

Southwest Gas Corporation

(U 905 G)

Emissions Mitigation Plan

In compliance with:
Decision 17-06-015

Compliance Period:
January 1, 2018 – December 31, 2019

Date:
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- A. Emission Calculation Sheets
- B. Purging Procedure
- C. Main and Service Policy
- D. Emergency Plan Manual - Section 6
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EXECUTIVE SUMMARY

Southwest Gas Corporation (Southwest Gas or Company) is committed to enhancing its current methane emissions reduction efforts through the activities described within this Emissions Mitigation Plan (Plan). This Plan was prepared in accordance with Senate Bill (SB) 1371, incorporated as Sections 975, 977 and 978 of the California Public Utilities Code (PU Code), as well as Decision (D.)17-06-015, issued by the California Public Utilities Commission (Commission) June 19, 2017.

Company Overview

Southwest Gas is a multi-jurisdictional natural gas local distribution company, engaged in the retail transmission, distribution, transportation, and sale of natural gas for domestic, commercial, agricultural, and industrial uses. Southwest Gas has two distinct and separate service territories in northern and southern California. Areas served in northern California include North Lake Tahoe, South Lake Tahoe and Truckee. In southern California, the Company serves Barstow, Needles, Victorville, Big Bear, and other surrounding cities in the High Desert area. The Company serves approximately 194,000 California customers, the majority of which are residential and small commercial customers.

Background

SB 1371 was signed into law in 2014, and became effective January 1, 2015. In relevant part, SB 1371 aims to reduce methane emissions by requiring the Commission to establish and require the use of best practices for leak surveys, patrols, leak survey technology, leak prevention, and leak reduction.

On January 22, 2015, the Commission opened a rulemaking to adopt rules and procedures to minimize natural gas leakage from Commission-regulated natural gas pipeline facilities, consistent with SB 1371 and the state's goal of reducing GHG emissions. In D.17-06-015, the Commission established best practices and reporting requirements for California's regulated natural gas transmission and distribution utilities, including the requirement for a biennial compliance plan, to be incorporated into each company's safety plans.

2018 and 2019 Plan

This Plan covers the compliance period from January 1, 2018 through December 31, 2019. This Plan is subject to review and evaluation by the Commission's Safety Enforcement Division (SED), in consultation with the California Air Resources Board (CARB). This Plan provides an overview of each Best Practice (BP) for reducing methane emissions as prescribed by D.17-06-015, utilizing the Compliance Plan Template developed by the parties and SED.

Southwest Gas is a Class B utility as defined in D.17-06-015, as its total annual methane emissions are between 50,000 and 500,000 Mscf. As such, the Company is seeking exemptions from certain BPs, as detailed more fully herein. In addition, the Company is proposing Research and Development (R&D) and/or a pilot program to meet the requirements of certain BPs. A R&D program is proposed for BP# 22 (Pipe Fitting Specification), and a pilot program is proposed, in addition to R&D, for BP# 18 (Stationary Methane Detectors). Supporting justification for these proposals is provided within the Best Practices section of the Plan.

Southwest Gas anticipates the proposed actions outlined in its Plan will lead to an estimated reduction of emissions of approximately 111.176 Mscf during the reporting period, based on the implementation of new procedures to minimize emissions during operations and maintenance activities. The BPs identified in this Plan are anticipated to reduce emissions throughout the Company's operations and maintenance in California. Southwest Gas is committed to emission reduction in these categories through implementation of the policies, procedures, and activities outlined in the Best Practices section of this Plan. Due to vicissitudes in economic growth which directly impact the Company's operations, the Company is unable to estimate its projected long-term emissions reduction through the year 2030 at this time.

Southwest Gas is dedicated to providing safe and reliable natural gas service while protecting the environment through the mitigation of methane emissions. This Plan reflects the Company's ongoing commitment to enhancing its current methane emissions reduction efforts, evaluating and implementing new practices and procedures, and exploring new technologies aimed at reducing methane emissions.



Eric DeBonis, P.E.
Senior Vice President, Operations

BEST PRACTICES SECTION

This section outlines the Company's proposed actions relative to each of the 26 BPs. Each BP is addressed in its own chapter utilizing the Compliance Plan Template.

The status of each BP is referenced in Part 1(b) of the Compliance Plan Template, as follows:

BP Status	Description	Applicable BP
Ongoing Best Practice	Activity preceded SB 1371	8, 10, 15, 16, 19, 23-25
Proposed Best Practice	Activity proposed in compliance with the BP	1-7, 9, 11, 12, 13, 20b, 21, 26
Pilot	Pilot proposed to gather additional information regarding feasibility of implementing BP	18
Research and Development	Research and Development proposed due to lack of commercially available technology	18, 22
Exemption	Exemption requested	14, 17, 20a
Phased-In Implementation	A phased approach is proposed for this BP	Not applicable this Plan period.
Other (See Summary)	Other category not identified above	Not applicable this Plan period.

POLICIES AND PROCEDURES

CHAPTER 1

Best Practice 1 – Compliance Plan

PART 1: OVERVIEW	
a) Best Practice: 1	b) Status: Proposed Best Practice
Compliance Plan Written Compliance Plan identifying the policies, programs, procedures, instructions, documents, etc. used to comply with the Final Decision in this Proceeding (R.15-01-008). Exact wording TBD by the company and approved by the CPUC, in consultation with CARB. Compliance Plans shall be signed by company officers certifying their company's compliance. Compliance Plans shall include copies of all policies and procedures related to their Compliance Plans. Compliance Plans shall be filed biennially (i.e. every other year) to evaluate best practices based on progress and effectiveness of companies' natural gas leakage abatement and minimization of methane emissions.	
PART 2: BEST PRACTICE DETAILS	
a) Historic work: None.	
b) Alternative Proposal to BP or exemption? Not applicable.	
c) Proposed Plan: Southwest Gas developed this written Plan consistent with the requirements of this BP.	
d) Overlap with other regulations? No. What portion of the BP is incremental beyond those regulations? Not applicable.	
e) What technology is required to implement the best practice and why? Not applicable.	
f) Will work require additional personnel and/or contract support? If so, please provide details. Not applicable.	
g) What changes to existing operations are required? Changes to operations that are required to implement this Plan are detailed in proposed revisions to policies and procedures contained within the applicable BP Chapters of this Plan. Proposed revisions to various sections of the Company's Operations Manual and its California Safety Plan are included in this Plan. How will those changes be implemented? Upon approval, the Company will revise its Operations Manual and its California Safety Plan during the next scheduled quarterly manual release. Training of new or revised policies and procedures will be conducted within 30-60 days of publication with all affected Company and contractor personnel through the Company's normal manual revision training process.	
h) What are the new procedures to develop or existing procedures to modify? Please provide details. Reference section (g) above.	
i) Timeline for implementation (Milestones): Reference section (g) above.	
j) Identify the range of factors or considerations used to determine cost-effectiveness of this measure, when costs estimates have been determined: Not applicable.	
k) Identify any cost benefits from this BP, when cost estimates are known: Not applicable.	

l) Do any incremental costs, if known, or benefits overlap with other BPs? If so, to which BP do they overlap, what are they, and how do they overlap? Not applicable.
m) Anticipated Emissions Reductions from this BP: Not applicable. 2015 Baseline Emissions affected, where known: Not applicable.
n) Calculation Methodology: Not applicable.
o) Additional Comments: None.
p) Overlap with Safety: Not applicable.
SUPPLEMENTAL INFORMATION
a) Technology: Not applicable.
b) Changes to Operations: Reference the California Safety Plan.
c) Research or Studies: Not applicable.
d) Other: Not applicable.

CHAPTER 2

Best Practice 2 – Methane Greenhouse Gas Policy

PART 1: OVERVIEW	
a) Best Practice: 2	b) Status: Proposed Best Practice
Methane GHG Policy Written company policy stating that methane is a potent Greenhouse Gas (GHG) whose emissions to the atmosphere must be minimized. Include reference to SB 1371 and SB 1383. Exact wording TBD by the company and approved by the CPUC, in consultation with CARB, as part of Compliance Plan filing.	
PART 2: BEST PRACTICE DETAILS	
a) Historic work: None.	
b) Alternative Proposal to BP or exemption? Not applicable.	
c) Proposed Plan: The Company developed a policy consistent with the requirements of this BP. The policy is included in Section 2.12.1 of the Company's California Safety Plan.	
d) Overlap with other regulations? No. What portion of the BP is incremental beyond those regulations? Not applicable.	
e) What technology is required to implement the best practice and why? Not applicable.	
f) Will work require additional personnel and/or contract support? If so, please provide details. Not applicable.	
g) What changes to existing operations are required? Proposed changes to the Company's California Safety Plan, to incorporate the new policy (at Section 2.12.1) are included in this Plan. The new policy establishes Southwest Gas' Emissions Mitigation Plan and reflects the Company's commitment to reducing methane emissions. How will those changes be implemented? Upon approval, the Company will revise its California Safety Plan during the next scheduled quarterly manual release. Training of new policy will be conducted within 30 days of publication with all affected Company and contractor personnel through the Company's normal manual revision training process.	
h) What are the new procedures to develop or existing procedures to modify? Please provide details. Reference section (g) above.	
i) Timeline for implementation (Milestones): Reference section (g) above.	
j) Identify the range of factors or considerations used to determine cost-effectiveness of this measure, when costs estimates have been determined: Not applicable.	
k) Identify any cost benefits from this BP, when cost estimates are known: Not applicable.	
l) Do any incremental costs, if known, or benefits overlap with other BPs? If so, to which BP do they overlap, what are they, and how do they overlap? Not applicable.	
m) Anticipated Emissions Reductions from this BP:	

Not applicable.
2015 Baseline Emissions affected, where known:
Not applicable.
n) Calculation Methodology:
Not applicable.
o) Additional Comments:
None.
p) Overlap with Safety:
Not applicable.
SUPPLEMENTAL INFORMATION
a) Technology:
Not applicable.
b) Changes to Operations:
The new policy developed pursuant to this BP is attached, and is included at Section 2.12.1 of the California Safety Plan.
c) Research or Studies:
Not applicable.
d) Other:
Not applicable.

Best Practice 2 – Attachment

Southwest Gas, California Safety Plan – Section 2.12.1 – New Policy

Southwest Gas is committed to minimizing methane emissions to the atmosphere. The Company's Emissions Mitigation Plan is incorporated into this Safety Plan in accordance with the requirements set forth in D.17-06-015 and the mandates of Senate Bills (SB) 1371 and 1383. The Emissions Mitigation Plan will clearly document and define Company policies and procedures related to emissions reduction. (CA PUC 975) These policies and procedures align with California SB 1371 and SB 1383. (CA PUC 975 & D.17-06-015) The Company is also a partner in the United States Environmental Protection Agency Natural Gas Methane Challenge Program.

CHAPTER 3

Best Practice 3 Pressure Reduction Policy

PART 1: OVERVIEW	
a) Best Practice: 3	b) Status: Proposed Best Practice
Pressure Reduction Policy Written company policy stating that pressure reduction to the lowest operationally feasible level in order to minimize methane emissions is required before non-emergency venting of high-pressure distribution (above 60 psig), transmission and underground storage infrastructure consistent with safe operations and considering alternative potential sources of supply to reliably serve customers. Exact wording TBD by the company and approved by the CPUC, in consultation with CARB, as part of Compliance Plan filing.	
PART 2: BEST PRACTICE DETAILS	
a) Historic work: None.	
b) Alternative Proposal to BP or exemption? Not applicable.	
c) Proposed Plan: Southwest Gas revised its Purging Procedure and Main and Service Policy to include a requirement that pressure be reduced to the lowest operationally feasible level prior to blowdown and purging of high-pressure distribution and transmission facilities.	
d) Overlap with other regulations? No. What portion of the BP is incremental beyond those regulations? Not applicable.	
e) What technology is required to implement the best practice and why? Not applicable.	
f) Will work require additional personnel and/or contract support? If so, please provide details. Not applicable.	
g) What changes to existing operations are required? Proposed changes to the Company's Operations Manual – Purging Procedure (Section 1.1.16) and Main and Service Policy (Section 6.1.5) are included in this Plan. The proposed changes require that pressure be reduced to the lowest operationally feasible level prior to blowdown and purging of high-pressure distribution and transmission facilities. How will those changes be implemented? Upon approval, the Company will revise these sections of its Operations Manual during the next scheduled quarterly manual release. Training will be conducted within 30 days of publication with all affected Company and contractor personnel through the Company's normal manual revision training process.	
h) What are the new procedures to develop or existing procedures to modify? Please provide details. Reference section (g) above.	
i) Timeline for implementation (Milestones): Reference section (g) above.	
j) Identify the range of factors or considerations used to determine cost-effectiveness of this measure, when costs estimates have been determined: Not applicable.	
k) Identify any cost benefits from this BP, when cost estimates are known: Not applicable.	
l) Do any incremental costs, if known, or benefits overlap with other BPs? If so, to which BP do they overlap, what are they, and how do they overlap? Not applicable.	
m) Anticipated Emissions Reductions from this BP:	

Not applicable.
2015 Baseline Emissions affected, where known:
Not applicable.
n) Calculation Methodology:
Not applicable.
o) Additional Comments:
None.
p) Overlap with Safety:
Not applicable.
SUPPLEMENTAL INFORMATION
a) Technology:
Not applicable.
b) Changes to Operations:
The proposed changes to the Company's Operations Manual, Purging Procedure, Section 1.1.16 and Main and Service Policy, Section 6.1.5 are attached. Reference the Supplemental Section of this Plan for the entirety of the Purging Procedure and the Main and Service Policy.
c) Research or Studies:
Not applicable.
d) Other:
Not applicable.

Best Practice 3 – Attachment

Southwest Gas, Operations Manual - Purging Procedure, Section 1.1.16 – New Policy

For active pipelines operating at greater than 60 psig, Division or District Engineering will provide the steps required to reduce pressure to the lowest operationally feasible level to minimize methane emissions when purging a pipeline of natural gas.

Southwest Gas, Operations Manual – Main and Service Policy, Section 6.1.5 – New Policy

6.1.5 For active pipelines operating at greater than 60 psig, Division or District Engineering must provide the steps required to reduce pressure to the lowest operationally feasible level to minimize methane emissions when purging a pipeline of natural gas.

6.1.5.1 Time must be built into a project's schedule to allow for reduction of pressure.

6.1.5.2 The completion of this pressure reduction activity must be documented in the project file, and should include the final pressure at the completion of the pressure reduction.

6.1.5.3 Pressure reduction is not required if one of the following project conditions exist:

- Emergency work activity*
- Inconsistent with safe operating practices*
- System is not configured to facilitate a pressure reduction*

CHAPTER 4

Best Practice 4 – Project Scheduling Policy

PART 1: OVERVIEW	
a) Best Practice: 4	b) Status: Proposed Best Practice
Project Scheduling Policy Written company policy stating that any high-pressure distribution (above 60 psig), transmission or underground storage infrastructure project that requires evacuating methane will build time into the project schedule to minimize methane emissions to the atmosphere consistent with safe operations and considering alternative potential sources of supply to reliably serve customers. Projected schedules of high pressure distribution (above 60 psig), transmission or underground storage infrastructure work, requiring methane evacuation, shall also be submitted to facilitate audits, with line venting schedule updates TBD. Exact wording TBD by the company and approved by the CPUC, in consultation with CARB, as part of the Compliance Plan filing.	
PART 2: BEST PRACTICE DETAILS	
a) Historic work: None.	
b) Alternative Proposal to BP or exemption? No.	
c) Proposed Plan: Southwest Gas revised its Main and Service Policy to require the inclusion of time within each project schedule to perform a pressure reduction to the lowest operationally feasible level prior to blowdown and purging of all high-pressure distribution and transmission facilities.	
d) Overlap with other regulations? No. What portion of the BP is incremental beyond those regulations? Not applicable.	
e) What technology is required to implement the best practice and why? Not applicable.	
f) Will work require additional personnel and/or contract support? If so, please provide details. Not applicable.	
g) What changes to existing operations are required? Proposed changes to the Company's Operations Manual, Main and Service Policy (Section 6.1.5.1) are included in this Plan. The proposed changes require that time be included within each project to allow for a pressure reduction as described in this BP. How will those changes be implemented? Upon approval, the Company will revise its Main and Service Policy during the next scheduled quarterly manual release. Training will be conducted within 30 days of publication with all affected Company and contractor personnel through the Company's normal manual revision training process.	
h) What are the new procedures to develop or existing procedures to modify? Please provide details. Reference section (g) above.	
i) Timeline for implementation (Milestones): Reference section (g) above.	
j) Identify the range of factors or considerations used to determine cost-effectiveness of this measure, when costs estimates have been determined: Not applicable.	
k) Identify any cost benefits from this BP, when cost estimates are known:	

Not applicable.
l) Do any incremental costs, if known, or benefits overlap with other BPs? If so, to which BP do they overlap, what are they, and how do they overlap? Not applicable.
m) Anticipated Emissions Reductions from this BP: Not applicable. 2015 Baseline Emissions affected, where known: Not applicable.
n) Calculation Methodology: Not applicable.
o) Additional Comments: None.
p) Overlap with Safety: Not applicable.
SUPPLEMENTAL INFORMATION
a) Technology: Not applicable.
b) Changes to Operations: The proposed changes to the Company's Operations Manual, Main and Service Policy, Section 6.1.5.1 are attached. Reference the Supplemental Section of this Plan for the entirety of the Main and Service Policy.
c) Research or Studies: Not applicable.
d) Other: Not applicable.

Best Practice 4 – Attachment

Southwest Gas, Operations Manual – Main and Service Policy, Section 6.1.5.1 – New Policy

6.1.5 For active pipelines operating at greater than 60 psig, Division or District Engineering must provide the steps required to reduce pressure to the lowest operationally feasible level to minimize methane emissions when purging a pipeline of natural gas.

6.1.5.1 Time must be built into a project's schedule to allow for reduction of pressure.

CHAPTER 5

Best Practice 5 – Methane Evacuation Procedure

PART 1: OVERVIEW	
a) Best Practice: 5	b) Status: Proposed Best Practice
Methane Evacuation Procedure Written company procedures implementing the BPs approved for use to evacuate methane for non-emergency venting of high pressure distribution (above 60 psig), transmission or underground storage infrastructure and how to use them consistent with safe operations and considering alternative potential sources of supply to reliably serve customers. Exact wording TBD by the company and approved by the CPUC, in consultation with CARB, as part of the Compliance Plan filing.	
PART 2: BEST PRACTICE DETAILS	
a) Historic work: None.	
b) Alternative Proposal to BP or exemption? Not applicable.	
c) Proposed Plan: Approve equipment for the evacuation of methane during non-emergency high-pressure distribution and transmission pipeline work. Upon selection of appropriate equipment, Southwest Gas will develop equipment specific procedures regarding the safe and efficient use of the equipment and train affected employees and contract personnel.	
d) Overlap with other regulations? No. What portion of the BP is incremental beyond those regulations? Not applicable.	
e) What technology is required to implement the best practice and why? Equipment to evacuate methane during non-emergency, high-pressure distribution and transmission pipeline work is required to implement this BP.	
f) Will work require additional personnel and/or contract support? If so, please provide details. Not applicable.	
g) What changes to existing operations are required? The Company does not currently utilize equipment to pressurize and transfer gas between pipelines or to mobile storage for re-injection into high-pressure distribution and transmission pipelines. New procedures as outlined in section (h) below, to allow the use of methane evacuation equipment, are required in order to implement this BP. How will those changes be implemented? Reference section (c) above.	
h) What are the new procedures to develop or existing procedures to modify? Please provide details. Proposed changes to the Company's Operations Manual – Purging Procedure (Section 1.1.16) and Main and Service Policy (Section 6.1.5) are included in this Plan. The proposed changes require that pressure be reduced to the lowest operationally feasible level prior to blowdown and purging of high-pressure distribution and transmission facilities. Additionally, equipment specific procedures need to be developed.	
i) Timeline for implementation (Milestones): Within six months of approval, Southwest Gas will complete the equipment selection process. Following the selection of suitable equipment, the Company will develop equipment specific procedures and will revise its Operations Manual as part of the next quarterly manual release to include the equipment procedures. Training of new or revised policies and procedures will be conducted within 30 days of publication with all affected	

Company and contractor personnel through the Company's normal manual revision training process.
j) Identify the range of factors or considerations used to determine cost-effectiveness of this measure: Not applicable.
k) Identify any cost benefits from this BP: Not applicable.
l) Do any incremental costs, if known, or benefits overlap with other BPs? If so, to which BP do they overlap, what are they, and how do they overlap? Not applicable.
m) Anticipated Emissions Reductions from this BP: Not applicable. 2015 Baseline Emissions affected, where known: Not applicable.
n) Calculation Methodology: Not applicable.
o) Additional Comments: None.
p) Overlap with Safety: Not applicable.
SUPPLEMENTAL INFORMATION
a) Technology: Not applicable.
b) Changes to Operations: Not applicable.
c) Research or Studies: Not applicable.
d) Other: Not applicable.

CHAPTER 6

Best Practice 6 – Methane Evacuation Work Orders Policy

PART 1: OVERVIEW

a) Best Practice: 6

b) Status: Proposed Best Practice

Methane Evacuation Work Orders Policy

Written company policy that requires that for any high-pressure distribution (above 60 psig), transmission or underground storage infrastructure projects requiring evacuating methane, Work Planners shall clearly delineate, in procedural documents, such as work orders used in the field, the steps required to safely and efficiently reduce the pressure in the lines, prior to lines being vented, considering alternative potential sources of supply to reliably serve customers. Exact wording TBD by the company and approved by the CPUC, in consultation with CARB, as part of the Compliance Plan filing.

PART 2: BEST PRACTICE DETAILS

a) Historic work:

None.

b) Alternative Proposal to BP or exemption?

Not applicable.

c) Proposed Plan:

Southwest Gas plans to implement the portion of the BP relative to methane evacuation in conjunction with BP# 5 following the same proposed Plan. Relative to the portion of this BP associated with pressure reductions, Southwest Gas will revise its Purging Design, Purging Procedure, and Main and Service Policy to define the steps necessary to perform a pressure reduction to the lowest operationally feasible level prior to blowdown and purging of high-pressure distribution and transmission facilities to minimize methane emissions. Consistent with the Company's existing procedures pertaining to "purging procedures" developed by Engineering, the steps necessary to performing a pressure reduction utilizing methane evacuation equipment will be included in the work package provided to field employees.

d) Overlap with other regulations?

No.

What portion of the BP is incremental beyond those regulations?

Not applicable.

e) What technology is required to implement the best practice and why?

Not applicable.

f) Will work require additional personnel and/or contract support? If so, please provide details.

Not applicable.

g) What changes to existing operations are required?

Reference BP#5.

How will those changes be implemented?

Reference BP#5.

h) What are the new procedures to develop or existing procedures to modify?

Please provide details.

Reference section (c) above.

i) Timeline for implementation (Milestones):

Southwest Gas will implement this BP in conjunction with BP# 5 following the same proposed plan for methane evacuation. Additionally, Southwest Gas will revise its Operations Manual as part of the next quarterly manual release to require the steps necessary for a pressure reduction. Training of new or revised policies and procedures will be conducted within 30 days of publication with all affected Company and contractor personnel through the Company's normal manual revision training process.

j) Identify the range of factors or considerations used to determine cost-effectiveness of this measure, when costs estimates have been determined: Not applicable.
k) Identify any cost benefits from this BP, when cost estimates are known: Not applicable.
l) Do any incremental costs, if known, or benefits overlap with other BPs? If so, to which BP do they overlap, what are they, and how do they overlap? Not applicable.
m) Anticipated Emissions Reductions from this BP: Not applicable. 2015 Baseline Emissions affected, where known: Not applicable.
n) Calculation Methodology: Not applicable.
o) Additional Comments: None.
p) Overlap with Safety: Not applicable.
SUPPLEMENTAL INFORMATION
a) Technology: Not applicable.
b) Changes to Operations: Not applicable.
c) Research or Studies: Not applicable.
d) Other: Not applicable.

Best Practice 6 – Attachment

Southwest Gas, Operations Manual - Purging Design, Section 1.1.9 – Revised Policy

*1.1.9 Each purge procedure developed by Engineering will include the following:
(Bullet 2)*

- *Steps to perform a pressure reduction to the lowest operationally feasible level, as applicable per Main and Service Policy*

Southwest Gas, Operations Manual - Purging Procedure, Section 1.1.16 – New Policy

For active pipelines operating at greater than 60 psig, Division or District Engineering will provide the steps required to reduce pressure to the lowest operationally feasible level to minimize methane emissions when purging a pipeline of natural gas.

CHAPTER 7

Best Practice 7 – Bundling Work Policy

PART 1: OVERVIEW	
a) Best Practice: 7	b) Status: Proposed Best Practice
Bundling Work Policy Written company policy requiring bundling of work, whenever practicable, to prevent multiple venting of the same piping consistent with safe operations and considering alternative potential sources of supply to reliably serve customers. Company policy shall define situations where work bundling is not practicable. Exact wording TBD by the company and approved by the CPUC, in consultation with CARB, as part of the Compliance Plan filing.	
PART 2: BEST PRACTICE DETAILS	
a) Historic work: None.	
b) Alternative Proposal to BP or exemption? Not applicable.	
c) Proposed Plan: Southwest Gas revised its Operations Manual, Main & Service Policy to require the coordination of all high-pressure distribution and transmission projects to avoid multiple purging of the same pipeline facilities when practicable.	
d) Overlap with other regulations? No. What portion of the BP is incremental beyond those regulations? Not applicable.	
e) What technology is required to implement the best practice and why? Not applicable.	
f) Will work require additional personnel and/or contract support? If so, please provide details. Not applicable.	
g) What changes to existing operations are required? Proposed changes to the Company's Operations Manual, Main and Service Policy (Section 6.1.6) are included in this Plan. The proposed changes the coordination of all high-pressure distribution and transmission projects to avoid multiple purging of the same pipeline facilities when practicable. How will those changes be implemented? Upon approval, the Company will revise this section of its Operations Manual during the next scheduled quarterly manual release. Training will be conducted within 30 days of publication with all affected Company and contractor personnel through the Company's normal manual revision training process.	
h) What are the new procedures to develop or existing procedures to modify? Please provide details. Reference section (g) above.	
i) Timeline for implementation (Milestones): Reference section (g) above.	
j) Identify the range of factors or considerations used to determine cost-effectiveness of this measure, when costs estimates have been determined: Not applicable.	
k) Identify any cost benefits from this BP, when cost estimates are known: Not applicable.	
l) Do any incremental costs, if known, or benefits overlap with other BPs? If so, to which BP do they overlap, what are they, and how do they overlap?	

Not applicable.
m) Anticipated Emissions Reductions from this BP: Not applicable.
2015 Baseline Emissions affected, where known: Not applicable.
n) Calculation Methodology: Not applicable.
o) Additional Comments: None.
p) Overlap with Safety: Not applicable.
SUPPLEMENTAL INFORMATION
a) Technology: Not applicable.
b) Changes to Operations: The proposed changes to the Company's Operations Manual, Main and Service Policy, Section 6.1.6 are attached. Reference the Supplemental Section of this Plan for the entirety of the Main and Service Policy.
c) Research or Studies: Not applicable.
d) Other: Not applicable.

Best Practice 7 – Attachment

Southwest Gas, Operations Manual – Main and Service Policy, Section 6.1.6 – New Policy

6.1.6 For active pipelines operating at greater than 60 psig, each Division and District must bundle projects when practicable to prevent multiple occurrences of venting the same facility. Project bundling may not be practicable if one of the following project conditions exist:

- Emergency work activity*
- Permit restrictions*
- Weather restrictions*
- System reliability concerns that compromise service to customers*
- Conflicts with joint-agency project schedules*

CHAPTER 8

Best Practice 8 – Company Emergency Procedures

PART 1: OVERVIEW	
a) Best Practice: 8	b) Status: Ongoing Best Practice
Company Emergency Procedures Written company emergency procedures which describe the actions company staff will take to prevent, minimize and/or stop the uncontrolled release of methane from the gas system or storage facility consistent with safe operations and considering alternative potential sources of supply to reliably serve customers. Exact wording TBD by the company and approved by the CPUC, in consultation with CARB, as part of the Compliance Plan filing.	
PART 2: BEST PRACTICE DETAILS	
a) Historic work: Southwest Gas' existing Emergency Plan Manual (EPM) details the process for responding to a natural gas emergency. One objective of the EPM is to control the flow of gas (and by extension, the uncontrolled release of methane) as soon as practical in a safe manner. Section 6 of the EPM addresses gas control.	
b) Alternative Proposal to BP or exemption? Not applicable.	
c) Proposed Plan: Not applicable.	
d) Overlap with other regulations? No. What portion of the BP is incremental beyond those regulations? Not applicable.	
e) What technology is required to implement the best practice and why? Not applicable.	
f) Will work require additional personnel and/or contract support? If so, please provide details. Not applicable.	
g) What changes to existing operations are required? None. How will those changes be implemented? Not applicable.	
h) What are the new procedures to develop or existing procedures to modify? Please provide details. Not applicable.	
i) Timeline for implementation (Milestones): Not applicable.	
j) Identify the range of factors or considerations used to determine cost-effectiveness of this measure, when costs estimates have been determined: Not applicable.	
k) Identify any cost benefits from this BP, when cost estimates are known: Not applicable.	
l) Do any incremental costs, if known, or benefits overlap with other BPs? If so, to which BP do they overlap, what are they, and how do they overlap? Not applicable.	
m) Anticipated Emissions Reductions from this BP: Not applicable. 2015 Baseline Emissions affected, where known: Not applicable.	
n) Calculation Methodology:	

Not applicable.
o) Additional Comments: None.
p) Overlap with Safety: While there is no incremental cost overlap between this BP and the Company's existing EPM, there is overlapping benefit. By providing the procedures necessary to safely and efficiently manage an uncontrolled release of natural gas, the Company is also safely and efficiently managing the uncontrolled release of methane emissions into the atmosphere.
SUPPLEMENTAL INFORMATION
a) Technology: Not applicable.
b) Changes to Operations: Although changes to Southwest Gas' EPM are not being proposed with respect to this BP, a copy of the EPM, Section 6 is provided in the Supplemental Section of this Plan.
c) Research or Studies: Not applicable.
d) Other: Not applicable.

RECORDKEEPING

CHAPTER 9

Best Practice 9 – Recordkeeping

PART 1: OVERVIEW	
a) Best Practice: 9	b) Status: Proposed Best Practice
Recordkeeping Written Company Policy directing the gas business unit to maintain records of all SB 1371 Annual Emissions Inventory Report methane emissions and leaks, including the calculations, data and assumptions used to derive the volume of methane released. Records are to be maintained in accordance with G.O. 112 F and succeeding revisions, and 49 CFR 192. Currently, the record retention time in G.O. 112 F is at least 75 years for the transmission system. 49 CFR 192.1011 requires a record retention time of at least 10 years for the distribution system. Exact wording TBD by the company and approved by the CPUC, in consultation with CARB, as part of the Compliance Plan filing.	
PART 2: BEST PRACTICE DETAILS	
a) Historic work: Southwest Gas has retained records in accordance with 49 CFR 192, which requires record retention of at least 10 years for distribution system records, and California GO 112F, which requires record retention of 75 years. The Company has retained the previously submitted Annual Emissions Inventory Reports.	
b) Alternative Proposal to BP or exemption? Not applicable.	
c) Proposed Plan: The Company revised its California Safety Plan to include an Emissions Mitigation Plan. Section 2.12.3.9 of the Emissions Mitigation Plan requires document retention for the Annual Emissions Inventory Reports and all supporting documents and calculations, consistent with this BP.	
d) Overlap with other regulations? The written policy developed pursuant to this BP overlaps with G.O. 112F in that it requires the same document retention for transmission and distribution records related to the Company's Annual Emissions Inventory Reports as G.O. 112F requires for pipeline records. What portion of the BP is incremental beyond those regulations? Reference the above response.	
e) What technology is required to implement the best practice and why? Not applicable.	
f) Will work require additional personnel and/or contract support? If so, please provide details. Not applicable.	
g) What changes to existing operations are required? How will those changes be implemented? Proposed changes to the Company's California Safety Plan to include an Emissions Mitigation Plan, which outlines document retention requirements for the Annual Emissions Inventory Reports in Section 2.12.3.9. Proposed changes to the Company's California Safety Plan are included in the Supplemental Section of this Plan. Upon approval, the Company will revise its California Safety Plan the during the next scheduled quarterly manual release. Training on the revised California Safety Plan will be conducted within 60 days of publication with all affected Company and contractor personnel through the Company's normal manual revision training process.	
h) What are the new procedures to develop or existing procedures to modify? Please provide details.	

Please refer to "g" above.
i) Timeline for implementation (Milestones): Please refer to "g" above.
j) Identify the range of factors or considerations used to determine cost-effectiveness of this measure, when costs estimates have been determined: Not applicable.
k) Identify any cost benefits from this BP, when cost estimates are known: Not applicable.
l) Do any incremental costs, if known, or benefits overlap with other BPs? If so, to which BP do they overlap, what are they, and how do they overlap? Not applicable.
m) Anticipated Emissions Reductions from this BP: Not applicable. 2015 Baseline Emissions affected, where known: Not applicable.
n) Calculation Methodology: Not applicable.
o) Additional Comments: None.
p) Overlap with Safety: Not applicable.
SUPPLEMENTAL INFORMATION
a) Technology: Not applicable.
b) Changes to Operations: The proposed changes to the Company's California Safety Plan are attached.
c) Research or Studies: Not applicable.
d) Other: Not applicable.

Best Practice 9 – Attachment

Southwest Gas, California Safety Plan – Emissions Mitigation Plan, Section 2.12.3.9 – New Policy

The Company maintains the Annual Emissions Inventory Report filings for 75 years, as the data contained in the report covers transmission, as well as distribution systems. The report includes calculations, data, and assumptions used for the report. The Company's records retention policy for transmission pipelines in California is listed in the Operations Manual Main and Service Installation Policy and meets the requirements of California General Order 112F. The records retention policy for distribution pipelines in California is listed in the Operations Manual Distribution Integrity Management Program (DIMP) and meets the requirements of 49 CFR 192.1011.

TRAINING

CHAPTER 10

Best Practice 10 – Minimize Uncontrolled Natural Gas Emission Training

PART 1: OVERVIEW	
a) Best Practice: 10	b) Status: Ongoing Best Practice
Minimize Uncontrolled Natural Gas Emissions Training Training to ensure that personnel know how to use company emergency procedures which describe the actions staff shall take to prevent, minimize and/or stop the uncontrolled release of natural gas from the gas system or storage facility. Training programs to be designed by the Company and approved by the CPUC, in consultation with CARB, as part of the Compliance Plan filing. If integration of training and program development is required with the company's General Rate Case (GRC) and/or Collective Bargaining Unit (CBC) processes, then the company shall file a draft training program and plan with a process to update the program once finalized into its Compliance Plan.	
PART 2: BEST PRACTICE DETAILS	
a) Historic work: Southwest Gas currently trains and qualifies both Company and contract personnel in Emergency Response Operator Qualifications (OQ), Damage Prevention OQ, Line Locating OQ, Squeezing OQ, and Emergency Response Facility OQ Procedures, all of which describe the actions that should be taken to control the flow of gas (and, by extension the uncontrolled release of methane) as soon as practical in a safe manner.	
b) Alternative Proposal to BP or exemption? Not applicable.	
c) Proposed Plan: Not applicable.	
d) Overlap with other regulations? No. What portion of the BP is incremental beyond those regulations? Not applicable.	
e) What technology is required to implement the best practice and why? Not applicable.	
f) Will work require additional personnel and/or contract support? If so, please provide details. Not applicable.	
g) What changes to existing operations are required? None. How will those changes be implemented? Not applicable.	
h) What are the new procedures to develop or existing procedures to modify? Please provide details. Not applicable.	
i) Timeline for implementation (Milestones): Not applicable.	
j) Identify the range of factors or considerations used to determine cost-effectiveness of this measure, when costs estimates have been determined: Not applicable.	
k) Identify any cost benefits from this BP, when cost estimates are known: Not applicable.	
l) Do any incremental costs, if known, or benefits overlap with other BPs? No. If so, to which BP do they overlap, what are they, and how do they overlap? Not applicable.	

m) Anticipated Emissions Reductions from this BP: Not applicable. 2015 Baseline Emissions affected, where known: Not applicable.
n) Calculation Methodology: Not applicable.
o) Additional Comments: None.
p) Overlap with Safety: While there is no incremental cost overlap between this BP and the Company's existing emergency response activities, there is overlapping benefit. By providing the procedures necessary to safely and efficiently manage an uncontrolled release of natural gas, the Company is also safely and efficiently managing the uncontrolled release of methane emissions into the atmosphere.
SUPPLEMENTAL INFORMATION
a) Technology: Not applicable.
b) Changes to Operations: Not applicable.
c) Research or Studies: Not applicable.
d) Other: Not applicable.

CHAPTER 11

Best Practice 11 – Methane Emissions Minimization Policies Training

PART 1: OVERVIEW	
a) Best Practice: 11	b) Status: Proposed Best Practice
Methane Emissions Minimization Policies Training Ensure that training programs educate workers as to why it is necessary to minimize methane emissions and abate natural gas leaks. Training programs to be designed by the Company and approved by the CPUC, in consultation with CARB, as part of the Compliance Plan filing. If integration of training and program development is required with the company's GRC and/or CBC processes, then the company shall file a draft training program and plan with a process to update the program once finalized into its Compliance Plan.	
PART 2: BEST PRACTICE DETAILS	
a) Historic work: None.	
b) Alternative Proposal to BP or exemption? Not applicable.	
c) Proposed Plan: Educate affected Company and contractor personnel as to why it is necessary to minimize methane emissions and abate natural gas leaks using the Company's existing training programs.	
d) Overlap with other regulations? No. What portion of the BP is incremental beyond those regulations? Not applicable.	
e) What technology is required to implement the best practice and why? Not applicable.	
f) Will work require additional personnel and/or contract support? If so, please provide details. Not applicable.	
g) What changes to existing operations are required? How will those changes be implemented? Proposed changes to the Company's California Safety Plan, to include an Emissions Mitigation Plan that describes the need for, and importance of, minimizing methane emissions are included in this Plan. Upon approval, the Company will revise its California Safety Plan during the next scheduled quarterly manual release. Training on the revised California Safety Plan will be conducted within 60 days of publication with all affected Company and contractor personnel through the Company's normal manual training revision process.	
h) What are the new procedures to develop or existing procedures to modify? Please provide details. Not applicable.	
i) Timeline for implementation (Milestones): Reference section (g) above.	
j) Identify the range of factors or considerations used to determine cost-effectiveness of this measure, when costs estimates have been determined: Not applicable.	
k) Identify any cost benefits from this BP, when cost estimates are known: Not applicable.	
l) Do any incremental costs, if known, or benefits overlap with other BPs? If so, to which BP do they overlap, what are they, and how do they overlap?	

Not applicable.
m) Anticipated Emissions Reductions from this BP: Not applicable. 2015 Baseline Emissions affected, where known: Not applicable.
n) Calculation Methodology: Not applicable.
o) Additional Comments: None.
p) Overlap with Safety: Not applicable.
SUPPLEMENTAL INFORMATION
a) Technology: Not applicable.
b) Changes to Operations: Not applicable.
c) Research or Studies: Not applicable.
d) Other: Not applicable.

CHAPTER 12

Best Practice 12 – Knowledge Continuity Training Programs

PART 1: OVERVIEW	
a) Best Practice: 12	b) Status: Proposed Best Practice
Knowledge Continuity Training Programs Knowledge Continuity (Transfer) Training Programs to ensure knowledge continuity for new methane emissions reductions best practices as workers, including contractors, leave and new workers are hired. Knowledge continuity training programs to be designed by the Company and approved by the CPUC, in consultation with CARB, as part of the Compliance Plan filing. If integration of training and program development is required with the company's GRC and/or CBC processes, then the company shall file a draft training program and plan with a process to update the program once finalized into its Compliance Plan.	
PART 2: BEST PRACTICE DETAILS	
a) Historic work: None.	
b) Alternative Proposal to BP or exemption? Not applicable.	
c) Proposed Plan: Southwest Gas ensures continuity of knowledge through training and qualifying new Company and contractor personnel on Company policies and procedures upon hiring. Southwest Gas currently trains, qualifies, and re-qualifies both Company and contract personnel on up-to-date training upon hiring, and on an annual, 3-year, and 5-year basis, depending on the task. New methane emissions minimization and leak abatement best practices, as proposed in the Plan, will be incorporated into the Company's existing training programs thus ensuring that new Company and contract personnel receive the necessary training during standard initial Company training.	
d) Overlap with other regulations? No. What portion of the BP is incremental beyond those regulations? Not applicable.	
e) What technology is required to implement the best practice and why? Not applicable.	
f) Will work require additional personnel and/or contract support? If so, please provide details. Not applicable.	
g) What changes to existing operations are required? None. How will those changes be implemented? Not applicable.	
h) What are the new procedures to develop or existing procedures to modify? Please provide details. Not applicable.	
i) Timeline for implementation (Milestones): Upon approval of the Plan, the Company will revise the applicable Operations Manual sections during the next scheduled quarterly manual release. Training will be conducted within 30-60 days of publication with all affected Company and contractor personnel through the Company's normal manual revision training process.	
j) Identify the range of factors or considerations used to determine cost-effectiveness of this measure, when costs estimates have been determined: Not applicable.	
k) Identify any cost benefits from this BP, when cost estimates are known: Not applicable.	

l) Do any incremental costs, if known, or benefits overlap with other BPs? No. If so, to which BP do they overlap, what are they, and how do they overlap? Not applicable.
m) Anticipated Emissions Reductions from this BP: None. 2015 Baseline Emissions affected, where known: Not applicable.
n) Calculation Methodology: Not applicable.
o) Additional Comments: None.
p) Overlap with Safety: Not applicable.
SUPPLEMENTAL INFORMATION
a) Technology: Not applicable.
b) Changes to Operations: Not applicable.
c) Research or Studies: Not applicable.
d) Other: Not applicable.

CHAPTER 13

Best Practice 13 – Performance Focused Training Programs

PART 1: OVERVIEW	
a) Best Practice: 13	b) Status: Proposed Best Practice
Performance Focused Training Programs Create and implement training programs to instruct workers, including contractors, on how to perform the BPs chosen, efficiently and safely. Training programs to be designed by the Company and approved by the CPUC, in consultation with CARB, as part of the Compliance Plan filing. If integration of training and program development is required with the company's GRC and/or CBC processes, then the company shall file a draft training program and plan with a process to update the program once finalized into its Compliance Plan.	
PART 2: BEST PRACTICE DETAILS	
a) Historic work: None.	
b) Alternative Proposal to BP or exemption? None.	
c) Proposed Plan: Southwest Gas' existing training programs ensure Company procedures performed by field personnel are done both safely and efficiently. New methane emissions minimization and leak abatement best practices, as proposed in the Plan, will be incorporated into the Company's existing training programs.	
d) Overlap with other regulations? No. What portion of the BP is incremental beyond those regulations? Not applicable.	
e) What technology is required to implement the best practice and why? Not applicable.	
f) Will work require additional personnel and/or contract support? If so, please provide details. Not applicable.	
g) What changes to existing operations are required? None. How will those changes be implemented? Not applicable.	
h) What are the new procedures to develop or existing procedures to modify? Please provide details. Not applicable.	
i) Timeline for implementation (Milestones): Not applicable.	
j) Identify the range of factors or considerations used to determine cost-effectiveness of this measure, when costs estimates have been determined: Not applicable.	
k) Identify any cost benefits from this BP, when cost estimates are known: Not applicable.	
l) Do any incremental costs, if known, or benefits overlap with other BPs? If so, to which BP do they overlap, what are they, and how do they overlap? Not applicable.	
m) Anticipated Emissions Reductions from this BP: Not applicable.	

2015 Baseline Emissions affected, where known: Not applicable.
n) Calculation Methodology: Not applicable.
o) Additional Comments: None.
p) Overlap with Safety: Not applicable.
SUPPLEMENTAL INFORMATION
a) Technology: Not applicable.
b) Changes to Operations: Not applicable.
c) Research or Studies: Not applicable.
d) Other: Not applicable.

EXPERIENCED, TRAINED PERSONNEL

CHAPTER 14

Best Practice 14 – Formal Job Classifications

PART 1: OVERVIEW	
a) Best Practice: 14	b) Status: Exemption
Formal Job Classifications Create new formal job classifications for apprentices, journeyman, specialists, etc., where needed to address new methane emissions minimization and leak abatement best practices, and filed as part of the Compliance Plan filing, to be approved by the CPUC, in consultation with CARB.	
PART 2: BEST PRACTICE DETAILS	
a) Historic work: None.	
b) Alternative Proposal to BP or exemption? Southwest Gas requests an exemption to the requirements of this BP. The Company's organizational structure does not mirror the structure outlined in the BP. Southwest Gas does not utilize a collective bargaining agreement workforce. Southwest Gas' workforce is organized by job title with each job title having specific covered task qualifications assignments. The Company will revise its covered tasks assignments to include the new methane emissions minimization and leak abatement best practices as proposed in the Plan.	
c) Proposed Plan: Not applicable.	
d) Overlap with other regulations? No. What portion of the BP is incremental beyond those regulations? Not applicable.	
e) What technology is required to implement the best practice and why? Not applicable.	
f) Will work require additional personnel and/or contract support? If so, please provide details. Not applicable.	
g) What changes to existing operations are required? Not applicable. How will those changes be implemented? Not applicable.	
h) What are the new procedures to develop or existing procedures to modify? Please provide details. Not applicable.	
i) Timeline for implementation (Milestones): Not applicable.	
j) Identify the range of factors or considerations used to determine cost-effectiveness of this measure, when costs estimates have been determined: Not applicable.	
k) Identify any cost benefits from this BP, when cost estimates are known: Not applicable.	
l) Do any incremental costs, if known, or benefits overlap with other BPs? If so, to which BP do they overlap, what are they, and how do they overlap? Not applicable.	
m) Anticipated Emissions Reductions from this BP: Not applicable. 2015 Baseline Emissions affected, where known:	

Not applicable.
n) Calculation Methodology: Not applicable.
o) Additional Comments: Not applicable.
p) Overlap with Safety: Not applicable.
SUPPLEMENTAL INFORMATION
a) Technology: Not applicable.
b) Changes to Operations: Not applicable.
c) Research or Studies: Not applicable.
d) Other: Not applicable.

LEAK DETECTION

CHAPTER 15

Best Practice 15 – Gas Distribution Leak Surveys

PART 1: OVERVIEW	
a) Best Practice: 15	b) Status: Ongoing Best Practice
Gas Distribution Leak Surveys Utilities should conduct leak surveys of the gas distribution system every 3 years, not to exceed 39 months, in areas where G.O. 112-F, or its successors, requires surveying every 5 years. In lieu of a system-wide three-year leak survey cycle, utilities may propose and justify in their Compliance Plan filings, subject to Commission approval, a risk-assessment based, more cost-effective methodology for conducting gas distribution pipeline leak surveys at a less frequent interval. However, utilities shall always meet the minimum requirements of G.O. 112-F, and its successors.	
PART 2: BEST PRACTICE DETAILS	
a) Historic work: Southwest Gas' existing policies and procedures include a three-year leak survey frequency. No additional procedural changes are necessary to comply with this BP. Southwest Gas implemented a three-year gas distribution leak survey in 2012 to align with its existing three-year atmospheric corrosion inspection. As a result, the Company realized additional pipeline risk reduction, and more efficient resource management.	
b) Alternative Proposal to BP or exemption? Not applicable.	
c) Proposed Plan: Not applicable.	
d) Overlap with other regulations? No. What portion of the BP is incremental beyond those regulations? Not applicable.	
e) What technology is required to implement the best practice and why? Not applicable.	
f) Will work require additional personnel and/or contract support? If so, please provide details. Not applicable.	
g) What changes to existing operations are required? How will those changes be implemented? Not applicable.	
h) What are the new procedures to develop or existing procedures to modify? Please provide details. Not applicable.	
i) Timeline for implementation (Milestones): Not applicable.	
j) Identify the range of factors or considerations used to determine cost-effectiveness of this measure, when costs estimates have been determined: Not applicable.	
k) Identify any cost benefits from this BP, when cost estimates are known: Not applicable.	
l) Do any incremental costs, if known, or benefits overlap with other BPs? If so, to which BP do they overlap, what are they, and how do they overlap? Not applicable.	
m) Anticipated Emissions Reductions from this BP: Not applicable.	

2015 Baseline Emissions affected, where known: Because the Company transitioned to a three-year leak survey prior to calculating 2015 Baseline Emissions, its 2015 Baseline Emissions are inclusive of any reduction in emissions associated with this BP.
n) Calculation Methodology: Not applicable.
o) Additional Comments: Not applicable.
p) Overlap with Safety: While there is no incremental cost overlap between this BP and the Company's existing three-year leak survey policy, there is overlapping benefit. By reducing the leak survey interval from 5 years to 3 years the maximum dwell time of a leak is significantly shorted, resulting in enhanced public safety while decreasing methane emissions into the atmosphere.
SUPPLEMENTAL INFORMATION
a) Technology: Not applicable.
b) Changes to Operations: Not applicable.
c) Research or Studies: Not applicable.
d) Other: Not applicable.

CHAPTER 16

Best Practice 16 – Special Leak Surveys

PART 1: OVERVIEW	
a) Best Practice: 16	b) Status: Ongoing Best Practice
Special Leak Surveys Utilities shall conduct special leak surveys, possibly at a more frequent interval than required by G.O. 112-F (or its successors) or BP 15, for specific areas of their transmission and distribution pipeline systems with known risks for natural gas leakage. Special leak surveys may focus on specific pipeline materials known to be susceptible to leaks or other known pipeline integrity risks, such as geological conditions. Special leak surveys shall be coordinated with transmission and distribution integrity management programs (TIMP/DIMP) and other utility safety programs. Utilities shall file in their Compliance Plan proposed special leak surveys for known risks and proposed methodologies for identifying additional special leak surveys based on risk assessments (including predictive and/or historical trends analysis). As surveys are conducted over time, utilities shall report as part of their Compliance Plans, details about leakage trends. Predictive analysis may be defined differently for differing companies based on company size and trends.	
PART 2: BEST PRACTICE DETAILS	
a) Historic work: Southwest Gas currently performs special or accelerated leak surveys as necessary for distribution and transmission system integrity purposes of risk reduction. Surveys include early vintage plastic pipe, pre-1970's vintage high-pressure steel, and other accelerated leak monitoring based upon threat identification in the Company's Integrity Management Programs. As described in BP# 15, the Company also conducts leak surveys of its distribution facilities on a three-year cycle.	
b) Alternative Proposal to BP or exemption? Not applicable.	
c) Proposed Plan: Southwest Gas is not proposing any new special or accelerated leak surveys as part of this BP. Consistent with this BP, the Company has included information on its existing special and accelerated leak surveys. Refer to the attached for additional detail on these activities.	
d) Overlap with other regulations? Yes. This BP overlaps with 49 CFR Part 192, Subparts O and P, and the Commission's G.O. 112-F. What portion of the BP is incremental beyond those regulations? None.	
e) What technology is required to implement the best practice and why? Not applicable.	
f) Will work require additional personnel and/or contract support? If so, please provide details. Not applicable.	
g) What changes to existing operations are required? How will those changes be implemented? Not applicable.	
h) What are the new procedures to develop or existing procedures to modify? Please provide details. Not applicable.	
i) Timeline for implementation (Milestones): Not applicable.	

j) Identify the range of factors or considerations used to determine cost-effectiveness of this measure, when costs estimates have been determined: Not applicable.
k) Identify any cost benefits from this BP, when cost estimates are known: Not applicable.
l) Do any incremental costs, if known, or benefits overlap with other BPs? If so, to which BP do they overlap, what are they, and how do they overlap? Not applicable.
m) Anticipated Emissions Reductions from this BP: Not applicable. 2015 Baseline Emissions affected, where known: Not applicable.
n) Calculation Methodology: Not applicable.
o) Additional Comments: None.
p) Overlap with Safety: Not applicable.
SUPPLEMENTAL INFORMATION
a) Technology: Not applicable.
b) Changes to Operations: Not applicable.
c) Research or Studies: Not applicable.
d) Other: Reference the Supplemental Section of this Plan for the Company's currently existing special and accelerated leak survey documentations.

CHAPTER 17

Best Practice 17 – Enhanced Methane Detection

PART 1: OVERVIEW	
a) Best Practice: 17	b) Status: Exemption
Enhanced Methane Detection Utilities shall utilize enhanced methane detection practices (e.g. mobile methane detection and/or aerial leak detection) including gas speciation technologies.	
PART 2: BEST PRACTICE DETAILS	
a) Historic work: None.	
b) Alternative Proposal to BP or exemption? Southwest Gas requests an exemption to the requirements of this BP. The Company conducted several field trials of advanced leak detection technologies, from two different manufactures. To date, this enhanced technology has not provided additional leakage detection beyond that which was identifiable utilizing the Company's current methodologies. The Company believes that its current practices have proved adequate in determining the existence of natural gas leaks. For example, Southwest Gas undertook a six-month field trial of an advanced leak detection system based on cavity ring-down spectroscopy. The field trial, conducted in coordination with the manufacturer in multiple geographic locations, provided no demonstrable advantage over the Company's current leakage detection methodologies. Most significantly, the instrument proved ineffective in the Company's higher elevation service territories such as Big Bear and Lake Tahoe/Truckee. The vendors could not produce a solution that allowed the technology to effectively work at these elevations. Additionally, several leak sites previously identified through existing leak survey instrumentation, were not consistently detected by the advanced leak detection technology during field trials. Current leak survey practices at Southwest Gas include the use of portable and mobile leak survey instrumentation, Hydrogen Flame Ionization, Infrared, and laser based technologies. The Company believes that current methane leak detection equipment and the level of training and experience of leak surveyors, combined with the Company's three-year leak survey frequency, and its practice of repairing rather monitoring leaks are effective in detecting leaks and reducing methane emissions. Southwest Gas will continue to review and evaluate new technologies for enhanced leak detection and incorporate them into its portfolio of existing leak detection practices and its future Compliance Plans, as appropriate.	
c) Proposed Plan: Not applicable.	
d) Overlap with other regulations? No. What portion of the BP is incremental beyond those regulations? Not applicable.	
e) What technology is required to implement the best practice and why? Not applicable.	
f) Will work require additional personnel and/or contract support? If so, please provide details. Not applicable.	

g) What changes to existing operations are required? How will those changes be implemented? Not applicable.
h) What are the new procedures to develop or existing procedures to modify? Please provide details. Not applicable.
i) Timeline for implementation (Milestones): Not applicable.
j) Identify the range of factors or considerations used to determine cost-effectiveness of this measure, when costs estimates have been determined: Not applicable.
k) Identify any cost benefits from this BP, when cost estimates are known: None identified at this time.
l) Do any incremental costs, if known, or benefits overlap with other BPs? If so, to which BP do they overlap, what are they, and how do they overlap? Not applicable.
m) Anticipated Emissions Reductions from this BP: Not applicable. 2015 Baseline Emissions affected, where known: Not applicable.
n) Calculation Methodology: Not applicable.
o) Additional Comments: None.
p) Overlap with Safety: Not applicable.
SUPPLEMENTAL INFORMATION
a) Technology: Not applicable.
b) Changes to Operations: Not applicable.
c) Research or Studies: Not applicable.
d) Other: Not applicable.

CHAPTER 18

Best Practice 18 – Stationary Methane Detection

PART 1: OVERVIEW	
a) Best Practice: 18	b) Status: Pilot and Research and Development
Stationary Methane Detectors Utilities shall utilize Stationary Methane Detectors for early detection of leaks. Locations include: Compressor Stations, Terminals, Gas Storage Facilities, City Gates, and Metering & Regulating (M&R) Stations (M&R above ground and greater than 300 psig only). Methane detector technology should be capable of transferring leak data to a central database, if appropriate for location.	
PART 2: BEST PRACTICE DETAILS	
a) Historic work: None.	
b) Alternative Proposal to BP or exemption? No. However, Southwest Gas may request an exemption if its proposed pilot and Research and Development (R&D) are not approved as part of this Plan.	
c) Proposed Plan: Southwest Gas will perform a pilot (Attachment 1) to evaluate the suitability, reliability, and configuration required for current technology to monitor facilities for leakage on a continuous basis at selected sites. The proposed pilot will be conducted in Southwest Gas' southern California service territory, and will include one location in 2018 and two additional locations in 2019. Southwest Gas is also proposing to fund an industry driven Research and Development (Attachment 2) project for stationary methane detection equipment specific to this application for City Gates and M&R Stations. The total anticipated funding level for this proposed R&D is currently estimated at \$1,100,000 over an 18-month period, with an estimated \$470,000 to be expensed in 2018 and an estimated \$630,000 to be expensed in 2019. Southwest Gas anticipates that as participation in this R&D effort increases, the associated cost will be allocated across all participants.	
d) Overlap with other regulations? No. What portion of the BP is incremental beyond those regulations? Not applicable.	
e) What technology is required to implement the best practice and why? Southwest Gas proposes a pilot evaluation of existing technologies to determine which methane detector types are suitable for this application, the required supporting infrastructure (power, communications, security, etc.) as well as how the detectors will interface with the Company's SCADA system and network architecture in a secure manner. Southwest Gas does not currently anticipate that any new technology will be required to implement its R&D proposal.	
f) Will work require additional personnel and/or contract support? If so, please provide details. No.	
g) What changes to existing operations are required? None. How will those changes be implemented?	

Not applicable.
h) What are the new procedures to develop or existing procedures to modify? Please provide details. To be determined following conclusion of pilot.
i) Timeline for implementation (Milestones): Upon approval, Southwest Gas will initiate the pilot, which will include one site in 2018, proposed for Adelanto Tap in Victorville, California, and two additional sites in 2019, proposed for the Regulating Station at Baker Road and Old Woman Springs Road in Victorville, California, and the Regulating Station at Division Drive and Northshore Drive in Big Bear, California. Southwest Gas will also initiate the industry driven R&D project for stationary methane detection equipment, which is currently scheduled for an 18-month period over 2018 and 2019.
j) Identify the range of factors or considerations used to determine cost-effectiveness of this measure, when costs estimates have been determined: Cost effectiveness of this best practice is currently unknown, but will be determined as part of the pilot program and R&D as the Company gains more information on the potential emissions reductions associated with these efforts.
k) Identify any cost benefits from this BP, when cost estimates are known: The pilot program will collect information to determine any cost benefits from this BP.
l) Do any incremental costs, if known, or benefits overlap with other BPs? If so, to which BP do they overlap, what are they, and how do they overlap? Not applicable.
m) Anticipated Emissions Reductions from this BP: Emission reductions will be determined after the pilot program concludes. 2015 Baseline Emissions affected, where known: Not applicable.
n) Calculation Methodology: To be determined following conclusion of pilot.
o) Additional Comments: None.
p) Overlap with Safety: Continuous monitoring of stations will facilitate real time notification of leakage.
SUPPLEMENTAL INFORMATION
a) Technology: Not applicable.
b) Changes to Operations: Not applicable.
c) Research or Studies: Details on the Company's proposed pilot program and the proposed industry-driven R&D project are attached.
d) Other: Not applicable.

Best Practice 18 – Attachment 1

Stationary Methane Detection – Pilot Proposal

In support of Best Practice #18, Southwest Gas is proposing to perform a pilot to evaluate the feasibility of monitoring Metering & Regulating (M&R) facilities for early detection of leakage using commercially available methane detection equipment. The purpose of the pilot will be to determine the suitability, reliability, and configuration required for current methane detection equipment. This will include field testing of the equipment at sites within the Company's California service territory.

Southwest Gas will work with various vendors to determine what methane detection equipment is commercially available and suitable for installation at M&R stations. After selecting equipment for the pilot, Southwest Gas will field test the equipment to determine:

- Detection Coverage – the configuration and number of detectors needed to provide reliable coverage for a M&R station;
- Communication – the methods of communication compatible with the detectors and the additional equipment needed to connect to the Company's SCADA system for real time monitoring;
- Physical Security – the additional protective measures needed at each site to protect the methane detection equipment and appurtenances from theft or vandalism;
- Power needs – the applicability of commercial or solar power to supply the power needs for continuous detection capabilities;
- Detection Response – the emergency response procedures for when methane detections occur;
- Maintenance – the tools and training for testing and maintaining the new equipment.

Southwest Gas has several M&R stations in its Southern California service territory that meet the requirements established under Best Practice #18 - above ground facility and operating at greater than 300 psig. The pilot will include one field test site in 2018, currently proposed for Adelanto Tap in Victorville, California. In 2019, the pilot will include two additional field test sites, currently proposed for the Regulating Station at Baker Rd and Old Woman Springs in Victorville, California, and the Regulating Station at Division Drive and Northshore Drive in Big Bear, California.

The estimated cost for the pilot is \$150,000 for each site. Cost effectiveness of this pilot is currently unknown, but will be determined as part of the pilot program as the Company gains more information on the potential emissions reductions associated with these efforts.

Upon completion of the pilot, Southwest Gas will evaluate the results, including costs and emissions reductions, from all three field test locations and develop recommendations for either implementation and deployment, additional testing, or revisions to the Best Practice. The pilot outcome and recommendation will be recorded in a format to facilitate sharing with SED and the other utilities as part of a workshop.

Best Practice 18 – Attachment 2

Stationary Methane Detection – Research and Development Proposal

OPERATIONS TECHNOLOGY DEVELOPMENT

2018 Proposal

Evaluation and Demonstration of Stationary Continuous Methane Monitoring Systems for Gas Utility Facilities

Project Duration: 18 months

Project Cost: \$1,100,000

2018 \$ 470,000

2019 \$ 630,000

OBJECTIVE

Evaluate and field demonstrate new and advanced stationary continuous methane monitoring systems for potential use at facilities such as Compressor Stations, Terminals, Gas Storage Facilities, City Gates, and Metering and Regulating (M&R) Stations.

BUSINESS VALUE

The adoption of advanced methane monitoring technologies can improve the ability to identify and locate leaks resulting in a more efficient leak detection and repair process, while reducing emissions from natural gas leakage. These technologies also allow for remote monitoring of target assets that may require frequent longer-term detection of methane. Broadening the toolbox of methane detection devices will allow for more tailored leak detection methods resulting in increased safety for people and reducing the impact of methane in the environment.

INDUSTRY NEED

Gas utilities are required to survey, identify, and mitigate leaks as a measure to increase public safety and reduce environmental impacts. Furthermore, in California under SB 1371, gas utilities must now utilize stationary methane detectors for early detection of leaks at facilities such as Compressor Stations, Terminals, Gas Storage Facilities, City Gates, and M&R Stations. With the advancement of technologies coupled with the focus on reducing methane emissions from natural gas industry facilities, there has been an increase over the past several years in the number of products entering the market for detecting methane. There is a need to evaluate the performance of these new and emerging technologies for suitable applications for utility operations to ensure their effectiveness for early detection of leaks in specific use case scenarios. Having technical data on the performance of these technologies in the field and real world operating environments is necessary prior to any type of wide scale deployment and implementation.

BACKGROUND

GTI is executing a large body of work in the area of methane sensing. The technologies range from early research stages to

commercialization and adoption of leak detection tools. Sensing technologies have included laser-based sensors, optical imaging techniques, biosensors and MEMS based methods. Examples of ongoing work at GTI are “Methane Sensing for First Responders,” “Methane Sensor State of the Art Investigation” and “Field Measurement of Methane Flow Rate”. It is evident there is not a “one size fits all” solution when it comes to methane detection. Different applications and use cases warrant fit-for-purpose technologies. A leak detection tool used by an operator performing a walking leak survey for regulatory compliance has different requirements than a device made to remotely monitor leaks at a large storage field.

Technologies for Stationary Remote Monitoring

Advancements have been made that allow for the production of low cost, low power methane sensors. Simultaneous advances in wireless technology have led to sensors that can be deployed as a “network” to remotely monitor areas of interest. One OTD member has begun deploying a network of methane sensors in response to recent incidences. The network consists of monitoring stations (currently 12) in a specific region of interest that includes sensors that read concentrations every 5 minutes near high-pressure pipelines.

Additional studies have also been performed by Pipeline Research Council International that conducted targeted pilot testing on the Remote Emissions Monitor by Heath at an underground storage facility operated by a west coast utility. The system was able to capture trends of emissions however; additional evaluations and demonstrations are needed to validate the performance of these types of methane monitoring technologies in varying applications, facilities, and environmental conditions to ensure their accuracy, reliability, stability and other performance metrics.

Another important aspect is to develop the networking and communications platforms that will enable a utility to have remote access to the data collected. The proper synthesis and analysis of that data will enable operators to make appropriate decisions and

take actions to prevent leaks from becoming a safety or environmental issue.

SCOPE

The project will focus on conducting field demonstrations of commercially available systems as well as a few near/pre-commercial systems.

Task 1 Project Scoping & Selection of Test Sites

Several studies (PRCI, OTD) have reviewed methane sensor systems that are being developed or currently available for use in utility applications. Based on these previous studies, GTI will select four candidate stationary methane-monitoring technologies for testing. Potential candidate systems include:

- Heath Remote Emissions Monitor
- Sensit Fixed Point Laser Methane Gas Monitor
- University of Colorado Frequency Comb Based Methane Detection Network
- Quanta3
- UE Controls Vanguard System
- Unattended Methane Monitor under development by OTD
- Other commercial or near commercial technologies that become available

The systems selected will be a mixture of remote/optical and point sensors so that several sensing modes can be evaluated. Each will have unique communication and data storage modes.

GTI and the sponsors will review available test sites. The test site characteristics will influence the choice of technologies for evaluation. In addition to the GTI leak testing facility, the goal is to have at least one field test site designated. Having additional field sites to provide alternates would be preferred. However,

multiple systems can be tested at the same site.

Budget: \$50,000
Duration: 3 months

Task 2 Deployment Planning

GTI will work with the sponsors and the technology providers to develop a detailed work plan. GTI will develop a bill of materials and costs for each of the four demonstration systems.

The installation procedures and physical footprint of the monitoring systems will be developed. It is also necessary to determine in advance the requirements for power supplies and wireless coverage. Estimates for the permitting and the personnel required to perform the installation will be developed.

GTI will meet with the various project stakeholders to review the entire package. Any required adjustments to the plan will be completed before moving on to Task 3.

Budget: \$100,000
Duration: 6 months

Task 3 Technology Acquisition and Validation Testing

GTI will procure the necessary materials to set up the four technology demonstration systems. These will be temporarily set up and run at the GTI leak testing facility.

This process will verify the functionality of all four systems. They will be tested in a repeatable environment that can simulate methane leaks. This testing will establish a common baseline sensitivity for all the methane sensors.

This validation testing will also allow personnel to become familiar with the operation of the systems prior to field deployment at a utility site. Any missing

components or consumable items will be identified.

The data communication systems and means for remote monitoring will be verified. This component contributes to the efficacy of the system as much as the sensors themselves. In cases where there are multiple sensors deployed in an area, the delivery of data must be managed carefully. Part of the evaluation is how each of the four systems handle this aspect of the application.

GTI will prepare a report on the set up and testing of the stationary methane monitoring systems. This report will serve as a reference manual for the utility personnel that will be receiving the systems. This material will be reviewed with the sponsors prior to Task 4.

Budget: \$500,000
Duration: 6 months

Task 4 Technology Field Deployment and Testing

The four stationary methane-monitoring systems will be shipped to the field test site(s). GTI will set up and commission the systems with assistance from the utility.

The intention is to carry out six to nine months of observation. The exact duration of testing is dependent on the installation schedule executed in conjunction with the utility hosting the test location. This is impacted by construction schedules and seasonal variations in utility workloads.

A controlled release of methane will be conducted on a regular basis to confirm the stationary sensor systems are working properly and assist with comparisons between the sensor systems. A standardized release method, such as a small sample cylinder, will be used to ensure repeatability.

The communication systems provided with the stationary methane-monitoring

system will also be evaluated in this field deployment. The test systems will be evaluated not only on their ability to deliver raw data, but also on their user interfaces. The goal is to minimize the personnel effort required to maintain these systems.

An operations dashboard or short report format will be set up to display the monitoring results. Short monthly reports will be provided during the testing period that capture the key performance data. Examples of key performance indicators are down time, false positives, communication outages, or unscheduled maintenance.

Budget: \$200,000
Duration: 9 months

Task 5 Data Analysis and Reporting

In addition to the standard OTD quarterly and final reports, a number of other data products will be provided. As noted in the body of the proposal, data from the operation of the methane monitoring systems will be captured during pre-deployment testing at GTI and during the utility deployment. This data will form the basis for performance evaluations at the ends of Task 3 and Task 4.

Budget: \$100,000
Duration: 15 months

Task 6. Project Management and Reporting

The work in this task will include standard project management activities including scheduling, budgeting, and communications. The budget for this task also includes the cost of developing the two-page summary for the annual OTD report.

Cost: \$150,000
Duration: 18 months

DELIVERABLES

The following are the expected deliverables.

- Site characteristics of at least one appropriate utility field test site at stationary facilities.
- Bill of materials and installation plans for four distinct stationary methane-monitoring systems.
- Pre-deployment testing of the four systems at a GTI facility with simulated methane leaks.
- A report on the pre-deployment testing that captures any variance from the initial installation plans. Finalized requirements for the test site support infrastructure.
- Delivery, set up, and commissioning of the four systems to the utility field test site(s). Utility personnel will assist with set up as needed.
- Support of the field deployment testing. Short monthly reports of data and system performance.

PROJECT TEAM

Kristine Wiley
Chris Ziolkowski

BUDGET

Task	Title	Total Budget	2018 Budget	2019 Budget
1	Project Scoping & Site Selection	\$50,000	\$50,000	-
2	Deployment Planning	\$100,000	\$100,000	-
3	Technology Acquisition & Validation Testing	\$500,000	\$250,000	\$250,000
4	Technology Field Deployment & Testing	\$200,000	-	\$200,000
5	Data Analysis and Reporting	\$100,000	\$20,000	\$80,000
6	Project Management	\$150,000	\$50,000	\$100,000
	Total	\$1,100,000	\$470,000	\$630,000

SCHEDULE

		2018		2019			
Task	Title	Q3	Q4	Q1	Q2	Q3	Q4
1	Project Scoping & Site Selection						
2	Deployment Planning						
3	Technology Acquisition & Validation Testing						
4	Technology Field Deployment & Testing						
5	Data Analysis and Reporting						
6	Project Management						

The information contained in this offering is proprietary and confidential. Use of this information is limited to members of Operations Technology Development (OTD) and their employees and may only be used for the members internal purpose and not be disclosed to third parties

CHAPTER 19

Best Practice 19 – Above Ground Leak Surveys

PART 1: OVERVIEW	
a) Best Practice: 19	b) Status: Ongoing Best Practice
Above Ground Leak Surveys Utilities shall conduct frequent leak surveys and data collection at above ground transmission and high pressure distribution (above 60 psig) facilities including Compressor Stations, Gas Storage Facilities, City Gates, and Metering & Regulating (M&R) Stations (M&R above ground and greater than 300 psig only). At a minimum, above ground leak surveys and data collection must be conducted on an annual basis for compressor stations and gas storage facilities.	
PART 2: BEST PRACTICE DETAILS	
a) Historic work: Southwest Gas checks for leakage at its city gates and metering stations on a prescribed frequency, either semi-annually or annually, depending on the type of station. Note: Southwest Gas does not own or operate any compressor stations in the State of California.	
b) Alternative Proposal to BP or exemption? Not applicable.	
c) Proposed Plan: Not applicable.	
d) Overlap with other regulations? No. What portion of the BP is incremental beyond those regulations? None.	
e) What technology is required to implement the best practice and why? Not applicable.	
f) Will work require additional personnel and/or contract support? If so, please provide details. Not applicable.	
g) What changes to existing operations are required? Not applicable. How will those changes be implemented? Not applicable.	
h) What are the new procedures to develop or existing procedures to modify? Please provide details. Not applicable.	
i) Timeline for implementation (Milestones): Not applicable.	
j) Identify the range of factors or considerations used to determine cost-effectiveness of this measure, when costs estimates have been determined: Not applicable.	
k) Identify any cost benefits from this BP, when cost estimates are known: Not applicable.	
l) Do any incremental costs, if known, or benefits overlap with other BPs? If so, to which BP do they overlap, what are they, and how do they overlap? Not applicable.	
m) Anticipated Emissions Reductions from this BP: Not applicable.	

2015 Baseline Emissions affected, where known: Not applicable.
n) Calculation Methodology: Not applicable.
o) Additional Comments: None.
p) Overlap with Safety: Not applicable.
SUPPLEMENTAL INFORMATION
a) Technology: Not applicable.
b) Changes to Operations: Not applicable.
c) Research or Studies: Not applicable.
d) Other: Not applicable.

CHAPTER 20A

Best Practice 20a – Quantification

PART 1: OVERVIEW	
a) Best Practice: 20a	b) Status: Exemption
Quantification Utilities shall develop methodologies for improved quantification and geographic evaluation and tracking of leaks from the gas systems. Utilities shall file in their Compliance Plan how they propose to address quantification. Utilities shall work together, with CPUC and ARB staff, to come to agreement on a similar methodology to improve emissions quantification of leaks to assist demonstration of actual emissions reductions.	
PART 2: BEST PRACTICE DETAILS	
a) Historic work: None.	
b) Alternative Proposal to BP or exemption? In the Company's 2016 Natural Gas Abatement Report, Southwest Gas identified a total of 62 leaks which accounted for less than 3 percent of the total reported emissions. Given such a small population of leaks coupled with the Company's practice of repairing leaks (versus monitoring), an exemption to this BP is being requested. Additionally, Southwest Gas proposes to participate in discussions with the other utilities, the CPUC and ARB staff, regarding a methodology to improve emission quantification. Southwest Gas will also reevaluate the applicability of this BP in future Compliance Plan filings.	
c) Proposed Plan: Not applicable.	
d) Overlap with other regulations? No. What portion of the BP is incremental beyond those regulations? Not applicable.	
e) What technology is required to implement the best practice and why? Not applicable.	
f) Will work require additional personnel and/or contract support? If so, please provide details. Not applicable.	
g) What changes to existing operations are required? None. How will those changes be implemented? Not applicable.	
h) What are the new procedures to develop or existing procedures to modify? Please provide details. Not applicable.	
i) Timeline for implementation (Milestones): Not applicable.	
j) Identify the range of factors or considerations used to determine cost-effectiveness of this measure, when costs estimates have been determined: Not applicable.	
k) Identify any cost benefits from this BP, when cost estimates are known: Not applicable.	
l) Do any incremental costs, if known, or benefits overlap with other BPs? If so, to which BP do they overlap, what are they, and how do they overlap? Not applicable.	

m) Anticipated Emissions Reductions from this BP: Not applicable. 2015 Baseline Emissions affected, where known: Not applicable.
n) Calculation Methodology: Not applicable.
o) Additional Comments: None.
p) Overlap with Safety: None Not applicable.
SUPPLEMENTAL INFORMATION
a) Technology: Not applicable.
b) Changes to Operations: Not applicable.
c) Research or Studies: Not applicable.
d) Other: Not applicable.

CHAPTER 20B

Best Practice 20b – Geographic Tracking

PART 1: OVERVIEW	
a) Best Practice: 20b	b) Status: Proposed Best Practice
Geographic Tracking Utilities shall develop methodologies for improved geographic tracking and evaluation of leaks from the gas systems. Utilities shall work together, with CPUC and ARB staff, to come to agreement on a similar methodology to improve geographic evaluation and tracking of leaks to assist demonstration of actual emissions reductions. Leak detection technology should be capable of transferring leak data to a central database in order to provide data for leak maps. Geographic leak maps shall be publicly available with leaks displayed by zip code or census tract.	
PART 2: BEST PRACTICE DETAILS	
a) Historic work: Southwest Gas currently maps the location of leaks and historical repairs in the Company's Geographical Information System (GIS). However, this information is not currently shared with the general public.	
b) Alternative Proposal to BP or exemption? Not applicable.	
c) Proposed Plan: The Company will develop an outward-facing web page to present a summary of leaks by zip code.	
d) Overlap with other regulations? No. What portion of the BP is incremental beyond those regulations? Not applicable.	
e) What technology is required to implement the best practice and why? The Company will utilize its existing work management and GIS systems to post information into a public port on the Company's external website.	
f) Will work require additional personnel and/or contract support? If so, please provide details. Not applicable.	
g) What changes to existing operations are required? No. How will those changes be implemented? Not applicable.	
h) What are the new procedures to develop or existing procedures to modify? Please provide details. Not applicable.	
i) Timeline for implementation (Milestones): Upon approval, the Company will initiate the implementation of this BP. Deployment of this BP is estimated at 6-9 months from the approval date.	
j) Identify the range of factors or considerations used to determine cost-effectiveness of this measure, when costs estimates have been determined: Not applicable.	
k) Identify any cost benefits from this BP, when cost estimates are known: Not applicable	
l) Do any incremental costs, if known, or benefits overlap with other BPs? If so, to which BP do they overlap, what are they, and how do they overlap?	

Not applicable
m) Anticipated Emissions Reductions from this BP: Not applicable. 2015 Baseline Emissions affected, where known: Not applicable
n) Calculation Methodology: Not applicable.
o) Additional Comments: None.
p) Overlap with Safety: Not applicable.
SUPPLEMENTAL INFORMATION
a) Technology: Not applicable.
b) Changes to Operations: Not applicable.
c) Research or Studies: Not applicable.
d) Other: Not applicable.

LEAK REPAIRS

CHAPTER 21

Best Practice 21 – “Find It/Fix It”

PART 1: OVERVIEW	
a) Best Practice: 21 “Find-It/Fix-It” Utilities shall repair leaks as soon as reasonably possible after discovery, but in no event, more than three (3) years after discovery. Utilities may make reasonable exceptions for leaks that are costly to repair relative to the estimated size of the leak.	b) Status: Proposed Best Practice
PART 2: BEST PRACTICE DETAILS	
a) Historic work: Southwest Gas currently repairs all Distribution Grade 2 leaks within 30 days from the date of discovery or re-evaluates the leak every 30 days after detection until repaired, reclassified or no longer results in a reading. The re-evaluations may continue for a maximum of twelve months from date of discovery. Distribution Grade 3 leaks must be repaired or re-evaluated during the next scheduled survey, not to exceed 15 months and every calendar year thereafter, not to exceed 15 months. Grade 2 and Grade 3 leaks on transmission lines must be repaired upon discovery, or within one year of the date of discovery.	
b) Alternative Proposal to BP or exemption? Not applicable.	
c) Proposed Plan: Southwest Gas revised its Leak Survey Procedure, Section 1.5.3 to state that re-evaluations of non-hazardous Distribution Grade 3 leaks may continue for a maximum of 3 years from date of discovery, at which time the leak must be repaired unless such repair is costly relative to the estimated size of the leak.	
d) Overlap with other regulations? No. What portion of the BP is incremental beyond those regulations? Not applicable.	
e) What technology is required to implement the best practice and why? Not applicable.	
f) Will work require additional personnel and/or contract support? If so, please provide details. No.	
g) What changes to existing operations are required? Proposed changes to the Company’s Leak Survey Policy are included in this Plan. The proposed changes require that Distribution Grade 3 leaks be repaired no later than 3 years from the date of discovery unless such repair is impractical. How will those changes be implemented? Upon approval, the Company will revise its Leak Survey Policy during the next scheduled quarterly manual release. Training will be conducted within 30 days of publication with all affected Company and contractor personnel, through the normal manual revision training process.	
h) What are the new procedures to develop or existing procedures to modify? Please provide details. Not applicable.	
i) Timeline for implementation (Milestones): Reference section (g) above.	

j) Identify the range of factors or considerations used to determine cost-effectiveness of this measure, when costs estimates have been determined: Not applicable.
k) Identify any cost benefits from this BP, when cost estimates are known: Not applicable.
l) Do any incremental costs, if known, or benefits overlap with other BPs? If so, to which BP do they overlap, what are they, and how do they overlap? Not applicable.
m) Anticipated Emissions Reductions from this BP: As reported in the Company's 2017 Natural Gas Leakage Abatement Program Report (2016 reporting year), the emissions from the two pending Distribution Grade 3 leaks are currently estimated to be 44.8 Mscf. Southwest Gas does not have any pending Transmission leaks. The Company anticipates repairing the pending Grade 3 leaks during the compliance period (2018-2019) covered by this Plan. Consequently, emissions associated with these leaks will be reduced to zero. 2015 Baseline Emissions affected, where known: Not applicable.
n) Calculation Methodology: Calculation of current California Grade 3 leaks longer than one year.
o) Additional Comments: Southwest Gas estimates the cost to repair one of the two pending leaks at \$150,000, due to its location (interstate bridge crossing). This leak accounts for 22.4 Mscf emissions annually.
p) Overlap with Safety: Not applicable.
SUPPLEMENTAL INFORMATION
a) Technology: Not applicable.
b) Changes to Operations: The proposed changes to the Company's Leak Survey Procedure are attached. Reference the Supplemental Section of this Plan for the entirety of the Leak Survey Policy.
c) Research or Studies: Not applicable.
d) Other: Not applicable.

Best Practice 21 – Attachment

Southwest Gas, Leak Survey Procedure (Revised), Section 1.5.3

A Grade 3 leak must be repaired, or re-evaluated during the next scheduled survey or within 15-months of the date of discovery, whichever occurs first. Thereafter, the leak must be re-evaluated every calendar year, not to exceed 15 months until the leak is repaired, regraded or no longer results in a reading. The re-evaluations may continue for a maximum of 3 years from the reported date, unless such repair is costly relative to the estimated size of the leak.

LEAK PREVENTION

CHAPTER 22

Best Practice 22 – Pipe Fitting Specifications

PART 1: OVERVIEW	
a) Best Practice: 22	b) Status: Research and Development
Pipe Fitting Specifications Companies shall review and revise pipe fitting specifications, as necessary, to ensure tighter tolerance/better quality pipe threads. Utilities are required to review any available data on its threaded fittings, and if necessary, propose a fitting replacement program for threaded connections with significant leaks or comprehensive procedures for leak repairs and meter set assembly installations and repairs as part of their Compliance Plans. A fitting replacement program should consider components such as pressure control fittings, service tees, and valves metrics, among other things.	
PART 2: BEST PRACTICE DETAILS	
a) Historic work: None.	
b) Alternative Proposal to BP or exemption? No. However, Southwest Gas may request an exemption if its proposed Research and Development (R&D) is not approved as part of this Plan.	
c) Proposed Plan: Southwest Gas is proposing to participate in the funding of an industry R&D study through NYSEARCH. NYSEARCH, part of the Northeast Gas Association, is a R&D consortium focused on innovation within the natural gas industry. Information supporting the Company's R&D proposal is attached.	
d) Overlap with other regulations? No. What portion of the BP is incremental beyond those regulations? Not applicable.	
e) What technology is required to implement the best practice and why? Not applicable.	
f) Will work require additional personnel and/or contract support? If so, please provide details. Not applicable.	
g) What changes to existing operations are required? None. How will those changes be implemented? Not applicable.	
h) What are the new procedures to develop or existing procedures to modify? Please provide details. Not applicable.	
i) Timeline for implementation (Milestones): The industry driven research study through NYSEARCH is scheduled to begin and conclude in 2018.	
j) Identify the range of factors or considerations used to determine cost-effectiveness of this measure, when costs estimates have been determined: Not applicable.	
k) Identify any cost benefits from this BP, when cost estimates are known: Any cost benefits from this BP would be determined through the results of the NYSEARCH study.	

l) Do any incremental costs, if known, or benefits overlap with other BPs? If so, to which BP do they overlap, what are they, and how do they overlap? Not applicable.
m) Anticipated Emissions Reductions from this BP: Emission reductions will be determined after the pilot program concludes. 2015 Baseline Emissions affected, where known: Not applicable.
n) Calculation Methodology: Not applicable.
o) Additional Comments: None.
p) Overlap with Safety: Not applicable.
SUPPLEMENTAL INFORMATION
a) Technology: Not applicable.
b) Changes to Operations: Not applicable.
c) Research or Studies: Information on the NYSEARCH R&D Industry project is attached.
d) Other: Not applicable.

Best Practice 22 – Attachment

Pipe Fitting Specifications – Research & Development Proposal

The Company has experienced a very low occurrence of leakage at meter set assemblies (MSA), where the majority of threaded fittings are utilized. Approximately 0.5% of MSAs had leakage in California as reported in the CPUC 2016 Natural Gas Abatement Report. Southwest Gas believes this low leakage rate can be attributed to its current installation practices, fittings, and joint sealant material. However, the Company understands and supports the need to reduce methane emissions, including leakage through threaded fittings. To support this effort, Southwest Gas proposes its participation in an industry R&D study through NYSEARCH on pipe fittings.

The proposed project objectives include:

- 1) Demonstrate the sealing performance of representative threaded connections.
- 2) Understand the ability to reduce emissions and to determine the impacts of changing the thread specifications or finding alternatives such as sealants or other best practices to reduce the emissions.

Southwest Gas seeks approval to participate in the funding of the industry R&D study at a cost of \$20,500 for 2018.

CHAPTER 23

Best Practice 23 – Minimize Emissions from Operations, Maintenance, and Other Activities

PART 1: OVERVIEW	
a) Best Practice: 23	b) Status: Ongoing Best Practice
Minimize Emissions from Operations, Maintenance and Other Activities Utilities shall minimize emissions from operations, maintenance and other activities, such as new construction or replacement, in the gas distribution and transmission systems and storage facilities. Utilities shall replace high-bleed pneumatic devices with technology that does not vent gas (i.e. no-bleed) or vents significantly less natural gas (i.e. low-bleed) devices. Utilities shall also reduce emissions from blowdowns, as much as operationally feasible.	
PART 2: BEST PRACTICE DETAILS	
a) Historic work: Although Southwest Gas has not historically had specific policies or procedures directed at minimizing methane emissions during operations, maintenance, or other activities, the Company's focus on pipeline safety has resulted in actions that have reduced methane emissions. These current actions include on-going pipeline replacement programs and accelerated special leak surveys identified through the Company's Integrity Management programs (BP# 16), a change from a 5-year to 3-year leak survey frequency (BP# 15), and a historical emphasis on repairing non-hazardous leaks versus monitoring them (BP# 21).	
b) Alternative Proposal to BP or exemption? Not applicable.	
c) Proposed Plan: In addition to the ongoing best practices referenced above, Southwest Gas revised its policies and procedures to require pressure reductions prior to blowdown and purging of high pressure distribution and transmission facilities, build time in the project schedule and document the steps required to perform the pressure reduction, and bundle work to avoid multiple purging of the same facilities. Upon approval of the respective BPs the Company will adjust its operations accordingly. Additionally, the Company is investigating methane evacuation equipment to further facilitate pressure reduction to be incorporated into its operations. Specific to pneumatic devices, the Southwest Gas also revised its Operations Manual, Selection of Material Policy (Section 6.2) to include a requirement that no-bleed or low-bleed pneumatic devices be used on all new or replaced facilities.	
d) Overlap with other regulations? No. What portion of the BP is incremental beyond those regulations? Not applicable.	
e) What technology is required to implement the best practice and why? Methane evacuation equipment as described in BP#5 is required in order to pressurize and transfer gas between pipelines or to mobile storage for re-injection into high-pressure distribution and transmission pipelines.	
f) Will work require additional personnel and/or contract support? If so, please provide details. Not applicable.	
g) What changes to existing operations are required?	

Reference BPs# 3, 4, 5, 6, and 7. In addition, proposed changes to the Company's Operations Manual, Selection of Material Policy (Section 6.2) are attached. How will those changes be implemented? Upon approval, the Company will revise this section of its Operations Manual during the next scheduled quarterly manual release. Training will be conducted within 30 days of publication with all affected Company and contractor personnel, through the Company's normal manual revision training process.
h) What are the new procedures to develop or existing procedures to modify? Please provide details. Reference section (g) above.
i) Timeline for implementation (Milestones): Reference section (g) above.
j) Identify the range of factors or considerations used to determine cost-effectiveness of this measure, when costs estimates have been determined: Not applicable.
k) Identify any cost benefits from this BP, when cost estimates are known: Not applicable.
l) Do any incremental costs, if known, or benefits overlap with other BPs? If so, to which BP do they overlap, what are they, and how do they overlap? Because of the similarities between this BP and BPs # 3, 4, 5, 6 and 7, the anticipated benefits will overlap. The extent of overlap cannot be determined at this time.
m) Anticipated Emissions Reductions from this BP: An estimated reduction of emissions of approximately 66.5 Mscf per year during the first two years, based on the implementation of new procedures to minimize emissions during operations and maintenance activities. 2015 Baseline Emissions affected, where known: No affected emissions as Southwest Gas only utilizes low-bleed/no-bleed pneumatic devices.
n) Calculation Methodology: Reference applicable worksheets contained within the supplemental section of the Plan.
o) Additional Comments: None.
p) Overlap with Safety: Not applicable.
SUPPLEMENTAL INFORMATION
a) Technology: Not applicable.
b) Changes to Operations: Reference BPs# 3, 4, 5, 6, and 7. In addition, the proposed changes to the Company's Operations Manual, Selection of Material Policy, Section 6.2, are attached. Reference the Supplemental Section of this Plan for the entirety of the Selection of Material Policy.
c) Research or Studies: Not applicable.
d) Other: Not applicable.

Best Practice 23 – Attachment

Southwest Gas, Operations Manual – Selection of Material Policy, Section 6.2 - New Policy

6.2 Control Valves

6.2.1 Control valves equipped with positioners/controllers using natural gas as the pneumatic source will be “low bleed” or “no bleed” design on all new installations, including any activities that replace existing positioners/controllers or control valves.

CHAPTER 24

Best Practice 24 – Dig-Ins/Public Education Program

PART 1: OVERVIEW	
a) Best Practice: 24	b) Status: Ongoing Best Practice
Dig-Ins / Public Education Program Dig-Ins – Expand existing public education program to alert the public and third-party excavation contractors to the Call Before You Dig – 811 program. In addition, utilities must provide procedures for excavation contractors to follow when excavating to prevent damaging or rupturing a gas line.	
PART 2: BEST PRACTICE DETAILS	
a) Historic work: Southwest Gas recognizes that excavation damage is the top threat to distribution and transmission pipeline facilities. In addition to the public safety hazard a damaged natural gas line represents, the Company also recognizes the increased methane emissions resulting from excavation damages. The Company also is a member of the EPA Methane Challenge program with a focus on methane emissions reduction through reduced excavation damages. The Company provides annual excavator mailings that communicate safe digging practices when excavations occur near Company facilities. The Company also strongly supports the use of “811” Call Before your Dig. This information is also shared through Damage Prevention materials provided to contractors as Company crews patrol Company facilities. State laws for excavation also provide requirements for safely digging around utilities. Print and radio advertising, bill inserts, and social media are also used to convey the 811 message. The annual excavator mailing brochure and poster contain information regarding procedures for safe excavation practices. The 2016 public awareness effectiveness evaluations found that 100% of excavators surveyed were familiar with a free service they can call to have underground utility lines located and marked before digging. Of those, 65% correctly identified 811 as the number to call. This was a significant improvement over the 2012 survey at 28% and the 2009 survey at only 6%. For the general public, 66% were aware of 811 in 2016, a substantial increase over the 39% from the 2012 survey. While encouraging, there is still room for improvement.	
b) Alternative Proposal to BP or exemption? Not applicable.	
c) Proposed Plan: Not applicable.	
d) Overlap with other regulations? No. What portion of the BP is incremental beyond those regulations? Not applicable.	
e) What technology is required to implement the best practice and why? Not applicable.	
f) Will work require additional personnel and/or contract support? If so, please provide details. Not applicable.	
g) What changes to existing operations are required? None. How will those changes be implemented? Not applicable.	

h) What are the new procedures to develop or existing procedures to modify? Please provide details. Not applicable.
i) Timeline for implementation (Milestones): Not applicable.
j) Identify the range of factors or considerations used to determine cost-effectiveness of this measure, when costs estimates have been determined: Not applicable.
k) Identify any cost benefits from this BP, when cost estimates are known: This is an existing Company practice; therefore, the Company cannot readily determine cost benefit for this action.
l) Do any incremental costs, if known, or benefits overlap with other BPs? If so, to which BP do they overlap, what are they, and how do they overlap? Not applicable.
m) Anticipated Emissions Reductions from this BP: As noted above, survey results have improved significantly and as the message becomes more prevalent, it is reasonable to expect that damages will decline resulting in decreased methane emissions. However, given the varied nature of the Company's facilities (operating pressure and pipe diameter) anticipated emissions reduction from this BP can't be determined. 2015 Baseline Emissions affected, where known: The Company's 2015 Baseline emissions already reflect reduction in emissions from implementation of this ongoing BP.
n) Calculation Methodology: Not applicable.
o) Additional Comments: Not applicable.
p) Overlap with Safety: Not applicable.
SUPPLEMENTAL INFORMATION
a) Technology: Not applicable.
b) Changes to Operations: Not applicable.
c) Research or Studies: Not applicable.
d) Other: Reference the Supplemental Section of this Plan for copies of the Company's current Excavation Damage Prevention Public Awareness documentation.

CHAPTER 25

Best Practice 25 – Dig-Ins/Company Standby Monitors

PART 1: OVERVIEW	
a) Best Practice: 25	b) Status: Ongoing Best Practice
Dig-Ins / Company Standby Monitors Dig-Ins – Utilities must provide company monitors to witness all excavations near gas transmission lines to ensure that contractors are following utility procedures to properly excavate and backfill around transmission lines.	
PART 2: BEST PRACTICE DETAILS	
a) Historic work: The Company utilizes Standby Procedures for High-Pressure pipelines (facilities operating greater than 60-psig and transmission facilities) and installations using trenchless (boring) methods that it believes satisfies the intent of this BP. Backfill requirements are also provided during the standby activity. Standby and backfill information is also provided in the annual excavator mailing materials (BP# 24).	
b) Alternative Proposal to BP or exemption? Not applicable.	
c) Proposed Plan: Not applicable.	
d) Overlap with other regulations? No. What portion of the BP is incremental beyond those regulations? Not applicable.	
e) What technology is required to implement the best practice and why? Not applicable.	
f) Will work require additional personnel and/or contract support? If so, please provide details. Not applicable.	
g) What changes to existing operations are required? None. How will those changes be implemented? Not applicable.	
h) What are the new procedures to develop or existing procedures to modify? Please provide details. Not applicable.	
i) Timeline for implementation (Milestones): Not applicable.	
j) Identify the range of factors or considerations used to determine cost-effectiveness of this measure, when costs estimates have been determined: Not applicable.	
k) Identify any cost benefits from this BP, when cost estimates are known: This is an existing Company practice; therefore, the Company cannot readily determine cost benefit for this action.	
l) Do any incremental costs, if known, or benefits overlap with other BPs? If so, to which BP do they overlap, what are they, and how do they overlap? Not applicable.	
m) Anticipated Emissions Reductions from this BP: Not applicable. 2015 Baseline Emissions affected, where known: Not applicable.	

n) Calculation Methodology: Not applicable.
o) Additional Comments: Not applicable.
p) Overlap with Safety: While there is no incremental cost overlap between this BP and the Company's existing standby procedures, there is overlapping benefit. By providing procedures necessary to monitor excavations near High-Pressure pipelines the possibility of an uncontrolled release of natural gas is minimized, and by extension, the uncontrolled release of methane emissions into the atmosphere.
Supplemental information
a) Technology: Not applicable.
b) Changes to Operations: Not applicable.
c) Research or Studies: Not applicable.
d) Other: Reference Supplemental Section for a copy of the Company's Line Locating Policy, Section 1.5 and the Line Locating Procedure, Sections 11 and 12.

CHAPTER 26

Best Practice 26 – Dig-Ins/Repeat Offenders

PART 1: OVERVIEW	
a) Best Practice: 26	b) Status: Proposed Best Practice
Dig-Ins / Repeat Offenders Utilities shall document procedures to address Repeat Offenders such as providing post-damage safe excavation training and on-site spot visits. Utilities shall keep track and report multiple incidents, within a 5-year period, of dig-ins from the same party in their Annual Emissions Inventory Reports. These incidents and leaks shall be recorded as required in the recordkeeping best practice. In addition, the utility should report egregious offenders to appropriate enforcement agencies including the California Contractor's State License Board. The Board has the authority to investigate and punish dishonest or negligent contractors. Punishment can include suspension of their contractor's license.	
PART 2: BEST PRACTICE DETAILS	
a) Historic work: The Southwest Gas Damage Prevention Program (DPP) outlines additional damage prevention measures including Repeat Offender Training in which the Company sends letter(s) to contractors or excavators that damage Company facilities and provide supplemental training. If the opportunity exists, the Company also provides on-site training for excavators after an incident, or on a proactive basis at the request of an excavator. Damages are tracked in a Company database. The Company currently reports offenders to the CPUC under GO 112-F in the Quarterly Incident Report.	
b) Alternative Proposal to BP or exemption? Not applicable.	
c) Proposed Plan: The Company revised its California Safety Plan, Section 2.12.3.26 to include tracking and reporting multiple incidents from the same party within a 5-year period, as well as reporting egregious offenders to the appropriate enforcement agency. The revisions also include a recordkeeping requirement that is consistent with this BP.	
d) Overlap with other regulations? Yes. GO 112-F requires natural gas utility operators to report quarterly damage incident data, including the name and address of the damaging party. What portion of the BP is incremental beyond those regulations? Not applicable	
e) What technology is required to implement the best practice and why? Not applicable.	
f) Will work require additional personnel and/or contract support? If so, please provide details. Not applicable.	
g) What changes to existing operations are required? Proposed changes to the Company's California Safety Plan, Section 2.12.3.26 are included in this Plan. These changes require the Company to track and report multiple incidents from the same party within a 5-year period, and to report egregious offenders to the appropriate enforcement agency. The revisions also include a recordkeeping requirement. How will those changes be implemented? Upon approval, the Company will revise its California Safety Plan during the next scheduled quarterly manual release. Training will be conducted within 30 days of publication with all affected Company and contractor personnel, through the Company's normal manual revision training process.	

h) What are the new procedures to develop or existing procedures to modify? Please provide details. Reference section (g) above.
i) Timeline for implementation (Milestones): Reference section (g) above.
j) Identify the range of factors or considerations used to determine cost-effectiveness of this measure, when costs estimates have been determined: Not applicable.
k) Identify any cost benefits from this BP, when cost estimates are known: Not applicable.
l) Do any incremental costs, if known, or benefits overlap with other BPs? If so, to which BP do they overlap, what are they, and how do they overlap? Not applicable.
m) Anticipated Emissions Reductions from this BP: Not applicable. 2015 Baseline Emissions affected, where known: Not applicable.
n) Calculation Methodology: Not applicable.
o) Additional Comments: None.
p) Overlap with Safety: Not applicable.
SUPPLEMENTAL INFORMATION
a) Technology: Not applicable.
b) Changes to Operations: The proposed changes to the Company's California Safety Plan, Section 2.12.3.26 are attached.
c) Research or Studies: Not applicable.
d) Other: Not applicable.

Best Practice 26 – Attachment

Southwest Gas, California Safety Plan – Section 2.12.3.26 – New Policy

2.12.3.26 Best Practice 26 – Dig-ins – Repeat Offenders

Utilities shall document procedures to address Repeat Offenders such as providing post-damage safe excavation training and on-site spot visits. Utilities shall keep track and report multiple incidents, within a 5- year period, of dig-ins from the same party in their Annual Emissions Inventory Reports. These incidents and leaks shall be recorded as required in the recordkeeping best practice. In addition, the utility should report egregious offenders to appropriate enforcement agencies including the California Contractor's State License Board. The Board has the authority to investigate and punish dishonest or negligent contractors. Punishment can include suspension of their contractor's license.

The Operations Manual Damage Prevention Program outlines the actions to be taken for repeat offenders, including letters to be sent to damaging parties and reporting to state and federal regulators. The Company tracks damages in the Damage Cause Database (DCD) and the Public Awareness database (PA-SMS). Division Compliance personnel will be responsible for completing the 5-year Repeat Offenders Report, utilizing the DCD and PA-SMS. The report will be included with the Annual Emissions Inventory Reports. Additionally, the Company will report egregious offenders to the appropriate enforcement agency.

Emission Mitigation Plan
Supplemental Section

A.

Emission Calculation Sheets

2015 Transmission Emissions						2015 Distribution Main Emissions							
Reduction Due to Pressure Reduction Requirement						Reductions Due to Pressure Reduction Requirement							
V-9 Calculation Spread Sheet						V-19 Calculation Spread Sheet							
					V-9 Total	147,195.18						V-9 Total	1,596.32
V-9, Trans Blowdowns					Q total	147,195.18	V-19, Dist Main Blowdowns					Q total	1,596.32
Ftg	Avg PSIG		Size (IPS)	Size (CTS)	ID	CF	Ftg	Avg PSIG		Size (IPS)	Size (CTS)	ID	CF
-	-	Stl	3/8"	B - Std	0.493	0.000			Stl	3/8"	B - Std	0.493	0.000
-	-	Stl	1/2"	B - Std	0.622	0.000			Stl	1/2"	B - Std	0.622	0.000
-	-	Stl	3/4"	B - Std	0.824	0.000			Stl	3/4"	B - Std	0.824	0.000
-	-	Stl	1"	B - Std	1.049	0.000			Stl	1"	B - Std	1.049	0.000
-	-	Stl	1 1/4"	B - Std	1.380	0.000			Stl	1 1/4"	B - Std	1.380	0.000
-	-	Stl	1 1/2"	B - Std	1.610	0.000			Stl	1 1/2"	B - Std	1.610	0.000
80	100	Stl	2"	B - Std	2.067	14.547			Stl	2"	B - Std	2.067	0.000
-	-	Stl	2 1/2"	B - Std	2.469	0.000			Stl	2 1/2"	B - Std	2.469	0.000
-	-	Stl	3"	B - Std	3.068	0.000			Stl	3"	B - Std	3.068	0.000
-	-	Stl	3 1/2"	B - Std	3.548	0.000			Stl	3 1/2"	B - Std	3.548	0.000
507	100	Stl	4"	X-52 .237	4.026	349.752	2,598	60	Stl	4"	B - Std	4.026	1167.209
-	-	Stl	4"		4.124	0.000	551	100	Stl	4"		4.124	398.835
-	-	Stl	4"		4.000	0.000	28	100	Stl	4"	B - Std	4.026	19.316
-	-	Stl	5"		5.000	0.000			Stl	5"		5.000	0.000
-	-	Stl	5"	B - Std	5.047	0.000			Stl	5"	B - Std	5.047	0.000
3,065	100	Stl	6"	B .148	6.329	5225.229			Stl	6"		6.249	0.000
-	-	Stl	6"		6.125	0.000			Stl	6"		6.125	0.000
-	-	Stl	6"	B - Std	6.065	0.000	7	100	Stl	6"	B - Std	6.065	10.959
48,896	100	Stl	8"	B .188	8.249	141605.652			Stl	8"		8.249	0.000
-	-	Stl	8"	B - Std	7.981	0.000			Stl	8"	B - Std	7.981	0.000
		Stl	10"	X-52,Std	10.374	0.000			Stl	10"	B - Std	10.020	0.000
		Stl	12"	X-52,Std	12.312	0.000			Stl	12"	B - Std	12.000	0.000
		Stl	14"	B - Std	13.250	0.000			Stl	14"	B - Std	13.250	0.000
		Stl	16"	X-52,Std	15.562	0.000			Stl	16"	B - Std	15.250	0.000
		Stl	18"		18.000	0.000			Stl	18"		18.000	0.000
-	-	Stl	20"	B - Std	19.250	0.000			Stl	20"	B - Std	19.250	0.000
-	-	Stl	22"		22.000	0.000			Stl	22"		22.000	0.000
-	-	Stl	24"		24.000	0.000			Stl	24"		24.000	0.000
-	-	Stl	30"	X-42, std	29.250	0.000			Stl	30"	X-42, std	29.250	0.000
-	-	Stl	36"		36.000	0.000			Stl	36"		36.000	0.000
-	-	Stl				0.000			Stl				0.000
-	-	Stl				0.000			Stl				0.000
Font Colors:		NND	SCD				Font Colors:		NND	SCD			
Anticipated Emissions Reductions:													
181,042 CF reduction in emissions = 55% reduction in emissions													

2015 Transmission Emissions							2015 Distribution Main Emissions						
Additional Reductions Due to Evacuation Equipment							Potential Reductions due to Evacuation Equipment						
V-9 Calculation Spread Sheet							V-19 Calculation Spread Sheet						
						V-9 Total	25,281.13						
V-9, Trans Blowdowns						Q total	25,281.13						
Ftg	Avg PSIG		Size (IPS)	Size (CTS)	ID	CF	Ftg	Avg PSIG		Size (IPS)	Size (CTS)	ID	CF
-	-	Stl	3/8"	B - Std	0.493	0.000			Stl	3/8"	B - Std	0.493	0.000
-	-	Stl	1/2"	B - Std	0.622	0.000			Stl	1/2"	B - Std	0.622	0.000
-	-	Stl	3/4"	B - Std	0.824	0.000			Stl	3/4"	B - Std	0.824	0.000
-	-	Stl	1"	B - Std	1.049	0.000			Stl	1"	B - Std	1.049	0.000
-	-	Stl	1 1/4"	B - Std	1.380	0.000			Stl	1 1/4"	B - Std	1.380	0.000
-	-	Stl	1 1/2"	B - Std	1.610	0.000			Stl	1 1/2"	B - Std	1.610	0.000
80	5	Stl	2"	B - Std	2.067	2.498			Stl	2"	B - Std	2.067	0.000
-	-	Stl	2 1/2"	B - Std	2.469	0.000			Stl	2 1/2"	B - Std	2.469	0.000
-	-	Stl	3"	B - Std	3.068	0.000			Stl	3"	B - Std	3.068	0.000
-	-	Stl	3 1/2"	B - Std	3.548	0.000			Stl	3 1/2"	B - Std	3.548	0.000
507	5	Stl	4"	X-52 .237	4.026	60.071	2,598	5	Stl	4"	B - Std	4.026	307.818
-	-	Stl	4"		4.124	0.000	551	5	Stl	4"		4.124	68.501
-	-	Stl	4"		4.000	0.000	28	5	Stl	4"	B - Std	4.026	3.318
-	-	Stl	5"		5.000	0.000			Stl	5"		5.000	0.000
-	-	Stl	5"	B - Std	5.047	0.000			Stl	5"	B - Std	5.047	0.000
3,065	5	Stl	6"	B .148	6.329	897.446			Stl	6"		6.249	0.000
-	-	Stl	6"		6.125	0.000			Stl	6"		6.125	0.000
-	-	Stl	6"	B - Std	6.065	0.000	7	5	Stl	6"	B - Std	6.065	1.882
48,896	5	Stl	8"	B .188	8.249	24321.110			Stl	8"		8.249	0.000
-	-	Stl	8"	B - Std	7.981	0.000			Stl	8"	B - Std	7.981	0.000
		Stl	10"	X-52,Std	10.374	0.000			Stl	10"	B - Std	10.020	0.000
		Stl	12"	X-52,Std	12.312	0.000			Stl	12"	B - Std	12.000	0.000
		Stl	14"	B - Std	13.250	0.000			Stl	14"	B - Std	13.250	0.000
		Stl	16"	X-52,Std	15.562	0.000			Stl	16"	B - Std	15.250	0.000
		Stl	18"		18.000	0.000			Stl	18"		18.000	0.000
-	-	Stl	20"	B - Std	19.250	0.000			Stl	20"	B - Std	19.250	0.000
-	-	Stl	22"		22.000	0.000			Stl	22"		22.000	0.000
-	-	Stl	24"		24.000	0.000			Stl	24"		24.000	0.000
-	-	Stl	30"	X-42, std	29.250	0.000			Stl	30"	X-42, std	29.250	0.000
-	-	Stl	36"		36.000	0.000			Stl	36"		36.000	0.000
-	-	Stl				0.000			Stl				0.000
-	-	Stl				0.000			Stl				0.000
Font Colors:			NND	SCD			Font Colors:			NND	SCD		
Additional Anticipated Emissions Reductions:													
123,129 CF reduction in emissions = 83% reduction in emissions													
Ideal Gas Law Formula:							V ₂ = V ₁ *P ₁ /P ₂						
Corresponding Excel Formula:							G7 = ((F7^2)*A7*(B7+14.7))/2695						

B.

Purging Procedure



OPERATIONS MANUAL

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Prepared By: Gas Operations Support Staff
Approved By:
Issue Date: DRAFT
Effective Date:
Superseded Date: 04/01/16

Purging Procedure

1. PURGING.....ERROR! BOOKMARK NOT DEFINED.
 - 1.1 General Requirements Error! Bookmark not defined.
 - 1.2 Water and/or Debris Contamination Identification and Assessment..... Error! Bookmark not defined.
 - 1.3 Water and/or Debris Contamination Removal Procedures..... Error! Bookmark not defined.
2. METHODS OF PURGING.....ERROR! BOOKMARK NOT DEFINED.



OPERATIONS MANUAL

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Prepared By: Gas Operations Support Staff
Approved By:
Issue Date: DRAFT
Effective Date:
Superseded Date: 04/01/16

- 1.1.12 When purging newly installed mains or services over 500 ft. in length and 2 in. and larger in diameter, a minimum of a 2 in. purge assembly should be utilized directly in line at the end of the main/service to ensure a complete purge.
- 1.1.13 Appropriate notification must be made to Dispatch or the Office when purging in areas where odor calls can be expected.
- 1.1.14 A minimum of one fire extinguisher must be located at the purge site(s).
- 1.1.15 All purges must be verified with a confirmation instrument.
- 1.1.16 For active pipelines operating at greater than 60 psig, Division or District Engineering will provide the steps required to reduce pressure to the lowest operationally feasible level to minimize methane emissions when purging a pipeline of natural gas.
- 1.1.17 A written purge procedure prepared by Engineering is required for pipelines of 6-inches diameter or greater. Refer to 1.1.3 of [Purging Design](#) Section.
- 1.1.18 When a purge follows hydrotesting, the dew point must be verified (dew point monitor) to ensure the required reading has been achieved (if specified). The final reading must be documented on the as-built.

C.

Main and Service Policy



OPERATIONS MANUAL

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Prepared by: Engineering Services
Approved by:
Issue Date: DRAFT
Effective Date:
Superseded Date: 07/31/17

Main and Service Policy

1.	SYSTEM PRESSURE	ERROR! BOOKMARK NOT DEFINED.
1.1	Customer Delivery Pressure	ERROR! BOOKMARK NOT DEFINED.
1.2	Service Lines	ERROR! BOOKMARK NOT DEFINED.
1.3	All Systems	ERROR! BOOKMARK NOT DEFINED.
2.	DESIGN PRESSURE	ERROR! BOOKMARK NOT DEFINED.
2.1	General	ERROR! BOOKMARK NOT DEFINED.
3.	CLASS LOCATION	ERROR! BOOKMARK NOT DEFINED.
3.1	General	ERROR! BOOKMARK NOT DEFINED.
3.2	Review.....	ERROR! BOOKMARK NOT DEFINED.
4.	QUALIFICATION OF MAOP	ERROR! BOOKMARK NOT DEFINED.
4.1	General	ERROR! BOOKMARK NOT DEFINED.
5.	SYSTEM PLANNING	ERROR! BOOKMARK NOT DEFINED.
5.1	General	ERROR! BOOKMARK NOT DEFINED.
6.	DESIGN	6-1
6.1	General	6-1
6.2	Diversification.....	ERROR! BOOKMARK NOT DEFINED.
6.3	Transmission Design for Internal Corrosion	ERROR! BOOKMARK NOT DEFINED.
6.4	California Requirements.....	ERROR! BOOKMARK NOT DEFINED.
6.5	PHMSA Notification Requirements (49 CFR Part 191.22)	ERROR! BOOKMARK NOT DEFINED.
7.	VALVES	ERROR! BOOKMARK NOT DEFINED.
7.1	Essential Valves	ERROR! BOOKMARK NOT DEFINED.
7.2	Blowdowns.....	ERROR! BOOKMARK NOT DEFINED.
8.	ABANDONMENT	ERROR! BOOKMARK NOT DEFINED.
8.1	General	ERROR! BOOKMARK NOT DEFINED.



OPERATIONS MANUAL

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Prepared by: Engineering Services
Approved by:
Issue Date: DRAFT
Effective Date:
Superseded Date: 07/31/17

6. DESIGN

6.1 GENERAL

- 6.1.1 Mains and services will be installed in accordance with approved procedures, unless Engineering specifies more stringent provisions.
- 6.1.2 Engineering will ensure that when steel pipe is installed, replaced or abandoned, the integrity of any cathodic protection system is maintained. The Cathodic Protection department will be consulted for each installation or modification to steel pipelines.
- 6.1.3 Transmission pipelines will be designed to allow for cleaning and intelligent pigging in order to facilitate integrity assessment.
- 6.1.4 Each Division and District will implement procedures to ensure mains and services requiring special design due to length, load requirements or unique conditions are designed or reviewed by Engineering.
- 6.1.5 For active pipelines operating at greater than 60 psig, Division or District Engineering must provide the steps required to reduce pressure to the lowest operationally feasible level to minimize methane emissions when purging a pipeline of natural gas.
- 6.1.5.1 Time must be built into a project's schedule to allow for reduction of pressure.
- 6.1.5.2 The completion of this pressure reduction activity must be documented in the project file, and should include the final pressure at the completion of the pressure reduction.
- 6.1.5.3 Pressure reduction is not required if one of the following project conditions exist:
- Emergency work activity
 - Inconsistent with safe operating practices
 - System is not configured to facilitate a pressure reduction
- 6.1.6 For active pipelines operating at greater than 60 psig, each Division and District must bundle projects when practicable to prevent multiple occurrences of venting the same facility. Project bundling may not be practicable if one of the following project conditions exist:
- Emergency work activity

Policy	Main and Service - Abandonment	Sec-Pg 6-1
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OPERATIONS MANUAL

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Prepared by: Engineering Services
Approved by:
Issue Date: DRAFT
Effective Date:
Superseded Date: 07/31/17

- Permit restrictions
- Weather restrictions
- System reliability concerns that compromise service to customers
- Conflicts with joint-agency project schedules

6.1.7 When review is required in Standard Practice 450.0, main and service designs will be reviewed by Engineering Staff for the following:

- Compliance with the Operations Manual
- Compliance with the Material Specifications Manual
- Compatibility with system master plans

NOTE: When review by Engineering Staff is required for system improvement projects, Engineering should be prepared to provide flow study information.

D.

Emergency Plan Manual - Section 6



OPERATIONS MANUAL

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Prepared by:
Approved by:
Issue Date:
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Superseded Date:

Gas Operations Support Staff
Jerry Schmitz

Draft
04/24/17

Emergency Plan

6. GAS CONTROL	1
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6. GAS CONTROL

6.1.1 After the appropriate steps have been taken to secure the area and to protect the general public, at a minimum, develop a primary and secondary plan to safely control the flow of escaping gas.

6.1.2 The Gas Control Plan for the affected area may include any of the following methods:

- Manual or hydraulic squeezers
- Line stopping equipment
- Leak repair clamps
- Climax plugs
- Local regulator station or line valves
- Pressure reduction
- HALT (Hydraulically Actuated Leak Tool) machine
- Valve Isolation Plan (typically to isolate large sections of the system)
- Any other method that may be appropriate for the incident

NOTE: Engineering may be called upon to aid in developing a Gas Control Plan.

6.1.3 The location of the incident (metropolitan or rural) must be considered when establishing the priority for controlling the flow of gas. The objective is to control the flow of gas as soon as practical in a safe manner. The following must be considered when developing a Gas Control Plan:

- Protecting life and property
- Gas migration above and below ground
- The potential impact on public safety and property
- Blow time
- Review of maps and/or pertinent records
- Class location and business districts
- Facilities involved (system pressure, size, material, etc.)
- Implementation of the Valve Isolation Plan or a portion thereof
- Location of regulator stations
- Pressure reduction
- Weather conditions



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- 6.1.4 An estimate of the time required to de-gas the line should be made and communicated to the incident commander.
- 6.1.5 Fire, police or traffic control officers may be used as needed to prevent the public from entering areas where a hazard exists. Barricades and/or warning tape may also be used to prevent access to the area.

E.

DIMP – Section 8 – Special and Accelerated Leak Surveys



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DIMP Plan

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8. IDENTIFICATION AND IMPLEMENTATION OF MEASURES TO ADDRESS RISKS

The Company implements risk management measures and techniques to reduce the likelihood and/or alleviate the consequences of an occurrence. Appropriate actions depend on the type of threat, magnitude of risk and the viability of the actions in effectively allocating resources to manage the relevant risk factors. Risk mitigation activities can be in the form of high-level programs applied uniformly to a wide group of distribution pipelines or a single, specific activity aimed at a targeted distribution pipeline. Risk that has been identified through the DIMP Threat Checklist and not included in the Risk Assessment process will include mitigative actions.

The sections below describe various measures the Company uses to manage safety risks associated with the distribution pipelines.

8.1 LEAK MANAGEMENT PROGRAM

The Company's Leak Management Program is detailed in the Operations Manual Leak Survey and Leak Investigation Policy and Procedures.

8.1.1 Locate the Leaks

The Company has a leak management program, which includes locating leaks by visual inspection, leak survey equipment, timely response to customer notification of a gas odor and a variety of other means. It involves the use of qualified personnel to perform leak detection activities and the selection of appropriate leak detection equipment. The frequency and type of leak surveys to be conducted are based on environmental conditions, the Company's knowledge of the distribution pipelines and regulatory requirements. In addition, the Company has a number of special leak surveys that are intended to help mitigate risk on distribution pipelines.

8.1.1.1 Special Leak Survey

The special leak survey requirements are included in the table below.

Facility	Survey Requirements	Applicable Locations
Aldyl A mains	Four (4) times a year, not to exceed 4 ½ months	CAZ, NNV, SAZ and SNV Divisions
Aldyl A services	Twice per calendar year, not to exceed 7 ½ months	CAZ, NNV, SAZ and SNV Divisions
PVC mains and services	Once each calendar year, not to exceed 15 months	All Divisions

1984-1985 2" HDPE mains and services	Four (4) times a year, not to exceed 4 ½ months	Las Vegas Valley
1984-1985 2" HDPE services	Four (4) times a year, not to exceed 4 ½ months	Bullhead City, AZ and Laughlin, NV
1948-1949 2" Steel mains and services	Twice per calendar year, not to exceed 7 ½ months	Tucson District
Pre-1970s High Pressure (>60 psig) Steel	Once each calendar year, not to exceed 15 months	All Divisions

Table 9 – Special Leak Survey Frequencies

8.1.2 Evaluate the Potential Hazards

The Company's leak management program includes evaluating the severity of a leak according to established classification criteria. These classification criteria take into consideration the safety risk posed by the leak. The determination of leak migration is part of the process.

Leaks are classified using the following criteria:

- Leaks that require immediate action (Grade 1 Leaks):* A leak that has conditions that pose an immediate or imminent hazard to people or property. Grade 1 leaks require immediate and continuous action to repair or eliminate the hazard.
- Leaks scheduled for repair (Grade 2 Leaks):* A leak that is recognized as being non-hazardous at the time of detection, but requires scheduled repair based on probable future hazard.
- Monitored leaks (Grade 3 Leaks):* A leak that is non-hazardous at the time of detection and can be reasonably expected to remain non-hazardous.

The Operations Manual, Leak Survey Procedure - Section 1 Leak Classification provides examples of criteria for each leak grade and repair criteria.

8.1.3 Act Appropriately

Once a leak has been located and evaluated, the Company takes actions consistent with the severity of the leak, including temporary or permanent repair, replacement or other steps that reduce any immediate hazard posed by the leak. In the case of non-hazardous leaks, actions may include scheduling the line for repair or periodic monitoring. The Operations Manual, Leak Survey and Leak Investigation Policy



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and Procedures provide guidance on appropriate actions under varying circumstances.

8.1.4 Keep Records

The Company's leak management program includes the collection and recording of data pertinent to a leak to increase knowledge of the distribution pipelines, measure its performance and comply with regulatory reporting requirements. Leakage information is documented on the applicable Company forms or electronic equivalent.

8.1.5 Self-Assess

The Company's leak analysis program provides a self-assessment of the distribution pipelines by compiling associated performance metrics and analyzing pertinent information to determine if further risk control practices are needed to enhance the safety of the distribution pipelines. This process combined with the DPI process provides a comprehensive review of the distribution pipeline leakage.

8.2 RISK ASSESSMENT MITIGATION ACTIVITIES

8.2.1 Segments with a Risk Assessment value of 5.5 or higher will be remediated by total replacement of that segment. This replacement typically occurs within the following calendar year. If replacement cannot be done at that time, the affected division will notify System Integrity and additional or accelerated actions may be implemented until the segment is replaced.

8.2.2 Specific remediation related to risk ranking is not required for pipeline segments with a risk less than 5.5.

F.

Selection of Material Policy



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Selection of Material Policy

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6. ~~REGULATORS~~ PRESSURE CONTROL DEVICES

6.1 ~~General~~ Regulators

6.1.1 Regulators will be specified in accordance with the Selection of Materials Design section, ~~and will be consistent with the requirements of the Pressure Regulation Design section.~~

6.1.2 Specification of regulators not included in the Selection of Materials Design section must be approved by Engineering Staff

6.2 Control Valves

6.2.1 Control valves equipped with positioners/controllers using natural gas as the pneumatic source will be “low bleed” or “no bleed” design on all new installations, including any activities that replace existing positioners/controllers or control valves.

G.

Leak Survey Procedure



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Leak Survey Procedure

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1.5 GRADE 3

1.5.1 A leak that is non-hazardous at the time of detection and can be reasonably expected to remain non-hazardous is a Grade 3 leak.

1.5.2 Report Grade 3 leaks by the end of the same workday in which they are discovered.

Arizona Only: Report Grade 3 leaks on intrastate transmission lines immediately per the Arizona reporting requirements in the Emergency Plan. Grade 3 leaks on transmission lines must be repaired within one year after the date of discovery.

Nevada and California: Grade 3 leaks on transmission lines must be repaired upon discovery, or within one year of the date of discovery.

1.5.3 Leak repair:

A Grade 3 leak must be repaired, or re-evaluated during the next scheduled survey or within 15-months of the date of discovery, whichever occurs first. Thereafter, the leak must be re-evaluated every calendar year, not to exceed 15 months until the leak is repaired, regraded or no longer results in a reading. The re-evaluations may continue for a maximum of 3 years from the reported date, unless such repair is costly relative to the estimated size of the leak.

NOTE: Grade 3 leaks identified in High Consequence Areas (HCAs) may require accelerated repair. See [TRIMP Policy](#) 5.1.1.1.

1.5.4 **Nevada Only** - Grade 3 leaks identified on EVPP must be repaired within 14-days from the date of discovery. The leaks will be rechecked on a weekly basis until repaired.

NOTE: SWG must notify the PUCN of any instance where the repair of these leaks cannot be accomplished within 14-days.

H.

Line Locating Policy



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Line Locating Policy

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1. LINE LOCATING

1.1 LINE LOCATION POLICY

1.1.1. Preventing excavation damage to pipeline facilities is important to the health and safety of our customers and employees. Accurately identifying the location of the underground facilities prior to excavation activities is critical in preventing such damages.

1.1.2. The use of Southwest Gas approved methods to obtain an accurate location of pipeline facilities, is a critical first step in preventing excavation damage.

1.1.3. When locating facilities:

- A direct connection is the preferred method
- An induction method should be used if a direct connection is not possible
- A pothole must be performed when there is a discrepancy between the locate signal and documentation

1.2 GENERAL REQUIREMENTS

1.2.1 Southwest Gas will provide a means of receiving and recording locate notifications or "locate requests" of proposed excavation. This is accomplished by membership in the local One-Call center. The One-Call center coordinates and records all locate requests. Locate requests are received by the One-Call center and then sent to the appropriate facility operator so that the underground facilities may be marked. The appropriate state One-Call laws will be followed when locating underground facilities.

1.2.2 All Company facilities (pipelines, communications, electrical cables, bond cables, etc.) within a proposed work area or at the address requested will be located and marked by using the appropriate methods in the Line Locating Procedure.

1.3 BLASTING

1.3.1 When Company is notified, a leak survey must be done prior to and after blasting when within 250 feet of facilities.

1.4 ABANDONMENT

1.4.1 Company will indicate abandoned facilities at jobsites, when known.

1.5 STANDBY

1.5.1 When excavation is known to be performed around high pressure facilities (>60 psig), and facilities at higher risk of damage due to trenchless activities, such as directional boring, a standby will be performed.

1.5.2 When Company is aware of such excavation activities, the standby will continue until the work activities no longer poses a threat to Company facilities.

1.6 MARKING PIPELINES AND COMPANY OWNED FACILITIES

1.6.1 Pipelines and Company owned communications/electric facilities are to be marked with the appropriate color.

1.6.2 In the United States, the American Public Works Association (APWA) has the color guidelines which are to be used for identifying underground facilities.

1.6.3 Southwest Gas abides by the APWA and the guidelines when applying these marks.



Arizona Color Code



Nevada/California Color Code

NOTE: Arizona only; Slurry Pipelines and Water Systems are marked in Blue.



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1.7 CAMERA LOCATES

1.7.1 Company/contractor will perform camera inspections of Company main plastic facilities during replacement work.

1.8 DOCUMENTATION

1.8.1 The line locate must be documented per the Line Locating Procedure.

I.

Line Locating Procedure – Sections 11 and 12

Line Locating Procedure

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11. HIGH PRESSURE STANDBY PROCEDURE

11.1 EXCAVATION AROUND HIGH PRESSURE

11.1.1 If the requested work area crosses Southwest Gas' high pressure (above 60 PSIG) facilities or runs parallel within 24-inch, implement the standby procedure.

- 11.1.1.1 If high pressure facilities are present within the line location request limits, notify the excavator that they must:
- Hand dig within 24-inch. of SWG facilities
 - Notify and schedule SWG standby prior to the excavation with equipment

- 11.1.1.2 Accomplish notification by one of the following methods:
- Facsimile
 - Electronically
 - Field meeting
 - Written (e.g., direct mailing, door hangar)

NOTE: Consider implementing the standby procedure when work is being performed near critical supply facilities outside the One-Call guidelines.

- 11.1.1.3 Verify the excavator has a valid One-Call request ticket.

- 11.1.1.4 Verify the extent of the excavation.

- 11.1.1.5 Confirm that the line locations previously performed are correct by utilizing electronic locating equipment and documentation or by potholing the facilities. All high-pressure gas facilities must be located a minimum of 10 feet outside the marked work areas to remind the excavator of the facilities within the vicinity of the work area.

Procedure	Line Locating – High Pressure Standby Procedure	Sec-Pg. 11-2
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11.1.1.6 Verify the excavation is being conducted in a careful and prudent manner:

- The excavator must locate the facility manually when the excavation is within 24-inch
- After positive facility identification, the exposed facility must be protected and supported when necessary, prior to and during any additional excavation by the responsible party
- Caution the equipment operator about the potential for damage from pulling excavation material toward the facility. Ask that they excavate away from the facility whenever possible to reduce the risk.
- It is acceptable to utilize the soft dig process at the excavator's discretion
- During excavation, care must be taken to ensure the coating/facility is not damaged by hand digging within 24-inch
- If the facility's coating has been damaged, utilize the proper Company procedure to rewrap the facility
- Provide the excavator with a copy of the Gas Pipe Identification pamphlet (Form 284.0). Emphasize the different types of pipe used and the Company's backfill/compaction procedure on the back of the pamphlet.
- After the excavation has been extended a safe distance from the facility, the standby can be concluded
- Perform inspections of the job site until construction no longer poses a potential hazard

11.1.1.7 When the excavator has completed the work and is ready to backfill the high-pressure facility, implement the standby procedure to ensure no damage to the pipe or coating occurs during the backfill process.

Procedure	Line Locating – High Pressure Standby Procedure	Sec-Pg. 11-3
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12. LINE LOCATION FOR KNOWN BORE INSTALLATIONS

12.1 BORING AROUND PIPELINES

12.1.1 Upon notification by either the One-Call Center or by an excavator of a pending bore (e.g. directional, wet, pneumatic, auger, etc.), complete the following:

- 12.1.1.1 Document on Form 249.0 that the following safety information has been provided to the contractor and/or excavator.
- Review Form 279.0, Excavator Precautionary Guidelines and discuss.
 - Provide a Damage Prevention Packet; include a local contact phone number and the Emergency Contact Number.
 - Review the following responsibilities with the excavator:
 - Contact Southwest Gas Corporation (SWG) immediately if SWG facilities are damaged. Damage includes nicks or tears in steel pipe coatings or wrap, gouges in plastic pipe, tears or scrapes on tracer wire, disconnected tracer wire, dents or scrapes on steel pipe, etc.
 - Call 911, if damage results in the escape of gas.
 - Hand-dig within 24-inches of the SWG facilities. California excavators are required to get facility owner authorization.
 - Protect and support SWG facilities.
 - Pothole and expose SWG facilities at each location where the bore bit will cross within 24-inch of the facility markings.
 - Request and/or notify Southwest Gas personnel to visually verify that the exposed facilities are SWG facilities prior to the bore.
 - Leave potholed SWG facilities exposed during bore crossings and visually inspect SWG facilities during the boring operation to ensure that no damage occurs.
 - Excavate potholes appropriate to the installation to verify SWG facilities are not damaged when boring parallel within five feet of SWG facilities.
 - Hand-dig a minimum of 24-inches below the proposed bore path to ensure proper separation if SWG facility is deeper than the proposed bore path. Measure bore distance and observe the bore bit entering the inspection pothole. If bore bit does not enter the inspection hole, discontinue boring and locate the boring bit to ensure SWG facilities are not damaged.

Procedure	Line Locating – Line Location for Known Bore Installations	Sec-Pg. 12-2
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12.1.1.2 Additional information to review:

- Exposing the full circumference of the facility and providing adequate separation (maintain a minimum 12-inch clearance, preferably 24-inches from all exposed underground facilities, less than 12-inch clearance requires the approval of Southwest Gas). See Figure 1.
- Where the bore bit or reamer will cross within 24-inch of the facility itself, expose the full circumference of the facility and obtain no less than 6-inch clearance from the facility to the trench wall.
 - ✓ The pothole must be deep enough to visually see the bore bit and reamer. Maintain a minimum of 12-inch clearance, preferably 24-inch from all exposed underground facilities, less than 12-inch clearance requires approval of Southwest Gas.
- The depth of the bore bit/reamer is to be measured electronically 24 inches before and after crossing the gas facility
- Request excavating an inspection pothole at increments appropriate to the installation if the excavator is installing a facility parallel to a gas facility and the bore path is within 5 feet of the gas facility.
- Monitoring the bore path to ensure adequate separation is maintained from gas facilities during boring operations.
- Exposing and monitoring the gas facilities at each curb

12.1.1.3 Review the Southwest Gas backfill requirements with the excavator.

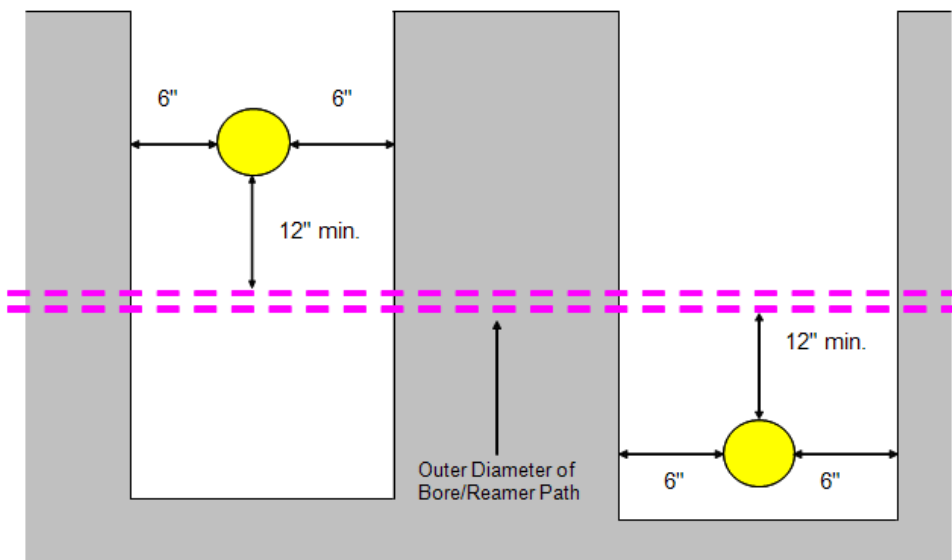


Figure 1

Procedure	Line Locating – Line Location for Known Bore Installations	Sec-Pg. 12-2
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- 12.1.1.4 If the gas facility is deeper than the proposed bore path, request the excavator to hand dig or pothole a minimum of 24-inches below the proposed bore path to ensure proper separation.
- Measure the distance of the bore from the bore bit's initial point of entry into the ground to the inspection pothole. Leave the inspection pothole open and observe the bore bit enter the inspection pothole.
 - If the bore bit has not reached the inspection pothole within the predetermined distance, request the excavator to discontinue the boring operation. Request the excavator to locate the bore bit and take other appropriate measures to determine if the gas facility was damaged.
- 12.1.1.5 If the gas facility is exposed, measure the distance of the bore from the bore bit's initial point of entry into the ground to the inspection pothole. Leave the inspection pothole open and observe the bore bit enter the inspection pothole.
- Measure the distance between the bore bit and the gas facility to determine if adequate clearance will be maintained during the boring process and between the gas facility and the new facility.
 - If the bore bit has not reached the inspection pothole within the predetermined distance, request the excavator to discontinue the boring operation. Request the excavator to locate the bore bit and take other appropriate measures to determine if the gas facility was damaged.

Procedure	Line Locating – Line Location for Known Bore Installations	Sec-Pg. 12-3
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- 12.1.1.6 If the bore is deeper than the gas facility, request the excavator to hand dig or pothole a minimum of 24-inches below the gas facility to ensure proper separation. See Figure 2.

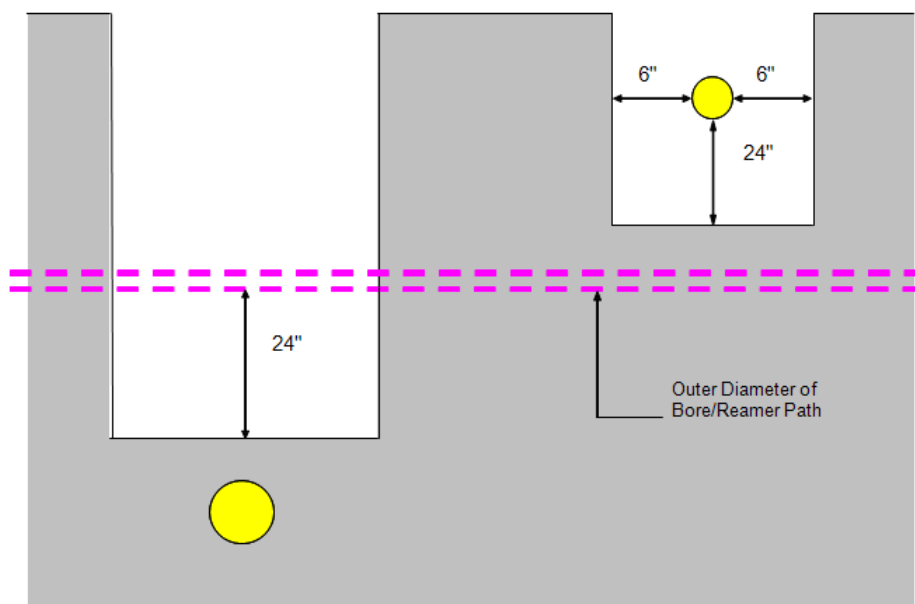


Figure 2

- 12.1.1.7 Upon notification from the excavator that the gas facilities have been potholed, the Company will positively identify the gas facilities prior to the bore operation.
- Company personnel will inspect known boring operations while in progress until the boring operation no longer poses a threat to the facilities
 - Southwest Gas personnel or representative should review Form 249.0 with the excavator prior to the bore operation

J.

Excavator Damages Public Awareness Materials

Natural Gas

Safety Information

For Excavators and Contractors

Información en español en el interior.



SOUTHWEST GAS

swgas.com/safety

2016

As a company that may excavate in our service territory, federal regulations require us to share important natural gas safety information with you. The following messages are intended to provide essential reminders about staying safe while working with or around natural gas.

Providing Gas Safely

Southwest Gas delivers natural gas safely and reliably through our pipeline systems. To ensure the continued integrity of these pipeline systems, we've implemented safe construction practices and procedures, as well as perform pipeline improvement projects and conduct routine safety inspections. To advance the safety of natural gas transmission high-pressure pipelines in populated areas, we've also developed and implemented a pipeline integrity management program. As a result of these efforts, Southwest Gas continues to meet or exceed all federal and state requirements for safe pipeline operation and maintenance.



SIGNS
of a Natural Gas leak



For more information about natural gas pipeline safety, visit us at [swgas.com/safety](https://www.swgas.com/safety)

Southwest Gas 24-Hour Emergency Phone Number:

877-860-6020

EMERGENCY PLANNING & TRAINING

Southwest Gas continually collaborates with local emergency response officials through regular meetings, participation in emergency response drills, and ongoing review of deployment practices. This allows each organization to refine safety procedures and coordinate how to respond with others involved in the event of a natural gas incident or emergency. Additionally, Southwest Gas provides pipeline safety training to employees and contractors. If you're interested in attending safety training, call 1-800-654-2765 for more information.

RECOGNITION & RESPONSE

Although natural gas pipelines are considered one of the safest methods of energy transportation in the United States, damage to pipelines can occur due to improper excavation, corrosion, or natural disasters, which may result in the release of natural gas. A natural gas leak has the potential to lead to evacuations, service outages, fire or explosion, property damage, injury, or loss of life. Timely recognition and response help minimize the potential effects caused by escaping gas.



SMELL

a distinct sulfur-like odor, similar to rotten eggs, even if it's faint or momentary.



HEAR

a hissing or roaring coming from the ground or aboveground pipeline.



SEE

dirt or water blowing into the air, unexplained dead or dying plants or grass, or standing water continuously bubbling.

For Everyone's Safety...

...IF A LINE HAS BEEN DAMAGED OR IF YOU SUSPECT A LEAK:

- Leave the area immediately.
- Move to a safe location and call **911** and Southwest Gas at **877-860-6020**, day or night. Remain at this location until fire department and Southwest Gas emergency crews arrive.
- Secure the area and keep all coworkers, bystanders, and traffic from entering.
- Don't enter the area where natural gas is escaping.
- Don't smoke or use lighters or matches.
- Eliminate nearby sources of ignition, such as sparks or flames.
- Don't move equipment, or turn it on or off, near the linebreak.
- Don't repair any damage or control the flow of natural gas.
- Don't extinguish a fire should ignition of escaping gas occur.

CALL 811 BEFORE YOU DIG—IT'S THE LAW

Natural gas pipelines can be buried anywhere. State law requires that excavators call a one-call center at least two working days before starting any digging project so that underground utilities can be marked. Calling **811** is the first step. They'll take your proposed excavation information and transmit it to Southwest Gas and other underground facility owners. We'll respond and mark each gas pipeline with yellow paint, yellow whiskers, yellow flags, or yellow stakes, and label the yellow marking with "SWG," so you'll know which markings are for our facilities. Additional markings are also provided including the size and material type and whether or not it's a distribution or high pressure-facility.

A quick phone call can prevent unnecessary damage to underground pipelines and avoid significant penalties or repair bills for the person digging into our pipeline. Remember to call **811** before you dig -- it's free, it's easy, it's the law.



5 Steps To Safe Excavation



1 WHITE LINE PROPOSED EXCAVATION
Define where you're digging!

2 CALL 811 BEFORE YOU DIG
It's free. It's the law!

3 WAIT THE REQUIRED TIME
It pays to wait!

4 RESPECT THE MARKS
Don't destroy the marks...they're there for your safety!

5 EXCAVATE WITH CARE!
Careless or unsafe excavating could damage the pipeline. This could result in a natural gas leak which has the potential to lead to evacuations, service outages, fire or explosion, property damage, injury, or loss of life.

For more information, please call **800-654-2765** and ask about our free damage prevention workshops or visit swgas.com/safety.

Rules To Ensure Your Safety

EXCAVATION OR INSTALLATION RULES

- Hand dig within 24" of the natural gas pipeline until it's exposed.
- Support pipelines during construction or excavation.
- Exposed pipelines need a 12" separation from all other utilities or sub-structures. If the 12" minimum cannot be maintained, Southwest Gas has other steps to protect the natural gas line that can be taken.
- Backfill the excavation 6" below and 6" above the pipeline with 3/8" minus shading material. This material under and around the pipe must be compacted, but DO NOT compact directly over the pipeline.
- If performing work near a high-pressure pipeline, call Southwest Gas 24 hours in advance to schedule a technician to standby. If a high-pressure pipeline is exposed, call us 24 hours a day, 7 days a week, and we'll immediately dispatch personnel to inspect the pipeline.

DAMAGES TO PLASTIC PIPE OR PROTECTIVE COATING ON STEEL PIPE

- Stop excavating and call Southwest Gas immediately if steel or plastic pipe or protective coating on steel pipe (which may contain asbestos), has been scuffed, nicked, or damaged without leaking gas, or if the tracer wire on plastic pipe has been broken or damaged. Repairs must be made by Southwest Gas crews and usually you won't be charged.
- Some abandoned Southwest Gas steel pipe with asphaltic coating may contain asbestos. Please call Southwest Gas before you disturb the coating on any pipe that may be an abandoned Southwest Gas pipe so that we can inspect and, where appropriate, render the pipe safe for removal. This inspection and related remediation is usually done without charge to you. Improper handling of coating that contains asbestos can be harmful to your employees and the general public and can subject you to liability and to civil and criminal penalties.

BORING UNDERGROUND AND BLASTING ALERTS

- The boring method merits its own special work practices around natural gas pipelines that differ from open trench installation. When you call **811** to request a line locate, be sure to tell the operator that boring is planned. This will help to ensure that the operator correctly completes your order.
- Potholing is required prior to boring near natural gas pipelines. Request that Southwest Gas personnel visually verify the exposed gas facilities prior to the bore operation. During the boring process, periodically inspect the pipeline facilities. Notify Southwest Gas immediately if you or others involved have any concerns or find any damage.
- **Call us before blasting if there are natural gas facilities in the area.** A leak survey must be conducted on all natural gas pipelines located within 250' before and after any blasting activity. While there are no charges for these services, one of our representatives must standby during blasting and boring activities.

EXCAVATING NEAR TRANSMISSION (HIGH-PRESSURE) PIPELINES

- Prior to performing any work in the vicinity of a high-pressure pipeline, call us 24 hours in advance to schedule a technician to standby while you're excavating around our high-pressure pipeline facilities.
- If at any time you've exposed a natural gas transmission (high-pressure) pipeline, it's important to call Southwest Gas at 1-877-860-6020 24 hours a day, 7 days a week, and we'll immediately dispatch personnel to inspect the pipeline.



Yellow Pipeline Markers

Since most natural gas pipelines are buried underground, line markers are used to indicate the approximate location of the pipeline. Pipeline markers:

- Are yellow
- Are typically seen where a pipeline intersects a street, highway, railway, or open field
- Are NOT required for all pipeline facilities
- DO NOT indicate the pipeline’s depth or exact location
- List emergency telephone numbers in case of a natural gas emergency

Make sure these markers are left undisturbed to help remind others that natural gas lines are in the area. Calling **811** is still required for marking the pipelines, even if the markers are present.

Additionally, below-ground markers, such as yellow warning tape or mesh, may be present to warn excavators of the presence of buried pipe. If this below ground marking tape is encountered, stop work immediately and call Southwest Gas.



Federal Law States

“Any person who willfully and knowingly defaces, damages, removes or destroys any pipeline sign or marker shall, upon conviction, be subject for offense to a fine of not more than \$5,000, imprisonment for a term not to exceed one year, or both.”

Utility Line Markings And What They Mean

ARIZONA

YELLOW Gas distribution and transmission, oil product distribution and transmission, dangerous materials	RED Electric power distribution and transmission	ORANGE Telephone and telegraph system, cable television
THE LETTER “F” IN SAFETY ALERT ORANGE Fiber optics communication lines	BLUE Water systems, slurry pipelines	GREEN Sanitary sewer systems
PURPLE Reclaimed water systems	WHITE Proposed excavation	

CALIFORNIA & NEVADA

YELLOW Gas, oil, steam, petroleum, gaseous or dangerous materials	RED Electric power lines, cables, conduit and lighting cables	ORANGE Communication, alarm or signal lines; cables or conduit systems
BLUE Potable water	GREEN Sewer and drain lines	PURPLE Reclaimed water systems, irrigation and slurry lines
WHITE Proposed excavation		

Cross Bore Information for Excavators/Plumbers

Natural gas utilities across the country have discovered locations where natural gas pipes were inadvertently installed through sewer pipes. This doesn't create a safety hazard if the natural gas pipe is undamaged. However, damage to natural gas pipes can occur when equipment is used to unclog sewer pipes. This can lead to a natural gas leak that could result in a fire or explosion, possibly causing injury or death to those who unclog the sewer pipes and to those in structures attached to the sewer pipe.

CALL BEFORE YOU CLEAR - KNOW WHAT'S INSIDE

If you're called to an address with a possible blockage in an outdoor sewer pipe, please call Southwest Gas at **877-860-6020** and press "9" for immediate assistance, even if the address doesn't have gas. The intersecting natural gas line could be serving others in the neighborhood. Southwest Gas will respond promptly to mark the location of our underground pipe before you clean out the sewer pipe. There's no charge for this service.

SENSE A BUMP? CALL IT IN!

If you begin clearing a sewer pipe and sense or see, but haven't penetrated, an obstruction in the pipe, call Southwest Gas at **877-860-6020** and press "9" for immediate assistance. A Southwest Gas representative will be there as soon as possible to ensure that a gas pipe hasn't been damaged. There's no charge for this service.

TAKE IMMEDIATE ACTION IF YOU ENCOUNTER ANY OF THE FOLLOWING SIGNS WHEN YOU CLEAN OUT A SEWER LINE WITH A ROOTER DEVICE:

- A natural gas odor at the cleanout or inside the building served by the sewer line, even if it's faint or momentary.
- Bubbles rising through standing water or in the toilet bowl.

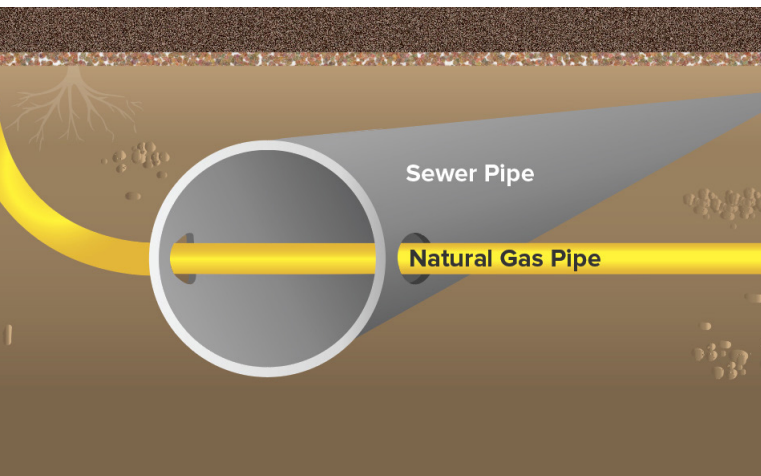
IF THESE SIGNS ARE PRESENT, STOP WHAT YOU'RE DOING, AND:

- **Exit the area or building immediately.** Tell others to evacuate and leave doors open.
- Don't use an automated door or turn on or off any electric switches, thermostats or appliance controls.
- From a safe place, call **911** and Southwest Gas at **877-860-6020** immediately, day or night. A Southwest Gas representative will be there as soon as possible.

Purging Natural Gas

Whenever you purge a natural gas line, don't rely on your sense of smell alone to detect the presence of natural gas.

An improperly performed purge may cause a fire or explosion, property damage, injury, or death. For more information, please consult the 2012 National Fuel Gas Code and the Southwest Gas Material Safety Data Sheets (MSDS) at swgas.com/safety.





RIGHTS-OF-WAY ENCROACHMENT

A right-of-way is a strip of land where some of the property owner's legal rights have been granted to a utility company. They allow the pipeline operator to inspect, repair, maintain, or replace pipeline on property owned by others. Pipeline markers are often placed along the rights-of-way to indicate the pipeline's approximate location.

Encroachments into the rights-of-way can cause unsafe conditions. When a pipeline is accidentally damaged by excavation and other construction activities, outages, impaired access, excessive/dangerous loads on the pipeline, and evacuations can occur.

Safety of rights-of-way can be promoted by:

- Always calling **811** at least two working days before any digging, blasting, or boring project
- Using safe excavation practices
- Monitoring and reporting suspicious activity on a rights-of-way
- Keeping rights-of-way free from obstructions
- Following recommended practices on land use near rights-of-way

EXCESS FLOW VALVES

Southwest Gas installs devices in its service lines that automatically shut in the event of damage. Known as an Excess Flow Valve (EFV), these valves may activate if there's excavation damage or any other damage to an underground or aboveground gas facility. It's important to understand the EFV doesn't shut off the flow of gas completely. Some leakage may still occur and result in a hazardous condition.

Important Phone Numbers and Websites

FOR GAS EMERGENCIES AND ADDITIONAL INFORMATION:

- Southwest Gas Emergency Number **877-860-6020**
- For more information about natural gas safety visit swgas.com/safety or call **877-860-6020**
- Material Safety Data Sheets (MSDS) for odorized natural gas swgas.com/safety
- U.S. Department of Transportation Pipeline Safety Community phmsa.dot.gov/pipeline
- Pipeline and Hazardous Materials Safety Administration, Office of Pipeline Safety National Pipeline Mapping System npms.phmsa.dot.gov
- Occupational Safety and Health Administration (OSHA) osha.gov





Información de Seguridad

Sobre el Gas Natural

Para Excavadores y Contratistas

Siendo usted parte de una compañía que puede realizar excavaciones dentro de nuestros territorios, las regulaciones federales requieren que compartamos información importante de seguridad del gas natural con usted. Los siguientes mensajes están destinados para proporcionar recordatorios necesarios sobre la seguridad al estar trabajando con o alrededor del gas natural.

Suministrando Gas con Seguridad

Southwest Gas suministra gas natural de forma segura y confiable a través de nuestros sistemas de tuberías. Para asegurar la integridad continuada de estos sistemas de tuberías, hemos implementado prácticas y procedimientos de construcción seguros, y también hemos llevado a cabo proyectos de mejoría de tuberías y realizamos inspecciones de seguridad rutinarias. Para fomentar la seguridad en la transmisión del gas natural por tuberías de alta presión a través de áreas pobladas, también hemos desarrollado e implementado un programa de administración de integridad de tuberías. Como resultado de estos esfuerzos, Southwest Gas sigue cumpliendo o excediendo todos los requisitos federales y estatales para la operación y el mantenimiento de tuberías seguras.



AVISOS
de una fuga de Gas Natural:



Para obtener más información sobre la seguridad de tuberías de gas, visítenos en swgas.com/safety.

Número de Teléfono de Southwest Gas de Emergencia las 24 horas:

877-860-6020

PLANEACIÓN Y CAPACITACIÓN PARA EMERGENCIAS

Southwest Gas colabora continuamente con funcionarios de respuesta a emergencias locales a través de reuniones periódicas, la participación en ejercicios de respuesta de emergencias, y la revisión continua de las prácticas a implementación. Esto permite que cada organización pueda afinar los procedimientos de seguridad y que coordine la forma de responder más eficazmente cuando hay otras personas involucradas en caso de un incidente o emergencia con gas natural. Además, Southwest Gas brinda capacitación de seguridad para tuberías a los empleados y contratistas. Si usted está interesado en asistir a una sesión de capacitación en seguridad, llame al **800-654-2765** para mayor información.

RECONOCIMIENTO Y RESPUESTA

A pesar de que las tuberías de gas natural son consideradas como uno de los métodos más seguros de transporte de energía en los Estados Unidos, los daños a las tuberías puede ocurrir debido a la excavación inadecuada, corrosión o desastres naturales, los cuales pueden resultar en la liberación de gas natural. Una fuga de gas natural tiene el potencial de provocar evacuaciones, interrupciones de servicios, incendios o explosiones, daños a propiedades, lesiones o pérdida de vidas. El reconocimiento y la respuesta oportuna ayudan a minimizar los efectos potenciales causados por las fugas de gas.



PERCIBE UN OLOR
peculiar semejante al azufre, similar a los huevos podridos, no importa si es muy ligero o momentáneo.



ESCUCHA
un siseo o rugido procedentes por debajo de la tierra o de la tubería que está sobre el suelo.



SI VE
tierra, suciedad o agua soplando en el aire, plantas muertas o moribundas sin explicación, o agua estancada con un burbujeo continuo.

Para la Seguridad de Todos...

... SI UNA TUBERÍA HA SIDO DAÑADA O SI SOSPECHA QUE HAY UNA FUGA:

- Salga del área inmediatamente.
- Vaya a un lugar seguro y llame al **911** y a Southwest Gas al teléfono **877-860-6020**, de día o de noche. Permanezca en ese lugar hasta que lleguen los bomberos y los equipos de emergencia de Southwest Gas.
- Asegure el área y evite que todos los compañeros de trabajo, los espectadores y el tráfico vayan a entrar.
- No entre al área donde está la fuga de gas.
- No fume ni prenda encendedores o cerillos.
- Elimine fuentes de ignición cercanas, tales como chispas o flamas.
- No mueva el equipo ni trate de encenderlo o apagarlo cerca de un interruptor de circuito eléctrico.
- No trate de reparar ningún tipo de daño o de controlar el flujo de gas natural.
- No intente extinguir el fuego si se enciende la fuga de gas.

LLAME AL 811 ANTES DE EXCAVAR. ES LA LEY

Las tuberías de gas natural pueden estar enterradas en cualquier lugar. La ley del estado exige que las compañías excavadoras se comuniquen al centro de reportes por lo menos dos días hábiles antes de comenzar el proyecto de excavación para que se puedan marcar las tuberías subterráneas. El primer paso es llamar al **811**. El centro de llamadas tomará la información de la excavación propuesta y la transmitirá a Southwest Gas y a otros propietarios de instalaciones subterráneas. Responderemos y marcaremos cada tubería de gas con pintura amarilla, fibras amarillas, banderas amarillas, o estacas amarillas, y pondremos en las marcas amarillas una etiqueta con las letras "SWG", y así usted sabrá qué marcas son para nuestras instalaciones. También se proporcionan marcas adicionales incluyendo el tamaño y el tipo de material y si es o no es una instalación de distribución o de alta presión.

Una breve llamada telefónica puede evitar daños innecesarios a las tuberías subterráneas y evitar multas significativas o cobros por reparaciones para la persona que excave en nuestra tubería. Recuerde que tiene que llamar al **811** antes de excavar. Es gratis, es fácil, es la ley.



Los 5 Pasos Para Una Excavación Segura



1 MARQUE CON UNA LÍNEA BLANCA DONDE QUIERE HACER LA EXCAVACIÓN

¡Defina dónde quiere excavar!

2 LLAME AL 811 ANTES DE EXCAVAR

Es gratis. ¡Es la ley!

3 ESPERE EL TIEMPO NECESARIO

¡Vale la pena esperar!

4 RESPETE LAS MARCAS

No destruya las marcas... ¡están ahí para su seguridad!

5 ¡EXCAVE CON CUIDADO!

Excavar sin precaución o sin seguridad, puede dañar la tubería. Esto podría dar lugar a una fuga de gas natural que tiene el potencial de provocar evacuaciones, las interrupciones de servicios, incendios, daños a propiedades, lesiones o pérdida de vidas.

Para obtener mayor información, por favor llame al **800-654-2765** y pregunte por nuestros cursos gratuitos de prevención de daños o visite swgas.com/safety.

Reglas Para Garantizar Su Seguridad

REGLAS DE EXCAVACIÓN O INSTALACIÓN

- Excave a mano a una distancia mínima de 24" de las tuberías de gas natural hasta que queden expuestas.
- Dé soporte a las tuberías durante la construcción o la excavación.
- Las tuberías expuestas necesitan una separación mínima de 12" del resto de los servicios públicos o de las subestructuras. Si no se puede mantener el mínimo de 12", llame a Southwest Gas para que se tomen otros pasos para proteger las tuberías de gas natural.
- Rellene la excavación 6" por debajo y 6" por encima de la tubería dejando menos 3/8" para el material de protección. El material por debajo y alrededor de la tubería debe ser compactado, pero NO lo compacte directamente sobre la tubería.
- Si se va a realizar trabajo cerca de una tubería de alta presión, debe llamar a Southwest Gas con 24 horas de anticipación para programar que un técnico esté presente. Si una tubería de alta presión está expuesta, llámenos las 24 horas del día, 7 días a la semana, y de inmediato enviaremos personal a inspeccionar la tubería.

DAÑOS A TUBERÍA DE PLÁSTICO O A RECUBRIMIENTOS PROTECTORES DE LA TUBERÍA DE ACERO

- Deje de excavar y llame a Southwest Gas de inmediato si algún tubo de acero o de plástico, o algún recubrimiento protector en tubos de acero (que pueden contener asbestos), se han raspado, roto o dañado sin dejar escapar el gas, o si el cable rastreador en un tubo de plástico se ha roto o ha sido dañado. El personal de Southwest Gas debe realizar las reparaciones y, por lo general, no se le cobrarán a usted.
- Algunas tuberías de acero con recubrimientos de asfalto abandonadas de Southwest pueden contener asbestos. Llame a Southwest Gas antes de que desestabilice el recubrimiento de algún tubo que pueda ser parte de una tubería abandonada de SWG y permita que la compañía la pueda inspeccionar. Si es factible, declararán que la tubería es segura para ser removida. Esta inspección y el saneamiento relacionado se hacen por lo general sin cargo para usted. El manejo inadecuado del recubrimiento que contiene asbestos puede ser dañino para sus empleados y para el público en general y puede causarle responsabilidades y penas civiles y criminales.

ALERTAS DE PERFORACIÓN SUBTERRÁNEA Y DE EXPLOSIÓN

- El Método de perforación conlleva sus propias prácticas especiales de trabajo alrededor de tuberías de gas, las cuales difieren de la instalación usando zanjas abiertas. Cuando llame al **811** para solicitar la ubicación de la tubería, asegúrese de decirle al operador que se planea hacer una perforación. Esto ayudará a asegurar que el operador llene correctamente la orden.
- Hay que hacer excavaciones de exploración antes de perforar cerca de las tuberías de gas natural. Pida que el personal de Southwest Gas verifique visualmente las instalaciones de gas que están expuestas antes de realizar la operación de perforado. Durante el proceso de perforación, se deben de inspeccionar las instalaciones de las tuberías de forma periódica. Notifique a Southwest Gas de inmediato si usted u otras personas involucradas tiene alguna duda o encuentra algún daño.
- **Llámenos antes de hacer las explosiones y si hay instalaciones de gas natural en la zona.** Debe de hacerse una verificación de fugas en todas las tuberías de gas que se localizan dentro de una distancia de 250 pies antes y después de realizar explosiones. Aunque estos servicios no se le cobran, uno de nuestros representantes debe estar presente durante las actividades de explosiones y perforaciones.

EXCAVACIONES CERCA DE TUBERÍAS DE TRANSMISIÓN (DE ALTA PRESIÓN)

- Antes de realizar cualquier trabajo en el entorno de una tubería de alta presión, llámenos con 24 horas de anticipación para programar que un técnico esté presente mientras se está excavando alrededor de nuestras instalaciones de tuberías de alta presión.
- Si en cualquier momento usted ha expuesto una tubería de transporte de gas natural (de alta presión), es importante llamar a Southwest Gas al teléfono **877-860-6020** las 24 horas del día, 7 días a la semana, y de inmediato enviaremos personal para inspeccionar la tubería.



Marcadores de las Tuberías Color Amarillo

Ya que la mayoría de las tuberías de gas natural están enterradas bajo tierra, se utilizan marcadores para indicar la ubicación aproximada de la tubería. Los marcadores de las tuberías tienen estas características:

- Son de color amarillo
- Por lo general se observan donde una tubería intersecta una calle, carretera o ferrocarril, o un campo abierto
- NO se requieren en todas las instalaciones de tuberías
- NO indican la profundidad de la tubería o su ubicación exacta
- Tienen una lista de números de teléfono para casos de emergencia de gas natural

Asegúrese de que los marcadores no se tocan y así ayuden a otras personas a recordar que hay tuberías de gas natural, en el área. La llamada al **811** todavía se requiere para el marcado de las tuberías, aunque ya haya marcadores presentes.

Además, los marcadores bajo tierra, tales como cinta de advertencia de color amarillo o las mallas, puede estar presentes para advertir a los excavadores de la presencia de tubería enterrada. Si se encuentra una cinta de advertencia de color amarillo subterránea, inmediatamente debe dejar de trabajar y debe llamar a Southwest Gas.



La Ley Federal Indica Que

“Toda persona que intencionalmente y con conocimiento desfigura, daña, elimina o destruye cualquier señal o marcador de tuberías, en caso de resultar culpable, será acreedor a una multa de no más de \$5,000, reclusión por un término no mayor de un año, o ambas cosas”.

Señales de Marcado de Tuberías de Servicios y su Significado

ARIZONA

AMARILLO Distribución y transmisión de gas, distribución y transmisión de derivados del petróleo, materiales peligrosos	ROJO Distribución y transmisión de energía eléctrica	NARANJA Sistemas de teléfono y de telégrafo, televisión por cable
La letra "F" EN ALERTA NARANJA DE SEGURIDAD Líneas de de comunicación de fibra óptica	AZUL Tuberías de sistemas de agua, y de lodos	VERDE Sistemas de alcantarillado sanitario
MORADO Sistemas de agua reciclada	BLANCO Excavación propuesta	

CALIFORNIA Y NEVADA

AMARILLO Gas, aceite, vapor, petróleo, materiales gaseosos o peligrosos	ROJO Líneas de energía eléctrica, cables, conductos y cables de pararrayos	NARANJA Líneas de comunicación, alarma o señales; cables o sistemas de conductos
AZUL Agua potable	VERDE Tuberías de drenaje y desagüe	MORADO Sistemas de agua recuperada, de riego y tuberías de lodos
BLANCO Excavación propuesta		

Información sobre Perforaciones Transversales para Excavadores y Plomeros

Empresas de servicios de suministro de gas natural del país han descubierto lugares donde las tuberías de gas natural se instalaron por error pasando por tuberías de drenaje. Esto no crea riesgos de seguridad siempre y cuando la tubería de gas natural no se haya dañado. Sin embargo, las tuberías de gas natural se pueden dañar cuando se utilizan equipos para desazolver las tuberías de drenaje. Esto puede provocar fugas de gas natural, que pueden generar un incendio o una explosión y posiblemente causar lesiones o hasta la muerte a quienes están desazolvando la tubería de drenaje y a las estructuras que están unidas al drenaje.

LLAME ANTES DE DESAZOLVAR SEPA LO QUE HAY ADENTRO

Si a usted le llaman a un lugar que tiene un posible bloqueo en una tubería exterior de drenaje, por favor llame a Southwest Gas al teléfono **877-860-6020** y presione “9” para asistencia inmediata, incluso si el lugar no tiene gas. La tubería de gas natural de la intersección puede estar surtiendo a otras personas del vecindario. Southwest Gas responderá de inmediato para marcar la ubicación de nuestra tubería subterránea antes de que vaya a desazolver la tubería de drenaje. No hay ningún cargo por este servicio.

¿SIENTE ALGUNA OBSTRUCCIÓN? ¡REPÓRTELA!

Si comienza a desazolver un drenaje y siente o ve alguna obstrucción o tope, pero aún no ha penetrado en el tubo, llame a los números de emergencia de Southwest Gas, al teléfono **877-860-6020** y presione el “9” para que lo atiendan de inmediato. Un representante de Southwest Gas estará ahí lo más pronto posible para asegurar que no ha sido dañada una tubería de gas. No hay ningún cargo por este servicio.

ACTÚE DE INMEDIATO SI ENCUENTRA CUALQUIERA DE LAS SIGUIENTES SEÑALES CUANDO LIMPIE UNA TUBERÍA DE DRENAJE CON UN DISPOSITIVO PARA DESAZOLVARLAS:

- Un olor a gas natural durante la limpieza o dentro del edificio al que sirve esa tubería de drenaje, aunque sea ligero o momentáneo.
- Se ven burbujas en agua estancada o en la taza del inodoro.

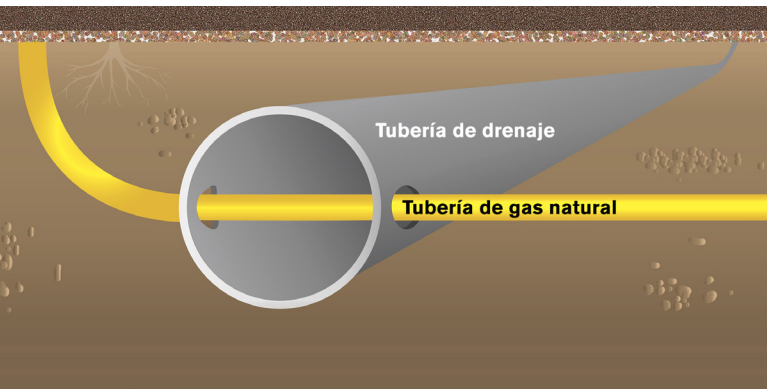
SI DETECTA ESTAS SEÑALES, DEJE LO QUE ESTÉ HACIENDO, Y HAGA LO SIGUIENTE:

- **Salga del área o edificio inmediatamente.** Dígame a las otras personas que evacúen la zona y que dejen las puertas abiertas.
- No utilice puertas automáticas ni encienda o apague interruptores eléctricos, termostatos o controles de aparatos.
- Desde un lugar seguro, llame de inmediato al **911** y a Southwest Gas al teléfono **877-860-6020**, de día o de noche. Un representante de Southwest Gas estará ahí lo más pronto posible.

Purgado de gas Natural

Cuando purgue una tubería de gas natural, no confíe únicamente en su sentido del olfato para detectar la presencia de gas natural.

Una purga realizada de manera incorrecta puede provocar un incendio o una explosión, daños a la propiedad, lesiones o la muerte. Para obtener más información, consulte el Código Nacional de Gas Combustible del 2012 (2012 National Fuel Gas Code) y las Hojas de Datos de Seguridad de Materiales (MSDS) de Southwest Gas en swgas.com/safety.





DERECHO DE PASO E INVASIONES

El derecho de paso es una franja de terreno en el que algunos de los derechos legales del dueño de la propiedad han sido concedidos a una empresa de servicios públicos. Permiten que el operador de la tubería pueda inspeccionar, reparar, mantener o reemplazar la tubería en la propiedad de otros. Los marcadores de las tuberías se colocan a menudo en los derechos de paso para indicar la ubicación aproximada de la tubería.

Las invasiones en los derechos de paso pueden causar condiciones inseguras. Cuando una tubería se daña accidentalmente por la excavación y otras actividades de construcción, pueden ocurrir interrupciones en el servicio, problemas de acceso, cargas excesivas o peligrosas en la tubería, y evacuaciones.

La seguridad en los derechos de paso puede mejorar si se cumple lo siguiente:

- Siempre llamamos al **811** por lo menos dos días hábiles antes de hacer proyectos de excavación, explosiones o perforaciones
- Se utilizan prácticas seguras de excavación
- Se monitorea y se reportan las actividades sospechosas en los derechos de paso
- Se mantienen los derechos de paso libres de obstáculos
- Se siguen las prácticas recomendadas para el uso de la tierra cerca de los derechos de paso

VÁLVULAS DE FLUJO EXCESIVO

Southwest Gas instala dispositivos en sus tuberías de servicio que se cierran de forma automática en caso de que ocurra algún desperfecto. Estas válvulas se conocen como las Válvulas De Flujo Excesivo (EFV), y se activan si hay daños por excavaciones o cualquier otro tipo de daño en una instalación de gas subterránea o sobre el suelo. Es importante entender que la válvula EFV no corta el flujo de gas por completo. Aun así puede haber fugas causando una condición peligrosa.

Números de Teléfono y Sitios Web Importantes

PARA EMERGENCIAS DE GAS E INFORMACIÓN ADICIONAL:

- Número de teléfono de emergencia de Southwest gas **877-860-6020**
- Para obtener más información sobre seguridad de gas natural, visite **swgas.com/safety** o llame al **877-860-6020**
- MSDS de gas natural **swgas.com/safety**
- Departamento de Transporte de Estados Unidos **phmsa.dot.gov/pipeline**
- Administración de Seguridad de Tuberías y Materiales Peligrosos, Oficina del Sistema Nacional de Mapeo de Tuberías para la Seguridad de las Tuberías **npms.phmsa.dot**
- Administración de Salud y Seguridad Laboral (OSHA) **osha.gov**





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Safety Information

Please share with others
in your organization.

Natural Gas
Safety Information
For Excavators and Contractors

Hit A Line? Suspect A Leak?

Leave the area immediately and call **911** & Southwest Gas at **877-860-6020** from a safe location.

SIGNS OF A NATURAL GAS LEAK

- **SMELL** a distinct sulfur-like odor, similar to rotten eggs, even if it's faint or momentary.
- **HEAR** a hissing or roaring coming from the ground or above-ground pipeline.
- **SEE** dirt or water blowing into the air, unexplained dead or dying plants or grass surrounding a pipeline, or standing water continuously bubbling.

5 Steps to a Safe Excavation

- 1 DEFINE THE DIG**
White line the proposed site to define where you're digging.
- 2 CALL 811**
Call before you dig. It's free and it's the law.
- 3 WAIT THE REQUIRED TIME**
Don't begin the dig until you get the "all clear."
- 4 RESPECT THE MARKS**
Don't destroy the marks...they're there for your safety!
- 5 DIG WITH CARE**
Careless or unsafe excavating could damage the pipeline and create a dangerous situation.



Call **800-654-2765** to schedule a free damage prevention workshop.

Información de Seguridad

Sobre el Gas Natural
Para Excavadores y Contratistas

¿Ha Tocado Una Tubería? ¿Sospecha Usted Que Hay Una Fuga?
Abandone el área inmediatamente y llame al **911** y Southwest Gas al teléfono **877-860-6020** desde un lugar seguro.

SEÑALES DE UNA FUGA DE GAS NATURAL

- **PUEDE OLER** un olor peculiar semejante al azufre, similar a los huevos podridos, no importa si es muy ligero o momentáneo.
- **PUEDE ESCUCHAR** un siseo o rugido procedentes de debajo de la tierra o de la tubería que está sobre el suelo.
- **PUEDE VER** tierra, suciedad o agua soplando en el aire, plantas muertas o moribundas sin explicación, o agua estancada con un burbujeo continuo.

Los 5 Pasos Para Una Excavación Segura

- 1 DEFINA LA EXCAVACIÓN**
Ponga una línea blanca en el lugar donde va a estar excavando
- 2 LLAME AL 811 ANTES DE EXCAVAR**
Es gratis y es la ley
- 3 ESPERE EL TIEMPO NECESARIO**
Permita que pasen dos días hábiles para que las compañías de servicios marquen las tuberías
- 4 RESPETE LAS MARCAS**
Mantenga las marcas durante la excavación. ¡Están allí para su seguridad!
- 5 EXCAVE CON CUIDADO**
Si se excava en forma descuidada o insegura se podría dañar la tubería de gas y generar una situación peligrosa.



Llame al teléfono **800-654-2765** para programar un taller gratuito de prevención de daños.