

# MEMORANDUM

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**TO:** UTILITIES ADVISORY COMMISSION

**FROM:** ADMINISTRATIVE SERVICES DEPARTMENT

**DATE:** AUGUST 1, 2007

**SUBJECT:** ENERGY RISK MANAGEMENT REPORT FOR THIRD QUARTER,  
FISCAL YEAR 2006-2007

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**REQUEST:**

This quarterly update on risks associated with the purchase of natural gas and electricity commodities is for the Commission's information only.

**EXECUTIVE SUMMARY:**

This quarterly update has been prepared to keep the Commission apprised of the major issues that are facing the City with regard to the purchase of energy commodities.

**ATTACHMENTS:**

**1. CITY OF PALO ALTO'S ENERGY RISK MANAGEMENT REPORT FOR THE  
THIRD QUARTER, FISCAL YEAR 2006-2007**

**PREPARED BY:**

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**Karl Van Orsdol**  
Energy Risk Manager

**APPROVED BY:**

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**Carl Yeats**  
Director of Administrative Services



**Table 1. Summary of Forward Electricity Positions and Exposures**

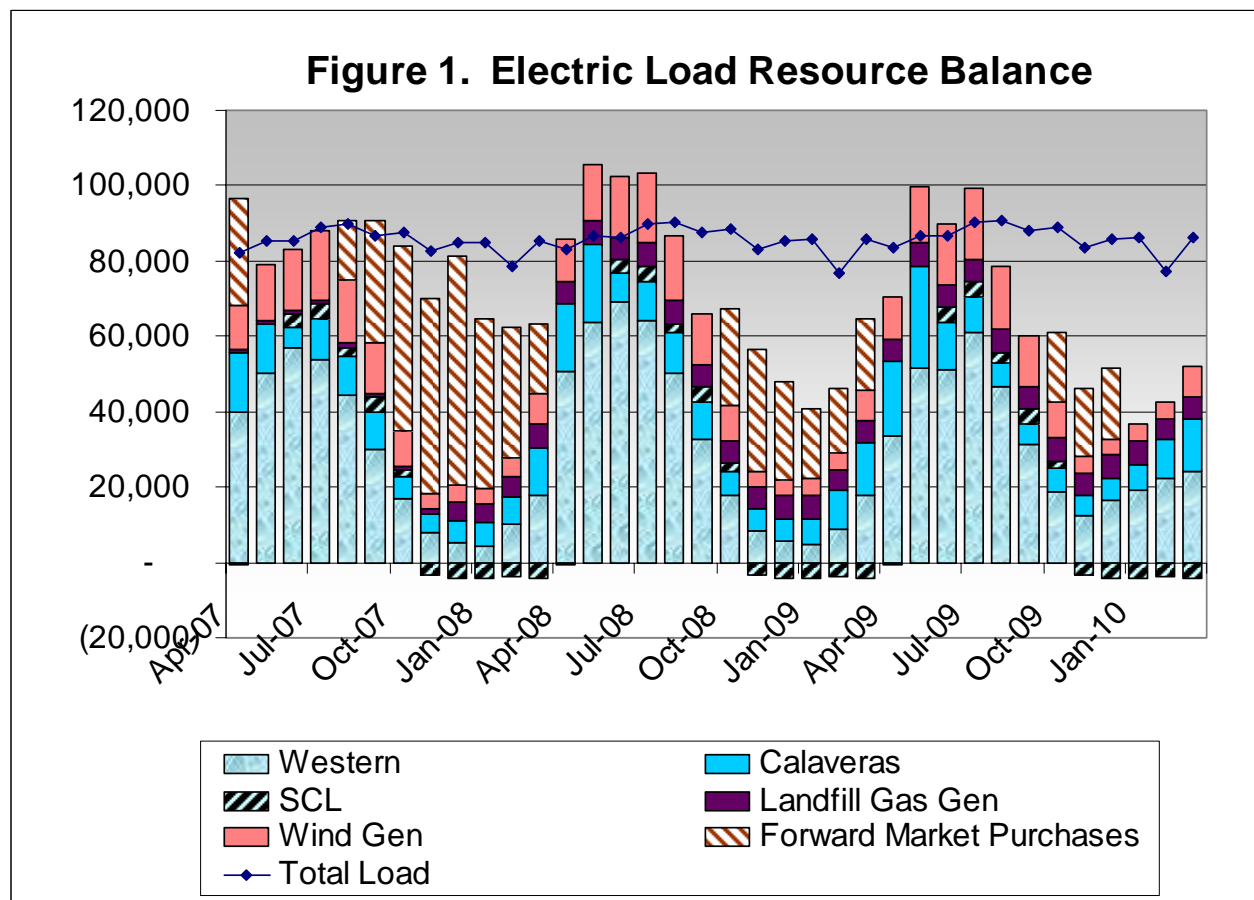
<b>Electric Limit Report</b>									
Limit report as of:		3/30/07							
<b>NO VIOLATIONS</b>									
<b>Volumes</b>									
Counterparty	Limit (Volume)	FY Ending 07 (12 months)	FY Ending 08	FY Ending 09	FY Ending 10	FY Ending 11	FY Ending 12	FY Ending 13	Violation
BP	500,000	46,080	14,655	0	0	0	0	0	0
Coral Power	400,000	162,145	152,425	138,515	55,225	0	0	0	0
Sempra	300,000	157,855	93,300	0	0	0	0	0	0
<b>Total</b>	#N/A	366,080	260,380	138,515	55,225	0	0	0	0
<b>HeadRoom</b>									
Counterparty	Unit: MWh	FY Ending 07 (12 months)	FY Ending 08	FY Ending 09	FY Ending 10	FY Ending 11	FY Ending 12	FY Ending 13	
BP		453,920	485,345	500,000	500,000	500,000	500,000	500,000	
Coral Power		237,855	247,575	261,485	344,775	400,000	400,000	400,000	
Sempra		142,145	206,700	300,000	300,000	300,000	300,000	300,000	
<b>Total</b>		833,920	939,620	1,061,485	1,144,775	1,200,000	1,200,000	1,200,000	
<b>Mark to Market</b>									
Counterparty	12 Month Fwd Credit Exposure Limit	Rolling 12 Months M2M Starting in April-07	Violation	Headroom	Total Credit Exposure Limit	Total M2M of Open Transactions Starting in April-07	Violation	Headroom	
BP	\$ 30,000,000	\$ 105,612		\$ 29,894,388	\$ 60,000,000	\$ 105,612		\$ 59,894,388	
Coral Power	\$ 25,000,000	\$ 4,000,096		\$ 20,999,904	\$ 45,000,000	\$ 10,270,939		\$ 34,729,061	
Sempra	\$ 15,000,000	\$ 674,615		\$ 14,325,385	\$ 30,000,000	\$ 674,615		\$ 29,325,385	
<b>Total</b>		\$ 4,780,323		\$ 65,219,677		\$ 11,051,166			

**Table 2. Summary of Forward Gas Positions and Exposures**

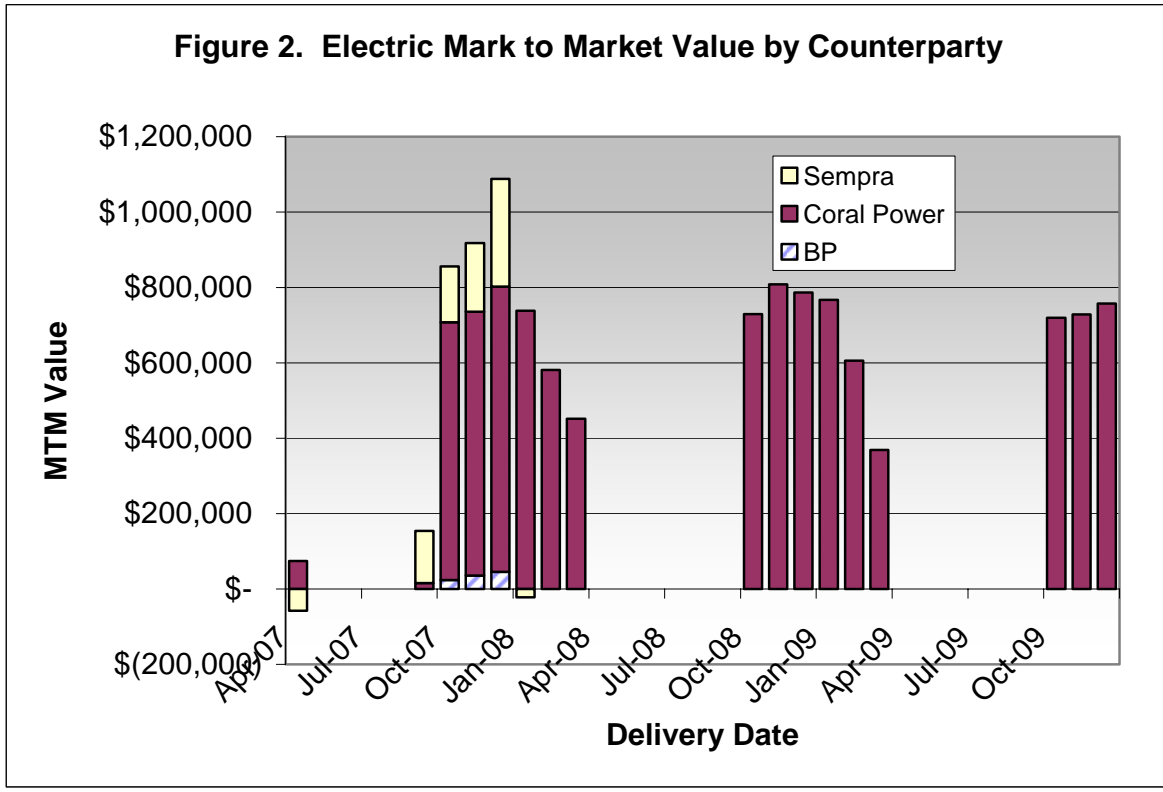
<b>Gas Counterparty Credit Exposure Summary As of 03/30/2007</b>										
<b>NO VIOLATION</b>			Total Open Starting in April-07	Open FY Ending/07 (starts in April-07)	FY Ending 07 (July to June)	FY Ending 08	FY Ending 09	FY Ending 10	FY Ending 11	12 Month (from Apr-07 to Mar-08)
Transaction Volume	MMBtu		4,327,840	435,930	2,238,600	2,055,540	1,514,370	322,000	-	2,127,470
Transaction Costs	\$		\$ 33,368,741	\$ 2,787,898	\$ 14,248,792	\$ 15,716,091	\$ 12,494,142	\$ 2,370,610	\$ -	\$ 15,942,099
Transaction Market Val	\$		\$ 35,504,565	\$ 3,026,560	\$ 4,426,694	\$ 17,307,258	\$ 12,643,519	\$ 2,527,228	\$ -	\$ 17,553,579
Mark to Market	\$		\$ 2,135,824	\$ 238,662	\$ 245,819	\$ 1,591,167	\$ 149,376	\$ 156,618	\$ -	\$ 1,611,480
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ConocoPhillips	Transaction Volume	MMBtu	-	-	(2,500)	-	-	-	-	-
	Transaction Limit Violation?	MMBtu			960,000	960,000	960,000	960,000	960,000	
	Transaction Value	\$	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	Mark to Market	\$	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	Mark to Market Limit Violation?	\$	25,000,000							
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BP	Transaction Volume	MMBtu	197,500	197,500	561,170	-	-	-	-	197,500
	Transaction Limit Violation?	MMBtu			1,600,000	1,600,000	1,600,000	1,600,000	1,600,000	
	Transaction Value	\$	\$ 1,373,812.50	\$ 1,373,812.50	\$ 1,864,446.40	\$ -	\$ -	\$ -	\$ -	\$ 1,373,812.50
	Mark to Market	\$	\$ 26,192	\$ 26,192	\$ (79,776)	\$ -	\$ -	\$ -	\$ -	\$ 26,192
	Mark to Market Limit Violation?	\$	45,000,000							
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Duke	Transaction Volume	MMBtu	-	-	-	-	-	-	-	-
	Transaction Limit Violation?	MMBtu			800,000	800,000	800,000	800,000	800,000	
	Transaction Value	\$	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	Mark to Market	\$	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -	\$ -
	Mark to Market Limit Violation?	\$	20,000,000							
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Sempra	Transaction Volume	MMBtu	1,586,140	-	944,300	796,000	560,140	230,000	-	644,000
	Transaction Limit Violation?	MMBtu			1,280,000	960,000	960,000	960,000	960,000	
	Transaction Value	\$	\$ 13,074,535	\$ -	\$ 874,665	\$ 6,604,565	\$ 4,683,317	\$ 1,786,653	\$ -	\$ 5,444,395
	Mark to Market	\$	\$ 1,106,238	\$ -	\$ 118,342	\$ 902,215	\$ 79,581	\$ 124,442	\$ -	\$ 794,125
	Mark to Market Limit Violation?	\$	25,000,000							
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Coral Energy	Transaction Volume	MMBtu	2,544,200	238,430	735,630	1,259,540	954,230	92,000	-	1,285,970
	Transaction Limit Violation?	MMBtu			1,280,000	1,280,000	1,280,000	1,280,000	1,280,000	
	Transaction Value	\$	\$ 21,056,218	\$ 1,652,748	\$ 1,687,583	\$ 10,702,693	\$ 7,960,201	\$ 740,575	\$ -	\$ 10,735,371
	Mark to Market	\$	\$ 1,003,393	\$ 212,470	\$ 207,253	\$ 688,952	\$ 69,795	\$ 32,175	\$ -	\$ 791,162
	Mark to Market Limit Violation?	\$	35,000,000							
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**DISCUSSION**

Electricity Purchases. As of March 31, 2007, the electric portfolio of long-term contracts consisted of 39 monthly deliveries through December 2009. These deliveries are contracted under 14 separate transactions. Figure 1 below illustrates the sources of electricity supplies by month for the next 36 months. The City currently has purchased supplies of electricity totaling 482,000 MWh for delivery between April 1, 2007 and December 31, 2009. The average price for all of the fixed-price purchases was \$49.10 per MWh. The forward purchases have been transacted with three approved counterparties: Coral Energy, Sempra Energy, and British Petroleum. In Figure 1, the Seattle City Light (SCL) volumes represent an “exchange” whereby Palo Alto supplies power to Seattle City Light in the winter months and Seattle provides power to Palo Alto during the summer months.



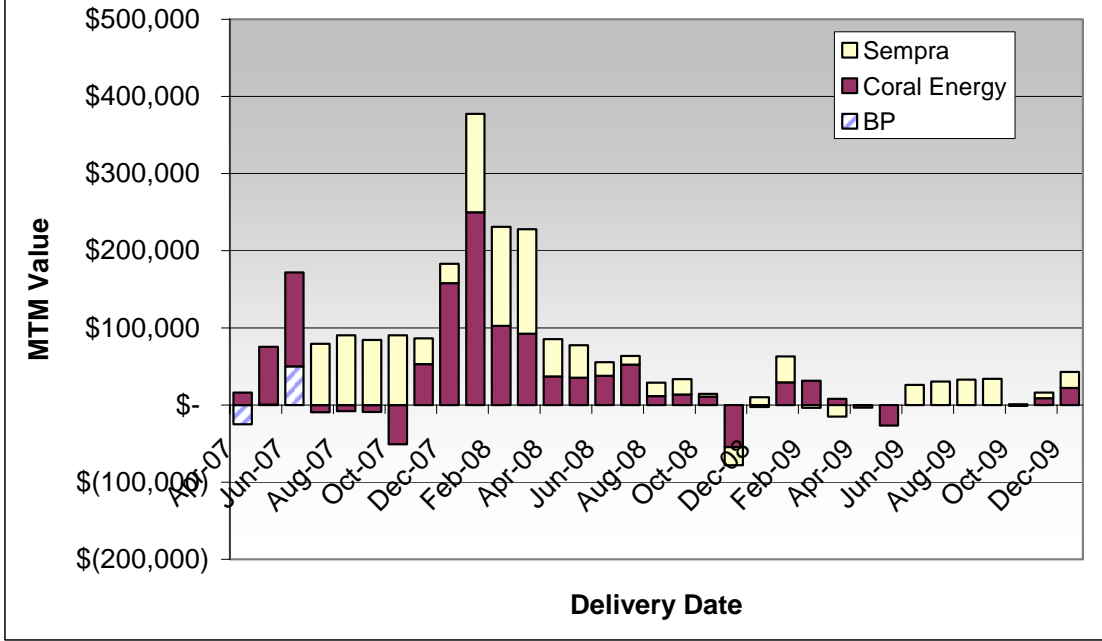
The MTM value of the City’s forward transactions for wholesale power remains at \$11.1 million. Figure 2 presents the MTM positions for each supplier by month. The MTM value of the City’s forward positions for renewable green power is \$0.58 million. The value of Western Hydro is \$14.3 million, while the value of Calaveras hydro is negative \$3.4 million. The total value of expected output from Calaveras and Western hydro generation is \$10.9 million, down from \$14.4 last quarter, due to the reduction in expected generation resulting from reduced precipitation. The value of the swap with Seattle City Light is negative \$277,000.



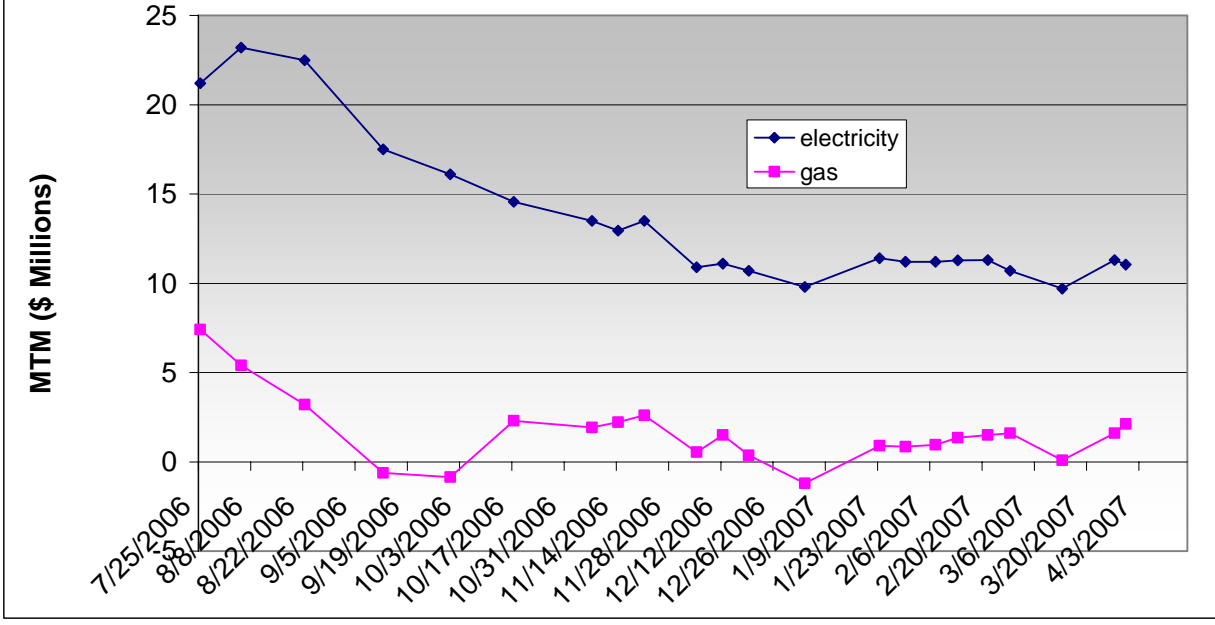
Natural Gas. As of March 31, 2007 the gas portfolio consisted of 71 separate transactions. The City currently has purchased supplies of gas totaling 4.33 million MMBtu for delivery between April 1, 2007 and December 31, 2009. The average price for all of the fixed-price purchases was \$7.64 per MMBtu, up from \$7.47 last quarter. The forward purchases have been transacted with three approved counterparties: Coral Energy, Sempra Energy and British Petroleum. The current MTM value of gas transactions is negative \$2.1 million, up from zero at the end of last quarter. The MTM value by month and by counterparty is presented in Figure 3.

The MTM history is presented in Figure 4.

**Figure 3. Natural Gas Portfolio Mark to Market**



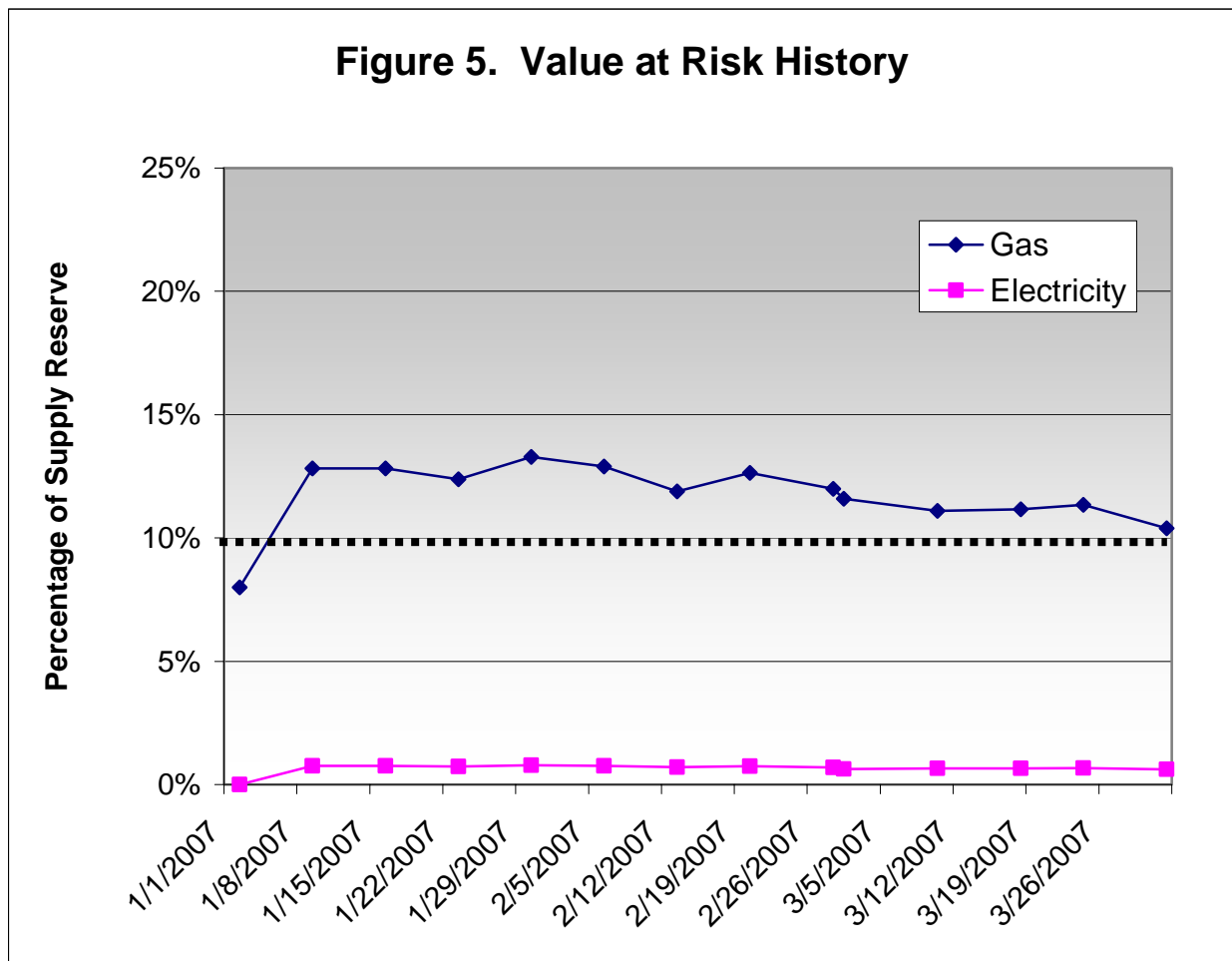
**Figure 4. Mark to Market History**



### Value at Risk

The “riskiness” of the energy portfolio is measured through the “value at risk” (or VaR). The VaR measures the risk that adverse market conditions could force CPAU to use reserves to cover costs on future purchases over what is reflected in current rates. Specifically, VaR measures how much projected 12-month net revenue could change in one week due to a potential adverse market change. Staff uses the VaR as one of the key measures of market price risk to CPAU.

In compliance with the Risk Management Guidelines, the Utilities staff and the Energy Risk Manager monitor the VaR level relative to the projected end-of-year supply Rate Stabilization Reserve (RSR) levels for both electricity and gas. Currently, the VaR for the electricity portfolio is 2% of the RSR. The VaR for gas moved below the 10% benchmark value for the first time in over 12 months, decreasing from 13% to 7.5% at the end of last quarter. The historic levels of the VaR values for electricity and gas are presented in Figure 5.



### Credit Risk

To manage credit risk, staff reports on major credit rating agency's (S&P and Moody's) scores, and, in addition, the "estimated default frequency" (EDF) using the Moody's KMV CreditEdge© system. The EDF is an estimated probability that a counterparty will default in the next 12 months.

Electricity. CPAU's electric supplier counterparty credit exposure and the supplier credit ratings are presented below. CPAU's largest exposure, in excess of \$11.8 million, is with Coral, a company rated A- by Standard and Poor's. Coral is a wholly owned subsidiary of Royal Dutch Shell which is rated AAA, the highest rating given.

**Table 1. Electricity Suppliers – Credit Exposure and Credit Ratings  
as of March 31, 2007**

<b>Counter party</b>	<b>Total Credit Exposure</b>	<b>S&amp;P Ranking</b>	<b>Previous Quarter Expected Default Frequency</b>	<b>Current Expected Default Frequency</b>	<b>Expected "Loss" (Exposure x Default)</b>
BP	\$ 105,612	AA+	.02	.02	\$21
Coral <sup>1</sup>	\$10,270,939	A-	.05	.05	\$2,054
Sempra	\$ 674,615	BBB+	.02	.02	\$134
Total	\$ 11,051,166				\$2,209

Renewable Electricity. Palo Alto's contracts for renewable "green" energy include both wind contracts with Pacificorp Power Marketing (PPM), discussed above, as well as contracts to convert landfill gas to electricity with Ameresco, Inc. The credit exposure and EDF ratings for these counterparties are presented below.

**Table 2. Green Energy Credit Exposure and Credit Ratings as of March 31, 2007**

<b>Counterparty</b>	<b>Total Credit Exposure</b>	<b>Previous Quarter Calculated Expected Default Frequency</b>	<b>Current Calculated Expected Default Frequency</b>	<b>Expected "Loss" (Exposure x Default)</b>
Ameresco, Inc.	\$ 250,021	0.50	0.50	\$ 1,250
Pacificorp Power Marketing	\$ 326,829	0.02	0.02	\$65
Total	\$576,850			\$1,315

Natural Gas. As Table 3 shows, the City has exposure to five counterparties totaling \$2.1 million over the next 36 months. As with electricity, this reduction in market exposure is the result of the slow decline in the forward energy prices. Table 3 below calculates the loss which the City would suffer should one of its gas counterparties default. This loss is calculated as the product of Estimated Default Frequency and the MTM value.

**Table 3. Credit Exposure and Default Ratings of Natural Gas Suppliers  
(March 31, 2007)**

<b>Counter party</b>	<b>Total Credit Exposure</b>	<b>S&amp;P Ranking</b>	<b>Previous Expected Default Frequency</b>	<b>Current Expected Default Frequency</b>	<b>Expected Loss<sup>2</sup> (Exposure x Default)</b>
BP	\$26,192	AA+	.02	.02	\$ 5
ConocoPhillips	0	A-	.03	.03	\$0
Coral <sup>1</sup>	\$ 1,003,393	A-	.05	.05	\$501
Sempra	\$1,106,238	BBB+	.03	.02	\$ 221
Total	\$ 2,135,824				\$ 727

Reserve Adequacy

A key premise to the City's risk management practices centers on the adequacy of supply reserves with respect to the risks undertaken as a result of purchases of gas and electricity commodities. Table 4 below summarizes the current and projected supply reserve levels for gas and electricity as of March 30, 2007. The current formulas for calculating maximum reserve balances are 103% and 75% of purchase costs for electric and gas respectively. The minimum reserve levels are 50% of the maximum levels for both gas and electricity.

**Table 4. Supply Reserve Levels for Electricity and Gas (\$ Millions)**

Commodity	Beginning Reserve Balance as of 6/30/06	Budgeted Reserve Guideline Range for FY 06/07		Unaudited Actual Reserve Balance as of 03/31/07 FY (06-07)*
		Min	Max	
Electricity	\$ 64.5	\$ 28.5	\$ 56.9	\$ 62.0
Gas	\$ 2.8	\$ 10.0	\$ 20.0	\$ 3.7

*\* Accounting activity figures to date reflect what has been booked into the City's accounting system (SAP). These figures are preliminary until outside auditors have completed their review and the CAFR is produced. There could be significant changes to the RSR balances based on year end adjustments that have not as yet been booked.*

The current reserves for electricity are well above the minimum and well above credit, regulatory and other risks for the next 12 months. Total risks associated with the electric supply reserve for the next 12 months include \$5.6 million for credit reserves (using best practice of 50% of largest single exposure); \$19.3 million for hydro risk; \$0.4 million for market risk of the yet-to-be-purchased positions in the next 12 months; and \$4.4 million for possible regulatory and other risks. These risks total \$29.7 million.

With regard to gas, the current projected reserve levels of \$3.7 million are below the minimum level of \$10.0 million as set by current policy. Reserve levels are adequate for the current risks they are intended to mitigate, given current market dynamics. Total risks associated with the gas supply reserve include \$1.1 million for credit reserves; \$0.8 million for unhedged commodities in the next 12 months; and \$0.5 million for possible regulatory and other risks; for a total of \$2.3 million. However, market prices for gas could quickly increase, and credit risk would therefore increase rapidly. It should be noted that changing market dynamics, international events, and other factors outside the City's control can have a significant and adverse impact on the adequacy of reserves for both gas and electricity over a short timeframe.

PREPARED BY:

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KARL VAN ORSDOL  
Energy Risk Manager

DEPARTMENT HEAD APPROVAL:

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CARL YEATS  
Director, Administrative Services

CITY MANAGER APPROVAL:

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EMILY HARRISON  
Assistant City Manager