

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

FORM APPROVED
OMB No. 1004-0137
Expires: July 31, 2010

SUNDRY NOTICES AND REPORTS ON WELLS
Do not use this form for proposals to drill or to re-enter an abandoned well. Use Form 3160-3 (APD) for such proposals.

5. Lease Serial No. **LC - 069157**
6. If Indian, Allottee or Tribe Name

SUBMIT IN TRIPLICATE - Other instructions on page 2.

7. If Unit of CA/Agreement, Name and/or No.

1. Type of Well
 Oil Well Gas Well Other

8. Well Name and No.
Dublin 23 Federal #1

2. Name of Operator
Marshall & Winston, Inc.

9. API Well No.
30-015-34879

3a. Address **P. O. Box 50880
Midland, TX 79710-0880**

3b. Phone No. (include area code)
432-684-6373

10. Field and Pool or Exploratory Area
Loving Brushy Canyon East

4. Location of Well (Footage, Sec., T., R., M., or Survey Description)
660' FSL & 1980' FEL, Unit O, Sec. 23, T22S, R28E

11. Country or Parish, State
Eddy Co., NM

12. CHECK THE APPROPRIATE BOX(ES) TO INDICATE NATURE OF NOTICE, REPORT OR OTHER DATA

TYPE OF SUBMISSION	TYPE OF ACTION			
<input type="checkbox"/> Notice of Intent	<input type="checkbox"/> Acidize	<input type="checkbox"/> Deepen	<input type="checkbox"/> Production (Start/Resume)	<input type="checkbox"/> Water Shut-Off
<input checked="" type="checkbox"/> Subsequent Report	<input type="checkbox"/> Alter Casing	<input type="checkbox"/> Fracture Treat	<input type="checkbox"/> Reclamation	<input type="checkbox"/> Well Integrity
<input type="checkbox"/> Final Abandonment Notice	<input type="checkbox"/> Casing Repair	<input type="checkbox"/> New Construction	<input type="checkbox"/> Recomplete	<input checked="" type="checkbox"/> Other H2S - ROE
	<input type="checkbox"/> Change Plans	<input type="checkbox"/> Plug and Abandon	<input type="checkbox"/> Temporarily Abandon	
	<input type="checkbox"/> Convert to Injection	<input type="checkbox"/> Plug Back	<input type="checkbox"/> Water Disposal	

13. Describe Proposed or Completed Operation: Clearly state all pertinent details, including estimated starting date of any proposed work and approximate duration thereof. the proposal is to deepen directionally or recomplete horizontally, give subsurface locations and measured and true vertical depths of all pertinent markers and zones. Attach the Bond under which the work will be performed or provide the Bond No. on file with BLM/BIA. Required subsequent reports must be filed within 30 days following completion of the involved operations. If the operation results in a multiple completion or recompletion in a new interval, a Form 3160-4 must be filed once testing has been completed. Final Abandonment Notices must be filed only after all requirements, including reclamation, have been completed and the operator has determined that the site is ready for final inspection.)

Radius of exposure of H2S per Onshore Oil and Gas
Order #6.III.A.2.
Volume Gas: 35,000 SCF/Day
H2S Conc.: 1800 ppm
500 ppm ROE = 8.2 feet
100 ppm ROE = 17.9 feet

Accepted for record
Accepted for record
NMOCD

RECEIVED
JUL 30 2012
NMOCD ARTESIA

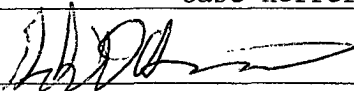
ACCEPTED FOR RECORD
JUL 25 2012
/s/ JD Whitlock Jr
BUREAU OF LAND MANAGEMENT
CARLSBAD FIELD OFFICE

14. I hereby certify that the foregoing is true and correct
Name (Printed/Typed)

Gabe Herrera

Title **Engineer**

Signature



Date **January 9, 2012**

THIS SPACE FOR FEDERAL OR STATE OFFICE USE

Approved by

Title

Date

Conditions of approval, if any, are attached. Approval of this notice does not warrant or certify that the applicant holds legal or equitable title to those rights in the subject lease which would entitle the applicant to conduct operations thereon.

Office

Title 18 U.S.C. Section 1001 and Title 43 U.S.C. Section 1212, make it a crime for any person knowingly and willfully to make to any department or agency of the United States any false fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

Marshall & Winston Inc.

Contingency Plan for

Hydrogen Sulfide

Legals for

Production Unit

Dublin Federal 23

FEL 1980', FSL 660'

Sec.23, Township 22S, Range 28E, Unit O

Eddy Co, NM

GPS Coordinates

N32'22.367'

W104"03.376'

Prepared by Total Safety US Inc.

1101 South First Street

Artesia NM 88211

Direction to location

From Carlsbad, NM take 62/180 east towards Hobbs go to US Refinery Rd turn south for 8.5 miles turn east at Marshall & Winston Dublin
Federal Lease sign go 1.9 miles to location

Table of Contents

1.	Process Safety Control Plan.....	3
1.1	Objective.....	3
1.2	Hazards.....	3
1.2.1	Fire	3
1.2.2	Natural Gas	4
1.3	Process Safety Controls	4
1.3.1	Operational Controls	4
1.3.1.1	Determination of H ₂ S concentration and Radius of Exposure	4
1.3.1.2	Signs.....	4
1.3.1.2.1	Marshall & Winston, Inc. Emergency Notification Number	4
1.3.1.2.2	All Tank Batteries and Test Headers, and Pumping Units within Sensitive Area	4
1.3.1.2.3	Buried Flow Lines and Trunk Lines	5
1.3.1.3	Security.....	5
1.3.1.3.1	Fencing	5
1.3.1.3.2	Locks	5
1.3.1.3.3	Plugging and Valve Openings.....	5
1.3.1.4	Personal H ₂ S monitoring	5
1.3.1.4.1	Personal Monitors.....	5
1.3.1.5	Employee and Contractor Training	5
1.3.1.6	Well Work Over / Completion.....	6
1.4	Maps of Sensitive Areas.....	7
2.	Contingency Plan	8
2.1	Operation Contingencies.....	8
2.1.1	Marshall & Winston, Inc. Employee Response.....	8
2.1.1.1	Communication Equipment	8
2.1.1.1.1	Pagers	8
2.1.1.1.2	Two-Way Radios	8
2.1.2	Individual or Public Response.....	9
2.2	Awareness Program	9
2.2.1	Affected Individuals and Businesses.....	9
2.2.2	Utility Companies and Emergency Response Agencies.....	9
2.3	Attachment #1.....	10

1 Process Safety Control Plan

When implemented, this process safety control plan will adequately protect the employees and contractors of, as well as, the public and environment from routine and unplanned releases of natural gas and production fluids that may contain toxic quantities of Hydrogen Sulfide (H_2S). This will be accomplished through administrative, as well as, operational controls. The management of *Marshall & Winston, Inc.* is responsible for implementation and maintenance of this plan.

1.1 Objective

This plan will discuss the hazards present at the referenced *Marshall & Winston, Inc.* production units and specifically address administrative and operational controls that will be sufficient to protect the residents domiciled in sensitive areas, recreational transients, and *Marshall & Winston, Inc.* employees and contractors.

1.2 Hazards

This *Marshall & Winston, Inc.* lease produces natural gas and condensate which are flammable and/or toxic (H_2S). Historically, i.e., for the past 20 years, there is no record of personal injury due to fire or H_2S exposure resulting from an atmospheric release from a *Marshall & Winston, Inc.* facility. *Marshall & Winston, Inc.* facilities also contribute, from time to time, odors and noise classified as "nuisance." The New Mexico OCD has issued air quality regulation exemptions and atmospheric release permits, on a location by location basis, where routine releases of natural gas occur.

1.2.1 Fire

Fire hazards are present at all *Marshall & Winston, Inc.* facilities and, except for the control battery where the crude oil and natural gas is separated, a fire would be composed of both crude oil and natural gas. Each *Marshall & Winston, Inc.* lease operator will have in the field vehicle an adequate and operable fire extinguisher for use in extinguishing incipient fires. Ignition sources at *Marshall & Winston, Inc.* locations will be reasonably eliminated.

1.2.1.1 Crude Oil

Crude oil is a flammable liquid confined to the flow lines, tank batteries, and trunk lines. Unplanned releases or spills present a flammable hazard.

1.2.1.2 Natural Gas

Limited quantities of flammable natural gas is present in the flow lines, tank batteries, and trunk lines which comprises the production gathering system. Unplanned releases or spills present a flammable hazard.

1.2.2 Toxicity

The production fluids and natural gas contain H_2S and has been summarized in the document titled, *Marshall & Winston, Inc. H₂S Survey and Radius of Exposure Determination for Production Unit; Dublin Federal 23, January 2008*. Allowable occupation exposure to this compound is limited to 10 ppm in an eight hour period (Permissible Exposure Limit-PBL) or 15 ppm for a single 15 minute period during an eight hour day (Short Term Exposure Limit-STEL) (OSHA/ANSI/NIOSH). Concentrations > 300 ppm H_2S are considered to be Immediately Dangerous to Life and Health (IDLH). Releases to the environment and exposure of individuals should be maintained as low as reasonably achievable.

1.2.2.1 Production Fluids

Production fluids are composed of natural gas and formation water. Both contain dissolved H₂S that eludes during agitation or heating and the formation water contains varying concentrations organic salts. During normal operations the head space gases of the storage tanks for crude oil and formation water contain hazardous concentrations of H₂S. Unplanned releases or spills of the production fluids will have a negative impact on the affected ecosystem matrices, i.e., soil, ground water, and surface water and pose a health risk to exposed individuals.

1.2.2.2 Natural Gas

The natural gas produced at most *Marshall & Winston, Inc.* locations contains hazardous H₂S concentrations. Exposures should be avoided.

1.3 Process Safety Controls

To protect the *Marshall & Winston, Inc.* employees, contractors and individuals in sensitive areas, *Marshall & Winston, Inc.* will design and implement a system of safety controls on equipment within sensitive areas.

1.3.1 Operational Controls

Operational controls consist of safety devices installed on production and handling equipment to immediately stop or reduce the release to the environment of fluid or gas resulting from an equipment failure.

1.3.1.1 Determination of H₂S concentrations and Radius of Exposures

Based on information and calculations contained in the report, *Marshall & Winston, Inc. H₂S Survey and Radius of Exposure Determination for Production Units: Dublin Federal 23, January 2008*. *Marshall & Winston, Inc.* is able to prescribe operational and administrative controls which will maintain exposures of employees, contractors, individuals living in sensitive areas, and the environment "as low as reasonably achievable." The "Zero back Pressure Flow Rates" and consequently the Radius of Exposures from representative wells in sensitive areas were verified empirically in the *Marshall & Winston, Inc.* report titled, *H₂S Survey and Radius of Exposure Determination for Production Units: Dublin Federal 23, January 2008*.

1.3.1.2 Signs

Signs will be used to communicate the hazards presented by *Marshall & Winston, Inc.* equipment and activities to the affected individuals.

1.3.1.2.1 *Marshall & Winston, Inc.* Emergency Notification Number

These permanently posted signs will facilitate notification of *Marshall & Winston, Inc.* field operations personnel of an equipment or system failure by individuals domiciled within sensitive areas. The sign will read:

**Property of Marshall & Winston, Inc. In Case of Emergency
Call**

432-684-6373

1.3.1.2.2 All Tank Batteries and Test Headers, and Pumping Units within Sensitive Areas
All bulk oil and produced water storage tank battery facilities and test headers, as well as, pumping units within sensitive areas will have signs lettered,

WARNING/DANGER H₂S GAS PRESENT

and will be permanently attached to an adequate structure.

1.3.1.2.3 Buried Flow Lines and Trunk Lines

Buried flow lines and trunk lines will be marked with signs identifying *Marshall & Winston, Inc.* as the owner and the number to call to report a leak or plan an excavation in the area. These signs will be constructed of flexible Carsonite and will be placed at appropriate intervals directly above the buried line and at all road crossings.

1.3.1.3 Security

These controls will limit, deter, and restrict access to *Marshall & Winston, Inc.* properties that pose health or environmental hazards. This will also insure to some degree that the integrity of the operational systems will not be perturbed.

1.3.1.3.1 Fencing

All *Marshall & Winston, Inc.* facilities within sensitive areas will be enclosed with a chain link fence at least 8 feet high. Additionally, pumping units located near schools will be totally enclosed. Tank batteries and Test headers outside sensitive areas will be fenced with 4-strand barbed wire.

1.3.1.3.2 Locks

All facilities enclosed by chain link fencing will be locked. Padlocks will be keyed alike.

1.3.1.3.3 Plugging Valve Openings

Valve openings will be plugged and ball valve handles removed at facilities within sensitive areas.

1.3.1.4 H₂S Monitoring

These monitors are designed to inform, by alarm, the *Marshall & Winston, Inc.*, employee or contractor of hazardous and dangerous accumulations or releases of H₂S.

1.3.1.4.1 Personal Monitors

All *Marshall & Winston, Inc.* employees and contractors will be required to have on their person while working in and around *Marshall & Winston, Inc.* properties a personal H₂S monitor. *Marshall & Winston, Inc.* will provide its' employees with monitors and train them in their use. Contractors will see that their employees are likewise equipped and trained.

1.3.1.5 Employee and Contractor Training

All *Marshall & Winston, Inc.* employees and contractors are required to attend annual H₂S Safety and Respiratory Protection training and will have on their person, as evidence of training, a field verification card showing the date of training and provider.

1.3.1.6 Well Workover/Completion

Marshall & Winston, Inc. will close in well immediately with BOP's and install TIW valve on tubing in case of release of natural gas during this operation. If release is necessary, *Marshall & Winston, Inc.* will flare blow down during this operation thence minimizing toxic gas in atmosphere (API RP55 9.12 and 9.14). During the release of toxic gas there will be a hydrogen sulfide package with hydrogen sulfide monitoring and detection instruments and respiratory protection available. All respirators shall meet the requirements of OSHA's Respiratory Protection Standard (refer to 29 Code of Federal Regulations Part 1910.134) and be approved under procedures outlined in ANSI Z88.2. All breathing air cylinders shall meet U.S. Department of Transportation (DOT) or other appropriate regulatory requirements (refer to 30 Code of Federal Regulations, Part 1910.134, Chapter 1, Subchapter B, Part II, Subpart H, Par. 11.80 and 49 Code of Federal Regulations Part 178, Subpart C). The following types of breathing equipment with full face piece meet these requirements and should be used where the work area atmospheric concentration exceeds 10 ppm for hydrogen sulfide or 2 ppm for sulfur dioxide:

- a. Self-contained, positive-pressure/pressure-demand breathing equipment that provides respiratory protection in any atmospheric concentration of hydrogen sulfide or sulfur dioxide.
- b. Positive-pressure/pressure-demand, air-line breathing equipment, with an auxiliary self-contained air supply (rated for a minimum of five minutes). This type unit can be used for entry as long as the air line is connected to a source of breathing air. The auxiliary self-contained air supply (rated for less than fifteen minutes) is suitable only for escape or self-rescue use.

Notes:

1. Personal assigned job-related tasks requiring routine use of breathing equipment shall have a periodic review to determine their physiological and psychological adequacy for use of this equipment (refer to ANSI Z88.2 and 29 Code of the Federal Regulations Part 1910.134).
2. Positive-pressure/pressure-demand, air-line or self-contained breathing apparatus, as appropriate, with full face piece shall be worn by personnel exposed to atmospheres containing concentrations of hydrogen sulfide and sulfur dioxide above OSHA's ACC's, STEL's, PEL's for air contaminants (refer to 29 Code of Federal Regulations Part 1910.1000).

CAUTION: Gas mask canister type breathing and demand type (negative pressure) equipment shall not be used in oil and gas producing and gas processing plant operations when a hydrogen sulfide or sulfur dioxide environment could be entered.

2 Contingency Plan

In the event of a natural disaster or equipment failure that subsequently results in an atmospheric release of hazardous fluids or gas, Marshall & Winston, Inc employees and affected individuals within sensitive areas.

2.1 Operational Contingencies

Marshall & Winston, Inc. equipment and facilities are designed to contain all production fluids and gas. All facilities are visually inspected /checked for leaks or deterioration by field personal once every (24) twenty four hours, if leaks are noted the employee responds appropriately. This, along with the system check valves and high and low-pressure shut downs will minimize inadvertent or accidental releases. However, in sensitive areas where the public is in close proximity to pumping units, flow lines, and test headers and are present locally (24)twenty fours a day, it is important that they know how to safely and effectively respond to Marshall & Winston, Inc. system leaks or spills.

2.1.1 Marshall & Winston, Inc. Employee Response

The employee of Marshall & Winston, Inc. that first responds to the release, whether the discoverer or directed by management, will be responsible for de-energizing equipment and closing valves to stop the release or spill and notifying affected residents of the area. If appropriately trained, the employee will also attempt to contain the spill. The employee will also contact the local emergency response agency or Fire Department for assistants. The matrix below contains pertinent telephone numbers.

Emergency Notification Numbers	
State Police	911
Emergency Medical/Ambulance Service	911
Fire Department	911
Hospital	575-887-4100
Sheriff's Department	911/ 575-887-7551
New Mexico OCD	575-393-6161
Marshall & Winston, Inc. Engineer Gabe Herrera	432-260-8650
Marshall & Winston, Inc lease operator Gary Standard	575-706-1770
Total Safety Artesia NM	575-746-2847
Marshall & Winston, Inc 24 hour Emergency Number	432-684-6373

Marshall & Winston, Inc. personnel will have communication devices available 24 hours a day

2.1.1.1.1. Pagers

Marshall & Winston, Inc supervisors and field personnel will have pagers on their person or in their presence 24 hours a day making them accessible during any emergency event

2.1.1.1.2 Two – Way Radios

All Marshall & Winston, Inc employees will have functional two-way radio communication

2.1.2 Individual or Public Response

Individuals domiciled in sensitive areas or recreational transients shall be made aware of the hazards presented by the oil and gas extraction activities conducted by *Marshall & Winston, Inc.* This will be accomplished with the use of adequate signage and marking. If an individual discovers an inadvertent release or spill, the appropriate response is to contact a representative of *Marshall & Winston, Inc.* at the telephone number listed on the signs. Which is:

432-684-6373

2.2 Awareness Program

Marshall & Winston, Inc. will implement this program to ensure appropriate response of individuals domiciled in sensitive areas or recreational transients, as well as, utility companies who traditionally install underground service and emergency response agencies.

2.2.1 Affected Individuals and Businesses

Marshall & Winston, Inc. will compose and distribute a written notice to individuals and businesses located within sensitive areas and will contain the following information. To verify delivery and receipt the affected individual will be asked to sign an addressed delivery roster.

- *Marshall & Winston, Inc.*, identified as the property owner
- Discuss hazards and nuisance.
- Telephone number to report a leak or equipment failure
- Stay away from the leak, especially children and pets
- Do not enter fenced areas. Call *Marshall & Winston, Inc.* to retrieve items within.

2.2.2 Utility Companies and Emergency Response Agencies

Marshall & Winston, Inc. will develop and transmit letters describing the locations of surface facilities and buried flow lines and associated hazards. This will enable utility companies to avoid contact with the buried lines and is necessary information that could feasibly affect emergency response procedures relative to a non-related emergency. Additionally, reporting requirements of SARA Title III have been filed with the New Mexico OCD and other appropriate emergency response agencies.

Wildcat Measurement Service
P.O.Box 1836
416 East Main Street
Artesia, NM 88211-1836

12/20/2011 10:58 AM
Phone: 575-746-3481
888-421-9453
Fax: 575-748-9852
dnorman@wildcatms.com

GAS ANALYSIS REPORT

Analysis For: MARSHALL & WINSTON, INC.
Field Name:
Well Name: DUBLIN FEDERAL "23" #1, #2 & #3
Station Number:
Purpose: SPOT-COMINGLED FROM GAS STREAM
Sample Deg. F: 60.0
Volume/Day:
Formation:
Line PSIG: 18.1
Line PSIA: 31.3

Run No: 2111220-01
Date Run: 12/20/2011
Date Sampled: 12/19/2011
Producer: MARSHALL & WINSTON
County: EDDY
State: NM
Sampled By: KARL HAENY
Atmos Deg. F: 54

GAS COMPONENTS			
		MOL%	GPM
Oxygen	O2:	0.0000	
Carbon Dioxide	C02:	0.0535	
Nitrogen	N2:	2.8926	
Hydrogen Sulfide	H2S:	0.1800	
Methane	C1:	61.1759	
Ethane	C2:	16.7019	4.4656
Propane	C3:	10.5115	2.8952
Iso-Butane	IC4:	1.3852	0.4532
Nor-Butane	NC4:	3.5364	1.1146
Iso-Pentane	IC5:	0.9915	0.3625
Nor-Pentanes	NC5:	1.0717	0.3884
Hexanes Plus	C6+:	1.4998	0.6520
Totals		100.0000	10.3315

Pressure Base: 14.730
Real BTU Dry: 1511.105
Real BTU Wet: 1484.872

Calc. Ideal Gravity: 0.9016
Calc. Real Gravity: 0.9064
Field Gravity:
Standard Pressure: 14.696
Ideal BTU Dry: 1499.048
Ideal BTU Wet: 1472.965
Z Factor: 0.9943
Average Mol Weight: 26.1133
Average CuFt/Gal: 51.5285
26 lb. Product: 2.1321
Ethane+ GPM: 10.3315
Propane+ GPM: 5.8659
Butane+ GPM: 2.9707
Pentane+ GPM: 1.4029

Remarks:
H2S IN GAS STREAM ON LOCATION: 0.1800% = 1,800 PPM

Analysis By: Don Norman

Wildcat Measurement Service
P.O.Box 1836
416 East Main Street
Artesia, NM 88211-1836

12/20/2011 11:02 AM
Phone: 575-746-3481
888-421-9453
Fax: 575-748-9852
dnorman@wildcatms.com

GAS ANALYSIS REPORT

Analysis For: **MARSHALL & WINSTON, INC.**
Field Name:
Well Name: **DUBLIN FEDERAL "23" #1, #2 & #3**
Station Number:
Purpose: **SPOT-FROM TANK**
Sample Deg. F: **60.0**
Volume/Day:
Formation:
Line PSIG:
Line PSIA:

Run No: **2111220-02**
Date Run: **12/20/2011**
Date Sampled: **12/19/2011**
Producer: **MARSHALL & WINSTON**
County: **EDDY**
State: **NM**
Sampled By: **KARL HAENY**
Atmos Deg. F: **54**

GAS COMPONENTS			
		MOL%	GPM
Oxygen	O2:	0.0000	
Carbon Dioxide	C02:	0.0508	
Nitrogen	N2:	3.0409	
Hydrogen Sulfide	H2S:	0.0300	
Methane	C1:	37.5914	
Ethane	C2:	21.2787	5.6893
Propane	C3:	20.9072	5.7585
Iso-Butane	IC4:	3.0885	1.0104
Nor-Butane	NC4:	7.8772	2.4828
Iso-Pentane	IC5:	1.9175	0.7011
Nor-Pentanes	NC5:	1.8891	0.6846
Hexanes Plus	C6+:	2.3287	1.0124
Totals		100.0000	17.3390

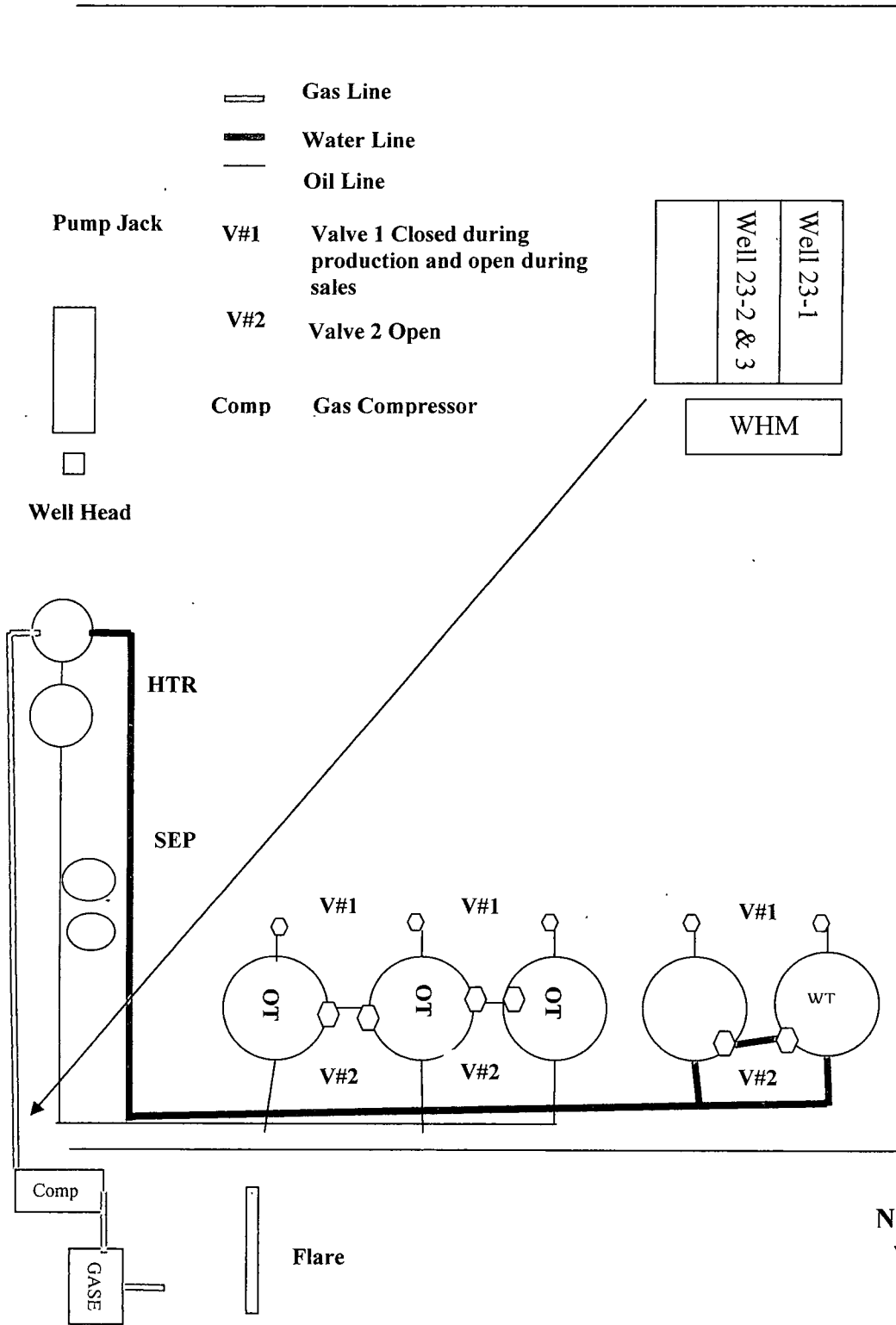
Pressure Base: **14.730**
Real BTU Dry: **1935.643**
Real BTU Wet: **1902.040**

Calc. Ideal Gravity: **1.1678**
Calc. Real Gravity: **1.1792**
Field Gravity:
Standard Pressure: **14.696**
Ideal BTU Dry: **1911.785**
Ideal BTU Wet: **1878.520**
Z Factor: **0.9899**
Average Mol Weight: **33.8225**
Average CuFt/Gal: **45.6756**
26 lb. Product: **3.5995**
Ethane+ GPM: **17.3390**
Propane+ GPM: **11.6497**
Butane+ GPM: **5.8913**
Pentane+ GPM: **2.3981**

Remarks:
H2S IN GAS STREAM ON LOCATION: 0.0300% = 300 PPM

Analysis By: **Don Norman**

SITE FACILITY DIAGRAM



Carlsbad Field Office

**Radius of Exposure of H₂S per Onshore Oil and Gas Order 6.III.A.2
Verification of Calculation**

1,000,000 = **one million**

100,000/1,000,000 = 0.10 = 10% = 100,000 ppm	Stay away.
1,000/1,000,000 = 0.01 = 1% = 1,000 ppm	Stay away
100/1,000,000 = 0.0001 = 0.01% = 100 ppm	Stay away
50/1,000,000 = 0.00005 = 0.005% = 50 ppm + 49 ppm to 11 ppm	Stay away Caution, tolerance level very limited.
10/1,000,000 = 0.00001 = 0.001% = 10 ppm	was the OSHA limit for a 8 hour work tour.
8/1,000,000 = 0.000008 = .0008% = 8 ppm	is the OSHA limit of exposure for a 8 hour work tour.

When the H₂S concentration in the escaping gas stream is less than 10 % (100,000 ppm).

X = radius of exposure in feet

H₂S Concentration = decimal equivalent of the mole or volume fractions of H₂S in the gaseous mixture

Example: 1800 ppm = 1800/1,000,000 = 0.0018.

Q = Maximum volume of gas determined to be available for escape in cubic feet per day
(at standard condition of 14.73 psia and 60° F).

Name of Operator: Marshall & Winston, Inc.

Facility or Well Name: Dublin 23 Federal #1

Date of Sundry: January 9, 2012

Where: 35,000 = Standard Cubic Feet of gas per day
1800 = parts per million (ppm) value

$$X = [(1.589) * (\text{H}_2\text{S concentration}) * (Q)]^{(0.6258)} = 100.1^{(0.6258)} = \boxed{17.9} \text{ Feet}$$

100 ppm radius of exposure, feet

$$X = [(0.4546) * (\text{H}_2\text{S concentration}) * (Q)]^{(0.4546)} = 28.6^{(0.4546)} = \boxed{8.2} \text{ Feet}$$

500 ppm radius of exposure, feet