WATER QUALITY IMPROVEMENTS
CONTACT CHAMBER EFFECTIVENESS

UTILITY COMMITTEE PRESENTATION

January 14, 2008

Public Utilities Department
Water / Wastewater Utilities

BACKGROUND

- The 2006 Water Quality Evaluation recommended the installation of contact chambers at all deep well sites to assist in stabilizing water chemistry.
- These chambers were identified as a necessary first step in addressing brown water issues.

BACKGROUND

- Source water has a natural demand for chlorine which results in chemical reactions.
- Due to limited piping available onsite from the wells, these reactions were occurring primarily within the distribution system (contributing to brown water issues).
- The installation of contact chambers at each deep well site provides adequate piping on site for these reactions to occur, prior to entering the distribution system.

ANALOGY

- Each well site can be likened to a factory, making a product for consumption.
- When making bread, for example, quality control is performed to ensure that the final product meets established standards.
- Would you perform quality control on the bread:
  - after mixing and rising of the bread; or
  - after mixing, rising and baking of the bread?

ANALOGY

- Just as baking the bread is a critical part of product development, the chemical reaction with chlorine is a critical part of the development of drinking water.
- The contact chamber is like the oven allowing for the reactions (baking) to be completed at the well site (factory) rather than within the distribution system (transport).

ANALOGY





- Performing quality control at the appropriate time ensures a more consistent product enters the market (distribution system) and is provided to the consumer.

CHAMBER #1 – WELL #13R

- The first contact chamber was installed in 2007 at Well Site #13R (Bayard Avenue).
- The contact chamber was brought online in December 2007.

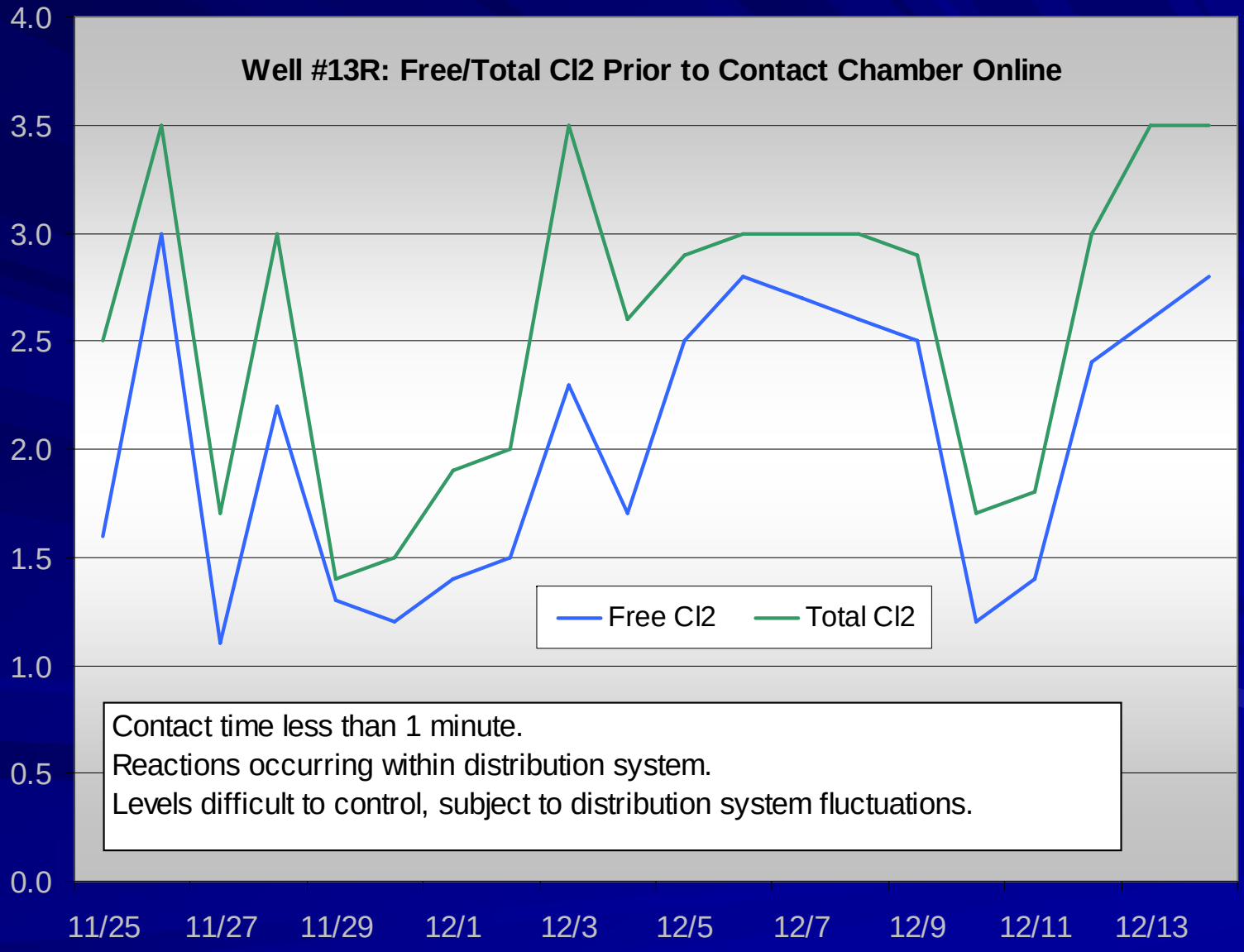




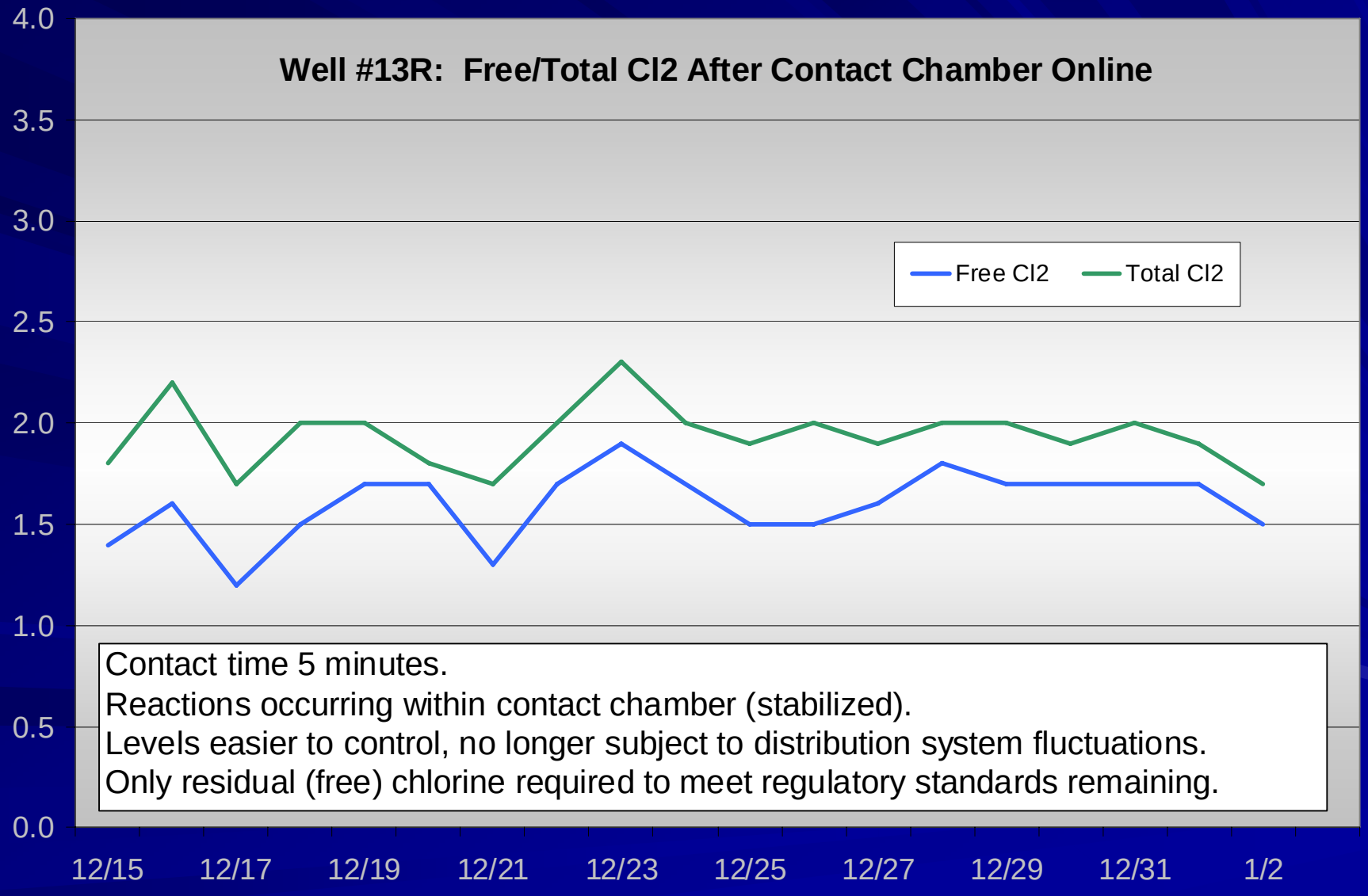
CHAMBER #1 – WELL #13R

- In order to verify the effectiveness of the contact chamber, data was collected before and after the chamber was brought online.
- Sample Data:
  - Total Chlorine – amount of combined (reacted) and uncombined (unreacted) chlorine within the water.
  - Free Chlorine – amount of uncombined (unreacted) chlorine within the water.

PRE-CHAMBER USAGE DATA



POST-CHAMBER USAGE DATA



MISSION ACCOMPLISHED!



SAMPLE DATA
CONFIRMS EXPECTED
RESULTS ACHIEVED



STABILIZED WATER CHEMISTRY
ENTERING DISTRIBUTION SYSTEM



PRIMARY REACTIONS COMPLETE



MOVING FORWARD

- All 13 contact chambers must be installed and placed online to realize maximum benefits.
  - 3 chambers have been installed
  - 2 chambers are online
- Anticipated that most of the chambers will be installed and online in FY 2008.

BE IT ORDAINED BY THE MAYOR AND COUNCIL OF THE CITY OF DOVER, IN COUNCIL MET:

The amounts hereinafter named in various City funds are changed from the currently approved revenues/receipts and appropriations to the revised revenues/receipts and revised appropriations for use by the various departments of the Municipal Government for

A. GENERAL FUND

RECEIPTS	Current Budgets	Additions (Reductions)	Revised Budgets
Beginning Balance	$ 3,542,086	$ 509,893	$ 4,051,979
Transfer from Realty Transfer Tax Fund	2,650,222	656,385	3,306,607
Transfer in from Parkland Reserve	1,987,200	(1,987,200)	-
Transfer in from Library Reserve	-	41,780	41,780
Net Adjustments		$ (779,142)	

EXPENDITURES	Current Budgets	Additions (Reductions)	Revised Budgets
Fire	$ 644,773	$ 5,964	$ 650,737
Library	1,132,283	41,780	1,174,063
Transfer to Governmental Capital Fund	4,680,362	(1,933,030)	2,747,332
Transfer to Library Reserve	399,350	449,759	849,109
Budget Balance	2,882,636	656,385	3,539,021
Net Adjustments		$ (779,142)	

B. GOVERNMENTAL CAPITAL FUND

RECEIPTS	Current Budgets	Additions (Reductions)	Revised Budgets
Transfer from Capital Asset Reserve	$ -	$ 135,515	$ 135,515
Transfer from General Fund for Projects	4,680,362	(1,933,030)	2,747,332
Transfer in from Parkland Reserve (JWP Cntr)	-	2,132,369	2,132,369
Transfer in from Library Reserve	-	10,094	10,094
Gifts/Donations (JWP Cntr)	-	83,000	83,000
Net Adjustments		$ 427,948	

EXPENDITURES	Current Budgets	Additions (Reductions)	Revised Budgets
Recreation	$ 2,135,700	$ 274,839	$ 2,410,539
Library	-	10,094	10,094
Streets	511,000	7,500	518,500
Sanitation	502,800	135,515	638,315
Net Adjustments		$ 427,948	

C. WATER/WASTEWATER FUND

REVENUES	Current Budgets	Additions (Reductions)	Revised Budgets
Beginning Balance - Water	$ 2,037,928	$ 182,533	$ 2,220,461
Beginning Balance - Wastewater	1,289,956	(197,224)	1,092,732
Wastewater Adjustment	(1,109,481)	88,720	(1,020,761)
Net Adjustments		$ 74,029	

EXPENSES	Current Budgets	Additions (Reductions)	Revised Budgets
Balance- Water	$ 430,356	$ 182,533	$ 612,889
Balance- Wastewater	566,474	(197,224)	369,250
Balance-Wastewater Adjustment	(910,591)	88,720	(821,871)
Net Adjustments		$ 74,029	

D. WATER/WASTEWATER IMPROVEMENT & EXTENSION FUND

REVENUES	Current Budgets	Additions (Reductions)	Revised Budgets
Beginning Balance - Water	$ 827	$ 274,307	$ 275,134
Beginning Balance - Wastewater	16,502	268,467	284,969
Net Adjustments		$ 542,774	

EXPENSES	Current Budgets	Additions (Reductions)	Revised Budgets
Water	$ 2,237,476	$ 241,231	$ 2,478,707
Wastewater	1,496,250	172,004	1,668,254
Balance- Water	453,001	33,076	486,077
Balance- Wastewater	163,604	96,463	260,067
Net Adjustments		$ 542,774	

E. ELECTRIC FUND

REVENUES	Current Budgets	Additions (Reductions)	Revised Budgets
Beginning Balance	$ 7,822,873	$ 458,780	$ 8,281,653
Sales to Customers	93,516,294	(978,750)	92,537,544
Utility Tax	1,599,100	57,200	1,656,300
Duke Contract Revenue	800,000	(800,000)	-
Net Adjustments		$ (1,262,770)	

EXPENSES	Current Budgets	Additions (Reductions)	Revised Budgets
Power Supply	$ 60,764,531	$ (270,290)	$ 60,494,241
Power Supply Management/Incentive	3,255,038	(255,038)	3,000,000
Capacity Charges	11,493,950	795,543	12,289,493
PJM Charges - Load	2,684,707	1,650	2,686,357
Generation Fuels	2,858,979	691	2,859,670
Capacity Credits	(11,933,536)	30,059	(11,903,477)
PJM Credits	(3,696,990)	2,228	(3,694,762)
Utility Tax	1,599,100	57,200	1,656,300
Accounts Receivable Write-Offs	100,000	25,000	125,000
Inventory Write-Offs	100,000	25,000	125,000
Debt Service	3,379,104	(575,000)	2,804,104
Budget Balance	7,908,700	(1,099,813)	6,808,887
Net Adjustments		$ (1,262,770)	

F. ELECTRIC IMPROVEMENT & EXTENSION FUND

REVENUES	Current Budgets	Additions (Reductions)	Revised Budgets
Beginning Balance	$ 13,954	$ 1,353,029	$ 1,366,983
Transfer from Depreciation Reserve	4,288,392	411,187	4,699,579
Net Adjustments		$ 1,764,216	

EXPENSES	Current Budgets	Additions (Reductions)	Revised Budgets
Electric Generation	$ 377,000	$ 400,000	$ 777,000
Electrical T & D	1,634,250	(7,000)	1,627,250
Electric Engineering	16,046,710	3,713,847	19,760,557
Electric Administration	8,000	17,500	25,500
Electric Metering	28,241	(7,841)	20,400
Budget Balance - Bond Proceeds	9,350,000	(2,198,827)	7,151,173
Budget Balance	153,463	(153,463)	-
Net Adjustments		$ 1,764,216	

G. GENERAL FUND CONTINGENCY RESERVE

REVENUES	Current Budgets	Additions (Reductions)	Revised Budgets
Beginning Balance	$ 647,680	$ (2,426)	$ 645,254
Net Adjustments		$ (2,426)	

EXPENSES	Current Budgets	Additions (Reductions)	Revised Budgets
Budget Balance	$ 711,180	$ (2,426)	$ 708,754
Net Adjustments		$ (2,426)	

H. GENERAL FUND LIBRARY RESERVE

REVENUES	Current Budgets	Additions (Reductions)	Revised Budgets
Prior Year Balance	$ 1,765,470	$ 608,306	$ 2,373,776
General Fund Appropriation	399,350	449,759	849,109
Interest Income	79,000	-	79,000
Net Adjustments	$ 2,243,820	$ 1,058,065	$ 3,301,885

EXPENSES	Current Budgets	Additions (Reductions)	Revised Budgets
Transfer out - Library related projects/security	$ -	$ 51,874	$ 51,874
Transfer to Parkland Reserve	334,000	-	334,000
Current Year Balance	1,909,820	1,006,191	2,916,011
Net Adjustments	$ 2,243,820	$ 1,058,065	$ 3,301,885

I. WATER/WASTEWATER CAPITAL ASSET RESERVE

REVENUES	Current Budgets	Additions (Reductions)	Revised Budgets
Beginning Balance	$ 1,617,841	$ 3,783	$ 1,621,624
Net Adjustments		$ 3,783	

EXPENSES	Current Budgets	Additions (Reductions)	Revised Budgets
Budget Balance	$ 1,663,841	$ 3,783	$ 1,667,624
Net Adjustments		$ 3,783	

J. WATER/WASTEWATER CONTINGENCY RESERVE

REVENUES	Current Budgets	Additions (Reductions)	Revised Budgets
Beginning Balance	$ 228,687	$ 801	$ 229,488
Net Adjustments		$ 801	

EXPENSES	Current Budgets	Additions (Reductions)	Revised Budgets
Budget Balance	$ 240,039	$ 801	$ 240,840
Net Adjustments		$ 801	

K. ELECTRIC CONTINGENCY RESERVE

REVENUES	Current Budgets	Additions (Reductions)	Revised Budgets
Beginning Balance	$ 840,652	$ 6,380	$ 847,032
Net Adjustments		$ 6,380	

EXPENSES	Current Budgets	Additions (Reductions)	Revised Budgets
Budget Balance	$ 878,652	$ 6,380	$ 885,032
Net Adjustments		$ 6,380	

L. ELECTRIC INSURANCE STABILIZATION RESERVE

REVENUES	Current Budgets	Additions (Reductions)	Revised Budgets
Beginning Balance	$ 350,000	$ 1,255	$ 351,255
Net Adjustments		$ 1,255	

EXPENSES	Current Budgets	Additions (Reductions)	Revised Budgets
Budget Balance	$ 360,500	$ 1,255	$ 361,755
Net Adjustments		$ 1,255	

M. ELECTRIC RATE STABILIZATION RESERVE

REVENUES	Current Budgets	Additions (Reductions)	Revised Budgets
Beginning Balance	$ 377,981	$ 1,802	$ 379,783
Net Adjustments		$ 1,802	

EXPENSES	Current Budgets	Additions (Reductions)	Revised Budgets
Budget Balance	$ 1,397,981	$ 1,802	$ 1,399,783
Net Adjustments		$ 1,802	

N. ELECTRIC DEPRECIATION RESERVE

REVENUES	Current Budgets	Additions (Reductions)	Revised Budgets
Beginning Balance	$ 13,450,200	$ 84,983	$ 13,535,183
Net Adjustments		$ 84,983	

EXPENSES	Current Budgets	Additions (Reductions)	Revised Budgets
Budget Balance	$ 9,737,808	$ 84,983	$ 9,822,791
Net Adjustments		$ 84,983	

O. FUTURE CAPACITY RESERVE

REVENUES	Current Budgets	Additions (Reductions)	Revised Budgets
Beginning Balance	$ 8,893,070	$ 65,722	$ 8,958,792
Net Adjustments		$ 65,722	

EXPENSES	Current Budgets	Additions (Reductions)	Revised Budgets
Budget Balance	$ 9,294,070	$ 65,722	$ 9,359,792
Net Adjustments		$ 65,722	

P. MUNICIPAL STREET AID

REVENUES	Current Budgets	Additions (Reductions)	Revised Budgets
Beginning Balance	$ 400	$ (254)	$ 146
Net Adjustments		$ (254)	

EXPENSES	Current Budgets	Additions (Reductions)	Revised Budgets
Budget Balance	$ 700	$ (254)	$ 446
Net Adjustments		$ (254)	

Q. COMMUNITY TRANSPORTATION FUND

REVENUES	Current Budgets	Additions (Reductions)	Revised Budgets
Beginning Balance	$ 311,165	$ (2,751)	$ 308,414
Net Adjustments		$ (2,751)	

EXPENSES	Current Budgets	Additions (Reductions)	Revised Budgets
Construction Purchase	$ 1,350,000	$ 55,000	$ 1,405,000
Operating transfer out (Parkland reserve)	55,000	(55,000)	-
Budget Balance	311,165	(2,751)	308,414
Net Adjustments		$ (2,751)	

R. WORKER'S COMPENSATION FUND

REVENUES	Current Budgets	Additions (Reductions)	Revised Budgets
Beginning Balance	$ 1,371,416	$ 75,808	$ 1,447,224
Net Adjustments		$ 75,808	

EXPENSES	Current Budgets	Additions (Reductions)	Revised Budgets
Budget Balance	$ 1,445,961	$ 75,808	$ 1,521,769
Net Adjustments		$ 75,808	

S. OTHER POST-EMPLOYMENT BENEFITS (OPEB)

REVENUES	Current Budgets	Additions (Reductions)	Revised Budgets
Beginning Balance	$ 3,790,513	$ 413,487	$ 4,204,000
Net Adjustments		$ 413,487	

EXPENSES	Current Budgets	Additions (Reductions)	Revised Budgets
Budget Balance	$ 3,920,757	$ 413,487	$ 4,334,244
Net Adjustments		$ 413,487	

T. PARKS & RECREATION RESERVE

REVENUES	Current Budgets	Additions (Reductions)	Revised Budgets
Beginning Balance	$ 1,569,025	$ 205,506	$ 1,774,531
Transfer from Library Reserve	334,000	-	334,000
Transfer from Community Transportation Fund	55,000	(55,000)	-
Interest Income	30,000	-	30,000
Net Adjustments	$ 1,988,025	$ 150,506	$ 2,138,531

EXPENSES	Current Budgets	Additions (Reductions)	Revised Budgets
Transfer to General Capital Project Fund (JWP Cntr)	$ 1,987,200	$ 145,169	$ 2,132,369
Budget Balance	825	5,337	6,162
Net Adjustments	$ 1,988,025	$ 150,506	$ 2,138,531

S. REALTY TRANSFER TAX FUND

REVENUES	Current Budgets	Additions (Reductions)	Revised Budgets
Realty transfer tax revenue	$ 2,650,222	656,385	$ 3,306,607
Net Adjustments		$ 656,385	

EXPENSES	Current Budgets	Additions (Reductions)	Revised Budgets
Transfer to General Fund	$ 2,650,222	656,385	$ 3,306,607
Net Adjustments		$ 656,385	

ADOPTED: FEBRUARY 11, 2008