

AURORA  
WATER

STORMWATER  
WASTEWATER  
OPERATIONS COMPLIANCE  
DIVISION

2011 Annual Report



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Water Department  
Wastewater & Stormwater Division  
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The City of Aurora Stormwater Division is responsible for the cleaning and maintenance of the City's curb inlets, storm drains, detention ponds, and storm channels. Some of these activities include: removing sediment and vegetation from channels, easements, forebays, and ponds; revegetation associated with channels and ponds; maintaining fall protection devices near stormwater infrastructure; flood monitoring and management; and snow removal.

The Stormwater staff exceeded their goals per the Federal Emergency Management Agency (FEMA) and the National Pollutant Discharge Elimination Standards (NPDES) requirements for sediment removal of ponds & channels. All 68 miles of earthen and 8.5 miles of concrete channels were cleaned of debris & trash, all 75 ponds & 224 trouble spots were maintained monthly and after each storm event, all graffiti was power washed / painted, 4,123 inlets were inspected and 85 inlets cleaned.

Stormwater crews cleaned the Binney Water Treatment plant's forebay, responded proactively to the July 7<sup>th</sup> storm event that impacted northern portions of Aurora, installed a toe drain at Rampart Reservoir, regraded and hauled debris from a Park's open space parcel at Quincy Highlands, developed and implemented a tracking program for channel and pond inspection reports completed by Operations Compliance staff, installed a cable fence along the Aurora Storage Facility's southern property line, completed several small sediment removal projects, continued to focus on the removal of noxious tree species in channels, provided support for the Highline Canal Cleanup and Household Chemical Roundup, and dedicated significant efforts to the operations required to maintain the stormwater system.

During 2011, the Stormwater Division's commitment to excellence was verified when the level of planned maintenance exceeded the Division's maintenance goals and staff responded proactively to numerous challenges. The Stormwater Division remains strong, well organized, and committed to being cooperative, responsive, and efficient when addressing the operational activities associated with stormwater management, responding to customer service inquiries and requests from the public and providing operational support for other Aurora Water divisions and other City of Aurora departments.

Respectfully,

Joe McCleary  
Superintendent of Stormwater Operations

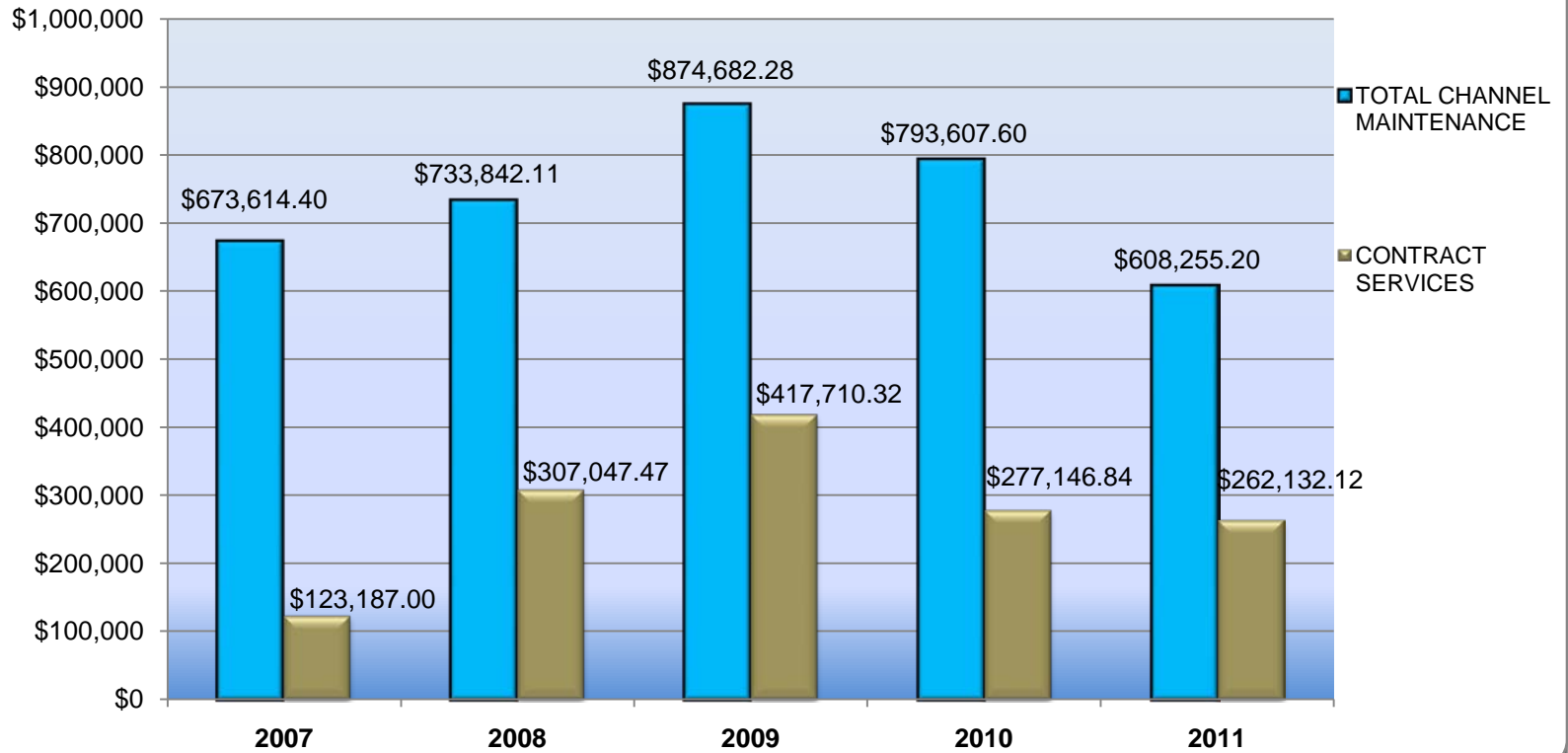
## Pond Maintenance Cost Comparison 2011



Pond Maintenance	2007	2008	2009	2010	2011
STORM MOSQUITO MANAGEMENT	\$ 4,073.00	\$ 2,802.00	\$ -	\$ 4,024.40	\$ 1,327.12
STORM SIGNS	\$ 502.19	\$ 738.74	\$ 227.62	\$ -	\$ 45.36
STORM WEED MAINTENANCE	\$ 2,293.77	\$ 2,196.60	\$ 2,827.80	\$ 2,285.14	\$ 295.16
STORM POND MAINTENANCE includes AFTER STORM TROUBLE SPOTS	\$ 21,641.54	\$ 140,421.27	\$ 53,013.31	\$ 25,536.48	\$ 33,924.77
STORM TRASH/DEBRIS/SEDIMENT REMOVAL	\$ 1,862.02	\$ 13,146.32	\$ 9,498.98	\$ 11,088.48	\$ 5,619.96
*CONTRACT SERVICES	N/A	\$ 105,769.86	\$ 112,479.95	\$ 62,829.06	\$ 49,374.49
TOTAL POND MAINTENANCE	\$ 30,372.52	\$ 265,074.79	\$ 178,047.66	\$ 105,763.56	\$ 90,586.86
TOTAL AMOUNT OF PONDS	52	53	61	61	75
MAINTENANCE COST PER POND	\$ 584.09	\$ 5,001.41	\$ 2,918.81	\$ 1,733.83	\$ 1,207.82

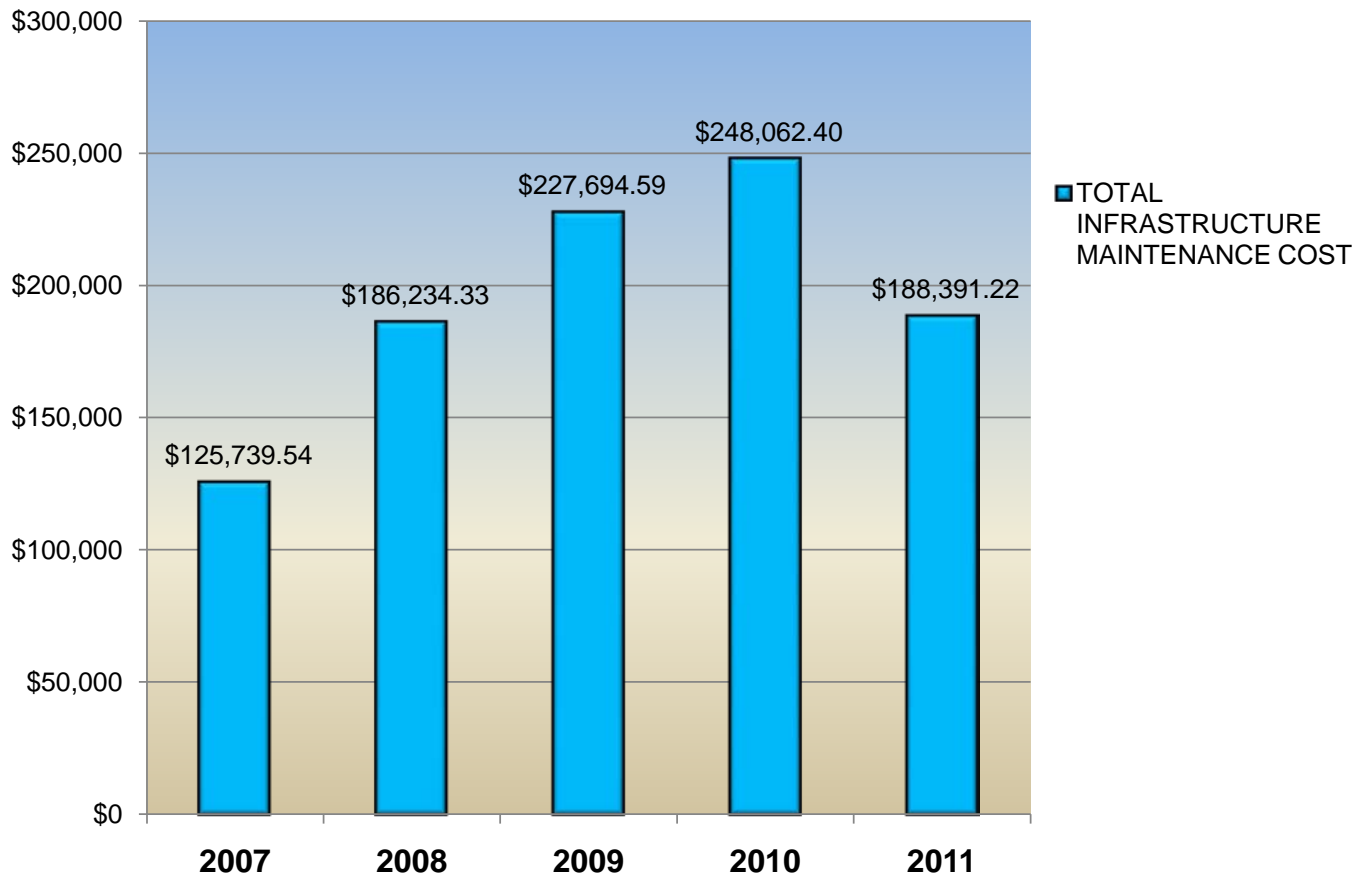
\*2007 Contract Services were not tracked

## Channel Maintenance Cost Comparison 2007-2011



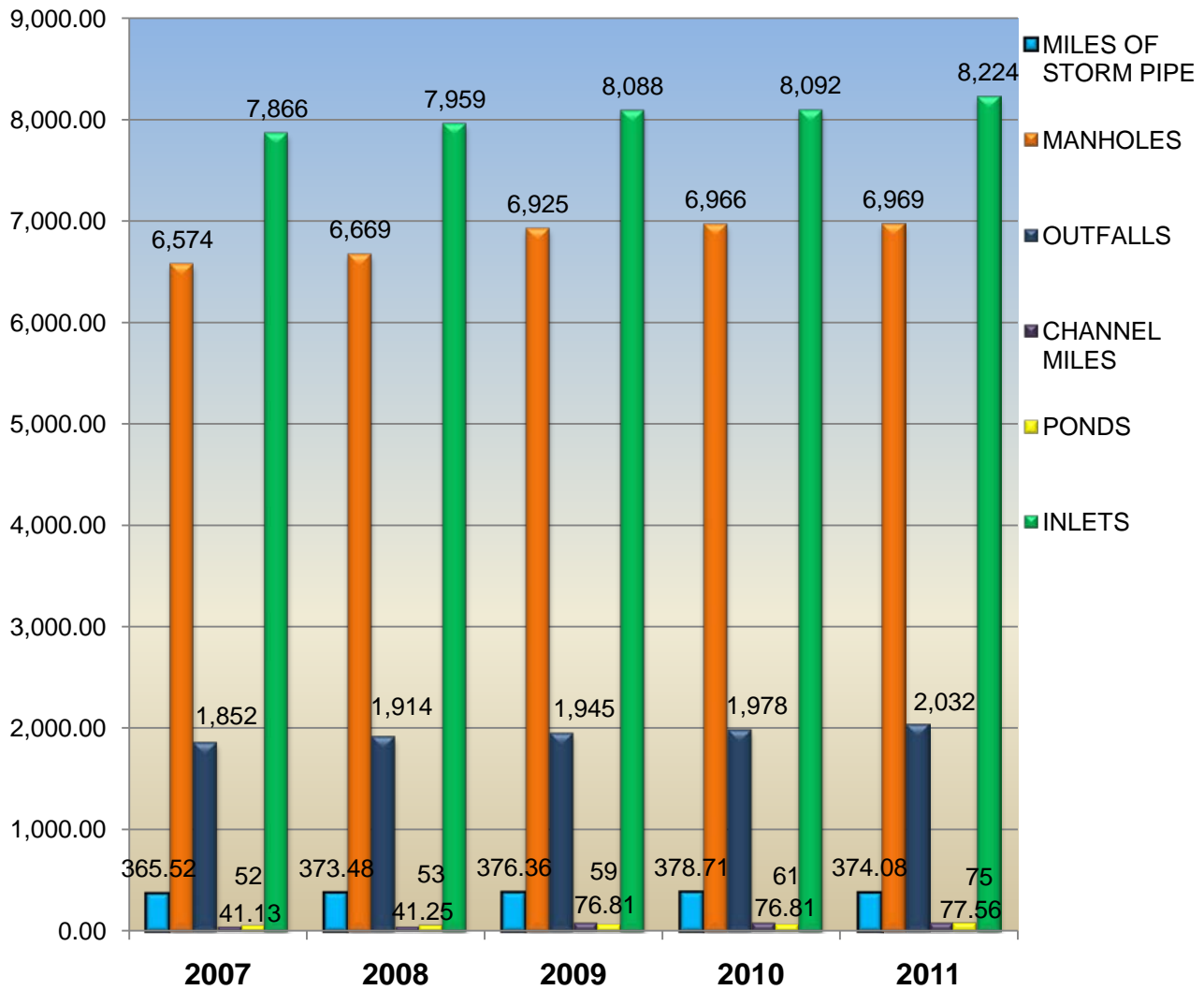
Channel Maintenance	2007	2008	2009	2010	2011
STORM CHANNEL MAINTENANCE	\$ 100,708.38	\$ 127,451.51	\$ 188,843.06	\$ 79,130.04	\$ 61,969.78
STORM CONCRETE EASEMENT	\$ 5,428.97	\$ 6,993.50	\$ 416.99	\$ 557.50	\$ -
STORM CONCRETE REPAIR	\$ 2,367.66	\$ 2,466.96	\$ 1,032.31	\$ 13,770.99	\$ 6,212.05
STORM TRASH/DEBRIS/SEDIMENT REMOVAL	\$ 120,693.00	\$ 98,501.66	\$ 72,012.72	\$ 142,248.20	\$ 76,355.29
STORM EROSION CONTROL	\$ 55,747.45	\$ 16,401.73	\$ 33,372.91	\$ 44,789.23	\$ 36,302.06
STORM FALL PROTECTION	\$ 765.29	\$ 10,379.23	\$ 2,464.34	\$ 17,152.81	\$ 2,919.29
STORM FENCE CONST/UPGRADE	\$ 1,813.29	\$ 1,736.76	\$ 2,358.37	\$ 1,324.25	\$ 18,370.42
STORM FENCE REPAIR	\$ 9,818.11	\$ 2,555.15	\$ 3,074.97	\$ 10,884.73	\$ 12,280.53
STORM LOCATES + PROJECT PLANNING	\$ 1,758.70	\$ 385.61	\$ 651.91	\$ 38,956.09	\$ 44,452.06
STORM TREE MAINTENANCE/WATER/PLANT	\$ 86,130.22	\$ 32,636.26	\$ 16,137.61	\$ 38,073.49	\$ 25,776.07
STORM OVERFLOW TRACT INSP	\$ -	\$ 14,440.37	\$ 12,690.59	\$ 20,637.93	\$ 7,897.93
STORM MOSQUITO MGMT	\$ 12,219.72	\$ 8,202.08	\$ 9,448.15	\$ 12,899.70	\$ 1,814.45
STORM REVEGETATION	\$ 42,219.74	\$ 3,889.06	\$ 2,803.74	\$ 1,566.10	\$ 2,290.66
STORM SIGNS	\$ 10,162.08	\$ 1,245.79	\$ 3,461.51	\$ 5,151.07	\$ 3,869.59
STORM WEED MAINTENANCE	\$ 100,594.79	\$ 98,867.21	\$ 107,008.28	\$ 88,036.57	\$ 44,021.13
STORM FLAPGATE INSPECTION + MAINTENANCE	\$ -	\$ 641.76	\$ 1,194.50	\$ 1,282.06	\$ 1,591.77
CONTRACT SERVICES	\$ 123,187.00	\$ 307,047.47	\$ 417,710.32	\$ 277,146.84	\$ 262,132.12
TOTAL CHANNEL MAINTENANCE	\$ 673,614.40	\$ 733,842.11	\$ 874,682.28	\$ 793,607.60	\$ 608,255.20
TOTAL MILES OF CHANNEL MAINTAINED	198.00	226.70	267.24	183.23	131.43
COST PER MILE	\$ 3,402.09	\$ 3,237.06	\$ 3,273.02	\$ 4,331.21	\$ 4,627.98

## Infrastructure Maintenance Cost Comparison 2007-2011



Infrastructure Maintenance	2007	2008	2009	2010	2011
STORM GRATE INSPECTION	\$ 383.36	\$ 5,937.99	\$ 912.33	\$ 136.12	\$ 48.59
STORM GRATE MAINTENANCE	\$ 3,467.64	\$ 5,745.80	\$ 1,823.03	\$ 4,106.29	\$ 372.13
STORM GRATE REPAIR	\$ 222.46	\$ 2,418.97	\$ 1,861.56	\$ 192.60	\$ 217.67
INLET INSPECTIONS - includes AFTER STORM TROUBLE SPOTS	\$ 23,536.04	\$ 36,673.77	\$ 91,326.71	\$ 97,575.05	\$ 95,471.93
STORM INLET REPAIR	\$ -	\$ 202.57	\$ 1,393.86	\$ 1,916.10	\$ 2,831.16
STORM INLET MAINTENANCE	\$ 73,477.07	\$ 104,503.69	\$ 70,784.22	\$ 50,908.73	\$ 19,178.20
STORM DEBRIS REMOVAL (OUTFALLS)	N/A	N/A	\$ 4,946.44	\$ 29,798.74	\$ 7,470.56
STORM MANHOLE INSPECTION	\$ 876.43	\$ 1,765.51	\$ 1,039.66	\$ 511.64	\$ 242.95
STORM MANHOLE REPAIRS	\$ 9,150.09	\$ 230.73	\$ 23,957.25	\$ 11,000.64	\$ 16,839.01
STORM PIPE RPL/RPR	\$ 5,363.61	\$ 14,975.77	\$ 14,474.21	\$ 19,736.01	\$ 14,100.61
SD PRESSURE CLEAN	\$ -	\$ -	\$ 2,776.09	\$ 7,172.48	\$ 8,825.38
STORM TV INSPECTION	\$ -	\$ -	\$ -	\$ -	\$ -
STORM MAIN INSPECTIONS	N/A	N/A	\$ 183.58	\$ -	\$ -
STORM GRAFFITI REMOVAL	\$ 9,262.84	\$ 13,779.53	\$ 12,215.65	\$ 25,008.00	\$ 22,793.03
<b>TOTAL INFRASTRUCTURE MAINTENANCE COST</b>	<b>\$ 125,739.54</b>	<b>\$ 186,234.33</b>	<b>\$ 227,694.59</b>	<b>\$ 248,062.40</b>	<b>\$ 188,391.22</b>

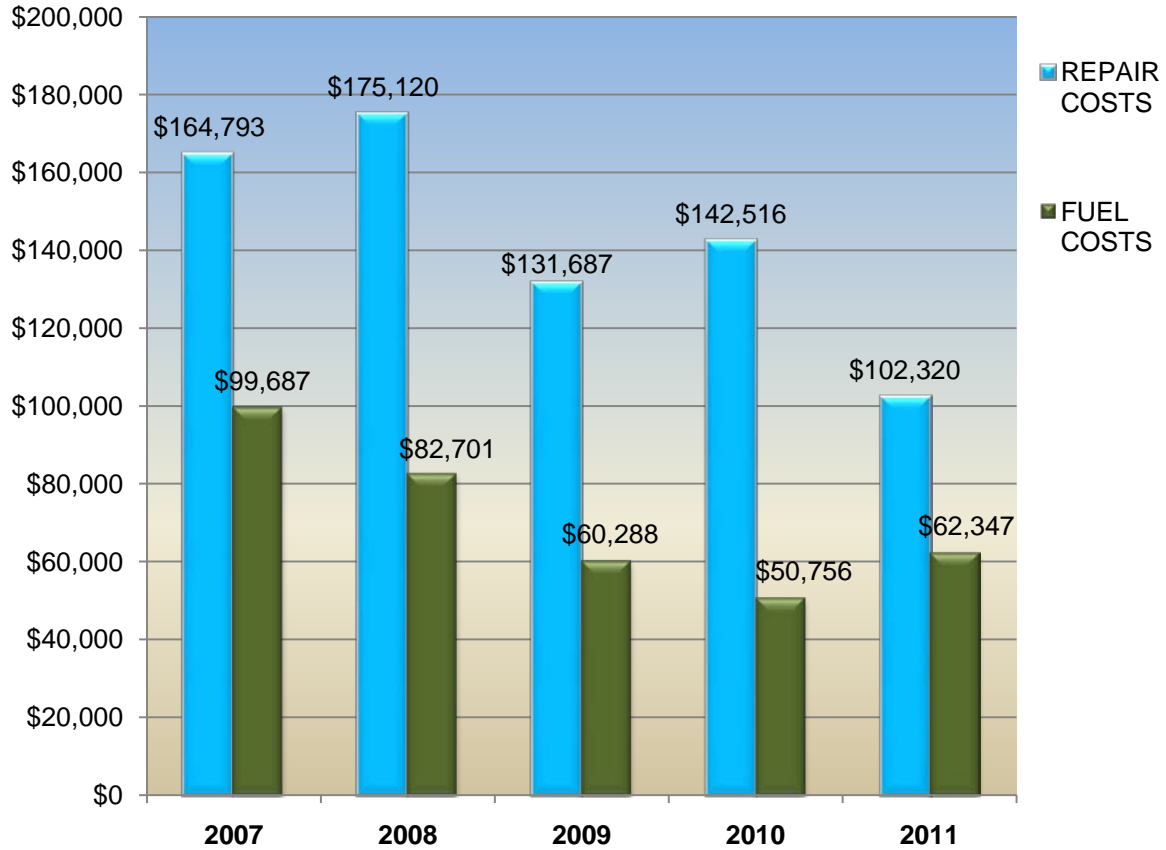
## Infrastructure Comparison 2007-2011



Infrastructure	2007	2008	2009	2010	2011
MANHOLES	6,574	6,669	6,925	6,966	6,969
INLETS	7,866	7,959	8,088	8,092	8,224
OUTFALLS	1,852	1,914	1,945	1,978	2,032
MILES OF STORM PIPE	365.52	373.48	376.36	378.71	374.08
CHANNEL MILES	41.13	41.25	76.81	76.81	77.56
PONDS	52	53	59	61	75



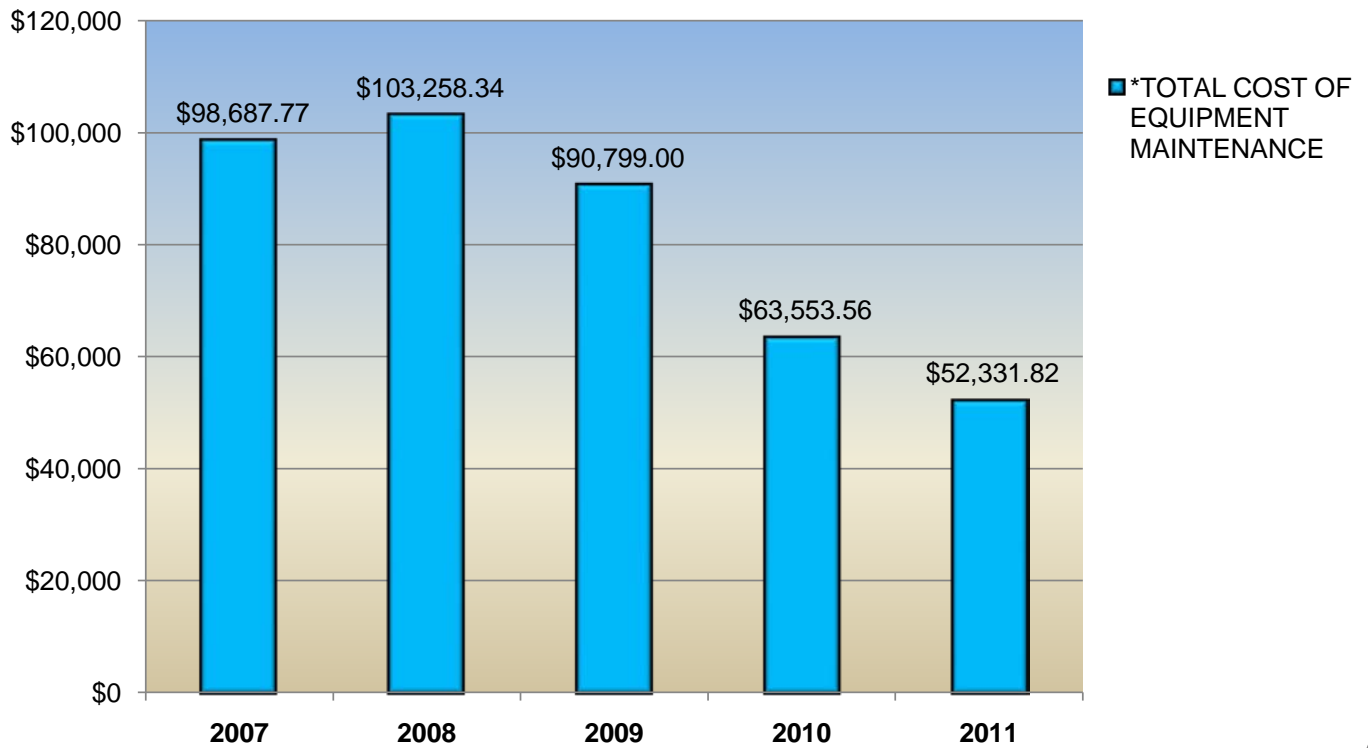
## Fleet Equipment Maintenance 2007-2011



Equipment	2007	2008	2009	2010	2011
REPAIR COSTS	\$ 164,793	\$ 175,120	\$ 131,687	\$ 142,516	\$ 102,320
FUEL COSTS	\$ 99,687	\$ 82,701	\$ 60,288	\$ 50,756	\$ 62,347
DOWNTIME HOURS	17,806.86	11,570.00	15,434.98	13,355.32	8,821.72

\*Note: In 2007 Fleet Overhead was charged as a separate budget line item. In previous years it was included in repair costs with no separation.

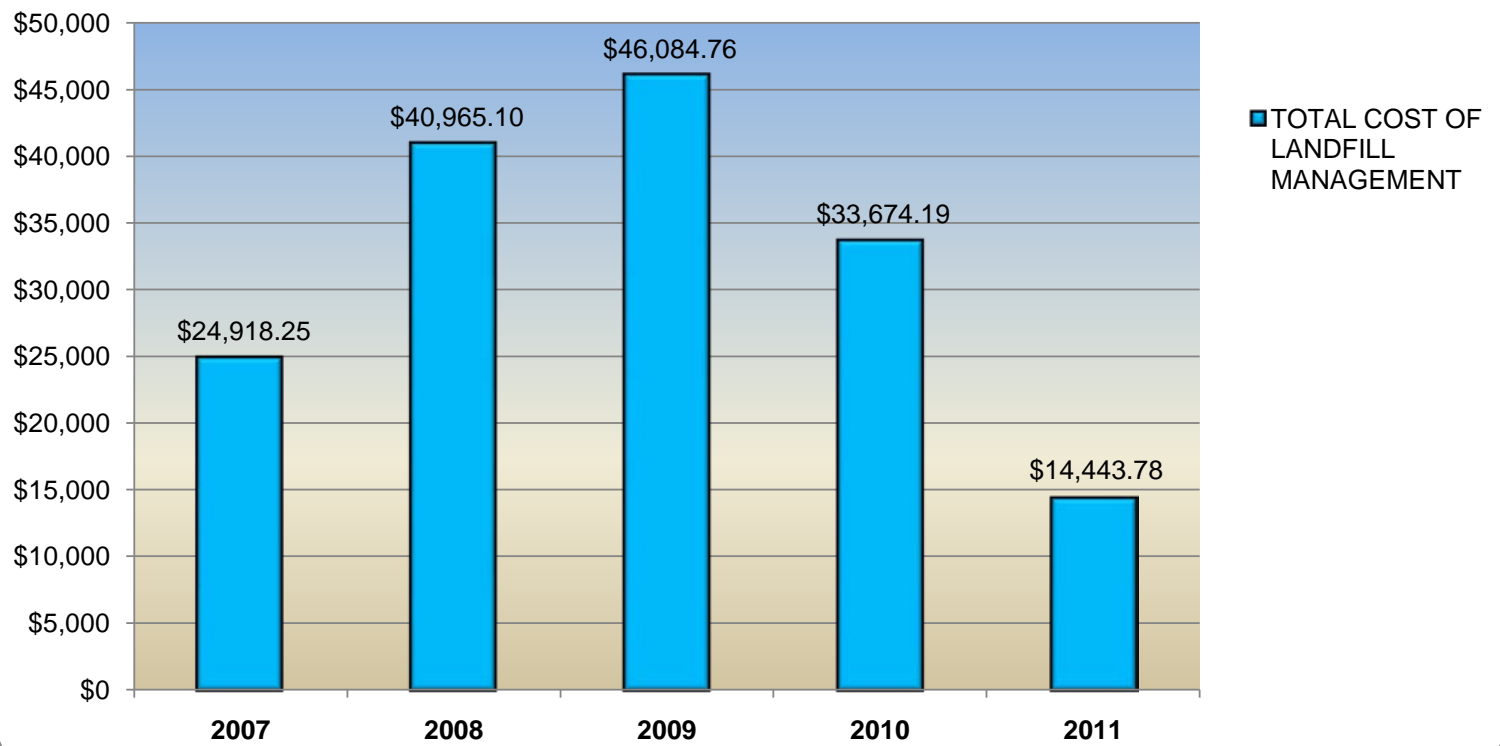
## Mobilization/Utilization Cost for Equipment 2007-2011



Equipment	2007	2008	2009	2010	2011
EQUIPMENT SERVICING	N/A	N/A	\$6,619.14	\$0.00	\$0.00
EQUIPMENT HAULING	\$ 3,066.43	\$ 150.56	\$0.00	\$0.00	\$0.00
EQUIPMENT INSPECTION & EQPT MISC	-	\$ 3,085.10	\$7,605.08	\$2,996.37	\$814.98
EQUIPMENT MAINTENANCE	\$ 94,634.11	\$ 98,369.42	\$76,464.56	\$60,557.19	\$51,516.84
INVENTORY/PARTS ADMIN	-	\$ 1,104.39	\$0.00	\$0.00	\$0.00
INVENTORY/PARTS PICKUP	\$ 987.23	\$ 548.87	\$110.22	\$0.00	\$0.00
<b>*TOTAL COST OF EQUIPMENT MAINTENANCE</b>	<b>\$ 98,687.77</b>	<b>\$ 103,258.34</b>	<b>\$ 90,799.00</b>	<b>\$ 63,553.56</b>	<b>\$ 52,331.82</b>

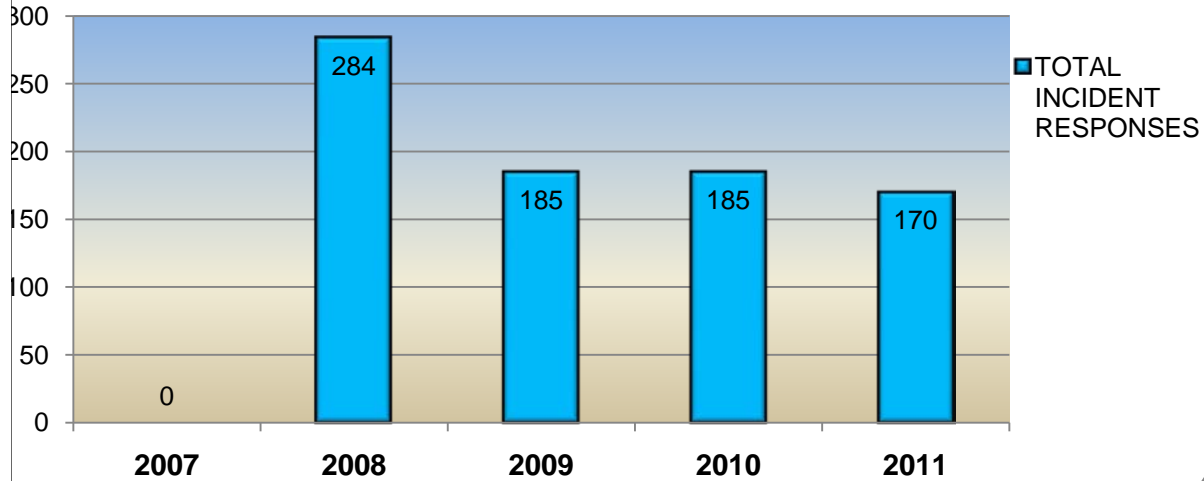
\*Includes trip inspections (pre and post) and any equipment related to maintenance and inspection i.e. fluids/lights etc.

## Landfill Management 2007-2011



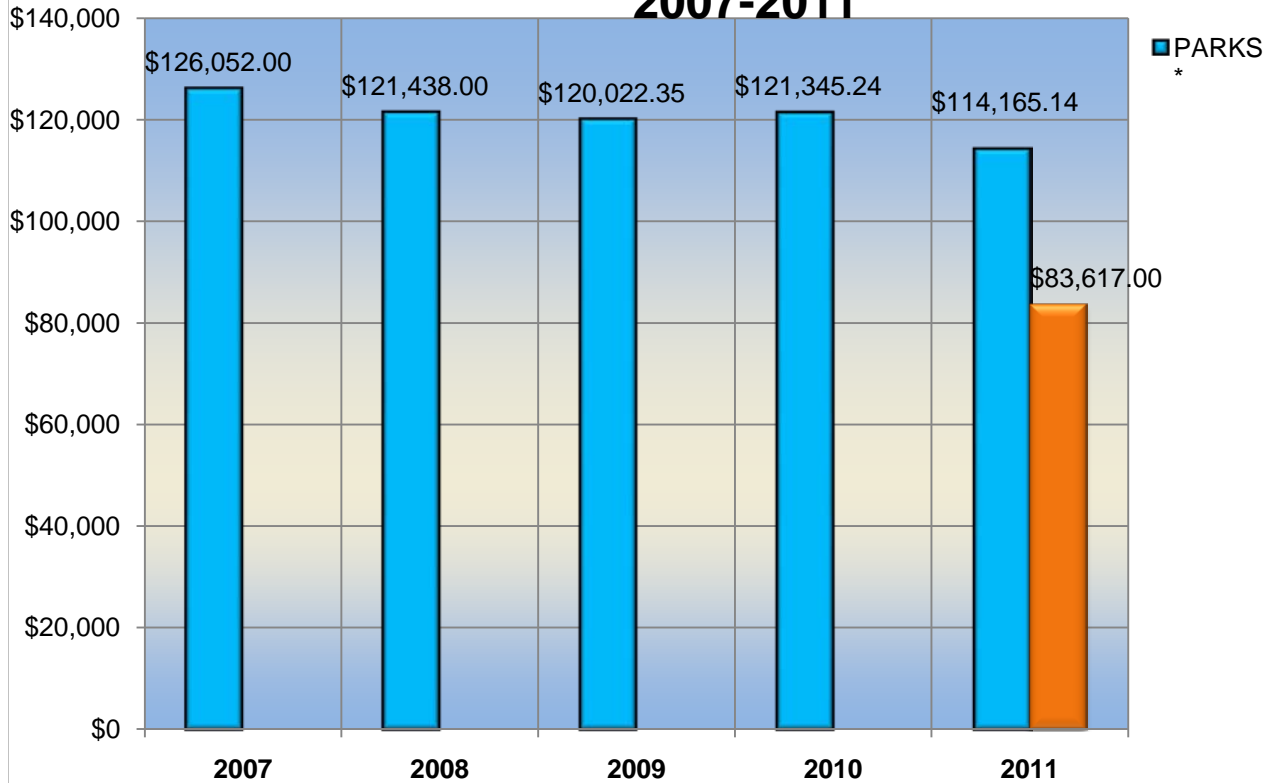
Landfill Management	2007	2008	2009	2010	2011
STORM SOIL CONSOLIDATION	\$ 22,338.60	\$ 40,913.76	\$46,084.76	\$33,674.19	\$14,443.78
AGGREGATE HAULING	\$ 2,579.65	\$ 51.34	\$0.00	\$0.00	\$0.00
<b>TOTAL COST OF LANDFILL MANAGEMENT</b>	<b>\$ 24,918.25</b>	<b>\$ 40,965.10</b>	<b>\$ 46,084.76</b>	<b>\$ 33,674.19</b>	<b>\$ 14,443.78</b>

## Incident Responses 2007-2011



Incident Responses	2007	2008	2009	2010	2011
MANHOLE MISCELLANEOUS	N/A	1	0	0	0
STORM SIGNS	N/A	0	1	0	0
SINK HOLE	N/A	0	1	0	0
ODOR COMPLAINT	N/A	1	0	1	0
STORM FALL PROTECTION	N/A	1	0	0	0
STORM GRATE REPAIR	N/A	1	0	0	1
STORM OVERFLOW TRACT INSP	N/A	1	0	1	0
STORM POND MAINTENANCE	N/A	1	0	0	1
INSPECTION MISCELLANEOUS	N/A	2	0	0	0
OTHER DEPARTMENTS	N/A	2	5	0	0
STORM CHANNEL INSPECTION	N/A	2	3	0	0
STORM POND INSPECTION	N/A	2	1	0	1
OTHER ACTIVITY	N/A	3	1	0	0
STORM GRATE INSPECTION	N/A	3	0	0	0
STORM CONCRETE EASEMENT	N/A	4	0	1	0
STORM FENCE REPAIR	N/A	4	0	1	4
STORM MANHOLE REPAIRS	N/A	4	0	2	0
STORM MOSQUITO MANAGEMENT	N/A	4	10	9	3
STORM MANHOLE INSPECTION	N/A	5	0	1	0
STORM TREE MAINTENANCE	N/A	6	0	1	3
CUSTOMER EDUCATION	N/A	7	0	0	0
STORM CHANNEL MAINTENANCE	N/A	7	0	4	2
STORM TRASH	N/A	8	23	3	1
STORM WEED MAINTENANCE	N/A	13	25	13	7
STORM INLET MAINTENANCE	N/A	14	0	10	10
STORM DEBRIS REMOVAL/TRASH	N/A	18	0	9	6
STORM INLET INSPECTION	N/A	23	15	3	5
STORM GRAFFITI REMOVAL	N/A	37	30	28	2
STORM INSPECTION MISC	N/A	50	70	94	123
STORM SPILL RESPONSE	N/A	60	N/A	N/A	N/A
WILDLIFE MANAGEMENT	N/A	N/A	N/A	4	1
<b>TOTAL INCIDENT RESPONSES</b>	<b>N/A</b>	<b>284</b>	<b>185</b>	<b>185</b>	<b>170</b>

## Stormwater Service Level Agreement Parks and OSNR Cost Comparison 2007-2011



Service Level Agreement	2007	2008	2009	2010	2011
<b>PARKS *</b>	\$ 126,052.00	\$ 121,438.00	\$ 120,022.35	\$ 121,345.24	\$ 114,165.14
<b>TOTAL ACRES</b>	117	117	117	117	117
<b>COST PER ACRE</b>	\$ 1,077.37	\$ 1,037.93	\$ 1,025.83	\$ 1,037.14	\$ 975.77

\* Turf Management

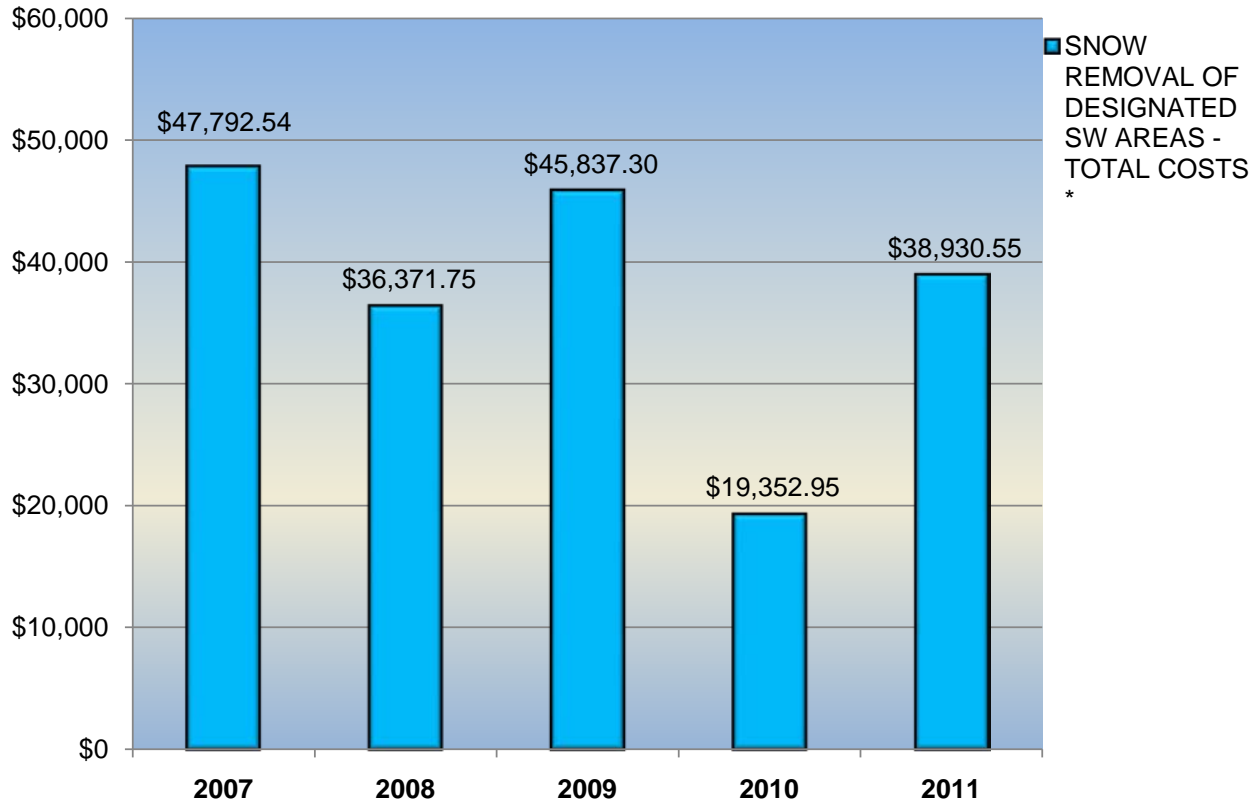
Service Level Agreement	2007	2008	2009	2010	2011
<b>OSNR **</b>	N/A	N/A	N/A	N/A	\$ 83,617.00
<b>TOTAL ACRES</b>	N/A	N/A	N/A	N/A	950
<b>COST PER ACRE</b>	N/A	N/A	N/A	N/A	\$ 88.02

\*\* Noxious Weed Management.

<b>2011 Stormwater Contract Services</b>		
<b>VENDOR</b>	<b>SERVICES PROVIDED</b>	<b>COST</b>
2011 OSNR SLA	2011 OSNR SLA	\$ 83,617.00
2011 PARKS SLA	2011 PARKS SLA	\$ 114,165.14
AGGREGATE INDUSTRIES	AGGREGATE SUPPLIES	\$ 2,567.74
ALBERT FREI AND SONS	AGGREGATE SUPPLIES	\$ 12,390.03
AMERICAN PEST CONTROL	RODENTS REMOVAL	\$ 8,040.00
ARKANSAS VALLEY SEED	SEED	\$ 2,045.48
BOWMAN CONST SUPPLY CO	EROSION CONTROL SUPPLIES	\$ 150.06
CO MOSQUITO CONTROL	MOSQUITO CONTROL	\$ 47,500.00
DAVEY TREE	LARGE TREES REMOVAL AND TRIMMING	\$ 2,660.00
EARTH WORKS	SILT FENCE INSTALL	\$ 168.75
G & K SERVICES	UNIFORMS	\$ 3,831.43
LIGHTNING MOBILE	GRAFFITI REMOVAL	\$ 2,965.00
QUALITY WATER BIO SYSTEMS	POND MAINT	\$ 6,869.75
REDD CO FENCE (FORMERLY ARAY FENCE)	HANDRAILS AND FENCE REPAIR	\$ 1,906.00
STREET CONCRETE	INLETS REHAB AND REPLACEMENT	\$ 30,000.00
WASTE MANAGEMENT	HAULING TRASH TO DADS	\$ 14,134.08
WILDLIFE-2000	TRAP AND REMOVE BEAVERS FOR RELOCATION	\$ 8,496.15
<b>TOTAL 2011 PURCHASE ORDERS</b>		<b>\$ 341,506.61</b>

\* E. T. Technologies - in 2011 Stormwater transferred **\$3,502.05** to Operations Compliance for hazardous material removal

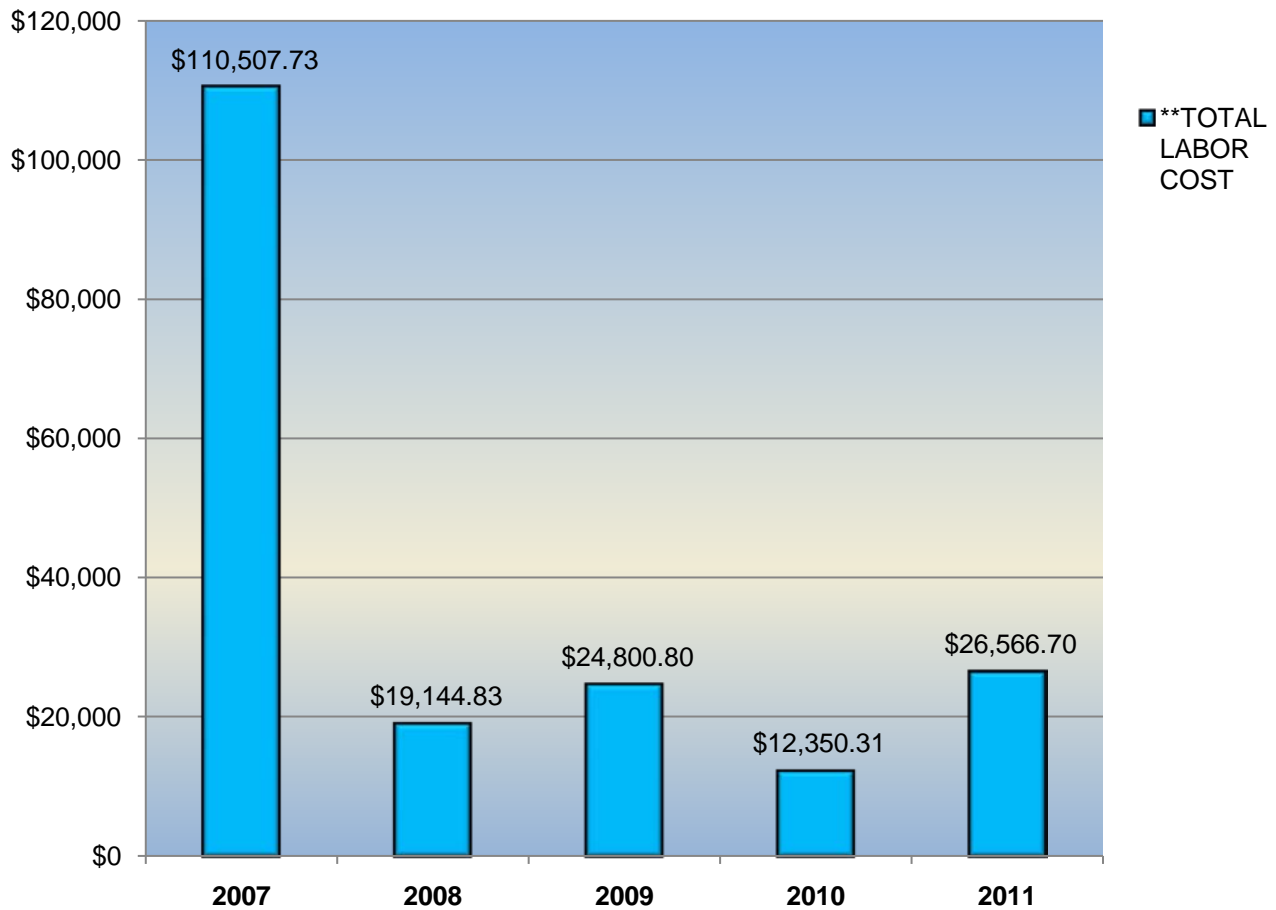
## Snow Removal Stormwater Maintenance Areas 2007-2011



Snow Removal	2007	2008	2009	2010	2011
<b>SNOW REMOVAL OF DESIGNATED SW AREAS - TOTAL COSTS *</b>	\$ 47,792.54	\$ 36,371.75	\$ 45,837.30	\$ 19,352.95	\$ 38,930.55

\* Total Costs include employee labor and equipment used.

## Snow Removal for Other Departments 2007-2011



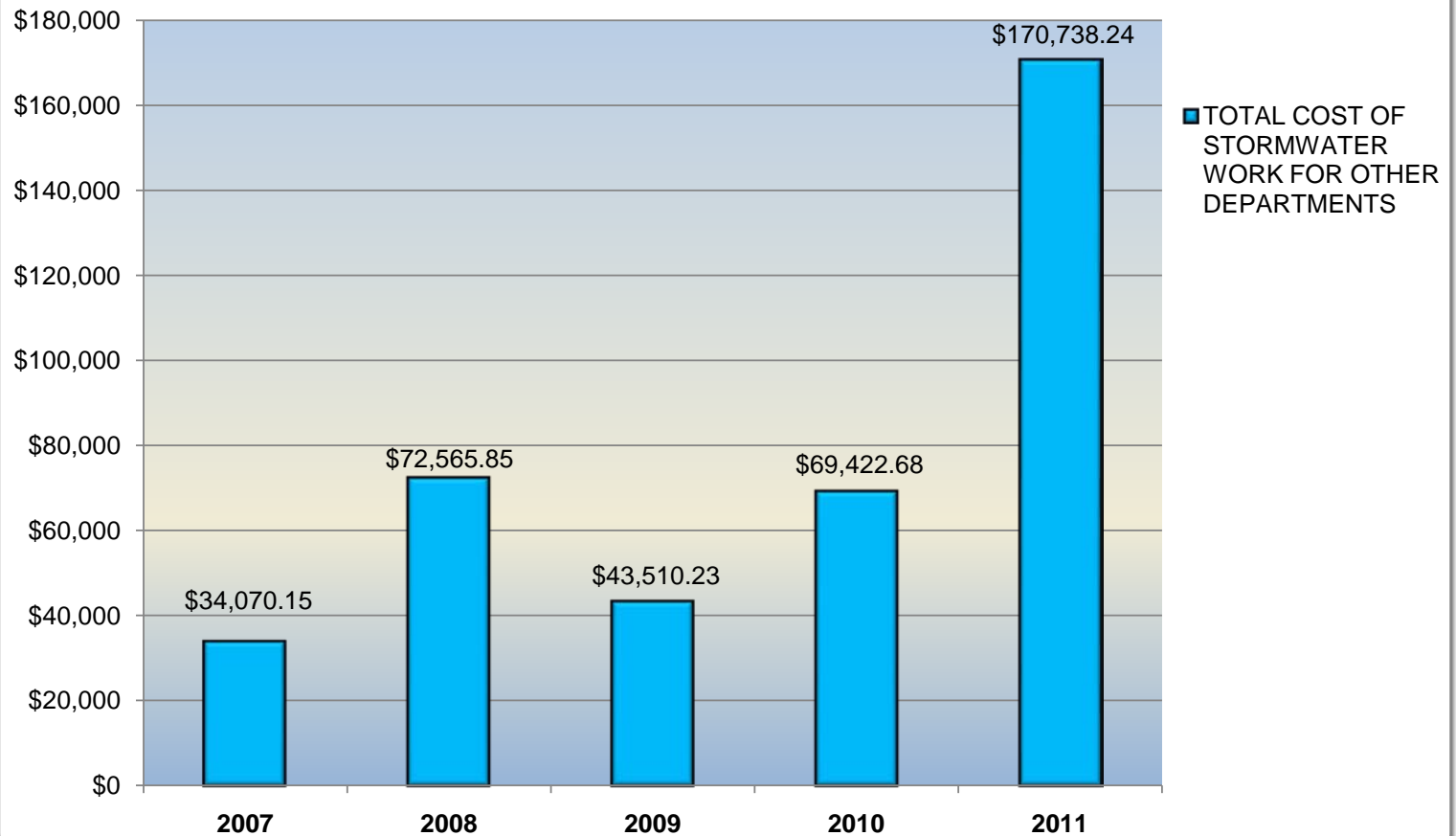
Snow Removal	2007	2008	2009	2010	2011
*SNOW REMOVAL FOR PARKS	\$ 35,429.56	\$ -	\$ -	\$ -	\$ -
SNOW TRAINING	N/A	N/A	N/A	\$ 5,483.49	\$ 4,930.97
SNOW PREP, TRUCKS, PLOWS	\$ 1,729.16	\$ 12,668.36	\$ 13,919.59	\$ 4,279.44	\$ 9,401.96
SNOW REMOVAL FOR STREETS	\$ 73,349.01	\$ 6,476.47	\$ 10,881.21	\$ 2,587.38	\$ 12,233.77
**TOTAL LABOR COST	\$ 110,507.73	\$ 19,144.83	\$ 24,800.80	\$ 12,350.31	\$ 26,566.70

\*Parks includes right of ways and bike paths

\*\*This labor cost is paid from Stormwater's funds and includes employee labor and equipment used - does not include overtime paid by Streets.



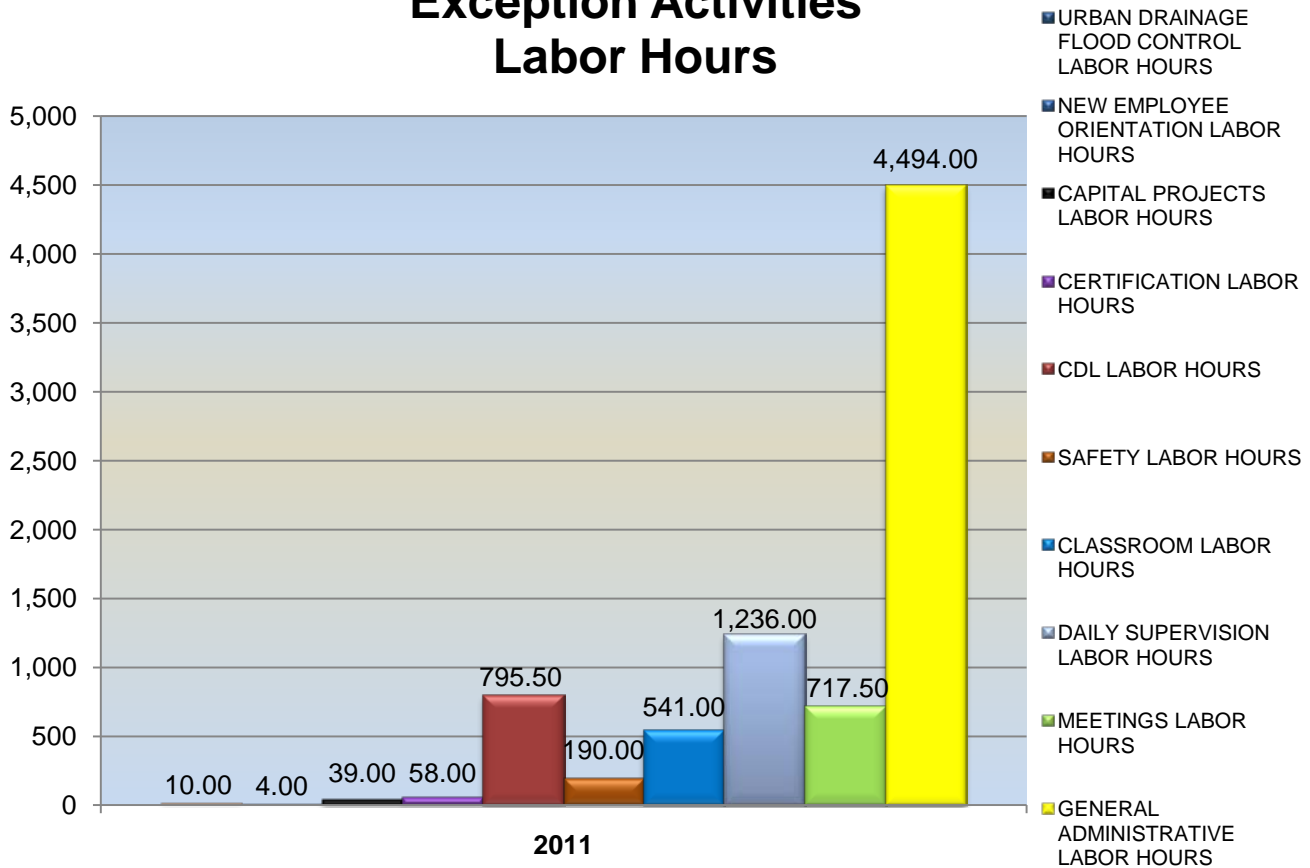
## Stormwater Costs of Work for Other Departments 2007-2011



LABOR & VEHICLE COSTS	2007	2008	2009	2010	2011
WATER CONSERVATION	\$ 524.55	\$ 147.87	\$ 3,445.52	\$ 1,019.30	\$ -
METER MAINTENANCE	\$ 29.81	\$ -	\$ -	\$ -	\$ -
PARKS	\$ 13,724.56	\$ -	\$ 2,611.68	\$ 10,129.73	\$ 5,957.19
PUMPING	\$ 1,070.88	\$ 27,059.24	\$ 703.94	\$ 1,006.77	\$ 8,020.16
RE-USE TREATMENT PLANT	\$ 273.12	\$ -	\$ -	\$ -	\$ -
SOURCE OF SUPPLY	\$ 9,791.72	\$ 23,954.68	\$ 12,541.86	\$ 19,190.43	\$ 74,214.68
STREETS	\$ 4,720.96	\$ -	\$ 4,021.56	\$ 1,614.04	\$ 1,931.75
SUPPLY AND TREATMENT	\$ 97.58	\$ -	\$ 2,005.41	\$ 5,804.13	\$ 16,383.04
TRADES	\$ 1,626.78	\$ -	\$ 389.82	\$ 182.50	\$ -
RISK MANAGEMENT	\$ -	\$ 438.62	\$ -	\$ -	\$ -
PUBLIC IMPROVEMENTS/WORKS	\$ -	\$ 18.75	\$ -	\$ 1,371.59	\$ -
WASTEWATER COLLECTIONS	\$ -	\$ -	\$ -	\$ 2,148.22	\$ 2,093.67
WASTEWATER CONSTRUCTION	\$ 2,210.19	\$ 18,485.57	\$ 7,505.41	\$ 15,133.48	\$ 33,129.88
WASTEWATER CCTV	\$ -	\$ 517.73	\$ 887.12	\$ 8,106.91	\$ 18,694.44
WATER T&D	\$ -	\$ 60.63	\$ -	\$ 824.46	\$ 1,047.42
WATER RESOURCES	\$ -	\$ 1,882.76	\$ 362.32	\$ -	\$ 4,064.83
*OTHER DEPARTMENTS	\$ -	\$ -	\$ 9,035.59	\$ 2,891.12	\$ 5,201.18
<b>TOTAL COST OF STORMWATER WORK FOR OTHER DEPARTMENTS</b>	<b>\$ 34,070.15</b>	<b>\$ 72,565.85</b>	<b>\$ 43,510.23</b>	<b>\$ 69,422.68</b>	<b>\$ 170,738.24</b>

\*Other Departments includes other Divisions within Aurora Water and other departments within the City of Aurora

## Exception Activities Labor Hours



Exception Activities-Labor	2007	2008	2009	2010	2011
URBAN DRAINAGE FLOOD CONTROL LABOR HOURS	N/A	4.50	0.00	0.00	10.00
NEW EMPLOYEE ORIENTATION LABOR HOURS	24.00	26.00	28.00	8.00	4.00
CAPITAL PROJECTS LABOR HOURS	N/A	44.00	59.00	36.50	39.00
CERTIFICATION LABOR HOURS	288.00	371.50	141.50	96.00	58.00
CDL LABOR HOURS	361.50	434.00	271.50	249.00	795.50
SAFETY LABOR HOURS	98.50	628.00	208.50	104.00	190.00
CLASSROOM LABOR HOURS	1,202.00	794.00	763.50	385.50	541.00
INSPECTIONS/WALK-THROUGH	N/A	N/A	N/A	N/A	60.00
DAILY SUPERVISION LABOR HOURS	1,440.50	1,482.75	1,628.50	1,538.00	1,236.00
MEETINGS LABOR HOURS	890.50	1,651.25	1,350.50	821.50	717.50
GENERAL ADMINISTRATIVE LABOR HOURS	5,546.00	7,705.00	6,287.64	4,626.75	4,494.00

Exception Activities-Labor	2007	2008	2009	2010	2011
URBAN DRAINAGE FLOOD CONTROL LABOR COST	N/A	\$ 175.78	\$ -	\$ -	\$ 505.14
NEW EMPLOYEE ORIENTATION LABOR COST	\$ 255.36	\$ 456.20	\$ 653.70	\$ 148.96	\$ 79.80
CAPITAL PROJECTS LABOR COST	N/A	\$ 2,084.86	\$ 2,958.49	\$ 2,101.03	\$ 1,971.97
CDL LABOR COST	\$ 10,075.24	\$ 9,775.64	\$ 7,712.70	\$ 7,806.19	\$ 22,768.04
CERTIFICATION LABOR COST	\$ 8,861.41	\$ 11,608.83	\$ 3,314.83	\$ 2,227.00	\$ 1,247.15
SAFETY LABOR COST	\$ 2,591.37	\$ 14,786.20	\$ 5,659.90	\$ 2,757.10	\$ 4,804.57
CLASSROOM LABOR COST	\$ 34,952.65	\$ 23,240.63	\$ 20,513.81	\$ 11,354.27	\$ 16,133.34
INSPECTIONS/WALK-THROUGH	N/A	N/A	N/A	N/A	\$ 3,030.86
MEETINGS LABOR COST	\$ 28,344.71	\$ 59,452.78	\$ 51,483.94	\$ 33,581.60	\$ 28,126.23
DAILY SUPERVISOR LABOR COST	\$ 5,559.86	\$ 59,730.61	\$ 67,874.68	\$ 59,279.58	\$ 48,793.73
GENERAL ADMINISTRATIVE LABOR COST	\$ 180,199.13	\$ 231,513.43	\$ 232,623.99	\$ 184,291.72	\$ 159,385.29

\* Hours and costs included for Superintendent and below.



It is with great honor that I bring to you the 2011 Annual Report for the Wastewater Division. In 2011 the Wastewater Division experienced a tremendous honor by being named the Collection System of the Year for 2010 by the Rocky Mountain Water Environment Association for the outstanding work done by everyone in the division. In 2011, the division experienced another outstanding year in the amount of work accomplished. The division produced 4.5 million feet of wastewater collection lines that were cleaned, 545,000 feet of wastewater collection lines inspected and 612 repairs were done to the wastewater collection system. All of this work resulted in having only **two** municipal sewer stoppages in 1,041 miles of wastewater collection lines. This feat is a direct reflection of the dedication and work effort of the entire Wastewater Division.

I would like to express my thanks and gratitude to the entire staff of the Wastewater Division for making 2011 a very successful year.

*Coby Shurtleff,  
Wastewater Superintendent*

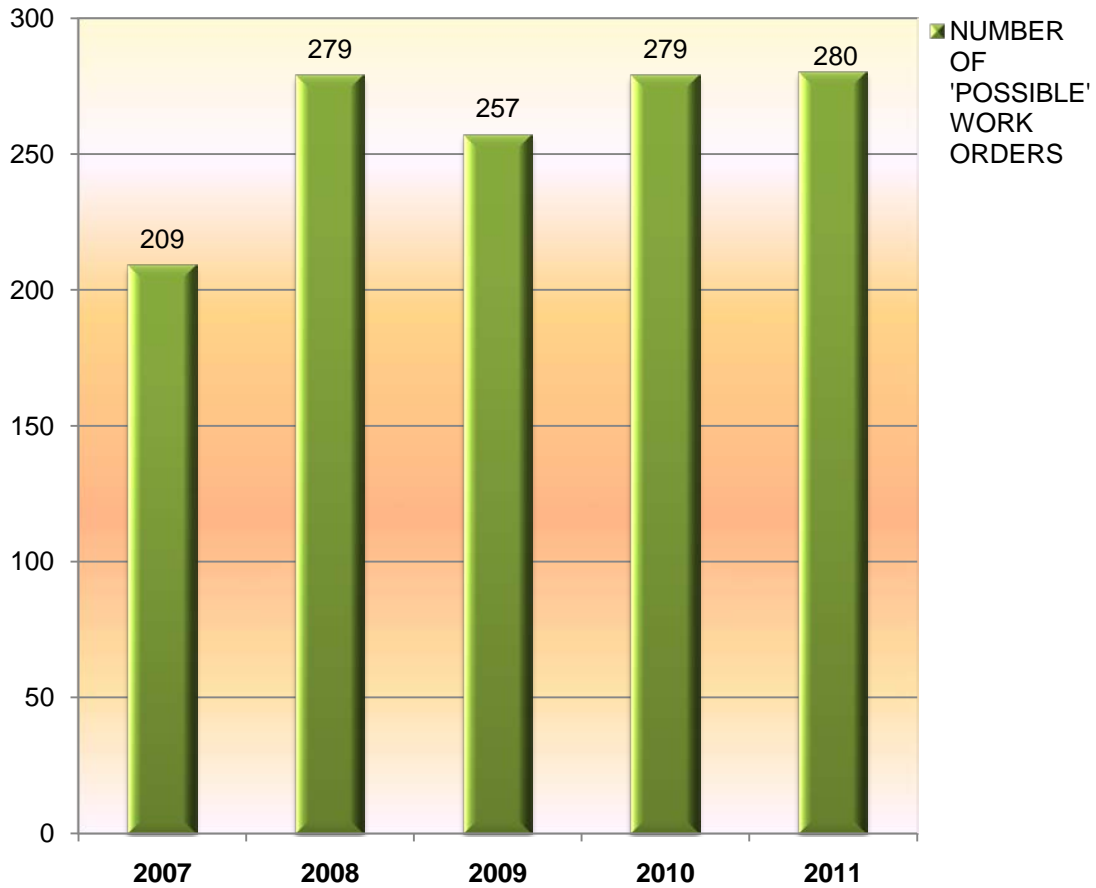
## Wastewater Pressure Cleaning Footage Comparison 2007-2011



Pressure Cleaning	2007	2008	2009	2010	2011
<b>TOTAL FOOTAGE</b>	3,960,386	3,847,865	4,907,590	4,686,470	4,548,736
<b>TOTAL COST</b>	\$376,814.36	\$413,401.15	\$493,986.35	\$492,859.82	\$458,580.96
<b>COST PER FOOT</b>	\$0.10	\$0.11	\$0.10	\$0.11	\$0.10
<b>TOTAL LABOR HOURS</b>	10,530.50	9,990.00	12,806.75	12,765.00	11,642.00
<b># FEET PER MANHOUR</b>	376.09	385.17	383.20	367.13	390.72

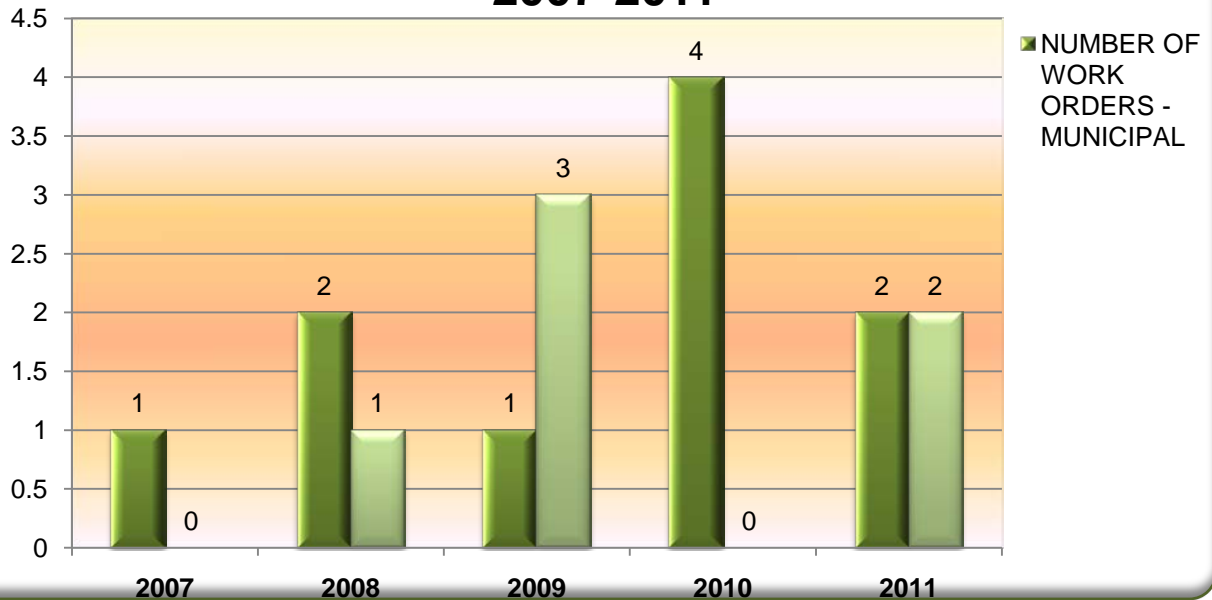
**Total Cost includes employee labor and equipment used**

## Possible Stoppages in the Wastewater Collection System Comparison 2007-2011



Possibles	2007	2008	2009	2010	2011
NUMBER OF 'POSSIBLE' WORK ORDERS	209	279	257	279	280
TOTAL COST	\$12,624.45	\$15,555.94	\$12,924.80	\$19,025.92	\$27,119.10
COST PER 'POSSIBLE' WORK ORDER	\$60.40	\$55.76	\$50.29	\$68.19	\$96.85

## Sanitary Sewer Stoppages Comparison 2007-2011

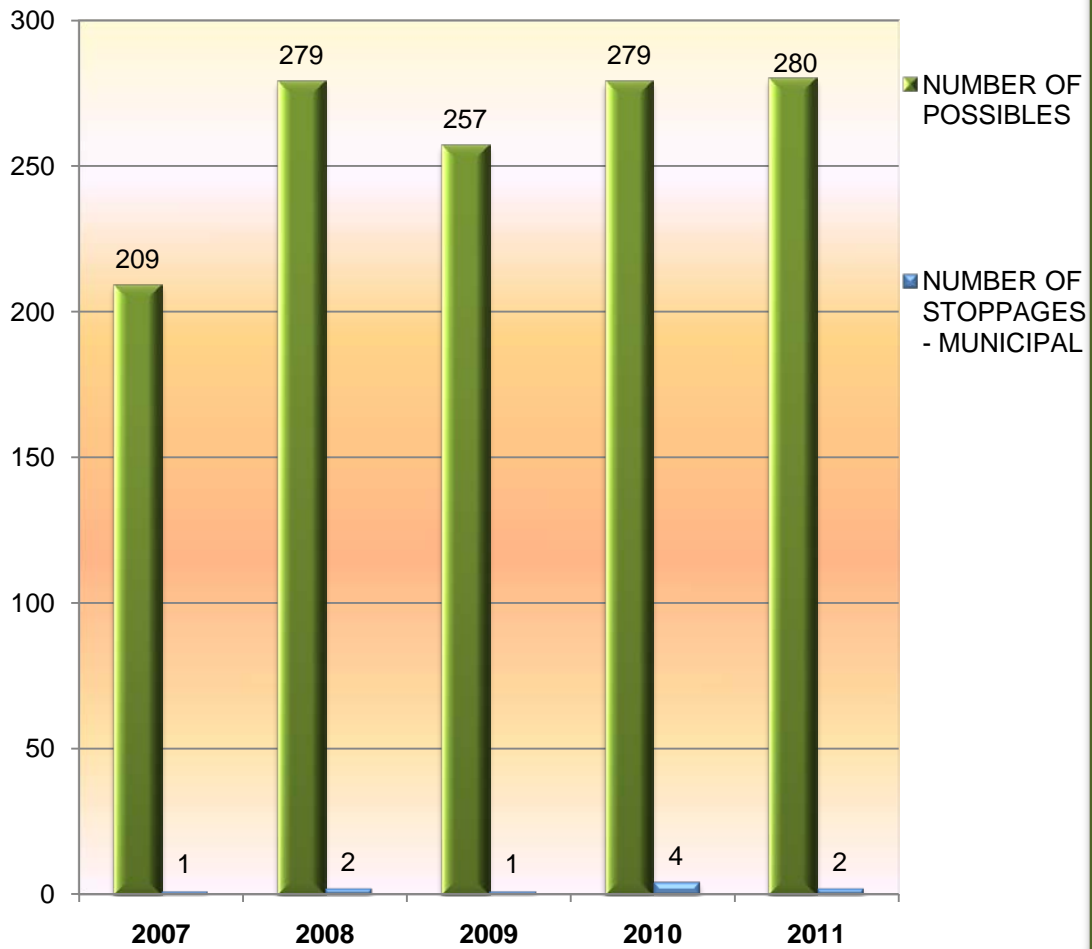


Municipal Stoppages	2007	2008	2009	2010	2011
NUMBER OF WORK ORDERS - MUNICIPAL	1	2	1	4	2
TOTAL COST	\$ 487.21	\$ 1,595.19	\$ 1,065.37	\$ 2,726.22	\$ 489.15
TOTAL COST PER WORK ORDER	\$ 487.21	\$ 797.60	\$ 1,065.37	\$ 681.56	\$ 244.58
TOTAL LABOR HOURS	9	48	26	66	11
LABOR HOURS PER STOPPAGE	9	24	26	16.5	5.5
RESTORATION COSTS	\$17,974.00	\$13,428.00	\$12,000.00	\$272,734.52	\$17,130.30
STOPPAGES PER 100 MILES	0.10	0.19	0.10	0.39	0.20

Non-Municipal Stoppages	2007	2008	2009	2010	2011
NUMBER OF WORK ORDERS - NON-MUNICIPAL	N/A	1	3	0	2
TOTAL COST	N/A	\$ 1,595.19	\$ 1,418.23	\$ -	\$ 512.58
TOTAL COST PER WORK ORDER	N/A	\$ 1,595.19	\$ 472.74	\$ -	\$ 256.29
TOTAL LABOR HOURS	N/A	36	38	0	13.5
LABOR HOURS PER STOPPAGE	N/A	36	12.67	0.00	6.75

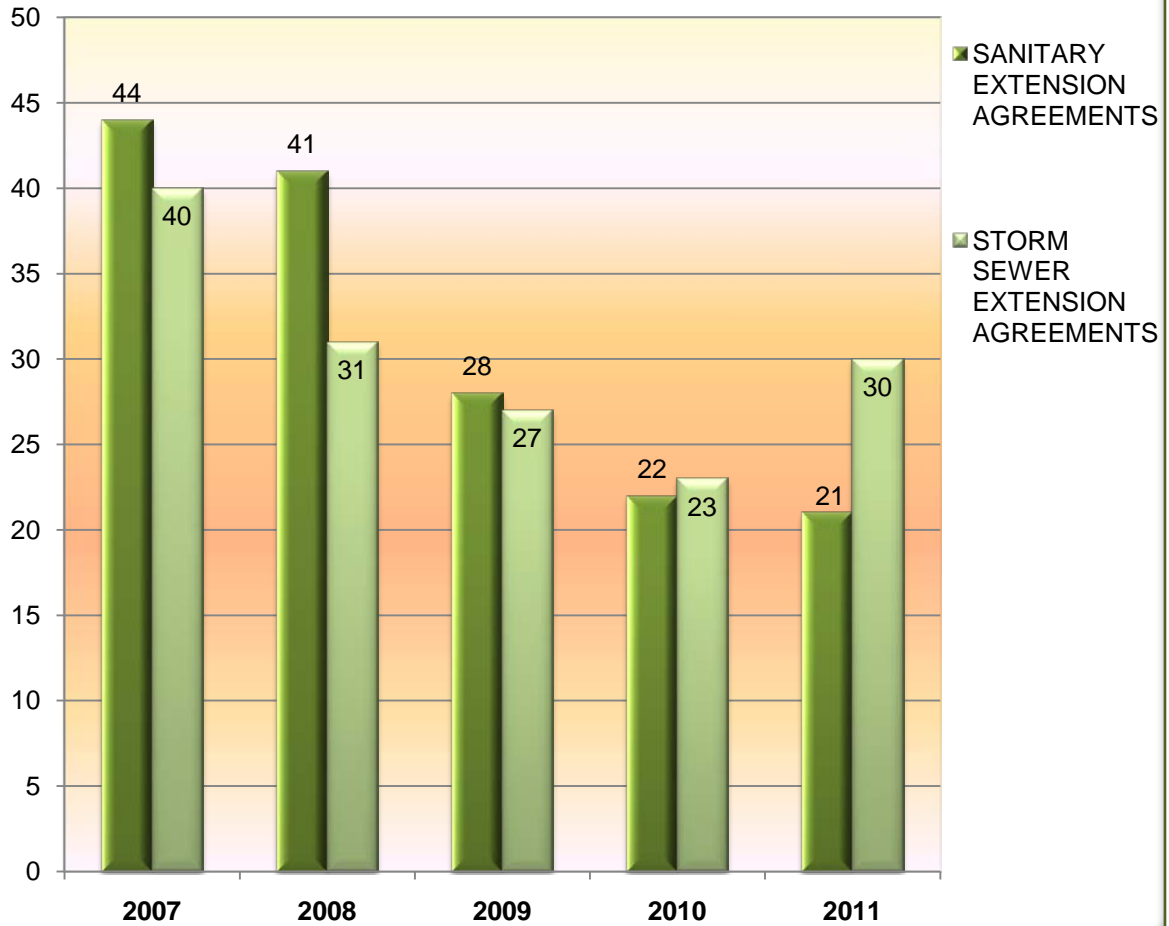
\* Total Cost includes employee labor and equipment used

## Possibles vs. Stoppages in the Wastewater Collection System Comparison 2007-2011



Possibles vs. Stoppages	2007	2008	2009	2010	2011
NUMBER OF POSSIBLES	209	279	257	279	280
NUMBER OF STOPPAGES - MUNICIPAL	1	2	1	4	2

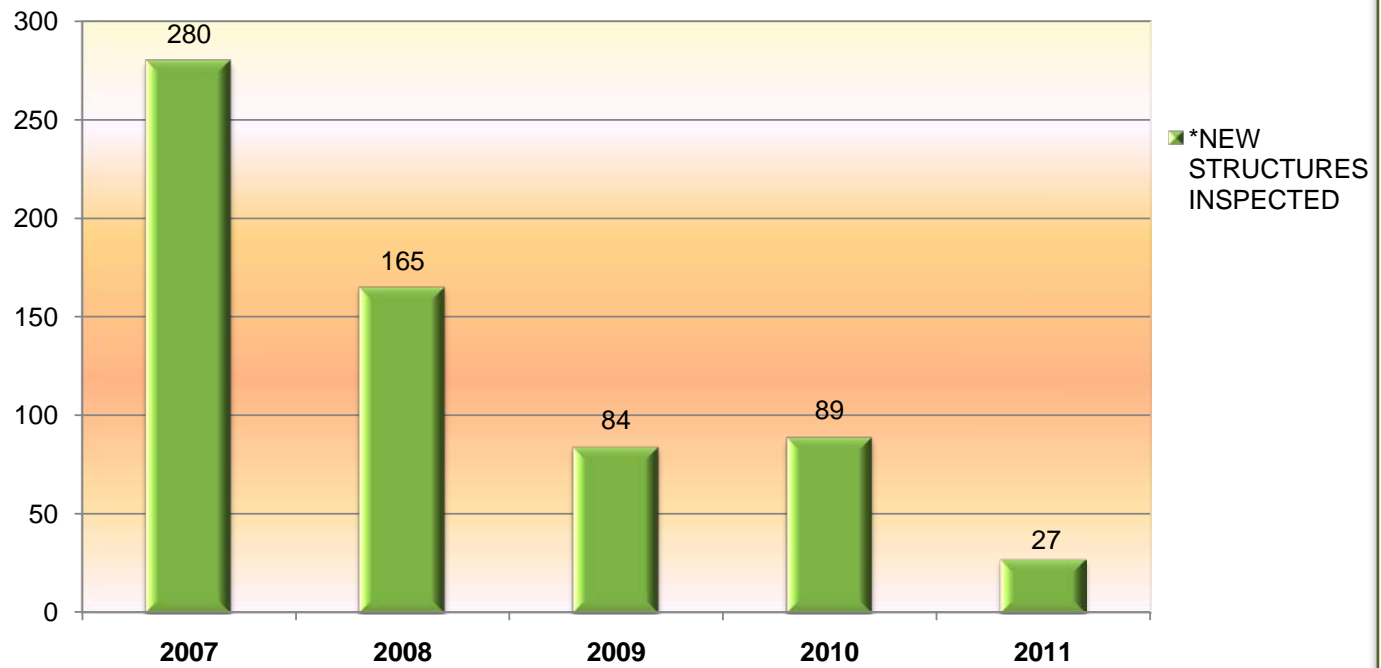
## CCTV Sanitary and Storm Sewer Extension Agreements 2007-2011



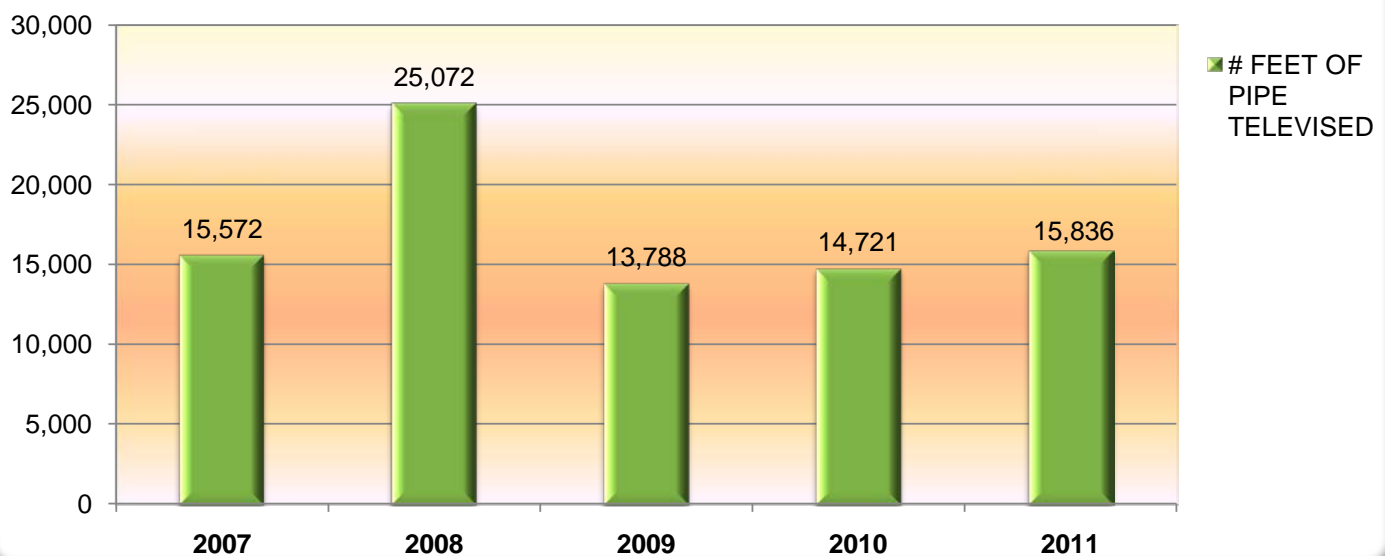
	2007	2008	2009	2010	2011
<b>SANITARY EXTENSION AGREEMENTS</b>	44	41	28	22	21
<b>STORM SEWER EXTENSION AGREEMENTS</b>	40	31	27	23	30



## CCTV Storm Drain Structures Inspected 2007-2011



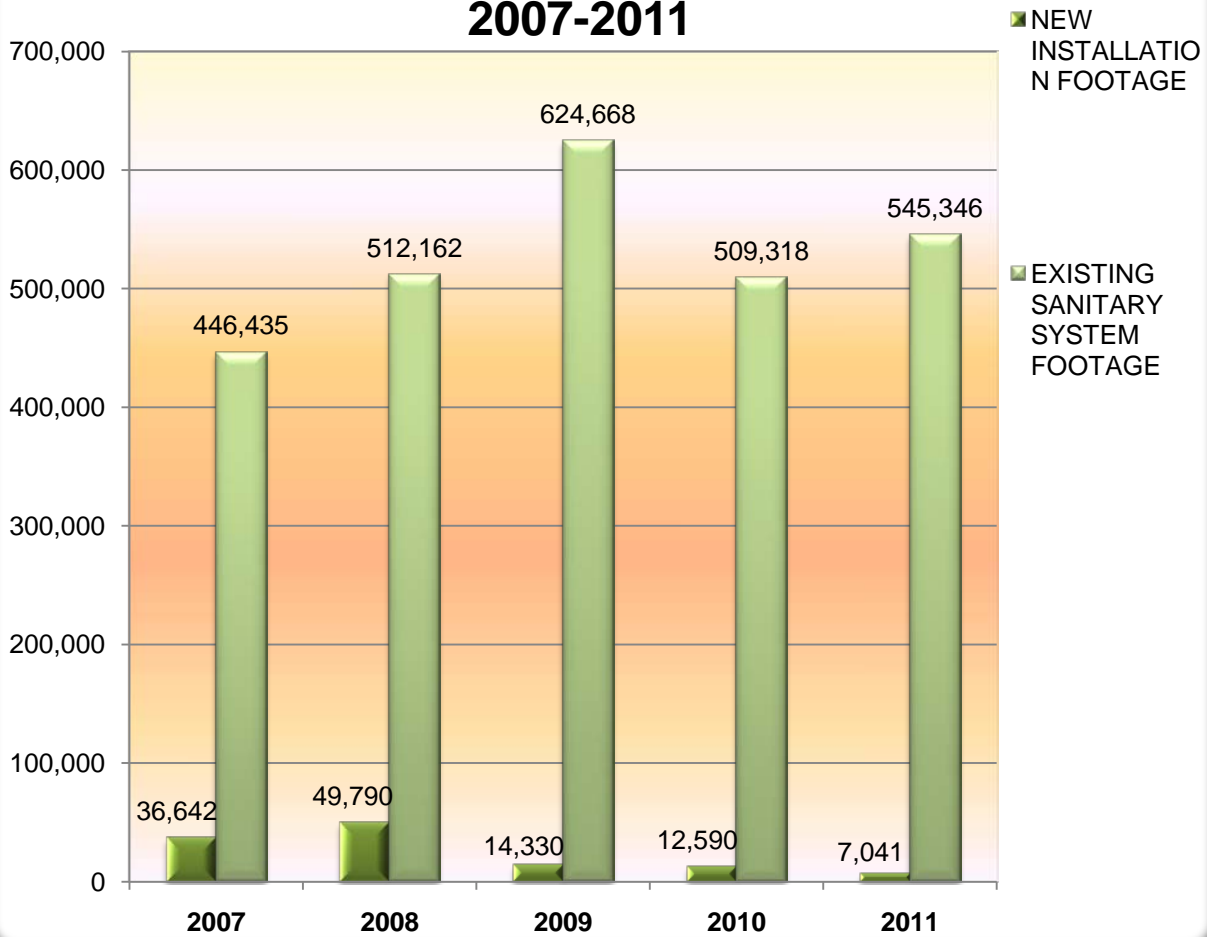
## CCTV Storm Drain Televised Footage 2007-2011



Storm Drains Televised	2007	2008	2009	2010	2011
<b>*NEW STRUCTURES INSPECTED</b>	280	165	84	89	27
<b># FEET OF PIPE TELEVISED</b>	15,572	25,072	13,788	14,721	15,836
<b>TOTAL COST</b>	N/A	\$19,411.16	\$9,555.74	\$8,234.05	\$8,750.72
<b># LABOR HOURS</b>	N/A	636.50	289.00	250.50	272.50
<b># FEET PER HOUR TELEVISED</b>	N/A	39.39	47.71	58.77	58.11
<b>COST PER FOOT</b>	N/A	\$0.77	\$0.69	\$0.56	\$0.55

\* New structures inspected include manholes and inlets

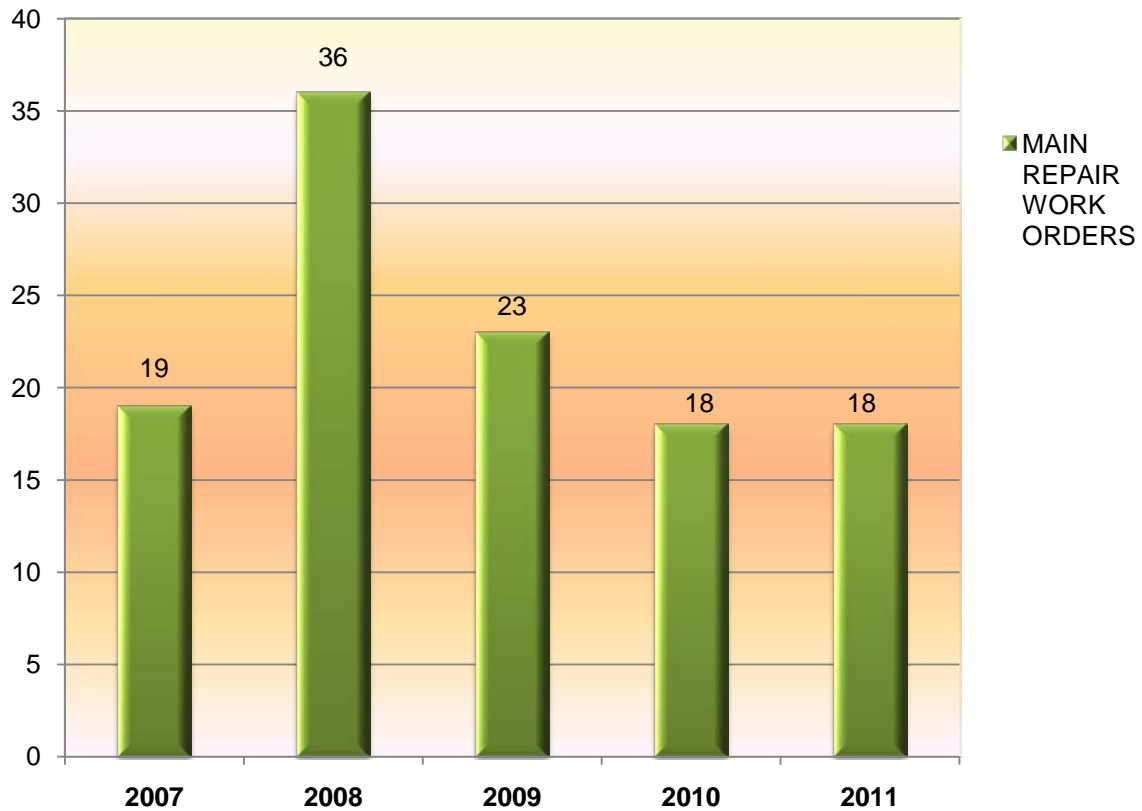
## CCTV Sanitary Televised Inspection Footage 2007-2011



Sanitary TV Inspections	2007	2008	2009	2010	2011
<b>NEW INSTALLATION FOOTAGE</b>	36,642	49,790	14,330	12,590	7,041
<b>EXISTING SANITARY SYSTEM FOOTAGE</b>	446,435	512,162	624,668	509,318	545,346
<b>TOTAL SANITARY FOOTAGE</b>	483,077	561,952	638,998	521,908	552,387
<b>TOTAL COST</b>	\$247,940.37	\$284,177.13	\$297,897.84	\$278,628.64	\$290,570.40
<b>COST PER FOOT</b>	\$0.51	\$0.51	\$0.47	\$0.53	\$0.53
<b>LABOR HOURS</b>	8,079	8,888	9,115	8,343	8,765
<b>FEET PER MANHOUR</b>	60	63	70	63	63

\*Total cost includes employee labor and equipment used

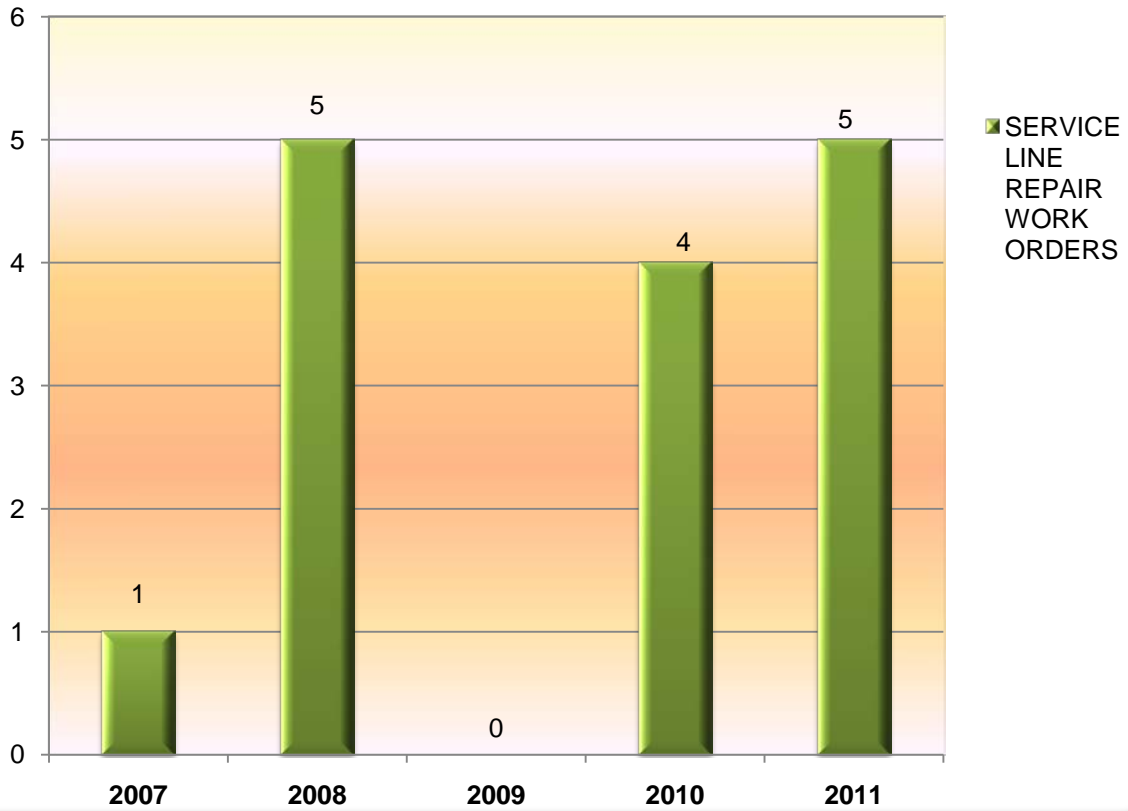
## Sewer Main Repair Comparison 2007-2011



Sewer Main Repairs	2007	2008	2009	2010	2011
<b>MAIN REPAIR WORK ORDERS</b>	19	36	23	18	18
<b>* TOTAL COST FOR MAIN REPAIRS</b>	N/A	\$91,780.50	\$27,095.60	\$16,736.25	\$15,308.38
<b>COST PER WORK ORDER</b>	N/A	\$2,549.46	\$1,178.07	\$929.79	\$850.47

\* Total Cost includes employee labor, material and equipment used.

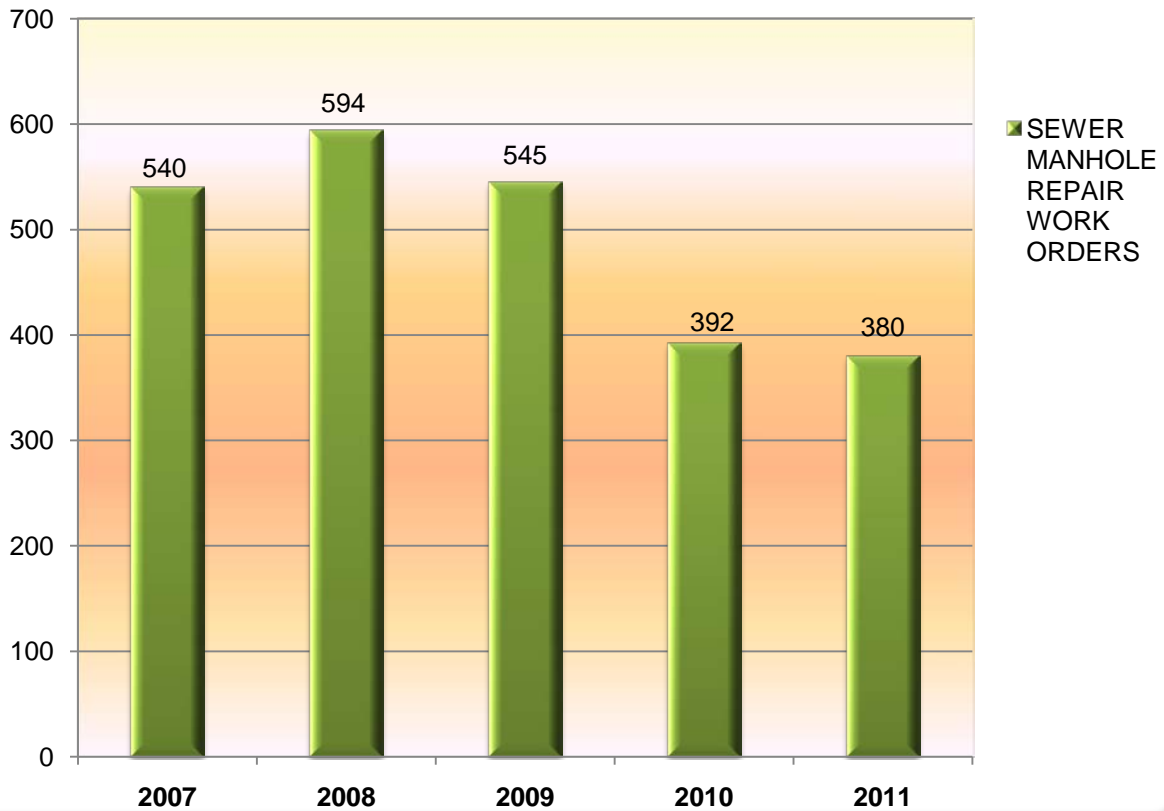
## Service Line Repair Comparison 2007-2011



Service Line Repairs	2007	2008	2009	2010	2011
<b>SERVICE LINE REPAIR WORK ORDERS</b>	1	5	0	4	5
<b>* TOTAL COST FOR REPAIRS</b>	\$371.26	\$1,703.50	\$0.00	\$1,576.93	\$2,086.74
<b>COST PER WORK ORDER</b>	\$371.26	\$340.70	\$0.00	\$394.23	\$417.35

\* Total Cost includes employee labor, material and equipment used.

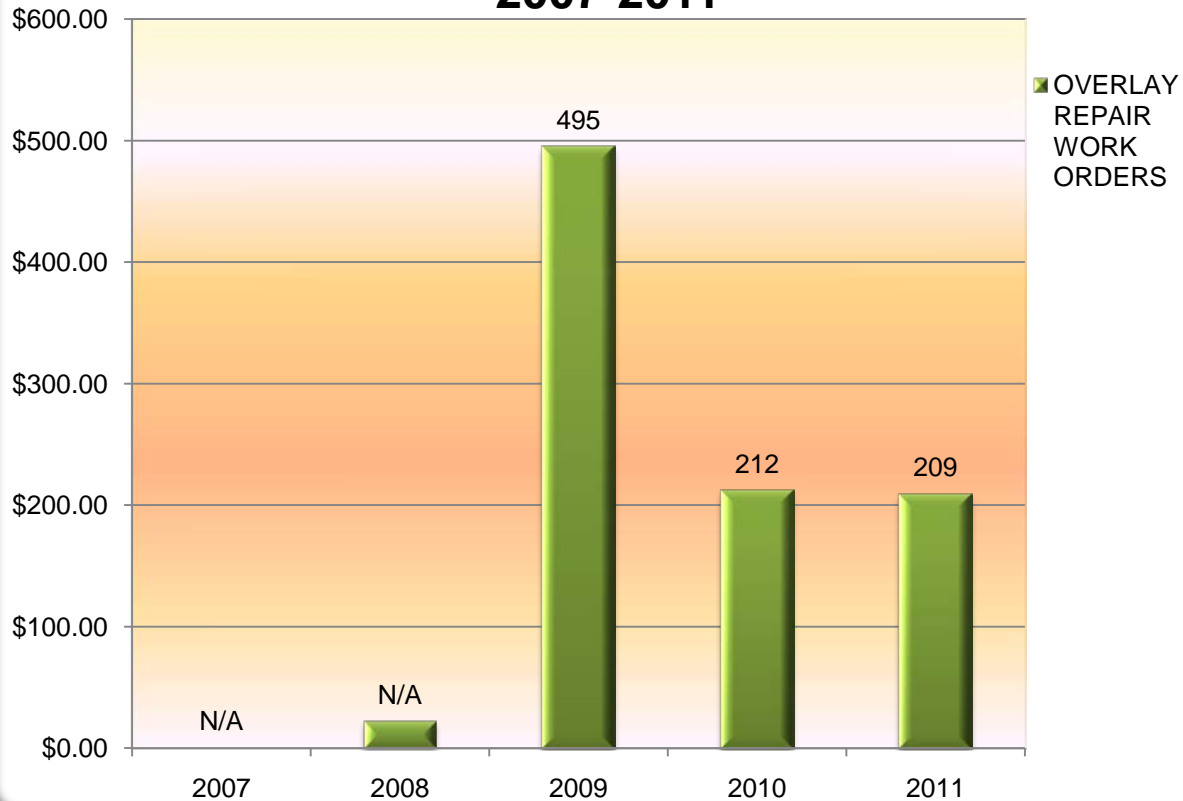
## Sewer Manhole Repair Comparison 2007-2011



Sewer Manhole Repairs	2007	2008	2009	2010	2011
<b>SEWER MANHOLE REPAIR WORK ORDERS</b>	540	594	545	392	380
<b>TOTAL COST FOR REPAIRS</b>	\$42,050.27	\$62,672.26	\$73,801.05	\$64,663.85	\$58,179.62
<b>COST PER WORK ORDER</b>	\$77.87	\$105.51	\$135.41	\$164.96	\$153.10

\* Total Cost includes employee labor, material and equipment used.

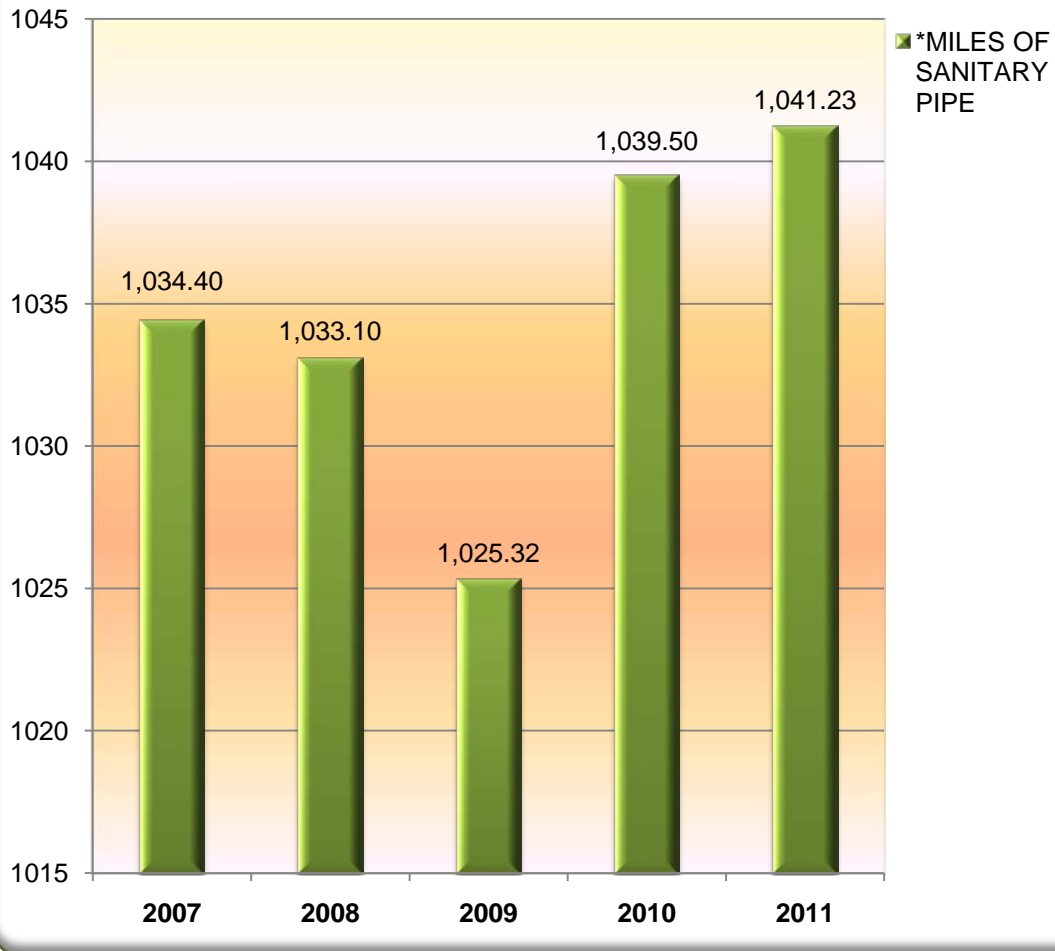
## Stormwater and Wastewater Overlay Repair Comparison 2007-2011



Overlay	2007	2008	2009	2010	2011
<b>OVERLAY REPAIR WORK ORDERS</b>	N/A	22	495	212	209
<b>WASTEWATER and STORMWATER INSPECTION COST</b>	N/A	N/A	\$12,118.67	\$16,258.88	\$19,008.11
<b>WASTEWATER REPAIR COST</b>	N/A	N/A	\$59,407.57	\$23,509.80	\$19,282.30
<b>STORMWATER REPAIR COST</b>	N/A	N/A	\$16,780.06	\$2,996.69	\$8,863.76
<b>* OVERLAY TOTAL COST</b>	\$3,590.46	\$14,451.93	\$88,306.30	\$42,765.37	\$47,154.17
<b>COST PER WORK ORDER</b>	\$3,590.46	\$656.91	\$178.40	\$201.72	\$225.62

\*Overlay cost includes inspection and repair; cost includes labor hours, materials, equipment used

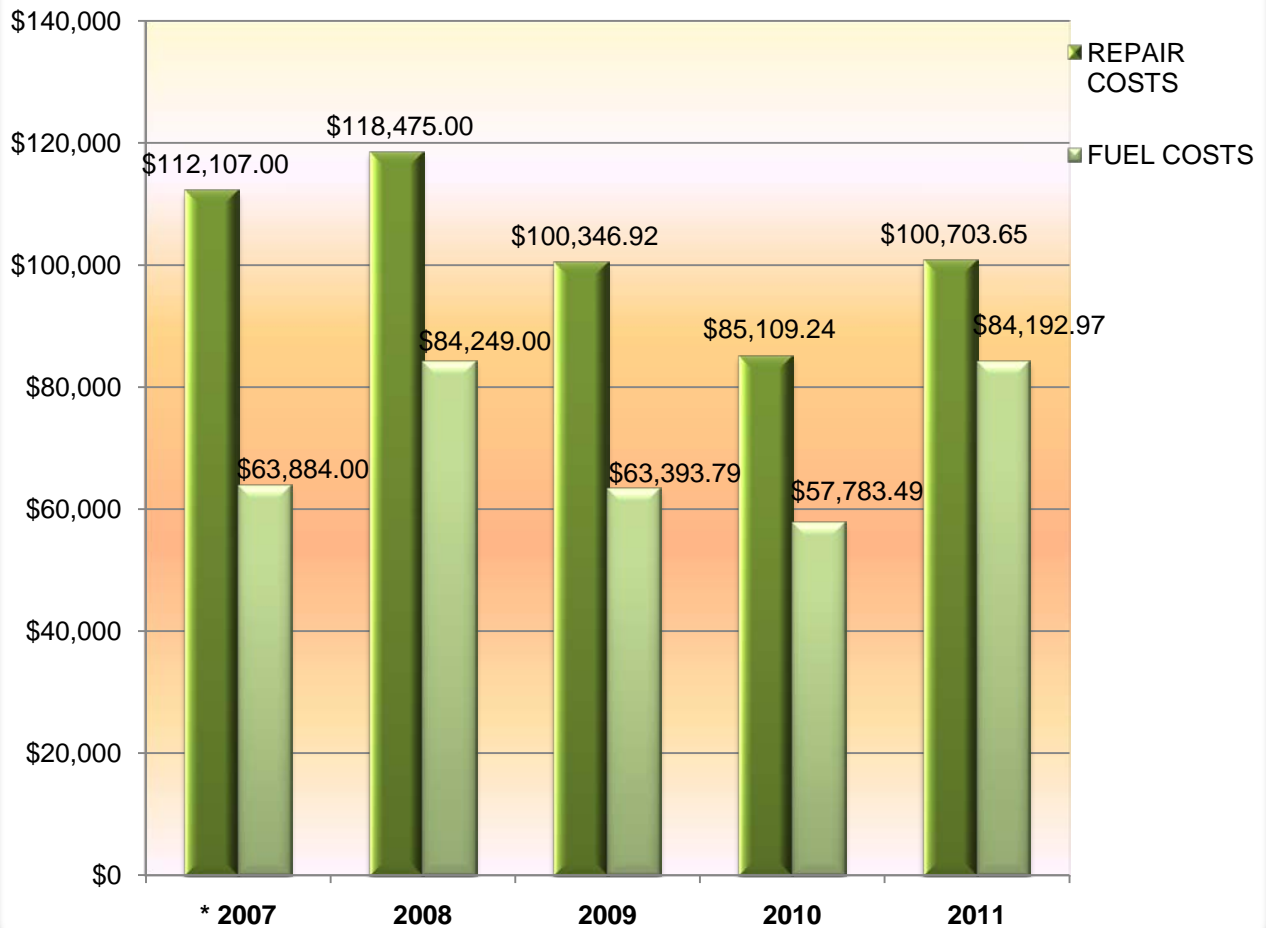
## Wastewater Infrastructure Comparison 2007-2011



Infrastructure	2007	2008	2009	2010	2011
WASTEWATER MANHOLES	26,527	26,820	26,820	26,845	26,896
*MILES OF SANITARY PIPE	1,034.40	1,033.10	1,025.32	1,039.50	1,041.23

\*GIS information

## Wastewater Fleet Vehicle and Equipment Maintenance Cost Comparison 2007-2011



Vehicle & Equipment	* 2007	2008	2009	2010	2011
<b>REPAIR COSTS</b>	\$ 112,107.00	\$ 118,475.00	\$ 100,346.92	\$ 85,109.24	\$ 100,703.65
<b>FUEL COSTS</b>	\$ 63,884.00	\$ 84,249.00	\$ 63,393.79	\$ 57,783.49	\$ 84,192.97
<b>DOWNTIME HOURS</b>	5,388.63	6,089.56	5,215.45	5,789.88	5,648.24

\* Note: In 2007 Fleet Overhead was charged as a separate budget line item. In previous years it was included in repair costs with no separation.



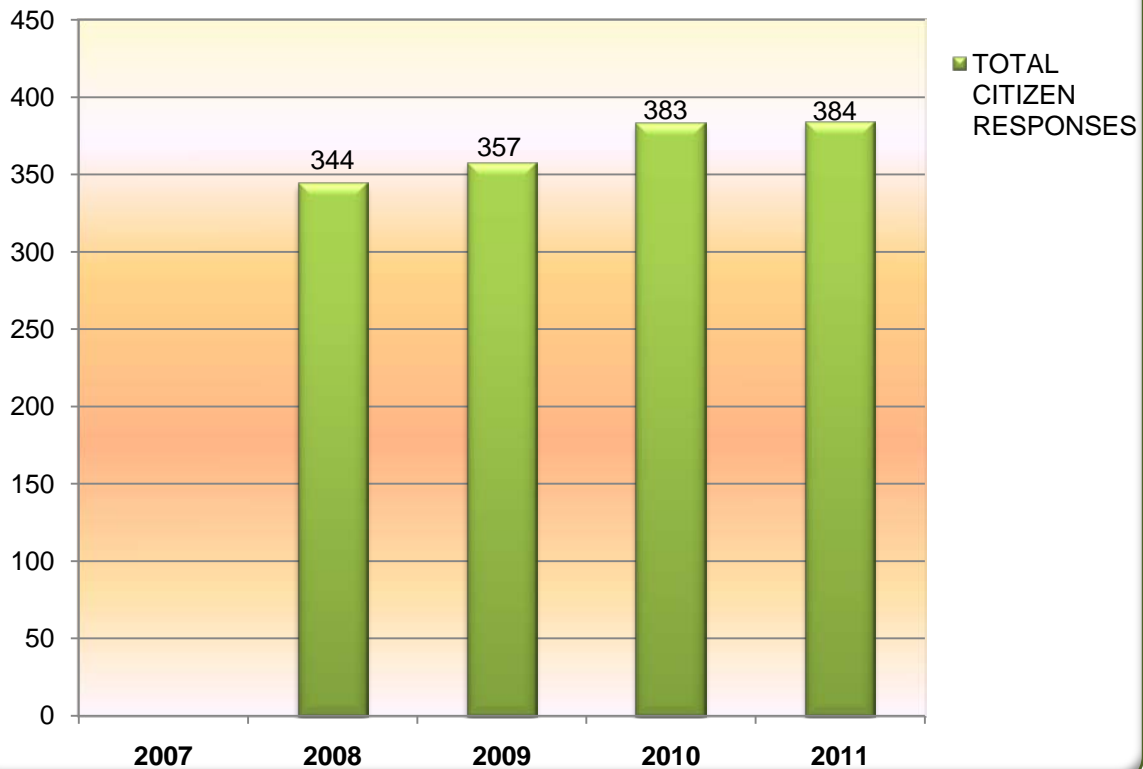
## Mobilization/Utilization Cost for Equipment 2007-2011



*Equipment Maintenance	2007	2008	2009	2010	2011
<b>COST OF MAINTAINING EQUIPMENT</b>	\$ 152,564.60	\$ 198,449.64	\$ 185,916.03	\$ 204,329.30	\$ 206,414.16

\* Includes trip inspections (pre and post) and any equipment related to maintenance and inspection i.e. fluids/lights etc.

## Wastewater Citizen Responses 2007-2011



Citizen Responses	2007	2008	2009	2010	2011
INSPECTION MISCELLANEOUS	N/A	1	0	4	2
CUSTOMER EDUCATION	N/A	0	7	4	4
SERVICE LINE TV INSPECTION	N/A	1	0	0	0
WW PRESSURE CLEAN	N/A	1	0	3	0
MAIN TV INSPECTION	N/A	2	1	0	2
SEWER SERVICE LINE REPAIR	N/A	2	0	0	1
STOPPAGE	N/A	2	4	4	4
OTHER DEPARTMENTS	N/A	4	21	20	13
SINKHOLE	N/A	4	0	5	5
OTHER ACTIVITY	N/A	5	10	4	5
SPILL RESPONSE	N/A	5	5	6	4
MANHOLE MISCELLANEOUS	N/A	10	11	18	40
SEWER MANHOLE REPAIRS	N/A	12	21	17	15
SEWER MANHOLE INSPECTION	N/A	16	20	19	9
POSSIBLE	N/A	279	257	279	280
<b>TOTAL CITIZEN RESPONSES</b>	N/A	<b>344</b>	<b>357</b>	<b>383</b>	<b>384</b>



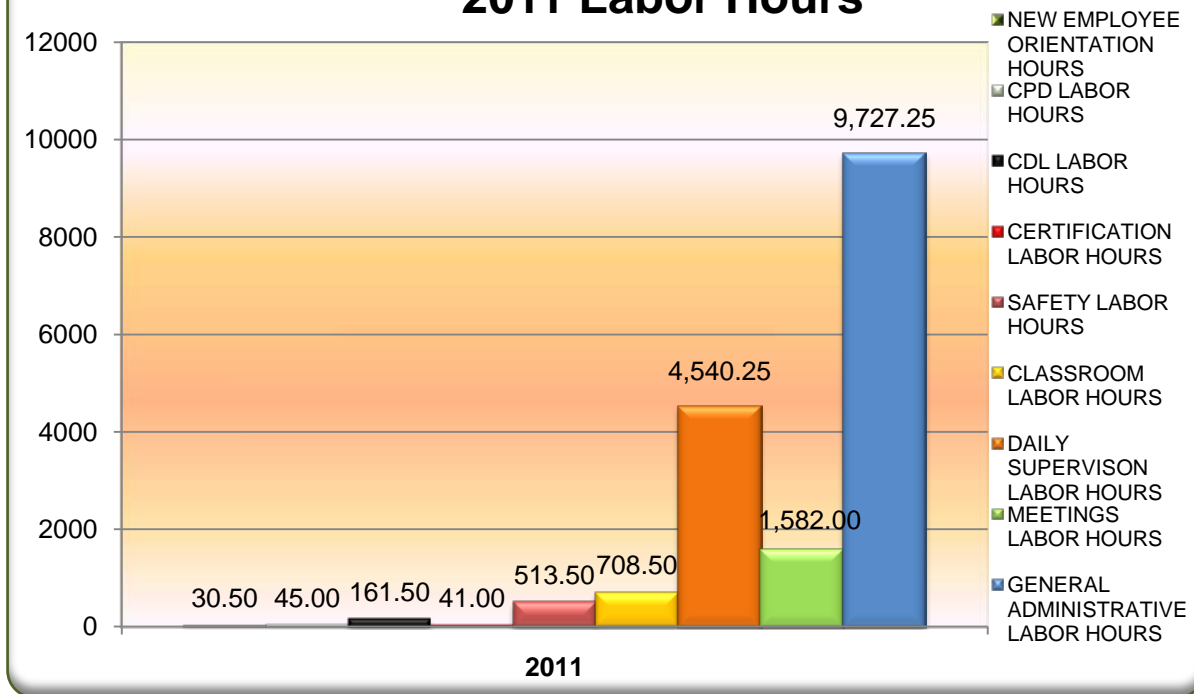
Cost	2007	2008	2009	2010	2011
WORK FOR STORMWATER	N/A	\$4,124.69	\$9,198.20	\$2,581.71	\$1,819.64
WORK FOR OTHERS - PARKS	N/A	\$162.08	\$972.46	\$794.86	\$1,029.62
WW COST OF SNOW REMOVAL FOR STREETS DEPT - INCLUDES VEHICLE PREPARATION & TRAINING **	N/A	\$2,736.29	\$37,821.97	\$8,263.12	\$14,770.84
* WORK FOR OTHERS MISC	N/A	\$20,398.33	\$26,292.71	\$25,907.90	\$15,409.65
<b>TOTAL COST</b>	N/A	\$27,421.39	\$74,285.34	\$37,547.59	\$33,029.75

Labor Hours	2007	2008	2009	2010	2011
WORK FOR STORMWATER	N/A	160.75	306.00	82.00	57.00
WORK FOR OTHERS - PARKS	N/A	6.00	30.00	27.00	30.50
WW COST OF SNOW REMOVAL FOR STREETS DEPT - INCLUDES VEHICLE PREPARATION & TRAINING **	N/A	140.00	1,753.85	317.00	513.50
* WORK FOR OTHERS MISC	N/A	782.50	218.75	805.50	450.00
<b>TOTAL LABOR HOURS</b>	N/A	1,089.25	2,308.60	1,231.50	1,051.00

\* Work for others-misc includes work for various divisions within Aurora Water and other departments within the City of Aurora. Such work includes crane lifts, special cleaning, lift station cleaning, etc.

\*\* Training for Snow Removal was not tracked separately until 2011. Prior years' figures do not include training hours.

## Exception Activities 2011 Labor Hours



Exception Activities - Labor Hours	2007	2008	2009	2010	2011
NEW EMPLOYEE ORIENTATION HOURS	N/A	46.50	9.00	16.00	30.50
CPD LABOR HOURS	N/A	47.00	47.00	62.00	45.00
CDL LABOR HOURS	N/A	295.00	27.00	104.00	161.50
CERTIFICATION LABOR HOURS	N/A	314.50	382.00	138.00	41.00
SAFETY LABOR HOURS	N/A	894.75	358.00	246.00	513.50
CLASSROOM LABOR HOURS	N/A	1,491.25	934.50	609.50	708.50
DAILY SUPERVISOR LABOR HOURS	N/A	1,930.00	2,704.50	3,741.50	4,540.25
MEETINGS LABOR HOURS	N/A	3,708.25	2,998.75	2,205.50	1,582.00
GENERAL ADMINISTRATIVE LABOR HOURS	N/A	14,111.75	12,196.29	7,987.00	9,727.25

Exception Activities - Labor Cost	2007	2008	2009	2010	2011
NEW EMPLOYEE ORIENTATION LABOR COST	N/A	\$ 911.72	\$ 176.05	\$ 236.74	\$ 516.71
CPD LABOR COST	N/A	\$ 2,223.88	\$ 2,268.39	\$ 3,053.93	\$ 2,638.20
CDL LABOR COST	N/A	\$ 6,755.80	\$ 673.93	\$ 2,814.25	\$ 4,083.63
CERTIFICATION LABOR COST	N/A	\$ 9,004.56	\$ 10,298.77	\$ 4,483.43	\$ 912.33
SAFETY LABOR COST	N/A	\$ 24,722.19	\$ 10,284.16	\$ 7,407.83	\$ 16,187.11
CLASSROOM LABOR COST	N/A	\$ 43,076.49	\$ 26,810.65	\$ 18,330.09	\$ 20,521.99
DAILY SUPERVISOR LABOR COST	N/A	\$ 71,479.23	\$ 102,776.76	\$ 152,191.44	\$ 182,149.88
MEETINGS LABOR COST	N/A	\$ 124,130.67	\$ 105,557.08	\$ 79,183.49	\$ 50,127.88
GENERAL ADMINISTRATIVE LABOR COST	N/A	\$ 453,664.15	\$ 384,289.62	\$ 294,751.81	\$ 342,677.28

\* Hours and costs included for Superintendent and below.

Water Department  
Wastewater & Stormwater Division  
Phone: 303-326-8050  
Fax: 303-326-8070



The mission of the Operational Compliance Division is to help ensure that stormwater and wastewater discharged from public and private sources throughout the City is of the quality and characteristics that comply with applicable environmental regulations and municipal code, and are protective of public health and the environment. The Operational Compliance staff provides inspections services that support, complement and streamline the work within Aurora Water.

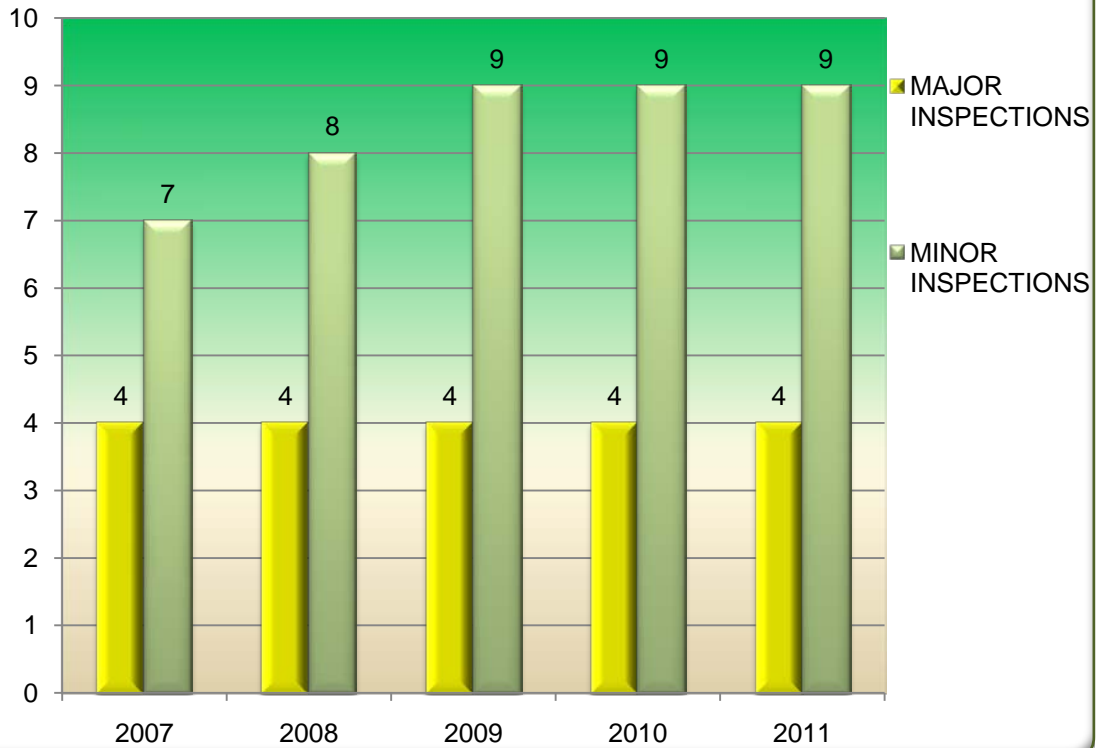
The following are outstanding accomplishments for the Operational Compliance team for 2011:

- Inspected 1042 grease and sand interceptors
- Inspected 49 industrial sites
- Inspected 52.41 miles of stormwater creeks and channels
- Responded to 160 citizen-reported incidents
- Responded to over 93 spills, sewer overflows (SSO) and illicit discharges (in some cases these did impact adversely the stormwater conveyance system)
- Performed 13 inspections of municipal maintenance facilities in order to assist with the compliance of the City's MS4 permit.
- Provided stormwater awareness training to over 350 City employees from multiple departments

This 2011 Annual report is respectfully submitted by:

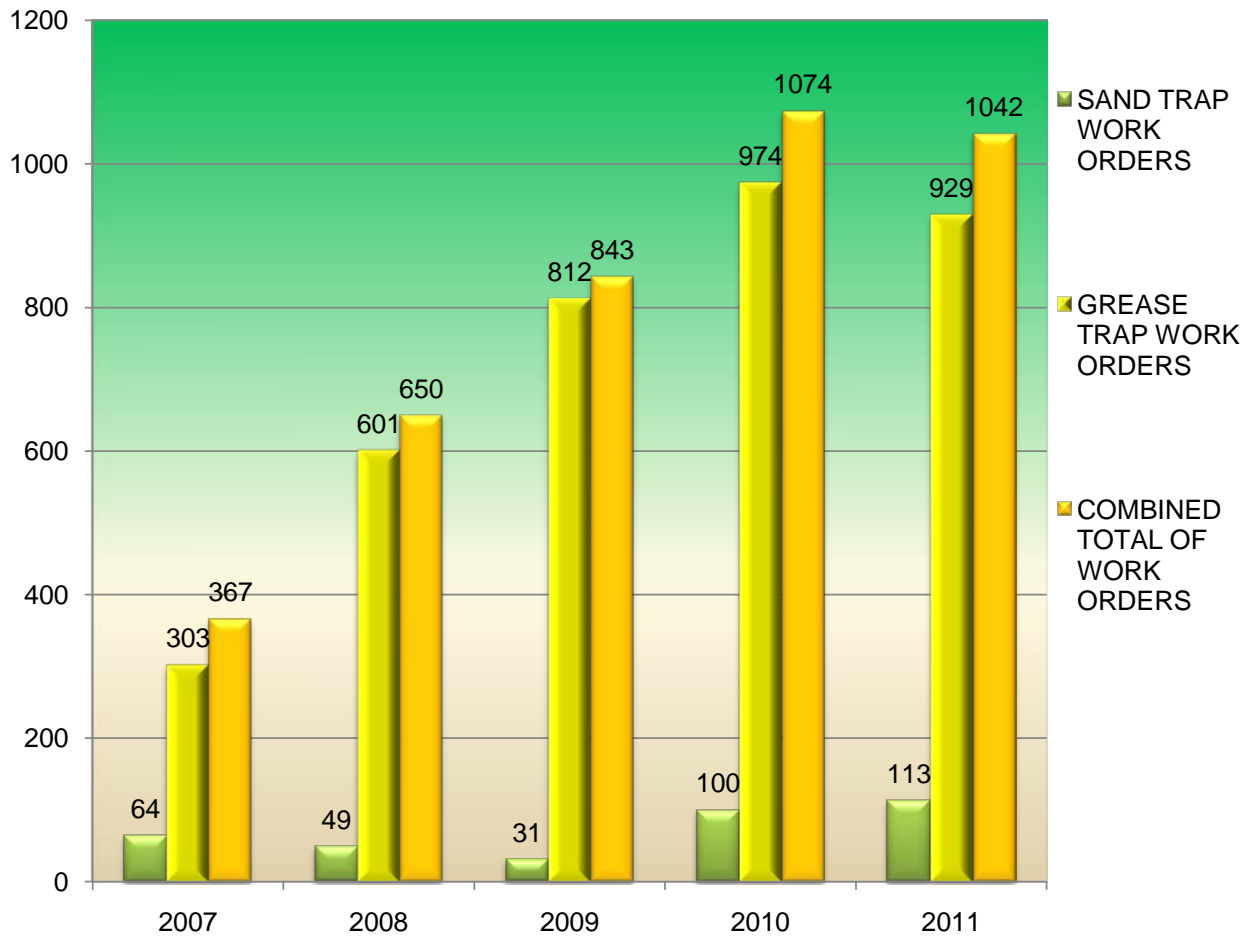
*Coby Shurtleff, MBA & CWP*  
*Superintendent of Wastewater Operations and*  
*Interim Operations Compliance Coordinator*

## Annual Facility Inspections 2007-2011



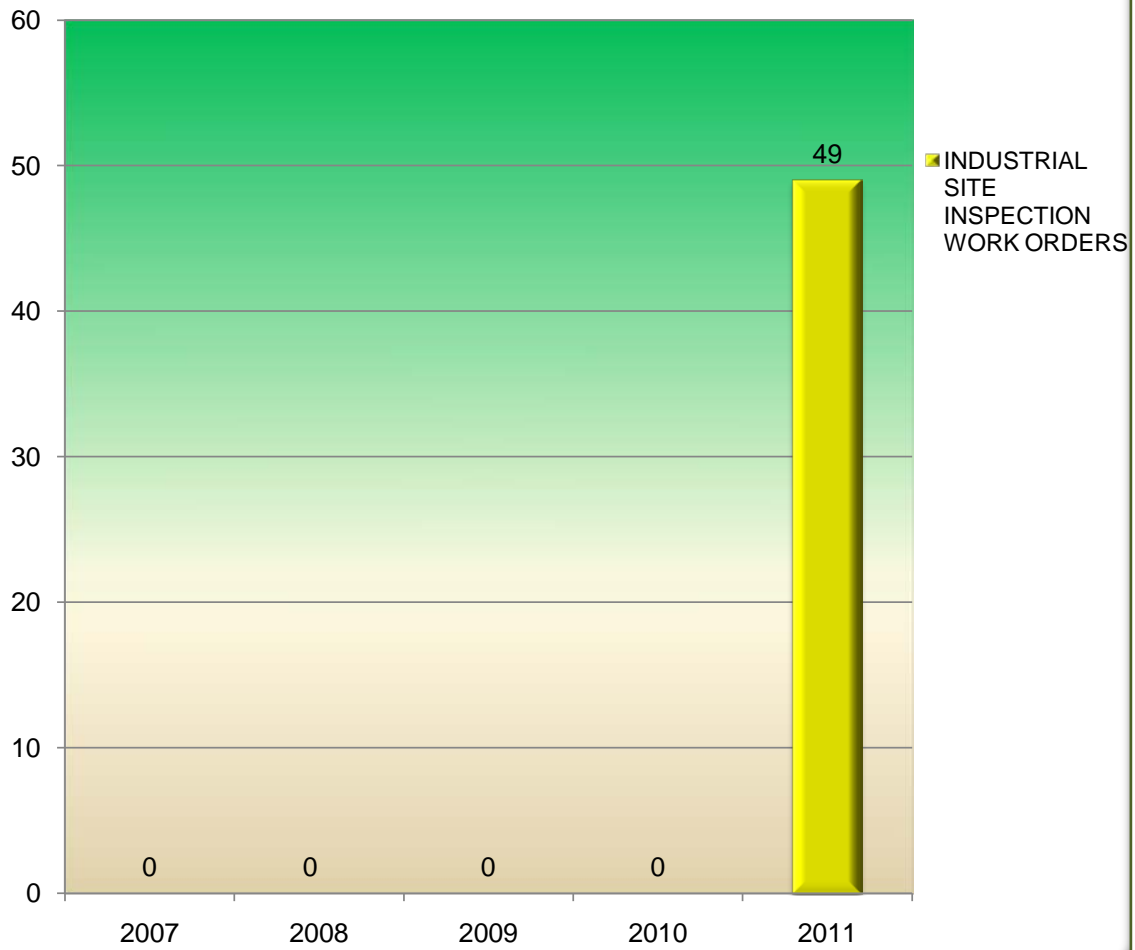
Inspections	2007	2008	2009	2010	2011
MAJOR INSPECTIONS	4	4	4	4	4
MINOR INSPECTIONS	7	8	9	9	9
TOTAL INSPECTIONS	11	12	13	13	13
TOTAL WORK ORDER COST	N/A	N/A	\$5,787.94	\$7,905.30	\$4,797.96
COST PER INSPECTION	N/A	N/A	\$445.23	\$608.10	\$369.07

## Annual Grease and Sand Trap Inspections 2007-2011



Inspections	2007	2008	2009	2010	2011
<b>COMBINED TOTAL OF WORK ORDERS</b>	367	650	843	1074	1042
<b>GREASE TRAP WORK ORDERS</b>	303	601	812	974	929
<b>SAND TRAP WORK ORDERS</b>	64	49	31	100	113
<b>TOTAL WORK ORDER COST</b>	\$709.00	\$5,087.00	\$12,492.92	\$20,528.93	\$21,208.16
<b>COST PER WORK ORDER</b>	\$1.93	\$7.83	\$14.82	\$19.11	\$20.35

## Annual Industrial Site Inspections 2007-2011

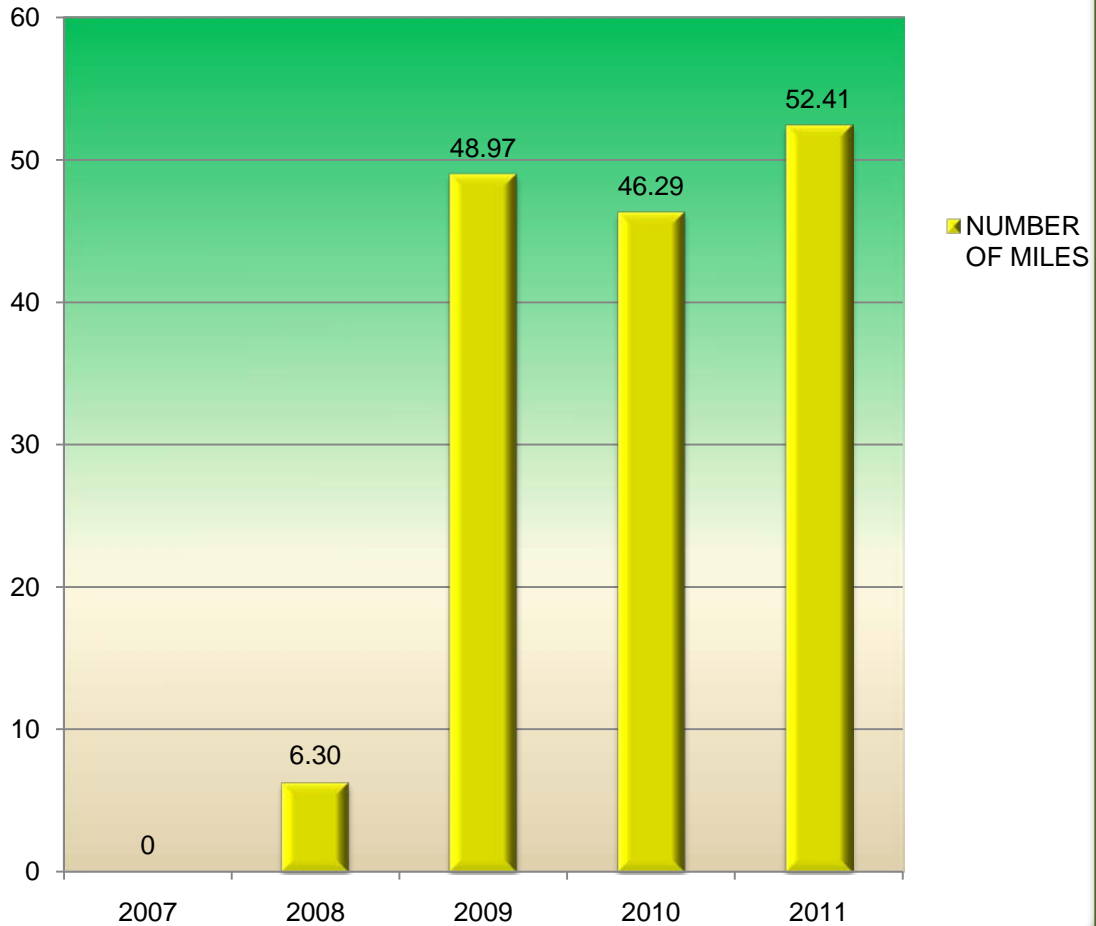


Inspections	2007	2008	2009	2010	2011
<b>INDUSTRIAL SITE INSPECTION WORK ORDERS</b>	N/A	N/A	N/A	N/A	49
<b>TOTAL WORK ORDER COST</b>	N/A	N/A	N/A	N/A	\$3,949.86
<b>COST PER WORK ORDER</b>	N/A	N/A	N/A	N/A	\$80.61

\* Program started in 2011

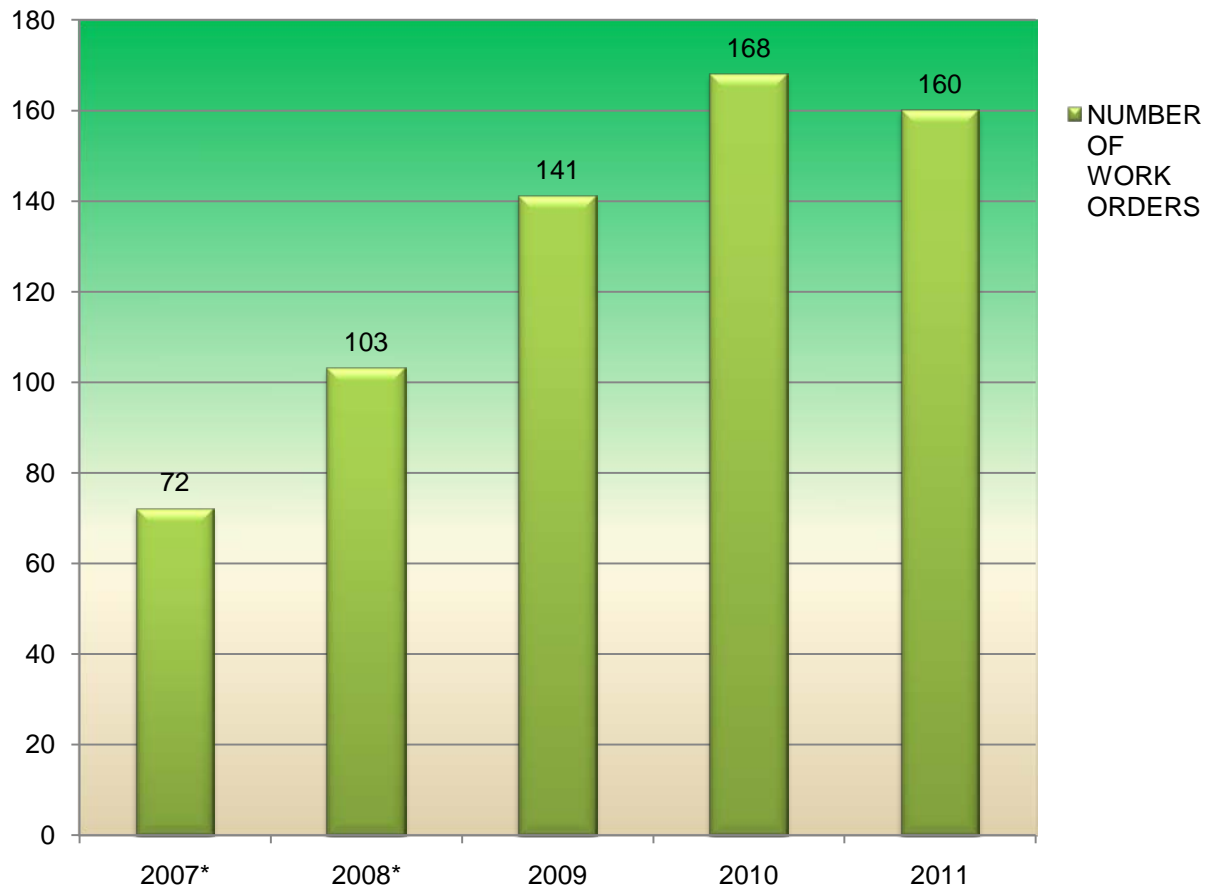


## Annual Stormwater Channel Inspections 2007-2011



Stormwater Channel Inspections	2007	2008	2009	2010	2011
NUMBER OF MILES	N/A	6.30	48.97	46.29	52.41
TOTAL WORK ORDER COST	N/A	\$5,226.92	\$21,284.71	\$24,766.06	\$19,901.08
COST PER MILE	N/A	\$829.67	\$434.65	\$535.02	\$379.72

## Incident Response Comparison 2007 - 2011



Incident Response	2007*	2008*	2009	2010	2011
<b>NUMBER OF WORK ORDERS</b>	72	103	141	168	160
<b>SPILL</b>	N/A	N/A	49	38	30
<b>SANITARY SEWER OVERFLOW (SSO)</b>	N/A	N/A	14	9	12
<b>ILLICIT DISCHARGE</b>	N/A	N/A	69	48	51
<b>OTHER</b>	N/A	N/A	9	73	67
<b>NUMBER REPORTABLE BY LAW</b>	N/A	N/A	8	14	6
<b>TOTAL WORK ORDER COST</b>	\$6,131.43	\$9,618.99	\$21,132.95	\$25,214.12	\$31,005.23
<b>COST PER RESPONSE</b>	\$85.16	\$93.39	\$149.88	\$150.08	\$193.78
<b>NUMBER OF CONTRACTOR</b>	N/A *	N/A *	N/A *	4	15
<b>E.T. TECHNOLOGIES CONTRACTOR COST **</b>	N/A *	N/A *	N/A *	\$12,794.75	\$13,502.05
<b>COST PER RESPONSE BY CONTRACTOR</b>	N/A *	N/A *	N/A *	\$3,198.69	\$900.14

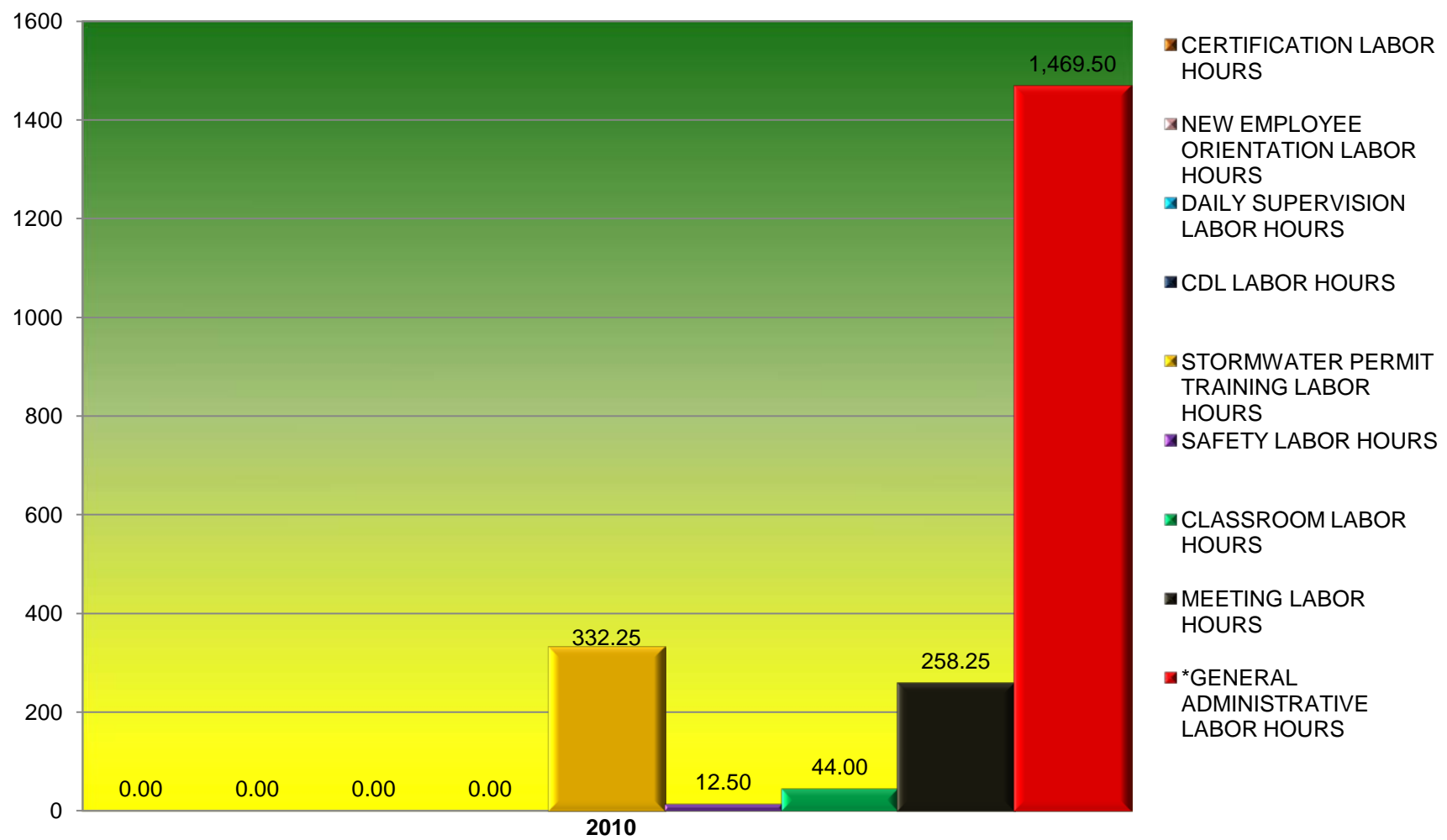
### Definitions:

**Spill**-release of non-stormwater to land surface (no impact to MS4)  
**SSO**-sanitary sewer overflow (no impact to MS4)  
**Illicit Discharge**-release of non-stormwater to MS4 (including SSO's)  
**Other**- other incident responses (i.e. abandoned hazardous materials, private pond complaint investigations, sanitary sewer trouble spot investigations)

\* Tracking not itemized

\*\* E.T. Technologies, Stormwater paid all expenses in 2010 and \$3,502.05 in 2011

### Exception Activities Labor Hours



Exception Activities-Labor Hours	2007	2008	2009	2010	2011
CERTIFICATION LABOR HOURS	21.75	2.00	61.00	14.00	0.00
NEW EMPLOYEE ORIENTATION LABOR HOURS	0.00	4.00	0.00	9.00	0.00
DAILY SUPERVISION LABOR HOURS	0.00	6.00	0.00	0.00	0.00
CDL LABOR HOURS	0.00	7.00	0.00	0.00	0.00
STORMWATER PERMIT TRAINING LABOR HOURS	0.00	25.50	153.00	337.00	332.25
SAFETY LABOR HOURS	4.75	34.25	16.50	0.00	12.50
CLASSROOM LABOR HOURS	191.50	204.25	588.50	270.50	44.00
MEETING LABOR HOURS	162.25	534.25	648.50	340.00	258.25
*GENERAL ADMINISTRATIVE LABOR HOURS	359.00	1,568.50	2,491.50	1,424.75	1,469.50

Exception Activities-Labor Cost	2007	2008	2009	2010	2011
CERTIFICATION LABOR COST	\$ 620.70	\$ 59.55	\$ 2,072.36	\$ 254.84	\$ -
CDL LABOR COST	\$ -	\$ 91.00	\$ -	\$ -	\$ -
NEW EMPLOYEE ORIENTATION LABOR COST	\$ -	\$ 191.52	\$ -	\$ 241.46	\$ -
DAILY SUPERVISION LABOR COST	\$ -	\$ 287.28	\$ -	\$ -	\$ -
STORMWATER PERMIT TRAINING LABOR COST	\$ -	\$ 331.50	\$ 4,422.70	\$ 9,237.59	\$ 9,462.33
SAFETY LABOR COST	\$ 127.47	\$ 999.52	\$ 503.55	\$ -	\$ 344.04
CLASSROOM LABOR COST	\$ 5,206.17	\$ 6,890.49	\$ 14,465.56	\$ 5,754.55	\$ 1,342.87
MEETINGS LABOR COST	\$ 4,431.71	\$ 16,087.38	\$ 22,859.93	\$ 7,884.29	\$ 7,146.29
*GENERAL ADMINISTRATIVE LABOR COST	\$ 9,321.89	\$ 49,272.08	\$ 84,393.57	\$ 33,130.67	\$ 40,011.38

\* General Administrative Labor includes inspection-related paperwork and tracking, incident follow-up, development and writing of plans and specs, special assignments (BI driven activities, ETC.), telephone calls.