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OFFICE OF RATEPAYER ADVOCATES
CALIFORNIA PUBLIC UTILITIES COMMISSION

Prepared Testimony on Southern California Gas Company and San Diego Gas & Electric Company Application for Pipeline Safety and Reliability Memorandum Account (PSRMA) Cost Recovery

ORA Supporting Attachments
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DIVISION OF RATEPAYER ADVOCATES
CALIFORNIA PUBLIC UTILITIES COMMISSION

DRA Report on the Pipeline Safety Enhancement Plan of Southern California Gas Company and San Diego Gas & Electric Company

Hydrostatic Pressure Test Costs

San Francisco, California
June 19, 2012

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I. SCOPE OF TESTIMONY

In Decision 11-06-017, the Commission describes several elements that each natural gas operator must include with their proposed Pipeline Safety Enhancement Plans. Among those, the Commission directed the utilities to provide the "...best available expense and capital cost projections for each Plan component..."[1] Pursuant to that order, Southern California Gas Company (SoCalGas) and San Diego Gas & Electric Company (SDG&E), collectively referred to as Sempra, or the Sempra utilities, provided testimony relating to their "Pressure Testing Cost Estimating Methodology and Assumptions."[2]

In this report, the Division of Ratepayer Advocates (DRA) reviews Sempra's hydrotest cost estimate, and presents its findings that the cost estimate is generally unsupported or excessive, and recommendations for Commission consideration of Sempra's proposed costs. This testimony reviews only the cost of performing tests, even though the cost of repairs resulting from hydrotesting is included in Sempra's testimony. DRA's testimony on repair costs is included in Exhibit 2.

II. REVIEW OF SEMPRA'S HYDROTEST COST ESTIMATE

A. Overview and terminology

Sempra's Pipeline Safety Enhancement Plan (sometimes referred to as Plan or PSEP) includes 27 hydrotest projects in Phase 1A, each of which is identified by the line number of the pipeline being tested.[3] Sempra's workpapers refer to a "test

[1] *Decision Determining Maximum Allowable Operating Pressure Methodology and Requiring Filing of Natural Gas Transmission Pipeline Replacement or Testing Implementation Plans* (2011) D.11-06-017, Ordering Paragraph 9.

[2] Amended Testimony of Southern California Gas Company and San Diego Gas & Electric Company in Support of Proposed Natural Gas Pipeline Safety Enhancement Plan (Amended Testimony), Appendix D.

[3] See Amended Workpapers: SoCalGas transmission, 17 projects, WP-IX-1-5; SoCalGas distribution, 8 projects, WP-IX-1-9; SoCalGas storage, 2 projects, WP-IX-1-13; SDG&E transmission, no Phase 1A projects, WP-IX-1-17; SDG&E distribution, 1 project, WP-IX-1-

(continued on next page)

segment" as a physically contiguous section of pipeline that is pressurized at the same time. A test segment is a subset of a hydrotest project, and 14 proposed hydrotest projects have more than one test section.[4]

B. Cost model overview

Sempra requests a total of $175.2 million for hydrotesting in Phase 1A of the Plan.[5] This cost is obtained as the sum of the total estimated costs for 27 projects, as estimated by Sempra's consultant SPEC. A workpaper for each project was provided except for SoCalGas storage projects,[6] and estimating assumptions were listed in Appendix D of Sempra's amended testimony. Sempra describes the cost estimates as "all-inclusive."[7]

DRA obtained the SPEC workpapers in MS excel format to 1) better understand the model used by SPEC to estimate hydrotest costs; 2) verify that the estimating assumptions in Appendix D were implemented as stated; 3) uncover other assumptions that might not have been explicitly listed in Appendix D; and 4) to group costs into fixed and variable costs for comparison to PG&E cost estimates. An overview of SPEC's cost model is provided here, and a critique and comparison to other cost data is provided in Section III.

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[4] The number of test segments is provided on the SPEC cost estimate for each project. DRA workpaper TCR-WP1 compiles the number of test segments for all Sempra planned hydrotests.

[5] This is the sum the costs cited in footnote 3 above. The difference between this figure and the values in the testimony (Table IX-1 and IX-2) is that $6.6 million for repairs is not included.

[6] Sempra's response to data request DRA-TCR-2, Question 1-1 indicated that SPEC did not provide cost estimates for the two SoCalGas storage projects. Sempra provided cost estimates for these two projects on June 15, 2012, but not in the MS Excel format requested, and not in sufficient detail to verify the costs provided in the Amended Workpapers, p.WP-IX-1-13.

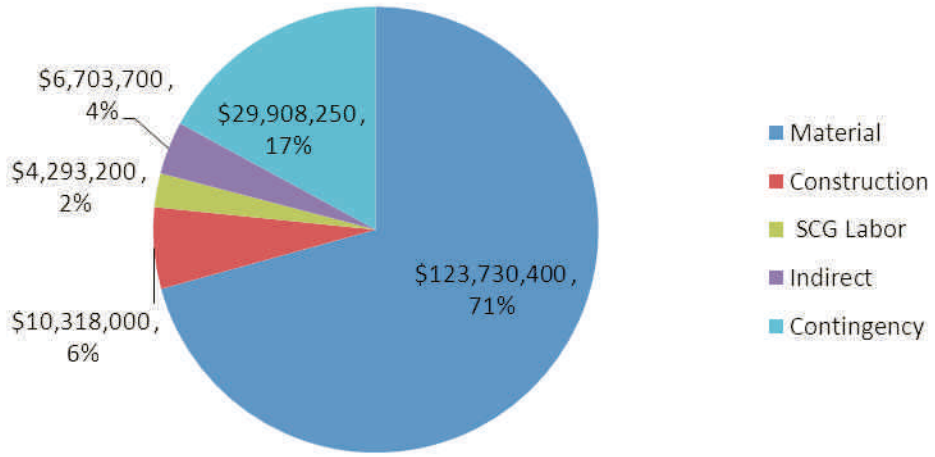
[7] Amended Testimony, p.103, lines 16-17.

The cost estimate model applied by SPEC is the same for both SoCalGas and SDG&E pipelines, and includes the following major cost components:[8]

- Materials - including water and equipment rental
- Construction – including all labor costs, including third-party witness
- SCG Labor/Inspection
- Design/Engineering/Permits/Environmental
- Contingency

The following chart illustrates the Sempra's hydrotest cost estimate is driven primarily by material costs:[9]

Figure 1 - Breakdown of total hydrotest costs, as estimated by Sempra



Each type of cost is further defined in the following sections.

[8] Sempra indicated in the May 30, 2012 workshop in this proceeding that there are no significant differences between the hydrotest procedures used on SoCalGas and SDG&E pipelines.

[9] This figure omits $1.2 million for SCG storage projects, for which SPEC did not provide workpapers. Refer to footnote 6 above.

C. Material costs

Sempra's cost estimate includes both fixed and variable costs for consumable materials and rental fees. A fixed material cost of $25,000 is estimated each hydrotest project for a "Temporary Pig Launcher/Receiver."[10] This cost appears to be for a "temporary launcher and receiver"[11] which will be used to fill and drain the line,[12] and provide access for swabbing pigs used to dry the line.[13] Four of the test projects have two diameters of pipe, and for these projects a second fixed charge of $25,000 is applied.[14] This cost does not depend on the size of pipe tested. Sempra did not provide further justification for this cost, even in response to a DRA data request.[15] The fixed material costs also include rental costs for a vacuum truck ($5,000) and pump ($486) to fill the pipeline with water and pressurize it, as these costs are estimated at a fixed rate of one per test section. [16]

The majority of material costs are for water supply and disposal, and for equipment to store, filter, and transport it. These are variable costs tied either directly or indirectly to the volume of pipeline being tested. Supplying clean water to fill the line and disposing of the water upon test completion are the largest costs, and these costs are tied directly to the volume on the line, at an estimated cost of $19 per

---

[10] The number of temporary launcher and receivers is provided on the SPEC cost estimate for each project. DRA workpaper TCR-WP1 compiles these costs for all Sempra planned hydrotests..

[11] Amended Testimony, Appendix D, p. D-1, lines 32-34.

[12] Ibid, pp. D-1 to D-2, lines 36 - 11.

[13] Ibid, p. D-2, lines 13-16.

[14] Refer to Amended Workpapers for projects on lines 406 (p. WP-IX-1-A23), 1005 (p. WP-IX-1-A41), 1013 (p. WP-IX-1-A48), and 2000 (p. WP-IX-1-A67).

[15] Response to DRA-TCR-3, Question 3.1(b). Refer to Appendix F of this exhibit.

[16] Project 38-528 includes the cost for a second vacuum truck for an additional $5,000, but no justification is provided. Refer to Amended Workpapers p. WP-IX-1-B128. Variations are also noted on the cost for pump rental. For example, the test for line 4000 (WP-IX-1-A88) includes 2 days rental for a single test section while the test of line 404 (WP-IX-1-A18) includes 5 days rental for 13 test sections. Since the pump cost is low relative to other test costs, $486 per day, variations do not significantly impact the cost of a project.

barrel and $55 per barrel respectively.[17] Thus, for a given diameter and wall thickness of line, these costs are constant on a linear foot basis. Sempra's estimate "assumes the disposal of contaminated test water through Baker tanks with filtration and testing at an approved location."[18]

The remaining variable costs are also driven by pipe volume, but the calculation of these costs is more complicated and does not result in a constant cost per foot as discussed above for water supply and disposal. Baker tanks and vacuum trucks are used to remove water from the line, filter and treat the water, and transport the water to a disposal site. These costs are calculated based on a rental cost per day of $1,600 and $5,000 respectively. The number of rental days required depends on the volume of water in the line, the capacity of the tanks (500 barrels) and trucks (120 barrels), and a number of operational assumptions.[19] The fact that tanks and trucks are available only in fixed sized results in the indirect relationship between their cost and the volume of test water.

Sempra assumes that all lines are purged with nitrogen prior to test. The cost of the required gas is estimated based on the volume of the line and a cost of $.19 per standard cubic foot, but the cost calculation assumes that the line is purged between existing block valves, and that the minimum distance between these valves is 4 miles. Thus, the cost of gas is determined by the volume of the actual test section length or 4 miles of pipe, whichever is larger. Sempra's cost estimate does not include a cost for pigging lines to remove contamination in the lines prior to test. . Sempra indicated during the May 30, 2012 workshop at the CPUC that its lines are generally already clean due to ongoing cleaning performed in advance of inline inspection (ILI) runs.[20]

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[17] Sempra uses a price based on an "oil barrel" which is equal to 42 gallons or 5.615 cubic feet.

[18] Amended Testimony, p.D-2, lines 32-33.

[19] See Amended Testimony, p.D-2, lines 4-11.

[20] The workshop was help among parties to this proceeding and CPUC staff. Refer to Assigned Commissioner's Scoping Memo and Ruling in this proceeding dated February 24,

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Sempra estimates the costs for "air compressors, pigs, valves, fittings, disposables, etc." at 5% of the above material costs and classifies them as "Miscellaneous Materials."[21]

D. Construction non-company labor costs

Sempra estimates a fixed cost per test section which includes estimated contractor labor costs of $77,000 per test. This includes "mobilization, set-up, hydrotest work, clean-up, and purging of lines",[22] and also includes the cost tying the pipeline back in after the test is complete, and of a third party witness.[23] These estimated costs do not depend on the size of pipe tested.

E. SCG labor

"SCG Labor/Inspection" is applied as a percentage of construction and material costs. The percentage rate varies according to the size of the project:[24]

Table 1– Sempra proposed "SCG Labor/Inspection" rates

Project Size	SCG Labor/Inspection Rate
< $1 million	10%
$1 million <Project <$10 million	5%
Project >$10 million	2.5%

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2012, pp. 6-7.

[21] Amended Testimony, p.D-2, l. 18. The 5% is shown as the final line under Section 1 "Materials" in the workpaper for each project. For example, see Amended Workpapers, p. WP-IX-1-A3.

[22] Amended Testimony, Appendix D, p. D-3, lines 2-3.

[23] This is shown on the workpaper for each project under Section 2 "Construction". For example, see Amended Workpapers, p. WP-IX-1-A3.

[24] This is shown on the workpaper for each project under Section 3 "SCG Labor/Inspection". For example, see Amended Workpapers, p. WP-IX-1-A3

F. Other indirect costs

"Planning/Design/Engineering/Coordination/Procurement" is applied at a rate of 5% of construction and material costs. The SPEC cost model includes placeholders for ROW acquisition, permits, and environmental monitoring, but these costs are not applied for Sempra's Plan.[25]

G. Contingency

Sempra applies a contingency fee to each project. The contingency rate is 30% for small projects (<$2 million) and 20% for large projects.[26] Sempra's testimony does not provide justification for these rates, nor the risks they are intended to accommodate.

III. ANALYSIS

A. Sempra's cost model is significantly different from PG&E's, and also overestimates hydrotest costs

Sempra uses a simplified cost model which effectively captures the nature of hydrotesting: there are fixed costs for tests setup and variable costs that depend on the volume of pipeline tested. The MS excel version of the model provided to DRA made the assumptions and calculations relatively transparent. DRA found that that Sempra's workpapers uniformly and correctly implement the assumptions provided in testimony, with only minor exceptions.[27] However, Sempra's testimony lacks justification of critical unit costs, such as the cost of water supply, treatment, and disposal costs. It also lacks justification for key loading rates, such as SCG labor

[25] This appears as a 0% entry for these categories in Section 4 "Design/Eng./Cons./Environ." of the workpaper for each project, and zero cost for these categories. For example, see Amended Workpapers, p. WP-IX-1-A3.

[26] This is shown on the workpaper for each project under Section 5 "Contingency". For example, see Amended Workpapers, p. WP-IX-1-A3.

[27] The SCG Labor rate was not applied uniformly. Refer to Appendix F of this exhibit, Sempra response to DRA-TCR-2, Question 1-3.

and contingency. Sempra was unable to provide adequate justification for these costs, even in response to specific data requests from DRA, included in Appendix F. Sempra's project level hydrotest costs per mile range from $125k (Line 44-1008) to $517 million (Line 41-90). The wide range of project prices on a per foot basis is not unique to Sempra, and PG&E's PSEP contained an even wider range of costs.[28] The cost range is a natural result of projects with significant fixed costs per projects, and a wide range of pipe lengths which drive variable costs. The range is lower compared to PG&E since Sempra's fixed costs are significantly lower. Detailed analyses of each type of cost are provided in the following sections.

DRA's recent analysis of PG&E's Pipeline Safety Enhancement Plan revealed that hydrotest costs are best understood in terms of fixed costs that are incurred for each hydrotest, regardless of the length or diameter of a line, variable costs which vary with the volume of the pipe and the water required to pressurize it, and indirect costs which are generally applied to overall project costs. Based on DRA's review of SPEC's cost model, DRA grouped Sempra's costs into these categories according to the following table:

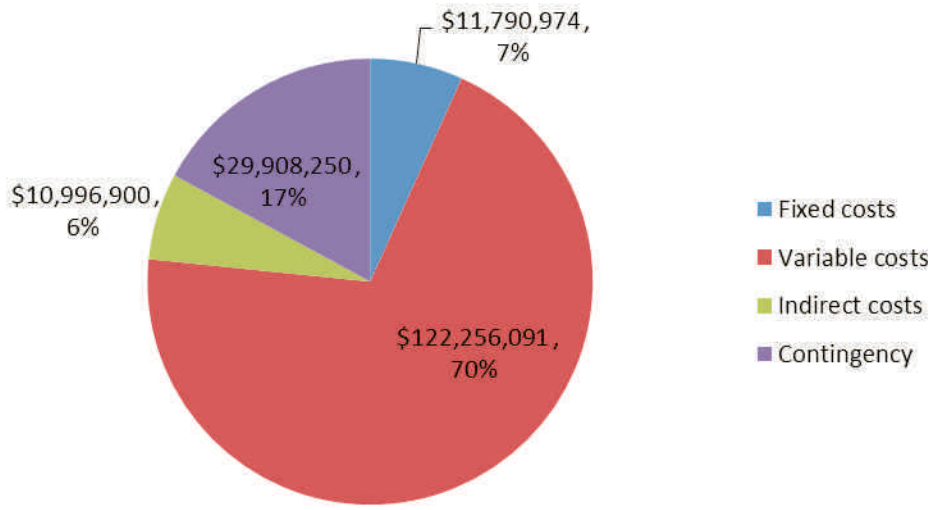
Table 2 - DRA mapping of Sempra's costs

Sempra Category	Fixed	Variable	Indirect
Temporary Pig Launcher/Receiver	X		
Water Injection Pump & Filter	X		
On-Site Vacuum Truck(s) for fill	X		
Other material costs		X	
Construction	X		
SCG Labor/Inspection			X
Design/Engineering/Permits/Environmental			X

Based on this mapping of costs, the following chart illustrates the Sempra's hydrotest cost estimate is driven primarily by variable costs:

[28] A.11-02-019 Exhibit 2, PG&E Opening Testimony, p 3-42, lines 1-2. Also see DRA Opening Brief in A.11-02-019 dated May 14, 2012, pp. 67-69.

Figure 2 - Breakdown of total hydrotest costs, reclassified by DRA



B. Sempra's variable hydrotest costs are ill-defined and excessive

The first step of DRA's analysis of Sempra's variable costs was to compare them to evidence provided in PG&E's Pipeline Safety Enhancement case, A.11-02-019. PG&E provided variable costs in two forms. First, in testimony PG&E provided the following "all-in" costs per foot:[29]

Table 3– PG&E estimated variable hydrotest costs

Pipe Size Range	PG&E Hydrotesting Costs per foot
10"	$30
16"	$39
24"	$45
36"	$59

These unit costs include substantial allowances for cleaning lines prior to testing, escalation at 3.12% for years beyond 2011, and indirect costs totaling more than

[29] A.11-02-019, Exhibit 2, PG&E Opening Testimony, p. 3E-17. PG&E's use of the term "all-in" cost is a misnomer since it does not include substantial fixed costs. See DRA Opening Testimony in A.11-02-019 dated January 31, 2011, Exhibit 144, p. 64, lines 6-10.

31% of direct costs.[30] This estimate builds upon an estimate of hydrotests provided by one of PG&E's contractors, ARB, which included costs to "fill and hydrotest" the lines and "clean and dry" them:[31]

Table 4– ARB estimated variable hydrotest costs

Pipe Size Range	ARB Hydrotesting Costs per foot
10"	$10
16"	$14
24"	$16
36"	$22

Sempra did not provide variable costs for specific sizes of pipes, so a few analytical steps were required to compare Sempra costs with those above. First, DRA calculated the average cost per test for nitrogen, Baker tanks and vacuum trucks, then added these average indirect variable costs to the direct variable costs (for water supply and disposal). DRA then converted the total variable costs to a cost per foot for the four specific pipe sizes used in PG&E's cost estimates. The result of these steps is provided in the following table:[32]

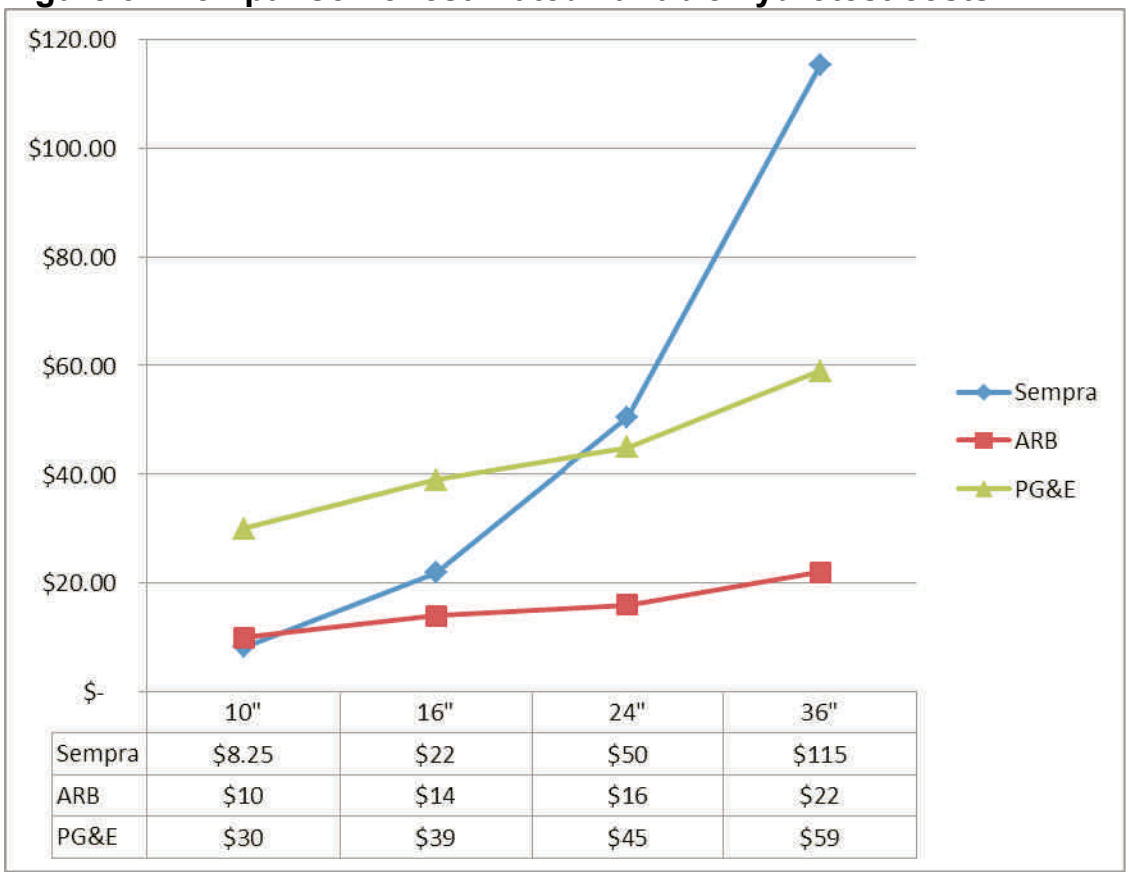
Table 5 – DRA estimate of Sempra variable hydrotest costs

Pipe Size Range	Sempra Hydrotesting Costs per foot
10"	$8.25
16"	$22
24"	$50
36"	$115

These costs do not include indirect costs or contingency fees. The following figure compares the cost estimates for Sempra, ARB and PG&E:

[30] A.11-02-019, Exhibit 2, PG&E Opening Testimony, pp. 3E-8 to 3E-10.
[31] A.11-02-019, Exhibit 56, PG&E response to DRA-61, Question 1, attachment 1, page 2.
[32] Calculation provided in DRA workpaper TCR-WP1.

Figure 3– Comparison of estimated variable hydrotest costs



	10"	16"	24"	36"
Sempra	$8.25	$22	$50	$115
ARB	$10	$14	$16	$22
PG&E	$30	$39	$45	$59

This chart illustrates that Sempra's cost model is fundamentally different from PG&E's. Sempra's exponential increase in cost as a function of pipe diameter is not surprising, since 70% of Sempra's costs are determined by the volume of water to be handled, and this volume increases with the square of the pipe diameter. This chart also illustrates that Sempra's variable costs are significantly higher than ARB's estimates for all sizes except 10" outside diameter (OD) pipes. DRA determined that Sempra's hydrotest plan has an average diameter of 26", so the larger sizes are the most relevant. Sempra's costs are even higher than PG&E's estimates for 24" and 36" pipes, even though PG&E's estimate includes an allowance for pre-test pipe cleaning that is included in Sempra's estimate.[33] To better understand Sempra's high costs, DRA investigated each component of Sempra's variable costs.

[33] This allowance for pre-test pipe cleaning is the largest single variable cost in PG&E's hydrotest cost estimate. See A.11-02-019, Exhibit 144, Opening Testimony of DRA Witness Thomas Roberts, p.75, Figure 11. Also DRA Opening Brief in dated May 14, 2012, pp. 85-

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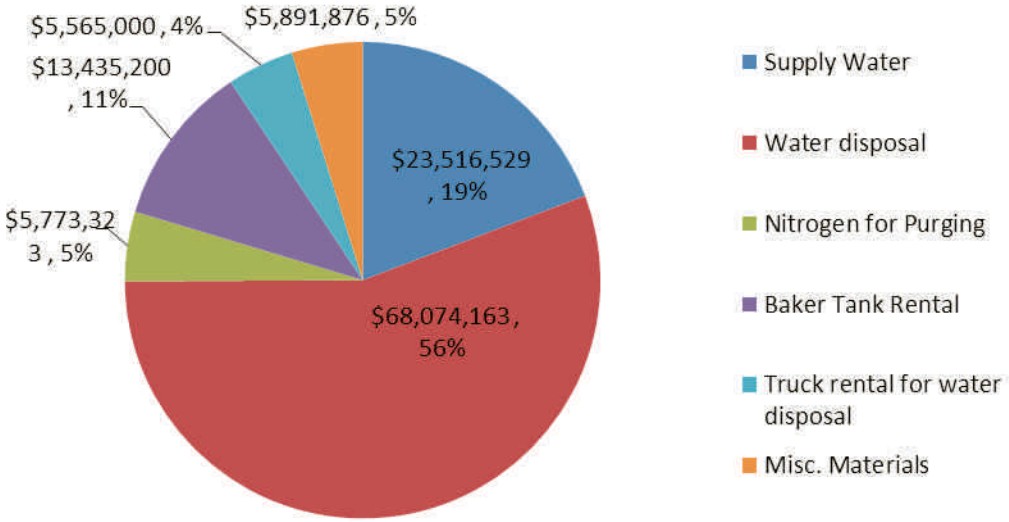
Figure 4– Breakdown of Sempra's estimated variable hydrotest costs



1. Water supply costs

Sempra estimates that supplying clean water for a test will cost $19 per barrel, or approximately $.45 per gallon. Sempra's estimate separately includes the cost of a vacuum truck and pump to fill the line, and states that the estimate "assumes on-site water supply will be available for purchase at one end of the pipeline segment."[34] Sempra's $.45 cost per gallon can therefore be compared to water from a tap or fire hydrant in a populated area which is typical of a Class 3 of HCA area, since the source is assumed to be on-site. To determine the reasonableness of this estimated cost, DRA first determined that the cost of residential tap water in the City of Oakland is $.005 per gallon, or ½ cent per gallon.[35] Sempra's proposed costs are nearly 100 times higher, which indicated that a more comprehensive survey should be performed.

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[34] Amended Testimony, p.D-1, lines 36-37. DRA interprets this statement as this condition will exist for most test sections, and that the additional costs that would be incurred where this assumption is not true will be covered by contingency.

[35] This is based on the highest residential rate of $2.83 and the highest elevation surcharge of $.88, both per unit of water or hundreds of cubic feet (HCF). One HCF is equal to 748 gallons. See http://www.ebmud.com/for-customers/account-information/water-rates-service-charges.

DRA contacted numerous water utilities and cities to better understand and quantify the costs associated with water supply for temporary construction projects such as hydrotests. The most common option is to get a hydrant meter, which generally includes a fee per "unit" of water used, and fixed costs for meter installation, account set up, monthly or bi-monthly meter reading, billing, and other fixed fees.[36] This is a typical source of water used for construction projects. The following is a summary of applicable rates for a random sample of water sources in California:[37]

Table 6– Results of DRA survey of water supply costs

Water Source	Upfront costs	Other fixed costs	Volumetric fee ($/HCF)	Volumetric fee ($/gal)	Cost for 50,000 gal	Total Cost ($/Gal)
LADWP Hydrant Meter, low use	$565.00	$ -	$ 3.00	$ 0.004	$ 765.53	$ 0.02
LADWP Hydrant Meter, high use	$565.00		$ 6.08	$ 0.008	$ 971.42	$ 0.02
City of Riverside Hydrant meter	$ 40.00	$ 271.20	$ 2.71	$ 0.004	$ 492.35	$ 0.01
City of San Diego, temporary construction	$ -	$ 136.74	$ 4.01	$ 0.005	$ 404.79	$ 0.01
Irvine Ranch WD, base use	$ -	$ 187.74	$ 1.22	$ 0.002	$ 269.29	$ 0.01
Irvine Ranch WD, high use	$ -	$ 187.74	$ 9.48	$ 0.013	$ 821.43	$ 0.02
Cochella Valley, max. temp. construction	$120.00	$ 125.00	$ 2.27	$ 0.003	$ 396.55	$ 0.01
EBMUD Hydrant Meter	$ 76.00	$ 327.00	$ 3.11	$ 0.004	$ 610.89	$ 0.01
SFPUC 3" Hydrant Meter	$125.00	$ 252.40	$ 5.10	$ 0.007	$ 718.31	$ 0.01

This table calculates the total cost per gallon including fixed costs for a usage of 50,000 gal, which is less than the volume of ½ miles of 24" OD pipe. The total cost per gallon will vary with the amount of water required per test, due to the upfront and fixed charges, and will be lower for longer test sections. DRA calculated that the average volume per test section in Sempra's Pipeline Safety Enhancement Plan is greater than 270,000 gallons, so the average water supply cost per gallon for Safety Enhancement tests will be less than this, approaching the volumetric fee. This survey indicates that Sempra should be paying approximately $.01 to $.02 per gallon for supply water, not $.45 as used in its Safety Enhancement estimate.

[36] One "unit" of water is 100 cubic feet or one "HCF". One HCF is equal to 748 gallons.
[37] Refer to Appendix A of this exhibit for details.

Sempra's estimated cost also assumes new potable water is purchased for each test. Other options which cost even less include reusing water from a previous hydro test or using reclaimed water.[38]

2. Water disposal process

Determination of a reasonable water disposal cost is much more complicated than supply water costs because 1) the level of contamination is not known at this time; 2) disposal costs depend on the level of contamination; 3) there are multiple disposal options available to Sempra, and 4) the disposal options and costs depending on where the test is performed. The overall disposal process involves the following steps:

1. Pumping water out of the pipeline test section,
2. Testing the water to determine levels of regulated contaminants,
3. Pre-treating the water, if required based on the level of contamination,
4. Transportation of the water to a disposal site, if more cost effective than local disposal,
5. Dumping the water into a permitted disposal site

These steps will be described in reverse order since the overall process is driven by permit requirements at the final point of disposal.

It is worth repeating that Sempra has been cleaning its lines as part of ILI testing, and that only clean water will be used to fill the lines for test. The "effluent" from hydrotesting should therefore be relatively clean such that all the disposal sources discussed below can potentially be used.[39]

[38] The Irvine Ranch Water District states that "[r]ecycled water sold for industrial purposes such as toilet flushing, cooling towers, composting, and concrete production, is sold for 40 percent less than potable water." See http://www.irwd.com/customer-care/understanding-your-bill/duplicate-of-recycled-water-rates.html. Sempra will need to develop water quality standards for its hydrotest program and compare these to the specifications for reclaimed water from each potential source.

[39] Effluent is an outflow or discharge of liquid waste, as from a sewage system, factory, or power plant.

Most urban locations have both storm water and sanitary sewer ("sewer") systems, distinguished by the fact that water in the sewer system is cleaned in a water treatment plant while storm water is not treated prior to being dumped into a river, bay, or ocean.[40] The allowed level of contaminants can be lower for the storm water system than for sewers because of the lack of subsequent treatment. Discharge permits are required for both systems, and the permit terms include discharge point, discharge rate (e.g. gallon per day), allowable levels of contaminants, and testing protocols. Storm water system discharge permits are issued by one of nine Regional Water Quality Control Boards (Regional Boards), "that exercise rulemaking and regulatory activities"[41] for the California State Water Resources Control Board. Wastewater discharge permits for sewer systems are managed at a local level by city sanitation districts, city public works departments, municipal water utilities, and other agencies. For example in the City of Oakland, sewer lines are owned and maintained by the city public works department, but water treatment is provided by EBMUD. DRA surveyed wastewater disposal in a number of municipalities and determined that there is significant variation in how sewer systems are owned and operated, and the process to secure a discharge permit.

One challenge is that obtaining a permit for either storm drain or sewer disposal requires an accurate assessment of the level of contamination. This challenge can be avoided if SoCalGas hires a private remediation company to take the water and dispose of it under an existing permit, but as shown in the following section, Sempra would pay extra for this service.

If a hydrotest site is located directly adjacent to an appropriate sewer or storm water collection point (e.g. a storm drain with sufficient excess capacity), waste water can be drained or pumped directly into the drain. Otherwise the wastewater must be

[40] The San Francisco PUC operates a combined storm/sewer system where all water is diverted to, and processed by waste treatment plants. Waste water can also be recycled, evaporated, and disposed on land.

[41] See http://www.waterboards.ca.gov/publications_forms/publications/factsheets/docs/region_brds.pdf

collected and transported to a collection point, which incurs additional transportation costs.

If a pipeline test segment is sufficiently clean as to not contaminate the clean water used for the test, the test effluent will meet the disposal permit requirements and can be dumped. If not, the water must be "pretreated," typically by filtration and settling, until the waste water meets the disposal permit water quality requirements. The waste water must be tested per specified protocols to accurately determine if contamination levels are acceptable for disposal.

Finally, a pump is typically required to remove water from the pipeline test section and move it to the pretreatment or disposal site.[42]

3. Water disposal costs

Appendix D provides many key assumptions which impact Sempra's estimated water disposal costs:[43]

1. Water will be temporarily stored in 500 barrel Baker Tanks after the test
2. 120 barrel vacuum trucks will be used to transport water to a disposal site,
3. The disposal site will be close enough to allow a 1-hour round trip for each truck, including loading and unloading the water
4. The waste water is assumed to be "contaminated"[44]
5. Water is filtered through the Baker Tanks and tested at an approved location
6. A "treated water disposal" fee of $55 per barrel will be charged

Comparing these assumptions to the five steps previously mentioned reveals that:

- Testing costs are explicitly addressed
- Pre-treatment via filtration is explicitly addressed

[42] Elevation changes between the pipeline and the disposal site may allow gravity to push the water out of the pipeline. The need for a pump and the size of the pump, depend on the topography of the test site.

[43] Amended Testimony, Appendix D.

[44] In response to DRA data request TCR-3, question 3.1(a) Sempra stated that the cost estimate assumed "average treatment cost for hydrocarbon based contaminated water." See Appendix F of this exhibit.

- Transportation costs are included as the costs of Baker tanks and vacuum trucks
- Sempra plans to obtain permits, and incur permit fees to dispose of waste water

As before, these will be addressed in detail in reverse order. Sempra estimates that the water disposal fee will be $55 per barrel, or approximately $1.31 per gallon. Since Sempra separately estimates costs for treatment, testing, and transportation, the water disposal cost of $1.31 per gallon is essentially the permit and other fees charged to use the storm drain or sewer system, or the disposal fee charged to a centralized waste treatment facility (discussed below).

As an initial estimate of water disposal costs, DRA reviewed costs to dispose of wastewater into the San Francisco Bay (SF Bay), based on the assumption that the SF Bay would be one of California's most tightly regulated bodies of water. For wastewater in the City of Oakland, the volumetric disposal fee is less than 2 cents per gallon, even for the most expensive commercial rates.[45] Sempra's proposed costs are over 65 times higher than this, which indicated that a more comprehensive survey should be performed.

DRA contacted numerous organizations to better understand and quantify the costs associated with water disposal, the results of which are summarized in the following table:[46]

[45] The residential volumetric rate is $.62 and the highest commercial base rate is $10.47 for tallow rendering companies, both per unit of water or hundreds of cubic feet (HCF). Commercial rates also include fees based on total suspended solids (TSS) and Chemical Oxygen Demand, Filtered (CODF), but these are primarily related to organic material in sewage and are not expected to be significant in hydrotest effluent. See http://www.ebmud.com/our-water/wastewater-treatment/wastewater-treatment-programs/wastewater-rates-charges-and-fees.

[46] See Appendix B for details regarding this data.

Table 7– Results of DRA survey of water disposal costs

Water Disposal Organization	Upfront costs	Other fixed costs	Volumetric fee ($/HCF)	Volumetric fee ($/gal)	Cost for 250,000 gal	Total Cost ($/Gal)
Region 7 WQCB, storm drain permit	$ 1,943					
Region 8 WQCB, storm drain permit	$ 1,944	$ -	$ -	$ -	$ 1,944	$ 0.01
Region 9 WQCB, storm drain permit, Class 3	$ 1,943			$ -	$ 1,943	$ 0.01
Region 9 WQCB, storm drain permit, Class 1	$ 11,195			$ -	$ 11,195	$ 0.04
				$ -	$ -	$ -
Cochella Valley Water, commercial	$ 4,231		$ 1.43	$ 0.002	$ 4,709	$ 0.02
City of Riverside, industiral "pumping" rate	$ -	$ -	$ 2.18	$ 0.003	$ 729	$ 0.00
LA County, joint permit	$ 401,647	$ 1,250	$ 2.37	$ 0.003	$ 403,688	$ 1.61
SFPUC Temporary Discharge Fee, metered supply	$ -	$ -	$ -	$ -	$ -	$ -
SFPUC Temporary Discharge Fee, non-metered supply	$ -	$ -	$ 6.55	$ 0.009	$ 2,189	$ 0.01
					$ -	$ -
DeMenno Kerdoon, disposal at Compton Ca.	$ -	$ -	$ -	$ 0.350	$ 87,500	$ 0.35
Crosby Overton, disposal at Long Beach Ca.	$ -	$ -	$ -	$ 0.080	$ 20,000	$ 0.08

The first group of costs is for disposal in the storm water system, which is regulated by the Regional Water Quality Control Boards (WQCBs).[47] In the three regions surveyed, there is only an annual permit fee, and the fees in this table are based on statewide "de minimis" fee schedule. [48] While the de minimis fees schedule is established on a statewide basis, the permit applications are reviewed, and permits are issued, regionally. The survey data above reveals two important findings. First, the only costs are fixed costs, so the cost per gallon depends on the number of gallons to be disposed. The RWQWB de minimis permits are issued on an annual basis,[49] and cover all locations within the region, so the per-gallon costs can be minimized if all tests in a region could be performed within a year. Second, there are three "Classes" of permit fees based on the expected level of contamination, with Class 3 requiring no pre-treatment to meet the permit contaminant limits.[50] The water disposal fee is therefore dependent on the expected level of pipeline

[47] Comparing the SoCalGas system map at Figure III-1, page 32 of Sempra's Amended Testimony to the RWQCD map at http://www.waterboards.ca.gov/waterboards_map.shtml., is appears that Sempra's territory overlaps WQCB Regions 3, 4, 5, 6, 7, 8, and 9.

[48] The de minimis permit applies to "discharges resulting from the maintenance of uncontaminated water supply wells, pipelines, tanks, etc.; discharges resulting from hydrostatic testing of water supply vessels, pipelines, tanks, etc." See page 9, footnote 17 of fee schedule available at: http://www.waterboards.ca.gov/resources/fees/docs/fy1112fee_schdl.pdf.

[49] The one year permit term begins once the permit is granted.

[50] Class descriptions and fees are provided on page 9 of the 2011/2012 fee schedule, available at: http://www.waterboards.ca.gov/resources/fees/docs/fy1112fee_schdl.pdf.

contamination, but even with Class 1 contamination the disposal fee shown above is 4.1 cents per gallon.

Discharge into a storm drain could also be covered by a statewide State Water Resources Control Board permit. There are existing permits which are administered on a statewide basis, including one for dewatering utility vaults (Permit CAG990002).[51] State Water Resources Control Board staff has indicated that the existing permits do not cover hydrotesting of gas pipelines, and that they are "not aware of any plans to develop a statewide general permit for hydrotest water."[52] In Section IV below, DRA recommends pursuit of a statewide permit for hydrotesting of gas pipelines.

The second group of costs included in Table 7 above is for disposal in a sewer system. This data indicates a wider range of costs. One element of this variation is clearly due to differing volumetric fees, similar to the range in water supply costs. The more significant variable is the upfront costs, which reflect an important finding of DRA's survey: many waste water agencies (e.g. city and county public works and sanitation departments) were not set up to permit large one-time discharges. In some of these cases, (e.g. portions of Los Angeles County) a "connection fee" is assessed based on the expected long-term capital upgrades required to support the increased capacity required for a new customer's wastewater flow. This fee is clearly inappropriate for a one time disposal, and a better option in regions without the ability to issue temporary discharge permits may be to transport the water to an alternative disposal location. However, note that it is only in this worst possible case scenario that a cost comparable to Sempra's estimate is obtained ($1.61 vs. $1.31). A variable not fully reflected in this survey is that there are multiple types of potential sewer collection/dumping points including existing Sempra facilities that are already

[51] See http://www.waterboards.ca.gov/water_issues/programs/npdes/utilityvaults.shtml.

[52] Email from Philip Isorena of the State Water Resources Control Board , dated June 13, 2012. Contact pisorena@waterboards.ca.gov.

permitted to discharge wastewater. The potential savings in disposal costs from using an existing Sempra facility instead of a local sewer drain point must be weighed against the potential increase in transportation costs relative to those assumed by Sempra in Appendix D.

The final group of costs is for private centralized waste treatment companies. In these cases, pre-treatment is not required, and contaminated water is removed from Baker tanks with vacuum trucks and transported to a central reclamation point. The overall cost of this alternative is highly dependent on the distance between the test site and the reclamation point due to the required transportation costs.[53] Transportation, pretreatment, and testing costs are discussed below under indirect water disposal costs.

4. Indirect water disposal costs

Indirect water disposal costs are based on, but not directly proportional, to the volume of a test section. These include the cost for Baker Tanks, filtration equipment, and vacuum trucks required to hold, filter, and transport the effluent to the disposal sight. DRA contacted local suppliers to determine if Sempra's estimate was reasonable.

Sempra estimated the cost of "500 BBL Baker Tanks" at $1,600 per day in its workpapers and subsequently stated that this cost includes "daily rental fees, mobilization/demobilization costs, labor costs associated with the operation of Baker Tanks during the pipeline filling and discharge, and vapor control system and tank cleaning costs."[54] However, Sempra only provided support for daily rental fees ($60) and mobilization/demobilization costs ($720 per test section).[55] These costs are less than half the estimated daily rate. In addition, Sempra estimates that each tank

[53] An estimate of transportation costs from American Integrated Services is provided in Appendix C of this Exhibit.
[54] Sempra response to DRA Data Request TCR-3, Question 3.1(e). See Appendix F of this exhibit.
[55] Ibid, See estimate from Baker Corporation at the end of Appendix F of this exhibit.

will be required for a minimum of 6 days per test section, so the setup costs should be allocated across these 6 days, which reduces the daily cost to $180 per day.[56] Baker tanks are storage tanks that do not need to be actively "operated" during the test, they include an integral vapor control system if correctly ordered, and given the relative cleanliness of the hydrotest effluent, it is unlikely that any cleaning of the tanks will be required beyond removal of the water with a vacuum truck.[57] Sempra similarly inadequately supported and overestimated the cost of vacuum trucks. Sempra estimated the cost of "120 BBL vacuum trucks" at $5,000 per day in its workpapers and subsequently said that this cost includes "the direct cost for the vacuum truck, fuel charges, and labor costs for a driver and operator to handle and transport pre and post hydrotest water.[58] DRA obtained a cost estimate from a waste transportation company that operates throughout southern California at a non-overtime rate of $720 per eight-hour day.[59] This rate includes the truck, operator, and fuel.[60]

As noted previously, Sempra provides no support for the plan to use a maximum of 10 Baker tanks and one vacuum truck per tank to dispose of water. Given the relatively small size of these costs, DRA did not perform a detailed analysis of whether this assumption is reasonable. More importantly, DRA determined that the

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[56] DRA also notes that the duration that the estimated duration of Baker tank rental appears to be excessive since Sempra's cost estimate is based on having the tanks on-site for the full five days estimated for test setup. Since the tanks are only required once the 8 hour test is completed, it would appear that the tanks could be delivered and set up a day before filling begins, and plumbed during filling and the actual test. The rental duration for Baker tanks should be reduced to 2-3 days per test section, plus disposal time, unless Sempra can provide conclusive evidence supporting a longer duration.

[57] Refer to the Baker Corporation cost estimate obtained by DRA in Appendix C of this exhibit. The first line item on page 1 is for a vapor tight tank, as shown on the following web-page: http://www.bakercorp.com/tanks-steel-safety-vapor.asp. The fourth term on page 2 of the estimate addressed tank cleaning, and should be read in the context that that a typical use of Baker tanks is removing waste from sewers and porta-potties.

[58] Sempra response to DRA Data Request TCR-3, Question 3.1(f). See Appendix F of this Exhibit.

[59] See Appendix C, American Integrated Services, Inc.

[60] The salesperson indicated that a 15% fuel surcharge could be waived.

optimum configuration of Baker Tanks and vacuum trucks will depend on the level of contamination and local disposal options. At one extreme, no tanks or trucks would be required if pre-treatment was not required and a permitted disposal site was located within the footprint of the test setup. At the other extreme, a large fleet of tanks and trucks could be required if significant settling was required, and/or the water had to be stored onsite while slowly disposed of either off-site or into a low-capacity sewer.

Sempra provides conflicting information regarding pretreatment and testing costs. Sempra testimony implies that all clean up costs are included in its estimate[61] and also states that water is filtered in the Baker Tanks and tested at an approved location.[62] And, more generally, Sempra's testimony states that the estimate is "all-inclusive."[63] However in response to a DRA data request, Sempra stated that "the estimate assumes that there is no on-site pretreating of the hydrotest water" and did not adequately respond to a data request question regarding whether environmental monitoring costs are included.[64] DRA determined that hydrocarbon contamination, as expected by Sempra, can be removed via carbon filtration, and that the supplier of Baker tanks can provide carbon filtration equipment at minimal cost, so it is relatively immaterial if Sempra included this cost or not.[65] DRA has not researched

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[61] Amended Testimony, Appendix D, p. D-3, lines 1-3 states "Estimate includes all labor, materials, and equipment for one eight-person crew, working eight hours per day for estimated duration. The duration includes mobilization, set-up, hydrotest work, clean-up and purging of pipeline."

[62] Amended Testimony, Appendix D, p. D-2, lines 32-33.

[63] Amended Testimony, p.103, lines 6-17.

[64] Sempra response to DRA-TCR-3, Question 3.2(b). Environmental monitoring is typically required by environmental permits. For example, a wastewater discharge permit will establish sampling and testing requirements for effluent to ensure the water quality is within the specified limits. Also note that Sempra workpaper "SCG NTSB_Hydrotest_Summary and Reference.xlsx" indicates that the cost of $55 per barrel is for "Treated Water Disposal" at cell A31.

[65] Refer to the Baker Corporation cost estimate obtained by DRA in Appendix C of this exhibit. A 800 GPM cartridge system rents for $13 per day, and cartridges cost $15.50 each.

water quality test costs, but these costs likely depend on the number and type of contaminants to be measured.

5. Sempra's request for a nitrogen purge is unsupported

Sempra is requesting $5.9 million for nitrogen to "push a pig through the test section and purge the pipeline of gas and air.[66] PG&E's Pipeline Safety Enhancement Plan did not explicitly include a nitrogen purge, and Sempra has not described why a purge is necessary. Sempra also provided only a single Praxair invoice from 2007 to support its claimed cost of $.19 per standard cubic feet (SCF), and this estimate indicates a cost of $.0016 per CCF.[67] Sempra does not demonstrate how the Praxair invoice supports the claimed unit cost.[68]

C. Sempra's contingency rates are excessive and unsupported

Exhibit 2 provides and overall discussion regarding contingency and specific recommendations. This exhibit compares Sempra's contingency request to approved contingency in adopted advanced metering Infrastructure (AMI) cases in California.

Sempra requests a total of $31.5 million in contingency costs, or approximately 17% of the overall hydrotest request. Sempra provided no justification for the use of a 20% rate for projects larger than $2 million, nor for a higher 30% rate for small projects. While Sempra clearly states that its cost estimates are "all-inclusive" Sempra does not identify the risks that are captured by its contingency request, nor

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[66] Amended Testimony, p.D-1, lines 26-27. Aggregate cost provided in DRA workpaper TCR-WP1.

[67] Sempra response to DRA Data Request TCR-3, Question 3.1(a). See estimate from Praxair at the end of Appendix F of this Exhibit.

[68] The invoice shows a total cost of $3,286.99 for "20,148.00 CCF" of "NPS Nitrogen," or a cost of $.163 per 100 cubic feet (CCF), or $.0016 per cubic foot (CF). At face value, a CCF is 100 times greater than an SCF, which indicates a cubic foot of gas at "standard" temperature and pressure.

provide any quantitative risk analysis. In one instance, Sempra states that "provisions were included in the cost estimates to allow for additional hydrotest sections, if necessary," but it not clear if the provisions are provided in the contingency request, or as an adjustment to the quantities and unit costs used in the estimate.[69] Sempra does not address other risks, such as contaminated lines that require extra water treatment, environmental remediation of the test site, and proximity of water supply and disposal sites. It appears that Sempra has simply made a ball-park contingency estimate as a "pad" to the baseline estimate.

One of PG&E's contingency witnesses in its original AMI application, A.05-06-028, was Mr. Stephen Lechner, who also addressed certain contingency issues in PG&E's Pipeline Safety Enhancement Plan proceeding.[70] In PG&E's original AMI proceeding, Mr. Lechner testified that a contingency of 5-7% "reflects typical contingency values for standard construction projects (e.g., road and highway construction) that do not have the additional complexities of a project like PG&E's AMI Project."[71] In that case, the Commission adopted a 8.0% contingency for PG&E's original AMI project.[72]

PG&E's original AMI application was the first one filed by a California utility, and it proposed implementation of state-of-the-art metering technology and major upgrades and enhancements to PG&E's information technology systems. In contrast, the technology associated with pipeline installation, replacement, and hydrotesting is largely decades-old. PG&E argued in the AMI case that "it is necessary for PG&E to consider a significantly higher contingency value associated

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[69] See Amended Testimony, Appendix D, p. D-1, lines 19-21.

[70] R.11-02-019, Exhibit 21, PG&E Rebuttal Testimony, p.14-3, lines 31-32.

[71] R.11-02-019, Exhibit 114, Rebuttal Testimony of Stephen P. Lechner in Application 05-06-028, p. 13-5, lines 12-18.

[72] D.06-07-027, Conclusion of Law 3 ("There is sufficient credible evidence to adopt as reasonable a project budget of $1.7394 billion, inclusive of a Risk Based Allowance, or contingency, of $128.8 million …) $1,739.4-$128.8)/$1,739.4 = 8.0%.

with IT elements of the AMI Project than for a typical construction project."[73] While Mr. Lechner did not know if the "pipeline replacement and hydrotest portions of PG&E's Pipeline Safety Enhancement Plan require[d] the use of any new or innovative technologies,"[74] he confirmed that the only significant information technology request in the Plan is for a database upgrade ("GTAM"), not for pipe replacement.[75]

Sempra's Pipeline Safety Enhancement Plan is similar is scope to PG&E's Plan and both are very different from an AMI project. DRA believes that hydrotesting has more in common with road and highway projects than a state-of-the-art metering and data management system, and should thus have a contingency consistent with a "standard construction project." The following table shows that the Commission adopted contingency rates of 6.3% and 7.0% for SDG&E and SoCalGas respectively:

Table 8 – CPUC approved contingency rates for AMI applications

Project	Cost Reqstd	Cost Adptd	Contingny Reqstd	Contingny Adopted	% Reqstd	% Adptd	Cite
PG&E Original		$ 1,739.4		$ 128.8		8.0%	D.09-03-026 in A.07-12-009, p.87.
SDG&E		$ 572.0		$ 33.8		6.3%	D.07-04-043 in A.05-03-015, p.38
		$ 490.0		$ 33.8		7.4%	p.38 also says 7.4%???
SCE		$ 1,634.0		$ 130.1		8.7%	D.08-09-039 in A.07-07-027; Dec. 5, 2007 errata Testimony, SCE-2, P.14 has contingency costs
PG&E Upgrade	$ 572.4	$ 467.0	$ 65.5	$ 49.0	12.9%	11.7%	D.09-03-026 in A.07-12-009
SoCalGas	$ 1,080.0	$ 1,051.0	$ 98.0	$ 68.7	10.0%	7.0%	D.10-04-027 in A.08-09-023, pp. 2, 37,
All AMI		$ 5,463.4		$ 410.4		**8.1%**	**8.1% is the average for all AMI**

In no event should the Pipeline Safety Enhancement Plan have a *higher* contingency than established in the original AMI application. On this basis, absent a proper contingency analysis, DRA recommends that the contingency for the Plan be no more than 8%.

[73] R.11-02-019, Exhibit 114, Rebuttal Testimony of Stephen P. Lechner in Application 05-06-028, p.13-6, lines 19-21.

[74] R.11-02-019, 14 RT 1932, lines 1-5, Lechner/PG&E.

[75] R.11-02-019, 14 RT 1930, lines 9-22, Lechner/PG&E.

D. DRA did not determine whether or not Sempra's fixed and indirect costs are reasonable

Sempra's cost estimate includes $11.8 million for fixed test costs and $11.0 million for indirect costs.[76] When combined, they constitute 13% of the cost estimate which is significantly less than the 56% of cost they represent in PG&E's Pipeline Safety Enhancement Plan.[77] DRA focused its analysis on variable costs and contingency and performed minimal discovery and analysis on fixed and indirect costs since they were such a small proportion of the total costs. However, given DRA's findings that Sempra's variable and contingency costs are inflated, the Commission should not perceive DRA's lack of criticism of fixed and indirect costs as a sign that DRA considers them reasonable.

IV. DRA ESTIMATED HYDROTEST PHASE 1A COSTS

In Exhibit 2 of DRA's opening testimony, Witness Phan recommends that Phase 1A scope only include high priority category 4 miles. Exhibit 2 also recommends that hydrotesting be performed instead of replacement. In this Exhibit, evidence has been presented showing that Sempra's estimated hydrotest costs are excessive. To support DRA's exhibits on policy and cost recovery, illustrative calculations were performed to which combine the reduction in scope from Exhibit 2, with DRA recommended reductions in hydrotest unit costs. Details defining the model used are provided in Appendix D of this exhibit, but key assumptions are summarized here:

1. Category 4 miles only
2. No pipeline repair
3. $25 per barrel variable cost applied based on the volume of each test segment

[76] See Figure 2 of this Exhibit.

[77] R.11-02-019, Exhibit 144, Opening Testimony of DRA Witness Thomas Roberts, p. 64, lines 7-10. Note that indirect costs are part of PG&E's "all-in rate," as are test heads.

4. $25,000 fixed cost applied to each test project (per Sempra)
5. $82,486 fixed cost applied to each test section (per Sempra)
6. 5 % miscellaneous material rate (per Sempra)
7. 3% rate for SCG labor and inspection
8. 5% rate for engineering
9. 8% contingency

Comparing these assumptions to the analysis in Section III reveals that not all of DRA's unit costs concerns are addressed in these calculations. Refer to Appendix D for details.

Results for SoCalGas and SDG&E are provided in the following tables, using the format required for entry into Sempra's Results of Operations (RO) model:

Table 9 - DRA adjusted hydrotest costs for SoCalGas

SoCalGas Pressure Testing ($ millions)		2012	2013	2014	2015	Total
O&M-Distribution, Company Labor		$ 0.17	$ 0.23	$ 0.23	$ 0.23	$ 0.87
O&M-Distribution, Non- Company Labor		$ 6.16	$ 8.21	$ 8.21	$ 8.21	$ 30.78
O&M-Transportation, Company Labor		$ 0.22	$ 0.30	$ 0.30	$ 0.30	$ 1.11
O&M-Transportation, Non- Company Labor		$ 8.03	$ 10.70	$ 10.70	$ 10.70	$ 40.12
O&M-Transportation, Company Labor (Storage)		$ -	$ -	$ -	$ -	$ -
O&M-Transportation, Non- Company Labor (storage)		$ -	$ -	$ -	$ -	$ -
Total						**$ 72.88**

Table 10 - DRA adjusted hydrotest costs for SDG&E

SDG&E Pressure Testing ($ millions)		2012	2013	2014	2015	Total
O&M-Distribution, Company Labor		$ 0.03	$ 0.04	$ 0.04	$ 0.04	$ 0.14
O&M-Distribution, Non- Company Labor		$ 1.02	$ 1.36	$ 1.36	$ 1.36	$ 5.11
O&M-Transportation, Company Labor		$ -	$ -	$ -	$ -	$ -
O&M-Transportation, Non- Company Labor		$ -	$ -	$ -	$ -	$ -
Total						**$ 5.25**

These tables provide the total costs of DRA's recommended Phase 1A scope, without addressing who should pay for these costs. Note that since DRA

recommends against authorizing ratepayer funding of replacement projects at this time, DRA's estimated cost for Sempra's Pipeline Safety Enhancement Plan projects includes only O&M costs for hydrotesting. DRA Exhibits 2 and 4 include DRA's recommendations regarding how these illustrative calculations should be utilized in this proceeding.

V. DRA RECOMMENDATIONS REGARDING HYDROTEST COSTS

A. The Commission Should Order Sempra to Develop a Water Management Plan to Minimize Water Supply and Disposal Costs

As discussed above, it is clear that the costs of water management drive Sempra's hydrotest cost estimate. It is also clear that Sempra's assumed unit costs related to water management are excessive or unsupported. More importantly, Sempra has multiple water management options available at any given hydrotest location, and determination of the most cost-effective option requires additional analysis. For example, the savings from using a disposal site with lower costs must be weighed against the potential increase in water holding and transportation costs. DRA recommends that the Commission direct Sempra to develop and implement two types of water management plans: a strategic plan prior to disposition of this application, and project level cost benefit analyses as part of detailed project engineering reports to be provided to the Commission. The strategic plan should have the following elements:

- Maps of proposed projects, with an overlay of existing Sempra water supply and disposal points
- Discussion of the use of recycled water in hydrotests, and water quality requirements
- An analysis of the water quality of hydrotest effluent, and description of "typical" effluent contamination for the purpose of estimating disposal costs
- A summary of water disposal costs at all potential types of disposal sites (e.g. sewer, storm drain, existing Sempra facilities) within the Sempra service territories

- A detailed strategy for maximizing water reuse and minimizing overall water supply and disposal costs
- A schedule of proposed projects based on the above strategy
- A template for a cost-benefit analysis to be performed during project engineering which accounts for testing, pre-treating, transportation, and disposal costs
- A draft RFQ and list of potential remediation sub-contractors who could bid to take contaminated water from Phase 1A tests

This final point is based on DRA's conversations with American Integrated and Crosby Overton, which indicated that companies capable of taking Sempra's test effluent will likely bid aggressively to capture even a portion of the proposed scope of work.

The second type of water management plan would be a project specific plan based on engineered projects and actual water costs at the test location. These plans would be provided to the CPUC on an ongoing basis as projects are engineered, and would include a cost-benefit analysis using the pre-approved template.

B. DRA Supports Sempra's Request for CPUC Assistance in Streamlining the Permitting Process for Water Disposal

The state water board, local sanitation districts, and the CPUC are all public agencies dedicated to preserving public welfare. The CPUC mandated hydrotest program addressed by Sempra's Pipeline Safety Enhancement Plan is a temporary program whose sole purpose is to establish a safe baseline for ongoing integrity management programs. This test program is relatively unique in that large volumes of water will be disposed one time only at different locations and different times over a multi-year period, and some agencies do not have a permit program in place to accommodate these discharges. Inconsistent and potentially excessive water discharge permit standards, which were designed and implemented based on permanent wastewater sources, could both delay testing and increase cost.

DRA's survey of water disposal options indicates that disposal in local storm drains, with the appropriate pre-treatment and Regional WQCB permit, is a viable option with a potentially reasonable cost. Since waste water from Sempra's hydrotest program should be relatively clean, minimal pre-treatment costs should be required to meet the appropriate RWQCB water quality standards. DRA supports Sempra's general request for CPUC assistance with permitting issues.[78] Specifically, DRA recommends that the CPUC work with the State Water Resources Control Board to establish a statewide permit, or to educate the Regional WQCBs about the public benefit of hydrotesting, and to guide and coordinate the regional water board permit processes. Such statewide coordination could significantly reduce Sempra's estimated water disposal costs of approximately $75 million for Phase 1A.[79]

C. Adopt Unit Cost Caps Rather Than Aggregate Cost Caps – Resolve What Can Be Resolved Now (Unit Costs); Leave Debate About Scope Until Projects Are Engineered

Given the absence a well-defined and accurate project scope, DRA recommends adopting unit rather than aggregate or average hydrotest costs. Sempra indicates that "actual scope of project and associated permit conditions" can only be determined once detailed engineering and design are completed.[80] Further, a reasonable estimate of the scope of Phase 1 hydrotesting cannot be determined until the Commission resolves such issues as the appropriate decision tree to use and the appropriate criteria for accelerating low priority segments into Phase 1. Without an accurate scope, the Commission cannot determine a reasonable estimate of aggregate Pipeline Safety Enhancement Plan hydrotest costs.

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[78] Amended Testimony, pp. 26-27.

[79] This recommended action could also reduce overall permit processing times and permit costs for other CPUC regulated utilities statewide. In the March 7,2012 CPUC hydrotest symposium, PG&E indicated that water management from hydrotests was a challenge during 2011 PSEP tests. See slide 26 of the presentation at http://www.cpuc.ca.gov/NR/rdonlyres/193C6EBB-9653-49EB-BF28-1FD7DC436174/0/SecondCPUCHydrostaticTestingSymposium372012.pdf.

[80] Amended Testimony, Appendix D, p.D-3, lines 9-12.

The Commission can however make a determination on reasonable hydrotest unit costs based on evidence provided by parties to this proceeding, and in PG&E's Pipeline Safety Enhancement Plan proceeding, R.11-02-019. The SPEC cost model provides a reasonable framework upon which to establish fixed, variable, and indirect hydrotest costs, but DRA does not recommend using the costs as calculated by Sempra, as they are excessive.

D. The Commission Should Limit Sempra's Contingency Request, And Adopt Standards For Drawing Down Contingency Funds

The following recommendations were developed by DRA in response to PG&E's Pipeline Safety Enhancement Plan, and should be applied to Sempra:[81]

- Sempra should provide justification for its contingency request, including a proper Quantitative Risk Analysis (QRA)
- The approved contingency rate should be no more than 8%
- Sempra should provide a detailed report of the amount and justification for requests to draw from contingency funds
- Contingency amounts should apply to specific cost categories provided by Sempra in Appendix B, and fund shifting between cost categories should be limited

[81] R.11-02-019, Exhibit 144, Opening Testimony of DRA Witness Thomas Roberts, pp. 104-106. Also see DRA Opening Brief in A.11-02-019 dated May 14, 2012, pp. 117-120.

APPENDIX A – DRA WATER SUPPLY COST SURVEY REFERENCES

Table 6 in Section III above summarizes the results of a DRA survey on water supply costs performed in May and June 2012. Table 6 is reproduced here, along with rate information for each provider.

Water Source	Upfront costs	Other fixed costs	Volumetric fee ($/HCF)	Volumetric fee ($/gal)	Cost for 50,000 gal	Total Cost ($/Gal)
LADWP Hydrant Meter, low use	$565.00	$ -	$ 3.00	$ 0.004	$ 765.53	$ 0.02
LADWP Hydrant Meter, high use	$565.00		$ 6.08	$ 0.008	$ 971.42	$ 0.02
City of Riverside Hydrant meter	$ 40.00	$ 271.20	$ 2.71	$ 0.004	$ 492.35	$ 0.01
City of San Diego, temporary construction	$ -	$ 136.74	$ 4.01	$ 0.005	$ 404.79	$ 0.01
Irvine Ranch WD, base use	$ -	$ 187.74	$ 1.22	$ 0.002	$ 269.29	$ 0.01
Irvine Ranch WD, high use	$ -	$ 187.74	$ 9.48	$ 0.013	$ 821.43	$ 0.02
Cochella Valley, max. temp. construction	$120.00	$ 125.00	$ 2.27	$ 0.003	$ 396.55	$ 0.01
EBMUD Hydrant Meter	$ 76.00	$ 327.00	$ 3.11	$ 0.004	$ 610.89	$ 0.01
SFPUC 3" Hydrant Meter	$125.00	$ 252.40	$ 5.10	$ 0.007	$ 718.31	$ 0.01

Refundable deposit costs, required for all hydrant meters, are not included in Table 6.

1. **Los Angeles Department of Water and Power (LADWP)**
   Upfront cost covers first 30 days of use, see https://www.ladwp.com/ladwp/faces/ladwp/commercial/c-customerservice/c-cs-waterservices/c-cs-ws-temporarywateservice?_adf.ctrl-state=rcm921so0_4&_afrLoop=299694232116853.
   Volumetric fees from 2011-2012 Schedule C. Low use rate for Tier 1 low season; High rate for Tier 2 high season. See: https://www.ladwp.com/ladwp/faces/ladwp/aboutus/a-financesandreports/a-fr-waterrares/a-fr-wr-scheduleccommercialindustrialandgovernmental?_adf.ctrl-state=rcm921so0_106&_afrLoop=300407727361853.

2. **City of Riverside**
   $40 upfront processing fee for permit per water rule 8. See http://www.riversideca.gov/utilities/pdf/water-rules/w_rule8.pdf. Rates for schedule WA-2 temporary service include $271.20 rental for up to 34 days,

and a volumetric rate of $2.71 per unit. See http://www.riversideca.gov/utilities/pdf/water-rates/2010/wrateWA2_110110-032906_CC.pdf.

3. **City of San Diego**

City of San Diego fixed costs for "temporary construction" with 3" service. See http://www.sandiego.gov/water/rates/rates.shtml.

4. **Irvine Ranch Water District**

Irvine Ranch fixed costs are monthly service for commercial, industrial, or agricultural customer with 3" service. Volumetric rates based on highest and lowest rate tiers based on usage. 2012-13 proposed rates effective July 1, 2012. See http://www.irwd.com/assets/files/Rates/Prop%20218%20Irvine%20Commercial%20-%20FY1213%281%29.pdf.

5. **Coachella Valley Water District**

$120 permit application fee. $125 monthly service charge for 3" service or smaller. Volumetric rate for highest rate for temporary construction supply ($880), and highest replenishment fee ($107.57), both charged based on acre-feet where 1 acre-foot = 435.6 HCF. See http://www.cvwd.org/service/rates/RateSheet_Developer&Misc.pdf.

6. **East Bay Municipal Water District (EBMUD)**

Fixed costs include service establishment fee, bi-monthly service fee, and site visit fee. See http://www.ebmud.com/sites/default/files/pdfs/Hydrant%20Mtr%20Chg%20July%201%202011%20rates.pdf.

7. **San Francisco Public Utilities Commission (SFPUC)**

SFPUC costs for a 3" hydrant meter and a test duration of less than a month effective July 1, 2012 per Schedule W-5. See http://www.sfwater.org/modules/showdocument.aspx?documentid=1230.

APPENDIX B – DRA WATER DISPOSAL COST SURVEY REFERENCES

Table 7 in Section III above summarizes the results of a DRA survey on water disposal costs performed in May and June 2012. Table 7 is reproduced here, along with detailed notes regarding each organization that was contacted.

Water Disposal Organization	Upfront costs	Other fixed costs	Volumetric fee ($/HCF)	Volumetric fee ($/gal)	Cost for 250,000 gal	Total Cost ($/Gal)
Region 7 WQCB, storm drain permit	$ 1,943					
Region 8 WQCB, storm drain permit	$ 1,944	$ -	$ -	$ -	$ 1,944	$ 0.01
Region 9 WQCB, storm drain permit, Class 3	$ 1,943			$ -	$ 1,943	$ 0.01
Region 9 WQCB, storm drain permit, Class 1	$ 11,195			$ -	$ 11,195	$ 0.04
				$ -	$ -	$ -
Cochella Valley Water, commercial	$ 4,231		$ 1.43	$ 0.002	$ 4,709	$ 0.02
City of Riverside, industiral "pumping" rate	$ -	$ -	$ 2.18	$ 0.003	$ 729	$ 0.00
LA County, joint permit	$ 401,647	$ 1,250	$ 2.37	$ 0.003	$ 403,688	$ 1.61
SFPUC Temporary Discharge Fee, metered supply	$ -	$ -	$ -	$ -	$ -	$ -
SFPUC Temporary Discharge Fee, non-metered supply	$ -	$ -	$ 6.55	$ 0.009	$ 2,189	$ 0.01
					$ -	$ -
DeMenno Kerdoon, disposal at Compton Ca.	$ -	$ -	$ -	$ 0.350	$ 87,500	$ 0.35
Crosby Overton, disposal at Long Beach Ca.	$ -	$ -	$ -	$ 0.080	$ 20,000	$ 0.08

1. **California State Water Resources Control Board, Region 7 Water Quality Control Board** (WQCB), Colorado River (southeast corner of California) Permit cost for General Low Threat Permit per Order number R7-2009-030 (NPDES[82] No. CAG997001), available at http://www.swrcb.ca.gov/coloradoriver/board_decisions/adopted_orders/orders/2009/0300low_threat.pdf. The cost provided includes the 21% surcharge, and base rate increase to $1,606 for 2011/2012 (see Page 7 of 2011/12 fee schedule, Category 3, at http://www.waterboards.ca.gov/resources/fees/#npdes

[82] NPDES is the National Pollutant Discharge Elimination System.

Contact: John Carmona, (760) 341-6820.

2. **California State Water Resources Control Board, Region 8 WQCB,** Orange County
The de minimis permit for most of the region (R8-2009-0003) has a fee of $1944. The Newport Bay Watershed has specific issues related to nitrogen and selenium. The Newport Bay Watershed permit (R8-2007-041) fee is a little over $11,000. Since nitrogen and selenium are not expected, the de minimis permit fee was used. Contact: Bill Norton (951) 782-4381.

3. **California State Water Resources Control Board, Region 9 WQCB,** San Diego
Cost from 2011-2012 fee schedule, including 21% surcharge. Contact: Bob Norris (858) 467-2692.

4. **Coachella Valley Water District**
Costs are for a one time connection fee for "all other areas" and monthly volumetric service fee for the commercial customers in the highest cost areas (50 and 82). See http://www.cvwd.org/service/rates.php.

5. **City of Riverside**
The City of Riverside issues temporary discharge permits. There are no application or fixed costs. Regular monthly rates are applied on a volumetric basis. The most expensive industrial rate is a "pumping" rate for locations where the effluent must be pumped by the city to reach the waste treatment facility. The rate for gravity feed locations is $1.64 per HCF, both rates effective July 1, 2012. Contact: Al Pielin, (951) 351-6072.

6. **Los Angeles County, Public Works/Sanitation District**, Locations throughout L.A. Basin

A “Joint Permit” for industrial waste disposal is required the sewer systems in unincorporated L.A. County, and certain cities that contract with L.A. county for waste water disposal. Public Works reviews applications and charges the following: $447 permit application; Plan check $748 - $1,748 depending on the industry and strength of effluent (DRA estimated cost of $1,200 for hydrotests); and Annual inspection fee of $293 - $2,870 depending on the industry and strength of effluent (DRA estimated cost of $1,250 for hydrotests). The Sanitation District charges a “connection fee” and volumetric fee of $3,163 per million gallons (.31 cents per gallon). The connection fee assumes a wastewater source will be operating indefinitely, and that additional capacity will be required. DRA used a flow rate of 40,000 gallons in its calculations, which allows two 120 BBL vacuum trucks to drain per day, and would require a full week to completely dispose the water from a 250,000 gallon test. A “capacity unit” is based on 260 gallons per day, which is the average residential usage per day. In addition, a district by district multiplier of approximately .66 is applied. Thus, 40,000 gallons of incremental new daily flow is approximately 100 capacity units. The cost of this additional capacity varies by district, but is approximately $4,000 per “capacity unit” expected per day. This results in a one-time connection fee of approximately $400,000. Contacts: Randall Davis, Public Works Industrial Waste Supervisor, (626) 458-5173; Linda Shadler, L.A. County Sanitation Districts Industrial Waste Section Supervisor, (562) 908-4288, x2932.

7. **San Francisco Public Utilities Commission**

No fee for temporary discharge permit. Sewer fee of $6.62 per unit is included in most supply water rates, but is only applicable if metered water is not used. Contact: John Gregson, (415) 695-7360, or Brian Kuhn, (415) 695-7360.

8. **Crosby and Overton**, Long Beach

Rough estimate of 8 cents per gallon based on non-hazardous water, 1 million gallons per month, and transportation not included. Final cost based on water sample and actual volume. Contact: Michelle Dalot, (562) 254-5950. http://crosbyoverton.com/.

9. **DeMenno Kerdoon**, Compton
   Rough estimate of 35 cents per gallon based on non-hazardous water, minimum 100 ppm of hydrocarbons, and transportation not included. Contact: Theresa, (310) 537-7100. http://www.demennokerdoon.com/.

APPENDIX C- OTHER DRA COST SURVEY DATA

DRA contacted the following local companies to determine the cost of Baker tanks, filtration equipment, and vacuum trucks.

1. **American Integrated Services Inc**., Wilmington Ca. Headquarters.
   American provides waste water transportation in 120 BBL vacuum trucks at the following hourly rates, which include the truck, driver, and fuel: $90 regular time; $95 overtime; $100 premium time (12+ hours days, holidays). A 15% fuel surcharge is negotiable. Rates are applied "portal to portal" from American facilities in Wilmington, the Inland Empire (e.g. San Bernardino), Orange County, Ventura, and Fairfield. Contact: Arsinio Hernandez, (310) 864-2418. http://www.americanintegrated.com/.

2. **Baker Corporation,** San Diego Branch Office
   Baker Corporation provided the following estimated costs for Baker Tanks, filtration equipment, and other supporting equipment in response to a DRA request. Contact: Christina Black, (760) 745-1767. Email: cblack@bakercorp.com
   www.bakercorp.com.

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DATE:	6/5/12
CONTACT NAME:	Tom Roberts
COMPANY:	Various SDG&E/So Cal Ed
CUSTOMER #:	Various SDG&E/So Cal Ed
ADDRESS:	
CITY, STATE, ZIP:	
PHONE NUMBER:	415-703-5278
FAX NUMBER:	
EMAIL ADDRESS:	tor@cpuc.ca.gov
Quote#:	
PO#:	
PROJECT NAME:	Testing Natural Gas Lines
LOCATION:	San Diego, Riverside, Imperial
START DATE:	2012 - 2013
TYPE OF LIQUID:	Water w/condensate
TEMPERATURE:	AMBIENT
pH:	
PREPARED BY:	PATRICK THURMAN
CC:	
CELL NUMBER:	760-802-7551
OFFICE PH #:	
OFFICE FAX #:	
RNTL TERM MTH:	OPEN
RENTAL SCOPE:	

SPECIALTY MEDIA AND EQUIPMENT QUOTED SEPERATELY. CUSTOMER TO PROVIDE ALL WATER ANALYSIS AND DISCHARGE PERMITS. CUSTOMER RESPONSIBLE FOR DISPOSAL OF ALL MEDIA AT THE END OF THE JOB. UNUSED MEDIA CANNOT BE RETURNED.

RENTAL

Equipment Description		Equipment Notes	Equip. Daily Rate	Equip. Wkly. Rate	Equip. Monthly Rate	Est. Qty.	Est. Rent Term (Mnth)	Total Rental Cost Based on Rental Term
110/1200	500 BBL FXD AXLE VPR TIGHT TANK LINED 5M		$39.00	$273.00	$1,092.00			
100/1890	TANK MANIFOLDING	per tank assembly	$6.50	$39.50	$238.00			
199/1150	SAFEGUARD BERM 10 X 50		$26.00	$182.00	$728.00			
406/104	PRIME ASSIST DEL GIPAK TRASH PUMP 6"		$215.00	$645.00	$1,935.00			
425/1010	PUMP BERM 10' X 10'		$12.00	$84.00	$336.00			
703/1612	SUCTION HOSE CAMLOCK 6" X 20'		$22.00	$66.00	$198.00			
703/1610	SUCTION HOSE CAMLOCK 6" X 10'		$16.00	$48.00	$144.00			
703/2612	DISCHARGE HOSE CAMLOCK 6" X 50'		$22.00	$66.00	$198.00			
600/1021	KLEEN WATER FILTER UNIT HI/PRESS 2000 LB	carbon units	$13.00	$91.00	$364.00			
601/4054	4 POD SAND FILTER 54" DIAMETER		$120.00	$875.00	$3,500.00			
602/250	3" BAG/CARTRIDGE FILTER SST 200GPM EXD	or equivalent	$180.00	$540.00	$1,620.00			
403/2001	ELEC SUBMERSIBLE PUMP 1HP 1PH 2"	must have a generator onsite	$13.50	$94.50	$378.00			
Additional Rental Items Item Attachment								
Subtotal Rental Items								

Metered equipment quoted single shift standard rate (6-8 hrs). (9-16hrs) Standard rate X 1.5, (17-24hrs) standard rate X 2.0 *Billing Cycle is 28 Days*

TRANSPORTATION / LABOR

Description		Equipment Notes	Delivery Charge	Return Charge			Total Trans. Cost
9000200	BAKER TRACTOR 3 AXLE	transportation is quoted at $105 / hr					
9999640	SA FILTRATION SET UP	portal to portal. Customer must have					
9999040	PUMP SET UP/LABOR	equipment onsite to offload rental equip					
9987052	INSTALLATION OF PIPE/FITTINGS	Labor is not quoted at this time					
9987054	REMOVAL OF PIPE/FITTINGS						
Subtotal Transportation							

Actual materials/labor may vary according to terrain and vehicle access
Non Prevailing Wage quote

PURCHASE ITEMS

Description		Equipment Notes	Unit Cost	Qnty.	Total Cost
9999766	CARTRIDGE MEDIA	1, 5 micron string cartridges	$15.50		
9999767	BAG FILTER MEDIA	25, 10, or 5 micron bags	$9.50		
9999672	CARBON MEDIA	Reactivated carbon 8 x 30	$0.90		
Subtotal Purchase Items					

TOTAL PROJECT COST ESTIMATE BASED ON RENTAL TERM (Above) *(Customer responsible for all applicable taxes)*

Quote subject to equipment availability at receipt of order
Quote valid for 30 days after issue date

Items not included in Bid Above	Cost
Customer Signature	

Customer Signature is acknowledgement of receipt and understanding of terms and conditions outlined.

Customer Signature: **Date:**

BAKER CORP

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QUOTE DATE: 6/5/12 **COMPANY NAME:** Tom Roberts **QUOTE #**

KEY TERMS AND CONDITIONS to quotes from Baker Corp These terms and conditions of sale shall apply to all service, rentals, and equipment, goods or products manufactured distributed or sold by Baker Corp ("Seller") unless otherwise specified in writing by the Seller and the Purchaser

DELIVERY Equipment sold hereunder shall be delivered FOB Seller's warehouse. Delivery dates specified in any quote are approximate, unless specified as binding. Delivery performance is dependent upon prompt receipt from the Purchaser of all specifications, final approved drawings and any other details essential to the proper execution of the Purchaser's order. Upon notification of readiness of Equipment by Seller, Equipment shall be delivered promptly to Purchaser. Any delay of Purchaser in accepting delivery of Equipment shall cause storage charges to be charged to Purchaser. Such storage shall be entirely at the Purchaser's risk. Payment terms tied to notification of readiness or delivery, shall apply. Unless otherwise agreed upon between the parties, Purchaser shall have the sole responsibility of choosing the carrier and routing from Seller's manufacturing facilities to the final destination. Transportation rates quoted on rental equipment are estimates only. Purchaser will be billed according to the actual time accumulated "Portal to Portal" (round trip) for each delivery and again on each pickup. These rates are figured on normal business hours. 7am to 5pm weekdays. Night, weekend and holiday rates are higher

EQUIPMENT Statements regarding compatibility of equipment made by Seller's personnel or contained herein are based upon information from material suppliers and careful examination of available published information and are believed to be accurate. However, since the resistance of metals, plastics, and elastomers can be affected by contaminants, pH, temperature, presence of other chemicals and other factors, this information should be considered only as a general guide. Ultimately, the Purchaser must determine the suitability of the equipment used in various situations after taking into consideration all relevant factors.

WASTE MANAGEMENT SERVICES-Customer agrees that the responsibilities of the seller under this agreement is only to merely coordinate the pickup and delivery of low-level hazardous or non-hazardous substances, waste, soils, water, or debris from the customer's site to the customer designated treatment, storage, and disposal facilities (TSDF), as set forth in the waste profile. Customer acknowledges that the seller has no independent discretion with regard to the selection of the TSDF or the Transporter, and at no time will the ownership of the waste transfer from the customer to the seller. Customer further agrees that it shall obtain, maintain, and pay for all permits and licenses required by Law that are associated with waste generation and disposal.

SPECIALTY MEDIA-Specialty Media on rental applications are provided at flat rate to customer "loaded" into vessels unless otherwise noted on bid. On completion of project Purchaser is responsible for emptying and disposing of all used sand, gravel, carbon or other media. Sand filters, cartridge filter units, tanks, pumps, pipe, hose and fittings all need to be empty, rinsed and clean of all solids and liquids. Purchaser acknowledges that all new and used media is the property of Purchaser.
The spent specialty media purchased by the Purchaser will be subjected to disposition facility's acceptance testing by Seller. Further, Seller may periodically retest the spent specialty media to assure it remains acceptable for disposition. If periodic spent specialty media testing determines the spent media is unacceptable for designated disposition, Seller may provide Purchaser with alternate disposition facility options which may affect service pricing. Purchaser will provide any information required by Seller relative to evaluating spent media acceptance. Seller reserves the right to reject any and all disposition facilities if, in its judgment, it is unsuitable for the designated disposition facility. Seller reserves the right to dispose of the spent media at any of its disposition facilities where spent media acceptance exists. All specialty media purchases are non-refundable once delivered to Purchaser.

CLEANING OF EQUIPMENT-Seller's rental equipment is rated according to application and will be delivered to Purchaser clean, free of any deposits or fluids, and are expected to be returned in the same condition. Depending on the use for which the equipment was rented, this may mean simply a wash out with a high pressure hose. In some cases a steam wash with detergent/solvent may be required. In some cases where no facilities are available for onsite cleaning, Seller can help with recommendations for outside cleaning firms. In the case of specialty media equipment rental, Seller can perform cleaning if contracted by Purchaser for service. For the safety of Seller's driver, it is asked that all valves be opened, cleaned and left in the open position. Equipment must be free of fluids and/or deposits prior to pickup to allow for transportation of equipment over the highway.

DRY RUNS-A dry run is charged when Seller is requested to pick up rental equipment but the rental equipment is still dirty, blocked by other equipment, in an impassable location, or otherwise not removable by Seller's driver. This means the released rental equipment will go back on rent and transportation costs will be charged to Purchaser accordingly

EQUIPMENT PERFORMANCE-Purchaser acknowledges that the Seller's equipment, rental or sale, is sized by the Purchaser's provided specifications. Changes in influent and/or flow rates may result in a complete system change(s) which may involve concealed costs or be completely outside the realm of Seller's equipment capabilities. Purchaser agrees to provide on site employees to be trained by Seller for operation of the equipment. Purchaser acknowledges that Seller's equipment can range from manned to fully automated, no matter what type of set up is selected. Purchaser must be sure to check on its operation 1-2 times per shift. This is essential to confirm that pumps are fueled regularly (diesel pumps or generator with electric submersibles) and filter units are operating properly. Some minor adjustments and maintenance may be necessary and will be the responsibility of the Purchaser. Service calls other than equipment related issues will be billed per hour

SET UP COSTS-Set up costs (which include influent and effluent lines) are the responsibility of Purchaser unless specifically included in Seller's bid quotation. If Seller is providing set up, materials are based on initial layout of the job. Changes in site conditions will be billed at actual time and materials. If Electric submersible pumps are used on this project, then 480/3-phase power needs to be supplied by Purchaser (or Generator equivalent in size required by Seller's personnel). Purchaser also needs to provide licensed electrician to install final wiring to pumps, control boxes and power source. Customer is responsible for satisfying all Federal and State regulations and permits pertaining to the discharge of treated water and/or air. It is the customer's responsibility to assess that satisfactory water and air quality requirements have been met and to open the system to full discharge.

RENTAL PERIOD & CALCULATION OF CHARGES-Rental charges commence upon shipment of the equipment from seller's yard and end when the equipment demobilization begins. Purchaser acknowledges responsibility to pay for installation and demobilization. All installation costs are billed at actual time and materials unless otherwise indicated. Purchaser agrees to provide appropriate power source for system and a qualified electrician to do final installation. Rental charges accrue during Saturdays, Sundays and holidays. Rental rates are for normal usage based on an eight hour day, 40 hours per week and 160 hours per month. On power equipment, operation in excess of one shift (eight hours per day) will be at Seller's standard premium rates. Purchaser will truthfully and accurately certify to Seller the number of shifts the equipment was operated. Transportation costs for delivery and pick up and rent for equipment covered by this agreement shall be in accordance with Seller's Rate Sheet in effect from time to time

PAYMENT-All obligations for rental under this agreement shall be paid in full upon return of the equipment to Seller or within 30 days after Seller's invoice to Purchaser, whichever occurs first. Purchaser and Seller agree that there shall be added to all past due rental charges a late payment fee equal to the lesser of 2% per month (24% per annum), or the maximum amount allowed by applicable law

DAMAGES AND LOSS CLAIMS-All claims for loss, damage and delay in transit are to be transacted by the Purchaser directly with the carrier. Claims for shortages of incorrect equipment must be made in writing to the Seller within fifteen (15) days after receipt of the shipment. Failure to give such notice shall constitute unqualified acceptance and a waiver by the Purchaser of all claims for shortages or incorrect equipment. The Purchaser shall examine the equipment upon taking possession of same and shall inform Seller immediately in writing of all defects and deficiencies for which Seller is responsible. If Purchaser omits to so notify Seller within thirty (30) days of Purchaser's possession of the equipment, same shall be deemed to have been accepted

FORCE MAJEURE-Purchaser acknowledges that they are solely responsible for operation of the equipment and assumes all risks inherent in the operation and use of the equipment by Purchaser, and will take all necessary precaution to protect all persons and property from injury or damage while in possession of the equipment. Seller shall not be responsible to Purchaser or to any other party for any loss, damage or injury (including any loss of profits, business interruption or other special or consequential damages) caused by, resulting from, or in any way connected with the equipment, its operation or use, or any defect with respect thereto. Purchaser agrees to defend, indemnify and hold Seller harmless from and against any and all liability, claims and damages of any kind (including attorneys' fees) for injuries or death to persons and damage to property arising out of the use, maintenance, instruction, operation, possession, ownership or rental of the equipment, however caused

RETURN OF EQUIPMENT, DAMAGED & LOST EQUIPMENT-At the expiration of the rental the Purchaser will return the equipment in the same condition as when delivered to the Purchaser, empty of all contents and filtration media and in clean condition, usual wear and tear excepted. Purchaser is responsible for cleaning and disposal of all liquids and solids including liquid and filter media solids whether hazardous or nonhazardous waste. Additionally Seller reserves the right to charge for any repairs that may be necessary, including cleaning of interior or exterior and disposal of any contents. Purchaser shall be liable for all damages to or loss of the equipment, including, but not limited to: (1) vacuum or pressure damage; (ii) tilting or upset due to unbalanced load; (iii) overloading; and (iv) internal damage caused by adverse effects of cargo or mixture of cargoes, cleaning solvents and/or cleaning processes undertaken by Purchaser or its agents and any damage during transit to or from Purchaser. Purchaser shall pay Seller the reasonable cost of transportation, repair and pay rental on the equipment at the regular rental rate until all repairs have been completed. Seller shall be under no obligation to commence repair work until Purchaser has paid to Seller the estimated cost thereof. In the case of the loss or destruction of any equipment, or inability or failure to return same to Seller for any reason whatsoever, Purchaser will pay Seller the then full replacement list price together with the full rental rate as specified until such equipment is replaced.

REASONABLE WEAR AND TEAR-Reasonable wear and tear of the equipment shall mean only the normal deterioration of the equipment caused by ordinary and reasonable use on a one shift (eight hours per day, 50 hours per week) basis. The following shall not be deemed reasonable wear and tear: (a) damage resulting from lack of lubrication or maintenance of necessary oil, water and air pressure levels (b) damage resulting from lack of servicing or preventive maintenance suggested in the manufacturer's operation and maintenance manual; (c) damage resulting from any collision, overturning, or improper operation, including overloading or exceeding the rated capacity of the equipment; (d) damage in the nature of dents, bending, tearing, scaring and misalignment to or of the equipment or any part thereof; (e) wear resulting from use in excess of shifts for which rented; and (f) any other damage to the equipment which is not considered ordinary and reasonable in the equipment rental industry. Repairs to the equipment shall be made only by a facility approved by Seller to the reasonable satisfaction of Seller and in a manner which will not adversely affect the operation, manufacturer's design or value of the equipment

Force Majeure Seller shall not be liable in damages and have the right to terminate this Agreement for any delay or default in performing hereunder if such delay or default is caused by conditions beyond its control including, but not limited to Acts of God, Government restrictions (including the denial or cancellation of any export, tariffs, or other necessary license), wars, insurrections and/or any other cause beyond the reasonable control of the party whose performance is affected

APPENDIX D – DRA HYDROTEST COST ESTIMATE MODEL AND COST ESTIMATE

Four major steps were required to generate DRA's illustrative cost estimates, the results of which are summarized in Section IV above: 1) develop a simple model that can be applied at either the project or segment level; 2) determine reasonable unit costs to use in the model; 3) apply the model to pipeline sections that were designated for *hydrotesting* by Sempra; and 4) apply the model to pipeline sections that were designated for *replacement* by Sempra. Note that in steps 3 and 4, the model was only applied to Category 4 miles. Derivation of Tables 9 and 10 in Section IV above is provided in workpaper TCR-WP4. DRA's model calculated total costs for Phase 1A, which were then allocated to 2012, 2013, 2014, 2015 using the approximate ratios Sempra used for SoCalGas pressure testing.[83]

A. Step 1 – DRA's Hydrotest Cost Model

As discussed in Section III above, DRA mapped Sempra's estimated unit costs into fixed, variable, or indirect costs, plus contingency. This allowed DRA to calculate aggregate costs as follows:

1. A fixed cost per project is applied for each hydrotest project (e.g. for each pipeline included in the Pipeline Safety Enhancement Plan)
2. A fixed cost per section is applied for each hydrotest segment, regardless of whether a project has one or 37 segments (e.g., Line 2000 has 37 test segments)
3. A variable cost per barrel is applied based on the length, diameter, and wall thickness of the test segment. A wall thickness of .250" was used for all segments as a simplification. Where a test segment had more than one diameter, the most prevalent diameter was used. Since the costs for nitrogen, Baker tanks, and vacuum trucks are only indirectly tied to pipeline volume, average costs were calculated and added to

[83] Amended Testimony, p. B-1. DRA used the ratios for SoCalGas pressure testing, but simplified them slightly to 20% for 2012, and 26.66% for 2013-2015.

the cost per barrel of water. Average cost calculations are provided in workpaper TCR-WP-1.

4. Indirect rates were applied based to the same bases as used by Sempra.

Once the model was developed, DRA performed a calibration using Sempra's proposed unit costs and scope which yielded a cost of $174,787,253, which is only .2% lower than Sempra's estimated cost for the same scope of $174,954,500.[84] While the model provides an accurate aggregate Pipeline Safety Enhancement Plan hydrotest costs, it over-estimates the cost of large individual projects by 2%- 4%, and under-estimates small projects by up to 28%. This is because the average costs are driven be a handful of large projects, such as lines 2000, 2001 West, and 2003. The model is available in MS Excel format in DRA workpapers TCR-WP2 and TCR-WP3 which makes all calculations and assumptions transparent.

B. Step 2 – DRA's adjusted hydrotest unit costs

DRA's analysis of Sempra's cost model concluded that excessive unit costs were used for water supply, water disposal, Baker Tanks, vacuum trucks. For fixed and indirect costs, DRA used Sempra unit costs, either as provided or in a simplified form, as a default since DRA did not derive an alternative.

1. Variable costs

DRA's cost estimate uses a unit cost of $25 per barrel on test section volume to cover the cost of water supply, disposal, storage, filtering, and transportation. Sempra's cost estimate includes $91.6 million directly tied, and $30.7 million indirectly tied to the volume of the line being tested, and as shown previously in Figure 4.[85]

[84] The model does not include repair costs and the calibration run did not include SoCalGas Storage projects. This calibration run is included in workpaper TCR-WP2.

[85] Water supply and disposal costs sum to $91.6 million, the balance of costs sums to $30.7 million.

Sempra's direct variable costs are based on the assumption that water supply and disposal will cost $74 per barrel. Based on the analysis above in Section III, DRA used a cost 1/10 of Sempra's cost, or $7.4 per barrel. This cost corresponds to a water supply cost of 4.5 cents per gallon, which is more than double the water costs observed in DRA's survey, and a water disposal cost of 13.1 cents a gallon. This disposal cost is significantly more than disposal fees for storm drains and sewers in regions with temporary water discharge permit programs, as well as the disposal cost at Crosby Overton.

The average costs of indirect variable costs used by Sempra are approximately $4.25, $11.50, and $4.25 per barrel of test section volume for nitrogen supply, Baker tanks, and vacuum trucks, respectively. Combined with the $7.4 per barrel for water, this yields a total variable cost of $27.4 per barrel. DRA initially used a lower cost of $25 per barrel in its cost calculations since there were indications that Sempra's costs for Baker tanks were excessive. Subsequent analysis, presented in Section III, indicated that Sempra's costs for both Baker tanks and vacuum trucks were inflated, much more than DRA initially suspected. In the final analysis, the $25 per barrel cost DRA used is generous, and more than compensates for filtration equipment, or other costs Sempra may have omitted from its estimate.

2. Contingency

DRA's cost model uses an 8% contingency based on the analysis and recommendations presented in this exhibit.

3. Fixed cost per test project

DRA used Sempra's estimated fixed material cost of $25,000 for each hydrotest project for a "Temporary Pig Launcher/Receiver."

4. Fixed cost per test segment

Sempra estimated a fixed cost per test section which includes estimated labor costs of $77,000 per test, and $5,486 for material. Labor costs includes mobilization, set-up, hydrotest work, clean-up, and purging of lines, and also includes the cost of tying the pipeline back in after the test is complete, and of a third party witness. The

fixed material costs are rental costs for a vacuum truck ($5,000) and pump ($486) to fill the pipeline with water and pressurize it. DRA used these costs in its cost model.

5. Indirect costs

Sempra used different indirect rates for Engineering and Sempra company labor depending on the size of each hydrotest project. DRA used Sempra's average rate for each of these in its cost estimate: 5% for engineering and 3% for Sempra company labor.

C. Step 3 – Application of DRA's model to pipeline sections that were designated for *hydrotesting* by Sempra

Workpaper TCR-WP2 applies the DRA model for projects designated by Sempra for hydrotesting. Separate tabs show the adjusted cost based only on DRA unit costs ($51.6 million), and based on both adjusted scope and unit costs ($34.7 million). Removing accelerated miles from the scope of Phase 1A reduced the test mileage by approximately 50%, and this reduction should also be reflected in a reduction in the number of test segments. DRA divided the Category 4 miles for each project by 2.5 miles to obtain a revised estimate of the number of test segments. Workpapers were not available for Sempra's proposed hydrotests of SoCalGas storage pipelines when DRA performed these calculations, so these projects are not included in DRA's calculations.

D. Step 4 – Application of DRA's model to pipeline sections that were designated for *replacement* by Sempra

Workpaper TCR-WP3 applies the DRA model for projects designated for Sempra for replacement. This workpaper applies the DRA model for each segment with Category 4 miles. DRA did not attempt to combine test segments together to form projects, but rather applied a fixed cost of $107,486 to each of 306 estimated test segments. The number of segments was determined for each Category 4 segment in a pipeline with a unique diameter or wall thickness. In addition, segments were designated for every 2.5 miles of long pipelines. These conservative assumptions resulted in aggregate fixed costs of $32.4 million, which are much higher than the variable cost of $4.2 million. The overall cost of hydrotesting segments that Sempra

slated for replacement is $43.5 million using this approach, and this is the cost incorporated in Tables 9 and 10.

APPENDIX E - QUALIFICATIONS AND PREPARED TESTIMONY OF THOMAS ROBERTS

Q.1.Please state your name and business address.
A.1.My name is Thomas Roberts. My business address is 505 Van Ness Avenue, San Francisco, CA 94102.

Q.2.By whom are you employed and in what capacity?
A.2.I am employed by the California Public Utilities Commission as a Senior Utilities Engineer in the Electric Pricing and Consumer Program Branch of the Division of Ratepayer Advocates ("DRA").

Q.3.Please describe your educational background and professional experience.
A.3.I received a Bachelor of Science Degree in Mechanical Engineering from the California State Polytechnic University in 1988, and a Masters of Business Administration from the Peter F. Drucker Center at the Claremont Graduate School in 1994. I am currently registered in California as a Professional Mechanical Engineer.

As a Regulatory Analyst and Engineer, I have contributed to a wide variety of proceedings, including advanced metering infrastructure (AMI), energy efficiency (EE), and avoided costs. I provided testimony on DRA's behalf in the 2006 Long Term Procurement Proceeding (LTPP), in 2007 hearings on the EE Risk/Reward Incentive Mechanism, and PG&E's recent Pipeline Safety Enhancement Plan application (A.11-02-019). I have served DRA as project coordinator for AMI programs, and for distributed generation programs including the California Solar Initiative (CSI) and the Self-Generator Incentive Mechanism (SGIP). Prior to joining DRA, I held various professional positions including Senior Test Engineer/Scientist and Program Manager at Boeing Space Systems, and as an applications engineer for an instrumentation manufacturer.

Q.4.What is your area of responsibility in this proceeding?
A.4I am sponsoring DRA Exhibit DRA-2A, which is DRA's Prepared Testimony in R.11-11-002 on Sempra's Pipeline Safety Enhancement Plan Hydrotest Costs.

Q.5Does this complete your testimony?
A.5Yes, it does.

APPENDIX F - SEMPRA RESPONSES TO SELECTED DRA DATA REQUESTS REGARDING HYDROTEST COSTS

This appendix contains selected questions and responses for the following DRA data requests:

- DRA-TCR-1 – Issued January 13, 2012; responses January 27, 2012
- DRA-TCR-2 – Issued May 25, 2012; responses June 11 and June 15, 2012
- DRA-TCR-3 – Issued June 6, 2012; responses June 13 and June 18, 2012.

QUESTION TCR1-1:

TCR 1-1: Please provide all workpapers supporting SoCalGas/SDG&E's unit and overall costs for hydrotesting. Provide excel versions with active formulas, links, and linked files where they were created by SoCalGas/SDG&E.

RESPONSE TCR 1-1:

Information regarding the pressure test cost estimates included in the PSEP can be found on pages WP-IX-1-2 through WP-IX-1-20 of the workpapers supporting Chapter IX of the Testimony and in the workpaper Appendices IX-1-A through IX-1-D. Excel versions of these documents, including the cost estimate sheets completed by SPEC Services, were provided to DRA on 12/9/2011.

QUESTION TCR 1-2:

TCR 1-2: Please provide detailed hydrotesting unit costs for the following:

a. Pre-test line cleaning.
b. In-line tools for cleaning.
c. Cost of water delivered to test site.
d. Cost to remove water from test site and disposal.
e. Pump for line filling and pressurization.
f. Testing costs, including third-party costs for filling, pressurization, leak detection, depressurization, and independent verification.

g. Post-test line cleaning.
h. Line drying.
i. Air compressor.
j. Test monitoring and recording equipment.
k. Labor per project, including all types of labor required.

RESPONSE TCR 1-2:

All unit costs contributing to the overall hydrotest cost estimate for a specific project in the PSEP are contained within the SPEC Services cost estimate sheets. These can be found in Appendices IX-1-A through IX-1-D. Excel versions of these estimate sheets were provided to DRA on 12/9/2011.

QUESTION TCR 1-3:

TCR 1-3: Please provide a detailed budget justification for fixed costs, including details of all the costs associated:

a. Hydrotests.
b. Pipeline replacement projects.

RESPONSE TCR 1-3:

SoCalGas/SDG&E utilized a reputable, Southern California-based pipeline engineering company (SPEC Services) for the pressure test and replacement cost estimation effort in order to get an experienced, independent, third party perspective on the cost to replace or pressure test pipe segments. No preliminary engineering or site evaluation was performed in advance of the formulation of these estimates. As such, SPEC attempted to identify all expected cost contributors as line items and relied on past project experience to assign individual costs. Detail regarding the assumptions and basis for the pressure test and replacement costs can be found in Appendices D and E of the Testimony.

QUESTION DRA-TCR-TCAP-PSEP-02-01-01:

Exhibit Reference: Chapter IX, Cost Workpapers

Excel versions of the Chapter IX workpaper were provided to DRA. A separate spreadsheet was provided for SPEC's detailed cost estimate for each of the 15 of the 17 hydrotests proposed, but not for the two projects on

SoCalGas storage lines (Goleta and Playa del Rey). Please provide excel versions of the workpapers on these two hydrotest projects.

RESPONSE DRA-TCR-TCAP-PSEP-02-01-01:

Individual workpapers were not created for the SoCalGas Storage pressure test projects and SPEC Services did not provide cost estimates.

The SoCalGas Storage pressure test project estimates were completed by internal field technical services staff. The basis used in making these estimates were cost estimates being developed for other Storage projects which included hydrotesting as part of the scope of work. Details regarding the breakdown of those estimates are being compiled and will be provided by June 13, 2012

QUESTION DRA-TCR-TCAP-PSEP-02-01-03:

The calculation of SCG labor, section 3 of the cost estimate, appears to multiply the 10% value for small projects to only the labor costs from section 2, but multiplies the 5% value for larger projects to the sum of the labor cost of section 2 as well as the material cost from section 1. Please explain if this was a mistake, and if not, the justification for this calculation logic

RESPONSE DRA-TCR-TCAP-PSEP-02-01-03:

The hydrotest cost estimate sheets have the following equations in the SCG Labor section:

- Project < $1 million, 10%
  - =IF((L53+L64)<=1*10^6, (**L19**+L64)*F66/100,0)
- $1 million < Project < $10 million, 5%
  - =IF((L53+L64)>1*10^6, (IF((L53+L64)<=10*10^6, (L53+L64)*F67/100,0)),0)
- Project > $10 million, 2%
  - =IF((L53+L64)>10*10^6, (L53+L64)*F68/100,0)

where cells L53 and L64 reference the Total Material Cost and Total Construction Cost, respectively.

The equation that applies a 10% factor to determine the SCG Labor incorrectly references cell L19 in the equation (which is a blank cell), instead

of cell L53. As such, the calculation is only based on the Total Construction Cost and not the sum of the Construction and Material costs.

This calculation error affects eleven pressure test cost estimates:

Pipeline	As Filed SCG Labor Cost	Adjusted SCG Labor Cost	Δ
235 East	$ 7,700	$ 75,070	$ 67,370
317	$ 7,700	$ 31,560	$ 23,860
1024	$ 7,700	$ 73,500	$ 65,800
33-121	$ 7,700	$ 29,570	$ 21,870
36-8-06	$ 7,700	$ 13,730	$ 6,030
36-1032	$ 7,700	$ 21,630	$ 13,930
38-528	$ 15,400	$ 28,890	$ 13,490
41-25	$ 7,700	$ 13,820	$ 6,120
41-90	$ 7,700	$ 13,600	$ 5,900
44-1008	$ 23,100	$ 89,840	$ 66,740
49-15	$ 7,700	$ 14,640	$ 6,940
Total			$ 298,050

Since the SCG Labor cost factors into the calculation of Contingency, upon correction of this cell reference error the overall project cost estimate would increase by an amount slightly greater than the difference noted in the table above:

Pipeline	As Filed Pressure Test Cost Estimate	Adjusted Pressure Test Cost Estimate	Δ
235 East	$ 1,034,800	$ 1,122,500	$ 87,700
317	$ 440,900	$ 471,900	$ 31,000
1024	$ 1,012,900	$ 1,098,400	$ 85,500
33-121	$ 413,700	$ 442,200	$ 28,500
36-8-06	$ 197,500	$ 205,400	$ 7,900
36-1032	$ 305,400	$ 323,600	$ 18,200
38-528	$ 414,500	$ 432,000	$ 17,500
41-25	$ 198,800	$ 206,900	$ 8,100
41-90	$ 195,700	$ 203,400	$ 7,700
44-1008	$ 1,256,500	$ 1,343,300	$ 86,800
49-15	$ 210,000	$ 219,100	$ 9,100
Total			$ 388,000

Because the PSEP contains a contingency and is based on estimates that will be updated when the detailed engineering, design, and execution planning is completed, SCG/SDG&E are not proposing to update the cost estimates or amend the PSEP filing in order to correct this minor error as it is within the accuracy of the overall estimate. The updated estimates produced during the engineering, design, and execution planning phase for each project will be produced based on a defined scope, material quantities, and man-hour estimates.

QUESTION DRA-TCR-TCAP-PSEP-3.1:

3.1 Estimating assumptions are provided in Appendix D of Sempra's Amended Testimony. Please provide any supporting workpapers, assumptions, justifications, or any other evidence supporting the following costs in the detailed cost estimates:

a. Nitrogen ($.19 per SCF)
b. Temporary pig launcher/receiver ($25,000 each)
c. Hydrotest water ($19 per bbl)
d. Hydrotest water disposal ($55 per bbl)
e. Baker Tanks ($1,600 per day)
f. Vacuum Trucks ($5,000 per day)
g. Water pump and Filter ($486 per day)
h. Misc. materials (5%)
i. All labor unit costs in section 2, Construction

RESPONSE DRA-TCR-TCAP-PSEP-3.1:

As stated in Response SCGC-4.4.1:

> "Based on the preliminary nature of the pipe replacement cost estimates and the minimal engineering, operational planning, and project execution planning that has been done, per the AACE classification the cost estimates developed for the Pipeline Safety Enhancement Plan can be considered slightly better than a Class 5 Estimate."
> *Note: the same statement can be applied to the pipeline hydrotest cost estimates provided by SPEC Services*

Per AACE Guidelines, a Class 5 cost estimate is defined as having a level of project definition of 0-2% and typically uses stochastic or judgment as the method of estimating. The hydrotest cost estimates can be considered Class

5 estimates and were based on analogous and parametric estimating techniques, using historical costs of projects that were completed for numerous clients of SPEC Services. These projects were completed by energy-type companies, on projects with similar scope. As these estimates were compiled in a short amount of time, some exact costs were not available and judgment based, order of magnitude numbers were used.

a. The Nitrogen cost per SCF includes the cost of nitrogen as well as labor costs associated with the sub-contractor. The sub-contractor work includes purging technicians, truck drivers, mobilization/demobilization, etc. (see Praxair invoice at the end of this Appendix).

b. The temporary pig launcher/receiver unit cost includes pricing for material used to construct the launcher/receiver (such as pipe, valves, and fittings) and the labor cost for the fabrication and installation of the pig launcher/receiver.

c. Hydrotest water unit costs include average direct pricing for the water and costs associated with filling the pipeline with the hydrotest water.

d. Hydrotest water disposal unit costs include costs associated with treatment of contaminated hydrotest water and were developed through conversations with water treatment vendors and review of past projects of similar scope.

e. Baker Tank unit costs include daily rental fees, mobilization/demobilization costs, labor costs associated with the operation of Baker Tanks during the pipeline filling and discharge, and vapor control system and tank cleaning costs. (see Baker Corporation) invoice at the end of this Appendix).

f. Vacuum truck costs include the direct cost for the vacuum truck, fuel charges, and labor costs for a driver and operator to handle and transport pre and post hydrotest water.

g. Water pump and filter costs include direct rental costs and the cost of power or fuel to operate the pump.

h. The miscellaneous materials are included in estimates as a cost factor, but include cost estimates for air compressors, pigs, valves, fittings and other construction disposables. See Note 10 on page D-2 of the Amended Testimony.

i. Construction labor unit costs include test technicians, welders, helpers, pipe fitter and associated labor required to complete the hydrotest work. The hydrotest work includes nitrogen purging of the pipeline, excavation for installation of temporary pig traps, cutting of existing pipeline, water fill, performing the hydrotest, discharge of the hydrotest water, drying of

the pipeline, and tie-ins for reactivation of the pipeline. Labor costs were developed via past projects of similar scope.

QUESTION DRA-TCR-TCAP-PSEP-3.2:

3.2 Estimating methodology is provided in Appendix D of Sempra's Amended Testimony. Please provide any supporting workpapers, assumptions, justifications, or any other evidence supporting the following elements of the detailed cost estimates:

a. Types and levels of contaminants in the effluent water from a hydrotest,
b. Requirements for onsite pretreating of waste water following a hydrotest,
c. Water pretreatment methods and costs,
d. Whether the temporary pig launcher/receiver also provide the functionality of test heads and/or test caps,
e. Reason to limit the number of Baker Tanks per test to ten,
f. What is included in SCG Labor/Inspection labor rate?
g. Derivation of the three SCG Labor/Inspection labor rates,
h. What is included in "Planning/Design/Engineering/Coordination/Procurement" labor rate?
i. Derivation of the 5% "Planning/Design/Engineering/Coordination/Procurement" labor rate,
j. ROW, permit costs, and environmental monitoring costs – where are they included in the estimate?
k. Derivation of the 20% contingency rate?
l. The reason for a higher 30% contingency rate for smaller projects.

RESPONSE DRA-TCR-TCAP-PSEP-3.2:

a. The costs included in the estimates for treating the hydrotest water are based on an average treatment cost for hydrocarbon based contaminated water. In order to refine this cost, actual testing would need to be completed to determine whether other, non-hydrocarbon based contaminates may be contained within the pipe; potentially altering the basis of the estimate.

b. The estimate assumes that there is no on-site pretreating of the hydrotest water.
c. See Response DRA-TCR-TCAP-PSEP-3.2(b)
d. The function of temporary launchers and receivers are similar to test headers.
e. The maximum number of Baker Tanks was set to 10 to limit the construction work area to a reasonable size. Hydrotest water is temporarily stored in Baker Tanks before it is to be transported to a site for filtration and cleaning prior to disposal. The estimates assume Baker Tanks (500 BBL capacity) will be positioned at the end of each hydrotest section to collect water after each hydrotest. For each Baker Tank there will be a dedicated vacuum truck collecting water for disposal. This quantity of tanks assumes dewatering and disposal can occur simultaneously at a comparable rate. Water disposal locations were assumed to allow for ten round trips per day for each vacuum truck. The estimates assume a 1-hour round trip, contaminated water, and a disposal fee.
f. The SCG Labor/Inspection costs cover construction management and field inspection
g. The same company labor/inspection factors that were included in the pipe replacement cost estimates were also used in the hydrotest cost estimates. These factors were agreed upon by subject matter experts knowledgeable of pipeline project costs and take into consideration that the company labor component of a project accounts for a relatively smaller percentage as the overall project scope and cost increases. The following direct costs were examples used to determine the basis and closely resemble historical replacement project direct costs:

Project Cost	Company Labor	%
$ 350,000	$ 35,000	10%
$ 2,000,000	$ 90,000	4.5%
$ 10,000,000	$ 400,000	4.0%
$ 32,000,000	$ 800,000	2.5%

h. Activities considered in this cost category include project engineering and design, review and approval of test procedures, and data analysis.
i. The 5% factor used represents a reasonable estimate of the going rate for such engineering services.

j. The hydrotest estimates do not include costs for right-of-way acquisition, construction permits, or environmental permits (see item 7(a) on page E-2 of the testimony).
k. See Response DRA-DAO-01-5
l. See Response DRA-DAO-01-5

ATTACHMENTS TO SEMPRA'S RESPONSE TO DRA-TCR-3

Praxair reference quote document dated August 2007. The unit pricing was increased to account for inflation between 2007 and 2011.

PRAXAIR

PRAXAIR SERVICES INC

PAGE	ACCOUNT NUMBER	INVOICE NUMBER	INVOICE DATE
1 of 1	[redacted]	[redacted]	8/16/2007

REMITTANCE INSTRUCTIONS:

PLEASE SHOW INVOICE NUMBER AND DATE ON REMITTANCE, AND MAIL TO:

Praxair Services, Inc.
PO Box 840193
Dallas TX 752840193

TERMS

Net 30 days from invoice date

Net Due Date 9/15/2007

BILL TO:

[redacted]

SHIP TO:

[redacted]

QUESTIONS

QUESTIONS REGARDING THIS INVOICE SHOULD BE DIRECTED TO:

Kelly M. Day
PO Box 1248
La Porte TX 77572

TEL. 281-478-1904
FAX. 281-478-1919
E-MAIL Kelly_Day@Praxair.com

COMMENTS

[redacted]

Total amount due from customer may include various itemized charges, including: charges for handling of hazardous materials and for compliance with laws and regulations concerning hazardous materials; charges for handling, delivery, shipping; charges for energy or fuel. None of the charges represent a tax or fee paid to or imposed by any governmental authority, and all of the charges are retained by the company.

INVOICE DETAIL

PRODUCT DESCRIPTION, REL#, PRAXAIR#, PO#	SHIP DATE	ORDER NUMBER	UNIT QUANTITY	U/S	UNIT PRICE	AMOUNT	TAX Y/N	TAX RATE/ AMT	TAX ST
Minimum Service Charge - Other [redacted]	08/14/2007	11418811	1.0	EA	1,925.0000	1,925.00	N		CA
NPS Nitrogen - PSI Pumped [redacted]	08/14/2007	11418811	20,148.00	CCF	.8350	168.24	N		CA
Pumper Hrs [redacted]	08/14/2007	11418811	2.50	HR	145.0000	362.50	N		CA
Pumper Miles [redacted]	08/14/2007	11418811	125	MI	3.9500	493.75	N		CA
Technician ST Hours [redacted]	08/14/2007	11418811	2.50	HR	125.0000	312.50	N		CA
Reg Compliance Charge [redacted]	08/14/2007	11418811	1.0	EA	25.0000	25.00	N		CA
Sub Total Praxair [redacted]			20,280.0	EA		3,286.99			

10355163 UT3

AMOUNT	SALES TAX	TOTAL AMOUNT
$ 3,286.99	$ .00	$ 3,286.99

1

BAKERCORP

Baker Rental Quote & Transportation

5500 Rawlings Avenue * South Gate, CA 90280
Phone (562) 904-3680 * Fax (562) 904-1583

Name:		Date:	
Company:	SPEC Services	Contents:	Contaminated Water w/ Hydrocarbon
Address:	17101 Bushard Street Fountain Valley, CA 92708	Job Location: Start Date:	
Phone:	714-963-8077	Duration:	
Fax:	714-963-4634	Baker Rep:	Andrew Romano
E-Mail:		Mobile:	562-244-9781

ESTIMATED QUOTE FOR EQUIPMENT RENTAL

Equipment Type	Qty	Rate Per Item	Note
500 bbl (21,000 gals) Safety Vapor Tight Steel Tank	2	$35/day	
Safeguard Steel Tank Berm	2	$25/day	
Set-up and Take Down Charge of Berm	2	$300	

All equipment subject to inventory availability

ESTIMATED TRANSPORTATION COST

Equipment Type	Delivery	Pick Up
Per Steel Tank	$210.00	$210.00

Transportation is portal to portal

IMPORTANT: CHANGE OF SCOPE OF WORK

This quote is an estimate based on information given by the customer. The actual cost may differ from the quote if the job requirements change prior to the start of the project or during the project. Any unforeseen changes, for example, permit processing time, use of additional spotters, equipment placement changes, or any delays not caused by BakerCorp will be charged at $105 per man per hour.

RENTAL TERMS & CONDITIONS

*BakerCorp equipment billing cycle is 28 days.
Pumps billing cycle is 3 days = 1 week and 3 weeks = 1 month
*BakerCorp equipment is delivered clean & free of deposits and fluids *
All equipment MUST be cleaned and decontaminated before they are off rent
Estimated transportation charges DO NOT include delays on the jobsite caused by others
Overtime transportation rates apply weekdays before 7 a.m. and after 5 p.m., and all day Saturday and Sunday.
Thank you for giving BakerCorp the opportunity to present you with the above quotation.
BakerCorp offers America's largest inventory and broadest variety of rental containment.
Quick response & immediate delivery are available 24 hours a day.
Quotation is valid for 60 days

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BAKERCORP

Terms and Conditions

Availability: All quotes are based on inventory available at the time/date our quote is made. To help ensure availability at the time the order is place, please allow as much reasonable notice as possible prior to the actual day the equipment is needed.

Rental Billing: Tanks billing is on a 28 day cycle. **Example:** If the rental start is on January 15th, you will be billed every 28 days from that start date. Pumps billing is on a 28 day cycle although, 1-3 days are invoiced at the daily rate, 3-7 days are invoiced for a full week, 7-21 days are adjusted to the weekly rate, 21-28 days are invoiced for a full month, and 28 days are adjusted to the monthly rate. Pumps single shift is based on an eight hour day or 224 hours per month. Any additional hours is subject to second or third shift rates.

Transportation: The transportation rates quoted are estimates only. You will be billed according to the actual time accumulated "Portal to Portal" (round trip) for each delivery ad again on each pickup. These rates are figured on NORMAL BUSINESS HOURS...7AM-5PM Monday-Friday. After business hours, weekend, and holiday rates will be charged as overtime.

Compatibility of Equipment: Statements regarding compatibility of equipment made by Baker personnel or contained herein are based upon information from material suppliers and careful examination of available published information they, are believed to be accurate. However, since the resistance of metals, plastics, and elastomers can be affected by concentrations, pH, temperature, presence of other chemicals and other factors, this information should be considered only as a general guide. Ultimately, the customer must determine the suitability of the equipment used in various situations after taking into consideration all relevant factors.

Equipment Cleanout Procedures: IT'S THE CUSTOMER'S RESPONSIBILITY FOR CLEANOUT OF EQUIPMENT PRIOR TO PICKUP. To ensure proper cleaning of all equipment, please forward a copy of this to all persons in charge of this project. Baker's equipment is rated according to application and will be delivered to you clean, free of any deposits or fluids, we expected it to be returned in the same condition. Depending on the use for which the equipment was rented, this may mean simply a wash out with a high pressure hose. In some cases a steam wash with detergent/solvent may be required. For the safety of our driver, we ask that all valves be opened, cleaned, and left in the open position. Equipment must be free of fluids and/or deposits prior to pickup to enable us to transport equipment over the highway. If needed, contact your sales representative for a list of qualified cleaning companies.

TO AVOID UNNECESSARY "DRY RUNS" IT'S IMPORTANT TO READ THIS THOROUGHLY: It is our strong desire to help our customers avoid incurring extra charges for unnecessary "DRY RUNS". A "DRY RUN" is charged when BakerCorp is requested to pick up equipment but the equipment is still dirty, blocked by other equipment, in an impassable location, or otherwise not removable by our driver. This means the equipment will go back on rent and transportation costs will be charged to the customer accordingly. To avoid these charges, please inspect the equipment carefully for cleanliness and accessibility prior to release.

Customer acknowledges that the Filtration Division system is sized by above customer provided specifications. Changes in influent and/or flow rates may result in a complete system change(s) which may involve increased costs or be completely outside the realm of our equipment capabilities. Customer agrees to provide 1-2 key on site employees to be trained by Baker personnel for operation of the system. Customer acknowledges that the Baker filtration systems can range from manned to fully automated filtration. Customer must be sure to check on its operation 1-2 times per shift. This is essential to confirm that pumps are fueled regularly (diesel pumps or generator with electric submersibles) and filter units are operating properly. Some minor adjustments and maintenance may be necessary and will be the responsibility of the lessee. Service calls other than equipment related issues will be billed per our standard hourly rate.

Set-up cost (which include influent and effluent lines) are the responsibility of the customer unless specifically included in our bid quotation. If Baker is providing set-up, materials are based on initial layout of the job. Changes in site conditions will be billed at actual time and materials.

Filtration Media is provided at flat rate to customer "loaded" into vessels unless otherwise noted on quote. On completion of project customer is responsible for emptying and disposing of all used sand and gravel (normally easiest to hire a Industrial Vacuum Service to accomplish). Sand Filter, Cartridge Filter units, Tanks, Pumps, pipe hose and fittings all need to be empty, rinsed and clean of all solids and liquids.

Customer will need to be responsible for the power supply and source.

Customer is responsible for satisfying all Federal and State regulations and permits pertaining to the discharge of treated water. It is the customer's responsibility to assess that satisfactory water quality requirements have been met and to open the system to full discharge.

CUSTOMER AGREES AND ACCEPTS THE QUOTATION BID AND ITS TERMS AND CONDITIONS:

Signed: _____

Print Name: _____

Date: _____

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