

# OLVER ASSOCIATES INC.

ENVIRONMENTAL  
290 MAIN STREET

ENGINEERS  
WINTERPORT, MAINE

## COMBINED SEWER OVERFLOW (CSO) ABATEMENT PROJECT UPDATE

PRESENTED TO:

SKOWHEGAN BOARD OF SELECTMEN

MAY 10, 2016

## **SKOWHEGAN'S CSO REDUCTION GOALS**

- Town has over 30 miles of sewers.
- 60% of sewers were old, leaking clay pipes that allow groundwater infiltration.
- Many sewers have connected catchbasins that allow stormwater inflow to overload system.
- CSO overflow points allow untreated sewage to discharge into Kennebec River if sewer system capacity is exceeded.
- DEP requires Town to implement long term plan to eliminate CSO discharges during reasonable storm events (such as up to a 25 year storm).

## OBSERVED CSO ACTIVATION EVENTS PER YEAR

CSO	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015
002 (HESELTON PS)	24	30	36	11	8	6	0	0	0	0	0	0	0	0	0
006 (DINSMORE PS)	34	43	36	26	29	15	0	0	0	0	0	0	0	0	0
007 (BUSH ST)	25	26	38	24	36	27	15	0	0	0	0	0	0	0	0
010 (NORTH AVE)	34	19	27	27	40	31	19	40	7	11	4	7	4	4	3
003 (FOOTBRIDGE NO.)	34	59	40	49	68	72	52	1	2	3	7	11	11	14	18
009 (ISLAND PS)	10	52	48	56	65	62	35	20	2	11	12	5	14	0	0
005 (ELM ST PS)	15	14	16	12	33	9	5	8	6	13	3	9	9	10	5
008 (FOOTBRIDGE SO.)	17	21	13	7	16	13	10	8	7	11	11	12	15	12	10
004 (JOYCE ST/POTW)	84	99	63	40	46	17	12	21	11	22	19	22	36	17	24
<b>TOTAL EVENTS</b>	<b>277</b>	<b>363</b>	<b>317</b>	<b>252</b>	<b>341</b>	<b>252</b>	<b>148</b>	<b>98</b>	<b>35</b>	<b>71</b>	<b>56</b>	<b>66</b>	<b>89</b>	<b>57</b>	<b>60</b>
<b>TOTAL RAINFALL (IN/YR)</b>	<b>32.70</b>	<b>39.97</b>	<b>45.54</b>	<b>35.68</b>	<b>63.38</b>	<b>48.14</b>	<b>49.59</b>	<b>65.72</b>	<b>52.77</b>	<b>49.92</b>	<b>45.57</b>	<b>46.70</b>	<b>46.18</b>	<b>50.46</b>	<b>42.21</b>
<b>EVENTS PER INCH OF RAIN</b>	<b>8.50</b>	<b>9.10</b>	<b>7.00</b>	<b>7.10</b>	<b>5.40</b>	<b>5.20</b>	<b>3.00</b>	<b>1.50</b>	<b>0.70</b>	<b>1.40</b>	<b>1.20</b>	<b>1.40</b>	<b>1.90</b>	<b>1.10</b>	<b>1.40</b>

## ANNUAL CSO DISCHARGE VOLUMES PER YEAR

YEAR	CSO VOLUME DISCHARGED (GAL/YR)	RAINFALL (IN/YR)	UNITIZED DISCHARGE (GAL/INCH OF RAIN)
2001	12,316,000	32.70	377,000
2002	10,883,000	39.97	272,000
2003	22,768,000	45.54	500,000
2004	12,083,000	35.68	339,000
2005	47,873,000	63.38	755,000
2006	31,314,000	48.14	650,000
2007	21,597,000	49.59	436,000
2008	61,963,000	65.72	939,000
2009	6,074,000	52.77	115,000
2010	7,551,000	49.92	151,000
2011	4,758,000	45.57	104,000
2012	4,240,000	46.70	91,000
2013	4,750,000	46.18	103,000
2014	3,861,000	50.46	76,500
2015 (Total)	6,790,000*	42.21	160,900
2015 (Less Sept. 29 Storm)	1,980,000	36.36	54,500

\*4,810,000 gallons of the total 6,790,000 gallons (71% of annual total) occurred on September 29, 2015 during an intense rain event of 5.85 in/day which is equivalent to a 100 year storm.

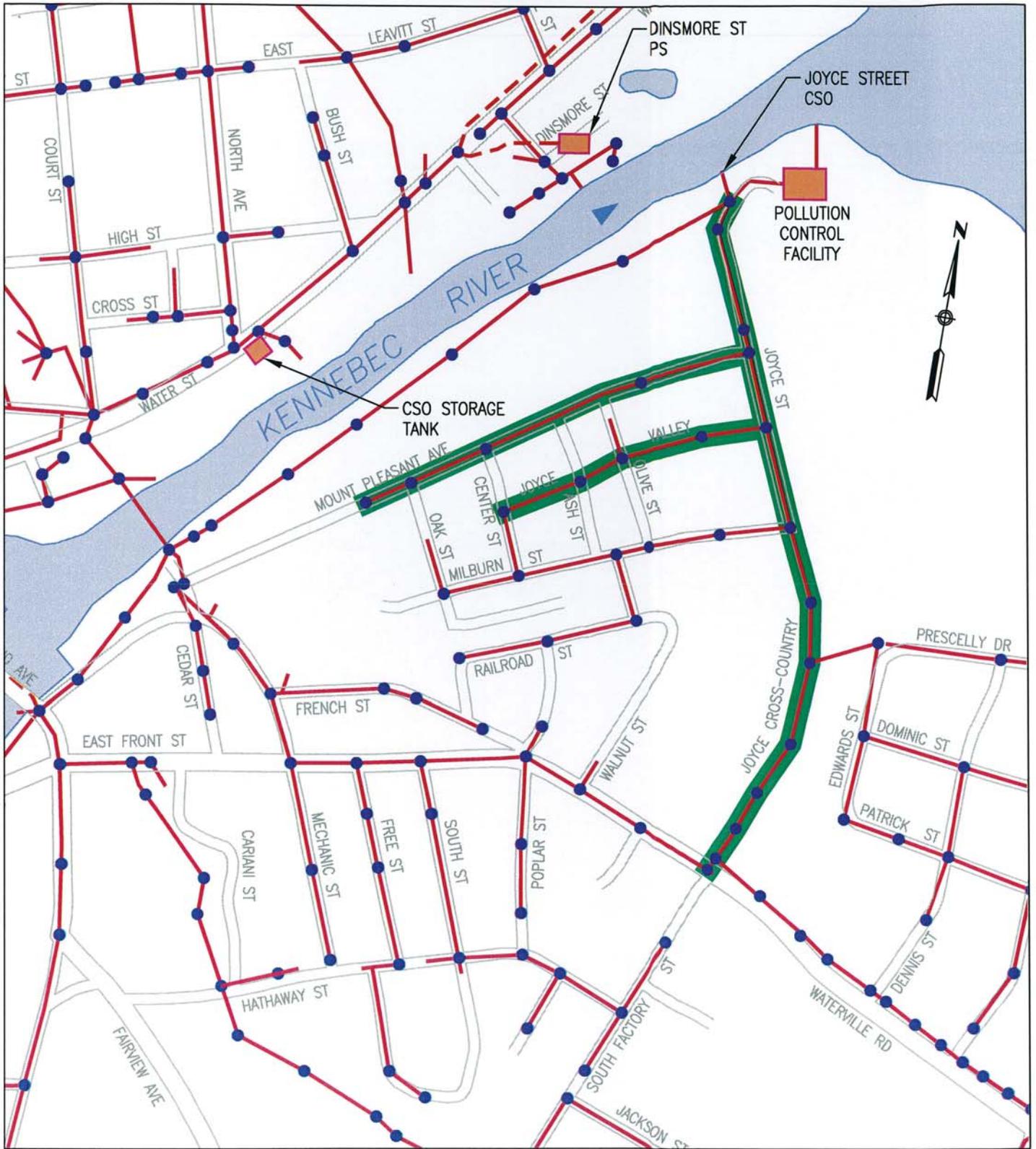
## SEWER REMEDIATION PROJECT PHASES

<u>PHASE</u>	<u>YEAR</u>	<u>AREAS</u>
<u>PREVIOUS PHASES</u>		
1.0	2004	Increase treatment plant capacity
2.0	2008	Heselton Street pump station Elm Street pump station Miscellaneous sewer improvements Water Street storage tank
<u>RECENT PHASES</u>		
3.1	2013	Island Avenue Pump Station
3.2	2014	Elm Street Summer Street Bennett Avenue Winter Street Chandler Street Dane Avenue East Maple Street
3.3	2015	Main Street Willow Street Bailey Street Bloomfield Street Alder Street Turner Avenue
<u>CURRENT PROJECT</u>		
3.4	2016	Joyce Street Joyce Valley Joyce Cross-country to Waterville Road Mount Pleasant Avenue
3.5	2017	North Avenue Madison Avenue
	2018	CSO Master Plan Update

## CONSTRUCTION BUDGETS BY PROJECT PHASES

PHASE	BUDGET (\$)	FINAL COST (\$)	DIFFERENCE (\$)
3.1	610,000	584,613	(25,387)
3.2	2,790,000	2,767,943	(22,057)
3.3	2,530,000	2,278,508	(251,492)
3.4	1,520,000	Not awarded yet	-
3.5	3,055,000	Not bid yet	-
Totals	\$10,505,000	\$5,631,064	(298,936)

Total Construction Funds	\$10,505,000
Total Spent To-Date	\$ 5,631,064
Total Remaining	\$ 4,873,936



**LEGEND**

- SANITARY SEWER
- - - FORCE MAIN
- MANHOLE

TOWN OF SKOWHEGAN, ME

**CSO ABATEMENT PHASE 3.4  
SEWER IMPROVEMENT AREAS**

**OLVER ASSOCIATES INC.**

ENVIRONMENTAL ENGINEERS  
290 MAIN STREET WINTERPORT, MAINE

**OBSERVED EXCESS SEWER FLOWS IN JOYCE  
STREET AREA**

STREET	PEAK GROUNDWATER INFILTRATION (GAL/DAY)	PEAK STORMWATER INFLOW (GPD/INCH OF RAIN)
Joyce Street	41,000	136,000
Joyce Valley	84,000	190,000
Joyce Cross-Country to Waterville Road	18,000	120,000
Mount Pleasant Avenue	10,000	50,000
<b>TOTAL</b>	<b>153,000 GPD</b>	<b>496,000 GPD/Inch</b>
<b>PERCENT OF SYSTEM TOTAL</b>	<b>19%</b>	<b>12%</b>

## **FINAL PHASE 3.4 DESIGN SCOPE CHANGES FROM ORIGINAL CSO MASTER PLAN CONCEPTS**

### 1. Reroute sewers from Joyce Valley to Mount Pleasant Avenue

- Issues with Joyce Valley
  - Sanitary sewer under wet drainage swale
  - Difficult to access for sewer maintenance
  - Easements are poorly defined
  - At least one structure over sewer
  
- Redirect sanitary sewage to Mount Pleasant Avenue
  - Abandon Joyce Valley sanitary sewer
  - Leave existing line in place as a drain
  - Reroute Joyce Valley to Mount Pleasant Avenue
  - Results in deeper sewer due to grade difference
  - Advantage is sewer is now all in public way

### 2. Additional connected catchbasins located on Milburn Street

- TV video work/smoke testing conducted during design
  - 4 reconnected catchbasins identified on adjacent Milburn Street
  - Added to project as Alternate Bid
  - Can be removed from project without penalty

### 3. Complete roadway reconstruction of Mount Pleasant Avenue

- CSO Master Plan scope was to pave sewer trenches and overlay road
  - Soils borings during design showed poor clay base
  - Roadbed in poor condition
  - Town was concerned that multiple trench excavation work will cause differential settlement and worsen road
  - Town asked for complete Mount Pleasant Avenue roadway reconstruction to be included in sewer project



## **BID RESULTS FOR PHASE 3.4 (JOYCE STREET AREA)**

Contractor	Address	Base Bid	Alternate Bid	Total Bid
Sargent Corporation	Stillwater, Maine	\$ 1,993,360	\$126,890	\$ 2,120,250
Stetson & Watson	Holden, Maine	\$ 2,061,200	\$ 166,750	\$ 2,227,950
Jordan Excavation	Kingfield, Maine	\$ 2,351,928	\$ 223,930	\$ 2,575,858

TOTAL BASE BID PLUS ALTERNATE BID	\$2,120,250
<u>ALLOCATED BUDGET FOR PHASE 3.4</u>	<u>\$1,520,000</u>
VARIATION	\$ 600,250

**SOURCE OF BID VARIATION VERSUS ORIGINAL  
BUDGET**

<u>SCOPE CHANGE</u>	<u>ADDED COST</u>
• Deeper sewer to Mount Pleasant Avenue	\$ 101,860
• Alternate Bid to add Milburn Street catchbasins	\$ 126,890
• Added cost to rebuild Mount Pleasant Avenue roadway	\$ 371,500
<u>Total</u>	<u>\$ 600,250</u>

## OPTIONS TO ADDRESS ADDED PROJECT COSTS

### 1. Award Total Project to Sargent Corporation at \$2,120,250

Remaining Construction Funds	\$ 4,873,936
<u>Bid Award</u>	<u>\$ 2,120,250</u>
Balance for future work	\$ 2,753,686

### 2. Eliminate Alternate Bid on Milburn Street catchbasins

Remaining Construction Funds	\$ 4,873,936
<u>Bid Award</u>	<u>\$ 1,993,360</u>
Balance for future work	\$ 2,880,576

### 3. Reject all Bids and Rebid with Road Reconstruction eliminated

Delete Alternate Bid	\$ 126,890
<u>Delete Unbudgeted Roadwork of</u>	<u>\$ 371,500</u>
Total	\$ 498,390

(Sewer project did not anticipate complete funding of roadway reconstruction)

(No guarantee that lower prices will be received in rebid since construction costs are rising)

## **RECOMMENDED APPROACH**

- Award contract to Sargent Corporation (excellent firm/sound reputation/market priced bid) in amount of \$1,993,360.
- Eliminate Alternate Bid of \$126,890 for Milburn Street work.
- Rebuild Mount Pleasant Avenue as requested by Town with understanding that this is adding \$371,500 road reconstruction impact to sewer project.
- Will leave \$2,880,576 in construction funds for completion of next project phase.

**IMPACT OF RECOMMENDED OPTION ON  
REMAINING PROJECT PHASE 3.5**

<u>Budgeted future Phase 3.5 sewer work</u>	
North Avenue	\$1,630,000
<u>Madison Avenue</u>	<u>\$1,425,000</u>
Total	\$3,055,000

- North Avenue separation work is essential next project.
- Madison Avenue work scope has been left until last because extent of required work will depend on North Avenue results.
- Focus bulk of \$2,880,576 funds on North Avenue area.