

ENVIRONMENTAL RESPONSE FUND WELL SITE INVESTIGATION REPORT - SOUTHWEST REGION

**WALTER GOFF #11 - API #05-083-06139
MONTEZUMA COUNTY, COLORADO**

APRIL 2008

Prepared for:

**COLORADO OIL AND GAS CONSERVATION COMMISSION
Denver, Colorado**

**ENVIRONMENTAL RESPONSE FUND WELL SITE
INVESTIGATION REPORT - SOUTHWEST REGION**

**WALTER GOFF #11 - API #05-083-06139
MONTEZUMA COUNTY, COLORADO**

APRIL 2008

Prepared for:

**COLORADO OIL AND GAS CONSERVATION COMMISSION
1120 Lincoln Street, Suite 801
Denver, Colorado 80203**

Prepared By:

**LT ENVIRONMENTAL, INC.
15 West Mill Street, Suite 213
PO Box 874
Bayfield, Colorado 81122
(970) 884-5215**



TABLE OF CONTENTS

	<u>Page</u>
EXECUTIVE SUMMARY	ii
SECTION 1.0 INTRODUCTION	1-1
1.1 OBJECTIVES	1-1
1.2 BACKGROUND	1-1
1.3 SITE LOCATION INFORMATION.....	1-1
1.4 SITE DESCRIPTION	1-2
SECTION 2.0 METHODOLOGY.....	2-1
2.1 DATABASE RESEARCH AND PLANNING	2-1
2.2 SOIL GAS SURVEY	2-1
2.3 SENSITIVE RECEPTOR SURVEY	2-2
SECTION 3.0 RESULTS	3-1
3.1 WELL SITE IDENTIFICATION	3-1
3.2 SOIL GAS SURVEY	3-1
3.3 SENSITIVE RECEPTOR SURVEY	3-1
SECTION 4.0 CONCLUSIONS AND RECOMMENDATIONS	4-1

LIST OF FIGURES

FIGURE 1	SITE LOCATION MAP
FIGURE 2	SITE MAP

LIST OF TABLES

TABLE 1	SOIL GAS SURVEY DATA
---------	----------------------

APPENDICES

APPENDIX A	EQUIPMENT SPECIFICATIONS
APPENDIX B	FIELD FORM

EXECUTIVE SUMMARY

LT Environmental, Inc. (LTE) has been retained by the Colorado Oil and Gas Conservation Commission (COGCC) to conduct a soil gas survey at the Walter Goff #11 (API #05-083-06139) abandoned production well site. The survey was conducted as part of the Environmental Response Fund (ERF) well investigation which included surveys of 31 orphan plugged and abandoned (P&A) well sites in the southwest region of Colorado.

The objective of this study is to determine whether potentially hazardous environmental conditions exist, specifically methane seepage, in the vicinity of the well site as a result of unsuccessful plugging operations and/or changing environmental conditions.

Based on the results of the soil gas survey, methane was not detected in the 21 subsurface probes advanced by LTE at the Walter Goff #11 abandoned production well site. Therefore, LTE does not believe that additional investigation is warranted at this time. However, future changes to the well site and/or surrounding properties, including development, may warrant additional investigation.

SECTION 1.0

INTRODUCTION

LT Environmental, Inc. (LTE) has been retained by the Colorado Oil and Gas Conservation Commission (COGCC) to conduct a soil gas survey at the Walter Goff #11 (API #05-083-06139) abandoned production well site. The survey was conducted as part of the Environmental Response Fund (ERF) well investigation which included surveys of 31 orphan plugged and abandoned (P&A) well sites in the southwest region of Colorado.

1.1 OBJECTIVES

The objective of this study is to determine whether potentially hazardous environmental conditions exist, specifically methane seepage, in the vicinity of the well site as a result of unsuccessful plugging operations and/or changing environmental conditions.

1.2 BACKGROUND

The ERF program has funded the plugging and abandonment of over 200 orphan oil and gas production wells in Colorado. Only limited documentation regarding the completion and/or the plugging and abandonment of these wells is available. In 2005, methane seepage from the Bryce 1-X orphan well in Bondad, Colorado created increased awareness of the potential hazardous conditions associated with the integrity of the P&A of orphan wells.

1.3 SITE LOCATION INFORMATION

The following table presents the location of the Walter Goff #11 orphan well, including the geographic coordinates, as measured by LTE using a Global Positioning System (GPS), and the legal description, as listed on the COGCC database.

WELL SITE LOCATION

Walter Goff #11 (API #05-083-06139)			
Geographic Coordinates (NAD83)		PLSS Location	County
Latitude	Longitude		
37.316981 North	-108.318311 West	NESE Sec. 6, T35N, R13W	Montezuma

API - American Petroleum Institute
NAD 83 - North American Datum 1983
PLSS - Public Land Survey System



1.4 SITE DESCRIPTION

The Walter Goff #11 abandoned well site is located in Montezuma County, Colorado, approximately 2.2 miles southwest of Mancos, Colorado (Figure 1). A pasture surrounds the well site to the north, east, south, and west. An un-named stream is located south of the abandoned well site. Pertinent photographs are presented below.



Walter Goff #11 - API#05-083-06139: Abandoned well location, view west



Walter Goff #11 - API#05-083-06139: Site layout with stream to south, view south

SECTION 2.0

METHODOLOGY

The following section summarizes the methodology used to complete the well site investigation.

2.1 DATABASE RESEARCH AND PLANNING

Prior to field activities, LTE conducted research of the online COGCC database. LTE reviewed the online well files for the orphan well site in order to compile any information relevant to location and boundaries of the well site and/or associated wellhead. This information was incorporated into the Geographic Information System (GIS) and used to develop a sampling grid for the well site. LTE also acquired aerial photographic images for the survey area and incorporated them into the GIS to assist in identifying the former location of the well site.

After database research was completed, LTE contacted the Utility Notification Center of Colorado (UNCC) in order to identify any buried utilities within the gas survey area. LTE also contacted all non-UNCC members (such as municipalities) in order to ensure that all known buried utilities within the survey area were marked prior to the advancement of soil gas survey probes. The LTE field crew carried copies of the utility locate request and associated identification numbers during field activities.

LTE created a 300-foot by 300-foot sampling grid with 100-foot spacing to cover the mapping area systematically and to provide a means to delineate the extent of the gas seepage. The grid was generated using AutoCAD LT® 2004 and projected into the appropriate coordinate system using ArcMap 8.3. The grid was uploaded onto a Trimble GeoXT® GPS unit for use in the field. The Trimble GPS unit meets the specifications of the COGCC Rule 215. The specification sheet for the GPS is included in Appendix A.

2.2 SOIL GAS SURVEY

On March 26, 2008, LTE conducted a soil gas survey of the well site. LTE used information obtained from the COGCC database, field observations, and information obtained through interviews with the current landowner to identify the location of the well site.

Once the well site location was determined, LTE used the electronic grid overlay to initiate the soil gas survey. During the survey, a slide hammer was used to advance a half-inch diameter steel rod (probe) at the corners of each square on the grid. Tubing was lowered into each borehole and gas measurements were collected directly from the shallow surface soil approximately 1 foot to 4 feet below ground surface (bgs). LTE measured the concentration of methane, carbon monoxide, hydrogen sulfide, and oxygen at each sampling location using a Mine Safety Appliances (MSA) Gasport® four gas meter. The specification sheet for the four gas meter is included in Appendix A.

Each sample location was recorded using the GPS. The measured gas concentrations and other relevant field notes were stored as attributes in the GPS unit with the associated GPS mapped

position. LTE also mapped pertinent features, if observed, including abandoned wellhead markers, the corners of the well site, roads, surface water features, and/or other structures on site.

LTE collected photographs of pertinent features observed during the soil gas survey. At a minimum, two photographs were collected depicting the site layout and/or wellhead marker. The starting and ending digital image file numbers were stored in the GPS datalogger.

A well investigation field form was completed for the well site survey. The form included the following information:

- The well name and API number;
- Directions to the well site;
- The absence or presence of a well marker or wellpad;
- The absence or presence of other wells at the well site;
- Whether or not methane was detected at the well site;
- The absence or presence of stressed vegetation at the well site;
- The absence or presence of surface staining at the well site;
- The absence or presence of utilities at the well site;
- The absence or presence of oil and gas related equipment at the well site;
- The absence or presence of sensitive receptors on or nearby the well site; and
- A photographic log.

The field form is included as Appendix B of this report.

2.3 SENSITIVE RECEPTOR SURVEY

LTE conducted a sensitive receptor survey at the well site. LTE observed the well site and surrounding area to determine if receptors, such as houses, surface water features, and/or water wells, were present which could potentially be impacted by methane seepage from the well site. LTE documented the presence or absence of sensitive receptors on the well investigation field forms.

SECTION 3.0

RESULTS

The following section summarizes the results of the soil gas survey conducted at the well site.

3.1 WELL SITE IDENTIFICATION

No abandoned well marker or well pad was observed at the location of the well site. Database research indicated that the well casing was most likely cut at a depth of 4 feet bgs and the area was backfilled and restored to its original condition. According to Mr. Wayne Robb, the landowner of the property, a tank associated with gas production was once located next to the COGCC database position of the abandoned well. Therefore, the sampling grid for this survey was centered over the location of the abandoned well as provided on the COGCC database.

3.2 SOIL GAS SURVEY

Results of this survey indicate that methane was not detected at any of the sample locations. Additionally, hydrogen sulfide was not detected at any of the sample locations. Oxygen concentrations ranged from 18.6 percent (%) to 20.8%. Detectable concentrations of carbon monoxide ranged from 1 part per million (ppm) to 5 ppm. No stressed vegetation was observed during the survey. Results of the soil gas survey are depicted on Figure 2. Table 1 presents the subsurface gas measurements collected during the survey.

3.3 SENSITIVE RECEPTOR SURVEY

LTE observed an un-named stream located approximately 175 feet south of the abandoned well site. LTE did not observe any visible methane seeps within the surface water of the stream.

SECTION 4.0

CONCLUSIONS AND RECOMMENDATIONS

Based on the results of the soil gas survey, methane was not detected in the 21 subsurface probes advanced by LTE at the Walter Goff #11 abandoned production well site. Therefore, LTE does not believe that additional investigation is warranted at this time. However, future changes to the well site and/or surrounding properties, including development, may warrant additional investigation.

FIGURES



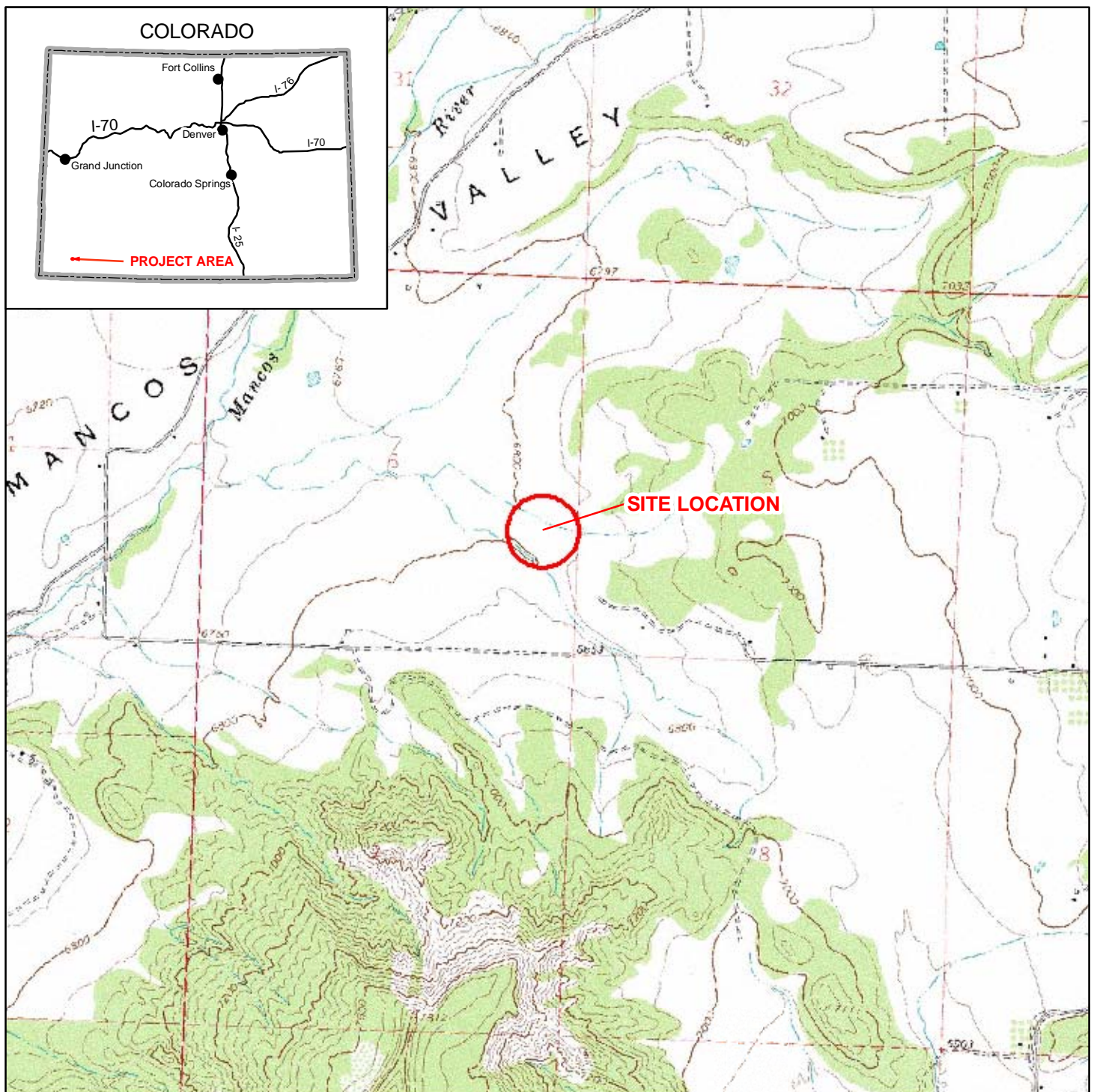
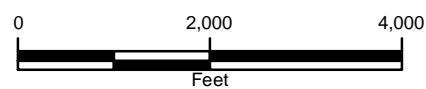


IMAGE COURTESY OF USDA/NRCS, VARIOUS DATES



LEGEND

○ SITE LOCATION

FIGURE 1
SITE LOCATION MAP
GOFF, WALTER #11 (05-083-06139)
MONTEZUMA COUNTY, COLORADO

COLORADO OIL & GAS CONSERVATION COMMISSION





IMAGE COURTESY OF GOOGLE EARTH

LEGEND

SUBSURFACE METHANE MEASUREMENTS

- 0 ppm
- 1 ppm - 500 ppm
- 501 ppm - 5%
- 6% - 15%
- 16% - 25%
- 26% - 50%
- 51% - 75%
- 76% - 100%
- SECTION LINE

COGCC OIL & GAS WELL (API NO.)

- FORMER TANK
- ⊘ ABANDONED LOCATION
- ⊕ DRY AND ABANDONED
- ⊕ PLUGGED AND ABANDONED



FIGURE 1
SITE LOCATION MAP
GOFF, WALTER #11 (05-083-06139)
MONTEZUMA COUNTY, COLORADO

COLORADO OIL & GAS CONSERVATION COMISSION



TABLE



TABLE 1
SOIL GAS SURVEY DATA
WALTER GOFF #11 (API#05-083-06139)
MONTEZUMA COUNTY, COLORADO
COLORADO OIL AND GAS CONSERVATION COMMISSION

Point ID	Sample Date	Subsurface CH ₄ Conc. (ppm)	Subsurface O ₂ Conc. (%)	Subsurface H ₂ S Conc. (ppm)	Subsurface CO Conc. (ppm)
1	3/26/2008	0	20.4	0	5
2	3/26/2008	0	20.7	0	1
3	3/26/2008	0	20.4	0	2
4	3/26/2008	0	19.4	0	4
5	3/26/2008	0	20.8	0	1
6	3/26/2008	0	20.8	0	1
7	3/26/2008	0	20.4	0	1
8	3/26/2008	0	20.4	0	4
9	3/26/2008	0	20.4	0	4
10	3/26/2008	0	18.6	0	0
11	3/26/2008	0	20.8	0	4
12	3/26/2008	0	20.8	0	0
13	3/26/2008	0	20.3	0	0
14	3/26/2008	0	20.4	0	0
15	3/26/2008	0	20.8	0	0
16	3/26/2008	0	20.8	0	0
17	3/26/2008	0	20.8	0	0
18	3/26/2008	0	20.4	0	0
19	3/26/2008	0	20.8	0	0
20	3/26/2008	0	20.4	0	0
21	3/26/2008	0	20.4	0	2

Notes:

CH₄ - methane

O₂ - oxygen

H₂S - hydrogen sulfide

CO - carbon monoxide

Conc. - concentration

ppm - parts per million

% - percent



APPENDIX A
EQUIPMENT SPECIFICATIONS



The Gasport Gas Tester is designed for gas utility workers to detect methane and certain toxic gases. It is a reliable, simple, versatile tool to help your service technicians get the job done quickly! With multiple ranges and sensing capabilities built into one rugged housing, the Gasport Tester simplifies your work by reducing the number of meters you have to carry on the job.



Applications

The Gasport Tester's poison-tolerant methane sensor provides three measurement ranges for your daily service needs:

- Open air, safety sampling
- Small, in-home leak detection
- Street/outdoor service line leak detection

Features and Benefits

- **Proven in field use—rugged and reliable**
Less costly to maintain, less time in repair
- **Multiple functions in one instrument**
No need to buy, carry & maintain multiple instruments
- **New, poison-tolerant combustible gas sensor**
Reduces meter ownership costs
- **User-selectable, “silent” operation mode**
Reduces customer disturbances and worries
- **Fast warm up time**
Fastest warm up time in industry saves time
- **Can monitor up to four gases at a time**
Fewer instruments to carry
- **Show all gas concentrations simultaneously**
Eliminates guesswork on what reading is displayed
- **Autoranging methane sensor**
Automatically switches between 0-5% and 5-100% methane ranges
- **Gas readings recorded for later retrieval**
Can double check readings after job is done
- **Simple manual or automated calibration options**
Reduces training time and helps ensure accuracy
- **Intrinsically safe**
Meets safety standards for work in hazardous areas
- **Lifetime warranty on case and electronics**
Reduced maintenance and lifetime costs



Specifications

Gas	Range	Resolution
Methane	0–5000 ppm	50 ppm
Methane	0–100% LEL or 0–5% CH ₄	1 % LEL or 0.1% CH ₄
Methane	5–100% CH ₄	1% CH ₄
Oxygen	0–25%	0.1%
Carbon Monoxide	0–1000 ppm	1 ppm
Hydrogen Sulfide	0–100 ppm	1 ppm

Battery types:	NiCd and Alkaline
Case material:	Impact resistant, stainless-steel-fiber-filled polycarbonate
Operating temperature:	normal -10 to 40°C; extended -20 to 50°C
Operating humidity:	Continuous: 15-95% RH, non-condensing Intermittent duty: 5-95% RH, non condensing
Warm up time:	Less than 20 seconds to initial readings
Datalog capacity:	12 hours
Input:	3 clearly marked, metal domed keys
Warranty:	Case and Electronics: Lifetime Sensors and consumable parts: 1 year

The answer for gas utilities' gas detection needs

Ordering Information

Battery Chargers

Part No.	Description
494716	Omega 120 VAC 50/60Hz
495965	Omega 220 VAC 50/60Hz
801759	Omega 110/220 VAC, Five Unit, 50/60Hz
800525	Omega 8 - 24VDC for vehicle use

Battery Packs

Part No.	Description
496990	Standard NiCd Rechargeable
800526	Alkaline, Type C
711041	Alkaline, with Thumbscrews
800527	Heavy Duty NiCd Rechargeable

Sensors

Part No.	Description
813693	Combustible Gas
480566	O ₂
812389	CO
812390	H ₂ S

Protective Boots

Part No.	Description
804955	Black, for NiCd Battery Packs
802806	Orange, for NiCd Battery Packs
806751	Black, for Alkaline Battery Packs
806750	Orange, for Alkaline Battery Packs
806749	Black, for HD NiCd Battery Packs
806748	Orange, for HD NiCd Battery Packs
812833	Yellow Soft Carrying Case with Harness
711022	Black padded Vinyl Carrying Case with Harness

Sampling Equipment

Part No.	Description
800332	Probe - 1 ft., plastic
800333	Probe - 3 ft., plastic
803561	Probe - 3 ft., plastic (holes 2" from end) (bar hole probe)
803962	Probe - 3 ft., plastic (holes 2" from handle) (solid probe)
803848	Probe - Hot Gas Sampler
710465	Sampling Line - 5 ft., coiled
497333	Sampling Line - 10 ft.
497334	Sampling Line - 15 ft.
497335	Sampling Line - 25 ft.

Sampling Accessories

Part No.	Description
801582	Replacement Filter, Probe, pkg. of 10
801291	External Filter Holder
014318	Charcoal Filter
711039	Line Scrubber Filter Holder
711059	Line Scrubber Replacement Cartridges, Box of 12
808935	Dust Filter, Pump Module
802897	Water Trap (Teflon) Filter, Pump Module

Calibration Check Equipment

Part No.	Description
477149	Calibration Kit Model RP with 0.25 lpm Regulator
491041	Calibration Gas - methane, 2.5%
473180	Calibration Gas - 300 ppm CO
813718	Calibration Gas - methane, 2.5% oxygen, 15% 60 ppm CO
813720	Calibration Gas - methane, 2.5% oxygen, 15% 300 ppm CO 10 ppm H ₂ S
710288	Gasmiser™ Demand Regulator 0 - 3.0 lpm

Accessories

Part No.	Description
804679	Data Docking Module Kit. Includes the Data Docking Module, MSA Link Software and Instruction Manual

Approvals

The Gasport Gas Tester has been designed to meet intrinsic safety testing requirements in certain hazardous atmospheres.

The Gasport Gas Tester is approved by MET (an OSHA Nationally Recognized Testing Laboratory [NRTL]) for use in Class I, Division I, Groups A, B, C, D; Class II, Division I, Groups E, F, G; and Class III Hazardous locations. Gasport tGas Testers sold in Canada are approved by CSA for use in Class I, Division I, Groups A, B, C, and D locations.

Contact MSA at 1-800-MSA-2222 for more information or with questions regarding the status of approvals.

Gasport Gas Tester Kits

	LEL Display	O ₂	CO	H ₂ S	Alarms Always	Alarms Optional	Leak Detect Page	Peak	Alkaline Battery	NiCd Battery	5ft Coiled Line	1ft Probe	Part No.
4-Gas, Selectable, NiCd	•	•	•	•	•	•	•	•	•	•	•	•	711489
4-Gas, Selectable, Alkaline	•	•	•	•	•	•	•	•	•	•	•	•	711490
3-Gas, Selectable, NiCd	•	•	•	•	•	•	•	•	•	•	•	•	711493
3-Gas, Selectable, Alkaline	•	•	•	•	•	•	•	•	•	•	•	•	711494
2-Gas, Selectable, NiCd	•	•	•	•	•	•	•	•	•	•	•	•	711495
2-Gas, Selectable, Alkaline	•	•	•	•	•	•	•	•	•	•	•	•	711496
4-Gas, Alarms On, NiCd	•	•	•	•	•	•	•	•	•	•	•	•	711491
4-Gas, Alarms On, Alkaline	•	•	•	•	•	•	•	•	•	•	•	•	711492

Assemble-to-Order (ATO) System: You Make the Choices

The ATO System makes it easy to "custom order" the Gasport Gas Tester, configured exactly the way you want it. You can choose from an extensive line of base instrument components and accessories. To obtain a copy of the "ATO System and Price Information for the Gasport Gas Tester," call toll-free 1-800-MSA-2222, and request Bulletin 0804-28. To obtain a copy of the ATO via FAX, call MSA QuickLit Information Service at 1-800-672-9010. At the prompt, request QuickLit Document #2345 (ATO for Gasport Gas Tester).

Note: This Data Sheet contains only a general description of the products shown. While uses and performance capabilities are described, under no circumstances shall the products be used by untrained or unqualified individuals and not until the product instructions including any warnings or cautions provided have been thoroughly read and understood. Only they contain the complete and detailed information concerning proper use and care of these products.

ID 08-04-27-MC / May 2000
© MSA 2000 Printed in U.S.A.



Corporate Headquarters
P.O. Box 426
Pittsburgh, PA 15230 USA
Phone (412) 967-3000
www.MSAnet.com

U.S. Customer Service Center
1-800-MSA-2222

MSA International
Phone (412) 967-3354
FAX (412) 967-3451

Offices and representatives worldwide
For further information:



The total GPS platform for all your GIS field requirements

The GeoXT™ handheld, from the GeoExplorer® series, is an essential tool for maintaining your GIS. It's all you need to collect location data, keep existing GIS information up to date, and even mobilize your GIS.

The unique GeoExplorer series combines a Trimble® GPS receiver with a rugged field-ready handheld computer running the Microsoft® Windows Mobile™ 2003 software for Pocket PCs. Plus there's an internal battery that easily lasts for a whole day of GPS operation. The result is tightly integrated, tough, and incredibly powerful.

High-accuracy integrated GPS

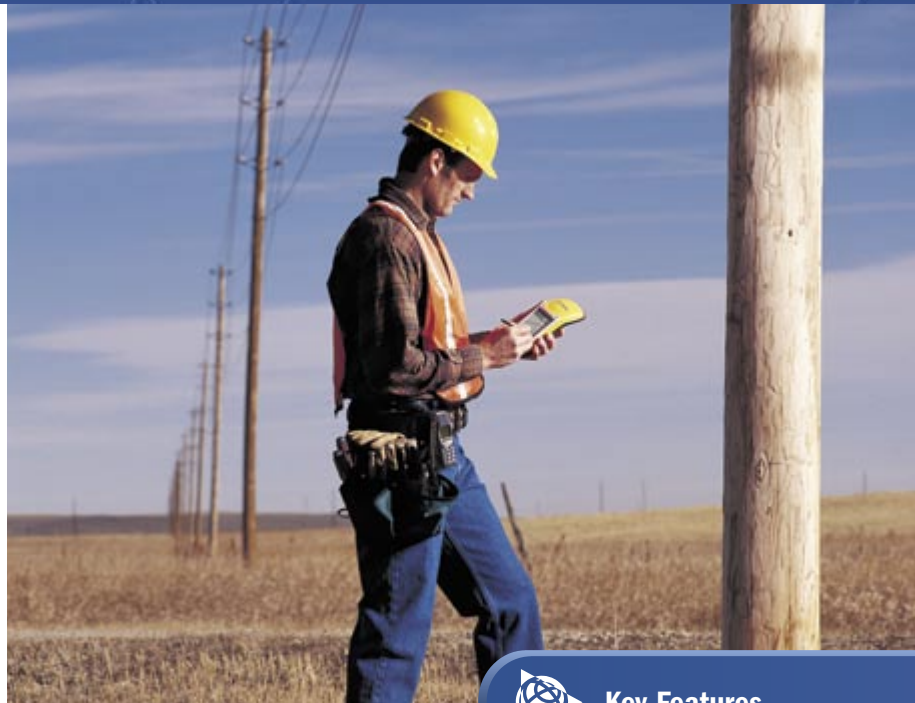
The GeoXT is optimized to provide the reliable, high-accuracy location data you need. Advanced features like EVEREST™ multipath rejection technology let you work under canopy, in urban canyons, or anywhere where accuracy is crucial.

Need submeter accuracy in real-time? Use corrections from a satellite-based augmentation system (SBAS) like WAAS¹ or EGNOS². Want to get that extra edge in precision? Collect data with Trimble's TerraSync™ or GPSCorrect™ software, and then postprocess back in the office.

Because the GPS receiver and antenna are built into the handheld computer, it's never been easier to use GPS in your application. The system is more than just cable-free: it's a totally integrated solution.

Optimized productivity

Take advantage of the power and flexibility of Windows Mobile software for Pocket PCs by choosing from the most comprehensive range of field software available—whether off-the-shelf or purpose-built. Whatever your needs, Windows



Key Features

- High-performance submeter GPS with integrated WAAS/EGNOS
- Windows Mobile 2003 software for Pocket PCs, allowing maximum flexibility in software choice
- Rugged handheld with all-day battery
- Advanced color TFT display with backlight
- Integrated Bluetooth for wireless connectivity

Mobile lets you choose a software solution to match your workflow.

Windows Mobile includes familiar Microsoft productivity tools, including Pocket Word, Pocket Excel, and Pocket Outlook®. Pocket Outlook lets you synchronize e-mails, contacts, appointments, and data with your office computer, so whether you're in the office or in the field, you're always up to date.

Go wireless with integrated Bluetooth®* for connection to other Bluetooth-enabled devices, including cell phones and PCs. You also have the option to use the USB support module to connect to a desktop computer, or use the optional serial clip for cabled connections in the field.

Receive a free copy of Microsoft Streets & Trips** 2004 software with your GeoXT handheld, and take advantage of comprehensive map and travel information for easy navigation and route planning.

All the memory you need

There's plenty of storage space in the GeoXT for all your GIS data. The fast processor and large memory mean even big graphics files load quickly—and they're crisp and crystal-clear on the advanced TFT outdoor color screen.

From data collection to data maintenance, to mobile GIS and beyond ... the GeoXT is the handheld of choice.

* Bluetooth type approvals are country specific. GeoExplorer series handhelds are approved for use with Bluetooth in the USA. For a complete list of other countries with Bluetooth approval please refer to:

www.trimble.com/geo_bluetooth.html.

** Microsoft Streets & Trips 2004 software available in US/Canada; Microsoft AutoRoute® 2004 in Europe.

The total GPS platform for all your GIS field requirements

Standard features

System

- Microsoft Windows Mobile 2003 software for Pocket PCs
- 206 MHz Intel StrongARM processor
- 512 MB non-volatile Flash data storage
- Outdoor color display
- Ergonomic cable-free handheld
- Rugged and water-resistant design
- All-day internally rechargeable battery
- Bluetooth wireless

GPS

- Submeter accuracy
- Integrated WAAS¹/EGNOS²
- RTCM real-time correction support
- NMEA and TSIP protocol support
- EVEREST multipath rejection technology

Software

- GPS Controller for control of integrated GPS and in-field mission planning
- GPS Connector for connecting integrated GPS to external ports
- File Explorer, Internet Explorer, Pocket Outlook (Inbox, Calendar, Contacts, Tasks, Notes), Sprite Pocket Backup, Transcriber, Pocket Word, Pocket Excel, Pictures, Windows® Media Player, Bluetooth File Transfer, Calculator, ActiveSync®
- Microsoft Streets & Trips/AutoRoute 2004 software

Accessories

- Support module with power supply and USB data cable
- Getting Started Guide
- Companion CD includes Outlook 2002 and ActiveSync 3.7.1
- Hand strap
- Pouch
- Stylus

Optional Features

Software

- TerraSync
- GPSCorrect for ESRI® ArcPad®
- GPS Pathfinder® Tools Software Development Kit (SDK)
- GPS Pathfinder Office
- Trimble GPS Analyst extension for ArcGIS®

Accessories

- Serial clip for field data and power input
- Vehicle power adaptor³
- Portable power kit³
- Hurricane antenna
- External patch antenna
- Pole-mountable ground plane
- Baseball cap with antenna sleeve
- Beacon-on-a-Belt (BoB™) differential correction receiver³
- Hard carry case
- Null modem cable³
- Backpack kit

Specifications subject to change without notice.

Technical specifications

Physical

Size 21.5 cm × 9.9 cm × 7.7 cm (8.5 in × 3.9 in × 3.0 in)
 Weight 0.72 kg (1.59 lb) with battery
 Processor 206 MHz Intel StrongARM SA-1110
 Memory 64 MB RAM and 512 MB internal Flash disk
 Power
 Low (no GPS) 0.6 Watts
 Normal (with GPS) 1.4 Watts
 High (with GPS, backlight, and Bluetooth) 2.5 Watts
 Battery Internal lithium-ion, rapidly rechargeable in unit, 21 Watt-hours

Environmental

Temperature
 Operating -10 °C to +50 °C (14 °F to 122 °F)
 Storage -20 °C to +70 °C (-4 °F to 158 °F)
 Humidity 99% non-condensing
 Casing Wind-driven rain and dust-resistant per IP 54 standard
 Slip-resistant grip, shock- and vibration-resistant

Input/output

Communications Bluetooth for wireless connectivity
 USB via support module, serial via optional DE9 serial clip adaptor

Bluetooth

Certification Bluetooth type approvals are country specific.
 GeoExplorer series handhelds are approved for use with Bluetooth in the USA.
 For a complete list of other countries with Bluetooth approval please refer to www.trimble.com/geoxt_ts.asp.

Profiles

Both client and host support Serial Port, File Transfer (using OBEX)
 Client support only Dial-Up Networking, Lan Access
 Host support only Basic Imaging, Object Push
 Display Advanced outdoor TFT, 240 × 320 pixel, 65,536 colors, with backlight
 Audio Microphone and half duplex speaker, record and playback utilities
 Interface Anti-glare coated touch screen, Soft Input Panel (SIP) virtual keyboard
 2 hardware control keys plus 4 programmable permanent touch buttons
 Handwriting recognition software, Audio system events, warnings, and notifications

GPS

Channels 12
 Integrated real-time WAAS¹ or EGNOS²
 Update rate 1 Hz
 Time to first fix 30 sec (typical)
 Protocols NMEA (GGA, VTG, GLL, GSA, ZDA, GSV, RMC),
 TSIP (Trimble Standard Interface Protocol)

Accuracy (RMS)⁴ after differential correction

Postprocessed⁵ Submeter
 Carrier postprocessed⁶
 With 10 minutes tracking satellites 30 cm
 Real-time Submeter

¹ WAAS (Wide Area Augmentation System). Available in North America only.

For more information, see <http://gps.faa.gov/programs/index.htm>.

² EGNOS (European Geostationary Navigation Overlay System). Available in Europe only.

For more information, see <http://www.esa.int/export/esaSA/navigation.html>.

³ Serial clip also required.

⁴ Horizontal accuracy. Requires data to be collected with minimum of 4 satellites, maximum PDOP of 6, minimum SNR of 4, minimum elevation of 15 degrees, and reasonable multipath conditions. Ionospheric conditions, multipath signals or obstruction of the sky by buildings or heavy tree canopy may degrade precision by interfering with signal reception. Accuracy varies with proximity to base station by +1 ppm for postprocessing and real-time, and by +5 ppm for carrier postprocessing.

⁵ Postprocessing with GPS Pathfinder Office software or GPS Analyst extension for ArcGIS.

⁶ Requires collection of carrier data. (Only available with the GPS Pathfinder Office software).

NORTH & SOUTH AMERICA

Trimble Navigation Limited
 7403 Church Ranch Blvd • Suite 100
 Westminster, CO 80021 • USA
 +1-720-887-4374 Phone • +1-720-887-8019 Fax

EUROPE, AFRICA & MIDDLE EAST

Trimble GmbH
 Am Prime Parc 11 • 65479 Raunheim • GERMANY
 +49-6142-2100-0 Phone • +49-6142-2100-550 Fax

ASIA-PACIFIC

Trimble Navigation Australia Pty. Ltd
 Level 1 • 123 Gotha St • Fortitude Valley
 Queensland 4006 • AUSTRALIA
 +61-7-3216-0044 Phone • +61-7-3216-0088 Fax



APPENDIX B
ERF WELL INVESTIGATION FIELD FORM



ERF Well Investigation Field Form

Well Name Walter Goff #11
 API # 05-083-06139
 Directions G Road, N into Wayne Robb property
 Date Visited 3/26/08 Personnel KGS/TL

Was the well or wellpad identified? Y ☒ N
 Are other wells observed on the wellpad? Y ☒ N
 Was methane detected during the survey? Y ☒ N
 Was stressed vegetation observed? Y ☒ N
 Was surface staining observed? Y ☒ N
 Are utilities present? Y ☒ N
 Is oil and gas related equipment present? Y ☒ N
 Are any sensitive receptors present? ☒ Y ☒ N

If so, what are they? Un named Stream
 Where are they located (distance/direction)? South \approx 175' from COGCC database position of well

Photograph Log

Feature	View	File Number
<u>Well marker</u>	<u>W</u>	<u>3402</u>
<u>Site layout</u>	<u>S</u>	<u>3405</u>
<u>Possible tank(former)</u>	<u>N</u>	<u>3404</u>

Additional Comments: Mr. Wayne Robb, landowner, stated that a tank associated w/ O+G was once located next to the COGCC database position of well.

Checklist

	Complete	N/A
Grid sampling	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Measurement next to well casing	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Map stressed vegetation / staining	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Map well pad corners	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Map well location	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Map pertinent features	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Receptor survey	<input checked="" type="checkbox"/>	<input type="checkbox"/>
Photograph collection	<input checked="" type="checkbox"/>	<input type="checkbox"/>