-central New Mexico within Dona Ana County and approximately 18 miles northeast of Las Cruces, NM. The investigation took place primarily within the 200 Area and extended into adjacent portions of the 100, 600, and 800 Areas. Figure 1-1 shows the locations of the geophysical survey lines in these areas.

1.3 OBJECTIVE OF INVESTIGATION

The objectives of the electrical resistivity and seismic refraction surveys were to:

- Map the three-dimensional shape of the top of the buried bedrock surface,
- Identify the location and orientation of fractures, and where possible the direction and magnitude of displacement on the faults in the area,
- Identify the location and orientations of fluid-filled fractures within the bedrock.

The methods were selected to take advantage of physical property contrasts that are reflective of site conditions. For example, it was expected that the bedrock would be of significantly higher acoustic velocity compared to the overlying alluvium. Likewise, the electrical resistivity of competent bedrock should be higher than porous alluvium. Moreover, any fluid-filled fractures should show as very low resistivity in highly resistive bedrock.

1.4 SCOPE OF WORK

The scope of the geophysical survey within the 200 Area and eastern 600 Area at WSTF included three acquisition phases:

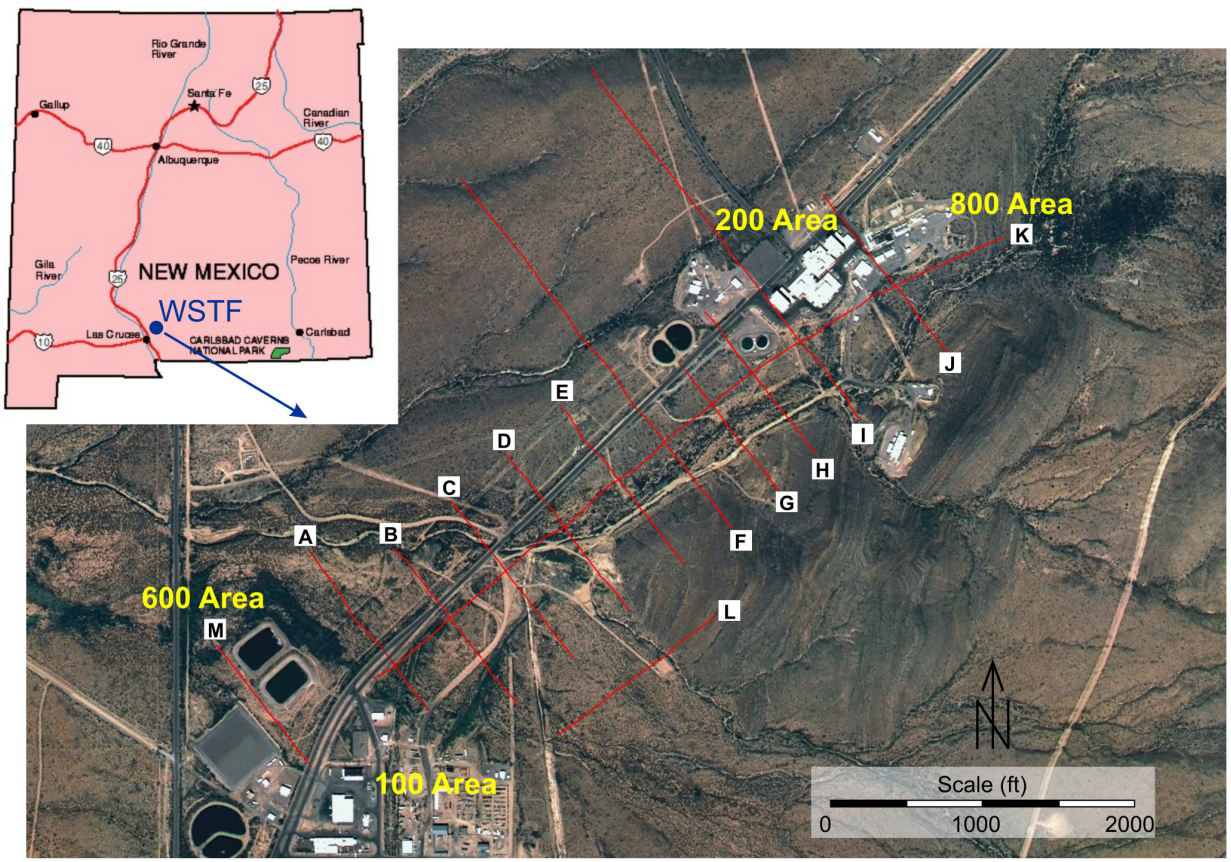
- **Phase I - Anomaly mapping with EM**. HydroGEOPHYSICS, Inc. (HGI) acquired EM data along lines coincident with the ERC to map anomalies associated with site infrastructure or buried debris,

- **Phase II – Geologic mapping with ERC**. Thirteen lines of ERC data were acquired to map subsurface structural features, fluid filled fractures, and depth to bedrock,

- **Phase III – Geologic mapping with seismic refraction**. Subsequent to the ERC survey seismic refraction data were acquired along the same lines to map the three-dimensional (3D) shape of the top of the buried bedrock surface.

Concurrent with the acquisition of data, preliminary processing was conducted to ensure that high quality data were being obtained. In the event of problems in data acquisition that could have affected data quality, the processing team would alert the field team to examine the acquisition parameters more closely (e.g., electrode/geophone coupling, acoustic noise, etc.). The processing team comprised a dedicated team of experienced geophysicists. Final processing was conducted in the HGI office in Tucson, AZ working directly with the members of the field acquisition team as well as WSTF (Navarro Research and Engineering, Inc. [Navarro]) geologists to ensure all relevant information was used for constructing the final geophysical images and geological interpretations.

Figure 1-1. General Site Map with Geophysical Survey Lines.



2.0 BACKGROUND

WSTF is located on the western pediment slope of the southern San Andres Mountains (SAM). The pediment slope extends west into the Jornada del Muerto Basin (JDMB). The north-northwest trending SAM and broad intermontaine JDMB are part of the Rio Grande Rift, where extensile tectonics dominate the structural setting. The three major geologic bedrock units that underlie WSTF are, from east to west: Paleozoic (Pennsylvanian to Permian) sedimentary rocks (mostly limestone); Tertiary andesite and rhyolite; and deep Tertiary/Quaternary alluvium of the Jornada del Muerto structural graben. Bedrock is overlain by Late Tertiary/Quaternary unconsolidated basin fill eroded from the adjacent SAM. North-northwest trending half-graben faults have down-dropped the major bedrock units on the west relative to the adjacent units on the east. Figure 2-1 shows surficial geology, developed from Seager (1981).

The 200 Area and adjacent 600 Area are located in the WSTF industrial complex and just west of the low foothills adjacent to the SAM (Figure 2-1). Permian sedimentary rocks locally outcrop on the east side of the 200 Area. Beneath the 200 Area, block faulting has resulted in depths to bedrock that range from 14 feet to 150 ft below ground surface (bgs). The bedrock surface is capped by coalescent alluvial fan deposits derived from the SAM that are composed primarily of sandy gravels. Gravel clasts range from pebbles to boulders and may locally reach up to several feet in diameter.

2.1 BEDROCK GEOLOGY

Bedrock is locally shallow below the 200 Area building complex with depths as little as 14 ft bgs at the location of the former Clean Room underground storage tank (UST). The depth to bedrock increases on all sides away from the central block (presumably across faults) to as much as 150 ft bgs in borings 200-E and 200-B-240, located several hundred feet northwest of Apollo Boulevard. Southeast of the GSA, is a second bedrock high where Paleozoic sedimentary rocks crop out. The interpretation of bedrock topography and structure is based on: 1) previous geophysical surveys, 2) borings advanced at various locations in the 200 Area and adjacent portions of the 100, 600 and 800 Areas, 3) the bedrock outcrops in the southeastern portion of the 200 Area, and 4) bedrock encountered when the Clean Room UST was excavated and removed in 1986. More generally, the topographic high is a localized horst block centered beneath the 200 Area building complex with the bounding normal faults striking northeast – southwest. Antithetic normal faults striking northwest-southeast will be shown to have down-dropped towards the southwestern and northeastern portions of the horst in a step-like fashion. Figure 2-2 shows the latest interpretation of the top of bedrock topography prior to this study, as based on the previous data. Part of the purpose of this geophysical study was to determine if this interpretation is fundamentally correct, and if so, to further refine it.

Figure 2-1. Aerial Photo of Site with Geology from Seager (1981)

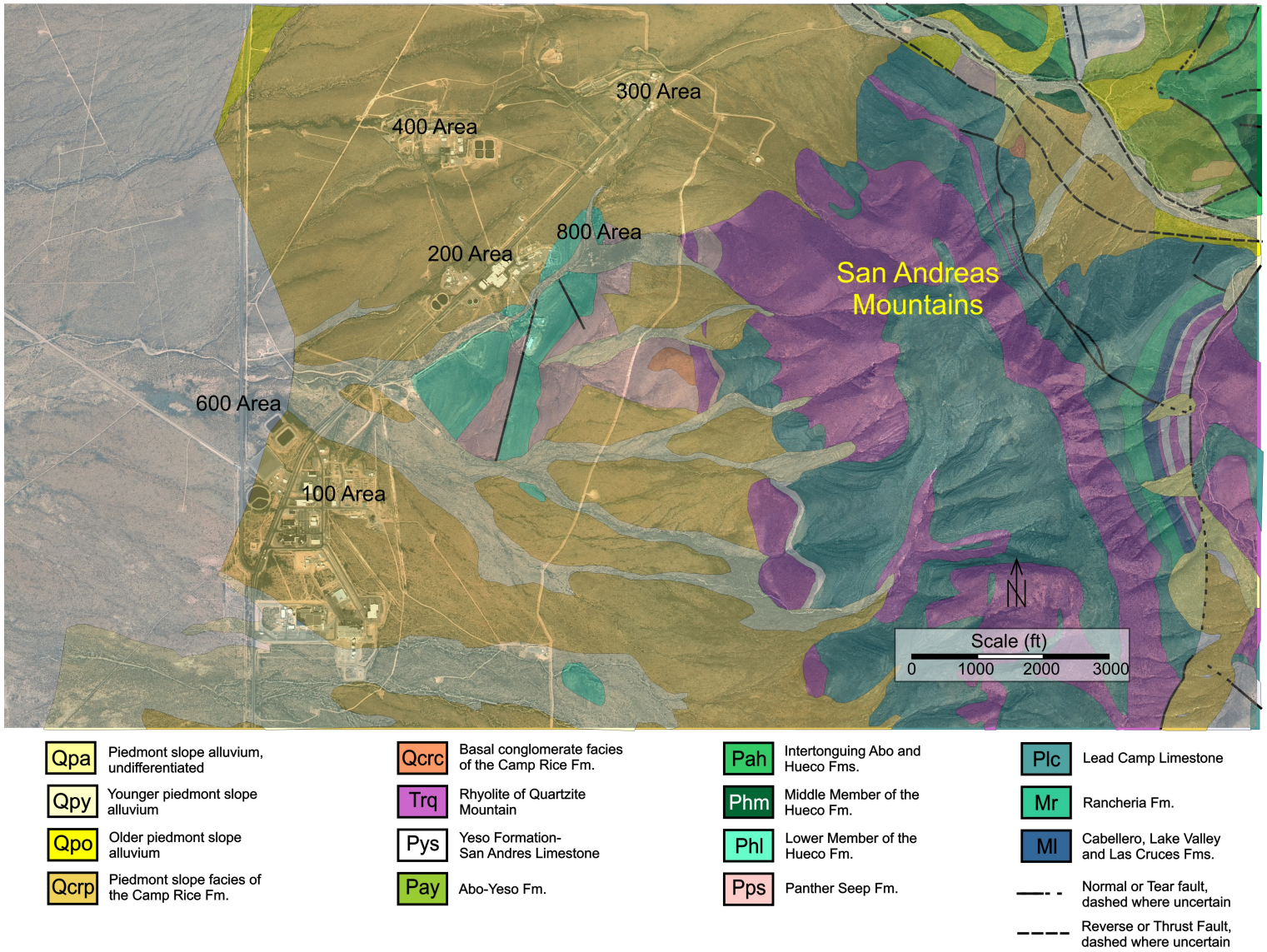
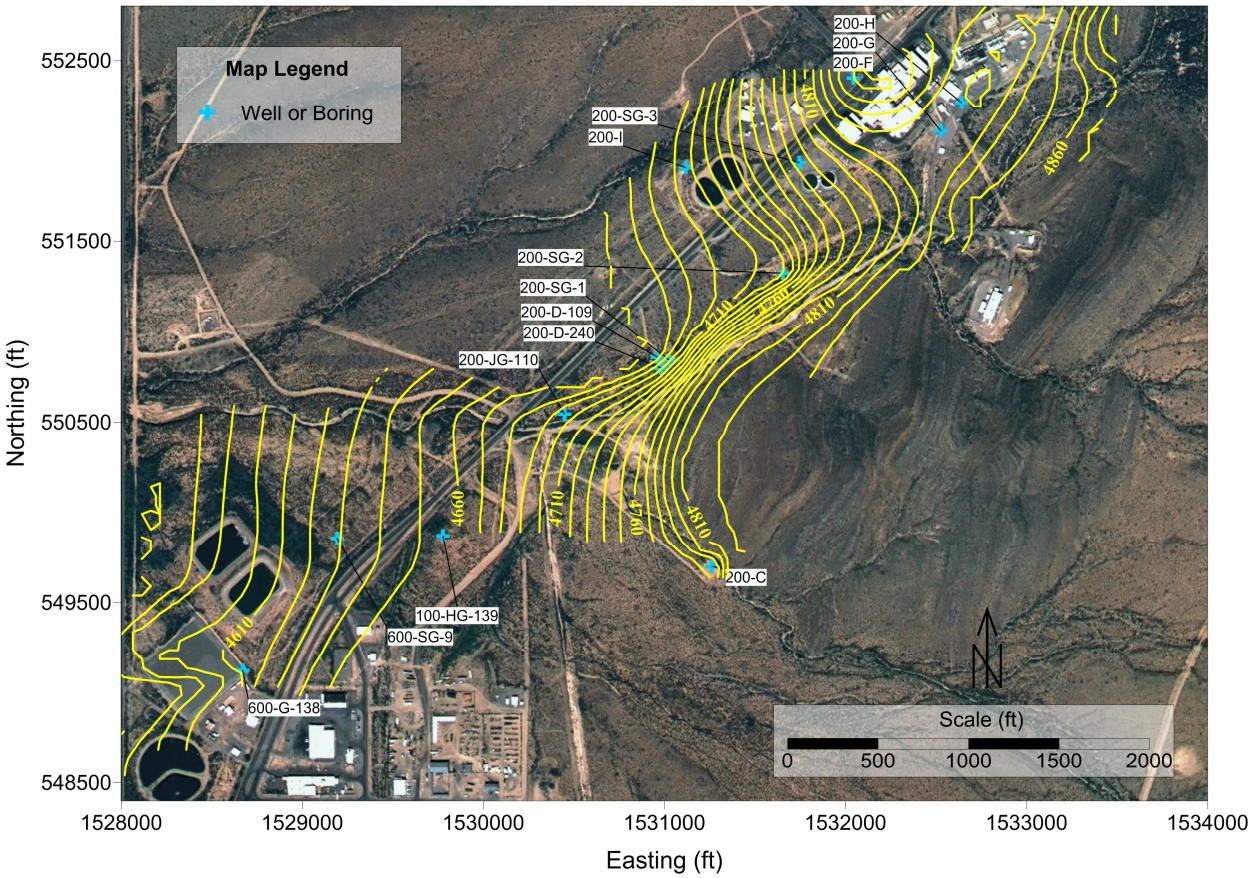


Figure 2-2. Model for the Top of Bedrock Elevation Map (Conceptual), Prior to Geophysical Acquisition.



Note: Coordinate system is the New Mexico State Plane (NMSP), Central with a North American Datum of 1983 (NAD83).

During the interpretation phase of the project, John W. Pearson of the WSTF Environment Department reevaluated many of the borehole logs, including geophysical logs, to gain a better appreciation of the depth to bedrock. Additionally, the information was used to provide a more detailed description of alluvium. The notes that he made, transmitted via email to Dale Rucker of HGI on 1 November 2012, state:

- 600-SG-9, alluvium becomes limestone rich at 84 ft to the andesite bedrock surface at 132 ft.

- 200-D-109, at 30 ft depth alluvium is noted to have limestone, from 45-70 ft alluvium is limestone rich, 70-115 ft is a mixture of limestone and siltstone, limestone bedrock at 115 ft depth.

- 200-D-240, 0-50 ft depth mixed lithologies in alluvium, 50-60 ft volcanic rich alluvium with a caliche horizon at 55-65 ft, 60-95 ft siltstone and limestone alluvium, limestone bedrock at 95 ft depth.
- 200-SG-1, break in alluvium at 30 ft depth going from sandy gravel to a silty-clayey gravel above a limestone bedrock at 92 ft depth.
- 200-I, geophysical logs indicate bedrock in the depth range of 130 to 140 ft.
- 200-SG-3, break in alluvium at 20 ft depth from silty gravel to a clayey silt, break in alluvium at 30 ft from clayey silt to gravelly silt above limestone bedrock at 80 ft.
- 200-H, the archived drilling chips do not match the Gamma log. The chips indicate 0-35 ft depth as limestone clast dominant, 35-45 ft limestone and rhyolite mix, 45-55 ft rhyolite dominant, 55-70 ft rhyolite and limestone pebble mix, 74 ft depth limestone bedrock. Gamma log clearly indicates limestone bedrock at 50 ft depth. I believe the Gamma log more than the chips.
- NASA-4, possible typographic error in table of bedrock depths. This bedrock should be at 125 ft.
- 200-E, limestone bedrock indicated between 150 and 170 ft depth from geophysics.

These new interpretations are not included in the map shown in Figure 2-2, but were used in the annotation and interpretation of geophysical data in Section 5.

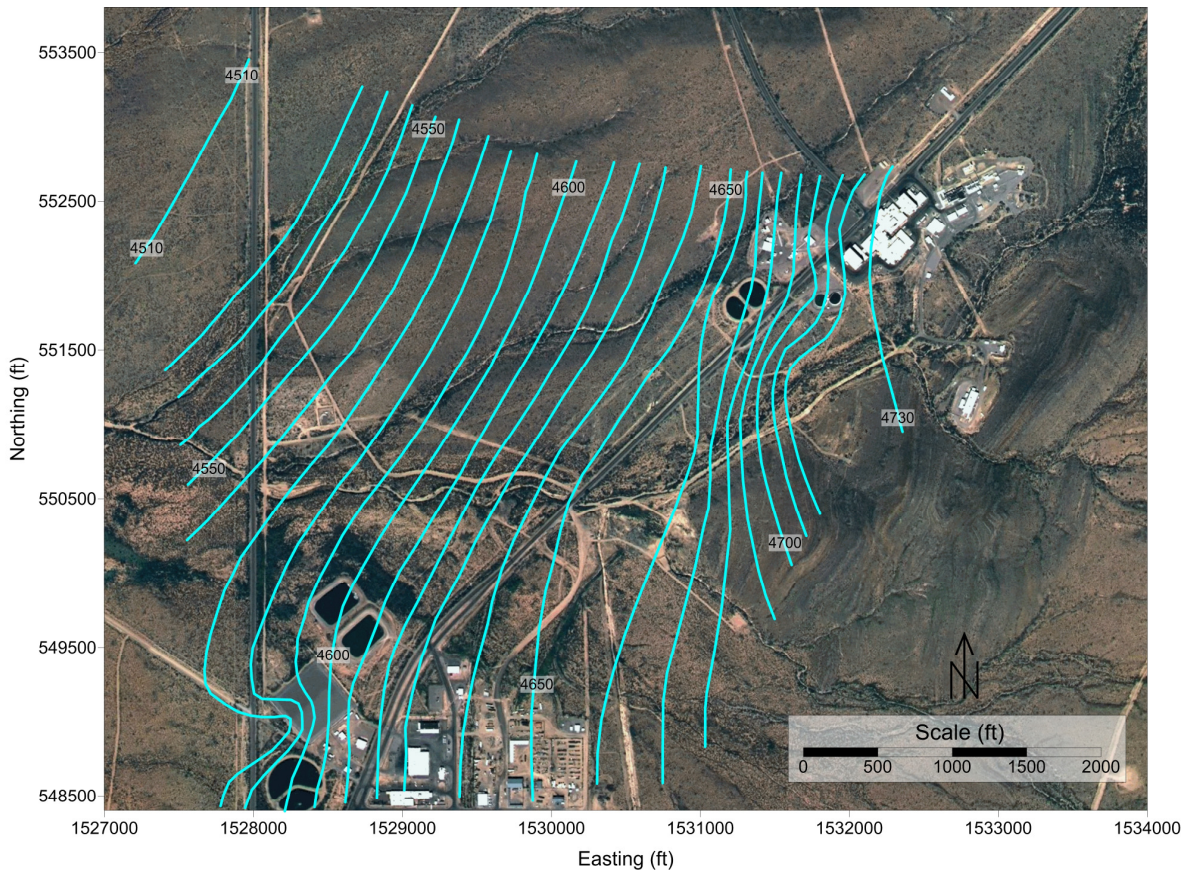
2.2 HYDROSTRATIGRAPHY

The Paleozoic limestone sequence at the 200 Area comprises the Pennsylvanian Panther Seep Formation overlain by the lower member of the Permian Hueco Limestone. Seager (1981) describes the Panther Seep as brown to gray shale, sandstone, siltstone, and fine-grained laminated limestone. The lower member of the Hueco Formation is described as gray limestone and platy to shaley limestone. Based on recent fieldwork by Thomas A. McCrory of the WSTF Environmental Department , the nearest strata outcropping east of the 200 Area strike north-northeast and dip between 20 to 42 degrees to the northwest.

Within the 200 Area, groundwater migration had been previously recorded (WSTF camera logs in open boreholes 200-F, 200-G, and 200-H) along bedding plane solution channels and fractures in the limestone bedrock. The groundwater flow along specific bedding planes can be forceful enough to cause visible agitation of particulates in the groundwater. The local aquifer and upper potentiometric surface are confined to fractured bedrock. Interbedded layers of shaley limestones and shales locally keep the groundwater confined (as defined within pressure profiles

from Westbay multiport wells). In some cases when these bedrock fractures have been intercepted by drilling, the water level in the boring has risen above the alluvium/bedrock contact. An interpretation of the water table elevation by Thomas A. McCrory is presented in Figure 2-3. The data are from November 2012.

Figure 2-3. Water Table Elevation, November 2012



Note: Coordinate system is the NMSP, Central with a datum of NAD83.

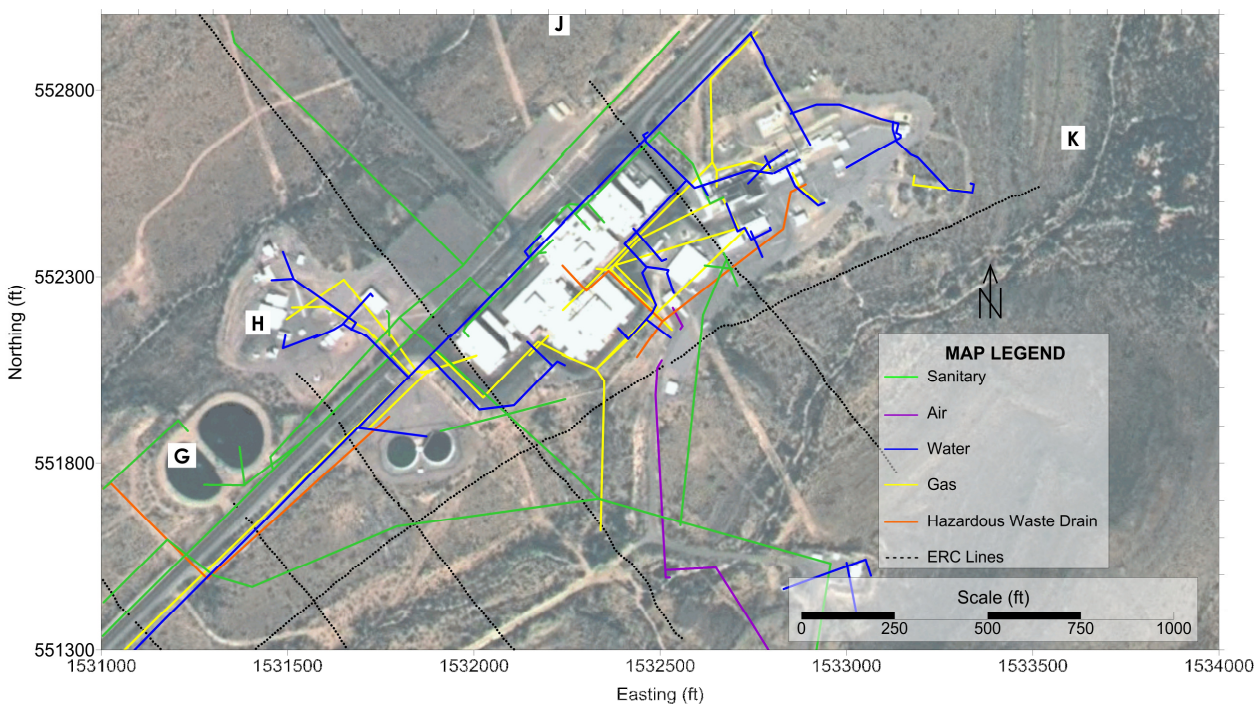
2.3 SURVEY AREA INFRASTRUCTURE

Figure 2-4 displays infrastructure as digitized from the WSTF 200 Area utility map, which covers only a portion of the survey area (Lines J and Partial G, H, I, and K). Not surprisingly, the region adjacent to the building complex is the most utility-rich area of this WSTF survey. Subsurface utilities of interest to the resistivity analysis include sanitary, water, gas, air, and the Hazardous Waste Drain Line. These utilities are typically housed in a metal casing which the

resistivity measurement equipment may detect and will thereby affect the resistivity results. Utilities made of fiber optic and cable were not expected to affect the resistivity data and were not considered in the analysis.

The utilities of interest were digitized and their locations with respect to the ERC electrodes were posted on the top of the resistivity profiles in Section 5.0 to aid in analysis of the investigation results.

Figure 2-4. Survey Area Infrastructure



Note: Coordinate system is the NMSP, Central with a datum of NAD83.

2.4 ELECTROMAGNETIC INDUCTION SURVEY RESULTS

The main objective for the EM investigation was to detect and map the location of buried metallic infrastructure and debris. The subsurface metal may interfere with electrical resistivity measurements. A significant amount of metal in the subsurface, such as that of an underground metal-cased pipe, will produce a noticeable anomaly in the electromagnetic data. In contrast, objects such as non-reinforced concrete, clay pipes, polyvinyl chloride pipes, and fiber optic lines have little physical property contrasts of sufficient volume and are virtually undetectable. More information on the theory and method of data acquisition for the EM portion of the survey can be found in Sections 3.1 (EM Theory) and 4.0 (Methodology) of this report.

Figure 2-5 and Figure 2-6 present the results of the EM survey. The EM data were acquired along the same traverses as the ERC lines, and pin flag numbers are listed on the top of the plots

for reference. The data are presented as electrical conductivity in milliSiemens per meter (mS/m). In areas where an anomaly is present, the data will show high electrical conductivity spikes, which indicate the presence of a metallic object in the subsurface. The electromagnetic data were helpful in locating buried metallic items within the project areas that the utility map (Figure 2-4) did not cover (Lines A-F, L and M), and also for verifying the locations of known utilities mapped for the 200 Area (Lines J and Partial G, H, I, and K). The EM survey results were used to support interpretation of the results of the ERC and resistivity surveys.

Figure 2-5. EM Survey Results, Lines A through F

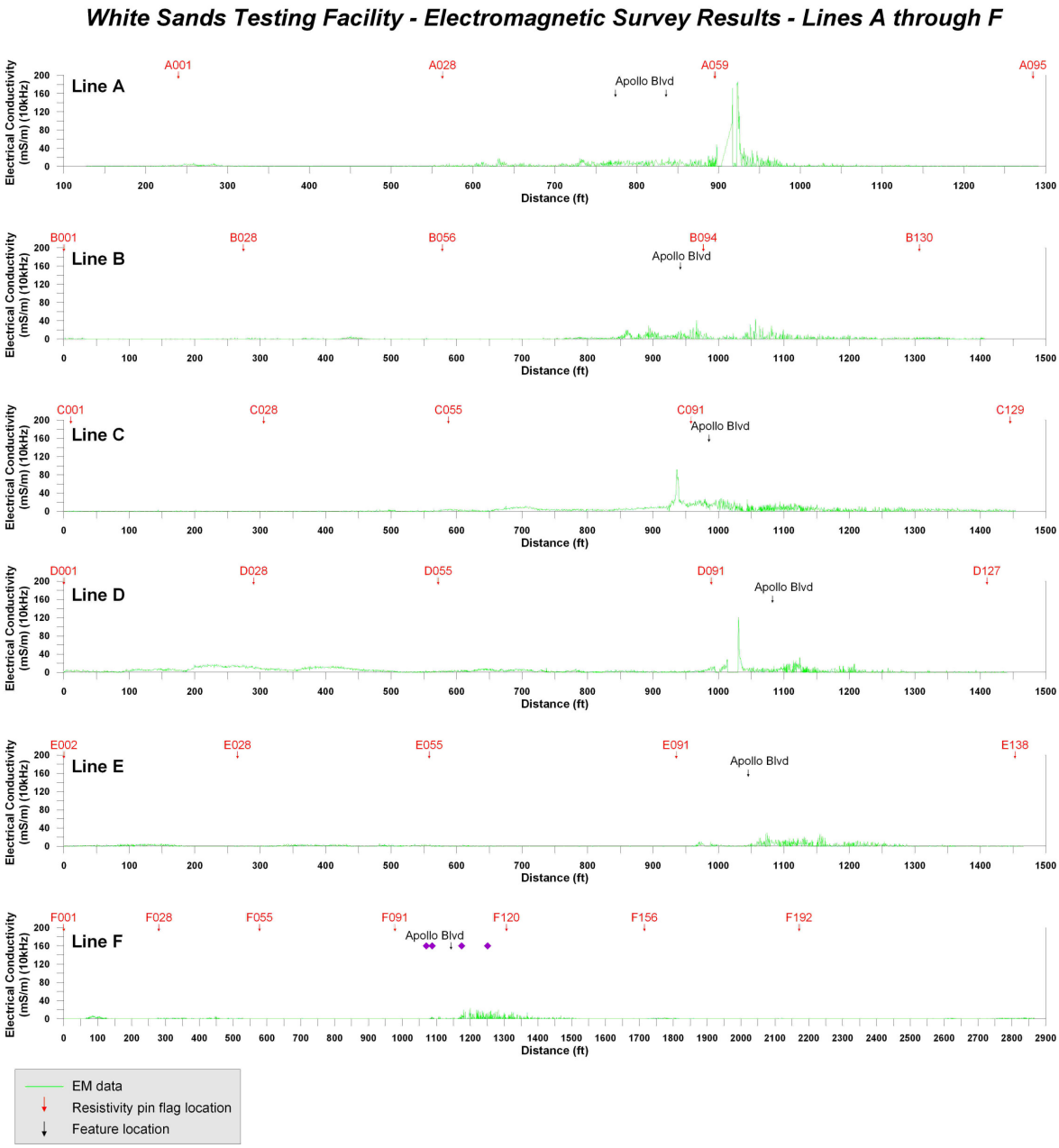
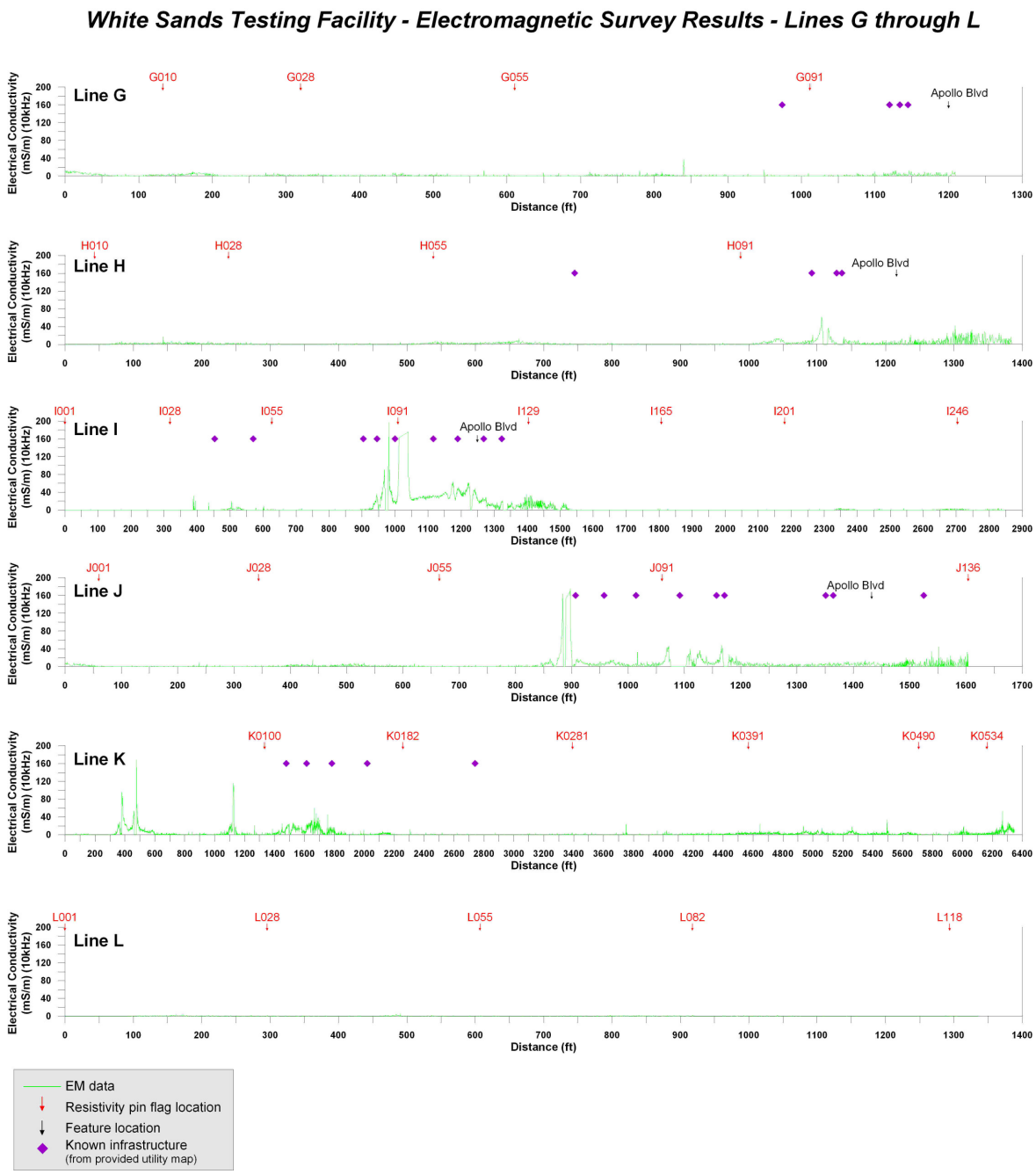


Figure 2-6. EM Survey Results, Lines G through L



3.0 GEOPHYSICAL THEORY

3.1 ELECTROMAGNETIC INDUCTION

Electromagnetic field data are typically collected using portable ground conductivity instrumentation. A transmitting coil induces an electromagnetic field, and a receiving coil at a (usually) fixed separation measures the amplitudes of the in-phase and quadrature components of the secondary electromagnetic field. Various instruments have different coil spacings and operating frequencies. Spacing and frequency affect depth of signal penetration. Both single frequency and multi-frequency instruments have been developed for commercial use.

Earth and metallic materials have the capacity to transmit induced currents over a wide range. For earthen materials, conductivity is a function of soil type, porosity, and dissolved salts. For buried metallic debris, the conductivity will be a function of size, metal type, and depth. Methods that measure the conductivity seek to identify various earth and man-made materials by measuring their electrical characteristics and interpreting results in terms of those characteristics. EM techniques are used to measure earth conductivities of the various components at individual sites employing portable, rapid, non-invasive equipment operating at various frequencies, depending on range and depth desired.

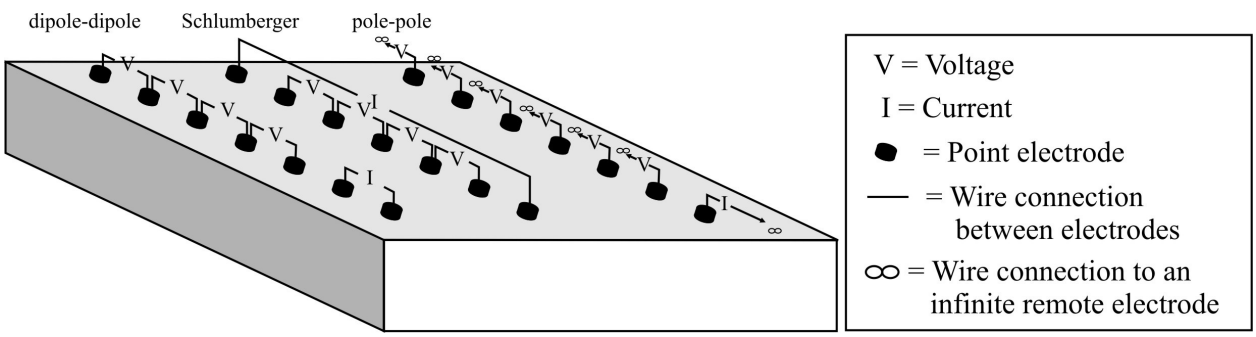
The recorded electromagnetic field is separable into two sub-components; in-phase and conductivity (also referred to as quadrature). The in-phase component is most sensitive to ferrous metallic objects and is measured in parts per million . The conductivity is sensitive to soil condition variations and nonferrous metal and is measured – for the GEM-2 instrument – in mS/m. For the work conducted at WSTF, we chose to interpret the conductivity, since it is sensitive to all metal.

3.2 ELECTRICAL RESITIVITY CHARACTERIZATION

Electrical resistivity is a volumetric property that describes the resistance of electrical current flow within a medium (Rucker et al., 2011; Telford et al., 1990). Direct electrical current is propagated in rocks and minerals by electronic or electrolytic means. Electronic conduction occurs in minerals where free electrons are available, such as the electrical current flow through metal. Electrolytic conduction, on the other hand, relies on the dissociation of ionic species within a pore space and is more common in the partially saturated sandy alluvium and fractured limestone encountered at WSTF. With electrolytic conduction, the movement of electrons varies with the mobility, concentration, and the degree of dissociation of the ions. Competent rock free of fissures and fractures will have a higher resistivity compared to less competent rock.

Mechanistically, the resistivity method uses electric current (I) that is transmitted into the earth through one pair of electrodes (transmitting dipole) that are in contact with the soil. The resultant voltage potential (V) is then measured across another pair of electrodes (receiving dipole). Numerous electrodes can be deployed along a transect (which may be anywhere from feet to miles in length), or within a grid. Figure **3-1** shows examples of electrode layouts for surveying. The figure shows transects with a variety of array types (dipole-dipole, Schlumberger, pole-pole). A complete set of measurements occurs when each electrode (or adjacent electrode pair) passes current, while all other adjacent electrode pairs are utilized for voltage measurements. Modern equipment automatically switches the transmitting and receiving electrode pairs through a single multi-core cable connection. Rucker et al. (2009) describe in more detail the methodology for efficiently conducting an electrical resistivity survey.

Figure 3-1**. Possible Arrays for use in Electrical Resistivity Characterization**



The modern application of the resistivity method uses numerical modeling and inversion theory to estimate the electrical resistivity distribution of the subsurface given the known quantities of electrical current, measured voltage, and electrode positions. A common resistivity inverse method incorporated in commercially available codes is the regularized least squares optimization method (Sasaki, 1989; Loke, et al., 2003). The objective function within the optimization aims to minimize the difference between measured and modeled potentials (subject to certain constraints, such as the type and degree of spatial smoothing or regularization) and the optimization is conducted iteratively due to the nonlinear nature of the model that describes the potential distribution. The relationship between the subsurface resistivity (ρ) and the measured voltage is given by the following equation (from Dey and Morrison, 1979):

$$-\nabla \cdot \left[\frac{1}{\rho(x,y,z)} \nabla V(x,y,z) \right] = \left(\frac{I}{U} \right) \delta(x - x_s)\, \delta(y - y_s)\, \delta(z - z_s) \qquad (1)$$

where I is the current applied over an elemental volume U specified at a point (x_s, y_s, z_s) by the Dirac delta function.

Equation (1) is solved many times over the volume of the earth by iteratively updating the resistivity model values using either the L_2-norm smoothness-constrained least squares method, which aims to minimize the square of the misfit between the measured and modeled data (de Groot-Hedlin & Constable, 1990; Ellis & Oldenburg, 1994):

$$\left(J_i^T J_i + \lambda_i W^T W\right)\Delta r_i = J_i^T g_i - \lambda_i W^T W r_{i-1} \tag{2}$$

or the L_1-norm that minimizes the sum of the absolute value of the misfit:

$$\left(J_i^T R_d J_i + \lambda_i W^T R_m W\right)\Delta r_i = J_i^T R_d g_i - \lambda_i W^T R_m W r_{i-1} \tag{3}$$

where g is the data misfit vector containing the difference between the measured and modeled data, J is the Jacobian matrix of partial derivatives, W is a roughness filter, R_d and R_m are the weighting matrices to equate model misfit and model roughness, Δr_i is the change in model parameters for the ith iteration, r_i is the model parameters for the previous iteration, and λ_i = the damping factor.

3.3 SEISMIC REFRACTION

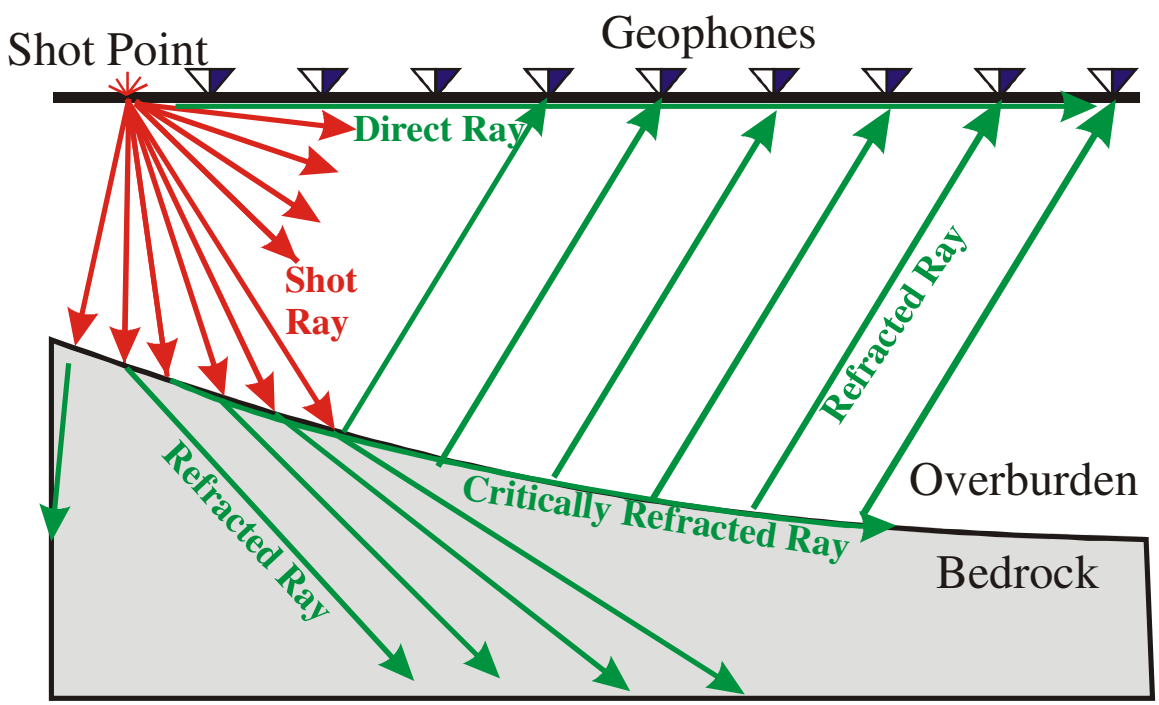
The seismic refraction method is based on the measurement of the travel time of seismic waves refracted at the interfaces between subsurface layers of different velocity. Figure 3-2 shows an example of the seismic refraction method. Seismic energy is provided by a source ('shot') located on the surface. For shallow applications, the shot normally comprises a hammer and plate, weight drop, or small explosive charge (blank shotgun cartridge). Energy radiates out from the shot point, either traveling directly through the upper layer (direct arrivals), or traveling down to and then laterally along higher velocity layers (refracted arrivals) before returning to the surface. The refracted energy is detected on the surface using a linear array (or spread) of geophones spaced at regular intervals. Beyond a certain distance from the shot point, known as the cross-over distance, the refracted signal is observed as a first-arrival signal at the geophones (arriving before the direct arrival). Observation of the travel times of the direct and refracted signals provides information on the depth profile of the refractor.

Data are recorded on a seismograph and later downloaded to a computer for analysis of the first-arrival times to the geophones from each shot position. Travel-time versus distance graphs are then constructed and velocities calculated for the overburden and refractor layers through analysis of the direct arrival and T-minus graph gradients. Depth profiles for each refractor are produced by an analytical procedure based on consideration of shot and receiver geometry and

the measured travel-times and calculated velocities. The final output comprises a depth profile of the refractor layer and a velocity model of the subsurface.

The primary applications of seismic refraction are for determining depth to bedrock and bedrock structure. Due to the dependence of seismic velocity on the elasticity and density of the material through which the energy is passing, seismic refraction surveys provide a measure of material strengths and can consequently be used as an aid in assessing rippability and rock quality. The technique has been successfully applied to mapping depth to base of backfilled quarries, depth of landfills, thickness of overburden, voids, and the topography of groundwater.

Figure 3-2. Ray Travel for Seismic Refraction Surveying



4.0 METHODOLOGY

4.1 SURVEY AREA AND LOGISTICS

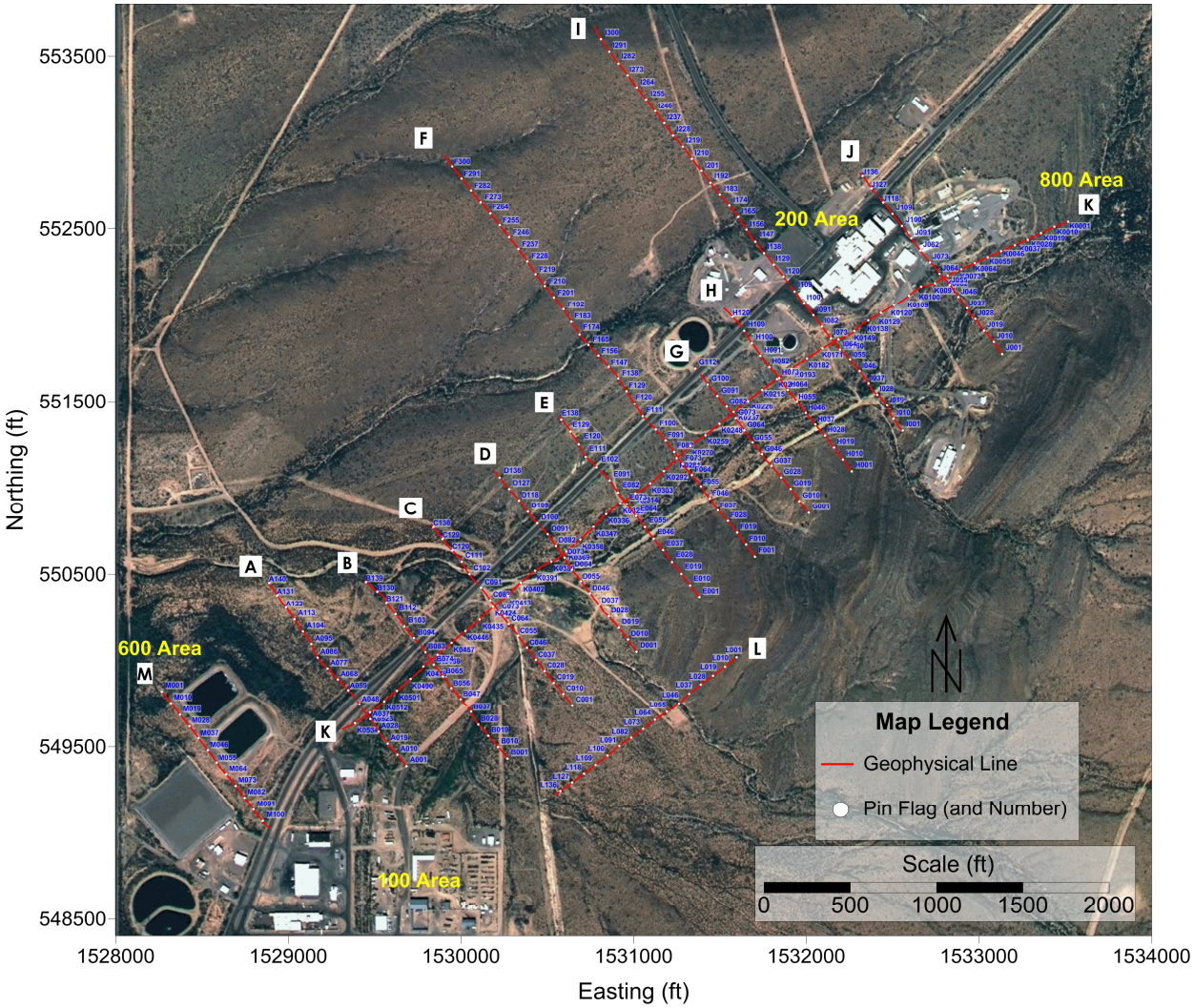
A geophysical survey, including EM, ERC, and seismic refraction, was conducted in the field at WSTF between September 4, 2012 and September 27, 2012. The geophysical survey area included the 200 Area, easternmost 600 Area, the northernmost 100 Area, and much of the 800 Area. Figure 4-1 shows a detailed line layout for the geophysical surveying. The majority of lines were oriented southeast to northwest in order to be perpendicular to the orientation of the major faults based upon previous studies. Two tie-lines, K and L, were utilized to help fill in the blank regions between adjacent survey lines and to test for antithetic structures.

4.2 EQUIPMENT

4.2.1 Equipment for EM

Multi-frequency electromagnetic data were acquired using a Geophex, Inc. (Raleigh, NC) GEM-2 electromagnetic conductivity and susceptibility instrument. The GEM-2 consists of a sensor housing (ski) and electronics console. The GEM-2 was carried by the operator via a shoulder strap along the survey lines shown in Figure 4-1, and was capable of recording real-time Global Positioning System (GPS) input for navigation. The ski contains three coils; i) transmitter (TX) coil, ii) receiver (RX) coil, and iii) a bucking coil which helps reduce noise between the TX and RX coils. The TX and RX coils are separated by 1.66 m. The electronics console contained a data logger that recorded EM and GPS data. Both in-phase (real) and quadrature (imaginary) data were collected at three frequencies ranging from 5 kilohertz (kHz) to 20 kHz. The electromagnetic data were then converted to electrical conductivity using the WinGEM software.

Figure 4-1. Detailed Line layout



Note: Coordinate system is the NMSP, Central with a datum of NAD83.

4.2.2 Equipment for ERC

ERC data were acquired using an Advanced Geosciences, Inc. (AGI) Super Sting R8 resistivity instrument, in the pole-pole array configuration. The unit is a direct-current powered, battery operated, low voltage, low amperage, automatic, eight channel resistivity and induced polarization system. This system employs a SuperSting Switchbox (multiplexor) which directs signal to preprogrammed electrodes connected via passive multi-conductor cables. Each electrode has the capability of acting as either a low-amperage current transmitter or as potential measuring receiver.

The Sting R-8 has the capability of automatically switching between electrodes without having to physically move the electrode connections after initial set-up. Automatic switching decreases physical labor, reduces n human transcription and tracking errors, allows the operator to enhance control array logistics, and increases the rate and density of data acquired. HGI personnel took advantage of this capability and programmed the Sting R-8 to use a survey line spread of 84 electrodes with inter-electrode spacings ranging from three to 249 m.

NASA WSTF personnel provided GPS services for recording and storing the locations of the ERC electrodes. This information was utilized by HGI for geo-referencing the ERC data.

4.2.3 Equipment for Seismic Refraction

The Geode Ultra-Light Exploration Seismograph (Geometrics, Inc., San Jose, CA) 24-channel seismic system was used for seismic refraction surveying. Geophone placement was every 10 feet (reoccupying the locations of the electrodes from the ERC survey) with shot points located at 60-foot stations along each spread and off-end shots at 60 or 120 feet off the ends of the line. The source was a 16-lb sledgehammer. A PEG-40 accelerated weight drop (Exploration Instruments, Austin, TX) propelled energy generator was used to propel the hammer to a high velocity and was mounted on an all-terrain vehicle for ease of moving the source along the survey line.

The Geode ran from a laptop in order to view each shot to ensure acceptable data quality, and record and process the data. Additional hammer blows forming a new "stack" of data were added until the desired data quality was achieved. The shot record (seismogram) was also saved to the computer and stored for subsequent processing. A real-time noise monitor showing all geophones was carefully scrutinized during shots to ensure that noise levels were at a minimum for each shot. This included watching for breaks in vehicle traffic, demolition activities, and other sources of noise.

In areas covered with asphalt pavement several methods were tested for geophone placement before a satisfactory solution was found. The first method was placing geophones directly into holes previously occupied by ERC electrodes and backfilling with dirt; however, the data for this method were unsatisfactory. The second method attempted was using the screw-on plates provided by the equipment manufacturer and placing the geophone on top of the asphalt; but this also produced data that were deemed unsatisfactory. The final method was making a pilot hole in the asphalt pavement using a sacrificial geophone stake and then placing the geophone snugly into the asphalt. This resulted in satisfactory data acquisition results.

4.3 DATA PROCESSING

Once acquired, the data were evaluated onsite to ensure sufficient quality for processing. If the data passed the initial inspection, they were sent to HGI's Tucson office for preliminary processing for evaluation by the field geophysicist and the client. Final processing occurred after demobilization.

4.3.1 Quality Control – Onsite

Data for each survey method were given a preliminary assessment for quality control (QC) in the field to assure quality of data before progressing the survey. Following onsite QC, the data were transferred to the HGI server for storage and detailed data processing and analysis.

4.3.2 Electromagnetic Processing and Plotting

The first step in processing was to convert the GPS coordinate data from a Universal Transverse Mercator system to a State Plane coordinate system using Corpscon V.6 Software (Army Corps of Engineers). Since electromagnetic data were recorded at a higher sampling rate than the GPS data, the resulting GPS coordinate point for each electromagnetic data reading was linearly interpolated within the electromagnetic data acquisition system. After coordinate conversion, the data from the full survey files were separated into data for each survey line using Microsoft Excel. The data for each line were plotted in Grapher Software (Golden Software, Inc) for interpretation of linear or discrete metallic objects, which could have affected the resistivity results.

Table 4-1 contains a data summary for the EM data acquired with the GEM-2. The data were acquired over a two-day period and show a relatively high data count number. HGI uses a rule-of-thumb of at least 200 data values per 100 ft to gain sufficient resolution of targets. Table 4-1 shows that we acquired nearly twice that value.

Table 4-1. EM Acquisition Dates and Data Count

Survey Line	Date	Data Count	Data Count per 100ft
A	9/5/12	5357	392
B	9/5/12	5230	382
C	9/5/12	5750	420
D	9/5/12	5846	427
E	9/5/12	5254	384
F	9/5/12	10774	378

Survey Line	Date	Data Count	Data Count per 100ft
G	9/4/12	4452	408
H	9/4/12	4964	400
I	9/5/12	10780	378
J	9/4/12	5462	399
K	9/4/12	21689	407
L	9/4/12	4561	333
		Total = 90119	Average = 392

4.3.3 Resistivity Processing

The geophysical data for the resistivity survey, including measured voltage, current, measurement (repeat) error, and electrode position, were recorded digitally with the AGI SuperSting R8 resistivity meter. Each line of acquisition was recorded with a separate file name. Following field data collection, the raw resistivity data files were transmitted to the HGI server located in Tucson, Arizona. Data quality was inspected and checked for consistency with respect to adjacent line results, and then data files were saved to designated folders on the server. The server was backed up nightly and backup tapes were stored at an offsite location on a weekly and monthly basis.

Survey configuration, location, time and date, field manager, equipment used, environmental conditions, proximal infrastructure, and other useful information were recorded during data acquisition on standard HGI resistivity field forms. These forms were submitted with the raw resistivity data and were subsequently saved to the HGI Tucson server.

Raw resistivity data were imported and parsed using the HGI Pro (v 3.4.2) Software. This software provided a simple means for quality checking and preliminary assessment by using a Microsoft Excel® template, which charts specific data parameters. After parsing, the raw data were evaluated for measurement noise. Those data that appeared to be extremely noisy and fell outside the normal range of accepted conditions were removed. Examples of conditions that would cause data to be removed include, negative or very low voltages, high-calculated apparent resistivity, extremely low current, and high repeat measurement error.

Table 4-2 lists specific ERC line information and data editing statistics such as the number of lines completed, line identification number , data acquisition date, total line length, total number

® Microsoft Excel is a registered trademark of Microsoft Corporation in the United States and/or other countries.

of raw points acquired, the remaining number of raw points after editing, and the root mean square (RMS) error. The RMS describes the goodness of fit between the measured and modeled voltage and is part of the objective function in inverse modeling. Through modeling, one tries to achieve a low RMS, with values below 5% within three to five iterations considered excellent.

Table 4-2. ERC File Names, Acquisition Dates, and Data Count

Line Name	Date	Length (ft)	Raw Data Count	Edited Data Count	RMS Error (%)
A	9/11/12	1368	6496	6474	1.5
B	9/11/12	1368	6860	6782	1.0
C	9/10/12	1368	7134	7042	1.2
D	9/6/12	1368	7134	6976	1.4
E	9/6/12	1368	7072	6848	1.6
F	9/14/12	3021	18591	18327	0.7
G	9/7/12	1092	5089	5017	2.7
H	9/10/12	1240	6152	6000	2.5
I	9/9/12	3021	18775	18112	1.9
J	9/8/12	1368	7188	6918	3.4
K	9/16/12	5324	35978	28580*	3.8
L	9/5/12	1368	6557	5430	1.8
M	9/13/12	1033	4864	4832	1.0
Total		24307	137890	98758	

*A portion of the data were removed at the greatest a-spacings to meet file size restrictions in the 2-dimensional (2D) inversion software

4.3.3.1 2D Resistivity Inversion

RES2DINV software (Geotomo, Inc.) was used for inverting individual lines in two dimensions. RES2DINV is a commercial resistivity inversion software package available to the public from www.geoelectrical.com. An input file was created from the edited resistivity data and inversion parameters were chosen to maximize the likelihood of convergence. It is important to note that up to this point, no resistivity data values had been manipulated or changed, such as smoothing routines or box filters. Noisy data had only been removed from the general population.

The inversion process followed a set of stages that utilized consistent inversion parameters to maintain consistency between each model. Inversion parameter choices included the starting model, the inversion routine (robust or smooth), the constraint defining the value of smoothing and various routine halting criteria that automatically determined when an inversion was

complete. Convergence of the inversion was judged whether the model achieved an RMS of less than 5% within three to five iterations.

4.3.3.2 2D Resistivity Plotting

The inverted data were output from RES2DINV into an .XYZ data file and were then gridded and color contoured in Surfer (Golden Software, Inc.). Information such as roadways, pipelines, resistivity line intersections, and other relevant line features from the provided utility map (Figure 2-4) and well records were plotted on the resistivity section to assist in data analysis. Qualified in-house inversion experts (e.g., Dr. Dale Rucker) subjected each profile to a final review.

4.3.4 Seismic Refraction Processing

Data processing for the seismic refraction method consisted primarily of accounting for energy source and geophone locations, making adjustments for topographic changes along the geophone array profiles, and determining the first arrival times at the geophones. The final step was to determine subsurface acoustic properties using two different processing methods: refraction analysis, and tomographic inversion. The software incorporated all of the features necessary for accurate representation of subsurface properties, including the first break pick, inversion, and plotting.

Input Data: Data were reformatted to SEG-Y internal format while preserving trace header information. The geometry was created to define the relationship between the field file and channel numbers, and the source and receiver station numbers. Records marked in the Observer's logs as needing to be omitted were edited from the data.

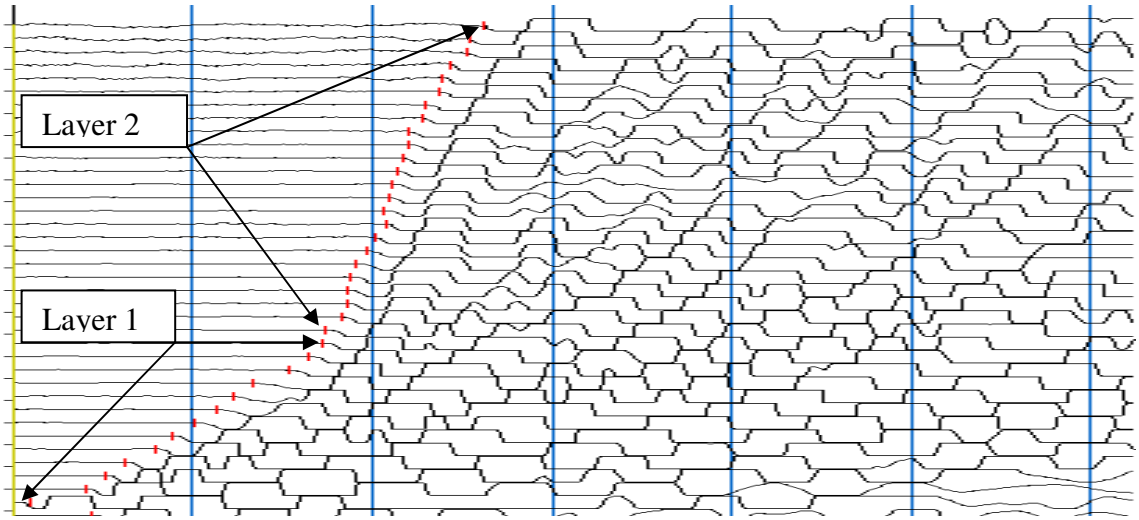
Geometry & Editing: Positional data provided by the client was merged with the trace data. The data was output as a SEG-Y formatted file for input into the refraction statics program Seisimager (Geometrics, Inc.). At this stage and within the software, edits and corrections were made to account for any errors made in the field.

First Arrival Selection: The first step for data processing was to pick the time for first arrival of energy at the geophone from each of the shot records, also known as first break picking. Each geophone had a separate first break pick for each shot. The first break picking was conducted interactively within the Seisimager's software called Pickwin Version 4.2.0.0

Figure 4-2 shows an example shot record taken along Line L. The x-axis is time in milliseconds and the y-axis is distance between geophones. The first break picks of energy arriving at the geophones are annotated as red marks below. There is an automatic picking option that is used initially in the software and then each trace in each shot record is manually reviewed and adjusted. In total there were 614 shot records and nearly 30,000 first break picks assigned. There were two distinct velocity slopes in arrivals representing the two layers as illustrated in Figure 4-2. The first slope, which is much steeper, indicates the slower velocity alluvium layer.

The other layer is the refracted energy as it returns from the second and higher velocity layer. The second higher velocity layer was either a more consolidated alluvium or bedrock.

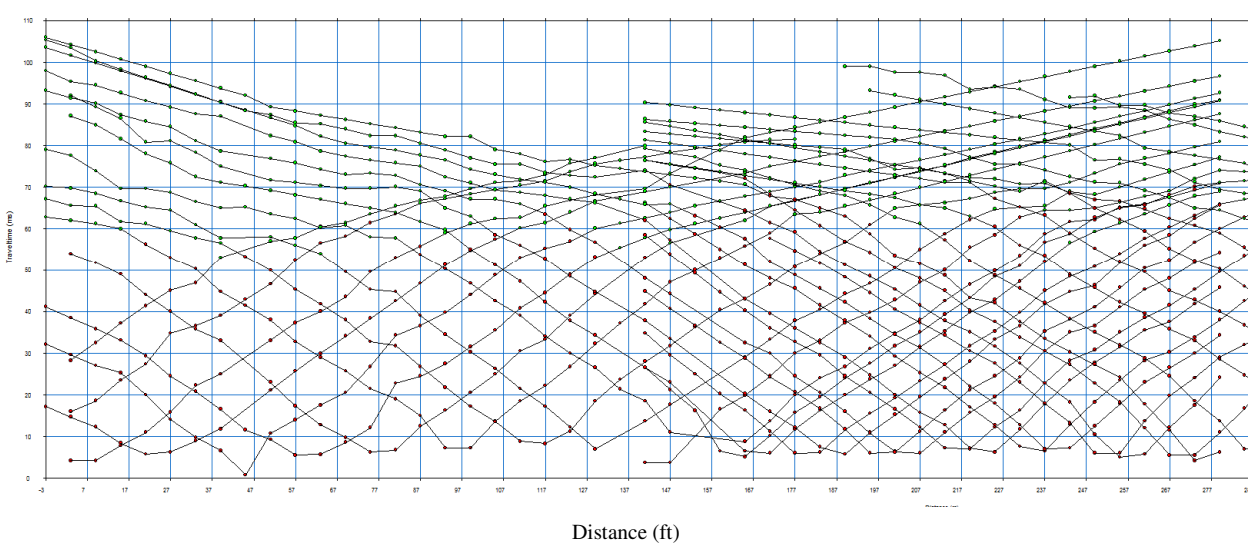
Figure 4-2. Example shot record (Line L) showing first break picks.



4.3.4.1 Seismic Refraction Modeling

Layer Assignment: Once the first breaks were assigned for all of the seismic lines, the next step in the process was layer assignment, where the user chose the slopes that best fit the two-layer model. Three-layer models were attempted, but only a few first arrivals indicated a third layer. In order to be an effective model, most of the first arrivals would have needed to show a third layer. Figure 4-3 shows an example of the layer assignment chosen for a portion of Line A. The x-axis now shows distance and the y-axis shows the time in milliseconds. The red circles indicate Layer 1 and the green circles indicate Layer 2.

Figure 4-3. Example of layer assignments (Line A).



Refraction Analysis: Upon completion of the first break picks and the layer assignments, the refraction analysis was completed using the Seisimager software. Refraction analysis was completed for all 13 lines using the time-term inversion modeling assuming a two layer model. An initial model was used for geometry verification. The refraction statics program compared the predicted pick times with the actual pick times producing numerous statistical displays used for finding and correcting shot/patch position errors. A two layer depth model was created using algorithms based on the generalized reciprocal method. This method assumed that layer velocity was constant and that the layer extended throughout the modeled section.

The results on time-term inversions have been posted as a layer on top of the resistivity results. Table 4-3 shows the velocities of the layers as calculated by the time-term inversions. With the exception of Line L, the first layer velocities were very similar, averaging around, 3,000 ft/s. The velocity of the second layer can be categorized into two groups. The lines to the south, A, B, C, and M indicated an average velocity of 15,000 ft/s. In comparison, the lines to the north, D, E, F, G, H, I, and J, indicated that the velocity of the second layer was much less in comparison at 10,300 ft/s.

Table 4-3. Layer velocities from seismic inversions

Line Name	Length (ft)	Layer 1 Velocity (ft/s)	Layer 2 Velocity (ft/s)
A	1368	3280	15419
B	1368	3280	14763
C	1368	2952	13779
D	1368	2296	10170
E	1368	2952	11482
F	3021	3280	9842
G	1092	2952	8202
H	1240	2952	10498
I	3021	3280	9842
J	1368	2952	9842
K	5324	3280	11154
L	1368	1968	11482
M	1033	3937	16076
Total	24307		

5.0 RESULTS & INTERPRETATION

The main objective for the geophysical surveys was to remap the bedrock and major faults surrounding the 200 Area and adjacent portions of the 200, 600 and 800 Areas as well as identifying fluid-filled fractures. With the new interpretations of geological structure, it was anticipated that the information could be used to better define the contaminant travel pathways and distribution in groundwater. To that end, HGI and Navarro personnel examined each of the 13 profiles individually, looking for evidence of possible structural features. These features were then tested for various correlation patterns between adjacent lines. Finally, the structural features that passed this scrutiny were integrated into a plan map. The process was iterative, going back to profiles to adjust locations of structural features to ensure the optimal alignment on the final map.

Figure 1-1 and Figure 4-1 show the location of the survey, and each of the 13 individual geophysical profiles are presented below with an interpretation. The resistivity data are presented as trapezoids of color contours representing the resistivity values. The longest side of the trapezoid is at the surface. Based on the sensitivity of the method at the ends of lines, the models are limited to the regions shown in the figures below. The maximum amount of data removed is approximately 150 ft on each end of a line at a depth of 300 ft bgs.

In the appendix, a set of clean profiles without interpretation are also provided.

5.1 LINES A & B

Figure 5-1 shows two adjacent lines, A and B. Each line is approximately 1370 ft in length. The lines have both resistivity contours showing high and low resistivity values as well as the two-layer seismic model created from time-term inversion (the break in seismic layers 1 and 2 is shown as a dotted white line across the profiles). The seismic two-layer system represents a loose alluvium upper layer overlying either a more consolidated, limestone-rich alluvium or bedrock. Other features are presented to help place the interpreted features in perspective, such as the individual pin flags, well locations, cross-line K, and Apollo Blvd. Solid black lines have been added as an interpretation of bedrock.

The shallow surface of both lines show mostly high resistivity material that could be reflective of desiccated soils and caliche. Figure 2-5 shows a spike in the EM data in Line A, northwest of pin flag A059. However, there is no indication of a low resistivity anomaly associated with a buried pipe. Below the top layer are regions of lowered resistivity of varying thickness that lie atop a layer of moderate resistivity values. The deepest material tends to become more conductive.

Within the geophysical profiles are consistent structural features that can be mapped across the lines. The most prominent features have been assigned numbers. The breaks in the moderate resistivity layer have been interpreted as fractures. Where offset is seen in the layers of similar resistivity the fractures are interpreted to be faults. Feature '1' is likely a normal fault with minimal to no offset in limestone. It is unclear whether the fault is fluid-filled based on the low resistivity contrast between the fault and surrounding media. To be consistent with well lithologic logs and the inferred position of the limestone/andesite contact from site maps, the fault at marker '2' has been assigned to andesite. The bottom seismic layer appears to correlate with the top of the limestone. Seismic velocities for the lower layer (Table 4-3) confirm that the bedrock geology of Lines A, B, C, and M is significantly different than the other lines. This difference is attributed to faster acoustic waves traveling through andesite relative to limestone.

The andesite in the central portion of the line appears to have been dropped down relative to the limestone. This feature, interpreted as a normal fault, appears to strike towards the southwest and dip southeast as the feature is traced from Line B to A. Feature '3' appears to be a break in the andesite, but the offset, if any, is unclear. It is also unclear whether this fault is fluid filled. A round resistivity contour, north of '3', is also consistent in both lines. This contour assists in tying the other structural features together.

5.2 LINE C

Figure 5-2 shows Line C, with a line length of about 1370 ft. The bedrock underlying the northwestern portion of the line is expected to be andesite. The resistivity variations show a stair step feature that descends to the northwest. The stair step is demarcated by a low resistivity upper layer and moderate resistivity lower layer. The break in stair steps are interpreted as faults. The most significant fault is identified with a '1' and lies beneath the GSA. A small graben is also interpreted towards the southeast extent of the line; it is southeast of GSA.

The seismic model shows a much shallower layer change than that interpreted from the resistivity. Whereas the bedrock interpretation from the resistivity data used the existing bedrock model (Figure 2-2) to help place the boundary, the seismic layering is likely associated with a change in cementation and consistency in the alluvium. Borehole records in other lines confirm that the seismic layering coincides with a change in the alluvium from looser material to one that is more calcareous and limestone rich. This refractive layer occurs above the bedrock surface.

Figure 5-1. Lines A and B with Interpretation

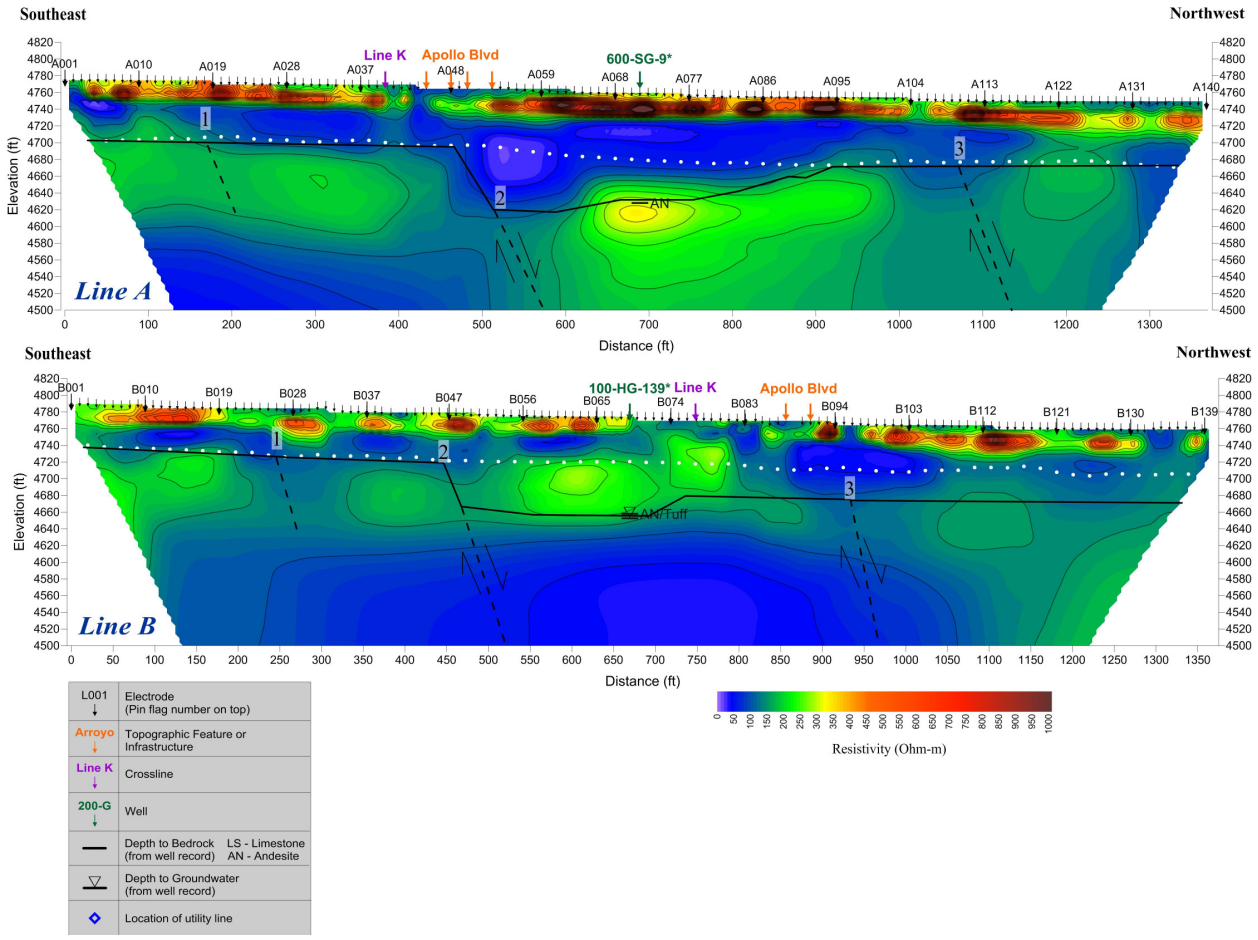
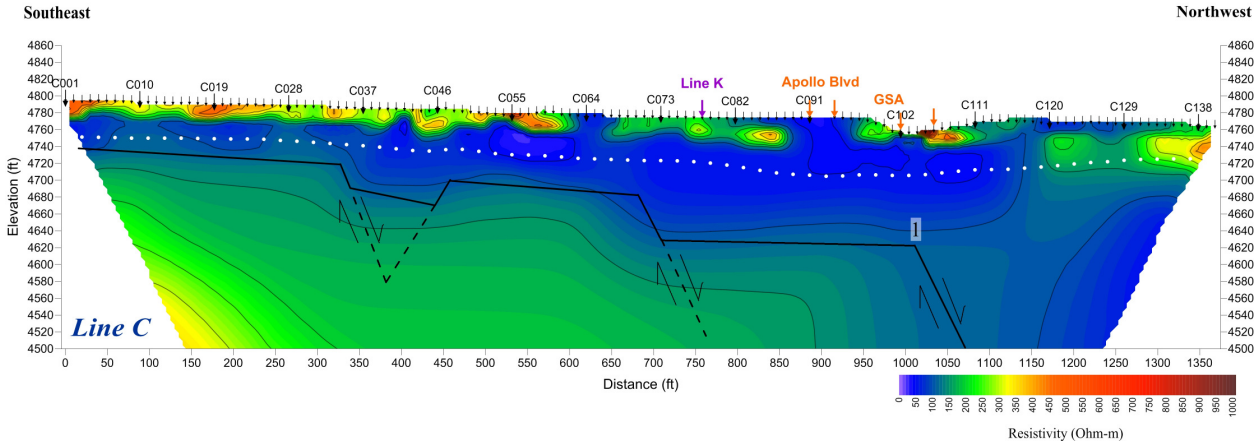


Figure 5-2. Line C with Interpretation



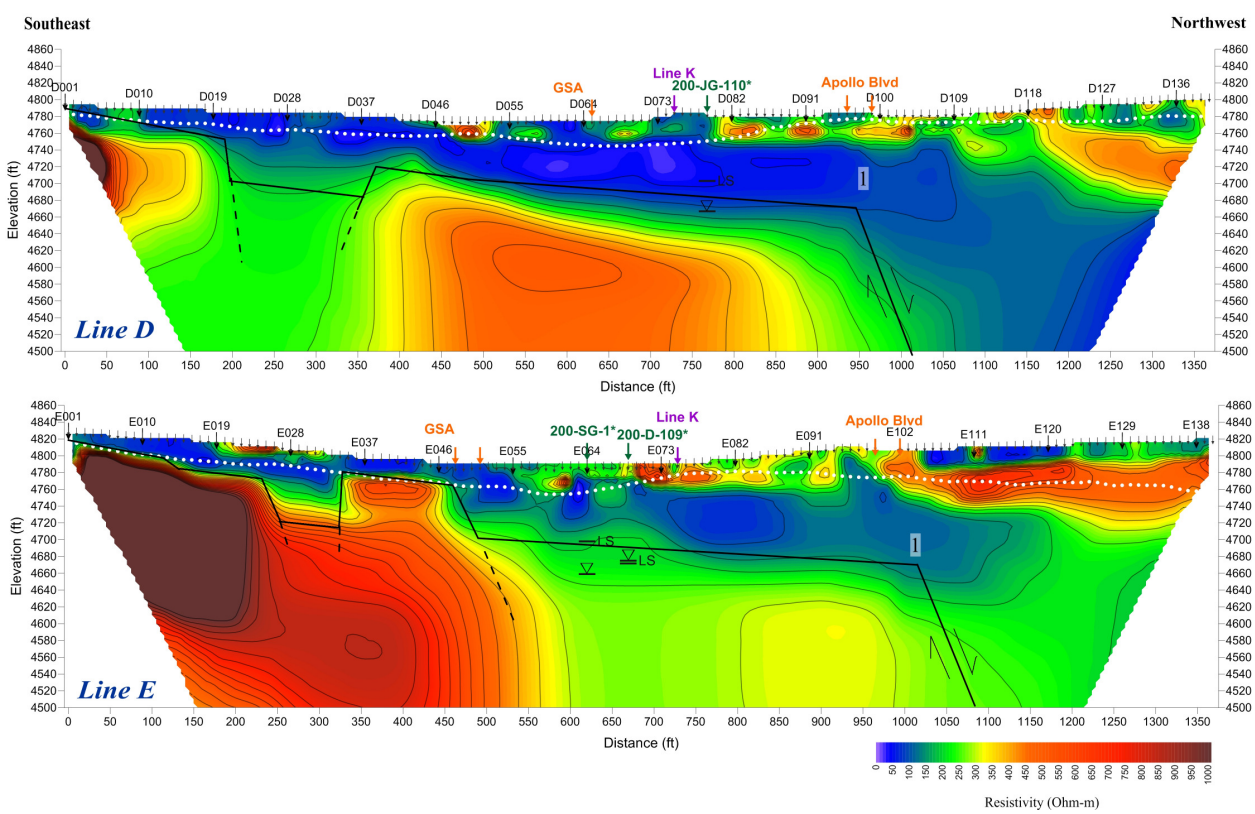
5.3 LINES D AND E

Figure 5-3 combines the lines D and E as a pair to highlight similar features. Both lines are approximately 1370ft in length and are underlain throughout their length by limestone bedrock. A break in continuity of resistivity values between lines C and D, noted in crossing Lines K and L, as well as the lithological information from nearby wells, confirms the transition from andesite to limestone. The most notable feature of these lines is the lower resistivity near the surface and high resistivity basement, which appears discontinuous. The discontinuities are interpreted as faults and grabens. To the southeast is the graben feature that was identified in Line C. Moving northwest, a sloping bedrock ends at the feature designated as '1', where the bedrock appears to drop to a depth that is difficult to determine investigation. As will be shown in Figure 5-11, this feature is coincident with the 200-West fault identified by Maciejewski (1996).

In the near surface, a high resistivity lens is observed to the north of the line, which is suspected to be a gravelly layer as identified from boreholes in adjacent lines.

Similar to Figure 5-1 and Figure 5-2, the seismic layering does not coincide with the bedrock, except in the south where bedrock is shallow.

Figure 5-3. Lines D and E with Interpretation



5.4 LINES F AND I

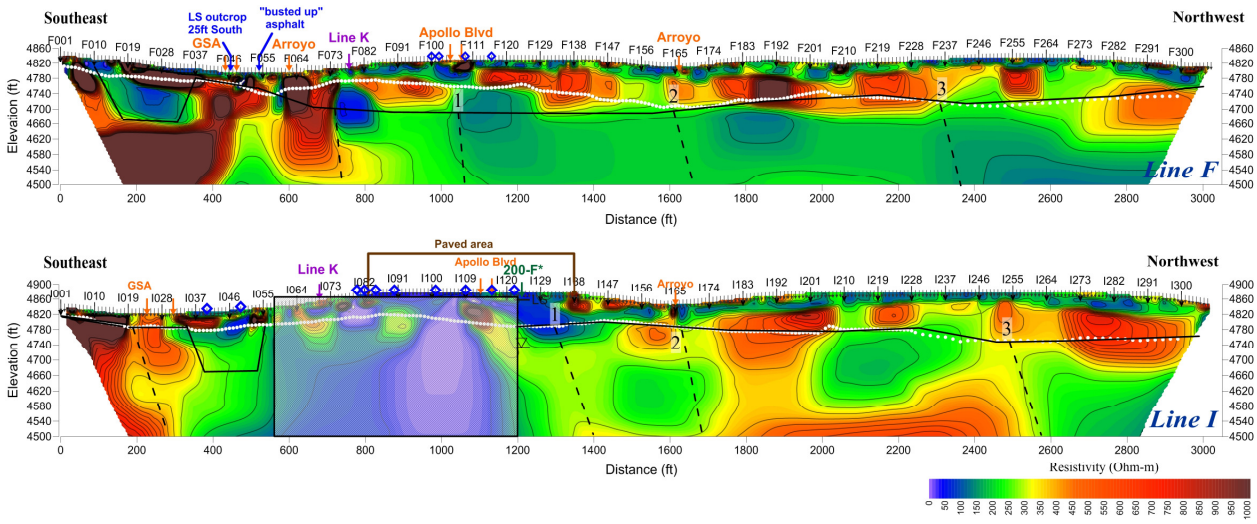
Due to the increased lengths of Lines F and I (over 3,000 ft), presenting these lines together helps draw attention to consistent and large features that cross the northern portion of the site. The first item is the box covering a large portion of Line I near cross-line K. This area is thought to be corrupted by metallic infrastructure, causing very low resistivity values that interfere with strict geological interpretation. Figure 2-6 also shows the metallic response in the EM data.

The structural feature, designated as '3' in the northwestern portions of both lines, marks the transition from limestone in the south to a northern andesite. Moving southeast, features '1' and '2' correlate with breaks in the resistivity value that could simply be fractures with no offset. Their locations are consistent with features observed in aerial photos, with feature '2' correlating to the primary arroyo northwest of the 200 Area (see Figure 1-1 for location). Furthermore, feature '1' coincides with the 200 West fault identified by Maciejewski (1996).

Along both lines, the seismic layer interpretations and resistivity bedrock interpretation coincide with reasonable fidelity. Northwest of feature '2', we interpreted the bedrock to be coincident with the transition in seismic layering. Here, the bedrock is at a depth of about 100 ft to 120 ft. In line F, there is a significant deviation between the seismic layering and bedrock interpretation between the GSA and feature '2'. Southeast of the GSA, the bedrock and seismic layer realign.

The southeastern portion of both lines show a graben, with the graben in line F south of the GSA and the graben in Line I north of the arroyo. The graben in F is consistent with the lines C-E. As will be shown later, the graben at line I is consistent with that of line J. The relationship, if any, between this graben and the one further southwest is uncertain. The fault in Line F, southeast of the crossline K, appears to align with the 200 East fault identified by Maciejewski (1996). Lastly, none of the faults appear to be fluid-filled, as they are more resistive than the surrounding media.

Figure 5-4. Lines F and I with Interpretation



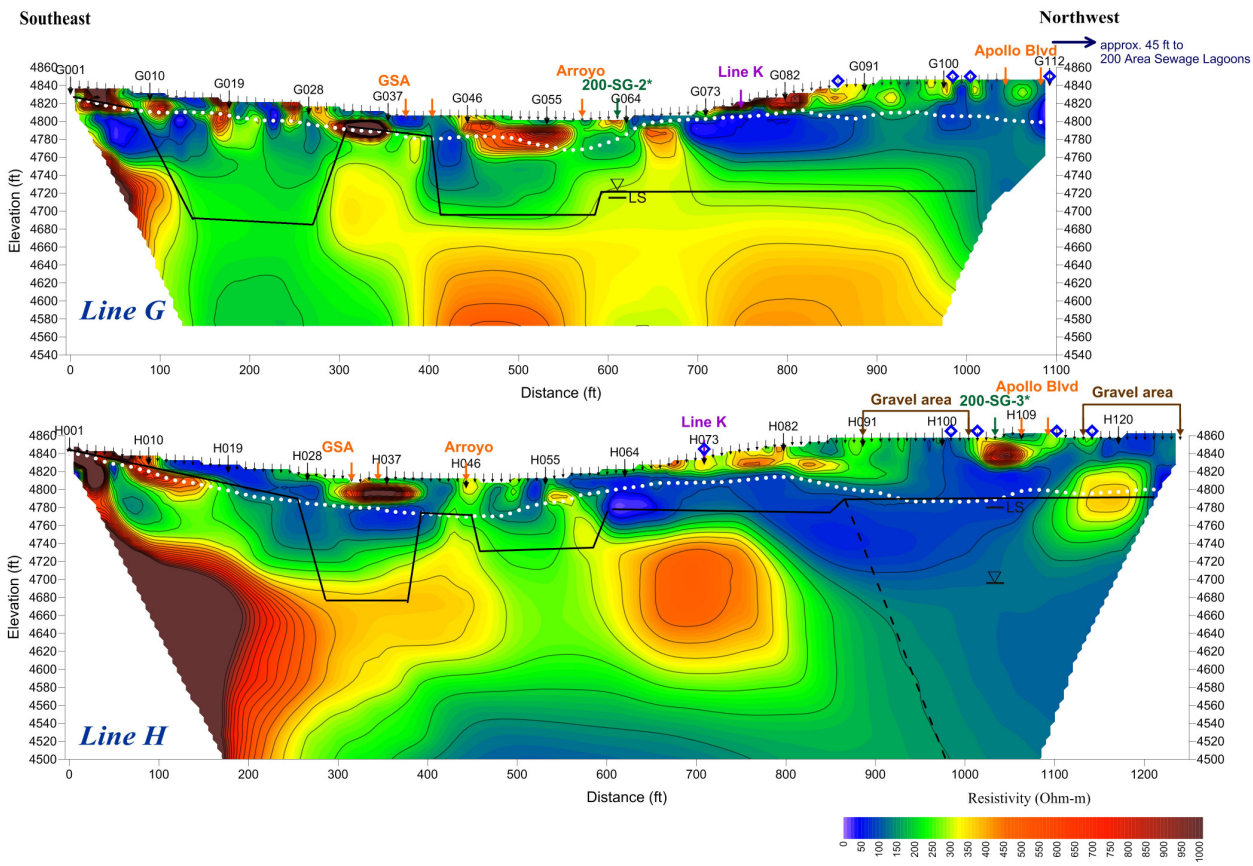
5.5 LINES G AND H

Lines G and H were necessarily truncated to less than 1200 ft in length due to surface obstructions as the lines got closer to infrastructure in the 200 Area. Line G was run up to the southern edge of the 200 Area wastewater lagoon. Each lagoon cell was originally constructed with approximately 1 ft of clayey material on the bottom and 2 ft on the inside slopes. Past leakage of wastewater out of the lagoon is a possibility and the conductive response in the northern portions of both lines may have been influenced by increased saturation.

Moving southeastward, there appears to be reasonable consistency between the lines, and efforts were made to align relevant features from Line G to Line H. The southeastern-most portion of the lines show the edge of a very high resistivity feature at approximately 100 ft bgs. Immediately to the northwest, the lowered resistivity anomaly is interpreted as a graben in both lines, although the floor in Line G is conductive and the floor of the graben in Line H is resistive. The bedrock of the horst immediately north and south of this graben was identified in both the resistivity and seismic data. As will be shown in Figure 5-10, this graben is consistent in lines C through F.

A second graben has been mapped towards the center of both lines with the bedrock following the information provided in nearby wells. For example, the bedrock in 200-SG-2 in line G is approximately 85 ft bgs, and we used that information to estimate bedrock elevation across the entire line. This second graben could easily be a fault, but the width of influence in the resistivity data is quite significant (over 100 ft wide).

Figure 5-5. Lines G and H with Interpretation

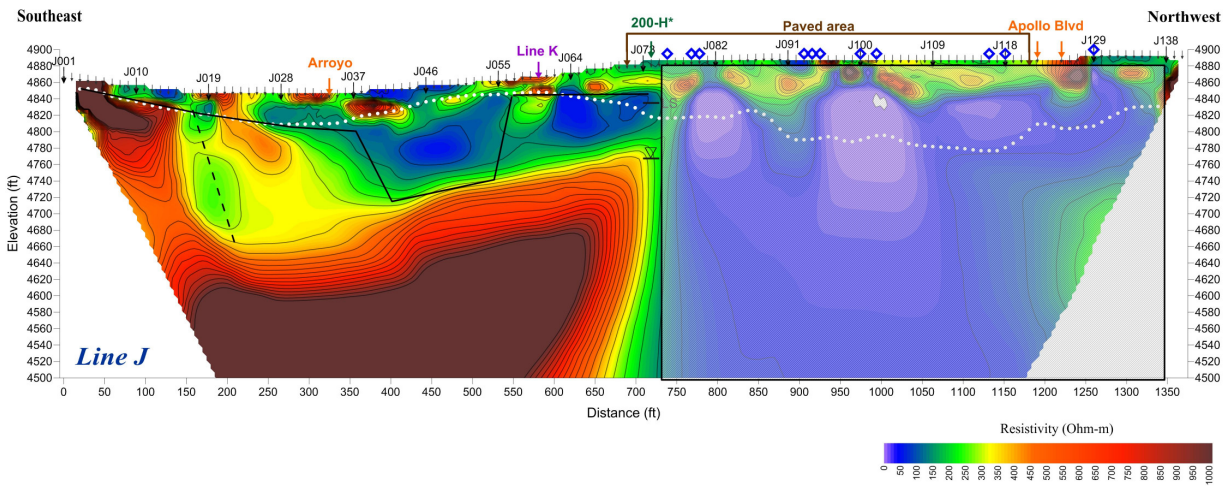


5.6 LINE J

Line J, at a length of about 1350 ft, was placed north of the 200 Area buildings and through the majority of a paved area. The infrastructure beneath the buildings is suspected to have caused serious interferences, and the modeled section where the interference occurred has been blocked over in Figure 5-6. Figure 2-6 shows the EM data, where a broad area was seen to be electrically conductive. Additionally, the air conditioners and other motors turning on and off caused noise in the seismic data, preventing meaningful bedrock models from being developed.

The information south of the paved area was imaged successfully, and many of the features identified in Line I can be traced to Line J. The graben northwest of the arroyo as well as the fault southeast of the arroyo are consistent within both lines. The basement also appears rather resistive in Line J. Lastly, a fault at around station J019 appears to be fluid-filled.

Figure 5-6. Line J with Interpretation



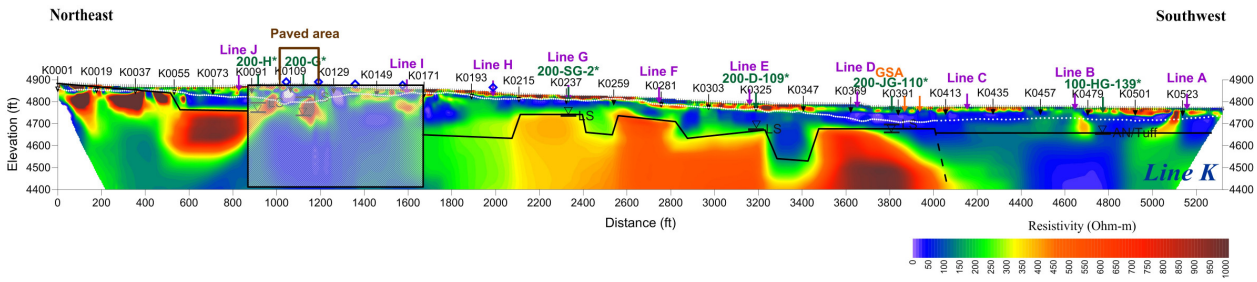
5.7 LINE K

Figure 5-7 shows the geophysical results of Line K, which was the longest line run at the site at approximately 5300 ft in length.. The line was placed perpendicular to the other lines presented so far, parallel to Apollo Blvd., and allowed a means to tie information from adjacent lines together. Generally, the line shows very complex structure with antithetic faults and graben-like structures identified by low resistivity material alternating with high resistivity bedrock. These features are particularly evident in the section between lines C and I. Southwest of Line C, the resistive bedrock gives way to a more conductive material that is consistent with andesite mapped in Lines A-C.

A significant portion of the line in the northeast, near the 200 Area buildings, appeared corrupted by the metallic infrastructure. The infrastructure is also visible as conductive anomalies in Figure 2-6. A box, graying out the affected area, has been placed over the affected section of the line.

The seismic interpretation shows that the northeastern portion of the line matches with interpreted bedrock from the resistivity. As the bedrock becomes deeper, the seismic layering diverges from picking bedrock and likely picks up the transition from looser alluvium to limestone-rich soil.

Figure 5-7. Line K with Interpretation

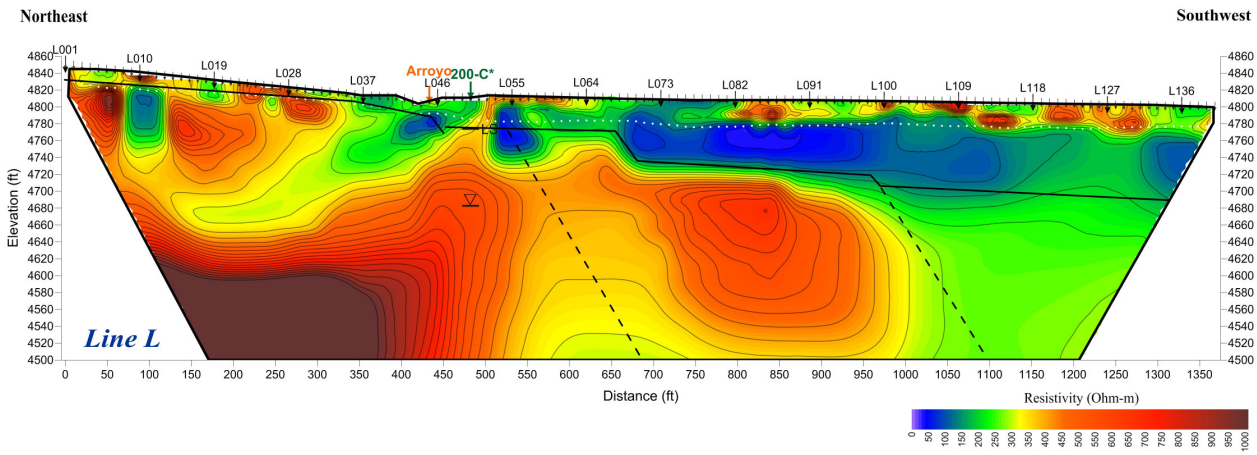


5.8 LINE L

Figure 5-8 shows the geophysical results of Line L, at a length of approximately 1350 ft. The line was oriented parallel to, but shorter than Line K, and placed approximately 1,100 ft to the south. Even with those distances, there is a consistent feature on the southwest portion of the line: a major fault that runs from northwest to southeast. In both lines, the transition is marked by a resistive bedrock changing to a slightly more conductive bedrock.

Within the northeast portion of the line, the data are highly resistive at depth with breaks that could be interpreted as fractures. These fractures do not appear to be fluid-filled. At the near surface, the material is slightly more conductive, perhaps due to limestone weathering and a thin soil horizon. The geophysical line crosses an arroyo, where the resistivity is very conductive from thicker soils replacing eroded limestone with a limited amount of saturation. The seismic layering coincides with the shallow nature of the bedrock in the northeast, but diverges from bedrock towards the southwest.

Figure 5-8. Line L with Interpretation

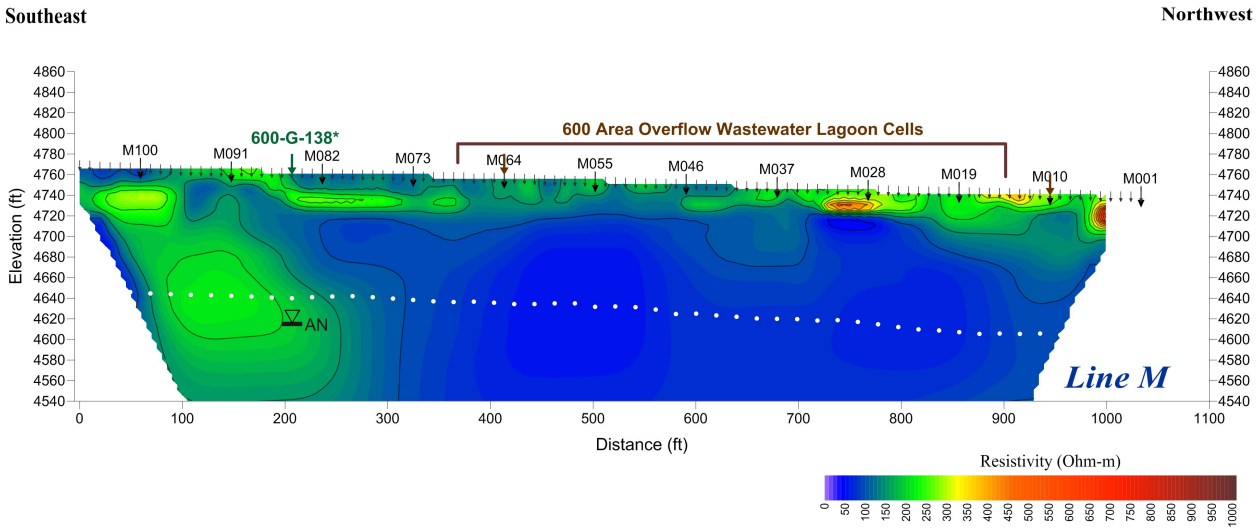


5.9 LINE M

The last line to be acquired was Line M. The line was placed to the southwest of Line A and adjacent to the 600 Area overflow wastewater lagoon. The decision to acquire data along Line M was made after the initial survey design. The general purpose of the line was to map bedrock features to help investigate the distribution of TCE-contaminated groundwater identified on top of the andesite bedrock surface in well 600-G-138. Perched water occupies bedrock lows based on recent drilling information within the area.

It appears that the conductive nature of the data is due to potential leaking from the lagoon. Two low resistivity zones are observed in the line, which correlate with the placement of the two individual lagoon cells. Therefore, Line M cannot be interpreted for geologically relevant features.

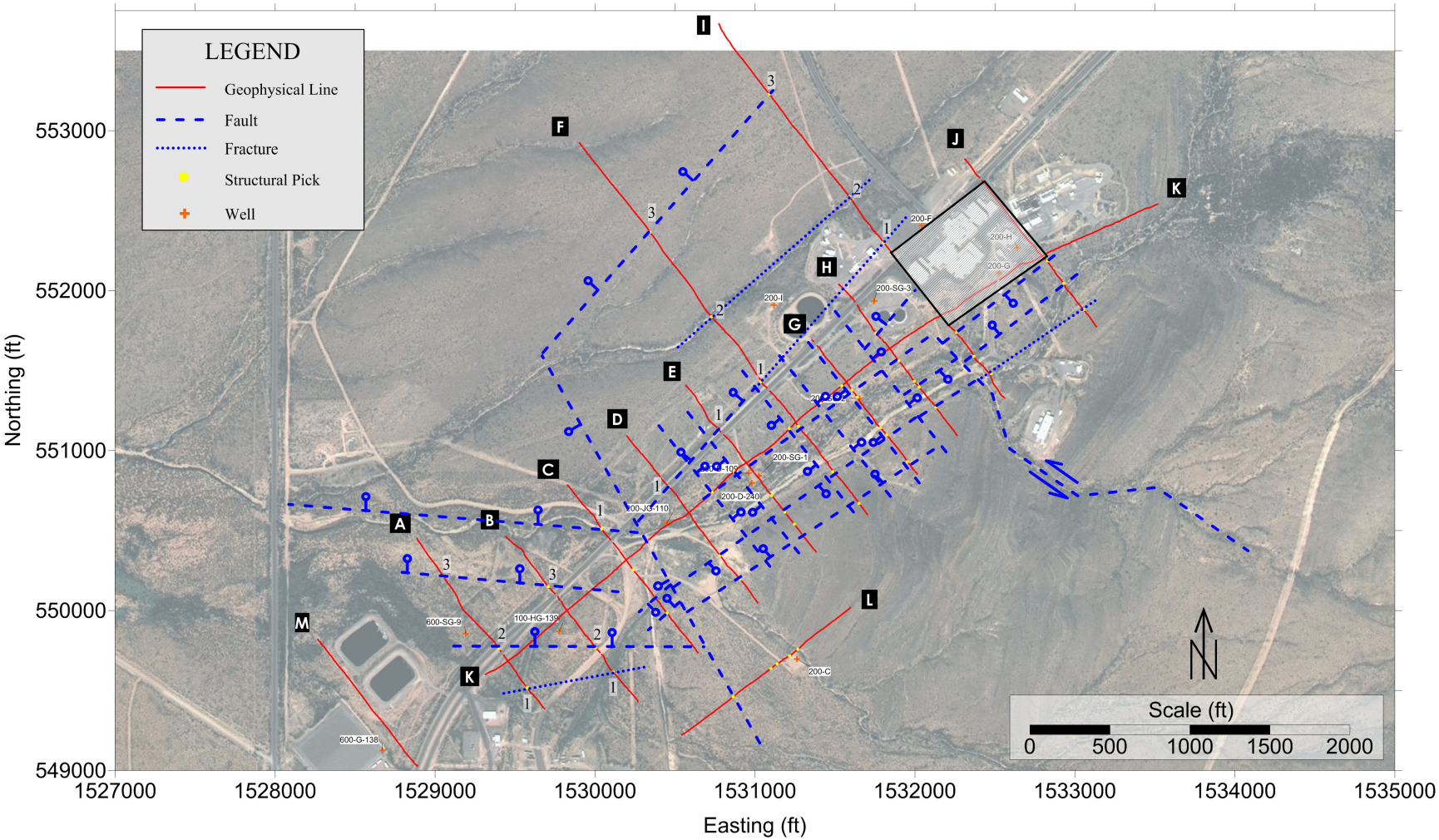
Figure 5-9. Line M with Interpretation



5.10 PLAN MAP OF INTERPRETED STRUCTURE

The structural features from each of the 13 geophysical lines were collated, georeferenced, and plotted on a plan map to help bridge the information along adjacent lines. Figure 5-10 shows the results of the plotting, with dashed lines showing the location of faults and dotted lines showing fractures. The creation of the final version of the map was an iterative process to ensure continuity of features across the study area using the structural picks for each individual profile. A marker has been placed on the hanging wall of each fault. Numbers have also been added to help explain their location on the individual profiles.

Figure 5-10. Plan Map with Interpreted Structural Features



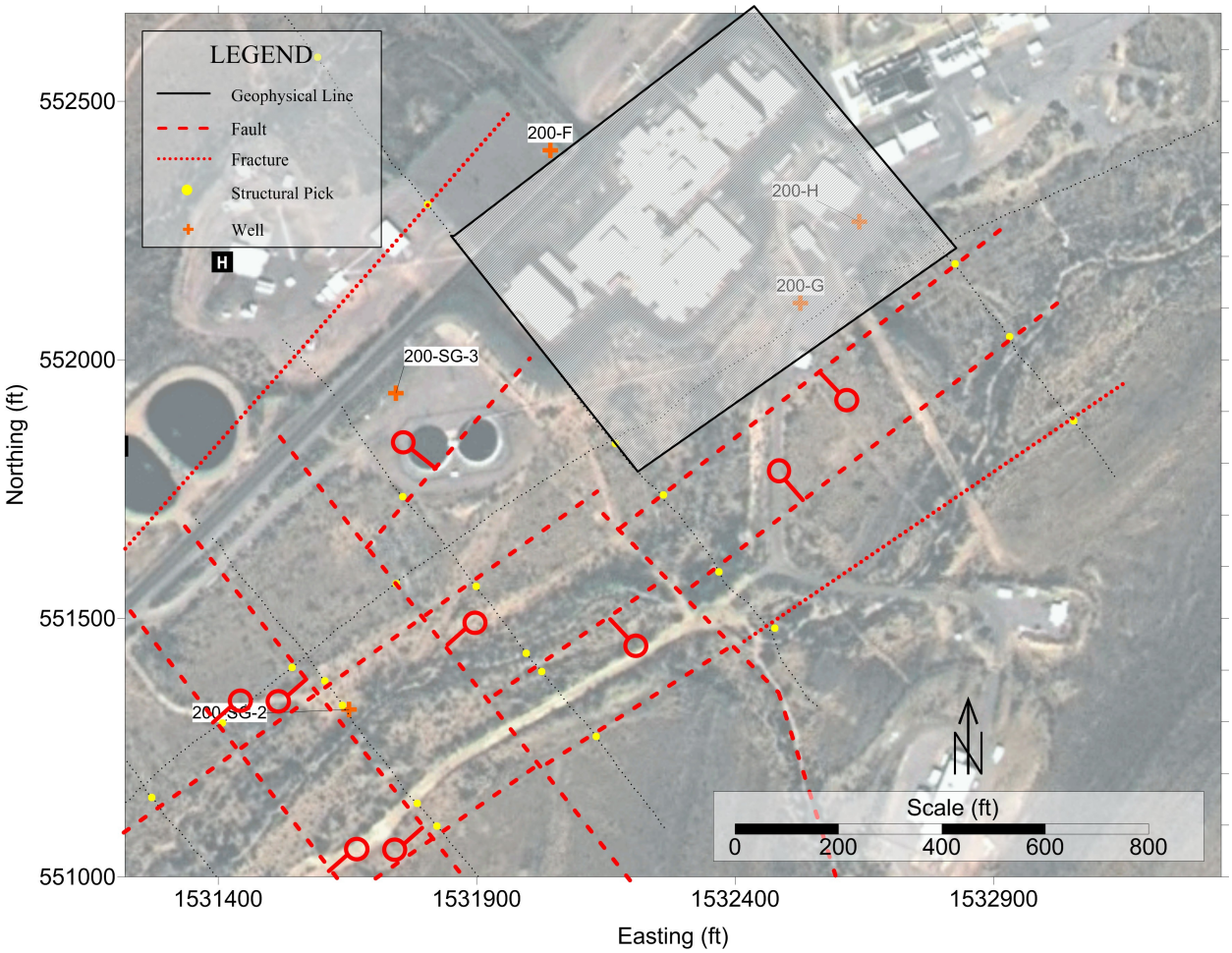
Note: Coordinate system is the NMSP, Central with a datum of NAD83.

The southwest portion of the project area, encompassing Lines A-C, shows the break between limestone and andesite with a dotted line. The geological transition fault marked '2' can be traced in Lines A and B and has nearly the same orientation as those marked '1' and '3'. In fact, the east-west orientation can be traced to the direction of the GSA, which is also aligned with a fault identified as '1' in Line C. The arroyo changes direction almost exactly where the eastern transition from limestone to andesite (east of Line C) has been identified. The newly interpreted location highlighting the transition from limestone to andesite is also consistent with the borehole records of 600-SG-9 and 100-HG-139.

On a broader scale, all of the arroyos appear to align with structural features observed in the resistivity record. Although not completed for this work, a photo lineament analysis would likely confirm this hypothesis. For example, in the north at the transition of limestone to andesite in Lines F and I, the fault is oriented the same (northeast – southwest) as those structural features (grabens, faults, fractures) nearer the eastern extent of the GSA in the southeastern portion of the site. Perpendicular to the main faulting patterns are smaller scale horst and grabens located beneath Apollo Blvd within a larger horst block (200 Area "high") that trends northeast in the same direction as the road. In the far eastern portion of the project area, a small graben between Lines I and J has been offset from a graben that has also been identified on Line H. A highly questionable slip-strike fault along the arroyo passing by the hyper-velocity testing facility marks the transition in the offset. For a detailed view of the area, Figure 5-11 has been prepared that expands the size of the eastern portion of the project area. No visible ground record of the slip-strike fault could be found during a site walk-down by Thomas A. McCrory and John W. Pearson of the WSTF Environment Department. The northeast-southwest graben observed in Lines H through J extends all the way to Line C.

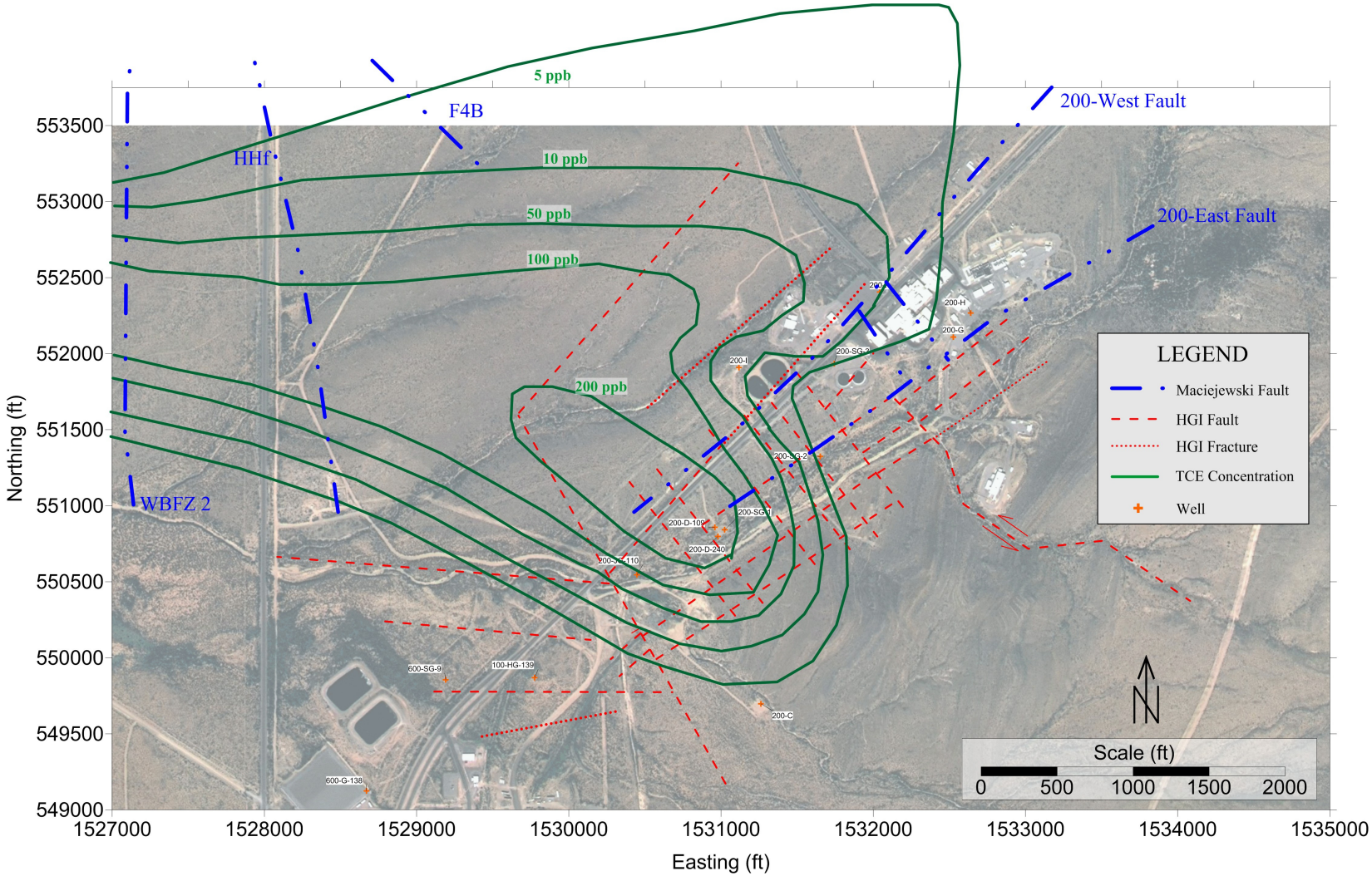
As a last analysis, it is important to consider the new geophysical information in conjunction with other geophysical or hydrogeological data. Figure 5-12 shows an overlay of the structure interpreted from a seismic reflection survey completed by Maciejewski (1996) and recent (Third Quarter, 2011) TCE data. The contours of TCE have been interpreted based on available well data. Firstly, it appears that the Maciejewski faults defining the 200 Area horst beneath Apollo Blvd (Apollo Blvd Horst, ABH) coincide with faults and fractures identified in the resistivity. Additionally, Maciejewski identified a horst directly beneath the 200 Area complex along the same orientation as those identified in Line K of the resistivity. Away from the 200 Area in the northwest portion of Figure 5-11, a series of north-south trending faults (WBFZ 2, HHf, and F4B) do not trend with the features at the 200 Area or the arroyos. Unfortunately, electrical resistivity data for this study were not collected that far from Apollo Blvd, making the northwest faults interpreted by Maciejewski impossible to verify.

Figure 5-11. Interpreted Structural Features with a Focus on the Eastern Project Area



Note: Coordinate system is the NMSP, Central with a datum of NAD83.

Figure 5-12. Plan Map with Structure and TCE



Note: Coordinate system is the NMSP, Central with a datum of NAD83.

The TCE contour patterns can be inferred to correlate to the newly mapped structural features. While the direction and extent of the concentration isopleths are controlled by the hydraulic gradient, nuances in shape are likely the result of faults that contort the plume. In the north, for example, the lobe heading in a northeast direction is coincident with the identified structure mapped by geophysical lines A through C. In the south near 200-JG-110, the TCE contours show a high gradient as the bedrock geology transitions from limestone to andesite. It may even be that the gradient is sharper than presented in Figure 5-12, contorting around the contacts. Lastly, the high concentration TCE source observed in the well cluster around 200-D-109 may be related to the low resistivity graben on Line K, which is approximately 100 ft wide. This graben feature is approximately coincident with the center of the high TCE concentration.

6.0 CONCLUSIONS

A geophysical study was conducted within the 200 Area and adjacent portions of the 100 and 600 Areas at WSTF to address the objective of mapping bedrock and structural features that may be controlling contaminant movement down-gradient from historical source areas and to locate fluid-filled fractures if they existed. The geophysical methods utilized primarily included electrical resistivity and seismic refraction. A third method, electromagnetic induction, was used to help map metallic infrastructure (e.g., pipes) that may have interfered with the electrical resistivity interpretation.

The design of the geophysical survey was intended to capture known prominent features that trend in the northeast-southwest direction. Eleven lines were distributed within the 200 and 600 Areas along Apollo Blvd, with lengths generally ranging from 1,200 to 3,000 ft. The lines were acquired as profiles, allowing a two-dimensional view into the subsurface to depths of 300 ft. In addition, a long tie-line was placed perpendicular to the main set of geophysical lines and parallel (and south of) Apollo Blvd. The tie-line was to help bridge the information from all other lines, where line spacing was typically 200 ft or more. A final line was placed far south of Apollo Blvd, near well 200-C that straddled a tributary arroyo that contributes to the GSA.

The main source for information for mapping both bedrock and structure was the electrical resistivity data. The use of the pole-pole array provided data that were of low noise, thus allowing high confidence in the model results. The electrical resistivity method highlighted contrasts in electrical properties that were indicative of faults, fractures (fluid-filled or not), and grabens. Faults were mostly identified by an offset in the top of resistive bodies. Grabens were shown to be wide conductive bodies in a relatively resistive matrix. Fractures were identified by breaks in resistive features, but with no offset. If the faults were shown to be resistive relative to the host media, it was assumed that they were not fluid-filled. A very conductive fault was assumed to be fluid filled. Faults with resistivity values near the host rock were could not be determined as to whether they contained water. The structural features were identified across each of the 13 lines. The features were then correlated between the lines and transferred to a plan map showing the primary interpreted structural features for the project area.

The seismic refraction provided confirmation of bedrock topography, when bedrock was relatively shallow. Bedrock was shallow towards the south and on the south side of the GSA and locally crops out on the low foothills hills of the SAM located adjacent and to the southeast. Moving northward and west, the deeper bedrock could not be imaged by the refraction method, instead picking up a transition between looser alluvium and a limestone-rich alluvium horizon located on the top of the bedrock surface. Additionally, the method was unable to map grabens

identified by the resistivity due to the relatively narrow width compared to the resolution of the method.

After mapping the structural features in each of the geophysical profiles, the information was transferred to the plan map of the site to help bridge all of the information across adjacent lines. The results of this mapping effort showed remarkable coherency and allowed an interpretation that was consistent with other geophysical and hydrogeological information. The primary horst feature, ABH, identified by a past seismic reflection survey was also identified in the resistivity profiles. The 200-East and 200-West faults in the survey conducted by Maciejewski, marking the edges of the ABH, were identified in the resistivity data with significantly improved fidelity. This trend was also identified in other faults and grabens nearby, which is consistent with the surface orientations of arroyos that are interpreted to approximate the locations of structural lineaments in bedrock arroyos. Along the ABH, cross-cutting faults and grabens consistent in direction and scale were also identified. These cross-cutting faults and grabens were previously identified (although in less detail) by Maciejewski.

When comparing and correlating the newly interpreted structure with the TCE concentration data, it is apparent that the groundwater plume may be controlled by bounding faults and geological transitions. While the direction and extent of the plume is dictated by the strong hydraulic gradient in the area, the position of and shape of contours on a more local scale appear to be highly influenced by the structure. In the main part of the plume, for example, where concentrations exceed 200 ppb, a significant graben has been identified in geophysical line K. It is possible that most of the groundwater contaminant pathway resides in that graben and the 200 ppb isopleth line is narrower than currently interpreted using monitoring well data. Additionally, the south contours could be closer together as the faults in the western portion of the study area prevent backflow of TCE into the limestone.

A significant effort was expended in ensuring a consistent and uniform interpretation with existing site data. However, these data were rather sparse in key areas of the site and the type of structure, exact width, and final depth are still not well resolved. Immediately south of the 200 Area complex, and south of wells 200-G and 200-H, there are structural features that require more detailed investigation. Additionally, the western region north of wells 100-HG-139 and 600-SG-9 has little corroborating evidence. It is recommended that new monitoring wells be placed in these areas to corroborate the interpretation. Additional geophysical information (in the form of additional survey lines) would also help bridge information and reduce uncertainty from largely spaced lines, where features were generally smaller than the line spacing.

7.0 REFERENCES

deGroot-Hedlin, C., and S.C. Constable, 1990, Occam's inversion to generate smooth, two-dimensional models from magnetotelluric data: Geophysics 55, 1613– 1624.

Dey, A., and H.F. Morrison, 1979, Resistivity modeling for arbitrarily shaped three-dimensional structures: Geophysics, 44, 753-780.

Ellis, R.G., and D.W. Oldenburg, 1994, Applied geophysical inversion: Geophysical Journal International, 116, 5-11.

Loke, M.H., I. Acworth, and T. Dahlin, 2003, A comparison of smooth and blocky inversion methods in 2D electrical imaging surveys: Exploration Geophysics, 34, 182-187.

Maciejewski, T.J., 1996. Integrated Geophysical Interpretation of Bedrock Geology, San Andres Mountains, New Mexico. Master's Thesis, University of Texas El Paso, 123 pp. December 1996.

Rucker, D.F., Levitt, M.T., Greenwood, W.J., 2009. Three-dimensional electrical resistivity model of a nuclear waste disposal site. Journal of Applied Geophysics 69, 150-164.

Rucker, D.F., G.E. Noonan, and W.J. Greenwood, 2011. Electrical resistivity in support of geologic mapping along the Panama Canal. Engineering Geology 117(1-2):121-133.

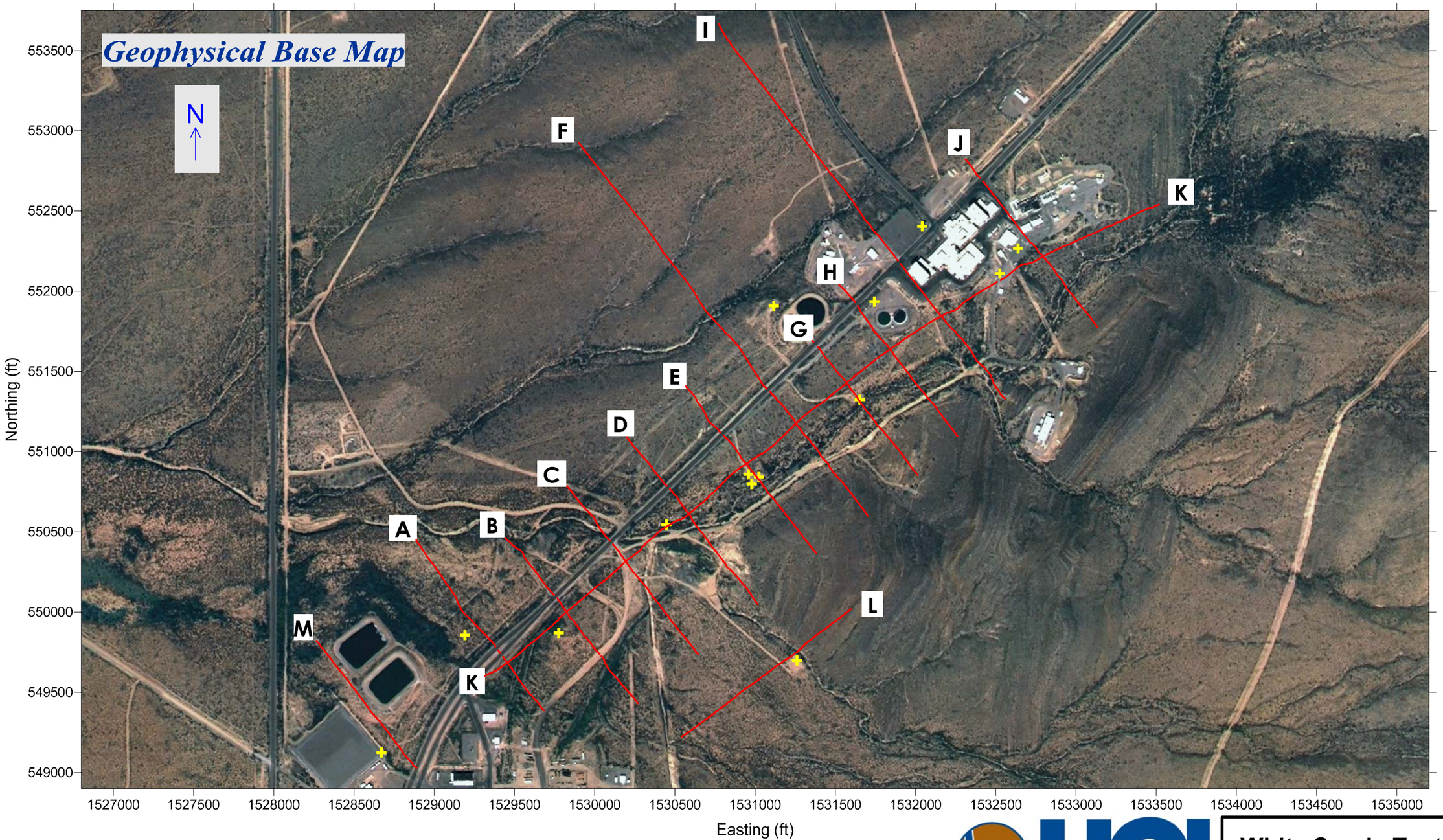
Seager, W. "Geology of Organ Mountains and Southern San Andres Mountains, New Mexico," Memoir 36, New Mexico Bureau of Mines & Mineral Resources, Socorro, NM. May 1981.

Sasaki, Y., 1989, Two-dimensional joint inversion of magnetotelluric and dipole-dipole resistivity data: Geophysics, 54, 254-262.

Telford, W., Geldart, L., Sheriff, R., 1990. Applied Geophysics. Cambridge Univ Press, Cambridge, UK, 790 pp.

APPENDIX A

CROSS SECTIONS OF TWO-DIMENSIONAL INVERSION RESULTS



LEGEND	
—	Geophysical Line
+	Well Location

Coordinate System
NMSP, Central, ft.
NAD83

Scale (feet)
0 500 1000 1500 2000

hydroGEOPHYSICS

White Sands Test Facility

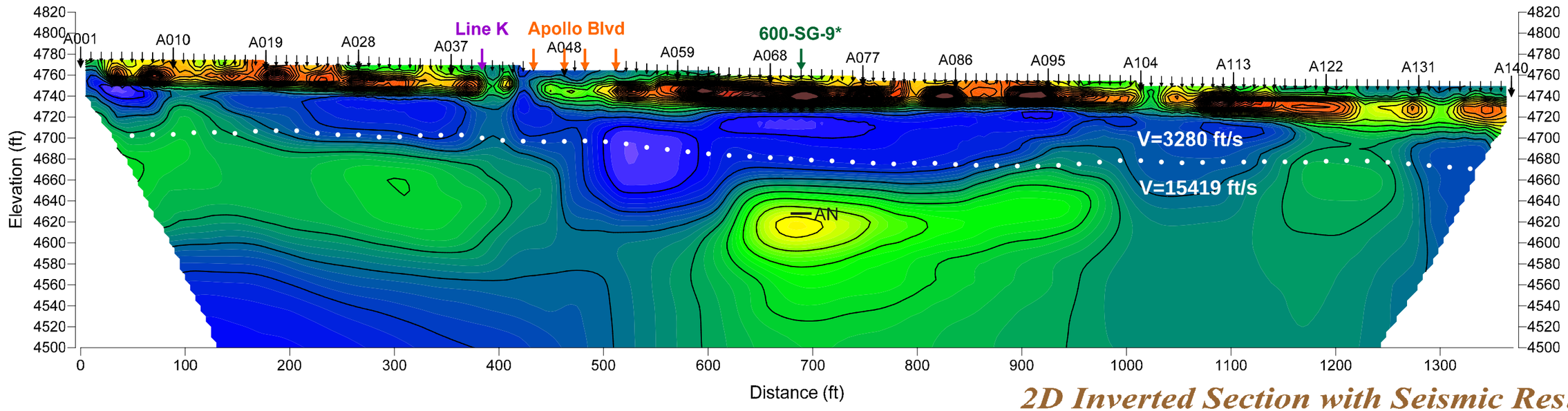
Date: Sept 2012

Fig.: Base Map

11/08/12 10:24:31

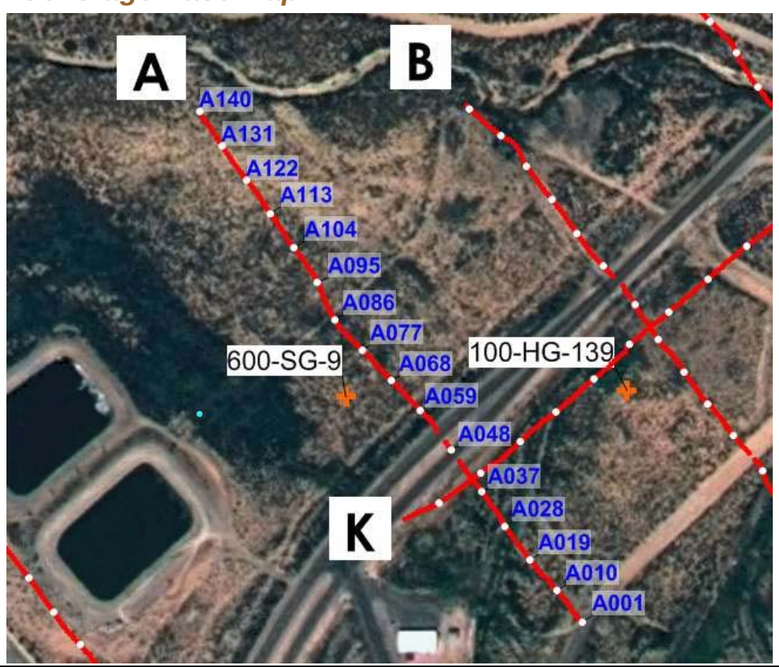
2302 North Forbes Blvd. • Tucson, Arizona 85745 • (520) 647-3315

Electrical Resistivity and Seismic Results
Line A



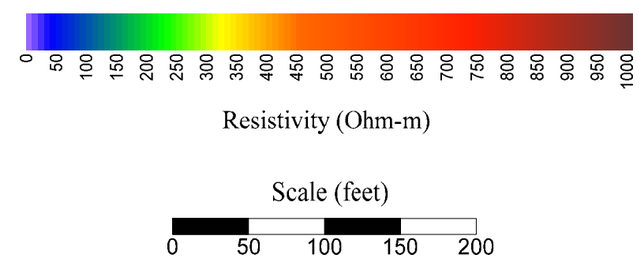
2D Inverted Section with Seismic Results

Coverage Base Map



L001 ↓	Electrode (Pin flag number on top)
Arroyo ↓	Topographic Feature or Infrastructure
Line K ↓	Crossline
200-G ↓	Well
—	Depth to Bedrock (from well record) LS - Limestone AN - Andesite
▽	Depth to Groundwater (from well record)
◇	Location of known utility line
V=3000 ft/s ••••••• V=15000 ft/s	Seismic Layer Interpretation (with layer velocity in feet/second)

** Well 600-SG-9 is located approx. 95 ft. SW of resistivity line*



hydroGEOPHYSICS

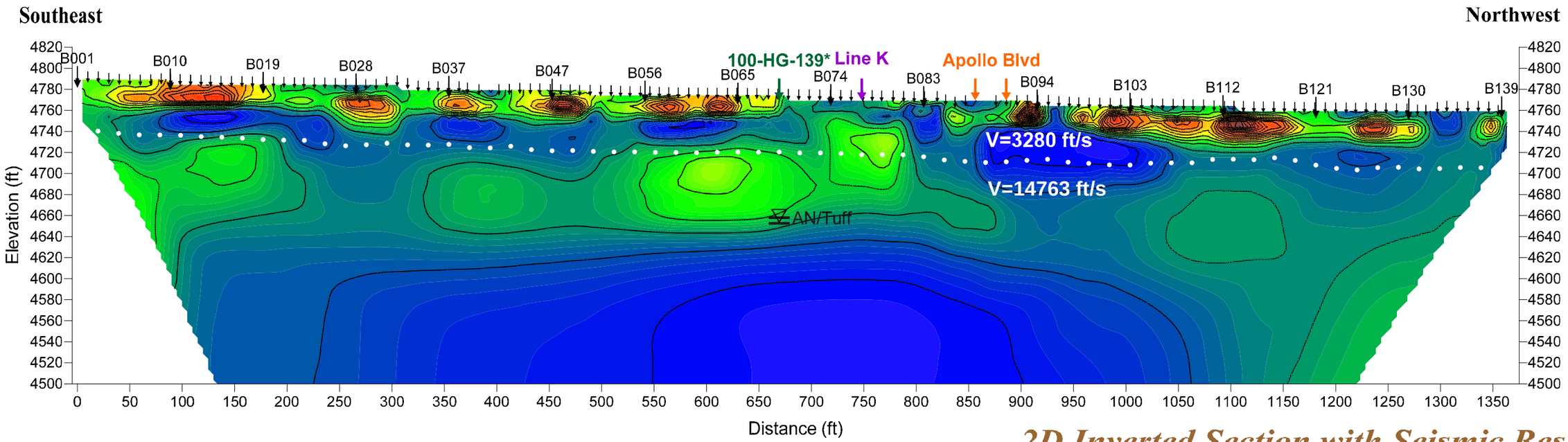
White Sands Test Facility
Las Cruces, NM

Date: Sep. 2012 | **Fig.: Line A**

FILES: 12/07/12 11:13:56

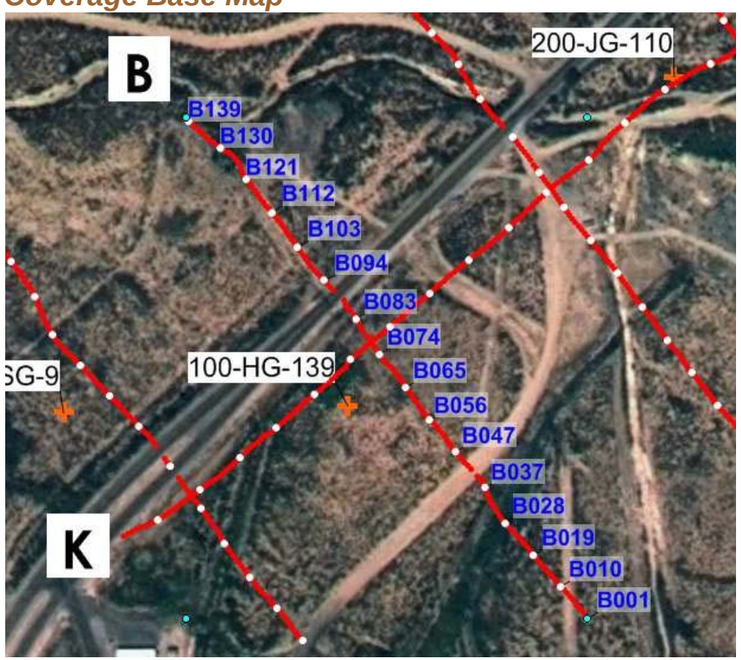
2302 North Forbes Blvd. • Tucson, Arizona 85745 • (520) 647-3315

Electrical Resistivity and Seismic Results
Line B



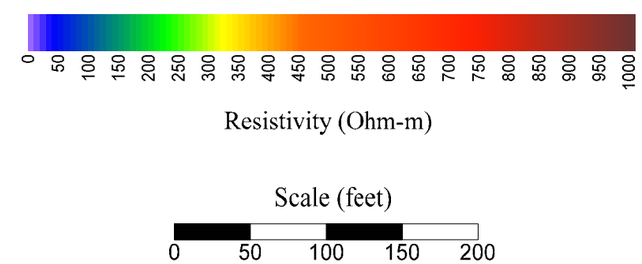
2D Inverted Section with Seismic Results

Coverage Base Map



L001 ↓	Electrode (Pin flag number on top)
Arroyo ↓	Topographic Feature or Infrastructure
Line K ↓	Crossline
200-G ↓	Well
—	Depth to Bedrock (from well record) LS - Limestone AN - Andesite
▽	Depth to Groundwater (from well record)
◇	Location of known utility line
V=3000 ft/s ●●●●●●● V=15000 ft/s	Seismic Layer Interpretation (with layer velocity in feet/second)

** Well 100-HG-139 is located approx. 120 ft. SW of resistivity line*



hydroGEOPHYSICS

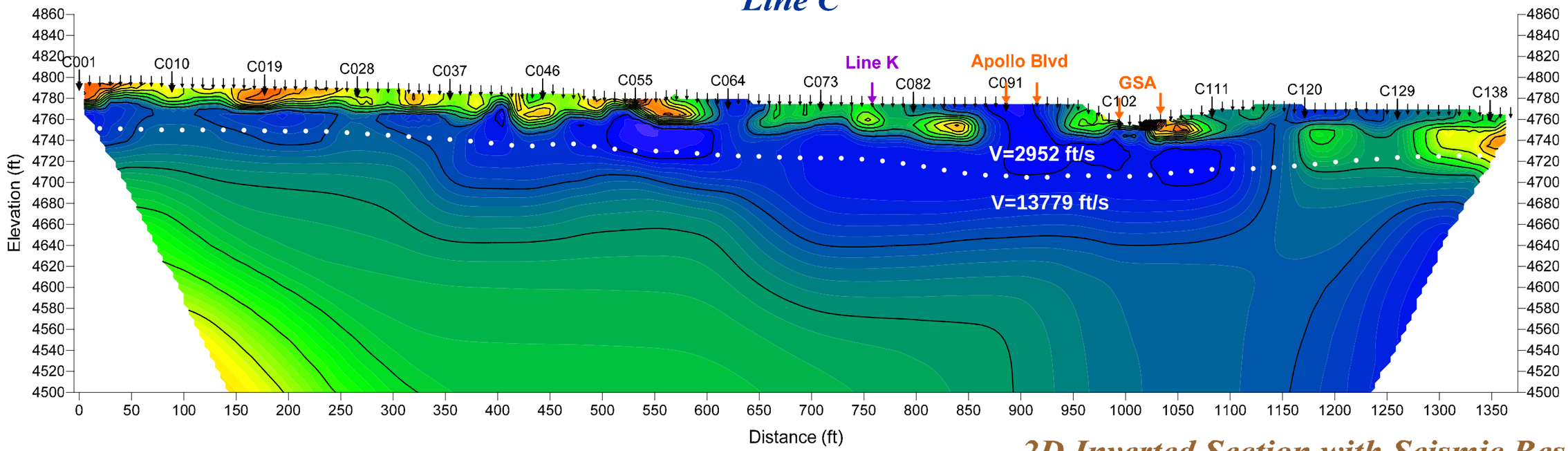
White Sands Test Facility
Las Cruces, NM

Date: Sep. 2012 | **Fig.: Line B**

FILES: 12/07/12 11:14:50

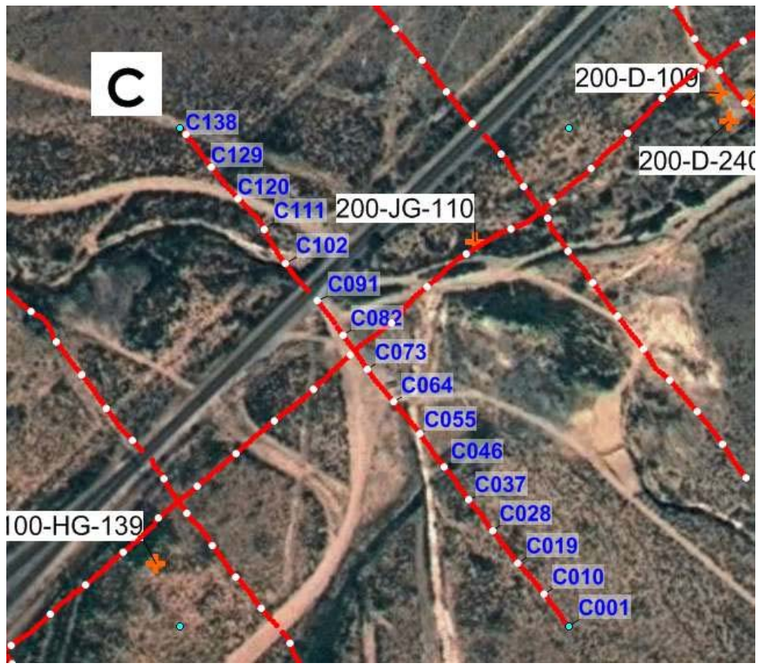
2302 North Forbes Blvd. • Tucson, Arizona 85745 • (520) 647-3315

Electrical Resistivity and Seismic Results
Line C

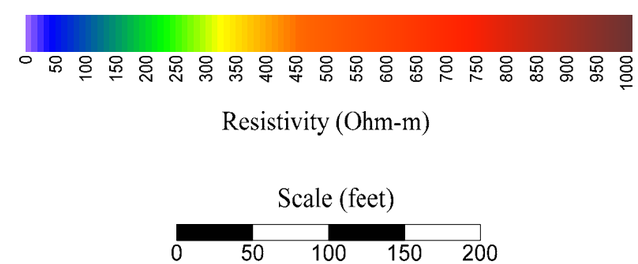


2D Inverted Section with Seismic Results

Coverage Base Map



L001 ↓	Electrode (Pin flag number on top)
Arroyo ↓	Topographic Feature or Infrastructure
Line K ↓	Crossline
200-G ↓	Well
—	Depth to Bedrock (from well record) LS - Limestone AN - Andesite
▽	Depth to Groundwater (from well record)
◆	Location of known utility line
V=3000 ft/s ••••••• V=15000 ft/s	Seismic Layer Interpretation (with layer velocity in feet/second)



hydroGEOPHYSICS

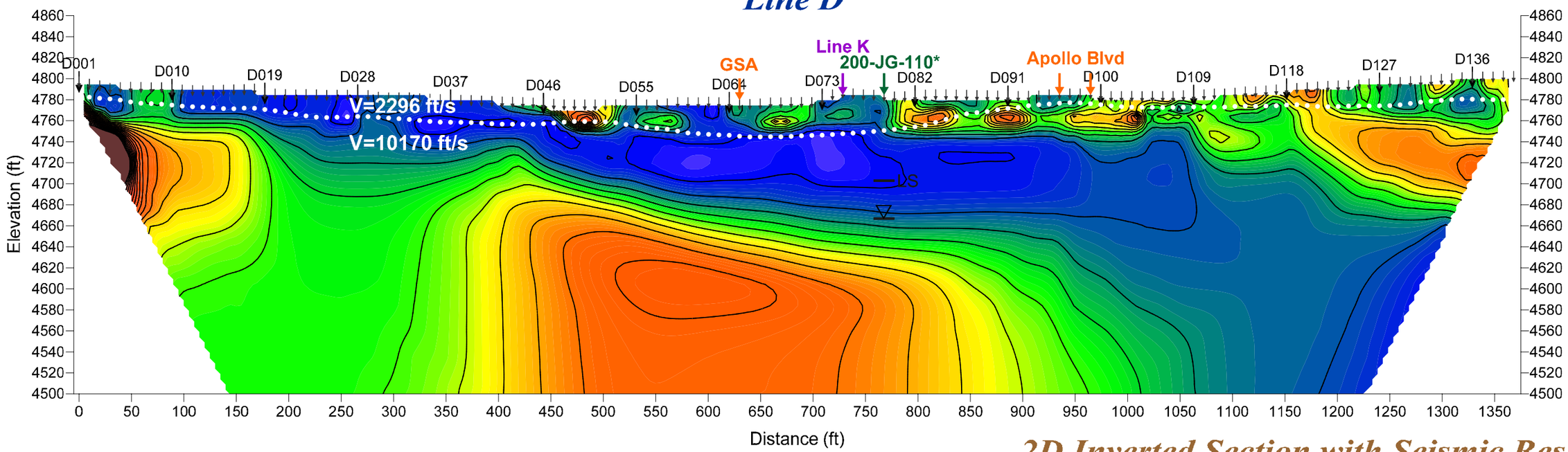
White Sands Test Facility
Las Cruces, NM

Date: Sep. 2012 | **Fig.: Line C**

FILES: 12/07/12 11:15:50

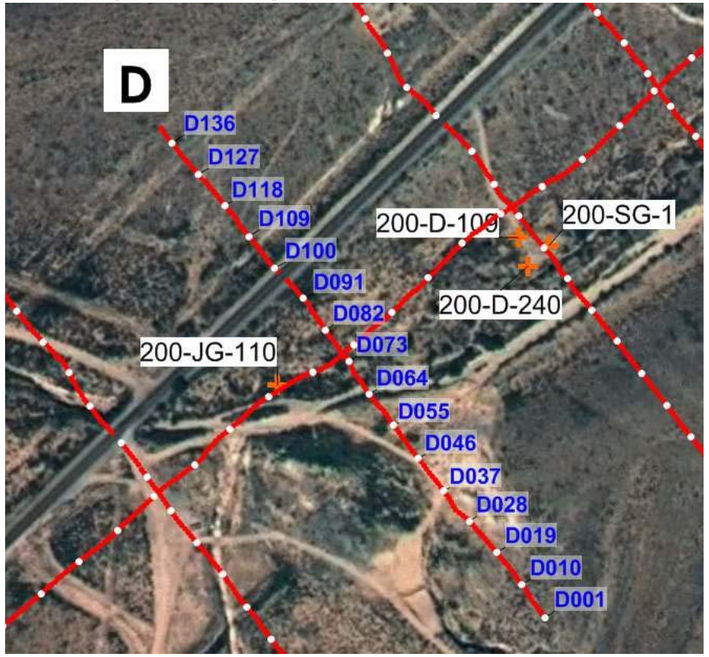
2302 North Forbes Blvd. • Tucson, Arizona 85745 • (520) 647-3315

Electrical Resistivity and Seismic Results
Line D



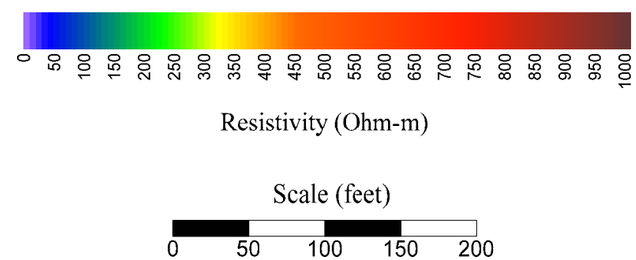
2D Inverted Section with Seismic Results

Coverage Base Map



L001 ↓	Electrode (Pin flag number on top)
Arroyo ↓	Topographic Feature or Infrastructure
Line K ↓	Crossline
200-G ↓	Well
—	Depth to Bedrock (from well record) LS - Limestone AN - Andesite
▽	Depth to Groundwater (from well record)
◆	Location of known utility line
V=3000 ft/s ●●●●●●● V=15000 ft/s	Seismic Layer Interpretation (with layer velocity in feet/second)

** Well 200-JG-110 is located approx. 150 ft. SW of resistivity line*



hydroGEOPHYSICS

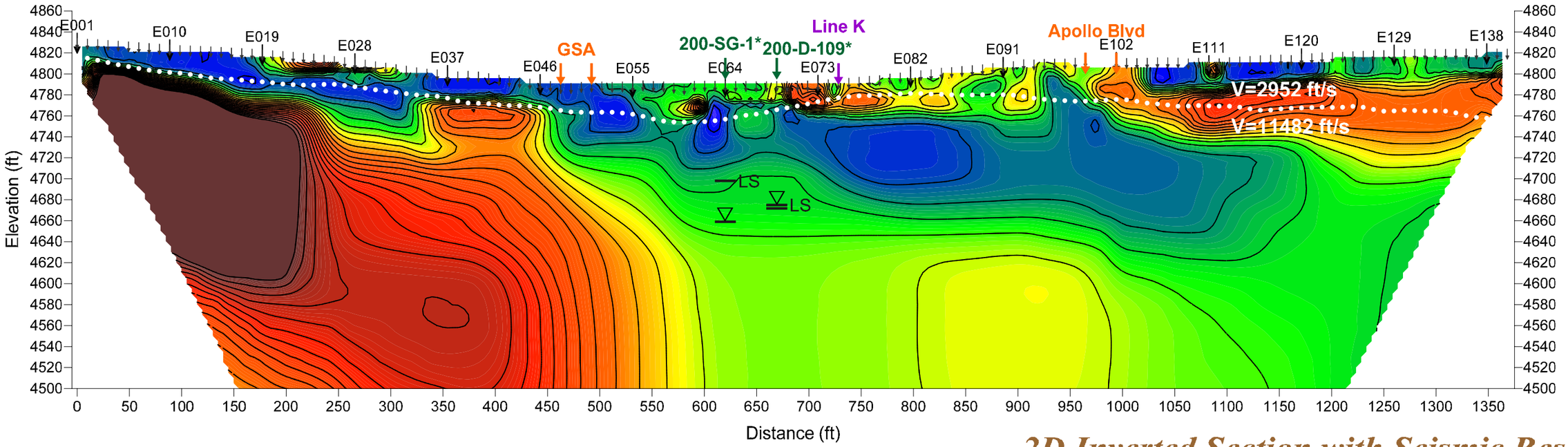
White Sands Test Facility
Las Cruces, NM

Date: Sep. 2012 | **Fig.: Line D**

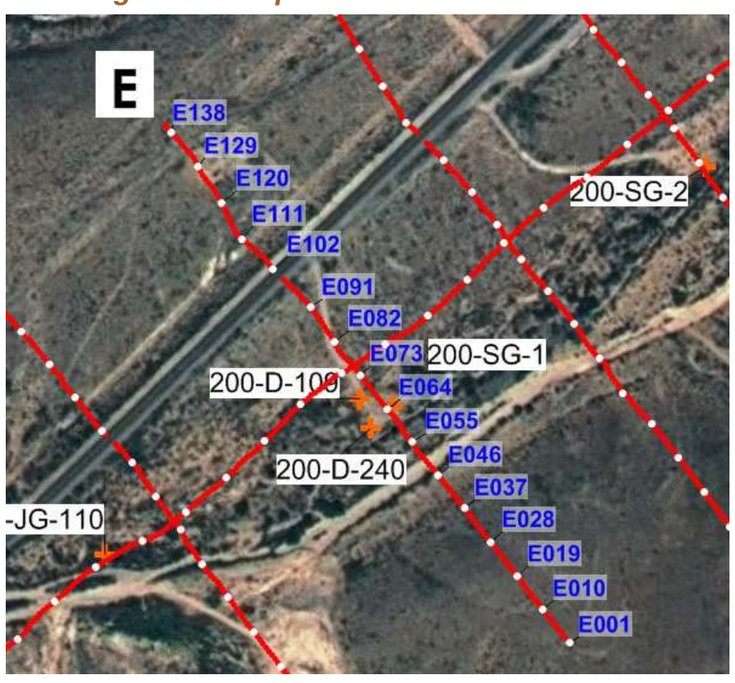
FILES: 12/07/12 11:24:57

2302 North Forbes Blvd. • Tucson, Arizona 85745 • (520) 647-3315

Electrical Resistivity and Seismic Results
Line E



Coverage Base Map

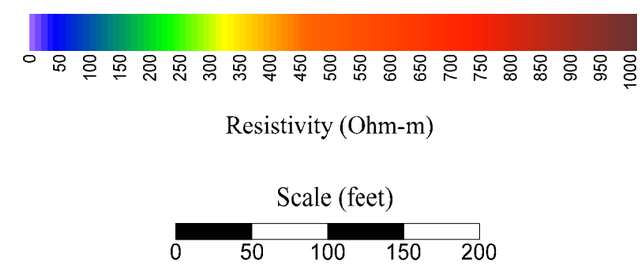


L001 ↓	Electrode (Pin flag number on top)
Arroyo ↓	Topographic Feature or Infrastructure
Line K ↓	Crossline
200-G ↓	Well
—	Depth to Bedrock (from well record) LS - Limestone AN - Andesite
▽	Depth to Groundwater (from well record)
◆	Location of known utility line
V=3000 ft/s ●●●●●●● V=15000 ft/s	Seismic Layer Interpretation (with layer velocity in feet/second)

** Well 200-D-109 is located approx. 30 ft. SW of resistivity line*

** Well 200-SG-1 is located approx. 8 ft. NE of resistivity line*

2D Inverted Section with Seismic Results



HGI hydroGEOPHYSICS

White Sands Test Facility
Las Cruces, NM

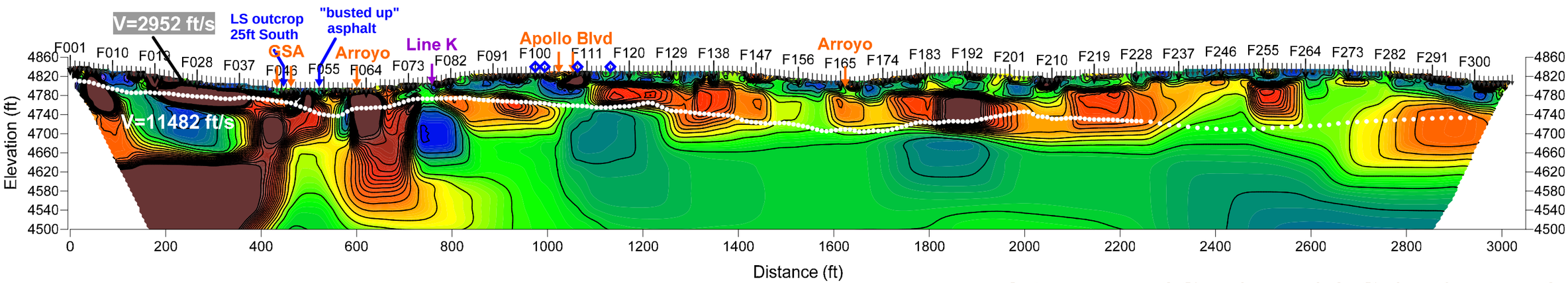
Date: Sep. 2012 | **Fig.: Line E**

FILES: 12/07/12 11:25:49

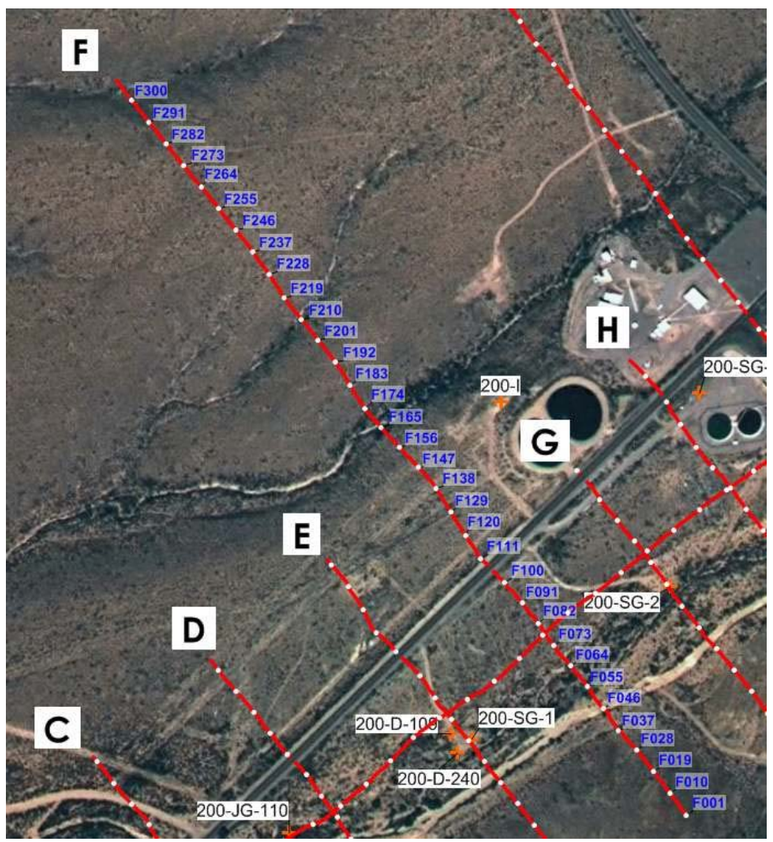
2302 North Forbes Blvd. • Tucson, Arizona 85745 • (520) 647-3315

Electrical Resistivity and Seismic Results
Line F

Southeast — Northwest

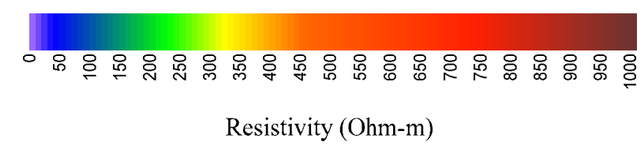


Coverage Base Map



2D Inverted Section with Seismic Results

L001 ↓	Electrode (Pin flag number on top)
Arroyo ↓	Topographic Feature or Infrastructure
Line K ↓	Crossline
200-G ↓	Well
—	Depth to Bedrock (from well record) LS - Limestone AN - Andesite
▽	Depth to Groundwater (from well record)
◇	Location of known utility line
V=3000 ft/s ●●●●●●● V=15000 ft/s	Seismic Layer Interpretation (with layer velocity in feet/second)



Scale (feet)

0 100 200 300 400

HGI hydroGEOPHYSICS

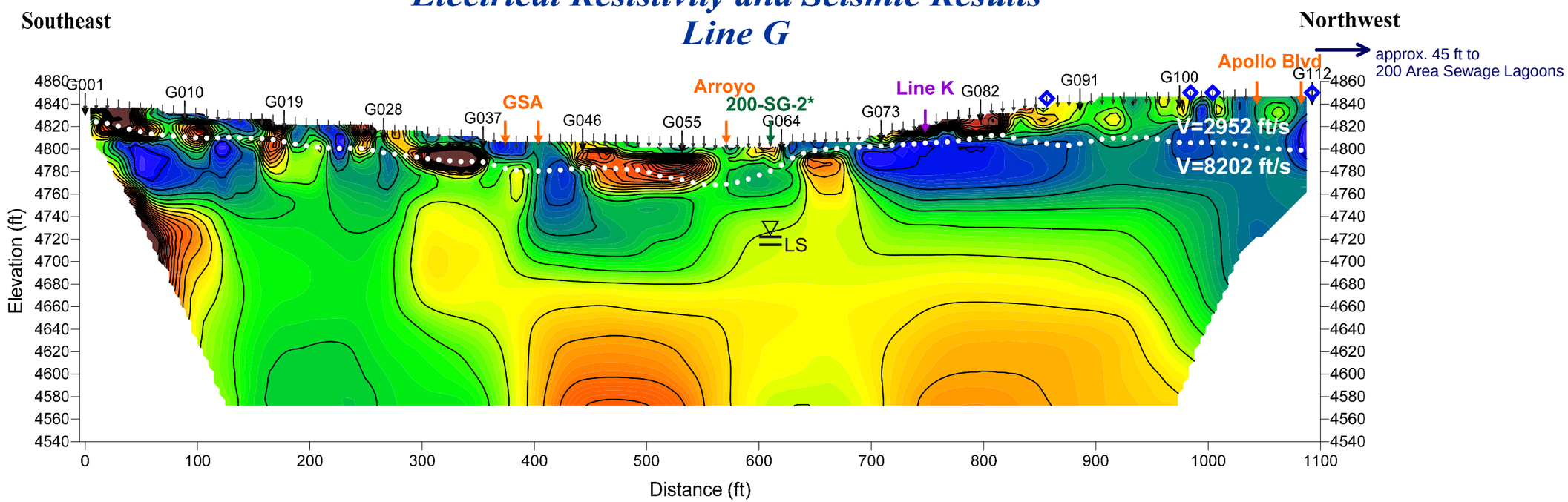
White Sands Test Facility
Las Cruces, NM

Date: Sep. 2012 | **Fig.: Line F**

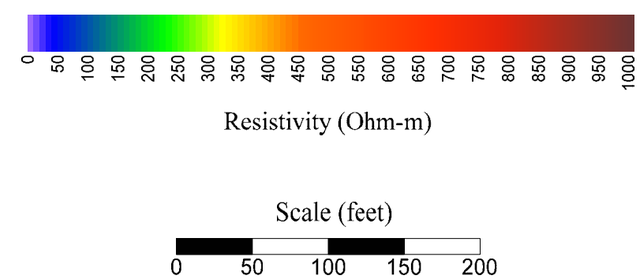
FILES: 12/07/12 11:26:21

2302 North Forbes Blvd. • Tucson, Arizona 85745 • (520) 647-3315

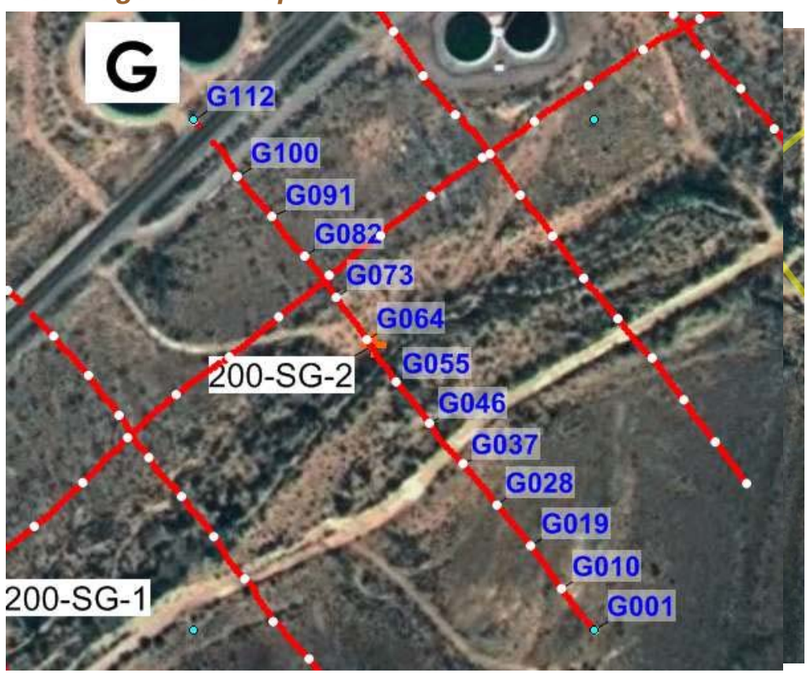
Electrical Resistivity and Seismic Results
Line G



2D Inverted Section with Seismic Results



Coverage Base Map



L001 ↓	Electrode (Pin flag number on top)
Arroyo ↓	Topographic Feature or Infrastructure
Line K ↓	Crossline
200-G ↓	Well
—	Depth to Bedrock (from well record) LS - Limestone AN - Andesite
▽	Depth to Groundwater (from well record)
◇	Location of known utility line
V=3000 ft/s •••••••• V=15000 ft/s	Seismic Layer Interpretation (with layer velocity in feet/second)

** Well 200-SG-2 is located approx. 5 ft. NE of resistivity line*

hydroGEOPHYSICS

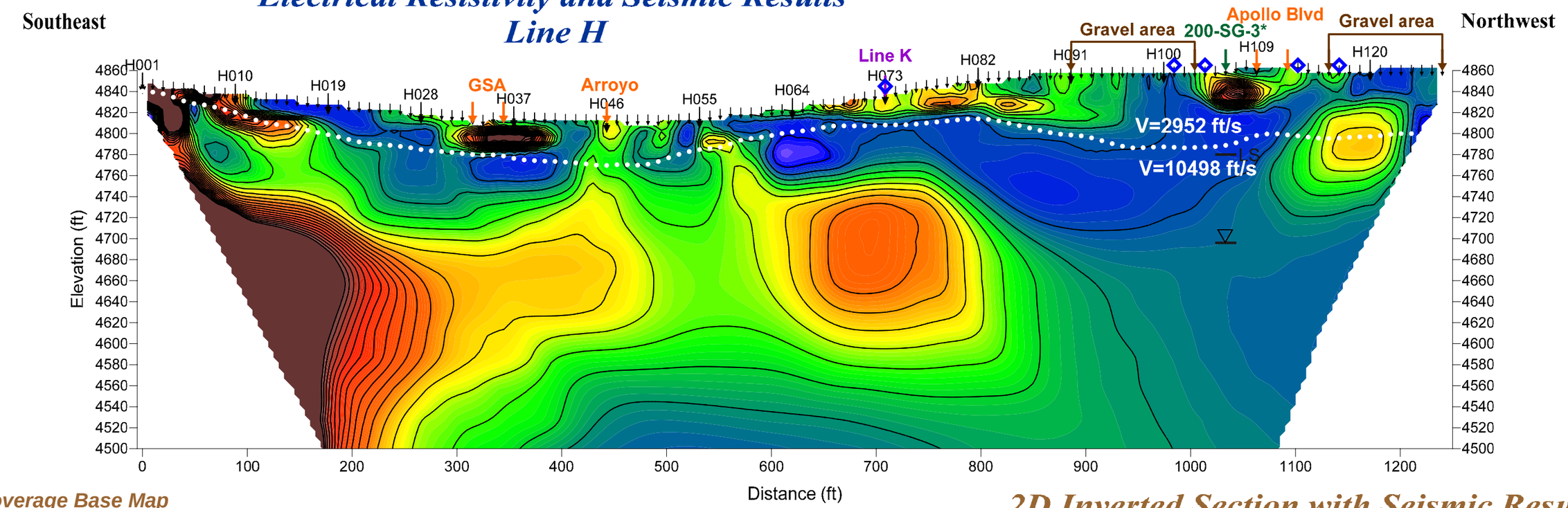
White Sands Test Facility
Las Cruces, NM

Date: Sep. 2012 | **Fig.: Line G**

FILES: 12/07/12 11:27:14

2302 North Forbes Blvd. • Tucson, Arizona 85745 • (520) 647-3315

Electrical Resistivity and Seismic Results
Line H

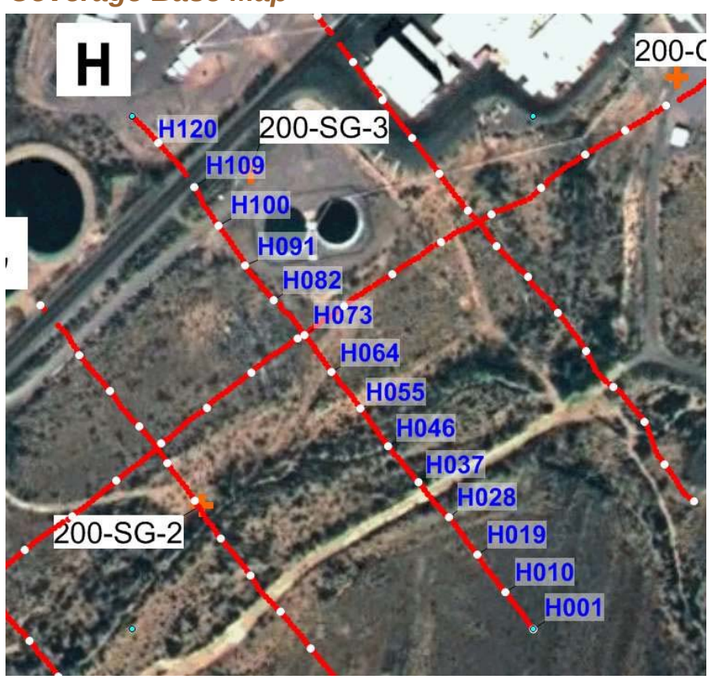


2D Inverted Section with Seismic Results

Scale (feet)

0 50 100 150 200

Coverage Base Map



L001 ↓	Electrode (Pin flag number on top)
Arroyo ↓	Topographic Feature or Infrastructure
Line K ↓	Crossline
200-G ↓	Well
—	Depth to Bedrock (from well record) LS - Limestone AN - Andesite
▽	Depth to Groundwater (from well record)
◇	Location of known utility line
V=3000 ft/s ••••••• V=15000 ft/s	Seismic Layer Interpretation (with layer velocity in feet/second)

** Well 200-SG-3 is located approx. 105 ft. NE of resistivity line*

hydroGEOPHYSICS

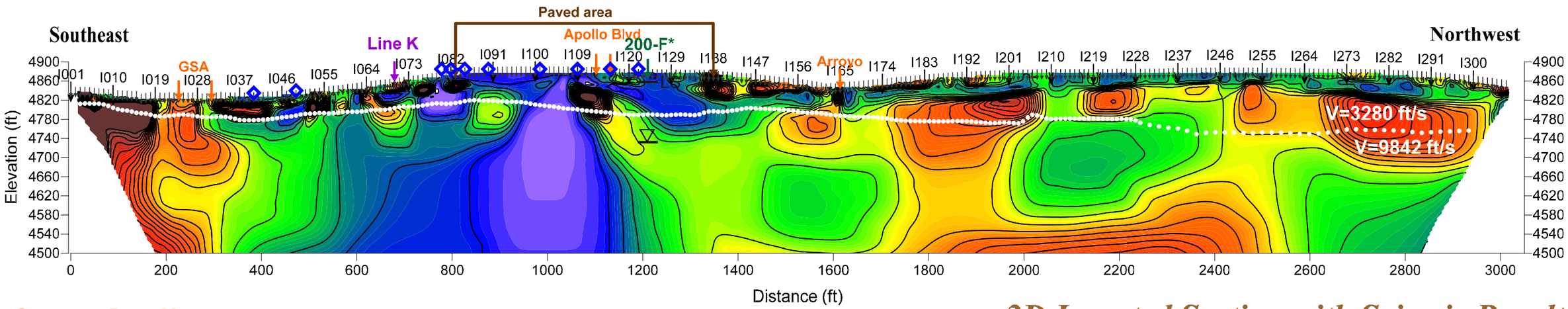
White Sands Test Facility
Las Cruces, NM

Date: Sep. 2012 | **Fig.: Line H**

FILES: 12/07/12 11:27:45

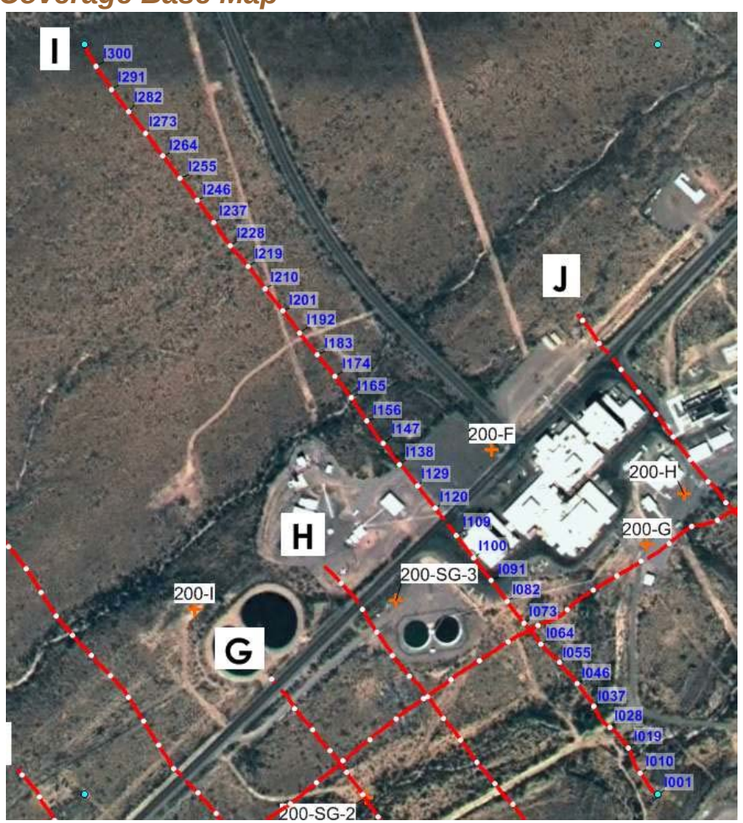
2302 North Forbes Blvd. • Tucson, Arizona 85745 • (520) 647-3315

Electrical Resistivity and Seismic Results
Line I



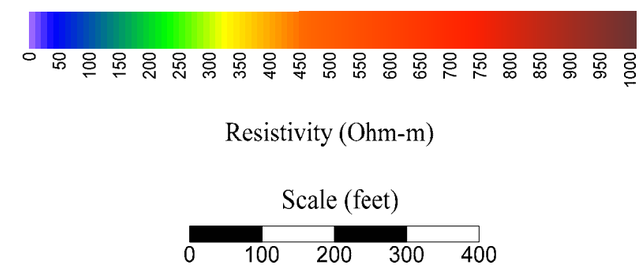
2D Inverted Section with Seismic Results

Coverage Base Map



L001 ↓	Electrode (Pin flag number on top)
Arroyo ↓	Topographic Feature or Infrastructure
Line K ↓	Crossline
200-G ↓	Well
—	Depth to Bedrock (from well record) LS - Limestone AN - Andesite
▽	Depth to Groundwater (from well record)
◇	Location of known utility line
V=3000 ft/s ••••••• V=15000 ft/s	Seismic Layer Interpretation (with layer velocity in feet/second)

** Well 200-F is located approx. 250 ft. NE of resistivity line*



hydroGEOPHYSICS

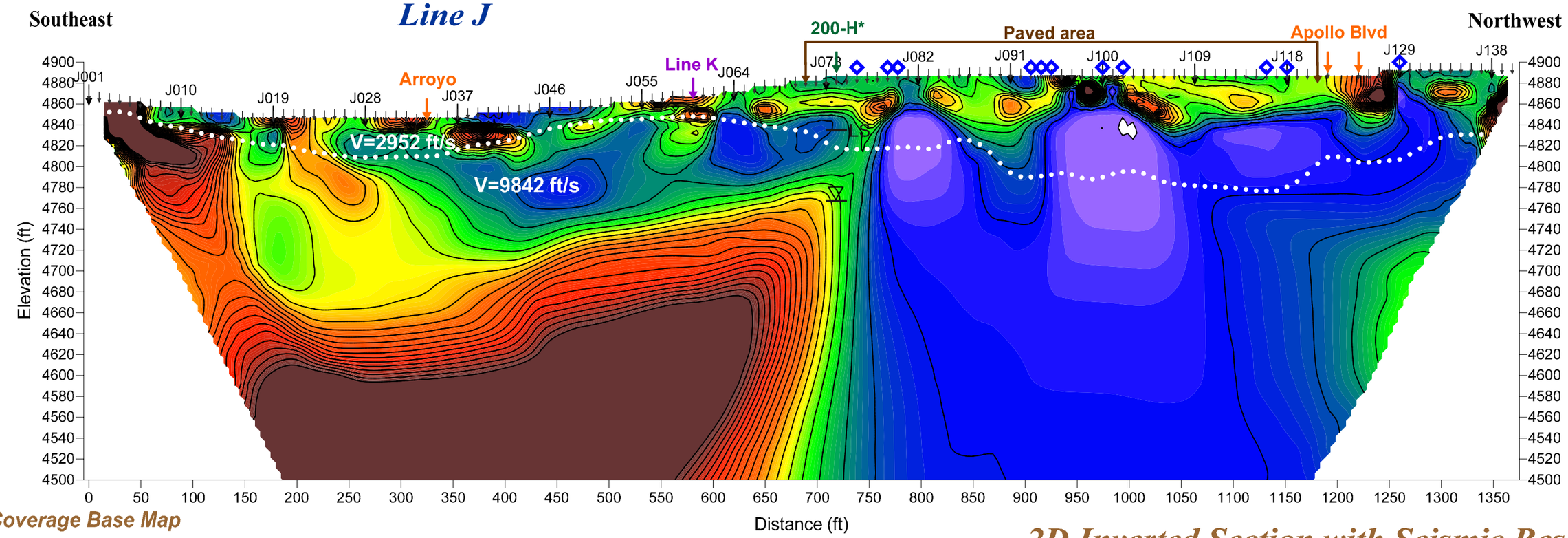
White Sands Test Facility
Las Cruces, NM

Date: Sep. 2012 | **Fig.: Line I**

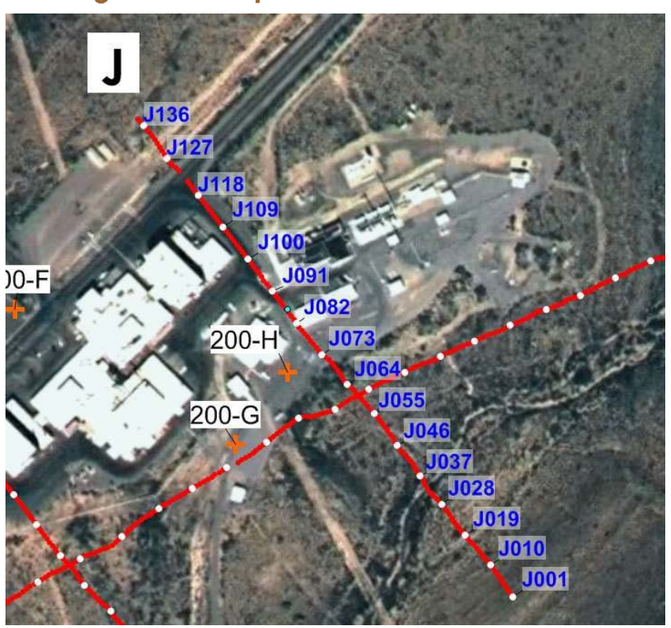
FILES: 12/07/12 11:29:56

2302 North Forbes Blvd. • Tucson, Arizona 85745 • (520) 647-3315

Electrical Resistivity and Seismic Results
Line J



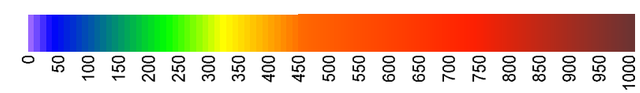
Coverage Base Map



L001 ↓	Electrode (Pin flag number on top)
Arroyo ↓	Topographic Feature or Infrastructure
Line K ↓	Crossline
200-G ↓	Well
—	Depth to Bedrock (from well record) LS - Limestone AN - Andesite
▽	Depth to Groundwater (from well record)
◇	Location of known utility line
V=3000 ft/s ••••••• V=15000 ft/s	Seismic Layer Interpretation (with layer velocity in feet/second)

** Well 200-H is located approx. 85 ft. SW of resistivity line*

2D Inverted Section with Seismic Results



Scale (feet)

0 50 100 150 200

hydroGEOPHYSICS

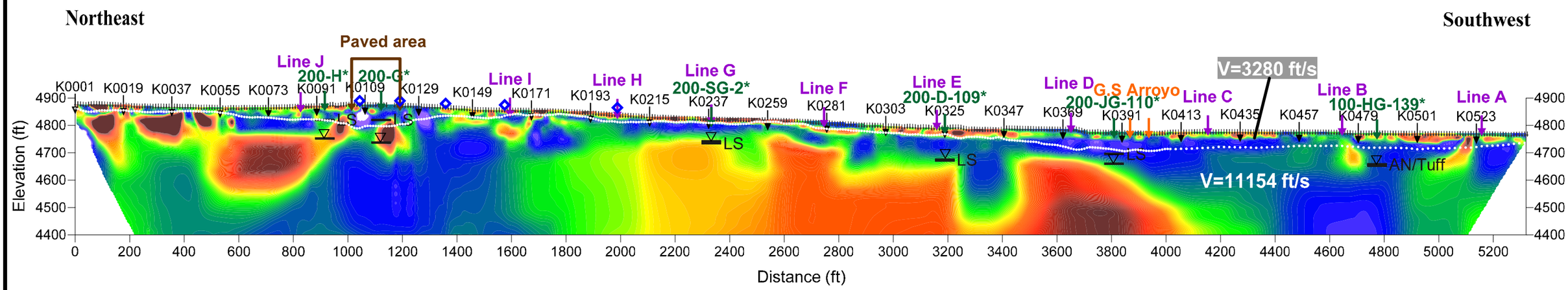
White Sands Test Facility
Las Cruces, NM

Date: Sep. 2012 | **Fig.: Line J**

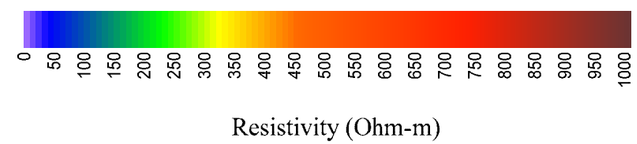
FILES: 12/07/12 11:29:07

2302 North Forbes Blvd. • Tucson, Arizona 85745 • (520) 647-3315

Electrical Resistivity and Seismic Results
Line K



2D Inverted Section with Seismic Results

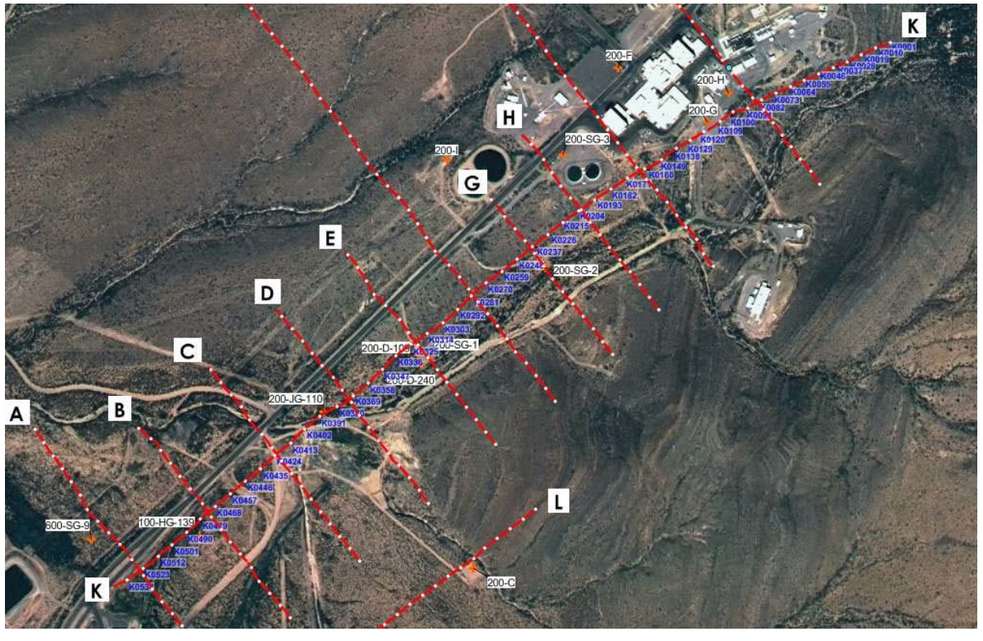


Scale (feet)

0 100 200 300 400 500 600 700 800

L001 ↓	Electrode (Pin flag number on top)
Arroyo ↓	Topographic Feature or Infrastructure
Line K ↓	Crossline
200-G ↓	Well
—	Depth to Bedrock (from well record) LS - Limestone AN - Andesite
▽	Depth to Groundwater (from well record)
◆	Location of known utility line
V=3000 ft/s ••••••• V=15000 ft/s	Seismic Layer Interpretation (with layer velocity in feet/second)

Coverage Base Map



* Well 200-G is located approx. 35 ft. NW of resistivity line
* Well 200-SG-2 is located approx. 130 ft. SE of resistivity line
* Well 200-D-109 is located approx. 65 ft. SE of resistivity line
* Well 200-JG-110 is located approx. 10 ft. NW of resistivity line

* Well 200-H is located approx. 110 ft. NW of resistivity line
* Well 100-HG-139 is located approx. 60 ft. SE of resistivity line

hydroGEOPHYSICS

White Sands Test Facility
Las Cruces, NM

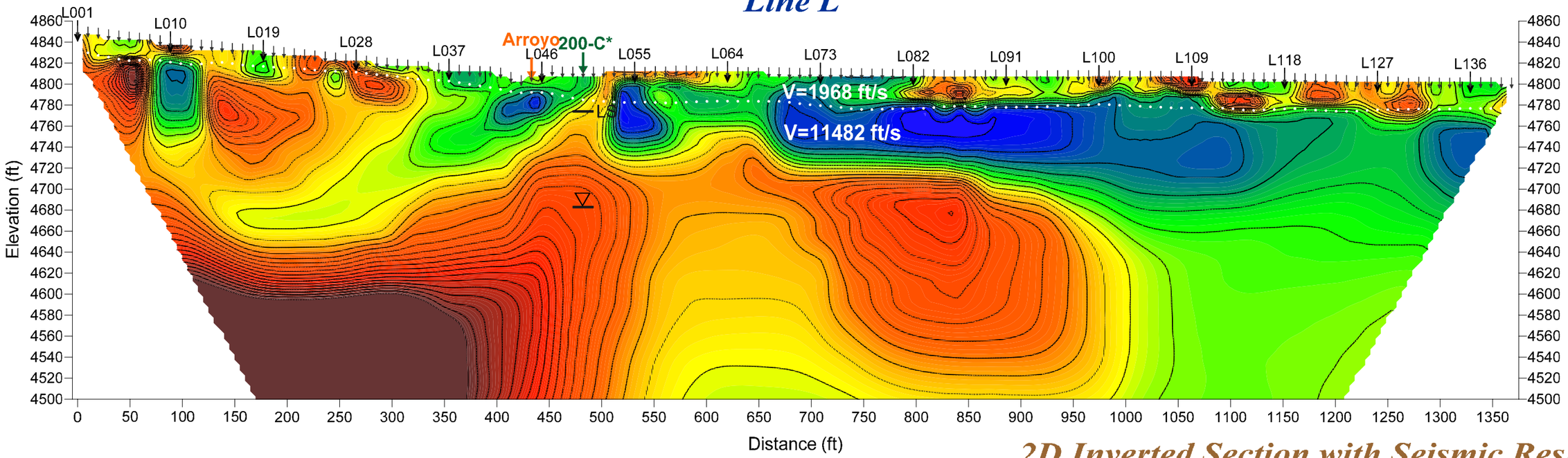
Date: Sep. 2012 | **Fig.: Line K**

FILES: 12/07/12 11:28:32

2302 North Forbes Blvd. • Tucson, Arizona 85745 • (520) 647-3315

Electrical Resistivity and Seismic Results
Line L

Northeast — Southwest

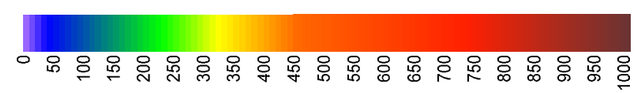


2D Inverted Section with Seismic Results

Coverage Base Map

L001 ↓	Electrode (Pin flag number on top)
Arroyo ↓	Topographic Feature or Infrastructure
Line K ↓	Crossline
200-G ↓	Well
—	Depth to Bedrock (from well record) LS - Limestone AN - Andesite
▽	Depth to Groundwater (from well record)
◇	Location of known utility line
V=3000 ft/s ●●●●●● V=15000 ft/s	Seismic Layer Interpretation (with layer velocity in feet/second)

** Well 200-C is located approx. 40 ft. SE of resistivity line*



Scale (feet)

0 50 100 150 200

hydroGEOPHYSICS

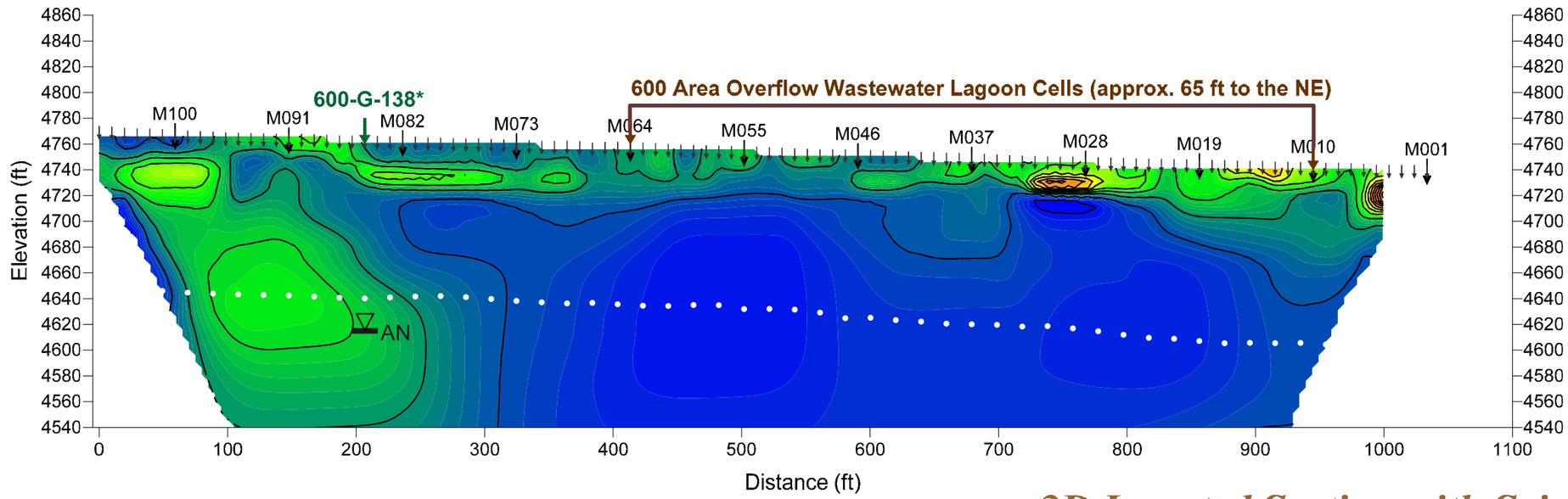
White Sands Test Facility
Las Cruces, NM

Date: Sep. 2012 | **Fig.: Line L**

FILES: 12/07/12 11:30:16

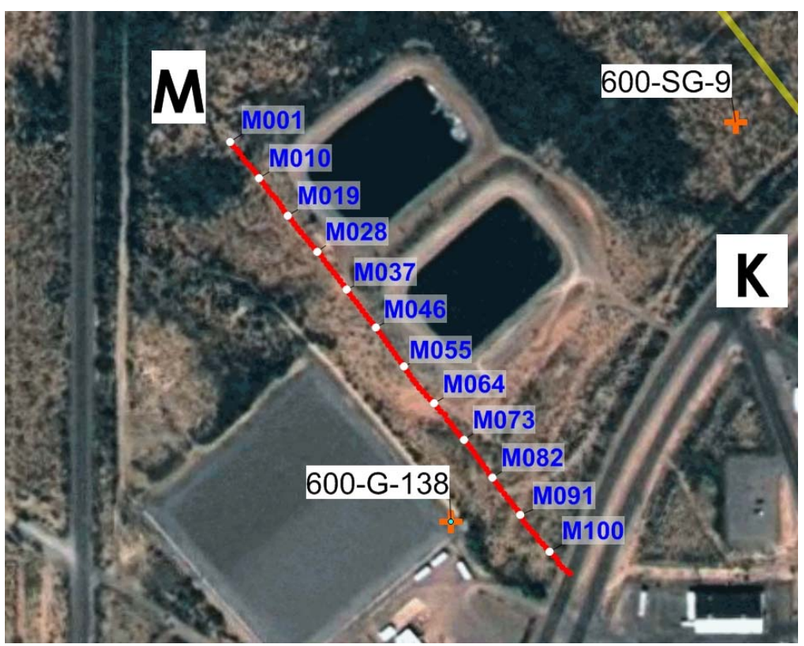
2302 North Forbes Blvd. • Tucson, Arizona 85745 • (520) 647-3315

Electrical Resistivity and Seismic Results
Line M



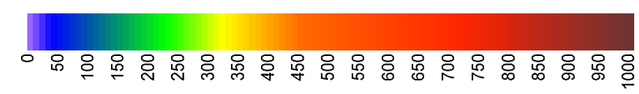
2D Inverted Section with Seismic Results

Coverage Base Map



L001 ↓	Electrode (Pin flag number on top)
Arroyo ↓	Topographic Feature or Infrastructure
Line K ↓	Crossline
200-G ↓	Well
—	Depth to Bedrock (from well record) LS - Limestone AN - Andesite
▽	Depth to Groundwater (from well record)
◇	Location of known utility line
V=3000 ft/s ••••••• V=15000 ft/s	Seismic Layer Interpretation (with layer velocity in feet/second)

** Well 600-G-138 is located approx. 100 ft. SW of resistivity line*



Scale (feet)

0 50 100 150 200

hydroGEOPHYSICS

White Sands Test Facility
Las Cruces, NM

Date: Sep. 2012 | **Fig.: Line M**

FILES: 12/07/12 11:31:09

2302 North Forbes Blvd. • Tucson, Arizona 85745 • (520) 647-3315

Appendix C Soil Vapor Analytical Results

GORE Surveys

FOR ENVIRONMENTAL

Laboratory Report

Site: WSTF-NASA
NM

Prepared for:

NAVARRO RESEARCH AND ENGINEERING INC
669 EMORY VALLEY ROAD
OAK RIDGE, TN
UNITED STATES

Prepared on:
November 28, 2012

© 2012 W. L. Gore & Associates, Inc.

Project Summary and Objective

W. L. Gore & Associates, Inc. (Gore) provided the GORE® Survey (Survey) used at:

WSTF-NASA

NM

The service provided by Gore included delivery of the required quantity of GORE® Modules, analysis by the method described below for the requested organic compounds, reporting of the data, and contour mapping (as needed).

This report includes results for only the samples noted under the Laboratory Sample Report section. If contour maps are part of the project deliverable, the maps will be prepared and issued under a separate report cover, upon receipt of a usable sitemap (electronic) and compound choices for contouring.

Written/submitted by:

Dayna M Cobb

Project Manager

Reviewed/approved by:

Jay W Hodny

Project Manager

Analytical data approved by:

Ian McMullen

Chemist

© 2012 W. L. Gore & Associates, Inc.

Quality Assurance Statement

The Survey Products Group laboratory, at W. L. Gore & Associates' facility in Elkton, MD USA, operates under the guidelines of its ISO Standard 17025 DoD ELAP accreditation, and its Quality Assurance Manual, Operating Procedures, and Methods (SPG-SOP-0462).

For this project, the analytical method, results, and observations reported do [ ] do not [√] fall within the scope of W. L. Gore's ISO 17025 accreditation.

Screening/Concentration Method

The GORE® Modules are analyzed at Gore's fixed laboratory using thermal desorption-gas chromatography/mass spectrometry (TD-GC/MS) instrumentation following U.S. EPA Method 8260 (SPG-WI-0292) which includes the following:

- **BFB Tuning Frequency:** A BFB tune is analyzed at the start of each analytical run and after every 30 samples.
- **Initial Calibration:** A minimum of a five point calibration curve is analyzed prior to the analysis of samples.
- **Linearity of Target Compounds:** If the RSD of any target analyte is less than or equal to 25% then average response factor can be used for quantitation. If the RSD exceeds 25% for a target compound a regression equation can be used for quantitation.
- **Continuing Calibration Verification:** After every 10 samples, and at the end of each analytical batch, and a second-source Reference Standard is analyzed near the mid point of the calibration curve. The acceptance criteria for all target analytes in the reference standards are +/- 50% of the true value.
- **Method Blank:** Analyzed prior to the analysis of field samples and every 30 samples.

Note: Analyte levels reported for the field-deployed GORE® Modules that exceed trip and method blank levels, and/or method detection limit, are more likely to have originated from on-site sources.

Media Sampled:	SOIL GAS
Chemist - sample analysis:	Fatima Niazi
Chemist - data processor:	Fatima Niazi
Chemist - data review:	Ian McMullen

Method deviations: None.

Please note that data file names ending with R are rerun samples using the second pair of sorbers, in which the original results were not reported. Data file names ending in D are duplicate analysis results for the second set of sorbers from the same module, and are reported.

© 2012 W. L. Gore & Associates, Inc.

Additional Report Information

- Comments
- Laboratory Sample Report
- Chain of Custody
- Installation and Retrieval Log
- Data Table(s) and Key to Data Tables
- Concentration Calculation Method Summary (as applicable)
- Total Ion Chromatograms

Project Specific Comments

Survey period [1] The modules were exposed for 13 days.

Tamper seal intact: Yes

Date received: 11/1/2012 2:45PM By: Clarence W Whigham

COC returned: Yes

Comments:

None.

1 - Installation start to end of retrieval, as reported. See installation and retrieval log for individual deployment and retrieval dates and times (i.e., sampler exposure time).

© 2012 W. L. Gore & Associates, Inc.

General Comments

Analytical QA/QC

Laboratory instrumentation consists of gas chromatographs equipped with mass selective detectors, coupled with automated thermal desorption units. Sample preparation involves cutting the tip off the bottom of the GORE® Module, and transferring one or more "sorbers" to a thermal desorption tube for analysis. The insertion/retrieval cord prevents soil, water and other interferences from coming in contact with the adsorbent. No further sample preparation is required. Any replicate sorbers not consumed in the initial analysis will be discarded fifteen (15) days from the date of the laboratory report.

Data are archived and stored in a secure manner as per Gore's Quality Assurance program (SPG-SOP-0462).

Total petroleum hydrocarbons (TPH), gasoline-range petroleum hydrocarbons (GRPH), and/or diesel range petroleum hydrocarbons (DRPH), when reported, are calculated using the area under the peaks observed in m/z 55 and 57 selected ion chromatograms. Quantitation of the mass values was performed using the response factor for a specific alkane (present in the calibration standards). TPH values include the entire chromatogram and provide estimates for aliphatic hydrocarbon ranges of C4 to C20. GRPH and DRPH include only the relevant regions of the chromatograms and provide estimates for C4 to C10 and C10 to C20 aliphatic hydrocarbons, respectively.

Trip blanks were provided to document potential exposures that were not part of the signal of interest (e.g., impact during sampler shipment, installation and/or retrieval, and storage). The trip blanks are identically manufactured and packaged GORE® Modules to those modules deployed in the field. The trip blanks remain unopened during all phases of the project. Levels reported on the trip blanks may indicate potential impact to the modules other than the contaminant source of interest.

Unresolved peak envelopes (UPEs) are represented as a series of compound peaks clustered together around a central gas chromatograph elution time in the total ion chromatogram. UPEs may be indicative of complex fluid mixtures. UPEs observed early in the chromatograms are considered to indicate presence of more volatile fluids, while UPEs observed later in the chromatogram may indicate the presence of less volatile fluids. Multiple UPEs may indicate the presence of multiple complex fluids.

Total ion chromatograms (TICs) are included in the Attachments. The eight-digit serial number of each module is incorporated in the TIC identification (e.g., 12345678.D represents GORE® Module 12345678).

© 2012 W. L. Gore & Associates, Inc.

General Comments

Soil Gas Sampling

For soil gas sampling, the GORE® Survey reports mass levels migrating through the open pore spaces of the soil and diffusing through the sampler membrane for sorption by the engineered, hydrophobic adsorbents, housed within the membrane tube. During the migration of the soil gas away from the source to the GORE® Module, the vapors are subject to a variety of attenuation factors. The soil gas masses reported on the modules compare favorably with the concentrations reported in the soil or groundwater (e.g., where soil gas levels are reported at greater levels to other sampled locations on the site, the matrix data should reveal the same pattern, and vice versa). However, due to a variety of factors, a perfect comparison between matrix data and soil gas levels can rarely be achieved.

Soil gas concentrations (µg/m3) are calculated following the method described in the Additional Report Information section.

Soil gas signals reported by this method cannot be correlated specifically to soil adsorbed, groundwater, and/or free-phase contamination. The soil gas signal reported from each GORE® Module can evolve from all of these sources. Differentiation between soil and groundwater contamination can only be achieved with prior knowledge of the site history (i.e., the site is known to have groundwater contamination only).

Air Sampling

For indoor, outdoor, and crawlspace air sampling, the GORE® Survey reports mass levels present in the air and diffusing through the sampler membrane for sorption by the engineered adsorbents housed within the membrane tube.

Air concentrations (µg/m3) are calculated following the method described in the Additional Report Information section.

Groundwater and Sediment Porewater Sampling

For groundwater and sediment porewater sampling, the GORE® Survey reports the mass levels of compounds present in the water which, when coming in contact with the sampler membrane, partitions out of solution, and diffuses through the sampler membrane for sorption by the engineered adsorbents.

Water concentrations (µg/L) are calculated using the quantified mass, exposure period and the compound specific uptake rate. The rates were measured under controlled experimental conditions. The uptake rates are corrected for water pressure (depth of the GORE® Module below the water table), water temperature and the aquifer flow rate.

© 2012 W. L. Gore & Associates, Inc.

LABORATORY SAMPLE REPORT

Project: ENV 21815026-2 **Site Name: WSTF-NASA** **Module Type: SPG0001**

Module ID	Sample Type	Field ID
00696355	FIELD_SAMPLE	A 1
00696356	FIELD_SAMPLE	B 1
00696357	FIELD_SAMPLE	C 1
00696358	FIELD_SAMPLE	D 1
00696359	FIELD_SAMPLE	E 1
00696360	FIELD_SAMPLE	F 1
00696361	FIELD_SAMPLE	G 1
00696362	FIELD_SAMPLE	H 1
00696363	FIELD_SAMPLE	H 2
00696364	FIELD_SAMPLE	G 2
00696365	FIELD_SAMPLE	F 2
00696366	FIELD_SAMPLE	E 2
00696367	FIELD_SAMPLE	D 2
00696368	FIELD_SAMPLE	C 2
00696369	FIELD_SAMPLE	B 2
00696370	FIELD_SAMPLE	A 2
00696371	FIELD_SAMPLE	A 3
00696372	FIELD_SAMPLE	B 3
00696373	FIELD_SAMPLE	C 3
00696374	FIELD_SAMPLE	D 3
00696375	FIELD_SAMPLE	E 3
00696376	FIELD_SAMPLE	F 3
00696377	FIELD_SAMPLE	G 3
00696378	FIELD_SAMPLE	H 3
00696379	FIELD_SAMPLE	H 4
00696380	FIELD_SAMPLE	G 4
00696381	FIELD_SAMPLE	F 4
00696382	FIELD_SAMPLE	E 4
00696383	FIELD_SAMPLE	D 4
00696384	FIELD_SAMPLE	C 4
00696385	FIELD_SAMPLE	B 4
00696386	FIELD_SAMPLE	A 4
00696387	FIELD_SAMPLE	A 5
00696388	FIELD_SAMPLE	B 5
00696389	FIELD_SAMPLE	C 5
00696390	FIELD_SAMPLE	D 5
00696391	FIELD_SAMPLE	E 5
00696392	FIELD_SAMPLE	F 5
00696393	FIELD_SAMPLE	G 5
00696394	FIELD_SAMPLE	H 5
00696395	FIELD_SAMPLE	H 6
00696396	FIELD_SAMPLE	G 6
00696397	FIELD_SAMPLE	F 6
00696398	FIELD_SAMPLE	E 6
00696399	TRIP_BLANK	TB 1

© 2012 W. L. Gore & Associates, Inc.

00696400	TRIP_BLANK	TB 2
00696401	TRIP_BLANK	TB 3
00696402	TRIP_BLANK	TB 4
00696403	FIELD_SAMPLE	D 6
00696404	FIELD_SAMPLE	C 6
00696405	FIELD_SAMPLE	B 6
00696406	FIELD_SAMPLE	A 6
00696407	FIELD_SAMPLE	A 7
00696408	FIELD_SAMPLE	B 7
00696409	FIELD_SAMPLE	C 7
00696410	FIELD_SAMPLE	D 7
00696411	FIELD_SAMPLE	E 7
00696412	FIELD_SAMPLE	F 7
00696413	FIELD_SAMPLE	G 7
00696414	FIELD_SAMPLE	H 7
00696415	FIELD_SAMPLE	H 9
00696416	FIELD_SAMPLE	H 8
00696417	FIELD_SAMPLE	G 8
00696418	FIELD_SAMPLE	F 8
00696419	FIELD_SAMPLE	E 8
00696420	FIELD_SAMPLE	D 8
00696421	FIELD_SAMPLE	C 8
00696422	FIELD_SAMPLE	B 8
00696423	FIELD_SAMPLE	A 8
00696424	FIELD_SAMPLE	A 9
00696425	FIELD_SAMPLE	B 9
00696426	FIELD_SAMPLE	C 9
00696427	FIELD_SAMPLE	D 9
00696428	FIELD_SAMPLE	E 9
00696429	FIELD_SAMPLE	F 9
00696430	FIELD_SAMPLE	G 9
00696431	FIELD_SAMPLE	H10
00696432	FIELD_SAMPLE	G10
00696433	FIELD_SAMPLE	F10
00696434	FIELD_SAMPLE	E10
00696435	FIELD_SAMPLE	D10
00696436	FIELD_SAMPLE	C10
00696437	FIELD_SAMPLE	B10
00696438	FIELD_SAMPLE	A10
00696439	FIELD_SAMPLE	A11
00696440	FIELD_SAMPLE	Not Provided
00696441	FIELD_SAMPLE	C11
00696442	FIELD_SAMPLE	D11
00696443	FIELD_SAMPLE	E11
00696444	FIELD_SAMPLE	F11
00696445	FIELD_SAMPLE	G11
00696446	FIELD_SAMPLE	H11
00696447	TRIP_BLANK	TB5
00696448	TRIP_BLANK	TB6
00696449	TRIP_BLANK	TB7
00696450	TRIP_BLANK	TB8
00696451	FIELD_SAMPLE	H12
00696452	FIELD_SAMPLE	G12

© 2012 W. L. Gore & Associates, Inc.

00696459	FIELD_SAMPLE	F12
00696460	FIELD_SAMPLE	E12
00696461	FIELD_SAMPLE	D12
00696462	FIELD_SAMPLE	C12
00696463	FIELD_SAMPLE	B12
00696464	FIELD_SAMPLE	A12
00696465	FIELD_SAMPLE	A13
00696466	FIELD_SAMPLE	B13
00696467	FIELD_SAMPLE	C13
00696468	FIELD_SAMPLE	D13
00696469	FIELD_SAMPLE	E13
00696470	FIELD_SAMPLE	F13
00696471	FIELD_SAMPLE	G13
00696472	FIELD_SAMPLE	H13
00696473	FIELD_SAMPLE	H14
00696474	FIELD_SAMPLE	G14
00696475	FIELD_SAMPLE	F14
00696476	FIELD_SAMPLE	E14
00696477	FIELD_SAMPLE	D14
00696478	FIELD_SAMPLE	C14
00696479	FIELD_SAMPLE	B14
00696480	FIELD_SAMPLE	A14
00696481	FIELD_SAMPLE	A15
00696482	FIELD_SAMPLE	B15
00696483	FIELD_SAMPLE	C15
00696484	FIELD_SAMPLE	D15
00696485	FIELD_SAMPLE	E15
00696486	FIELD_SAMPLE	F15
00696487	FIELD_SAMPLE	G15
00696488	FIELD_SAMPLE	H15
00696489	FIELD_SAMPLE	H16
00696490	FIELD_SAMPLE	G16
00696491	FIELD_SAMPLE	F16
00696492	FIELD_SAMPLE	E16
00696493	FIELD_SAMPLE	D16
00696494	FIELD_SAMPLE	C16
00696495	FIELD_SAMPLE	B16
00696496	FIELD_SAMPLE	A16
00696497	FIELD_SAMPLE	A17
00696498	FIELD_SAMPLE	B17
00696499	FIELD_SAMPLE	C17
00696500	FIELD_SAMPLE	D17
00696501	TRIP_BLANK	TB9
00696502	TRIP_BLANK	TB10
00696503	TRIP_BLANK	TB11
00696504	TRIP_BLANK	TB12
00696505	FIELD_SAMPLE	E17
00696506	FIELD_SAMPLE	F17
00696507	FIELD_SAMPLE	G17
00696512	FIELD_SAMPLE	E18
00696513	FIELD_SAMPLE	D18
00696514	FIELD_SAMPLE	C18
00696515	FIELD_SAMPLE	B18

© 2012 W. L. Gore & Associates, Inc.

00696516	FIELD_SAMPLE	A18
00696517	FIELD_SAMPLE	A19
00696518	FIELD_SAMPLE	B19
00696519	FIELD_SAMPLE	C19
00696520	FIELD_SAMPLE	D19
00696525	FIELD_SAMPLE	BP-1
00696526	FIELD_SAMPLE	BP-2
00696527	FIELD_SAMPLE	SH-1
00696528	FIELD_SAMPLE	SH-2
00696529	FIELD_SAMPLE	BL-1
00696530	FIELD_SAMPLE	BL-2
00696531	FIELD_SAMPLE	SB-1
00696532	FIELD_SAMPLE	SB-2
00696533	FIELD_SAMPLE	SB-3
00696534	FIELD_SAMPLE	SB-4
00696535	FIELD_SAMPLE	DP-1
00696536	FIELD_SAMPLE	DP-2
00696537	FIELD_SAMPLE	CS-1
00696538	FIELD_SAMPLE	CS-2
00696539	FIELD_SAMPLE	SR-1*
00696540	TRIP_BLANK	TB13
00696541	FIELD_SAMPLE	SR-2
00696542	FIELD_SAMPLE	AD-1
00696543	FIELD_SAMPLE	AD-2
00696544	FIELD_SAMPLE	CL-1
00696545	FIELD_SAMPLE	CL-2
00696546	FIELD_SAMPLE	CP-1
00696547	FIELD_SAMPLE	CP-2
00696548	FIELD_SAMPLE	CR-1
00696549	FIELD_SAMPLE	CR-2
00696550	TRIP_BLANK	TB14
00696551	TRIP_BLANK	TB15
00696552	TRIP_BLANK	TB16
00696553	FIELD_SAMPLE	AA-1
00696554	FIELD_SAMPLE	AA-2
00696555	FIELD_SAMPLE	600-G-138
00696556	FIELD_SAMPLE	NASA 4
00696557	FIELD_SAMPLE	100-HG-139
00696558	FIELD_SAMPLE	200-JG-110
00696559	FIELD_SAMPLE	200-D-109
00696560	FIELD_SAMPLE	200-D-240
00696561	FIELD_SAMPLE	200-B-240
00696562	FIELD_SAMPLE	600-C-173
00696563	FIELD_SAMPLE	600-C-210
00696564	FIELD_SAMPLE	NASA 2
00696565	FIELD_SAMPLE	NASA 7
00696566	FIELD_SAMPLE	NASA 8
00696567	FIELD_SAMPLE	BLM-3-182
00696568	FIELD_SAMPLE	OS-1

© 2012 W. L. Gore & Associates, Inc.

Total # "FIELD SAMPLES"	Total # "TRIP BLANKS"	Total # "UNUSED"	Total # "LOST"
184	16	0	0

Duplicate samples: 0

© 2012 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

GORE® Survey Chain of Custody
Soil gas and/or Air Sampling

Production Order #: 21815026

Customer Name: NAVARRO RESEARCH AND ENGINEERING INC
Address: 669 EMORY VALLEY ROAD
OAK RIDGE, TN 37830
USA

Site Name: WSTF-NASA
Site Address: NM
Project Manager:

Serial # of GORE Modules Shipped					
00696355	-	00696452	# of Modules for Installation	220.00	# of Trip Blanks 20
00696459	-	00696578	Total Modules Shipped	240.00	Pieces
00696585	-	00696606	Total Modules Received	240	Pieces
			Total Modules Installed	200	Pieces

Serial # of Trip Blanks (Client Decides)

696399	696448	696503
696400	696449	696504
696401	696440	696540
696402	696501	696550
696447	696502	696551
		696552

Prepared By: Darlene Gillowdy
Verified By:

Installation Method: (Circle those that apply)
Slide Hammer Hammer Drill Auger
Other ROTOHAMMER DRILL

Installation Performed By:
Name:
Company: NAVARRO RES & ENG

Retrieval Performed By:
Name:
Company: NAVARRO RES & ENG

Installation Start Date / Time: 10/16/12 1300
Installation Complete Date / Time: 10/18/12 1415

Retrieval Start Date / Time: 10/29/12 1300
Retrieval Complete Date / Time: 10/31/12 1124

Total Modules Retrieved: 200 (INCLUDES 16 X FBLANKS)
Total Modules Lost In Field: —
Total Unused Modules ~~Returned~~: 40 (RETAINED @ WSTF)

Relinquished By Darlene Gillowdy	Date/Time 9-14-12	**Received By:**	Date/Time 9/18/12
Company: W.L. Gore	7:00 AM	**Company:** NAVARRO RES & ENG	1430 HRS
Relinquished By	Date/Time 10/31/12	**Received By:**	Date/Time
Company: NAVARRO RES & ENG	1400 HRS	**Company:**	
Relinquished By	Date/Time	**Received By:**	Date/Time 11/1/12
Company:		**Company:** W.L. Gore	2:45

Arrived 11/1/12

© 2011 W. L. Gore & Associates, Inc.

W. L. Gore & Associates, Inc.
100 Chesapeake Boulevard
Elkton, MD USA 21921
ph: 410-392-7600

GORE Project No: ENV 21815026
Site Name: WSTF-NASA
Site Location: NM

GORE(R) Surveys
Installation & Retrieval Log

Company Name: NAVARRO RESEARCH AND ENGINEERING INC
Location:
Samples collected by:

*** Optional or as needed**

MODULE SERIAL NO.	FIELD ID* (e.g., arbitrary, US EPA)	SAMPLE TYPE (Field Sample, Trip Blank, Field Blank, etc.)	INSTALLATION DATE & TIME MM/DD/YYYY HH:MM (24 Hour) ex. 12/27/2000 13:00	RETRIEVAL DATE & TIME MM/DD/YYYY HH:MM (24 Hour) ex. 12/30/2000 13:00	OBSERVATIONS/COMMENTS* (e.g., sample depth, location description, missing, pulled from hole, etc. - as needed)	SAMPLE ENVIRONMENT* (e.g., grass, bare soil, through slab)	YES / NO			AT MINIMUM PROVIDE SOIL TYPE	
							EVIDENCE OF LIQUID PETROLEUM HYDROCARBONS?	ODOR ?	WATER IN INSTALLATION HOLE?	SOIL TYPE AT MODULE DEPTH (clay, loamy sand etc.)	TOTAL SOIL POROSITY AT MODULE DEPTH* (total volume of pores/total volume)
00696355	A 1	FIELD_SAMPLE	10/16/2012 13:00	10/29/2012 13:05	22.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696356	B 1	FIELD_SAMPLE	10/16/2012 13:05	10/29/2012 13:11	25.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696357	C 1	FIELD_SAMPLE	10/16/2012 13:07	10/29/2012 13:17	28.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696358	D 1	FIELD_SAMPLE	10/16/2012 13:31	10/29/2012 13:23	22.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696359	E 1	FIELD_SAMPLE	10/16/2012 13:40	10/29/2012 13:28	31.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696360	F 1	FIELD_SAMPLE	10/16/2012 13:46	10/29/2012 13:32	31.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696361	G 1	FIELD_SAMPLE	10/16/2012 13:51	10/29/2012 13:36	30.0 in.	Gravel road	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696362	H 1	FIELD_SAMPLE	10/16/2012 14:00	10/29/2012 13:45	27.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696363	H 2	FIELD_SAMPLE	10/16/2012 14:10	10/29/2012 13:48	23.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696364	G 2	FIELD_SAMPLE	10/16/2012 14:16	10/29/2012 13:58	32.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696365	F 2	FIELD_SAMPLE	10/16/2012 14:24	10/29/2012 14:02	32.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696366	E 2	FIELD_SAMPLE	10/16/2012 14:30	10/29/2012 14:06	26.0 in.	Sparse desert brush - adjacent to road	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696367	D 2	FIELD_SAMPLE	10/16/2012 14:37	10/29/2012 14:10	32.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696368	C 2	FIELD_SAMPLE	10/17/2012 7:58	10/30/2012 7:50	32.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696369	B 2	FIELD_SAMPLE	10/17/2012 8:07	10/30/2012 7:57	27.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696370	A 2	FIELD_SAMPLE	10/17/2012 8:13	10/30/2012 8:00	25.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696371	A 3	FIELD_SAMPLE	10/17/2012 8:19	10/30/2012 8:03	26.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696372	B 3	FIELD_SAMPLE	10/17/2012 8:24	10/30/2012 8:05	27.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696373	C 3	FIELD_SAMPLE	10/17/2012 8:33	10/30/2012 8:12	27.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696374	D 3	FIELD_SAMPLE	10/17/2012 8:38	10/30/12 0817	23.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696375	E 3	FIELD_SAMPLE	10/17/2012 8:44	10/30/2012 9:17	29.0 in.	Sparse desert brush - adjacent to road	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696376	F 3	FIELD_SAMPLE	10/17/2012 9:05	10/30/2012 9:37	27.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696377	G 3	FIELD_SAMPLE	10/17/2012 9:10	10/30/2012 9:42	30.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696378	H 3	FIELD_SAMPLE	10/17/2012 9:14	10/30/2012 9:46	31.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696379	H 4	FIELD_SAMPLE	10/17/2012 9:18	10/30/2012 9:50	26.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696380	G 4	FIELD_SAMPLE	10/17/2012 9:27	10/30/2012 9:56	28.0 in.	Gravel road	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696381	F 4	FIELD_SAMPLE	10/17/2012 9:34	10/30/2012 9:58	27.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696382	E 4	FIELD_SAMPLE	10/17/2012 9:40	10/30/2012 10:03	31.0 in.	Sparse desert brush - adjacent to road	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696383	D 4	FIELD_SAMPLE	10/17/2012 9:50	10/30/2012 10:07	27.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696384	C 4	FIELD_SAMPLE	10/17/2012 9:56	10/30/2012 10:10	29.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696385	B 4	FIELD_SAMPLE	10/17/2012 10:02	10/30/2012 10:15	27.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696386	A 4	FIELD_SAMPLE	10/17/2012 10:10	10/30/2012 10:19	30.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696387	A 5	FIELD_SAMPLE	10/17/2012 10:15	10/30/2012 10:22	23.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696388	B 5	FIELD_SAMPLE	10/17/2012 10:20	10/30/2012 10:25	24.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696389	C 5	FIELD_SAMPLE	10/17/2012 10:36	10/30/2012 10:30	28.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696390	D 5	FIELD_SAMPLE	10/17/2012 10:43	10/30/2012 10:36	29.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696391	E 5	FIELD_SAMPLE	10/17/2012 10:55	10/30/2012 10:40	26.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696392	F 5	FIELD_SAMPLE	10/17/2012 11:01	10/30/2012 10:52	26.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696393	G 5	FIELD_SAMPLE	10/17/2012 13:12	10/30/2012 12:56	27.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696394	H 5	FIELD_SAMPLE	10/17/2012 13:18	10/30/2012 12:58	28.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696395	H 6	FIELD_SAMPLE	10/17/2012 13:22	10/30/2012 13:02	30.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696396	G 6	FIELD_SAMPLE	10/17/2012 13:28	10/30/2012 13:05	25.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696397	F 6	FIELD_SAMPLE	10/17/2012 13:47	10/30/2012 13:22	28.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696398	E 6	FIELD_SAMPLE	10/17/2012 13:52	10/30/2012 13:25	26.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696399	TB 1	TRIP_BLANK			Trip Blank						
00696400	TB 2	TRIP_BLANK			Trip Blank						
00696401	TB 3	TRIP_BLANK			Trip Blank						
00696402	TB 4	TRIP_BLANK			Trip Blank						
00696403	D 6	FIELD_SAMPLE	10/17/2012 14:47	10/30/2012 13:32	29.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696404	C 6	FIELD_SAMPLE	10/17/2012 14:44	10/30/2012 13:25	28.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696405	B 6	FIELD_SAMPLE	10/18/2012 8:00	10/31/2012 8:21	25.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696406	A 6	FIELD_SAMPLE	10/18/2012 8:05	10/31/2012 8:24	28.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696407	A 7	FIELD_SAMPLE	10/18/2012 8:09	10/31/2012 8:27	22.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696408	B 7	FIELD_SAMPLE	10/18/2012 8:23	10/31/2012 8:36	28.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696409	C 7	FIELD_SAMPLE	10/18/2012 8:27	10/31/2012 8:39	27.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696410	D 7	FIELD_SAMPLE	10/18/1934 8:34	10/31/2012 8:43	28.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%

GORE and designs are trademarks of W. L. Gore Associates, Inc.

W. L. Gore & Associates, Inc.
100 Chesapeake Boulevard
Elkton, MD USA 21921
ph: 410-392-7600

GORE Project No: ENV 21815026
Site Name: WSTF-NASA
Site Location: NM

GORE(R) Surveys
Installation & Retrieval Log

Company Name: NAVARRO RESEARCH AND ENGINEERING INC
Location:
Samples collected by:

*** Optional or as needed**

MODULE SERIAL NO.	FIELD ID* (e.g., arbitrary, US EPA)	SAMPLE TYPE (Field Sample, Trip Blank, Field Blank, etc.)	INSTALLATION DATE & TIME MM/DD/YYYY HH:MM (24 Hour) ex. 12/27/2000 13:00	RETRIEVAL DATE & TIME MM/DD/YYYY HH:MM (24 Hour) ex. 12/30/2000 13:00	OBSERVATIONS/COMMENTS* (e.g., sample depth, location description, missing, pulled from hole, etc. - as needed)	SAMPLE ENVIRONMENT* (e.g., grass, bare soil, through slab)	YES / NO			AT MINIMUM PROVIDE SOIL TYPE	
							EVIDENCE OF LIQUID PETROLEUM HYDROCARBONS?	ODOR ?	WATER IN INSTALLATION HOLE?	SOIL TYPE AT MODULE DEPTH (clay, loamy sand etc.)	TOTAL SOIL POROSITY AT MODULE DEPTH* (total volume of pores/total volume)
00696411	E 7	FIELD_SAMPLE	10/18/2012 8:45	10/31/2012 8:50	28.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696412	F 7	FIELD_SAMPLE	10/18/2012 9:07	10/31/2012 9:00	21.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696413	G 7	FIELD_SAMPLE	10/18/2012 9:15	10/31/2012 9:03	24.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696414	H 7	FIELD_SAMPLE	10/18/2012 9:20	10/31/2012 9:07	30.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696415	H 9	FIELD_SAMPLE	10/18/2012 9:30	10/31/2012 9:15	27.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696416	H 8	FIELD_SAMPLE	10/18/2012 9:47	10/31/2012 9:20	27.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696417	G 8	FIELD_SAMPLE	10/18/2012 9:55	10/31/2012 9:24	26.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696418	F 8	FIELD_SAMPLE	10/18/2012 10:01	10/31/2012 9:30	27.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696419	E 8	FIELD_SAMPLE	10/18/2012 10:34	10/31/2012 9:39	27.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696420	D 8	FIELD_SAMPLE	10/18/2012 10:47	10/31/2012 9:43	29.0 in.	Sparse desert brush - adjacent to road	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696421	C 8	FIELD_SAMPLE	10/18/2012 10:53	10/31/2012 9:47	29.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696422	B 8	FIELD_SAMPLE	10/18/2012 11:02	10/31/2012 10:05	28.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696423	A 8	FIELD_SAMPLE	10/18/2012 11:14	10/31/2012 10:12	30:0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696424	A 9	FIELD_SAMPLE	10/18/2012 11:20	10/31/2012 10:17	29.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696425	B 9	FIELD_SAMPLE	10/18/2012 11:25	10/31/2012 10:21	29.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696426	C 9	FIELD_SAMPLE	10/18/2012 13:40	10/31/2012 10:27	27.0 in.	Sparse desert brush - adjacent to sewage lagoon	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696427	D 9	FIELD_SAMPLE	10/18/2012 13:55	10/31/2012 10:30	27.0 in.	Sparse desert brush - adjacent to road	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696428	E 9	FIELD_SAMPLE	10/18/2012 14:00	10/31/2012 10:34	26.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696429	F 9	FIELD_SAMPLE	10/18/2012 14:09	10/31/2012 10:41	27.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696430	G 9	FIELD_SAMPLE	10/18/2012 14:15	10/31/2012 10:45	28.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696431	H10	FIELD_SAMPLE	10/18/2012 14:10	10/31/2012 11:24	30.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696432	G10	FIELD_SAMPLE	10/18/2012 14:06	10/31/2012 11:19	20.0 in. - intercepted boulder	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696433	F10	FIELD_SAMPLE	10/18/2012 14:01	10/31/2012 11:14	25.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696434	E10	FIELD_SAMPLE	10/18/2012 13:55	10/31/2012 11:10	28.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696435	D10	FIELD_SAMPLE	10/18/2012 13:52	10/31/2012 11:07	20.0 in. - intercepted boulder	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696436	C10	FIELD_SAMPLE	10/18/2012 13:45	10/31/2012 11:02	28.0 in.	Gravel parking lot	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696437	B10	FIELD_SAMPLE	10/18/2012 13:40	10/31/2012 10:59	25.0 in.	Gravel parking lot	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696438	A10	FIELD_SAMPLE	10/18/2012 13:35	10/31/2012 10:55	26.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696439	A11	FIELD_SAMPLE	10/18/2012 10:57	10/31/2012 10:51	26.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696450	B11	FIELD_SAMPLE	10/18/2012 10:54	10/31/2012 10:45	28.0 in. - out of sequence	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696441	C11	FIELD_SAMPLE	10/18/2012 10:50	10/31/2012 10:40	29.0 in.	Gravel parking lot	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696442	D11	FIELD_SAMPLE	10/18/2012 10:45	10/31/2012 10:33	28.0 in.	Gravel parking lot	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696443	E11	FIELD_SAMPLE	10/18/2012 10:34	10/31/2012 10:28	28.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696444	F11	FIELD_SAMPLE	10/18/2012 10:29	10/31/2012 10:24	25.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696445	G11	FIELD_SAMPLE	10/18/2012 10:25	10/31/2012 10:21	24.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696446	H11	FIELD_SAMPLE	10/18/2012 10:20	10/31/2012 10:18	29.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696447	TB5	TRIP_BLANK			Trip Blank						
00696448	TB6	TRIP_BLANK			Trip Blank						
00696449	TB7	TRIP_BLANK			Trip Blank						
00696450	TB8	TRIP_BLANK			Trip Blank						
00696451	H12	FIELD_SAMPLE	10/18/2012 10:00	10/31/2012 9:43	27.0 in.	Gravel road	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696452	G12	FIELD_SAMPLE	10/18/2012 9:54	10/31/2012 9:38	27.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696459	F12	FIELD_SAMPLE	10/18/2012 9:50	10/31/2012 9:35	26.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696460	E12	FIELD_SAMPLE	10/18/2012 9:45	10/31/2012 9:34	26.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696461	D12	FIELD_SAMPLE	10/18/2012 9:40	10/31/2012 9:21	30.0 in.	Asphalt parking lot	Asphalt		No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696462	C12	FIELD_SAMPLE	10/18/2012 9:35	10/31/2012 9:18	30.0 in.	Gravel parking lot	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696463	B12	FIELD_SAMPLE	10/18/2012 9:28	10/31/2012 9:15	30.0 in.	Gravel road	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696464	A12	FIELD_SAMPLE	10/18/2012 9:24	10/31/2012 9:11	30.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696465	A13	FIELD_SAMPLE	10/18/2012 9:10	10/31/2012 9:05	28.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696466	B13	FIELD_SAMPLE	10/18/2012 9:06	10/31/2012 9:00	29.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696467	C13	FIELD_SAMPLE	10/18/2012 9:02	10/31/2012 8:55	28.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696468	D13	FIELD_SAMPLE	10/18/2012 9:00	10/31/2012 8:48	28.0 in.	Asphalt parking lot	Asphalt		No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696469	E13	FIELD_SAMPLE	10/18/2012 8:50	10/31/2012 8:35	25.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696470	F13	FIELD_SAMPLE	10/18/2012 8:32	10/31/2012 8:25	24.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696471	G13	FIELD_SAMPLE	10/18/2012 8:28	10/31/2012 8:18	24.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%

GORE and designs are trademarks of W. L. Gore Associates, Inc.

W. L. Gore & Associates, Inc.
100 Chesapeake Boulevard
Elkton, MD USA 21921
ph: 410-392-7600

GORE Project No: ENV 21815026
Site Name: WSTF-NASA
Site Location: NM

GORE(R) Surveys
Installation & Retrieval Log

Company Name: NAVARRO RESEARCH AND ENGINEERING INC
Location:
Samples collected by:

*** Optional or as needed**

MODULE SERIAL NO.	FIELD ID* (e.g., arbitrary, US EPA)	SAMPLE TYPE (Field Sample, Trip Blank, Field Blank, etc.)	INSTALLATION DATE & TIME MM/DD/YYYY HH:MM (24 Hour) ex. 12/27/2000 13:00	RETRIEVAL DATE & TIME MM/DD/YYYY HH:MM (24 Hour) ex. 12/30/2000 13:00	OBSERVATIONS/COMMENTS* (e.g., sample depth, location description, missing, pulled from hole, etc. - as needed)	SAMPLE ENVIRONMENT* (e.g., grass, bare soil, through slab)	YES / NO			AT MINIMUM PROVIDE SOIL TYPE	
							EVIDENCE OF LIQUID PETROLEUM HYDROCARBONS?	ODOR ?	WATER IN INSTALLATION HOLE?	SOIL TYPE AT MODULE DEPTH (clay, loamy sand etc.)	TOTAL SOIL POROSITY AT MODULE DEPTH* (total volume of pores/total volume)
00696472	H13	FIELD_SAMPLE	10/18/2012 8:25	10/31/2012 8:12	25.0 in.	Gravel clearing	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696473	H14	FIELD_SAMPLE	10/18/2012 8:12	10/31/2012 8:04	27.0 in.	Gravel clearing	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696474	G14	FIELD_SAMPLE	10/18/2012 8:08	10/31/2012 8:00	23.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696475	F14	FIELD_SAMPLE	10/18/2012 8:02	10/31/2012 7:54	24.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696476	E14	FIELD_SAMPLE	10/18/2012 7:55	10/31/2012 7:50	29.0 in.	Gravel parking lot	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696477	D14	FIELD_SAMPLE	10/18/2012 7:50	10/31/2012 7:45	26.0 in. - borehole driven over in parking lot	Asphalt parking lot	Asphalt		No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696478	C14	FIELD_SAMPLE	10/17/2012 14:50	10/30/2012 14:06	27.0 in. - moist on collection/asphalt fragments	Asphalt parking lot	Asphalt		No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696479	B14	FIELD_SAMPLE	10/17/2012 14:45	10/30/2012 14:04	30.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696480	A14	FIELD_SAMPLE	10/17/2012 14:40	10/30/2012 14:00	24.0 in. - module cold on collection	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696481	A15	FIELD_SAMPLE	10/17/2012 14:35	10/30/2012 13:56	26.0 in. - adjacent to gas line, module cold	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696482	B15	FIELD_SAMPLE	10/17/2012 14:32	10/30/2012 13:54	30.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696483	C15	FIELD_SAMPLE	10/17/2012 14:20	10/30/2012 13:50	25.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696484	D15	FIELD_SAMPLE	10/17/2012 14:10	10/30/2012 13:38	28.0 in. - module moist on collection	Asphalt parking lot	Asphalt		No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696485	E15	FIELD_SAMPLE	10/17/2012 14:04	10/30/2012 13:34	28.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696486	F15	FIELD_SAMPLE	10/17/2012 14:00	10/30/2012 13:30	25.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696487	G15	FIELD_SAMPLE	10/17/2012 13:55	10/30/2012 13:27	28.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696488	H15	FIELD_SAMPLE	10/17/2012 13:50	10/30/2012 13:22	29.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696489	H16	FIELD_SAMPLE	10/17/2012 13:45	10/30/2012 13:18	26.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696490	G16	FIELD_SAMPLE	10/17/2012 13:38	10/30/2012 13:14	25.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696491	F16	FIELD_SAMPLE	10/17/2012 13:34	10/30/2012 13:10	24.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696492	E16	FIELD_SAMPLE	10/17/2012 13:30	10/30/2012 13:05	25.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696493	D16	FIELD_SAMPLE	10/17/2012 13:27	10/30/2012 13:00	29.0 in.	Gravel parking lot	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696494	C16	FIELD_SAMPLE	10/17/2012 13:22	10/30/2012 12:58	26.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696495	B16	FIELD_SAMPLE	10/17/2012 13:19	10/30/2012 12:54	28.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696496	A16	FIELD_SAMPLE	10/17/2012 13:15	10/30/2012 12:50	27.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696497	A17	FIELD_SAMPLE	10/17/2012 11:07	10/30/2012 10:37	28.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696498	B17	FIELD_SAMPLE	10/17/2012 11:05	10/30/2012 10:35	29.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696499	C17	FIELD_SAMPLE	10/17/2012 11:00	10/30/2012 10:30	29.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696500	D17	FIELD_SAMPLE	10/17/2012 10:55	10/30/2012 10:25	27.0 in.	Gravel parking lot	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696501	TB9	TRIP_BLANK			Trip Blank						
00696502	TB10	TRIP_BLANK			Trip Blank						
00696503	TB11	TRIP_BLANK			Trip Blank						
00696504	TB12	TRIP_BLANK			Trip Blank						
00696505	E17	FIELD_SAMPLE	10/17/2012 10:28	10/30/2012 10:08	26.0 in.	Gravel parking lot	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696506	F17	FIELD_SAMPLE	10/17/2012 10:18	10/30/2012 10:05	23.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696507	G17	FIELD_SAMPLE	10/17/2012 10:10	10/30/2012 10:01	27.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696508	H17*	FIELD_SAMPLE			No borehole installation - Inaccessible terrain						
00696509	H18*	FIELD_SAMPLE			No borehole installation - Inaccessible terrain						
00696510	G18*	FIELD_SAMPLE			No borehole installation - Inaccessible terrain						
00696511	F18*	FIELD_SAMPLE			No borehole installation - Inaccessible terrain						
00696512	E18	FIELD_SAMPLE	10/17/2012 10:02	10/30/2012 9:55	25.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696513	D18	FIELD_SAMPLE	10/17/2012 9:58	10/30/2012 9:50	25.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696514	C18	FIELD_SAMPLE	10/17/2012 9:55	10/30/2012 9:47	25.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696515	B18	FIELD_SAMPLE	10/17/2012 9:50	10/30/2012 9:44	30.0 in.	Sparse desert brush - adjacent to road	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696516	A18	FIELD_SAMPLE	10/17/2012 9:45	10/30/2012 9:40	29.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696517	A19	FIELD_SAMPLE	10/17/2012 9:40	10/30/2012 9:36	26.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696518	B19	FIELD_SAMPLE	10/17/2012 9:35	10/30/2012 9:32	25.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696519	C19	FIELD_SAMPLE	10/17/2012 9:32	10/30/2012 9:25	24 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696520	D19	FIELD_SAMPLE	10/17/2012 9:25	10/30/2012 9:20	26.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696521	E19*	FIELD_SAMPLE			No borehole installation - Inaccessible terrain						
00696522	F19*	FIELD_SAMPLE			No borehole installation - Inaccessible terrain						
00696523	G19*	FIELD_SAMPLE			No borehole installation - Inaccessible terrain						
00696524	H19*	FIELD_SAMPLE			No borehole installation - Inaccessible terrain						
00696525	BP-1	FIELD_SAMPLE	10/16/2012 13:10	10/29/2012 13:00	28.0 in.	Gravel parking lot	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696526	BP-2	FIELD_SAMPLE	10/16/2012 13:15	10/29/2012 13:02	29.0 in.	Gravel parking lot	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%

GORE and designs are trademarks of W. L. Gore Associates, Inc.

W. L. Gore & Associates, Inc.
100 Chesapeake Boulevard
Elkton, MD USA 21921
ph: 410-392-7600

GORE Project No: ENV 21815026
Site Name: WSTF-NASA
Site Location: NM

GORE(R) Surveys
Installation & Retrieval Log

Company Name: NAVARRO RESEARCH AND ENGINEERING INC
Location:
Samples collected by:

*** Optional or as needed**

MODULE SERIAL NO.	FIELD ID* (e.g., arbitrary, US EPA)	SAMPLE TYPE (Field Sample, Trip Blank, Field Blank, etc.)	INSTALLATION DATE & TIME MM/DD/YYYY HH:MM (24 Hour) ex. 12/27/2000 13:00	RETRIEVAL DATE & TIME MM/DD/YYYY HH:MM (24 Hour) ex. 12/30/2000 13:00	OBSERVATIONS/COMMENTS* (e.g., sample depth, location description, missing, pulled from hole, etc. - as needed)	SAMPLE ENVIRONMENT* (e.g., grass, bare soil, through slab)	YES / NO			AT MINIMUM PROVIDE SOIL TYPE	
							EVIDENCE OF LIQUID PETROLEUM HYDROCARBONS?	ODOR ?	WATER IN INSTALLATION HOLE?	SOIL TYPE AT MODULE DEPTH (clay, loamy sand etc.)	TOTAL SOIL POROSITY AT MODULE DEPTH* (total volume of pores/total volume)
00696527	SH-1	FIELD_SAMPLE	10/16/2012 13:20	10/29/2012 13:07	25.0 in.	Gravel clearing	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696528	SH-2	FIELD_SAMPLE	10/16/2012 13:25	10/29/2012 13:09	29.0 in.	Gravel clearing	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696529	BL-1	FIELD_SAMPLE	10/16/2012 13:30	10/29/2012 13:11	27.0 in.	Gravel clearing	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696530	BL-2	FIELD_SAMPLE	10/16/2012 13:32	10/29/2012 13:14	28.0 in.	Gravel clearing	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696531	SB-1	FIELD_SAMPLE	10/16/2012 13:34	10/29/2012 13:16	26.0 in.	Gravel clearing	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696532	SB-2	FIELD_SAMPLE	10/16/2012 13:36	10/29/2012 13:17	25.0 in.	Gravel clearing	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696533	SB-3	FIELD_SAMPLE	10/16/2012 13:40	10/29/2012 13:20	26.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696534	SB-4	FIELD_SAMPLE	10/16/2012 13:42	10/29/2012 13:22	25.0 in.	Sparse desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696535	DP-1	FIELD_SAMPLE	10/16/2012 13:45	10/29/2012 13:24	29.0 in. - proximal to FO line, module cold on retrieval	Asphalt parking lot	Asphalt		No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696536	DP-2	FIELD_SAMPLE	10/16/2012 13:48	10/29/2012 13:26	29.0 in. - proximal to FO line, module cold on retrieval	Asphalt parking lot	Asphalt		No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696537	CS-1	FIELD_SAMPLE	10/16/2012 13:50	10/29/2012 13:29	29.0 in.	Gravel clearing	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696538	CS-2	FIELD_SAMPLE	10/16/2012 13:54	10/29/2012 13:31	29.0 in.	Gravel clearing	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696539	SR-1*	FIELD_SAMPLE			Borehole intercepted a compressed air line						
00696540	TB13	TRIP_BLANK			Trip Blank						
00696541	SR-2	FIELD_SAMPLE	10/16/2012 14:00	10/29/2012 13:32	29.0 in. - run over by bobcat, module moist on retrieval	Gravel ditch			No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696542	AD-1	FIELD_SAMPLE	10/16/2012 14:05	10/29/2012 13:34	27.0 in. - module moist on retrieval	Asphalt parking lot	Asphalt		No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696543	AD-2	FIELD_SAMPLE	10/16/2012 14:08	10/29/2012 13:35	30.0 in.	Asphalt parking lot	Asphalt		No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696544	CL-1	FIELD_SAMPLE	10/16/2012 14:10	10/29/2012 13:37	27.0 in.	Asphalt parking lot	Asphalt		No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696545	CL-2	FIELD_SAMPLE	10/16/2012 14:14	10/29/2012 13:39	27.0 in.	Asphalt parking lot	Asphalt		No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696546	CP-1	FIELD_SAMPLE	10/16/2012 14:18	10/29/2012 13:43	29.0 in.	Gravel ditch	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696547	CP-2	FIELD_SAMPLE	10/16/2012 14:20	10/29/2012 13:44	30.0 in. - module slightly moist on retrieval	Gravel ditch	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696548	CR-1	FIELD_SAMPLE	10/16/2012 14:25	10/29/2012 13:47	23.0 in. - module slightly moist on retrieval	Asphalt parking lot	Asphalt		No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696549	CR-2	FIELD_SAMPLE	10/16/2012 14:28	10/29/2012 13:49	30.0 in. - sampler cold on retrieval	Asphalt parking lot	Asphalt		No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696550	TB14	TRIP_BLANK			Trip Blank						
00696551	TB15	TRIP_BLANK			Trip Blank						
00696552	TB16	TRIP_BLANK			Trip Blank						
00696553	AA-1	FIELD_SAMPLE	10/16/2012 14:45	10/29/2012 14:00	29.0 in.	Desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696554	AA-2	FIELD_SAMPLE	10/16/2012 14:48	10/29/2012 14:02	30.0 in.	Desert brush	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696555	600-G-138	FIELD_SAMPLE	10/16/2012 14:55	10/29/2012 14:10	Module suspended in conventional water well	Suspended 2 feet from TOC using well cap	No	No	No		
00696556	NASA 4	FIELD_SAMPLE	10/16/2012 15:10	10/29/2012 14:15	Module suspended in conventional water well	Suspended 2 feet from TOC using well cap	No	No	No		
00696557	100-HG-139	FIELD_SAMPLE	10/16/2012 15:15	10/29/2012 14:20	Module suspended in conventional water well	Suspended 2 feet from TOC using well cap	No	No	No		
00696558	200-JG-110	FIELD_SAMPLE	10/17/2012 7:30	10/30/2012 7:28	Module suspended in conventional water well	Suspended 2 feet from TOC using well cap	No	No	No		
00696559	200-D-109	FIELD_SAMPLE	10/17/2012 7:55	10/30/2012 7:45	Module suspended in conventional water well	Suspended 2 feet from TOC using well cap	No	No	No		
00696560	200-D-240	FIELD_SAMPLE	10/17/2012 8:00	10/30/2012 7:50	Module suspended in conventional water well	Suspended 2 feet from TOC using well cap	No	No	No		
00696561	200-B-240	FIELD_SAMPLE	10/17/2012 8:12	10/30/2012 8:05	Module suspended in conventional water well	Suspended 2 feet from TOC using well cap	No	No	No		
00696562	600-C-173	FIELD_SAMPLE	10/17/2012 8:20	10/30/2012 8:15	Module suspended in conventional water well	Suspended 2 feet from TOC using well cap	No	No	No		
00696563	600-C-210	FIELD_SAMPLE	10/17/2012 8:25	10/30/2012 8:20	Module suspended in conventional water well	Suspended 2 feet from TOC using well cap	No	No	No		
00696564	NASA 2	FIELD_SAMPLE	10/17/2012 8:28	10/30/2012 8:25	Module suspended in conventional water well	Suspended 2 feet from TOC using well cap	No	No	No		
00696565	NASA 7	FIELD_SAMPLE	10/17/2012 8:32	10/30/2012 8:27	Module suspended in conventional water well	Suspended 2 feet from TOC using well cap	No	No	No		
00696566	NASA 8	FIELD_SAMPLE	10/17/2012 8:36	10/30/2012 8:30	Module suspended in conventional water well	Suspended 2 feet from TOC using well cap	No	No	No		
00696567	BLM-3-182	FIELD_SAMPLE	10/17/2012 8:40	10/30/2012 8:36	Module suspended in conventional water well	Suspended 2 feet from TOC using well cap	No	No	No		
00696568	OS-1	FIELD_SAMPLE	10/18/2012 8:20	10/31/2012 8:18	26.0 in. - out of sequence	Gravel clearing	No	No	No	Silty sandy gravel	Porosity of soils = 29 - 52%
00696569		FIELD_SAMPLE									
00696570		FIELD_SAMPLE									
00696571		FIELD_SAMPLE									
00696572		FIELD_SAMPLE									
00696573		FIELD_SAMPLE									
00696574		FIELD_SAMPLE									
00696575		FIELD_SAMPLE									
00696576		FIELD_SAMPLE									
00696577		FIELD_SAMPLE									
00696578		FIELD_SAMPLE									
00696585		FIELD_SAMPLE									
00696586		FIELD_SAMPLE									
00696587		FIELD_SAMPLE									

GORE and designs are trademarks of W. L. Gore Associates, Inc.

W. L. Gore & Associates, Inc.
100 Chesapeake Boulevard
Elkton, MD USA 21921
ph: 410-392-7600

GORE Project No: ENV 21815026
Site Name: WSTF-NASA
Site Location: NM

GORE(R) Surveys
Installation & Retrieval Log

Company Name: NAVARRO RESEARCH AND ENGINEERING INC
Location:
Samples collected by:

*** Optional or as needed**

MODULE SERIAL NO.	FIELD ID* (e.g., arbitrary, US EPA)	SAMPLE TYPE (Field Sample, Trip Blank, Field Blank, etc.)	INSTALLATION DATE & TIME MM/DD/YYYY HH:MM (24 Hour) ex. 12/27/2000 13:00	RETRIEVAL DATE & TIME MM/DD/YYYY HH:MM (24 Hour) ex. 12/30/2000 13:00	OBSERVATIONS/COMMENTS* (e.g., sample depth, location description, missing, pulled from hole, etc. - as needed)	SAMPLE ENVIRONMENT* (e.g., grass, bare soil, through slab)	YES / NO			AT MINIMUM PROVIDE SOIL TYPE	
							EVIDENCE OF LIQUID PETROLEUM HYDROCARBONS?	ODOR ?	WATER IN INSTALLATION HOLE?	SOIL TYPE AT MODULE DEPTH (clay, loamy sand etc.)	TOTAL SOIL POROSITY AT MODULE DEPTH* (total volume of pores/total volume)
00696588		FIELD_SAMPLE									
00696589		FIELD_SAMPLE									
00696590		FIELD_SAMPLE									
00696591		FIELD_SAMPLE									
00696592		FIELD_SAMPLE									
00696593		FIELD_SAMPLE									
00696594		FIELD_SAMPLE									
00696595		FIELD_SAMPLE									
00696596		FIELD_SAMPLE									
00696597		FIELD_SAMPLE									
00696598		FIELD_SAMPLE									
00696599		FIELD_SAMPLE									
00696600		FIELD_SAMPLE									
00696601		FIELD_SAMPLE									
00696602		FIELD_SAMPLE									
00696603		FIELD_SAMPLE									
00696604	TB17	TRIP_BLANK			Trip Blank						
00696605	TB18	TRIP_BLANK			Trip Blank						
00696606	TB19	TRIP_BLANK			Trip Blank						

GORE and designs are trademarks of W. L. Gore Associates, Inc.

GORE(R) Surveys
Installation & Retrieval Log

*** Optional or as needed**

MODULE SERIAL NO.	WATER FILLED SOIL POROSITY AT MODULE DEPTH* (volume of water/volume of pores)
00696355	Moisture of soils = 1.5 - 10%
00696356	Moisture of soils = 1.5 - 10%
00696357	Moisture of soils = 1.5 - 10%
00696358	Moisture of soils = 1.5 - 10%
00696359	Moisture of soils = 1.5 - 10%
00696360	Moisture of soils = 1.5 - 10%
00696361	Moisture of soils = 1.5 - 10%
00696362	Moisture of soils = 1.5 - 10%
00696363	Moisture of soils = 1.5 - 10%
00696364	Moisture of soils = 1.5 - 10%
00696365	Moisture of soils = 1.5 - 10%
00696366	Moisture of soils = 1.5 - 10%
00696367	Moisture of soils = 1.5 - 10%
00696368	Moisture of soils = 1.5 - 10%
00696369	Moisture of soils = 1.5 - 10%
00696370	Moisture of soils = 1.5 - 10%
00696371	Moisture of soils = 1.5 - 10%
00696372	Moisture of soils = 1.5 - 10%
00696373	Moisture of soils = 1.5 - 10%
00696374	Moisture of soils = 1.5 - 10%
00696375	Moisture of soils = 1.5 - 10%
00696376	Moisture of soils = 1.5 - 10%
00696377	Moisture of soils = 1.5 - 10%
00696378	Moisture of soils = 1.5 - 10%
00696379	Moisture of soils = 1.5 - 10%
00696380	Moisture of soils = 1.5 - 10%
00696381	Moisture of soils = 1.5 - 10%
00696382	Moisture of soils = 1.5 - 10%
00696383	Moisture of soils = 1.5 - 10%
00696384	Moisture of soils = 1.5 - 10%
00696385	Moisture of soils = 1.5 - 10%
00696386	Moisture of soils = 1.5 - 10%
00696387	Moisture of soils = 1.5 - 10%
00696388	Moisture of soils = 1.5 - 10%
00696389	Moisture of soils = 1.5 - 10%
00696390	Moisture of soils = 1.5 - 10%
00696391	Moisture of soils = 1.5 - 10%
00696392	Moisture of soils = 1.5 - 10%
00696393	Moisture of soils = 1.5 - 10%
00696394	Moisture of soils = 1.5 - 10%
00696395	Moisture of soils = 1.5 - 10%
00696396	Moisture of soils = 1.5 - 10%
00696397	Moisture of soils = 1.5 - 10%
00696398	Moisture of soils = 1.5 - 10%
00696399	
00696400	
00696401	
00696402	
00696403	Moisture of soils = 1.5 - 10%
00696404	Moisture of soils = 1.5 - 10%
00696405	Moisture of soils = 1.5 - 10%
00696406	Moisture of soils = 1.5 - 10%
00696407	Moisture of soils = 1.5 - 10%
00696408	Moisture of soils = 1.5 - 10%
00696409	Moisture of soils = 1.5 - 10%
00696410	Moisture of soils = 1.5 - 10%

GORE and designs are trademarks of W. L. Gore Associates, Inc.

GORE(R) Surveys
Installation & Retrieval Log

*** Optional or as needed**

MODULE SERIAL NO.	WATER FILLED SOIL POROSITY AT MODULE DEPTH* (volume of water/volume of pores)
00696411	Moisture of soils = 1.5 - 10%
00696412	Moisture of soils = 1.5 - 10%
00696413	Moisture of soils = 1.5 - 10%
00696414	Moisture of soils = 1.5 - 10%
00696415	Moisture of soils = 1.5 - 10%
00696416	Moisture of soils = 1.5 - 10%
00696417	Moisture of soils = 1.5 - 10%
00696418	Moisture of soils = 1.5 - 10%
00696419	Moisture of soils = 1.5 - 10%
00696420	Moisture of soils = 1.5 - 10%
00696421	Moisture of soils = 1.5 - 10%
00696422	Moisture of soils = 1.5 - 10%
00696423	Moisture of soils = 1.5 - 10%
00696424	Moisture of soils = 1.5 - 10%
00696425	Moisture of soils = 1.5 - 10%
00696426	Moisture of soils = 1.5 - 10%
00696427	Moisture of soils = 1.5 - 10%
00696428	Moisture of soils = 1.5 - 10%
00696429	Moisture of soils = 1.5 - 10%
00696430	Moisture of soils = 1.5 - 10%
00696431	Moisture of soils = 1.5 - 10%
00696432	Moisture of soils = 1.5 - 10%
00696433	Moisture of soils = 1.5 - 10%
00696434	Moisture of soils = 1.5 - 10%
00696435	Moisture of soils = 1.5 - 10%
00696436	Moisture of soils = 1.5 - 10%
00696437	Moisture of soils = 1.5 - 10%
00696438	Moisture of soils = 1.5 - 10%
00696439	Moisture of soils = 1.5 - 10%
00696450	Moisture of soils = 1.5 - 10%
00696441	Moisture of soils = 1.5 - 10%
00696442	Moisture of soils = 1.5 - 10%
00696443	Moisture of soils = 1.5 - 10%
00696444	Moisture of soils = 1.5 - 10%
00696445	Moisture of soils = 1.5 - 10%
00696446	Moisture of soils = 1.5 - 10%
00696447	
00696448	
00696449	
00696450	
00696451	Moisture of soils = 1.5 - 10%
00696452	Moisture of soils = 1.5 - 10%
00696459	Moisture of soils = 1.5 - 10%
00696460	Moisture of soils = 1.5 - 10%
00696461	Moisture of soils = 1.5 - 10%
00696462	Moisture of soils = 1.5 - 10%
00696463	Moisture of soils = 1.5 - 10%
00696464	Moisture of soils = 1.5 - 10%
00696465	Moisture of soils = 1.5 - 10%
00696466	Moisture of soils = 1.5 - 10%
00696467	Moisture of soils = 1.5 - 10%
00696468	Moisture of soils = 1.5 - 10%
00696469	Moisture of soils = 1.5 - 10%
00696470	Moisture of soils = 1.5 - 10%
00696471	Moisture of soils = 1.5 - 10%

GORE and designs are trademarks of W. L. Gore Associates, Inc.

GORE(R) Surveys
Installation & Retrieval Log

*** Optional or as needed**

MODULE SERIAL NO.	WATER FILLED SOIL POROSITY AT MODULE DEPTH* (volume of water/volume of pores)
00696472	Moisture of soils = 1.5 - 10%
00696473	Moisture of soils = 1.5 - 10%
00696474	Moisture of soils = 1.5 - 10%
00696475	Moisture of soils = 1.5 - 10%
00696476	Moisture of soils = 1.5 - 10%
00696477	Moisture of soils = 1.5 - 10%
00696478	Moisture of soils = 1.5 - 10%
00696479	Moisture of soils = 1.5 - 10%
00696480	Moisture of soils = 1.5 - 10%
00696481	Moisture of soils = 1.5 - 10%
00696482	Moisture of soils = 1.5 - 10%
00696483	Moisture of soils = 1.5 - 10%
00696484	Moisture of soils = 1.5 - 10%
00696485	Moisture of soils = 1.5 - 10%
00696486	Moisture of soils = 1.5 - 10%
00696487	Moisture of soils = 1.5 - 10%
00696488	Moisture of soils = 1.5 - 10%
00696489	Moisture of soils = 1.5 - 10%
00696490	Moisture of soils = 1.5 - 10%
00696491	Moisture of soils = 1.5 - 10%
00696492	Moisture of soils = 1.5 - 10%
00696493	Moisture of soils = 1.5 - 10%
00696494	Moisture of soils = 1.5 - 10%
00696495	Moisture of soils = 1.5 - 10%
00696496	Moisture of soils = 1.5 - 10%
00696497	Moisture of soils = 1.5 - 10%
00696498	Moisture of soils = 1.5 - 10%
00696499	Moisture of soils = 1.5 - 10%
00696500	Moisture of soils = 1.5 - 10%
00696501	
00696502	
00696503	
00696504	
00696505	Moisture of soils = 1.5 - 10%
00696506	Moisture of soils = 1.5 - 10%
00696507	Moisture of soils = 1.5 - 10%
00696508	
00696509	
00696510	
00696511	
00696512	Moisture of soils = 1.5 - 10%
00696513	Moisture of soils = 1.5 - 10%
00696514	Moisture of soils = 1.5 - 10%
00696515	Moisture of soils = 1.5 - 10%
00696516	Moisture of soils = 1.5 - 10%
00696517	Moisture of soils = 1.5 - 10%
00696518	Moisture of soils = 1.5 - 10%
00696519	Moisture of soils = 1.5 - 10%
00696520	Moisture of soils = 1.5 - 10%
00696521	
00696522	
00696523	
00696524	
00696525	Moisture of soils = 1.5 - 10%
00696526	Moisture of soils = 1.5 - 10%

GORE and designs are trademarks of W. L. Gore Associates, Inc.

GORE(R) Surveys
Installation & Retrieval Log

*** Optional or as needed**

MODULE SERIAL NO.	WATER FILLED SOIL POROSITY AT MODULE DEPTH* (volume of water/volume of pores)
00696527	Moisture of soils = 1.5 - 10%
00696528	Moisture of soils = 1.5 - 10%
00696529	Moisture of soils = 1.5 - 10%
00696530	Moisture of soils = 1.5 - 10%
00696531	Moisture of soils = 1.5 - 10%
00696532	Moisture of soils = 1.5 - 10%
00696533	Moisture of soils = 1.5 - 10%
00696534	Moisture of soils = 1.5 - 10%
00696535	Moisture of soils = 1.5 - 10%
00696536	Moisture of soils = 1.5 - 10%
00696537	Moisture of soils = 1.5 - 10%
00696538	Moisture of soils = 1.5 - 10%
00696539	
00696540	
00696541	Moisture of soils = 1.5 - 10%
00696542	Moisture of soils = 1.5 - 10%
00696543	Moisture of soils = 1.5 - 10%
00696544	Moisture of soils = 1.5 - 10%
00696545	Moisture of soils = 1.5 - 10%
00696546	Moisture of soils = 1.5 - 10%
00696547	Moisture of soils = 1.5 - 10%
00696548	Moisture of soils = 1.5 - 10%
00696549	Moisture of soils = 1.5 - 10%
00696550	
00696551	
00696552	
00696553	Moisture of soils = 1.5 - 10%
00696554	Moisture of soils = 1.5 - 10%
00696555	
00696556	
00696557	
00696558	
00696559	
00696560	
00696561	
00696562	
00696563	
00696564	
00696565	
00696566	
00696567	
00696568	Moisture of soils = 1.5 - 10%
00696569	
00696570	
00696571	
00696572	
00696573	
00696574	
00696575	
00696576	
00696577	
00696578	
00696585	
00696586	
00696587	

GORE and designs are trademarks of W. L. Gore Associates, Inc.

GORE[(R)] Surveys
Installation & Retrieval Log

* Optional or as needed

MODULE SERIAL NO.	WATER FILLED SOIL POROSITY AT MODULE DEPTH* (volume of water/volume of pores)
00696588	
00696589	
00696590	
00696591	
00696592	
00696593	
00696594	
00696595	
00696596	
00696597	
00696598	
00696599	
00696600	
00696601	
00696602	
00696603	
00696604	
00696605	
00696606	

GORE and designs are trademarks of W. L. Gore Associates, Inc.

GORE(TM) SURVEYS ANALYTICAL RESULTS
NAVARRO RESEARCH AND ENGINEERING INC, OAK RIDGE, TN
GORE STANDARD TARGET VOCs/SVOCs AND FREON TICS (SCREENING + TICS)
WSTF-NASA, NM
PRODUCTION ORDER # 21815026

DATE ANALYZED	SAMPLE NAME	TPH, ug	Freon11	BTEX, ug	BENZ, ug	TOL, ug	ETBENZ, ug	mpXYL, ug	oXYL, ug	C11, C13, &C15, ug	UNDEC, ug	TRIDEC, ug	PENTADEC, ug
	RL=	0.50	0.05		0.02	0.02	0.02	0.02	0.02		0.05	0.05	0.05
11/19/12	696355	0.57	bdl	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/16/12	696356	bdl	0.11	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/9/12	696357	bdl	bdl	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/16/12	696358	bdl	nd	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/9/12	696359	bdl	bdl	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/14/12	696360	3.14	bdl	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/13/12	696361	bdl	bdl	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/14/12	696362	bdl	bdl	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/14/12	696363	bdl	bdl	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/9/12	696364	0.53	bdl	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/13/12	696365	bdl	bdl	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/14/12	696366	bdl	nd	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	nd
11/19/12	696367	bdl	0.05	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/16/12	696368	bdl	0.14	bdl	bdl	nd	nd	nd	nd	bdl	nd	bdl	bdl
11/15/12	696369	bdl	0.31	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/15/12	696370	bdl	bdl	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/16/12	696371	bdl	bdl	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/14/12	696372	bdl	1.16	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/19/12	696373	bdl	0.51	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/15/12	696374	bdl	bdl	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/15/12	696375	bdl	0.10	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	nd
11/8/12	696376	0.65	nd	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/19/12	696377	bdl	0.08	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	nd
11/20/12	696378	bdl	bdl	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/16/12	696379	bdl	nd	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/19/12	696380	bdl	bdl	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/15/12	696381	bdl	nd	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/16/12	696382	bdl	0.07	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/15/12	696383	bdl	0.09	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/19/12	696384	bdl	1.34	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/16/12	696385	bdl	1.01	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	nd
11/8/12	696386	bdl	0.11	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	nd
11/15/12	696387	bdl	0.23	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/15/12	696388	bdl	0.34	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/13/12	696389	bdl	0.82	nd	nd	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/16/12	696390	bdl	0.13	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/15/12	696391	bdl	bdl	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	nd
11/14/12	696392	bdl	bdl	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl

No RL(Reporting Limit) is available for summed analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
NAVARRO RESEARCH AND ENGINEERING INC, OAK RIDGE, TN
GORE STANDARD TARGET VOCs/SVOCs AND FREON TICS (SCREENING + TICS)
WSTF-NASA, NM
PRODUCTION ORDER # 21815026

DATE ANALYZED	SAMPLE NAME	TPH, ug	Freon11	BTEX, ug	BENZ, ug	TOL, ug	ETBENZ, ug	mpXYL, ug	oXYL, ug	C11, C13, &C15, ug	UNDEC, ug	TRIDEC, ug	PENTADEC, ug
	RL=	0.50	0.05		0.02	0.02	0.02	0.02	0.02		0.05	0.05	0.05
11/15/12	696393	bdl	0.07	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/8/12	696394	bdl	bdl	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	nd
11/14/12	696395	bdl	bdl	nd	nd	nd	nd	nd	nd	bdl	bdl	bdl	nd
11/15/12	696396	bdl	nd	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/14/12	696397	bdl	bdl	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/16/12	696398	bdl	bdl	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/9/12	696403	bdl	0.16	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	nd
11/19/12	696404	0.51	0.35	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/15/12	696405	bdl	0.08	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/19/12	696406	bdl	0.57	bdl	bdl	nd	nd	nd	nd	bdl	nd	bdl	bdl
11/14/12	696407	bdl	0.59	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/15/12	696408	bdl	0.06	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	nd
11/20/12	696409	bdl	0.35	bdl	bdl	nd	nd	nd	nd	bdl	bdl	nd	bdl
11/9/12	696410	bdl	0.11	bdl	bdl	nd	nd	nd	nd	bdl	nd	bdl	bdl
11/16/12	696411	bdl	bdl	bdl	bdl	nd	nd	nd	nd	bdl	bdl	nd	bdl
11/14/12	696412	bdl	bdl	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/16/12	696413	bdl	nd	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/13/12	696414	bdl	nd	bdl	bdl	nd	nd	nd	nd	bdl	bdl	nd	nd
11/14/12	696415	bdl	bdl	nd	nd	nd	nd	nd	nd	bdl	nd	bdl	bdl
11/14/12	696416	0.79	bdl	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/19/12	696417	bdl	nd	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/9/12	696418	bdl	nd	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/16/12	696419	bdl	bdl	bdl	bdl	nd	nd	nd	nd	bdl	bdl	nd	nd
11/16/12	696420	bdl	0.16	bdl	bdl	nd	nd	nd	nd	bdl	nd	bdl	bdl
11/14/12	696421	bdl	0.21	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	nd
11/13/12	696422	bdl	bdl	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/16/12	696423	bdl	0.68	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/14/12	696424	bdl	0.16	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/15/12	696425	bdl	bdl	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/13/12	696426	bdl	bdl	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	nd
11/9/12	696427	0.54	0.16	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/14/12	696428	bdl	bdl	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	nd
11/16/12	696429	bdl	bdl	nd	nd	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/15/12	696430	bdl	0.07	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	nd
11/9/12	696431	bdl	bdl	bdl	bdl	nd	nd	nd	nd	bdl	nd	bdl	nd
11/19/12	696432	1.66	bdl	bdl	bdl	bdl	nd	nd	nd	0.09	bdl	0.09	bdl
11/19/12	696433	bdl	bdl	0.03	0.03	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/8/12	696434	bdl	nd	0.02	0.02	nd	nd	nd	nd	bdl	bdl	bdl	bdl

No RL(Reporting Limit) is available for summed analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
NAVARRO RESEARCH AND ENGINEERING INC, OAK RIDGE, TN
GORE STANDARD TARGET VOCs/SVOCs AND FREON TICS (SCREENING + TICS)
WSTF-NASA, NM
PRODUCTION ORDER # 21815026

DATE ANALYZED	SAMPLE NAME	TPH, ug	Freon11	BTEX, ug	BENZ, ug	TOL, ug	ETBENZ, ug	mpXYL, ug	oXYL, ug	C11, C13, &C15, ug	UNDEC, ug	TRIDEC, ug	PENTADEC, ug
	RL=	0.50	0.05		0.02	0.02	0.02	0.02	0.02		0.05	0.05	0.05
11/19/12	696435	1.55	0.07	bdl	bdl	bdl	nd	nd	nd	0.06	bdl	0.06	bdl
11/15/12	696436	bdl	0.12	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	nd
11/9/12	696437	9.17	bdl	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/15/12	696438	bdl	0.11	bdl	bdl	nd	nd	nd	nd	bdl	nd	bdl	nd
11/20/12	696439	1.15	0.09	0.02	0.02	nd	nd	nd	nd	bdl	bdl	bdl	nd
11/14/12	696440	bdl	nd	nd	nd	nd	nd	nd	nd	bdl	nd	bdl	nd
11/14/12	696441	bdl	0.19	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	nd
11/9/12	696442	bdl	0.06	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	nd
11/16/12	696443	bdl	bdl	bdl	bdl	nd	nd	nd	nd	bdl	nd	bdl	bdl
11/14/12	696444	bdl	bdl	bdl	bdl	nd	nd	nd	nd	bdl	nd	bdl	bdl
11/14/12	696445	bdl	nd	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/16/12	696446	bdl	bdl	bdl	bdl	nd	nd	nd	nd	bdl	nd	bdl	nd
11/8/12	696451	bdl	0.57	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/15/12	696452	bdl	nd	bdl	bdl	nd	nd	nd	nd	bdl	nd	bdl	bdl
11/14/12	696459	bdl	0.06	bdl	bdl	nd	nd	nd	nd	nd	nd	nd	nd
11/15/12	696460	bdl	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/19/12	696461	bdl	nd	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	nd
11/20/12	696462	0.87	0.07	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/9/12	696463	bdl	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/8/12	696464	bdl	0.21	bdl	bdl	nd	nd	nd	nd	nd	nd	nd	nd
11/8/12	696465	bdl	bdl	bdl	bdl	nd	nd	nd	nd	nd	nd	nd	nd
11/14/12	696466	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/14/12	696467	bdl	nd	0.03	0.03	nd	nd	nd	nd	nd	nd	nd	nd
11/20/12	696468	0.66	bdl	0.02	0.02	bdl	nd	nd	nd	bdl	bdl	bdl	bdl
11/14/12	696469	bdl	bdl	nd	nd	nd	nd	nd	nd	bdl	nd	nd	bdl
11/8/12	696470	bdl	0.08	bdl	bdl	nd	nd	nd	nd	bdl	nd	bdl	bdl
11/9/12	696471	bdl	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/15/12	696472	bdl	bdl	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	nd
11/13/12	696473	bdl	bdl	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/9/12	696474	bdl	nd	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/9/12	696475	bdl	nd	bdl	bdl	nd	nd	nd	nd	bdl	nd	bdl	nd
11/9/12	696476	bdl	0.06	0.02	0.02	nd	nd	nd	nd	nd	nd	nd	nd
11/15/12	696477	bdl	0.11	bdl	bdl	nd	nd	nd	nd	bdl	nd	bdl	bdl
11/20/12	696478	bdl	2.50	bdl	bdl	nd	nd	nd	nd	bdl	nd	bdl	bdl
11/15/12	696479	bdl	bdl	bdl	bdl	nd	nd	nd	nd	nd	nd	nd	nd
11/13/12	696480	bdl	bdl	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/8/12	696481	bdl	bdl	bdl	bdl	nd	nd	nd	nd	nd	nd	nd	nd
11/14/12	696482	bdl	0.50	bdl	bdl	nd	nd	nd	nd	nd	nd	nd	nd

No RL(Reporting Limit) is available for summed analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
NAVARRO RESEARCH AND ENGINEERING INC, OAK RIDGE, TN
GORE STANDARD TARGET VOCs/SVOCs AND FREON TICS (SCREENING + TICS)
WSTF-NASA, NM
PRODUCTION ORDER # 21815026

DATE ANALYZED	SAMPLE NAME	TPH, ug	Freon11	BTEX, ug	BENZ, ug	TOL, ug	ETBENZ, ug	mpXYL, ug	oXYL, ug	C11, C13, &C15, ug	UNDEC, ug	TRIDEC, ug	PENTADEC, ug
	RL=	0.50	0.05		0.02	0.02	0.02	0.02	0.02		0.05	0.05	0.05
11/15/12	696483	bdl	0.81	bdl	bdl	nd	nd	nd	nd	bdl	nd	bdl	bdl
11/15/12	696484	0.64	0.08	0.03	0.03	nd	nd	nd	nd	nd	nd	nd	nd
11/14/12	696485	bdl	nd	bdl	bdl	nd	nd	nd	nd	nd	nd	nd	nd
11/13/12	696486	bdl	bdl	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/15/12	696487	bdl	bdl	bdl	bdl	nd	nd	nd	nd	nd	nd	nd	nd
11/9/12	696488	bdl	0.15	bdl	bdl	nd	nd	nd	nd	nd	nd	nd	nd
11/20/12	696489	bdl	0.09	bdl	bdl	nd	nd	nd	nd	bdl	nd	bdl	bdl
11/15/12	696490	0.64	bdl	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/14/12	696491	bdl	bdl	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/14/12	696492	bdl	nd	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/8/12	696493	bdl	0.06	bdl	bdl	nd	nd	nd	nd	bdl	nd	bdl	bdl
11/8/12	696494	bdl	0.95	bdl	bdl	nd	nd	nd	nd	bdl	nd	bdl	nd
11/8/12	696495	bdl	1.31	bdl	bdl	bdl	nd	nd	nd	nd	nd	nd	nd
11/8/12	696496	bdl	0.19	bdl	bdl	nd	nd	nd	nd	bdl	nd	bdl	nd
11/15/12	696497	1.05	0.56	bdl	bdl	nd	nd	nd	nd	0.12	bdl	0.12	bdl
11/8/12	696498	bdl	3.03	bdl	bdl	nd	nd	nd	nd	bdl	nd	bdl	bdl
11/14/12	696499	bdl	0.18	bdl	bdl	nd	nd	nd	nd	nd	nd	nd	nd
11/13/12	696500	0.93	0.06	bdl	bdl	nd	nd	nd	nd	bdl	bdl	nd	nd
11/15/12	696505	bdl	bdl	bdl	bdl	nd	nd	nd	nd	bdl	nd	bdl	bdl
11/9/12	696506	0.51	nd	bdl	nd	bdl	nd	nd	nd	0.07	bdl	0.07	bdl
11/13/12	696507	bdl	nd	bdl	bdl	nd	nd	nd	nd	bdl	nd	bdl	nd
11/14/12	696512	bdl	0.14	bdl	bdl	bdl	nd	nd	nd	bdl	bdl	bdl	bdl
11/8/12	696513	bdl	0.26	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/19/12	696514	bdl	0.48	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/16/12	696515	bdl	1.48	bdl	bdl	nd	nd	nd	nd	bdl	nd	bdl	nd
11/19/12	696516	bdl	1.99	bdl	bdl	nd	nd	nd	nd	bdl	bdl	nd	nd
11/14/12	696517	bdl	1.41	bdl	bdl	nd	nd	nd	nd	bdl	nd	bdl	bdl
11/14/12	696518	bdl	1.70	bdl	bdl	nd	nd	nd	nd	bdl	nd	bdl	nd
11/8/12	696519	bdl	0.82	nd	nd	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/8/12	696520	bdl	0.36	bdl	bdl	nd	nd	nd	nd	bdl	nd	bdl	bdl
11/15/12	696525	bdl	0.09	bdl	bdl	bdl	nd	nd	nd	bdl	bdl	bdl	bdl
11/14/12	696526	bdl	0.10	0.02	0.02	bdl	nd	nd	nd	bdl	bdl	nd	nd
11/14/12	696527	bdl	nd	0.03	0.03	nd	nd	nd	nd	nd	nd	nd	nd
11/9/12	696528	bdl	nd	bdl	bdl	nd	nd	nd	nd	nd	nd	nd	nd
11/13/12	696529	bdl	0.12	bdl	bdl	nd	nd	nd	nd	nd	nd	nd	nd
11/15/12	696530	bdl	0.05	bdl	bdl	nd	nd	nd	nd	nd	nd	nd	nd
11/16/12	696531	bdl	0.16	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/8/12	696532	bdl	0.08	0.03	0.03	nd	nd	nd	nd	bdl	nd	bdl	bdl

No RL(Reporting Limit) is available for summed analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
NAVARRO RESEARCH AND ENGINEERING INC, OAK RIDGE, TN
GORE STANDARD TARGET VOCs/SVOCs AND FREON TICS (SCREENING + TICS)
WSTF-NASA, NM
PRODUCTION ORDER # 21815026

DATE ANALYZED	SAMPLE NAME	TPH, ug	Freon11	BTEX, ug	BENZ, ug	TOL, ug	ETBENZ, ug	mpXYL, ug	oXYL, ug	C11, C13, &C15, ug	UNDEC, ug	TRIDEC, ug	PENTADEC, ug
	RL=	0.50	0.05		0.02	0.02	0.02	0.02	0.02		0.05	0.05	0.05
11/14/12	696533	bdl	nd	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	nd
11/15/12	696534	bdl	nd	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/8/12	696535	bdl	0.69	bdl	bdl	nd	nd	nd	nd	nd	nd	nd	nd
11/16/12	696536	bdl	0.68	bdl	bdl	nd	nd	nd	nd	bdl	bdl	nd	nd
11/20/12	696537	bdl	1.46	bdl	bdl	bdl	nd	nd	nd	bdl	bdl	nd	nd
11/8/12	696538	0.54	1.08	bdl	bdl	bdl	nd	nd	nd	bdl	bdl	bdl	bdl
11/14/12	696539	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/13/12	696541	0.69	0.15	0.03	0.03	nd	nd	nd	nd	bdl	bdl	nd	nd
11/15/12	696542	bdl	0.17	bdl	bdl	nd	nd	nd	bdl	bdl	bdl	bdl	nd
11/8/12	696543	0.54	bdl	bdl	bdl	bdl	nd	nd	nd	bdl	bdl	bdl	bdl
11/16/12	696544	bdl	1.60	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/9/12	696545	0.64	2.92	bdl	bdl	bdl	bdl	bdl	bdl	nd	nd	nd	nd
11/14/12	696546	0.72	nd	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/9/12	696547	bdl	nd	bdl	bdl	nd	nd	nd	nd	nd	nd	nd	nd
11/15/12	696548	1.64	bdl	bdl	bdl	bdl	nd	nd	nd	bdl	bdl	bdl	bdl
11/20/12	696549	bdl	nd	0.02	0.02	bdl	nd	nd	nd	bdl	bdl	nd	nd
11/9/12	696553	bdl	bdl	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	nd
11/16/12	696554	bdl	bdl	bdl	bdl	nd	nd	nd	nd	nd	nd	nd	nd
11/20/12	696555	2.77	0.25	0.09	0.06	0.04	bdl	bdl	bdl	0.07	bdl	0.07	bdl
11/19/12	696556	14.20	0.28	bdl	bdl	bdl	nd	bdl	nd	0.14	0.06	0.08	bdl
11/16/12	696557	3.56	nd	0.07	0.07	bdl	nd	nd	nd	bdl	bdl	bdl	bdl
11/8/12	696558	3.44	2.72	0.04	0.04	bdl	nd	nd	nd	0.06	bdl	0.06	bdl
11/14/12	696559	1.89	0.25	0.31	0.07	0.16	bdl	0.04	0.03	bdl	bdl	bdl	bdl
11/15/12	696560	15.65	5.75	0.15	0.05	0.07	bdl	0.03	bdl	0.13	bdl	0.08	0.06
11/16/12	696561	7.81	50.34	0.08	0.04	0.03	bdl	0.02	bdl	0.11	bdl	0.11	bdl
11/16/12	696562	37.46	0.10	0.42	0.07	0.07	0.06	0.17	0.05	0.49	0.19	0.30	nd
11/16/12	696563	3.68	0.17	0.40	0.05	0.04	0.06	0.20	0.05	0.53	0.16	0.36	bdl
11/19/12	696564	0.79	0.15	0.09	0.06	0.03	bdl	bdl	bdl	bdl	bdl	bdl	bdl
11/19/12	696565	10.98	0.20	0.11	0.03	0.08	nd	nd	nd	0.21	0.06	0.15	bdl
11/16/12	696566	7.19	0.07	0.17	0.14	0.02	bdl	bdl	nd	bdl	bdl	bdl	bdl
11/15/12	696567	36.19	0.16	0.43	0.05	0.04	0.06	0.22	0.06	0.51	0.13	0.25	0.12
11/14/12	696568	0.62	bdl	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/19/12	696399	bdl	nd	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/13/12	696400	bdl	nd	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/19/12	696401	bdl	nd	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/14/12	696402	bdl	nd	bdl	bdl	nd	nd	nd	nd	bdl	nd	bdl	nd
11/16/12	696447	bdl	nd	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl

No RL(Reporting Limit) is available for summed analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
NAVARRO RESEARCH AND ENGINEERING INC, OAK RIDGE, TN
GORE STANDARD TARGET VOCs/SVOCs AND FREON TICS (SCREENING + TICS)
WSTF-NASA, NM
PRODUCTION ORDER # 21815026

DATE ANALYZED	SAMPLE NAME	TPH, ug	Freon11	BTEX, ug	BENZ, ug	TOL, ug	ETBENZ, ug	mpXYL, ug	oXYL, ug	C11, C13, &C15, ug	UNDEC, ug	TRIDEC, ug	PENTADEC, ug
	RL=	0.50	0.05		0.02	0.02	0.02	0.02	0.02		0.05	0.05	0.05
11/8/12	696448	bdl	nd	nd	nd	nd	nd	nd	nd	bdl	nd	bdl	nd
11/9/12	696449	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/15/12	696450	bdl	0.05	bdl	bdl	nd	nd	nd	nd	bdl	bdl	bdl	bdl
11/16/12	696501	bdl	nd	bdl	bdl	nd	nd	nd	nd	nd	nd	nd	nd
11/15/12	696502	bdl	nd	bdl	bdl	nd	nd	nd	nd	nd	nd	nd	nd
11/9/12	696503	bdl	nd	bdl	bdl	nd	nd	nd	nd	nd	nd	nd	nd
11/16/12	696504	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/14/12	696540	bdl	nd	bdl	bdl	nd	nd	nd	nd	nd	nd	nd	nd
11/15/12	696550	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/15/12	696551	bdl	nd	bdl	bdl	nd	nd	nd	nd	bdl	bdl	nd	nd
11/15/12	696552	bdl	nd	bdl	bdl	nd	nd	nd	nd	bdl	bdl	nd	nd
11/8/12	method blank	bdl	nd	bdl	bdl	nd	nd	nd	nd	nd	nd	nd	nd
11/9/12	method blank	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/14/12	method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/14/12	method blank	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/15/12	method blank	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/16/12	method blank	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/17/12	method blank	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/19/12	method blank	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/13/12	method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd

No RL(Reporting Limit) is available for summed analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
NAVARRO RESEARCH AND ENGINEERING INC, OAK RIDGE, TN
GORE STANDARD TARGET VOCs/SVOCs AND FREON TICS (SCREENING + TICS)
WSTF-NASA, NM
PRODUCTION ORDER # 21815026

SAMPLE NAME	TMBs, ug	124TMB, ug	135TMB, ug	ct12DCE, ug	t12DCE, ug	c12DCE, ug	NAPH&2-MN, ug	NAPH, ug	2MeNAPH, ug	MTBE, ug	11DCA, ug	111TCA, ug	12DCA, ug
RL=		0.02	0.02		0.02	0.02		0.05	0.05	0.02	0.02	0.02	0.02
696355	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696356	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696357	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696358	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696359	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696360	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696361	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696362	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696363	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696364	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696365	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696366	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696367	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696368	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696369	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696370	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696371	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696372	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696373	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696374	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696375	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696376	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696377	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696378	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696379	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696380	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696381	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696382	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696383	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696384	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696385	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696386	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696387	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696388	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696389	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696390	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696391	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696392	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd

No RL(Reporting Limit) is available for summed analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
NAVARRO RESEARCH AND ENGINEERING INC, OAK RIDGE, TN
GORE STANDARD TARGET VOCs/SVOCs AND FREON TICS (SCREENING + TICS)
WSTF-NASA, NM
PRODUCTION ORDER # 21815026

SAMPLE NAME	TMBs, ug	124TMB, ug	135TMB, ug	ct12DCE, ug	t12DCE, ug	c12DCE, ug	NAPH&2-MN, ug	NAPH, ug	2MeNAPH, ug	MTBE, ug	11DCA, ug	111TCA, ug	12DCA, ug
RL=		0.02	0.02		0.02	0.02		0.05	0.05	0.02	0.02	0.02	0.02
696393	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696394	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696395	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696396	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696397	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696398	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696403	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696404	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696405	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696406	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696407	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696408	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696409	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696410	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696411	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696412	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696413	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696414	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696415	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696416	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696417	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696418	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl
696419	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696420	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696421	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696422	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696423	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696424	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696425	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696426	bdl	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696427	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696428	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696429	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696430	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696431	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696432	bdl	nd	bdl	nd	nd	nd	nd	nd	nd	bdl	nd	nd	nd
696433	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696434	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd

No RL(Reporting Limit) is available for summed analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
NAVARRO RESEARCH AND ENGINEERING INC, OAK RIDGE, TN
GORE STANDARD TARGET VOCs/SVOCs AND FREON TICS (SCREENING + TICS)
WSTF-NASA, NM
PRODUCTION ORDER # 21815026

SAMPLE NAME	TMBs, ug	124TMB, ug	135TMB, ug	ct12DCE, ug	t12DCE, ug	c12DCE, ug	NAPH&2-MN, ug	NAPH, ug	2MeNAPH, ug	MTBE, ug	11DCA, ug	111TCA, ug	12DCA, ug
RL=		0.02	0.02		0.02	0.02		0.05	0.05	0.02	0.02	0.02	0.02
696435	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl
696436	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696437	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696438	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696439	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696440	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696441	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696442	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696443	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696444	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696445	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696446	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696451	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696452	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696459	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696460	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696461	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696462	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696463	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696464	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696465	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696466	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696467	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl
696468	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696469	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696470	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696471	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696472	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696473	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696474	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696475	nd	nd	nd	nd	nd	nd	bdl	bdl	nd	nd	nd	nd	nd
696476	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696477	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696478	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696479	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696480	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696481	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696482	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd

No RL(Reporting Limit) is available for summed analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
NAVARRO RESEARCH AND ENGINEERING INC, OAK RIDGE, TN
GORE STANDARD TARGET VOCs/SVOCs AND FREON TICS (SCREENING + TICS)
WSTF-NASA, NM
PRODUCTION ORDER # 21815026

SAMPLE NAME	TMBs, ug	124TMB, ug	135TMB, ug	ct12DCE, ug	t12DCE, ug	c12DCE, ug	NAPH&2-MN, ug	NAPH, ug	2MeNAPH, ug	MTBE, ug	11DCA, ug	111TCA, ug	12DCA, ug
RL=		0.02	0.02		0.02	0.02		0.05	0.05	0.02	0.02	0.02	0.02
696483	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696484	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl	nd	nd
696485	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696486	bdl	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696487	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696488	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696489	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696490	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696491	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696492	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696493	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696494	nd	nd	nd	nd	nd	nd	bdl	nd	bdl	nd	nd	nd	nd
696495	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696496	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696497	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696498	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696499	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696500	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl	nd	nd
696505	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696506	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696507	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696512	nd	nd	nd	nd	nd	nd	bdl	nd	bdl	nd	nd	nd	nd
696513	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696514	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696515	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696516	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696517	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696518	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696519	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696520	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696525	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl
696526	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl
696527	nd	nd	nd	nd	nd	nd	bdl	nd	bdl	nd	nd	bdl	nd
696528	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696529	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl	nd
696530	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl	nd
696531	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.06	nd
696532	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd

No RL(Reporting Limit) is available for summed analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
NAVARRO RESEARCH AND ENGINEERING INC, OAK RIDGE, TN
GORE STANDARD TARGET VOCs/SVOCs AND FREON TICS (SCREENING + TICS)
WSTF-NASA, NM
PRODUCTION ORDER # 21815026

SAMPLE NAME	TMBs, ug	124TMB, ug	135TMB, ug	ct12DCE, ug	t12DCE, ug	c12DCE, ug	NAPH&2-MN, ug	NAPH, ug	2MeNAPH, ug	MTBE, ug	11DCA, ug	111TCA, ug	12DCA, ug
RL=		0.02	0.02		0.02	0.02		0.05	0.05	0.02	0.02	0.02	0.02
696533	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl	nd
696534	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696535	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696536	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696537	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696538	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696539	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696541	0.14	nd	0.14	nd	nd	nd	nd	nd	nd	0.06	nd	nd	bdl
696542	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696543	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl
696544	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696545	bdl	bdl	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl
696546	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl	nd
696547	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696548	nd	nd	nd	nd	nd	nd	bdl	nd	bdl	nd	nd	nd	bdl
696549	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696553	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696554	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696555	bdl	bdl	bdl	bdl	nd	bdl	nd	nd	nd	nd	nd	bdl	nd
696556	nd	nd	nd	nd	nd	nd	bdl	nd	bdl	nd	nd	nd	nd
696557	bdl	bdl	bdl	nd	nd	nd	bdl	bdl	bdl	nd	nd	nd	bdl
696558	nd	nd	nd	bdl	nd	bdl	bdl	nd	bdl	nd	nd	nd	nd
696559	0.21	0.14	0.06	0.06	0.03	0.03	bdl	bdl	bdl	nd	nd	bdl	nd
696560	0.08	bdl	0.08	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696561	0.05	0.05	bdl	0.21	0.11	0.10	nd	nd	nd	bdl	nd	nd	nd
696562	0.05	0.05	bdl	nd	nd	nd	bdl	bdl	nd	nd	nd	nd	bdl
696563	bdl	bdl	bdl	nd	nd	nd	bdl	nd	bdl	nd	nd	bdl	nd
696564	bdl	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696565	nd	nd	nd	nd	nd	nd	bdl	nd	bdl	nd	nd	nd	nd
696566	bdl	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696567	0.05	0.05	bdl	nd	nd	nd	bdl	bdl	bdl	nd	nd	nd	bdl
696568	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696399	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696400	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696401	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696402	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696447	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd

No RL(Reporting Limit) is available for summed analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
NAVARRO RESEARCH AND ENGINEERING INC, OAK RIDGE, TN
GORE STANDARD TARGET VOCs/SVOCs AND FREON TICS (SCREENING + TICS)
WSTF-NASA, NM
PRODUCTION ORDER # 21815026

SAMPLE NAME	TMBs, ug	124TMB, ug	135TMB, ug	ct12DCE, ug	t12DCE, ug	c12DCE, ug	NAPH&2-MN, ug	NAPH, ug	2MeNAPH, ug	MTBE, ug	11DCA, ug	111TCA, ug	12DCA, ug
RL=		0.02	0.02		0.02	0.02		0.05	0.05	0.02	0.02	0.02	0.02
696448	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696449	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696450	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696501	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696502	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696503	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696504	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696540	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696550	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696551	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696552	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd

No RL(Reporting Limit) is available for summed analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
NAVARRO RESEARCH AND ENGINEERING INC, OAK RIDGE, TN
GORE STANDARD TARGET VOCs/SVOCs AND FREON TICS (SCREENING + TICS)
WSTF-NASA, NM
PRODUCTION ORDER # 21815026

SAMPLE NAME	TCE, ug	OCT, ug	PCE, ug	14DCB, ug	Acenaphthene, ug	Acenaphthylene, ug	Fluorene, ug	Freon113	Freon123	Freon123A	VC, ug	11DCE, ug	CHCl3, ug	CCl4, ug
RL=	0.02	0.02	0.02	0.02	0.05	0.05	0.05	0.05	0.05	0.05	0.20	0.02	0.02	0.02
696355	nd	nd	nd	nd	bdl	nd	bdl	0.29	nd	nd	nd	nd	nd	bdl
696356	nd	nd	nd	nd	nd	nd	nd	9.34	nd	nd	nd	nd	nd	nd
696357	nd	nd	nd	nd	bdl	nd	bdl	1.43	nd	nd	nd	nd	nd	bdl
696358	nd	nd	nd	nd	nd	nd	nd	0.07	nd	nd	nd	nd	nd	bdl
696359	nd	nd	nd	nd	nd	nd	nd	1.63	nd	nd	nd	nd	nd	bdl
696360	nd	nd	nd	nd	nd	nd	nd	1.28	nd	nd	nd	nd	nd	bdl
696361	nd	nd	nd	nd	nd	nd	bdl	3.71	nd	nd	nd	nd	nd	bdl
696362	nd	nd	nd	nd	nd	nd	nd	1.13	nd	nd	nd	nd	nd	bdl
696363	bdl	nd	bdl	nd	nd	nd	bdl	4.37	nd	nd	nd	nd	nd	bdl
696364	nd	nd	nd	nd	bdl	nd	bdl	0.88	nd	nd	nd	nd	nd	nd
696365	nd	nd	nd	nd	nd	nd	nd	3.17	nd	nd	nd	nd	nd	bdl
696366	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696367	nd	nd	bdl	nd	nd	nd	nd	3.45	nd	0.06	nd	nd	nd	bdl
696368	bdl	nd	bdl	nd	nd	nd	nd	8.85	nd	nd	nd	nd	nd	nd
696369	0.02	nd	bdl	nd	bdl	nd	bdl	15.58	nd	nd	nd	nd	nd	nd
696370	nd	nd	nd	nd	nd	nd	nd	0.33	nd	nd	nd	nd	nd	bdl
696371	nd	nd	nd	nd	nd	nd	nd	0.46	nd	nd	nd	nd	nd	bdl
696372	0.43	nd	0.07	nd	nd	nd	bdl	35.56	nd	nd	nd	nd	nd	nd
696373	0.16	nd	0.04	nd	nd	nd	nd	21.52	nd	nd	nd	nd	nd	nd
696374	nd	nd	nd	nd	nd	nd	nd	3.04	nd	nd	nd	nd	nd	nd
696375	nd	nd	0.02	nd	nd	nd	nd	18.56	nd	nd	nd	nd	nd	nd
696376	nd	nd	nd	nd	nd	nd	bdl	0.07	nd	nd	nd	nd	nd	bdl
696377	0.14	nd	0.11	nd	nd	nd	nd	17.55	nd	nd	nd	nd	nd	nd
696378	0.06	nd	0.06	nd	nd	nd	nd	7.21	nd	nd	nd	nd	nd	bdl
696379	bdl	nd	bdl	nd	nd	nd	bdl	0.51	nd	nd	nd	nd	nd	bdl
696380	0.16	nd	0.08	nd	nd	nd	nd	2.57	nd	nd	nd	nd	bdl	bdl
696381	nd	nd	nd	nd	nd	nd	nd	1.84	nd	nd	nd	nd	nd	bdl
696382	nd	nd	bdl	nd	nd	nd	bdl	16.18	nd	nd	nd	nd	nd	nd
696383	nd	nd	nd	nd	nd	nd	nd	10.20	nd	nd	nd	bdl	nd	nd
696384	0.33	nd	0.05	nd	bdl	nd	bdl	60.63	bdl	nd	nd	nd	nd	nd
696385	0.94	nd	0.13	nd	nd	nd	nd	30.82	nd	nd	nd	nd	nd	bdl
696386	nd	nd	nd	nd	nd	nd	nd	0.81	nd	nd	nd	nd	nd	bdl
696387	0.08	nd	bdl	nd	nd	nd	bdl	3.94	nd	nd	nd	nd	nd	nd
696388	0.03	nd	bdl	nd	nd	nd	bdl	14.51	nd	nd	nd	nd	nd	nd
696389	0.02	nd	bdl	nd	nd	nd	nd	53.26	nd	nd	nd	nd	nd	nd
696390	nd	nd	nd	nd	nd	nd	nd	21.43	nd	nd	nd	nd	nd	bdl
696391	nd	nd	nd	nd	nd	nd	nd	7.08	nd	nd	nd	nd	nd	nd
696392	nd	nd	0.07	nd	nd	nd	nd	3.41	nd	nd	nd	nd	nd	bdl

No RL(Reporting Limit) is available for summed analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
NAVARRO RESEARCH AND ENGINEERING INC, OAK RIDGE, TN
GORE STANDARD TARGET VOCs/SVOCs AND FREON TICS (SCREENING + TICS)
WSTF-NASA, NM
PRODUCTION ORDER # 21815026

SAMPLE NAME	TCE, ug	OCT, ug	PCE, ug	14DCB, ug	Acenaphthene, ug	Acenaphthylene, ug	Fluorene, ug	Freon113	Freon123	Freon123A	VC, ug	11DCE, ug	CHCl3, ug	CCl4, ug
RL=	0.02	0.02	0.02	0.02	0.05	0.05	0.05	0.05	0.05	0.05	0.20	0.02	0.02	0.02
696393	0.76	nd	0.24	nd	nd	nd	nd	19.01	nd	nd	nd	nd	nd	bdl
696394	6.56	nd	0.78	nd	nd	nd	nd	9.39	nd	nd	nd	nd	bdl	nd
696395	1.37	nd	0.16	nd	nd	nd	nd	12.35	nd	nd	nd	nd	bdl	nd
696396	0.28	nd	0.06	nd	nd	nd	nd	1.52	nd	nd	nd	nd	nd	bdl
696397	0.09	nd	0.15	nd	nd	nd	nd	2.44	nd	nd	nd	nd	nd	bdl
696398	0.04	nd	0.03	nd	bdl	nd	bdl	8.49	nd	nd	nd	nd	nd	bdl
696403	nd	nd	nd	nd	nd	nd	nd	26.08	nd	nd	nd	0.05	nd	nd
696404	bdl	nd	nd	nd	nd	nd	nd	40.71	nd	nd	nd	nd	nd	nd
696405	nd	nd	nd	nd	nd	nd	nd	5.50	nd	nd	nd	nd	nd	bdl
696406	0.07	nd	0.02	nd	nd	nd	nd	15.84	nd	nd	nd	nd	nd	bdl
696407	0.08	nd	bdl	nd	nd	nd	nd	20.90	nd	nd	nd	nd	nd	nd
696408	nd	nd	nd	nd	nd	nd	bdl	7.41	nd	nd	nd	nd	nd	bdl
696409	0.02	nd	bdl	nd	nd	nd	nd	56.02	nd	nd	nd	nd	nd	nd
696410	5.62	nd	0.81	nd	nd	nd	nd	42.13	nd	nd	nd	nd	nd	nd
696411	20.24	nd	1.68	nd	nd	nd	nd	30.04	nd	nd	nd	nd	bdl	nd
696412	0.38	nd	0.09	nd	nd	nd	nd	15.08	nd	nd	nd	nd	bdl	nd
696413	1.08	nd	0.11	nd	nd	nd	bdl	3.11	nd	nd	nd	nd	nd	bdl
696414	0.55	nd	0.11	nd	nd	nd	nd	7.74	nd	nd	nd	nd	nd	nd
696415	nd	nd	nd	nd	nd	nd	nd	0.10	nd	nd	nd	nd	nd	bdl
696416	0.05	nd	nd	nd	nd	nd	nd	2.06	nd	nd	nd	nd	nd	bdl
696417	nd	nd	nd	nd	nd	nd	nd	1.26	nd	nd	nd	nd	nd	bdl
696418	bdl	nd	bdl	nd	nd	nd	nd	0.57	nd	nd	nd	nd	nd	nd
696419	17.14	nd	1.47	nd	nd	nd	nd	19.32	nd	nd	nd	nd	bdl	nd
696420	4.52	nd	0.71	nd	nd	nd	nd	99.83	bdl	nd	nd	nd	nd	nd
696421	0.14	nd	bdl	nd	nd	nd	nd	36.16	nd	nd	nd	nd	nd	bdl
696422	nd	nd	nd	nd	nd	nd	nd	1.39	nd	nd	nd	nd	nd	bdl
696423	0.09	nd	0.02	nd	nd	nd	nd	21.64	nd	nd	nd	nd	nd	nd
696424	bdl	nd	0.02	nd	nd	nd	bdl	4.89	nd	nd	nd	nd	nd	bdl
696425	nd	nd	nd	nd	nd	nd	nd	0.99	nd	nd	nd	nd	nd	nd
696426	nd	nd	nd	nd	nd	nd	nd	4.08	nd	nd	nd	nd	nd	nd
696427	0.13	nd	0.03	nd	nd	nd	nd	38.66	nd	0.19	nd	0.07	bdl	nd
696428	0.08	nd	bdl	nd	nd	nd	nd	12.85	nd	nd	nd	nd	nd	bdl
696429	nd	nd	nd	nd	bdl	nd	bdl	3.68	nd	nd	nd	nd	nd	bdl
696430	bdl	nd	nd	nd	bdl	nd	bdl	16.19	bdl	nd	nd	nd	nd	bdl
696431	nd	nd	nd	nd	nd	nd	bdl	0.55	nd	nd	nd	nd	nd	nd
696432	nd	nd	nd	nd	nd	nd	nd	2.81	nd	nd	bdl	nd	nd	nd
696433	nd	nd	nd	nd	nd	nd	nd	0.91	nd	nd	nd	nd	nd	bdl
696434	bdl	nd	nd	nd	nd	nd	nd	4.10	nd	0.12	nd	nd	nd	bdl

No RL(Reporting Limit) is available for summed analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
NAVARRO RESEARCH AND ENGINEERING INC, OAK RIDGE, TN
GORE STANDARD TARGET VOCs/SVOCs AND FREON TICS (SCREENING + TICS)
WSTF-NASA, NM
PRODUCTION ORDER # 21815026

SAMPLE NAME	TCE, ug	OCT, ug	PCE, ug	14DCB, ug	Acenaphthene, ug	Acenaphthylene, ug	Fluorene, ug	Freon113	Freon123	Freon123A	VC, ug	11DCE, ug	CHCl3, ug	CCl4, ug
RL=	0.02	0.02	0.02	0.02	0.05	0.05	0.05	0.05	0.05	0.05	0.20	0.02	0.02	0.02
696435	0.09	bdl	0.02	nd	nd	nd	nd	29.62	bdl	nd	nd	nd	nd	nd
696436	5.79	nd	0.92	nd	nd	nd	nd	50.82	0.06	0.68	nd	nd	nd	nd
696437	nd	nd	0.03	nd	bdl	nd	bdl	0.49	nd	nd	nd	nd	nd	nd
696438	0.30	nd	0.10	nd	nd	nd	nd	3.57	nd	nd	nd	nd	nd	nd
696439	0.28	nd	0.09	nd	nd	nd	nd	1.96	nd	nd	nd	nd	nd	nd
696440	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696441	3.52	nd	0.66	nd	nd	nd	bdl	30.33	bdl	nd	nd	bdl	0.02	nd
696442	1.27	nd	0.10	nd	nd	nd	nd	5.76	nd	nd	nd	nd	bdl	bdl
696443	0.03	nd	bdl	nd	nd	nd	nd	24.29	nd	nd	nd	nd	nd	nd
696444	nd	nd	nd	nd	nd	nd	nd	0.32	nd	nd	nd	nd	nd	bdl
696445	nd	nd	nd	nd	bdl	nd	bdl	0.10	nd	nd	nd	nd	nd	bdl
696446	nd	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd	bdl
696451	nd	nd	nd	nd	nd	nd	nd	1.57	nd	nd	nd	nd	nd	nd
696452	nd	nd	nd	nd	bdl	nd	bdl	nd	nd	nd	nd	nd	nd	nd
696459	nd	nd	nd	nd	nd	nd	nd	0.51	nd	nd	nd	nd	nd	bdl
696460	0.07	nd	bdl	nd	nd	nd	nd	8.25	nd	nd	nd	nd	nd	bdl
696461	nd	nd	nd	nd	nd	nd	nd	0.53	0.05	0.69	nd	nd	nd	bdl
696462	1.37	nd	4.89	nd	nd	nd	bdl	6.81	nd	nd	nd	nd	nd	nd
696463	1.38	nd	0.39	nd	nd	nd	nd	1.97	nd	nd	nd	nd	nd	nd
696464	2.97	nd	0.37	nd	bdl	nd	bdl	3.95	nd	nd	nd	nd	nd	nd
696465	bdl	nd	bdl	nd	nd	nd	nd	0.21	nd	nd	nd	nd	nd	bdl
696466	0.37	nd	0.10	nd	nd	nd	nd	1.43	nd	nd	nd	nd	nd	bdl
696467	0.36	nd	0.05	nd	bdl	nd	bdl	0.26	nd	nd	nd	nd	nd	nd
696468	7.13	nd	1.02	nd	nd	nd	bdl	4.04	nd	0.11	nd	0.06	nd	nd
696469	nd	nd	nd	nd	nd	nd	nd	0.45	nd	nd	nd	nd	nd	nd
696470	nd	nd	nd	nd	nd	nd	nd	0.14	nd	nd	nd	nd	nd	bdl
696471	nd	nd	nd	nd	nd	nd	nd	0.09	nd	nd	nd	nd	nd	bdl
696472	nd	nd	nd	nd	nd	nd	nd	0.06	nd	nd	nd	nd	nd	bdl
696473	nd	nd	nd	nd	nd	nd	nd	0.11	nd	nd	nd	nd	nd	nd
696474	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl
696475	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl
696476	nd	nd	nd	nd	nd	nd	nd	0.06	nd	nd	nd	nd	nd	nd
696477	bdl	nd	nd	nd	nd	nd	nd	0.22	nd	nd	nd	nd	nd	nd
696478	10.36	nd	1.70	nd	nd	nd	nd	18.00	nd	nd	nd	0.13	0.05	nd
696479	8.45	nd	1.01	nd	nd	nd	nd	5.96	nd	nd	nd	0.05	bdl	nd
696480	0.14	nd	0.03	nd	nd	nd	nd	0.59	nd	nd	nd	nd	nd	bdl
696481	0.13	nd	0.02	nd	nd	nd	nd	0.43	nd	nd	nd	nd	nd	bdl
696482	39.45	nd	4.73	nd	nd	nd	nd	18.00	nd	nd	nd	0.16	0.02	nd

No RL(Reporting Limit) is available for summed analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
NAVARRO RESEARCH AND ENGINEERING INC, OAK RIDGE, TN
GORE STANDARD TARGET VOCs/SVOCs AND FREON TICS (SCREENING + TICS)
WSTF-NASA, NM
PRODUCTION ORDER # 21815026

SAMPLE NAME	TCE, ug	OCT, ug	PCE, ug	14DCB, ug	Acenaphthene, ug	Acenaphthylene, ug	Fluorene, ug	Freon113	Freon123	Freon123A	VC, ug	11DCE, ug	CHCl3, ug	CCl4, ug
RL=	0.02	0.02	0.02	0.02	0.05	0.05	0.05	0.05	0.05	0.05	0.20	0.02	0.02	0.02
696483	0.10	nd	0.05	nd	nd	nd	bdl	3.65	nd	nd	bdl	nd	nd	nd
696484	nd	nd	nd	nd	nd	nd	nd	0.12	nd	nd	nd	nd	nd	nd
696485	nd	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd	nd
696486	nd	nd	nd	nd	bdl	nd	bdl	nd	nd	nd	nd	nd	nd	bdl
696487	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl
696488	nd	nd	nd	nd	nd	nd	nd	0.30	nd	nd	nd	nd	nd	bdl
696489	nd	nd	nd	nd	bdl	nd	bdl	0.26	nd	nd	nd	nd	nd	bdl
696490	nd	nd	nd	nd	bdl	bdl	bdl	nd	nd	nd	nd	nd	nd	nd
696491	nd	nd	nd	nd	bdl	nd	bdl	nd	nd	nd	nd	nd	nd	bdl
696492	nd	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd	bdl
696493	nd	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd	nd
696494	0.07	nd	0.06	nd	bdl	nd	bdl	3.05	nd	bdl	nd	nd	bdl	bdl
696495	1.18	nd	0.32	nd	nd	nd	nd	6.33	nd	bdl	nd	bdl	bdl	nd
696496	0.61	nd	0.16	nd	nd	nd	nd	1.68	nd	nd	nd	nd	nd	bdl
696497	0.12	nd	0.04	nd	nd	nd	bdl	4.47	nd	nd	nd	nd	bdl	nd
696498	0.18	nd	0.09	nd	nd	nd	nd	10.88	nd	0.09	nd	nd	bdl	nd
696499	bdl	nd	nd	nd	nd	nd	nd	0.86	nd	nd	nd	nd	nd	bdl
696500	nd	nd	nd	nd	nd	nd	bdl	0.05	nd	nd	nd	nd	nd	nd
696505	nd	nd	nd	nd	bdl	nd	bdl	0.08	nd	nd	nd	nd	nd	nd
696506	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696507	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl
696512	nd	nd	nd	nd	bdl	nd	bdl	0.31	nd	nd	nd	nd	nd	nd
696513	bdl	nd	nd	nd	nd	nd	nd	0.33	nd	nd	nd	nd	nd	bdl
696514	0.03	nd	nd	nd	nd	nd	nd	1.25	nd	nd	nd	nd	bdl	nd
696515	0.98	nd	0.46	nd	nd	nd	nd	10.09	nd	nd	nd	nd	bdl	nd
696516	0.73	nd	0.34	nd	nd	nd	nd	14.42	nd	nd	nd	nd	bdl	bdl
696517	0.04	nd	0.07	nd	nd	nd	bdl	9.09	nd	nd	nd	nd	nd	nd
696518	0.17	nd	0.06	nd	nd	nd	nd	6.28	nd	nd	nd	nd	bdl	nd
696519	0.08	nd	bdl	nd	nd	nd	nd	1.14	nd	bdl	nd	nd	nd	bdl
696520	nd	nd	nd	nd	nd	nd	bdl	0.34	nd	nd	nd	nd	nd	bdl
696525	bdl	nd	bdl	nd	nd	nd	nd	12.00	nd	nd	nd	nd	nd	nd
696526	0.04	nd	0.11	nd	nd	nd	nd	12.22	nd	nd	nd	nd	nd	nd
696527	nd	nd	nd	nd	nd	nd	nd	1.08	nd	nd	nd	nd	nd	nd
696528	bdl	nd	bdl	nd	nd	nd	nd	0.40	nd	nd	nd	nd	bdl	nd
696529	bdl	nd	0.02	nd	nd	nd	nd	2.01	nd	nd	nd	nd	nd	nd
696530	0.07	nd	0.07	nd	nd	nd	nd	3.60	nd	nd	nd	nd	nd	bdl
696531	bdl	nd	nd	nd	nd	nd	nd	5.61	nd	nd	nd	nd	nd	bdl
696532	nd	nd	nd	nd	nd	nd	nd	0.12	nd	nd	nd	nd	nd	nd

No RL(Reporting Limit) is available for summed analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
NAVARRO RESEARCH AND ENGINEERING INC, OAK RIDGE, TN
GORE STANDARD TARGET VOCs/SVOCs AND FREON TICS (SCREENING + TICS)
WSTF-NASA, NM
PRODUCTION ORDER # 21815026

SAMPLE NAME	TCE, ug	OCT, ug	PCE, ug	14DCB, ug	Acenaphthene, ug	Acenaphthylene, ug	Fluorene, ug	Freon113	Freon123	Freon123A	VC, ug	11DCE, ug	CHCl3, ug	CCl4, ug
RL=	0.02	0.02	0.02	0.02	0.05	0.05	0.05	0.05	0.05	0.05	0.20	0.02	0.02	0.02
696533	bdl	nd	nd	nd	nd	nd	nd	0.13	nd	nd	nd	nd	bdl	bdl
696534	nd	nd	nd	nd	nd	nd	bdl	0.06	nd	nd	nd	nd	nd	nd
696535	nd	nd	nd	nd	nd	nd	nd	0.68	nd	nd	nd	nd	nd	nd
696536	bdl	nd	bdl	nd	nd	nd	nd	1.27	nd	nd	nd	nd	nd	nd
696537	nd	nd	nd	nd	nd	nd	nd	2.95	nd	nd	nd	nd	nd	nd
696538	nd	nd	nd	nd	nd	nd	nd	1.02	nd	nd	nd	nd	bdl	nd
696539	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696541	0.04	nd	nd	nd	nd	nd	nd	0.11	nd	nd	nd	nd	nd	nd
696542	0.07	nd	nd	nd	nd	nd	bdl	0.23	nd	nd	nd	nd	nd	nd
696543	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696544	0.04	nd	nd	nd	nd	nd	nd	2.19	nd	nd	nd	nd	nd	nd
696545	0.11	nd	bdl	nd	nd	nd	bdl	2.23	nd	nd	nd	nd	nd	nd
696546	6.29	nd	0.91	nd	nd	nd	nd	0.34	nd	nd	nd	0.02	nd	nd
696547	3.16	nd	0.44	nd	nd	nd	nd	0.16	nd	nd	nd	bdl	nd	nd
696548	3.46	nd	0.41	nd	nd	nd	nd	4.88	bdl	nd	nd	0.03	0.04	nd
696549	2.34	nd	0.93	nd	nd	nd	nd	11.68	bdl	nd	nd	nd	nd	nd
696553	0.39	nd	0.29	nd	bdl	nd	bdl	0.84	nd	nd	nd	nd	0.04	nd
696554	0.28	nd	0.31	nd	nd	nd	nd	1.25	nd	nd	nd	nd	0.03	nd
696555	126.38	0.03	0.08	nd	nd	nd	bdl	57.72	0.06	nd	nd	0.85	0.14	0.02
696556	0.03	nd	nd	nd	nd	bdl	bdl	3.07	nd	nd	nd	nd	nd	0.03
696557	0.04	nd	nd	nd	bdl	nd	bdl	5.61	nd	nd	nd	nd	nd	nd
696558	123.13	0.02	39.91	nd	bdl	bdl	bdl	128.24	nd	nd	nd	0.06	nd	nd
696559	169.25	bdl	130.06	nd	nd	nd	nd	130.33	bdl	nd	nd	0.59	bdl	nd
696560	3.71	0.07	0.16	nd	bdl	bdl	bdl	31.51	nd	nd	nd	nd	bdl	0.07
696561	28.64	bdl	1.18	nd	nd	bdl	bdl	115.22	nd	nd	nd	0.26	0.03	bdl
696562	0.07	0.15	bdl	bdl	bdl	bdl	bdl	28.93	nd	nd	nd	0.03	nd	0.05
696563	0.22	0.03	bdl	bdl	nd	nd	nd	6.25	nd	nd	nd	nd	bdl	0.07
696564	0.29	bdl	nd	bdl	nd	nd	bdl	4.06	nd	nd	nd	nd	bdl	0.07
696565	1.62	0.03	nd	nd	bdl	bdl	bdl	16.32	nd	nd	nd	nd	bdl	0.05
696566	80.99	bdl	0.13	bdl	nd	bdl	bdl	77.68	0.05	0.38	nd	0.54	0.03	nd
696567	1.60	0.02	nd	nd	bdl	bdl	bdl	21.37	nd	nd	nd	nd	0.03	0.05
696568	nd	nd	nd	nd	bdl	nd	bdl	0.09	nd	nd	nd	nd	nd	nd
696399	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696400	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696401	nd	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd	nd
696402	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696447	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd

No RL(Reporting Limit) is available for summed analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
NAVARRO RESEARCH AND ENGINEERING INC, OAK RIDGE, TN
GORE STANDARD TARGET VOCs/SVOCs AND FREON TICS (SCREENING + TICS)
WSTF-NASA, NM
PRODUCTION ORDER # 21815026

SAMPLE NAME	TCE, ug	OCT, ug	PCE, ug	14DCB, ug	Acenaphthene, ug	Acenaphthylene, ug	Fluorene, ug	Freon113	Freon123	Freon123A	VC, ug	11DCE, ug	CHCl3, ug	CCl4, ug
RL=	0.02	0.02	0.02	0.02	0.05	0.05	0.05	0.05	0.05	0.05	0.20	0.02	0.02	0.02
696448	nd	nd	nd	nd	bdl	nd	bdl	nd	nd	nd	nd	nd	nd	nd
696449	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696450	0.27	nd	0.07	nd	nd	nd	bdl	3.23	nd	nd	nd	nd	nd	bdl
696501	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696502	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696503	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696504	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696540	nd	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd	nd
696550	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696551	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696552	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	bdl	nd	bdl	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	bdl	nd	bdl	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	bdl	nd	bdl	nd	nd	nd	nd	nd	nd	nd

No RL(Reporting Limit) is available for summed analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
NAVARRO RESEARCH AND ENGINEERING INC, OAK RIDGE, TN
GORE STANDARD TARGET VOCs/SVOCs AND FREON TICS (SCREENING + TICS)
WSTF-NASA, NM
PRODUCTION ORDER # 21815026

SAMPLE NAME	112TCA, ug	ClBENZ, ug	1112TetCA, ug	1122TetCA, ug	13DCB, ug	12DCB, ug
RL=	0.02	0.02	0.02	0.02	0.02	0.02
696355	nd	nd	nd	nd	nd	nd
696356	nd	nd	nd	nd	nd	nd
696357	nd	nd	nd	nd	nd	nd
696358	nd	nd	nd	nd	nd	nd
696359	nd	nd	nd	nd	nd	nd
696360	nd	nd	nd	nd	nd	nd
696361	nd	nd	nd	nd	nd	nd
696362	nd	nd	nd	nd	nd	nd
696363	nd	nd	nd	nd	nd	nd
696364	nd	nd	nd	nd	nd	nd
696365	nd	nd	nd	nd	nd	nd
696366	nd	nd	nd	nd	nd	nd
696367	nd	nd	nd	nd	nd	nd
696368	nd	nd	nd	nd	nd	nd
696369	nd	nd	nd	nd	nd	nd
696370	nd	nd	nd	nd	nd	nd
696371	nd	nd	nd	nd	nd	nd
696372	nd	nd	nd	nd	nd	nd
696373	nd	nd	nd	nd	nd	nd
696374	nd	nd	nd	nd	nd	nd
696375	nd	nd	nd	nd	nd	nd
696376	nd	nd	nd	nd	nd	nd
696377	nd	nd	nd	nd	nd	nd
696378	nd	nd	nd	nd	nd	nd
696379	nd	nd	nd	nd	nd	nd
696380	nd	nd	nd	nd	nd	nd
696381	nd	nd	nd	nd	nd	nd
696382	nd	nd	nd	nd	nd	nd
696383	nd	nd	nd	nd	nd	nd
696384	nd	nd	nd	nd	nd	nd
696385	nd	nd	nd	nd	nd	nd
696386	nd	nd	nd	nd	nd	nd
696387	nd	nd	nd	nd	nd	nd
696388	nd	nd	nd	nd	nd	nd
696389	nd	nd	nd	nd	nd	nd
696390	nd	nd	nd	nd	nd	nd
696391	nd	nd	nd	nd	nd	nd
696392	nd	nd	nd	nd	nd	nd

No RL(Reporting Limit) is available for summed analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
NAVARRO RESEARCH AND ENGINEERING INC, OAK RIDGE, TN
GORE STANDARD TARGET VOCs/SVOCs AND FREON TICS (SCREENING + TICS)
WSTF-NASA, NM
PRODUCTION ORDER # 21815026

SAMPLE NAME	112TCA, ug	ClBENZ, ug	1112TetCA, ug	1122TetCA, ug	13DCB, ug	12DCB, ug
RL=	0.02	0.02	0.02	0.02	0.02	0.02
696393	nd	nd	nd	nd	nd	nd
696394	nd	nd	nd	nd	nd	nd
696395	nd	nd	nd	nd	nd	nd
696396	nd	nd	nd	nd	nd	nd
696397	nd	nd	nd	nd	nd	nd
696398	nd	nd	nd	nd	nd	nd
696403	nd	nd	nd	nd	nd	nd
696404	nd	nd	nd	nd	nd	nd
696405	nd	nd	nd	nd	nd	nd
696406	nd	nd	nd	nd	nd	nd
696407	nd	nd	nd	nd	nd	nd
696408	nd	nd	nd	nd	nd	nd
696409	nd	nd	nd	nd	nd	nd
696410	nd	nd	nd	nd	nd	nd
696411	nd	nd	nd	nd	nd	nd
696412	nd	nd	nd	nd	nd	nd
696413	nd	nd	nd	nd	nd	nd
696414	nd	nd	nd	nd	nd	nd
696415	nd	nd	nd	nd	nd	nd
696416	nd	nd	nd	nd	nd	nd
696417	nd	nd	nd	nd	nd	nd
696418	nd	nd	nd	nd	nd	nd
696419	nd	nd	nd	nd	nd	nd
696420	nd	nd	nd	nd	nd	nd
696421	nd	nd	nd	nd	nd	nd
696422	nd	nd	nd	nd	nd	nd
696423	nd	nd	nd	nd	nd	nd
696424	nd	nd	nd	nd	nd	nd
696425	nd	nd	nd	nd	nd	nd
696426	nd	nd	nd	nd	nd	nd
696427	nd	nd	nd	nd	nd	nd
696428	nd	nd	nd	nd	nd	nd
696429	nd	nd	nd	nd	nd	nd
696430	nd	nd	nd	nd	nd	nd
696431	nd	nd	nd	nd	nd	nd
696432	nd	nd	nd	nd	nd	nd
696433	nd	nd	nd	nd	nd	nd
696434	nd	bdl	nd	nd	nd	nd

No RL(Reporting Limit) is available for summed analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
NAVARRO RESEARCH AND ENGINEERING INC, OAK RIDGE, TN
GORE STANDARD TARGET VOCs/SVOCs AND FREON TICS (SCREENING + TICS)
WSTF-NASA, NM
PRODUCTION ORDER # 21815026

SAMPLE NAME	112TCA, ug	ClBENZ, ug	1112TetCA, ug	1122TetCA, ug	13DCB, ug	12DCB, ug
RL=	0.02	0.02	0.02	0.02	0.02	0.02
696435	nd	nd	nd	nd	nd	nd
696436	nd	nd	nd	nd	nd	nd
696437	nd	nd	nd	nd	nd	nd
696438	nd	nd	nd	nd	nd	nd
696439	nd	nd	nd	nd	nd	nd
696440	nd	nd	nd	nd	nd	nd
696441	nd	nd	nd	nd	nd	nd
696442	nd	nd	nd	nd	nd	nd
696443	nd	nd	nd	nd	nd	nd
696444	nd	nd	nd	nd	nd	nd
696445	nd	nd	nd	nd	nd	nd
696446	nd	nd	nd	nd	nd	nd
696451	nd	nd	nd	nd	nd	nd
696452	nd	nd	nd	nd	nd	nd
696459	nd	nd	nd	nd	nd	nd
696460	nd	nd	nd	nd	nd	nd
696461	nd	nd	nd	nd	nd	nd
696462	nd	nd	nd	nd	nd	nd
696463	nd	nd	nd	nd	nd	nd
696464	nd	nd	nd	nd	nd	nd
696465	nd	nd	nd	nd	nd	nd
696466	nd	nd	nd	nd	nd	nd
696467	nd	nd	nd	nd	nd	nd
696468	nd	nd	nd	nd	nd	nd
696469	nd	nd	nd	nd	nd	nd
696470	nd	nd	nd	nd	nd	nd
696471	nd	nd	nd	nd	nd	nd
696472	nd	nd	nd	nd	nd	nd
696473	nd	nd	nd	nd	nd	nd
696474	nd	nd	nd	nd	nd	nd
696475	nd	nd	nd	nd	nd	nd
696476	nd	nd	nd	nd	nd	nd
696477	nd	nd	nd	nd	nd	nd
696478	nd	nd	nd	nd	nd	nd
696479	nd	nd	nd	nd	nd	nd
696480	nd	nd	nd	nd	nd	nd
696481	nd	nd	nd	nd	nd	nd
696482	nd	nd	nd	nd	nd	nd

No RL(Reporting Limit) is available for summed analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
NAVARRO RESEARCH AND ENGINEERING INC, OAK RIDGE, TN
GORE STANDARD TARGET VOCs/SVOCs AND FREON TICS (SCREENING + TICS)
WSTF-NASA, NM
PRODUCTION ORDER # 21815026

SAMPLE NAME	112TCA, ug	ClBENZ, ug	1112TetCA, ug	1122TetCA, ug	13DCB, ug	12DCB, ug
RL=	0.02	0.02	0.02	0.02	0.02	0.02
696483	nd	nd	nd	nd	nd	nd
696484	nd	nd	nd	nd	nd	nd
696485	nd	nd	nd	nd	nd	nd
696486	nd	nd	nd	nd	nd	nd
696487	nd	nd	nd	nd	nd	nd
696488	nd	nd	nd	nd	nd	nd
696489	nd	nd	nd	nd	nd	nd
696490	nd	nd	nd	nd	nd	nd
696491	nd	nd	nd	nd	nd	nd
696492	nd	nd	nd	nd	nd	nd
696493	nd	nd	nd	nd	nd	nd
696494	nd	nd	nd	nd	nd	nd
696495	nd	nd	nd	nd	nd	nd
696496	nd	nd	nd	nd	nd	nd
696497	nd	nd	nd	nd	nd	nd
696498	nd	nd	nd	nd	nd	nd
696499	nd	nd	nd	nd	nd	nd
696500	nd	nd	nd	nd	nd	nd
696505	nd	nd	nd	nd	nd	nd
696506	nd	nd	nd	nd	nd	nd
696507	nd	nd	nd	nd	nd	nd
696512	nd	nd	nd	nd	nd	nd
696513	nd	nd	nd	nd	nd	nd
696514	nd	nd	nd	nd	nd	nd
696515	nd	nd	nd	nd	nd	nd
696516	nd	nd	nd	nd	nd	nd
696517	nd	nd	nd	nd	nd	nd
696518	nd	nd	nd	nd	nd	nd
696519	nd	nd	nd	nd	nd	nd
696520	nd	nd	nd	nd	nd	nd
696525	nd	nd	nd	nd	nd	nd
696526	nd	bdl	nd	nd	nd	nd
696527	nd	nd	nd	nd	nd	nd
696528	nd	nd	nd	nd	nd	nd
696529	nd	nd	nd	nd	nd	nd
696530	nd	nd	nd	nd	nd	nd
696531	nd	nd	nd	nd	nd	nd
696532	nd	nd	nd	nd	nd	nd

No RL(Reporting Limit) is available for summed analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
NAVARRO RESEARCH AND ENGINEERING INC, OAK RIDGE, TN
GORE STANDARD TARGET VOCs/SVOCs AND FREON TICS (SCREENING + TICS)
WSTF-NASA, NM
PRODUCTION ORDER # 21815026

SAMPLE NAME	112TCA, ug	ClBENZ, ug	1112TetCA, ug	1122TetCA, ug	13DCB, ug	12DCB, ug
RL=	0.02	0.02	0.02	0.02	0.02	0.02
696533	nd	nd	nd	nd	nd	nd
696534	nd	nd	nd	nd	nd	nd
696535	nd	nd	nd	nd	nd	nd
696536	nd	nd	nd	nd	nd	nd
696537	nd	nd	nd	nd	nd	nd
696538	nd	nd	nd	nd	nd	nd
696539	nd	nd	nd	nd	nd	nd
696541	nd	nd	nd	nd	nd	nd
696542	nd	nd	nd	nd	nd	nd
696543	nd	nd	nd	nd	nd	nd
696544	nd	nd	nd	nd	nd	nd
696545	nd	nd	nd	nd	nd	nd
696546	nd	nd	nd	nd	nd	nd
696547	nd	nd	nd	nd	nd	nd
696548	nd	nd	nd	nd	nd	nd
696549	nd	nd	nd	nd	nd	nd
696553	nd	nd	nd	nd	nd	nd
696554	nd	nd	nd	nd	nd	nd
696555	nd	nd	nd	nd	nd	nd
696556	nd	nd	nd	nd	nd	nd
696557	nd	nd	nd	nd	nd	nd
696558	nd	nd	nd	nd	nd	bdl
696559	bdl	nd	0.03	nd	nd	0.05
696560	nd	nd	nd	bdl	nd	nd
696561	nd	nd	nd	nd	nd	nd
696562	nd	nd	nd	nd	nd	nd
696563	nd	nd	nd	nd	nd	nd
696564	nd	nd	nd	nd	nd	nd
696565	nd	nd	nd	nd	nd	nd
696566	nd	nd	nd	nd	nd	nd
696567	nd	nd	nd	nd	nd	nd
696568	nd	nd	nd	nd	nd	nd
696399	nd	nd	nd	nd	nd	nd
696400	nd	nd	nd	nd	nd	nd
696401	nd	nd	nd	nd	nd	nd
696402	nd	nd	nd	nd	nd	nd
696447	nd	nd	nd	nd	nd	nd

No RL(Reporting Limit) is available for summed analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
NAVARRO RESEARCH AND ENGINEERING INC, OAK RIDGE, TN
GORE STANDARD TARGET VOCs/SVOCs AND FREON TICS (SCREENING + TICS)
WSTF-NASA, NM
PRODUCTION ORDER # 21815026

SAMPLE NAME	112TCA, ug	ClBENZ, ug	1112TetCA, ug	1122TetCA, ug	13DCB, ug	12DCB, ug
RL=	0.02	0.02	0.02	0.02	0.02	0.02
696448	nd	nd	nd	nd	nd	nd
696449	nd	nd	nd	nd	nd	nd
696450	nd	nd	nd	nd	nd	nd
696501	nd	nd	nd	nd	nd	nd
696502	nd	nd	nd	nd	nd	nd
696503	nd	nd	nd	nd	nd	nd
696504	nd	nd	nd	nd	nd	nd
696540	nd	nd	nd	nd	nd	nd
696550	nd	nd	nd	nd	nd	nd
696551	nd	nd	nd	nd	nd	nd
696552	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd

No RL(Reporting Limit) is available for summed analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

KEY TO DATA TABLE

UNITS

µg	micrograms, relative mass value
RL	reporting limit
bdl	below reporting limit; compound was observed at level below the RL
nd	non-detect, compound was not detected at any level

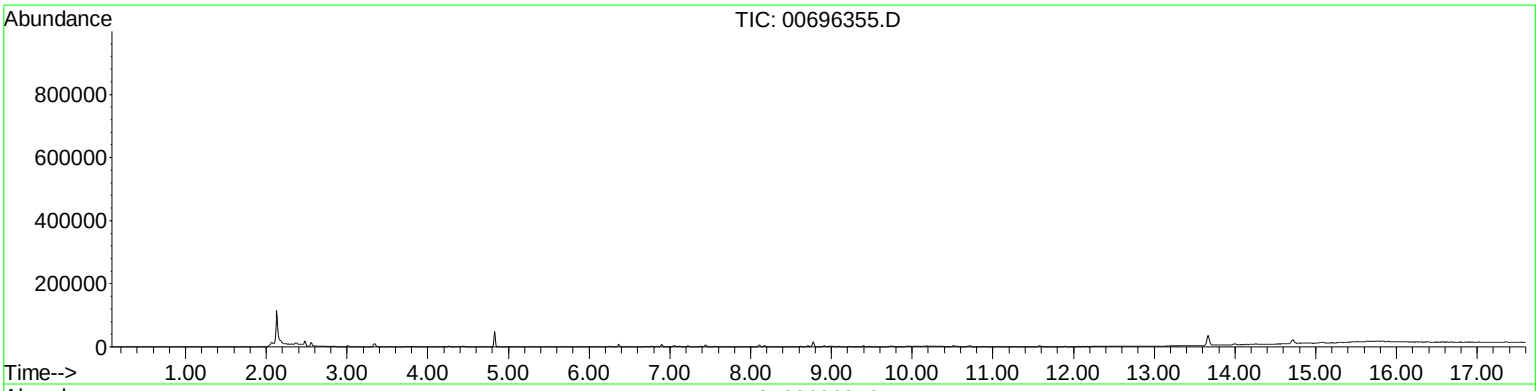
ANALYTES

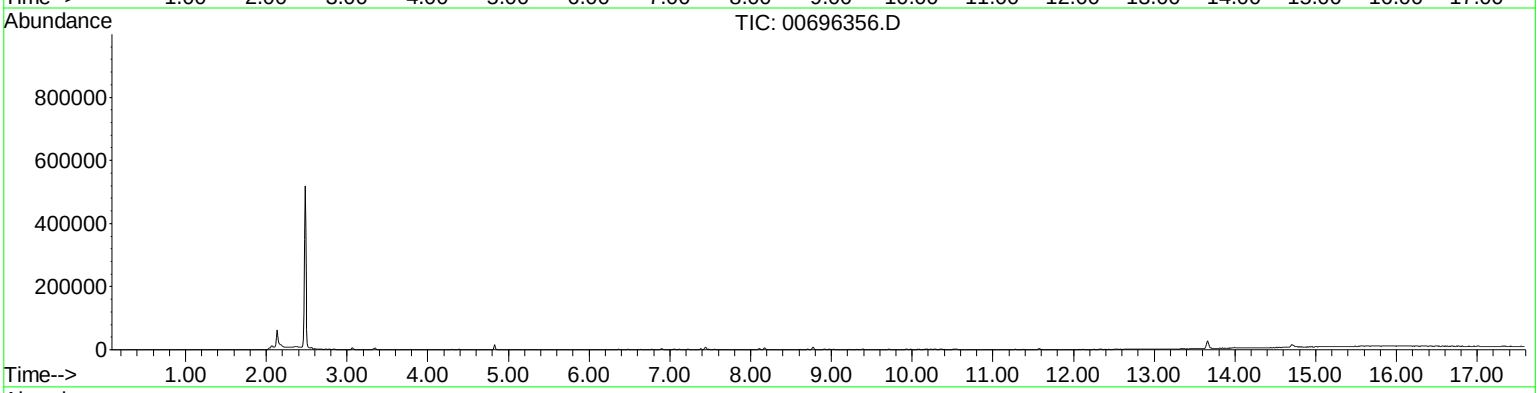
TPH	total petroleum hydrocarbons
BTEX	combined masses of benzene, toluene, ethylbenzene and total xylenes (Gasoline Range Aromatics)
BENZ	benzene
TOL	toluene
EtBENZ	ethylbenzene
mpXYL	m-, p-xylene
oXYL	o-xylene
C11,C13&C15	combined masses of undecane, tridecane, and pentadecane (C11+C13+C15) (Diesel Range Alkanes)
UNDEC	undecane
TRIDEC	tridecane
PENTADEC	pentadecane
TMBs	combined masses of 1,3,5-trimethylbenzene and 1,2,4-trimethylbenzene
135TMB	1,3,5-trimethylbenzene
124TMB	1,2,4-trimethylbenzene
MTBE	methyl t-butyl ether
PHEN	phenanthrene
NAPH	naphthalene
2MeNAPH	2-methyl naphthalene
OCT	octane
ct12DCE	cis- & trans-1,2-dichloroethene
t12DCE	trans-1,2-dichloroethene
c12DCE	cis-1,2-dichloroethene
11DCA	1,1-dichloroethane
CHC13	chloroform
111TCA	1,1,1-trichloroethane
12DCA	1,2-dichloroethane
CCl4	carbon tetrachloride
TCE	trichloroethene
PCE	tetrachloroethene
ClBENZ	chlorobenzene
14DCB	1,4-dichlorobenzene
112TCA	1,1,2-trichloroethane
1112TetCA	1,1,1,2-tetrachloroethane
1122TetCA	1,1,2,2-tetrachloroethane
13DCB	1,3-dichlorobenzene
12DCB	1,2-dichlorobenzene
11DCE	1,1-dichloroethene

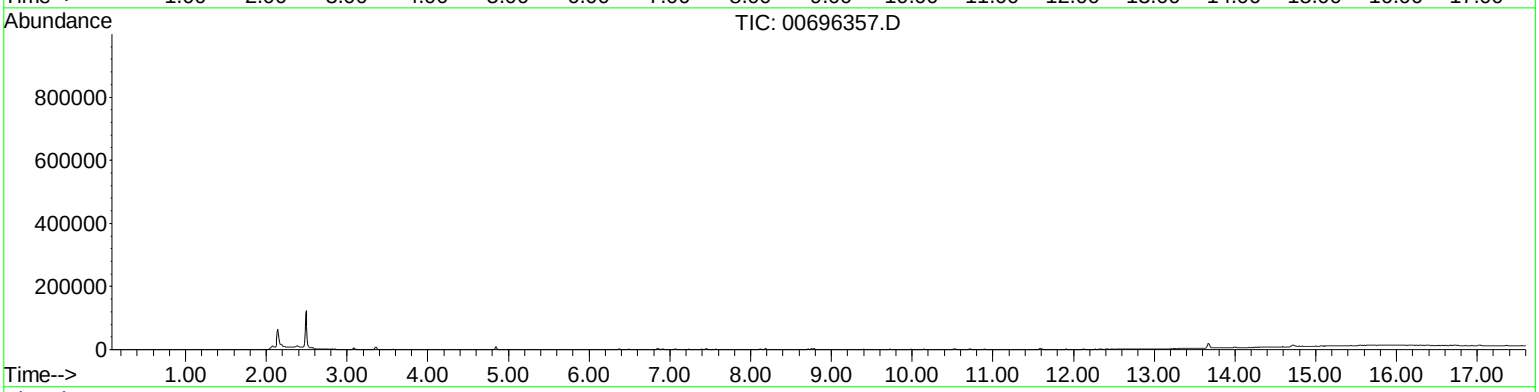
BLANKS

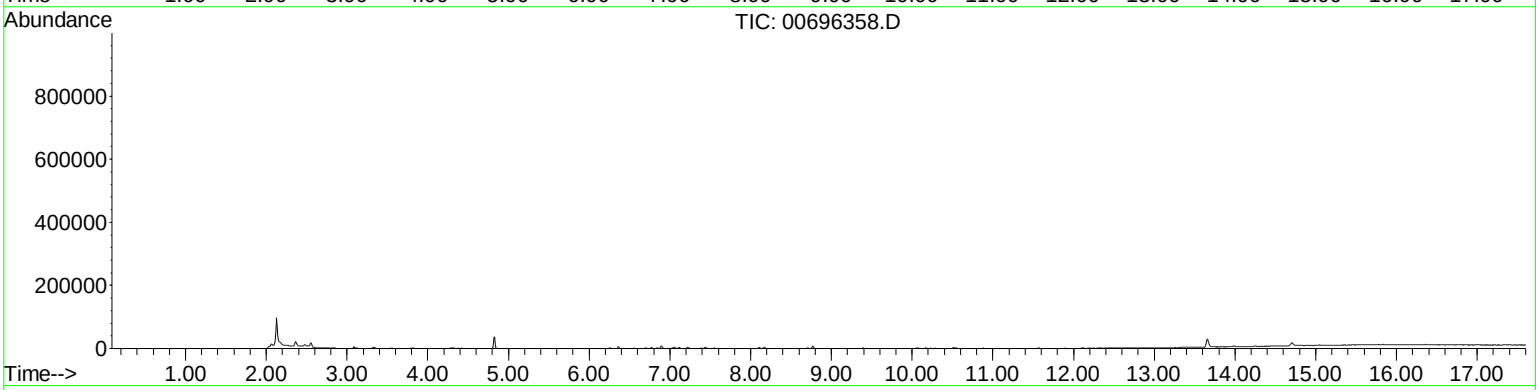
method blank	QA/QC module, documents analytical conditions during analysis

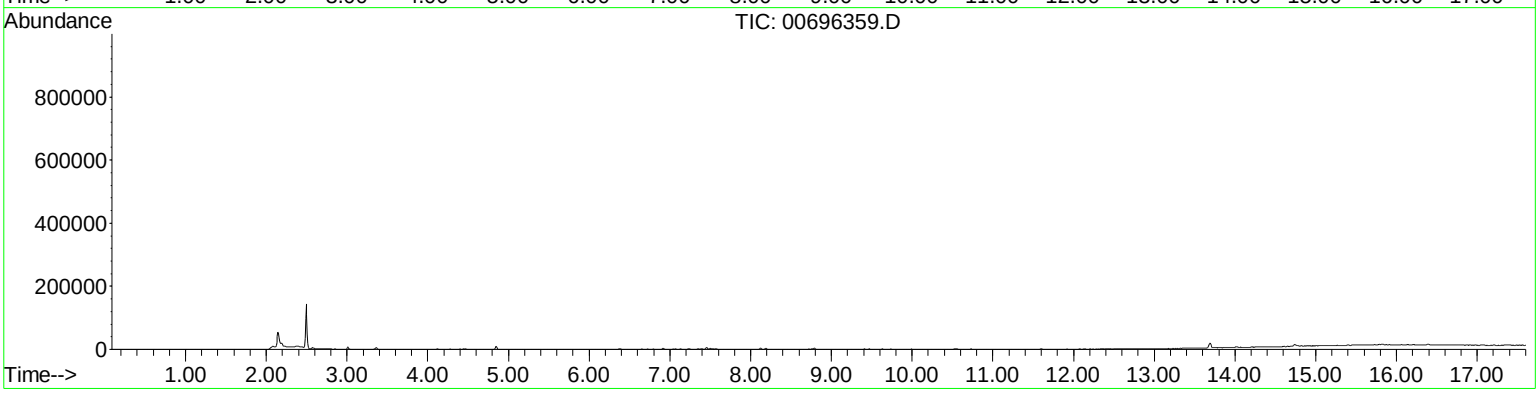
TICS 21815026-2
IN NUMERICAL ORDER



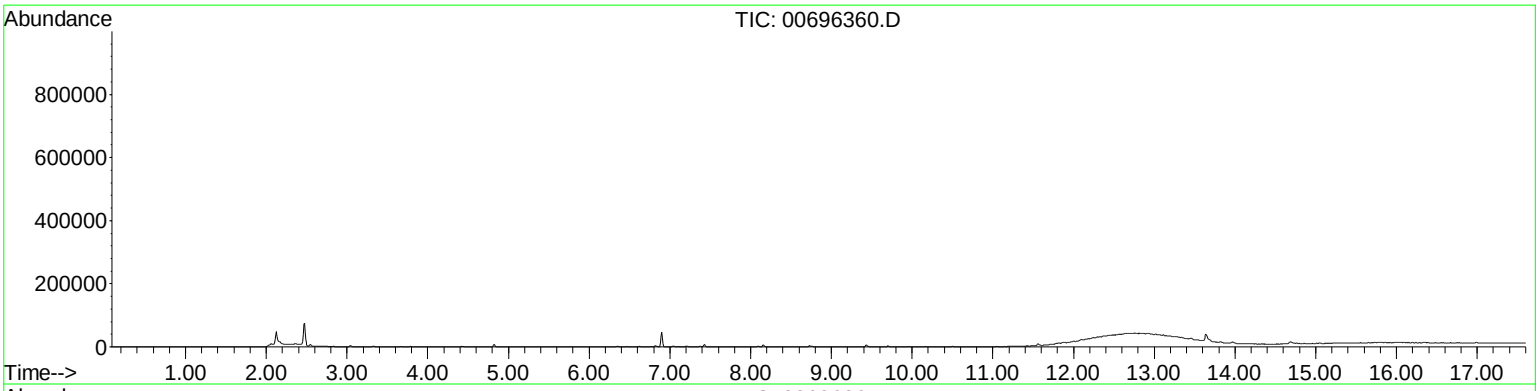


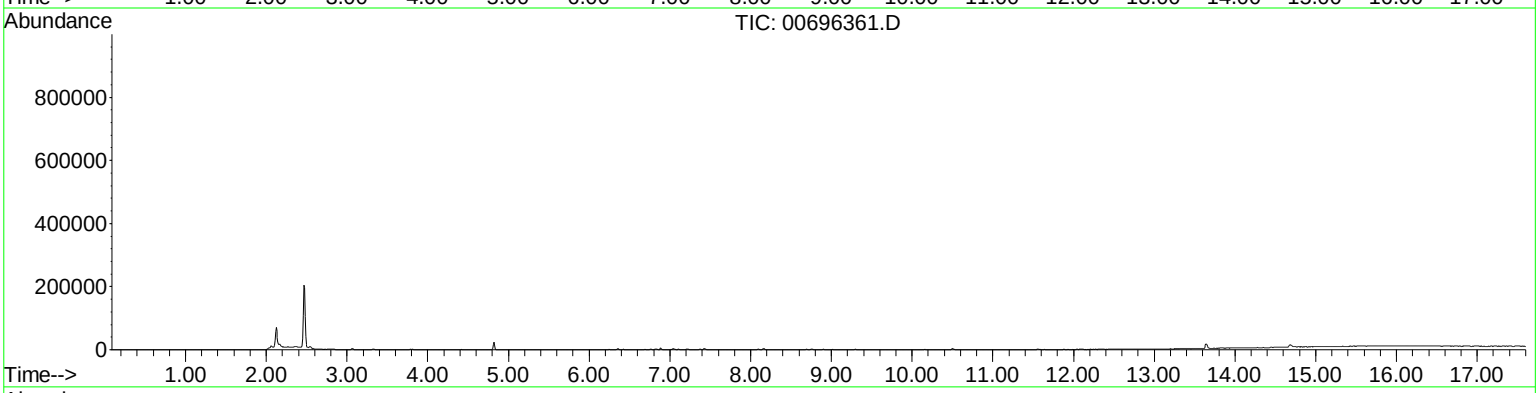


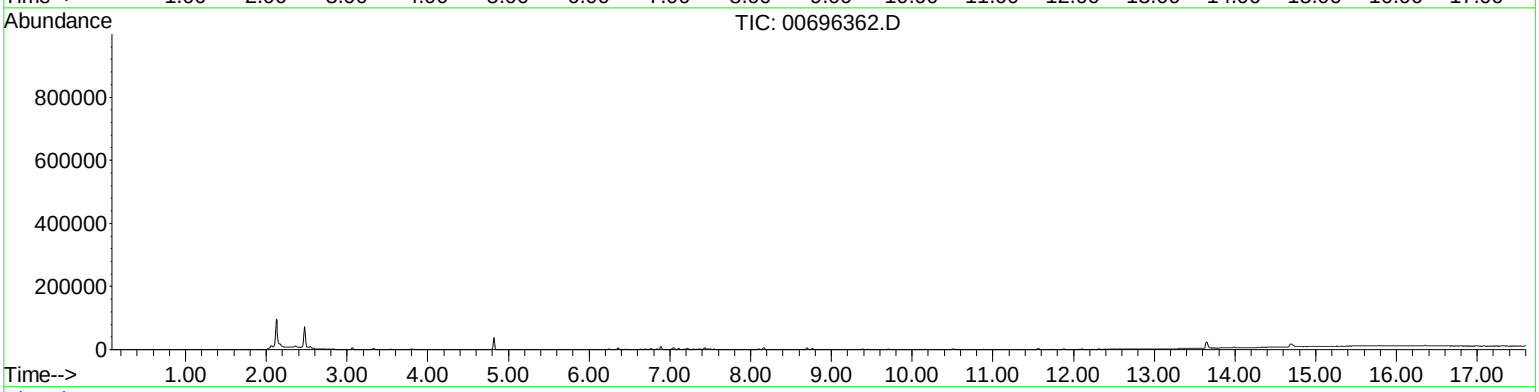


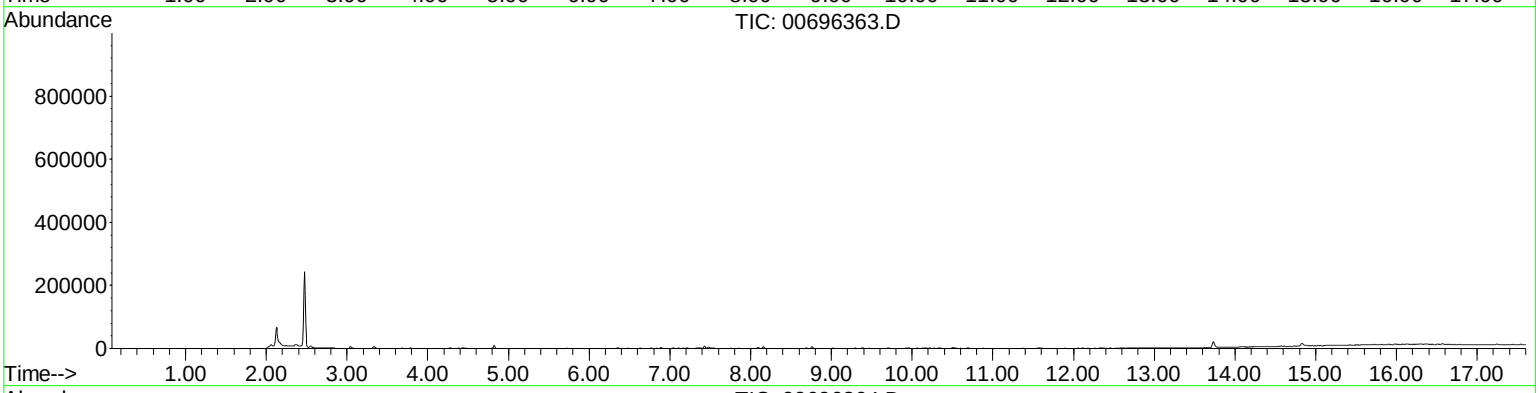


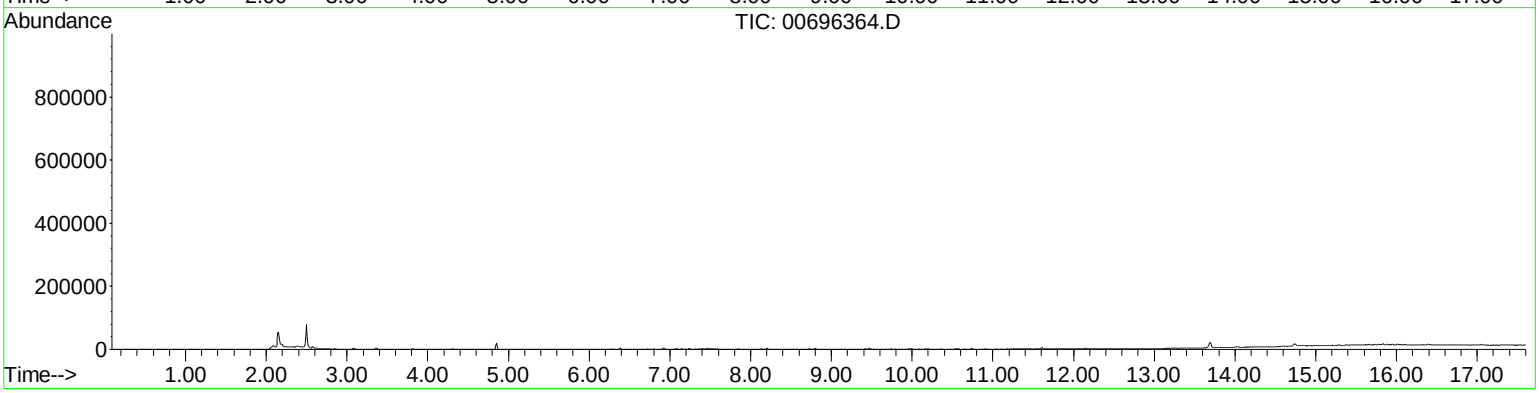
TICS 21815026-2
IN NUMERICAL ORDER



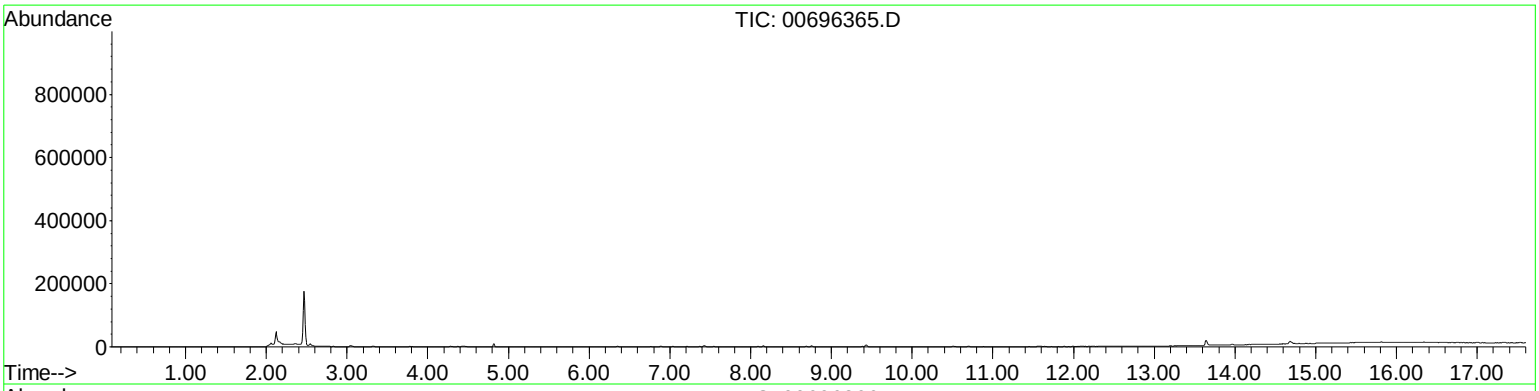


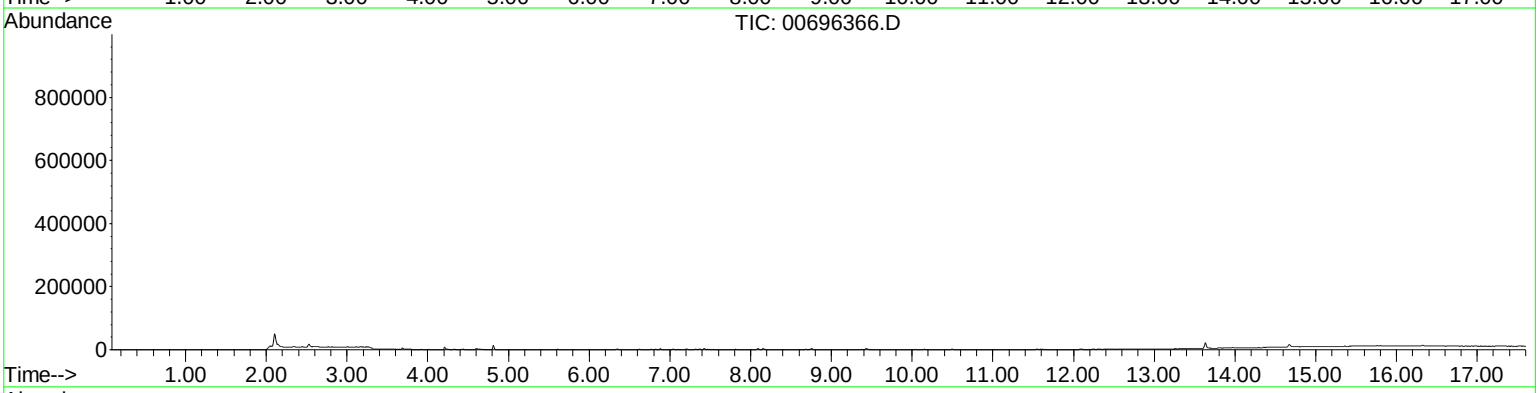


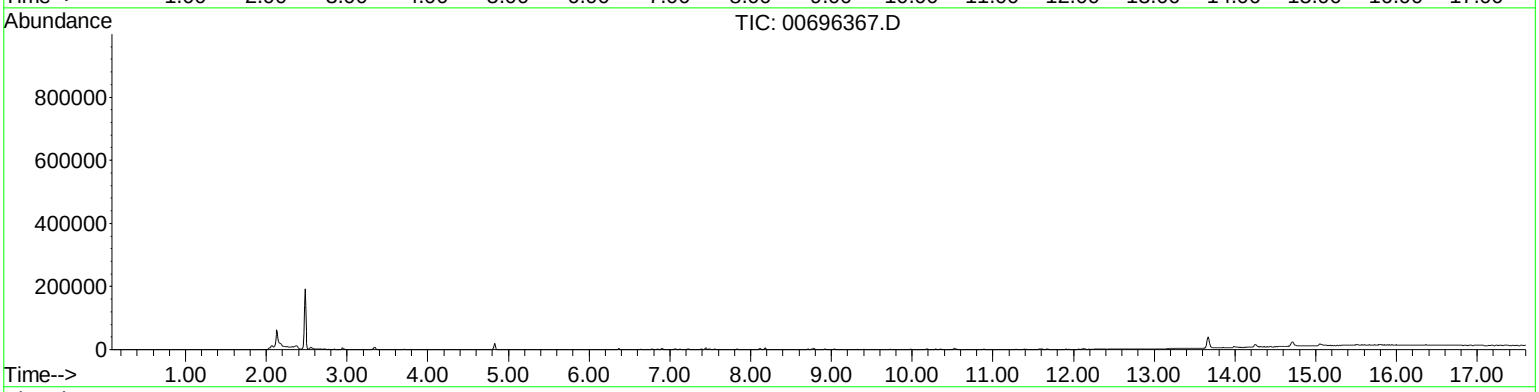


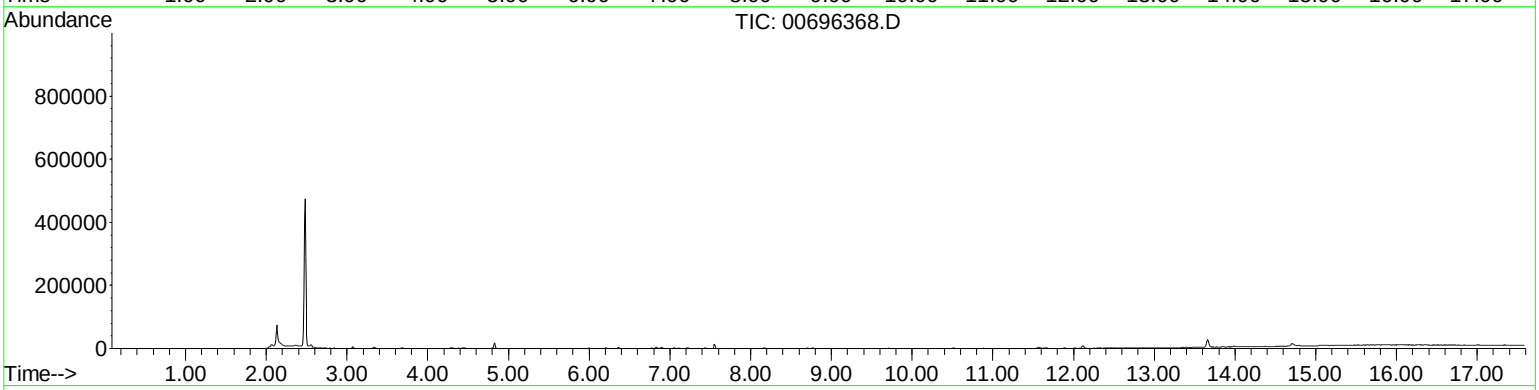


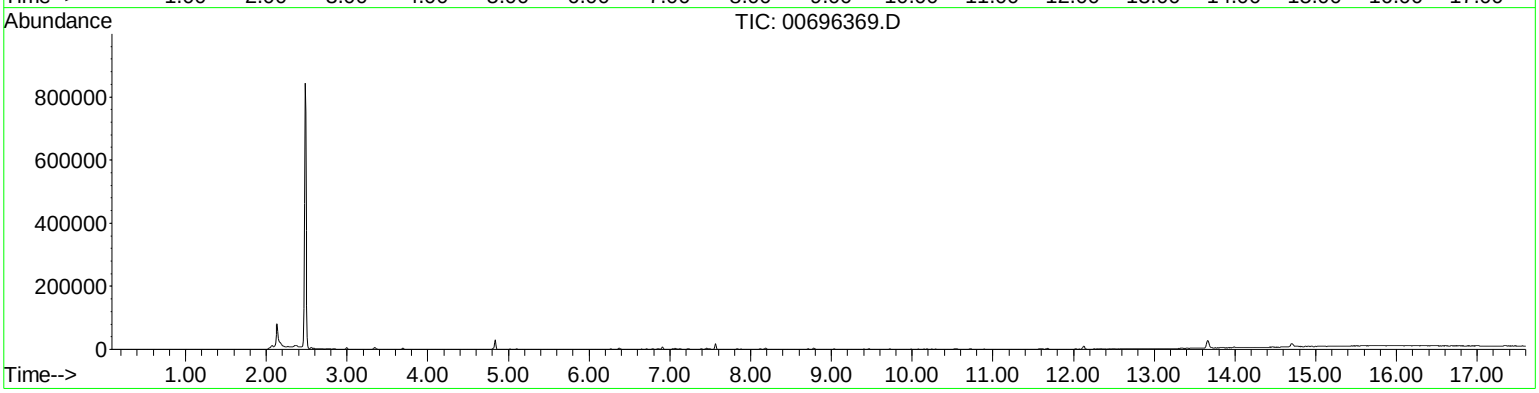
TICS 21815026-2
IN NUMERICAL ORDER



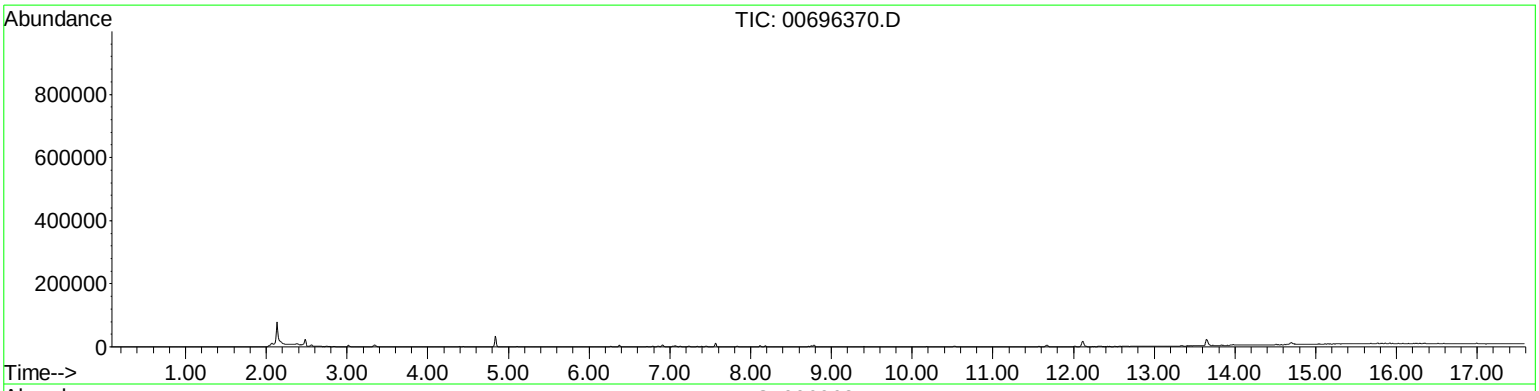


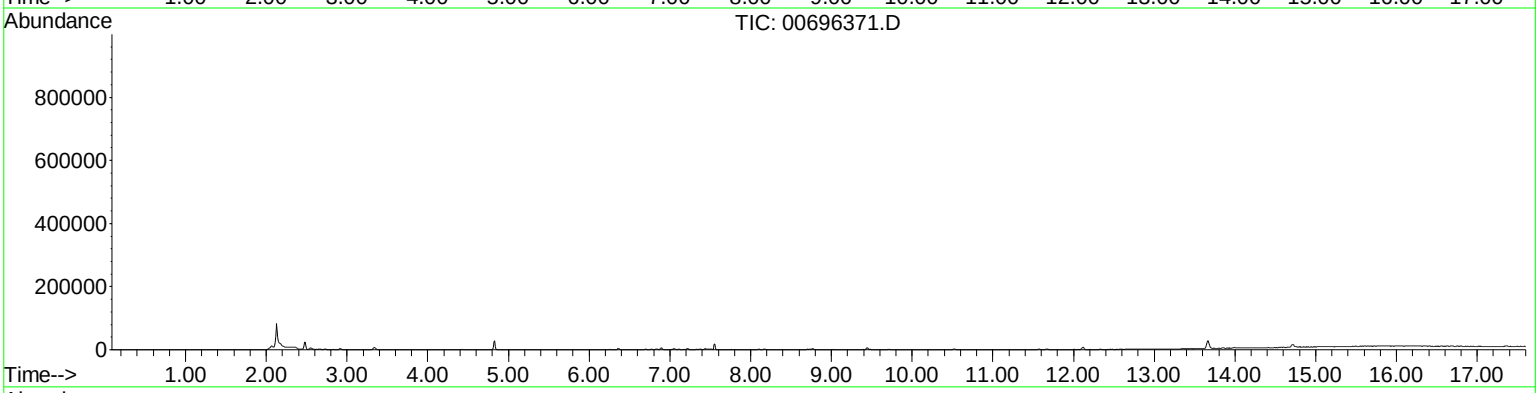


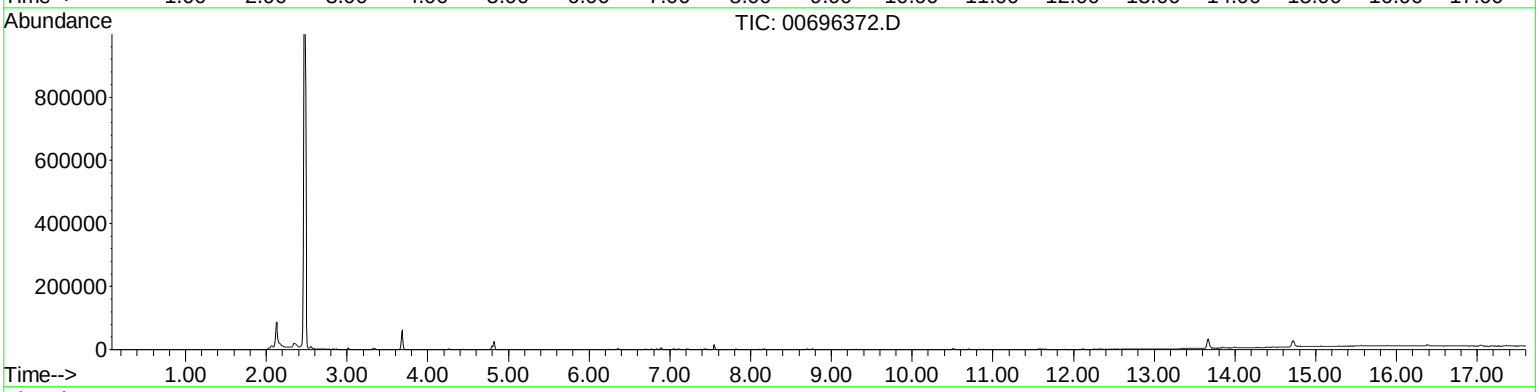


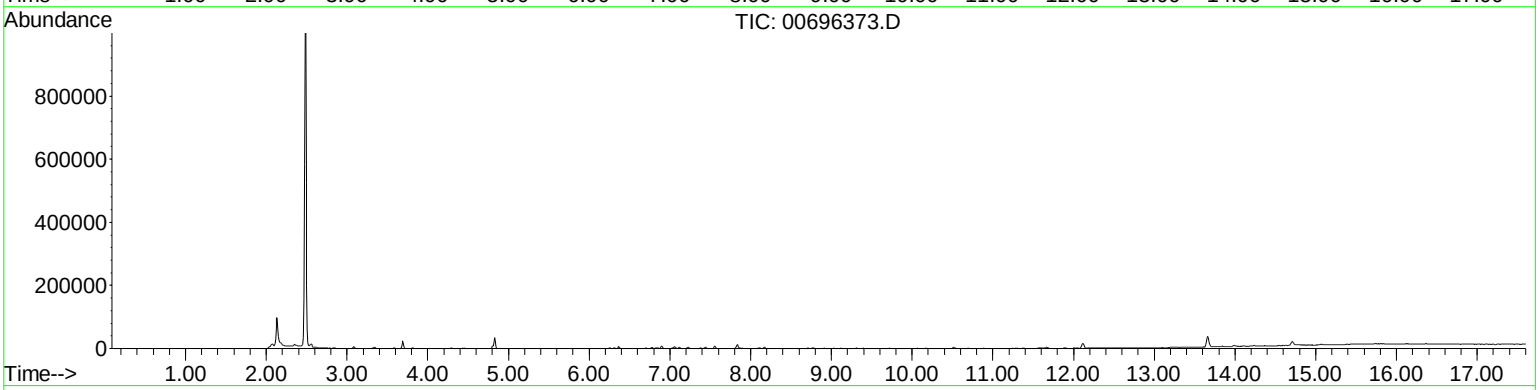


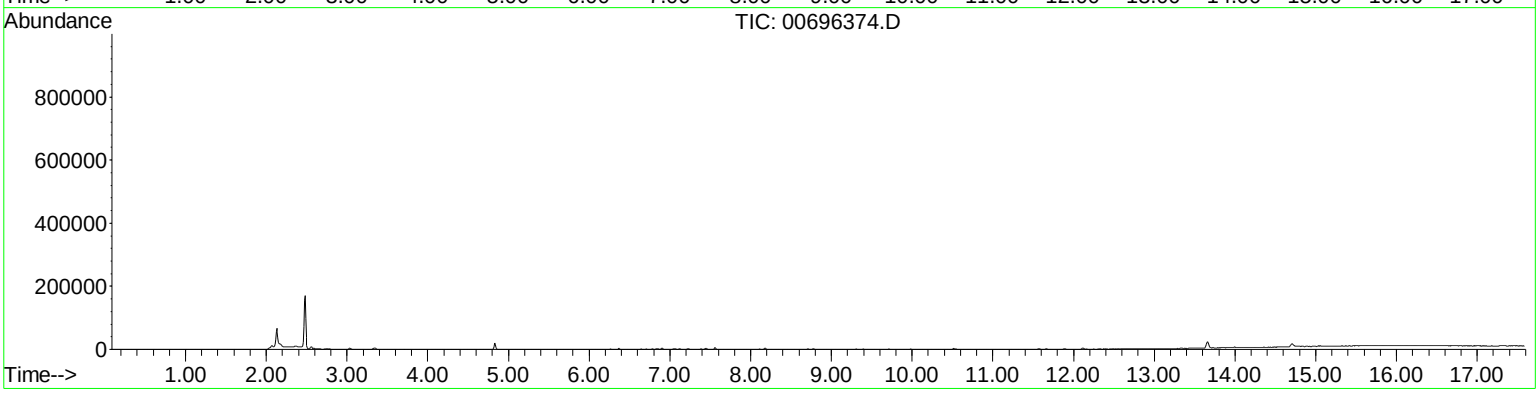
TICS 21815026-2
IN NUMERICAL ORDER



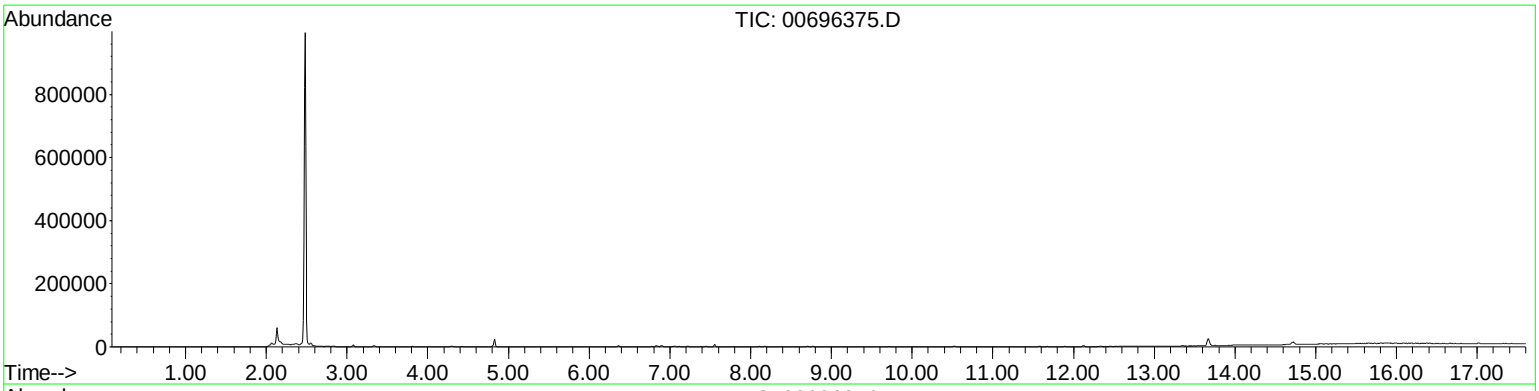


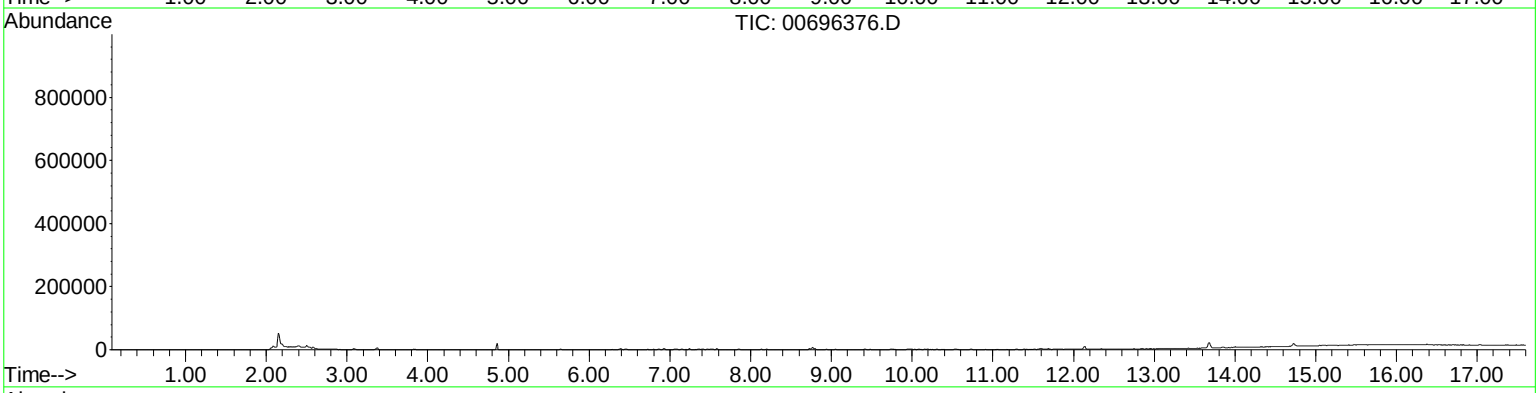


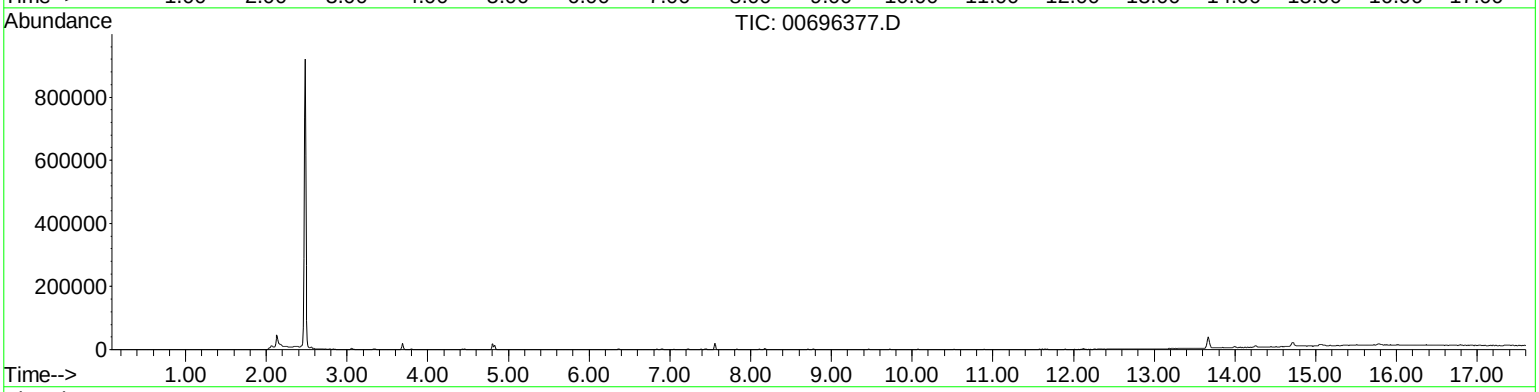


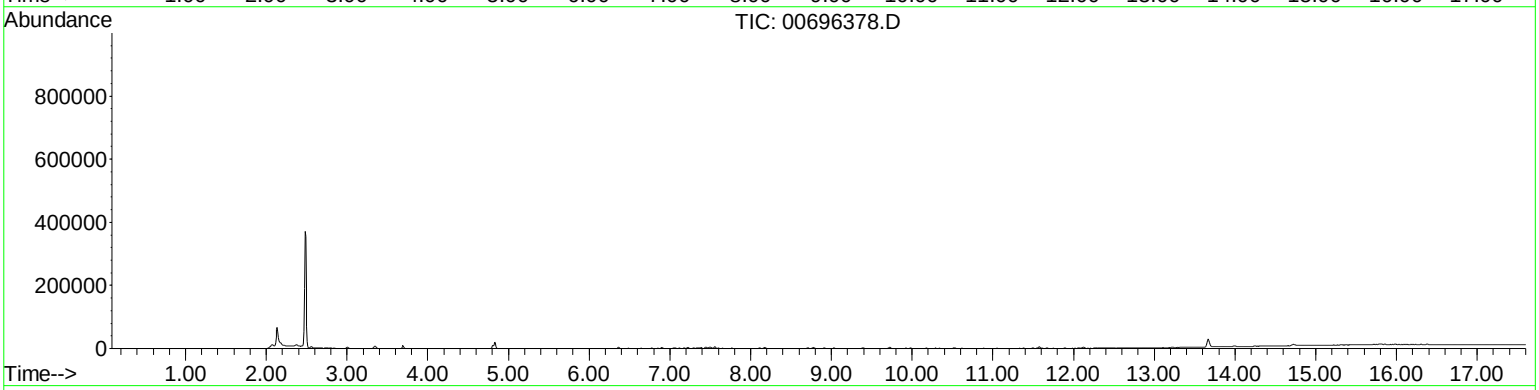


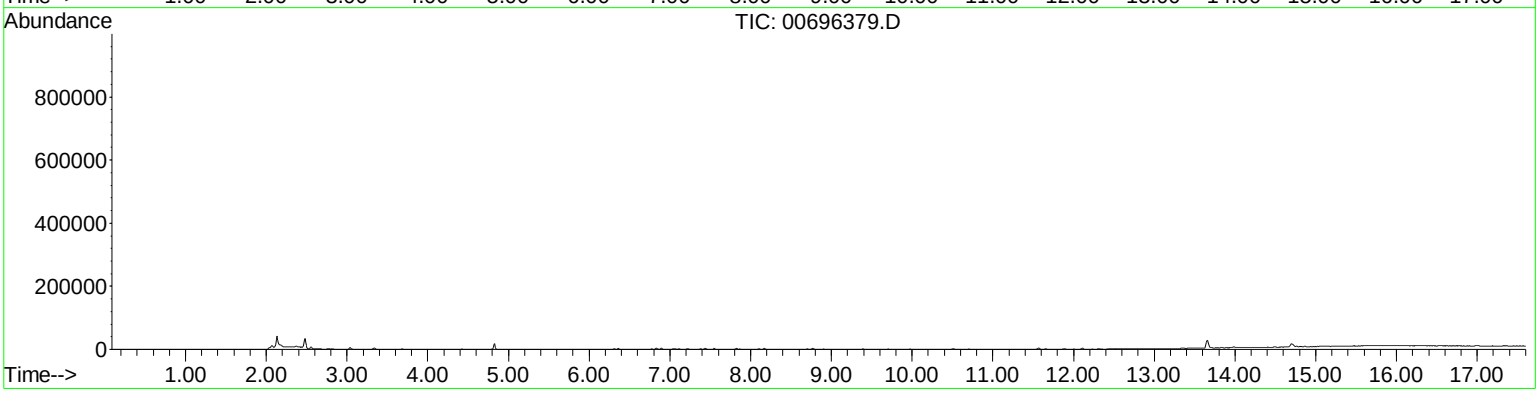
TICS 21815026-2
IN NUMERICAL ORDER



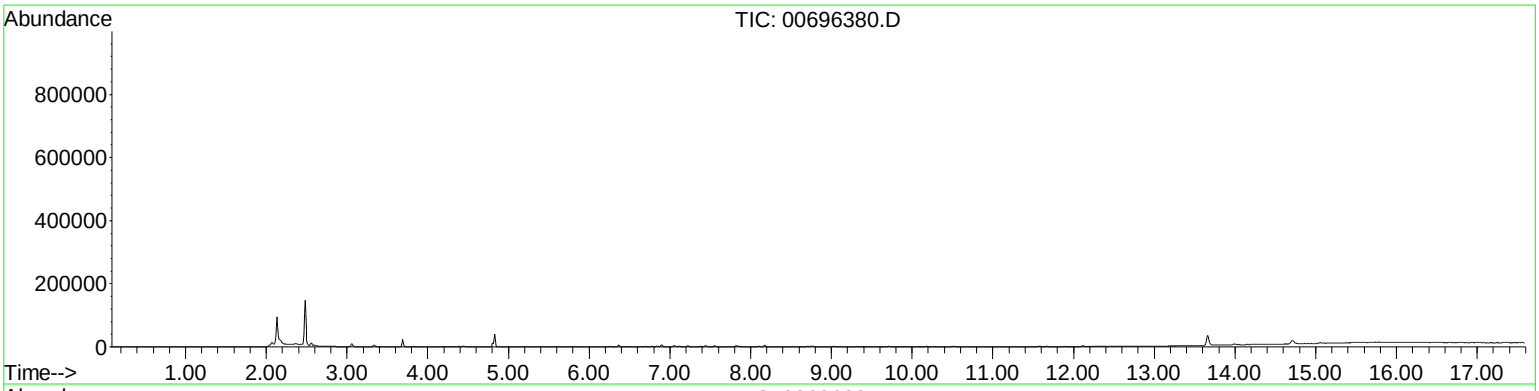


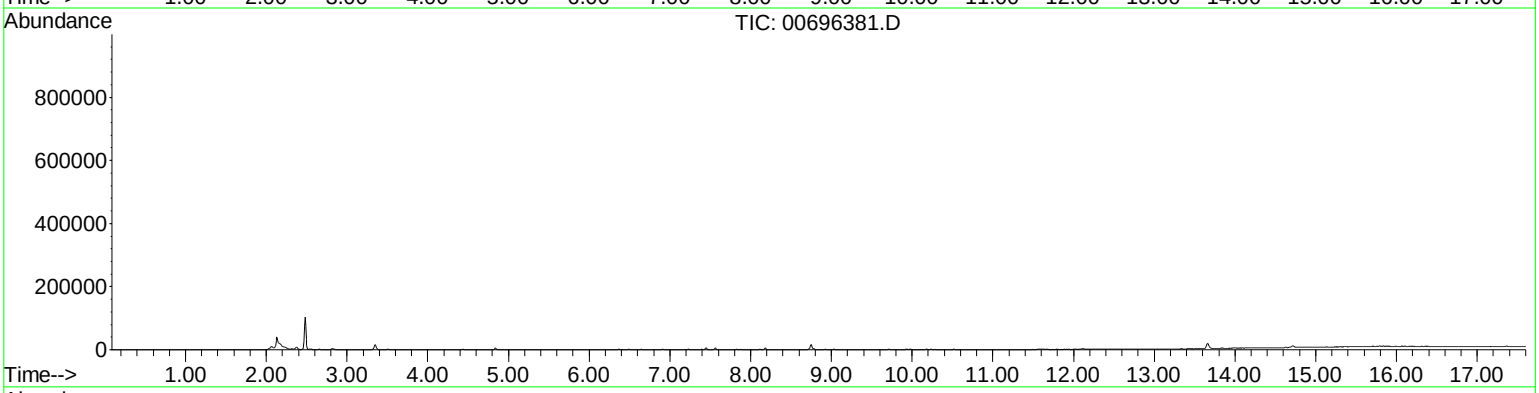


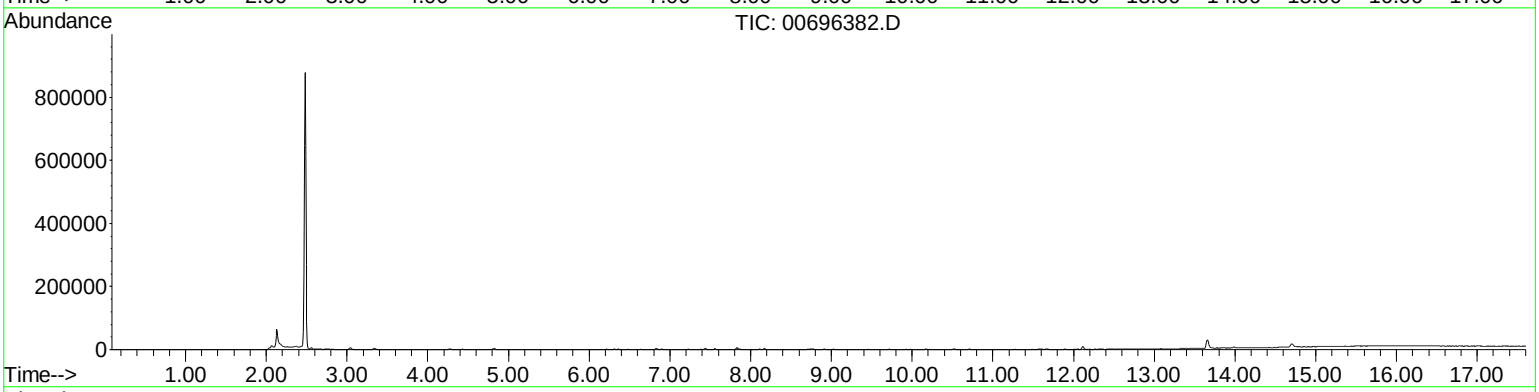


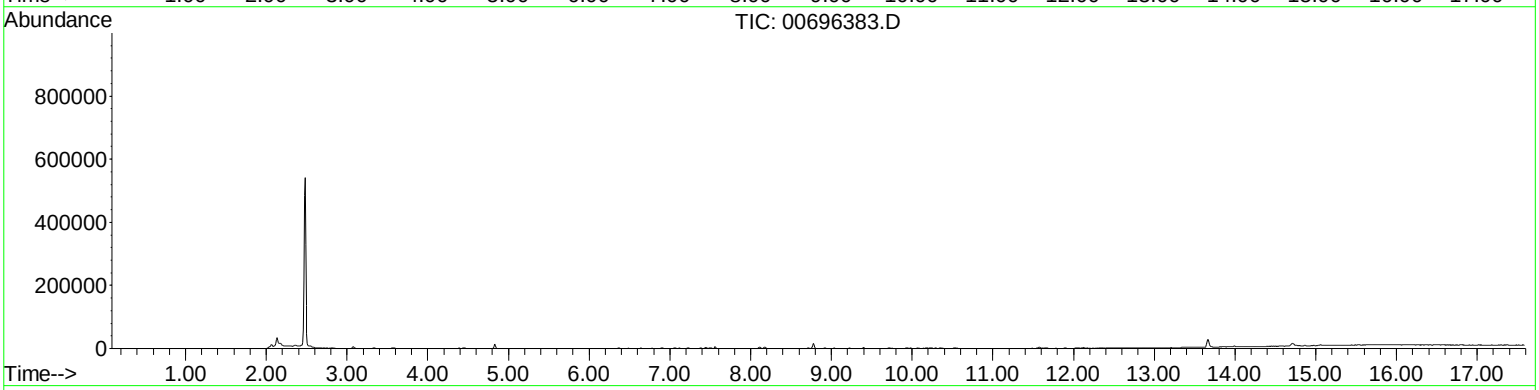


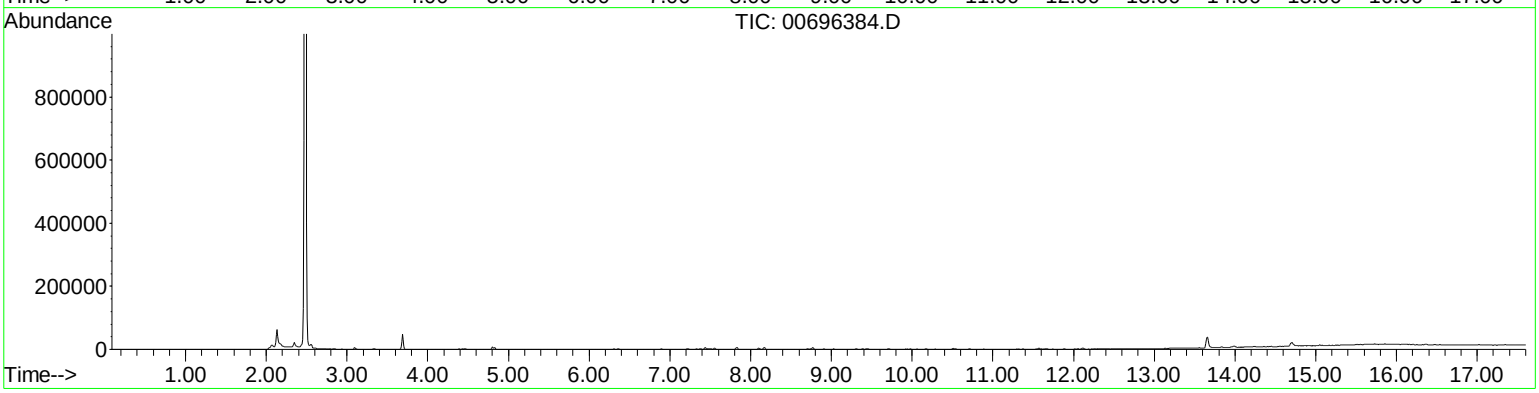
TICS 21815026-2
IN NUMERICAL ORDER



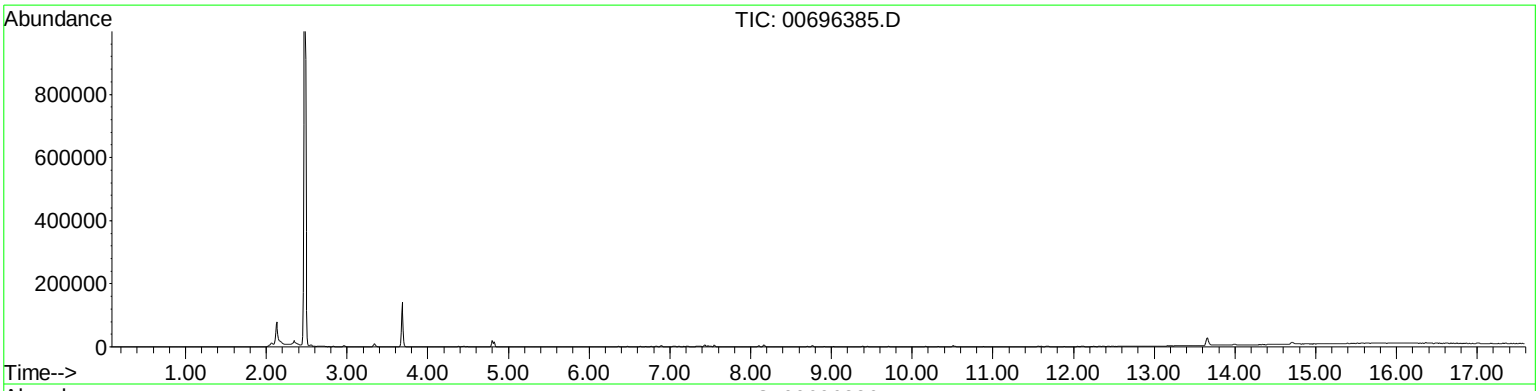


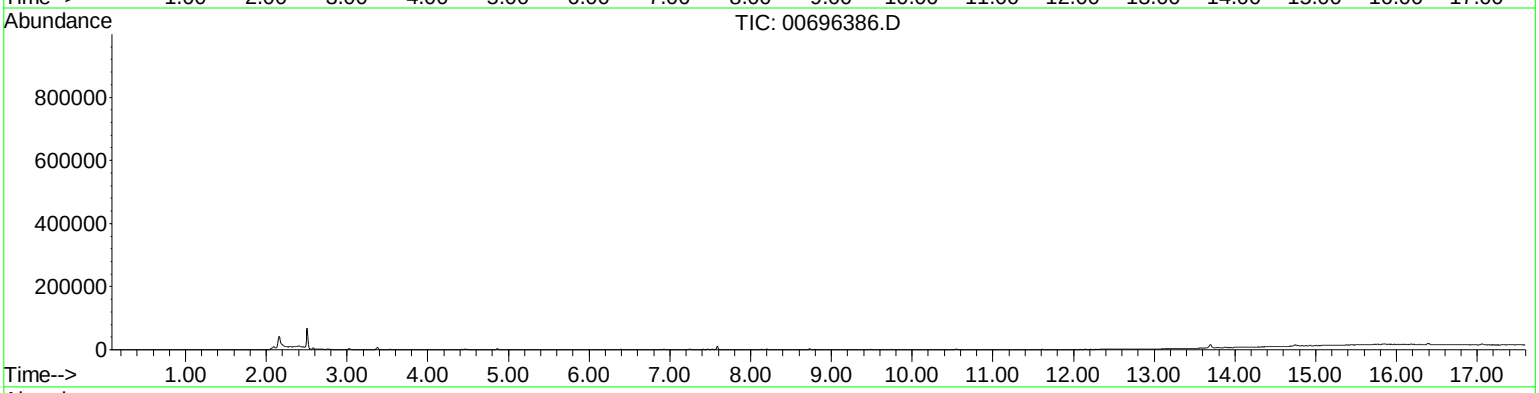


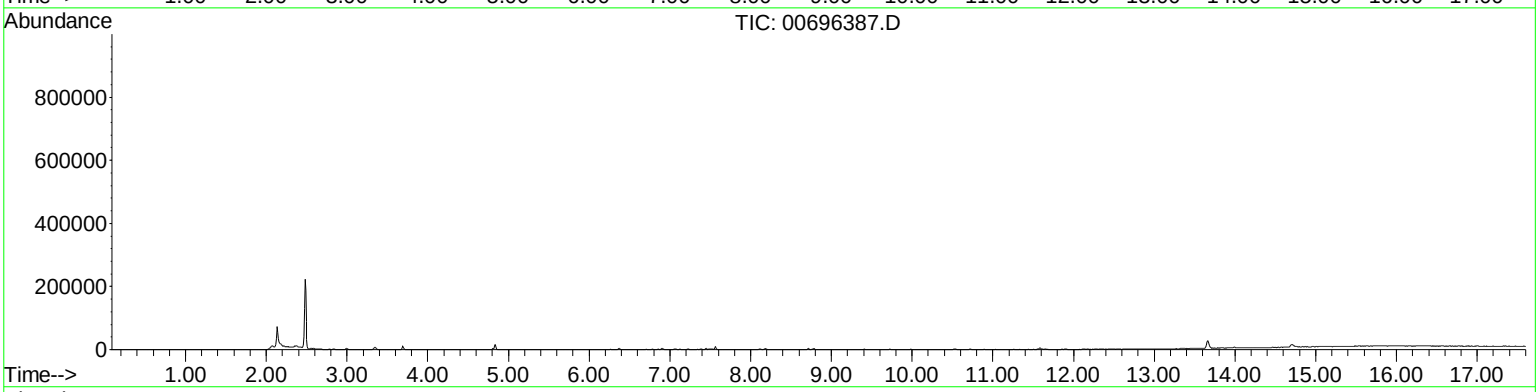


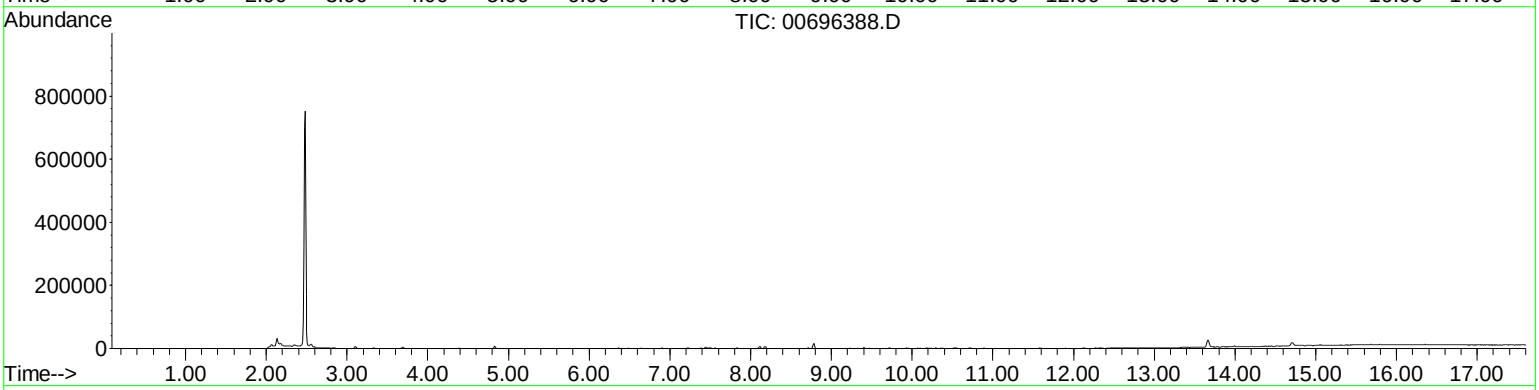


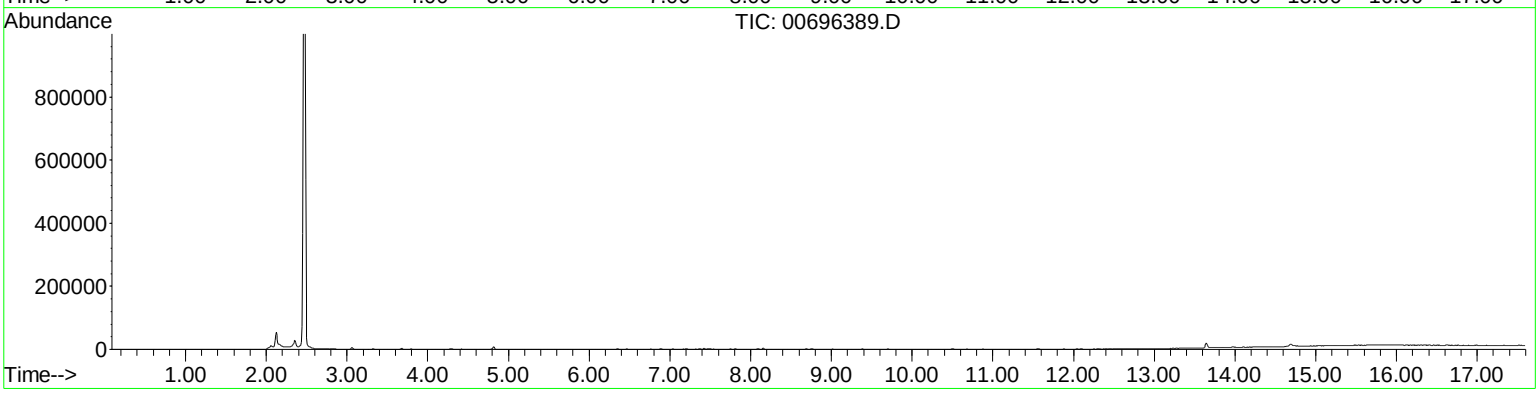
TICS 21815026-2
IN NUMERICAL ORDER



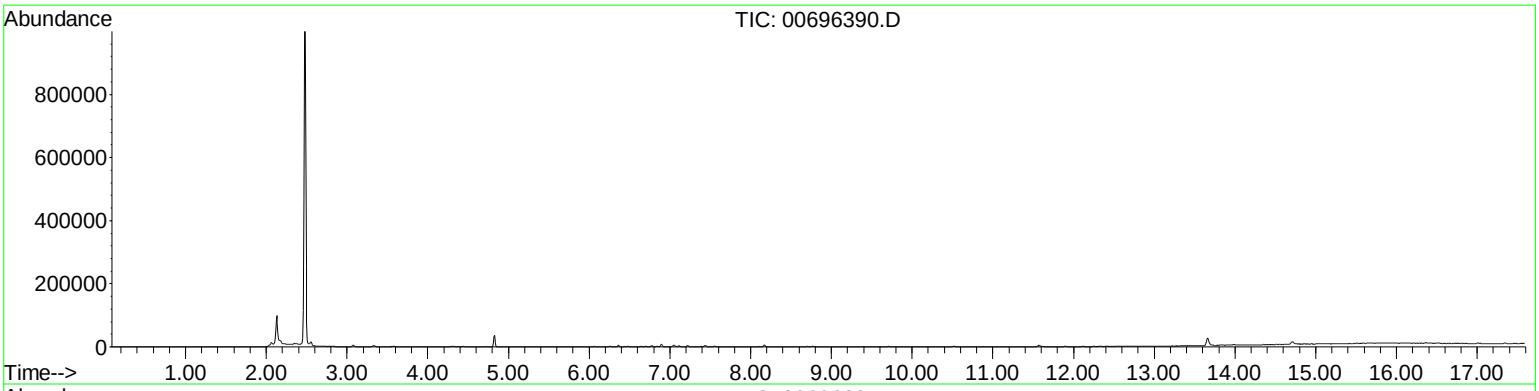


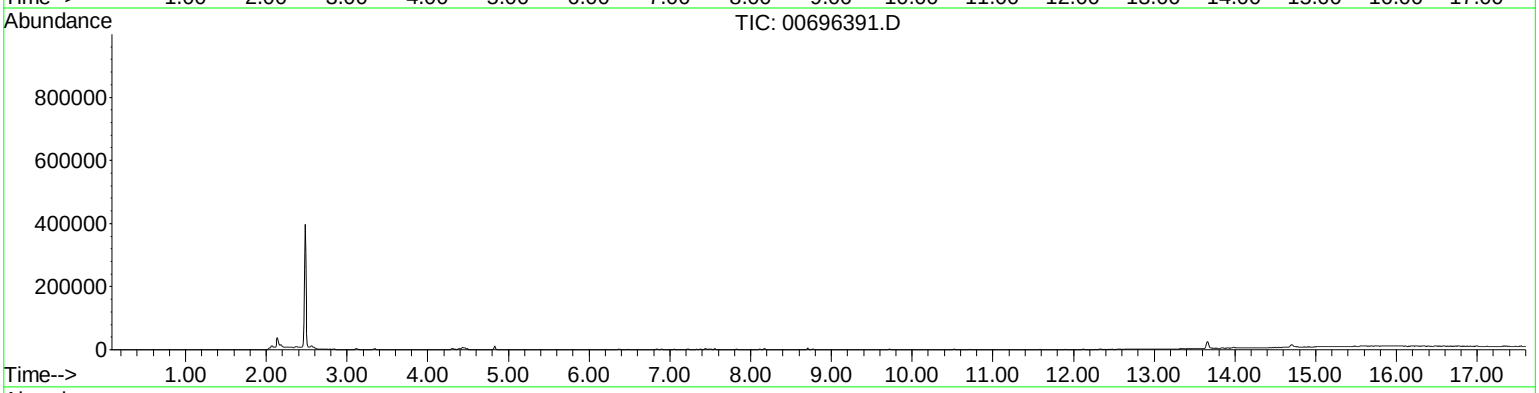


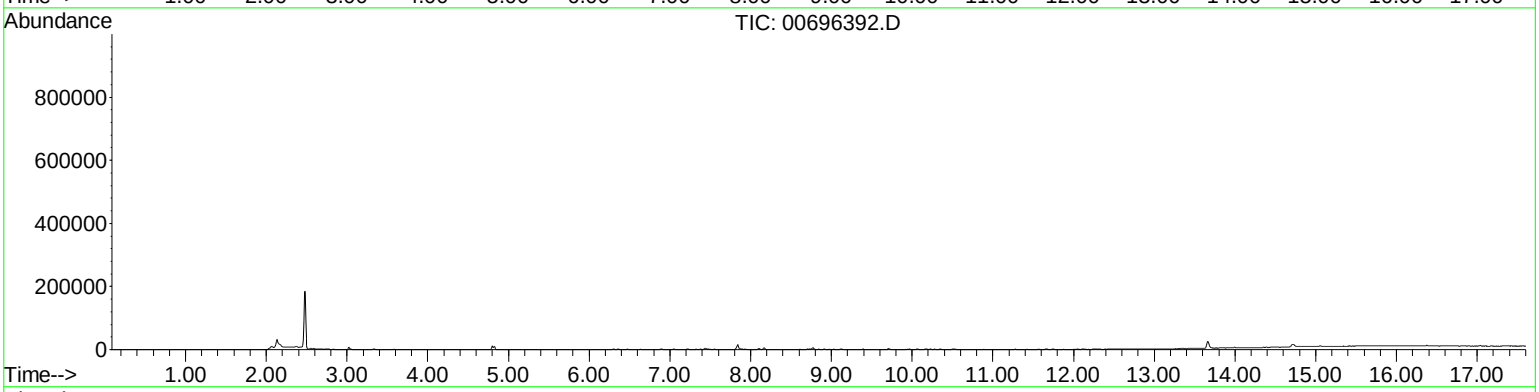


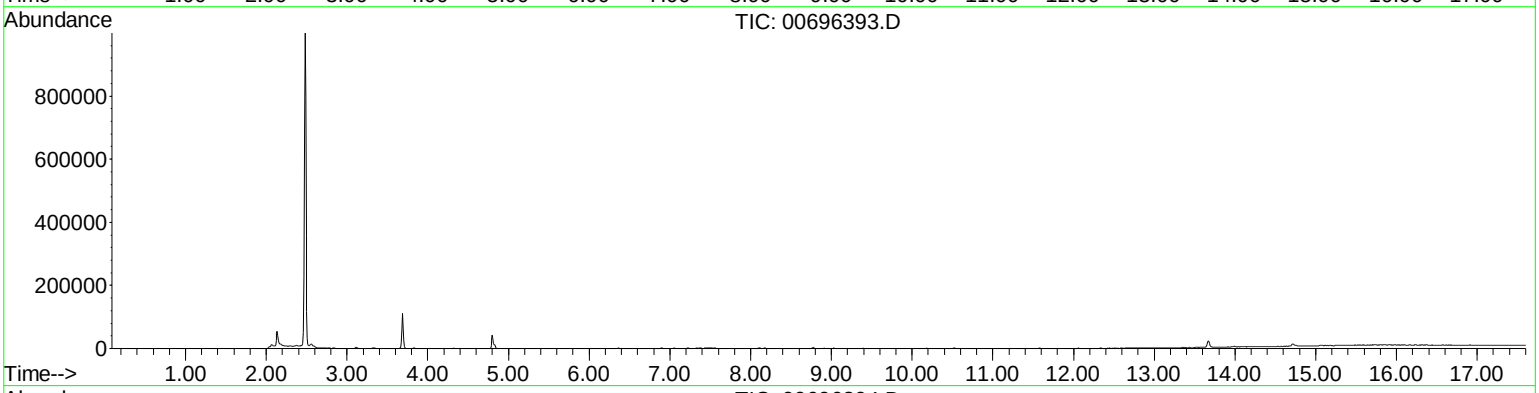


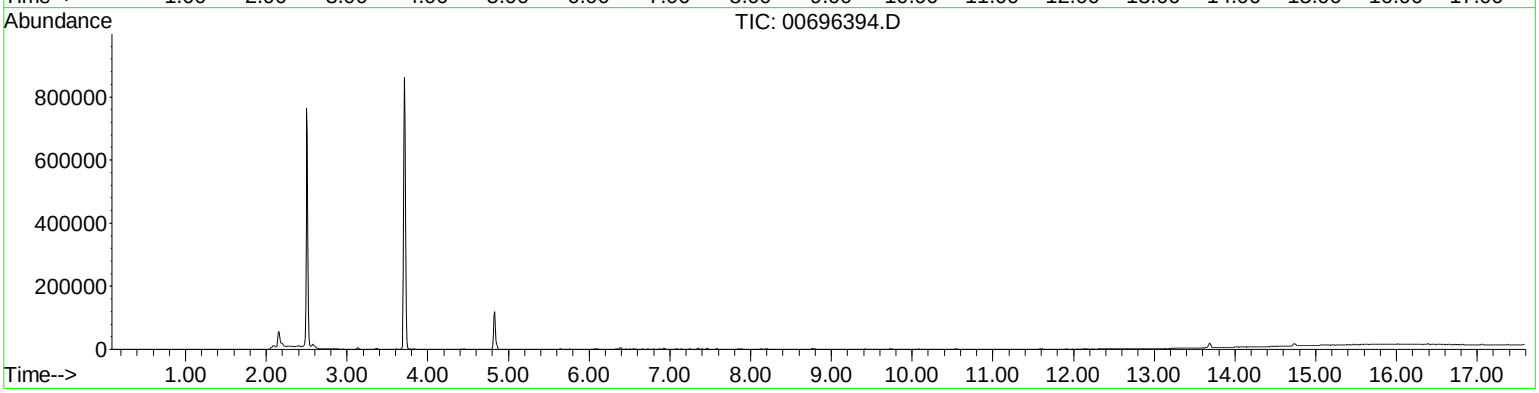
TICS 21815026-2
IN NUMERICAL ORDER



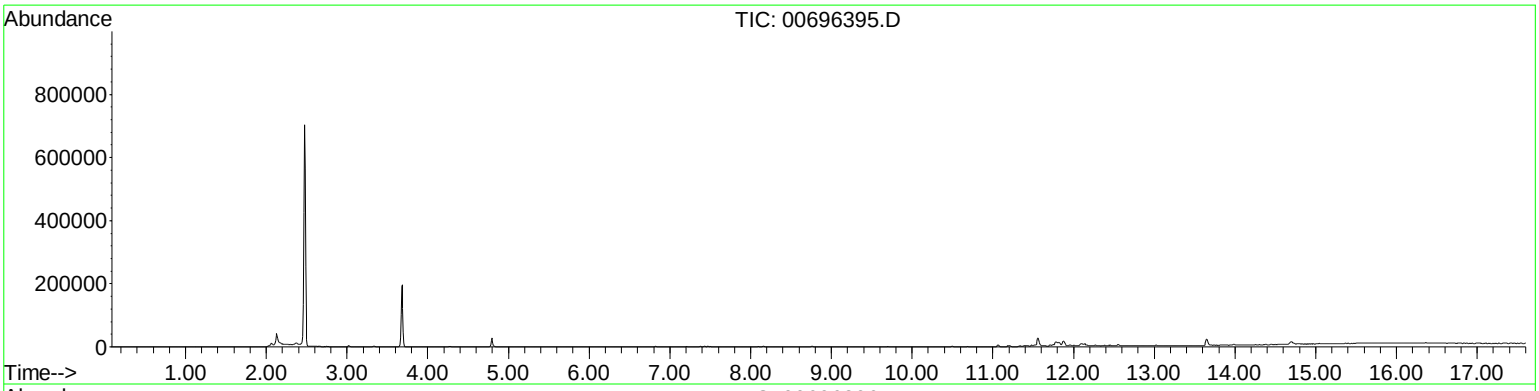


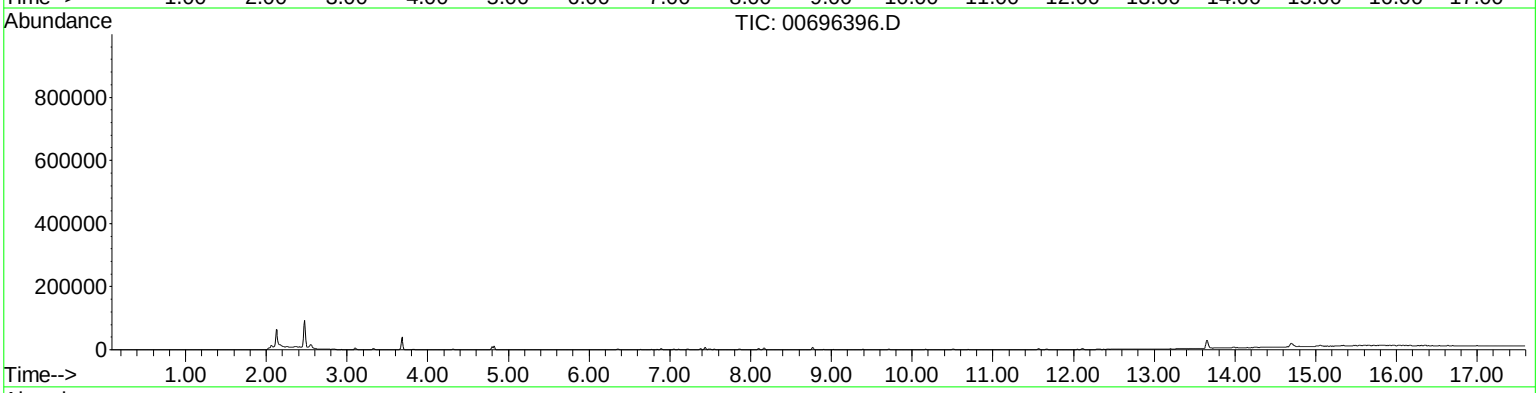


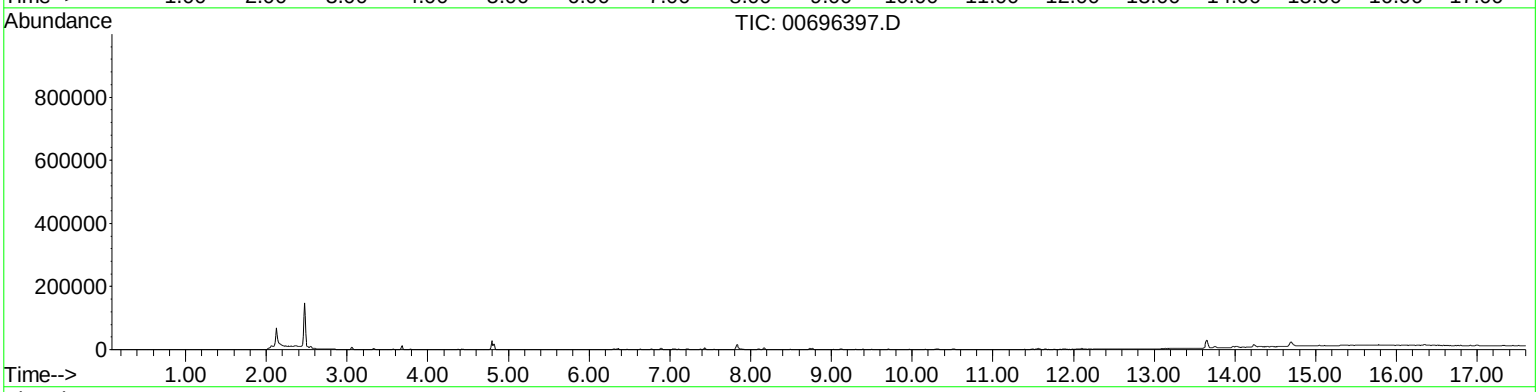


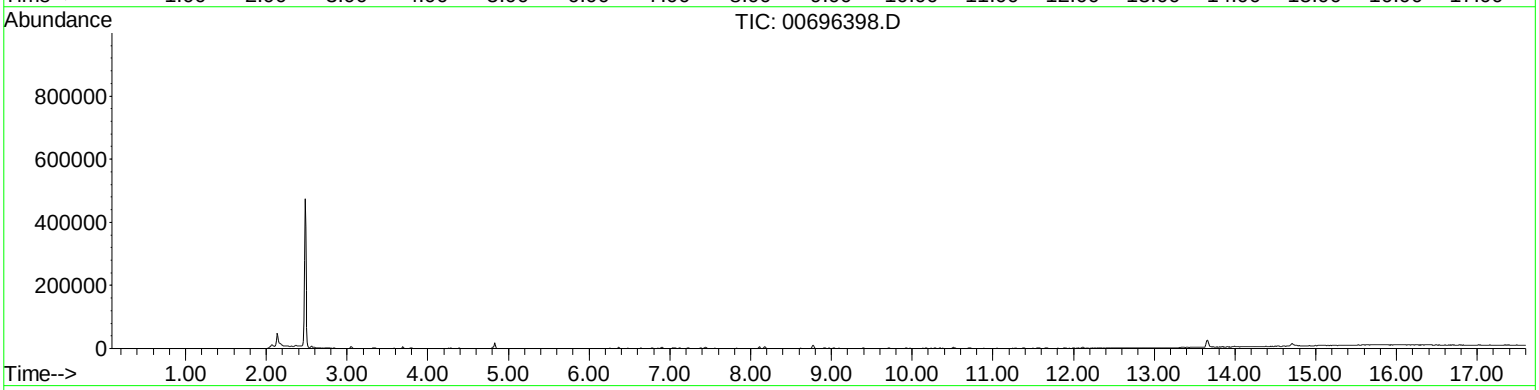


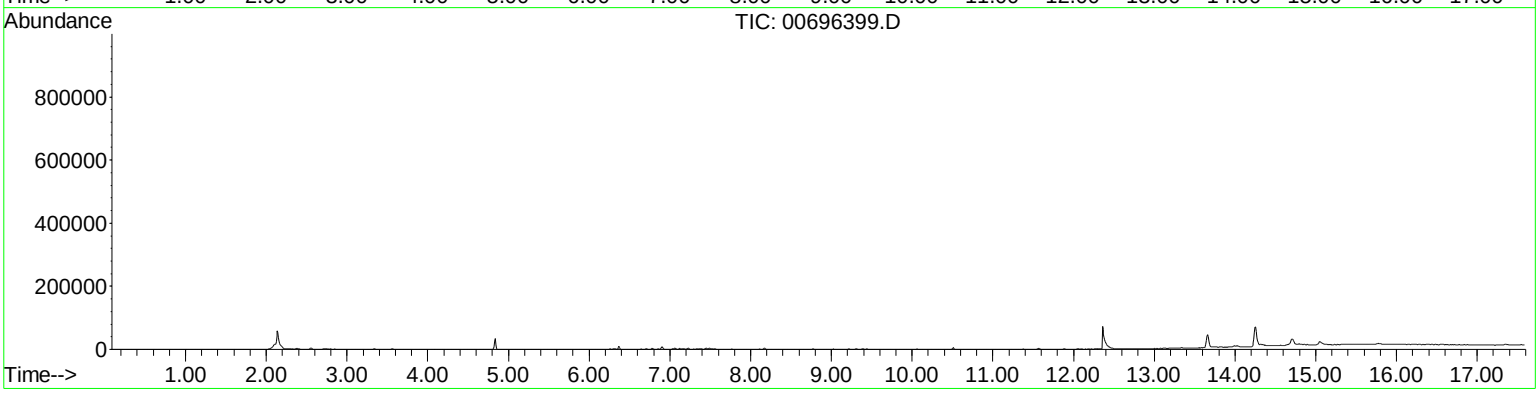
TICS 21815026-2
IN NUMERICAL ORDER



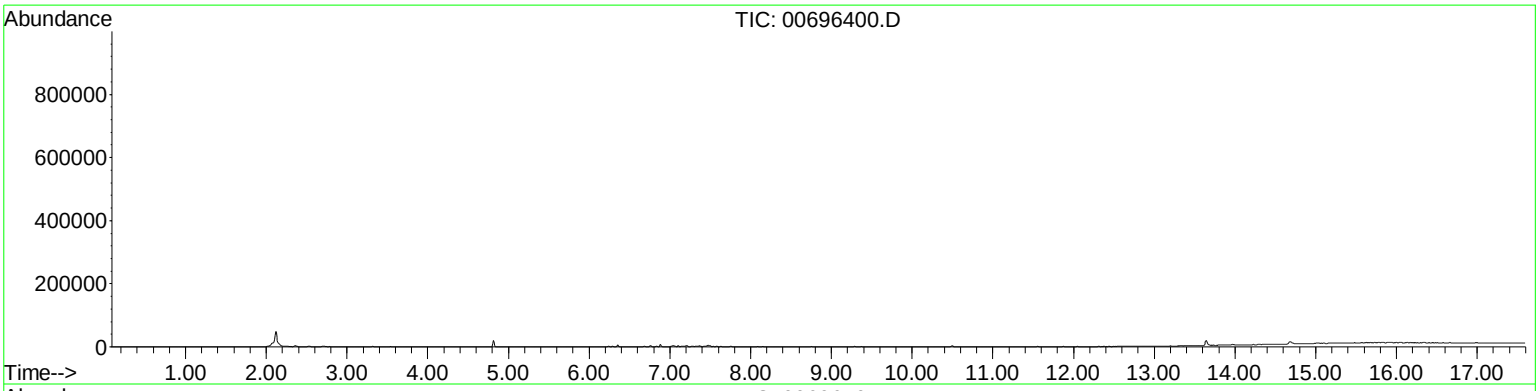


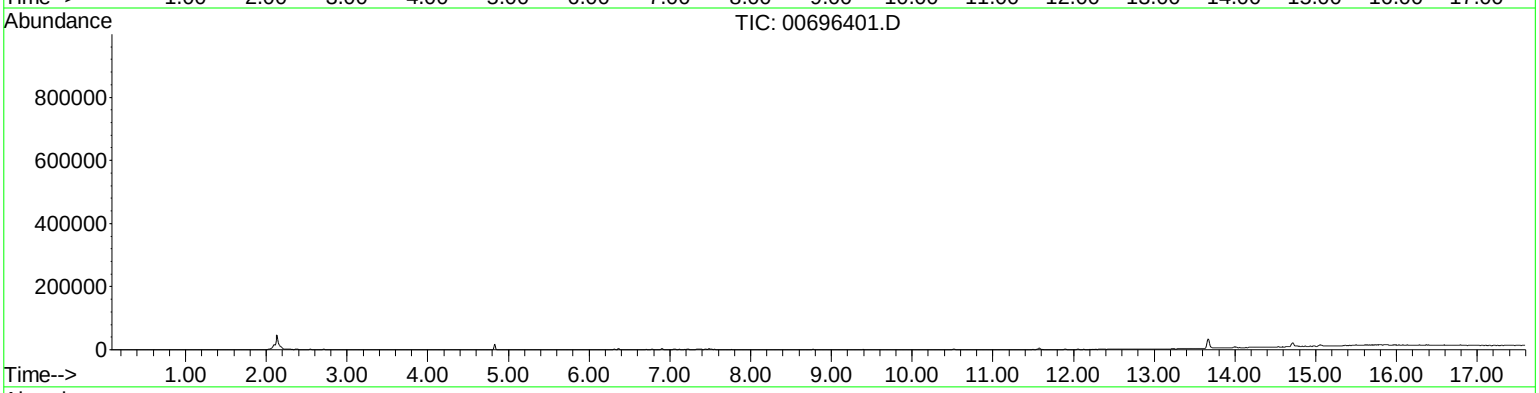


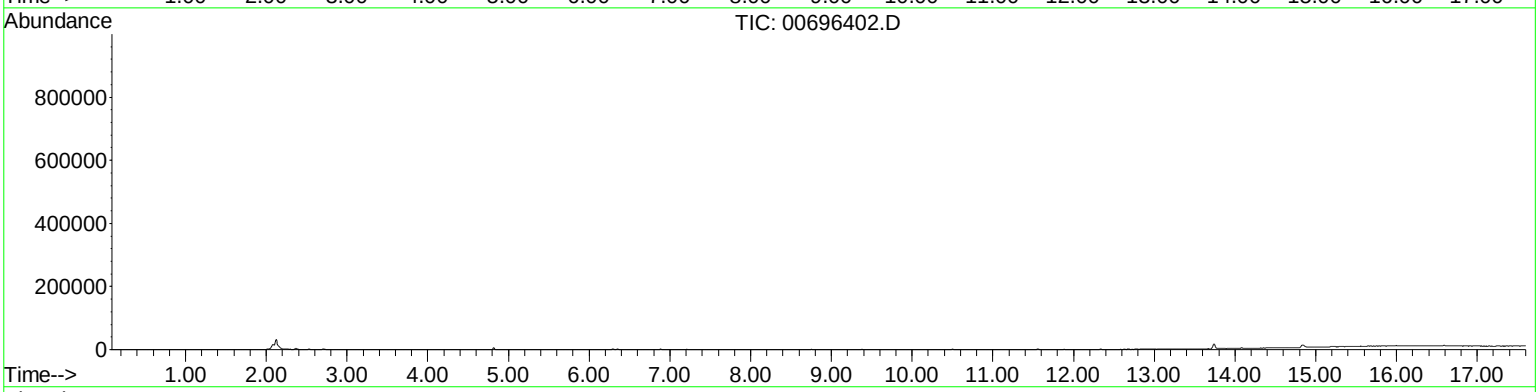


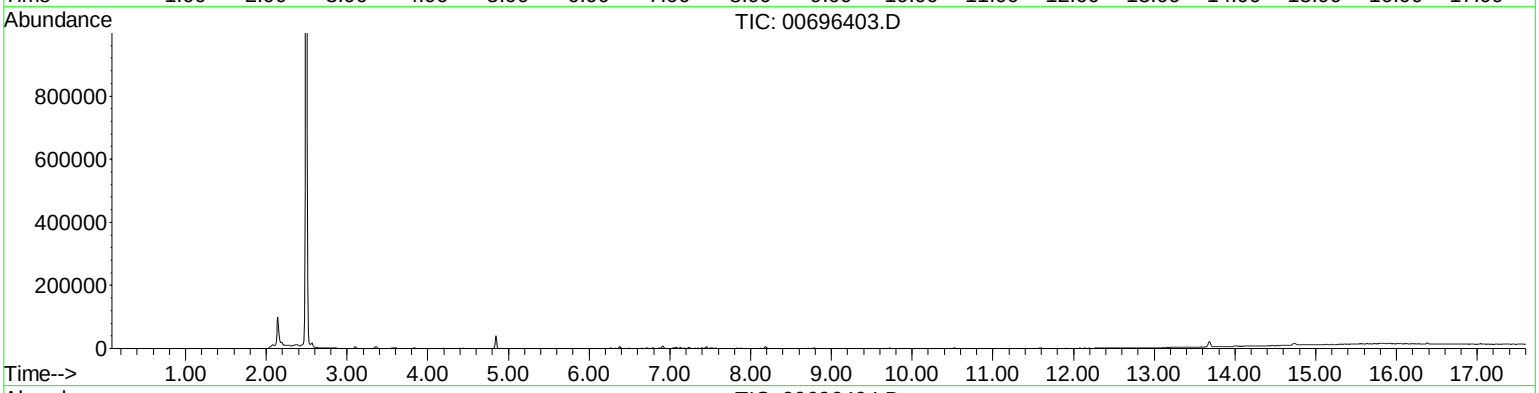


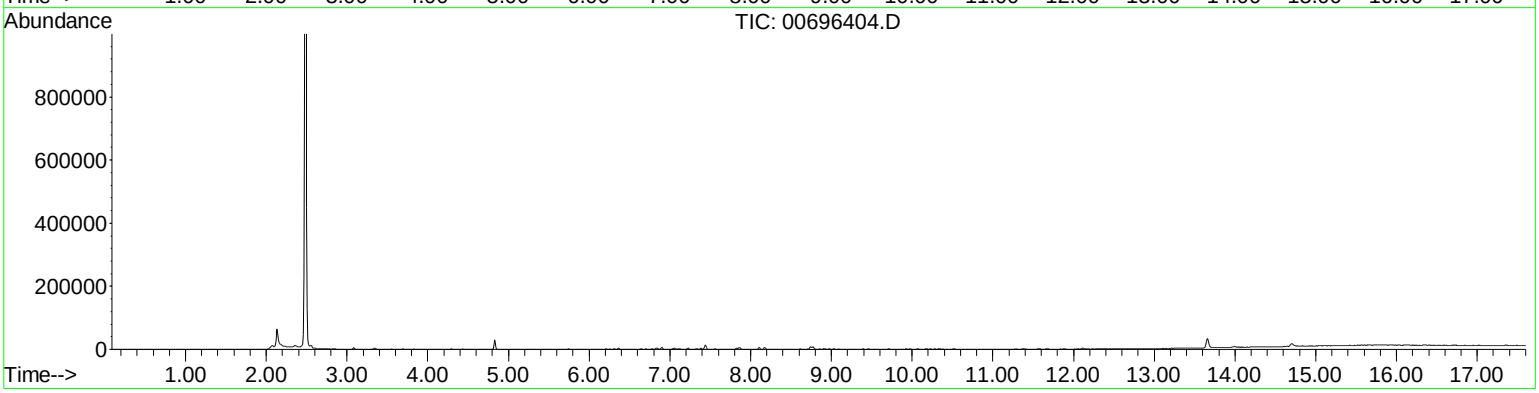
TICS 21815026-2
IN NUMERICAL ORDER



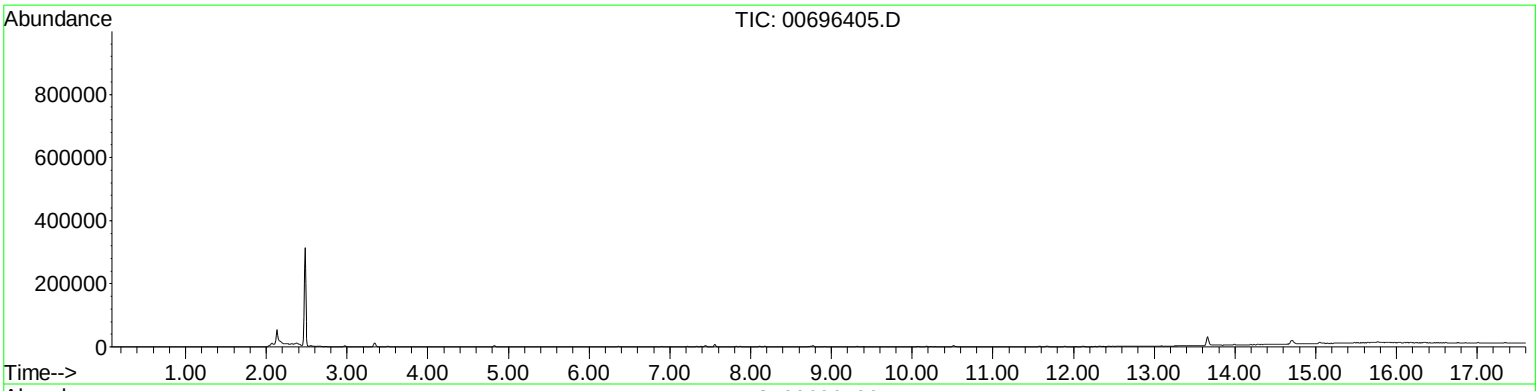


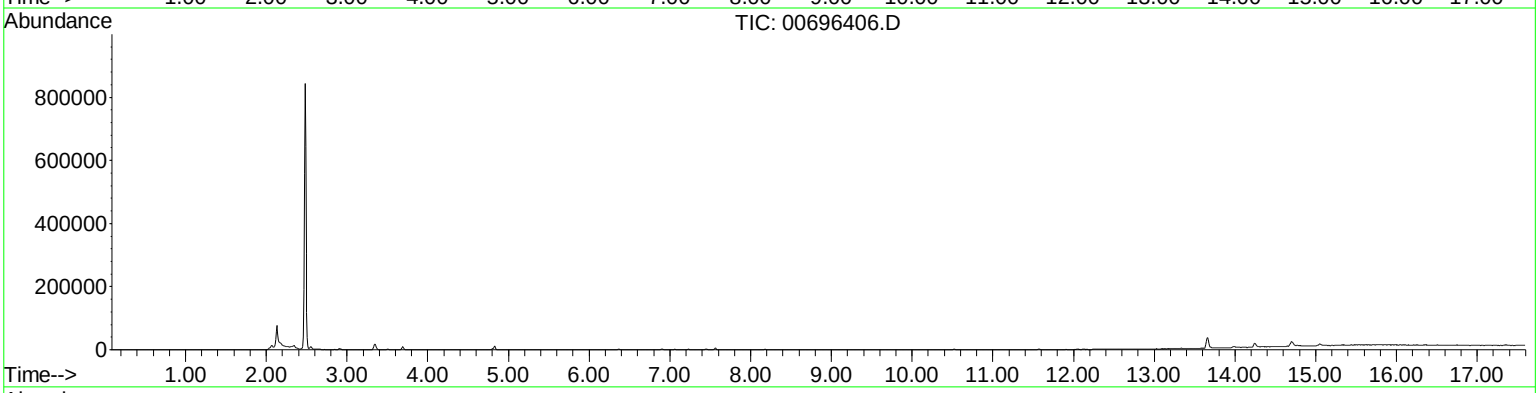


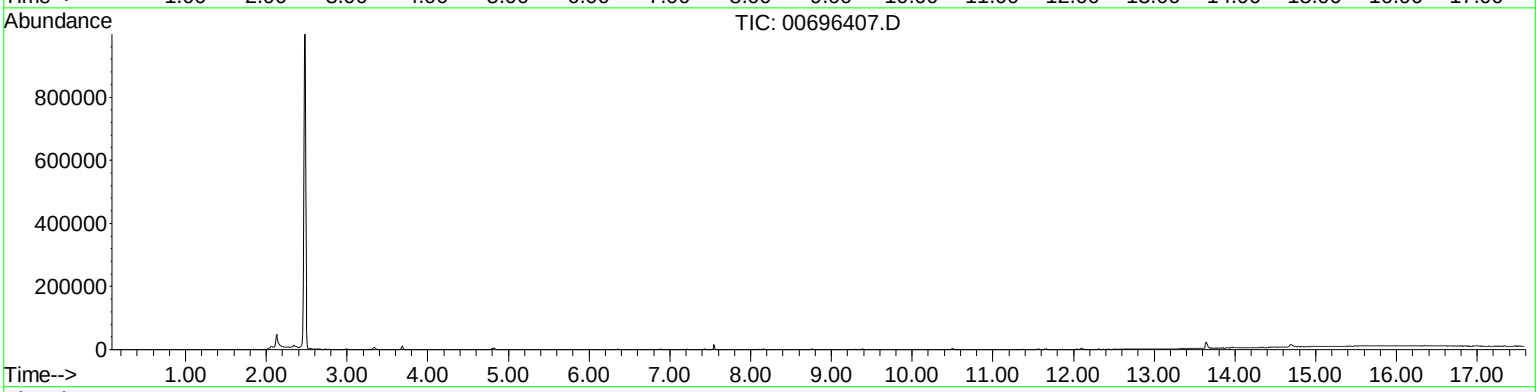


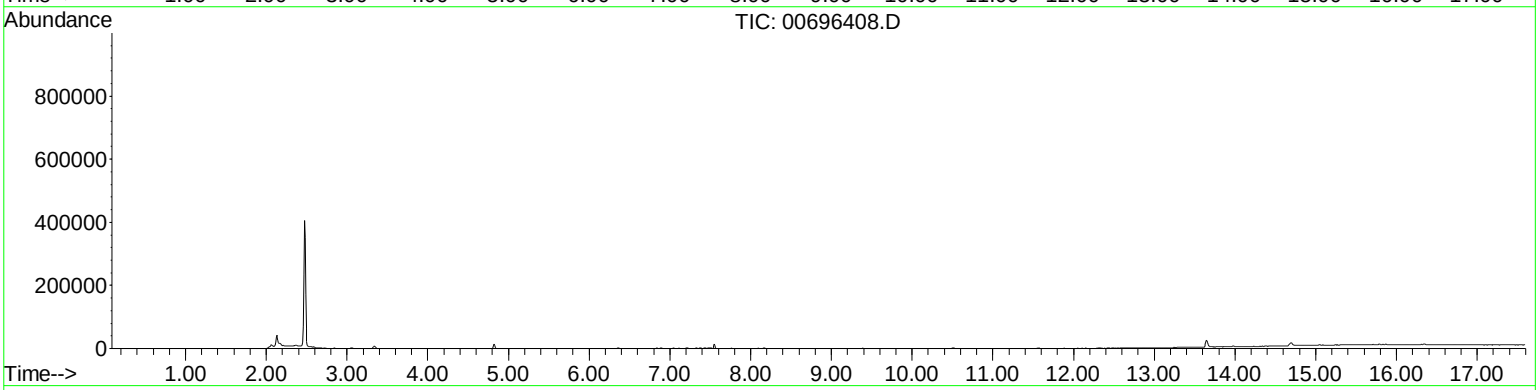


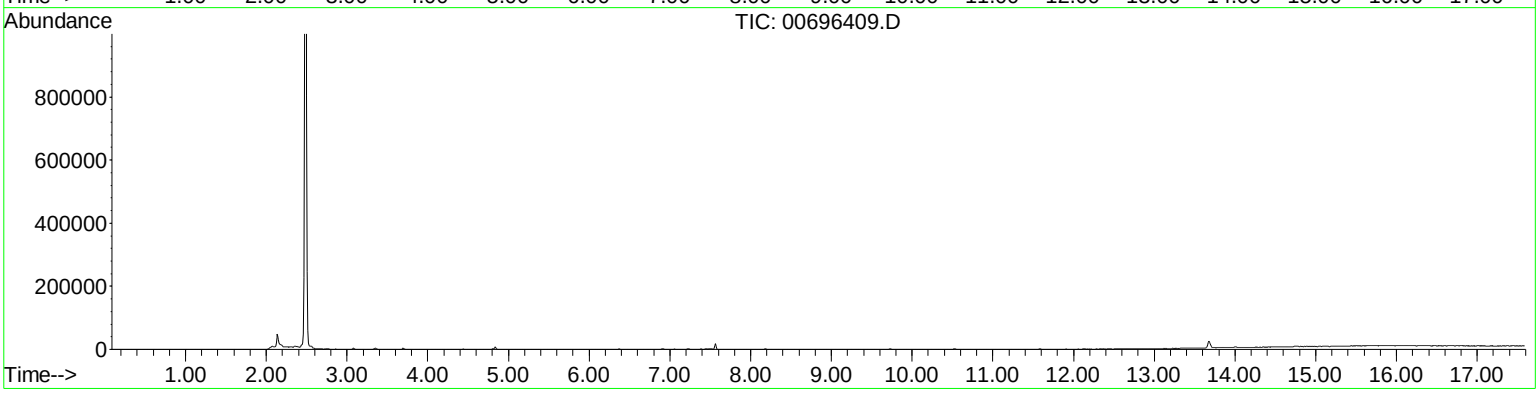
TICS 21815026-2
IN NUMERICAL ORDER



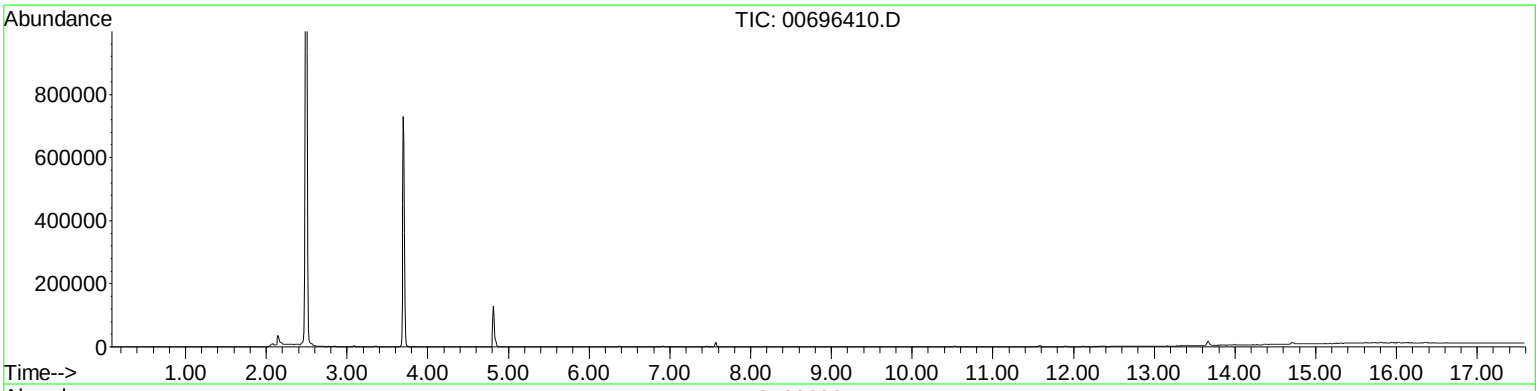


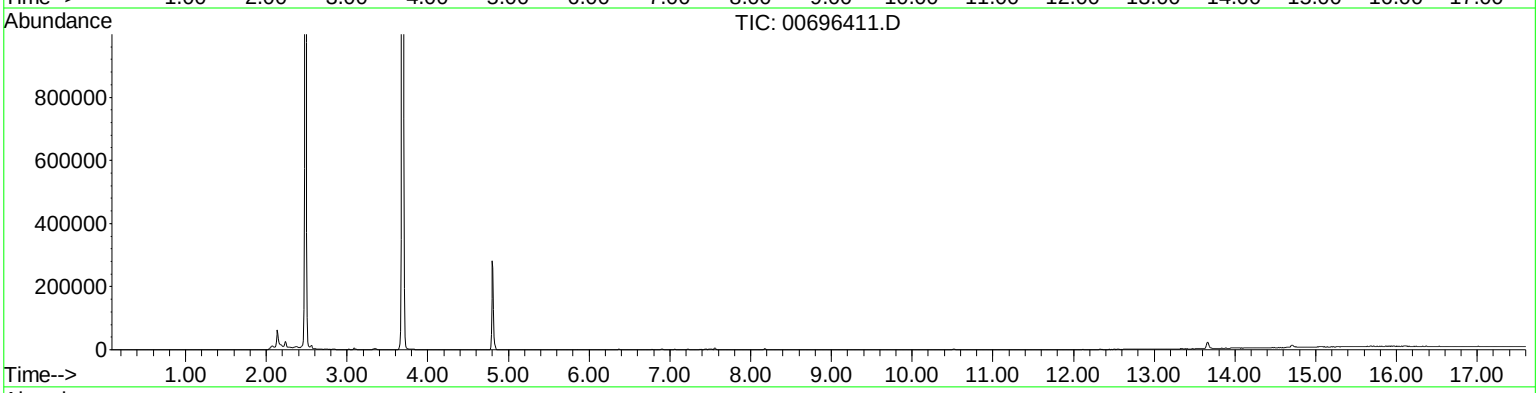


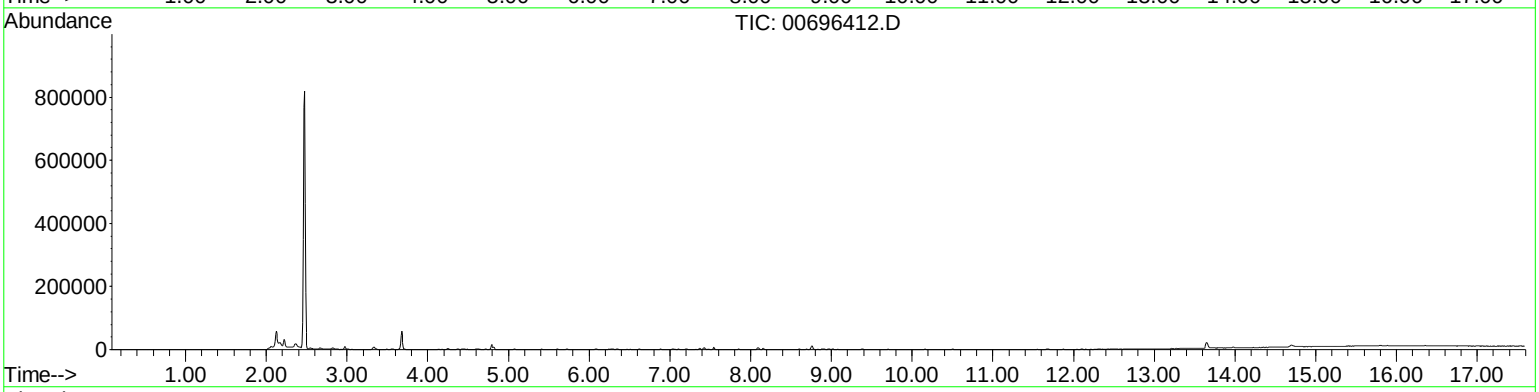


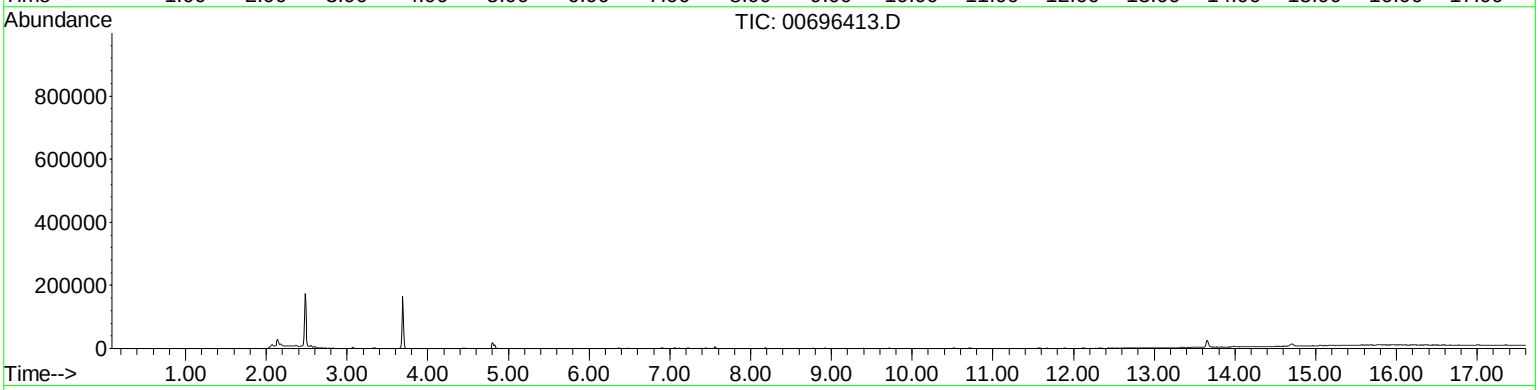


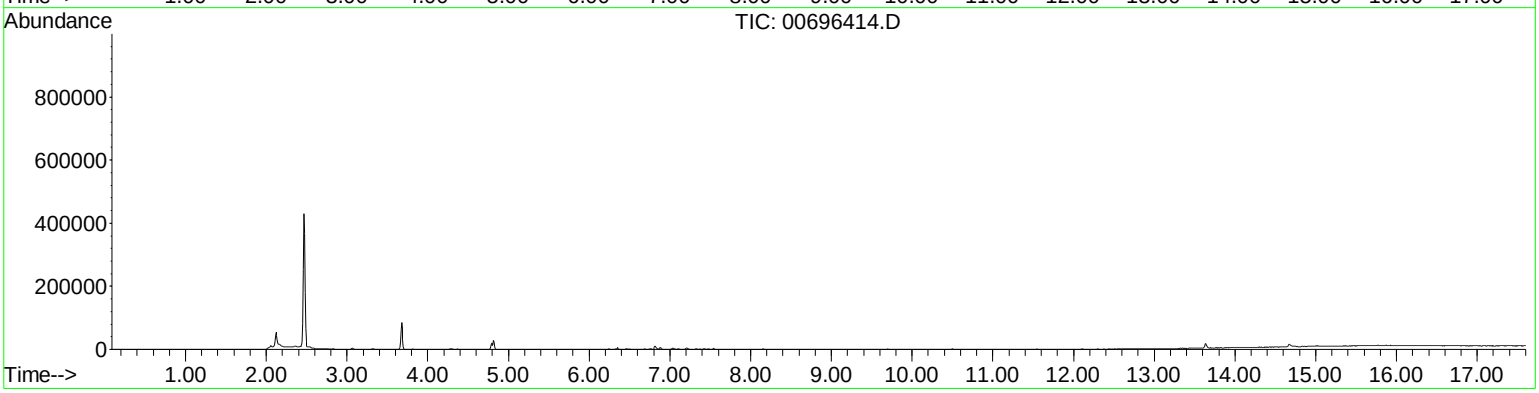
TICS 21815026-2
IN NUMERICAL ORDER



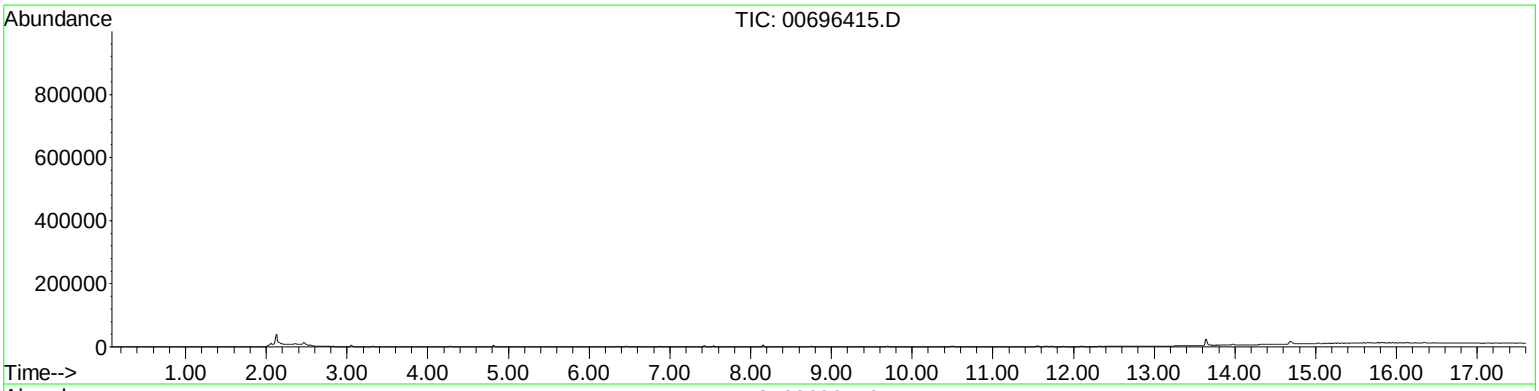


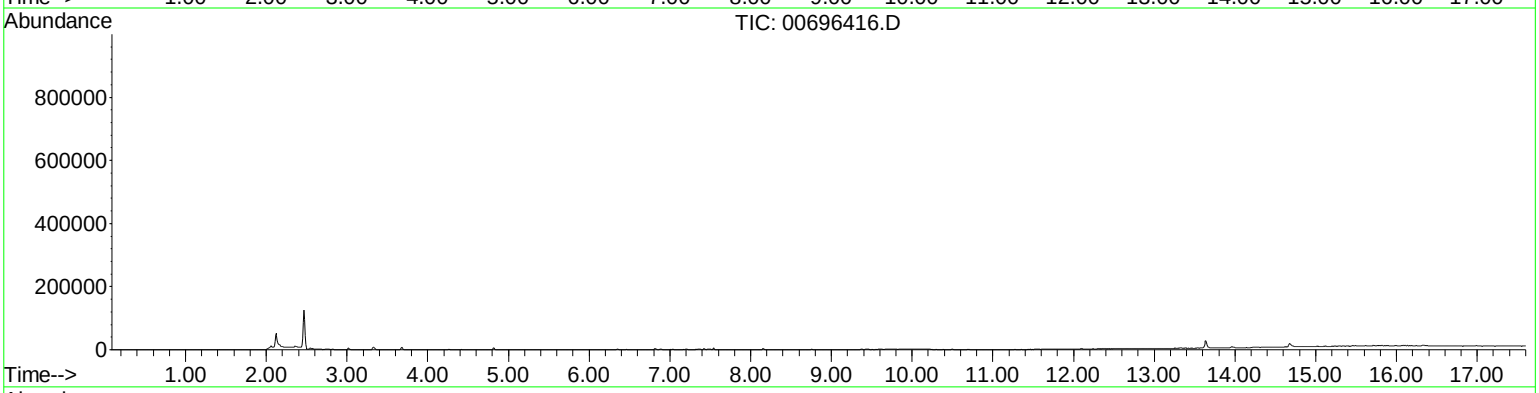


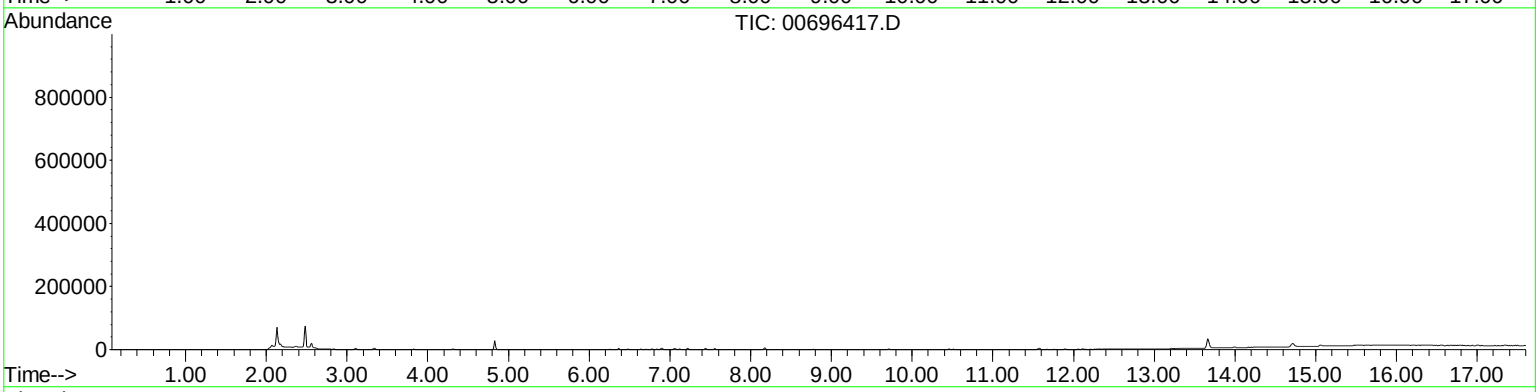


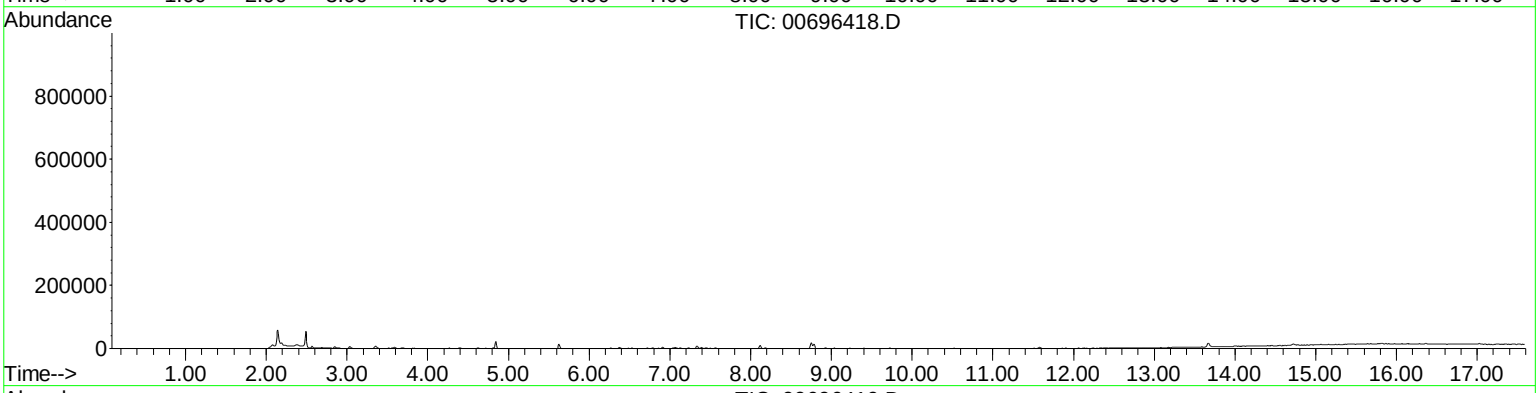


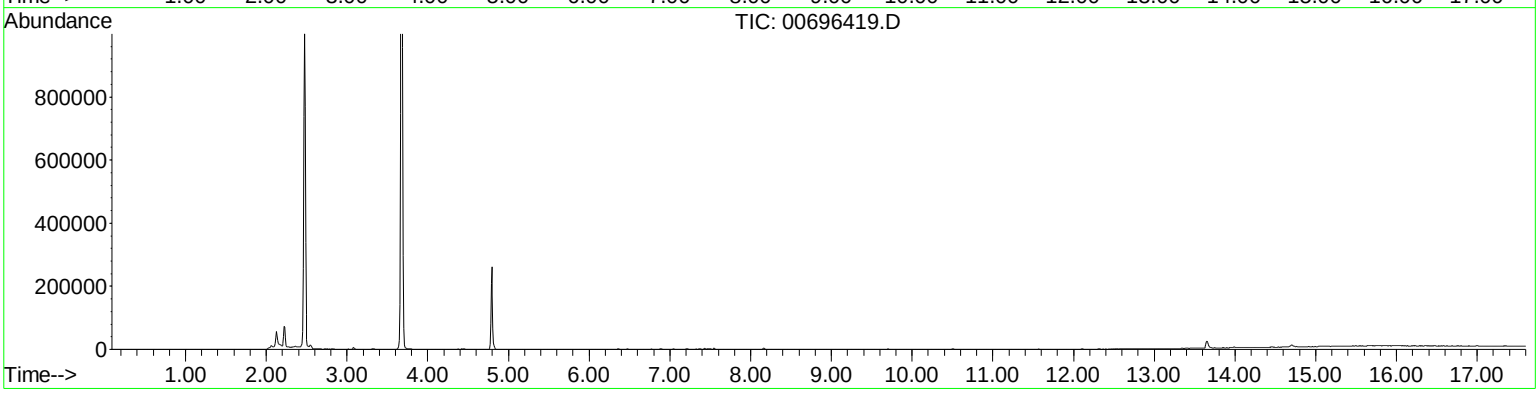
TICS 21815026-2
IN NUMERICAL ORDER



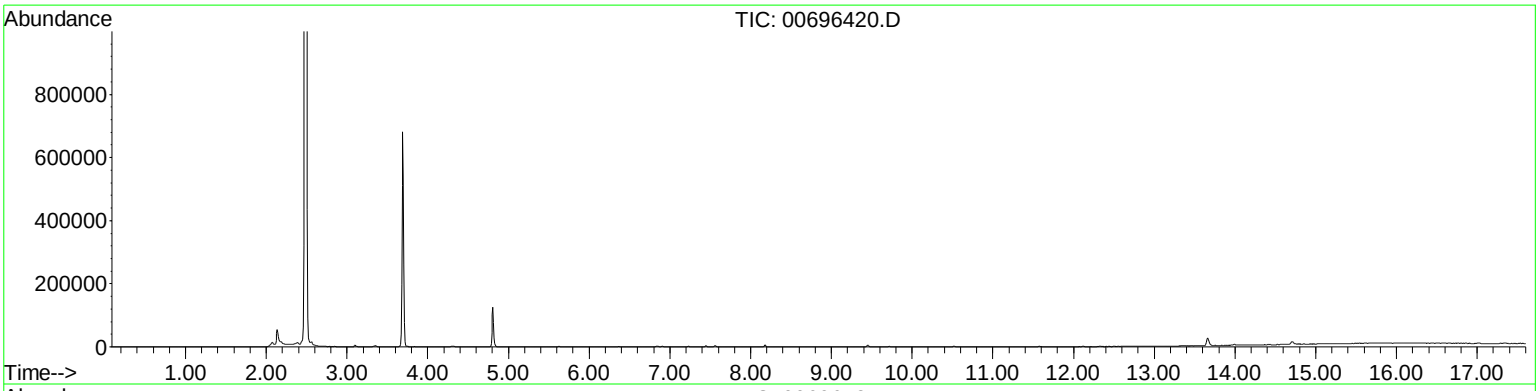


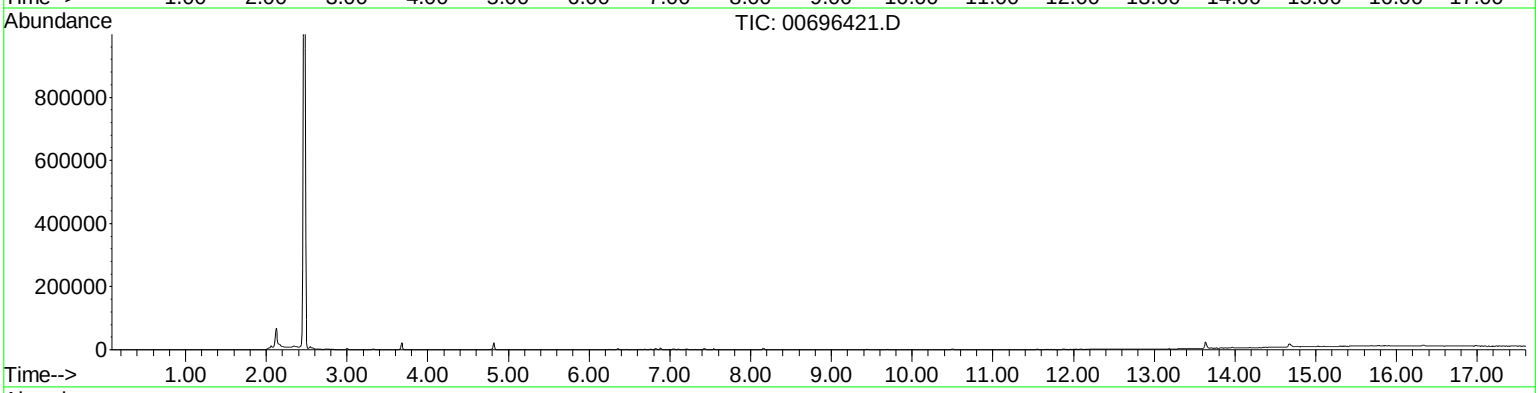


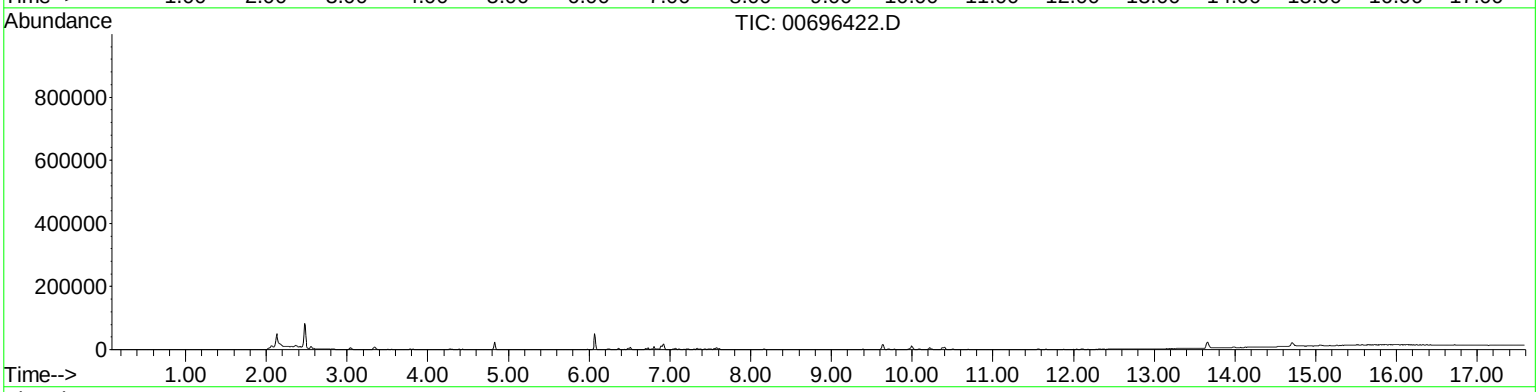


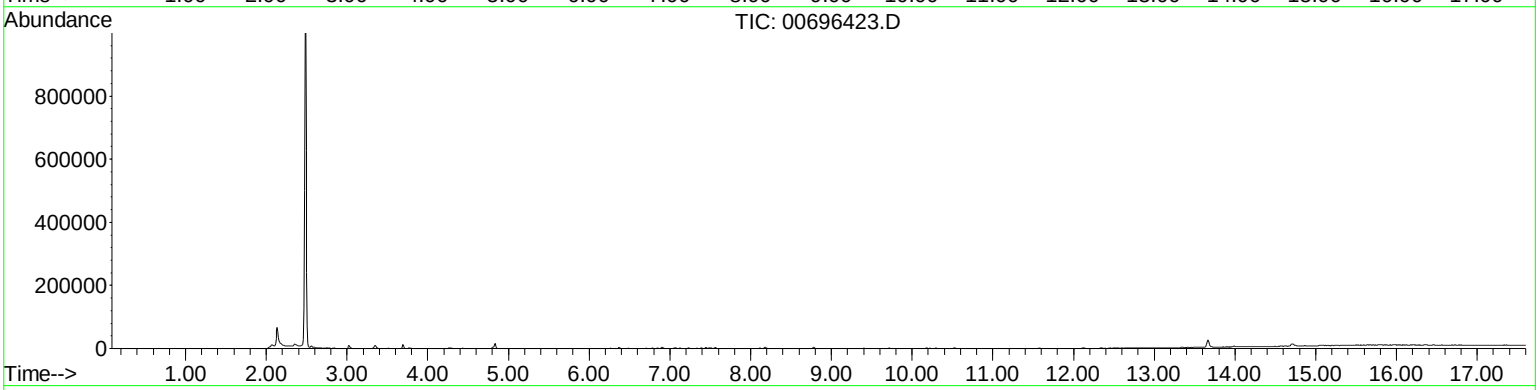


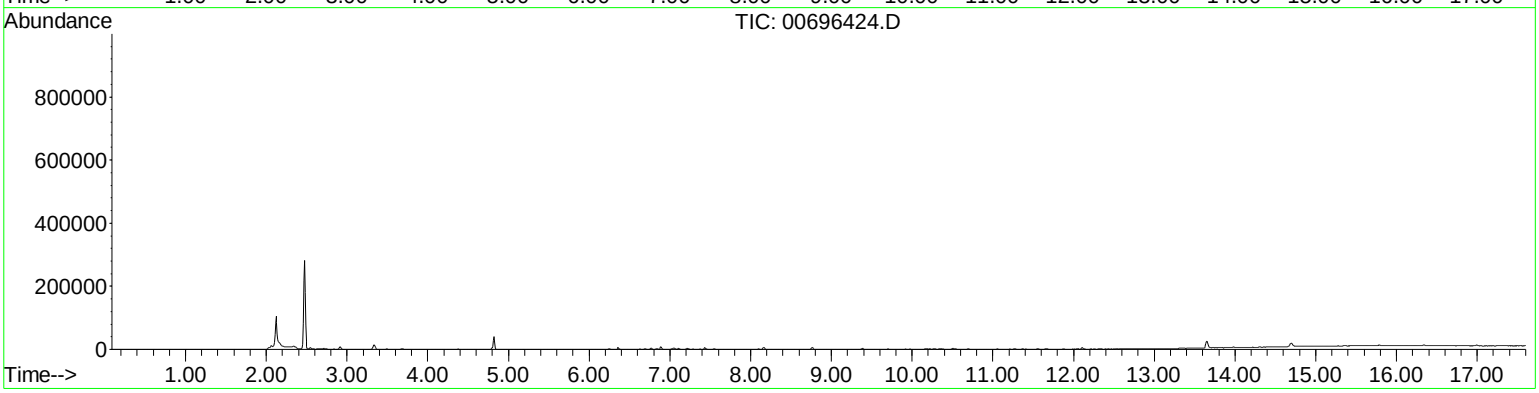
TICS 21815026-2
IN NUMERICAL ORDER



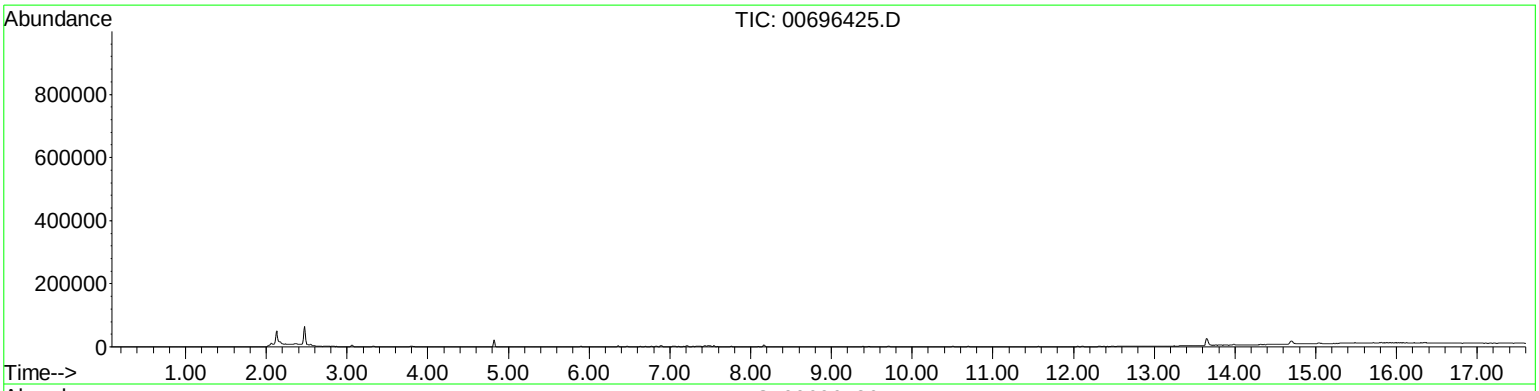


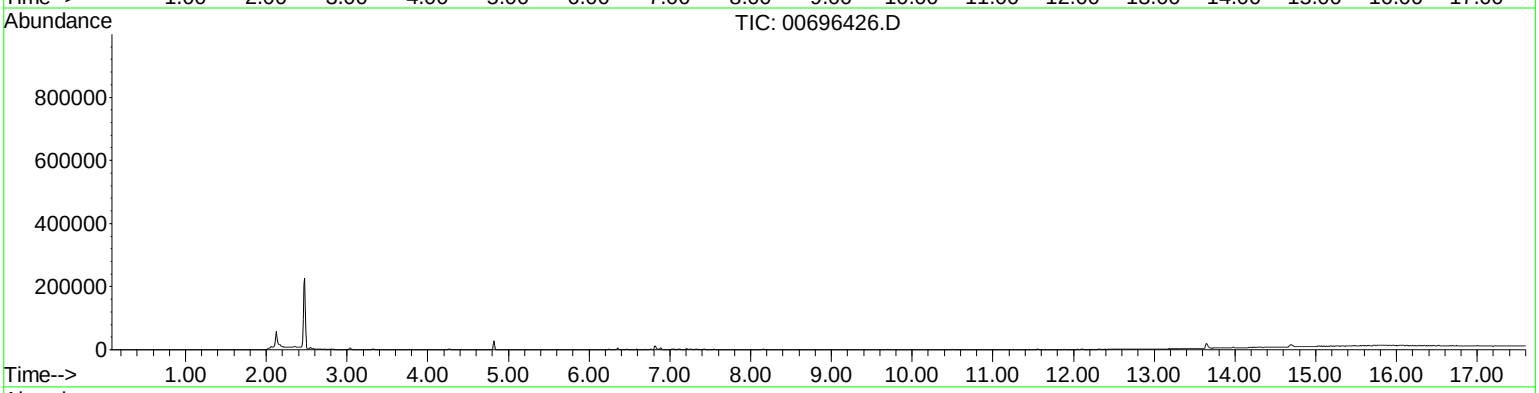


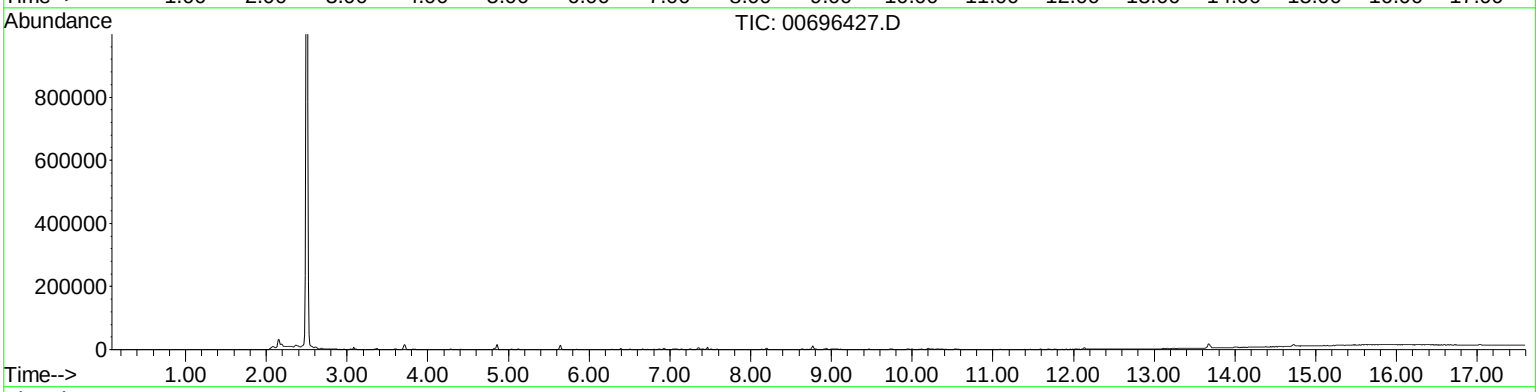


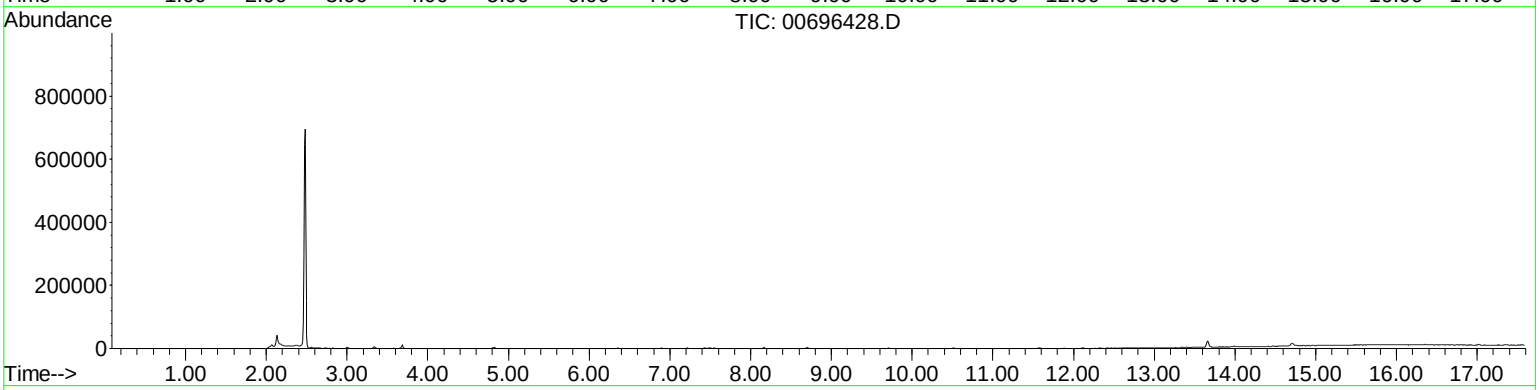


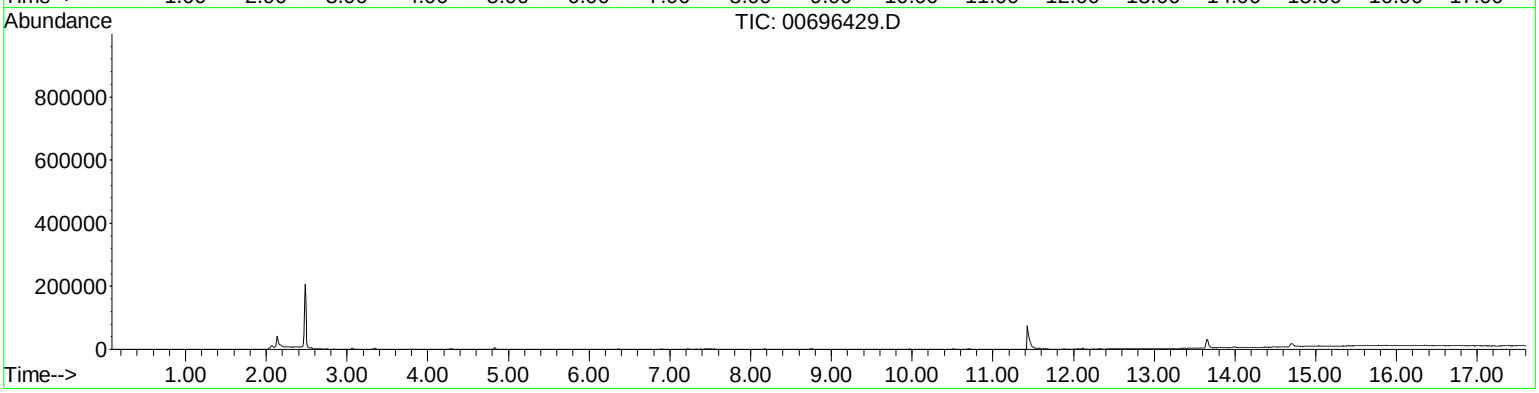
TICS 21815026-2
IN NUMERICAL ORDER



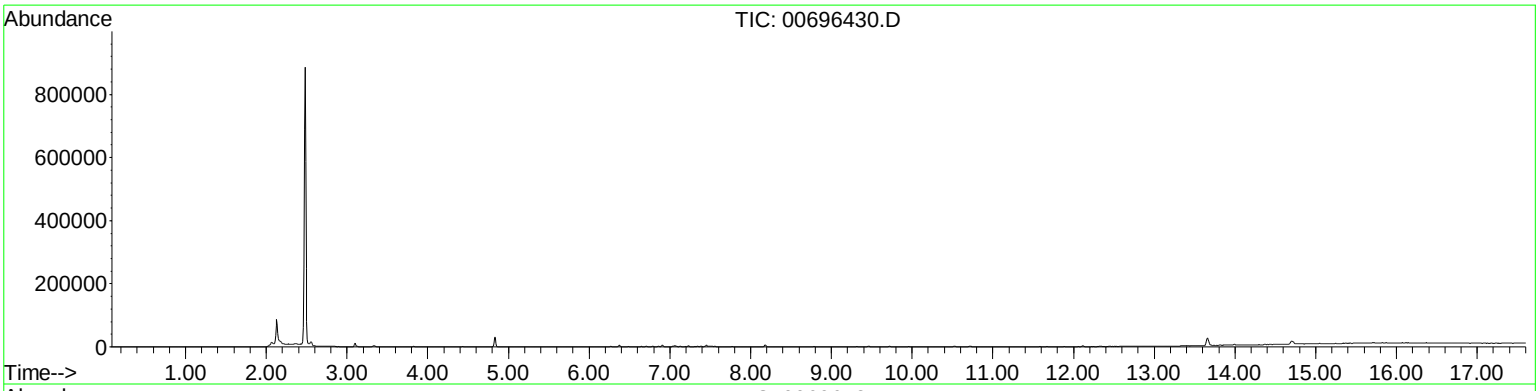


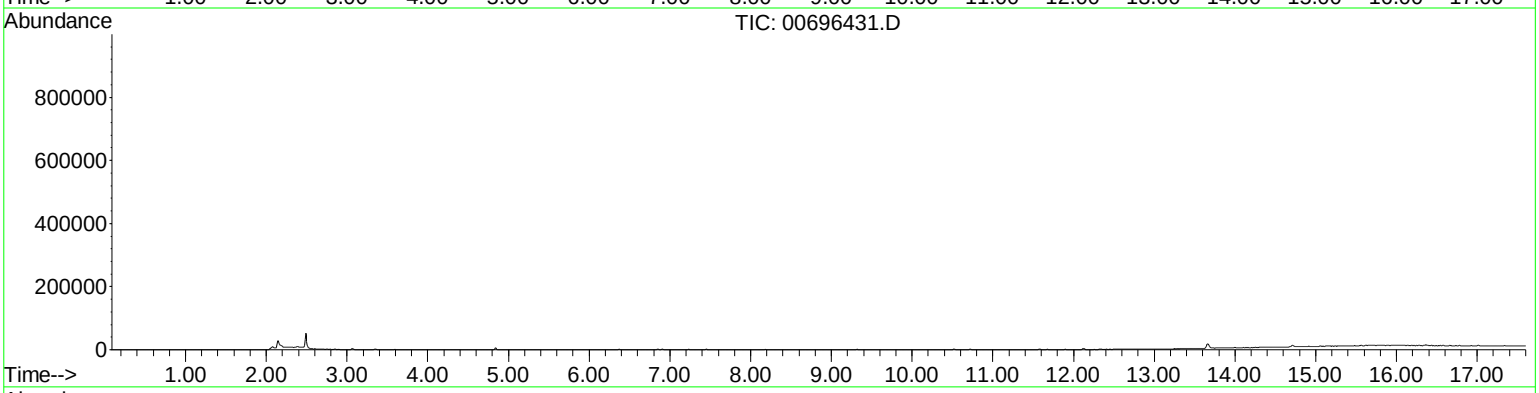


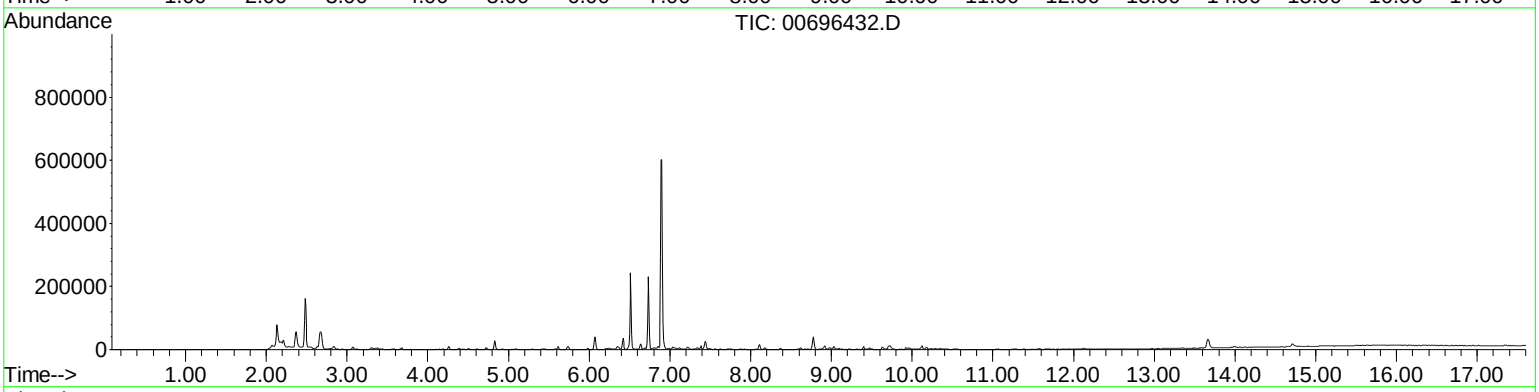


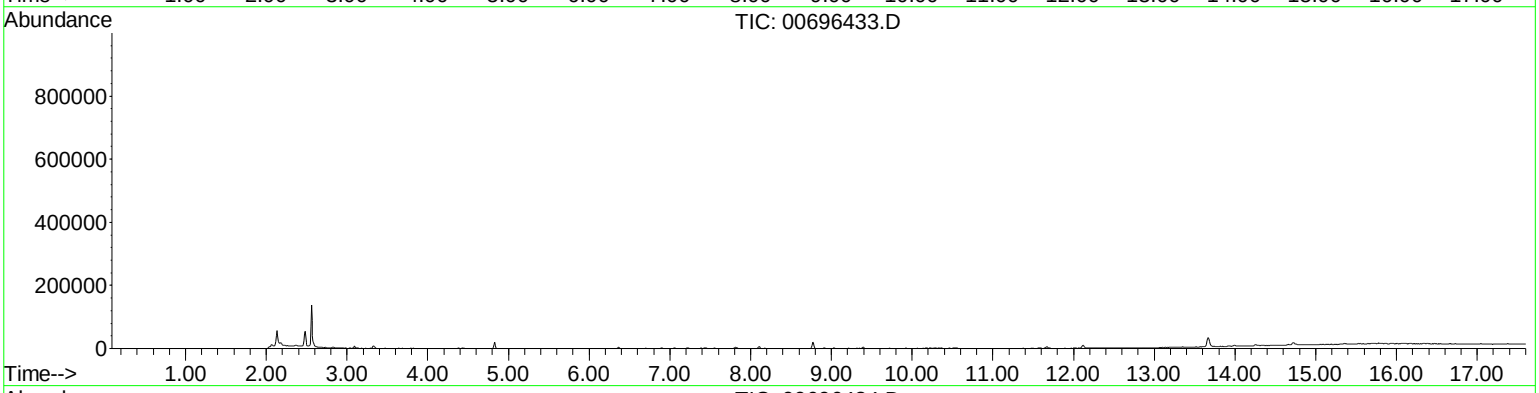


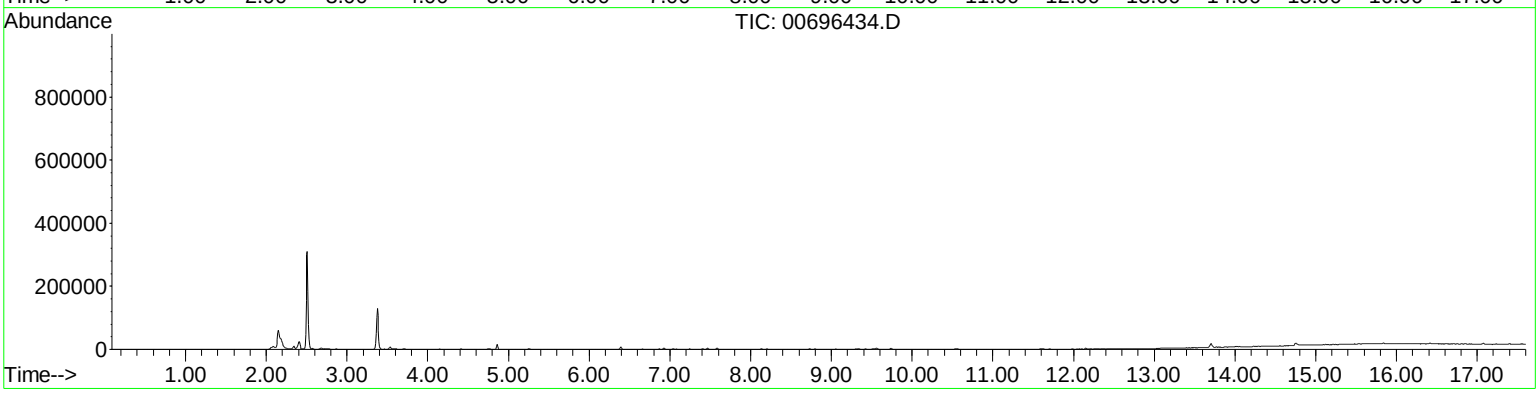
TICS 21815026-2
IN NUMERICAL ORDER



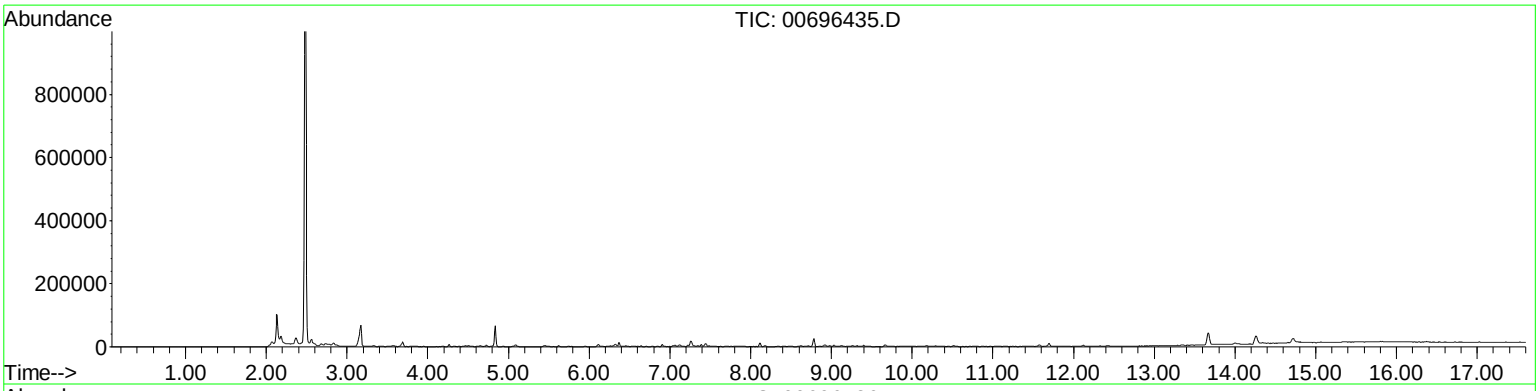


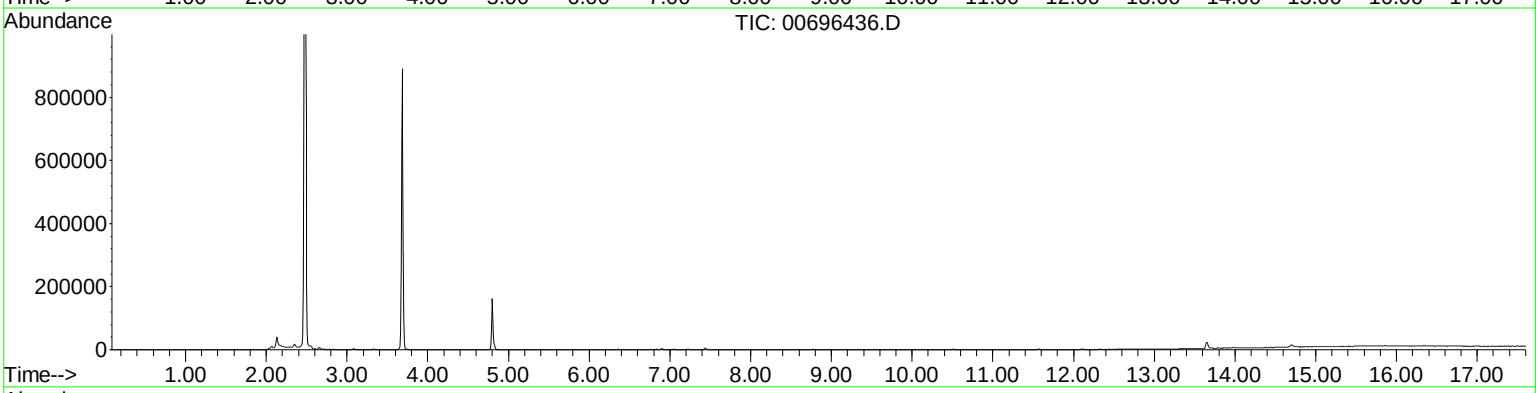


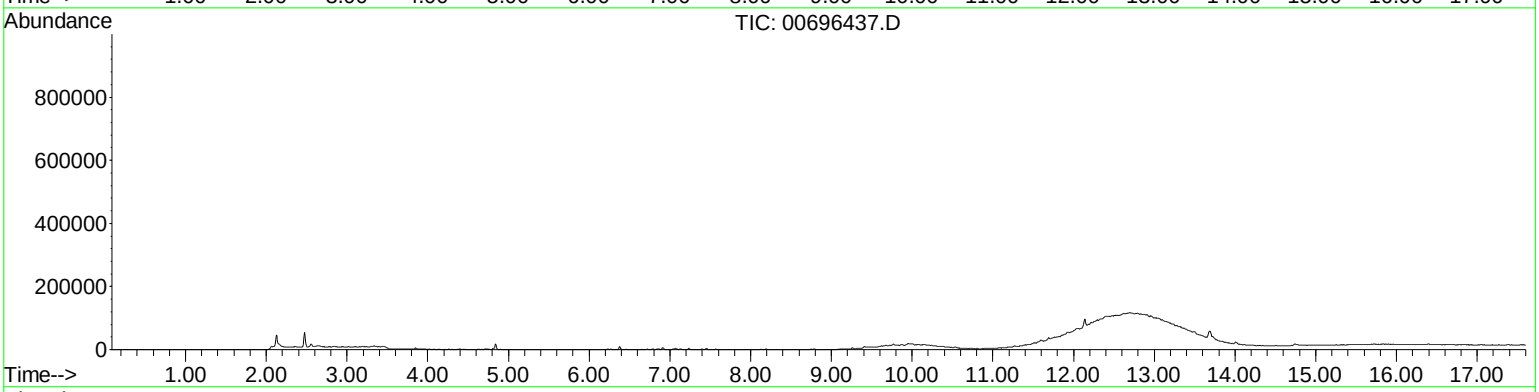


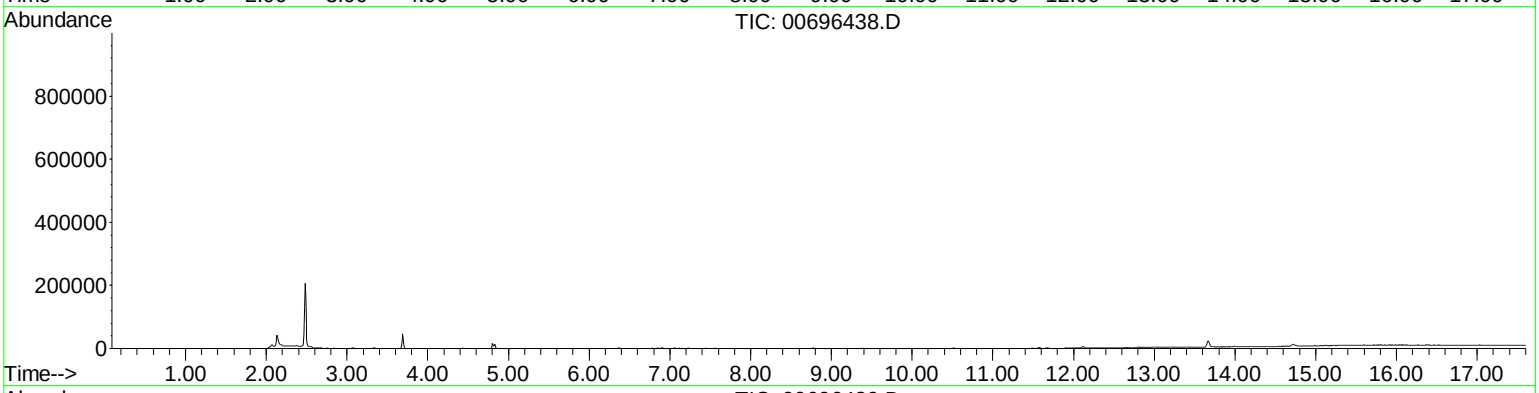


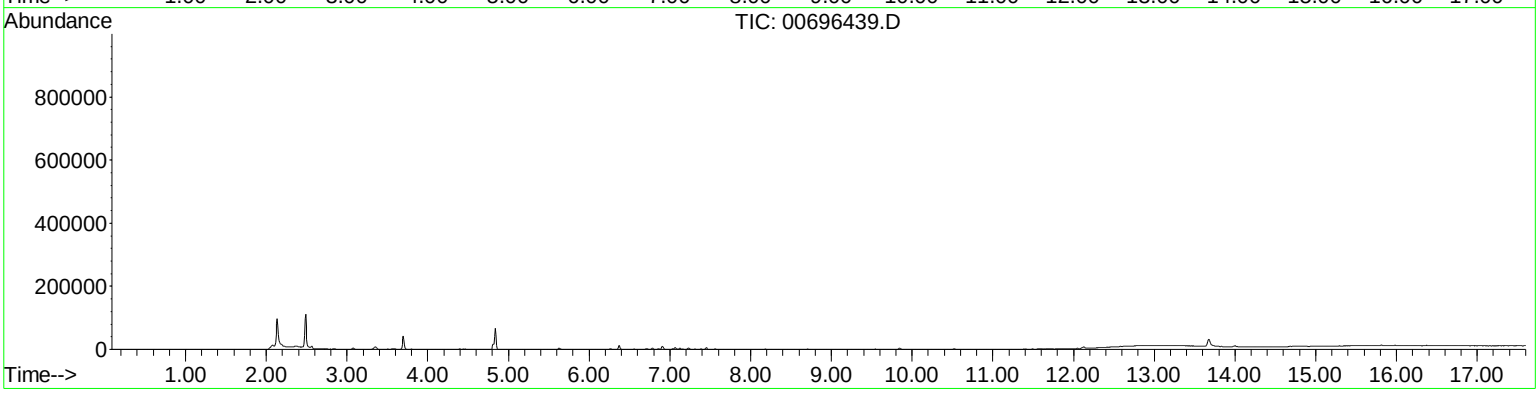
TICS 21815026-2
IN NUMERICAL ORDER



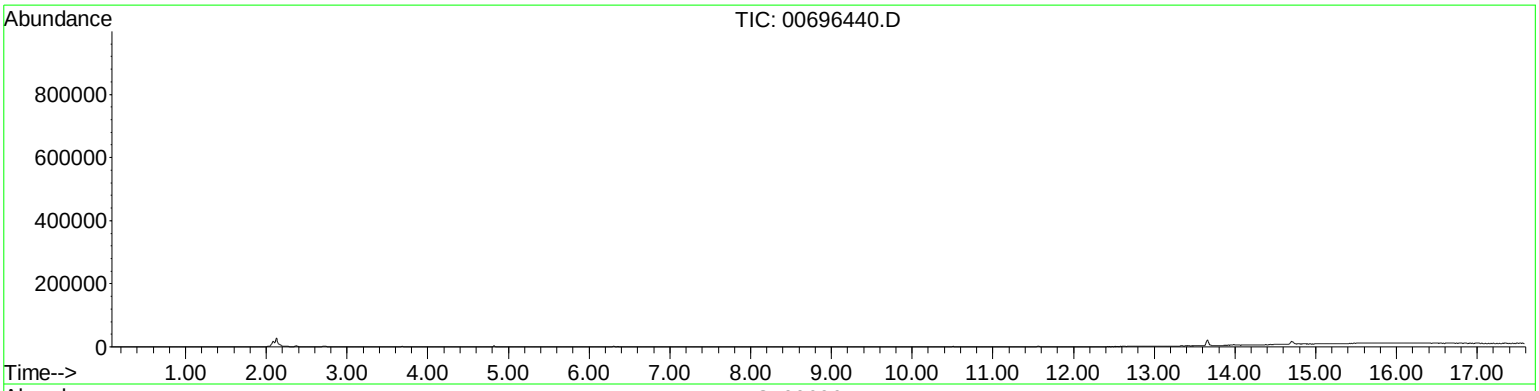


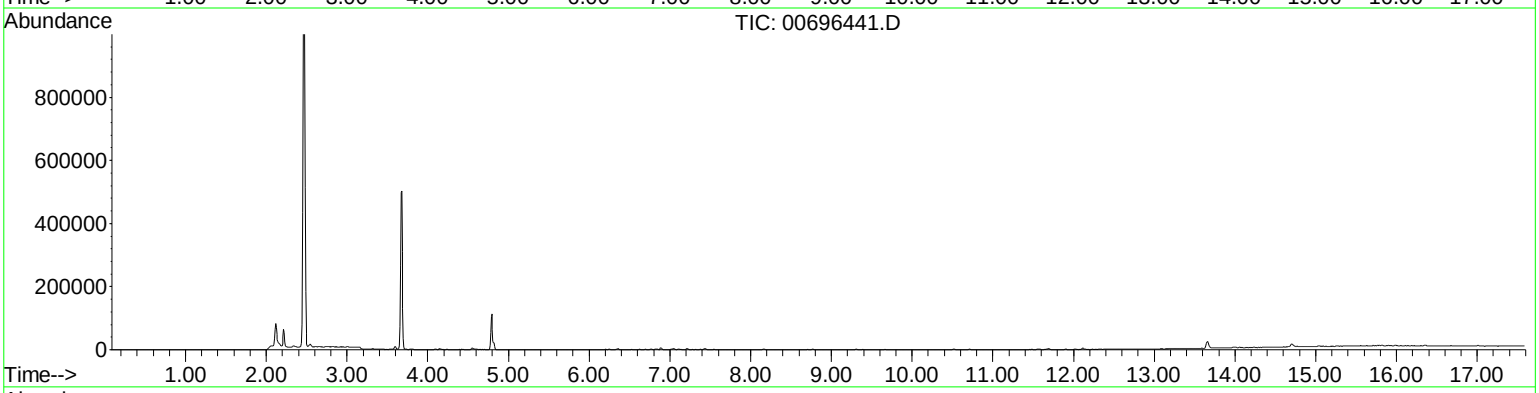


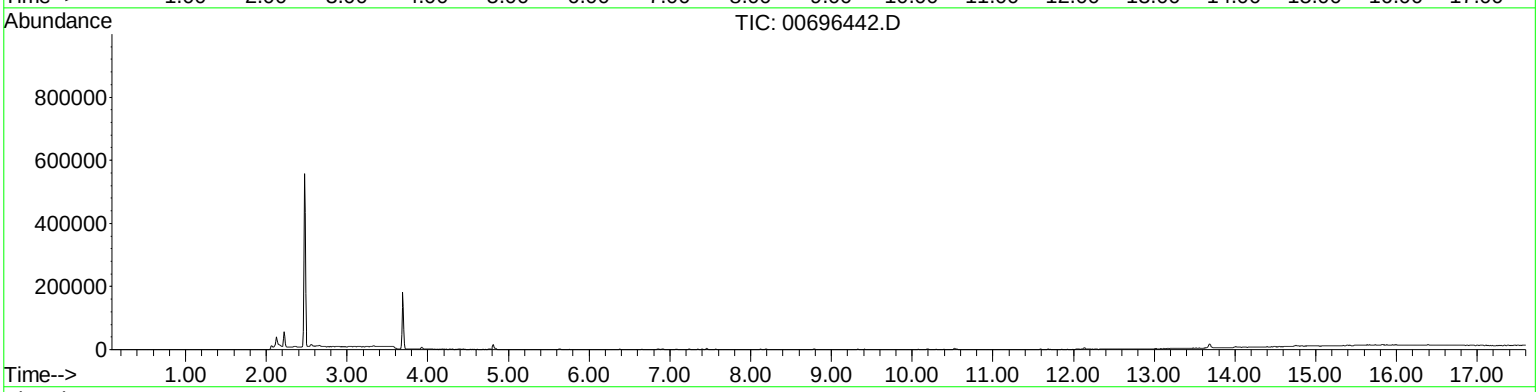


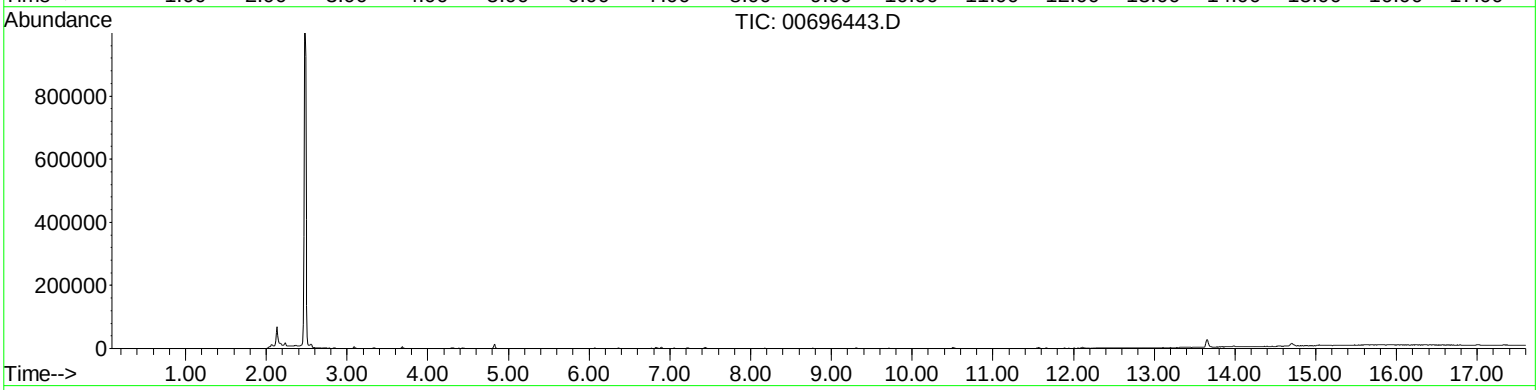


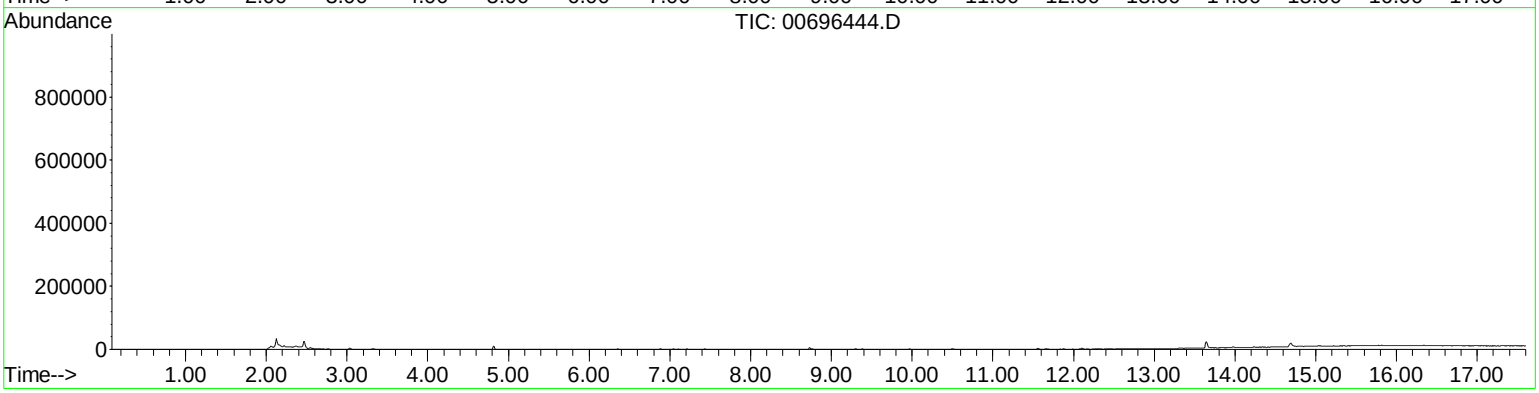
TICS 21815026-2
IN NUMERICAL ORDER



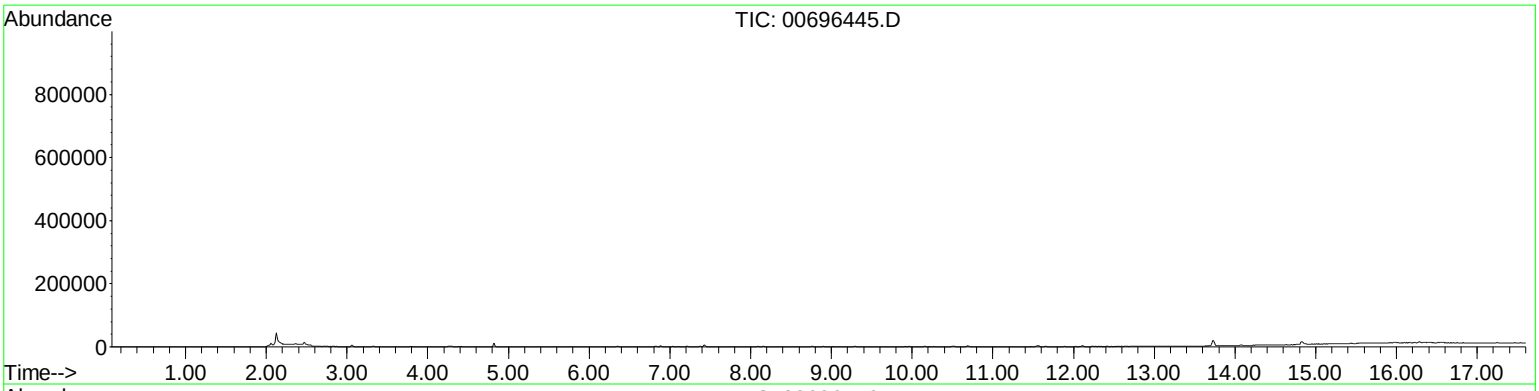


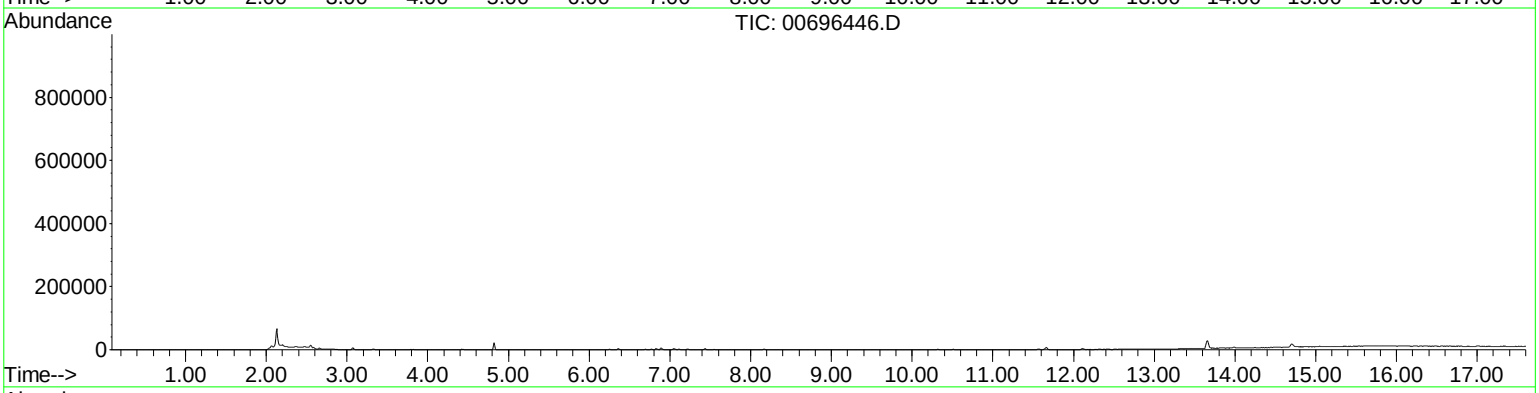


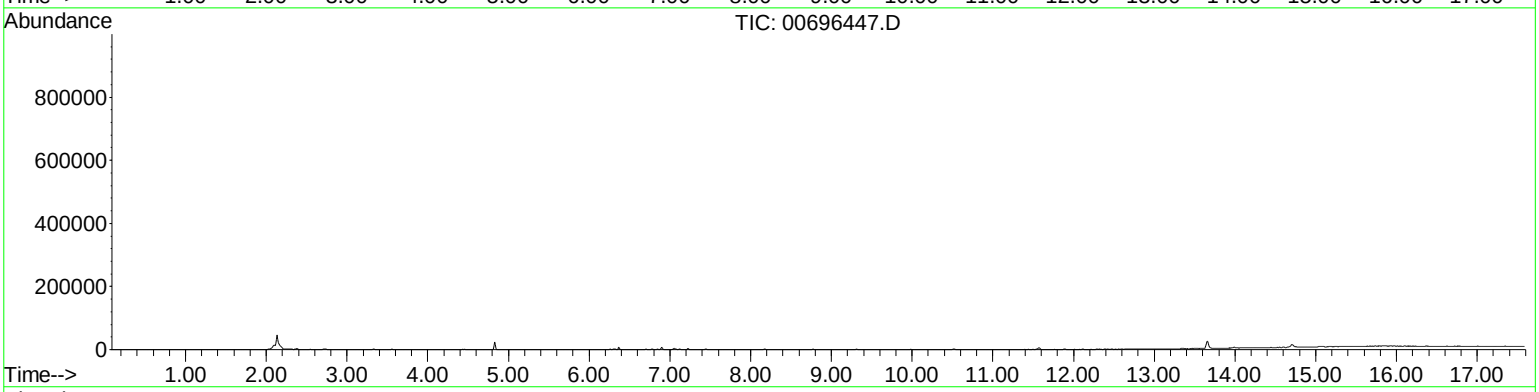


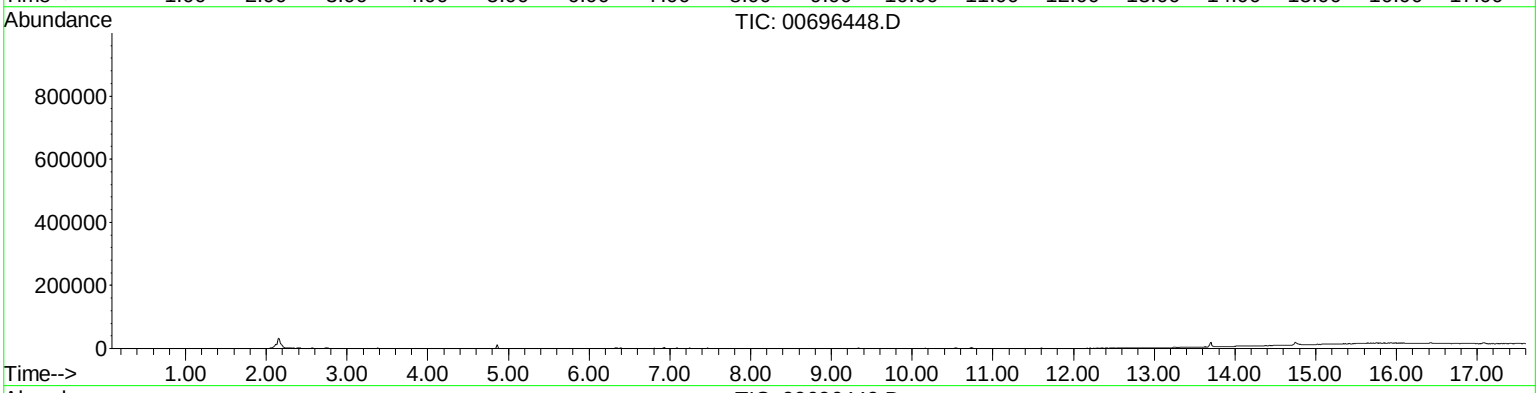


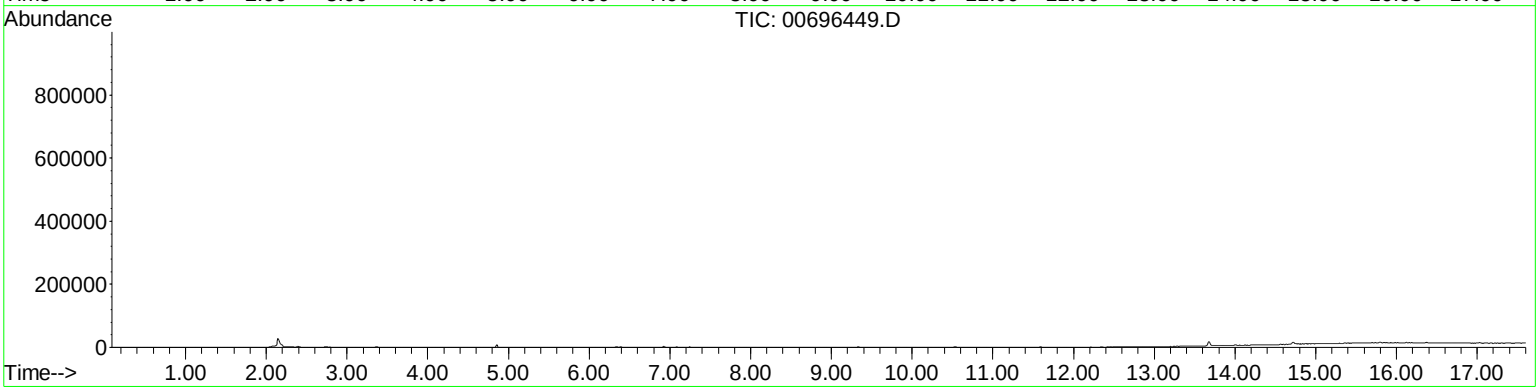
TICS 21815026-2
IN NUMERICAL ORDER



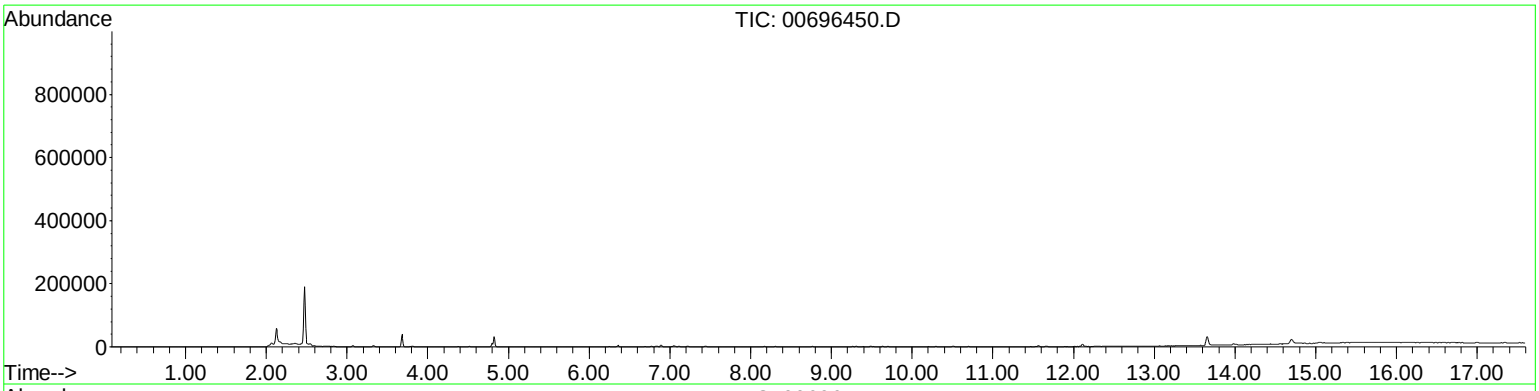


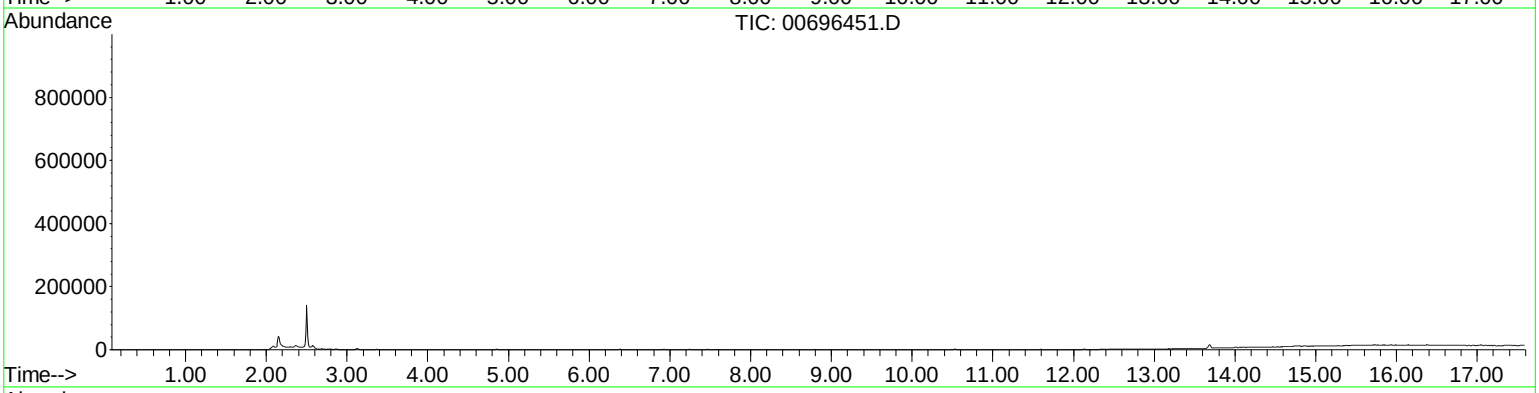


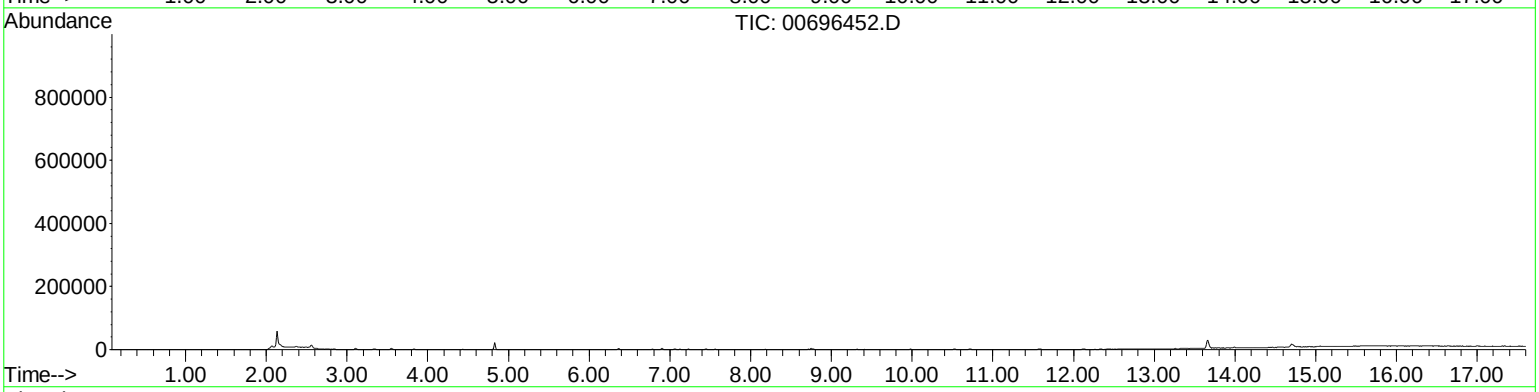


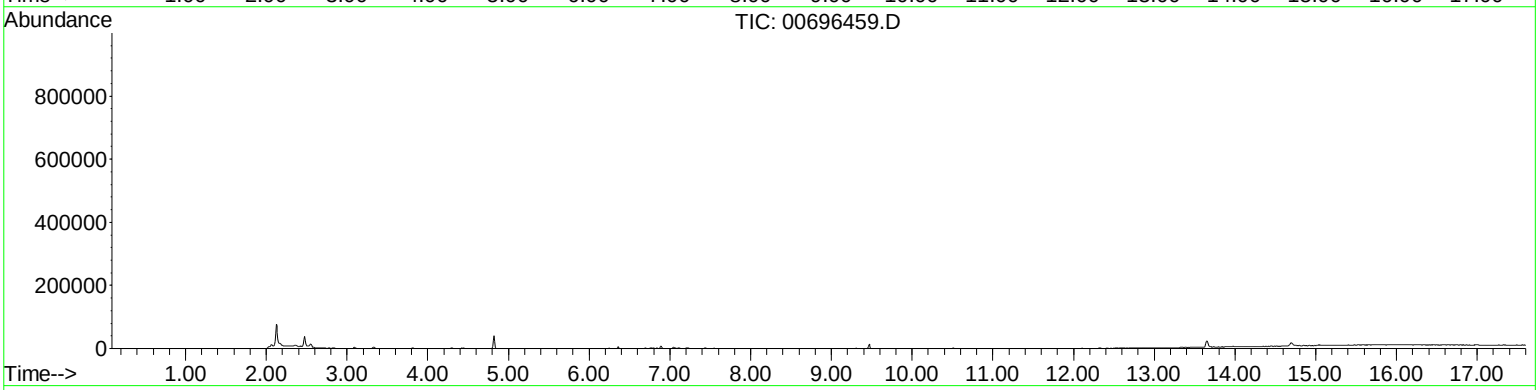


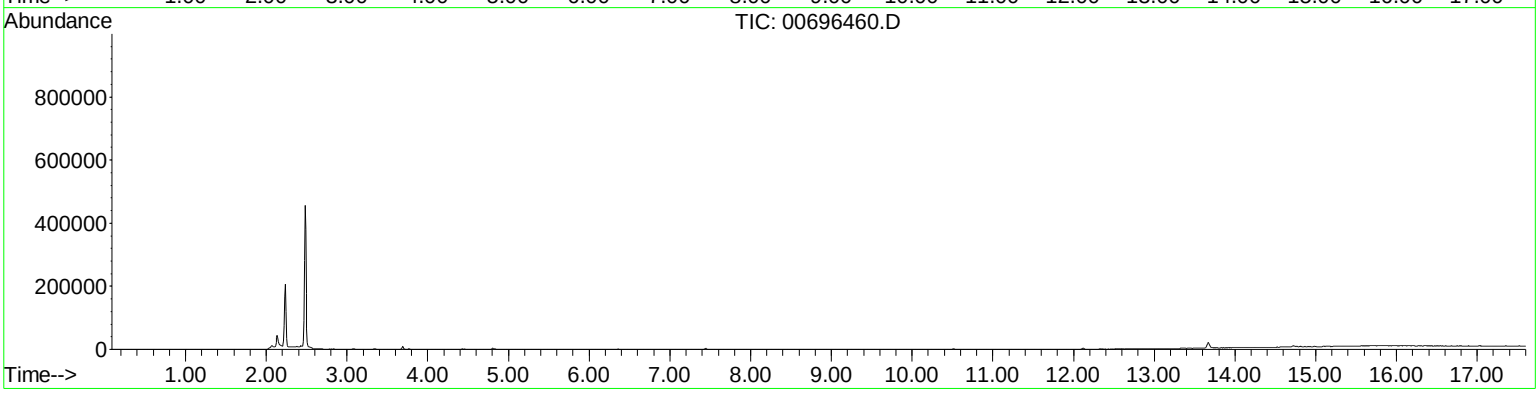
TICS 21815026-2
IN NUMERICAL ORDER



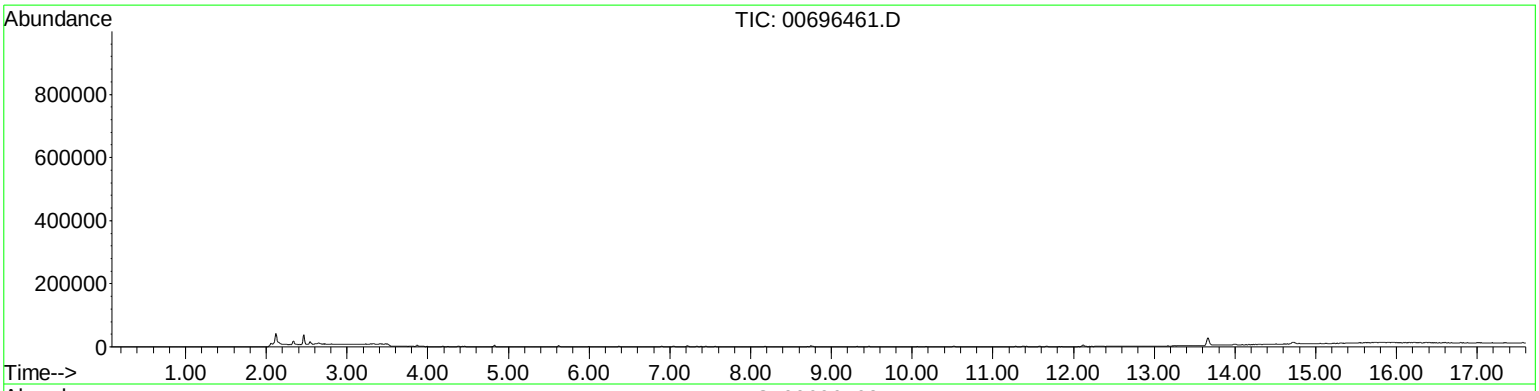


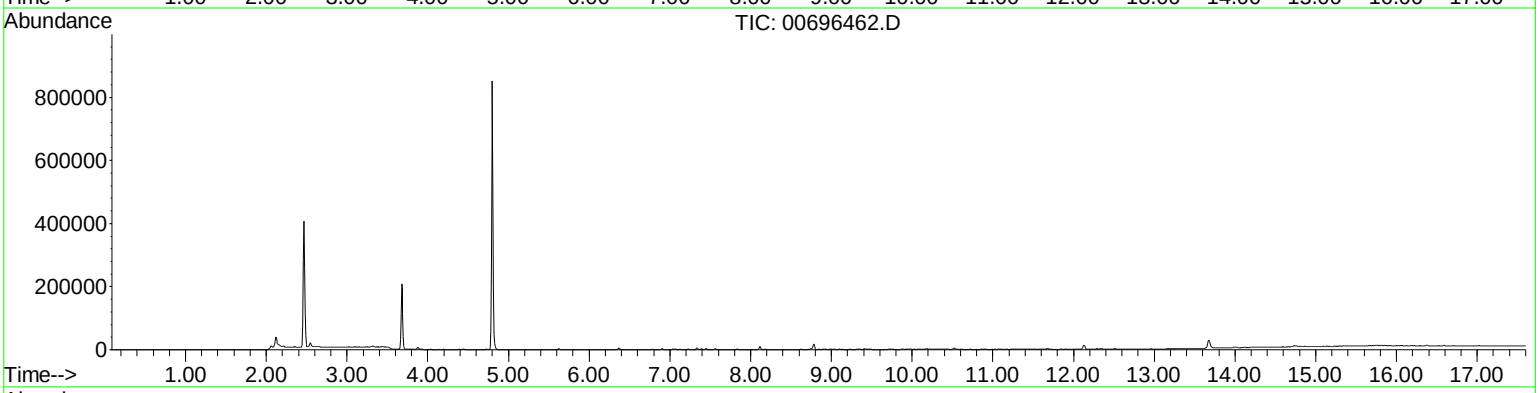


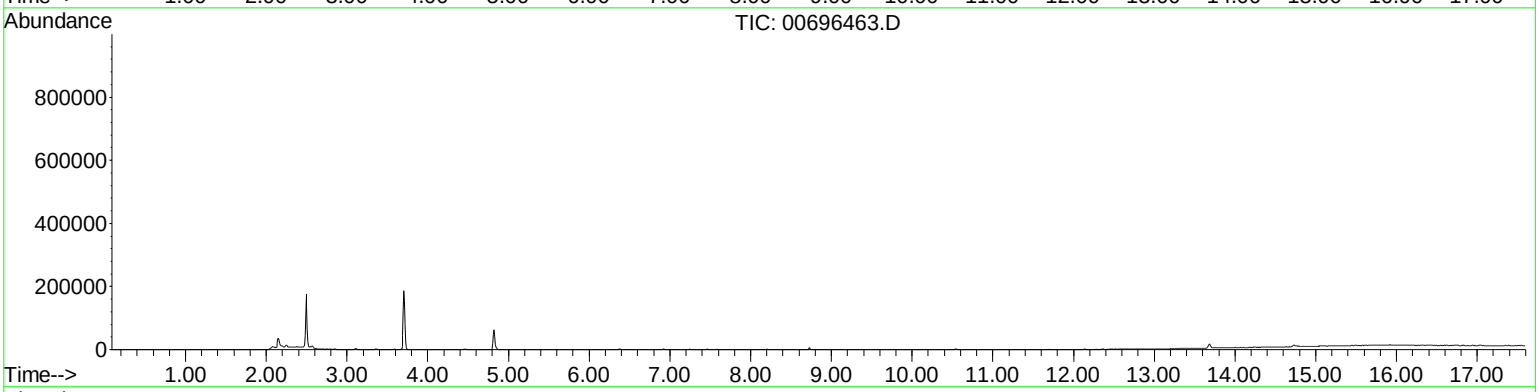


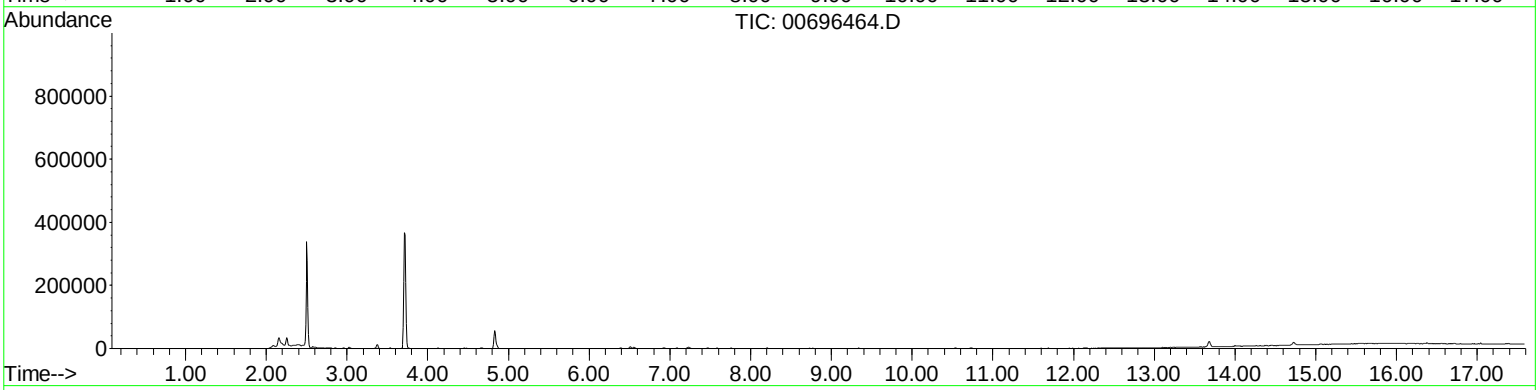


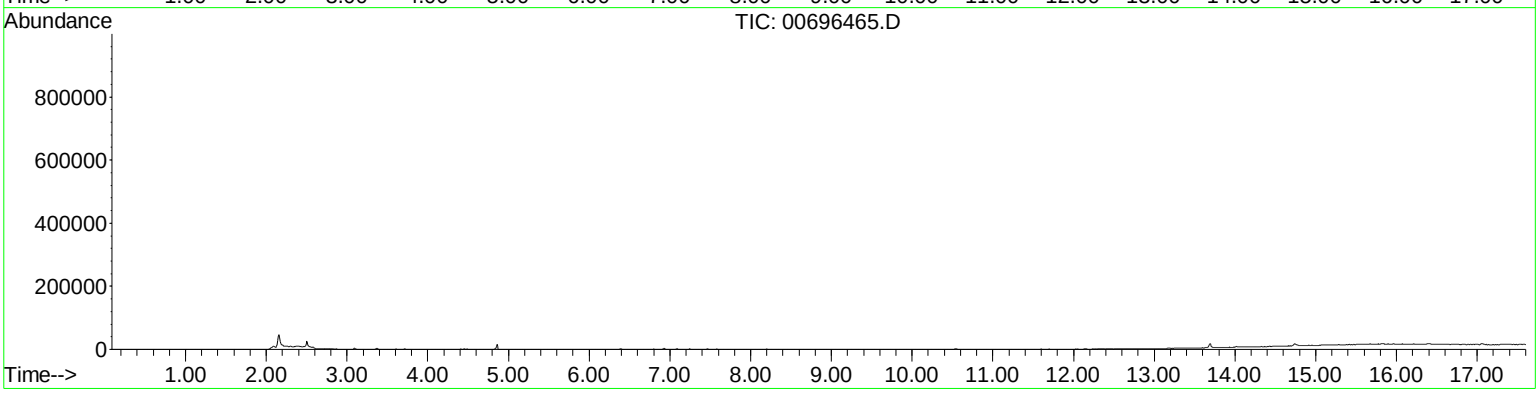
TICS 21815026-2
IN NUMERICAL ORDER



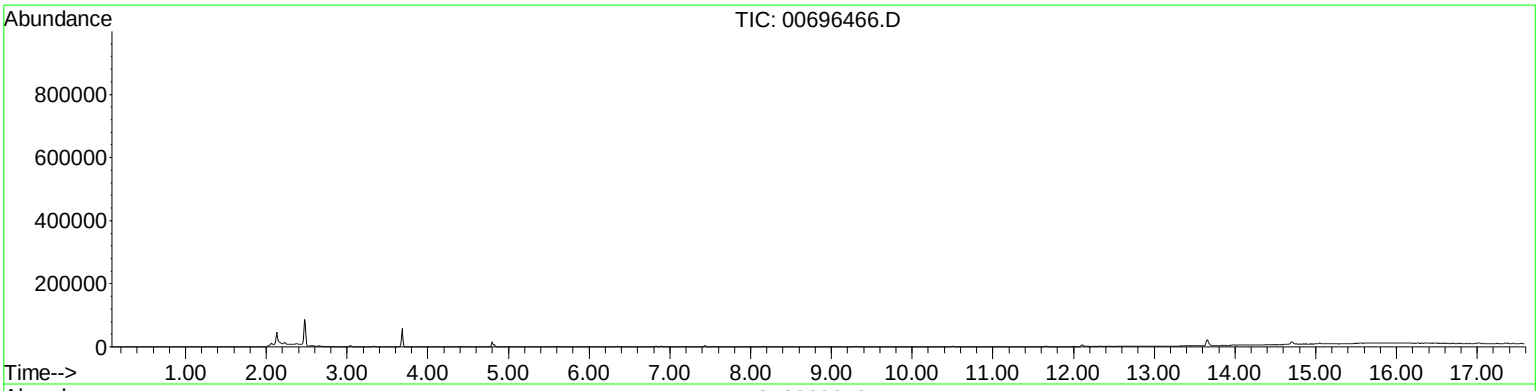


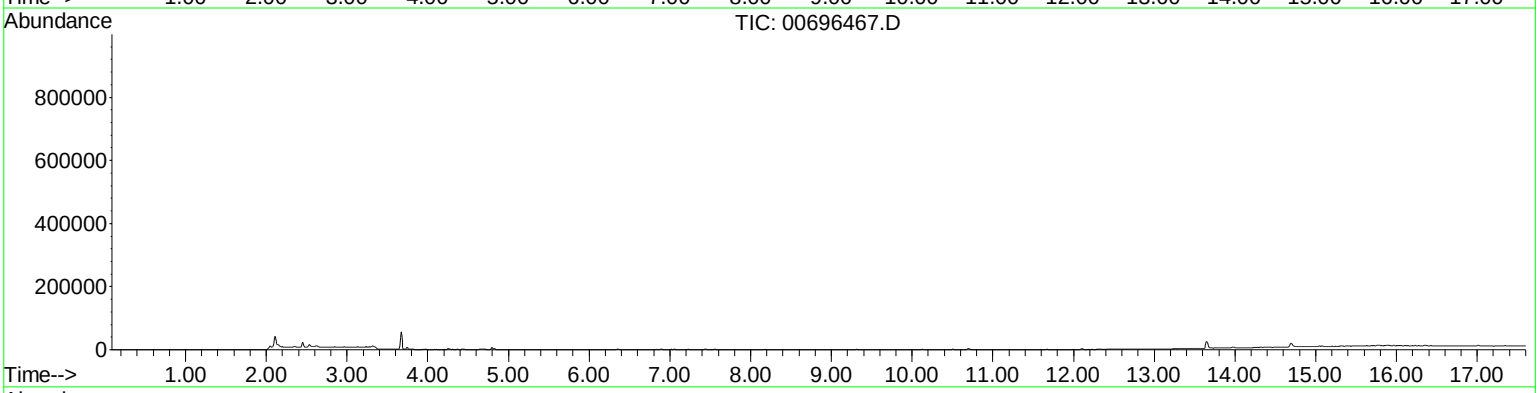


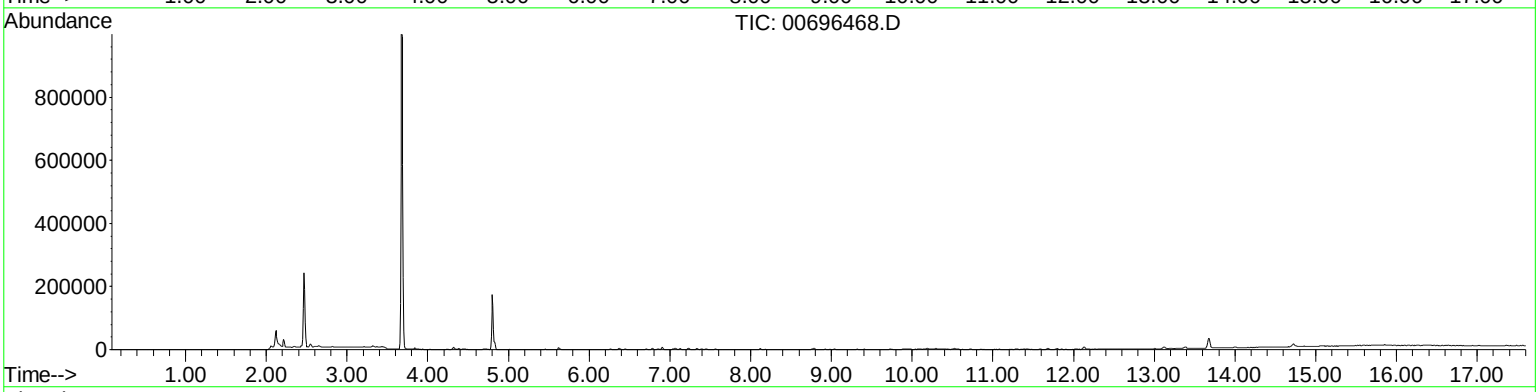


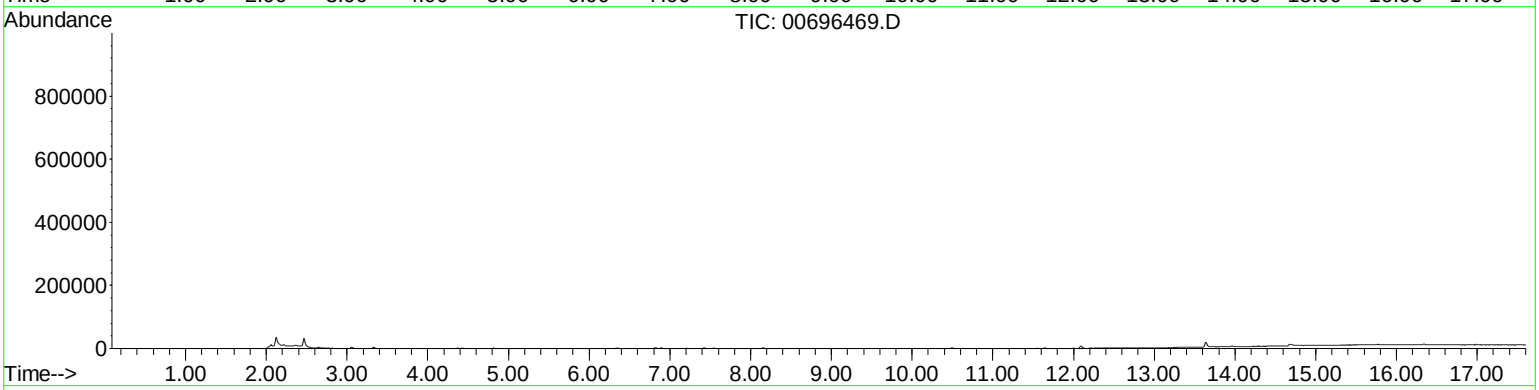


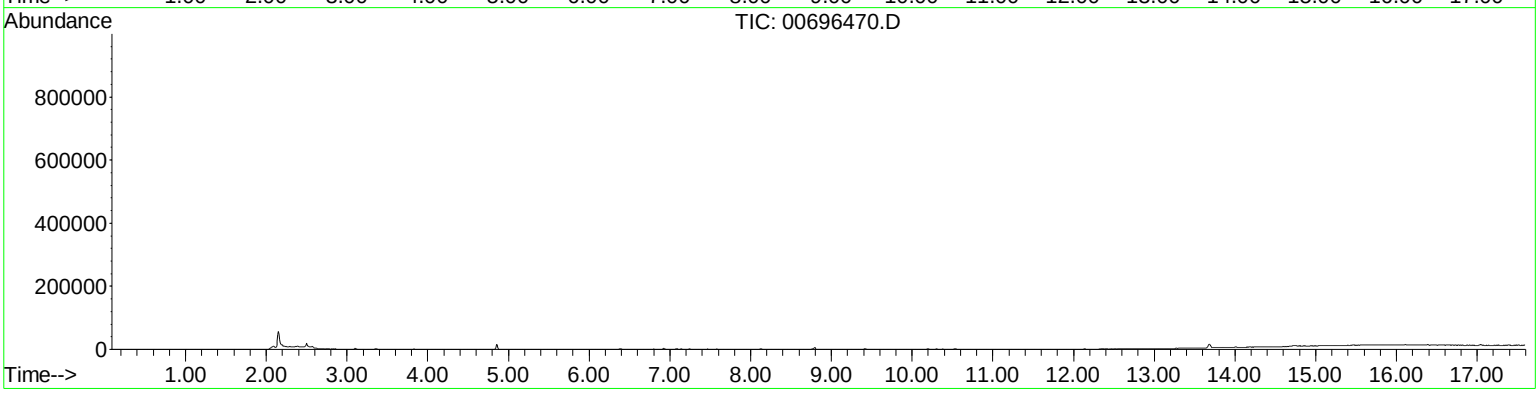
TICS 21815026-2
IN NUMERICAL ORDER



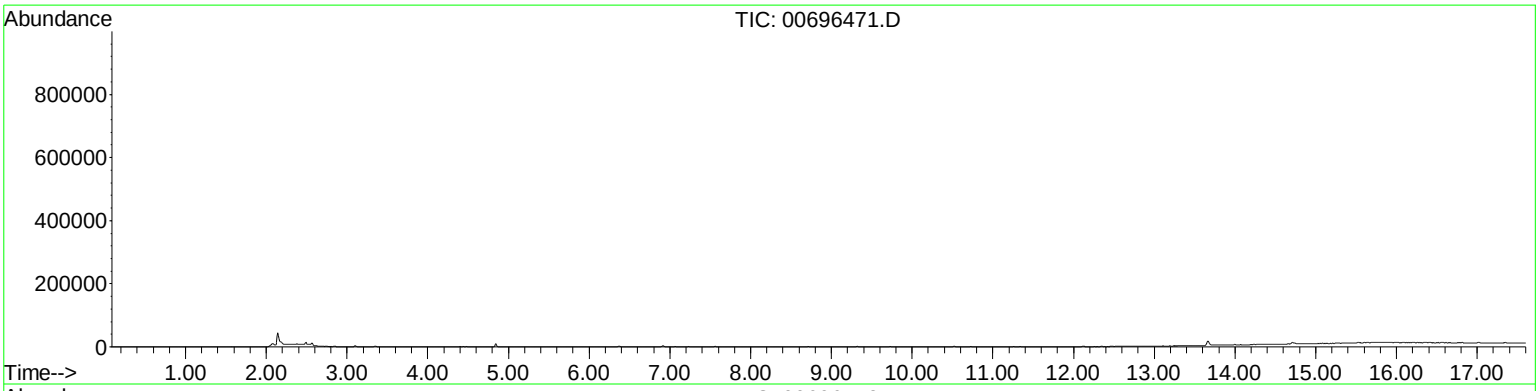


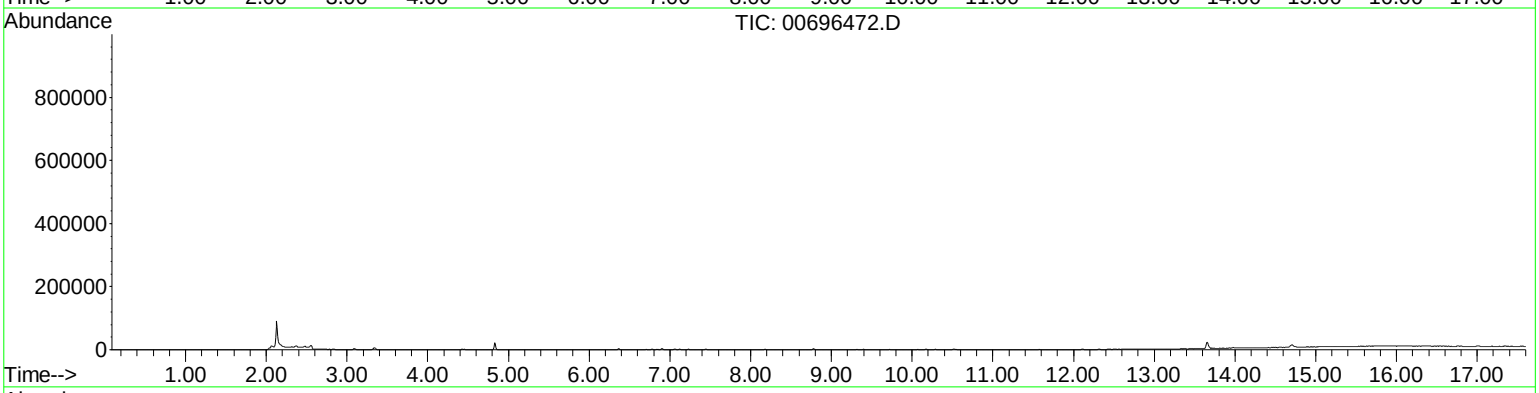


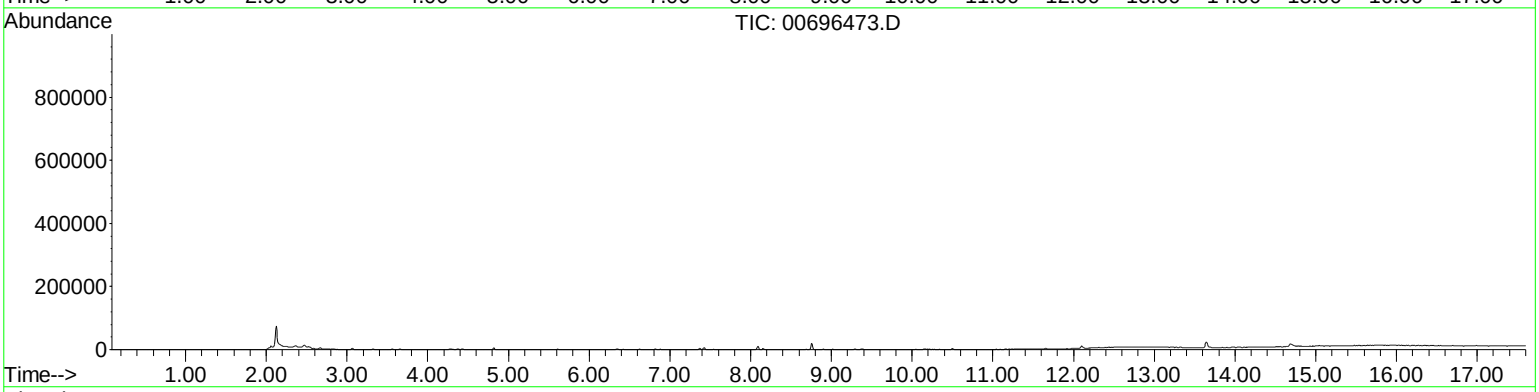


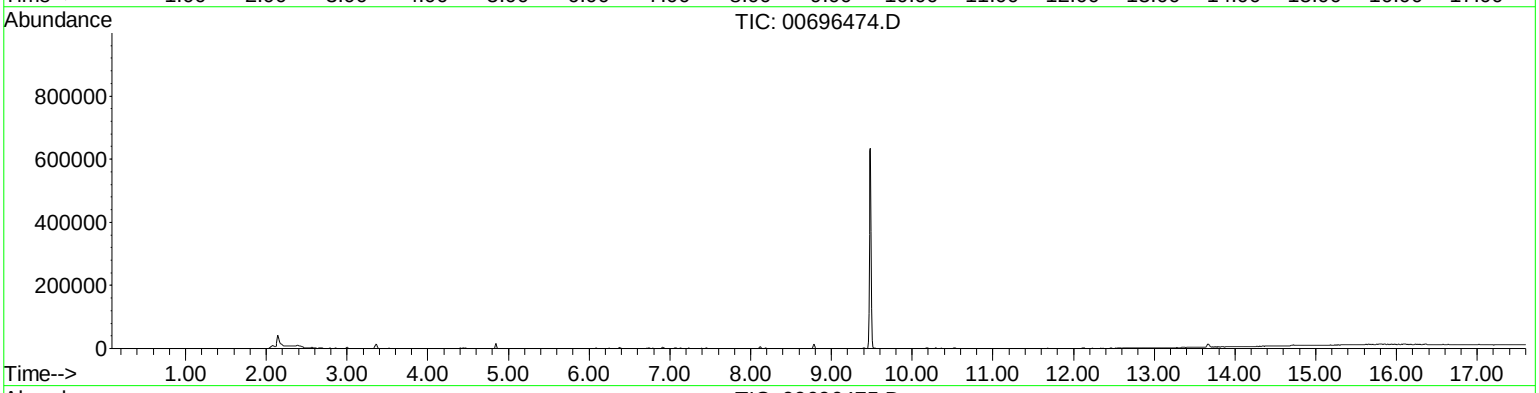


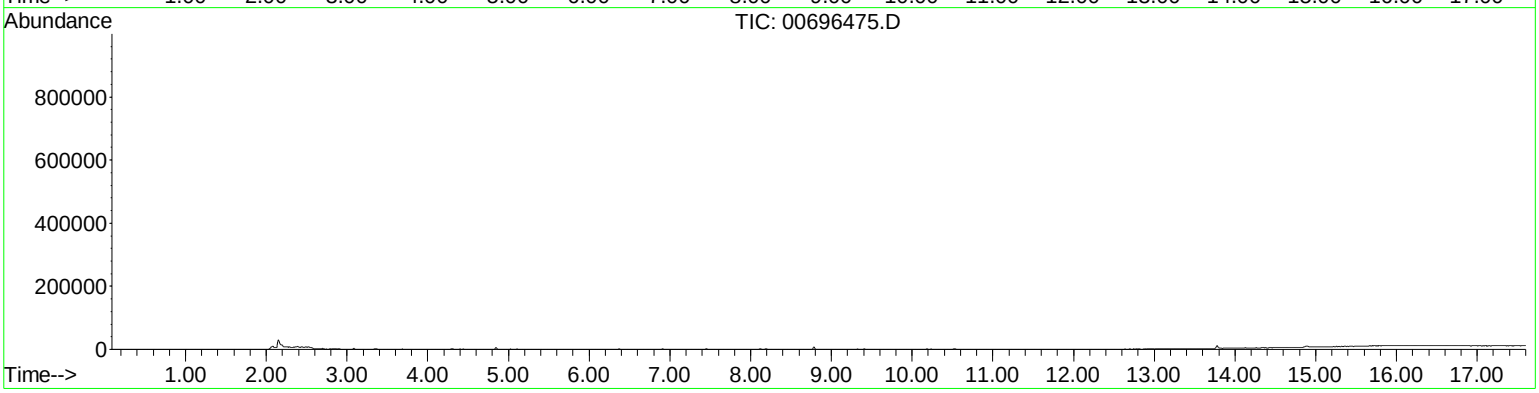
TICS 21815026-2
IN NUMERICAL ORDER



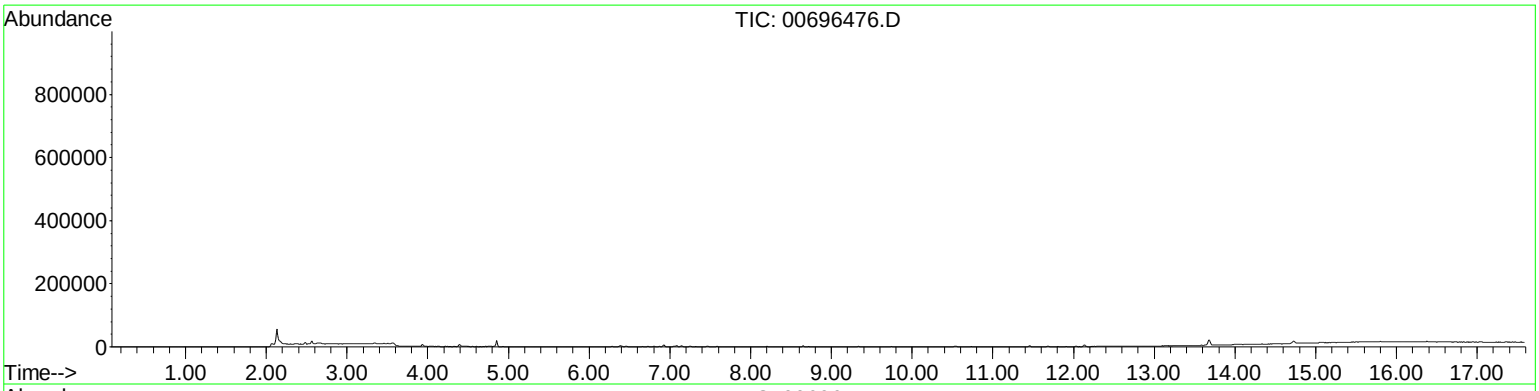


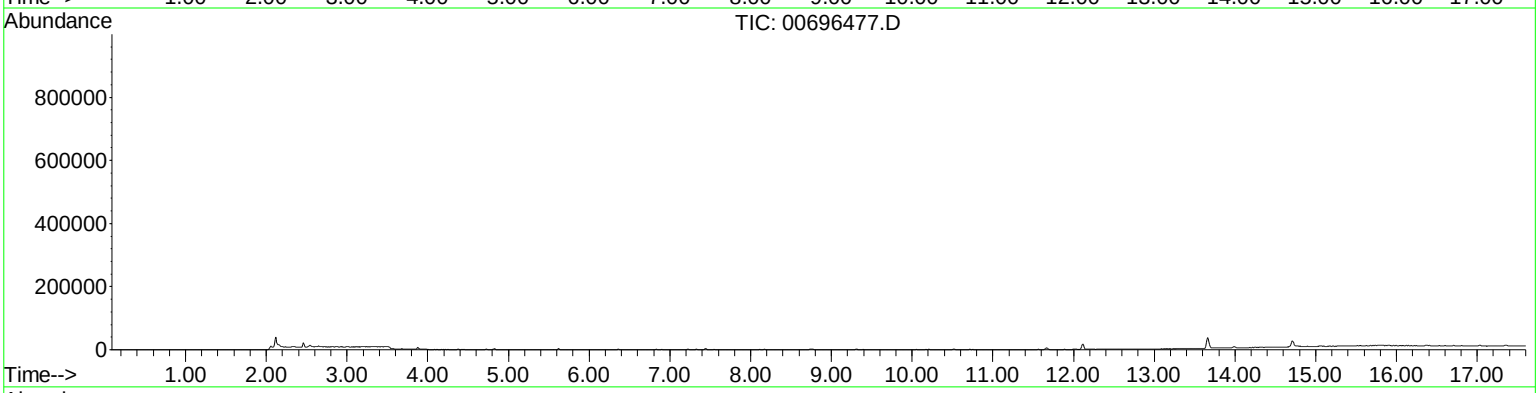


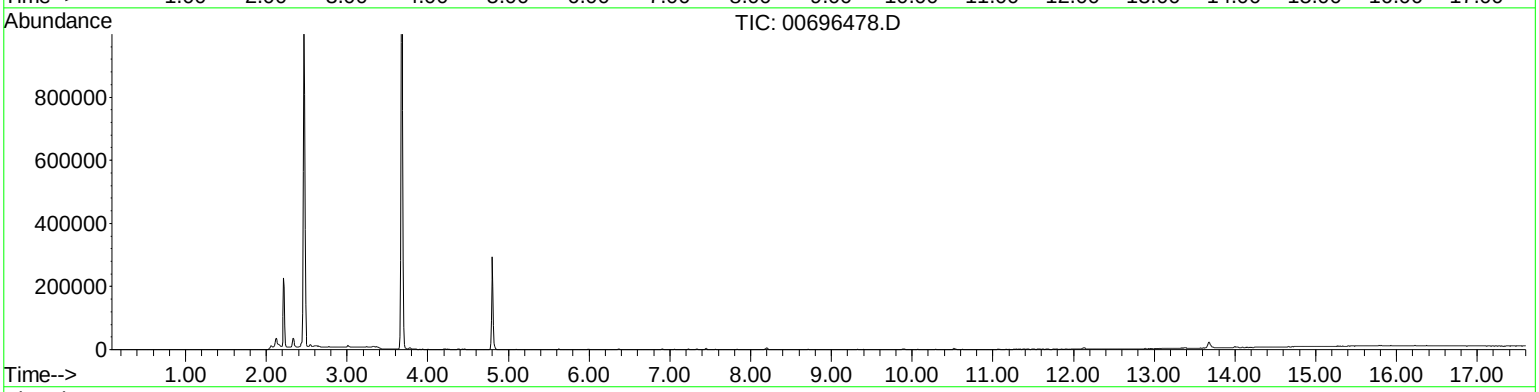


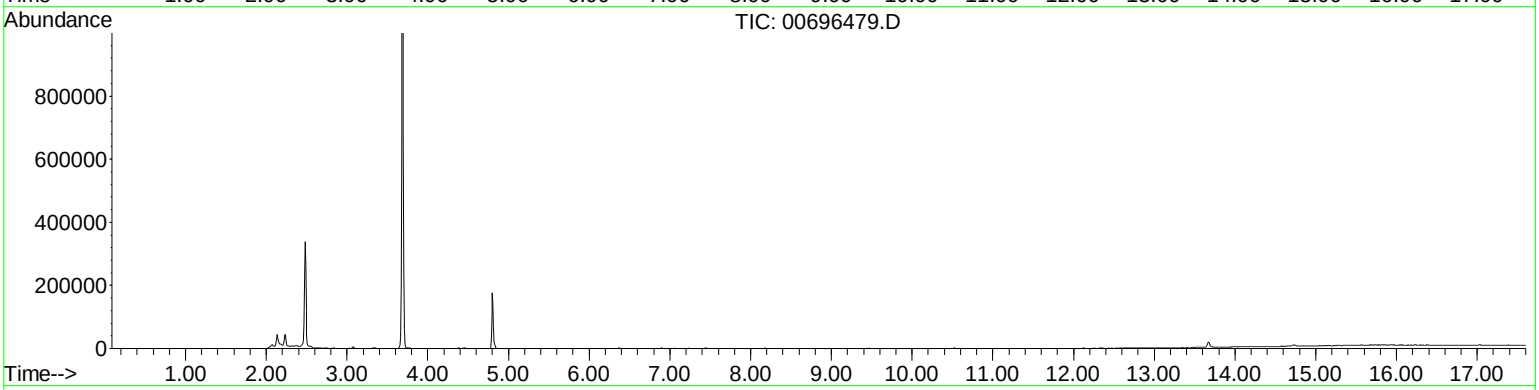


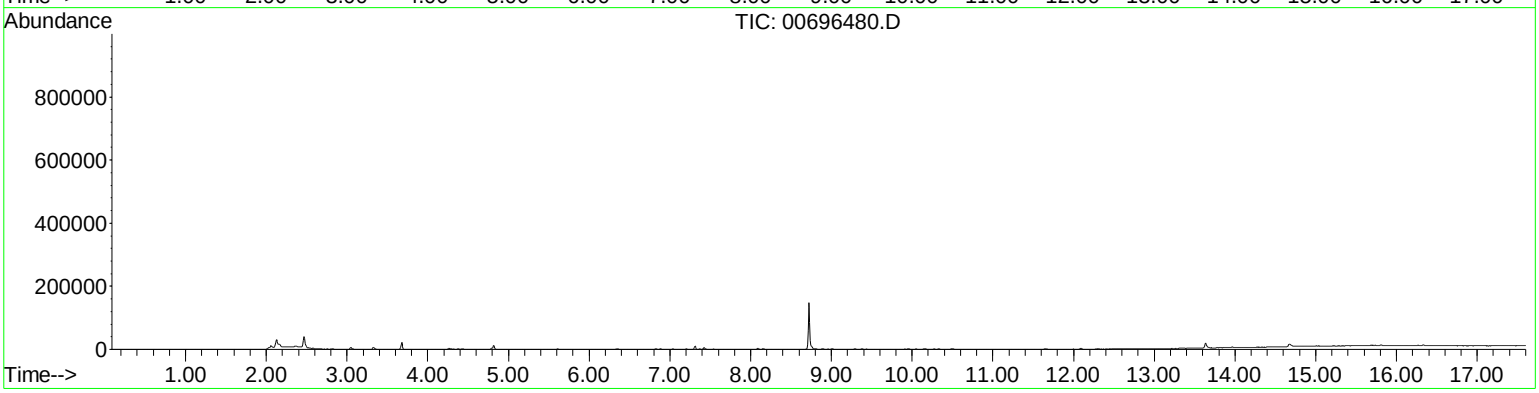
TICS 21815026-2
IN NUMERICAL ORDER



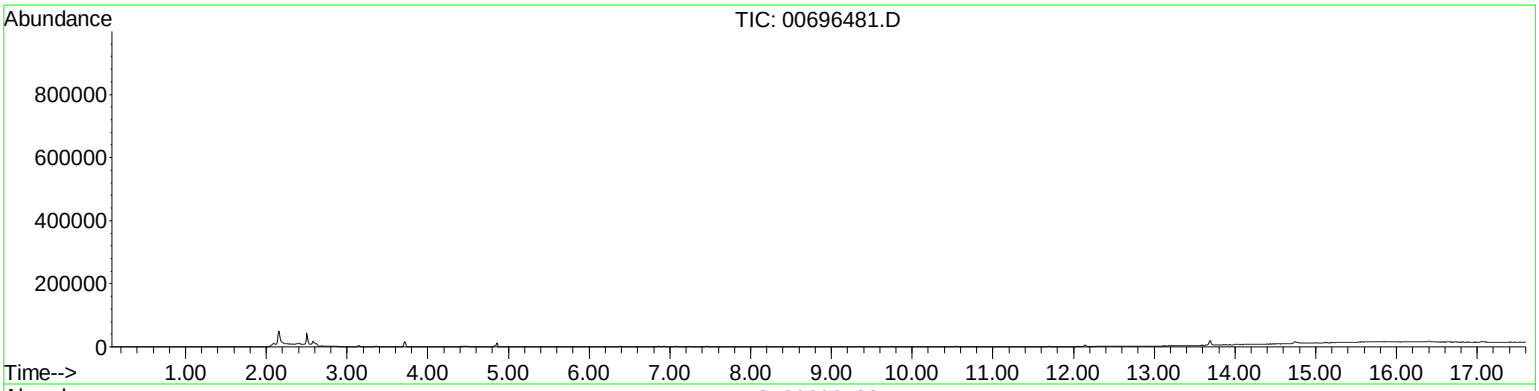


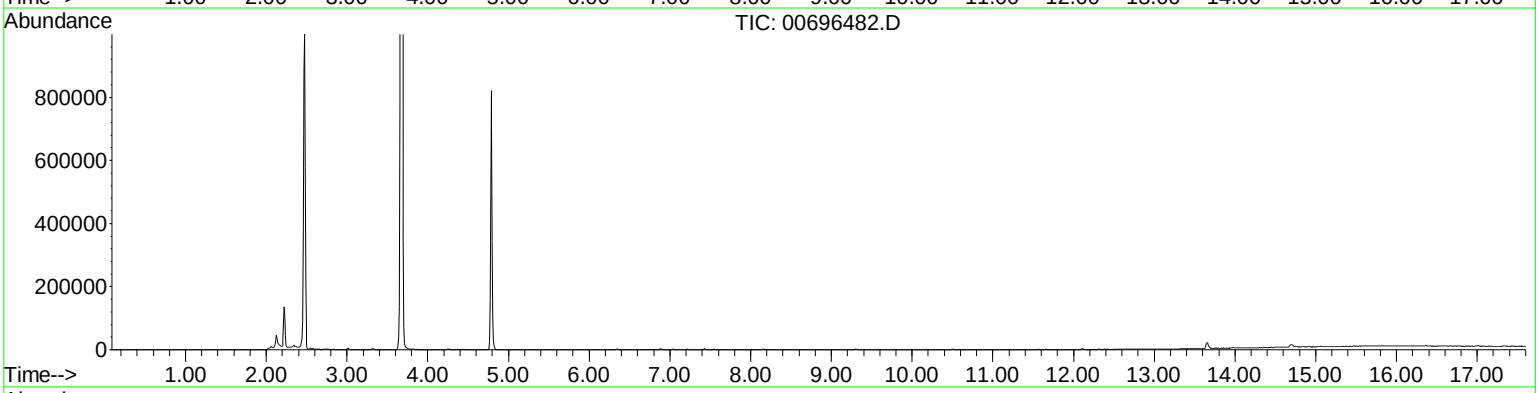


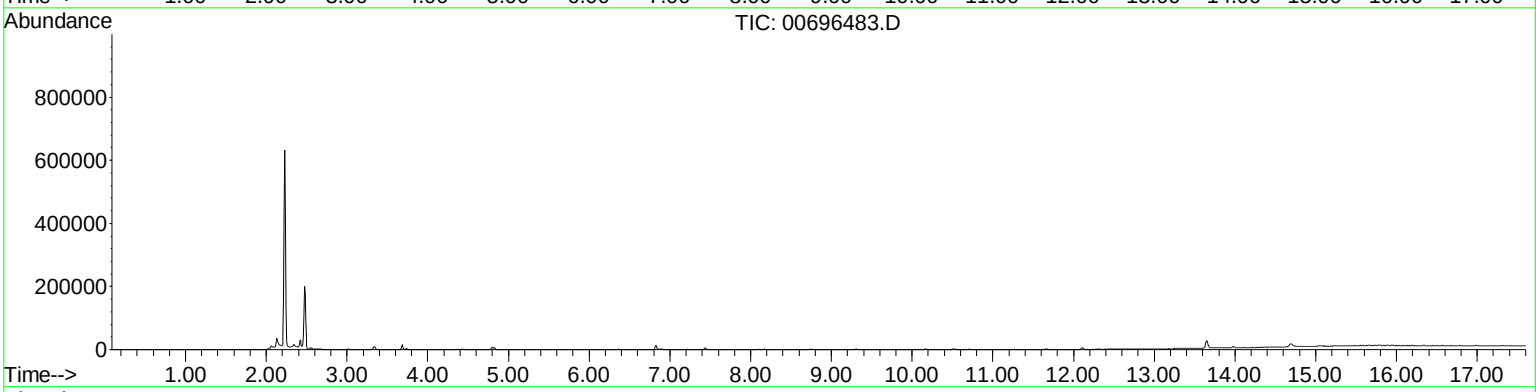


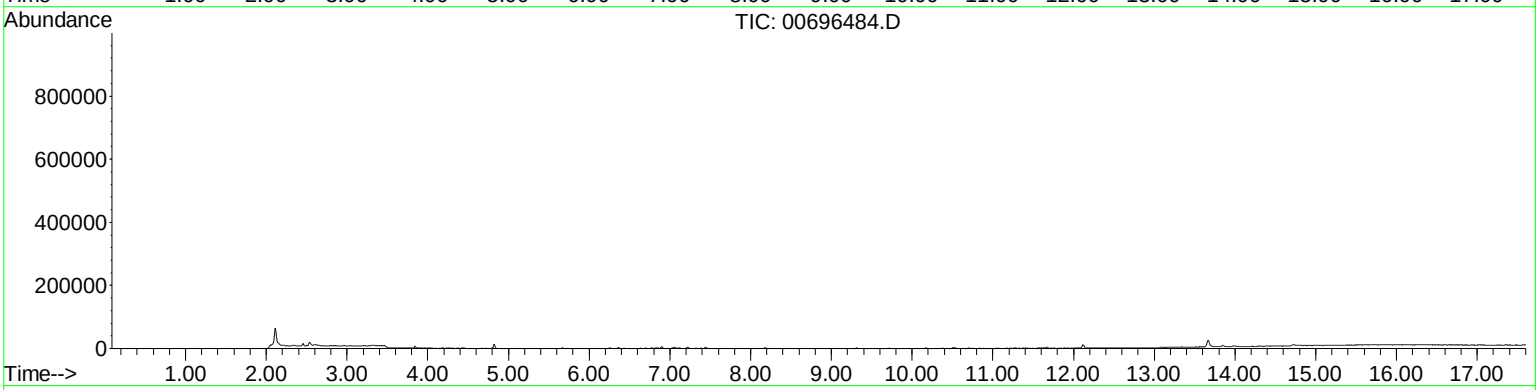


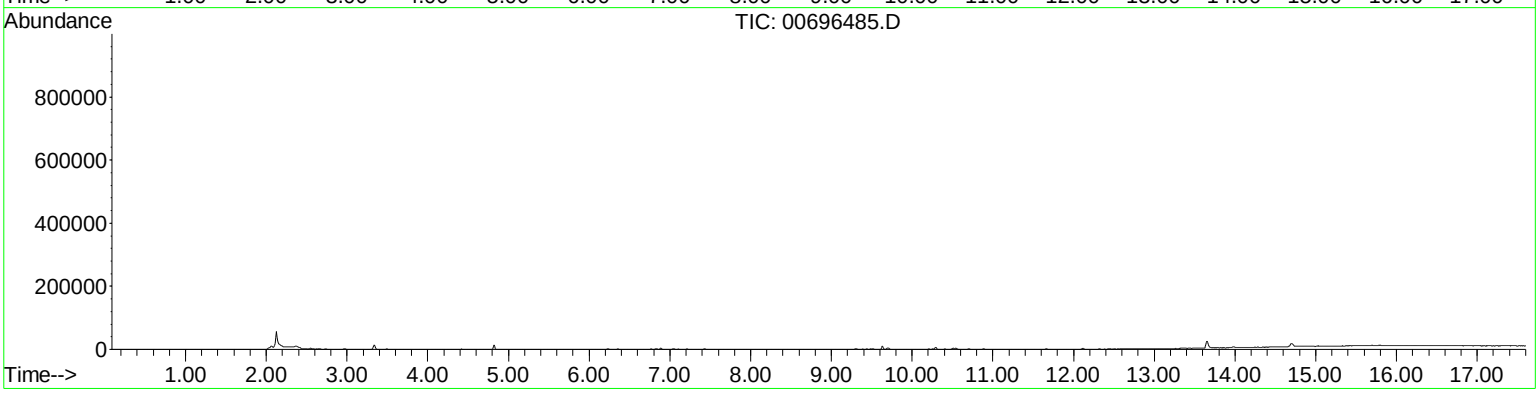
TICS 21815026-2
IN NUMERICAL ORDER



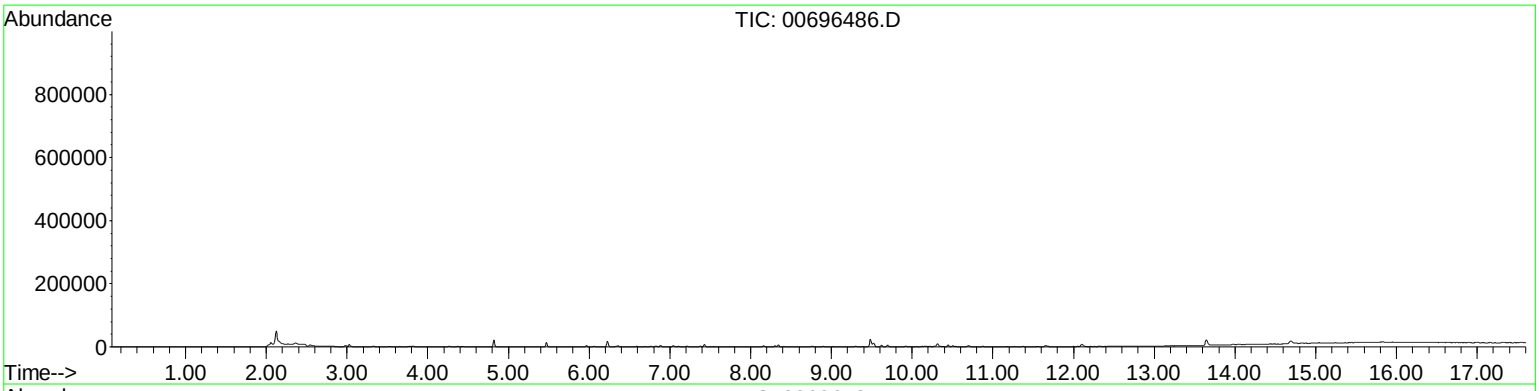


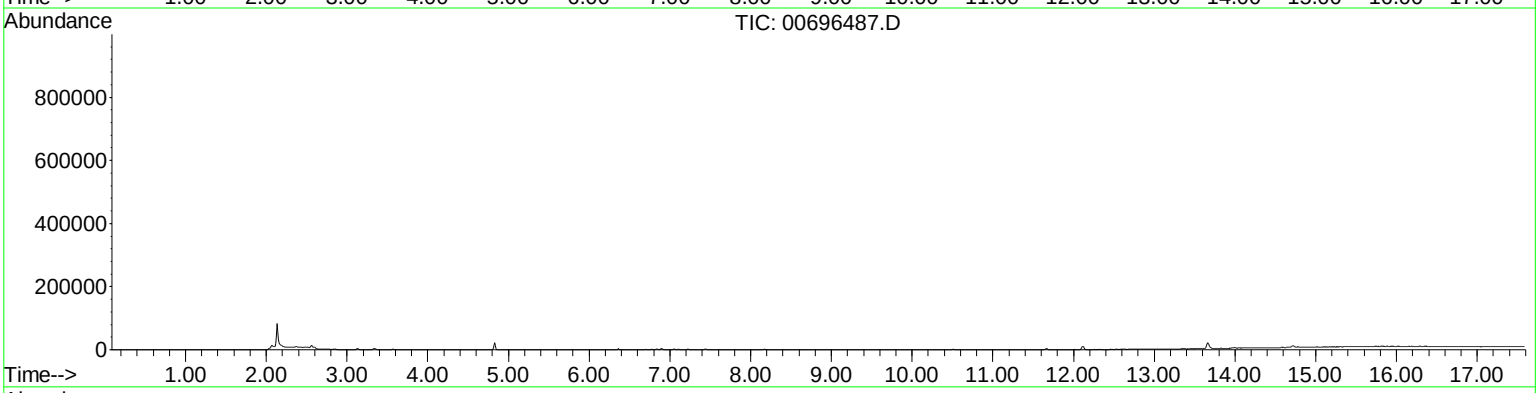


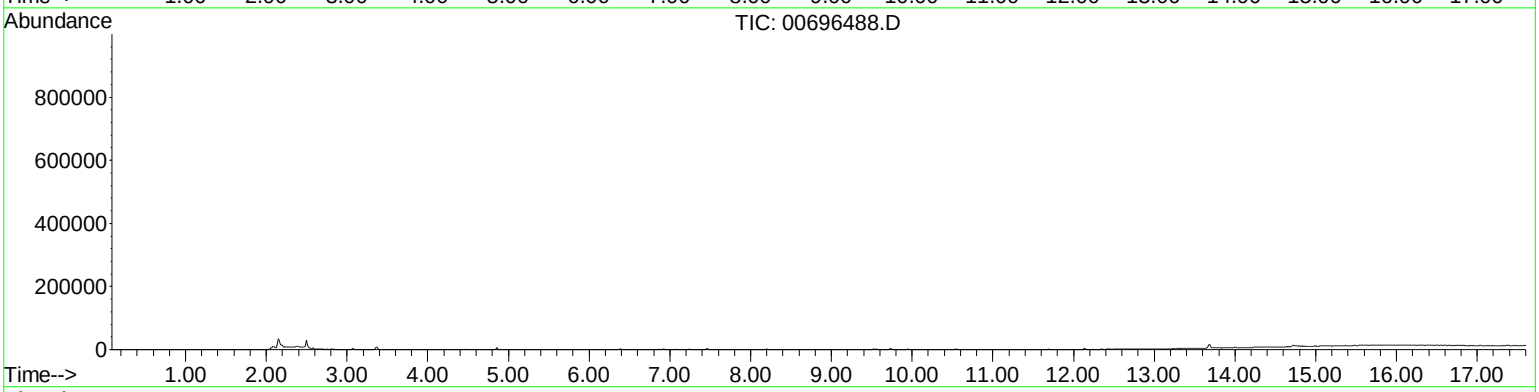


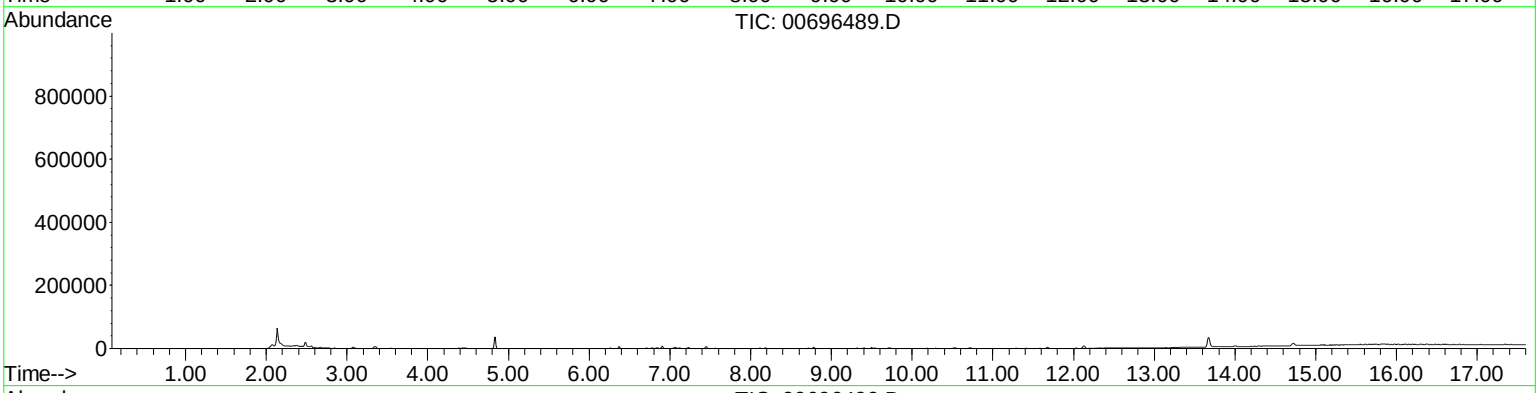


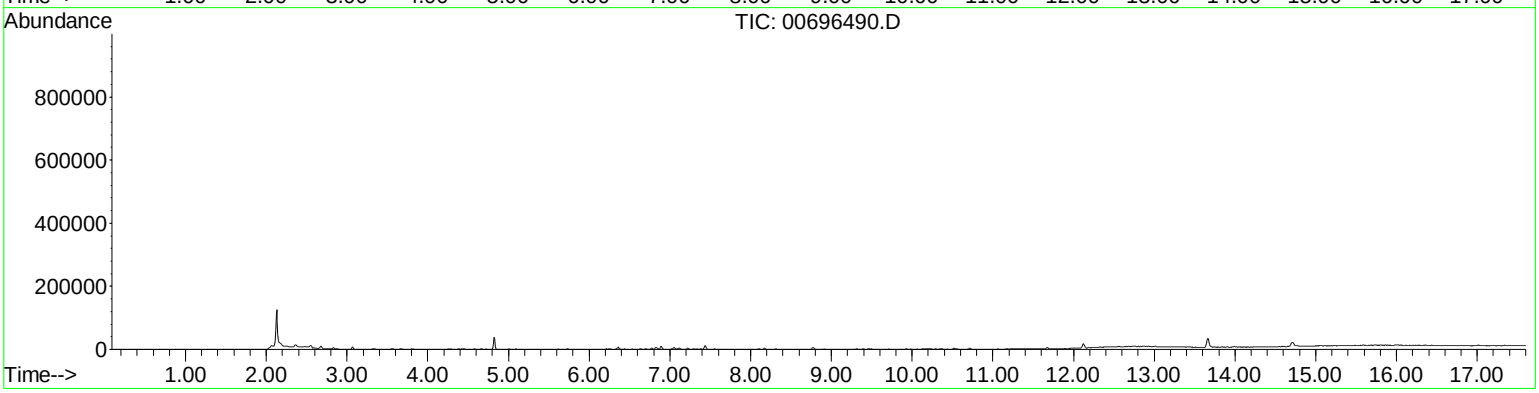
TICS 21815026-2
IN NUMERICAL ORDER



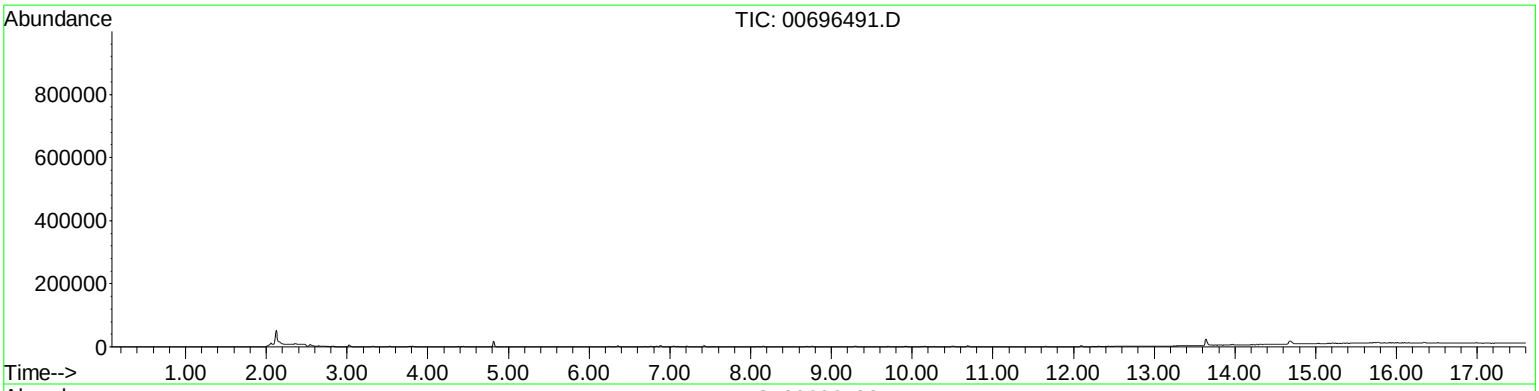


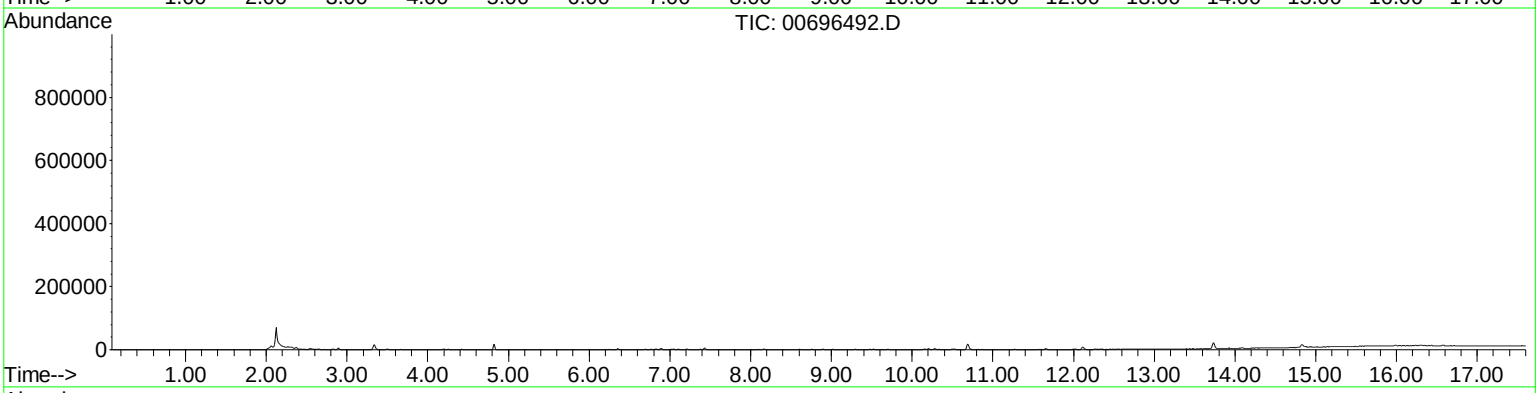


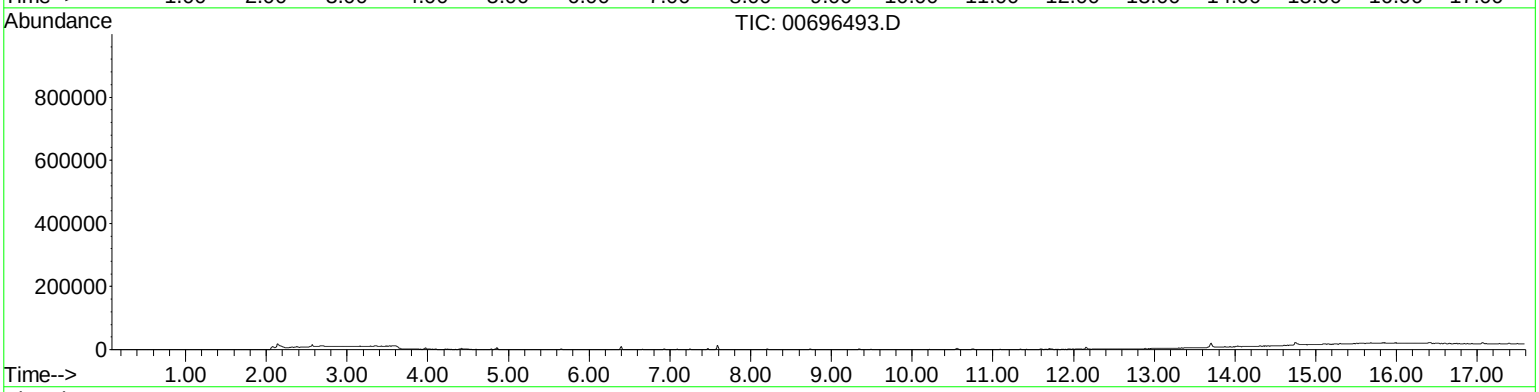


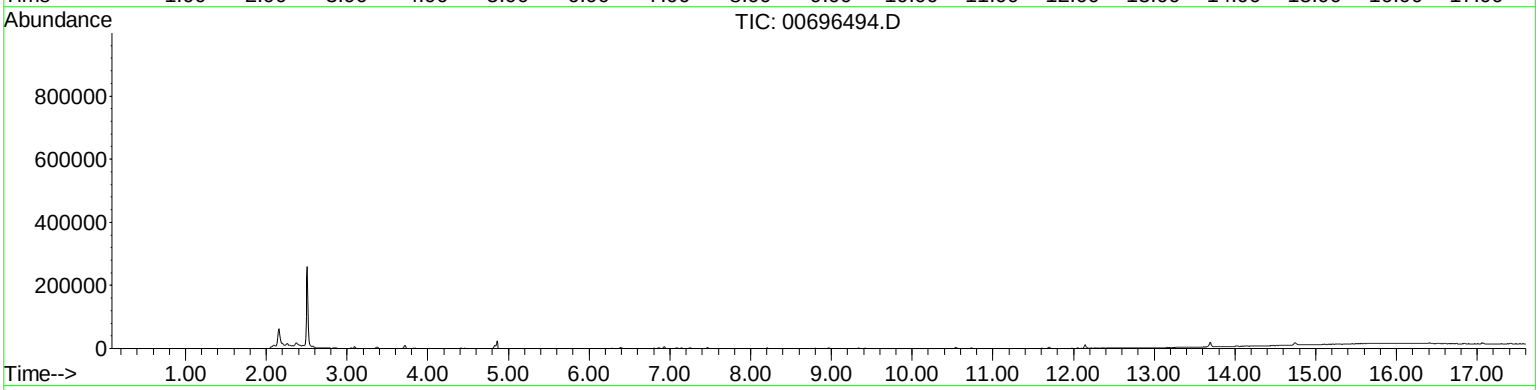


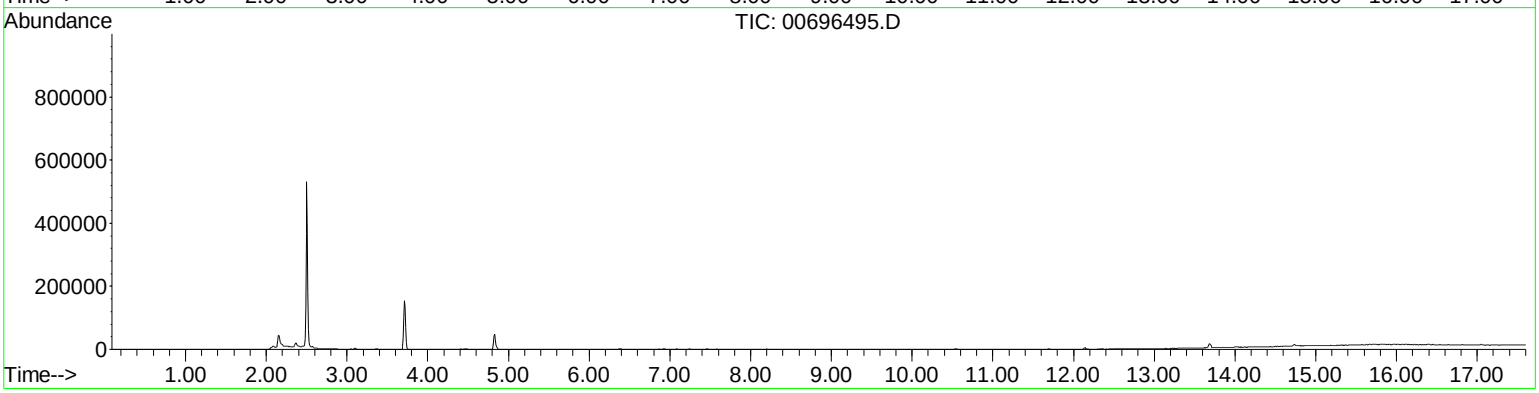
TICS 21815026-2
IN NUMERICAL ORDER



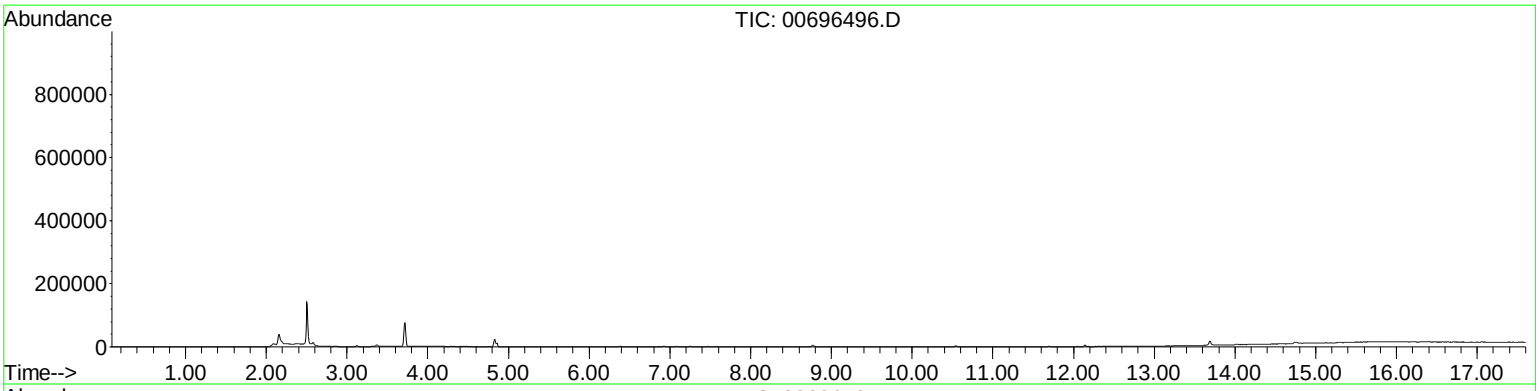


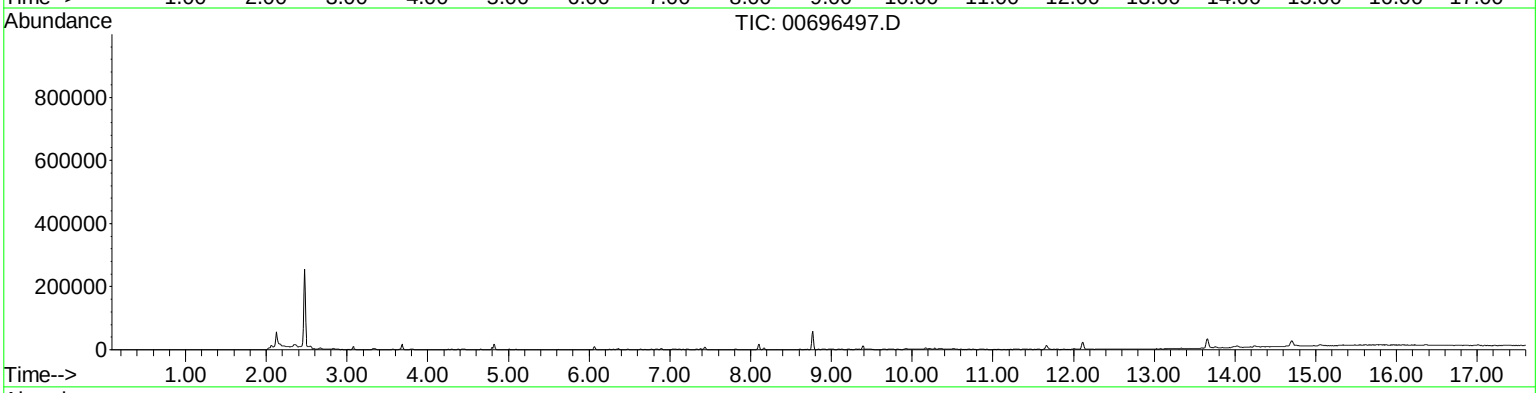


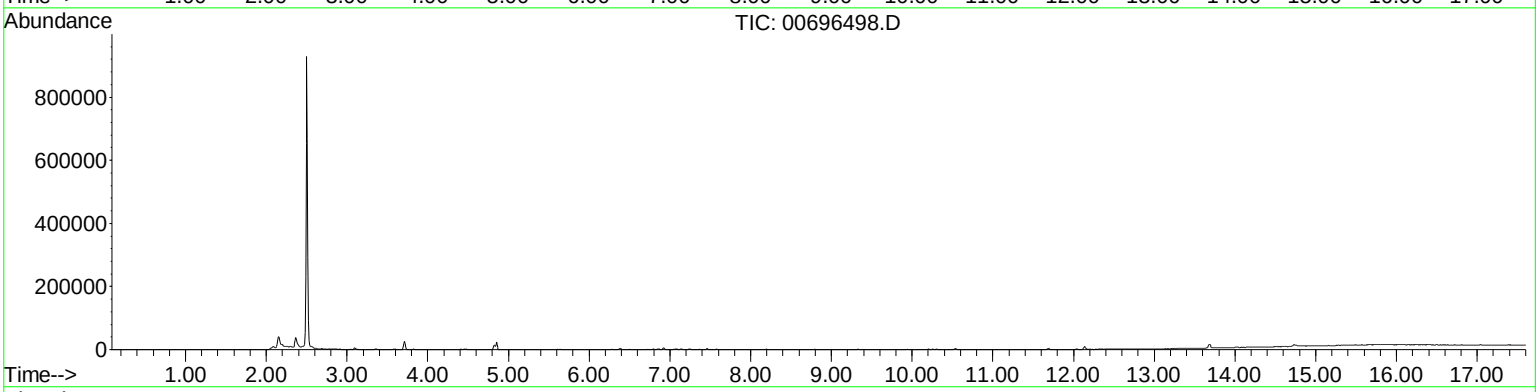


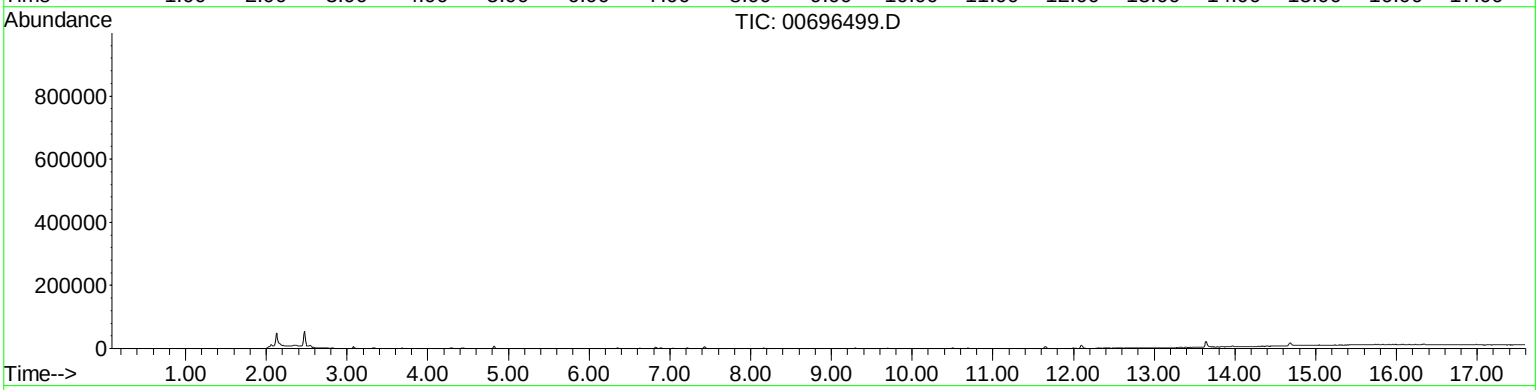


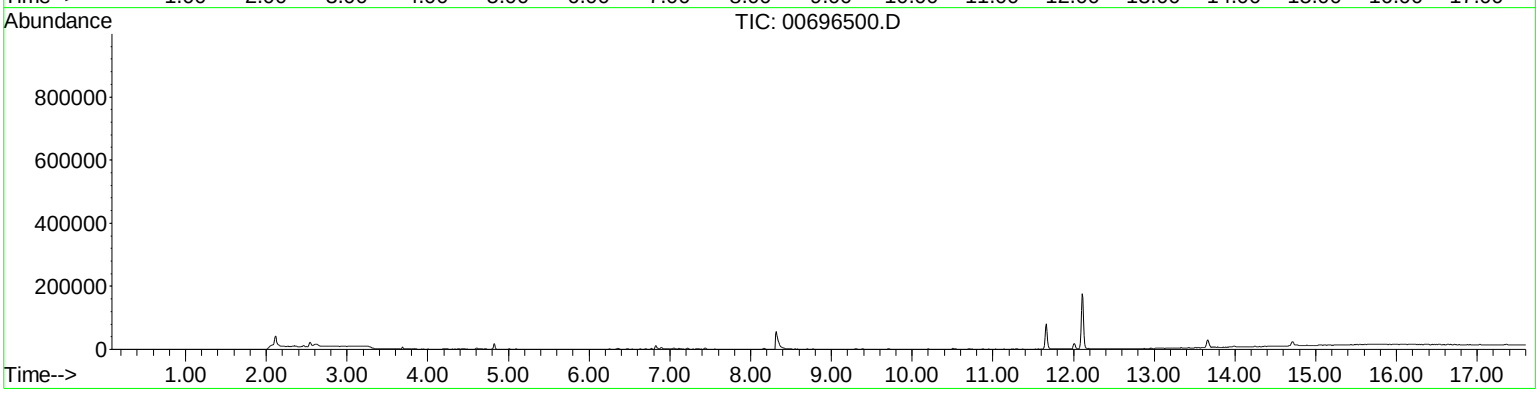
TICS 21815026-2
IN NUMERICAL ORDER



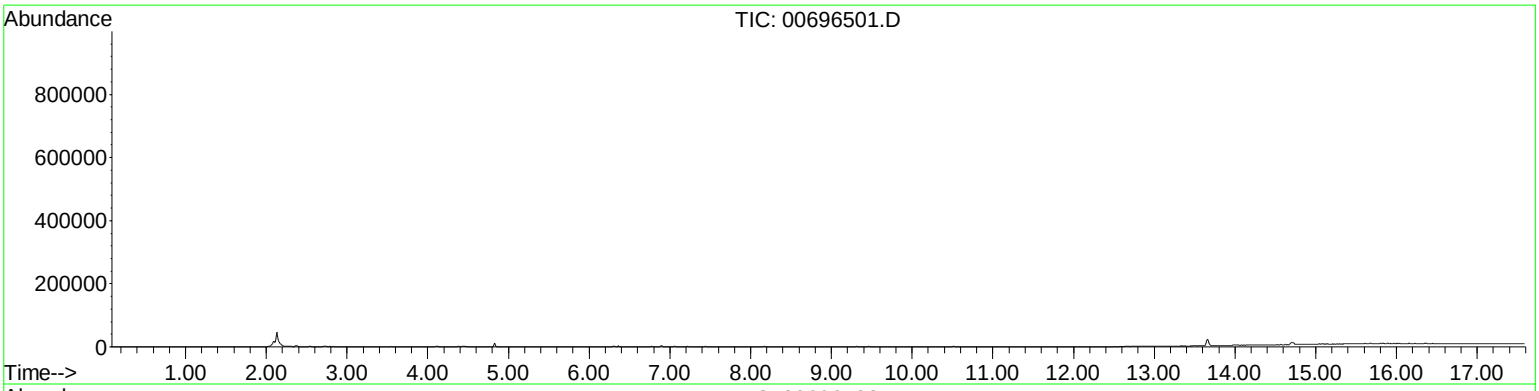


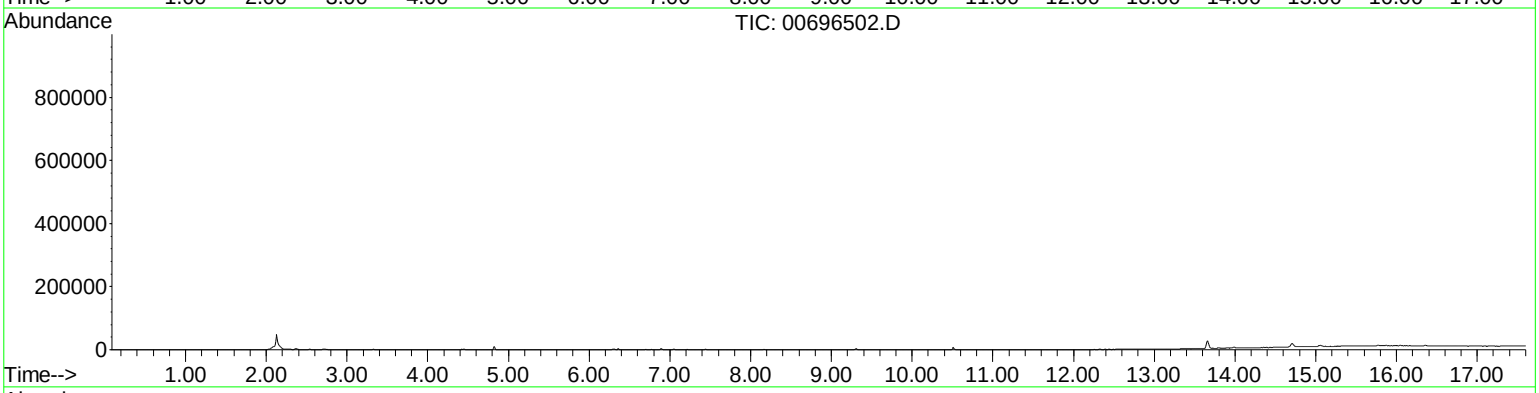


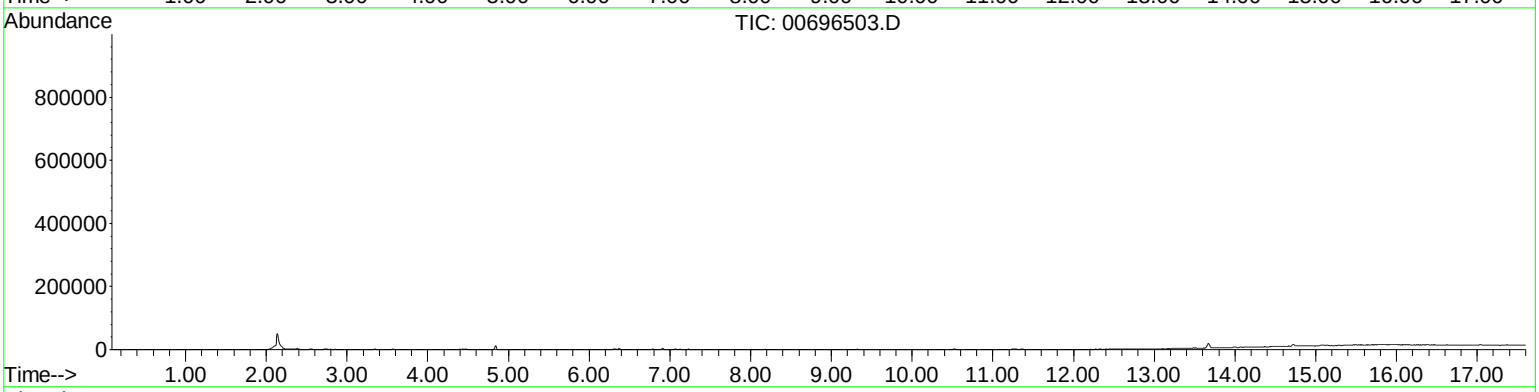


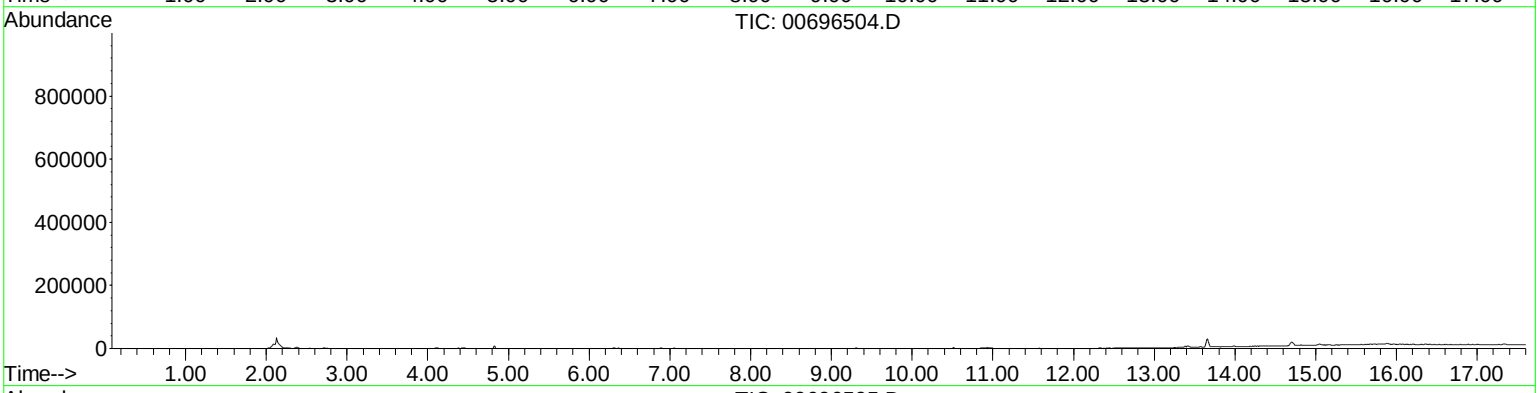


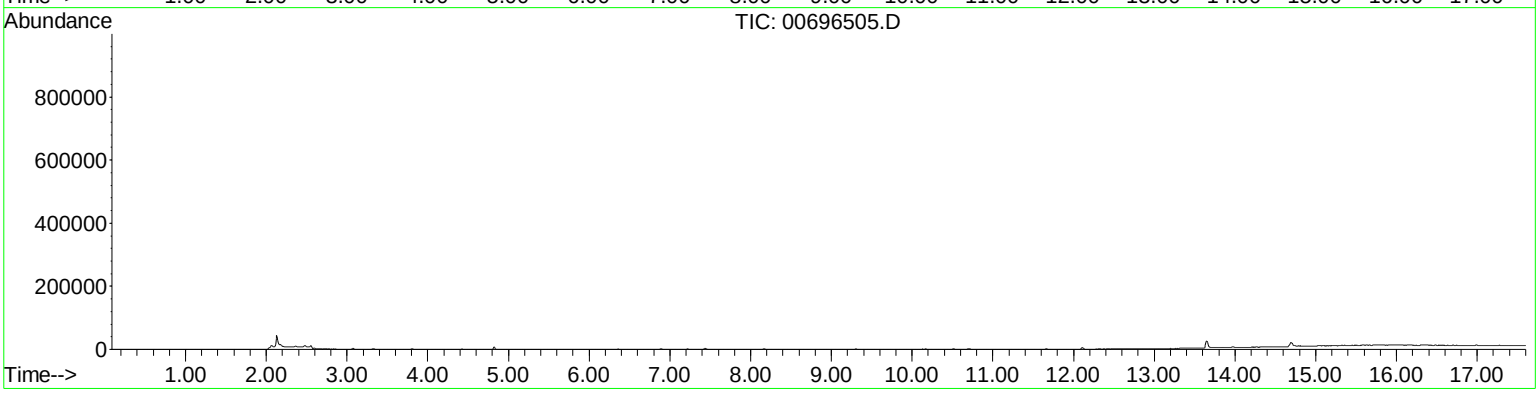
TICS 21815026-2
IN NUMERICAL ORDER



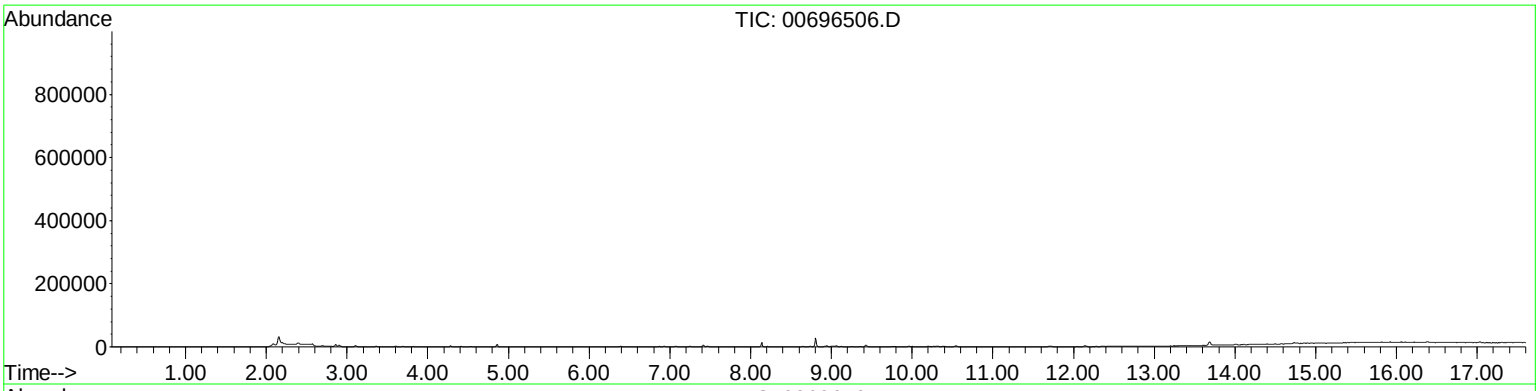


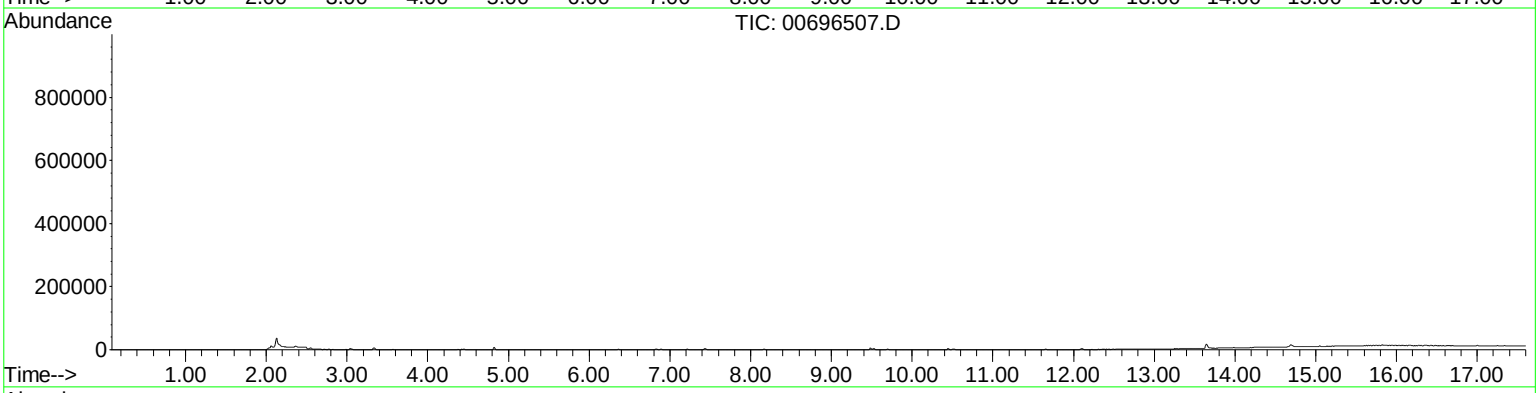


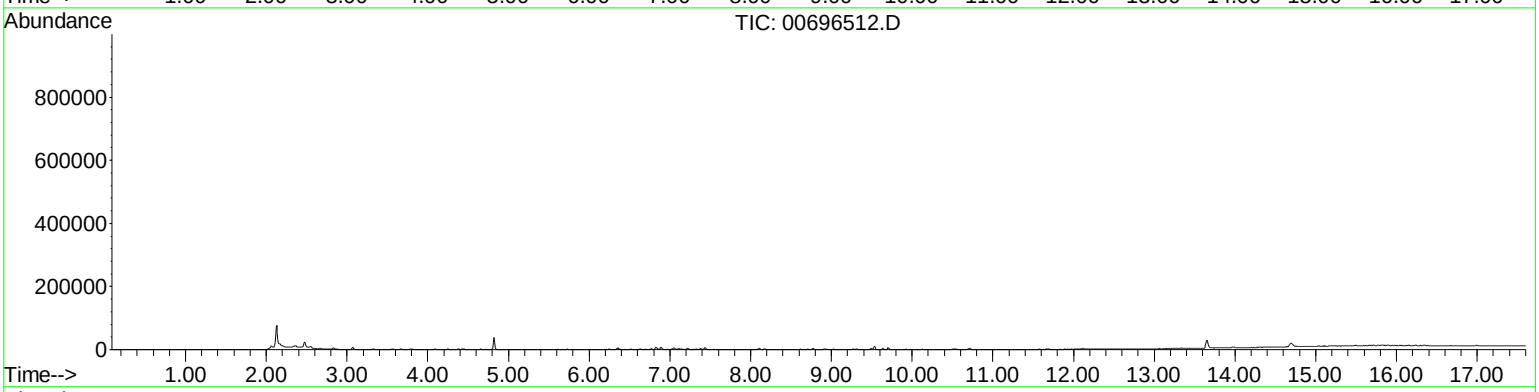


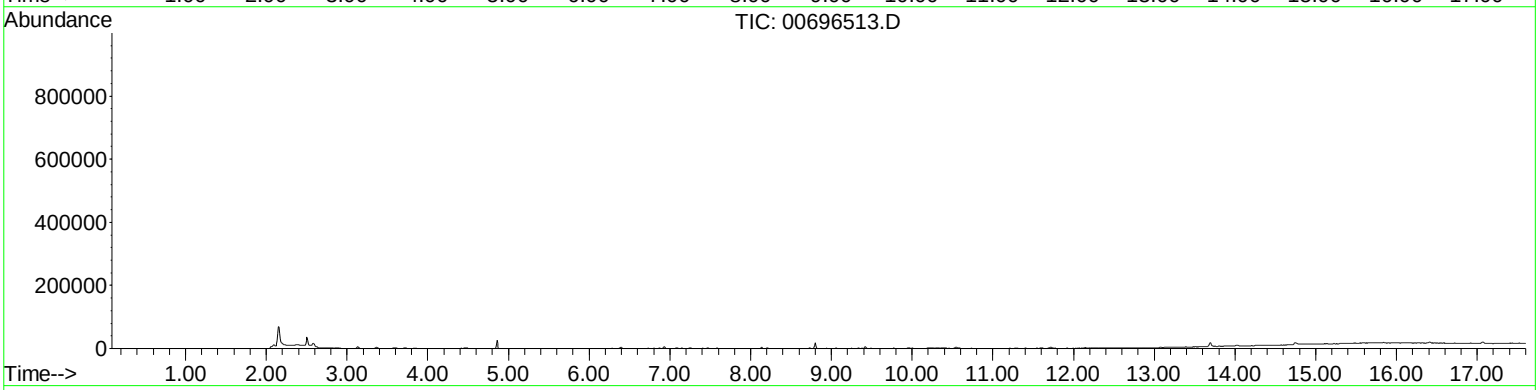


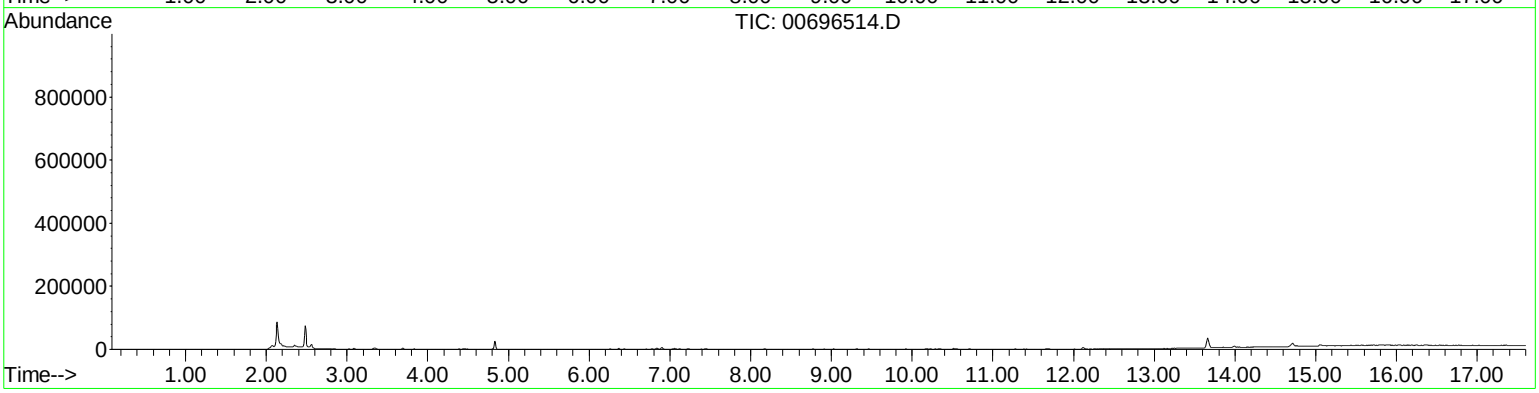
TICS 21815026-2
IN NUMERICAL ORDER



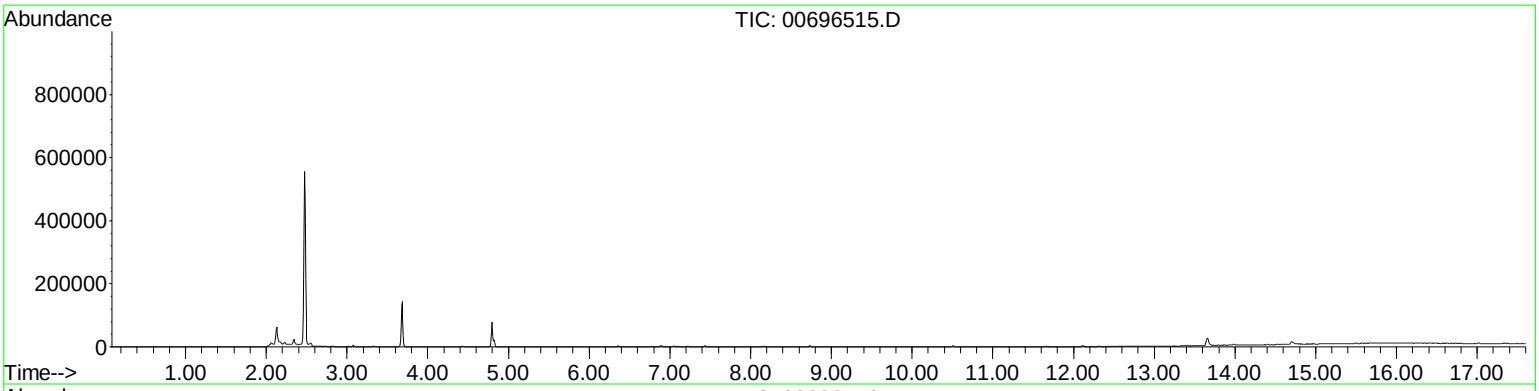


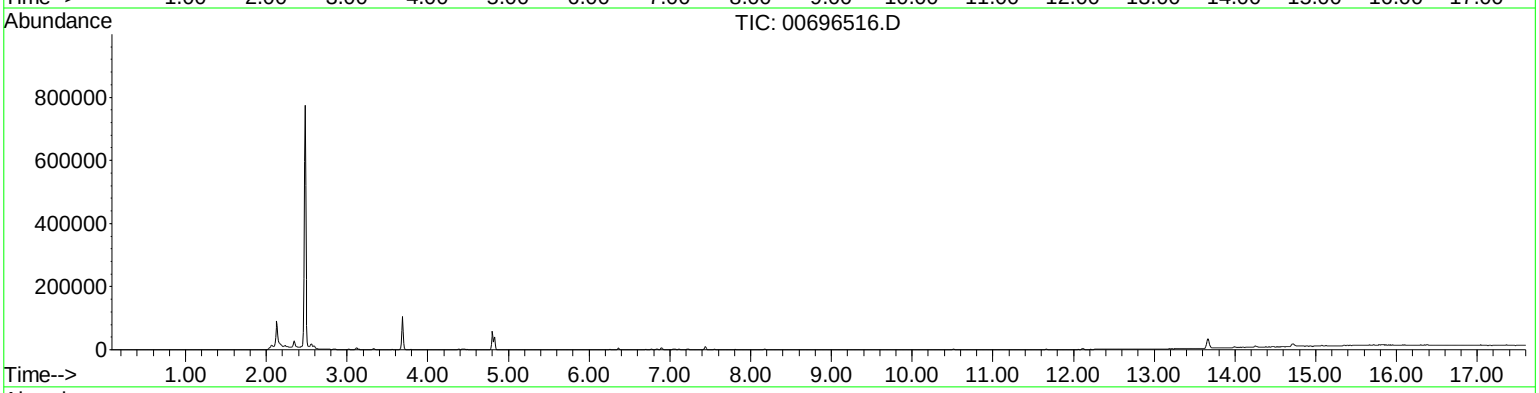


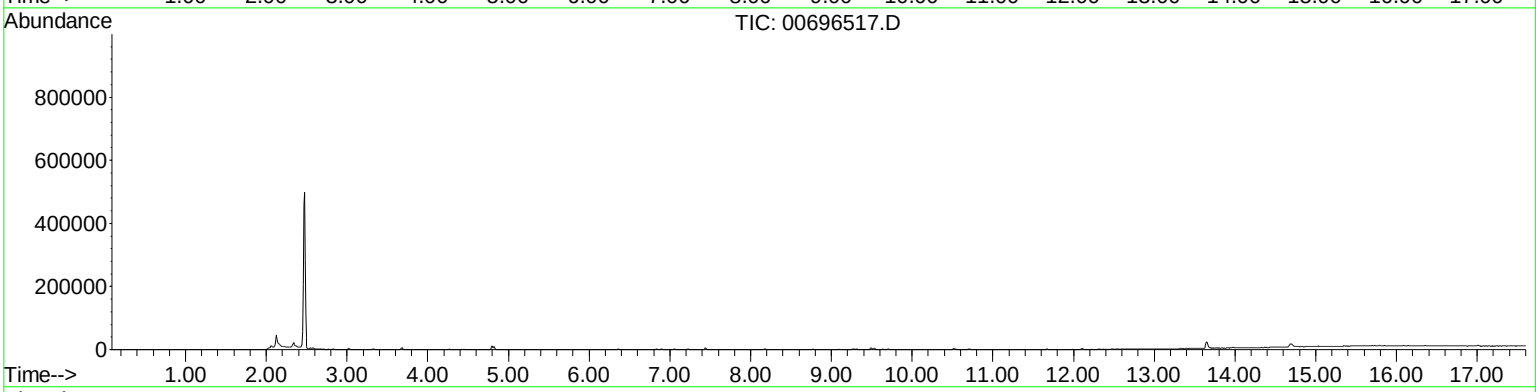


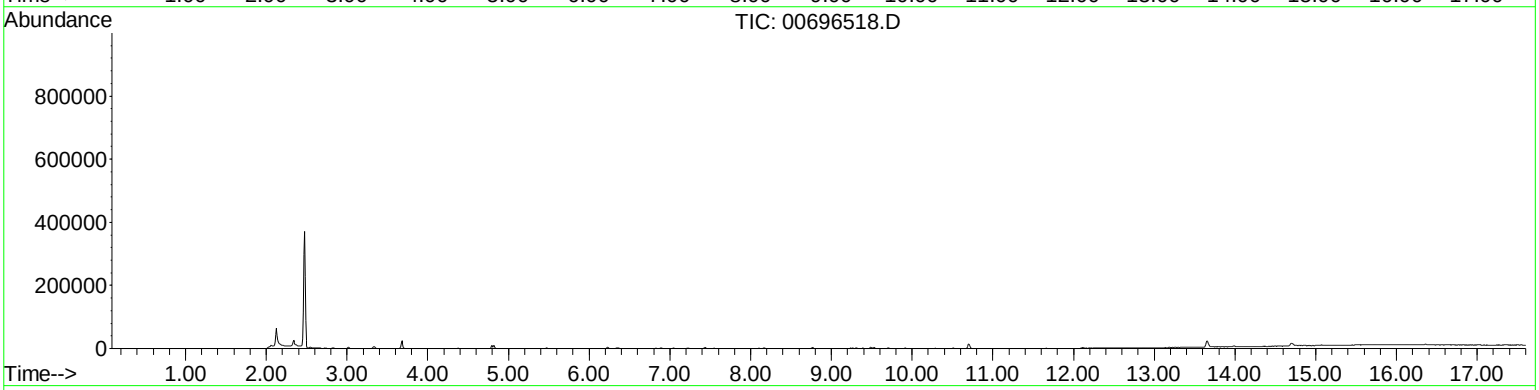


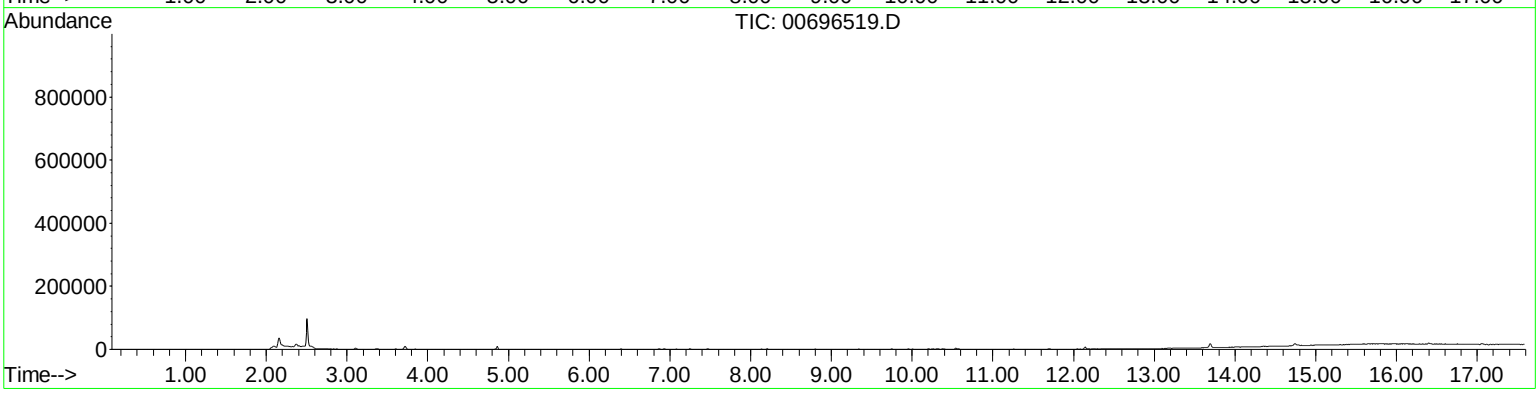
TICS 21815026-2
IN NUMERICAL ORDER



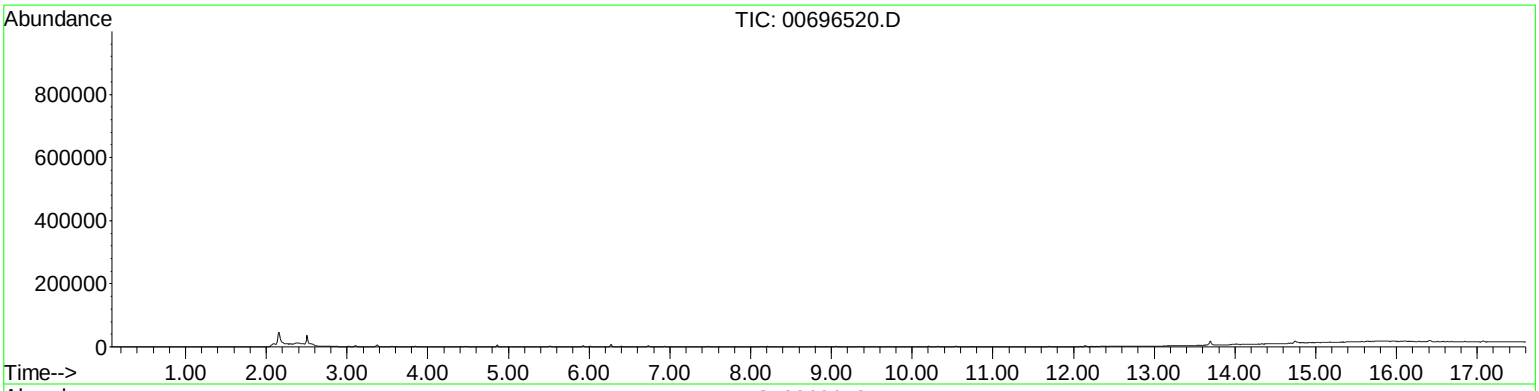


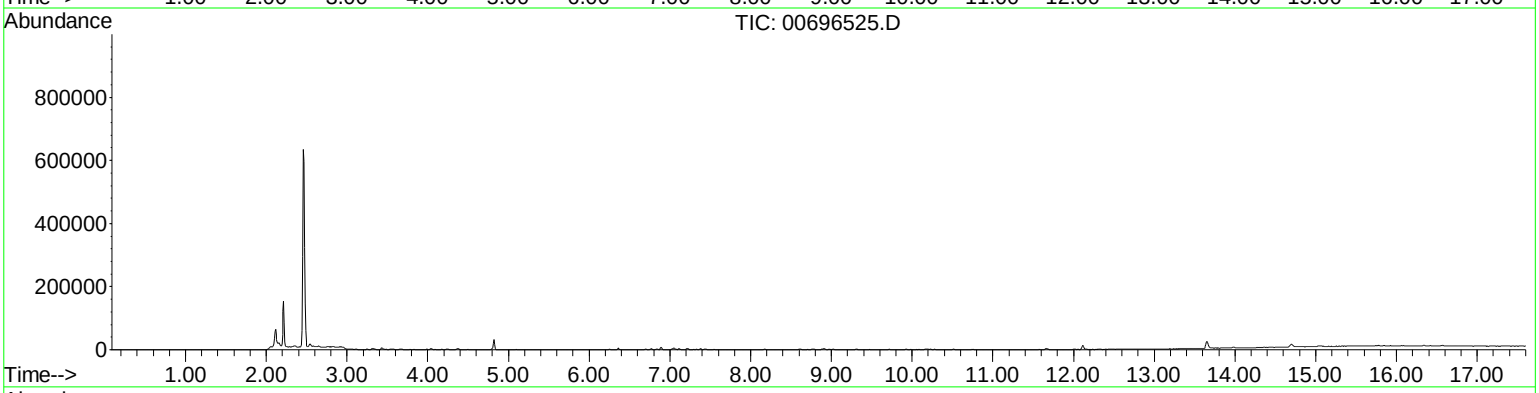


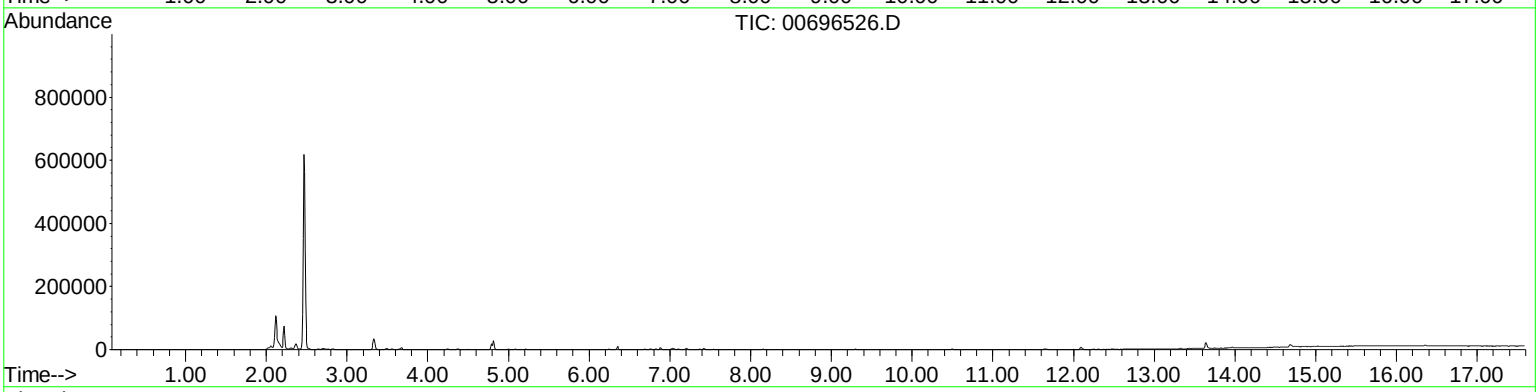


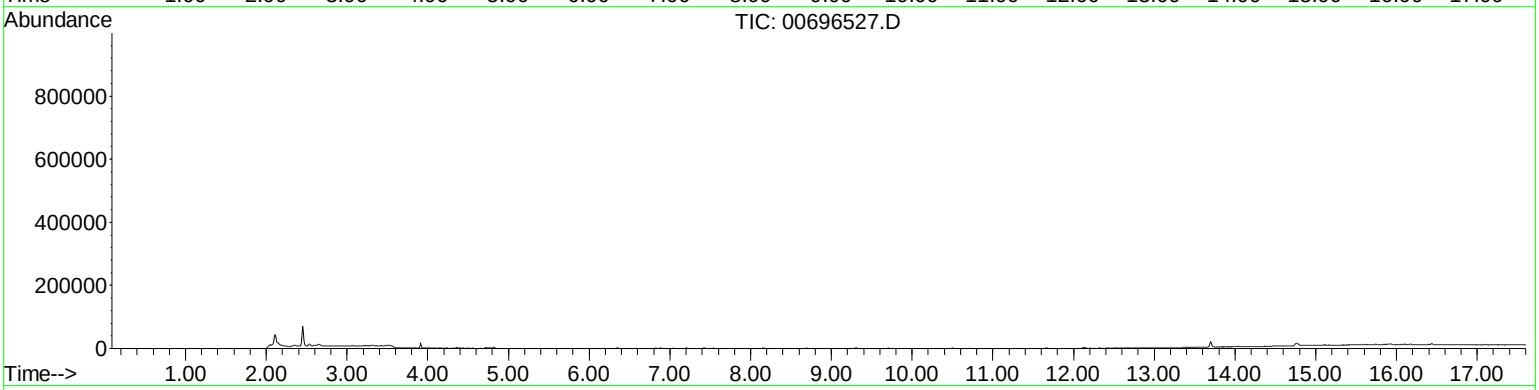


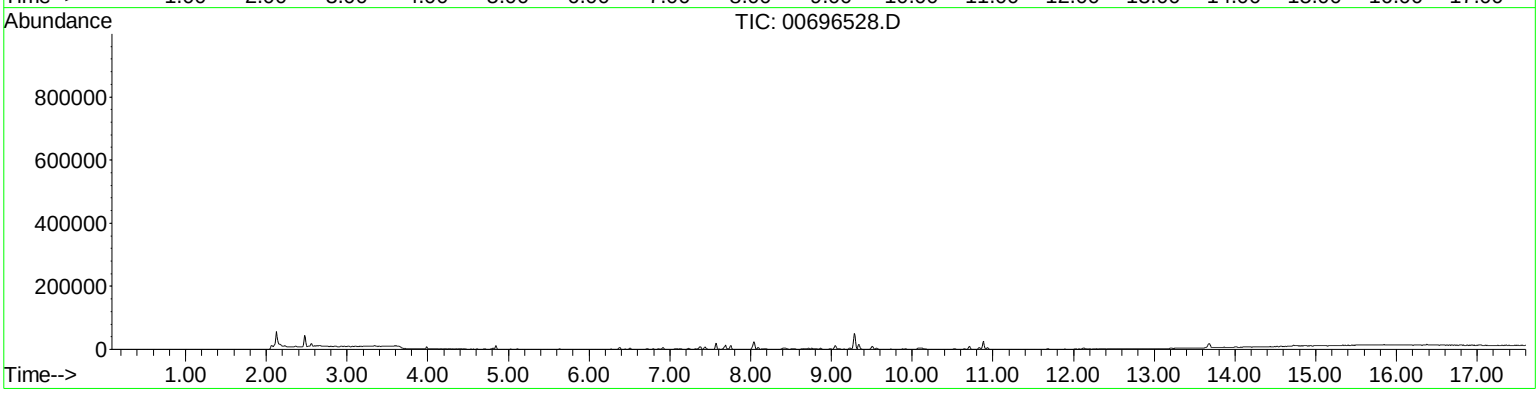
TICS 21815026-2
IN NUMERICAL ORDER



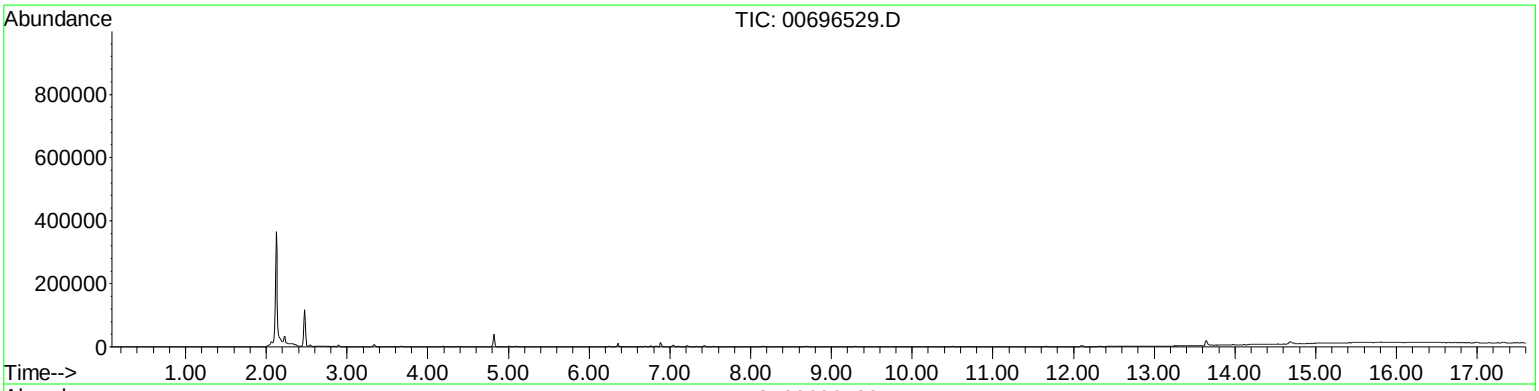


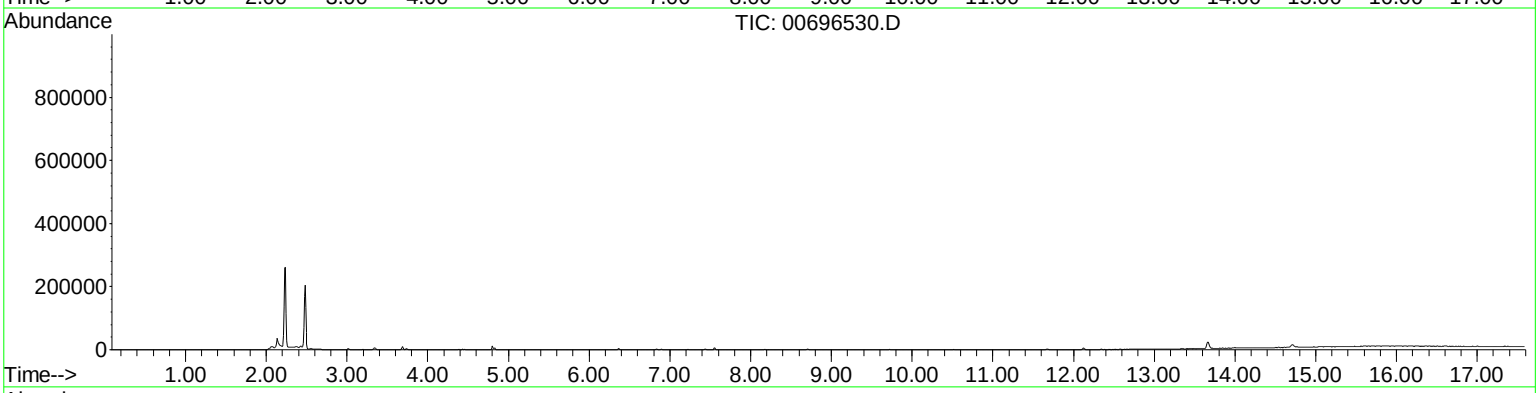


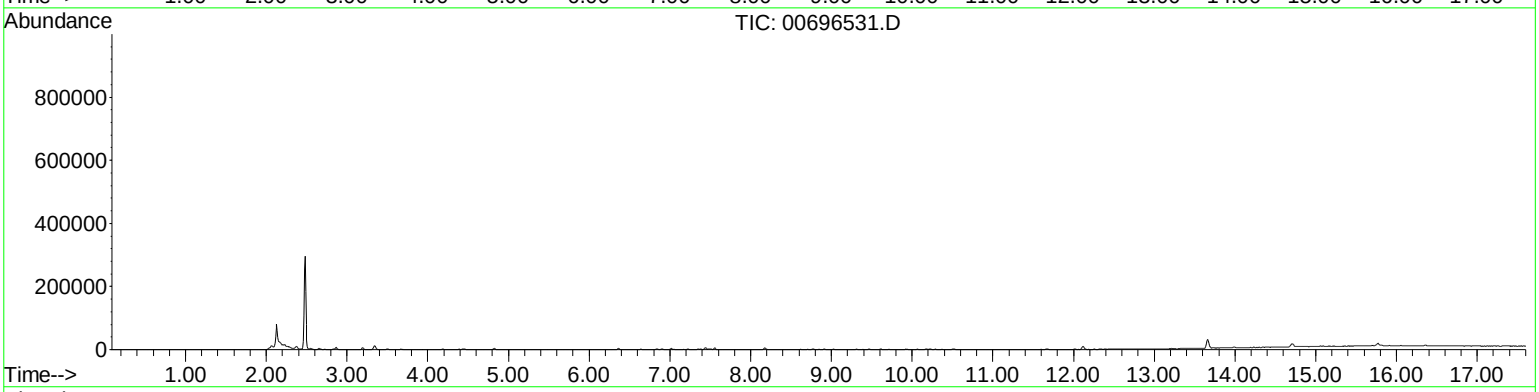


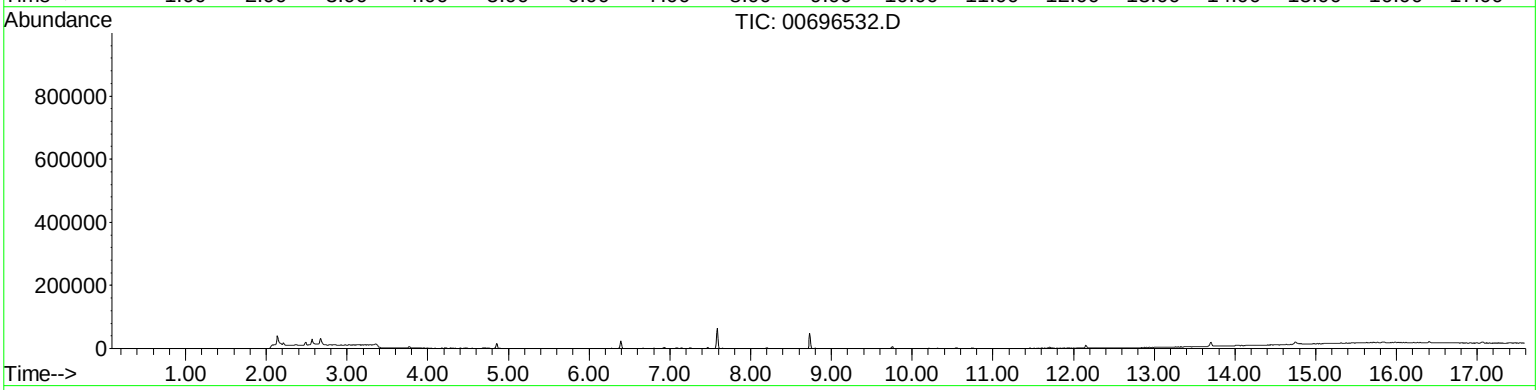


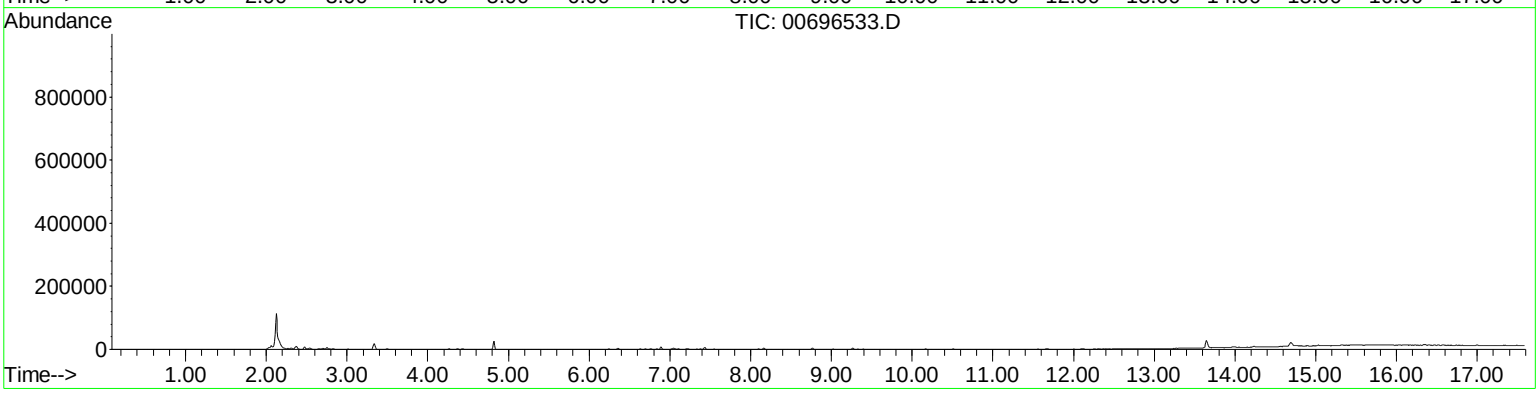
TICS 21815026-2
IN NUMERICAL ORDER



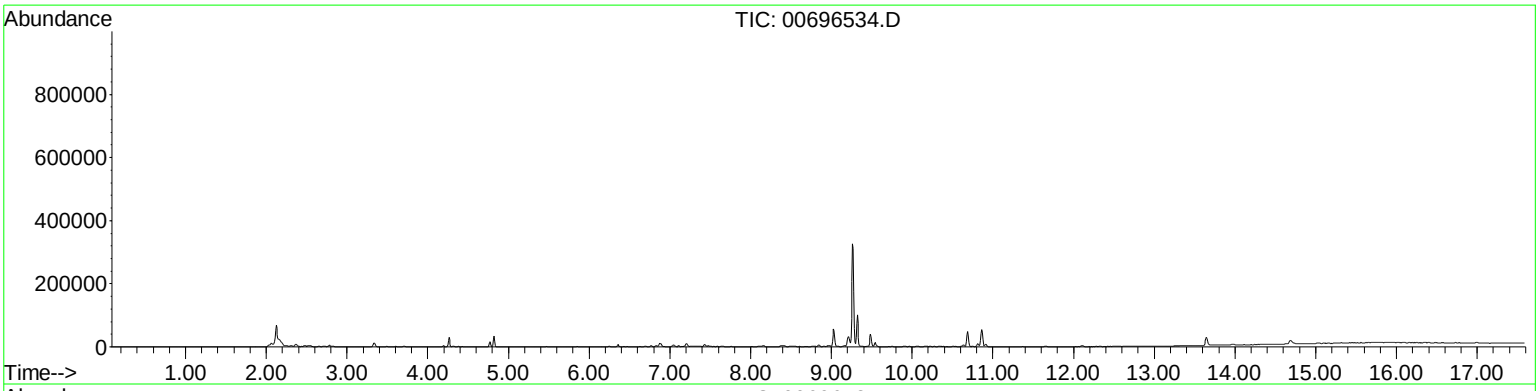


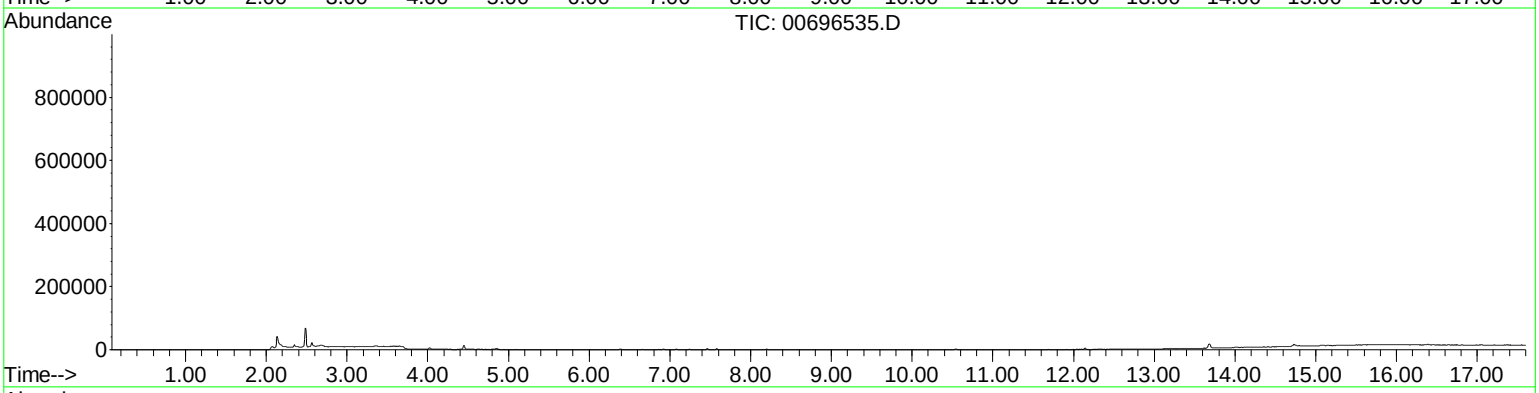


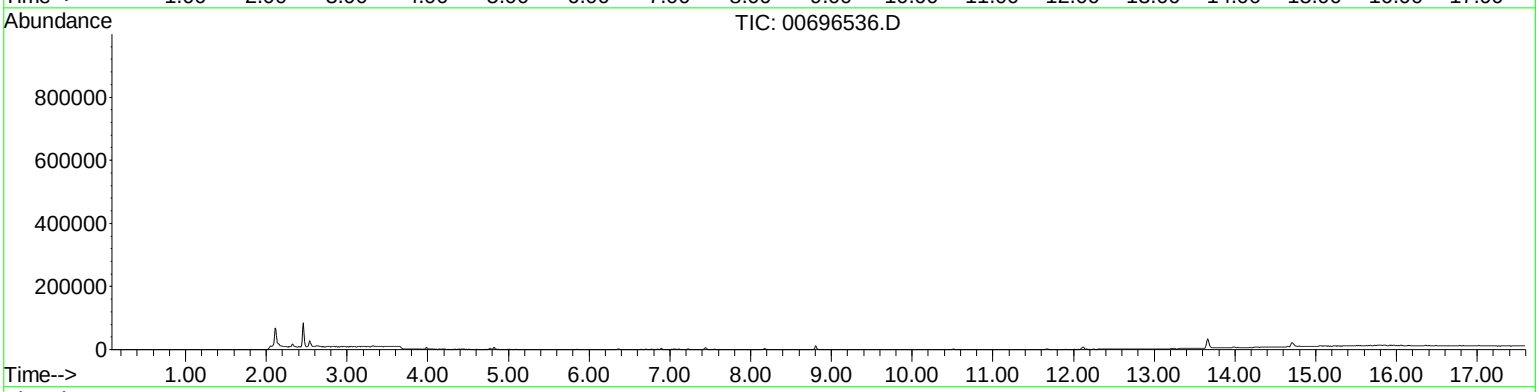


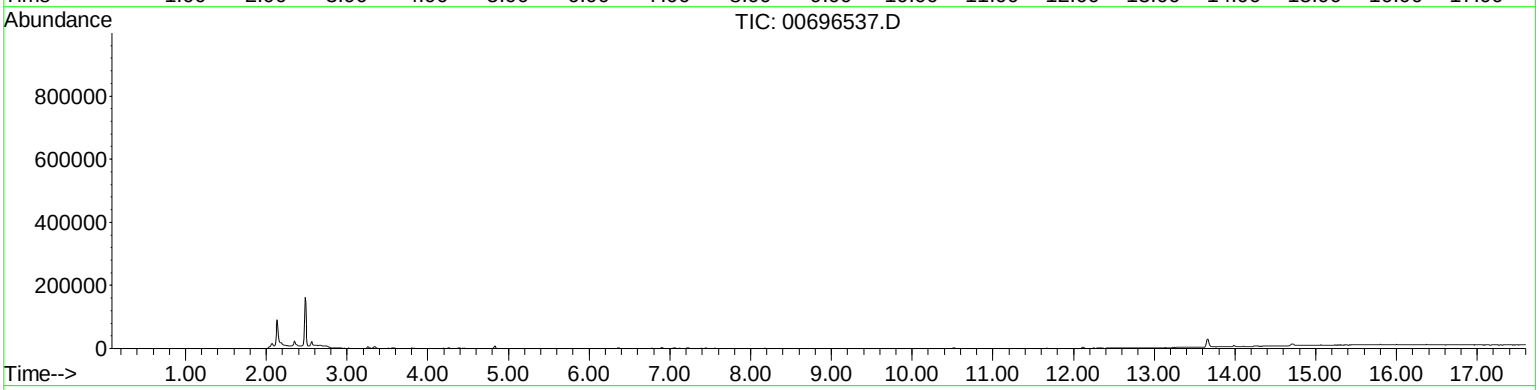


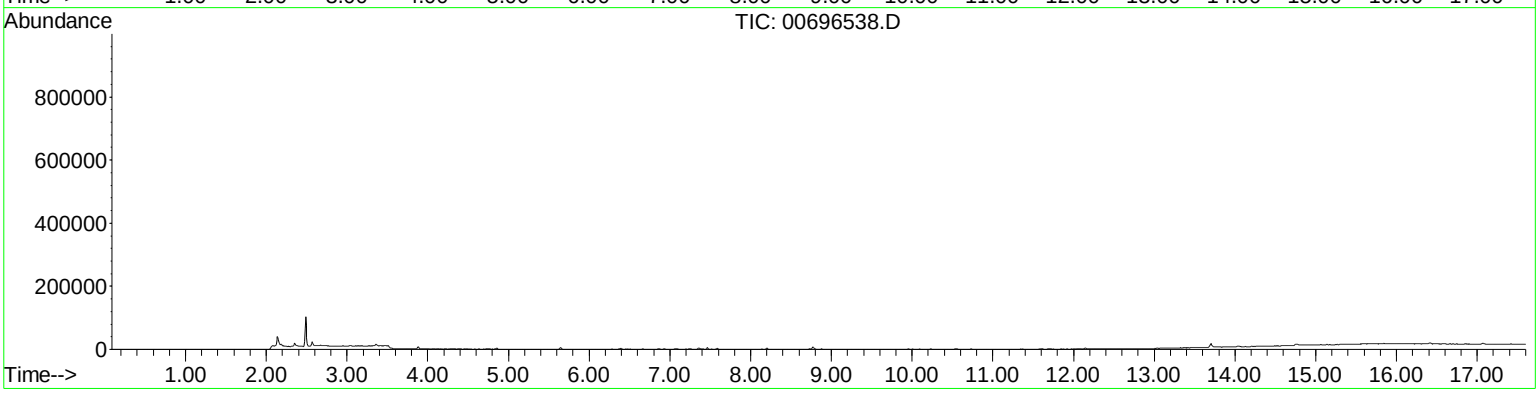
TICS 21815026-2
IN NUMERICAL ORDER



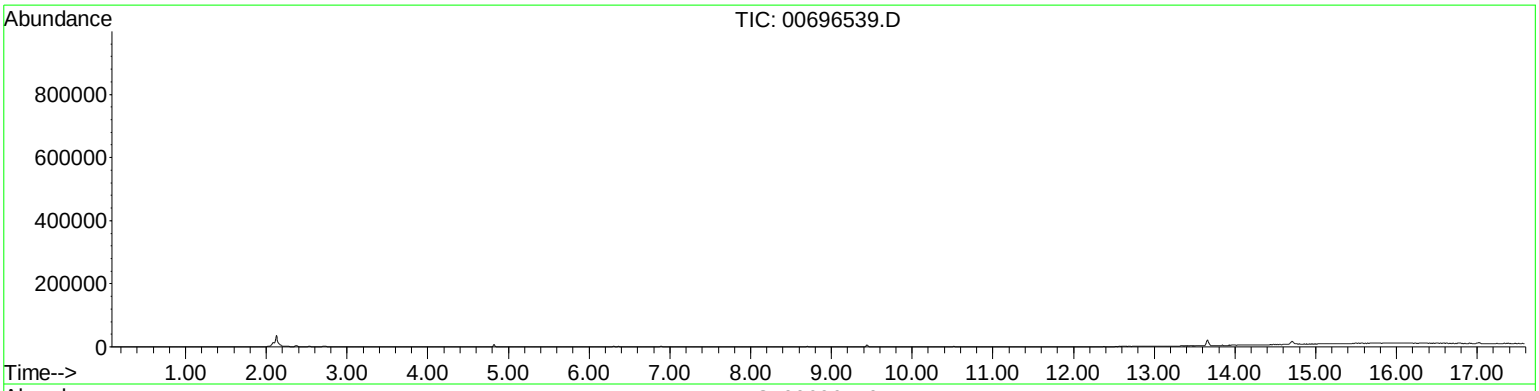


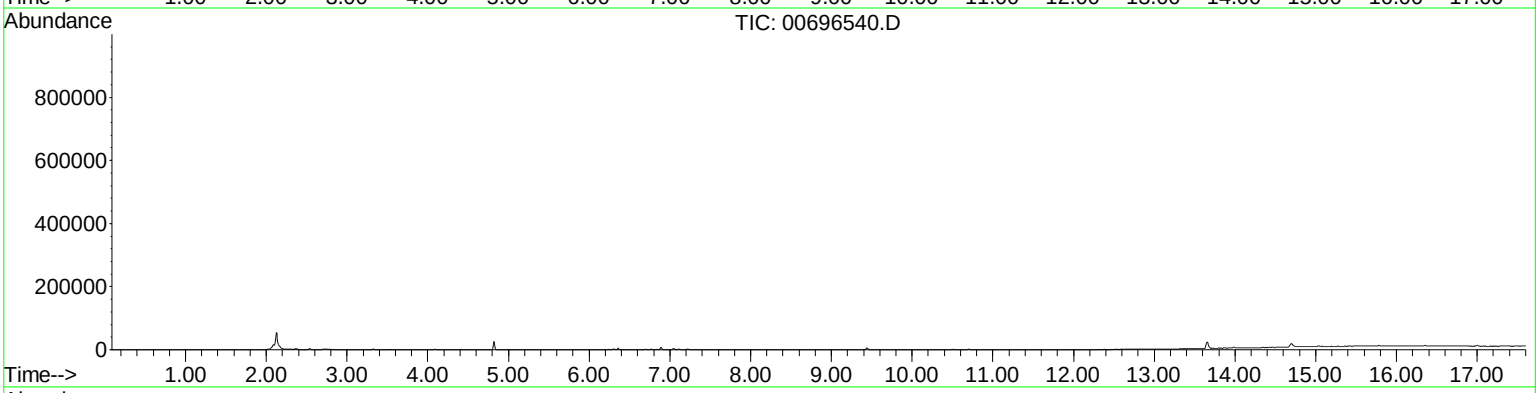


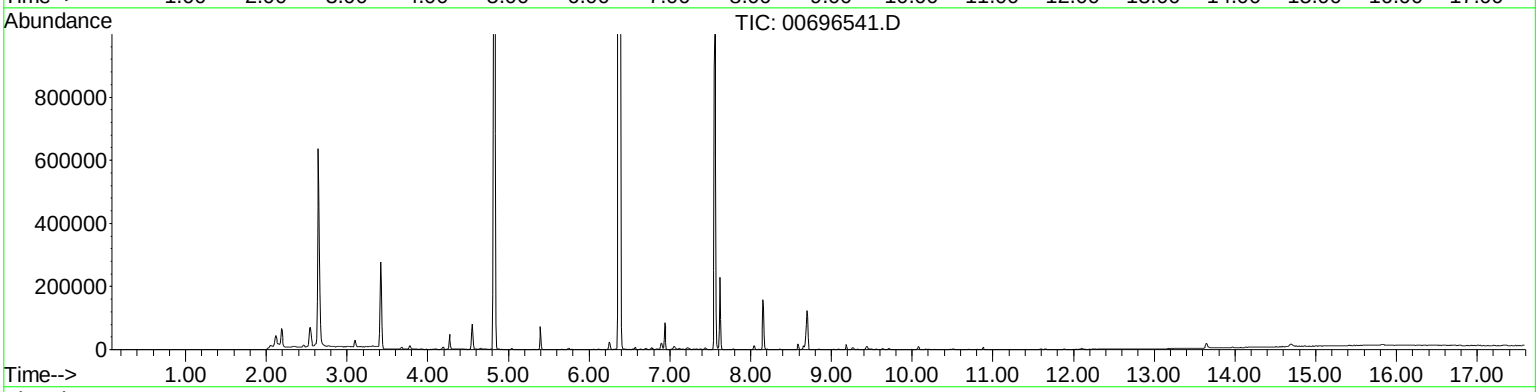


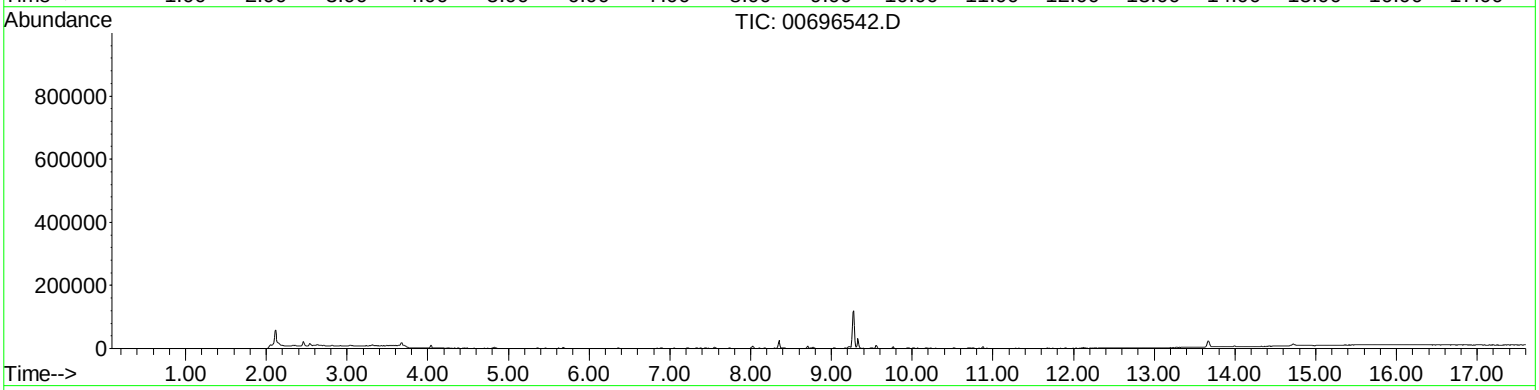


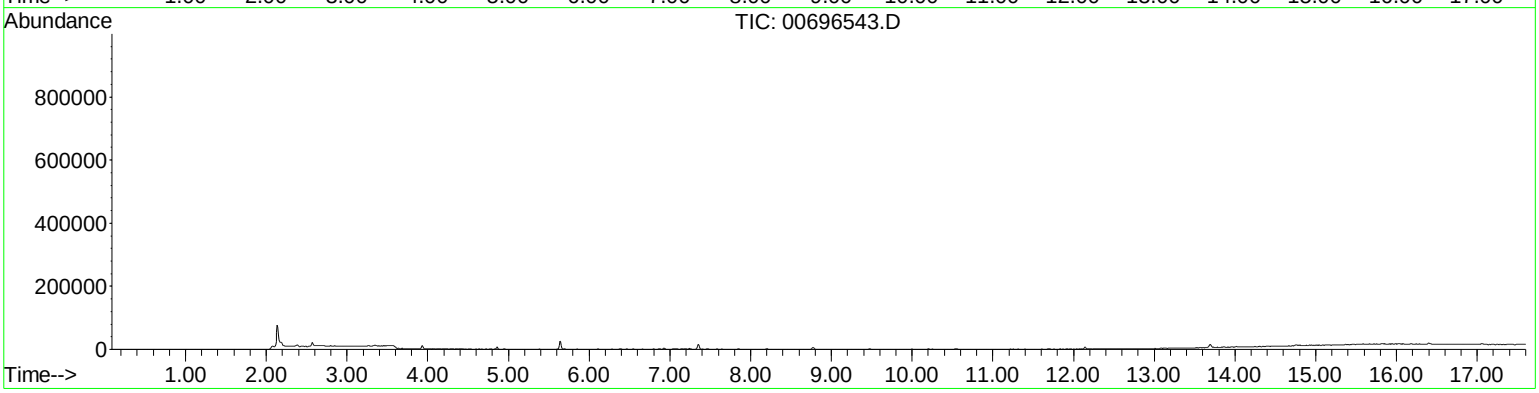
TICS 21815026-2
IN NUMERICAL ORDER



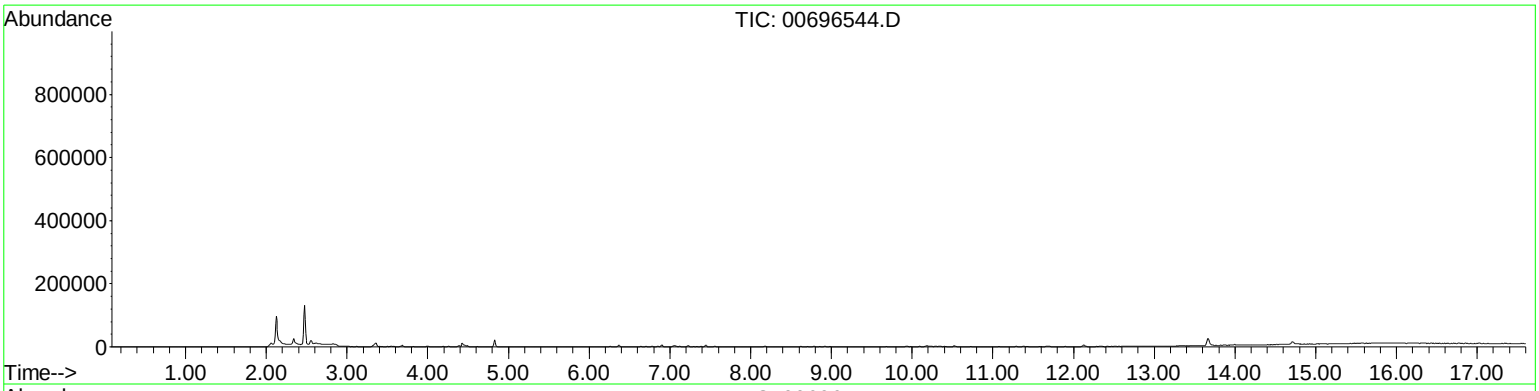


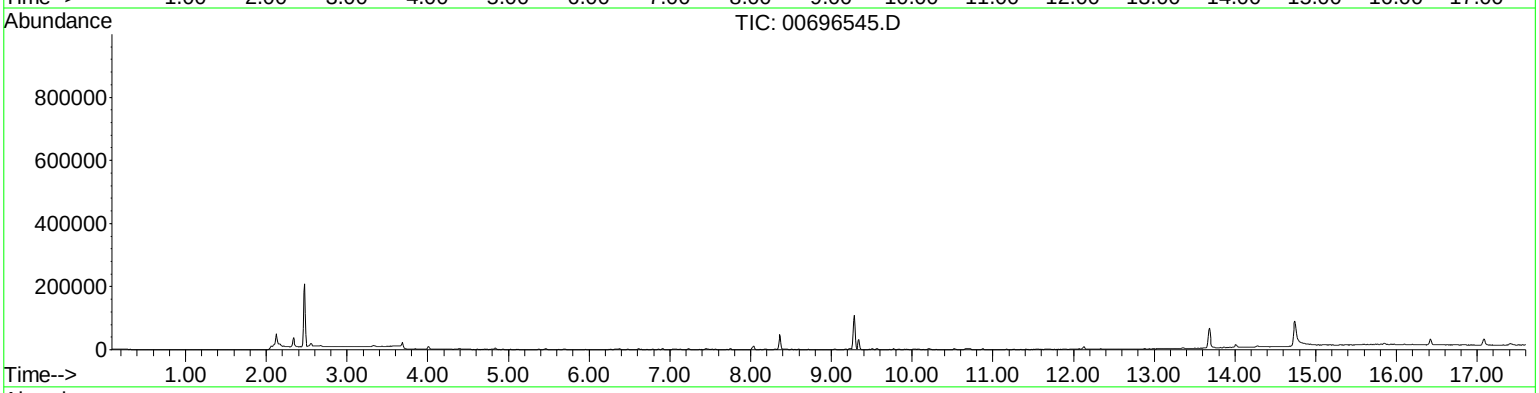


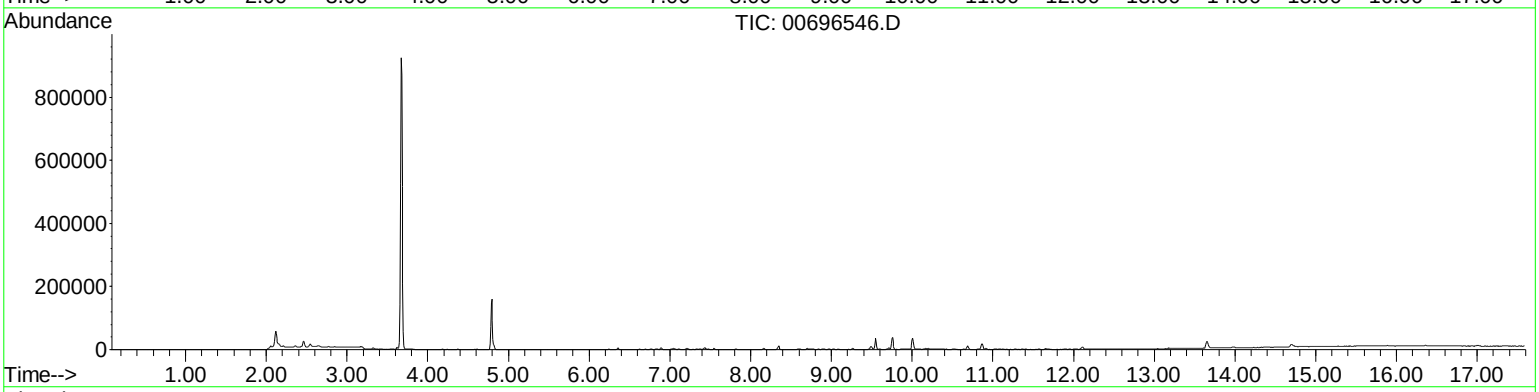


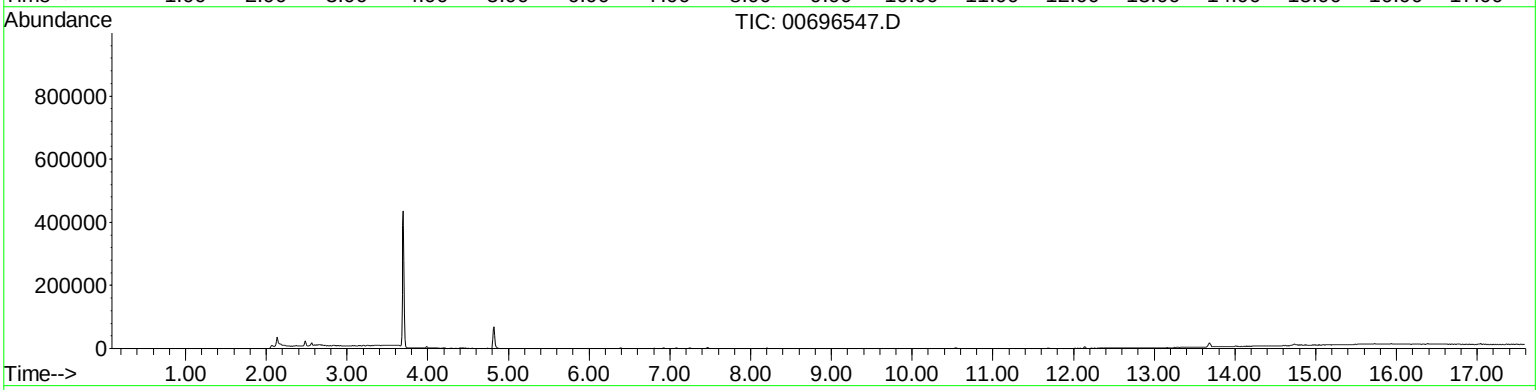


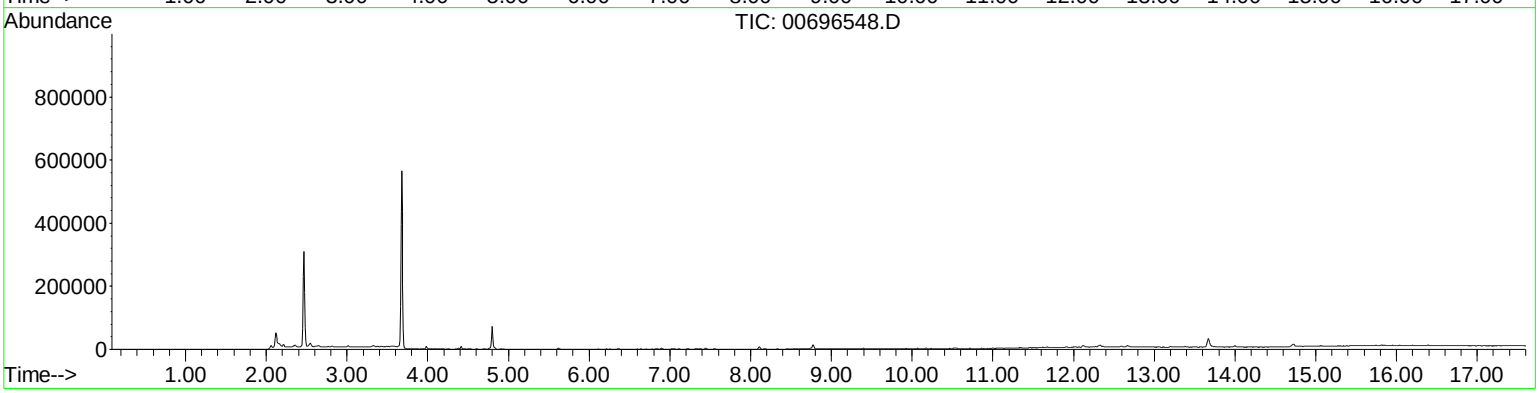
TICS 21815026-2
IN NUMERICAL ORDER



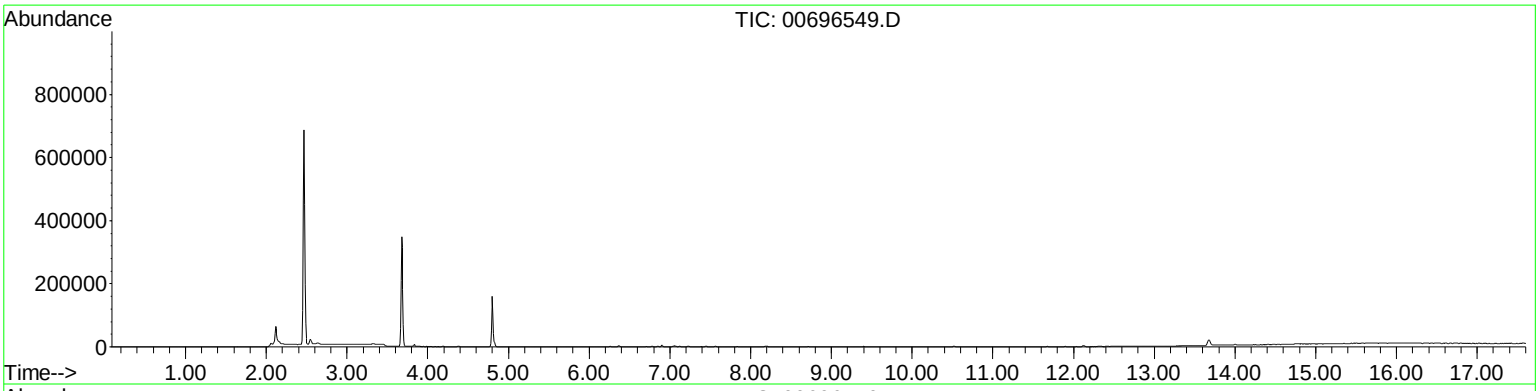


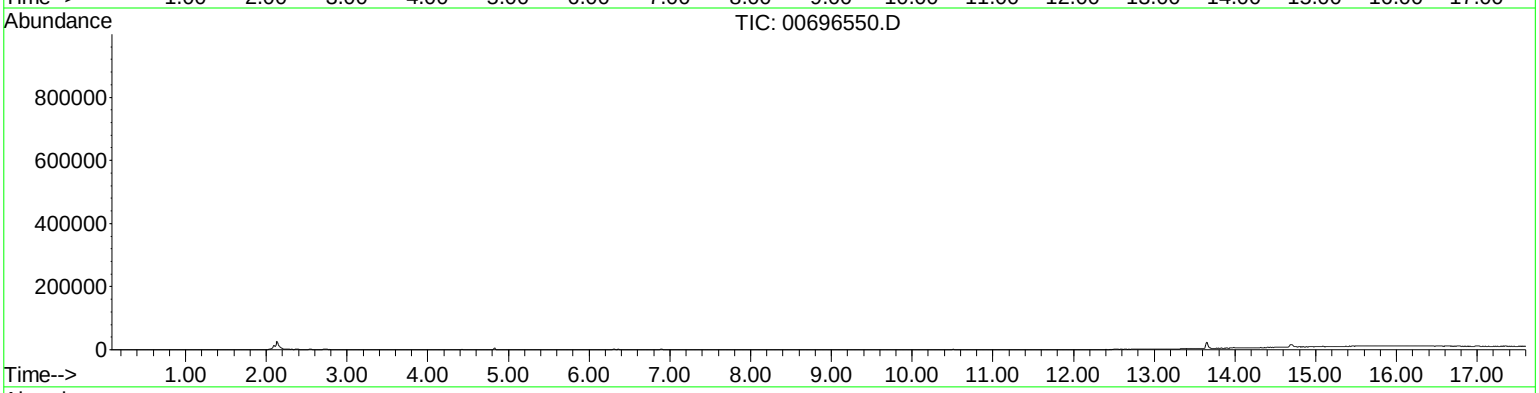


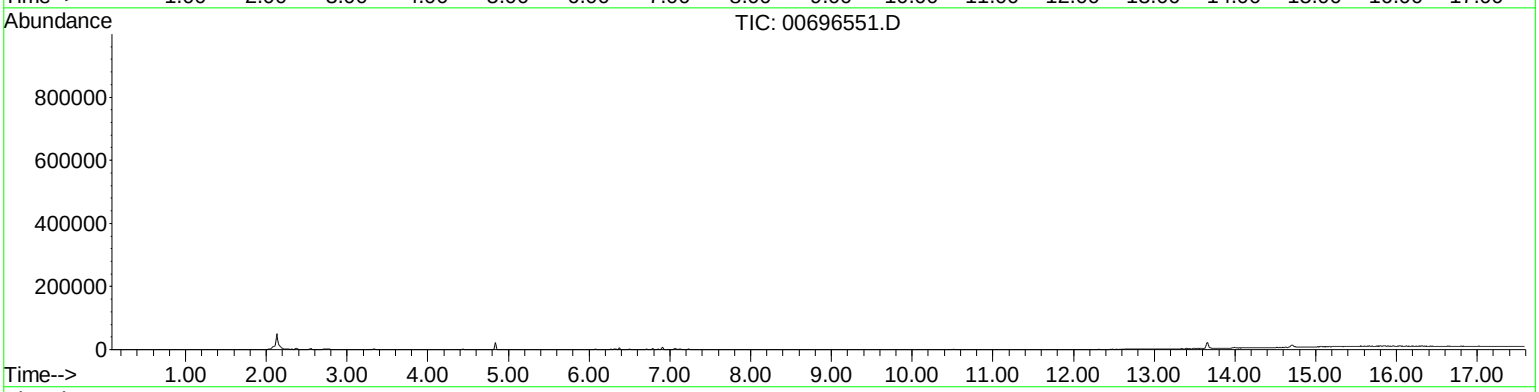


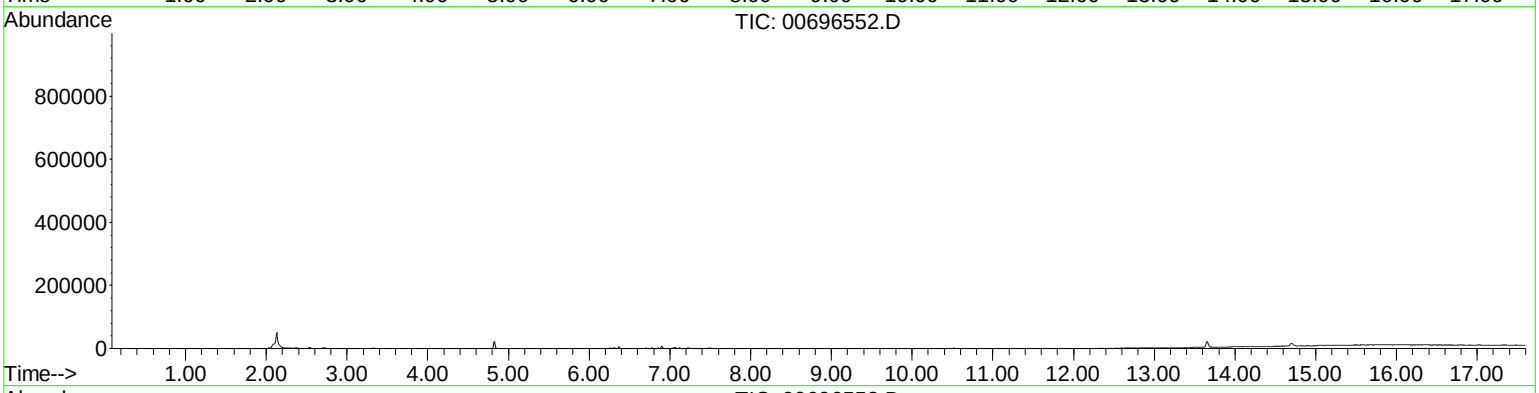


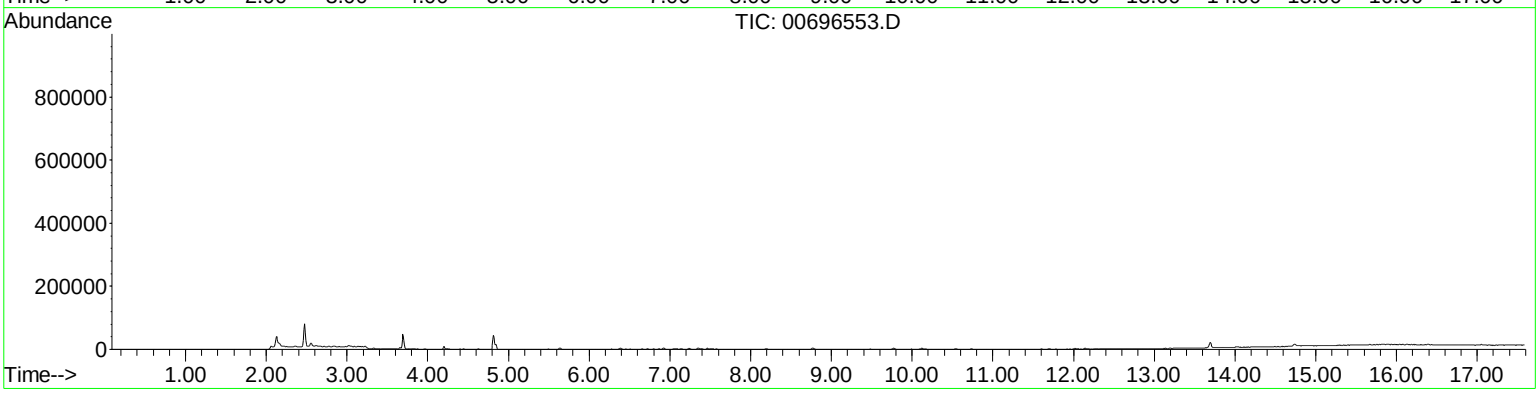
TICS 21815026-2
IN NUMERICAL ORDER



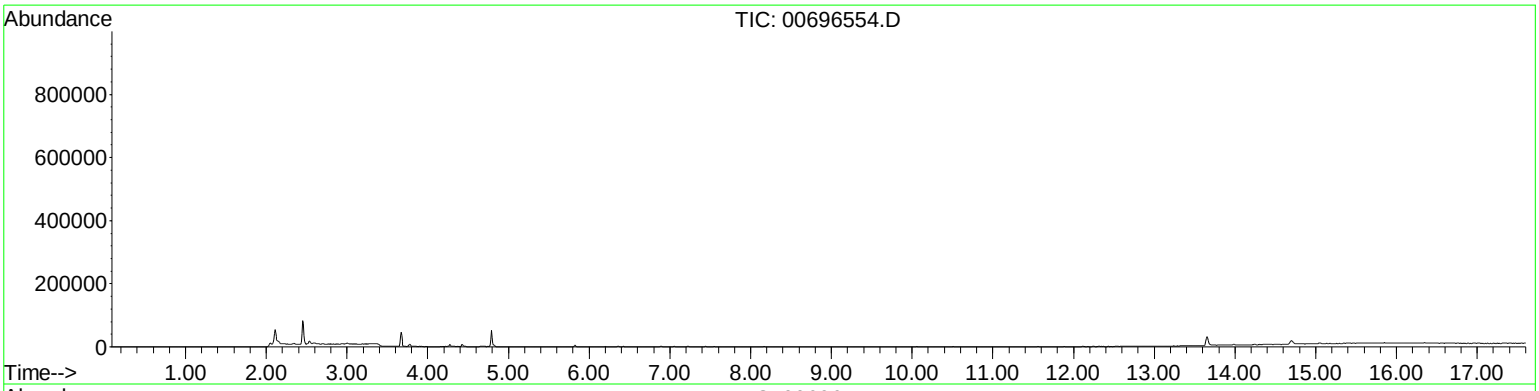


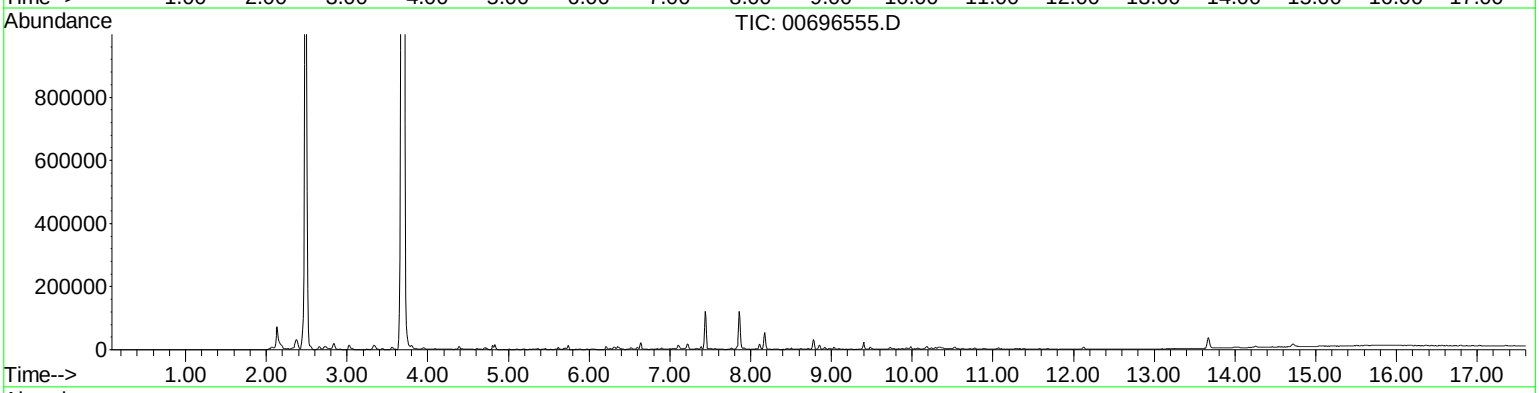


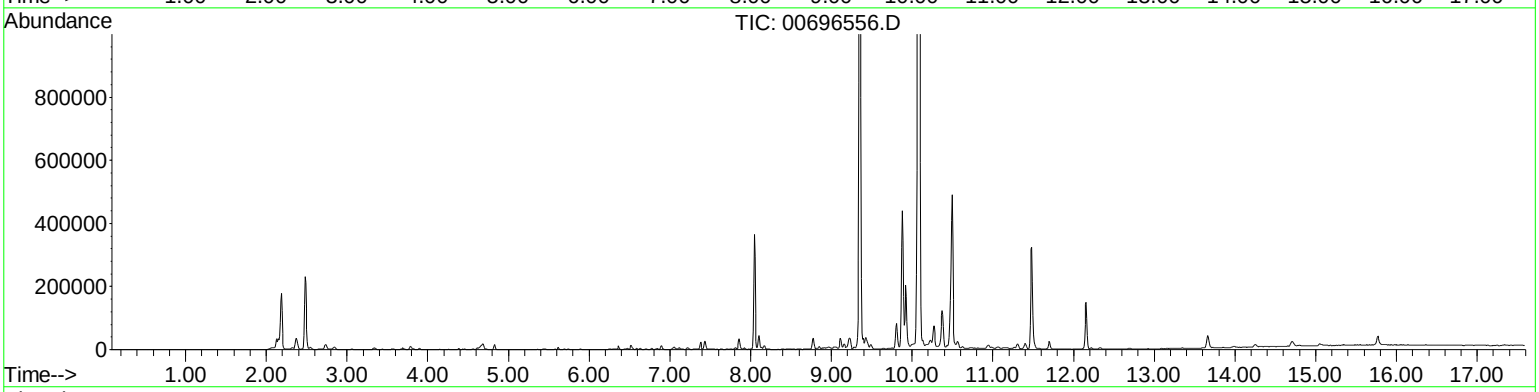


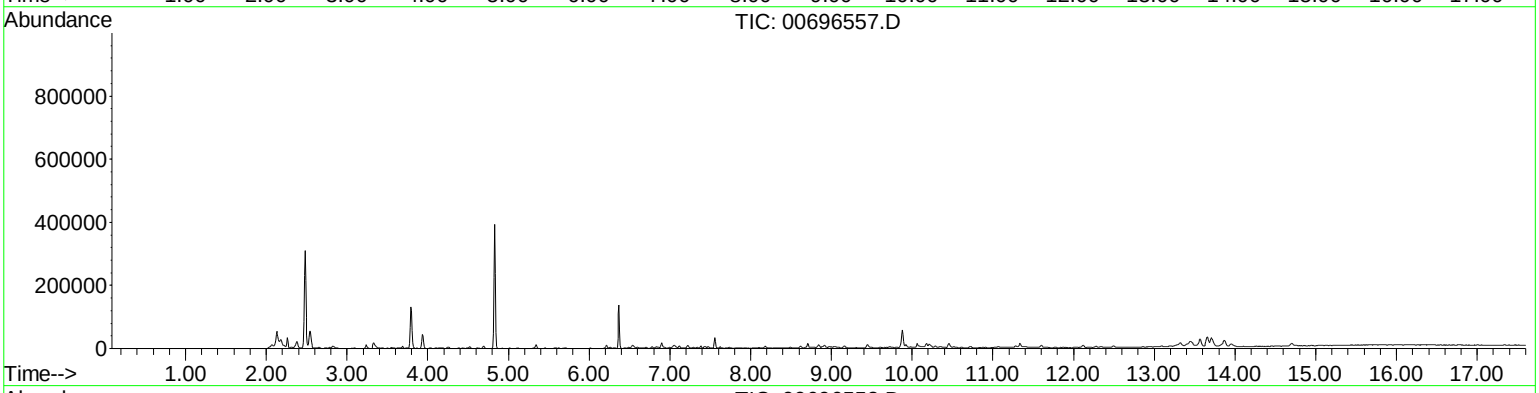


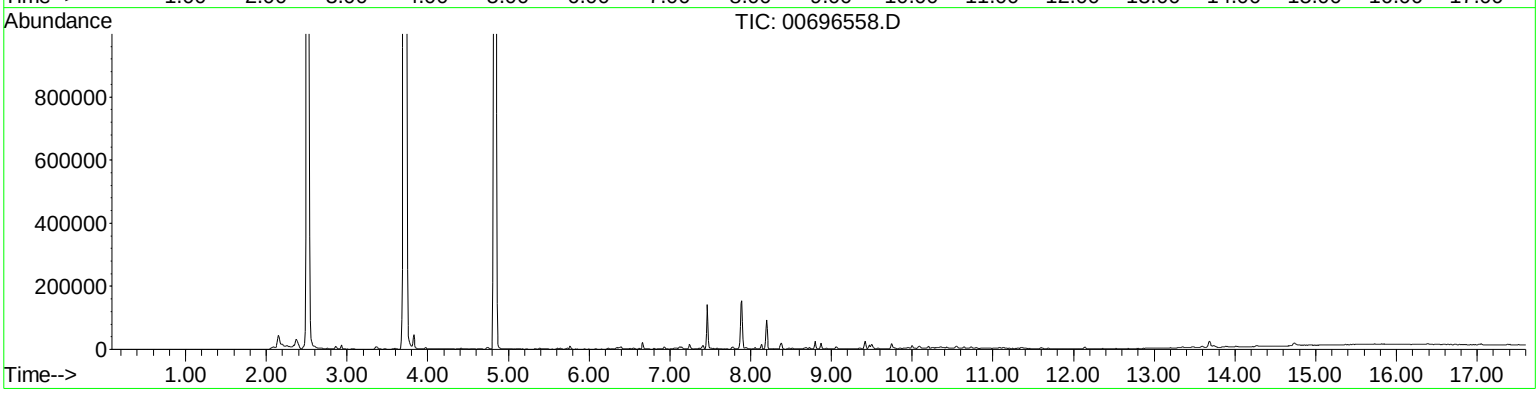
TICS 21815026-2
IN NUMERICAL ORDER



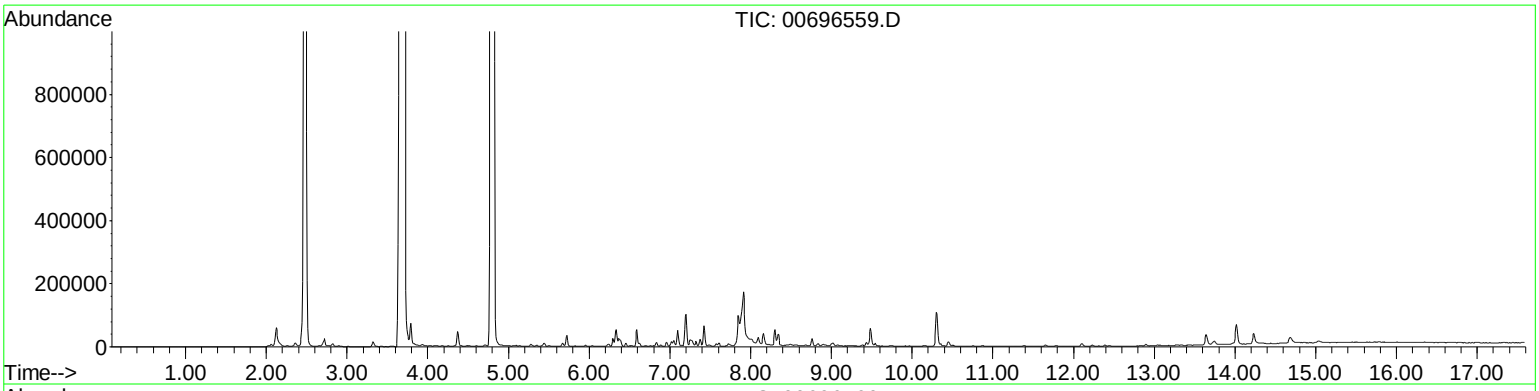


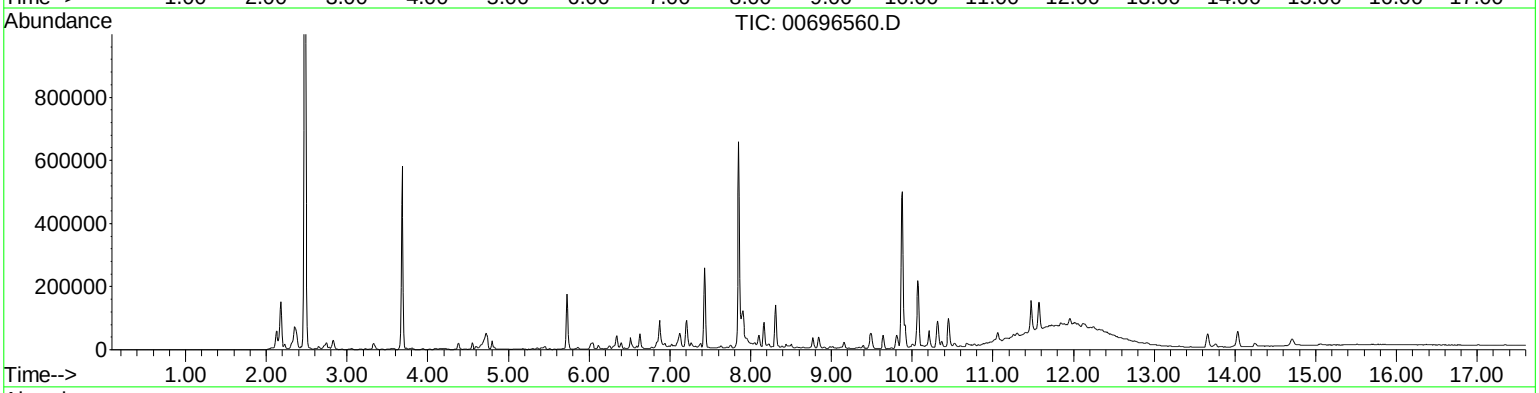


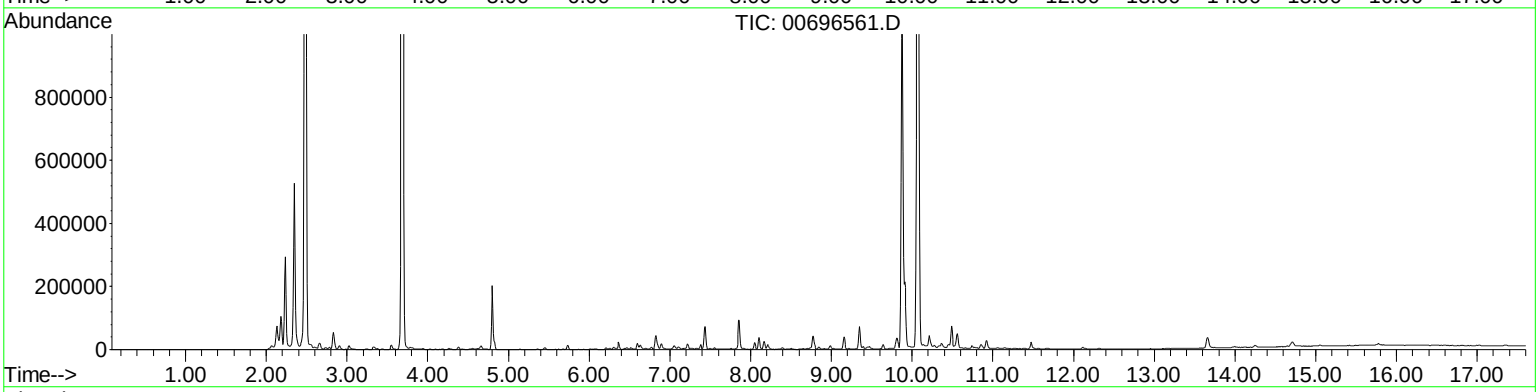


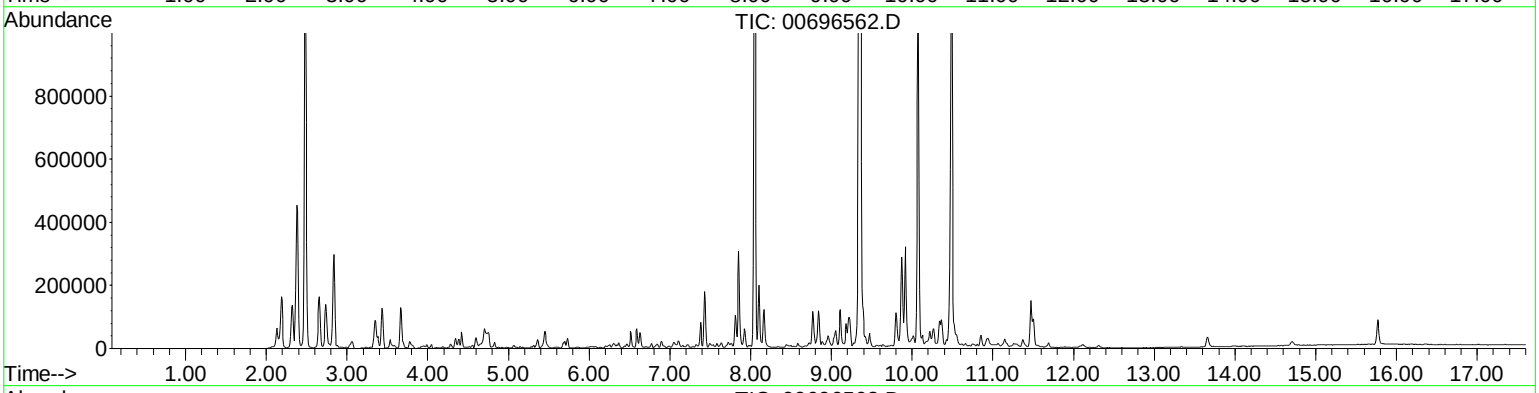


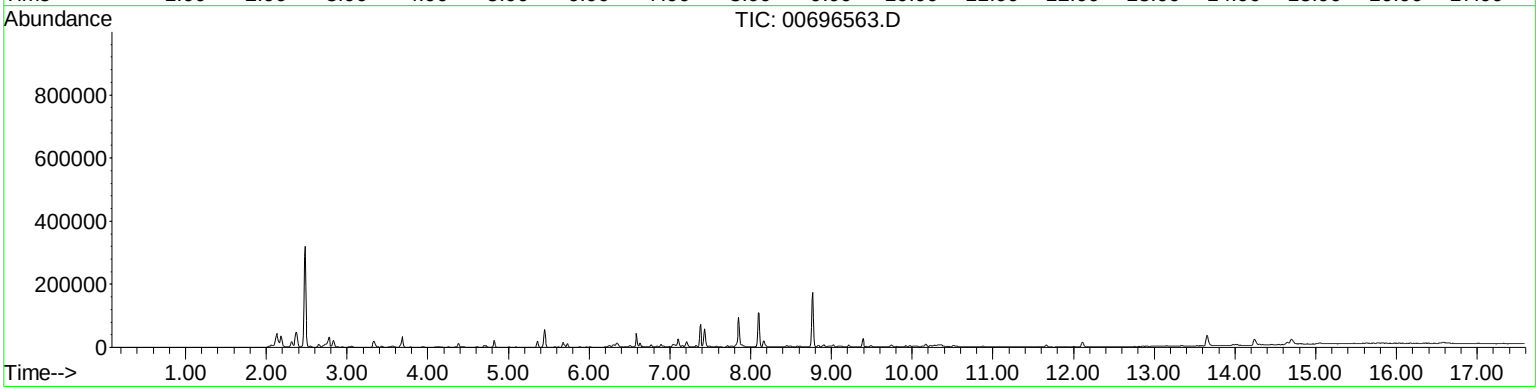
TICS 21815026-2
IN NUMERICAL ORDER



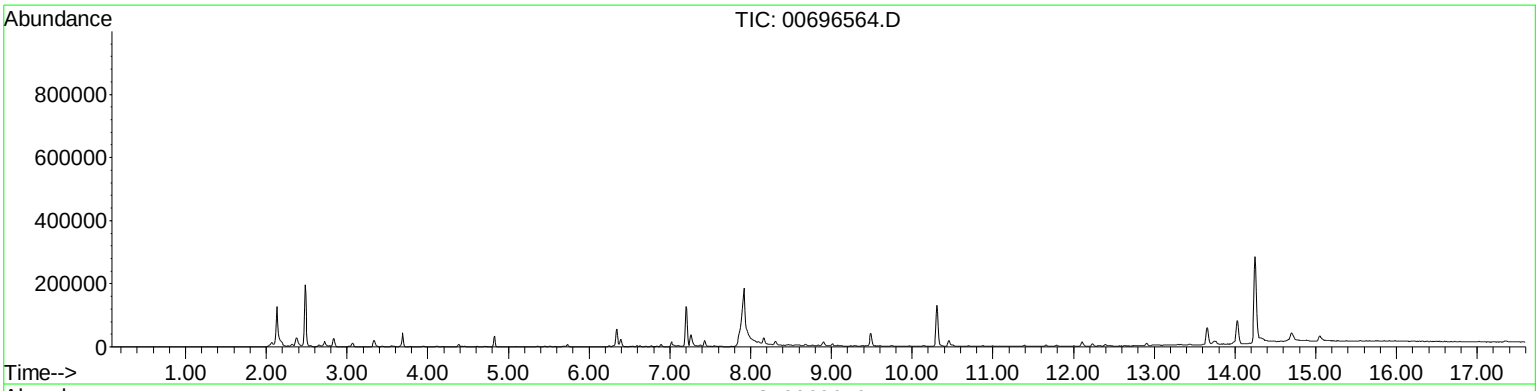


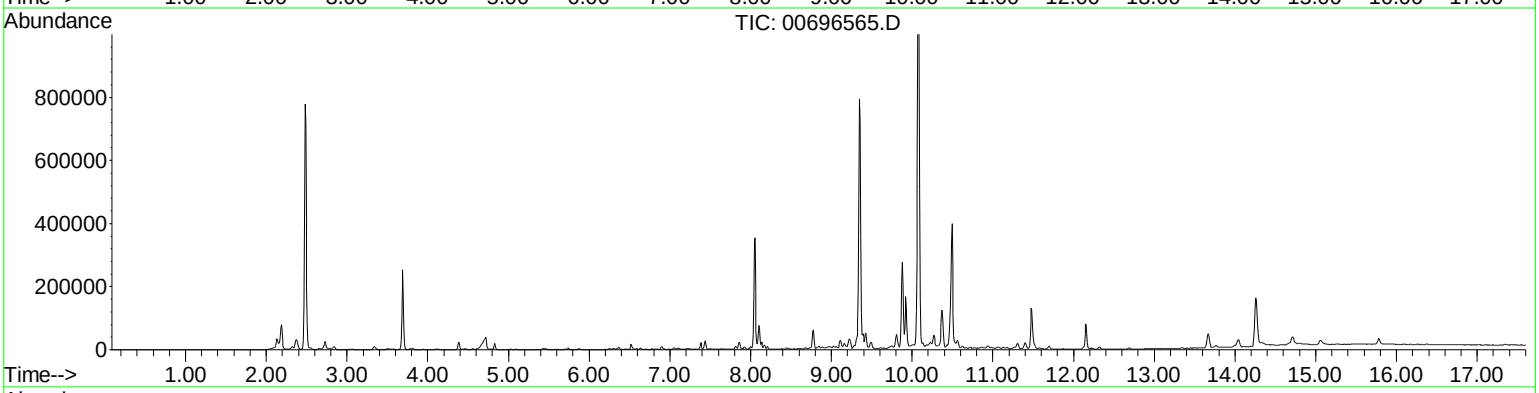


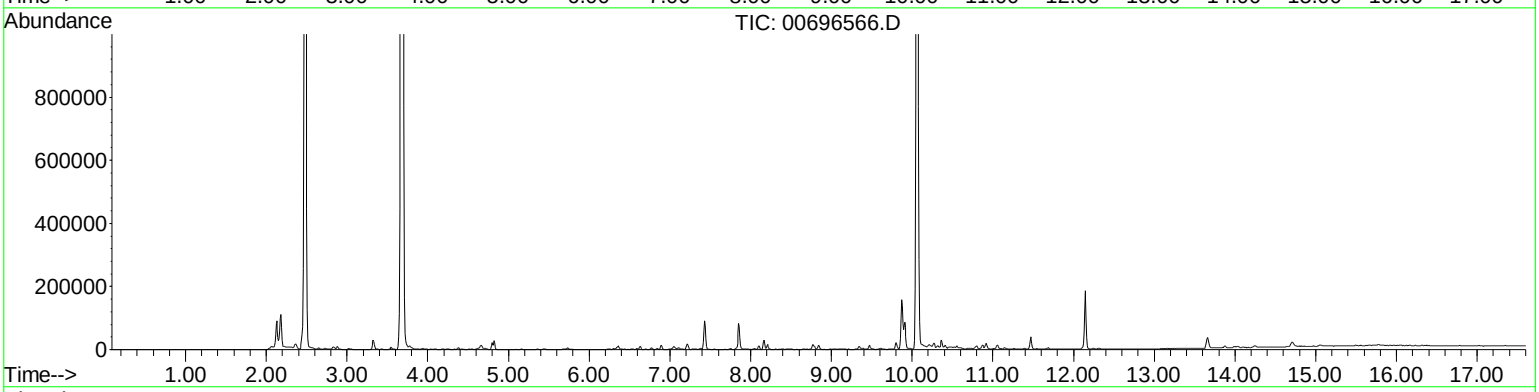


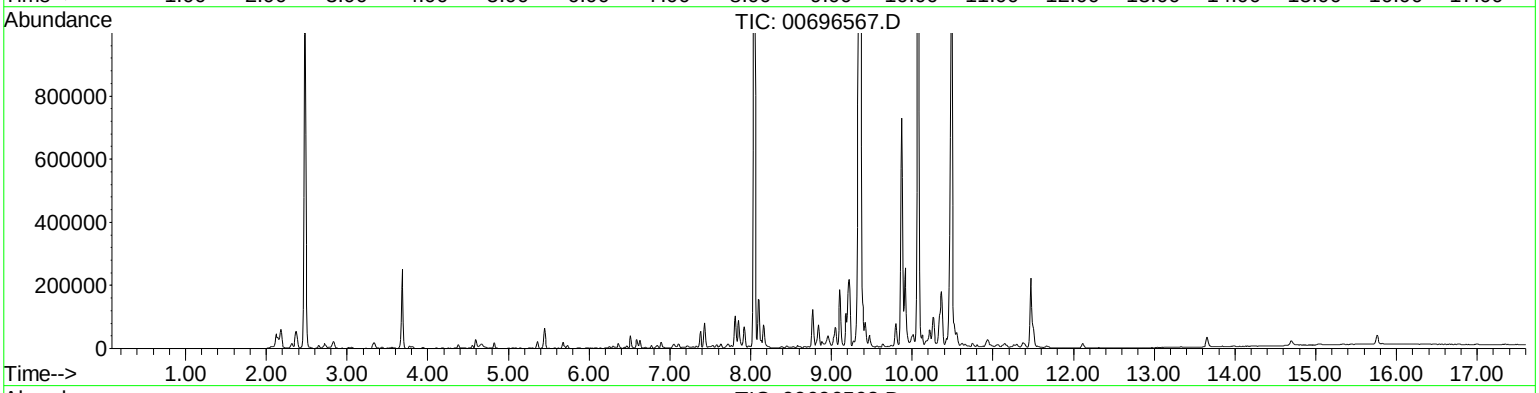


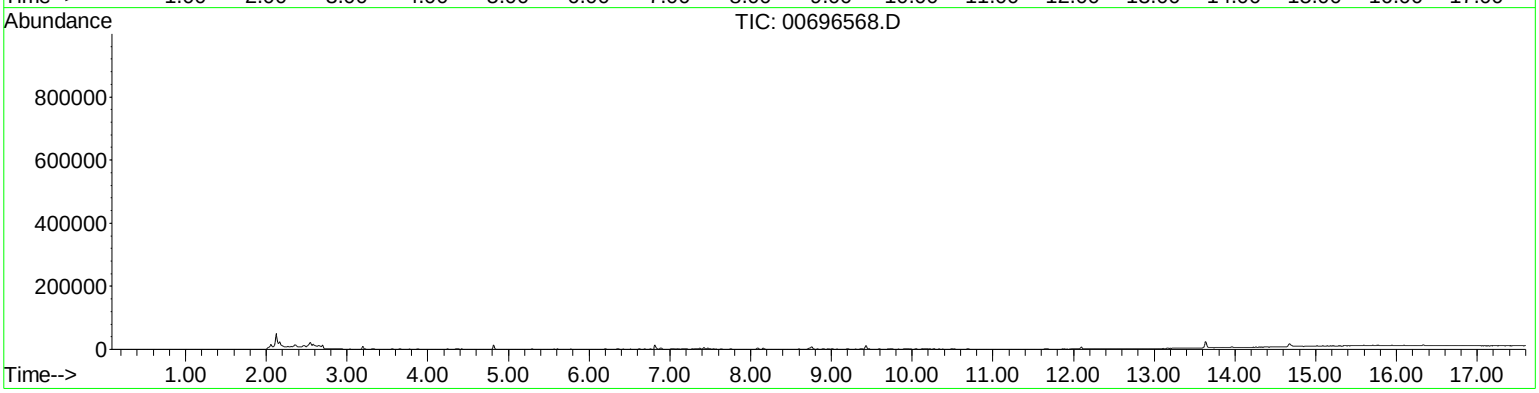
TICS 21815026-2
IN NUMERICAL ORDER











W. L. Gore & Associates, Inc.
100 Chesapeake Blvd. • P.O. Box 10
Elkton, MD 21922-0010
Phone: 410.392.7600 • 800.432.7998
Fax: 410.506.4780

gore.com/surveys

Sales Offices:
Europe: +49.89.4612.2198
San Francisco: 415.648.0438

Email: environmental@wlgore.com

Creative Technologies Worldwide

LIT 139.0 08/14/07

GORE and designs are trademarks of W. L. Gore & Associates, Inc. ©2007 W. L. Gore & Associates, Inc.

GORE Surveys

FOR ENVIRONMENTAL

Laboratory Report

Site: WSTF-NASA
NM

Prepared for:

NAVARRO RESEARCH AND ENGINEERING INC
669 EMORY VALLEY ROAD
OAK RIDGE, TN
UNITED STATES

Prepared on:
January 14, 2013

© 2013 W. L. Gore & Associates, Inc.

GORE(TM) SURVEYS ANALYTICAL RESULTS
NAVARRO RESEARCH AND ENGINEERING INC, OAK RIDGE, TN
GORE STANDARD TARGET VOCs/SVOCs AND FREON TICS (SCREENING + TICS)
WSTF-NASA, NM
PRODUCTION ORDER # 21815026

DATE ANALYZED	SAMPLE NAME	FIELD ID	TPH, ug	Freon11	BTEX, ug	BENZ, ug	TOL, ug	ETBENZ, ug	mpXYL, ug	oXYL, ug	C11, C13, &C15, ug	UNDEC, ug	TRIDEC, ug	PENTADEC, ug	TMBs, ug	124TMB, ug	135TMB, ug	ct12DCE, ug
	MDL=		0.50	0.05		0.02	0.02	0.02	0.02	0.02		0.05	0.05	0.05		0.02	0.02	
11/19/12	696355	A 1	0.57	bdl	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/16/12	696356	B 1	bdl	0.11	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/9/12	696357	C 1	bdl	bdl	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/16/12	696358	D 1	bdl	nd	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/9/12	696359	E 1	bdl	bdl	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/14/12	696360	F 1	3.14	bdl	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/13/12	696361	G 1	bdl	bdl	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/14/12	696362	H 1	bdl	bdl	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/14/12	696363	H 2	bdl	bdl	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/9/12	696364	G 2	0.53	bdl	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/13/12	696365	F 2	bdl	bdl	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/14/12	696366	E 2	bdl	nd	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	nd	nd	nd	nd	nd
11/19/12	696367	D 2	bdl	0.05	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/16/12	696368	C 2	bdl	0.14	0.00	bdl	nd	nd	nd	nd	0.00	nd	bdl	bdl	nd	nd	nd	nd
11/15/12	696369	B 2	bdl	0.31	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/15/12	696370	A 2	bdl	bdl	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/16/12	696371	A 3	bdl	bdl	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/14/12	696372	B 3	bdl	1.16	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/19/12	696373	C 3	bdl	0.51	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/15/12	696374	D 3	bdl	bdl	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/15/12	696375	E 3	bdl	0.10	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	nd	nd	nd	nd	nd
11/8/12	696376	F 3	0.65	nd	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/19/12	696377	G 3	bdl	0.08	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	nd	nd	nd	nd	nd
11/20/12	696378	H 3	bdl	bdl	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/16/12	696379	H 4	bdl	nd	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/19/12	696380	G 4	bdl	bdl	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/15/12	696381	F 4	bdl	nd	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/16/12	696382	E 4	bdl	0.07	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/15/12	696383	D 4	bdl	0.09	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/19/12	696384	C 4	bdl	1.34	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/16/12	696385	B 4	bdl	1.01	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	nd	nd	nd	nd	nd
11/8/12	696386	A 4	bdl	0.11	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	nd	nd	nd	nd	nd
11/15/12	696387	A 5	bdl	0.23	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/15/12	696388	B 5	bdl	0.34	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/13/12	696389	C 5	bdl	0.82	nd	nd	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/16/12	696390	D 5	bdl	0.13	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/15/12	696391	E 5	bdl	bdl	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	nd	nd	nd	nd	nd
11/14/12	696392	F 5	bdl	bdl	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/15/12	696393	G 5	bdl	0.07	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/8/12	696394	H 5	bdl	bdl	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	nd	nd	nd	nd	nd
11/14/12	696395	H 6	bdl	bdl	nd	nd	nd	nd	nd	nd	0.00	bdl	bdl	nd	nd	nd	nd	nd
11/15/12	696396	G 6	bdl	nd	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/14/12	696397	F 6	bdl	bdl	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/16/12	696398	E 6	bdl	bdl	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/9/12	696403	D 6	bdl	0.16	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	nd	nd	nd	nd	nd
11/19/12	696404	C 6	0.51	0.35	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/15/12	696405	B 6	bdl	0.08	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/19/12	696406	A 6	bdl	0.57	0.00	bdl	nd	nd	nd	nd	0.00	nd	bdl	bdl	nd	nd	nd	nd
11/14/12	696407	A 7	bdl	0.59	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/15/12	696408	B 7	bdl	0.06	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	nd	nd	nd	nd	nd
11/20/12	696409	C 7	bdl	0.35	0.00	bdl	nd	nd	nd	nd	0.00	bdl	nd	bdl	nd	nd	nd	nd
11/9/12	696410	D 7	bdl	0.11	0.00	bdl	nd	nd	nd	nd	0.00	nd	bdl	bdl	nd	nd	nd	nd
11/16/12	696411	E 7	bdl	bdl	0.00	bdl	nd	nd	nd	nd	0.00	bdl	nd	bdl	nd	nd	nd	nd

No RL(Reporting Limit) is available for summed analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
NAVARRO RESEARCH AND ENGINEERING INC, OAK RIDGE, TN
GORE STANDARD TARGET VOCs/SVOCs AND FREON TICS (SCREENING + TICS)
WSTF-NASA, NM
PRODUCTION ORDER # 21815026

DATE ANALYZED	SAMPLE NAME	FIELD ID	TPH, ug	Freon11	BTEX, ug	BENZ, ug	TOL, ug	ETBENZ, ug	mpXYL, ug	oXYL, ug	C11, C13, &C15, ug	UNDEC, ug	TRIDEC, ug	PENTADEC, ug	TMBs, ug	124TMB, ug	135TMB, ug	ct12DCE, ug
	MDL=		0.50	0.05		0.02	0.02	0.02	0.02	0.02		0.05	0.05	0.05		0.02	0.02	
11/14/12	696412	F 7	bdl	bdl	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/16/12	696413	G 7	bdl	nd	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/13/12	696414	H 7	bdl	nd	0.00	bdl	nd	nd	nd	nd	0.00	bdl	nd	nd	nd	nd	nd	nd
11/14/12	696415	H 9	bdl	bdl	nd	nd	nd	nd	nd	nd	0.00	nd	bdl	bdl	nd	nd	nd	nd
11/14/12	696416	H 8	0.79	bdl	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/19/12	696417	G 8	bdl	nd	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/9/12	696418	F 8	bdl	nd	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/16/12	696419	E 8	bdl	bdl	0.00	bdl	nd	nd	nd	nd	0.00	bdl	nd	nd	nd	nd	nd	nd
11/16/12	696420	D 8	bdl	0.16	0.00	bdl	nd	nd	nd	nd	0.00	nd	bdl	bdl	nd	nd	nd	nd
11/14/12	696421	C 8	bdl	0.21	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	nd	nd	nd	nd	nd
11/13/12	696422	B 8	bdl	bdl	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/16/12	696423	A 8	bdl	0.68	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/14/12	696424	A 9	bdl	0.16	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/15/12	696425	B 9	bdl	bdl	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/13/12	696426	C 9	bdl	bdl	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	nd	0.00	bdl	nd	nd
11/9/12	696427	D 9	0.54	0.16	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/14/12	696428	E 9	bdl	bdl	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	nd	nd	nd	nd	nd
11/16/12	696429	F 9	bdl	bdl	nd	nd	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/15/12	696430	G 9	bdl	0.07	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	nd	nd	nd	nd	nd
11/9/12	696431	H10	bdl	bdl	0.00	bdl	nd	nd	nd	nd	0.00	nd	bdl	nd	nd	nd	nd	nd
11/19/12	696432	G10	1.66	bdl	0.00	bdl	bdl	nd	nd	nd	0.09	bdl	0.09	bdl	0.00	nd	bdl	nd
11/19/12	696433	F10	bdl	bdl	0.03	0.03	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/8/12	696434	E10	bdl	nd	0.02	0.02	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/19/12	696435	D10	1.55	0.07	0.00	bdl	bdl	nd	nd	nd	0.06	bdl	0.06	bdl	nd	nd	nd	nd
11/15/12	696436	C10	bdl	0.12	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	nd	nd	nd	nd	nd
11/9/12	696437	B10	9.17	bdl	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/15/12	696438	A10	bdl	0.11	0.00	bdl	nd	nd	nd	nd	0.00	nd	bdl	nd	nd	nd	nd	nd
11/20/12	696439	A11	1.15	0.09	0.02	0.02	nd	nd	nd	nd	0.00	bdl	bdl	nd	nd	nd	nd	nd
11/14/12	696441	C11	bdl	0.19	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	nd	nd	nd	nd	nd
11/9/12	696442	D11	bdl	0.06	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	nd	nd	nd	nd	nd
11/16/12	696443	E11	bdl	bdl	0.00	bdl	nd	nd	nd	nd	0.00	nd	bdl	bdl	nd	nd	nd	nd
11/14/12	696444	F11	bdl	bdl	0.00	bdl	nd	nd	nd	nd	0.00	nd	bdl	bdl	nd	nd	nd	nd
11/14/12	696445	G11	bdl	nd	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/16/12	696446	H11	bdl	bdl	0.00	bdl	nd	nd	nd	nd	0.00	nd	bdl	nd	nd	nd	nd	nd
11/15/12	696450	B11	bdl	0.05	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/8/12	696451	H12	bdl	0.57	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/15/12	696452	G12	bdl	nd	0.00	bdl	nd	nd	nd	nd	0.00	nd	bdl	bdl	nd	nd	nd	nd
11/14/12	696459	F12	bdl	0.06	0.00	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/15/12	696460	E12	bdl	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/19/12	696461	D12	bdl	nd	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	nd	nd	nd	nd	nd
11/20/12	696462	C12	0.87	0.07	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/9/12	696463	B12	bdl	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/8/12	696464	A12	bdl	0.21	0.00	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/8/12	696465	A13	bdl	bdl	0.00	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/14/12	696466	B13	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/14/12	696467	C13	bdl	nd	0.03	0.03	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/20/12	696468	D13	0.66	bdl	0.02	0.02	bdl	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/14/12	696469	E13	bdl	bdl	nd	nd	nd	nd	nd	nd	0.00	nd	nd	bdl	nd	nd	nd	nd
11/8/12	696470	F13	bdl	0.08	0.00	bdl	nd	nd	nd	nd	0.00	nd	bdl	bdl	nd	nd	nd	nd
11/9/12	696471	G13	bdl	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/15/12	696472	H13	bdl	bdl	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	nd	nd	nd	nd	nd
11/13/12	696473	H14	bdl	bdl	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/9/12	696474	G14	bdl	nd	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd

No RL(Reporting Limit) is available for summed analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
NAVARRO RESEARCH AND ENGINEERING INC, OAK RIDGE, TN
GORE STANDARD TARGET VOCs/SVOCs AND FREON TICS (SCREENING + TICS)
WSTF-NASA, NM
PRODUCTION ORDER # 21815026

DATE ANALYZED	SAMPLE NAME	FIELD ID	TPH, ug	Freon11	BTEX, ug	BENZ, ug	TOL, ug	ETBENZ, ug	mpXYL, ug	oXYL, ug	C11, C13, &C15, ug	UNDEC, ug	TRIDEC, ug	PENTADEC, ug	TMBs, ug	124TMB, ug	135TMB, ug	ct12DCE, ug
	MDL=		0.50	0.05		0.02	0.02	0.02	0.02	0.02		0.05	0.05	0.05		0.02	0.02	
11/9/12	696475	F14	bdl	nd	0.00	bdl	nd	nd	nd	nd	0.00	nd	bdl	nd	nd	nd	nd	nd
11/9/12	696476	E14	bdl	0.06	0.02	0.02	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/15/12	696477	D14	bdl	0.11	0.00	bdl	nd	nd	nd	nd	0.00	nd	bdl	bdl	nd	nd	nd	nd
11/20/12	696478	C14	bdl	2.50	0.00	bdl	nd	nd	nd	nd	0.00	nd	bdl	bdl	nd	nd	nd	nd
11/15/12	696479	B14	bdl	bdl	0.00	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/13/12	696480	A14	bdl	bdl	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/8/12	696481	A15	bdl	bdl	0.00	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/14/12	696482	B15	bdl	0.50	0.00	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/15/12	696483	C15	bdl	0.81	0.00	bdl	nd	nd	nd	nd	0.00	nd	bdl	bdl	nd	nd	nd	nd
11/15/12	696484	D15	0.64	0.08	0.03	0.03	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/14/12	696485	E15	bdl	nd	0.00	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/13/12	696486	F15	bdl	bdl	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	0.00	bdl	nd	nd
11/15/12	696487	G15	bdl	bdl	0.00	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/9/12	696488	H15	bdl	0.15	0.00	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/20/12	696489	H16	bdl	0.09	0.00	bdl	nd	nd	nd	nd	0.00	nd	bdl	bdl	nd	nd	nd	nd
11/15/12	696490	G16	0.64	bdl	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/14/12	696491	F16	bdl	bdl	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/14/12	696492	E16	bdl	nd	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/8/12	696493	D16	bdl	0.06	0.00	bdl	nd	nd	nd	nd	0.00	nd	bdl	bdl	nd	nd	nd	nd
11/8/12	696494	C16	bdl	0.95	0.00	bdl	nd	nd	nd	nd	0.00	nd	bdl	nd	nd	nd	nd	nd
11/8/12	696495	B16	bdl	1.31	0.00	bdl	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/8/12	696496	A16	bdl	0.19	0.00	bdl	nd	nd	nd	nd	0.00	nd	bdl	nd	nd	nd	nd	nd
11/15/12	696497	A17	1.05	0.56	0.00	bdl	nd	nd	nd	nd	0.12	bdl	0.12	bdl	nd	nd	nd	nd
11/8/12	696498	B17	bdl	3.03	0.00	bdl	nd	nd	nd	nd	0.00	nd	bdl	bdl	nd	nd	nd	nd
11/14/12	696499	C17	bdl	0.18	0.00	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/13/12	696500	D17	0.93	0.06	0.00	bdl	nd	nd	nd	nd	0.00	bdl	nd	nd	nd	nd	nd	nd
11/15/12	696505	E17	bdl	bdl	0.00	bdl	nd	nd	nd	nd	0.00	nd	bdl	bdl	nd	nd	nd	nd
11/9/12	696506	F17	0.51	nd	0.00	nd	bdl	nd	nd	nd	0.07	bdl	0.07	bdl	nd	nd	nd	nd
11/13/12	696507	G17	bdl	nd	0.00	bdl	nd	nd	nd	nd	0.00	nd	bdl	nd	nd	nd	nd	nd
11/14/12	696512	E18	bdl	0.14	0.00	bdl	bdl	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/8/12	696513	D18	bdl	0.26	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/19/12	696514	C18	bdl	0.48	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/16/12	696515	B18	bdl	1.48	0.00	bdl	nd	nd	nd	nd	0.00	nd	bdl	nd	nd	nd	nd	nd
11/19/12	696516	A18	bdl	1.99	0.00	bdl	nd	nd	nd	nd	0.00	bdl	nd	nd	nd	nd	nd	nd
11/14/12	696517	A19	bdl	1.41	0.00	bdl	nd	nd	nd	nd	0.00	nd	bdl	bdl	nd	nd	nd	nd
11/14/12	696518	B19	bdl	1.70	0.00	bdl	nd	nd	nd	nd	0.00	nd	bdl	nd	nd	nd	nd	nd
11/8/12	696519	C19	bdl	0.82	nd	nd	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/8/12	696520	D19	bdl	0.36	0.00	bdl	nd	nd	nd	nd	0.00	nd	bdl	bdl	nd	nd	nd	nd
11/15/12	696525	BP-1	bdl	0.09	0.00	bdl	bdl	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/14/12	696526	BP-2	bdl	0.10	0.02	0.02	bdl	nd	nd	nd	0.00	bdl	nd	nd	nd	nd	nd	nd
11/14/12	696527	SH-1	bdl	nd	0.03	0.03	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/9/12	696528	SH-2	bdl	nd	0.00	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/13/12	696529	BL-1	bdl	0.12	0.00	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/15/12	696530	BL-2	bdl	0.05	0.00	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/16/12	696531	SB-1	bdl	0.16	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/8/12	696532	SB-2	bdl	0.08	0.03	0.03	nd	nd	nd	nd	0.00	nd	bdl	bdl	nd	nd	nd	nd
11/14/12	696533	SB-3	bdl	nd	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	nd	nd	nd	nd	nd
11/15/12	696534	SB-4	bdl	nd	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/8/12	696535	DP-1	bdl	0.69	0.00	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/16/12	696536	DP-2	bdl	0.68	0.00	bdl	nd	nd	nd	nd	0.00	bdl	nd	nd	nd	nd	nd	nd
11/20/12	696537	CS-1	bdl	1.46	0.00	bdl	bdl	nd	nd	nd	0.00	bdl	nd	nd	nd	nd	nd	nd
11/8/12	696538	CS-2	0.54	1.08	0.00	bdl	bdl	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/14/12	696539	SR-1*	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd

No RL(Reporting Limit) is available for summed analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
NAVARRO RESEARCH AND ENGINEERING INC, OAK RIDGE, TN
GORE STANDARD TARGET VOCs/SVOCs AND FREON TICS (SCREENING + TICS)
WSTF-NASA, NM
PRODUCTION ORDER # 21815026

DATE ANALYZED	SAMPLE NAME	FIELD ID	TPH, ug	Freon11	BTEX, ug	BENZ, ug	TOL, ug	ETBENZ, ug	mpXYL, ug	oXYL, ug	C11, C13, &C15, ug	UNDEC, ug	TRIDEC, ug	PENTADEC, ug	TMBs, ug	124TMB, ug	135TMB, ug	ct12DCE, ug
	MDL=		0.50	0.05		0.02	0.02	0.02	0.02	0.02		0.05	0.05	0.05		0.02	0.02	
11/13/12	696541	SR-2	0.69	0.15	0.03	0.03	nd	nd	nd	nd	0.00	bdl	nd	nd	0.14	nd	0.14	nd
11/15/12	696542	AD-1	bdl	0.17	0.00	bdl	nd	nd	nd	bdl	0.00	bdl	bdl	nd	nd	nd	nd	nd
11/8/12	696543	AD-2	0.54	bdl	0.00	bdl	bdl	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/16/12	696544	CL-1	bdl	1.60	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/9/12	696545	CL-2	0.64	2.92	0.00	bdl	bdl	bdl	bdl	bdl	nd	nd	nd	nd	0.00	bdl	bdl	nd
11/14/12	696546	CP-1	0.72	nd	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/9/12	696547	CP-2	bdl	nd	0.00	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/15/12	696548	CR-1	1.64	bdl	0.00	bdl	bdl	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/20/12	696549	CR-2	bdl	nd	0.02	0.02	bdl	nd	nd	nd	0.00	bdl	nd	nd	nd	nd	nd	nd
11/9/12	696553	AA-1	bdl	bdl	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	nd	nd	nd	nd	nd
11/16/12	696554	AA-2	bdl	bdl	0.00	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/20/12	696555	600-G-138	2.77	0.25	0.09	0.06	0.04	bdl	bdl	bdl	0.07	bdl	0.07	bdl	0.00	bdl	bdl	0.00
11/19/12	696556	NASA 4	14.20	0.28	0.00	bdl	bdl	nd	bdl	nd	0.14	0.06	0.08	bdl	nd	nd	nd	nd
11/16/12	696557	100-HG-139	3.56	nd	0.07	0.07	bdl	nd	nd	nd	0.00	bdl	bdl	bdl	0.00	bdl	bdl	nd
11/8/12	696558	200-JG-110	3.44	2.72	0.04	0.04	bdl	nd	nd	nd	0.06	bdl	0.06	bdl	nd	nd	nd	0.00
11/14/12	696559	200-D-109	1.89	0.25	0.31	0.07	0.16	bdl	0.04	0.03	0.00	bdl	bdl	bdl	0.21	0.14	0.06	0.06
11/15/12	696560	200-D-240	15.65	5.75	0.15	0.05	0.07	bdl	0.03	bdl	0.13	bdl	0.08	0.06	0.08	bdl	0.08	nd
11/16/12	696561	200-B-240	7.81	50.34	0.08	0.04	0.03	bdl	0.02	bdl	0.11	bdl	0.11	bdl	0.05	0.05	bdl	0.21
11/16/12	696562	600-C-173	37.46	0.10	0.42	0.07	0.07	0.06	0.17	0.05	0.49	0.19	0.30	nd	0.05	0.05	bdl	nd
11/16/12	696563	600-C-210	3.68	0.17	0.40	0.05	0.04	0.06	0.20	0.05	0.53	0.16	0.36	bdl	0.00	bdl	bdl	nd
11/19/12	696564	NASA 2	0.79	0.15	0.09	0.06	0.03	bdl	bdl	bdl	0.00	bdl	bdl	bdl	0.00	bdl	nd	nd
11/19/12	696565	NASA 7	10.98	0.20	0.11	0.03	0.08	nd	nd	nd	0.21	0.06	0.15	bdl	nd	nd	nd	nd
11/16/12	696566	NASA 8	7.19	0.07	0.17	0.14	0.02	bdl	bdl	nd	0.00	bdl	bdl	bdl	0.00	bdl	nd	nd
11/15/12	696567	BLM-3-182	36.19	0.16	0.43	0.05	0.04	0.06	0.22	0.06	0.51	0.13	0.25	0.12	0.05	0.05	bdl	nd
11/14/12	696568	OS-1	0.62	bdl	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd

No RL(Reporting Limit) is available for summed analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
NAVARRO RESEARCH AND ENGINEERING INC, OAK RIDGE, TN
GORE STANDARD TARGET VOCs/SVOCs AND FREON TICS (SCREENING + TICS)
WSTF-NASA, NM
PRODUCTION ORDER # 21815026

DATE ANALYZED	SAMPLE NAME	FIELD ID	TPH, ug	Freon11	BTEX, ug	BENZ, ug	TOL, ug	ETBENZ, ug	mpXYL, ug	oXYL, ug	C11, C13, &C15, ug	UNDEC, ug	TRIDEC, ug	PENTADEC, ug	TMBs, ug	124TMB, ug	135TMB, ug	ct12DCE, ug
	MDL=		0.50	0.05		0.02	0.02	0.02	0.02	0.02		0.05	0.05	0.05		0.02	0.02	
11/19/12	696399	Trip_Blank	bdl	nd	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/13/12	696400	Trip_Blank	bdl	nd	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/19/12	696401	Trip_Blank	bdl	nd	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/14/12	696402	Trip_Blank	bdl	nd	0.00	bdl	nd	nd	nd	nd	0.00	nd	bdl	nd	nd	nd	nd	nd
11/14/12	696440	Trip_Blank	bdl	nd	nd	nd	nd	nd	nd	nd	0.00	nd	bdl	nd	nd	nd	nd	nd
11/16/12	696447	Trip_Blank	bdl	nd	0.00	bdl	nd	nd	nd	nd	0.00	bdl	bdl	bdl	nd	nd	nd	nd
11/8/12	696448	Trip_Blank	bdl	nd	nd	nd	nd	nd	nd	nd	0.00	nd	bdl	nd	nd	nd	nd	nd
11/9/12	696449	Trip_Blank	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/16/12	696501	Trip_Blank	bdl	nd	0.00	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/15/12	696502	Trip_Blank	bdl	nd	0.00	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/9/12	696503	Trip_Blank	bdl	nd	0.00	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/16/12	696504	Trip_Blank	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/14/12	696540	Trip_Blank	bdl	nd	0.00	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/15/12	696550	Trip_Blank	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/15/12	696551	Trip_Blank	bdl	nd	0.00	bdl	nd	nd	nd	nd	0.00	bdl	nd	nd	nd	nd	nd	nd
11/15/12	696552	Trip_Blank	bdl	nd	0.00	bdl	nd	nd	nd	nd	0.00	bdl	nd	nd	nd	nd	nd	nd
11/8/12	method blank		bdl	nd	0.00	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/9/12	method blank		bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/14/12	method blank		nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/14/12	method blank		bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/15/12	method blank		bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/16/12	method blank		bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/17/12	method blank		bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/19/12	method blank		bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
11/13/12	method blank		nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd

No RL(Reporting Limit) is available for summed analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
NAVARRO RESEARCH AND ENGINEERING INC, OAK RIDGE, TN
GORE STANDARD TARGET VOCs/SVOCs AND FREON TICS (SCREENING + TICS)
WSTF-NASA, NM
PRODUCTION ORDER # 21815026

SAMPLE NAME	t12DCE, ug	c12DCE, ug	NAPH&2-MN, ug	NAPH, ug	2MeNAPH, ug	MTBE, ug	11DCA, ug	111TCA, ug	12DCA, ug	TCE, ug	OCT, ug	PCE, ug	14DCB, ug	Acenaphthene, ug	Acenaphthylene, ug	Fluorene, ug	Freon113
MDL=	0.02	0.02		0.05	0.05	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.05	0.05	0.05	0.05
696355	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl	nd	bdl	0.29
696356	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	9.34
696357	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl	nd	bdl	1.43
696358	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.07
696359	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	1.63
696360	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	1.28
696361	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl	3.71
696362	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	1.13
696363	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl	nd	bdl	nd	nd	nd	bdl	4.37
696364	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl	nd	bdl	0.88
696365	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	3.17
696366	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696367	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	3.45
696368	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl	nd	bdl	nd	nd	nd	nd	8.85
696369	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.02	nd	bdl	nd	bdl	nd	bdl	15.58
696370	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.33
696371	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.46
696372	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.43	nd	0.07	nd	nd	nd	bdl	35.56
696373	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.16	nd	0.04	nd	nd	nd	nd	21.52
696374	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	3.04
696375	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.02	nd	nd	nd	nd	18.56
696376	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl	0.07
696377	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.14	nd	0.11	nd	nd	nd	nd	17.55
696378	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.06	nd	0.06	nd	nd	nd	nd	7.21
696379	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl	nd	bdl	nd	nd	nd	bdl	0.51
696380	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.16	nd	0.08	nd	nd	nd	nd	2.57
696381	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	1.84
696382	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl	nd	nd	nd	bdl	16.18
696383	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	10.20
696384	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.33	nd	0.05	nd	bdl	nd	bdl	60.63
696385	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.94	nd	0.13	nd	nd	nd	nd	30.82
696386	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.81
696387	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.08	nd	bdl	nd	nd	nd	bdl	3.94
696388	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.03	nd	bdl	nd	nd	nd	bdl	14.51
696389	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.02	nd	bdl	nd	nd	nd	nd	53.26
696390	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	21.43
696391	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	7.08
696392	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.07	nd	nd	nd	nd	3.41
696393	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.76	nd	0.24	nd	nd	nd	nd	19.01
696394	nd	nd	nd	nd	nd	nd	nd	nd	nd	6.56	nd	0.78	nd	nd	nd	nd	9.39
696395	nd	nd	nd	nd	nd	nd	nd	nd	nd	1.37	nd	0.16	nd	nd	nd	nd	12.35
696396	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.28	nd	0.06	nd	nd	nd	nd	1.52
696397	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.09	nd	0.15	nd	nd	nd	nd	2.44
696398	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.04	nd	0.03	nd	bdl	nd	bdl	8.49
696403	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	26.08
696404	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd	40.71
696405	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	5.50
696406	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.07	nd	0.02	nd	nd	nd	nd	15.84
696407	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.08	nd	bdl	nd	nd	nd	nd	20.90
696408	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl	7.41
696409	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.02	nd	bdl	nd	nd	nd	nd	56.02
696410	nd	nd	nd	nd	nd	nd	nd	nd	nd	5.62	nd	0.81	nd	nd	nd	nd	42.13
696411	nd	nd	nd	nd	nd	nd	nd	nd	nd	20.24	nd	1.68	nd	nd	nd	nd	30.04

No RL(Reporting Limit) is available for summed analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
NAVARRO RESEARCH AND ENGINEERING INC, OAK RIDGE, TN
GORE STANDARD TARGET VOCs/SVOCs AND FREON TICS (SCREENING + TICS)
WSTF-NASA, NM
PRODUCTION ORDER # 21815026

SAMPLE NAME	t12DCE, ug	c12DCE, ug	NAPH&2-MN, ug	NAPH, ug	2MeNAPH, ug	MTBE, ug	11DCA, ug	111TCA, ug	12DCA, ug	TCE, ug	OCT, ug	PCE, ug	14DCB, ug	Acenaphthene, ug	Acenaphthylene, ug	Fluorene, ug	Freon113
MDL=	0.02	0.02		0.05	0.05	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.05	0.05	0.05	0.05
696412	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.38	nd	0.09	nd	nd	nd	nd	15.08
696413	nd	nd	nd	nd	nd	nd	nd	nd	nd	1.08	nd	0.11	nd	nd	nd	bdl	3.11
696414	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.55	nd	0.11	nd	nd	nd	nd	7.74
696415	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.10
696416	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.05	nd	nd	nd	nd	nd	nd	2.06
696417	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	1.26
696418	nd	nd	nd	nd	nd	nd	nd	nd	bdl	bdl	nd	bdl	nd	nd	nd	nd	0.57
696419	nd	nd	nd	nd	nd	nd	nd	nd	nd	17.14	nd	1.47	nd	nd	nd	nd	19.32
696420	nd	nd	nd	nd	nd	nd	nd	nd	nd	4.52	nd	0.71	nd	nd	nd	nd	99.83
696421	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.14	nd	bdl	nd	nd	nd	nd	36.16
696422	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	1.39
696423	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.09	nd	0.02	nd	nd	nd	nd	21.64
696424	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl	nd	0.02	nd	nd	nd	bdl	4.89
696425	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.99
696426	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	4.08
696427	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.13	nd	0.03	nd	nd	nd	nd	38.66
696428	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.08	nd	bdl	nd	nd	nd	nd	12.85
696429	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl	nd	bdl	3.68
696430	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl	nd	nd	nd	bdl	nd	bdl	16.19
696431	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl	0.55
696432	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	2.81
696433	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.91
696434	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd	4.10
696435	nd	nd	nd	nd	nd	nd	nd	nd	bdl	0.09	bdl	0.02	nd	nd	nd	nd	29.62
696436	nd	nd	nd	nd	nd	nd	nd	nd	nd	5.79	nd	0.92	nd	nd	nd	nd	50.82
696437	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.03	nd	bdl	nd	bdl	0.49
696438	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.30	nd	0.10	nd	nd	nd	nd	3.57
696439	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.28	nd	0.09	nd	nd	nd	nd	1.96
696441	nd	nd	nd	nd	nd	nd	nd	nd	nd	3.52	nd	0.66	nd	nd	nd	bdl	30.33
696442	nd	nd	nd	nd	nd	nd	nd	nd	nd	1.27	nd	0.10	nd	nd	nd	nd	5.76
696443	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.03	nd	bdl	nd	nd	nd	nd	24.29
696444	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.32
696445	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl	nd	bdl	0.10
696446	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl	nd
696450	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.27	nd	0.07	nd	nd	nd	bdl	3.23
696451	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	1.57
696452	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl	nd	bdl	nd
696459	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.51
696460	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.07	nd	bdl	nd	nd	nd	nd	8.25
696461	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.53
696462	nd	nd	nd	nd	nd	nd	nd	nd	nd	1.37	nd	4.89	nd	nd	nd	bdl	6.81
696463	nd	nd	nd	nd	nd	nd	nd	nd	nd	1.38	nd	0.39	nd	nd	nd	nd	1.97
696464	nd	nd	nd	nd	nd	nd	nd	nd	nd	2.97	nd	0.37	nd	bdl	nd	bdl	3.95
696465	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl	nd	bdl	nd	nd	nd	nd	0.21
696466	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.37	nd	0.10	nd	nd	nd	nd	1.43
696467	nd	nd	nd	nd	nd	nd	nd	nd	bdl	0.36	nd	0.05	nd	bdl	nd	bdl	0.26
696468	nd	nd	nd	nd	nd	nd	nd	nd	nd	7.13	nd	1.02	nd	nd	nd	bdl	4.04
696469	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.45
696470	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.14
696471	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.09
696472	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.06
696473	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.11
696474	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd

No RL(Reporting Limit) is available for summed analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
NAVARRO RESEARCH AND ENGINEERING INC, OAK RIDGE, TN
GORE STANDARD TARGET VOCs/SVOCs AND FREON TICS (SCREENING + TICS)
WSTF-NASA, NM
PRODUCTION ORDER # 21815026

SAMPLE NAME	t12DCE, ug	c12DCE, ug	NAPH&2-MN, ug	NAPH, ug	2MeNAPH, ug	MTBE, ug	11DCA, ug	111TCA, ug	12DCA, ug	TCE, ug	OCT, ug	PCE, ug	14DCB, ug	Acenaphthene, ug	Acenaphthylene, ug	Fluorene, ug	Freon113
MDL=	0.02	0.02		0.05	0.05	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.05	0.05	0.05	0.05
696475	nd	nd	0.00	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696476	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.06
696477	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd	0.22
696478	nd	nd	nd	nd	nd	nd	nd	nd	nd	10.36	nd	1.70	nd	nd	nd	nd	18.00
696479	nd	nd	nd	nd	nd	nd	nd	nd	nd	8.45	nd	1.01	nd	nd	nd	nd	5.96
696480	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.14	nd	0.03	nd	nd	nd	nd	0.59
696481	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.13	nd	0.02	nd	nd	nd	nd	0.43
696482	nd	nd	nd	nd	nd	nd	nd	nd	nd	39.45	nd	4.73	nd	nd	nd	nd	18.00
696483	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.10	nd	0.05	nd	nd	nd	bdl	3.65
696484	nd	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.12
696485	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl	nd
696486	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl	nd	bdl	nd
696487	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696488	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.30
696489	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl	nd	bdl	0.26
696490	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl	bdl	bdl	nd
696491	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl	nd	bdl	nd
696492	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl	nd
696493	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl	nd
696494	nd	nd	0.00	nd	bdl	nd	nd	nd	nd	0.07	nd	0.06	nd	bdl	nd	bdl	3.05
696495	nd	nd	nd	nd	nd	nd	nd	nd	nd	1.18	nd	0.32	nd	nd	nd	nd	6.33
696496	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.61	nd	0.16	nd	nd	nd	nd	1.68
696497	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.12	nd	0.04	nd	nd	nd	bdl	4.47
696498	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.18	nd	0.09	nd	nd	nd	nd	10.88
696499	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd	0.86
696500	nd	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd	nd	nd	bdl	0.05
696505	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl	nd	bdl	0.08
696506	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696507	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696512	nd	nd	0.00	nd	bdl	nd	nd	nd	nd	nd	nd	nd	nd	bdl	nd	bdl	0.31
696513	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd	0.33
696514	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.03	nd	nd	nd	nd	nd	nd	1.25
696515	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.98	nd	0.46	nd	nd	nd	nd	10.09
696516	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.73	nd	0.34	nd	nd	nd	nd	14.42
696517	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.04	nd	0.07	nd	nd	nd	bdl	9.09
696518	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.17	nd	0.06	nd	nd	nd	nd	6.28
696519	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.08	nd	bdl	nd	nd	nd	nd	1.14
696520	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl	0.34
696525	nd	nd	nd	nd	nd	nd	nd	nd	bdl	bdl	nd	bdl	nd	nd	nd	nd	12.00
696526	nd	nd	nd	nd	nd	nd	nd	nd	bdl	0.04	nd	0.11	nd	nd	nd	nd	12.22
696527	nd	nd	0.00	nd	bdl	nd	nd	bdl	nd	nd	nd	nd	nd	nd	nd	nd	1.08
696528	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl	nd	bdl	nd	nd	nd	nd	0.40
696529	nd	nd	nd	nd	nd	nd	nd	bdl	nd	bdl	nd	0.02	nd	nd	nd	nd	2.01
696530	nd	nd	nd	nd	nd	nd	nd	bdl	nd	0.07	nd	0.07	nd	nd	nd	nd	3.60
696531	nd	nd	nd	nd	nd	nd	nd	0.06	nd	bdl	nd	nd	nd	nd	nd	nd	5.61
696532	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.12
696533	nd	nd	nd	nd	nd	nd	nd	bdl	nd	bdl	nd	nd	nd	nd	nd	nd	0.13
696534	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl	0.06
696535	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.68
696536	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl	nd	bdl	nd	nd	nd	nd	1.27
696537	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	2.95
696538	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	1.02
696539	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd

No RL(Reporting Limit) is available for summed analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
NAVARRO RESEARCH AND ENGINEERING INC, OAK RIDGE, TN
GORE STANDARD TARGET VOCs/SVOCs AND FREON TICS (SCREENING + TICS)
WSTF-NASA, NM
PRODUCTION ORDER # 21815026

SAMPLE NAME	t12DCE, ug	c12DCE, ug	NAPH&2-MN, ug	NAPH, ug	2MeNAPH, ug	MTBE, ug	11DCA, ug	111TCA, ug	12DCA, ug	TCE, ug	OCT, ug	PCE, ug	14DCB, ug	Acenaphthene, ug	Acenaphthylene, ug	Fluorene, ug	Freon113
MDL=	0.02	0.02		0.05	0.05	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.05	0.05	0.05	0.05
696541	nd	nd	nd	nd	nd	0.06	nd	nd	bdl	0.04	nd	nd	nd	nd	nd	nd	0.11
696542	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.07	nd	nd	nd	nd	nd	bdl	0.23
696543	nd	nd	nd	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd	nd	nd
696544	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.04	nd	nd	nd	nd	nd	nd	2.19
696545	nd	nd	nd	nd	nd	nd	nd	nd	bdl	0.11	nd	bdl	nd	nd	nd	bdl	2.23
696546	nd	nd	nd	nd	nd	nd	nd	bdl	nd	6.29	nd	0.91	nd	nd	nd	nd	0.34
696547	nd	nd	nd	nd	nd	nd	nd	nd	nd	3.16	nd	0.44	nd	nd	nd	nd	0.16
696548	nd	nd	0.00	nd	bdl	nd	nd	nd	bdl	3.46	nd	0.41	nd	nd	nd	nd	4.88
696549	nd	nd	nd	nd	nd	nd	nd	nd	nd	2.34	nd	0.93	nd	nd	nd	nd	11.68
696553	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.39	nd	0.29	nd	bdl	nd	bdl	0.84
696554	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.28	nd	0.31	nd	nd	nd	nd	1.25
696555	nd	bdl	nd	nd	nd	nd	nd	bdl	nd	126.38	0.03	0.08	nd	nd	nd	bdl	57.72
696556	nd	nd	0.00	nd	bdl	nd	nd	nd	nd	0.03	nd	nd	nd	nd	bdl	bdl	3.07
696557	nd	nd	0.00	bdl	bdl	nd	nd	nd	bdl	0.04	nd	nd	nd	bdl	nd	bdl	5.61
696558	nd	bdl	0.00	nd	bdl	nd	nd	nd	nd	123.13	0.02	39.91	nd	bdl	bdl	bdl	128.24
696559	0.03	0.03	0.00	bdl	bdl	nd	nd	bdl	nd	169.25	bdl	130.06	nd	nd	nd	nd	130.33
696560	nd	nd	nd	nd	nd	nd	nd	nd	nd	3.71	0.07	0.16	nd	bdl	bdl	bdl	31.51
696561	0.11	0.10	nd	nd	nd	bdl	nd	nd	nd	28.64	bdl	1.18	nd	nd	bdl	bdl	115.22
696562	nd	nd	0.00	bdl	nd	nd	nd	nd	bdl	0.07	0.15	bdl	bdl	bdl	bdl	bdl	28.93
696563	nd	nd	0.00	nd	bdl	nd	nd	bdl	nd	0.22	0.03	bdl	bdl	nd	nd	nd	6.25
696564	nd	nd	nd	nd	nd	nd	nd	nd	nd	0.29	bdl	nd	bdl	nd	nd	bdl	4.06
696565	nd	nd	0.00	nd	bdl	nd	nd	nd	nd	1.62	0.03	nd	nd	bdl	bdl	bdl	16.32
696566	nd	nd	nd	nd	nd	nd	nd	nd	nd	80.99	bdl	0.13	bdl	nd	bdl	bdl	77.68
696567	nd	nd	0.00	bdl	bdl	nd	nd	nd	bdl	1.60	0.02	nd	nd	bdl	bdl	bdl	21.37
696568	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl	nd	bdl	0.09

No RL(Reporting Limit) is available for summed analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
NAVARRO RESEARCH AND ENGINEERING INC, OAK RIDGE, TN
GORE STANDARD TARGET VOCs/SVOCs AND FREON TICS (SCREENING + TICS)
WSTF-NASA, NM
PRODUCTION ORDER # 21815026

SAMPLE NAME	t12DCE, ug	c12DCE, ug	NAPH&2-MN, ug	NAPH, ug	2MeNAPH, ug	MTBE, ug	11DCA, ug	111TCA, ug	12DCA, ug	TCE, ug	OCT, ug	PCE, ug	14DCB, ug	Acenaphthene, ug	Acenaphthylene, ug	Fluorene, ug	Freon113
MDL=	0.02	0.02		0.05	0.05	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.05	0.05	0.05	0.05
696399	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696400	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696401	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl	nd
696402	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696440	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd	nd
696447	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696448	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl	nd	bdl	nd
696449	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696501	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696502	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696503	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696504	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696540	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl	nd
696550	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696551	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696552	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl	nd	bdl	nd
method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl	nd	bdl	nd
method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	bdl	nd	bdl	nd

No RL(Reporting Limit) is available for summed analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
NAVARRO RESEARCH AND ENGINEERING INC, OAK RIDGE, TN
GORE STANDARD TARGET VOCs/SVOCs AND FREON TICS (SCREENING + TICS)
WSTF-NASA, NM
PRODUCTION ORDER # 21815026

SAMPLE NAME	Freon123	Freon123A	VC, ug	11DCE, ug	CHCl3, ug	CCl4, ug	112TCA, ug	ClBENZ, ug	1112TetCA, ug	1122TetCA, ug	13DCB, ug	12DCB, ug
MDL=	0.05	0.05	0.20	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
696355	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696356	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696357	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696358	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696359	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696360	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696361	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696362	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696363	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696364	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696365	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696366	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696367	nd	0.06	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696368	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696369	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696370	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696371	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696372	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696373	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696374	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696375	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696376	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696377	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696378	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696379	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696380	nd	nd	nd	nd	bdl	bdl	nd	nd	nd	nd	nd	nd
696381	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696382	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696383	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd	nd	nd
696384	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696385	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696386	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696387	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696388	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696389	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696390	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696391	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696392	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696393	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696394	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd	nd
696395	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd	nd
696396	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696397	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696398	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696403	nd	nd	nd	0.05	nd	nd	nd	nd	nd	nd	nd	nd
696404	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696405	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696406	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696407	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696408	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696409	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696410	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696411	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd	nd

No RL(Reporting Limit) is available for summed analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
NAVARRO RESEARCH AND ENGINEERING INC, OAK RIDGE, TN
GORE STANDARD TARGET VOCs/SVOCs AND FREON TICS (SCREENING + TICS)
WSTF-NASA, NM
PRODUCTION ORDER # 21815026

SAMPLE NAME	Freon123	Freon123A	VC, ug	11DCE, ug	CHCl3, ug	CCl4, ug	112TCA, ug	ClBENZ, ug	1112TetCA, ug	1122TetCA, ug	13DCB, ug	12DCB, ug
MDL=	0.05	0.05	0.20	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
696412	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd	nd
696413	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696414	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696415	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696416	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696417	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696418	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696419	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd	nd
696420	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696421	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696422	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696423	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696424	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696425	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696426	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696427	nd	0.19	nd	0.07	bdl	nd	nd	nd	nd	nd	nd	nd
696428	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696429	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696430	bdl	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696431	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696432	nd	nd	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd
696433	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696434	nd	0.12	nd	nd	nd	bdl	nd	bdl	nd	nd	nd	nd
696435	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696436	0.06	0.68	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696437	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696438	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696439	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696441	bdl	nd	nd	bdl	0.02	nd	nd	nd	nd	nd	nd	nd
696442	nd	nd	nd	nd	bdl	bdl	nd	nd	nd	nd	nd	nd
696443	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696444	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696445	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696446	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696450	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696451	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696452	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696459	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696460	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696461	0.05	0.69	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696462	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696463	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696464	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696465	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696466	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696467	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696468	nd	0.11	nd	0.06	nd	nd	nd	nd	nd	nd	nd	nd
696469	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696470	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696471	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696472	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696473	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696474	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd

No RL(Reporting Limit) is available for summed analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
NAVARRO RESEARCH AND ENGINEERING INC, OAK RIDGE, TN
GORE STANDARD TARGET VOCs/SVOCs AND FREON TICS (SCREENING + TICS)
WSTF-NASA, NM
PRODUCTION ORDER # 21815026

SAMPLE NAME	Freon123	Freon123A	VC, ug	11DCE, ug	CHCl3, ug	CCl4, ug	112TCA, ug	ClBENZ, ug	1112TetCA, ug	1122TetCA, ug	13DCB, ug	12DCB, ug
MDL=	0.05	0.05	0.20	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
696475	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696476	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696477	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696478	nd	nd	nd	0.13	0.05	nd	nd	nd	nd	nd	nd	nd
696479	nd	nd	nd	0.05	bdl	nd	nd	nd	nd	nd	nd	nd
696480	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696481	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696482	nd	nd	nd	0.16	0.02	nd	nd	nd	nd	nd	nd	nd
696483	nd	nd	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd
696484	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696485	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696486	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696487	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696488	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696489	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696490	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696491	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696492	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696493	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696494	nd	bdl	nd	nd	bdl	bdl	nd	nd	nd	nd	nd	nd
696495	nd	bdl	nd	bdl	bdl	nd	nd	nd	nd	nd	nd	nd
696496	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696497	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd	nd
696498	nd	0.09	nd	nd	bdl	nd	nd	nd	nd	nd	nd	nd
696499	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696500	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696505	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696506	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696507	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696512	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696513	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696514	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd	nd
696515	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd	nd
696516	nd	nd	nd	nd	bdl	bdl	nd	nd	nd	nd	nd	nd
696517	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696518	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd	nd
696519	nd	bdl	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696520	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696525	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696526	nd	nd	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd
696527	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696528	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd	nd
696529	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696530	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696531	nd	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd
696532	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696533	nd	nd	nd	nd	bdl	bdl	nd	nd	nd	nd	nd	nd
696534	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696535	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696536	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696537	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696538	nd	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd	nd
696539	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd

No RL(Reporting Limit) is available for summed analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
NAVARRO RESEARCH AND ENGINEERING INC, OAK RIDGE, TN
GORE STANDARD TARGET VOCs/SVOCs AND FREON TICS (SCREENING + TICS)
WSTF-NASA, NM
PRODUCTION ORDER # 21815026

SAMPLE NAME	Freon123	Freon123A	VC, ug	11DCE, ug	CHCl3, ug	CCl4, ug	112TCA, ug	ClBENZ, ug	1112TetCA, ug	1122TetCA, ug	13DCB, ug	12DCB, ug
MDL=	0.05	0.05	0.20	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
696541	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696542	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696543	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696544	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696545	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696546	nd	nd	nd	0.02	nd	nd	nd	nd	nd	nd	nd	nd
696547	nd	nd	nd	bdl	nd	nd	nd	nd	nd	nd	nd	nd
696548	bdl	nd	nd	0.03	0.04	nd	nd	nd	nd	nd	nd	nd
696549	bdl	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696553	nd	nd	nd	nd	0.04	nd	nd	nd	nd	nd	nd	nd
696554	nd	nd	nd	nd	0.03	nd	nd	nd	nd	nd	nd	nd
696555	0.06	nd	nd	0.85	0.14	0.02	nd	nd	nd	nd	nd	nd
696556	nd	nd	nd	nd	nd	0.03	nd	nd	nd	nd	nd	nd
696557	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696558	nd	nd	nd	0.06	nd	nd	nd	nd	nd	nd	nd	bdl
696559	bdl	nd	nd	0.59	bdl	nd	bdl	nd	0.03	nd	nd	0.05
696560	nd	nd	nd	nd	bdl	0.07	nd	nd	nd	bdl	nd	nd
696561	nd	nd	nd	0.26	0.03	bdl	nd	nd	nd	nd	nd	nd
696562	nd	nd	nd	0.03	nd	0.05	nd	nd	nd	nd	nd	nd
696563	nd	nd	nd	nd	bdl	0.07	nd	nd	nd	nd	nd	nd
696564	nd	nd	nd	nd	bdl	0.07	nd	nd	nd	nd	nd	nd
696565	nd	nd	nd	nd	bdl	0.05	nd	nd	nd	nd	nd	nd
696566	0.05	0.38	nd	0.54	0.03	nd	nd	nd	nd	nd	nd	nd
696567	nd	nd	nd	nd	0.03	0.05	nd	nd	nd	nd	nd	nd
696568	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd

No RL(Reporting Limit) is available for summed analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
NAVARRO RESEARCH AND ENGINEERING INC, OAK RIDGE, TN
GORE STANDARD TARGET VOCs/SVOCs AND FREON TICS (SCREENING + TICS)
WSTF-NASA, NM
PRODUCTION ORDER # 21815026

SAMPLE NAME	Freon123	Freon123A	VC, ug	11DCE, ug	CHCl3, ug	CCl4, ug	112TCA, ug	ClBENZ, ug	1112TetCA, ug	1122TetCA, ug	13DCB, ug	12DCB, ug
MDL=	0.05	0.05	0.20	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
696399	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696400	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696401	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696402	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696440	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696447	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696448	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696449	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696501	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696502	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696503	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696504	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696540	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696550	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696551	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
696552	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
method blank	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd

No RL(Reporting Limit) is available for summed analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

Project Summary and Objective

W. L. Gore & Associates, Inc. (Gore) provided the GORE® Survey (Survey) used at:

WSTF-NASA

NM

The service provided by Gore included delivery of the required quantity of GORE® Modules, analysis by the method described below for the requested organic compounds, reporting of the data, and contour mapping (as needed).

This report includes results for only the samples noted under the Laboratory Sample Report section. If contour maps are part of the project deliverable, the maps will be prepared and issued under a separate report cover, upon receipt of a usable sitemap (electronic) and compound choices for contouring.

Written/submitted by:

Jim E Whetzel

CN = Jim E. Whetzel C = US O = W.L. Gore and Associates, Inc. OU = Survey Products Group 2013.01.15 07:58:50 - 04'00'

Project Manager

Reviewed/approved by:

Jay W Hodny

Project Manager

Analytical data approved by:

Ian McMullen

Chemist

© 2013 W. L. Gore & Associates, Inc.

Quality Assurance Statement

The Survey Products Group laboratory, at W. L. Gore & Associates' facility in Elkton, MD USA, operates under the guidelines of its ISO Standard 17025 DoD ELAP accreditation, and its Quality Assurance Manual, Operating Procedures, and Methods (SPG-SOP-0462).

For this project, the analytical method, results, and observations reported do [ ] do not [√] fall within the scope of W. L. Gore's ISO 17025 accreditation.

Screening/Concentration Method

The GORE® Modules are analyzed at Gore's fixed laboratory using thermal desorption-gas chromatography/mass spectrometry (TD-GC/MS) instrumentation following U.S. EPA Method 8260 (SPG-WI-0292) which includes the following:

- **BFB Tuning Frequency:** A BFB tune is analyzed at the start of each analytical run and after every 30 samples.
- **Initial Calibration:** A minimum of a five point calibration curve is analyzed prior to the analysis of samples.
- **Linearity of Target Compounds:** If the RSD of any target analyte is less than or equal to 25% then average response factor can be used for quantitation. If the RSD exceeds 25% for a target compound a regression equation can be used for quantitation.
- **Continuing Calibration Verification:** After every 10 samples, and at the end of each analytical batch, and a second-source Reference Standard is analyzed near the mid point of the calibration curve. The acceptance criteria for all target analytes in the reference standards are +/- 50% of the true value.
- **Method Blank:** Analyzed prior to the analysis of field samples and every 30 samples.

Note: Analyte levels reported for the field-deployed GORE® Modules that exceed trip and method blank levels, and/or method detection limit, are more likely to have originated from on-site sources.

Media Sampled:	SOIL GAS
Chemist - sample analysis:	Fatima Niazi
Chemist - data processor:	Fatima Niazi
Chemist - data review:	Ian McMullen

Method deviations: None.

Please note that data file names ending with R are rerun samples using the second pair of sorbers, in which the original results were not reported. Data file names ending in D are duplicate analysis results for the second set of sorbers from the same module, and are reported.

© 2013 W. L. Gore & Associates, Inc.

Additional Report Information

- Comments
- Laboratory Sample Report
- Installation and Retrieval Log
- Data Table(s)
- Concentration Calculation Method Summary (as applicable)
- Total Ion Chromatograms

Project Specific Comments

This report only includes results for samples received on December 28, 2012.

Survey period [1]	Modules were installed on December 14, 2012 and retrieved on December 27, 2012 for an exposure time of 13 days.
Tamper seal intact:	Yes
Date received:	12/28/2012 By: Clarence W Whigham
COC returned:	No

Comments:

No chain of custody was returned with the samples.

1 - Installation start to end of retrieval, as reported. See installation and retrieval log for individual deployment and retrieval dates and times (i.e., sampler exposure time).

© 2013 W. L. Gore & Associates, Inc.

General Comments

Analytical QA/QC

Laboratory instrumentation consists of gas chromatographs equipped with mass selective detectors, coupled with automated thermal desorption units. Sample preparation involves cutting the tip off the bottom of the GORE® Module, and transferring one or more "sorbers" to a thermal desorption tube for analysis. The insertion/retrieval cord prevents soil, water and other interferences from coming in contact with the adsorbent. No further sample preparation is required. Any replicate sorbers not consumed in the initial analysis will be discarded fifteen (15) days from the date of the laboratory report.

Data are archived and stored in a secure manner as per Gore's Quality Assurance program (SPG-SOP-0462).

Total petroleum hydrocarbons (TPH), gasoline-range petroleum hydrocarbons (GRPH), and/or diesel range petroleum hydrocarbons (DRPH), when reported, are calculated using the area under the peaks observed in m/z 55 and 57 selected ion chromatograms. Quantitation of the mass values was performed using the response factor for a specific alkane (present in the calibration standards). TPH values include the entire chromatogram and provide estimates for aliphatic hydrocarbon ranges of C4 to C20. GRPH and DRPH include only the relevant regions of the chromatograms and provide estimates for C4 to C10 and C10 to C20 aliphatic hydrocarbons, respectively.

Trip blanks were provided to document potential exposures that were not part of the signal of interest (e.g., impact during sampler shipment, installation and/or retrieval, and storage). The trip blanks are identically manufactured and packaged GORE® Modules to those modules deployed in the field. The trip blanks remain unopened during all phases of the project. Levels reported on the trip blanks may indicate potential impact to the modules other than the contaminant source of interest.

Unresolved peak envelopes (UPEs) are represented as a series of compound peaks clustered together around a central gas chromatograph elution time in the total ion chromatogram. UPEs may be indicative of complex fluid mixtures. UPEs observed early in the chromatograms are considered to indicate presence of more volatile fluids, while UPEs observed later in the chromatogram may indicate the presence of less volatile fluids. Multiple UPEs may indicate the presence of multiple complex fluids.

Total ion chromatograms (TICs) are included in the Attachments. The eight-digit serial number of each module is incorporated in the TIC identification (e.g., 12345678.D represents GORE® Module 12345678).

© 2013 W. L. Gore & Associates, Inc.

General Comments

Soil Gas Sampling

For soil gas sampling, the GORE® Survey reports mass levels migrating through the open pore spaces of the soil and diffusing through the sampler membrane for sorption by the engineered, hydrophobic adsorbents, housed within the membrane tube. During the migration of the soil gas away from the source to the GORE® Module, the vapors are subject to a variety of attenuation factors. The soil gas masses reported on the modules compare favorably with the concentrations reported in the soil or groundwater (e.g., where soil gas levels are reported at greater levels to other sampled locations on the site, the matrix data should reveal the same pattern, and vice versa). However, due to a variety of factors, a perfect comparison between matrix data and soil gas levels can rarely be achieved.

Soil gas concentrations (µg/m3) are calculated following the method described in the Additional Report Information section.

Soil gas signals reported by this method cannot be correlated specifically to soil adsorbed, groundwater, and/or free-phase contamination. The soil gas signal reported from each GORE® Module can evolve from all of these sources. Differentiation between soil and groundwater contamination can only be achieved with prior knowledge of the site history (i.e., the site is known to have groundwater contamination only).

Air Sampling

For indoor, outdoor, and crawlspace air sampling, the GORE® Survey reports mass levels present in the air and diffusing through the sampler membrane for sorption by the engineered adsorbents housed within the membrane tube.

Air concentrations (µg/m3) are calculated following the method described in the Additional Report Information section.

Groundwater and Sediment Porewater Sampling

For groundwater and sediment porewater sampling, the GORE® Survey reports the mass levels of compounds present in the water which, when coming in contact with the sampler membrane, partitions out of solution, and diffuses through the sampler membrane for sorption by the engineered adsorbents.

Water concentrations (µg/L) are calculated using the quantified mass, exposure period and the compound specific uptake rate. The rates were measured under controlled experimental conditions. The uptake rates are corrected for water pressure (depth of the GORE® Module below the water table), water temperature and the aquifer flow rate.

© 2013 W. L. Gore & Associates, Inc.

LABORATORY SAMPLE REPORT

Project: ENV 21815026 **Site Name: WSTF-NASA** **Module Type: SPG0001**

Module ID	Sample Type	Field ID
00696508	FIELD_SAMPLE	S1
00696509	FIELD_SAMPLE	S2
00696510	FIELD_SAMPLE	S3
00696511	FIELD_SAMPLE	S4
00696521	FIELD_SAMPLE	S5
00696522	FIELD_SAMPLE	S6
00696523	FIELD_SAMPLE	S7
00696524	FIELD_SAMPLE	S8
00696569	FIELD_SAMPLE	S9
00696570	FIELD_SAMPLE	S10
00696571	FIELD_SAMPLE	S11
00696572	FIELD_SAMPLE	S12
00696573	FIELD_SAMPLE	S13
00696574	FIELD_SAMPLE	S14
00696575	FIELD_SAMPLE	S15
00696576	FIELD_SAMPLE	S16
00696577	FIELD_SAMPLE	S17
00696578	FIELD_SAMPLE	S18
00696585	FIELD_SAMPLE	S19
00696586	FIELD_SAMPLE	S20
00696587	FIELD_SAMPLE	S21
00696588	FIELD_SAMPLE	S22
00696589	FIELD_SAMPLE	S23
00696590	FIELD_SAMPLE	S24
00696591	FIELD_SAMPLE	S25
00696592	FIELD_SAMPLE	S26
00696593	FIELD_SAMPLE	S27
00696594	FIELD_SAMPLE	S28
00696595	FIELD_SAMPLE	S29
00696596	FIELD_SAMPLE	S30
00696597	FIELD_SAMPLE	S31
00696598	FIELD_SAMPLE	S32
00696599	FIELD_SAMPLE	S33
00696600	FIELD_SAMPLE	S34
00696601	FIELD_SAMPLE	S35
00696602	FIELD_SAMPLE	S36
00696603	FIELD_SAMPLE	S37
00696604	FIELD_SAMPLE	S38
00696605	TRIP_BLANK	TB17
00696606	TRIP_BLANK	TB18

Total # "FIELD SAMPLES"	Total # "TRIP BLANKS"	Total # "UNUSED"	Total # "LOST"
38	2	0	0

© 2013 W. L. Gore & Associates, Inc.

Duplicate samples: **0**

© 2013 W. L. Gore & Associates, Inc.

W. L. Gore & Associates, Inc.
100 Chesapeake Boulevard
Elkton, MD USA 21921
ph: 410-392-7600

GORE Project No: ENV 21815026
Site Name: WSTF-NASA
Site Location: NM

GORE(R) Surveys
Installation & Retrieval Log

Company Name: NAVARRO RESEARCH AND ENGINEERING INC
Location:
Samples collected by:

*** Optional or as needed**

MODULE SERIAL NO.	FIELD ID* (e.g., arbitrary, US EPA)	SAMPLE TYPE (Field Sample, Trip Blank, Field Blank, etc.)	INSTALLATION DATE & TIME MM/DD/YYYY HH:MM (24 Hour) ex. 12/27/2000 13:00	RETRIEVAL DATE & TIME MM/DD/YYYY HH:MM (24 Hour) ex. 12/30/2000 13:00	OBSERVATIONS/COMMENTS* (e.g., sample depth, location description, missing, pulled from hole, etc. - as needed)	SAMPLE ENVIRONMENT* (e.g., grass, bare soil, through slab)	YES / NO		
							EVIDENCE OF LIQUID PETROLEUM HYDROCARBONS?	ODOR ?	WATER IN INSTALLATION HOLE?
00696508	S1	FIELD_SAMPLE	12/14/2012 7:45	12/27/2012 8:49	27.0 in. Raining	Sparse desert brush	No	No	No
00696509	S2	FIELD_SAMPLE	12/14/2012 7:50	12/27/2012 8:53	30.0 in. Raining	Sparse desert brush	No	No	No
00696510	S3	FIELD_SAMPLE	12/14/2012 7:55	12/27/2012 8:57	20.0 in. Raining	Sparse desert brush	No	No	No
00696511	S4	FIELD_SAMPLE	12/14/2012 8:00	12/27/2012 9:00	25.0 in. Raining	Sparse desert brush	No	No	No
00696521	S5	FIELD_SAMPLE	12/14/2012 8:04	12/27/2012 9:02	26.0 in. Raining	Sparse desert brush	No	No	No
00696522	S6	FIELD_SAMPLE	12/14/2012 8:07	12/27/2012 9:04	26.0 in. Raining	Sparse desert brush	No	No	No
00696523	S7	FIELD_SAMPLE	12/14/2012 8:11	12/27/2012 9:07	27.0 in. Raining	Sparse desert brush	No	No	No
00696524	S8	FIELD_SAMPLE	12/14/2012 8:15	12/27/2012 9:09	28.0 in. Raining	Sparse desert brush	No	No	No
00696569	S9	FIELD_SAMPLE	12/14/2012 8:19	12/27/2012 9:11	28.0 in. Raining	Sparse desert brush	No	No	No
00696570	S10	FIELD_SAMPLE	12/14/2012 8:22	12/27/2012 9:16	27.0 in. Raining	Sparse desert brush	No	No	No
00696571	S11	FIELD_SAMPLE	12/14/2012 8:37	12/27/2012 9:36	25.0 in. Raining	Sparse desert brush	No	No	No
00696572	S12	FIELD_SAMPLE	12/14/2012 8:42	12/27/2012 9:38	26.0 in. Raining	Sparse desert brush	No	No	No
00696573	S13	FIELD_SAMPLE	12/14/2012 9:38	12/27/2012 9:41	26.0 in. Raining	Sparse desert brush	No	No	No
00696574	S14	FIELD_SAMPLE	12/14/2012 9:43	12/27/2012 9:42	25.0 in. Raining	Sparse desert brush	No	No	No
00696575	S15	FIELD_SAMPLE	12/14/2012 9:46	12/27/2012 9:44	25.0 in. Raining	Sparse desert brush	No	No	No
00696576	S16	FIELD_SAMPLE	12/14/2012 9:48	12/27/2012 9:53	26.0 in. Raining	Sparse desert brush	No	No	No
00696577	S17	FIELD_SAMPLE	12/14/2012 9:55	12/27/2012 9:59	28.0 in. Raining	Sparse desert brush	No	No	No
00696578	S18	FIELD_SAMPLE	12/14/2012 9:59	12/27/2012 9:46	25.0 in. Raining	Sparse desert brush	No	No	No
00696585	S19	FIELD_SAMPLE	12/14/2012 10:02	12/27/2012 9:49	26.0 in. Raining	Sparse desert brush	No	No	No
00696586	S20	FIELD_SAMPLE	12/14/2012 10:05	12/27/2012 10:04	25.0 in. Raining	Sparse desert brush	No	No	No
00696587	S21	FIELD_SAMPLE	12/14/2012 10:08	12/27/2012 10:08	27.0 in. Raining	Sparse desert brush	No	No	No
00696588	S22	FIELD_SAMPLE	12/14/2012 10:12	12/27/2012 10:08	27.0 in. Raining	Sparse desert brush	No	No	No
00696589	S23	FIELD_SAMPLE	12/14/2012 12:55	12/27/2012 10:10	23.0 in. Windy	Sparse desert brush	No	No	No
00696590	S24	FIELD_SAMPLE	12/14/2012 13:00	12/27/2012 10:13	27.0 in. Windy	Sparse desert brush	No	No	No
00696591	S25	FIELD_SAMPLE	12/14/2012 13:03	12/27/2012 10:15	30.0 in. Windy	Sparse desert brush	No	No	No
00696592	S26	FIELD_SAMPLE	12/14/2012 13:04	12/27/2012 10:17	29.0 in. Windy	Sparse desert brush	No	No	No
00696593	S27	FIELD_SAMPLE	12/14/2012 13:11	12/27/2012 10:19	26.0 in. Windy	Sparse desert brush	No	No	No
00696594	S28	FIELD_SAMPLE	12/14/2012 13:14	12/27/2012 10:21	25.0 in. Windy	Sparse desert brush	No	No	No
00696595	S29	FIELD_SAMPLE	12/14/2012 13:24	12/27/2012 10:27	25.0 in. Windy	Sparse desert brush	No	No	No
00696596	S30	FIELD_SAMPLE	12/14/2012 13:26	12/27/2012 10:29	30.0 in. Windy	Sparse desert brush	No	No	No
00696597	S31	FIELD_SAMPLE	12/14/2012 13:28	12/27/2012 10:31	24.0 in. Windy	Sparse desert brush	No	No	No
00696598	S32	FIELD_SAMPLE	12/14/2012 13:32	12/27/2012 10:33	26.0 in. Windy	Sparse desert brush	No	No	No
00696599	S33	FIELD_SAMPLE	12/14/2012 13:34	12/27/2012 10:38	25.0 in. Windy	Sparse desert brush	No	No	No
00696600	S34	FIELD_SAMPLE	12/14/2012 13:08	12/27/2012 10:40	24.0 in. Windy	Sparse desert brush	No	No	No
00696601	S35	FIELD_SAMPLE	12/14/2012 13:52	12/27/2012 10:51	26.0 in. Windy	Sparse desert brush	No	No	No
00696602	S36	FIELD_SAMPLE	12/14/2012 13:41	12/27/2012 10:43	24.0 in. Windy	Sparse desert brush	No	No	No
00696603	S37	FIELD_SAMPLE	12/14/2012 13:43	12/27/2012 10:45	24.0 in. Windy	Sparse desert brush	No	No	No
00696604	S38	FIELD_SAMPLE	12/14/2012 13:50	12/27/2012 10:47	26.0 in. Windy	Sparse desert brush	No	No	No
00696605	TB17	TRIP_BLANK	N/A	N/A	Trip Blank				
00696606	TB18	TRIP_BLANK	N/A	N/A	Trip Blank				

GORE and designs are trademarks of W. L. Gore Associates, Inc.

GORE(R) Surveys
Installation & Retrieval Log

* Optional or as needed

	AT MINIMUM PROVIDE SOIL TYPE						
MODULE SERIAL NO.	SOIL TYPE AT MODULE DEPTH (clay, loamy sand etc.)	TOTAL SOIL POROSITY AT MODULE DEPTH* (total volume of pores/total volume)	WATER FILLED SOIL POROSITY AT MODULE DEPTH* (volume of water/volume of pores)	LONGITUDE (easting) or X	LATITUDE (northing) or Y	COORDINATE SYSTEM* (e.g., UTM Zone, Stateplane, etc.)	COORDINATE DATUM* (e.g., WGS 84)
00696508	SAND						
00696509	SAND						
00696510	SAND						
00696511	SAND						
00696521	SAND						
00696522	SAND						
00696523	SAND						
00696524	SAND						
00696569	SAND						
00696570	SAND						
00696571	SAND						
00696572	SAND						
00696573	SAND						
00696574	SAND						
00696575	SAND						
00696576	SAND						
00696577	SAND						
00696578	SAND						
00696585	SAND						
00696586	SAND						
00696587	SAND						
00696588	SAND						
00696589	SAND						
00696590	SAND						
00696591	SAND						
00696592	SAND						
00696593	SAND						
00696594	SAND						
00696595	SAND						
00696596	SAND						
00696597	SAND						
00696598	SAND						
00696599	SAND						
00696600	SAND						
00696601	SAND						
00696602	SAND						
00696603	SAND						
00696604	SAND						
00696605							
00696606							

GORE and designs are trademarks of W. L. Gore Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696508 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S1
Installation Date: 12/14/2012 7:45:00AM
Retrieval Date: 12/27/2012 8:49:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 7:18:00AM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Trichlorofluoromethane (TIC)	75-69-4	<0.05	0.05
Trichlorotrifluoroethane (TIC)	**76-13-1**	**8.35**	**0.05**
F-123 (TIC)	306-83-2	<0.05	0.05
F-123A (TIC)	306-83-2	<0.05	0.05
Vinyl Chloride	75-01-4	<0.20	0.2
Methyl tert-butyl ether	1634-04-4	<0.02	0
1,1-Dichloroethene	75-35-4	<0.02	0.02
trans-1,2-Dichloroethene	156-60-5	<0.02	0.02
1,1-Dichloroethane	75-34-3	<0.02	0.02
cis-1,2-Dichloroethene	156-59-2	<0.02	0.02
Chloroform	67-66-3	<0.02	0.02
1,1,1-Trichloroethane	71-55-6	<0.02	0.02
1,2-Dichloroethane	107-06-2	<0.02	0.02
Benzene	71-43-2	<0.02	0.02
Carbon Tetrachloride	**56-23-5**	**0.03**	0.02
Trichloroethene	79-01-6	<0.02	**0.02**
1,1,2-Trichloroethane	79-00-5	<0.02	0.02
Toluene	108-88-3	<0.02	0.02
Octane	111-65-9	<0.02	0.02
Tetrachloroethene	127-18-4	<0.02	0.02
Chlorobenzene	108-90-7	<0.02	0.02
1,1,1,2-Tetrachloroethane	630-20-6	<0.02	0.02
Ethylbenzene	100-41-4	<0.02	0.02
m,p-Xylene	108-38-3/106-42-3	<0.02	0.02
o-Xylene	95-47-6	<0.02	0.02
1,1,2,2-Tetrachloroethane	79-34-5	<0.02	0.02
1,3,5-Trimethylbenzene	108-67-8	<0.02	0.02
1,2,4-Trimethylbenzene	95-63-6	<0.02	0.02
1,3-Dichlorobenzene	541-73-1	<0.02	0.02
1,4-Dichlorobenzene	106-46-7	<0.02	0.02
1,2-Dichlorobenzene	95-50-1	<0.02	0.02
Undecane	1120-21-4	<0.05	0.05
Naphthalene	91-20-3	<0.05	0.05
Tridecane	629-50-5	<0.05	0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696508 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S1
Installation Date: 12/14/2012 7:45:00AM
Retrieval Date: 12/27/2012 8:49:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 7:18:00AM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
2-Methylnaphthalene	91-57-6	<0.05	0.05
Acenaphthylene	208-96-8	<0.05	0.05
Pentadecane	629-62-9	<0.05	0.05
Acenaphthene	83-32-9	<0.05	0.05
Fluorene	86-73-7	<0.05	0.05
TPH		<0.50	0.50
BTEX		<0.02	0.02

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696509 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S2
Installation Date: 12/14/2012 7:50:00AM
Retrieval Date: 12/27/2012 8:53:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 5:25:00AM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Trichlorofluoromethane (TIC)	75-69-4	<0.05	0.05
Trichlorotrifluoroethane (TIC)	**76-13-1**	**4.65**	**0.05**
F-123 (TIC)	306-83-2	<0.05	0.05
F-123A (TIC)	306-83-2	<0.05	0.05
Vinyl Chloride	75-01-4	<0.20	0.2
Methyl tert-butyl ether	1634-04-4	<0.02	0
1,1-Dichloroethene	75-35-4	<0.02	0.02
trans-1,2-Dichloroethene	156-60-5	<0.02	0.02
1,1-Dichloroethane	75-34-3	<0.02	0.02
cis-1,2-Dichloroethene	156-59-2	<0.02	0.02
Chloroform	67-66-3	<0.02	0.02
1,1,1-Trichloroethane	71-55-6	<0.02	0.02
1,2-Dichloroethane	107-06-2	<0.02	0.02
Benzene	71-43-2	<0.02	0.02
Carbon Tetrachloride	**56-23-5**	**0.02**	0.02
Trichloroethene	**79-01-6**	**0.02**	**0.02**
1,1,2-Trichloroethane	79-00-5	<0.02	**0.02**
Toluene	108-88-3	<0.02	0.02
Octane	111-65-9	<0.02	0.02
Tetrachloroethene	**127-18-4**	**0.04**	0.02
Chlorobenzene	108-90-7	<0.02	**0.02**
1,1,1,2-Tetrachloroethane	630-20-6	<0.02	0.02
Ethylbenzene	100-41-4	<0.02	0.02
m,p-Xylene	108-38-3/106-42-3	<0.02	0.02
o-Xylene	95-47-6	<0.02	0.02
1,1,2,2-Tetrachloroethane	79-34-5	<0.02	0.02
1,3,5-Trimethylbenzene	108-67-8	<0.02	0.02
1,2,4-Trimethylbenzene	95-63-6	<0.02	0.02
1,3-Dichlorobenzene	541-73-1	<0.02	0.02
1,4-Dichlorobenzene	106-46-7	<0.02	0.02
1,2-Dichlorobenzene	95-50-1	<0.02	0.02
Undecane	1120-21-4	<0.05	0.02
Naphthalene	91-20-3	<0.05	0.05
Tridecane	629-50-5	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696509 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S2
Installation Date: 12/14/2012 7:50:00AM
Retrieval Date: 12/27/2012 8:53:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 5:25:00AM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
2-Methylnaphthalene	91-57-6	<0.05	0.05
Acenaphthylene	208-96-8	<0.05	0.05
Pentadecane	629-62-9	<0.05	0.05
Acenaphthene	83-32-9	<0.05	0.05
Fluorene	86-73-7	<0.05	0.05
TPH		<0.50	0.50
BTEX		<0.02	0.02

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696510 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S3
Installation Date: 12/14/2012 7:55:00AM
Retrieval Date: 12/27/2012 8:57:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 1:57:00PM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Trichlorofluoromethane (TIC)	75-69-4	<0.05	0.05
Trichlorotrifluoroethane (TIC)	**76-13-1**	**0.12**	**0.05**
F-123 (TIC)	306-83-2	<0.05	0.05
F-123A (TIC)	306-83-2	<0.05	0.05
Vinyl Chloride	75-01-4	<0.20	0.2
Methyl tert-butyl ether	1634-04-4	<0.02	0
1,1-Dichloroethene	75-35-4	<0.02	0.02
trans-1,2-Dichloroethene	156-60-5	<0.02	0.02
1,1-Dichloroethane	75-34-3	<0.02	0.02
cis-1,2-Dichloroethene	156-59-2	<0.02	0.02
Chloroform	67-66-3	<0.02	0.02
1,1,1-Trichloroethane	71-55-6	<0.02	0.02
1,2-Dichloroethane	107-06-2	<0.02	0.02
Benzene	71-43-2	<0.02	0.02
Carbon Tetrachloride	56-23-5	<0.02	0.02
Trichloroethene	79-01-6	<0.02	0.02
1,1,2-Trichloroethane	79-00-5	<0.02	0.02
Toluene	108-88-3	<0.02	0.02
Octane	111-65-9	<0.02	0.02
Tetrachloroethene	127-18-4	<0.02	0.02
Chlorobenzene	108-90-7	<0.02	0.02
1,1,1,2-Tetrachloroethane	630-20-6	<0.02	0.02
Ethylbenzene	100-41-4	<0.02	0.02
m,p-Xylene	108-38-3/106-42-3	<0.02	0.02
o-Xylene	95-47-6	<0.02	0.02
1,1,2,2-Tetrachloroethane	79-34-5	<0.02	0.02
1,3,5-Trimethylbenzene	108-67-8	<0.02	0.02
1,2,4-Trimethylbenzene	95-63-6	<0.02	0.02
1,3-Dichlorobenzene	541-73-1	<0.02	0.02
1,4-Dichlorobenzene	106-46-7	<0.02	0.02
1,2-Dichlorobenzene	95-50-1	<0.02	0.02
Undecane	1120-21-4	<0.05	0.05
Naphthalene	91-20-3	<0.05	0.05
Tridecane	629-50-5	<0.05	0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696510 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S3
Installation Date: 12/14/2012 7:55:00AM
Retrieval Date: 12/27/2012 8:57:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 1:57:00PM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
2-Methylnaphthalene	91-57-6	<0.05	0.05
Acenaphthylene	208-96-8	<0.05	0.05
Pentadecane	629-62-9	<0.05	0.05
Acenaphthene	83-32-9	<0.05	0.05
Fluorene	86-73-7	<0.05	0.05
TPH		**2.71**	**0.50**
BTEX		<0.02	0.02

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696511 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S4
Installation Date: 12/14/2012 8:00:00AM
Retrieval Date: 12/27/2012 9:00:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 12:40:00AM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Trichlorofluoromethane (TIC)	75-69-4	<0.05	0.05
Trichlorotrifluoroethane (TIC)	**76-13-1**	**8.46**	**0.05**
F-123 (TIC)	306-83-2	<0.05	0.05
F-123A (TIC)	306-83-2	<0.05	0.05
Vinyl Chloride	75-01-4	<0.20	0.2
Methyl tert-butyl ether	1634-04-4	<0.02	0
1,1-Dichloroethene	75-35-4	<0.02	0.02
trans-1,2-Dichloroethene	156-60-5	<0.02	0.02
1,1-Dichloroethane	75-34-3	<0.02	0.02
cis-1,2-Dichloroethene	156-59-2	<0.02	0.02
Chloroform	67-66-3	<0.02	0.02
1,1,1-Trichloroethane	71-55-6	<0.02	0.02
1,2-Dichloroethane	107-06-2	<0.02	0.02
Benzene	71-43-2	<0.02	0.02
Carbon Tetrachloride	**56-23-5**	**0.03**	0.02
Trichloroethene	**79-01-6**	**2.06**	**0.02**
1,1,2-Trichloroethane	79-00-5	<0.02	**0.02**
Toluene	108-88-3	<0.02	0.02
Octane	111-65-9	<0.02	0.02
Tetrachloroethene	**127-18-4**	**0.24**	0.02
Chlorobenzene	108-90-7	<0.02	**0.02**
1,1,1,2-Tetrachloroethane	630-20-6	<0.02	0.02
Ethylbenzene	100-41-4	<0.02	0.02
m,p-Xylene	108-38-3/106-42-3	<0.02	0.02
o-Xylene	95-47-6	<0.02	0.02
1,1,2,2-Tetrachloroethane	79-34-5	<0.02	0.02
1,3,5-Trimethylbenzene	108-67-8	<0.02	0.02
1,2,4-Trimethylbenzene	95-63-6	<0.02	0.02
1,3-Dichlorobenzene	541-73-1	<0.02	0.02
1,4-Dichlorobenzene	106-46-7	<0.02	0.02
1,2-Dichlorobenzene	95-50-1	<0.02	0.02
Undecane	1120-21-4	<0.05	0.02
Naphthalene	91-20-3	<0.05	0.05
Tridecane	629-50-5	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696511 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S4
Installation Date: 12/14/2012 8:00:00AM
Retrieval Date: 12/27/2012 9:00:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 12:40:00AM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
2-Methylnaphthalene	91-57-6	<0.05	0.05
Acenaphthylene	208-96-8	<0.05	0.05
Pentadecane	629-62-9	<0.05	0.05
Acenaphthene	83-32-9	<0.05	0.05
Fluorene	86-73-7	<0.05	0.05
TPH		<0.50	0.50
BTEX		<0.02	0.02

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696521 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S5
Installation Date: 12/14/2012 8:04:00AM
Retrieval Date: 12/27/2012 9:02:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/8/2013 10:18:00PM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Trichlorofluoromethane (TIC)	75-69-4	<0.05	0.05
Trichlorotrifluoroethane (TIC)	**76-13-1**	**21.68**	**0.05**
F-123 (TIC)	306-83-2	<0.05	0.05
F-123A (TIC)	306-83-2	<0.05	0.05
Vinyl Chloride	75-01-4	<0.20	0.2
Methyl tert-butyl ether	1634-04-4	<0.02	0
1,1-Dichloroethene	**75-35-4**	**0.04**	0.02
trans-1,2-Dichloroethene	156-60-5	<0.02	**0.02**
1,1-Dichloroethane	75-34-3	<0.02	0.02
cis-1,2-Dichloroethene	156-59-2	<0.02	0.02
Chloroform	67-66-3	<0.02	0.02
1,1,1-Trichloroethane	71-55-6	<0.02	0.02
1,2-Dichloroethane	107-06-2	<0.02	0.02
Benzene	71-43-2	<0.02	0.02
Carbon Tetrachloride	56-23-5	<0.02	0.02
Trichloroethene	**79-01-6**	**2.23**	0.02
1,1,2-Trichloroethane	79-00-5	<0.02	**0.02**
Toluene	108-88-3	<0.02	0.02
Octane	111-65-9	<0.02	0.02
Tetrachloroethene	**127-18-4**	**0.21**	0.02
Chlorobenzene	108-90-7	<0.02	**0.02**
1,1,1,2-Tetrachloroethane	630-20-6	<0.02	0.02
Ethylbenzene	100-41-4	<0.02	0.02
m,p-Xylene	108-38-3/106-42-3	<0.02	0.02
o-Xylene	95-47-6	<0.02	0.02
1,1,2,2-Tetrachloroethane	79-34-5	<0.02	0.02
1,3,5-Trimethylbenzene	108-67-8	<0.02	0.02
1,2,4-Trimethylbenzene	95-63-6	<0.02	0.02
1,3-Dichlorobenzene	541-73-1	<0.02	0.02
1,4-Dichlorobenzene	106-46-7	<0.02	0.02
1,2-Dichlorobenzene	95-50-1	<0.02	0.02
Undecane	1120-21-4	<0.05	0.05
Naphthalene	91-20-3	<0.05	0.05
Tridecane	629-50-5	<0.05	0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696521 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S5
Installation Date: 12/14/2012 8:04:00AM
Retrieval Date: 12/27/2012 9:02:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/8/2013 10:18:00PM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
2-Methylnaphthalene	91-57-6	<0.05	0.05
Acenaphthylene	208-96-8	<0.05	0.05
Pentadecane	629-62-9	<0.05	0.05
Acenaphthene	83-32-9	<0.05	0.05
Fluorene	86-73-7	<0.05	0.05
TPH		<0.50	0.50
BTEX		<0.02	0.02

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696522 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S6
Installation Date: 12/14/2012 8:07:00AM
Retrieval Date: 12/27/2012 9:04:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 5:23:00PM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Trichlorofluoromethane (TIC)	75-69-4	<0.05	0.05
Trichlorotrifluoroethane (TIC)	**76-13-1**	**17.12**	**0.05**
F-123 (TIC)	306-83-2	<0.05	0.05
F-123A (TIC)	306-83-2	<0.05	0.05
Vinyl Chloride	75-01-4	<0.20	0.2
Methyl tert-butyl ether	1634-04-4	<0.02	0
1,1-Dichloroethene	75-35-4	<0.02	0.02
trans-1,2-Dichloroethene	156-60-5	<0.02	0.02
1,1-Dichloroethane	75-34-3	<0.02	0.02
cis-1,2-Dichloroethene	156-59-2	<0.02	0.02
Chloroform	67-66-3	<0.02	0.02
1,1,1-Trichloroethane	71-55-6	<0.02	0.02
1,2-Dichloroethane	107-06-2	<0.02	0.02
Benzene	71-43-2	<0.02	0.02
Carbon Tetrachloride	56-23-5	0.02	0.02
Trichloroethene	**79-01-6**	**2.36**	**0.02**
1,1,2-Trichloroethane	79-00-5	<0.02	0.02
Toluene	108-88-3	<0.02	0.02
Octane	111-65-9	<0.02	0.02
Tetrachloroethene	**127-18-4**	**0.21**	**0.02**
Chlorobenzene	108-90-7	<0.02	0.02
1,1,1,2-Tetrachloroethane	630-20-6	<0.02	0.02
Ethylbenzene	100-41-4	<0.02	0.02
m,p-Xylene	108-38-3/106-42-3	<0.02	0.02
o-Xylene	95-47-6	<0.02	0.02
1,1,2,2-Tetrachloroethane	79-34-5	<0.02	0.02
1,3,5-Trimethylbenzene	108-67-8	<0.02	0.02
1,2,4-Trimethylbenzene	95-63-6	<0.02	0.02
1,3-Dichlorobenzene	541-73-1	<0.02	0.02
1,4-Dichlorobenzene	106-46-7	<0.02	0.02
1,2-Dichlorobenzene	95-50-1	<0.02	0.02
Undecane	1120-21-4	<0.05	0.05
Naphthalene	91-20-3	<0.05	0.05
Tridecane	629-50-5	<0.05	0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696522 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S6
Installation Date: 12/14/2012 8:07:00AM
Retrieval Date: 12/27/2012 9:04:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 5:23:00PM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
2-Methylnaphthalene	91-57-6	<0.05	0.05
Acenaphthylene	208-96-8	<0.05	0.05
Pentadecane	629-62-9	<0.05	0.05
Acenaphthene	83-32-9	<0.05	0.05
Fluorene	86-73-7	<0.05	0.05
TPH		<0.50	0.50
BTEX		<0.02	0.02

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696523 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S7
Installation Date: 12/14/2012 8:11:00AM
Retrieval Date: 12/27/2012 9:07:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/8/2013 7:28:00PM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Trichlorofluoromethane (TIC)	75-69-4	<0.05	0.05
Trichlorotrifluoroethane (TIC)	**76-13-1**	**20.55**	**0.05**
F-123 (TIC)	306-83-2	<0.05	0.05
F-123A (TIC)	306-83-2	<0.05	0.05
Vinyl Chloride	75-01-4	<0.20	0.2
Methyl tert-butyl ether	1634-04-4	<0.02	0
1,1-Dichloroethene	75-35-4	<0.02	0.02
trans-1,2-Dichloroethene	156-60-5	<0.02	0.02
1,1-Dichloroethane	75-34-3	<0.02	0.02
cis-1,2-Dichloroethene	156-59-2	<0.02	0.02
Chloroform	67-66-3	<0.02	0.02
1,1,1-Trichloroethane	71-55-6	<0.02	0.02
1,2-Dichloroethane	107-06-2	<0.02	0.02
Benzene	71-43-2	<0.02	0.02
Carbon Tetrachloride	56-23-5	0.02	0.02
Trichloroethene	**79-01-6**	**11.25**	**0.02**
1,1,2-Trichloroethane	79-00-5	<0.02	0.02
Toluene	108-88-3	<0.02	0.02
Octane	111-65-9	<0.02	0.02
Tetrachloroethene	**127-18-4**	**0.90**	**0.02**
Chlorobenzene	108-90-7	<0.02	0.02
1,1,1,2-Tetrachloroethane	630-20-6	<0.02	0.02
Ethylbenzene	100-41-4	<0.02	0.02
m,p-Xylene	108-38-3/106-42-3	<0.02	0.02
o-Xylene	95-47-6	<0.02	0.02
1,1,2,2-Tetrachloroethane	79-34-5	<0.02	0.02
1,3,5-Trimethylbenzene	108-67-8	<0.02	0.02
1,2,4-Trimethylbenzene	95-63-6	<0.02	0.02
1,3-Dichlorobenzene	541-73-1	<0.02	0.02
1,4-Dichlorobenzene	106-46-7	<0.02	0.02
1,2-Dichlorobenzene	95-50-1	<0.02	0.02
Undecane	1120-21-4	<0.05	0.05
Naphthalene	91-20-3	<0.05	0.05
Tridecane	629-50-5	<0.05	0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696523 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S7
Installation Date: 12/14/2012 8:11:00AM
Retrieval Date: 12/27/2012 9:07:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/8/2013 7:28:00PM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
2-Methylnaphthalene	91-57-6	<0.05	0.05
Acenaphthylene	208-96-8	<0.05	0.05
Pentadecane	629-62-9	<0.05	0.05
Acenaphthene	83-32-9	<0.05	0.05
Fluorene	86-73-7	<0.05	0.05
TPH		<0.50	0.50
BTEX		<0.02	0.02

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696524 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S8
Installation Date: 12/14/2012 8:15:00AM
Retrieval Date: 12/27/2012 9:09:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 4:54:00PM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Trichlorofluoromethane (TIC)	75-69-4	<0.05	0.05
Trichlorotrifluoroethane (TIC)	**76-13-1**	**10.39**	**0.05**
F-123 (TIC)	306-83-2	<0.05	0.05
F-123A (TIC)	306-83-2	<0.05	0.05
Vinyl Chloride	75-01-4	<0.20	0.2
Methyl tert-butyl ether	1634-04-4	<0.02	0
1,1-Dichloroethene	75-35-4	<0.02	0.02
trans-1,2-Dichloroethene	156-60-5	<0.02	0.02
1,1-Dichloroethane	75-34-3	<0.02	0.02
cis-1,2-Dichloroethene	156-59-2	<0.02	0.02
Chloroform	67-66-3	<0.02	0.02
1,1,1-Trichloroethane	71-55-6	<0.02	0.02
1,2-Dichloroethane	107-06-2	<0.02	0.02
Benzene	71-43-2	<0.02	0.02
Carbon Tetrachloride	**56-23-5**	**0.02**	0.02
Trichloroethene	**79-01-6**	**0.04**	**0.02**
1,1,2-Trichloroethane	79-00-5	<0.02	**0.02**
Toluene	108-88-3	<0.02	0.02
Octane	111-65-9	<0.02	0.02
Tetrachloroethene	**127-18-4**	**0.05**	0.02
Chlorobenzene	108-90-7	<0.02	**0.02**
1,1,1,2-Tetrachloroethane	630-20-6	<0.02	0.02
Ethylbenzene	100-41-4	<0.02	0.02
m,p-Xylene	108-38-3/106-42-3	<0.02	0.02
o-Xylene	95-47-6	<0.02	0.02
1,1,2,2-Tetrachloroethane	79-34-5	<0.02	0.02
1,3,5-Trimethylbenzene	108-67-8	<0.02	0.02
1,2,4-Trimethylbenzene	95-63-6	<0.02	0.02
1,3-Dichlorobenzene	541-73-1	<0.02	0.02
1,4-Dichlorobenzene	106-46-7	<0.02	0.02
1,2-Dichlorobenzene	95-50-1	<0.02	0.02
Undecane	1120-21-4	<0.05	0.02
Naphthalene	91-20-3	<0.05	0.05
Tridecane	629-50-5	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696524 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S8
Installation Date: 12/14/2012 8:15:00AM
Retrieval Date: 12/27/2012 9:09:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 4:54:00PM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
2-Methylnaphthalene	91-57-6	<0.05	0.05
Acenaphthylene	208-96-8	<0.05	0.05
Pentadecane	629-62-9	<0.05	0.05
Acenaphthene	83-32-9	<0.05	0.05
Fluorene	86-73-7	<0.05	0.05
TPH		<0.50	0.50
BTEX		<0.02	0.02

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696569 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S9
Installation Date: 12/14/2012 8:19:00AM
Retrieval Date: 12/27/2012 9:11:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 12:03:00PM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Vinyl Chloride	75-01-4	<0.20	0.2
Methyl tert-butyl ether	1634-04-4	<0.02	0
1,1-Dichloroethene	75-35-4	<0.02	0.02
trans-1,2-Dichloroethene	156-60-5	<0.02	0.02
1,1-Dichloroethane	75-34-3	<0.02	0.02
cis-1,2-Dichloroethene	156-59-2	<0.02	0.02
Chloroform	67-66-3	<0.02	0.02
1,1,1-Trichloroethane	71-55-6	<0.02	0.02
1,2-Dichloroethane	107-06-2	<0.02	0.02
Benzene	71-43-2	<0.02	0.02
Carbon Tetrachloride	56-23-5	<0.02	0.02
Trichloroethene	**79-01-6**	**6.61**	0.02
1,1,2-Trichloroethane	79-00-5	<0.02	**0.02**
Toluene	108-88-3	<0.02	0.02
Octane	111-65-9	<0.02	0.02
Tetrachloroethene	**127-18-4**	**0.57**	0.02
Chlorobenzene	108-90-7	<0.02	**0.02**
1,1,1,2-Tetrachloroethane	630-20-6	<0.02	0.02
Ethylbenzene	100-41-4	<0.02	0.02
m,p-Xylene	108-38-3/106-42-3	<0.02	0.02
o-Xylene	95-47-6	<0.02	0.02
1,1,2,2-Tetrachloroethane	79-34-5	<0.02	0.02
1,3,5-Trimethylbenzene	108-67-8	<0.02	0.02
1,2,4-Trimethylbenzene	**95-63-6**	**0.03**	0.02
1,3-Dichlorobenzene	541-73-1	<0.02	**0.02**
1,4-Dichlorobenzene	106-46-7	<0.02	0.02
1,2-Dichlorobenzene	95-50-1	<0.02	0.02
Undecane	1120-21-4	<0.05	0.02
Naphthalene	91-20-3	<0.05	0.05
Tridecane	629-50-5	<0.05	0.05
2-Methylnaphthalene	**91-57-6**	**0.06**	0.05
Acenaphthylene	208-96-8	<0.05	**0.05**
Pentadecane	629-62-9	<0.05	0.05
Acenaphthene	83-32-9	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696569 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S9
Installation Date: 12/14/2012 8:19:00AM
Retrieval Date: 12/27/2012 9:11:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 12:03:00PM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Fluorene	86-73-7	<0.05	0.05
TPH		<0.50	0.5
BTEX		<0.02	0
Trichlorofluoromethane (TIC)	75-69-4	<0.05	0.02
Trichlorotrifluoroethane (TIC)	**76-13-1**	**16.16**	0.05
F-123 (TIC)	306-83-2	<0.05	**0.05**
F-123A (TIC)	306-83-2	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696570 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S10
Installation Date: 12/14/2012 8:22:00AM
Retrieval Date: 12/27/2012 9:16:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 6:50:00AM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Vinyl Chloride	75-01-4	<0.20	0.2
Methyl tert-butyl ether	1634-04-4	<0.02	0
1,1-Dichloroethene	75-35-4	<0.02	0.02
trans-1,2-Dichloroethene	156-60-5	<0.02	0.02
1,1-Dichloroethane	75-34-3	<0.02	0.02
cis-1,2-Dichloroethene	156-59-2	<0.02	0.02
Chloroform	67-66-3	<0.02	0.02
1,1,1-Trichloroethane	71-55-6	<0.02	0.02
1,2-Dichloroethane	107-06-2	<0.02	0.02
Benzene	71-43-2	<0.02	0.02
Carbon Tetrachloride	**56-23-5**	**0.04**	0.02
Trichloroethene	**79-01-6**	**0.23**	**0.02**
1,1,2-Trichloroethane	79-00-5	<0.02	**0.02**
Toluene	108-88-3	<0.02	0.02
Octane	111-65-9	<0.02	0.02
Tetrachloroethene	**127-18-4**	**0.18**	0.02
Chlorobenzene	108-90-7	<0.02	**0.02**
1,1,1,2-Tetrachloroethane	630-20-6	<0.02	0.02
Ethylbenzene	100-41-4	<0.02	0.02
m,p-Xylene	108-38-3/106-42-3	<0.02	0.02
o-Xylene	95-47-6	<0.02	0.02
1,1,2,2-Tetrachloroethane	79-34-5	<0.02	0.02
1,3,5-Trimethylbenzene	108-67-8	<0.02	0.02
1,2,4-Trimethylbenzene	95-63-6	<0.02	0.02
1,3-Dichlorobenzene	541-73-1	<0.02	0.02
1,4-Dichlorobenzene	106-46-7	<0.02	0.02
1,2-Dichlorobenzene	95-50-1	<0.02	0.02
Undecane	1120-21-4	<0.05	0.02
Naphthalene	91-20-3	<0.05	0.05
Tridecane	629-50-5	<0.05	0.05
2-Methylnaphthalene	91-57-6	<0.05	0.05
Acenaphthylene	208-96-8	<0.05	0.05
Pentadecane	629-62-9	<0.05	0.05
Acenaphthene	83-32-9	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696570 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S10
Installation Date: 12/14/2012 8:22:00AM
Retrieval Date: 12/27/2012 9:16:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 6:50:00AM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Fluorene	86-73-7	<0.05	0.05
TPH		<0.50	0.5
BTEX		<0.02	0
Trichlorofluoromethane (TIC)	75-69-4	<0.05	0.02
Trichlorotrifluoroethane (TIC)	**76-13-1**	**5.85**	0.05
F-123 (TIC)	306-83-2	<0.05	**0.05**
F-123A (TIC)	306-83-2	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696571 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S11
Installation Date: 12/14/2012 8:37:00AM
Retrieval Date: 12/27/2012 9:36:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/8/2013 5:34:00PM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Vinyl Chloride	75-01-4	<0.20	0.2
Methyl tert-butyl ether	1634-04-4	<0.02	0
1,1-Dichloroethene	75-35-4	<0.02	0.02
trans-1,2-Dichloroethene	156-60-5	<0.02	0.02
1,1-Dichloroethane	75-34-3	<0.02	0.02
cis-1,2-Dichloroethene	156-59-2	<0.02	0.02
Chloroform	67-66-3	<0.02	0.02
1,1,1-Trichloroethane	71-55-6	<0.02	0.02
1,2-Dichloroethane	107-06-2	<0.02	0.02
Benzene	71-43-2	<0.02	0.02
Carbon Tetrachloride	56-23-5	<0.02	0.02
Trichloroethene	**79-01-6**	**1.58**	0.02
1,1,2-Trichloroethane	79-00-5	<0.02	**0.02**
Toluene	108-88-3	<0.02	0.02
Octane	111-65-9	<0.02	0.02
Tetrachloroethene	**127-18-4**	**0.15**	0.02
Chlorobenzene	108-90-7	<0.02	**0.02**
1,1,1,2-Tetrachloroethane	630-20-6	<0.02	0.02
Ethylbenzene	100-41-4	<0.02	0.02
m,p-Xylene	**108-38-3/106-42-3**	**0.02**	0.02
o-Xylene	95-47-6	<0.02	**0.02**
1,1,2,2-Tetrachloroethane	79-34-5	<0.02	0.02
1,3,5-Trimethylbenzene	108-67-8	<0.02	0.02
1,2,4-Trimethylbenzene	95-63-6	<0.02	0.02
1,3-Dichlorobenzene	541-73-1	<0.02	0.02
1,4-Dichlorobenzene	106-46-7	<0.02	0.02
1,2-Dichlorobenzene	95-50-1	<0.02	0.02
Undecane	1120-21-4	<0.05	0.02
Naphthalene	91-20-3	<0.05	0.05
Tridecane	629-50-5	<0.05	0.05
2-Methylnaphthalene	91-57-6	<0.05	0.05
Acenaphthylene	208-96-8	<0.05	0.05
Pentadecane	629-62-9	<0.05	0.05
Acenaphthene	83-32-9	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696571 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S11
Installation Date: 12/14/2012 8:37:00AM
Retrieval Date: 12/27/2012 9:36:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/8/2013 5:34:00PM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Fluorene	86-73-7	<0.05	0.05
TPH		**1.30**	**0.50**
BTEX		0.02	0.02
Trichlorofluoromethane (TIC)	**75-69-4**	**0.80**	**0.05**
Trichlorotrifluoroethane (TIC)	**76-13-1**	**51.98**	**0.05**
F-123 (TIC)	306-83-2	<0.05	0.05
F-123A (TIC)	306-83-2	<0.05	0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696572 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S12
Installation Date: 12/14/2012 8:42:00AM
Retrieval Date: 12/27/2012 9:38:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/8/2013 9:50:00PM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Vinyl Chloride	75-01-4	<0.20	0.2
Methyl tert-butyl ether	1634-04-4	<0.02	0
1,1-Dichloroethene	75-35-4	<0.02	0.02
trans-1,2-Dichloroethene	156-60-5	<0.02	0.02
1,1-Dichloroethane	75-34-3	<0.02	0.02
cis-1,2-Dichloroethene	156-59-2	<0.02	0.02
Chloroform	67-66-3	<0.02	0.02
1,1,1-Trichloroethane	71-55-6	<0.02	0.02
1,2-Dichloroethane	107-06-2	<0.02	0.02
Benzene	71-43-2	<0.02	0.02
Carbon Tetrachloride	56-23-5	<0.02	0.02
Trichloroethene	79-01-6	<0.02	0.02
1,1,2-Trichloroethane	79-00-5	<0.02	0.02
Toluene	108-88-3	<0.02	0.02
Octane	111-65-9	<0.02	0.02
Tetrachloroethene	127-18-4	<0.02	0.02
Chlorobenzene	108-90-7	<0.02	0.02
1,1,1,2-Tetrachloroethane	630-20-6	<0.02	0.02
Ethylbenzene	100-41-4	<0.02	0.02
m,p-Xylene	108-38-3/106-42-3	<0.02	0.02
o-Xylene	95-47-6	<0.02	0.02
1,1,2,2-Tetrachloroethane	79-34-5	<0.02	0.02
1,3,5-Trimethylbenzene	108-67-8	<0.02	0.02
1,2,4-Trimethylbenzene	95-63-6	<0.02	0.02
1,3-Dichlorobenzene	541-73-1	<0.02	0.02
1,4-Dichlorobenzene	106-46-7	<0.02	0.02
1,2-Dichlorobenzene	95-50-1	<0.02	0.02
Undecane	1120-21-4	<0.05	0.02
Naphthalene	91-20-3	<0.05	0.05
Tridecane	629-50-5	<0.05	0.05
2-Methylnaphthalene	91-57-6	<0.05	0.05
Acenaphthylene	208-96-8	<0.05	0.05
Pentadecane	629-62-9	<0.05	0.05
Acenaphthene	83-32-9	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696572 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S12
Installation Date: 12/14/2012 8:42:00AM
Retrieval Date: 12/27/2012 9:38:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/8/2013 9:50:00PM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Fluorene	86-73-7	<0.05	0.05
TPH		<0.50	0.5
BTEX		<0.02	0
Trichlorofluoromethane (TIC)	**75-69-4**	**0.18**	0.02
Trichlorotrifluoroethane (TIC)	**76-13-1**	**24.32**	**0.05**
F-123 (TIC)	306-83-2	<0.05	**0.05**
F-123A (TIC)	306-83-2	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696573 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S13
Installation Date: 12/14/2012 9:38:00AM
Retrieval Date: 12/27/2012 9:41:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 12:31:00PM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Vinyl Chloride	75-01-4	<0.20	0.2
Methyl tert-butyl ether	1634-04-4	<0.02	0
1,1-Dichloroethene	75-35-4	<0.02	0.02
trans-1,2-Dichloroethene	156-60-5	<0.02	0.02
1,1-Dichloroethane	75-34-3	<0.02	0.02
cis-1,2-Dichloroethene	156-59-2	<0.02	0.02
Chloroform	67-66-3	<0.02	0.02
1,1,1-Trichloroethane	71-55-6	<0.02	0.02
1,2-Dichloroethane	107-06-2	<0.02	0.02
Benzene	71-43-2	<0.02	0.02
Carbon Tetrachloride	56-23-5	<0.02	0.02
Trichloroethene	**79-01-6**	**0.17**	**0.02**
1,1,2-Trichloroethane	79-00-5	<0.02	0.02
Toluene	108-88-3	<0.02	0.02
Octane	**111-65-9**	**0.10**	**0.02**
Tetrachloroethene	127-18-4	<0.02	0.02
Chlorobenzene	108-90-7	<0.02	0.02
1,1,1,2-Tetrachloroethane	630-20-6	<0.02	0.02
Ethylbenzene	100-41-4	<0.02	0.02
m,p-Xylene	**108-38-3/106-42-3**	**0.03**	**0.02**
o-Xylene	95-47-6	<0.02	0.02
1,1,2,2-Tetrachloroethane	79-34-5	<0.02	0.02
1,3,5-Trimethylbenzene	108-67-8	<0.02	0.02
1,2,4-Trimethylbenzene	95-63-6	<0.02	0.02
1,3-Dichlorobenzene	541-73-1	<0.02	0.02
1,4-Dichlorobenzene	106-46-7	<0.02	0.02
1,2-Dichlorobenzene	95-50-1	<0.02	0.02
Undecane	1120-21-4	<0.05	0.05
Naphthalene	91-20-3	<0.05	0.05
Tridecane	629-50-5	<0.05	0.05
2-Methylnaphthalene	91-57-6	<0.05	0.05
Acenaphthylene	208-96-8	<0.05	0.05
Pentadecane	629-62-9	<0.05	0.05
Acenaphthene	83-32-9	<0.05	0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696573 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S13
Installation Date: 12/14/2012 9:38:00AM
Retrieval Date: 12/27/2012 9:41:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 12:31:00PM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Fluorene	86-73-7	<0.05	0.05
TPH		<0.50	0.5
BTEX		**0.03**	0
Trichlorofluoromethane (TIC)	**75-69-4**	**0.73**	**0.02**
Trichlorotrifluoroethane (TIC)	**76-13-1**	**62.62**	**0.05**
F-123 (TIC)	306-83-2	<0.05	**0.05**
F-123A (TIC)	306-83-2	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696573D FIELD_SAMPLE
Dilution Factor: 1
Installation Date: 12/14/2012 9:38:00AM
Retrieval Date: 12/27/2012 9:41:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS
Porosity: 0.40
Product: SPG0001
Water Filled Voids: 0.37
Date Analyzed: 1/9/2013 1:00:00PM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Vinyl Chloride	75-01-4	<0.20	0.2
Methyl tert-butyl ether	1634-04-4	<0.02	0
1,1-Dichloroethene	75-35-4	<0.02	0.02
trans-1,2-Dichloroethene	156-60-5	<0.02	0.02
1,1-Dichloroethane	75-34-3	<0.02	0.02
cis-1,2-Dichloroethene	156-59-2	<0.02	0.02
Chloroform	67-66-3	<0.02	0.02
1,1,1-Trichloroethane	71-55-6	<0.02	0.02
1,2-Dichloroethane	107-06-2	<0.02	0.02
Benzene	71-43-2	<0.02	0.02
Carbon Tetrachloride	56-23-5	<0.02	0.02
Trichloroethene	**79-01-6**	**0.15**	0.02
1,1,2-Trichloroethane	79-00-5	<0.02	**0.02**
Toluene	108-88-3	<0.02	0.02
Octane	**111-65-9**	**0.13**	0.02
Tetrachloroethene	127-18-4	<0.02	**0.02**
Chlorobenzene	108-90-7	<0.02	0.02
1,1,1,2-Tetrachloroethane	630-20-6	<0.02	0.02
Ethylbenzene	100-41-4	<0.02	0.02
m,p-Xylene	**108-38-3/106-42-3**	**0.04**	0.02
o-Xylene	95-47-6	<0.02	**0.02**
1,1,2,2-Tetrachloroethane	79-34-5	<0.02	0.02
1,3,5-Trimethylbenzene	108-67-8	<0.02	0.02
1,2,4-Trimethylbenzene	95-63-6	<0.02	0.02
1,3-Dichlorobenzene	541-73-1	<0.02	0.02
1,4-Dichlorobenzene	106-46-7	<0.02	0.02
1,2-Dichlorobenzene	95-50-1	<0.02	0.02
Undecane	1120-21-4	<0.05	0.02
Naphthalene	**91-20-3**	**0.09**	0.05
Tridecane	629-50-5	<0.05	**0.05**
2-Methylnaphthalene	91-57-6	<0.05	0.05
Acenaphthylene	208-96-8	<0.05	0.05
Pentadecane	629-62-9	<0.05	0.05
Acenaphthene	83-32-9	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696573D FIELD_SAMPLE
Dilution Factor: 1
Installation Date: 12/14/2012 9:38:00AM
Retrieval Date: 12/27/2012 9:41:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS
Porosity: 0.40
Product: SPG0001
Water Filled Voids: 0.37
Date Analyzed: 1/9/2013 1:00:00PM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Fluorene	86-73-7	<0.05	0.05
TPH		<0.50	0.5
BTEX		**0.04**	0
Trichlorofluoromethane (TIC)	**75-69-4**	**0.75**	**0.02**
Trichlorotrifluoroethane (TIC)	**76-13-1**	**66.44**	**0.05**
F-123 (TIC)	306-83-2	<0.05	**0.05**
F-123A (TIC)	306-83-2	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696574 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S14
Installation Date: 12/14/2012 9:43:00AM
Retrieval Date: 12/27/2012 9:42:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 2:25:00PM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Vinyl Chloride	75-01-4	<0.20	0.2
Methyl tert-butyl ether	1634-04-4	<0.02	0
1,1-Dichloroethene	75-35-4	<0.02	0.02
trans-1,2-Dichloroethene	156-60-5	<0.02	0.02
1,1-Dichloroethane	75-34-3	<0.02	0.02
cis-1,2-Dichloroethene	156-59-2	<0.02	0.02
Chloroform	67-66-3	<0.02	0.02
1,1,1-Trichloroethane	71-55-6	<0.02	0.02
1,2-Dichloroethane	107-06-2	<0.02	0.02
Benzene	71-43-2	<0.02	0.02
Carbon Tetrachloride	**56-23-5**	**0.02**	0.02
Trichloroethene	**79-01-6**	**0.18**	**0.02**
1,1,2-Trichloroethane	79-00-5	<0.02	**0.02**
Toluene	108-88-3	<0.02	0.02
Octane	111-65-9	<0.02	0.02
Tetrachloroethene	**127-18-4**	**0.03**	0.02
Chlorobenzene	108-90-7	<0.02	**0.02**
1,1,1,2-Tetrachloroethane	630-20-6	<0.02	0.02
Ethylbenzene	100-41-4	<0.02	0.02
m,p-Xylene	108-38-3/106-42-3	<0.02	0.02
o-Xylene	95-47-6	<0.02	0.02
1,1,2,2-Tetrachloroethane	79-34-5	<0.02	0.02
1,3,5-Trimethylbenzene	108-67-8	<0.02	0.02
1,2,4-Trimethylbenzene	95-63-6	<0.02	0.02
1,3-Dichlorobenzene	541-73-1	<0.02	0.02
1,4-Dichlorobenzene	106-46-7	<0.02	0.02
1,2-Dichlorobenzene	95-50-1	<0.02	0.02
Undecane	1120-21-4	<0.05	0.02
Naphthalene	91-20-3	<0.05	0.05
Tridecane	629-50-5	<0.05	0.05
2-Methylnaphthalene	91-57-6	<0.05	0.05
Acenaphthylene	208-96-8	<0.05	0.05
Pentadecane	629-62-9	<0.05	0.05
Acenaphthene	83-32-9	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696574 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S14
Installation Date: 12/14/2012 9:43:00AM
Retrieval Date: 12/27/2012 9:42:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 2:25:00PM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Fluorene	86-73-7	<0.05	0.05
TPH		<0.50	0.5
BTEX		<0.02	0
Trichlorofluoromethane (TIC)	**75-69-4**	**0.66**	0.02
Trichlorotrifluoroethane (TIC)	**76-13-1**	**53.42**	**0.05**
F-123 (TIC)	306-83-2	<0.05	**0.05**
F-123A (TIC)	306-83-2	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696575 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S15
Installation Date: 12/14/2012 9:46:00AM
Retrieval Date: 12/27/2012 9:44:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 5:53:00AM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Vinyl Chloride	75-01-4	<0.20	0.2
Methyl tert-butyl ether	1634-04-4	<0.02	0
1,1-Dichloroethene	75-35-4	<0.02	0.02
trans-1,2-Dichloroethene	156-60-5	<0.02	0.02
1,1-Dichloroethane	75-34-3	<0.02	0.02
cis-1,2-Dichloroethene	156-59-2	<0.02	0.02
Chloroform	67-66-3	<0.02	0.02
1,1,1-Trichloroethane	71-55-6	<0.02	0.02
1,2-Dichloroethane	107-06-2	<0.02	0.02
Benzene	71-43-2	<0.02	0.02
Carbon Tetrachloride	56-23-5	<0.02	0.02
Trichloroethene	79-01-6	<0.02	0.02
1,1,2-Trichloroethane	79-00-5	<0.02	0.02
Toluene	108-88-3	<0.02	0.02
Octane	111-65-9	<0.02	0.02
Tetrachloroethene	127-18-4	<0.02	0.02
Chlorobenzene	108-90-7	<0.02	0.02
1,1,1,2-Tetrachloroethane	630-20-6	<0.02	0.02
Ethylbenzene	100-41-4	<0.02	0.02
m,p-Xylene	108-38-3/106-42-3	<0.02	0.02
o-Xylene	95-47-6	<0.02	0.02
1,1,2,2-Tetrachloroethane	79-34-5	<0.02	0.02
1,3,5-Trimethylbenzene	108-67-8	<0.02	0.02
1,2,4-Trimethylbenzene	95-63-6	<0.02	0.02
1,3-Dichlorobenzene	541-73-1	<0.02	0.02
1,4-Dichlorobenzene	106-46-7	<0.02	0.02
1,2-Dichlorobenzene	95-50-1	<0.02	0.02
Undecane	1120-21-4	<0.05	0.02
Naphthalene	91-20-3	<0.05	0.05
Tridecane	629-50-5	<0.05	0.05
2-Methylnaphthalene	91-57-6	<0.05	0.05
Acenaphthylene	208-96-8	<0.05	0.05
Pentadecane	629-62-9	<0.05	0.05
Acenaphthene	83-32-9	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696575 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S15
Installation Date: 12/14/2012 9:46:00AM
Retrieval Date: 12/27/2012 9:44:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 5:53:00AM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Fluorene	86-73-7	<0.05	0.05
TPH		**0.94**	**0.50**
BTEX		<0.02	0.02
Trichlorofluoromethane (TIC)	**75-69-4**	**0.24**	**0.05**
Trichlorotrifluoroethane (TIC)	**76-13-1**	**43.92**	**0.05**
F-123 (TIC)	306-83-2	<0.05	0.05
F-123A (TIC)	306-83-2	<0.05	0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696576 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S16
Installation Date: 12/14/2012 9:48:00AM
Retrieval Date: 12/27/2012 9:53:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 3:58:00PM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Vinyl Chloride	75-01-4	<0.20	0.2
Methyl tert-butyl ether	1634-04-4	<0.02	0
1,1-Dichloroethene	75-35-4	<0.02	0.02
trans-1,2-Dichloroethene	156-60-5	<0.02	0.02
1,1-Dichloroethane	75-34-3	<0.02	0.02
cis-1,2-Dichloroethene	156-59-2	<0.02	0.02
Chloroform	67-66-3	<0.02	0.02
1,1,1-Trichloroethane	71-55-6	<0.02	0.02
1,2-Dichloroethane	107-06-2	<0.02	0.02
Benzene	71-43-2	<0.02	0.02
Carbon Tetrachloride	56-23-5	<0.02	0.02
Trichloroethene	79-01-6	<0.02	0.02
1,1,2-Trichloroethane	79-00-5	<0.02	0.02
Toluene	108-88-3	<0.02	0.02
Octane	111-65-9	<0.02	0.02
Tetrachloroethene	127-18-4	<0.02	0.02
Chlorobenzene	108-90-7	<0.02	0.02
1,1,1,2-Tetrachloroethane	630-20-6	<0.02	0.02
Ethylbenzene	100-41-4	<0.02	0.02
m,p-Xylene	108-38-3/106-42-3	<0.02	0.02
o-Xylene	95-47-6	<0.02	0.02
1,1,2,2-Tetrachloroethane	79-34-5	<0.02	0.02
1,3,5-Trimethylbenzene	108-67-8	<0.02	0.02
1,2,4-Trimethylbenzene	95-63-6	<0.02	0.02
1,3-Dichlorobenzene	541-73-1	<0.02	0.02
1,4-Dichlorobenzene	106-46-7	<0.02	0.02
1,2-Dichlorobenzene	95-50-1	<0.02	0.02
Undecane	1120-21-4	<0.05	0.05
Naphthalene	91-20-3	<0.05	0.05
Tridecane	**629-50-5**	**0.06**	**0.05**
2-Methylnaphthalene	91-57-6	<0.05	0.05
Acenaphthylene	208-96-8	<0.05	0.05
Pentadecane	629-62-9	<0.05	0.05
Acenaphthene	83-32-9	<0.05	0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696576 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S16
Installation Date: 12/14/2012 9:48:00AM
Retrieval Date: 12/27/2012 9:53:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 3:58:00PM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Fluorene	86-73-7	<0.05	0.05
TPH		**1.17**	**0.50**
BTEX		<0.02	0.02
Trichlorofluoromethane (TIC)	75-69-4	<0.05	0.05
Trichlorotrifluoroethane (TIC)	**76-13-1**	**8.48**	**0.05**
F-123 (TIC)	306-83-2	<0.05	0.05
F-123A (TIC)	306-83-2	<0.05	0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696577 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S17
Installation Date: 12/14/2012 9:55:00AM
Retrieval Date: 12/27/2012 9:59:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 4:28:00AM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Vinyl Chloride	75-01-4	<0.20	0.2
Methyl tert-butyl ether	1634-04-4	<0.02	0
1,1-Dichloroethene	**75-35-4**	**0.09**	0.02
trans-1,2-Dichloroethene	156-60-5	<0.02	**0.02**
1,1-Dichloroethane	75-34-3	<0.02	0.02
cis-1,2-Dichloroethene	156-59-2	<0.02	0.02
Chloroform	67-66-3	<0.02	0.02
1,1,1-Trichloroethane	71-55-6	<0.02	0.02
1,2-Dichloroethane	107-06-2	<0.02	0.02
Benzene	71-43-2	<0.02	0.02
Carbon Tetrachloride	56-23-5	<0.02	0.02
Trichloroethene	79-01-6	<0.02	0.02
1,1,2-Trichloroethane	79-00-5	<0.02	0.02
Toluene	108-88-3	<0.02	0.02
Octane	111-65-9	<0.02	0.02
Tetrachloroethene	127-18-4	<0.02	0.02
Chlorobenzene	108-90-7	<0.02	0.02
1,1,1,2-Tetrachloroethane	630-20-6	<0.02	0.02
Ethylbenzene	100-41-4	<0.02	0.02
m,p-Xylene	108-38-3/106-42-3	<0.02	0.02
o-Xylene	95-47-6	<0.02	0.02
1,1,2,2-Tetrachloroethane	79-34-5	<0.02	0.02
1,3,5-Trimethylbenzene	108-67-8	<0.02	0.02
1,2,4-Trimethylbenzene	95-63-6	<0.02	0.02
1,3-Dichlorobenzene	541-73-1	<0.02	0.02
1,4-Dichlorobenzene	106-46-7	<0.02	0.02
1,2-Dichlorobenzene	95-50-1	<0.02	0.02
Undecane	1120-21-4	<0.05	0.02
Naphthalene	91-20-3	<0.05	0.05
Tridecane	629-50-5	<0.05	0.05
2-Methylnaphthalene	91-57-6	<0.05	0.05
Acenaphthylene	208-96-8	<0.05	0.05
Pentadecane	629-62-9	<0.05	0.05
Acenaphthene	83-32-9	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696577 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S17
Installation Date: 12/14/2012 9:55:00AM
Retrieval Date: 12/27/2012 9:59:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 4:28:00AM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Fluorene	86-73-7	<0.05	0.05
TPH		<0.50	0.5
BTEX		<0.02	0
Trichlorofluoromethane (TIC)	**75-69-4**	**0.06**	0.02
Trichlorotrifluoroethane (TIC)	**76-13-1**	**55.43**	**0.05**
F-123 (TIC)	306-83-2	<0.05	**0.05**
F-123A (TIC)	306-83-2	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696578 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S18
Installation Date: 12/14/2012 9:59:00AM
Retrieval Date: 12/27/2012 9:46:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 6:21:00AM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Vinyl Chloride	75-01-4	<0.20	0.2
Methyl tert-butyl ether	1634-04-4	<0.02	0
1,1-Dichloroethene	75-35-4	<0.02	0.02
trans-1,2-Dichloroethene	156-60-5	<0.02	0.02
1,1-Dichloroethane	75-34-3	<0.02	0.02
cis-1,2-Dichloroethene	156-59-2	<0.02	0.02
Chloroform	67-66-3	<0.02	0.02
1,1,1-Trichloroethane	71-55-6	<0.02	0.02
1,2-Dichloroethane	107-06-2	<0.02	0.02
Benzene	71-43-2	<0.02	0.02
Carbon Tetrachloride	56-23-5	<0.02	0.02
Trichloroethene	**79-01-6**	**0.05**	0.02
1,1,2-Trichloroethane	79-00-5	<0.02	**0.02**
Toluene	108-88-3	<0.02	0.02
Octane	111-65-9	<0.02	0.02
Tetrachloroethene	**127-18-4**	**0.02**	0.02
Chlorobenzene	108-90-7	<0.02	**0.02**
1,1,1,2-Tetrachloroethane	630-20-6	<0.02	0.02
Ethylbenzene	100-41-4	<0.02	0.02
m,p-Xylene	108-38-3/106-42-3	<0.02	0.02
o-Xylene	95-47-6	<0.02	0.02
1,1,2,2-Tetrachloroethane	79-34-5	<0.02	0.02
1,3,5-Trimethylbenzene	108-67-8	<0.02	0.02
1,2,4-Trimethylbenzene	95-63-6	<0.02	0.02
1,3-Dichlorobenzene	541-73-1	<0.02	0.02
1,4-Dichlorobenzene	106-46-7	<0.02	0.02
1,2-Dichlorobenzene	95-50-1	<0.02	0.02
Undecane	1120-21-4	<0.05	0.02
Naphthalene	91-20-3	<0.05	0.05
Tridecane	629-50-5	<0.05	0.05
2-Methylnaphthalene	91-57-6	<0.05	0.05
Acenaphthylene	208-96-8	<0.05	0.05
Pentadecane	629-62-9	<0.05	0.05
Acenaphthene	83-32-9	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696578 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S18
Installation Date: 12/14/2012 9:59:00AM
Retrieval Date: 12/27/2012 9:46:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 6:21:00AM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Fluorene	86-73-7	<0.05	0.05
TPH		<0.50	0.5
BTEX		<0.02	0
Trichlorofluoromethane (TIC)	**75-69-4**	**0.29**	0.02
Trichlorotrifluoroethane (TIC)	**76-13-1**	**59.53**	**0.05**
F-123 (TIC)	306-83-2	<0.05	**0.05**
F-123A (TIC)	306-83-2	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696585 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S19
Installation Date: 12/14/2012 10:02:00AM
Retrieval Date: 12/27/2012 9:49:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 12:12:00AM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Vinyl Chloride	75-01-4	<0.20	0.2
Methyl tert-butyl ether	1634-04-4	<0.02	0
1,1-Dichloroethene	75-35-4	<0.02	0.02
trans-1,2-Dichloroethene	156-60-5	<0.02	0.02
1,1-Dichloroethane	75-34-3	<0.02	0.02
cis-1,2-Dichloroethene	156-59-2	<0.02	0.02
Chloroform	67-66-3	<0.02	0.02
1,1,1-Trichloroethane	71-55-6	<0.02	0.02
1,2-Dichloroethane	107-06-2	<0.02	0.02
Benzene	71-43-2	<0.02	0.02
Carbon Tetrachloride	56-23-5	<0.02	0.02
Trichloroethene	**79-01-6**	**0.19**	0.02
1,1,2-Trichloroethane	79-00-5	<0.02	**0.02**
Toluene	108-88-3	<0.02	0.02
Octane	111-65-9	<0.02	0.02
Tetrachloroethene	**127-18-4**	**0.03**	0.02
Chlorobenzene	108-90-7	<0.02	**0.02**
1,1,1,2-Tetrachloroethane	630-20-6	<0.02	0.02
Ethylbenzene	100-41-4	<0.02	0.02
m,p-Xylene	108-38-3/106-42-3	<0.02	0.02
o-Xylene	95-47-6	<0.02	0.02
1,1,2,2-Tetrachloroethane	79-34-5	<0.02	0.02
1,3,5-Trimethylbenzene	108-67-8	<0.02	0.02
1,2,4-Trimethylbenzene	95-63-6	<0.02	0.02
1,3-Dichlorobenzene	541-73-1	<0.02	0.02
1,4-Dichlorobenzene	106-46-7	<0.02	0.02
1,2-Dichlorobenzene	95-50-1	<0.02	0.02
Undecane	1120-21-4	<0.05	0.02
Naphthalene	91-20-3	<0.05	0.05
Tridecane	629-50-5	<0.05	0.05
2-Methylnaphthalene	91-57-6	<0.05	0.05
Acenaphthylene	208-96-8	<0.05	0.05
Pentadecane	629-62-9	<0.05	0.05
Acenaphthene	83-32-9	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696585 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S19
Installation Date: 12/14/2012 10:02:00AM
Retrieval Date: 12/27/2012 9:49:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 12:12:00AM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Fluorene	86-73-7	<0.05	0.05
TPH		<0.50	0.5
BTEX		<0.02	0
Trichlorofluoromethane (TIC)	**75-69-4**	**0.21**	0.02
Trichlorotrifluoroethane (TIC)	**76-13-1**	**58.61**	**0.05**
F-123 (TIC)	306-83-2	<0.05	**0.05**
F-123A (TIC)	306-83-2	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696585D FIELD_SAMPLE
Dilution Factor: 1
Installation Date: 12/14/2012 10:02:00AM
Retrieval Date: 12/27/2012 9:49:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS
Porosity: 0.40
Product: SPG0001
Water Filled Voids: 0.37
Date Analyzed: 1/8/2013 11:44:00PM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Vinyl Chloride	75-01-4	<0.20	0.2
Methyl tert-butyl ether	1634-04-4	<0.02	0
1,1-Dichloroethene	**75-35-4**	**0.10**	0.02
trans-1,2-Dichloroethene	156-60-5	<0.02	**0.02**
1,1-Dichloroethane	75-34-3	<0.02	0.02
cis-1,2-Dichloroethene	156-59-2	<0.02	0.02
Chloroform	67-66-3	<0.02	0.02
1,1,1-Trichloroethane	71-55-6	<0.02	0.02
1,2-Dichloroethane	107-06-2	<0.02	0.02
Benzene	71-43-2	<0.02	0.02
Carbon Tetrachloride	56-23-5	<0.02	0.02
Trichloroethene	**79-01-6**	**0.13**	0.02
1,1,2-Trichloroethane	79-00-5	<0.02	**0.02**
Toluene	108-88-3	<0.02	0.02
Octane	111-65-9	<0.02	0.02
Tetrachloroethene	127-18-4	<0.02	0.02
Chlorobenzene	108-90-7	<0.02	0.02
1,1,1,2-Tetrachloroethane	630-20-6	<0.02	0.02
Ethylbenzene	100-41-4	<0.02	0.02
m,p-Xylene	108-38-3/106-42-3	<0.02	0.02
o-Xylene	95-47-6	<0.02	0.02
1,1,2,2-Tetrachloroethane	79-34-5	<0.02	0.02
1,3,5-Trimethylbenzene	108-67-8	<0.02	0.02
1,2,4-Trimethylbenzene	95-63-6	<0.02	0.02
1,3-Dichlorobenzene	541-73-1	<0.02	0.02
1,4-Dichlorobenzene	106-46-7	<0.02	0.02
1,2-Dichlorobenzene	95-50-1	<0.02	0.02
Undecane	1120-21-4	<0.05	0.02
Naphthalene	91-20-3	0.05	0.05
Tridecane	629-50-5	<0.05	0.05
2-Methylnaphthalene	91-57-6	<0.05	0.05
Acenaphthylene	208-96-8	<0.05	0.05
Pentadecane	629-62-9	<0.05	0.05
Acenaphthene	83-32-9	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696585D FIELD_SAMPLE
Dilution Factor: 1
Installation Date: 12/14/2012 10:02:00AM
Retrieval Date: 12/27/2012 9:49:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS
Porosity: 0.40
Product: SPG0001
Water Filled Voids: 0.37
Date Analyzed: 1/8/2013 11:44:00PM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Fluorene	86-73-7	<0.05	0.05
TPH		<0.50	0.5
BTEX		<0.02	0
Trichlorofluoromethane (TIC)	**75-69-4**	**0.20**	0.02
Trichlorotrifluoroethane (TIC)	**76-13-1**	**57.54**	**0.05**
F-123 (TIC)	306-83-2	<0.05	**0.05**
F-123A (TIC)	306-83-2	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696586 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S20
Installation Date: 12/14/2012 10:05:00AM
Retrieval Date: 12/27/2012 10:04:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 3:59:00AM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Vinyl Chloride	75-01-4	<0.20	0.2
Methyl tert-butyl ether	1634-04-4	<0.02	0
1,1-Dichloroethene	75-35-4	<0.02	0.02
trans-1,2-Dichloroethene	156-60-5	<0.02	0.02
1,1-Dichloroethane	75-34-3	<0.02	0.02
cis-1,2-Dichloroethene	156-59-2	<0.02	0.02
Chloroform	67-66-3	0.02	0.02
1,1,1-Trichloroethane	71-55-6	<0.02	0.02
1,2-Dichloroethane	107-06-2	<0.02	0.02
Benzene	71-43-2	<0.02	0.02
Carbon Tetrachloride	56-23-5	<0.02	0.02
Trichloroethene	**79-01-6**	**11.77**	0.02
1,1,2-Trichloroethane	79-00-5	<0.02	**0.02**
Toluene	108-88-3	<0.02	0.02
Octane	111-65-9	<0.02	0.02
Tetrachloroethene	**127-18-4**	**1.52**	0.02
Chlorobenzene	108-90-7	<0.02	**0.02**
1,1,1,2-Tetrachloroethane	630-20-6	<0.02	0.02
Ethylbenzene	100-41-4	<0.02	0.02
m,p-Xylene	108-38-3/106-42-3	<0.02	0.02
o-Xylene	95-47-6	<0.02	0.02
1,1,2,2-Tetrachloroethane	79-34-5	<0.02	0.02
1,3,5-Trimethylbenzene	108-67-8	<0.02	0.02
1,2,4-Trimethylbenzene	95-63-6	<0.02	0.02
1,3-Dichlorobenzene	541-73-1	<0.02	0.02
1,4-Dichlorobenzene	106-46-7	<0.02	0.02
1,2-Dichlorobenzene	95-50-1	<0.02	0.02
Undecane	1120-21-4	<0.05	0.02
Naphthalene	91-20-3	<0.05	0.05
Tridecane	629-50-5	<0.05	0.05
2-Methylnaphthalene	91-57-6	<0.05	0.05
Acenaphthylene	208-96-8	<0.05	0.05
Pentadecane	629-62-9	<0.05	0.05
Acenaphthene	83-32-9	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696586 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S20
Installation Date: 12/14/2012 10:05:00AM
Retrieval Date: 12/27/2012 10:04:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 3:59:00AM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Fluorene	86-73-7	<0.05	0.05
TPH		<0.50	0.5
BTEX		<0.02	0
Trichlorofluoromethane (TIC)	**75-69-4**	**0.09**	0.02
Trichlorotrifluoroethane (TIC)	**76-13-1**	**86.32**	**0.05**
F-123 (TIC)	306-83-2	<0.05	**0.05**
F-123A (TIC)	306-83-2	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696587 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S21
Installation Date: 12/14/2012 10:08:00AM
Retrieval Date: 12/27/2012 10:08:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 10:09:00AM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Vinyl Chloride	75-01-4	<0.20	0.2
Methyl tert-butyl ether	1634-04-4	<0.02	0
1,1-Dichloroethene	75-35-4	<0.02	0.02
trans-1,2-Dichloroethene	156-60-5	<0.02	0.02
1,1-Dichloroethane	75-34-3	<0.02	0.02
cis-1,2-Dichloroethene	156-59-2	<0.02	0.02
Chloroform	67-66-3	<0.02	0.02
1,1,1-Trichloroethane	71-55-6	<0.02	0.02
1,2-Dichloroethane	107-06-2	<0.02	0.02
Benzene	71-43-2	<0.02	0.02
Carbon Tetrachloride	56-23-5	<0.02	0.02
Trichloroethene	**79-01-6**	**1.37**	0.02
1,1,2-Trichloroethane	79-00-5	<0.02	**0.02**
Toluene	108-88-3	<0.02	0.02
Octane	111-65-9	<0.02	0.02
Tetrachloroethene	**127-18-4**	**0.15**	0.02
Chlorobenzene	108-90-7	<0.02	**0.02**
1,1,1,2-Tetrachloroethane	630-20-6	<0.02	0.02
Ethylbenzene	100-41-4	<0.02	0.02
m,p-Xylene	108-38-3/106-42-3	<0.02	0.02
o-Xylene	95-47-6	<0.02	0.02
1,1,2,2-Tetrachloroethane	79-34-5	<0.02	0.02
1,3,5-Trimethylbenzene	108-67-8	<0.02	0.02
1,2,4-Trimethylbenzene	95-63-6	<0.02	0.02
1,3-Dichlorobenzene	541-73-1	<0.02	0.02
1,4-Dichlorobenzene	106-46-7	<0.02	0.02
1,2-Dichlorobenzene	95-50-1	<0.02	0.02
Undecane	1120-21-4	<0.05	0.02
Naphthalene	91-20-3	<0.05	0.05
Tridecane	629-50-5	<0.05	0.05
2-Methylnaphthalene	91-57-6	<0.05	0.05
Acenaphthylene	208-96-8	<0.05	0.05
Pentadecane	629-62-9	<0.05	0.05
Acenaphthene	83-32-9	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696587 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S21
Installation Date: 12/14/2012 10:08:00AM
Retrieval Date: 12/27/2012 10:08:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 10:09:00AM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Fluorene	86-73-7	<0.05	0.05
TPH		<0.50	0.5
BTEX		<0.02	0
Trichlorofluoromethane (TIC)	75-69-4	<0.05	0.02
Trichlorotrifluoroethane (TIC)	**76-13-1**	**50.91**	0.05
F-123 (TIC)	306-83-2	<0.05	**0.05**
F-123A (TIC)	306-83-2	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696588 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S22
Installation Date: 12/14/2012 10:12:00AM
Retrieval Date: 12/27/2012 10:08:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 1:09:00AM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Vinyl Chloride	75-01-4	<0.20	0.2
Methyl tert-butyl ether	1634-04-4	<0.02	0
1,1-Dichloroethene	75-35-4	<0.02	0.02
trans-1,2-Dichloroethene	156-60-5	<0.02	0.02
1,1-Dichloroethane	75-34-3	<0.02	0.02
cis-1,2-Dichloroethene	156-59-2	<0.02	0.02
Chloroform	67-66-3	<0.02	0.02
1,1,1-Trichloroethane	71-55-6	<0.02	0.02
1,2-Dichloroethane	107-06-2	<0.02	0.02
Benzene	71-43-2	<0.02	0.02
Carbon Tetrachloride	56-23-5	0.02	0.02
Trichloroethene	**79-01-6**	**2.20**	0.02
1,1,2-Trichloroethane	79-00-5	<0.02	**0.02**
Toluene	108-88-3	<0.02	0.02
Octane	111-65-9	<0.02	0.02
Tetrachloroethene	**127-18-4**	**0.23**	0.02
Chlorobenzene	108-90-7	<0.02	**0.02**
1,1,1,2-Tetrachloroethane	630-20-6	<0.02	0.02
Ethylbenzene	100-41-4	<0.02	0.02
m,p-Xylene	**108-38-3/106-42-3**	**0.09**	0.02
o-Xylene	95-47-6	<0.02	**0.02**
1,1,2,2-Tetrachloroethane	79-34-5	<0.02	0.02
1,3,5-Trimethylbenzene	108-67-8	<0.02	0.02
1,2,4-Trimethylbenzene	95-63-6	<0.02	0.02
1,3-Dichlorobenzene	541-73-1	<0.02	0.02
1,4-Dichlorobenzene	106-46-7	<0.02	0.02
1,2-Dichlorobenzene	95-50-1	<0.02	0.02
Undecane	1120-21-4	<0.05	0.02
Naphthalene	91-20-3	<0.05	0.05
Tridecane	629-50-5	<0.05	0.05
2-Methylnaphthalene	91-57-6	<0.05	0.05
Acenaphthylene	208-96-8	<0.05	0.05
Pentadecane	629-62-9	<0.05	0.05
Acenaphthene	83-32-9	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696588 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S22
Installation Date: 12/14/2012 10:12:00AM
Retrieval Date: 12/27/2012 10:08:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 1:09:00AM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Fluorene	86-73-7	<0.05	0.05
TPH		**5.14**	**0.50**
BTEX		**0.09**	**0.02**
Trichlorofluoromethane (TIC)	75-69-4	<0.05	0.05
Trichlorotrifluoroethane (TIC)	**76-13-1**	**9.15**	**0.05**
F-123 (TIC)	306-83-2	<0.05	0.05
F-123A (TIC)	306-83-2	<0.05	0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696589 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S23
Installation Date: 12/14/2012 12:55:00PM
Retrieval Date: 12/27/2012 10:10:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 1:28:00PM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Vinyl Chloride	75-01-4	<0.20	0.2
Methyl tert-butyl ether	1634-04-4	<0.02	0
1,1-Dichloroethene	75-35-4	<0.02	0.02
trans-1,2-Dichloroethene	156-60-5	<0.02	0.02
1,1-Dichloroethane	75-34-3	<0.02	0.02
cis-1,2-Dichloroethene	156-59-2	<0.02	0.02
Chloroform	67-66-3	0.02	0.02
1,1,1-Trichloroethane	71-55-6	<0.02	0.02
1,2-Dichloroethane	107-06-2	<0.02	0.02
Benzene	**71-43-2**	**0.03**	0.02
Carbon Tetrachloride	56-23-5	<0.02	**0.02**
Trichloroethene	**79-01-6**	**68.28**	0.02
1,1,2-Trichloroethane	79-00-5	<0.02	**0.02**
Toluene	108-88-3	<0.02	0.02
Octane	111-65-9	<0.02	0.02
Tetrachloroethene	**127-18-4**	**5.41**	0.02
Chlorobenzene	108-90-7	<0.02	**0.02**
1,1,1,2-Tetrachloroethane	630-20-6	<0.02	0.02
Ethylbenzene	100-41-4	<0.02	0.02
m,p-Xylene	108-38-3/106-42-3	<0.02	0.02
o-Xylene	95-47-6	<0.02	0.02
1,1,2,2-Tetrachloroethane	79-34-5	<0.02	0.02
1,3,5-Trimethylbenzene	108-67-8	<0.02	0.02
1,2,4-Trimethylbenzene	95-63-6	<0.02	0.02
1,3-Dichlorobenzene	541-73-1	<0.02	0.02
1,4-Dichlorobenzene	106-46-7	<0.02	0.02
1,2-Dichlorobenzene	95-50-1	<0.02	0.02
Undecane	1120-21-4	<0.05	0.02
Naphthalene	91-20-3	<0.05	0.05
Tridecane	629-50-5	<0.05	0.05
2-Methylnaphthalene	91-57-6	<0.05	0.05
Acenaphthylene	208-96-8	<0.05	0.05
Pentadecane	629-62-9	<0.05	0.05
Acenaphthene	83-32-9	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696589 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S23
Installation Date: 12/14/2012 12:55:00PM
Retrieval Date: 12/27/2012 10:10:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 1:28:00PM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Fluorene	86-73-7	<0.05	0.05
TPH		<0.50	0.5
BTEX		**0.03**	0
Trichlorofluoromethane (TIC)	75-69-4	0.05	**0.02**
Trichlorotrifluoroethane (TIC)	**76-13-1**	**72.99**	0.05
F-123 (TIC)	306-83-2	<0.05	**0.05**
F-123A (TIC)	306-83-2	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696590 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S24
Installation Date: 12/14/2012 1:00:00PM
Retrieval Date: 12/27/2012 10:13:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/8/2013 7:56:00PM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Vinyl Chloride	75-01-4	<0.20	0.2
Methyl tert-butyl ether	1634-04-4	<0.02	0
1,1-Dichloroethene	75-35-4	<0.02	0.02
trans-1,2-Dichloroethene	156-60-5	<0.02	0.02
1,1-Dichloroethane	75-34-3	<0.02	0.02
cis-1,2-Dichloroethene	156-59-2	<0.02	0.02
Chloroform	**67-66-3**	**0.05**	0.02
1,1,1-Trichloroethane	71-55-6	<0.02	**0.02**
1,2-Dichloroethane	107-06-2	<0.02	0.02
Benzene	71-43-2	<0.02	0.02
Carbon Tetrachloride	56-23-5	<0.02	0.02
Trichloroethene	**79-01-6**	**6.68**	0.02
1,1,2-Trichloroethane	79-00-5	<0.02	**0.02**
Toluene	108-88-3	<0.02	0.02
Octane	111-65-9	<0.02	0.02
Tetrachloroethene	**127-18-4**	**0.77**	0.02
Chlorobenzene	108-90-7	<0.02	**0.02**
1,1,1,2-Tetrachloroethane	630-20-6	<0.02	0.02
Ethylbenzene	100-41-4	<0.02	0.02
m,p-Xylene	108-38-3/106-42-3	<0.02	0.02
o-Xylene	95-47-6	<0.02	0.02
1,1,2,2-Tetrachloroethane	79-34-5	<0.02	0.02
1,3,5-Trimethylbenzene	108-67-8	<0.02	0.02
1,2,4-Trimethylbenzene	95-63-6	<0.02	0.02
1,3-Dichlorobenzene	541-73-1	<0.02	0.02
1,4-Dichlorobenzene	106-46-7	<0.02	0.02
1,2-Dichlorobenzene	95-50-1	<0.02	0.02
Undecane	1120-21-4	<0.05	0.02
Naphthalene	91-20-3	<0.05	0.05
Tridecane	629-50-5	<0.05	0.05
2-Methylnaphthalene	91-57-6	<0.05	0.05
Acenaphthylene	208-96-8	<0.05	0.05
Pentadecane	629-62-9	<0.05	0.05
Acenaphthene	83-32-9	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696590 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S24
Installation Date: 12/14/2012 1:00:00PM
Retrieval Date: 12/27/2012 10:13:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/8/2013 7:56:00PM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Fluorene	86-73-7	<0.05	0.05
TPH		<0.50	0.5
BTEX		<0.02	0
Trichlorofluoromethane (TIC)	75-69-4	<0.05	0.02
Trichlorotrifluoroethane (TIC)	**76-13-1**	**43.26**	0.05
F-123 (TIC)	306-83-2	<0.05	**0.05**
F-123A (TIC)	306-83-2	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696591 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S25
Installation Date: 12/14/2012 1:03:00PM
Retrieval Date: 12/27/2012 10:15:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 10:37:00AM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Vinyl Chloride	75-01-4	<0.20	0.2
Methyl tert-butyl ether	1634-04-4	<0.02	0
1,1-Dichloroethene	75-35-4	<0.02	0.02
trans-1,2-Dichloroethene	156-60-5	<0.02	0.02
1,1-Dichloroethane	75-34-3	<0.02	0.02
cis-1,2-Dichloroethene	156-59-2	<0.02	0.02
Chloroform	**67-66-3**	**0.03**	0.02
1,1,1-Trichloroethane	71-55-6	<0.02	**0.02**
1,2-Dichloroethane	107-06-2	<0.02	0.02
Benzene	**71-43-2**	**0.03**	0.02
Carbon Tetrachloride	56-23-5	<0.02	**0.02**
Trichloroethene	**79-01-6**	**59.22**	0.02
1,1,2-Trichloroethane	79-00-5	<0.02	**0.02**
Toluene	108-88-3	<0.02	0.02
Octane	111-65-9	<0.02	0.02
Tetrachloroethene	**127-18-4**	**4.79**	0.02
Chlorobenzene	108-90-7	<0.02	**0.02**
1,1,1,2-Tetrachloroethane	630-20-6	<0.02	0.02
Ethylbenzene	100-41-4	<0.02	0.02
m,p-Xylene	108-38-3/106-42-3	<0.02	0.02
o-Xylene	95-47-6	<0.02	0.02
1,1,2,2-Tetrachloroethane	79-34-5	<0.02	0.02
1,3,5-Trimethylbenzene	108-67-8	<0.02	0.02
1,2,4-Trimethylbenzene	95-63-6	<0.02	0.02
1,3-Dichlorobenzene	541-73-1	<0.02	0.02
1,4-Dichlorobenzene	106-46-7	<0.02	0.02
1,2-Dichlorobenzene	95-50-1	<0.02	0.02
Undecane	1120-21-4	<0.05	0.02
Naphthalene	91-20-3	<0.05	0.05
Tridecane	629-50-5	<0.05	0.05
2-Methylnaphthalene	91-57-6	<0.05	0.05
Acenaphthylene	208-96-8	<0.05	0.05
Pentadecane	629-62-9	<0.05	0.05
Acenaphthene	83-32-9	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696591 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S25
Installation Date: 12/14/2012 1:03:00PM
Retrieval Date: 12/27/2012 10:15:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 10:37:00AM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Fluorene	86-73-7	<0.05	0.05
TPH		<0.50	0.5
BTEX		**0.03**	0
Trichlorofluoromethane (TIC)	75-69-4	<0.05	**0.02**
Trichlorotrifluoroethane (TIC)	**76-13-1**	**35.60**	0.05
F-123 (TIC)	306-83-2	<0.05	**0.05**
F-123A (TIC)	306-83-2	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696591D FIELD_SAMPLE
Dilution Factor: 1
Installation Date: 12/14/2012 1:03:00PM
Retrieval Date: 12/27/2012 10:15:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS
Porosity: 0.40
Product: SPG0001
Water Filled Voids: 0.37
Date Analyzed: 1/9/2013 11:06:00AM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Vinyl Chloride	75-01-4	<0.20	0.2
Methyl tert-butyl ether	1634-04-4	<0.02	0
1,1-Dichloroethene	75-35-4	<0.02	0.02
trans-1,2-Dichloroethene	156-60-5	<0.02	0.02
1,1-Dichloroethane	75-34-3	<0.02	0.02
cis-1,2-Dichloroethene	156-59-2	<0.02	0.02
Chloroform	**67-66-3**	**0.05**	0.02
1,1,1-Trichloroethane	71-55-6	<0.02	**0.02**
1,2-Dichloroethane	107-06-2	<0.02	0.02
Benzene	**71-43-2**	**0.03**	0.02
Carbon Tetrachloride	56-23-5	<0.02	**0.02**
Trichloroethene	**79-01-6**	**54.98**	0.02
1,1,2-Trichloroethane	79-00-5	<0.02	**0.02**
Toluene	108-88-3	<0.02	0.02
Octane	111-65-9	<0.02	0.02
Tetrachloroethene	**127-18-4**	**3.95**	0.02
Chlorobenzene	108-90-7	<0.02	**0.02**
1,1,1,2-Tetrachloroethane	630-20-6	<0.02	0.02
Ethylbenzene	100-41-4	<0.02	0.02
m,p-Xylene	108-38-3/106-42-3	<0.02	0.02
o-Xylene	95-47-6	<0.02	0.02
1,1,2,2-Tetrachloroethane	79-34-5	<0.02	0.02
1,3,5-Trimethylbenzene	108-67-8	<0.02	0.02
1,2,4-Trimethylbenzene	95-63-6	<0.02	0.02
1,3-Dichlorobenzene	541-73-1	<0.02	0.02
1,4-Dichlorobenzene	106-46-7	<0.02	0.02
1,2-Dichlorobenzene	95-50-1	<0.02	0.02
Undecane	1120-21-4	<0.05	0.02
Naphthalene	91-20-3	<0.05	0.05
Tridecane	629-50-5	<0.05	0.05
2-Methylnaphthalene	91-57-6	<0.05	0.05
Acenaphthylene	208-96-8	<0.05	0.05
Pentadecane	629-62-9	<0.05	0.05
Acenaphthene	83-32-9	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696591D FIELD_SAMPLE
Dilution Factor: 1
Installation Date: 12/14/2012 1:03:00PM
Retrieval Date: 12/27/2012 10:15:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS
Porosity: 0.40
Product: SPG0001
Water Filled Voids: 0.37
Date Analyzed: 1/9/2013 11:06:00AM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Fluorene	86-73-7	<0.05	0.05
TPH		<0.50	0.5
BTEX		**0.03**	0
Trichlorofluoromethane (TIC)	75-69-4	<0.05	**0.02**
Trichlorotrifluoroethane (TIC)	**76-13-1**	**42.66**	0.05
F-123 (TIC)	306-83-2	<0.05	**0.05**
F-123A (TIC)	306-83-2	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696592 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S26
Installation Date: 12/14/2012 1:04:00PM
Retrieval Date: 12/27/2012 10:17:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/8/2013 10:47:00PM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Vinyl Chloride	75-01-4	<0.20	0.2
Methyl tert-butyl ether	1634-04-4	<0.02	0
1,1-Dichloroethene	75-35-4	<0.02	0.02
trans-1,2-Dichloroethene	156-60-5	<0.02	0.02
1,1-Dichloroethane	75-34-3	<0.02	0.02
cis-1,2-Dichloroethene	156-59-2	<0.02	0.02
Chloroform	67-66-3	<0.02	0.02
1,1,1-Trichloroethane	71-55-6	<0.02	0.02
1,2-Dichloroethane	107-06-2	<0.02	0.02
Benzene	71-43-2	<0.02	0.02
Carbon Tetrachloride	56-23-5	<0.02	0.02
Trichloroethene	**79-01-6**	**2.09**	0.02
1,1,2-Trichloroethane	79-00-5	<0.02	**0.02**
Toluene	108-88-3	<0.02	0.02
Octane	111-65-9	<0.02	0.02
Tetrachloroethene	**127-18-4**	**0.19**	0.02
Chlorobenzene	108-90-7	<0.02	**0.02**
1,1,1,2-Tetrachloroethane	630-20-6	<0.02	0.02
Ethylbenzene	100-41-4	<0.02	0.02
m,p-Xylene	108-38-3/106-42-3	<0.02	0.02
o-Xylene	95-47-6	<0.02	0.02
1,1,2,2-Tetrachloroethane	79-34-5	<0.02	0.02
1,3,5-Trimethylbenzene	108-67-8	<0.02	0.02
1,2,4-Trimethylbenzene	95-63-6	<0.02	0.02
1,3-Dichlorobenzene	541-73-1	<0.02	0.02
1,4-Dichlorobenzene	106-46-7	<0.02	0.02
1,2-Dichlorobenzene	95-50-1	<0.02	0.02
Undecane	1120-21-4	<0.05	0.02
Naphthalene	91-20-3	<0.05	0.05
Tridecane	629-50-5	<0.05	0.05
2-Methylnaphthalene	91-57-6	<0.05	0.05
Acenaphthylene	208-96-8	<0.05	0.05
Pentadecane	629-62-9	<0.05	0.05
Acenaphthene	83-32-9	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696592 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S26
Installation Date: 12/14/2012 1:04:00PM
Retrieval Date: 12/27/2012 10:17:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/8/2013 10:47:00PM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Fluorene	86-73-7	<0.05	0.05
TPH		<0.50	0.5
BTEX		<0.02	0
Trichlorofluoromethane (TIC)	75-69-4	<0.05	0.02
Trichlorotrifluoroethane (TIC)	**76-13-1**	**6.64**	0.05
F-123 (TIC)	306-83-2	<0.05	**0.05**
F-123A (TIC)	306-83-2	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696593 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S27
Installation Date: 12/14/2012 1:11:00PM
Retrieval Date: 12/27/2012 10:19:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/8/2013 6:03:00PM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Vinyl Chloride	75-01-4	<0.20	0.2
Methyl tert-butyl ether	1634-04-4	<0.02	0
1,1-Dichloroethene	75-35-4	<0.02	0.02
trans-1,2-Dichloroethene	156-60-5	<0.02	0.02
1,1-Dichloroethane	75-34-3	<0.02	0.02
cis-1,2-Dichloroethene	156-59-2	<0.02	0.02
Chloroform	67-66-3	<0.02	0.02
1,1,1-Trichloroethane	71-55-6	<0.02	0.02
1,2-Dichloroethane	107-06-2	<0.02	0.02
Benzene	71-43-2	<0.02	0.02
Carbon Tetrachloride	**56-23-5**	**0.04**	0.02
Trichloroethene	**79-01-6**	**0.26**	**0.02**
1,1,2-Trichloroethane	79-00-5	<0.02	**0.02**
Toluene	108-88-3	<0.02	0.02
Octane	111-65-9	<0.02	0.02
Tetrachloroethene	127-18-4	0.02	0.02
Chlorobenzene	108-90-7	<0.02	0.02
1,1,1,2-Tetrachloroethane	630-20-6	<0.02	0.02
Ethylbenzene	100-41-4	<0.02	0.02
m,p-Xylene	108-38-3/106-42-3	<0.02	0.02
o-Xylene	95-47-6	<0.02	0.02
1,1,2,2-Tetrachloroethane	79-34-5	<0.02	0.02
1,3,5-Trimethylbenzene	108-67-8	<0.02	0.02
1,2,4-Trimethylbenzene	95-63-6	<0.02	0.02
1,3-Dichlorobenzene	541-73-1	<0.02	0.02
1,4-Dichlorobenzene	106-46-7	<0.02	0.02
1,2-Dichlorobenzene	95-50-1	<0.02	0.02
Undecane	1120-21-4	<0.05	0.02
Naphthalene	91-20-3	<0.05	0.05
Tridecane	629-50-5	<0.05	0.05
2-Methylnaphthalene	91-57-6	<0.05	0.05
Acenaphthylene	208-96-8	<0.05	0.05
Pentadecane	629-62-9	<0.05	0.05
Acenaphthene	83-32-9	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696593 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S27
Installation Date: 12/14/2012 1:11:00PM
Retrieval Date: 12/27/2012 10:19:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/8/2013 6:03:00PM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Fluorene	86-73-7	<0.05	0.05
TPH		<0.50	0.5
BTEX		<0.02	0
Trichlorofluoromethane (TIC)	75-69-4	<0.05	0.02
Trichlorotrifluoroethane (TIC)	**76-13-1**	**3.41**	0.05
F-123 (TIC)	306-83-2	<0.05	**0.05**
F-123A (TIC)	306-83-2	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696594 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S28
Installation Date: 12/14/2012 1:14:00PM
Retrieval Date: 12/27/2012 10:21:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 7:47:00AM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Vinyl Chloride	75-01-4	<0.20	0.2
Methyl tert-butyl ether	1634-04-4	<0.02	0
1,1-Dichloroethene	75-35-4	<0.02	0.02
trans-1,2-Dichloroethene	156-60-5	<0.02	0.02
1,1-Dichloroethane	75-34-3	<0.02	0.02
cis-1,2-Dichloroethene	156-59-2	<0.02	0.02
Chloroform	67-66-3	<0.02	0.02
1,1,1-Trichloroethane	71-55-6	<0.02	0.02
1,2-Dichloroethane	107-06-2	<0.02	0.02
Benzene	71-43-2	<0.02	0.02
Carbon Tetrachloride	56-23-5	<0.02	0.02
Trichloroethene	**79-01-6**	**10.26**	0.02
1,1,2-Trichloroethane	79-00-5	<0.02	**0.02**
Toluene	108-88-3	<0.02	0.02
Octane	111-65-9	<0.02	0.02
Tetrachloroethene	**127-18-4**	**0.47**	0.02
Chlorobenzene	108-90-7	<0.02	**0.02**
1,1,1,2-Tetrachloroethane	630-20-6	<0.02	0.02
Ethylbenzene	100-41-4	<0.02	0.02
m,p-Xylene	108-38-3/106-42-3	<0.02	0.02
o-Xylene	95-47-6	<0.02	0.02
1,1,2,2-Tetrachloroethane	79-34-5	<0.02	0.02
1,3,5-Trimethylbenzene	108-67-8	<0.02	0.02
1,2,4-Trimethylbenzene	95-63-6	<0.02	0.02
1,3-Dichlorobenzene	541-73-1	<0.02	0.02
1,4-Dichlorobenzene	106-46-7	<0.02	0.02
1,2-Dichlorobenzene	95-50-1	<0.02	0.02
Undecane	1120-21-4	<0.05	0.02
Naphthalene	91-20-3	<0.05	0.05
Tridecane	629-50-5	<0.05	0.05
2-Methylnaphthalene	91-57-6	<0.05	0.05
Acenaphthylene	208-96-8	<0.05	0.05
Pentadecane	629-62-9	<0.05	0.05
Acenaphthene	83-32-9	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696594 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S28
Installation Date: 12/14/2012 1:14:00PM
Retrieval Date: 12/27/2012 10:21:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 7:47:00AM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Fluorene	86-73-7	<0.05	0.05
TPH		<0.50	0.5
BTEX		<0.02	0
Trichlorofluoromethane (TIC)	75-69-4	<0.05	0.02
Trichlorotrifluoroethane (TIC)	**76-13-1**	**36.85**	0.05
F-123 (TIC)	306-83-2	<0.05	**0.05**
F-123A (TIC)	306-83-2	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696595 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S29
Installation Date: 12/14/2012 1:24:00PM
Retrieval Date: 12/27/2012 10:27:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/8/2013 7:00:00PM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Vinyl Chloride	75-01-4	<0.20	0.2
Methyl tert-butyl ether	1634-04-4	<0.02	0
1,1-Dichloroethene	75-35-4	<0.02	0.02
trans-1,2-Dichloroethene	156-60-5	<0.02	0.02
1,1-Dichloroethane	75-34-3	<0.02	0.02
cis-1,2-Dichloroethene	156-59-2	<0.02	0.02
Chloroform	67-66-3	<0.02	0.02
1,1,1-Trichloroethane	71-55-6	<0.02	0.02
1,2-Dichloroethane	107-06-2	<0.02	0.02
Benzene	71-43-2	<0.02	0.02
Carbon Tetrachloride	**56-23-5**	**0.02**	0.02
Trichloroethene	79-01-6	<0.02	**0.02**
1,1,2-Trichloroethane	79-00-5	<0.02	0.02
Toluene	108-88-3	<0.02	0.02
Octane	111-65-9	<0.02	0.02
Tetrachloroethene	127-18-4	<0.02	0.02
Chlorobenzene	108-90-7	<0.02	0.02
1,1,1,2-Tetrachloroethane	630-20-6	<0.02	0.02
Ethylbenzene	100-41-4	<0.02	0.02
m,p-Xylene	108-38-3/106-42-3	<0.02	0.02
o-Xylene	95-47-6	<0.02	0.02
1,1,2,2-Tetrachloroethane	79-34-5	<0.02	0.02
1,3,5-Trimethylbenzene	108-67-8	<0.02	0.02
1,2,4-Trimethylbenzene	95-63-6	<0.02	0.02
1,3-Dichlorobenzene	541-73-1	<0.02	0.02
1,4-Dichlorobenzene	106-46-7	<0.02	0.02
1,2-Dichlorobenzene	95-50-1	<0.02	0.02
Undecane	1120-21-4	<0.05	0.02
Naphthalene	91-20-3	<0.05	0.05
Tridecane	629-50-5	<0.05	0.05
2-Methylnaphthalene	91-57-6	<0.05	0.05
Acenaphthylene	208-96-8	<0.05	0.05
Pentadecane	629-62-9	<0.05	0.05
Acenaphthene	83-32-9	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696595 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S29
Installation Date: 12/14/2012 1:24:00PM
Retrieval Date: 12/27/2012 10:27:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/8/2013 7:00:00PM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Fluorene	86-73-7	<0.05	0.05
TPH		<0.50	0.5
BTEX		<0.02	0
Trichlorofluoromethane (TIC)	75-69-4	<0.05	0.02
Trichlorotrifluoroethane (TIC)	**76-13-1**	**0.36**	0.05
F-123 (TIC)	306-83-2	<0.05	**0.05**
F-123A (TIC)	306-83-2	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696596 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S30
Installation Date: 12/14/2012 1:26:00PM
Retrieval Date: 12/27/2012 10:29:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 4:26:00PM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Vinyl Chloride	75-01-4	<0.20	0.2
Methyl tert-butyl ether	1634-04-4	<0.02	0
1,1-Dichloroethene	**75-35-4**	**0.11**	0.02
trans-1,2-Dichloroethene	156-60-5	<0.02	**0.02**
1,1-Dichloroethane	75-34-3	<0.02	0.02
cis-1,2-Dichloroethene	156-59-2	<0.02	0.02
Chloroform	**67-66-3**	**0.02**	0.02
1,1,1-Trichloroethane	71-55-6	<0.02	**0.02**
1,2-Dichloroethane	107-06-2	<0.02	0.02
Benzene	71-43-2	<0.02	0.02
Carbon Tetrachloride	56-23-5	<0.02	0.02
Trichloroethene	**79-01-6**	**13.56**	0.02
1,1,2-Trichloroethane	79-00-5	<0.02	**0.02**
Toluene	108-88-3	<0.02	0.02
Octane	111-65-9	<0.02	0.02
Tetrachloroethene	**127-18-4**	**1.96**	0.02
Chlorobenzene	108-90-7	<0.02	**0.02**
1,1,1,2-Tetrachloroethane	630-20-6	<0.02	0.02
Ethylbenzene	100-41-4	<0.02	0.02
m,p-Xylene	108-38-3/106-42-3	<0.02	0.02
o-Xylene	95-47-6	<0.02	0.02
1,1,2,2-Tetrachloroethane	79-34-5	<0.02	0.02
1,3,5-Trimethylbenzene	108-67-8	<0.02	0.02
1,2,4-Trimethylbenzene	95-63-6	<0.02	0.02
1,3-Dichlorobenzene	541-73-1	<0.02	0.02
1,4-Dichlorobenzene	106-46-7	<0.02	0.02
1,2-Dichlorobenzene	95-50-1	<0.02	0.02
Undecane	1120-21-4	<0.05	0.02
Naphthalene	91-20-3	<0.05	0.05
Tridecane	629-50-5	<0.05	0.05
2-Methylnaphthalene	91-57-6	<0.05	0.05
Acenaphthylene	208-96-8	<0.05	0.05
Pentadecane	629-62-9	<0.05	0.05
Acenaphthene	83-32-9	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696596 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S30
Installation Date: 12/14/2012 1:26:00PM
Retrieval Date: 12/27/2012 10:29:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 4:26:00PM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Fluorene	86-73-7	<0.05	0.05
TPH		<0.50	0.5
BTEX		<0.02	0
Trichlorofluoromethane (TIC)	75-69-4	<0.05	0.02
Trichlorotrifluoroethane (TIC)	**76-13-1**	**8.74**	0.05
F-123 (TIC)	306-83-2	<0.05	**0.05**
F-123A (TIC)	306-83-2	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696597 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S31
Installation Date: 12/14/2012 1:28:00PM
Retrieval Date: 12/27/2012 10:31:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/8/2013 8:25:00PM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Vinyl Chloride	75-01-4	<0.20	0.2
Methyl tert-butyl ether	1634-04-4	<0.02	0
1,1-Dichloroethene	**75-35-4**	**0.14**	0.02
trans-1,2-Dichloroethene	156-60-5	<0.02	**0.02**
1,1-Dichloroethane	75-34-3	<0.02	0.02
cis-1,2-Dichloroethene	156-59-2	<0.02	0.02
Chloroform	67-66-3	<0.02	0.02
1,1,1-Trichloroethane	71-55-6	<0.02	0.02
1,2-Dichloroethane	107-06-2	<0.02	0.02
Benzene	71-43-2	<0.02	0.02
Carbon Tetrachloride	**56-23-5**	**0.03**	0.02
Trichloroethene	**79-01-6**	**11.26**	**0.02**
1,1,2-Trichloroethane	79-00-5	<0.02	**0.02**
Toluene	108-88-3	<0.02	0.02
Octane	111-65-9	<0.02	0.02
Tetrachloroethene	**127-18-4**	**0.97**	0.02
Chlorobenzene	108-90-7	<0.02	**0.02**
1,1,1,2-Tetrachloroethane	630-20-6	<0.02	0.02
Ethylbenzene	100-41-4	<0.02	0.02
m,p-Xylene	108-38-3/106-42-3	<0.02	0.02
o-Xylene	95-47-6	<0.02	0.02
1,1,2,2-Tetrachloroethane	79-34-5	<0.02	0.02
1,3,5-Trimethylbenzene	108-67-8	<0.02	0.02
1,2,4-Trimethylbenzene	95-63-6	<0.02	0.02
1,3-Dichlorobenzene	541-73-1	<0.02	0.02
1,4-Dichlorobenzene	106-46-7	<0.02	0.02
1,2-Dichlorobenzene	95-50-1	<0.02	0.02
Undecane	1120-21-4	<0.05	0.02
Naphthalene	91-20-3	<0.05	0.05
Tridecane	629-50-5	<0.05	0.05
2-Methylnaphthalene	91-57-6	<0.05	0.05
Acenaphthylene	208-96-8	<0.05	0.05
Pentadecane	629-62-9	<0.05	0.05
Acenaphthene	83-32-9	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696597 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S31
Installation Date: 12/14/2012 1:28:00PM
Retrieval Date: 12/27/2012 10:31:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/8/2013 8:25:00PM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Fluorene	86-73-7	<0.05	0.05
TPH		<0.50	0.5
BTEX		<0.02	0
Trichlorofluoromethane (TIC)	75-69-4	<0.05	0.02
Trichlorotrifluoroethane (TIC)	**76-13-1**	**13.66**	0.05
F-123 (TIC)	306-83-2	<0.05	**0.05**
F-123A (TIC)	306-83-2	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696598 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S32
Installation Date: 12/14/2012 1:32:00PM
Retrieval Date: 12/27/2012 10:33:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 3:31:00AM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Vinyl Chloride	75-01-4	<0.20	0.2
Methyl tert-butyl ether	1634-04-4	<0.02	0
1,1-Dichloroethene	**75-35-4**	**0.20**	0.02
trans-1,2-Dichloroethene	156-60-5	<0.02	**0.02**
1,1-Dichloroethane	75-34-3	<0.02	0.02
cis-1,2-Dichloroethene	156-59-2	<0.02	0.02
Chloroform	**67-66-3**	**0.03**	0.02
1,1,1-Trichloroethane	71-55-6	<0.02	**0.02**
1,2-Dichloroethane	107-06-2	<0.02	0.02
Benzene	71-43-2	<0.02	0.02
Carbon Tetrachloride	**56-23-5**	**0.03**	0.02
Trichloroethene	**79-01-6**	**9.42**	**0.02**
1,1,2-Trichloroethane	79-00-5	<0.02	**0.02**
Toluene	108-88-3	<0.02	0.02
Octane	111-65-9	<0.02	0.02
Tetrachloroethene	**127-18-4**	**1.00**	0.02
Chlorobenzene	108-90-7	<0.02	**0.02**
1,1,1,2-Tetrachloroethane	630-20-6	<0.02	0.02
Ethylbenzene	100-41-4	<0.02	0.02
m,p-Xylene	108-38-3/106-42-3	<0.02	0.02
o-Xylene	95-47-6	<0.02	0.02
1,1,2,2-Tetrachloroethane	79-34-5	<0.02	0.02
1,3,5-Trimethylbenzene	108-67-8	<0.02	0.02
1,2,4-Trimethylbenzene	95-63-6	<0.02	0.02
1,3-Dichlorobenzene	541-73-1	<0.02	0.02
1,4-Dichlorobenzene	106-46-7	<0.02	0.02
1,2-Dichlorobenzene	95-50-1	<0.02	0.02
Undecane	1120-21-4	<0.05	0.02
Naphthalene	91-20-3	<0.05	0.05
Tridecane	629-50-5	<0.05	0.05
2-Methylnaphthalene	91-57-6	<0.05	0.05
Acenaphthylene	208-96-8	<0.05	0.05
Pentadecane	629-62-9	<0.05	0.05
Acenaphthene	83-32-9	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696598 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S32
Installation Date: 12/14/2012 1:32:00PM
Retrieval Date: 12/27/2012 10:33:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 3:31:00AM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Fluorene	86-73-7	<0.05	0.05
TPH		<0.50	0.5
BTEX		<0.02	0
Trichlorofluoromethane (TIC)	**75-69-4**	**0.07**	0.02
Trichlorotrifluoroethane (TIC)	**76-13-1**	**14.96**	**0.05**
F-123 (TIC)	306-83-2	<0.05	**0.05**
F-123A (TIC)	306-83-2	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696599 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S33
Installation Date: 12/14/2012 1:34:00PM
Retrieval Date: 12/27/2012 10:38:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/8/2013 4:09:00PM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Vinyl Chloride	75-01-4	<0.20	0.2
Methyl tert-butyl ether	1634-04-4	<0.02	0
1,1-Dichloroethene	**75-35-4**	**0.49**	0.02
trans-1,2-Dichloroethene	156-60-5	<0.02	**0.02**
1,1-Dichloroethane	75-34-3	<0.02	0.02
cis-1,2-Dichloroethene	156-59-2	<0.02	0.02
Chloroform	**67-66-3**	**0.04**	0.02
1,1,1-Trichloroethane	71-55-6	<0.02	**0.02**
1,2-Dichloroethane	107-06-2	<0.02	0.02
Benzene	71-43-2	<0.02	0.02
Carbon Tetrachloride	56-23-5	<0.02	0.02
Trichloroethene	**79-01-6**	**18.92**	0.02
1,1,2-Trichloroethane	79-00-5	<0.02	**0.02**
Toluene	108-88-3	<0.02	0.02
Octane	111-65-9	<0.02	0.02
Tetrachloroethene	**127-18-4**	**1.62**	0.02
Chlorobenzene	108-90-7	<0.02	**0.02**
1,1,1,2-Tetrachloroethane	630-20-6	<0.02	0.02
Ethylbenzene	100-41-4	<0.02	0.02
m,p-Xylene	108-38-3/106-42-3	<0.02	0.02
o-Xylene	95-47-6	<0.02	0.02
1,1,2,2-Tetrachloroethane	79-34-5	<0.02	0.02
1,3,5-Trimethylbenzene	108-67-8	<0.02	0.02
1,2,4-Trimethylbenzene	95-63-6	<0.02	0.02
1,3-Dichlorobenzene	541-73-1	<0.02	0.02
1,4-Dichlorobenzene	106-46-7	<0.02	0.02
1,2-Dichlorobenzene	95-50-1	<0.02	0.02
Undecane	1120-21-4	<0.05	0.02
Naphthalene	91-20-3	<0.05	0.05
Tridecane	629-50-5	<0.05	0.05
2-Methylnaphthalene	91-57-6	<0.05	0.05
Acenaphthylene	208-96-8	<0.05	0.05
Pentadecane	629-62-9	<0.05	0.05
Acenaphthene	83-32-9	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696599 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S33
Installation Date: 12/14/2012 1:34:00PM
Retrieval Date: 12/27/2012 10:38:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/8/2013 4:09:00PM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Fluorene	86-73-7	<0.05	0.05
TPH		<0.50	0.5
BTEX		<0.02	0
Trichlorofluoromethane (TIC)	**75-69-4**	**0.12**	0.02
Trichlorotrifluoroethane (TIC)	**76-13-1**	**20.73**	**0.05**
F-123 (TIC)	306-83-2	<0.05	**0.05**
F-123A (TIC)	306-83-2	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696599D FIELD_SAMPLE
Dilution Factor: 1
Installation Date: 12/14/2012 1:34:00PM
Retrieval Date: 12/27/2012 10:38:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS
Porosity: 0.40
Product: SPG0001
Water Filled Voids: 0.37
Date Analyzed: 1/8/2013 4:37:00PM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Vinyl Chloride	75-01-4	<0.20	0.2
Methyl tert-butyl ether	1634-04-4	<0.02	0
1,1-Dichloroethene	**75-35-4**	**0.45**	0.02
trans-1,2-Dichloroethene	156-60-5	<0.02	**0.02**
1,1-Dichloroethane	75-34-3	<0.02	0.02
cis-1,2-Dichloroethene	156-59-2	<0.02	0.02
Chloroform	**67-66-3**	**0.04**	0.02
1,1,1-Trichloroethane	71-55-6	<0.02	**0.02**
1,2-Dichloroethane	107-06-2	<0.02	0.02
Benzene	71-43-2	<0.02	0.02
Carbon Tetrachloride	56-23-5	<0.02	0.02
Trichloroethene	**79-01-6**	**19.06**	0.02
1,1,2-Trichloroethane	79-00-5	<0.02	**0.02**
Toluene	108-88-3	<0.02	0.02
Octane	111-65-9	<0.02	0.02
Tetrachloroethene	**127-18-4**	**1.64**	0.02
Chlorobenzene	108-90-7	<0.02	**0.02**
1,1,1,2-Tetrachloroethane	630-20-6	<0.02	0.02
Ethylbenzene	100-41-4	<0.02	0.02
m,p-Xylene	108-38-3/106-42-3	<0.02	0.02
o-Xylene	95-47-6	<0.02	0.02
1,1,2,2-Tetrachloroethane	79-34-5	<0.02	0.02
1,3,5-Trimethylbenzene	108-67-8	<0.02	0.02
1,2,4-Trimethylbenzene	95-63-6	<0.02	0.02
1,3-Dichlorobenzene	541-73-1	<0.02	0.02
1,4-Dichlorobenzene	106-46-7	<0.02	0.02
1,2-Dichlorobenzene	95-50-1	<0.02	0.02
Undecane	1120-21-4	<0.05	0.02
Naphthalene	91-20-3	<0.05	0.05
Tridecane	629-50-5	<0.05	0.05
2-Methylnaphthalene	91-57-6	<0.05	0.05
Acenaphthylene	208-96-8	<0.05	0.05
Pentadecane	629-62-9	<0.05	0.05
Acenaphthene	83-32-9	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696599D FIELD_SAMPLE
Dilution Factor: 1
Installation Date: 12/14/2012 1:34:00PM
Retrieval Date: 12/27/2012 10:38:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS
Porosity: 0.40
Product: SPG0001
Water Filled Voids: 0.37
Date Analyzed: 1/8/2013 4:37:00PM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Fluorene	86-73-7	<0.05	0.05
TPH		<0.50	0.5
BTEX		<0.02	0
Trichlorofluoromethane (TIC)	**75-69-4**	**0.11**	0.02
Trichlorotrifluoroethane (TIC)	**76-13-1**	**18.42**	**0.05**
F-123 (TIC)	306-83-2	<0.05	**0.05**
F-123A (TIC)	306-83-2	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696600 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S34
Installation Date: 12/14/2012 1:08:00PM
Retrieval Date: 12/27/2012 10:40:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 11:34:00AM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Vinyl Chloride	75-01-4	<0.20	0.2
Methyl tert-butyl ether	1634-04-4	<0.02	0
1,1-Dichloroethene	**75-35-4**	**0.11**	0.02
trans-1,2-Dichloroethene	156-60-5	<0.02	**0.02**
1,1-Dichloroethane	75-34-3	<0.02	0.02
cis-1,2-Dichloroethene	156-59-2	<0.02	0.02
Chloroform	67-66-3	<0.02	0.02
1,1,1-Trichloroethane	71-55-6	<0.02	0.02
1,2-Dichloroethane	107-06-2	<0.02	0.02
Benzene	71-43-2	<0.02	0.02
Carbon Tetrachloride	56-23-5	<0.02	0.02
Trichloroethene	**79-01-6**	**5.50**	0.02
1,1,2-Trichloroethane	79-00-5	<0.02	**0.02**
Toluene	108-88-3	<0.02	0.02
Octane	111-65-9	<0.02	0.02
Tetrachloroethene	**127-18-4**	**0.47**	0.02
Chlorobenzene	108-90-7	<0.02	**0.02**
1,1,1,2-Tetrachloroethane	630-20-6	<0.02	0.02
Ethylbenzene	100-41-4	<0.02	0.02
m,p-Xylene	108-38-3/106-42-3	<0.02	0.02
o-Xylene	95-47-6	<0.02	0.02
1,1,2,2-Tetrachloroethane	79-34-5	<0.02	0.02
1,3,5-Trimethylbenzene	108-67-8	<0.02	0.02
1,2,4-Trimethylbenzene	95-63-6	<0.02	0.02
1,3-Dichlorobenzene	541-73-1	<0.02	0.02
1,4-Dichlorobenzene	106-46-7	<0.02	0.02
1,2-Dichlorobenzene	95-50-1	<0.02	0.02
Undecane	1120-21-4	<0.05	0.02
Naphthalene	91-20-3	<0.05	0.05
Tridecane	629-50-5	<0.05	0.05
2-Methylnaphthalene	91-57-6	<0.05	0.05
Acenaphthylene	208-96-8	<0.05	0.05
Pentadecane	629-62-9	<0.05	0.05
Acenaphthene	83-32-9	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696600 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S34
Installation Date: 12/14/2012 1:08:00PM
Retrieval Date: 12/27/2012 10:40:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 11:34:00AM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Fluorene	86-73-7	<0.05	0.05
TPH		<0.50	0.5
BTEX		<0.02	0
Trichlorofluoromethane (TIC)	75-69-4	<0.05	0.02
Trichlorotrifluoroethane (TIC)	**76-13-1**	**2.60**	0.05
F-123 (TIC)	306-83-2	<0.05	**0.05**
F-123A (TIC)	306-83-2	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696601 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S35
Installation Date: 12/14/2012 1:52:00PM
Retrieval Date: 12/27/2012 10:51:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 1:37:00AM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Vinyl Chloride	75-01-4	<0.20	0.2
Methyl tert-butyl ether	1634-04-4	<0.02	0
1,1-Dichloroethene	75-35-4	<0.02	0.02
trans-1,2-Dichloroethene	156-60-5	<0.02	0.02
1,1-Dichloroethane	75-34-3	<0.02	0.02
cis-1,2-Dichloroethene	156-59-2	<0.02	0.02
Chloroform	67-66-3	<0.02	0.02
1,1,1-Trichloroethane	71-55-6	<0.02	0.02
1,2-Dichloroethane	107-06-2	<0.02	0.02
Benzene	71-43-2	<0.02	0.02
Carbon Tetrachloride	56-23-5	<0.02	0.02
Trichloroethene	79-01-6	0.02	0.02
1,1,2-Trichloroethane	79-00-5	<0.02	0.02
Toluene	108-88-3	<0.02	0.02
Octane	111-65-9	<0.02	0.02
Tetrachloroethene	127-18-4	<0.02	0.02
Chlorobenzene	108-90-7	<0.02	0.02
1,1,1,2-Tetrachloroethane	630-20-6	<0.02	0.02
Ethylbenzene	100-41-4	<0.02	0.02
m,p-Xylene	108-38-3/106-42-3	<0.02	0.02
o-Xylene	95-47-6	<0.02	0.02
1,1,2,2-Tetrachloroethane	79-34-5	<0.02	0.02
1,3,5-Trimethylbenzene	108-67-8	<0.02	0.02
1,2,4-Trimethylbenzene	95-63-6	<0.02	0.02
1,3-Dichlorobenzene	541-73-1	<0.02	0.02
1,4-Dichlorobenzene	106-46-7	<0.02	0.02
1,2-Dichlorobenzene	95-50-1	<0.02	0.02
Undecane	1120-21-4	<0.05	0.02
Naphthalene	91-20-3	<0.05	0.05
Tridecane	629-50-5	<0.05	0.05
2-Methylnaphthalene	91-57-6	<0.05	0.05
Acenaphthylene	208-96-8	<0.05	0.05
Pentadecane	629-62-9	<0.05	0.05
Acenaphthene	83-32-9	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696601 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S35
Installation Date: 12/14/2012 1:52:00PM
Retrieval Date: 12/27/2012 10:51:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 1:37:00AM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Fluorene	86-73-7	<0.05	0.05
TPH		<0.50	0.5
BTEX		<0.02	0
Trichlorofluoromethane (TIC)	**75-69-4**	**0.11**	0.02
Trichlorotrifluoroethane (TIC)	**76-13-1**	**0.68**	**0.05**
F-123 (TIC)	306-83-2	<0.05	**0.05**
F-123A (TIC)	306-83-2	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696601D FIELD_SAMPLE
Dilution Factor: 1
Installation Date: 12/14/2012 1:52:00PM
Retrieval Date: 12/27/2012 10:51:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS
Porosity: 0.40
Product: SPG0001
Water Filled Voids: 0.37
Date Analyzed: 1/9/2013 2:06:00AM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Vinyl Chloride	75-01-4	<0.20	0.2
Methyl tert-butyl ether	1634-04-4	<0.02	0
1,1-Dichloroethene	75-35-4	<0.02	0.02
trans-1,2-Dichloroethene	156-60-5	<0.02	0.02
1,1-Dichloroethane	75-34-3	<0.02	0.02
cis-1,2-Dichloroethene	156-59-2	<0.02	0.02
Chloroform	67-66-3	<0.02	0.02
1,1,1-Trichloroethane	71-55-6	<0.02	0.02
1,2-Dichloroethane	107-06-2	<0.02	0.02
Benzene	71-43-2	<0.02	0.02
Carbon Tetrachloride	56-23-5	<0.02	0.02
Trichloroethene	**79-01-6**	**0.03**	0.02
1,1,2-Trichloroethane	79-00-5	<0.02	**0.02**
Toluene	108-88-3	<0.02	0.02
Octane	111-65-9	<0.02	0.02
Tetrachloroethene	127-18-4	<0.02	0.02
Chlorobenzene	108-90-7	<0.02	0.02
1,1,1,2-Tetrachloroethane	630-20-6	<0.02	0.02
Ethylbenzene	100-41-4	<0.02	0.02
m,p-Xylene	108-38-3/106-42-3	<0.02	0.02
o-Xylene	95-47-6	<0.02	0.02
1,1,2,2-Tetrachloroethane	79-34-5	<0.02	0.02
1,3,5-Trimethylbenzene	108-67-8	<0.02	0.02
1,2,4-Trimethylbenzene	95-63-6	<0.02	0.02
1,3-Dichlorobenzene	541-73-1	<0.02	0.02
1,4-Dichlorobenzene	106-46-7	<0.02	0.02
1,2-Dichlorobenzene	95-50-1	<0.02	0.02
Undecane	1120-21-4	<0.05	0.02
Naphthalene	91-20-3	<0.05	0.05
Tridecane	629-50-5	<0.05	0.05
2-Methylnaphthalene	91-57-6	<0.05	0.05
Acenaphthylene	208-96-8	<0.05	0.05
Pentadecane	629-62-9	<0.05	0.05
Acenaphthene	83-32-9	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696601D FIELD_SAMPLE
Dilution Factor: 1
Installation Date: 12/14/2012 1:52:00PM
Retrieval Date: 12/27/2012 10:51:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS
Porosity: 0.40
Product: SPG0001
Water Filled Voids: 0.37
Date Analyzed: 1/9/2013 2:06:00AM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Fluorene	86-73-7	<0.05	0.05
TPH		<0.50	0.5
BTEX		<0.02	0
Trichlorofluoromethane (TIC)	**75-69-4**	**0.13**	0.02
Trichlorotrifluoroethane (TIC)	**76-13-1**	**0.61**	**0.05**
F-123 (TIC)	306-83-2	<0.05	**0.05**
F-123A (TIC)	306-83-2	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696602 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S36
Installation Date: 12/14/2012 1:41:00PM
Retrieval Date: 12/27/2012 10:43:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/8/2013 6:31:00PM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Vinyl Chloride	75-01-4	<0.20	0.2
Methyl tert-butyl ether	1634-04-4	<0.02	0
1,1-Dichloroethene	75-35-4	<0.02	0.02
trans-1,2-Dichloroethene	156-60-5	<0.02	0.02
1,1-Dichloroethane	75-34-3	<0.02	0.02
cis-1,2-Dichloroethene	156-59-2	<0.02	0.02
Chloroform	67-66-3	<0.02	0.02
1,1,1-Trichloroethane	71-55-6	<0.02	0.02
1,2-Dichloroethane	107-06-2	<0.02	0.02
Benzene	71-43-2	<0.02	0.02
Carbon Tetrachloride	56-23-5	<0.02	0.02
Trichloroethene	**79-01-6**	**0.69**	0.02
1,1,2-Trichloroethane	79-00-5	<0.02	**0.02**
Toluene	108-88-3	<0.02	0.02
Octane	111-65-9	<0.02	0.02
Tetrachloroethene	**127-18-4**	**0.10**	0.02
Chlorobenzene	108-90-7	<0.02	**0.02**
1,1,1,2-Tetrachloroethane	630-20-6	<0.02	0.02
Ethylbenzene	100-41-4	<0.02	0.02
m,p-Xylene	108-38-3/106-42-3	<0.02	0.02
o-Xylene	95-47-6	<0.02	0.02
1,1,2,2-Tetrachloroethane	79-34-5	<0.02	0.02
1,3,5-Trimethylbenzene	108-67-8	<0.02	0.02
1,2,4-Trimethylbenzene	95-63-6	<0.02	0.02
1,3-Dichlorobenzene	541-73-1	<0.02	0.02
1,4-Dichlorobenzene	106-46-7	<0.02	0.02
1,2-Dichlorobenzene	95-50-1	<0.02	0.02
Undecane	1120-21-4	<0.05	0.02
Naphthalene	91-20-3	<0.05	0.05
Tridecane	629-50-5	<0.05	0.05
2-Methylnaphthalene	91-57-6	<0.05	0.05
Acenaphthylene	208-96-8	<0.05	0.05
Pentadecane	629-62-9	<0.05	0.05
Acenaphthene	83-32-9	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696602 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S36
Installation Date: 12/14/2012 1:41:00PM
Retrieval Date: 12/27/2012 10:43:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/8/2013 6:31:00PM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Fluorene	86-73-7	<0.05	0.05
TPH		**0.54**	**0.50**
BTEX		<0.02	0.02
Trichlorofluoromethane (TIC)	**75-69-4**	**0.30**	**0.05**
Trichlorotrifluoroethane (TIC)	**76-13-1**	**5.76**	**0.05**
F-123 (TIC)	306-83-2	<0.05	0.05
F-123A (TIC)	306-83-2	<0.05	0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696603 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S37
Installation Date: 12/14/2012 1:43:00PM
Retrieval Date: 12/27/2012 10:45:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 4:56:00AM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Vinyl Chloride	75-01-4	<0.20	0.2
Methyl tert-butyl ether	1634-04-4	<0.02	0
1,1-Dichloroethene	75-35-4	<0.02	0.02
trans-1,2-Dichloroethene	156-60-5	<0.02	0.02
1,1-Dichloroethane	75-34-3	<0.02	0.02
cis-1,2-Dichloroethene	156-59-2	<0.02	0.02
Chloroform	67-66-3	<0.02	0.02
1,1,1-Trichloroethane	71-55-6	<0.02	0.02
1,2-Dichloroethane	107-06-2	<0.02	0.02
Benzene	71-43-2	<0.02	0.02
Carbon Tetrachloride	**56-23-5**	**0.02**	0.02
Trichloroethene	**79-01-6**	**2.84**	**0.02**
1,1,2-Trichloroethane	79-00-5	<0.02	**0.02**
Toluene	108-88-3	<0.02	0.02
Octane	111-65-9	<0.02	0.02
Tetrachloroethene	**127-18-4**	**0.41**	0.02
Chlorobenzene	108-90-7	<0.02	**0.02**
1,1,1,2-Tetrachloroethane	630-20-6	<0.02	0.02
Ethylbenzene	100-41-4	<0.02	0.02
m,p-Xylene	108-38-3/106-42-3	<0.02	0.02
o-Xylene	95-47-6	<0.02	0.02
1,1,2,2-Tetrachloroethane	79-34-5	<0.02	0.02
1,3,5-Trimethylbenzene	108-67-8	<0.02	0.02
1,2,4-Trimethylbenzene	95-63-6	<0.02	0.02
1,3-Dichlorobenzene	541-73-1	<0.02	0.02
1,4-Dichlorobenzene	106-46-7	<0.02	0.02
1,2-Dichlorobenzene	95-50-1	<0.02	0.02
Undecane	1120-21-4	<0.05	0.02
Naphthalene	91-20-3	<0.05	0.05
Tridecane	629-50-5	<0.05	0.05
2-Methylnaphthalene	91-57-6	<0.05	0.05
Acenaphthylene	208-96-8	<0.05	0.05
Pentadecane	629-62-9	<0.05	0.05
Acenaphthene	83-32-9	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696603 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S37
Installation Date: 12/14/2012 1:43:00PM
Retrieval Date: 12/27/2012 10:45:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/9/2013 4:56:00AM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Fluorene	86-73-7	<0.05	0.05
TPH		<0.50	0.5
BTEX		<0.02	0
Trichlorofluoromethane (TIC)	**75-69-4**	**0.53**	0.02
Trichlorotrifluoroethane (TIC)	**76-13-1**	**11.77**	**0.05**
F-123 (TIC)	306-83-2	<0.05	**0.05**
F-123A (TIC)	306-83-2	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696604 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S38
Installation Date: 12/14/2012 1:50:00PM
Retrieval Date: 12/27/2012 10:47:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/8/2013 5:06:00PM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Vinyl Chloride	75-01-4	<0.20	0.2
Methyl tert-butyl ether	1634-04-4	<0.02	0
1,1-Dichloroethene	75-35-4	<0.02	0.02
trans-1,2-Dichloroethene	156-60-5	<0.02	0.02
1,1-Dichloroethane	75-34-3	<0.02	0.02
cis-1,2-Dichloroethene	156-59-2	<0.02	0.02
Chloroform	67-66-3	<0.02	0.02
1,1,1-Trichloroethane	71-55-6	<0.02	0.02
1,2-Dichloroethane	107-06-2	<0.02	0.02
Benzene	**71-43-2**	**0.03**	0.02
Carbon Tetrachloride	**56-23-5**	**0.03**	**0.02**
Trichloroethene	**79-01-6**	**1.04**	**0.02**
1,1,2-Trichloroethane	79-00-5	<0.02	**0.02**
Toluene	108-88-3	<0.02	0.02
Octane	111-65-9	<0.02	0.02
Tetrachloroethene	**127-18-4**	**0.10**	0.02
Chlorobenzene	108-90-7	<0.02	**0.02**
1,1,1,2-Tetrachloroethane	630-20-6	<0.02	0.02
Ethylbenzene	100-41-4	<0.02	0.02
m,p-Xylene	108-38-3/106-42-3	<0.02	0.02
o-Xylene	95-47-6	<0.02	0.02
1,1,2,2-Tetrachloroethane	79-34-5	<0.02	0.02
1,3,5-Trimethylbenzene	108-67-8	<0.02	0.02
1,2,4-Trimethylbenzene	95-63-6	<0.02	0.02
1,3-Dichlorobenzene	541-73-1	<0.02	0.02
1,4-Dichlorobenzene	106-46-7	<0.02	0.02
1,2-Dichlorobenzene	95-50-1	<0.02	0.02
Undecane	1120-21-4	<0.05	0.02
Naphthalene	91-20-3	<0.05	0.05
Tridecane	629-50-5	<0.05	0.05
2-Methylnaphthalene	91-57-6	<0.05	0.05
Acenaphthylene	208-96-8	<0.05	0.05
Pentadecane	629-62-9	<0.05	0.05
Acenaphthene	83-32-9	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696604 FIELD_SAMPLE
Dilution Factor: 1 Field ID: S38
Installation Date: 12/14/2012 1:50:00PM
Retrieval Date: 12/27/2012 10:47:00AM
Analyst: Fatima Niazi **Method: SPG-WI-0292**
Reviewer:

Matrix: SOIL GAS Product: SPG0001
Porosity: 0.38 Water Filled Voids: 0.14
Date Analyzed: 1/8/2013 5:06:00PM
Batch: ENV-130107-2
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Fluorene	86-73-7	<0.05	0.05
TPH		<0.50	0.5
BTEX		**0.03**	0
Trichlorofluoromethane (TIC)	75-69-4	<0.05	**0.02**
Trichlorotrifluoroethane (TIC)	**76-13-1**	**0.32**	0.05
F-123 (TIC)	306-83-2	<0.05	**0.05**
F-123A (TIC)	306-83-2	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696605 TRIP_BLANK
Dilution Factor: 1 Field ID: TB17

Matrix: SOIL GAS Product: SPG0001
Porosity: Water Filled Voids:

Date Analyzed: 1/8/2013 11:15:00PM

Analyst: Fatima Niazi **Method: SPG-WI-0292** **Batch: ENV-130107-2**
Reviewer:
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Vinyl Chloride	75-01-4	<0.20	0.2
Methyl tert-butyl ether	1634-04-4	<0.02	0
1,1-Dichloroethene	75-35-4	<0.02	0.02
trans-1,2-Dichloroethene	156-60-5	<0.02	0.02
1,1-Dichloroethane	75-34-3	<0.02	0.02
cis-1,2-Dichloroethene	156-59-2	<0.02	0.02
Chloroform	67-66-3	<0.02	0.02
1,1,1-Trichloroethane	71-55-6	<0.02	0.02
1,2-Dichloroethane	107-06-2	<0.02	0.02
Benzene	71-43-2	<0.02	0.02
Carbon Tetrachloride	56-23-5	<0.02	0.02
Trichloroethene	79-01-6	<0.02	0.02
1,1,2-Trichloroethane	79-00-5	<0.02	0.02
Toluene	108-88-3	<0.02	0.02
Octane	111-65-9	<0.02	0.02
Tetrachloroethene	127-18-4	<0.02	0.02
Chlorobenzene	108-90-7	<0.02	0.02
1,1,1,2-Tetrachloroethane	630-20-6	<0.02	0.02
Ethylbenzene	100-41-4	<0.02	0.02
m,p-Xylene	108-38-3/106-42-3	<0.02	0.02
o-Xylene	95-47-6	<0.02	0.02
1,1,2,2-Tetrachloroethane	79-34-5	<0.02	0.02
1,3,5-Trimethylbenzene	108-67-8	<0.02	0.02
1,2,4-Trimethylbenzene	95-63-6	<0.02	0.02
1,3-Dichlorobenzene	541-73-1	<0.02	0.02
1,4-Dichlorobenzene	106-46-7	<0.02	0.02
1,2-Dichlorobenzene	95-50-1	<0.02	0.02
Undecane	1120-21-4	<0.05	0.02
Naphthalene	91-20-3	<0.05	0.05
Tridecane	629-50-5	<0.05	0.05
2-Methylnaphthalene	91-57-6	<0.05	0.05
Acenaphthylene	208-96-8	<0.05	0.05
Pentadecane	629-62-9	<0.05	0.05
Acenaphthene	83-32-9	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696605 TRIP_BLANK
Dilution Factor: 1 Field ID: TB17

Matrix: SOIL GAS Product: SPG0001
Porosity: Water Filled Voids:

Date Analyzed: 1/8/2013 11:15:00PM

Analyst: Fatima Niazi **Method: SPG-WI-0292** **Batch: ENV-130107-2**
Reviewer:
TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Fluorene	86-73-7	<0.05	0.05
TPH		<0.50	0.5
BTEX		<0.02	0
Trichlorofluoromethane (TIC)	75-69-4	<0.05	0.02
Trichlorotrifluoroethane (TIC)	76-13-1	<0.05	0.05
F-123 (TIC)	306-83-2	<0.05	0.05
F-123A (TIC)	306-83-2	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696606 TRIP_BLANK
Dilution Factor: 1 Field ID: TB18

Matrix: SOIL GAS Product: SPG0001
Porosity: Water Filled Voids:

Date Analyzed: 1/9/2013 5:51:00PM

Analyst: Fatima Niazi **Method: SPG-WI-0292** **Batch: ENV-130107-2**
Reviewer:

TICs: F-123, F-123A, F-11, F-113

Compound	CAS #	Result (ug)	RL (ug)
Vinyl Chloride	75-01-4	<0.20	0.2
Methyl tert-butyl ether	1634-04-4	<0.02	0
1,1-Dichloroethene	75-35-4	<0.02	0.02
trans-1,2-Dichloroethene	156-60-5	<0.02	0.02
1,1-Dichloroethane	75-34-3	<0.02	0.02
cis-1,2-Dichloroethene	156-59-2	<0.02	0.02
Chloroform	67-66-3	<0.02	0.02
1,1,1-Trichloroethane	71-55-6	<0.02	0.02
1,2-Dichloroethane	107-06-2	<0.02	0.02
Benzene	71-43-2	<0.02	0.02
Carbon Tetrachloride	56-23-5	<0.02	0.02
Trichloroethene	79-01-6	<0.02	0.02
1,1,2-Trichloroethane	79-00-5	<0.02	0.02
Toluene	108-88-3	<0.02	0.02
Octane	111-65-9	<0.02	0.02
Tetrachloroethene	127-18-4	<0.02	0.02
Chlorobenzene	108-90-7	<0.02	0.02
1,1,1,2-Tetrachloroethane	630-20-6	<0.02	0.02
Ethylbenzene	100-41-4	<0.02	0.02
m,p-Xylene	108-38-3/106-42-3	<0.02	0.02
o-Xylene	95-47-6	<0.02	0.02
1,1,2,2-Tetrachloroethane	79-34-5	<0.02	0.02
1,3,5-Trimethylbenzene	108-67-8	<0.02	0.02
1,2,4-Trimethylbenzene	95-63-6	<0.02	0.02
1,3-Dichlorobenzene	541-73-1	<0.02	0.02
1,4-Dichlorobenzene	106-46-7	<0.02	0.02
1,2-Dichlorobenzene	95-50-1	<0.02	0.02
Undecane	1120-21-4	<0.05	0.02
Naphthalene	91-20-3	<0.05	0.05
Tridecane	629-50-5	<0.05	0.05
2-Methylnaphthalene	91-57-6	<0.05	0.05
Acenaphthylene	208-96-8	<0.05	0.05
Pentadecane	629-62-9	<0.05	0.05
Acenaphthene	83-32-9	<0.05	0.05
			0.05

© 2013 W. L. Gore & Associates, Inc.

GORE SURVEY PRODUCTS GROUP
100 CHESAPEAKE BOULEVARD ELKTON MARYLAND USA
+1 410 392 7600 ENVIRONMENTAL@WLGORE.COM

PROJECT NUMBER: ENV 21815026
SITE NAME: WSTF-NASA
SITE ADDRESS: NM

FOR: NAVARRO RESEARCH AND ENGINEERING INC
OAK RIDGE, TN 37830
USA

MODULE ID: 00696606 TRIP_BLANK
Dilution Factor: 1 Field ID: TB18

Matrix: SOIL GAS Product: SPG0001
Porosity: Water Filled Voids:

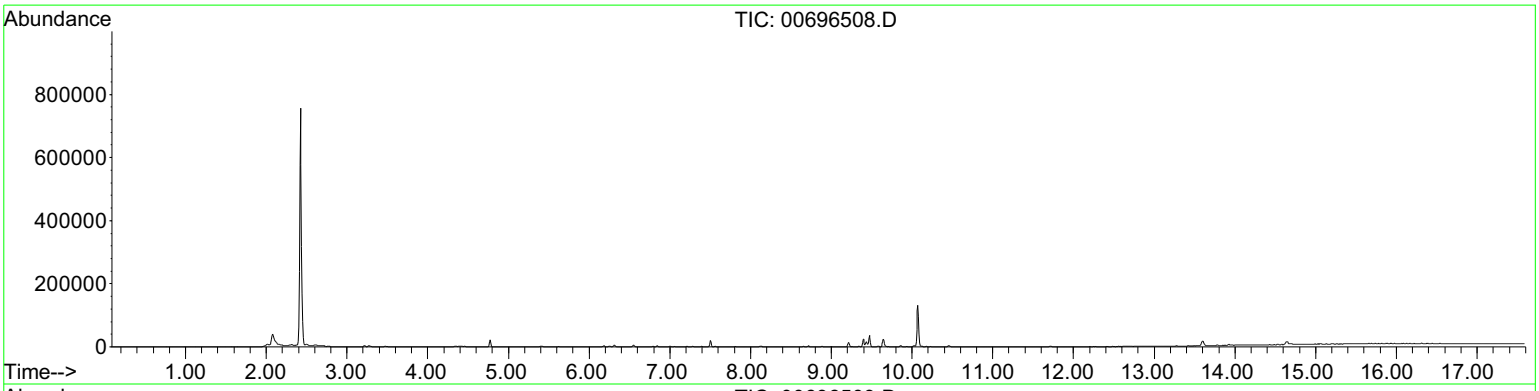
Date Analyzed: 1/9/2013 5:51:00PM

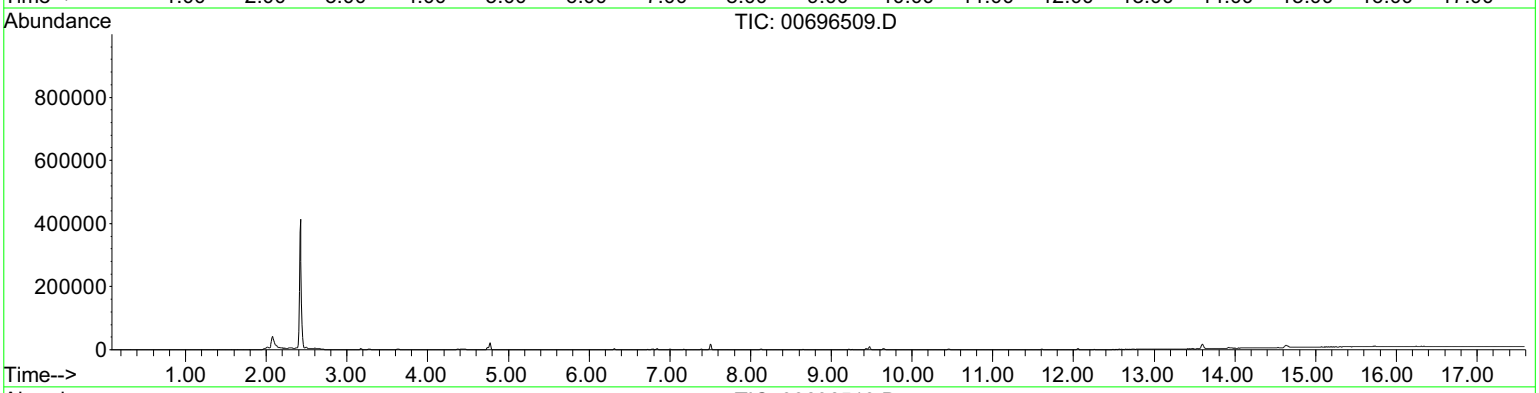
Analyst: Fatima Niazi **Method: SPG-WI-0292** **Batch: ENV-130107-2**
Reviewer:
TICs: F-123, F-123A, F-11, F-113

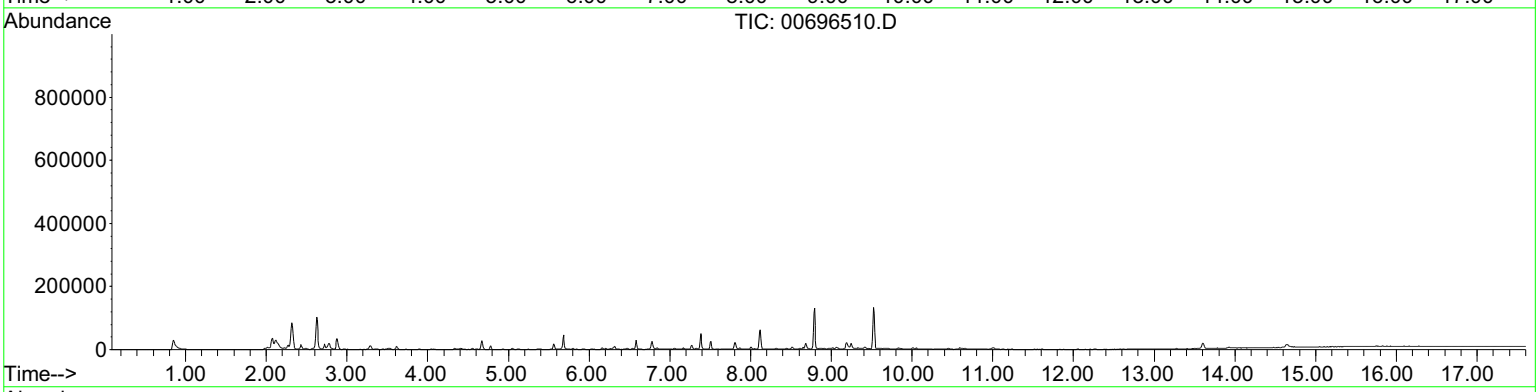
Compound	CAS #	Result (ug)	RL (ug)
Fluorene	86-73-7	<0.05	0.05
TPH		<0.50	0.5
BTEX		<0.02	0
Trichlorofluoromethane (TIC)	75-69-4	<0.05	0.02
Trichlorotrifluoroethane (TIC)	76-13-1	<0.05	0.05
F-123 (TIC)	306-83-2	<0.05	0.05
F-123A (TIC)	306-83-2	<0.05	0.05
			0.05

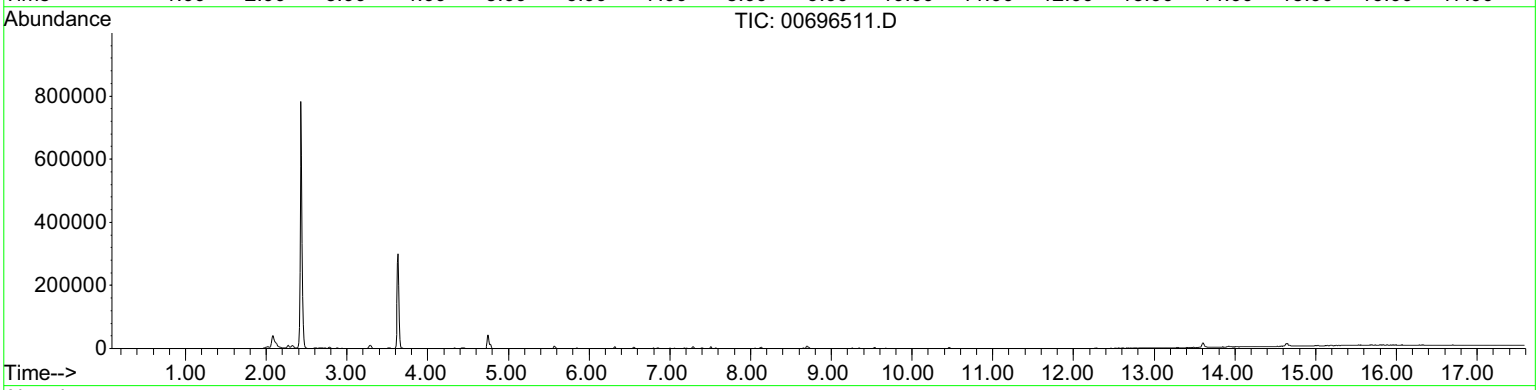
© 2013 W. L. Gore & Associates, Inc.

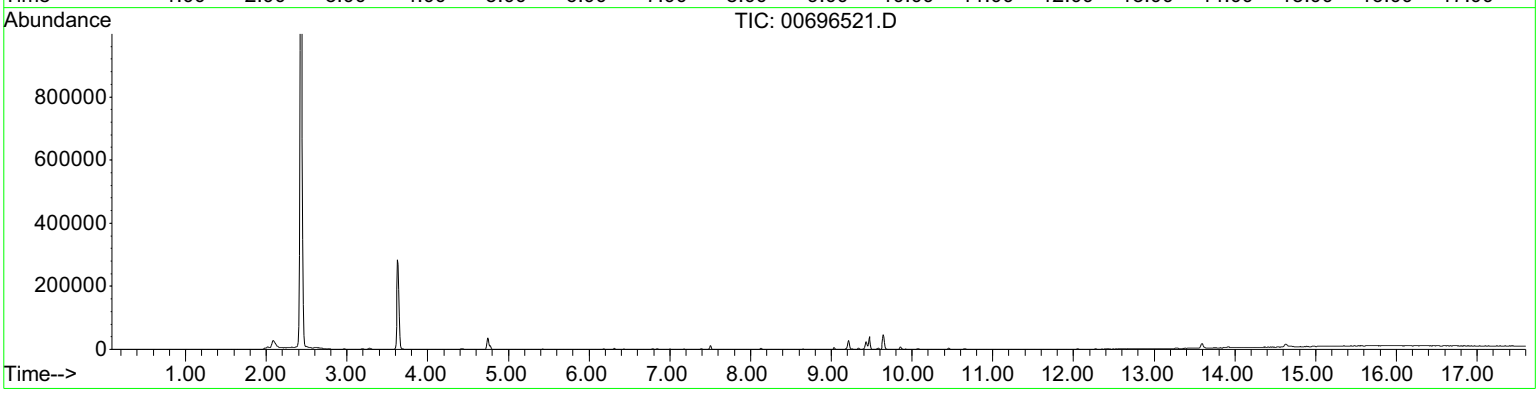
TICS - 21815026
IN NUMERICAL ORDER



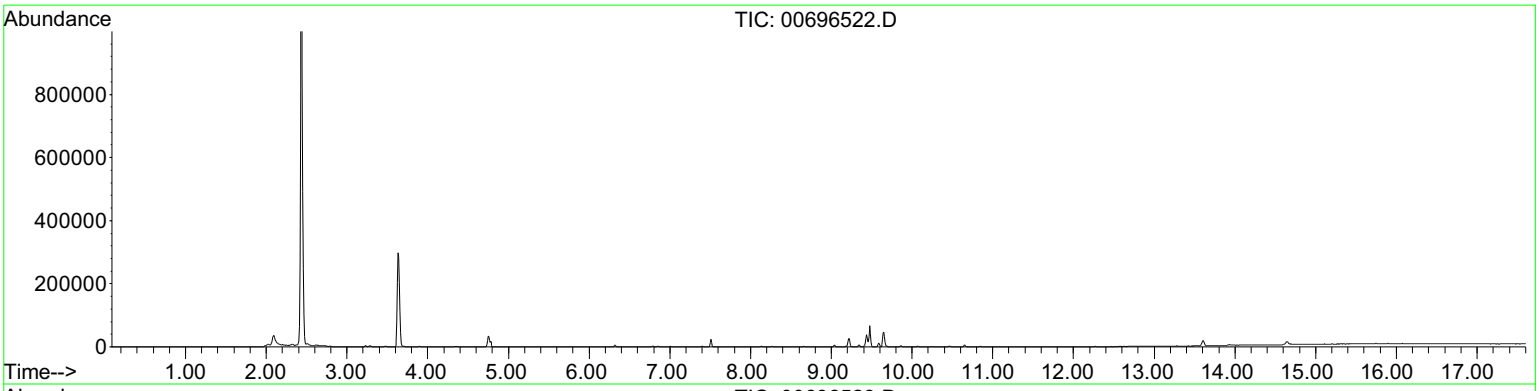


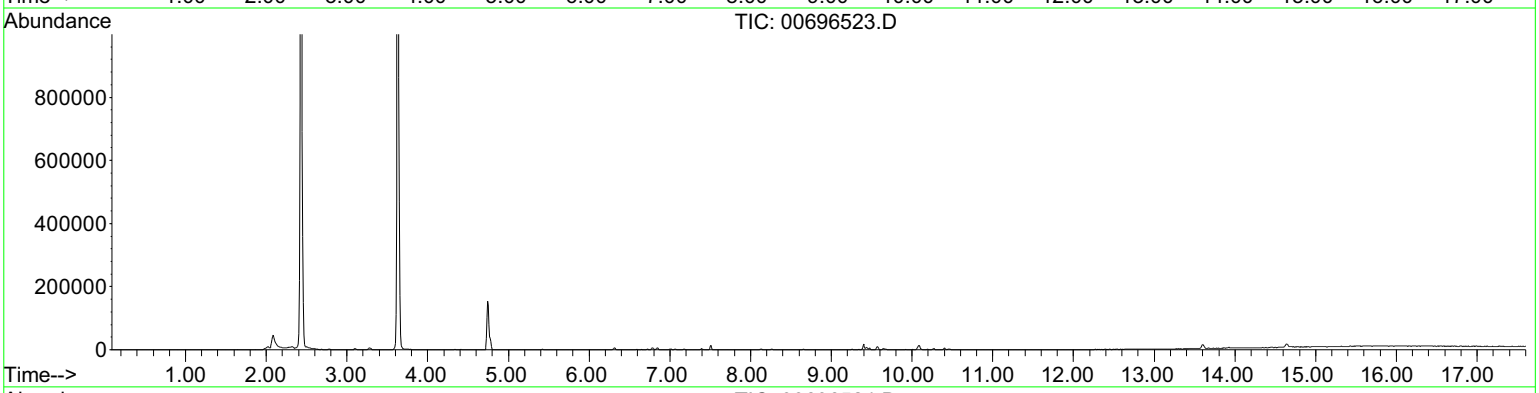


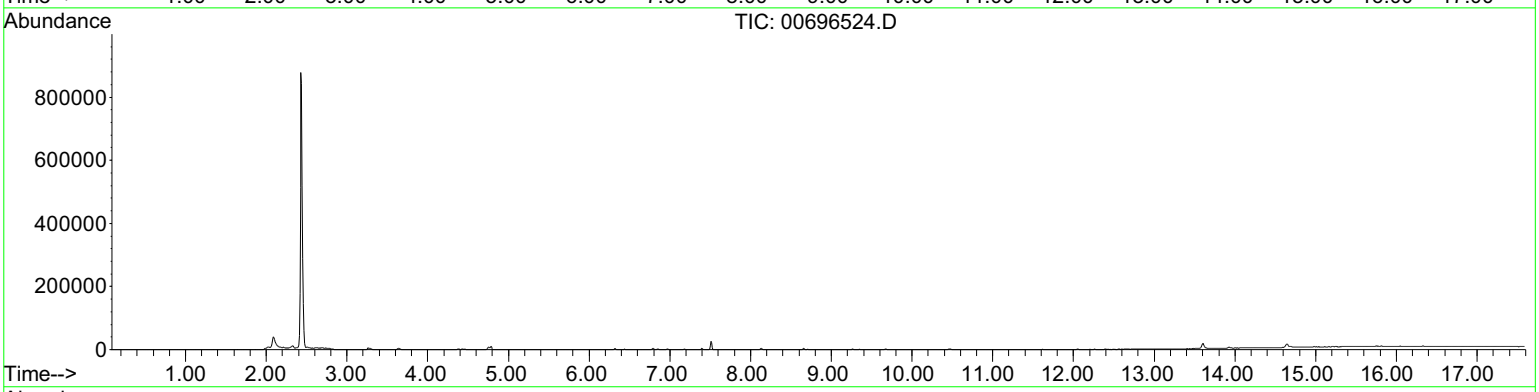


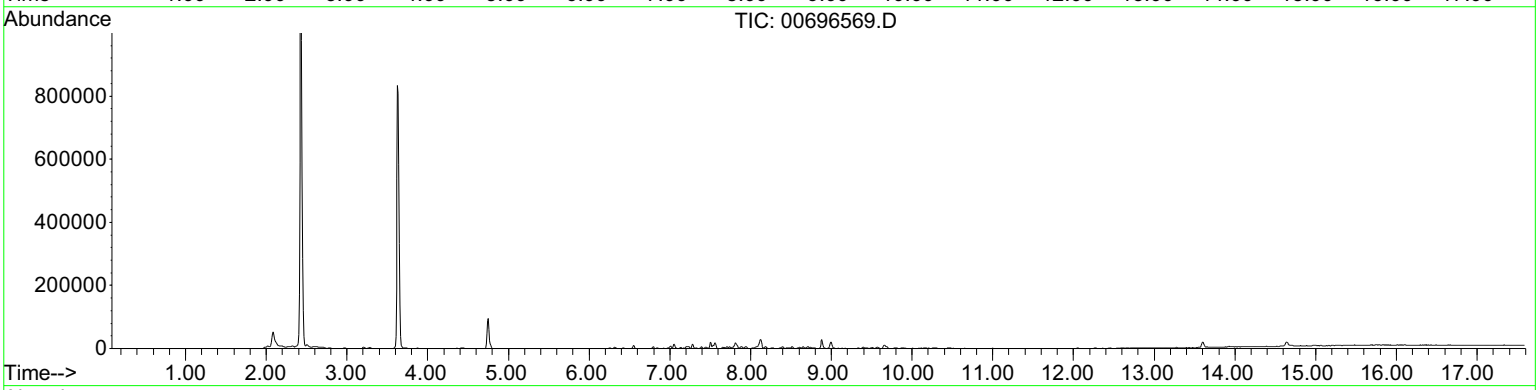


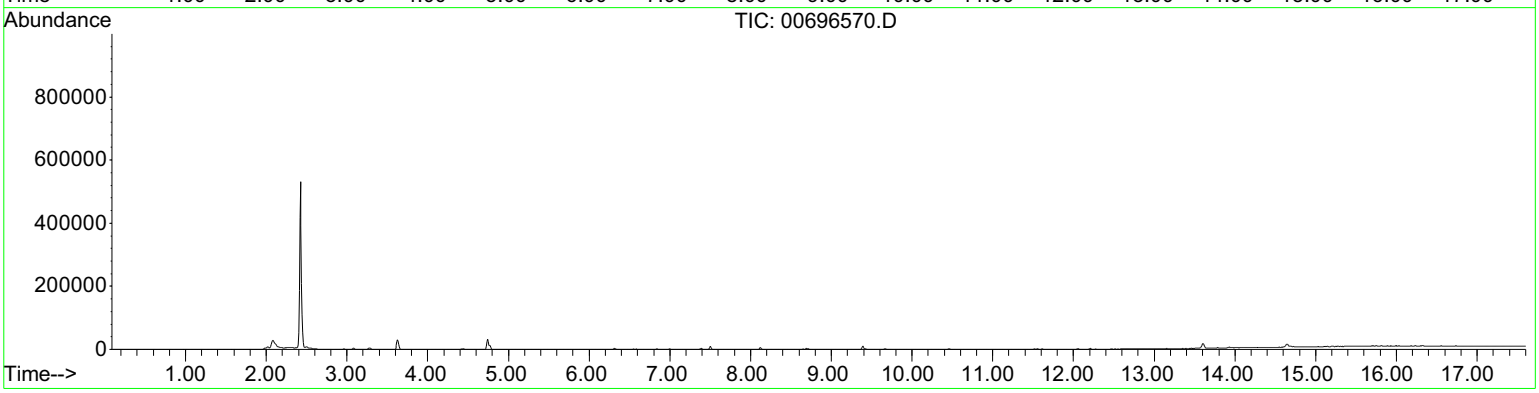
TICS - 21815026
IN NUMERICAL ORDER



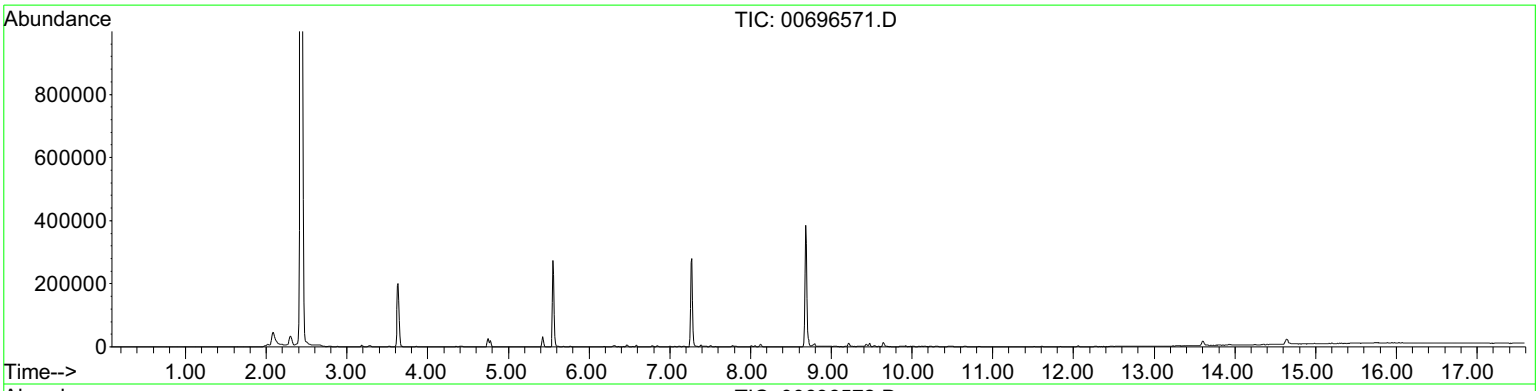


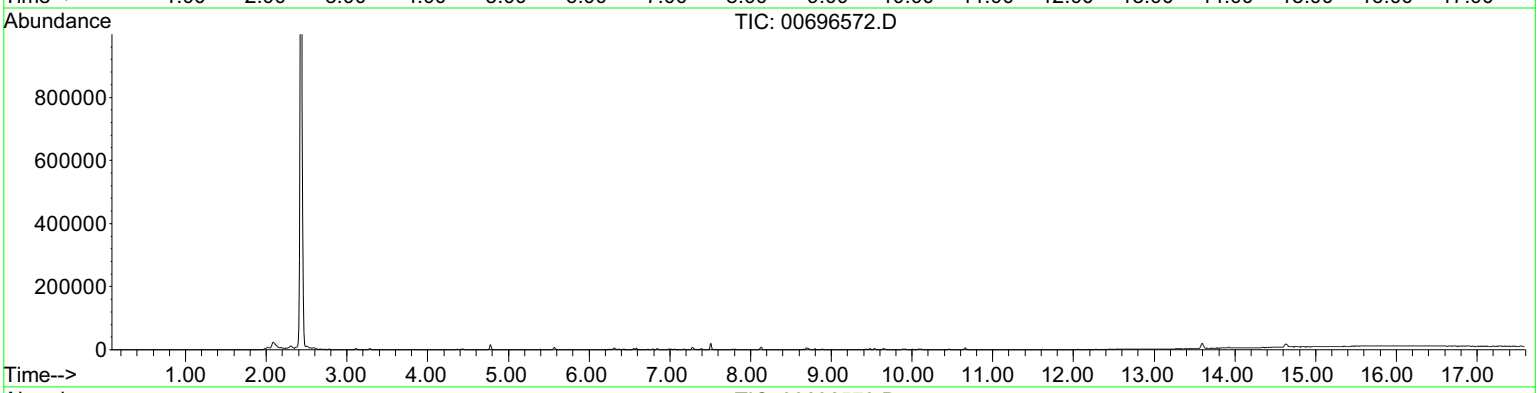


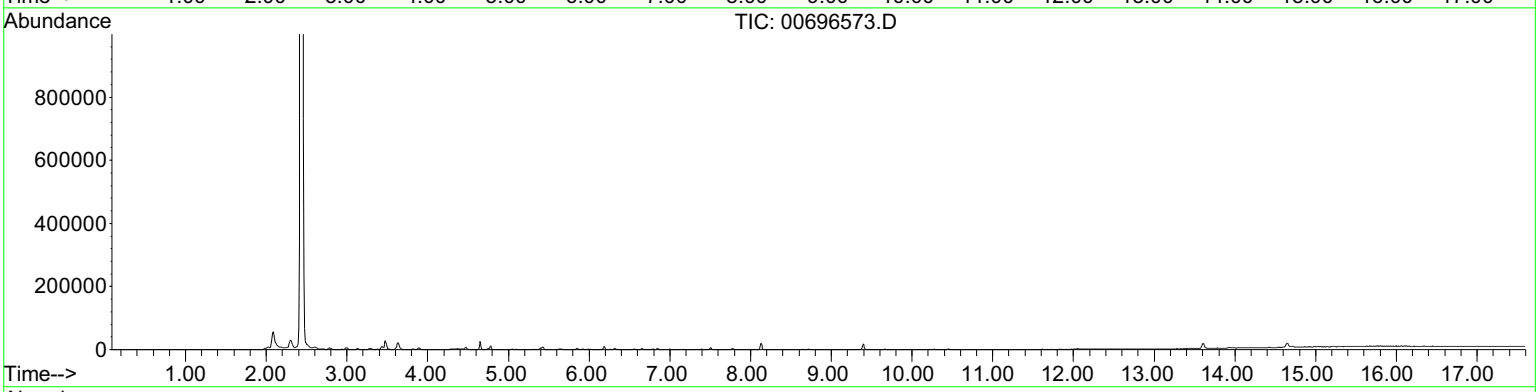


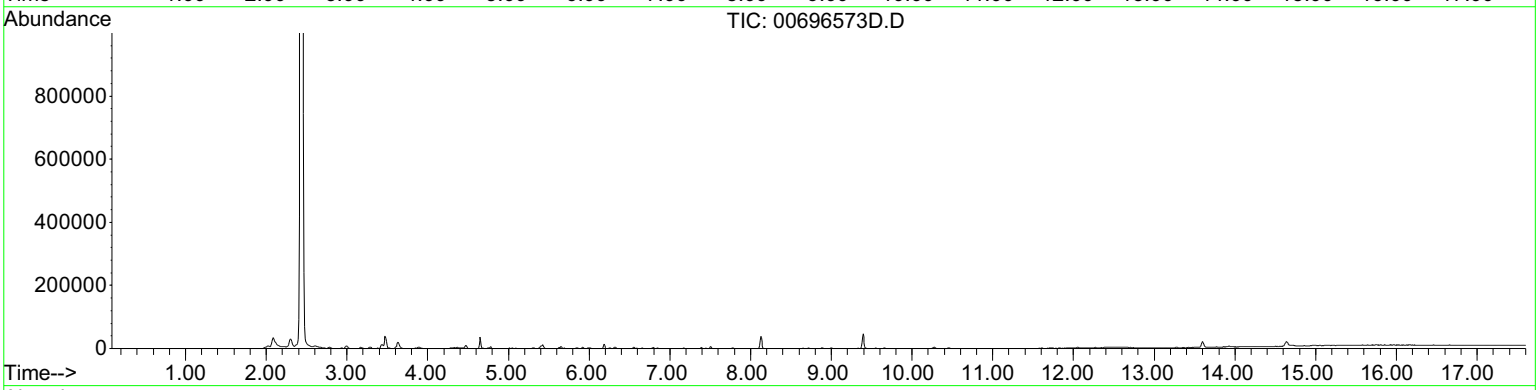


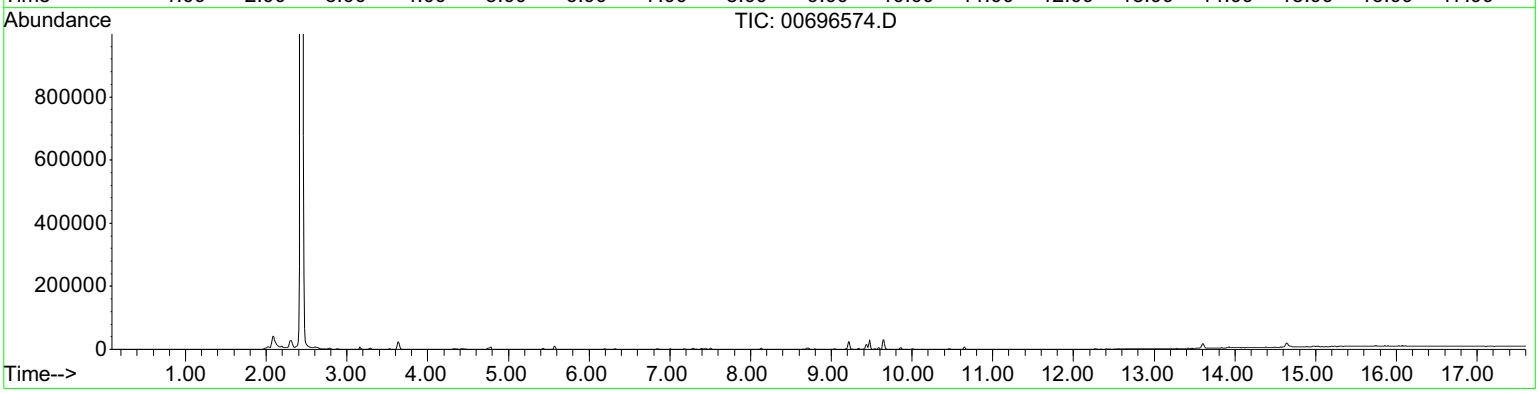
TICS - 21815026
IN NUMERICAL ORDER



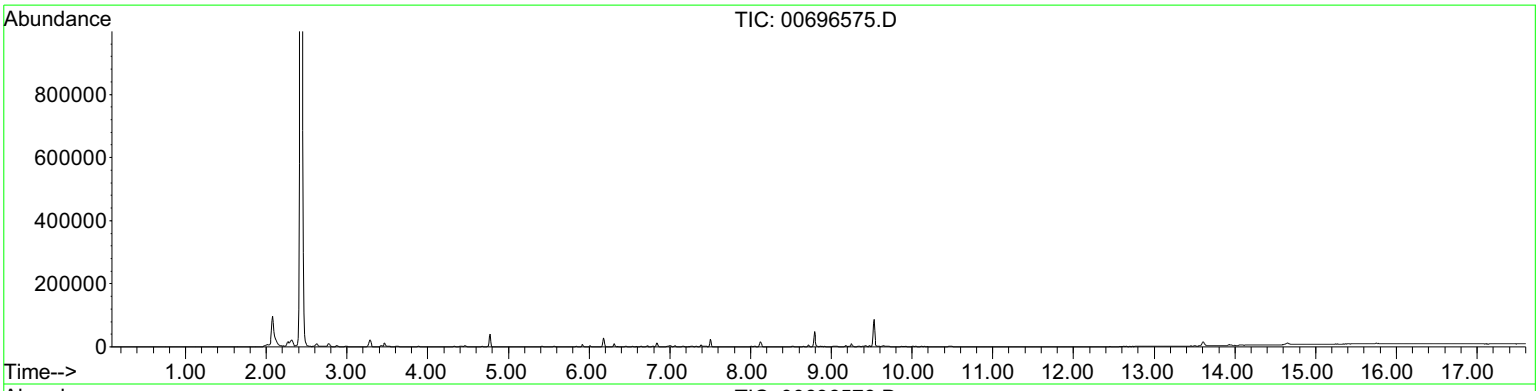


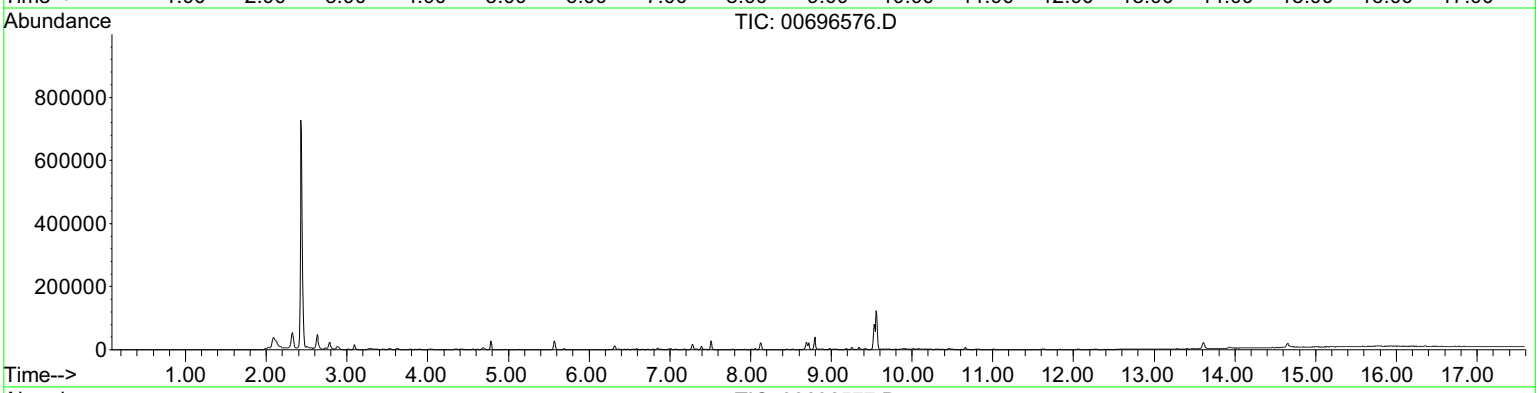


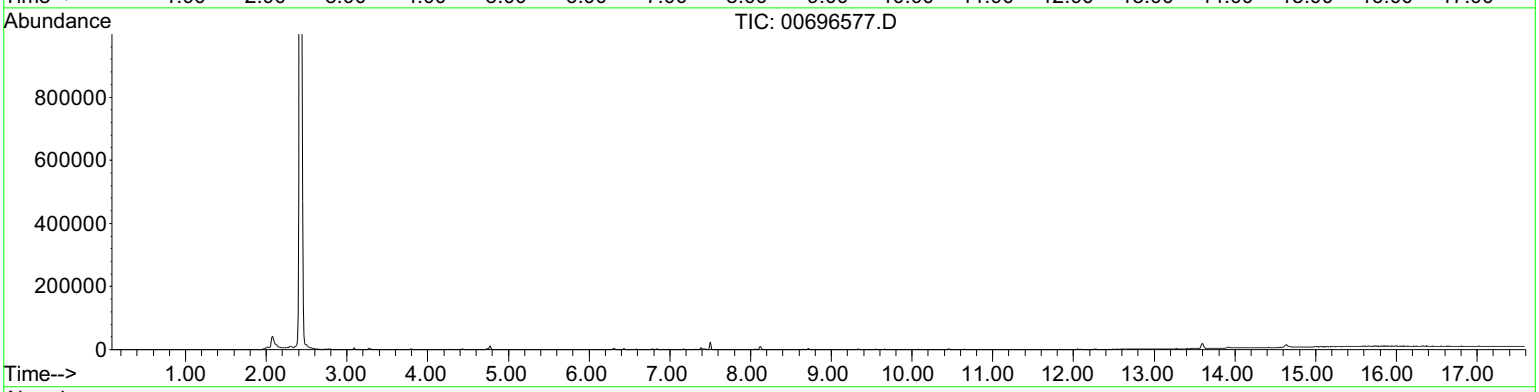


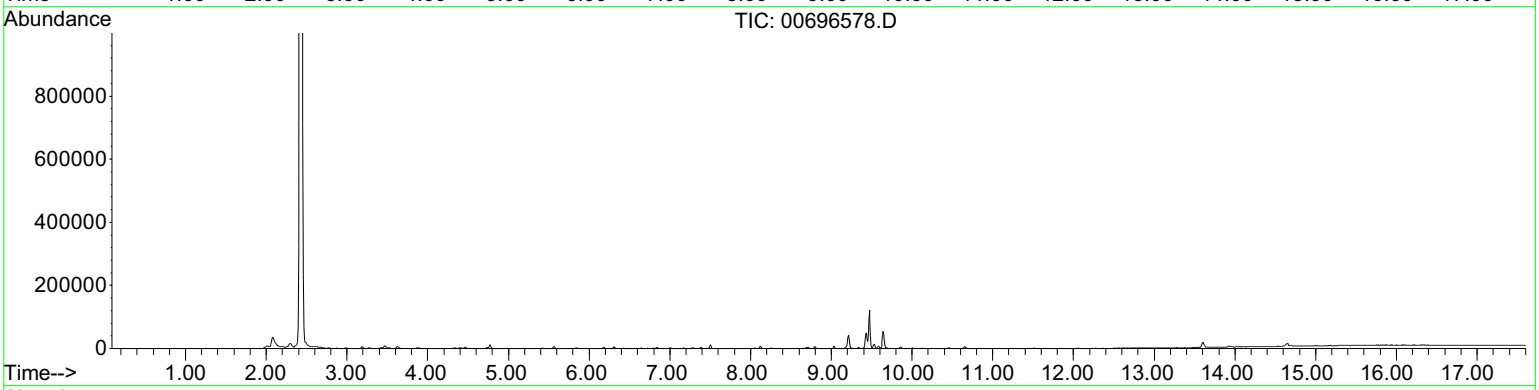


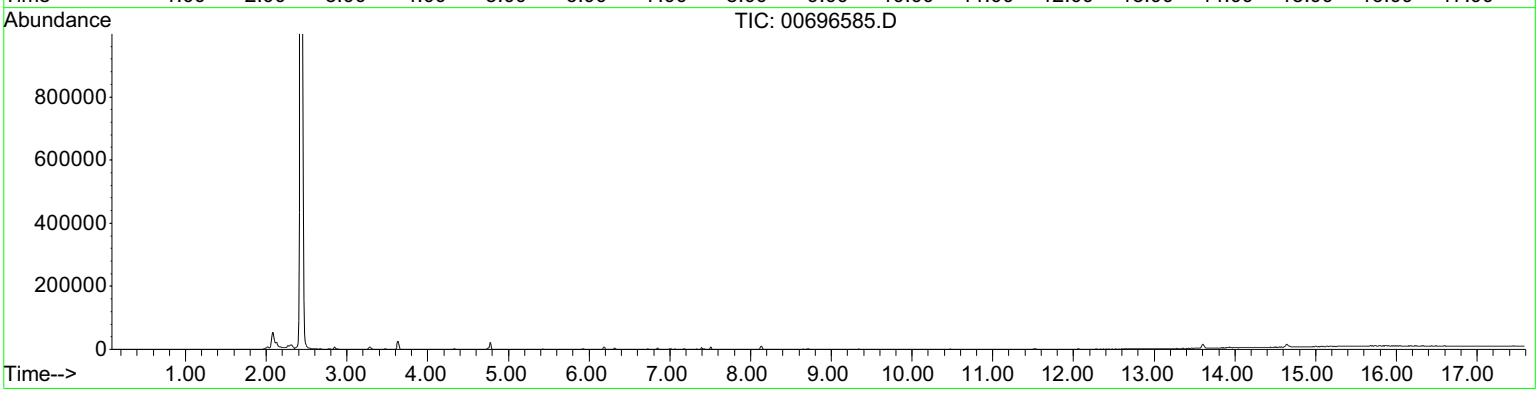
TICS - 21815026
IN NUMERICAL ORDER



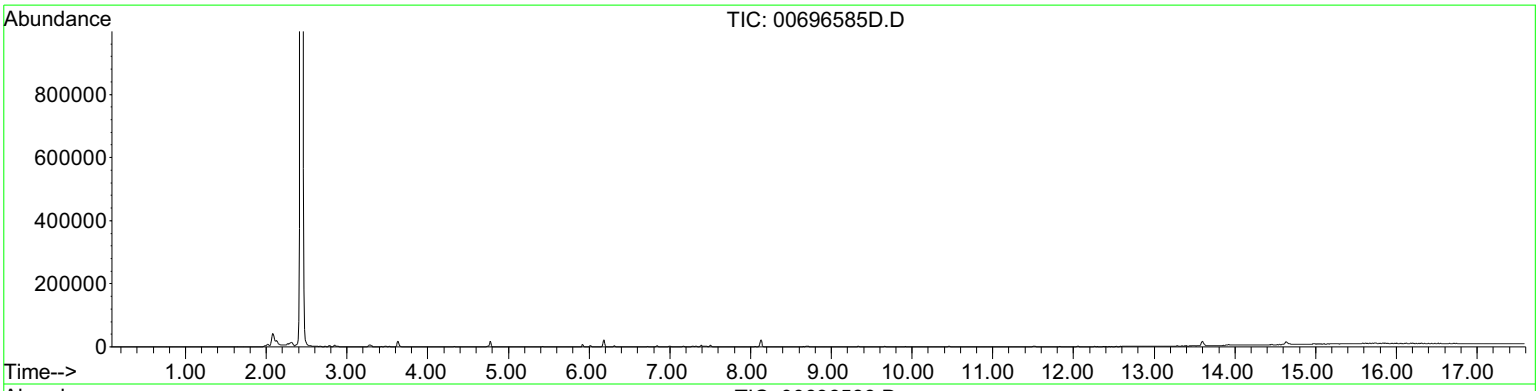


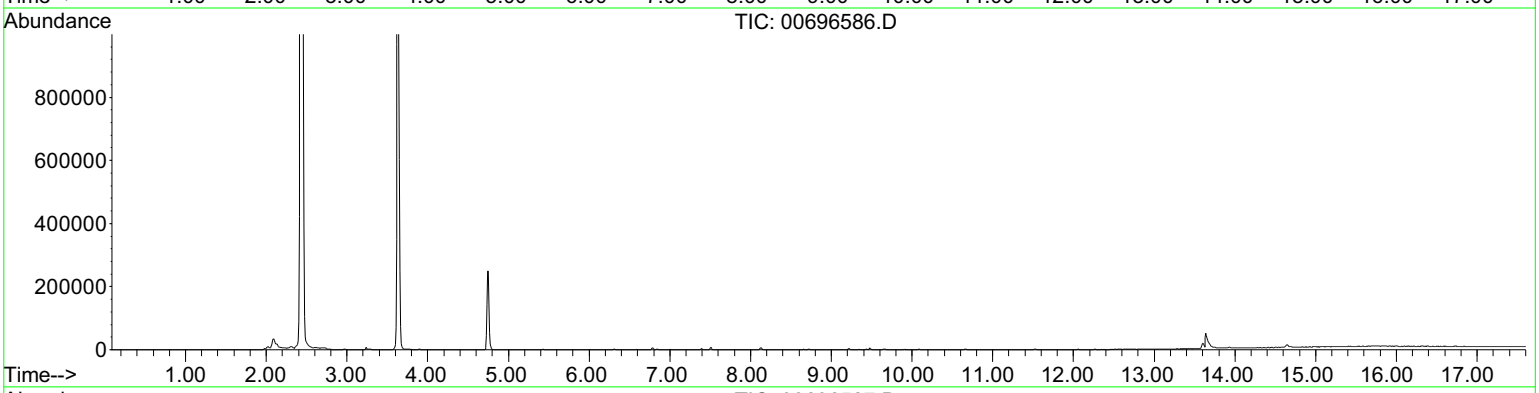


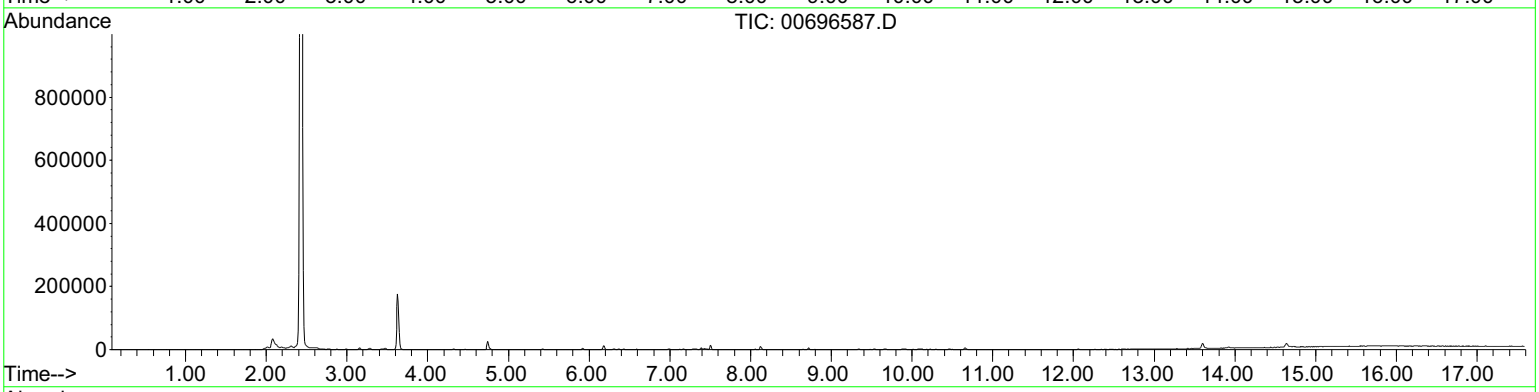


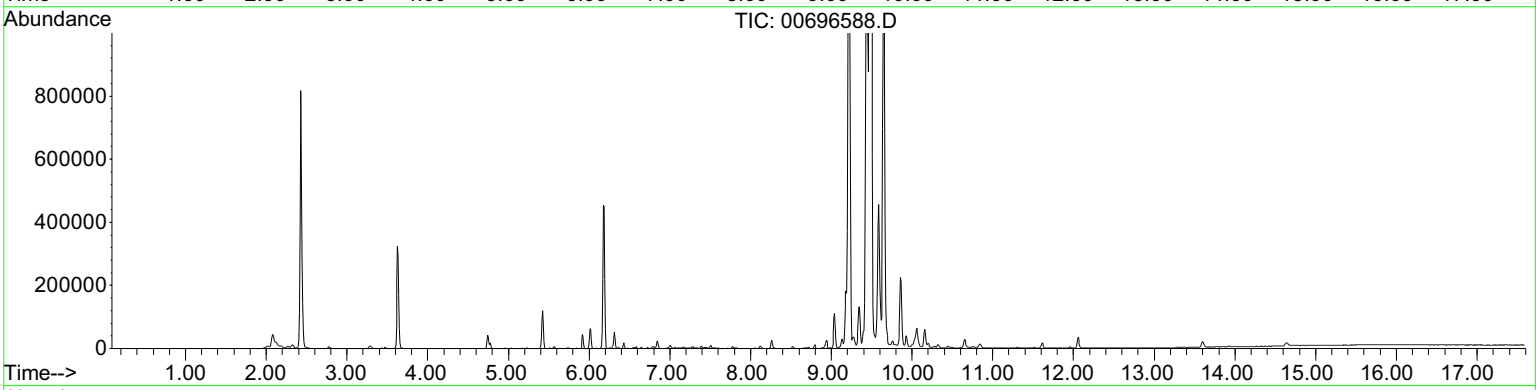


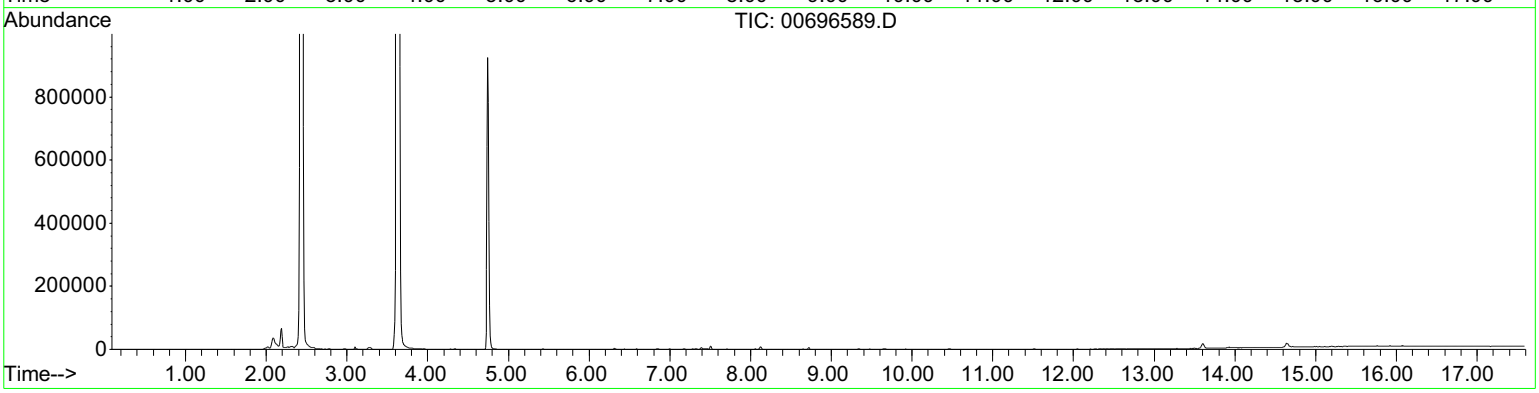
TICS - 21815026
IN NUMERICAL ORDER



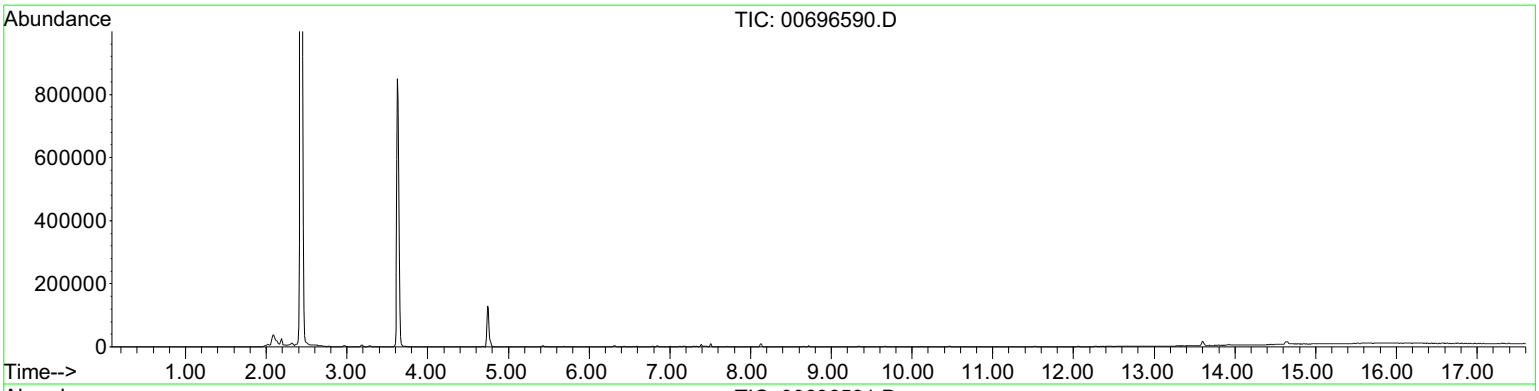


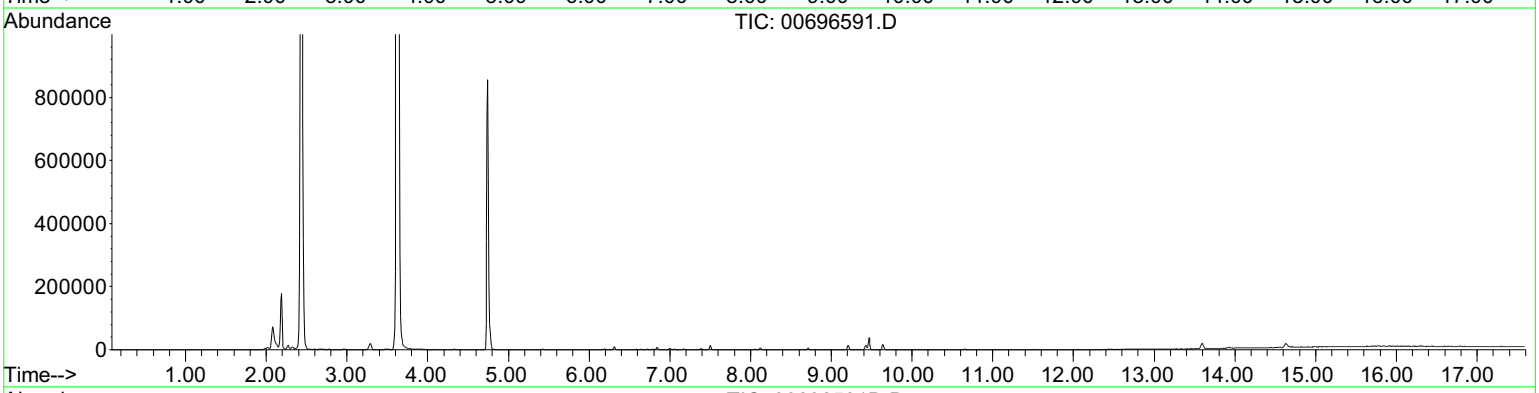


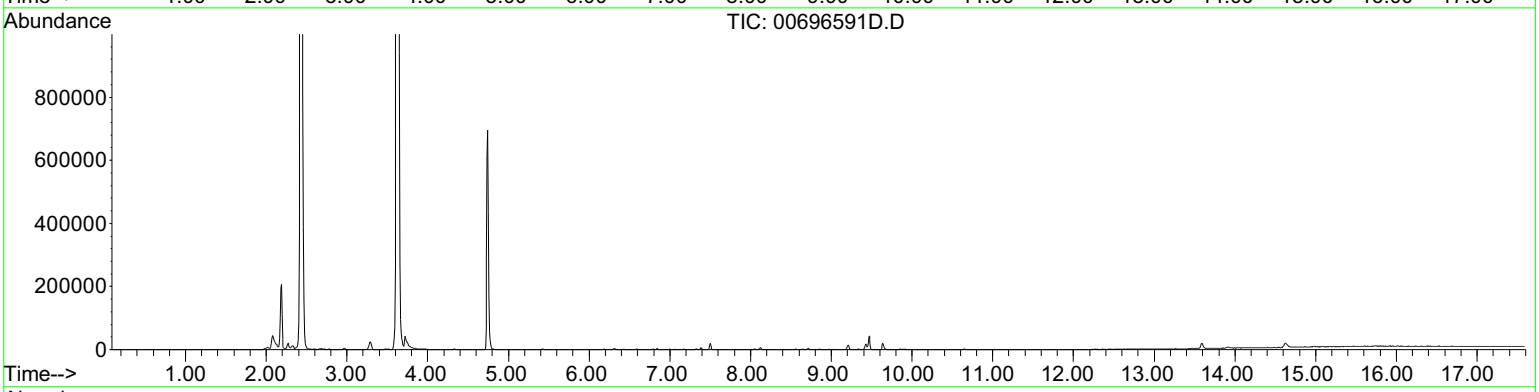


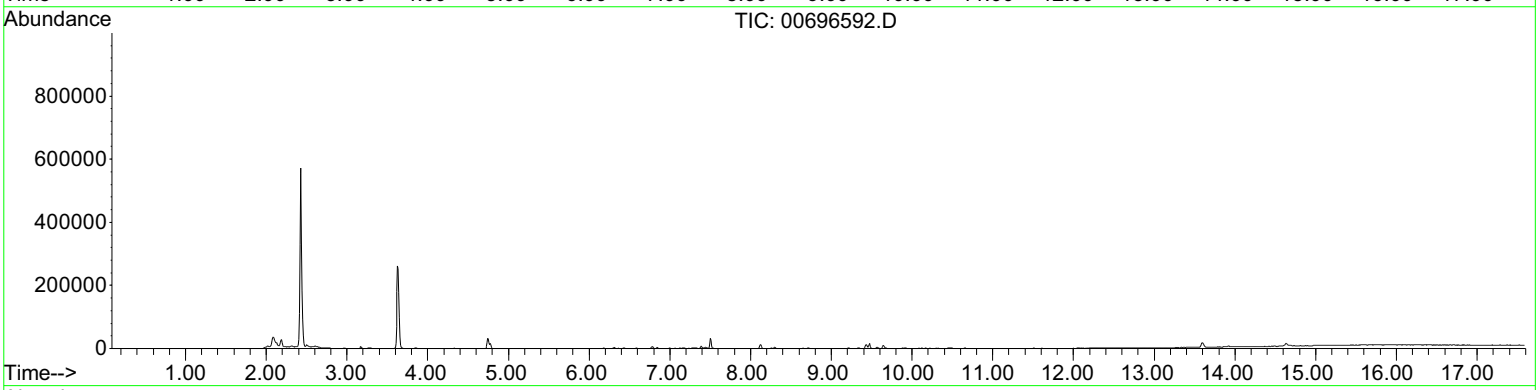


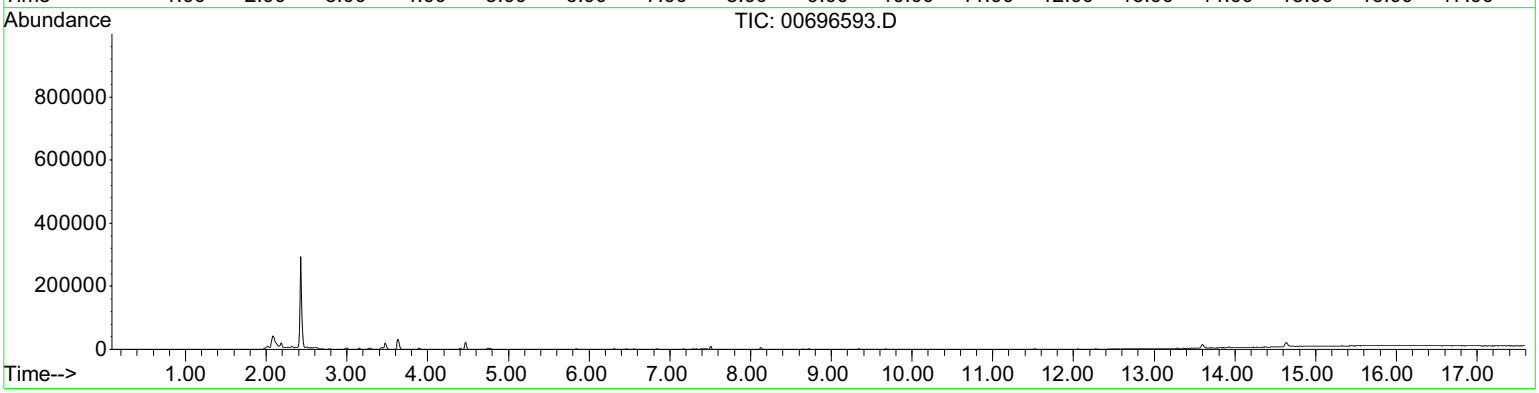
TICS - 21815026
IN NUMERICAL ORDER



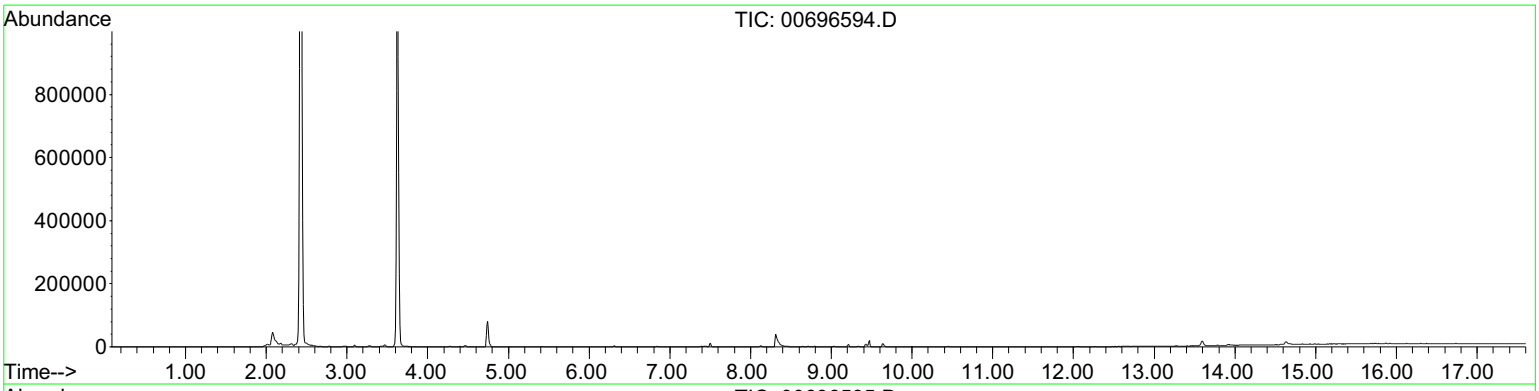


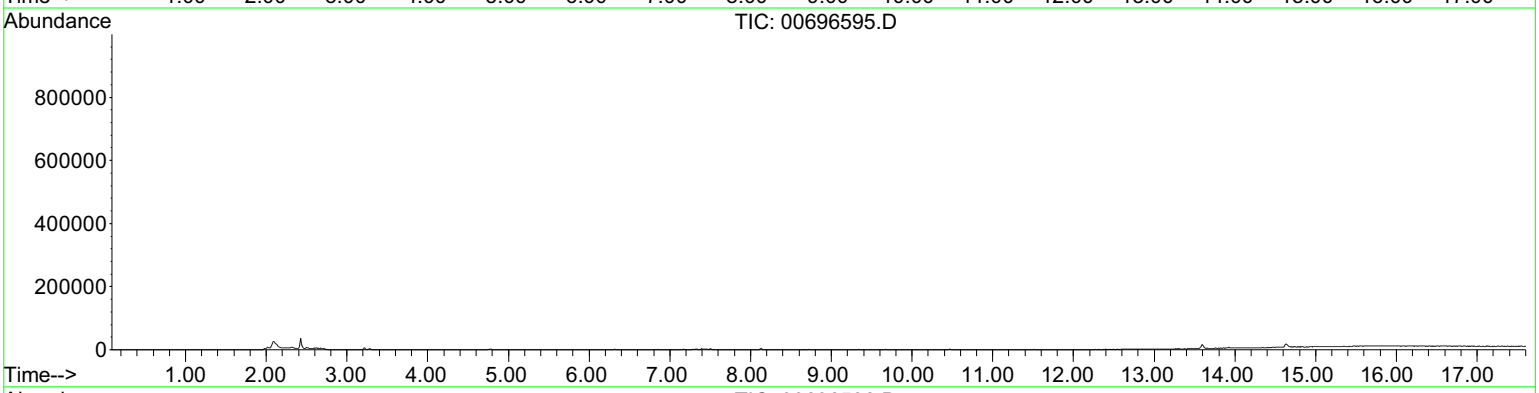


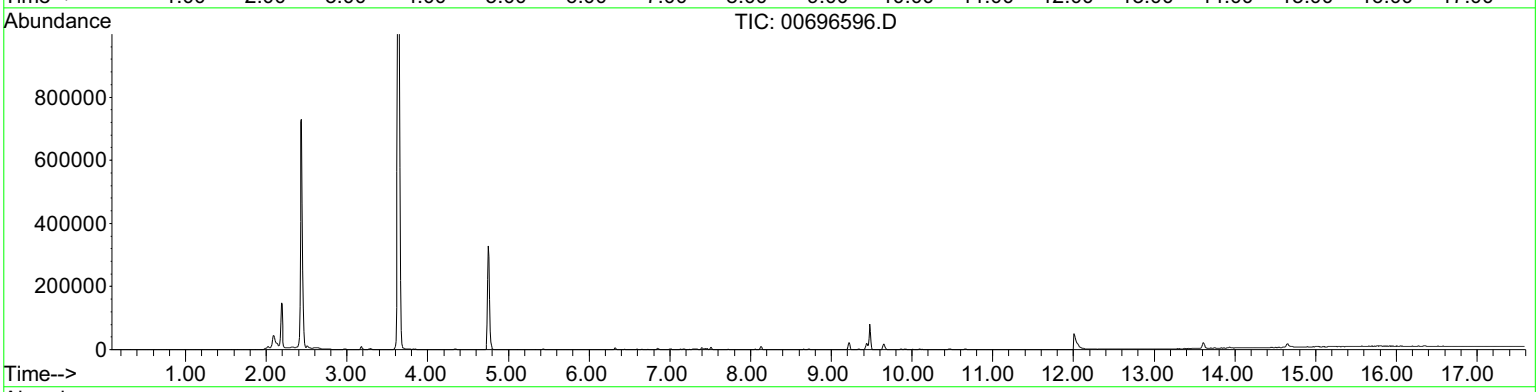


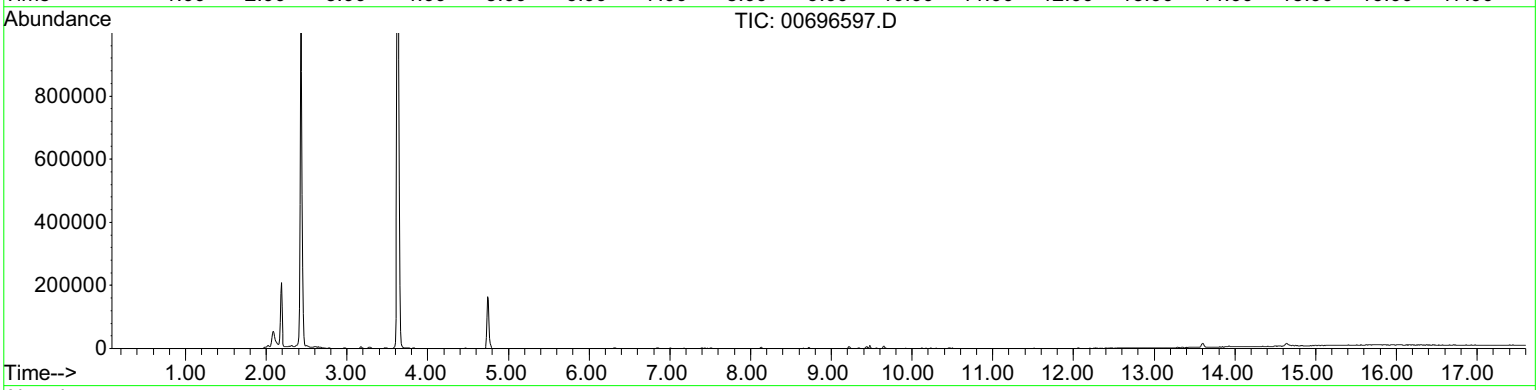


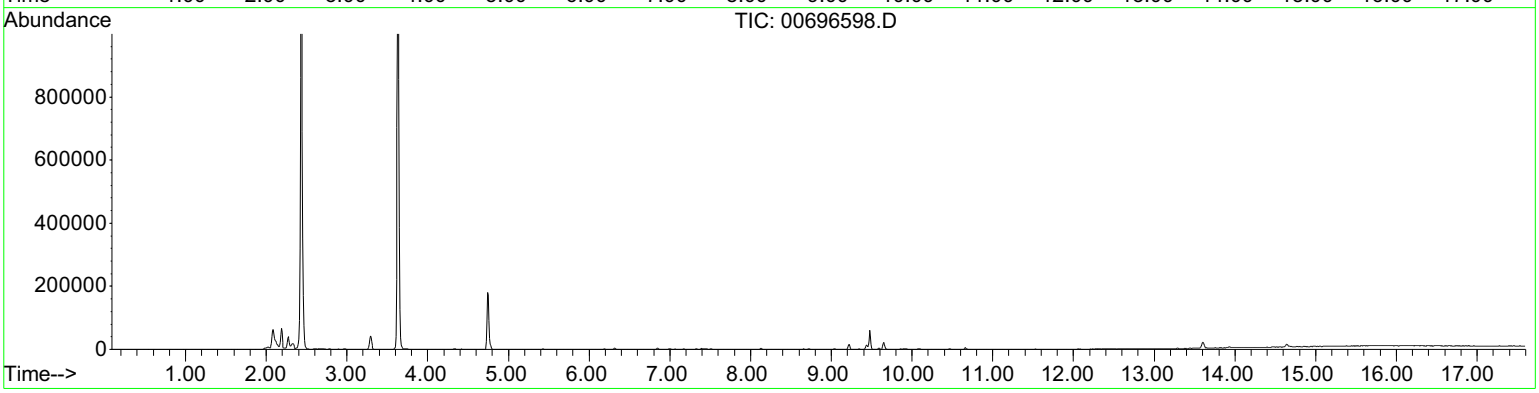
TICS - 21815026
IN NUMERICAL ORDER



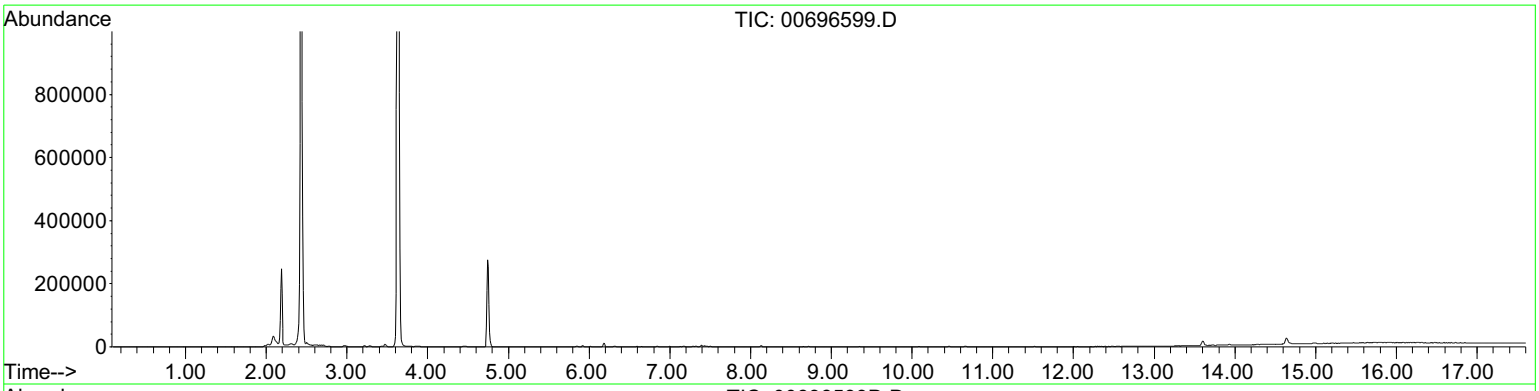


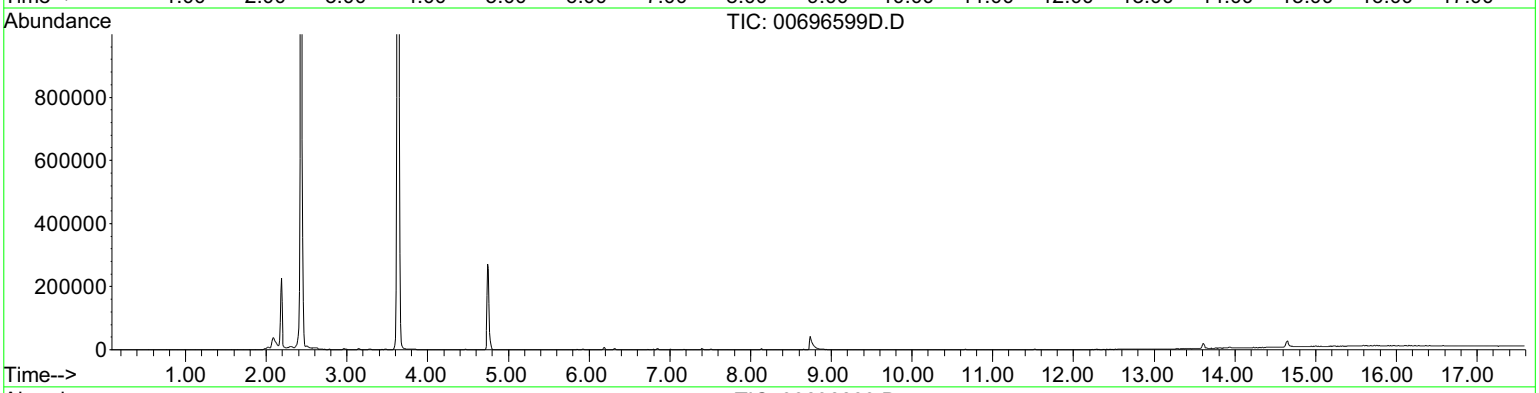


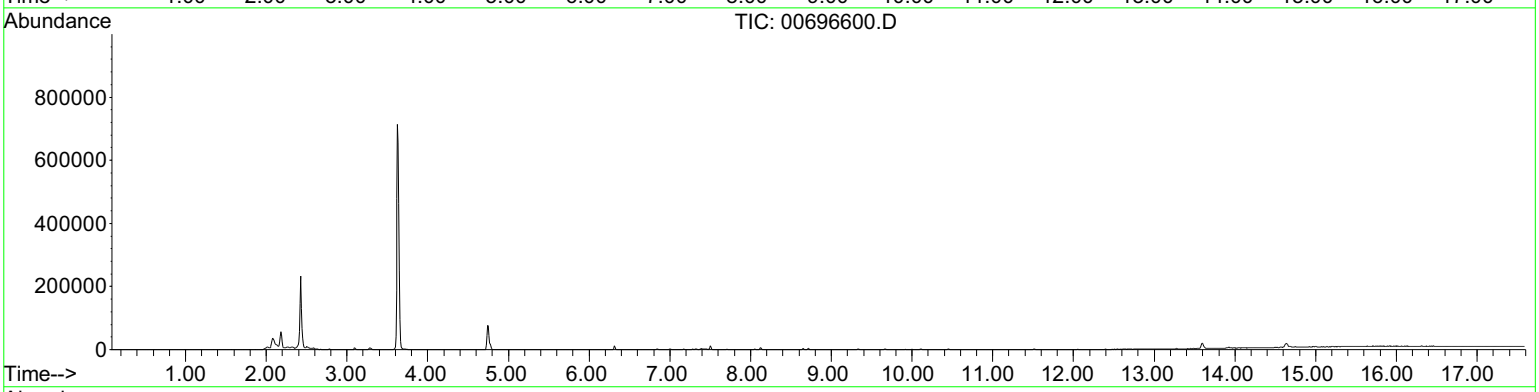


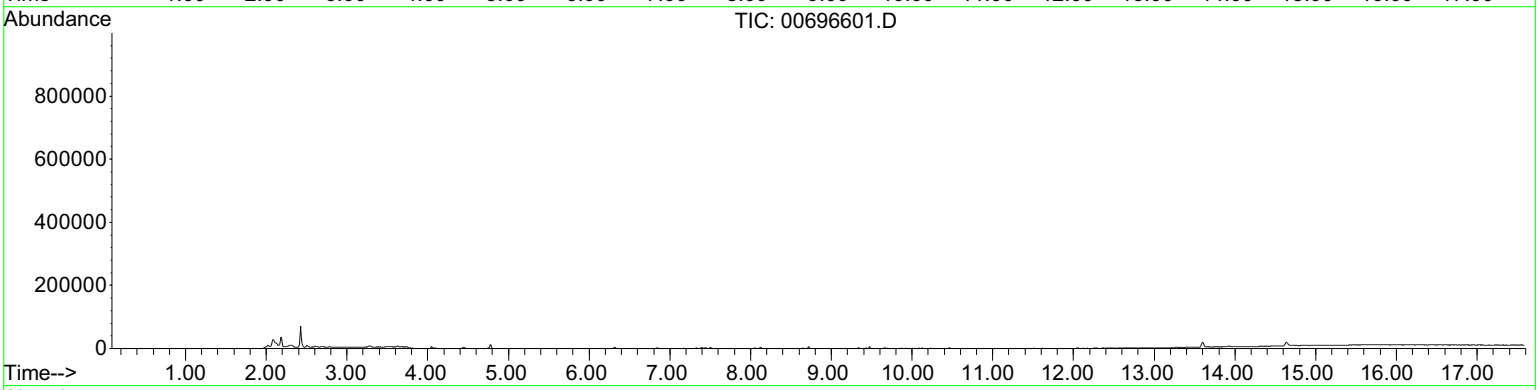


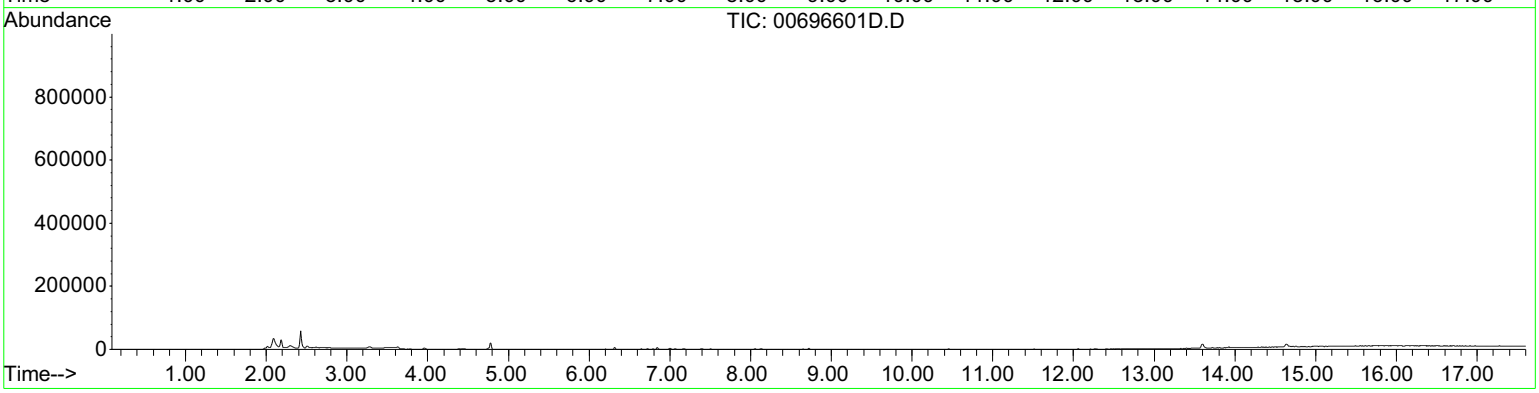
TICS - 21815026
IN NUMERICAL ORDER



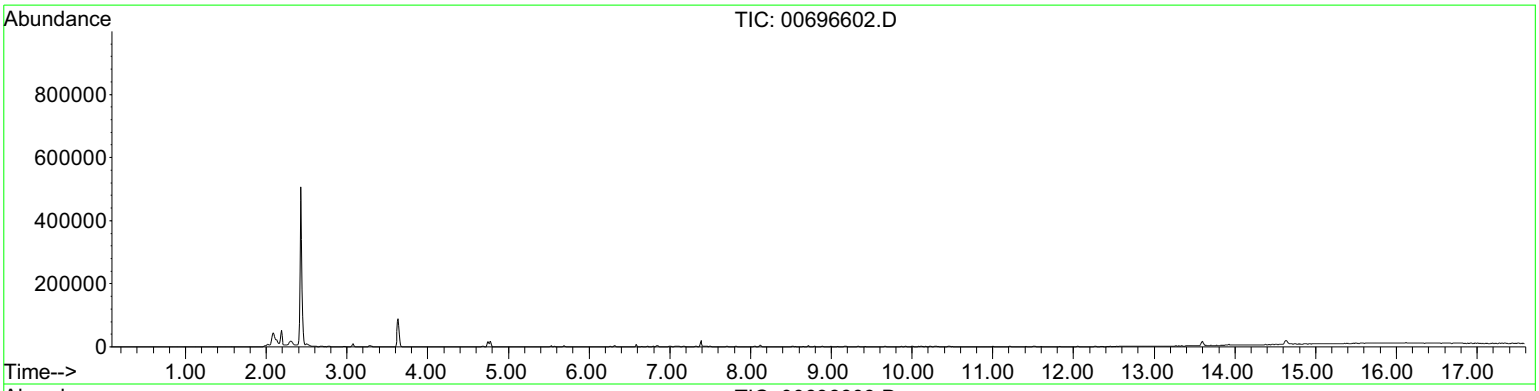


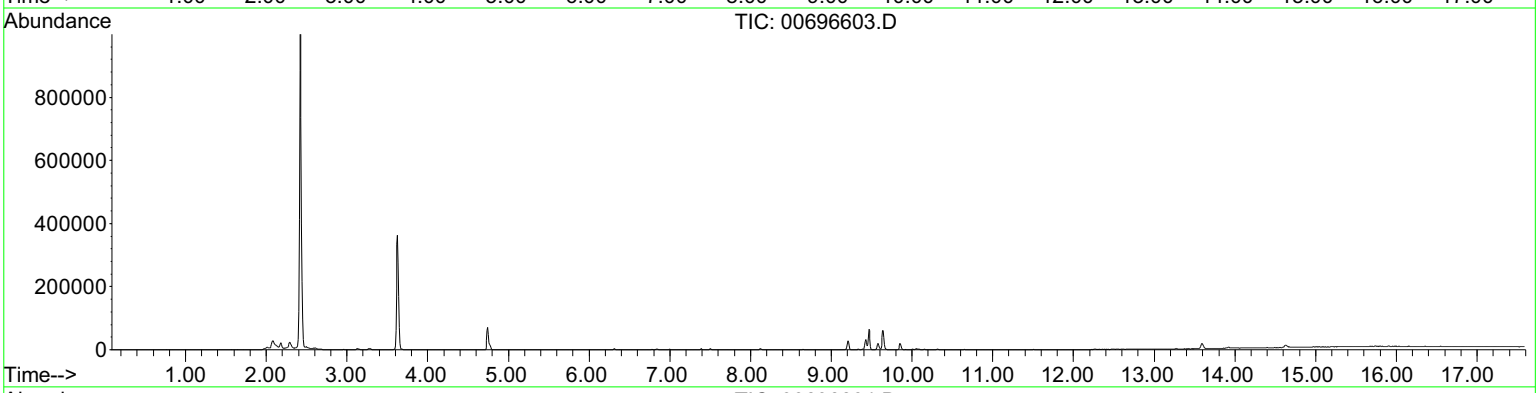


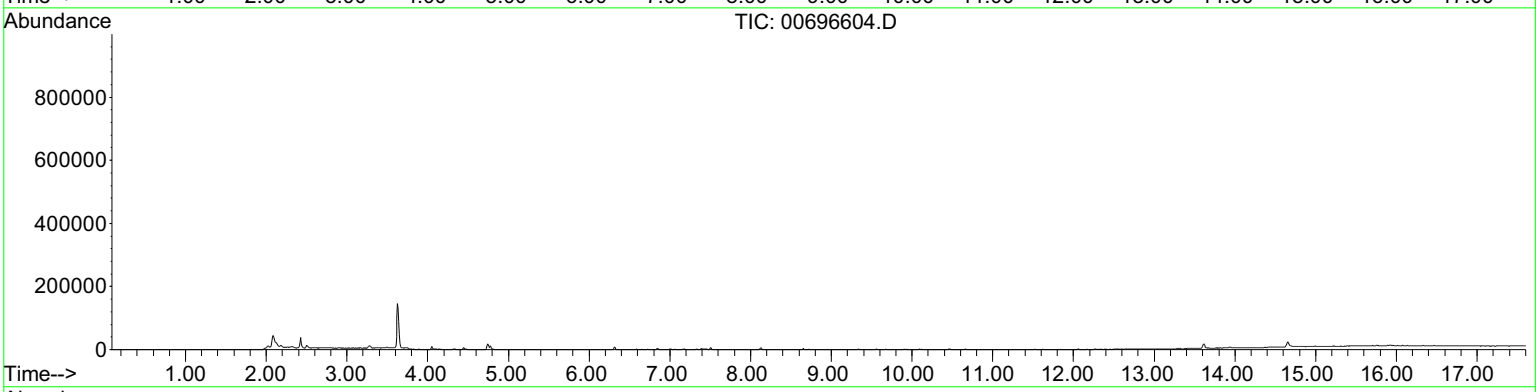


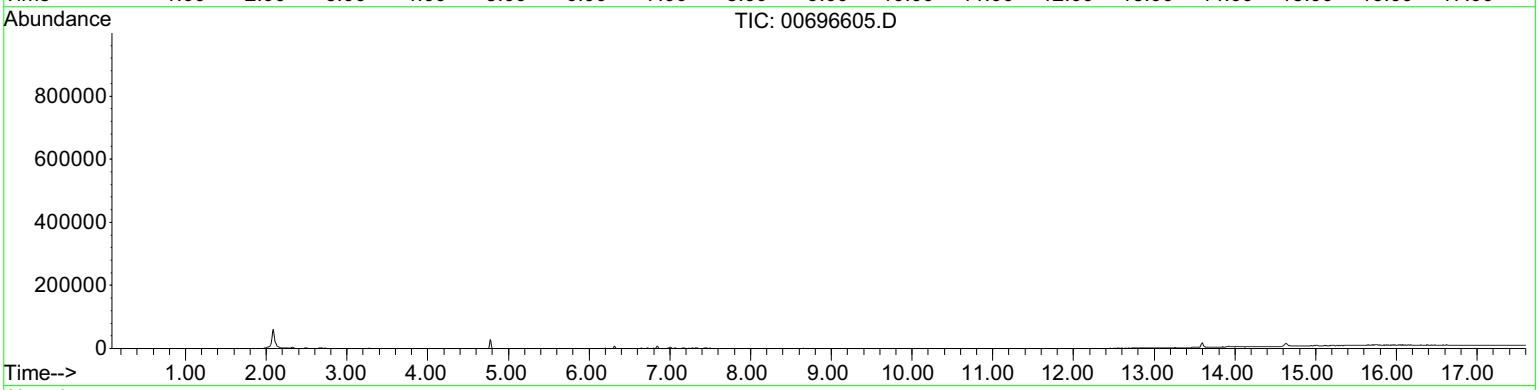


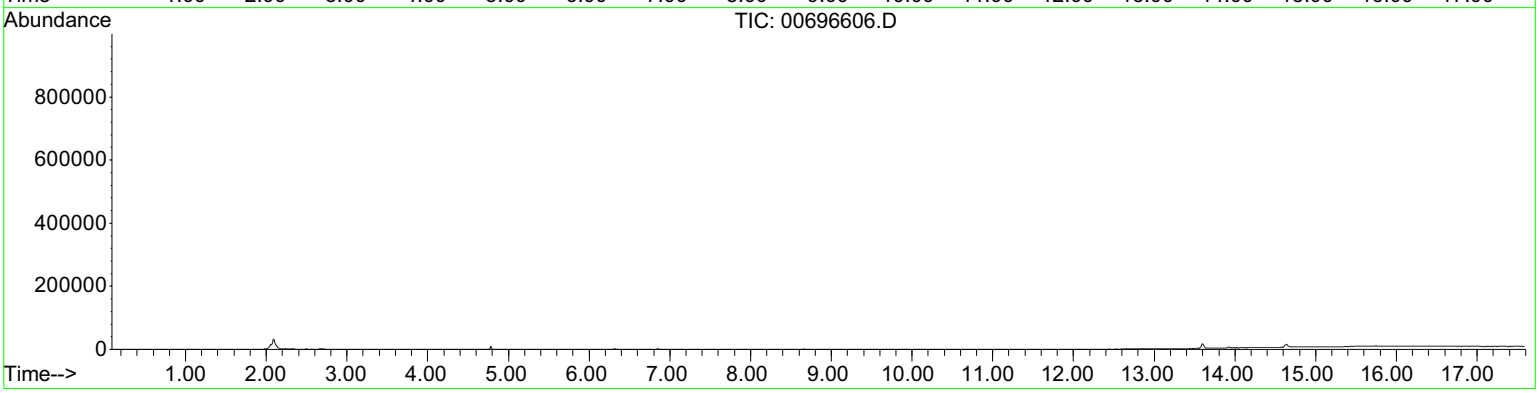
TICS - 21815026
IN NUMERICAL ORDER











W. L. Gore & Associates, Inc.
100 Chesapeake Blvd. • P.O. Box 10
Elkton, MD 21922-0010
Phone: 410.392.7600 • 800.432.7998
Fax: 410.506.4780

gore.com/surveys

Sales Offices:
Europe: +49.89.4612.2198
San Francisco: 415.648.0438

Email: environmental@wlgore.com

Creative Technologies Worldwide

LIT 139.0 08/14/07

GORE and designs are trademarks of W. L. Gore & Associates, Inc. © 2007 W. L. Gore & Associates, Inc.

GORE Surveys

FOR ENVIRONMENTAL

Mapping Report

Site: WSTF-NASA

NM

Prepared for:

NAVARRO RESEARCH AND ENGINEERING INC
669 EMORY VALLEY ROAD
OAK RIDGE, TN
UNITED STATES

Prepared on:

January 16, 2013

©2013 W. L. Gore & Associates, Inc.

GORE(TM) SURVEYS ANALYTICAL RESULTS
NAVARRO RESEARCH AND ENGINEERING INC, OAK RIDGE, TN
GORE STANDARD TARGET VOCs/SVOCs AND FREON TICS (SCREENING + TICS)
WSTF-NASA, NM PHASE 2
PRODUCTION ORDER # 21815026

DATE ANALYZED	SAMPLE NAME	FIELD ID	TPH, ug	Freon11, ug	BTEX, ug	BENZ, ug	TOL, ug	ETBENZ, ug	mpXYL, ug	oXYL, ug
	MDL=		0.50	0.05		0.02	0.02	0.02	0.02	0.02
1/9/2013	696508	S1	bdl	bdl	bdl	bdl	nd	bdl	bdl	bdl
1/9/2013	696509	S2	bdl	bdl	bdl	bdl	nd	nd	nd	nd
1/9/2013	696510	S3	2.71	nd	bdl	bdl	bdl	nd	bdl	nd
1/9/2013	696511	S4	bdl	nd	bdl	bdl	nd	nd	nd	nd
1/8/2013	696521	S5	bdl	bdl	bdl	bdl	nd	nd	nd	nd
1/9/2013	696522	S6	bdl	bdl	bdl	bdl	nd	nd	nd	nd
1/8/2013	696523	S7	bdl	bdl	bdl	bdl	nd	nd	nd	nd
1/9/2013	696524	S8	bdl	bdl	nd	nd	nd	nd	nd	nd
1/9/2013	696569	S9	bdl	bdl	bdl	bdl	nd	nd	nd	nd
1/9/2013	696570	S10	bdl	bdl	nd	nd	nd	nd	nd	nd
1/8/2013	696571	S11	1.30	0.80	0.02	bdl	nd	nd	0.02	nd
1/8/2013	696572	S12	bdl	0.18	bdl	nd	nd	nd	bdl	nd
1/9/2013	696573	S13	bdl	0.73	0.03	bdl	bdl	bdl	0.03	bdl
1/9/2013	696573	S13	bdl	0.75	0.04	bdl	bdl	bdl	0.04	bdl
1/9/2013	696574	S14	bdl	0.66	bdl	bdl	nd	nd	nd	nd
1/9/2013	696575	S15	0.94	0.24	bdl	bdl	bdl	nd	nd	nd
1/9/2013	696576	S16	1.17	bdl	bdl	bdl	nd	nd	nd	nd
1/9/2013	696577	S17	bdl	0.06	bdl	bdl	nd	nd	nd	nd
1/9/2013	696578	S18	bdl	0.29	nd	nd	nd	nd	nd	nd
1/9/2013	696585	S19	bdl	0.21	bdl	bdl	nd	nd	nd	nd
1/8/2013	696585	S19	bdl	0.20	bdl	bdl	nd	nd	nd	nd
1/9/2013	696586	S20	bdl	0.09	bdl	bdl	nd	nd	nd	nd
1/9/2013	696587	S21	bdl	bdl	nd	nd	nd	nd	nd	nd
1/9/2013	696588	S22	5.14	nd	0.09	nd	nd	nd	0.09	nd
1/9/2013	696589	S23	bdl	0.05	0.03	0.03	nd	nd	nd	nd
1/8/2013	696590	S24	bdl	bdl	bdl	bdl	nd	nd	nd	nd
1/9/2013	696591	S25	bdl	nd	0.03	0.03	nd	nd	nd	nd
1/9/2013	696591	S25	bdl	bdl	0.03	0.03	bdl	nd	bdl	nd
1/8/2013	696592	S26	bdl	bdl	nd	nd	nd	nd	nd	nd
1/8/2013	696593	S27	bdl	bdl	nd	nd	nd	nd	nd	nd
1/9/2013	696594	S28	bdl	bdl	bdl	bdl	nd	nd	nd	nd

No mdl is available for summed combinations of analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
NAVARRO RESEARCH AND ENGINEERING INC, OAK RIDGE, TN
GORE STANDARD TARGET VOCs/SVOCs AND FREON TICS (SCREENING + TICS)
WSTF-NASA, NM PHASE 2
PRODUCTION ORDER # 21815026

DATE ANALYZED	SAMPLE NAME	FIELD ID	TPH, ug	Freon11, ug	BTEX, ug	BENZ, ug	TOL, ug	ETBENZ, ug	mpXYL, ug	oXYL, ug
	MDL=		0.50	0.05		0.02	0.02	0.02	0.02	0.02
1/8/2013	696595	S29	bdl	bdl	nd	nd	nd	nd	nd	nd
1/9/2013	696596	S30	bdl	bdl	bdl	bdl	nd	nd	nd	nd
1/8/2013	696597	S31	bdl	bdl	bdl	bdl	nd	nd	nd	nd
1/9/2013	696598	S32	bdl	0.07	bdl	bdl	bdl	nd	nd	nd
1/8/2013	696599	S33	bdl	0.12	bdl	bdl	nd	nd	nd	nd
1/8/2013	696599	S33	bdl	0.11	bdl	bdl	nd	nd	nd	nd
1/9/2013	696600	S34	bdl	bdl	bdl	bdl	nd	nd	nd	nd
1/9/2013	696601	S35	bdl	0.11	bdl	bdl	nd	nd	nd	nd
1/9/2013	696601	S35	bdl	0.13	bdl	bdl	nd	nd	nd	nd
1/8/2013	696602	S36	0.54	0.30	bdl	bdl	nd	nd	nd	nd
1/9/2013	696603	S37	bdl	0.53	bdl	bdl	nd	nd	nd	nd
1/8/2013	696604	S38	bdl	bdl	0.03	0.03	bdl	nd	nd	nd
1/8/2013	696605	TB17	bdl	nd	bdl	bdl	nd	nd	nd	nd
1/9/2013	696606	TB18	bdl	nd	nd	nd	nd	nd	nd	nd
1/8/2013	method blank		bdl	nd	nd	nd	nd	nd	nd	nd
1/9/2013	method blank		nd	nd	nd	nd	nd	nd	nd	nd

No mdl is available for summed combinations of analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
NAVARRO RESEARCH AND ENGINEERING INC, OAK RIDGE, TN
GORE STANDARD TARGET VOCs/SVOCs AND FREON TICS (SCREENING + TICS)
WSTF-NASA, NM PHASE 2
PRODUCTION ORDER # 21815026

FIELD ID	C11, C13, &C15, ug	UNDEC, ug	TRIDEC, ug	PENTADEC, ug	TMBs, ug	124TMB, ug	135TMB, ug	ct12DCE, ug	t12DCE, ug
		0.05	0.05	0.05		0.02	0.02		0.02
S1	bdl	nd	bdl	bdl	bdl	bdl	bdl	nd	nd
S2	bdl	nd	bdl	nd	nd	nd	nd	nd	nd
S3	bdl	bdl	bdl	nd	nd	nd	nd	nd	nd
S4	bdl	bdl	bdl	nd	bdl	bdl	bdl	nd	nd
S5	bdl	nd	bdl	bdl	nd	nd	nd	nd	nd
S6	bdl	nd	bdl	nd	nd	nd	nd	nd	nd
S7	bdl	bdl	bdl	bdl	nd	nd	nd	nd	nd
S8	bdl	nd	bdl	bdl	nd	nd	nd	nd	nd
S9	bdl	bdl	bdl	bdl	0.03	0.03	bdl	nd	nd
S10	bdl	nd	bdl	nd	nd	nd	nd	nd	nd
S11	bdl	nd	bdl	bdl	bdl	bdl	nd	nd	nd
S12	bdl	bdl	bdl	bdl	bdl	bdl	bdl	nd	nd
S13	bdl	nd	bdl	nd	bdl	bdl	bdl	nd	nd
S13	bdl	nd	bdl	nd	bdl	bdl	bdl	nd	nd
S14	bdl	bdl	bdl	bdl	nd	nd	nd	nd	nd
S15	bdl	bdl	bdl	bdl	nd	nd	nd	nd	nd
S16	0.06	bdl	0.06	bdl	bdl	bdl	bdl	nd	nd
S17	bdl	bdl	bdl	bdl	nd	nd	nd	nd	nd
S18	bdl	bdl	bdl	bdl	bdl	bdl	nd	nd	nd
S19	bdl	bdl	bdl	nd	nd	nd	nd	nd	nd
S19	bdl	bdl	bdl	bdl	nd	nd	nd	nd	nd
S20	bdl	bdl	bdl	bdl	nd	nd	nd	nd	nd
S21	bdl	bdl	bdl	bdl	nd	nd	nd	nd	nd
S22	bdl	bdl	bdl	bdl	bdl	bdl	nd	nd	nd
S23	bdl	bdl	bdl	bdl	nd	nd	nd	nd	nd
S24	bdl	bdl	bdl	bdl	bdl	bdl	nd	nd	nd
S25	bdl	bdl	bdl	bdl	nd	nd	nd	nd	nd
S25	bdl	bdl	bdl	bdl	nd	nd	nd	nd	nd
S26	bdl	bdl	bdl	bdl	nd	nd	nd	nd	nd
S27	bdl	bdl	bdl	bdl	bdl	bdl	nd	nd	nd
S28	bdl	bdl	bdl	bdl	bdl	bdl	nd	nd	nd

No mdl is available for summed combinations of analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
NAVARRO RESEARCH AND ENGINEERING INC, OAK RIDGE, TN
GORE STANDARD TARGET VOCs/SVOCs AND FREON TICS (SCREENING + TICS)
WSTF-NASA, NM PHASE 2
PRODUCTION ORDER # 21815026

FIELD ID	C11, C13, &C15, ug	UNDEC, ug	TRIDEC, ug	PENTADEC, ug	TMBs, ug	124TMB, ug	135TMB, ug	ct12DCE, ug	t12DCE, ug
		0.05	0.05	0.05		0.02	0.02		0.02
S29	bdl	bdl	bdl	bdl	nd	nd	nd	nd	nd
S30	bdl	bdl	bdl	bdl	nd	nd	nd	nd	nd
S31	bdl	bdl	bdl	bdl	nd	nd	nd	nd	nd
S32	bdl	bdl	bdl	bdl	nd	nd	nd	nd	nd
S33	bdl	bdl	bdl	bdl	nd	nd	nd	nd	nd
S33	bdl	bdl	bdl	nd	nd	nd	nd	nd	nd
S34	bdl	bdl	bdl	bdl	nd	nd	nd	nd	nd
S35	bdl	bdl	bdl	bdl	nd	nd	nd	nd	nd
S35	bdl	bdl	bdl	nd	nd	nd	nd	nd	nd
S36	bdl	bdl	bdl	bdl	nd	nd	nd	nd	nd
S37	bdl	bdl	bdl	bdl	nd	nd	nd	nd	nd
S38	bdl	bdl	bdl	bdl	nd	nd	nd	nd	nd
TB17	bdl	bdl	bdl	bdl	nd	nd	nd	nd	nd
TB18	nd	nd	nd	nd	nd	nd	nd	nd	nd
	nd	nd	nd	nd	nd	nd	nd	nd	nd
	nd	nd	nd	nd	nd	nd	nd	nd	nd

No mdl is available for summed combinations of analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
NAVARRO RESEARCH AND ENGINEERING INC, OAK RIDGE, TN
GORE STANDARD TARGET VOCs/SVOCs AND FREON TICS (SCREENING + TICS)
WSTF-NASA, NM PHASE 2
PRODUCTION ORDER # 21815026

FIELD ID	c12DCE, ug	NAPH&2-MN, ug	NAPH, ug	2MeNAPH, ug	MTBE, ug	11DCA, ug	111TCA, ug	12DCA, ug	TCE, ug	OCT, ug	PCE, ug
	0.02		0.05	0.05	0.02	0.02	0.02	0.02	0.02	0.02	0.02
S1	nd	bdl	nd	bdl	nd	nd	nd	nd	nd	nd	nd
S2	nd	nd	nd	nd	nd	nd	nd	nd	0.02	nd	0.04
S3	nd	bdl	nd	bdl	nd	nd	nd	nd	bdl	nd	nd
S4	nd	nd	nd	nd	nd	nd	nd	nd	2.06	nd	0.24
S5	nd	nd	nd	nd	nd	nd	nd	nd	2.23	nd	0.21
S6	nd	nd	nd	nd	nd	nd	nd	nd	2.36	nd	0.21
S7	nd	nd	nd	nd	nd	nd	nd	nd	11.25	nd	0.90
S8	nd	nd	nd	nd	nd	nd	nd	nd	0.04	nd	0.05
S9	nd	0.06	bdl	0.06	nd	nd	nd	nd	6.61	nd	0.57
S10	nd	nd	nd	nd	nd	nd	nd	nd	0.23	nd	0.18
S11	nd	bdl	nd	bdl	nd	nd	nd	nd	1.58	nd	0.15
S12	nd	bdl	bdl	bdl	nd	nd	nd	nd	bdl	nd	nd
S13	nd	bdl	bdl	bdl	nd	nd	nd	nd	0.17	0.10	bdl
S13	nd	0.09	0.09	bdl	nd	nd	nd	nd	0.15	0.13	bdl
S14	nd	nd	nd	nd	nd	nd	nd	nd	0.18	nd	0.03
S15	nd	bdl	bdl	nd	nd	nd	nd	nd	bdl	nd	nd
S16	nd	bdl	nd	bdl	nd	nd	nd	nd	nd	nd	nd
S17	nd	nd	nd	nd	nd	nd	nd	nd	bdl	nd	bdl
S18	nd	nd	nd	nd	nd	nd	nd	nd	0.05	nd	0.02
S19	nd	bdl	bdl	nd	nd	nd	nd	nd	0.19	nd	0.03
S19	nd	0.05	0.05	nd	nd	nd	nd	nd	0.13	nd	bdl
S20	nd	bdl	nd	bdl	nd	nd	nd	nd	11.77	nd	1.52
S21	nd	nd	nd	nd	nd	nd	nd	nd	1.37	nd	0.15
S22	nd	bdl	nd	bdl	nd	nd	nd	nd	2.20	nd	0.23
S23	nd	nd	nd	nd	nd	nd	nd	nd	68.28	nd	5.41
S24	nd	nd	nd	nd	nd	nd	nd	nd	6.68	nd	0.77
S25	nd	nd	nd	nd	nd	nd	nd	nd	59.22	nd	4.79
S25	nd	nd	nd	nd	nd	nd	nd	nd	54.98	nd	3.95
S26	nd	nd	nd	nd	nd	nd	nd	nd	2.09	nd	0.19
S27	nd	nd	nd	nd	nd	nd	nd	nd	0.26	nd	0.02
S28	nd	nd	nd	nd	nd	nd	nd	nd	10.26	nd	0.47

No mdl is available for summed combinations of analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
NAVARRO RESEARCH AND ENGINEERING INC, OAK RIDGE, TN
GORE STANDARD TARGET VOCs/SVOCs AND FREON TICS (SCREENING + TICS)
WSTF-NASA, NM PHASE 2
PRODUCTION ORDER # 21815026

FIELD ID	c12DCE, ug	NAPH&2-MN, ug	NAPH, ug	2MeNAPH, ug	MTBE, ug	11DCA, ug	111TCA, ug	12DCA, ug	TCE, ug	OCT, ug	PCE, ug
	0.02		0.05	0.05	0.02	0.02	0.02	0.02	0.02	0.02	0.02
S29	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
S30	nd	nd	nd	nd	nd	nd	nd	nd	13.56	nd	1.96
S31	nd	nd	nd	nd	nd	nd	nd	nd	11.26	nd	0.97
S32	nd	bdl	nd	bdl	nd	nd	nd	nd	9.42	nd	1.00
S33	nd	nd	nd	nd	nd	nd	nd	nd	18.92	nd	1.62
S33	nd	nd	nd	nd	nd	nd	nd	nd	19.06	nd	1.64
S34	nd	nd	nd	nd	nd	nd	nd	nd	5.50	nd	0.47
S35	nd	nd	nd	nd	nd	nd	nd	nd	0.02	nd	bdl
S35	nd	nd	nd	nd	nd	nd	nd	nd	0.03	nd	bdl
S36	nd	bdl	nd	bdl	nd	nd	nd	nd	0.69	nd	0.10
S37	nd	nd	nd	nd	nd	nd	nd	nd	2.84	nd	0.41
S38	nd	nd	nd	nd	nd	nd	nd	nd	1.04	nd	0.10
TB17	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
TB18	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd
	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd	nd

No mdl is available for summed combinations of analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
NAVARRO RESEARCH AND ENGINEERING INC, OAK RIDGE, TN
GORE STANDARD TARGET VOCs/SVOCs AND FREON TICS (SCREENING + TICS)
WSTF-NASA, NM PHASE 2
PRODUCTION ORDER # 21815026

FIELD ID	14DCB, ug	Acenaphthene, ug	Acenaphthylene, ug	Fluorene, ug	Freon113, ug	Freon123, ug	Freon123A, ug	VC, ug	11DCE, ug
	0.02	0.05	0.05	0.05	0.05	0.05	0.05	0.20	0.02
S1	nd	nd	nd	nd	8.35	nd	nd	nd	nd
S2	nd	nd	nd	nd	4.65	nd	nd	nd	bdl
S3	nd	nd	nd	bdl	0.12	nd	nd	nd	nd
S4	nd	nd	nd	nd	8.46	nd	nd	nd	nd
S5	nd	bdl	nd	bdl	21.68	nd	nd	nd	0.04
S6	nd	bdl	nd	nd	17.12	nd	nd	nd	nd
S7	nd	nd	nd	nd	20.55	bdl	nd	nd	nd
S8	nd	nd	nd	nd	10.39	nd	nd	nd	nd
S9	nd	bdl	nd	nd	16.16	nd	nd	nd	nd
S10	nd	nd	nd	nd	5.85	nd	nd	nd	nd
S11	nd	nd	nd	bdl	51.98	nd	nd	nd	nd
S12	nd	bdl	bdl	bdl	24.32	nd	nd	nd	nd
S13	nd	nd	nd	nd	62.62	nd	nd	nd	nd
S13	nd	nd	nd	nd	66.44	nd	nd	nd	nd
S14	nd	nd	nd	nd	53.42	nd	nd	nd	nd
S15	nd	nd	nd	nd	43.92	nd	nd	nd	nd
S16	nd	bdl	bdl	bdl	8.48	nd	nd	nd	nd
S17	nd	bdl	nd	bdl	55.43	bdl	nd	nd	0.09
S18	nd	nd	nd	nd	59.53	nd	nd	nd	nd
S19	nd	nd	nd	nd	58.61	bdl	nd	nd	nd
S19	nd	nd	nd	nd	57.54	nd	nd	nd	0.10
S20	nd	bdl	bdl	bdl	86.32	bdl	nd	nd	nd
S21	nd	bdl	bdl	bdl	50.91	nd	nd	nd	nd
S22	nd	nd	nd	bdl	9.15	nd	nd	nd	nd
S23	nd	nd	nd	nd	72.99	bdl	nd	nd	nd
S24	nd	nd	nd	nd	43.26	bdl	nd	nd	nd
S25	nd	bdl	nd	bdl	35.60	bdl	nd	nd	nd
S25	nd	bdl	nd	nd	42.66	bdl	nd	nd	nd
S26	nd	bdl	nd	bdl	6.64	nd	nd	nd	bdl
S27	nd	nd	nd	nd	3.41	nd	nd	nd	bdl
S28	nd	nd	nd	nd	36.85	bdl	nd	nd	nd

No mdl is available for summed combinations of analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
NAVARRO RESEARCH AND ENGINEERING INC, OAK RIDGE, TN
GORE STANDARD TARGET VOCs/SVOCs AND FREON TICS (SCREENING + TICS)
WSTF-NASA, NM PHASE 2
PRODUCTION ORDER # 21815026

FIELD ID	14DCB, ug	Acenaphthene, ug	Acenaphthylene, ug	Fluorene, ug	Freon113, ug	Freon123, ug	Freon123A, ug	VC, ug	11DCE, ug
	0.02	0.05	0.05	0.05	0.05	0.05	0.05	0.20	0.02
S29	nd	nd	nd	nd	0.36	nd	nd	nd	nd
S30	nd	bdl	nd	bdl	8.74	nd	nd	nd	0.11
S31	nd	nd	nd	nd	13.66	nd	nd	nd	0.14
S32	nd	bdl	bdl	bdl	14.96	bdl	nd	nd	0.20
S33	nd	bdl	nd	bdl	20.73	nd	bdl	nd	0.49
S33	nd	bdl	nd	bdl	18.42	bdl	nd	nd	0.45
S34	nd	nd	nd	nd	2.60	nd	nd	nd	0.11
S35	nd	nd	nd	nd	0.68	nd	nd	nd	nd
S35	nd	nd	nd	nd	0.61	nd	bdl	nd	nd
S36	nd	nd	nd	nd	5.76	bdl	nd	nd	nd
S37	nd	nd	nd	nd	11.77	nd	nd	nd	nd
S38	nd	bdl	nd	bdl	0.32	nd	bdl	nd	bdl
TB17	nd	nd	nd	nd	nd	nd	nd	nd	nd
TB18	nd	nd	nd	nd	nd	nd	nd	nd	nd
	nd	bdl	nd	bdl	nd	nd	nd	nd	nd
	nd	nd	nd	nd	nd	nd	nd	nd	nd

No mdl is available for summed combinations of analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
NAVARRO RESEARCH AND ENGINEERING INC, OAK RIDGE, TN
GORE STANDARD TARGET VOCs/SVOCs AND FREON TICS (SCREENING + TICS)
WSTF-NASA, NM PHASE 2
PRODUCTION ORDER # 21815026

FIELD ID	CHCl3, ug	CCl4, ug	112TCA, ug	ClBENZ, ug	1112TetCA, ug	1122TetCA, ug	13DCB, ug	12DCB, ug
	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
S1	nd	0.03	nd	nd	nd	nd	nd	nd
S2	nd	0.02	nd	nd	nd	nd	nd	nd
S3	nd	nd	nd	nd	nd	nd	nd	nd
S4	nd	0.03	nd	nd	nd	nd	nd	nd
S5	bdl	bdl	nd	nd	nd	nd	nd	nd
S6	nd	0.02	nd	nd	nd	nd	nd	nd
S7	bdl	0.02	nd	nd	nd	nd	nd	nd
S8	nd	0.02	nd	nd	nd	nd	nd	nd
S9	bdl	bdl	nd	nd	nd	nd	nd	nd
S10	bdl	0.04	nd	nd	nd	nd	nd	nd
S11	nd	bdl	nd	nd	nd	nd	nd	nd
S12	nd	bdl	nd	nd	nd	nd	nd	nd
S13	nd	bdl	nd	nd	nd	nd	nd	nd
S13	nd	bdl	nd	nd	nd	nd	nd	nd
S14	nd	0.02	nd	nd	nd	nd	nd	nd
S15	nd	bdl	nd	nd	nd	nd	nd	nd
S16	nd	bdl	nd	nd	nd	nd	nd	nd
S17	nd	bdl	nd	nd	nd	nd	nd	nd
S18	nd	bdl	nd	nd	nd	nd	nd	nd
S19	nd	bdl	nd	nd	nd	nd	nd	nd
S19	nd	bdl	nd	nd	nd	nd	nd	nd
S20	0.02	bdl	nd	nd	nd	nd	nd	nd
S21	nd	bdl	nd	nd	nd	nd	nd	nd
S22	bdl	0.02	nd	nd	nd	nd	nd	nd
S23	0.02	nd	nd	nd	nd	nd	nd	nd
S24	0.05	bdl	nd	nd	nd	nd	nd	nd
S25	0.03	bdl	nd	nd	nd	nd	nd	nd
S25	0.05	bdl	nd	nd	nd	nd	nd	nd
S26	bdl	bdl	nd	nd	nd	nd	nd	nd
S27	nd	0.04	nd	nd	nd	nd	nd	nd
S28	bdl	bdl	nd	nd	nd	nd	nd	nd

No mdl is available for summed combinations of analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

GORE(TM) SURVEYS ANALYTICAL RESULTS
NAVARRO RESEARCH AND ENGINEERING INC, OAK RIDGE, TN
GORE STANDARD TARGET VOCs/SVOCs AND FREON TICS (SCREENING + TICS)
WSTF-NASA, NM PHASE 2
PRODUCTION ORDER # 21815026

FIELD ID	CHCl3, ug	CCl4, ug	112TCA, ug	ClBENZ, ug	1112TetCA, ug	1122TetCA, ug	13DCB, ug	12DCB, ug
	0.02	0.02	0.02	0.02	0.02	0.02	0.02	0.02
S29	nd	0.02	nd	nd	nd	nd	nd	nd
S30	0.02	bdl	nd	nd	nd	nd	nd	nd
S31	bdl	0.03	nd	nd	nd	nd	nd	nd
S32	0.03	0.03	nd	nd	nd	nd	nd	nd
S33	0.04	nd	nd	nd	nd	nd	nd	nd
S33	0.04	bdl	nd	nd	nd	nd	nd	nd
S34	nd	bdl	nd	nd	nd	nd	nd	nd
S35	nd	bdl	nd	nd	nd	nd	nd	nd
S35	nd	bdl	nd	nd	nd	nd	nd	nd
S36	nd	bdl	nd	nd	nd	nd	nd	nd
S37	bdl	0.02	nd	nd	nd	nd	nd	nd
S38	nd	0.03	nd	nd	nd	nd	nd	nd
TB17	nd	nd	nd	nd	nd	nd	nd	nd
TB18	nd	nd	nd	nd	nd	nd	nd	nd
	nd	nd	nd	nd	nd	nd	nd	nd
	nd	nd	nd	nd	nd	nd	nd	nd

No mdl is available for summed combinations of analytes. In summed columns (eg., BTEX), the reported values should be considered ESTIMATED if any of the individual compounds were reported as bdl.

Project Summary

W. L. Gore & Associates, Inc. (Gore) provided the GORE® Survey (Survey) used at:

WSTF-NASA

NM

The service provided by Gore included delivery of the required quantity of GORE Modules, analysis by the method described for the requested organic compounds, and reporting of the data. A Laboratory Report was issued previously which summarized the field sampling and analytical procedures, and contained the sample results.

Normally, when printed at scale, the maps are 11 x 17 inch in size. Other sizes are available upon request. General and project specific comments on the contouring and mapping can be found on the next page.

Maps prepared by:

Jim E Whetzel

CN = Jim E. Whetzel C = US O = W.L. Gore and Associates, Inc. OU = Survey Products Group 2013.01.17 11:13:59 - 04'00'

Project Manager

Maps reviewed/approved by:

Jay W Hodny

Project Manager

©2013 W. L. Gore & Associates, Inc.

General Comments

A minimum curvature algorithm was used to interpolate the data from the sample locations to a regularily-spaced grid. The resulting surface is considered to be the smoothest possible surface that will fit the observed values at each sample location (i.e., data honoring). The interpolation is performed in log space, with grid cell sizes approximately one-tenth the average distance between sample locations. For example, when GORE® Modules are placed about 50 feet apart, the grid cell size is set to five feet.

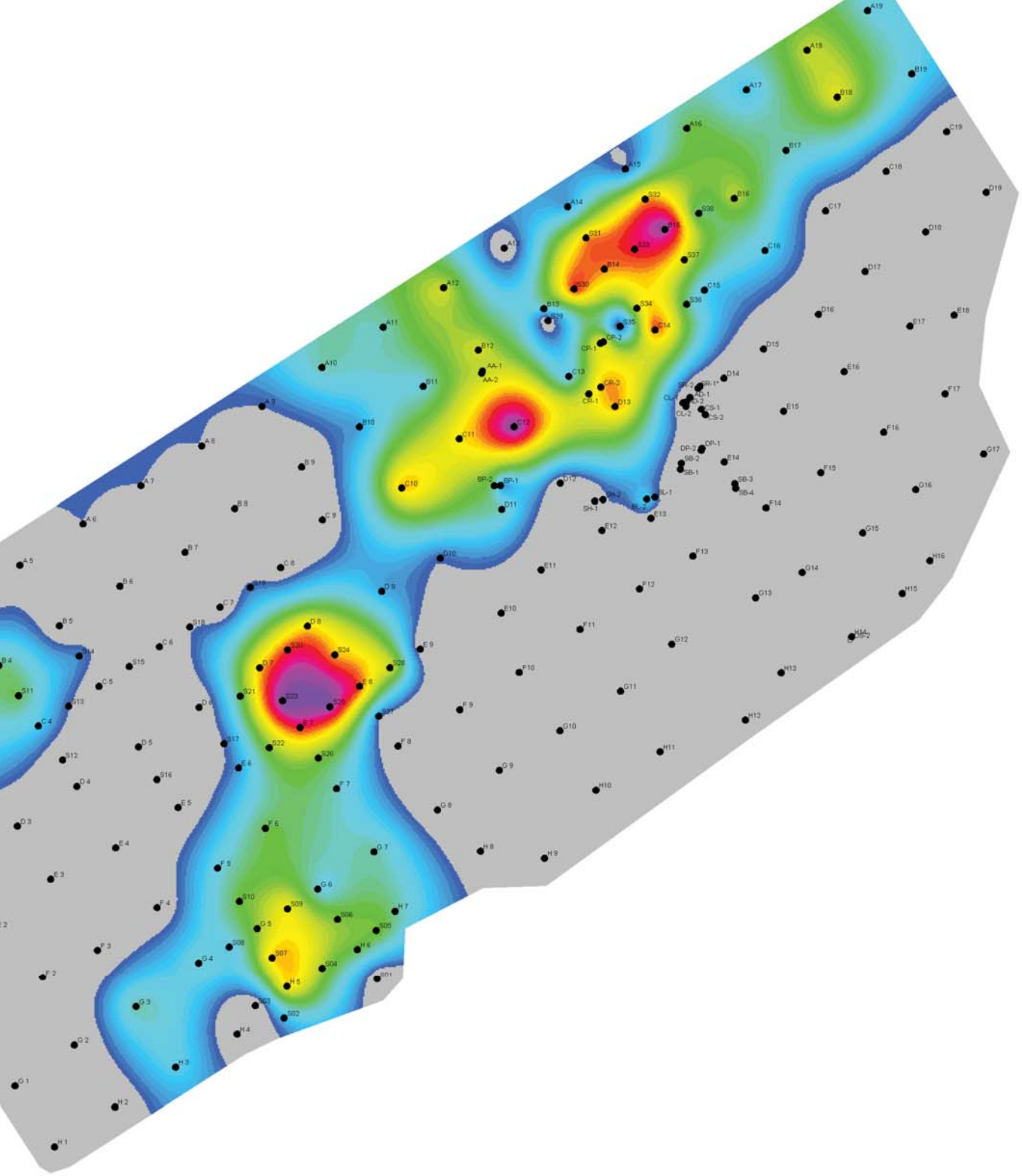
Where observations trend from lower to higher values, and moving towards the edge of the area sampled, the contour surface will continue to rise (showing warmer colors) as no additional data exist to constrain the interpolation. Where observations trend from high to low, towards the edge of the area sampled, the opposite is true.

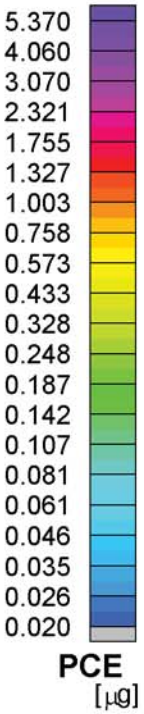
Contour minimums and maximums used in the color interval assignment are established based on the QA blank levels (trip and method blanks), method detection limits, and maximum values observed. The minimum contour level (gray color) is established using the maximum QA blank level or method detection limit, whichever is greater, per compound or groups of compounds. The maximum contour level is set at the maximum value observed, per compound or groups of compounds. Contour interval assignments can be modified at the client's request.

Project Specific Comments

Maps include results from a first phase of sampling.

©2013 W. L. Gore & Associates, Inc.

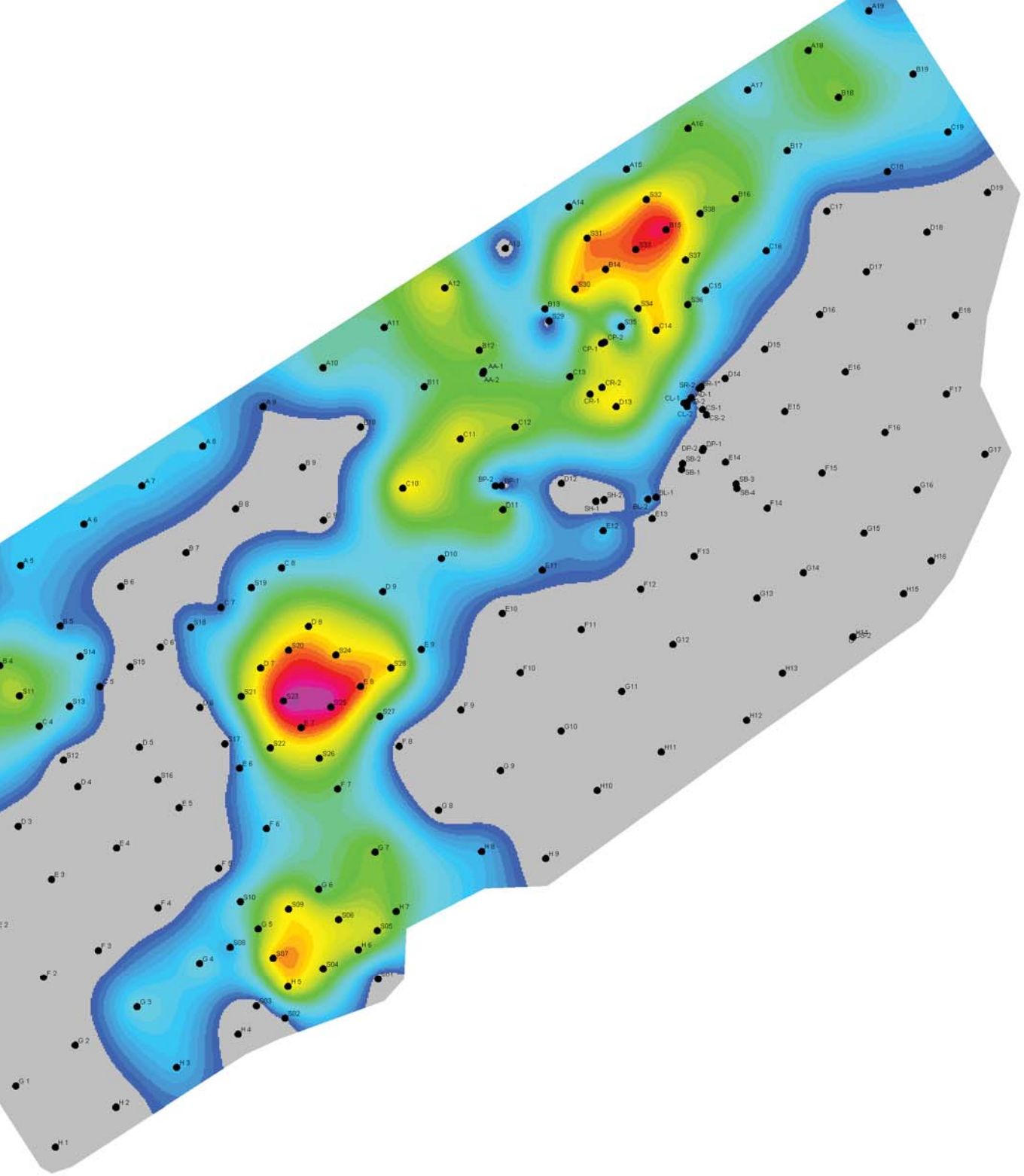


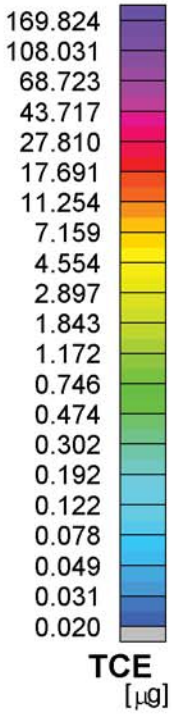


GORE ™ Surveys for Environme

W.L. GORE & ASS
100 CHESAPEAKE E
ELKTON, MD, US
USA
(410) 392-7

Navarro Research and
WSTF-NASA
Sampling Phases
Tetrachloroeth





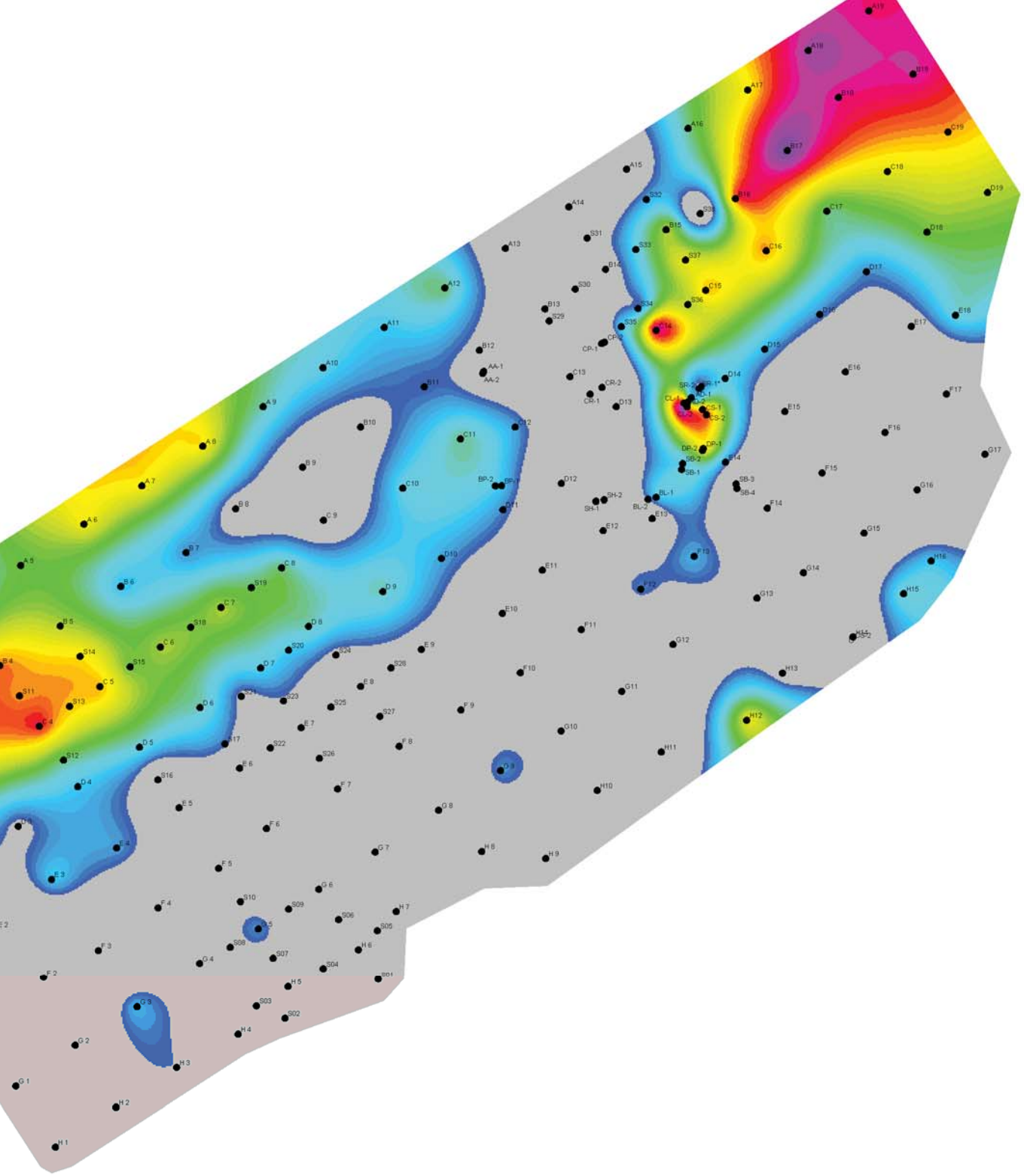
GORE ™ Surveys for Environme

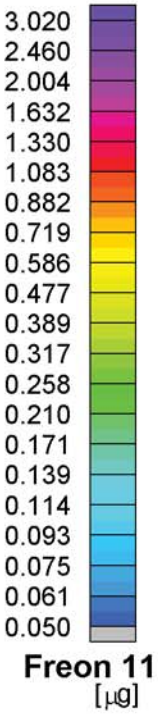
GORE
Creative Technologies Worldwide

W.L. GORE & ASS

100 CHESAPEAKE E
ELKTON, MD, US
USA
(410) 392-7

Navarro Research and
WSTF-NASA
Sampling Phases
Trichloroether





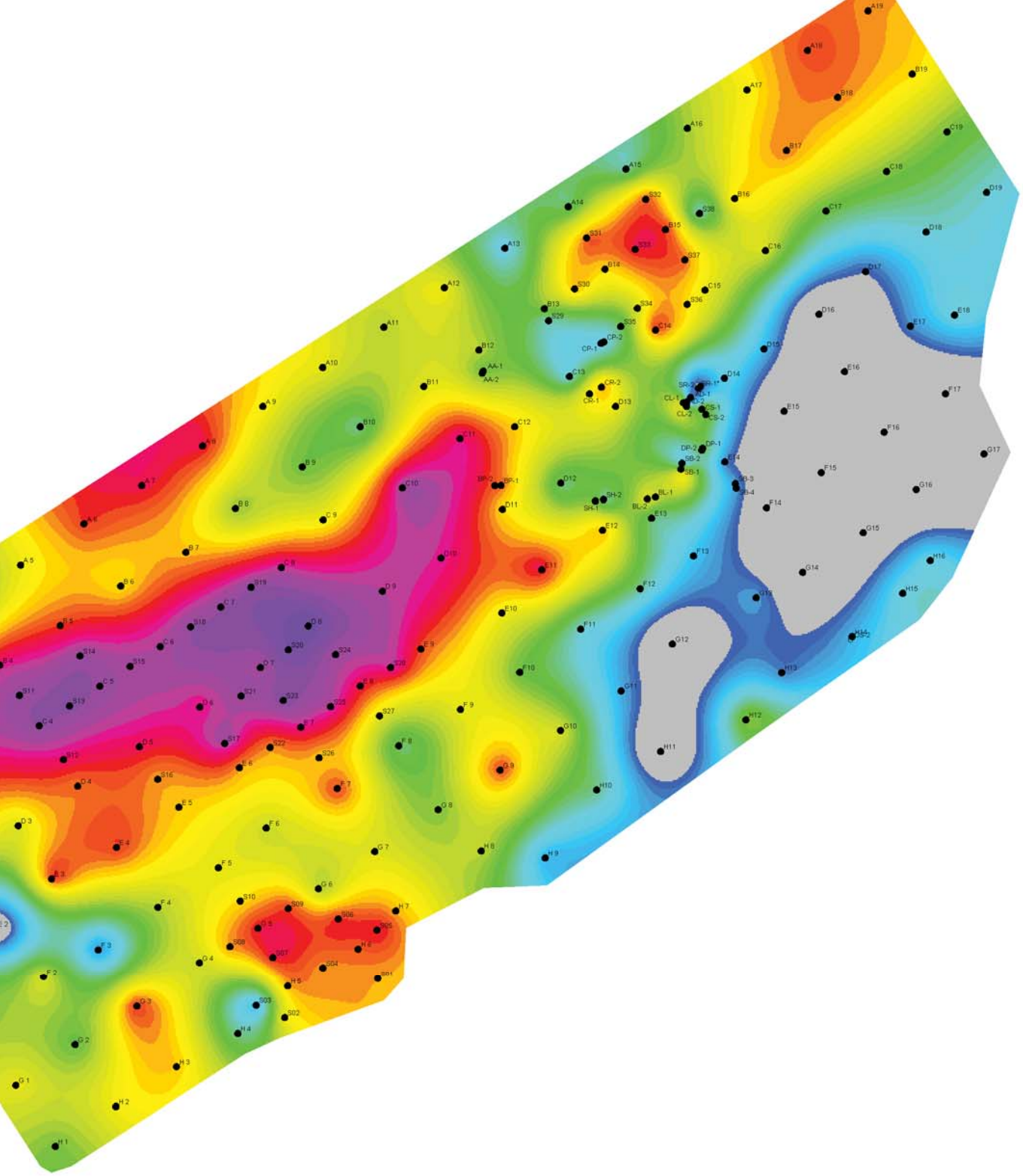
GORE ™ Surveys for Environme

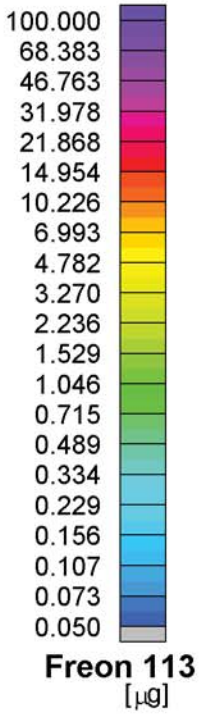
GORE
Creative Technologies Worldwide

W.L. GORE & ASS

100 CHESAPEAKE E
ELKTON, MD, US
USA
(410) 392-7

Navarro Research and
WSTF-NASA
Sampling Phases
Freon 11



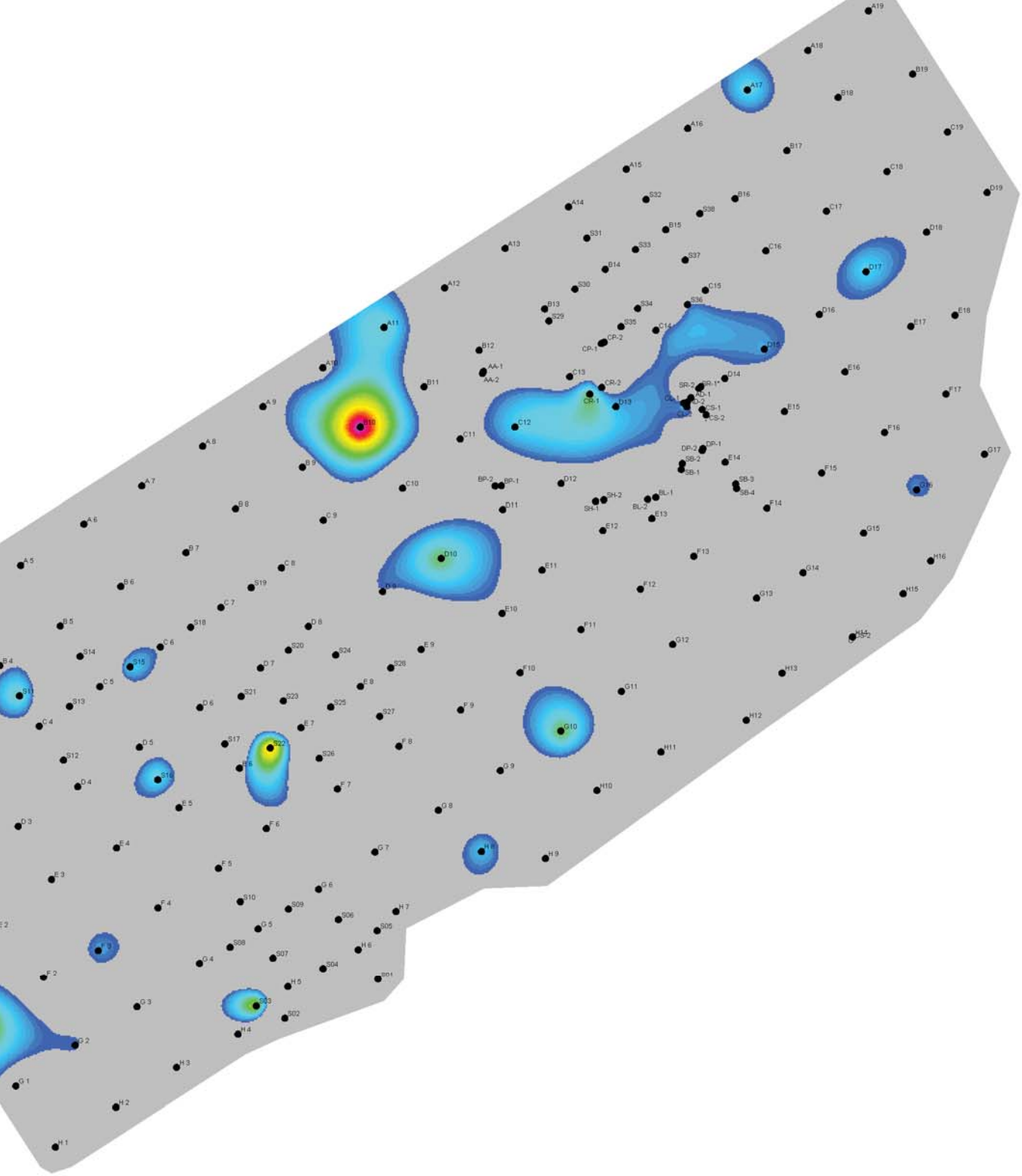


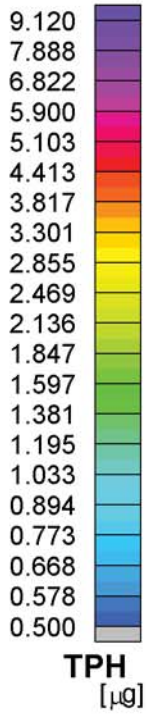
GORE ™ Surveys for Environme

GORE
Creative Technologies Worldwide

W.L. GORE & ASS
100 CHESAPEAKE B
ELKTON, MD, US
USA
(410) 392-7

Navarro Research and
WSTF-NASA
Sampling Phases
Freon 113





GORE ™ Surveys for Environme

GORE
Creative Technologies Worldwide

W.L. GORE & ASS
100 CHESAPEAKE E
ELKTON, MD, US
USA
(410) 392-7

Navarro Research and
WSTF-NASA
Sampling Phases
Total Petroleum Hydr

W. L. Gore & Associates, Inc.
100 Chesapeake Blvd. • P.O. Box 10
Elkton, MD 21922-0010
Phone: 410.392.7600 • 800.432.7998
Fax: 410.506.4780

gore.com/surveys

Sales Offices:
Europe: +49.89.4612.2198
San Francisco: 415.648.0438

Email: environmental@wlgore.com

Creative Technologies Worldwide

LIT 139.0 08/14/07

GORE and designs are trademarks of W. L. Gore & Associates, Inc. ©2007 W. L. Gore & Associates, Inc.

UNITED STATES POSTAL SERVICE

First-Class Mail
Postage & Fees Paid
USPS
Permit No. G-10

• Sender: Please print your name, address, and ZIP+4 in this box •

National Aeronautics and
Space Administration

Mail Code: RE-13-013
Lyndon B. Johnson Space Center
White Sands Test Facility
Post Office Box 20
Las Cruces, NM 88004-0020

SENDER: *COMPLETE THIS SECTION*

- Complete items 1, 2, and 3. Also complete item 4 if Restricted Delivery is desired.
- Print your name and address on the reverse so that we can return the card to you.
- Attach this card to the back of the mailpiece, or on the front if space permits.

1. Article Addressed to:

Hazardous Waste Bureau
Attn: Mr. Dan Comeau
New Mexico Environmental Department
2905 Rodeo Park Drive East, Building 1
Santa Fe, NM 87505

COMPLETE THIS SECTION ON DELIVERY

A. Signature
x [signature] ☐ Agent ☐ Addressee

B. Received by (Printed Name) [signature] C. Date of Delivery 1·31·13

D. Is delivery address different from item 1? ☐ Yes
If YES, enter delivery address below: ☐ No

3. Service Type
☑ Certified Mail ☐ Express Mail
☐ Registered ☑ Return Receipt for Merchandise
☐ Insured Mail ☐ C.O.D.

4. Restricted Delivery? *(Extra Fee)* ☐ Yes

2. Article Number
(Transfer from service label) 7009 3410 0001 5868 2558

PS Form 3811, February 2004 Domestic Return Receipt 102595-02-M-1540