

Application of San Diego Gas & Electric Company (U902M) for Authority, Among Other Things, to Increase Rates and Charges for Electric and Gas Service Effective on January 1, 2012.

A.10-12-005
(Filed December 15, 2010)

Application of Southern California Gas Company (U904G) for authority to update its gas revenue requirement and base rates effective on January 1, 2012.

A.10-12-006
(Filed December 15, 2010)

Application 10-12-006
Exhibit No.: (SCG-04-R)

REVISED
PREPARED DIRECT TESTIMONY OF
JAMES D. MANSDORFER
SOUTHERN CALIFORNIA GAS COMPANY

BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

JULY 2011



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**REVISED PREPARED DIRECT TESTIMONY OF
JAMES D. MANSDORFER
SOUTHERN CALIFORNIA GAS COMPANY
(UNDERGROUND STORAGE)**

I. INTRODUCTION

A. Purpose of Testimony

The purpose of this testimony is to demonstrate that Southern California Gas Company's (SoCalGas, SCG, or Company) Storage Operations Test Year (TY) 2012 operation and maintenance (O&M) expense and capital requirements for the underground storage system represent the necessary funding to maintain the integrity of the storage system to ensure a safe, reliable supply of natural gas throughout the SoCalGas service territory. This testimony forecasts \$28,939,000 for Test Year 2012 (TY 2012) O&M expenses and \$30,596,000 in capital expenditures. Unless otherwise noted, all costs are in 2009 dollars.

**Table JDM -1
Summary of TY 2012 Change
(Thousands of \$2009)**

Functional Area: SOCALGAS UNDERGROUND STORAGE				
Description	2009 Adjusted- Recorded	TY 2012 Estimated	Change	Testimony Reference
Total Non-Shared	26,997	28,939	1,942	Section II
Total Shared Services (Book Expense)	0	0	0	N/A
Total O&M	26,997	28,939	1,942	
Total Capital	33,617	30,596	(3,021)	Section IV

The TY 2012 estimate of \$28,939,000 for underground storage O&M expense reflects an emphasis on improving organizational performance and minimizing expenses where possible. It should be noted that pursuant to CPUC Decision 01-06-081, issued June 28, 2001, the costs exhibited in TY 2012 do not

1 include costs associated with the operation and maintenance of the Montebello
2 underground storage field or any costs associated with salvage operations. This
3 decision states that all costs associated with the Montebello underground storage
4 field operation be removed from rates as of August 29, 2001, which has been
5 done. Also, as of April 2009, the East Whittier storage field was removed from
6 rate base, and so costs associated with maintaining this field are also excluded
7 from this case. This case also does not include any costs associated with
8 SoCalGas' Native Gas program as provided in CPUC Decision 06-06-065.

9 The baseline cost level used to forecast 2012 non-labor O&M costs is the
10 2005 to 2009 five-year average. Identifiable new incremental costs that are
11 expected to be incurred were added to the five-year average to arrive at the
12 TY 2012 requirement. The increase from the five-year average to the TY 2012
13 forecast is \$1,234,000. As discussed later, this increase is principally due to new
14 regulations that will impact the storage fields.

15 The five-year average cost was used as a basis for projections because
16 storage non-labor O&M costs can fluctuate significantly from year to year. Over
17 the 2005 to 2009 period, non-labor costs varied from a high of \$15.3 million to a
18 low of \$14.1 million. One of the significant cost drivers for storage is the amount
19 of gas throughput for the storage fields. This throughput volume is dependent on
20 the weather and the national gas markets; the Storage Operations department has
21 no control over these two elements. Over the same five-year period, the volume
22 cycled through the storage fields (injection volume plus withdrawal volume)
23 varied from a high of 228 billion cubic feet (Bcf) to a low of 178 Bcf.

24 Higher throughput causes more wear on the compressors and more use of
25 consumables such as engine oil, glycol, etc. The weather also has a direct impact
26 on overall maintenance cost because of the rugged terrain in which the storage
27 fields are located. Years with heavy rainfall can cause significant costs for
28 cleaning up landslides and maintaining drainage systems, as well as vegetation
29 management. Another reason for the fluctuation in cost from year to year is that,
30 unlike other departments in SoCalGas where there are thousands of miles of pipe
31 or millions of meters and so repair costs tend to average out from year to year,

1 Storage has relatively few wells and compressors, but when a well or compressor
2 needs repair it can be costly. The problems with SoCalGas' aging wells and
3 compressors are partially dependent on throughput, but they are also subject to
4 random failure occurrence that can vary from year to year and therefore costs vary
5 from year to year. This means that a single event among relatively few facilities
6 can have a significant impact on expense history. It is for this reason that a
7 historical averaging methodology is considered appropriate for forecasting future
8 non-labor costs.

9 For labor O&M costs 2009 was used as a base, with identifiable
10 incremental requirements added to get to TY 2012 expected costs. Labor costs do
11 not fluctuate like non-labor costs and, historically, Storage Operations has added
12 employees mainly as necessary to manage ever-increasing monitoring and
13 reporting for the many regulatory agencies with jurisdiction over the storage
14 fields. Over the five-year period from 2005 through 2009, four positions were
15 added, while total labor costs increased by approximately \$800,000. Six positions
16 are projected to be added between 2009 and 2012. Four of these additional
17 positions are driven by new regulations, one is to maintain the new dehydration
18 plant at the Playa del Rey storage field that will go into service in 2010, and the
19 other is a staff position that will work with field employees to implement
20 technology to lower ongoing costs.

21 Most historic increases in costs for SoCalGas Storage Operations
22 (Storage) have been driven by new regulations from various agencies regarding
23 environmental requirements. For the 2009 to 2012 time period there are also new
24 costs related to overhead electrical line construction and maintenance regulations,
25 and wildfire preparations associated with these electrical facilities.

26 Storage has successfully offset significant increases in O&M costs with
27 cost savings achieved through improved organizational performance and applied
28 technology. Over the five-year period 2005 through 2009 used to establish the
29 base non-labor costs for TY 2012, Storage has increased the capacity of its
30 storage fields available for customers to use by 12 Bcf (and anticipates adding 1
31 more Bcf by the end of 2012 in addition to the Honor Rancho expansion approved

1 in D. 10-04-034) while holding non-labor costs level (on an average basis) over
2 the 2005 to 2009 period. Over this five-year period, labor costs increased by only
3 a small amount, primarily driven by the need for increased permitting and
4 reporting to regulatory agencies for O&M activities.

5 This testimony only addresses “Non-Shared Service” activities. SoCalGas
6 does not operate underground storage facilities in the SDG&E service territory,
7 and thus there are no shared services costs related to underground storage O&M.

8 The capital requirement for Storage in TY 2012 is forecast to be
9 \$3,021,000 less than the 2009 recorded capital expenditure. Capital expenditures
10 for 2009 for Storage were higher than normal, primarily because of the cost
11 associated with installing a new gas dehydration plant at Playa del Rey; the
12 capital budget for TY 2012 represents a return to normal capital investment in
13 storage infrastructure. The driving philosophy behind SoCalGas’ capital
14 expenditure plan for Storage Operations is to provide safe, reliable delivery of
15 natural gas to customers at the lowest reasonable cost. These investments also
16 enhance the efficiency and responsiveness of operations, and ensure compliance
17 with all applicable regulatory and environmental regulations.

18 Overall, Storage Capital spending in TY 2012 is expected to be
19 approximately 9% less than in base year 2009, although providing for upgrades
20 and replacements necessary for safe and efficient storage operations that are in
21 full regulatory compliance.

22 This testimony describes the anticipated changes in operations, discusses
23 why these changes are necessary, and indicates the resulting change in
24 expenditure requirements.

25 **B. Overview of Operations**

26 The capacity of a storage field is measured in ‘billion cubic feet’, or Bcf.
27 SoCalGas operates four underground storage fields with a working inventory
28 capacity of approximately 134 Bcf. These fields are Aliso Canyon (86 Bcf), La
29 Goleta (21.5 Bcf), Honor Rancho (24.1 Bcf), and Playa del Rey (2.4 Bcf). These
30 fields are depleted oil or gas fields which are now used as storage locations, gas
31 being pumped into the field during seasonal periods when gas consumption is

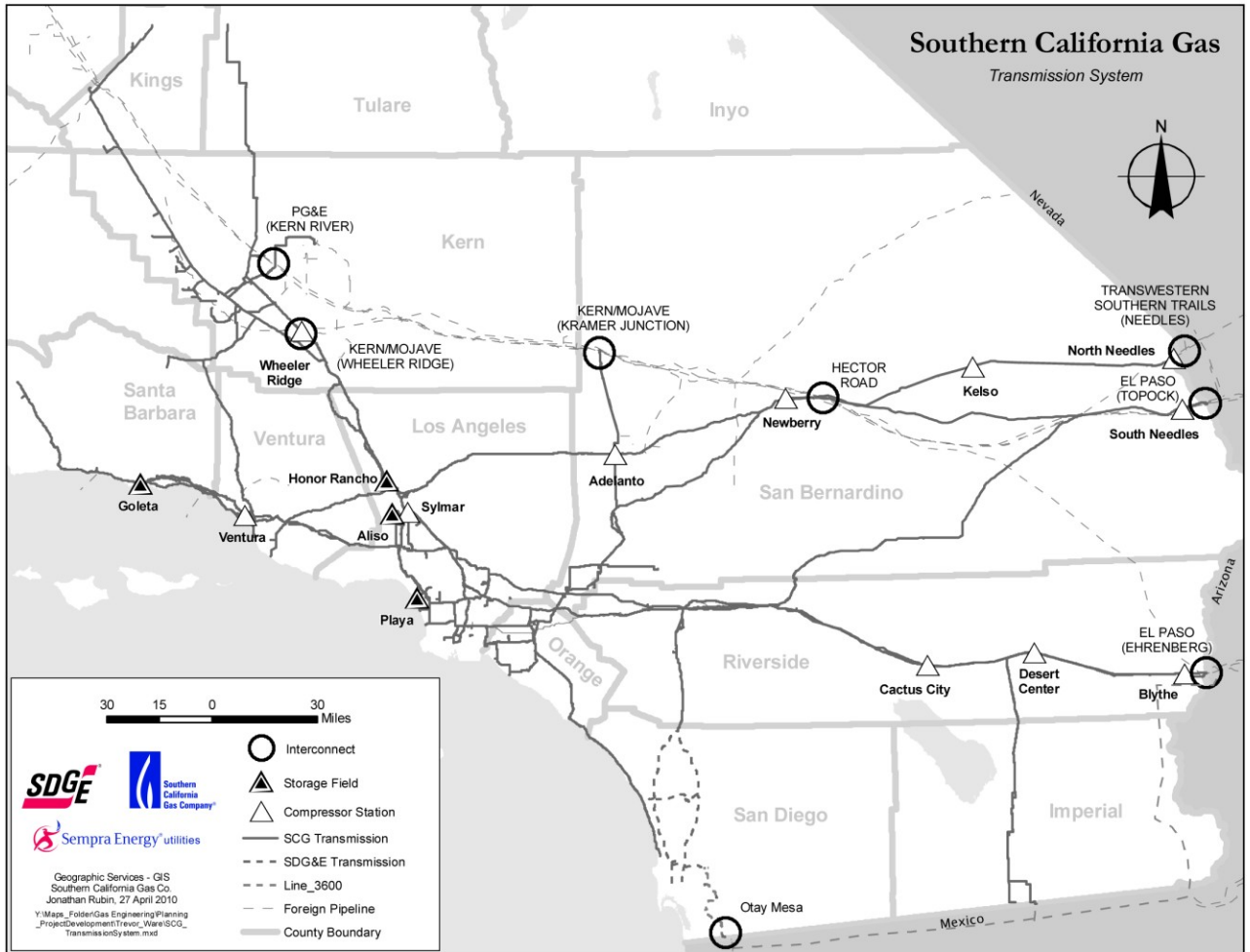
1 typically low, usually summer months, and withdrawn when gas consumption is
2 seasonally high, usually winter months. At the beginning of the traditional
3 withdrawal season, the combined storage capacity of the four storage fields is
4 enough to completely supply all of SoCalGas' customers for approximately six
5 weeks.

6 Gas storage fields can only be established in areas of unique geological
7 characteristics and proximity to markets. Furthermore, by their nature, gas
8 storage fields occupy large land areas and require considerable industrial
9 equipment such as compressors, regulators, and monitoring equipment. Because
10 of these requirements, all of SoCalGas' gas storage fields were at one time
11 producing gas or oil fields. The unique geology of these former producing fields
12 makes them suitable for gas storage in the SoCalGas system.

13 A diagram/map of SoCalGas' gas transmission system, including the
14 storage fields, is shown below.

15

Figure JDM-1



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These storage facilities are an integrated part of the energy infrastructure required to provide southern California businesses and residents with safe, reliable, and cost-effective energy services. The SoCalGas Storage department is responsible for the design, operations, and maintenance of the storage fields, and plans the necessary capital investments to continue providing valued storage services to SoCalGas customers. The key objectives for storage are safety, reliability, value, and compliance with regulations. As discussed later in my testimony, capital investments are made to ensure the continued integrity of the storage fields necessary to provide safe, reliable, and cost-effective operations. These investments also enhance the efficiency and responsiveness of operations

1 and ensure compliance with all applicable regulatory and environmental
2 regulations.

3 **C. Summary of Requirements**

4 **Table JDM 2**
5 **O&M Non-Shared Services**
6 **Testimony Section II**
7 **(Thousands of \$2009)**
8

SOCALGAS UNDERGROUND STORAGE			
Categories of Management	2009 Adjusted-Recorded	TY 2012 Estimated	Change
A. Underground Storage	26,997	28,939	1,942
Total	26,997	28,939	1,942

9
10 **Table JDM 3**
11 **O&M Shared Services**
12 **Testimony Section III**
13 **(Thousands of \$2009)**
14

SOCALGAS UNDERGROUND STORAGE			
Categories of Management	2009 Adjusted-Recorded	TY 2012 Estimated	Change
A. Underground Storage	0	0	0
Total	0	0	0

15
16 Note: There are no Shared Services expenses for Underground Storage.
17
18

Table JDM 4
Capital - Testimony Section IV
(Thousands of \$2009)

Category Description	2009 Recorded	2010 Estimated	2011 Estimated	2012 Estimated
1. ..BC 4X1 – Gas Transmission – Storage – Compressor Stations	\$7,489	\$4,430	\$6,851	\$6,851
2. ..BC 4X2 – Gas Transmission – Storage - Wells	\$5,651	\$11,055	\$7,616	\$7,616
3. ..BC 4X3 – Gas Transmission – Storage - Pipelines	\$4,303	\$4,222	\$3,493	\$3,493
4. ..BC 4X4 - Gas Transmission – Storage - Purification	\$10,015	\$2,031	\$4,191	\$4,191
5. ..BC 4X9 – Gas Transmission – Storage – Aux Equipment	\$6,159	\$5,923	\$9,454	\$8,445
Total Capital:	\$33,617	\$27,660	\$31,605	\$30,596

II. NONSHARED SERVICES

A. Introduction

The use of the underground storage fields is a key component of the SoCalGas transmission pipeline and underground storage system. The transmission and underground storage system is made up of interconnecting high-pressure pipelines, compressor stations, and underground storage fields, designed to receive natural gas from interstate pipelines and various local offshore and onshore production sources. The system then delivers the natural gas either to customers or to storage fields depending on demand. Minimum changes in supply and demand are met by increasing or “pulling” on the inventory in the transmission pipelines. This process is known as packing and drafting and is an efficient way to deal with minor changes in load. As the system load variations increase, the system is balanced by injecting natural gas into the storage fields when supply exceeds customer demand and withdrawing natural gas from storage when customer demand exceeds supply.

SoCalGas uses storage to meet customers' seasonal, as well as daily, balancing requirements. To satisfy these needs, the individual storage facilities operate as the system demand dictates. This fluctuating demand may translate to Storage Operations performing its necessary functions during any hour of the day, and on any day of the week, as defined by the SoCalGas Gas Operations department. To meet these operational demands, storage facilities are staffed with rotating operating crews to support 24-hour-per-day, 7-day-per-week operations.

Storage Operations has responsibility for the operation, maintenance, and engineering specific to the use of the underground storage facilities. The Storage department consists of approximately 150 employees and is organized with both operational and support groups to provide for cost-effective delivery of services essential to maintaining the integrity of the gas delivery infrastructure.

**Table JDM 5
O&M Non-Shared Services
(Thousands of \$2009)**

SOCALGAS UNDERGROUND STORAGE			
Categories of Management	2009 Adjusted-Recorded	TY 2012 Estimated	Change
A. Underground Storage	26,997	28,939	1,942
Total	26,997	28,939	1,942

B. Storage Operations Department Cost Center Management

Each storage field and support department within Storage Operations plans, tracks, and manages its activities and expenses independently. The company's cost center hierarchy within SAP provides the system and tools enabling the department managers and supervisors to manage their areas of responsibility. From an organizational perspective, however, all expenses and costs are ultimately rolled up and consolidated at the Storage Operations Director level. The finite annual budget allocation for Storage Operations must be managed at this level to ensure that the highest priority activities are addressed appropriately while maintaining regulatory compliance and a safe and efficient operation. All of the managers in Storage work as a team to manage expenses to meet the Storage department budget while providing safe and reliable service to

1 customers. It is for this reason that, in my testimony, all expenses are combined
2 into a single Storage Operations work group or category. This methodology
3 accurately reflects the manner in which expenses are managed.

4 **C. Storage Operations Activities**

5 While each storage field has its own unique operating circumstances and
6 characteristics, there are general and basic activities performed at each field on a
7 regular basis. In the same manner, the various functions for management,
8 supervision, and technical support - whether local at a field or in a central staff-
9 type office - perform activities that fall within general work-function categories.
10 These functions represent the ongoing daily activities that make up the bulk of
11 historical expenses shown in my testimony. In general, the activities that drive
12 the historical and ongoing O&M costs associated with the underground storage
13 operations can be summarized as follows:

14 Operation Supervision and Engineering

15 These activities cover the supervision and engineering costs associated
16 with the operation of the underground storage fields. Costs for reservoir
17 engineering studies necessary to ensure the integrity of the storage system, and in
18 connection with the operation of the underground storage wells, are also charged
19 to this activity.

20 Wells, Lines, and Compressor Stations:

21 These costs include salaries and expenses associated with operating
22 storage wells (such as the costs to turn wells on and off, testing, and running
23 pressure surveys); wellheads and cellars including well service contractors to
24 perform subsurface leakage surveys; underground storage injection, withdrawal,
25 and other field lines; and the costs associated with patrolling the lines, lubricating
26 valves, and cleaning the lines and drips. The costs associated with injecting
27 corrosion inhibitors, changing pressure charts, and maintaining alarms and gauges
28 are also covered in this activity as well as operating the underground storage
29 compressor stations. For example, these costs include those associated with
30 starting and monitoring engines, lubricating, checking pressures, cleaning, etc.

1 Equipment Operation and Maintenance:

2 These costs include salaries and expenses for maintenance work
3 performed at compressor stations at the underground storage fields. For
4 compressor stations, the work ranges from the repair of an oil leak to a major
5 overhaul of a compressor engine. Other maintenance categories include: work on
6 measuring and regulating equipment; and work on equipment used for purifying,
7 dehydrating, and conditioning natural gas, and the wastewater disposal systems.

8 Structural Improvements, Rents, Royalties:

9 This activity includes salaries and expenses for maintenance work
10 performed on compressor station structures at underground storage facilities along
11 with rental costs for property used in connection with underground storage.
12 Royalty payments associated with gas wells and gas land acreage located at
13 underground storage properties is also included.

14 Maps and Records:

15 These activities are associated with maintaining maps and land records
16 related to storage operations. Typical types of work performed include: surveys
17 and documentation of wells, pipelines, topography, roads, rights-of-way, various
18 infrastructure and easements boundary verification, and creation and maintenance
19 of maps related to underground zones/rights.

20 Compressor Station Fuel and Power, Gas Losses:

21 This area includes costs for fuel and power used to operate storage
22 reservoirs and compressor stations. The cost of natural gas and power used as
23 fuel to operate the compressors and other equipment necessary to operate the
24 storage fields is adjusted out and excluded from this testimony because these costs
25 are included in the Biennial Cost Allocation Proceeding (BCAP). In the same
26 manner, all recorded gas loss quantities associated with field operation activities

1 are similarly excluded from this general rate case due to cost recovery in the
2 BCAP. All other power costs, including the cost of electricity used in office
3 buildings, etc., are included in historical data and forecasts in my testimony.

4 Other Storage Expenses:

5 This area includes miscellaneous underground storage operating costs not
6 included in the categories above such as well safety and technical training costs
7 for underground storage personnel and emission credit costs. These emission
8 credit costs consist primarily of the cost to purchase RECLAIM credits. The
9 South Coast Air Quality Management District (SCAQMD) RECLAIM program
10 requires facilities with stationary combustion sources to reduce NOx emissions
11 and/or acquire emission credits to meet pre-determined emission limits.

12 **D. Challenges and Opportunities**

13 The cost-effective delivery of storage service requires coordinated effort
14 from the top to the bottom of the Storage organization. Examples are the
15 installation of exhaust catalysts and new combustion technology that help to
16 control the amount of emission credits needed and the associated costs;
17 computerized engine controls provide for quicker and smoother warm-up periods
18 for the engines, reducing the wear and tear normal to that process; new drilling
19 technology is being utilized to reduce the cost of maintaining and expanding
20 storage capacity.

21 A significant factor that has enabled the addition of substantial storage
22 capacity while holding the line on costs is the continued implementation of
23 electronic monitoring and control systems. These systems monitor pressures,
24 temperatures, vibrations, tank levels, and other variables at the compressors,
25 dehydration plants, tank farms, and wells. These systems free up operating
26 personnel to perform tasks other than take manual readings while enabling
27 real-time monitoring to detect problems before they become serious. Storage has
28 implemented use of a computer system known as PI that collects data from
29 thousands of inputs, trends the data, produces reports on operating performance,

1 and provides notifications when trends fall outside established limits, thereby
2 allowing for more efficient management of the impacted processes.

3 Environmental compliance is a key area of focus in Storage Operations.
4 Ever-changing and complex environmental rules require an increasing number of
5 individuals and labor hours to fully comply with air, hazardous materials, water,
6 and natural resource regulations. In the area of air quality, the SCAQMD
7 designates three storage fields (Aliso Canyon, Honor Rancho, and Playa del Rey)
8 as Regional Clean Air Initiative Market (RECLAIM) facilities. The La Goleta
9 storage facility, located within the Santa Barbara County Air Pollution Control
10 District (SBAPCD), is not a RECLAIM facility. The goal of RECLAIM is to
11 reduce stationary NOx emissions from large sources to achieve the Federal Clean
12 Air Act air quality standards for the region through the use of an emissions credit
13 trading market. Under RECLAIM, a facility's reported annual emissions must be
14 equal to or below the total quantity of emission credits held. Because many of the
15 turbines and compressors at SoCalGas storage fields were installed decades ago,
16 they produce higher unit emissions compared to new equipment. As a result,
17 SoCalGas has been replacing equipment and installing emissions control devices,
18 where feasible, and acquiring NOx RECLAIM Trading Credits to meet
19 compliance targets.

20 All four storage fields are classified as Title V facilities under the Clean
21 Air Act, which imposes very stringent monitoring and reporting requirements. As
22 an example, any malfunction of any piece of equipment at these storage fields
23 under permit from the air district must be self reported.

24 Each storage facility has its own unique set of natural resource issues,
25 including accommodations due to wetlands, oak tree groves, migratory species of
26 fowl, and Monarch Butterflies. An example of increased costs Storage
27 Operations is experiencing to protect natural resources is the new requirement to
28 involve a professional biologist whenever catch basins at Aliso Canyon are
29 cleaned out. These catch basins are required by the Spill Prevention, Control, and
30 Countermeasure Plan, and are located in each natural drainage location in the
31 field. They are designed to catch any oil that could be released from a pipeline or

1 tank leak. Because they are natural drainages, they fill up with silt and must be
 2 cleaned out with excavation equipment at least once each year. Recently, a
 3 protected species of newt was found to live in the catch basins, and so now an
 4 outside biologist must be brought in to capture the newts in each catch basin prior
 5 to the excavation equipment working, and then release the newts back into the
 6 catch basins after the excavation work is completed. These type of activities are
 7 important to maintain a healthy environment, but do complicate the management
 8 and cost to operate the storage fields.

9 At each storage field, modifications are continually being made to routine
 10 maintenance, operations, and recordkeeping requirements to preserve the
 11 environment and comply with an ever-increasing and changing set of regulatory
 12 requirements.

13 **E. Incremental Funding Requirements**

14 **Table JDM 6**
 15 **O&M Non-Shared Services**
 16 **Testimony Section II**
 17 **(Thousands of \$2009)**
 18

SOCALGAS UNDERGROUND STORAGE			
A. Underground Storage	2009 Adjusted-Recorded	TY 2012 Estimated	Change
1. Underground Storage	26,997	28,939	1,942
Total	26,997	28,939	1,942

19
 20 **Greenhouse Gas Regulations:** State and federal Greenhouse Gas (GHG)
 21 regulations that will take effect in 2012 will require enhanced fugitive leak
 22 detection, monitoring, and repair practices as well as additional reporting and
 23 record-keeping requirements. Fugitive emissions are unintended gas leaks from
 24 various industrial pressurized equipment such as compressors, valves, pressure-
 25 relief systems, and wellhead manifolds. These new regulations will require
 26 modifications to existing procedures leading to increases in the frequency of leak
 27 detection surveys, enhanced monitoring, and leak repair requirements. These
 28 procedural enhancements will generate additional work scheduling and tracking
 29 requirements, along with an increased volume of data to be collected, analyzed,

1 reported and stored. These activities will apply additional workload on the
2 current Storage workforce to meet the new compliance requirements. To address
3 this increased workload we are planning to hire four Project Specialists to manage
4 the GHG mandated surveying, monitoring and reporting activities. These
5 activities will be subject to the two-way balancing account treatment, NERBA.
6 GHG policy and NERBA details are addressed in the Environmental Services
7 direct testimony of Ms. Lisa Gomez.

8 The change from 2009 recorded expenses to 2012 estimated expenses is
9 \$304,000 and is attributable to the addition of four Storage Operations Project
10 Specialists to provide support in complying with these GHG regulations.

11 **SCAQMD Rule 317: Clean-Air Act Non Attainment Fees.** Federal law
12 mandates air districts that fail to meet the federal Clean Air Act’s ozone standard
13 by 2010 to levy mitigation fees on facilities that emit NOx and VOC. It is
14 virtually certain that the SCAQMD area will not meet the ozone standard. Major
15 stationary sources with NOx and/or VOC emissions greater than a predetermined
16 baseline level will be assessed a mitigation fee for each ton in excess of the
17 threshold. SoCalGas Storage Operations has three storage facilities within the
18 SCAQMD (Aliso Canyon, Honor Rancho, and Playa del Rey) that qualify under
19 both the NOx and VOC provisions of Rule 317. Further details of this issue are
20 addressed in the Environmental Services testimony of Ms. Lisa Gomez.

21 The change from 2005-2009 average recorded expenses to 2012 estimated
22 expenses of \$754,000 is attributable to the fees associated with the Clean Air Act.
23 Fee calculation amounts are detailed in my workpapers.

24 **CPUC General Order 95 (G.O. 95): Overhead Electrical Line**
25 **Construction.** This regulation defines safe practices for constructing and
26 maintaining systems of utility poles and overhead wiring. SoCalGas owns over
27 500 poles and associated wire and transformers that are used only for its own
28 operations. Because these systems do not provide electric service to customers,
29 prior to 2009 they did not fall under General Order regulations for electric
30 utilities. However, under changes to General Order 95 “Rules for Overhead
31 Electric Line Construction” regulations that were adopted by the CPUC in D 09-

1 08-029 on August 20, 2009, these SoCalGas systems are now required to be
2 constructed and maintained in compliance with G.O. 95 requirements.
3 Compliance with these regulations requires enhanced inspection, maintenance,
4 and follow-up repairs.

5 The change from 2005-2009 average recorded expenses to 2012 estimated
6 expenses is \$120,000, attributable to G.O. 95 compliance activities in the field,
7 including work on overhead wiring, vegetation management, and pole testing.

8 Due to the frequency and severity of wildfires in recent years, SoCalGas
9 has adopted new procedures designed to prevent wildfires associated with the
10 electric distribution system at the storage fields. These new procedures will
11 require the overhead electrical system to be de-energized under certain dry,
12 high-wind conditions until the wind event subsides. Prior to re-energizing the
13 electrical system, it must be inspected by qualified personnel. Furthermore,
14 certain infrastructure is required to maintain constant compliance with AQMD
15 rules and regulations at the facility during the shutdowns, and that infrastructure
16 requires maintenance.

17 The change from 2005-2009 average recorded expenses to 2012 estimated
18 expenses is \$75,000 attributable to the increased costs of electrical system
19 maintenance and contractor inspection costs associated with wildfire prevention.

20 Engineering analysis of electrical systems throughout the storage fields is
21 required to ensure compliance with G.O. 95 and the safe and reliable operation of
22 the system. Typical evaluation/analysis includes protective device coordination
23 studies, power factor evaluation, and voltage-drop calculations. Examples of
24 other documentation needed are a switching schedule/procedure, as-built circuit
25 maps, and schematic diagrams

26 The change from 2005-2009 average recorded expenses to 2012 estimated
27 expenses is \$50,000 attributable to the increased costs of electrical system
28 evaluation and documentation.

29 **La Goleta Programmatic Vegetation Management Permit**
30 **Requirements.** Santa Barbara County is in the process of developing a
31 programmatic permit for management of vegetation at the La Goleta storage field.

1 La Goleta is located along the beach within the Coastal Zone, and has numerous
2 sensitive habitats, including some designated as ESAs (Environmentally Sensitive
3 Areas). The new requirements will include more involvement of biologists,
4 time-of-year limitations, and increased monitoring and reporting to County
5 agencies.

6 The change from 2005-2009 average recorded expenses to 2012 estimated
7 expenses is \$50,000 attributable to the increased costs to comply with permitting
8 requirements at the La Goleta storage field.

9 **Santa Barbara Area Pollution Control District (SBAPCD) Rule 333 -**
10 **Changes to Air Quality Regulations.** Revisions to this rule have imposed
11 increased requirements for emissions testing and catalyst installations for
12 stationary internal combustion engines. The revised regulations prohibit pre-
13 testing and tuning-up of the engines prior to the official emissions test, and
14 impose a requirement that, if an engine fails the quarterly test, it will be subject to
15 monthly tests. The compressor engines at La Goleta are over 80 years old (they
16 were moved from a line compressor station to La Goleta in 1941) and Storage has
17 retrofitted these engines with modern control systems, but the engines were not
18 designed to meet current emissions standards or to work with modern control
19 systems, so the probability of failing a test is high. Part of the increase in
20 forecasted costs is to cover more frequent testing and part is for more frequent
21 change-out of the catalysts to reduce the probability of failing emission tests.

22 The change from 2005-2009 average recorded expenses to 2012 estimated
23 expenses is \$100,000 attributable to compliance work associated with SBAPCD
24 Rule 333.

25 **Operation Support for New Playa del Rey Dehydration Plant**

26 The dehydration plant is a substantial addition to the Playa del Rey storage
27 facility that has been under construction for several years and will go into service
28 in 2010. One additional employee will be required to operate and maintain the
29 complex instrumentation and controls in the plant. The change from 2009
30 recorded expenses to TY 2012 estimated expenses is \$80,000 attributable to labor

1 and non labor expenses to fund an additional technician to operate and maintain
2 the Playa del Rey dehydration system.

3 **Storage Operations Staff Support**

4 Storage Operations finds itself having to operate with some very old data
5 management applications. Recent upgrades to these applications have been made
6 to meet updated management requirements and take advantage of newer
7 enterprise-wide systems. To support this an additional project manager is
8 required to coordinate the ongoing Storage Operations activities with the
9 integration of these newly developed enterprise-wide business solutions. This
10 person would evaluate the new applications to determine how Storage Operations
11 could most effectively leverage new technology and procedures. Additionally,
12 this person would evaluate current organizational practices and procedures to
13 determine if modifications are necessary to more-readily integrate the new
14 business solutions opportunities.

15 The change from 2009 recorded expenses to TY 2012 estimated expenses
16 is \$95,000 attributable to labor and non labor expenses to fund an additional
17 project manager to integrate Storage Operations with new business solutions.

18 **III. SHARED SERVICES**

19 There are no Shared Services activities in the Storage organization.

20 **IV. CAPITAL**

21 **A. Introduction**

22 The capital costs described in this section cover the capital expenditures
23 estimated for SoCalGas' Storage operations. The driving philosophy behind
24 SoCalGas' capital expenditure plan is to provide safe, reliable delivery of natural
25 gas to customers at the lowest reasonable cost. These investments also enhance
26 the efficiency and responsiveness of operations, and ensure compliance with all
27 applicable regulatory and environmental regulations.

28 Upward pressures on capital costs are much the same as have been
29 discussed for O&M expenses. Examples include Budget Category 419 where
30 there are costs for work in the Storage fields to meet new General Order 95

“Rules for Overhead Electric Line Construction”, the regulations related to electric pole replacements. Also, in Budget Category 411, nearly \$1 million is estimated for catalyts to be retrofitted to compressor engines to meet the requirements of AQMD Rule 1110.2.

Overall, Storage Operations capital spending in TY 2012 is expected to be approximately 9% less than in base year 2009 while still providing for upgrades and replacements necessary for safe and efficient storage operations that are in full regulatory compliance.

**Table JDM -7
Capital Expenditures
(Thousands of 2009 dollars)**

Category Description	2009 Recorded	2010 Estimated	2011 Estimated	2012 Estimated
1. ..BC 4X1 – Gas Transmission – Storage – Compressor Stations	7,489	4,430	6,851	6,851
2. ..BC 4X2 – Gas Transmission – Storage - Wells	5,651	11,055	7,616	7,616
3. ..BC 4X3 – Gas Transmission – Storage - Pipelines	4,303	4,222	3,493	3,493
4. ..BC 4X4 - Gas Transmission – Storage - Purification	10,015	2,031	4,191	4,191
5. ..BC 4X9 – Gas Transmission – Storage – Aux Equipment	6,159	5,923	9,454	8,445
Total Capital:	\$33,617	\$27,660	\$31,605	\$30,596

B. Capital Requirement Detail

1. Budget Codes: 401, 411, 421, 431

**Table JDM - 8
Capital Expenditures
(Thousands of 2009 dollars)**

Description	2009 Adjusted Recorded	2010 Estimated	2011 Estimated	TY 2012 Estimated
BC 4X1 – Gas Transmission – Storage – Compressor Stations	7,489	4,430	6,851	6,851

1 This Budget Category presents necessary capital maintenance,
2 replacements, and upgrades at the various storage field compressor stations to
3 ensure safety, maintain or improve reliability, and to meet the required capacities
4 of the main compressor units. These units raise the pressure of natural gas for
5 injection into the underground storage reservoirs. Examples of the type of
6 equipment that would be included in this area are natural gas turbine engines,
7 high-pressure industrial gas compressors, compressed air system equipment, fire
8 suppression systems, scrubbers, and instruments to measure gas pressure,
9 temperature, humidity, and contaminant content.

10 The forecast for 2010 is based on the capital budget amount for fifteen
11 specific projects. Two projects warranting stand-alone workpapers
12 (accompanying this testimony) are:

13 Honor Rancho – Overhaul Main Unit #5 \$1.6 million (total in
14 2010-2011)

15 The overhaul of HR Main unit #5 serves to extend the life and reliability of the
16 main unit compressor by performing a 10-year overhaul of the engine and
17 compressor. Each main unit injects approximately 50 MMcf/d gas into Honor
18 Rancho Storage Field (20% of total injection rate). Unplanned down-time due to
19 equipment failure could have substantial impact on the field's ability to
20 effectively serve customers.

21 Aliso Canyon Turbine-Driven Compressors (TDC) \$4.2 million (total in
22 2010 through 2012)

23 The Aliso Canyon TDC project is required due to a delay in the issuance
24 of the Aliso Canyon Turbine Replacement Certificate of Public Convenience and
25 Necessity (CPCN), as compared to the previously anticipated issuance date. This
26 deferral necessitates additional capital expenditures in order to keep the TDC's
27 reliable and in service until replacement. These significant projects result from
28 the replacement delay of at least 1 year due to the EIR requirement in the CPCN
29 proceeding.

30 Two other noteworthy projects in this Budget Category are for catalyst
31 installations on main compressor units. One is at the Aliso Canyon storage field,

1 budgeted at \$446,000 to comply with Rule 1110.2. A similar installation is also
2 planned for the Honor Rancho facility costing \$503,000. Both projects are
3 scheduled in 2010.

4 The forecasts for years 2011 and 2012 are the average five years of
5 recorded costs in this Budget Category during years 2005-2009.

6 **2. Budget Codes: 402, 412, 422**

7
8 **Table JDM - 9**
9 **Capital Expenditures**
10 **(Thousands of 2009 dollars)**

11

Description	2009 Adjusted Recorded	2010 Estimated	2011 Estimated	TY 2012 Estimated
BC 4X2 – Gas Transmission – Storage - Wells	5,651	11,055	\$7,616	7,616

12
13 This Budget Code includes costs associated with replacing failed
14 components on existing wells and drilling replacement wells for the injection and
15 withdrawal of natural gas from underground storage facilities, including wells
16 used for observation. This includes hiring well workover contractors (major
17 maintenance of wells), and drilling contractors and purchasing materials such as
18 tubing, casing, and valves. SoCalGas has storage wells in service that are up to
19 80 years old. Some portions of SoCalGas' storage reservoirs contain
20 unconsolidated sand that can flow out with the gas at high velocity, causing
21 erosion. The combined effect of corrosion, erosion, and the effects of wide
22 variation in temperature and pressure on elastomer seals and cement, all take their
23 toll on storage wells over many years. In many cases it is more cost-effective to
24 replace the deliverability of a worn out well by drilling a new well rather than
25 costly repairs of an old well.

26 The forecast for 2010 is based on the capital budget for this Budget
27 Category which consists of eight specific projects. Three of these projects
28 warrant separate workpapers. They are:

29 Leaking Wellhead Equipment Replacements \$1.1 million (2010)

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Typically, three to four storage wells will require leaking wellhead equipment replacements and upgrades in a given calendar year. These wellhead replacements or upgrades are required on the existing 300+ aging wells throughout the storage fields. In the leaking condition, the wells pose a safety and environmental risk and have to be removed from service and thus will reduce the deliverability of the field until the wellhead equipment replacement/upgrade is performed.

Two Well Replacements per year \$7.0 million (each year)

The scope of this project is to replace two storage wells per year through at least the next seven years. Wells require replacement for a number of reasons, but replacements are primarily driven by factors associated with age or time in service, the continued integrity of the geological formation, and numerous other factors that adversely affect operating costs.

Expended Tubing Replacement \$901,000 (2010)

Typically, three to four storage wells will require expended well production tubing replacements in a given calendar year. These tubing replacements are required on the existing 300+ aging wells throughout the storage fields. The cost of the expended well tubing replacement projects include the new tubing, all of the services involved to secure the well while the tubing is removed, and the equipment and well services required for the well tubing removal and reinstallation operations.

The forecasts for years 2011 and 2012 are based on the five-year average recorded costs in years 2005 through 2009 with the exception that costs pertaining to “Cushion Gas” in 2005 and 2006 were removed from trended amounts due to the fact they were handled in a separate CPUC proceeding.

1 **3. Budget Codes: 403, 413, 423, 433**

2
3 **Table JDM - 10**
4 **Capital Expenditures**
5 **(Thousands of 2009 dollars)**

6

Description	2009 Adjusted Recorded	2010 Estimated	2011 Estimated	TY 2012 Estimated
BC 4X3 – Gas Transmission – Storage - Pipelines	4,303	4,222	3,493	3,493

7
8 SoCalGas is required to perform necessary pipeline maintenance,
9 replacements, relocations, and upgrades at the various storage fields to ensure
10 safety, maintain or improve reliability, and to meet the required capacities of the
11 various piping systems. This section forecasts costs associated with natural gas
12 pipelines used wholly or predominantly for conveying natural gas from
13 transmission or field lines to underground storage injection wells, and from the
14 underground storage withdrawal wells to the point where the natural gas enters
15 the transmission or distribution system. Included are the costs associated with
16 pipe, valves, fittings, and related cathodic protection equipment for these lines.
17 The forecasts for 2011 and 2012 are the result of averaging recorded costs in
18 years 2005-2009 to which is added new costs for Pipeline Integrity work in the
19 storage fields and a project to build a necessary pipeline span support bridge.
20 Specific large projects included in the estimates are:

21 Aliso Canyon Valve Replacement Program \$898,000 (per year)

22 Many valves (block, well site, safety, etc.) in the Storage Field are leaking and
23 new ones cost less than or equal to the cost of repair. This project will replace
24 approximately 5% of the larger field valves every year (e.g. replace valves
25 approximately every 20 years). This project will continue in each year after the
26 GRC cycle.

27 Honor Rancho High Pressure Production Pipeline \$2.7 million
28 (total in 2009-2010)

29 This project replaces an existing pipeline at Honor Rancho that has been de-rated
30 due to corrosion.

1 Aliso Canyon FF38 Span Bridge \$1.2 million (per year in 2011
2 and 2012)

3 This project will relocate an existing pipe rack out of an area with an active
4 landslide and soil erosion that is threatening several existing pipe supports. The
5 loss of this pipe rack would result in loss of approximately 635 MMcf/d of
6 withdrawal capability, and the impact on injection capability would also be
7 substantial.

8 **4. Budget Codes: 404, 414, 424, 434**

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10 **Table JDM - 11**
11 **Capital Expenditures**
12 **(Thousands of 2009 dollars)**

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Description	2009 Adjusted Recorded	2010 Estimated	2011 Estimated	TY 2012 Estimated
BC 4X4 - Gas Transmission – Storage - Purification	10,015	2,031	4,191	4,191

14
15 This Budget Category shows forecasts for costs associated with equipment
16 used primarily for the removal of impurities from, or the conditioning of, natural
17 gas withdrawn from underground storage fields. Some examples of the type of
18 equipment included in this area are dehydrators, coolers, scrubbers, boilers,
19 pumps, valves, piping, power supply, controls, and instrumentation.

20 The forecast for 2010 is based on the capital budget for this Budget
21 Category, which consists of six specific projects ranging in cost from \$101,000 to
22 \$897,000. Specific large projects included in the estimates are:

23 Playa del Rey Dehydration Unit \$897,000 (2010)

24 This project began construction in 2009 and will be completed in 2010. It
25 provides the necessary process system to reduce the water content of the gas
26 withdrawn from the PDR storage field to necessary levels. This project consists
27 of the installation of a tri-ethylene glycol (TEG) dehydration system for the
28 removal of water from natural gas. The main equipment consists of two 6 ft
29 diameter x 30 ft tall contactor vessels, one 5 MMBTU and one 2 MMBTU hot oil

1 heaters, a glycol regeneration skid for removing the water from the glycol, and
2 various pumps, filters, etc.

3 The forecasts for years 2011 and 2012 are five-year averages of costs in
4 this Budget Category that were incurred in recorded years 2005 through 2009.

5 **5. Budget Codes: 409, 419, 429, 439**

6
7 **Table JDM - 12**
8 **Capital Expenditures**
9 **(Thousands of 2009 dollars)**

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Description	2009 Adjusted Recorded	2010 Estimated	2011 Estimated	TY 2012 Estimated
BC 4X9 – Gas Transmission – Storage – Aux Equipment	6,159	5,923	9,454	8,445

11
12 This budget code includes work on various types of field equipment not
13 captured in other budget codes such as instrumentation, measurement, controls,
14 electrical, drainage, infrastructure, transportation, safety, and communications
15 systems.

16 The forecast for 2012 is based on the capital budget for this Budget
17 Category, which includes funds for twenty-five projects that range in cost from
18 \$51,000 to \$3.6 million. The forecast for years 2011 and 2012 is based on the
19 five-year average of recorded costs in years 2005-2009 to which is added, in 2011
20 and 2012, the cost of compliance with new General Order 95 requirements
21 including extensive modification to the power supply grid in the storage fields for
22 fire prevention purposes. Planned expenditures are \$1.8 million in both 2011 and
23 2012. Also added to the average in 2011 is the cost of upgrading three Motor
24 Control Centers (MCCs) in the Aliso Canyon Storage field, whose failure could
25 result in substantial loss of injection/withdrawal capacity. These units are decades
26 old and are additive because such costs do not appear in historic spending. The
27 cost of the MCC upgrades is \$1 million in 2011 only.

1 **V. CONCLUSION**

2 The forecasts of the O&M expenses and planned capital expenditures represented
3 in this testimony are appropriate and prudently derived and should be adopted by the
4 Commission. In this testimony, the requirements were presented to meet SoCalGas'
5 goals to maintaining safety and reliability of the gas storage infrastructure for both O&M
6 expenses and capital expenditures. The O&M and capital expenditures discussed in this
7 testimony are required to ensure public safety, to cost-effectively meet customer needs,
8 and to meet mandated regulatory requirements. These forecasts reflect sound judgment
9 and represent the significant impact that federal, state, and local legislation and
10 regulations will have on SoCalGas' storage fields.

11 This concludes my revised prepared direct testimony.
12

1 **VI. WITNESS QUALIFICATIONS**

2 I am employed by Southern California Gas Company (“SoCalGas”) as the
3 Storage Engineering Manager. I am responsible for reservoir engineering and drilling
4 and well workover operations at all of SoCalGas’ gas storage fields, as well as the
5 decommissioning operations at the Montebello and East Whittier storage fields.

6 I graduated with a B.S. in Civil Engineering from Purdue University in 1979, and
7 an M.S. in Petroleum Engineering from USC in 1985. I am a Registered Petroleum
8 Engineer in the State of California. I was employed by SoCalGas beginning in 1981,
9 starting as a Drilling Engineer. I have since been assigned to a number of positions in
10 Transmission and Storage, including Storage Field Engineer, District Pipeline Supervisor,
11 Project Superintendent, Pipeline Superintendent, Drilling Manager, and Pipeline
12 Operations Manager. I have previously testified before this Commission.

13

CHANGE LOG FOR ERRATA

Exhibit	Witness	Page	Line	Errata Item
SCG-04	Mansdorfer	JDM-1	12	Changed TY2012 O&M forecast from \$28,859,000 to \$28,939,000 to coincide with changes to workpaper.
SCG-04	Mansdorfer	JDM-1	Table JDM 1	“Total Non-Shared” row, “2009 Adjusted-Recorded” column, changed value from 26,595 to 26,997, reflecting change to workpaper.
SCG-04	Mansdorfer	JDM-1	Table JDM 1	“Total Non-Shared” row, “TY 2012 Estimated” column, changed value from 28,859 to 28,939, due to change to workpaper.
SCG-04	Mansdorfer	JDM-1	Table JDM 1	“Total Non-Shared” row, “Change” column, changed value from 2,264 to 1,942, correcting increase from 2009 to 2012 values.
SCG-04	Mansdorfer	JDM-1	Table JDM 1	“Total O&M” row, “2009 Adjusted-Recorded” column, changed value from 26,595 to 26,997, correcting column total.
SCG-04	Mansdorfer	JDM-1	Table JDM 1	“Total O&M” row, “TY 2012 Estimated” column, changed value from 28,859 to 28,939, correcting column total.
SCG-04	Mansdorfer	JDM-1	Table JDM 1	“Total O&M” row, “Change” column, changed value from 2,264 to 1,942, correcting column total.
SCG-04	Mansdorfer	JDM-1	19	Changed TY2012 O&M estimate from \$28,859,000 to \$28,939,000 to coincide with changes to workpaper.
SCG-04	Mansdorfer	JDM-2	13	Updated TY2012 increase from 5-year average for Non Labor from \$1,154,000 to \$1,234,000 due to changes in workpaper.

SCG-04	Mansdorfer	JDM-9	13	Changed title from “Table JDM 4” to “Table JDM 5” due to duplicate table numbering.
SCG-04	Mansdorfer	JDM-14	14	Changed title from “Table JDM 4” to “Table JDM 6” due to duplicate table numbering.
SCG-04	Mansdorfer	JDM-7 JDM-9 JDM-14	Table JDM 2 Table JDM 5 Table JDM 6	“A. Underground Storage” row, “2009 Adjusted-Recorded” column, changed value from 26,595 to 26,997, reflecting change to workpaper.
SCG-04	Mansdorfer	JDM-7 JDM-9 JDM-14	Table JDM 2 Table JDM 5 Table JDM 6	“A. Underground Storage” row, “TY 2012 Estimated” column, changed value from 28,859 to 28,939, due to change to workpaper.
SCG-04	Mansdorfer	JDM-7 JDM-9 JDM-14	Table JDM 2 Table JDM 5 Table JDM 6	“A. Underground Storage” row, “Change” column, changed value from 2,264 to 1,942, correcting change from 2009 to 2012 values.
SCG-04	Mansdorfer	JDM-7 JDM-9 JDM-14	Table JDM 2 Table JDM 5 Table JDM 6	“Total” row, “2009 Adjusted-Recorded” column, changed value from 26,595 to 26,997, correcting column total.
SCG-04	Mansdorfer	JDM-7 JDM-9 JDM-14	Table JDM 2 Table JDM 5 Table JDM 6	“Total” row, “TY 2012 Estimated” column, changed value from 28,859 to 28,939, correcting column total.
SCG-04	Mansdorfer	JDM-7 JDM-9 JDM-14	Table JDM 2 Table JDM 5 Table JDM 6	“Total” row, “Change” column, changed value from 2,264 to 1,942, correcting column total.
SCG-04	Mansdorfer	JDM-19	9	Changed title from “Table JDM 4” to “Table JDM 7” due to duplicate table numbering.
SCG-04	Mansdorfer	JDM-19	15	Changed title from “Table JDM 5” to “Table JDM 8” due to duplicate table numbering.
SCG-04	Mansdorfer	JDM-21	8	Changed title from “Table JDM 6” to “Table JDM 9” due to duplicate table numbering.
SCG-04	Mansdorfer	JDM-23	3	Changed title from “Table JDM 7” to “Table JDM 10” due to duplicate table numbering.

SCG-04	Mansdorfer	JDM-24	10	Changed title from "Table JDM 8" to "Table JDM 11" due to duplicate table numbering.
SCG-04	Mansdorfer	JDM-25	7	Changed title from "Table JDM 9" to "Table JDM 12" due to duplicate table numbering.
SCG-04-WP	Mansdorfer	14 of 20		"ERRATA" item added to workpaper to adjust for an invoice payment for 2009 expenses but paid and booked in 2010.

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