





***Recent Storm Impacts on MWRA
Collection System***

February 21, 2018



January 2018 Storm Events of Interest

- Astronomical/Storm Surge Tidal Impacts from Storm of Jan 4th -5th
- Snow Melt & Rainfall Impacts for Jan 11th – 13th
- High Tide Impacts on Jan 29th -30th



Jan 4th -5th Storm Actuals

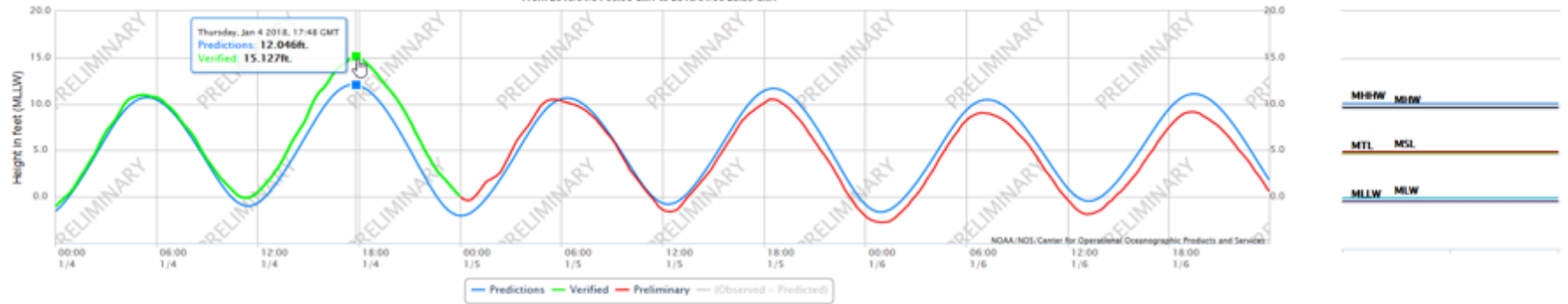


- PRODUCTS**
Data, Analyses, and Publications
- PROGRAMS**
Serving the Nation
- EDUCATION**
Tides, Currents, and Predictions
- HELP & ABOUT**
Info and how to reach us

Home / Products / Water Levels / 8443970 Boston, MA

Station Info | Tides/Water Levels | Meteorological Obs. | Phys. Oceanography

NOAA/NOS/CO-OPS
Observed Water Levels at 8443970, Boston MA
From 2018/01/04 00:00 GMT to 2018/01/06 23:59 GMT



Options for
8443970 Boston, MA

From:
Jan 4 2018

To:
Jan 6 2018

Units
Standard

Timezone
GMT

Datum
MLLW

Shift dates
Back 1 Day Forward 1 Day

Interval
6 min 1 hr H/L Day Month

Update
Plot Data Only



Facilities Impacted from Jan 4 – 5 Event

Impacted Facilities	Tidal Flow Increase (MGD)	% Increase over Dry Weather
Deer Island Wastewater Treatment	150	61%
Chelsea Creek Headworks	60	86%
Columbus Park Headworks	65	186%
Braintree-Weymouth Replacement PS	17	340%
Braintree-Weymouth Intermediate PS	15	100%
Squantum PS	2.75	367%
Quincy PS	2.5	45%
Hingham PS	0.4	31%



Observations of Impacted Areas in South Boston





Observations of Impacted Areas in Chelsea



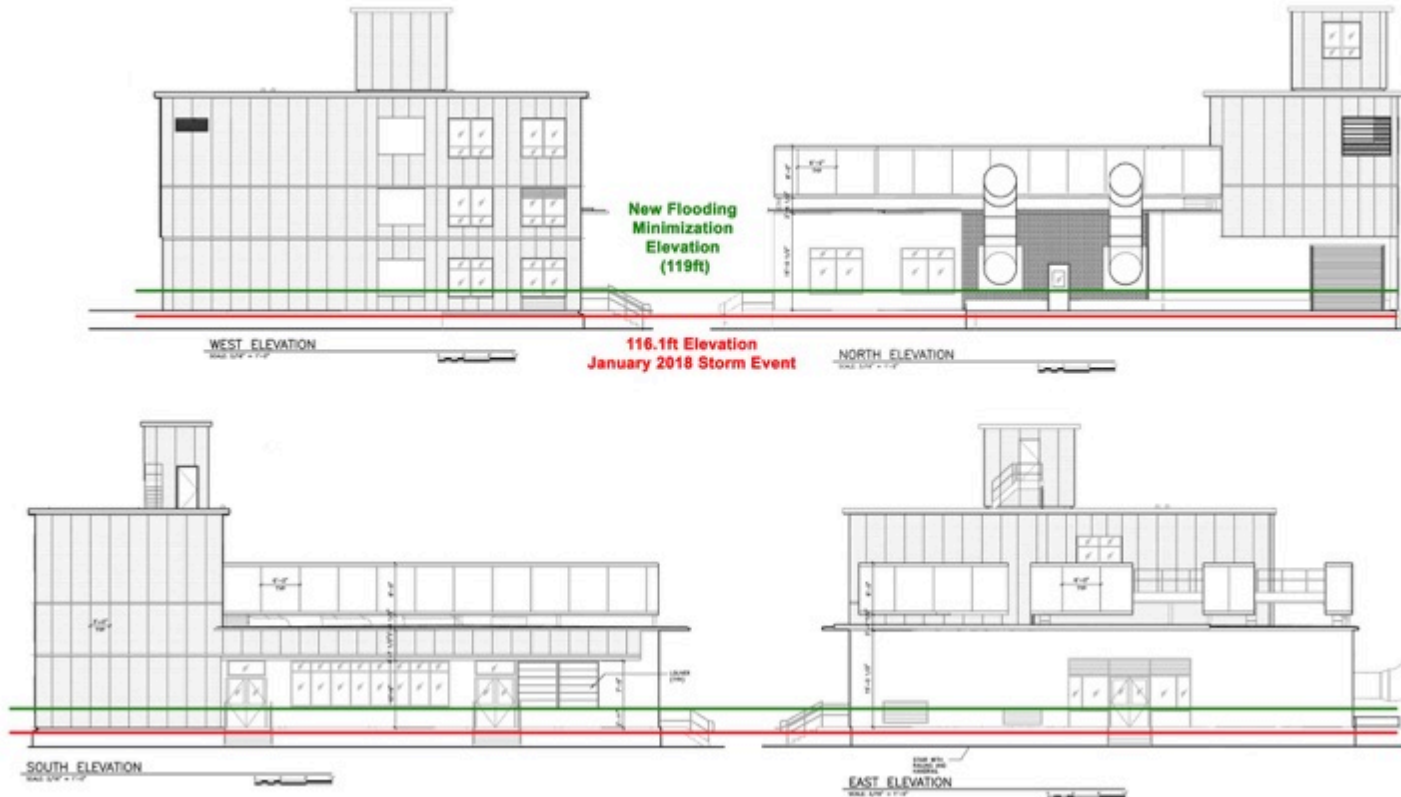
Central Ave. Chelsea Looking Towards Bridge



Eastern Ave. Looking Towards Chelsea Creek Headworks & Bridge



Chelsea Creek Headworks Elevation View



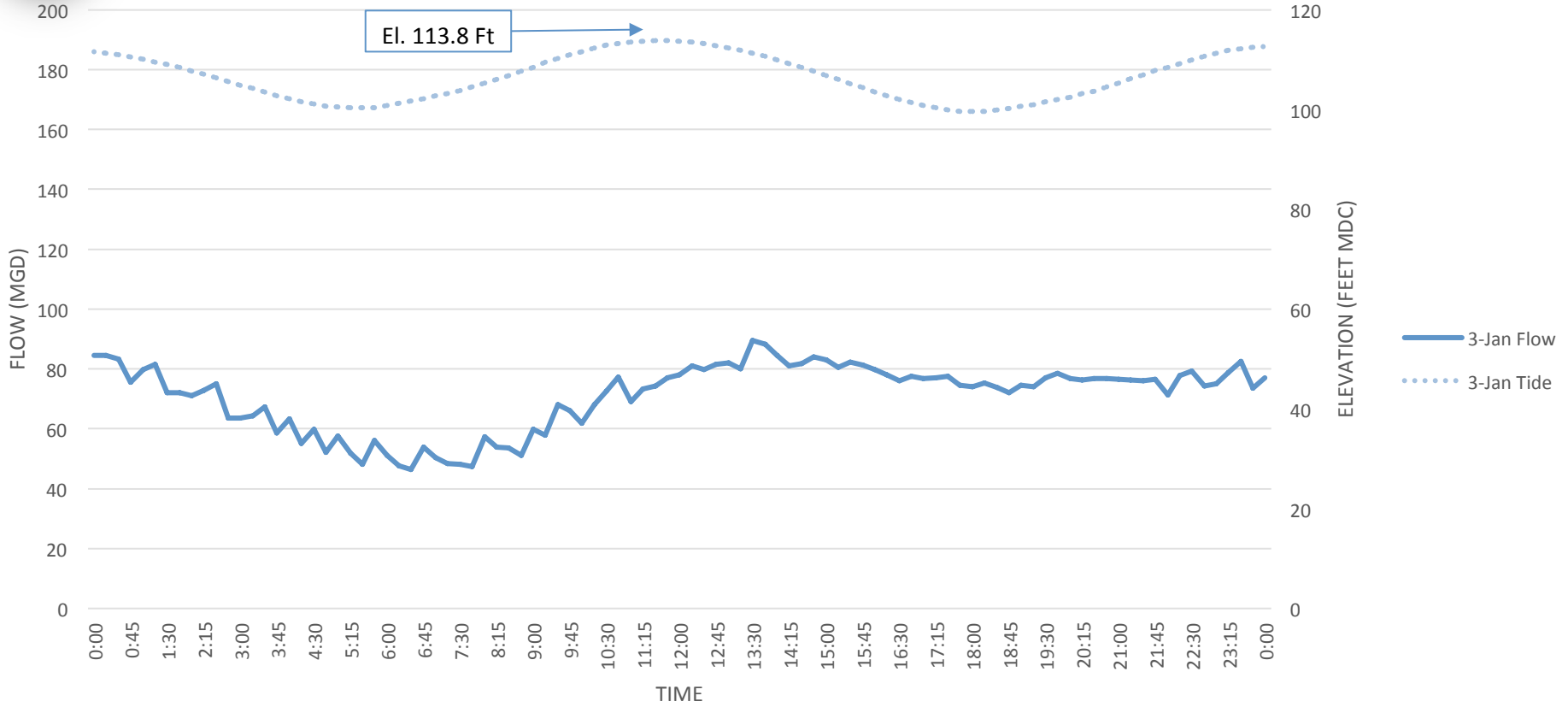


Model Representation of Impacted Area Near CCHW



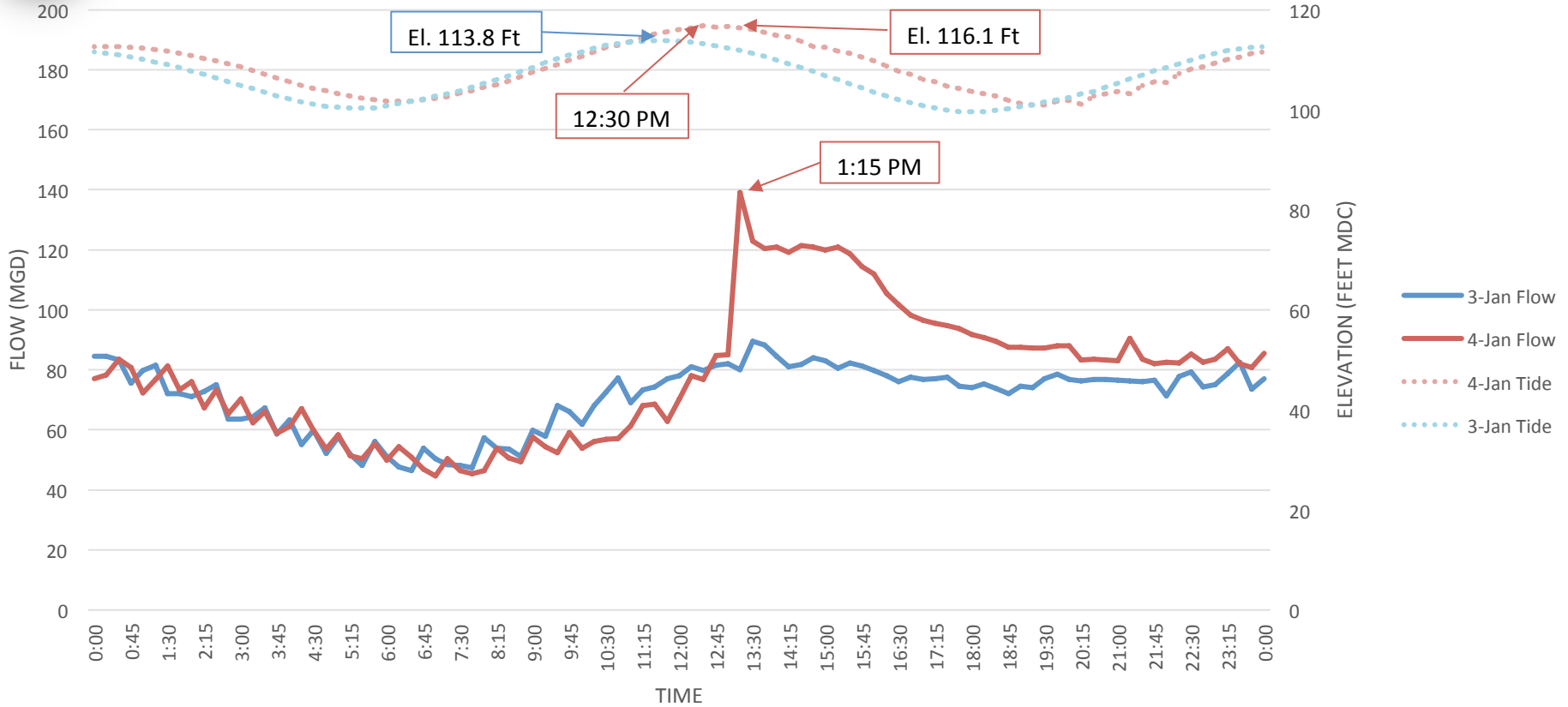


Chelsea Creek Headworks – January 3, 2018



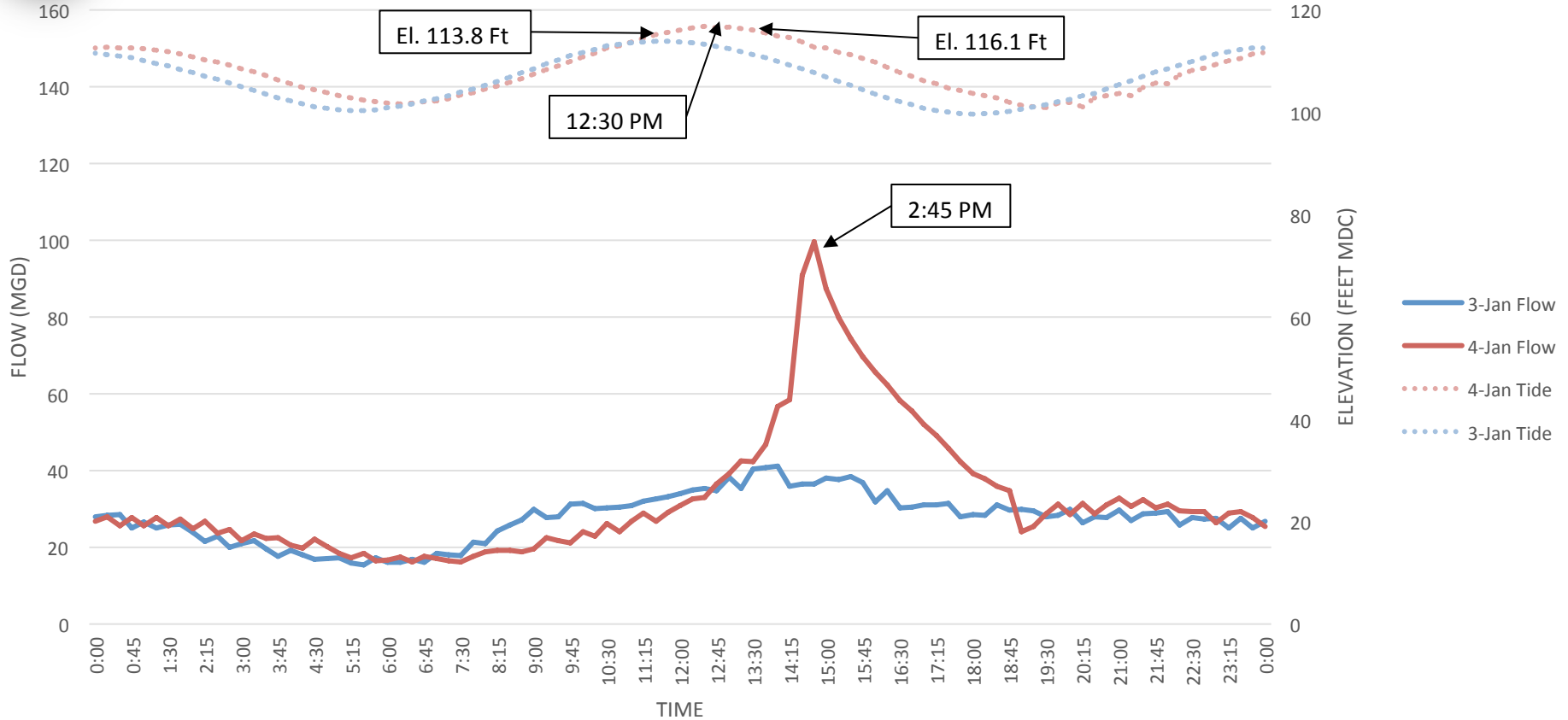


Chelsea Creek Headworks January 3-4, 2018





Columbus Park Headworks – January 3-4, 2018





Braintree-Weymouth Replacement Pump Station Elevation View





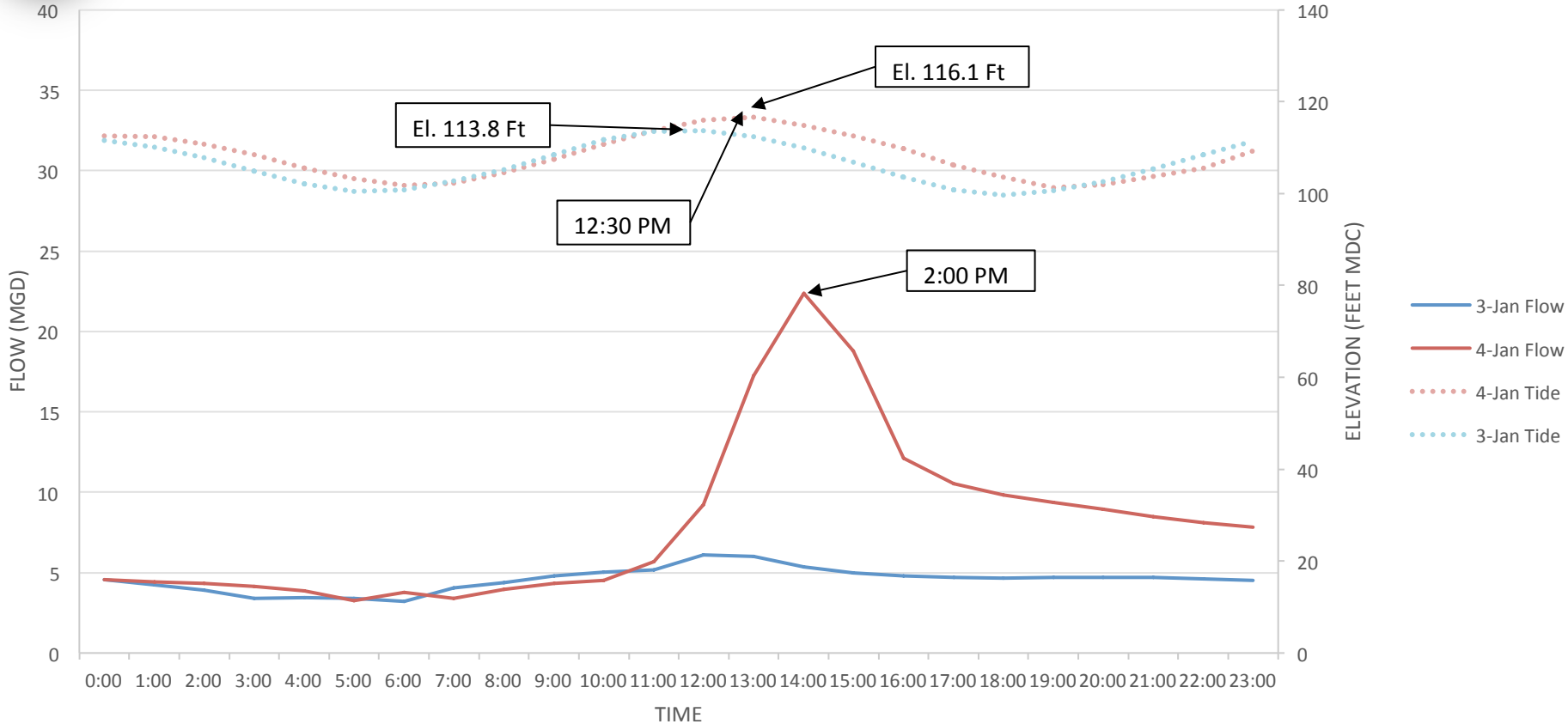
Model Representation of Impacted Area BWRPS



Braintree-Weymouth
Replacement Pump
Station

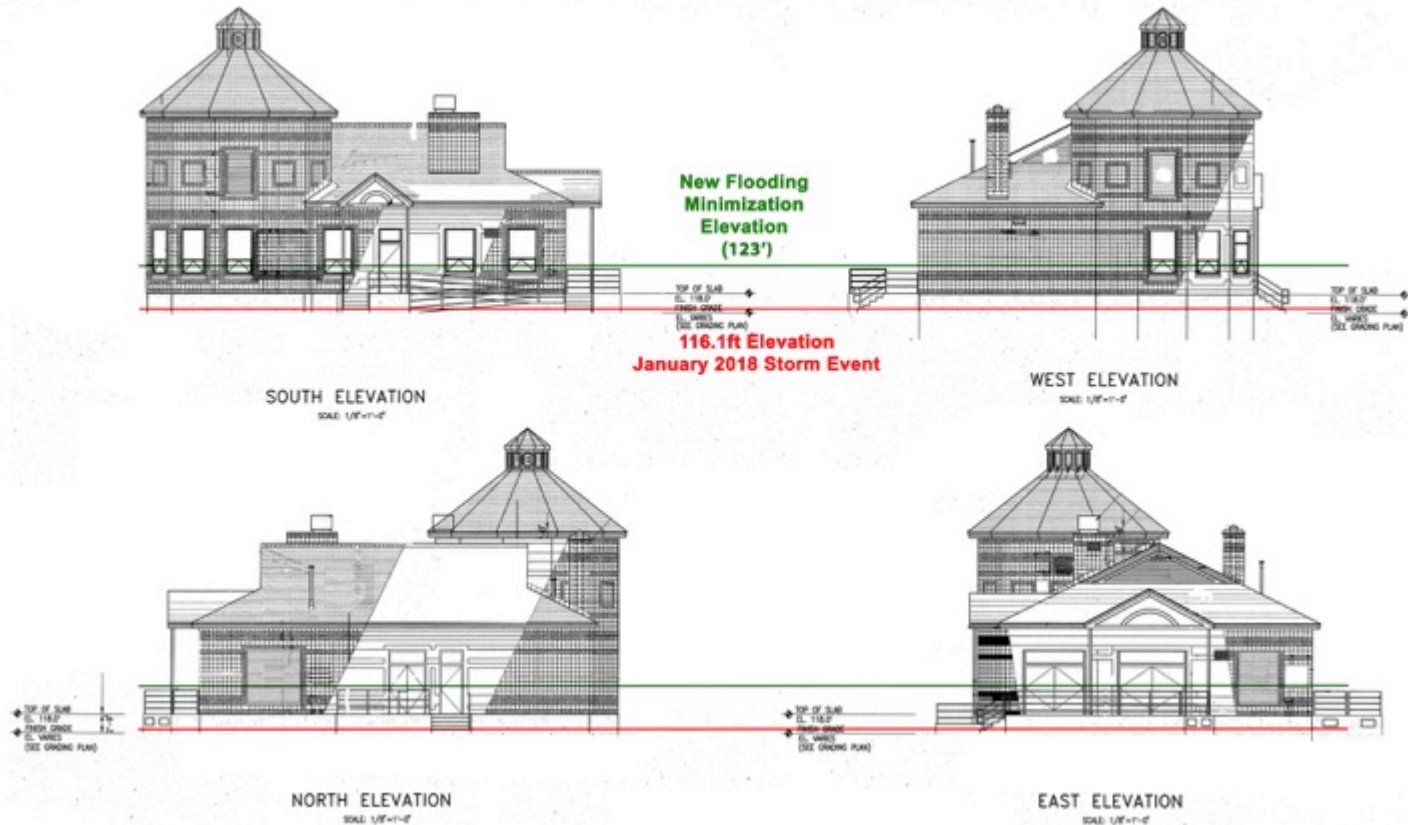


Braintree Weymouth PS – January 3-4, 2018



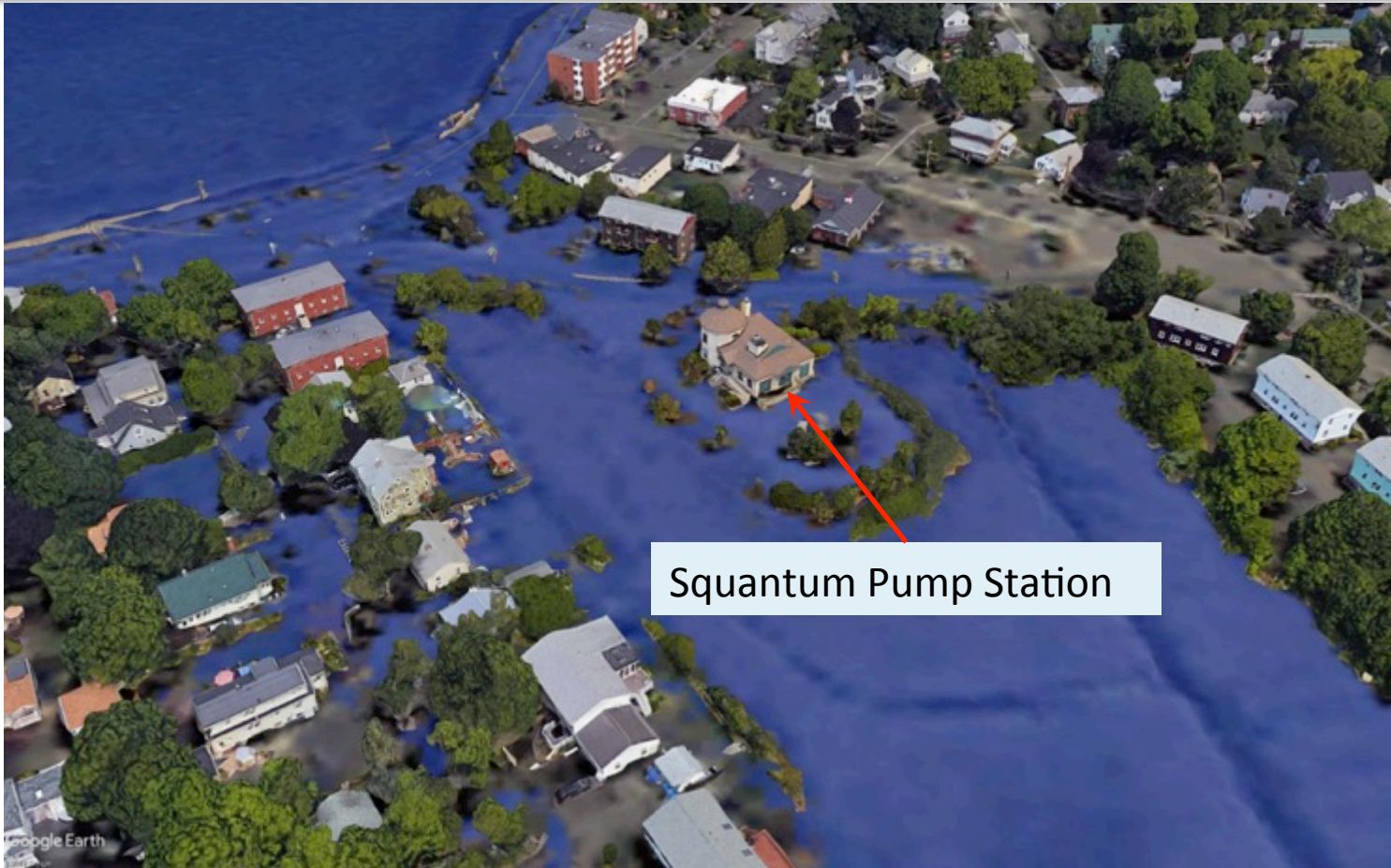


Quantum Pump Station Elevation View



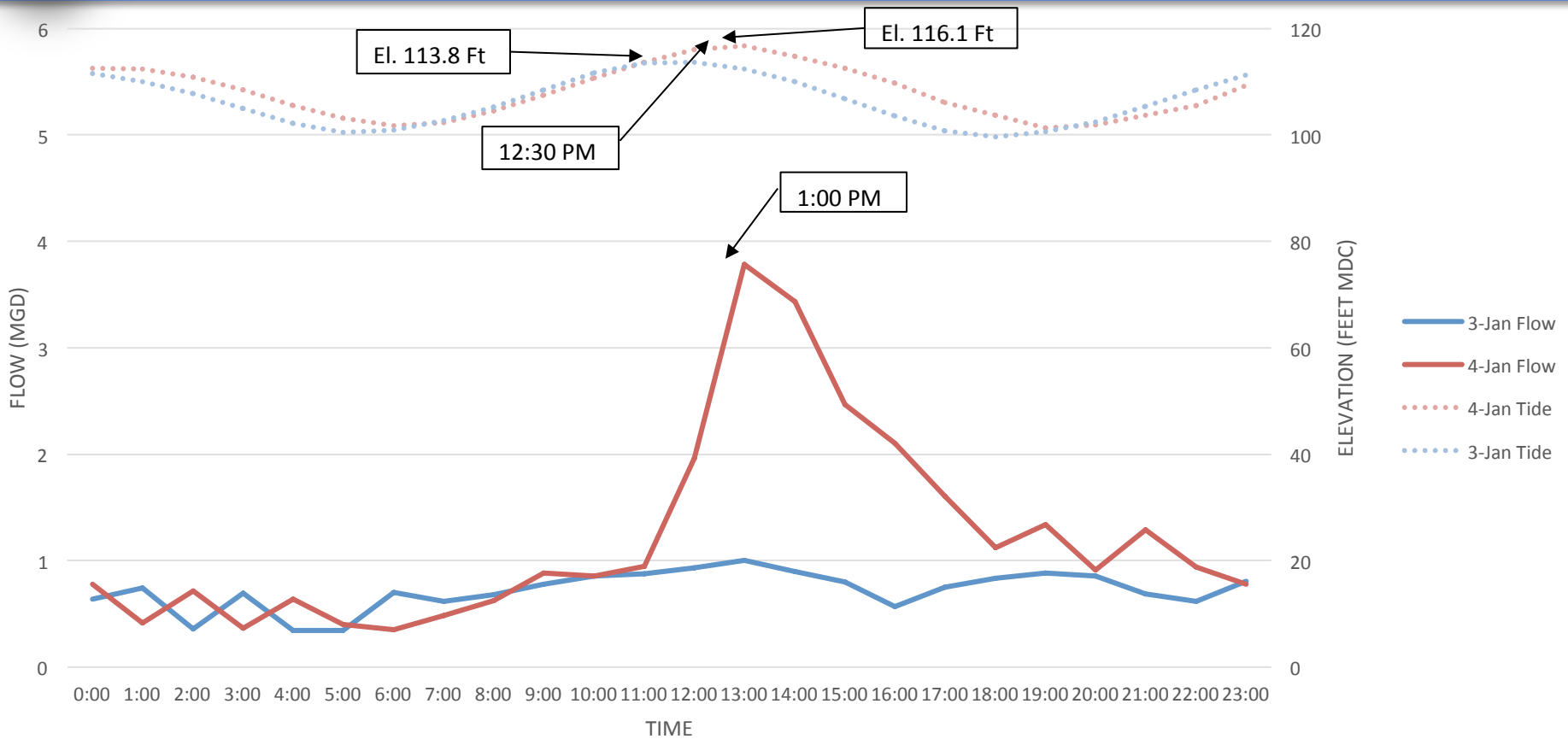


Model Representation of Impacted Area Near Quantum PS



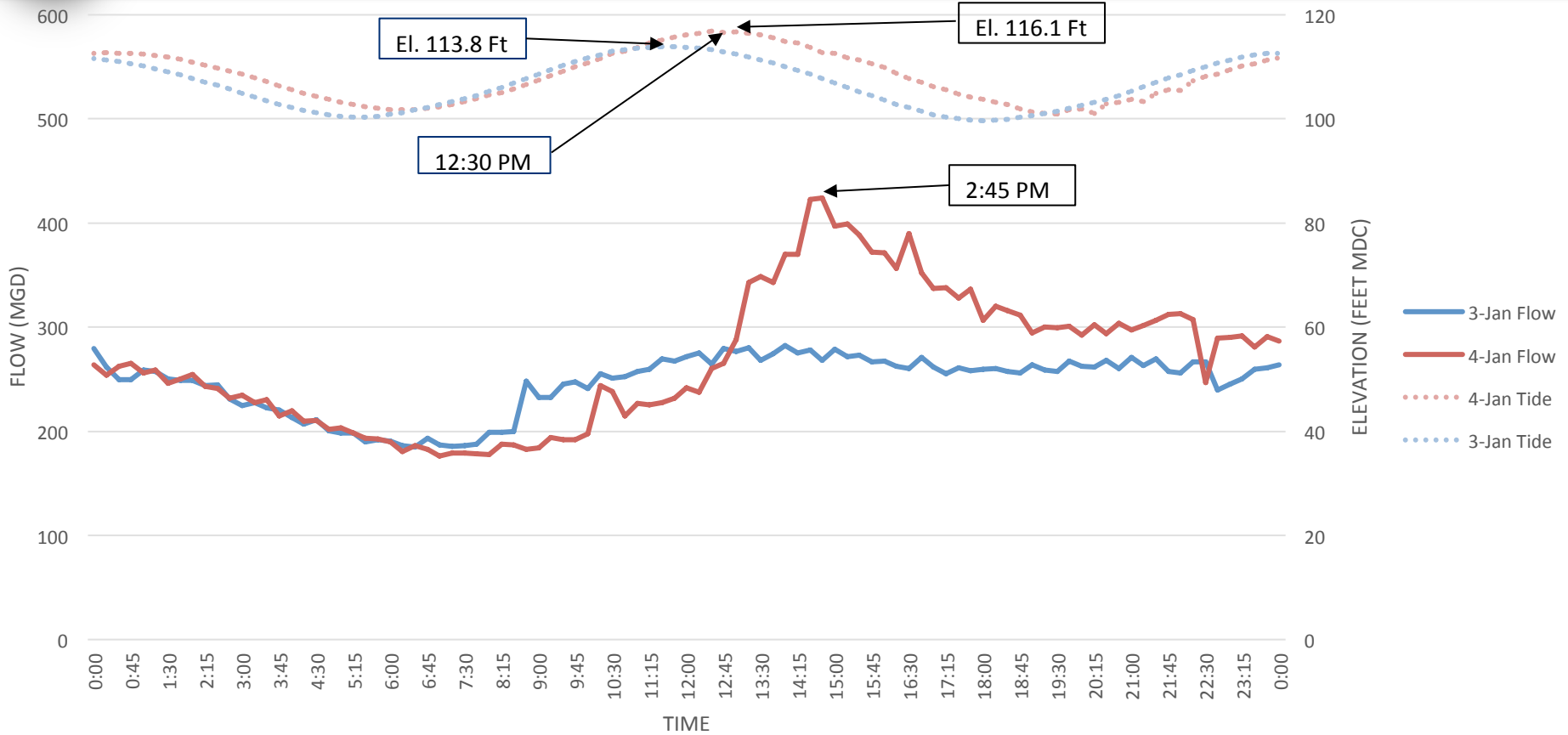


Quantum PS – January 3-4, 2018





Deer Island Treatment Plant – January 3-4, 2018





Access Issues from Tidal Event



Access to the following facilities was impaired.

- DITP
- Chelsea Admin.& Maintenance
- Quantum PS
- CCHW and CCSH
- Caruso PS

Flooded Roads in
Winthrop

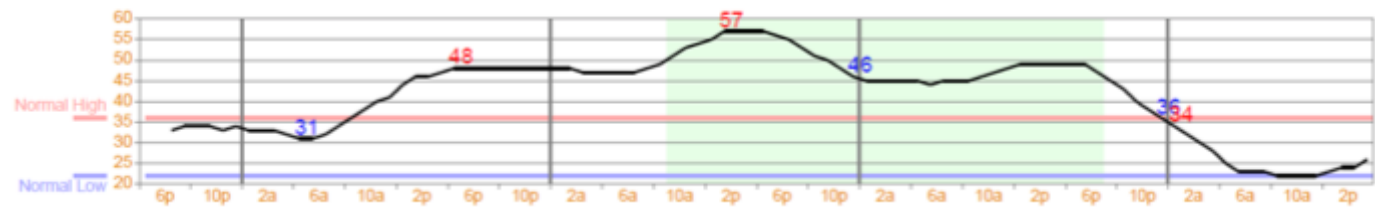


Jan 11th-13th Storm Forecasted & Actuals

January 11-13, 2018 Storm Event	Ward Street Rain Gauge	Columbus Park Rain Gauge	Chelsea Creek Rain Gauge
Total Rainfall (inches)	1.82	1.73	1.46
Duration (hour)	16.75	17.5	21.25
Avg. Intensity (inches/hr)	0.11	0.10	0.07
Peak Intensity (inches/hr)	0.40	0.45	0.38

Hourly Forecast

	Wed		Thursday				Friday				Saturday				Sunday									
	6p	10p	2a	6a	10a	2p	6p	10p	2a	6a	10a	2p	6p	10p	2a	6a	10a	2p	6p	10p	2a	6a	10a	2p
Temperature	33	33	33	32	40	46	48	48	47	47	53	57	55	48	45	45	47	49	47	38	30	23	22	24
Dew Point	20	23	25	26	29	34	37	39	40	42	42	41	43	42	41	40	40	37	34	30	25	20	19	14
Precip Prob	-	-	-	-	-	-	-	-	-	-	40	70	70	70	70	70	60	40	30	-	-	-	-	-
Precip Type	-	-	-	-	-	-	-	-	-	-	rain	rain	rain	rain	rain	rain	rain	rain	rain	-	-	-	-	-
4-hr Pr Amount	-	-	-	-	-	-	-	-	-	-	0.02	0.08	0.16	0.16	0.17	0.29	0.28	0.20	0.08	-	-	-	-	-
Wind Direction	WSW	SW	SSW	SSW	SW	SW	SW	SW	SSW	SSW	S	S	S	S	S	se	se	se	sse	SSW	SW	SW	WSW	W
Wind Speed	4	2	4	3	4	4	8	12	10	12	8	14	12	10	7	8	6	13	15	8	12	15	15	12
% Cloud Cover	20	20	50	50	50	50	70	70	70	70	100	100	100	100	100	100	100	100	100	70	70	50	50	50
Wind Chill	29	32	29	29	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	19	9	8	12





Headworks Flows and CSO Facility Activations

Key Facility Peak Flows

	MGD
Deer Island Treatment	1,180
Nut Island Headwork	312
Ward Street Headwork	260*
Columbus Park Headwork	210*
Chelsea Creek Headwork	330
* --- Design Capacity Exceeded	
	MG
Cottage Farm CSO	0
Prison Point CSO	30
Somerville Marginal CSO	6.9
Union Park CSO	3.6
South Boston CSO Tunnel	7.9
BOS019 Storage	0.5

Full Storm Report of January 12-13, 2018

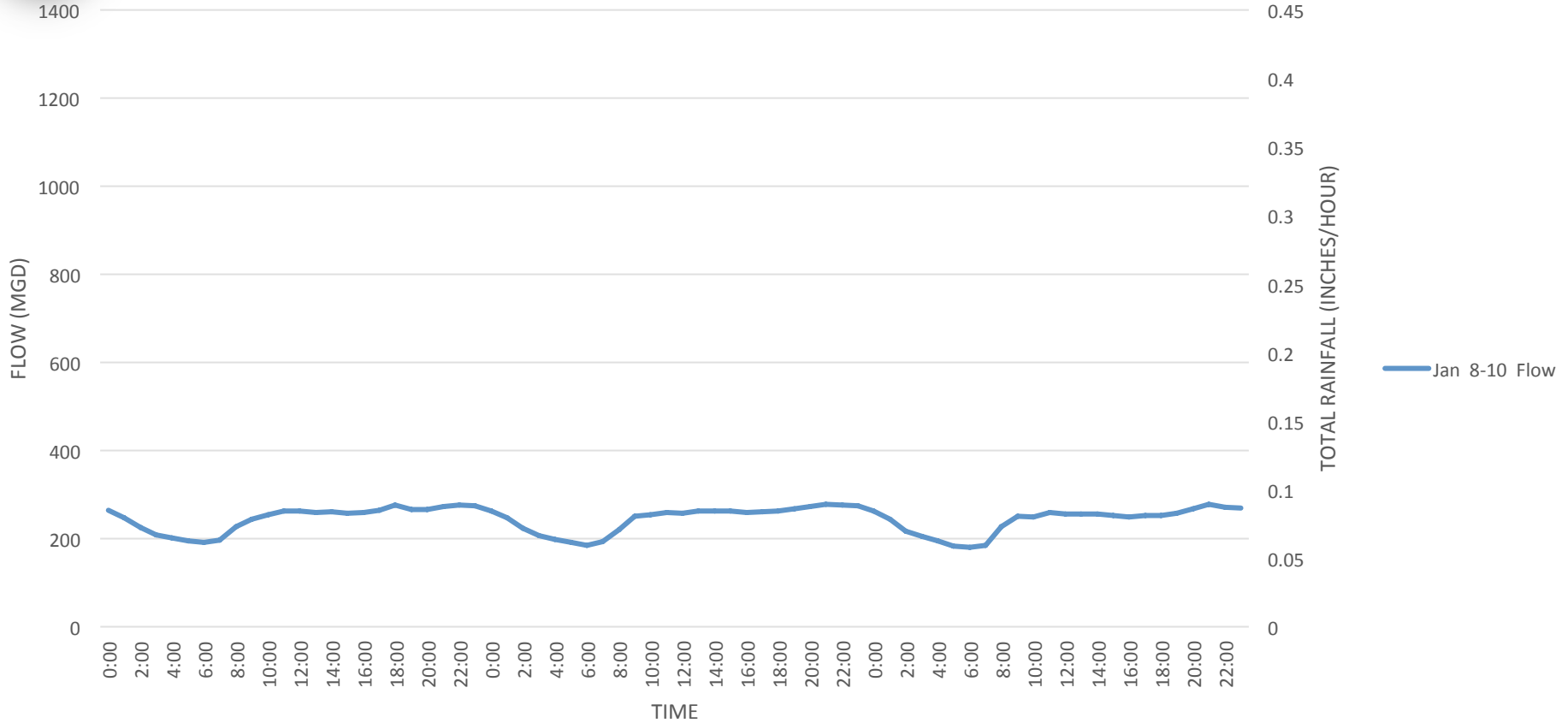
Time	Rainfall	Wind	WARD STREET HEADWORKS 200 Cap	COLUMBUS PARK HEADWORKS 180 Cap	CHELSEA CREEK HEADWORKS 390 Cap	TOTAL FLOW FOR HEADWORKS	OFFTANK FLOW	PRISON POINT HEADWORKS	SOMERVILLE MARGINAL CSO 10.8MGD	UNION PARK CSO	CSO Total Hourly Flow	SOUTH BOSTON TUNNEL STATION	SOUTH BOSTON TUNNEL FACILITY	SOUTH BOSTON PUMP STATION	DEER ISLAND TREATMENT
Begin/End	in	AM & PM	MG/Day	MG/Day	MG/Day	MG/Day	MG/Day	MG/Day	MG/Day	MG/Day	MG/Day	MG/Day	MG/Day	MG/Day	MG/Day
High @ 8:23PM 8.5 FT	0.03	06:00 PM	67	68	181	536	0.00	0.00	0.00	0.00	0.50	40	153	326	
Low @ 2:15AM 5.3 FT	0.09	07:00 PM	109	87	185	572	0.00	0.00	0.00	0.00	0.50	39	157	363	
High @ 8:35AM 8.5 FT	0.10	08:00 PM	129	104	199	636	0.00	0.00	0.00	0.00	0.00	421	42	166	
Low @ 2:15AM 5.3 FT	0.15	09:00 PM	130	91	209	643	0.00	0.00	0.00	0.00	0.00	411	49	181	
High @ 8:35AM 8.5 FT	0.12	10:00 PM	152	130	227	736	0.00	0.26	0.00	0.00	0.26	499	49	183	
Low @ 2:15AM 5.3 FT	0.08	11:00 PM	160	105	251	832	0.00	2.52	1.04	0.00	3.56	562	54	191	
High @ 8:35AM 8.5 FT	0.11	12:00 AM	200	156	271	996	0.00	2.45	0.55	0.00	3.85	617	64	204	
Low @ 2:15AM 5.3 FT	0.09	01:00 AM	176	136	277	889	0.00	1.45	0.13	0.00	1.59	575	71	210	
High @ 8:35AM 8.5 FT	0.15	02:00 AM	192	154	284	920	0.00	2.17	1.36	0.39	3.92	613	67	228	
Low @ 2:15AM 5.3 FT	0.14	03:00 AM	260	175	307	1076	0.00	1.76	1.34	0.95	6.05	720	85	256	
High @ 8:35AM 8.5 FT	0.10	04:00 AM	254	182	310	1190	0.00	3.72	3.44	0.27	4.43	728	103	270	
Low @ 2:15AM 5.3 FT	0.14	05:00 AM	219	182	316	1092	0.00	2.49	1.30	0.75	4.54	690	102	268	
High @ 8:35AM 8.5 FT	0.10	06:00 AM	209	182	326	1169	0.00	3.92	0.76	1.18	7.66	745	103	281	
Low @ 2:15AM 5.3 FT	0.03	07:00 AM	254	183	331	1162	0.00	2.59	0.03	0.06	2.68	742	109	322	
High @ 8:35AM 8.5 FT	0.02	08:00 AM	164	219	326	1146	0.00	0.99	0.00	0.00	0.99	703	100	333	
Low @ 2:15AM 5.3 FT	0.00	09:00 AM	149	154	301	1021	0.00	0.16	0.00	0.00	0.16	564	85	341	
High @ 8:35AM 8.5 FT	0.00	10:00 AM	139	107	283	809	0.00	0.00	0.00	0.00	0.00	513	72	344	
Low @ 2:15AM 5.3 FT	0.00	11:00 AM	124	99	269	903	0.00	0.00	0.00	0.00	0.00	479	68	348	
High @ 8:35AM 8.5 FT	0.00	12:00 PM	131	91	256	885	0.00	0.00	0.00	0.00	0.00	466	62	352	
Low @ 2:15AM 5.3 FT	0.00	01:00 PM	130	81	248	873	0.00	0.00	0.00	0.00	0.00	448	58	350	
High @ 8:35AM 8.5 FT	0.00	02:00 PM	125	74	236	843	0.00	0.00	0.00	0.00	0.00	427	58	345	
Low @ 2:15AM 5.3 FT	0.00	03:00 PM	119	77	227	828	0.00	0.00	0.00	0.00	0.00	417	51	342	
High @ 8:35AM 8.5 FT	0.00	04:00 PM	113	67	219	787	0.00	0.00	0.00	0.00	0.00	395	49	338	
Low @ 2:15AM 5.3 FT	0.00	05:00 PM	109	64	211	766	0.00	0.00	0.00	0.00	0.00	381	46	333	
	1.82						0.00	30.90	6.94	3.40	40.54				

CSO Facilities	START TIME	END TIME	Hours	Actual Total Run Time	CSO Chemical Use in Gallons		TOR Results		SPDES Peer Compliance Calendar Month	BOS 019	Other Marginal CSOs	Via Capture Discharge to Dewater Bay	Via Non-Capture Discharge Bay	
					Hypochlorite	Bleach	Max TOR Peak Dilution	Min TOR Peak Dilution						Count/100 RR
Cottage Farm	10:40 PM	9:00 AM	10	26	5,998	1,810	4.0	0.0	NA	Gate Open	Gate Closed	SCM 205A	Yes/No	Duration
Prison Point	10:50:00 PM	7:05 AM	8	35	1,088	285	5.0	0.0	NA	Tanks Filled	Via Capture	CAM 017	No	1:14:36 M
Somerville	2:33 AM	7:09 AM	4	36	2,300	280	5.0	0.0	NA	2	402,858	MWR 016, 019, 020	No	
Union Park														

Chemical Totals	9,311	3,388	ND= Not Sampled	*MPDES
South Boston CSO Tunnel	7,880,000	None		

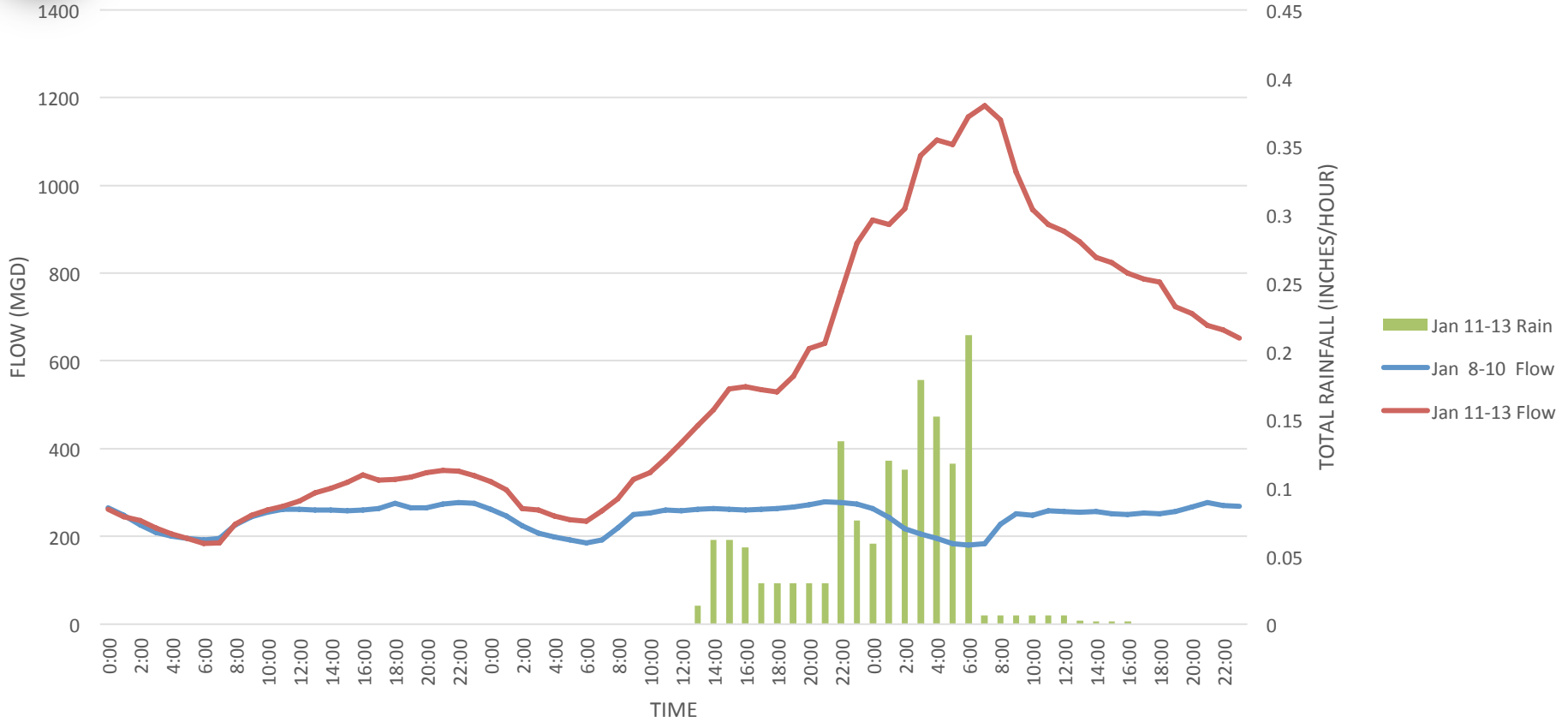


Deer Island Treatment Plant – January 8-10, 2018



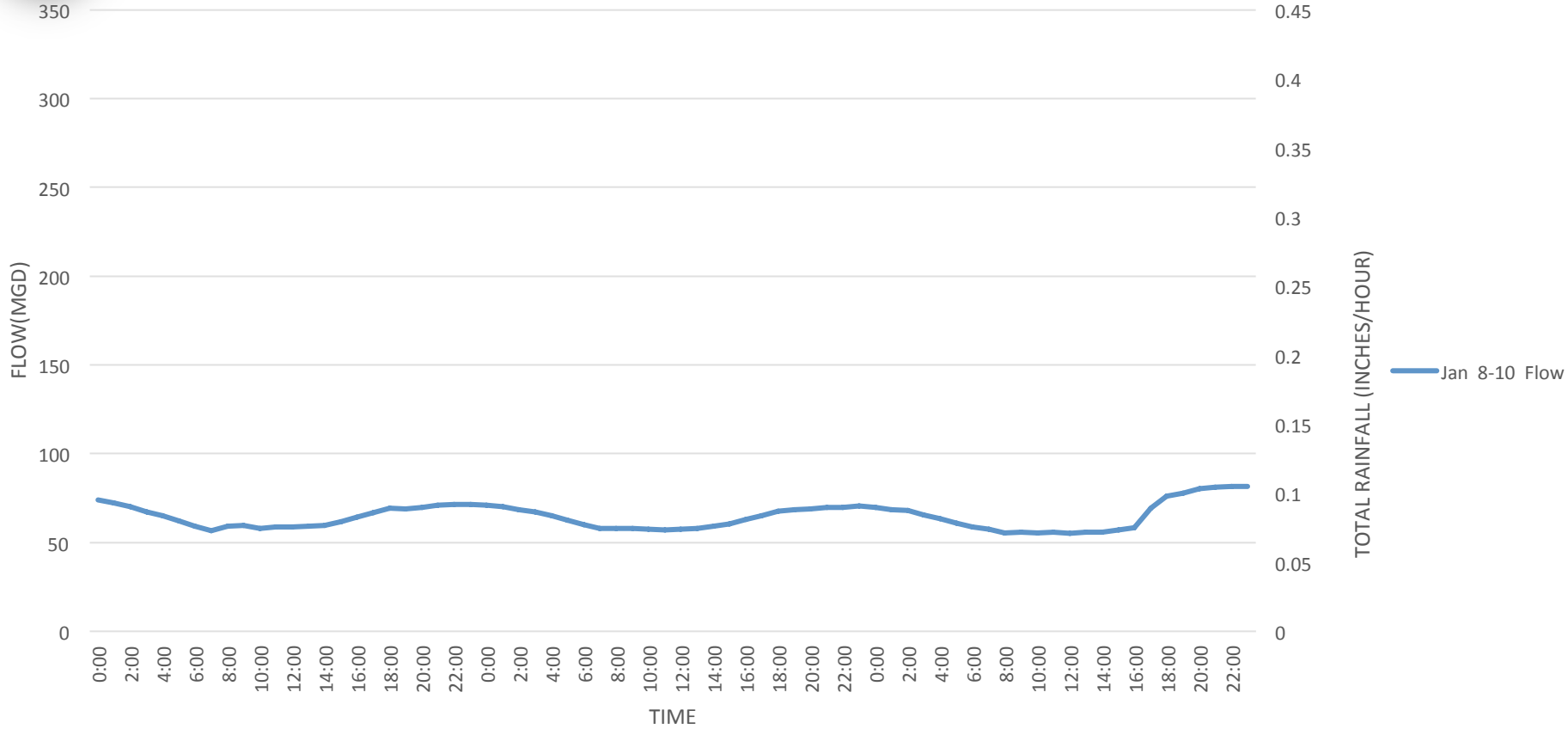


Deer Island Treatment Plant – January 11-13, 2018



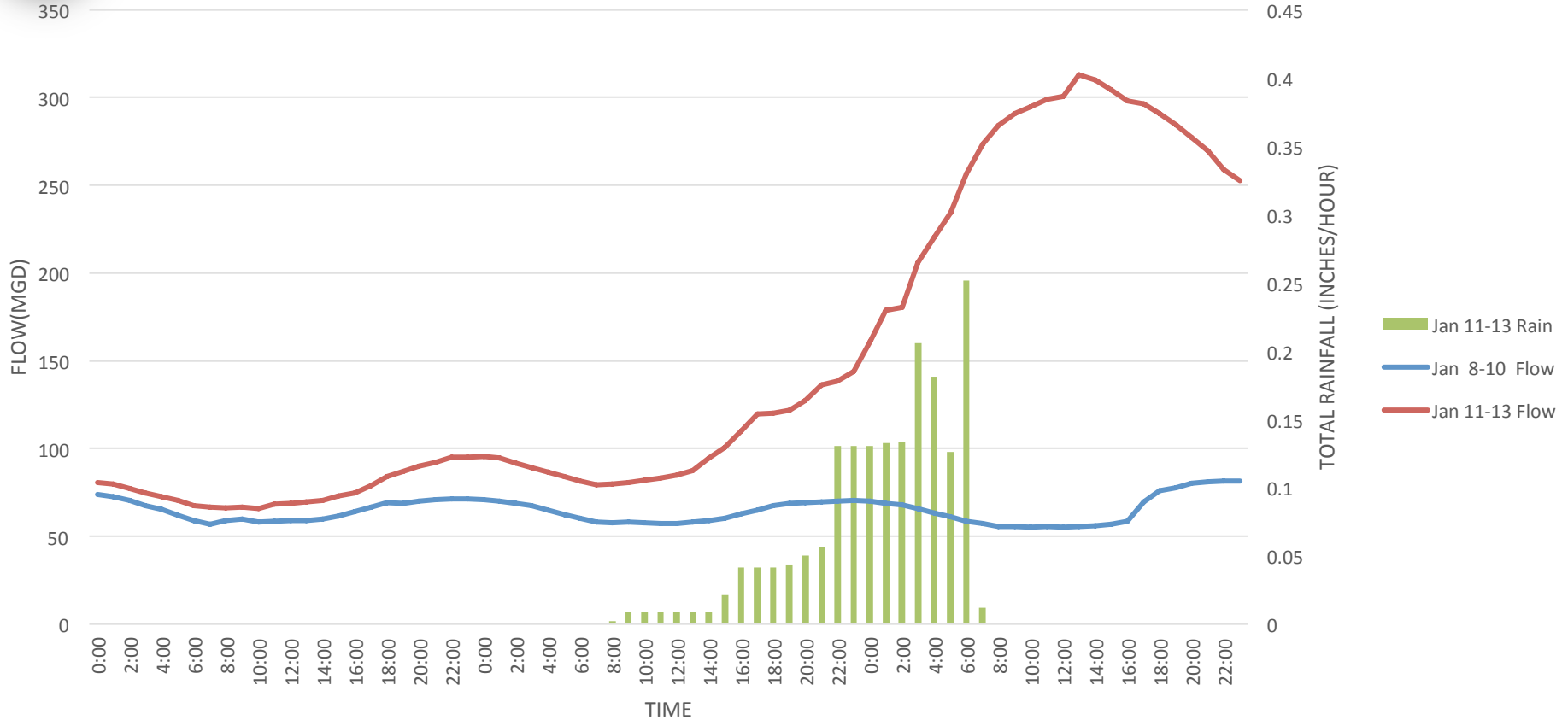


Nut Island Headworks – January 8-10, 2018





Nut Island Headworks – January 11-13, 2018



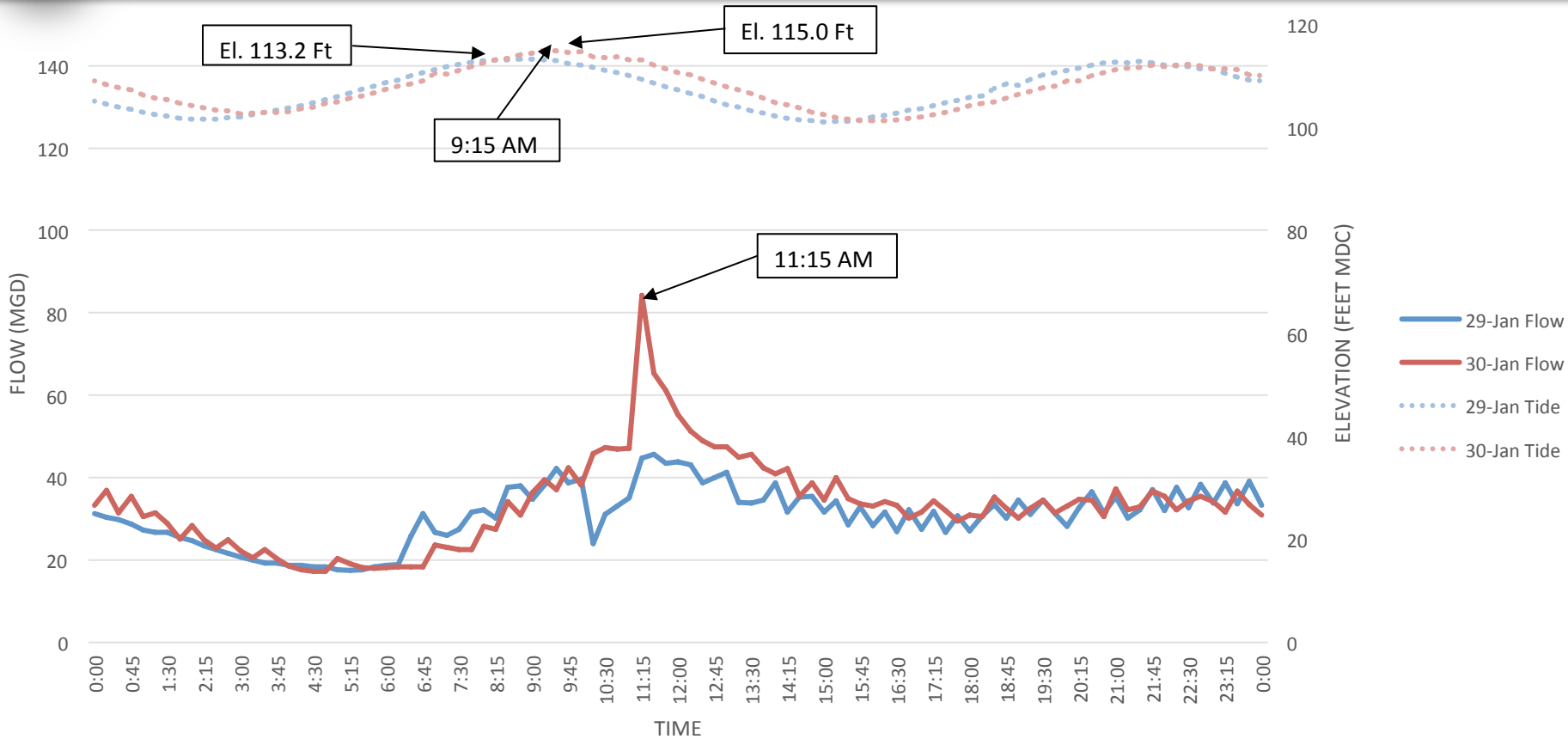


At What Point do Tidal Impacts Start?

- Jan. 30th experience tidal elevation of approx. 3 ft. above Mean High Tide (115' MDC Elev.)
- Significant increase in flows noted at Columbus Park Headworks
- Minor increase in flows noted at Braintree Weymouth PS and the IPS



Columbus Park Headworks – January 29-30, 2018





Conclusions/Next Steps

- Extreme tides impact MWRA and local systems above +/- 114.5' MDC datum
- MWRA System especially the South is significantly impacted by snowmelt followed by rain events
- Continue to refine critical tidal elevations
- Work with MWRA Communities to locate and correct tidal inflow sources
- Evaluate and refine procedures for installation of flood protection systems





***Emergency Repairs to Deer Island
Gravity Thickeners 5 and 6***

February 21, 2018



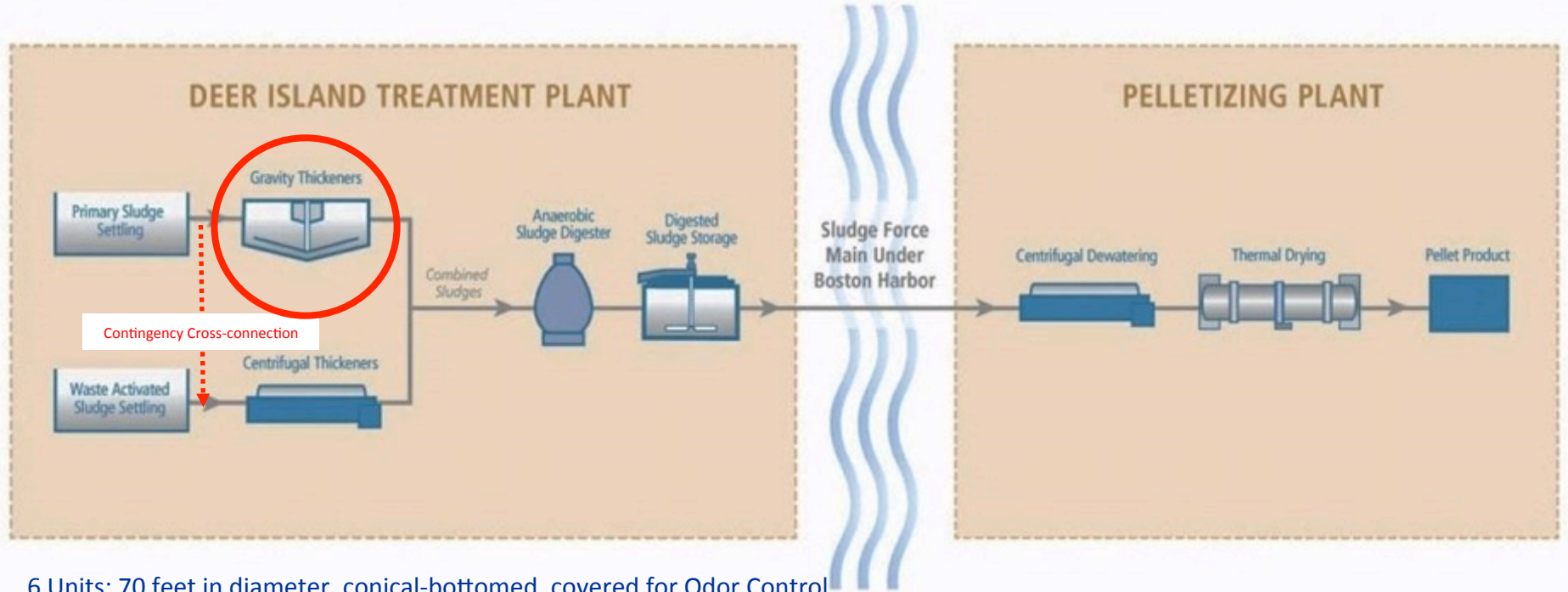
Deer Island Gravity Thickeners





Where Are Gravity Thickeners In The Deer Island Process?

Existing Solids Process Flow Diagram



6 Units: 70 feet in diameter, conical-bottomed, covered for Odor Control

Function: Concentrate primary sludge and scum using gravity

Pump thickened primary sludge from bottom, thickened scum from top surface – to anaerobic digesters (70% of total digester feed)

Sludge settling aided by circular motion of inner support structure. Key component – center cage



How Many Gravity Thickeners Are Required

Gravity Thickeners:

- 6 in total at Deer Island
- 5 required for maximum sludge quantities
- 4 could be operated for short periods



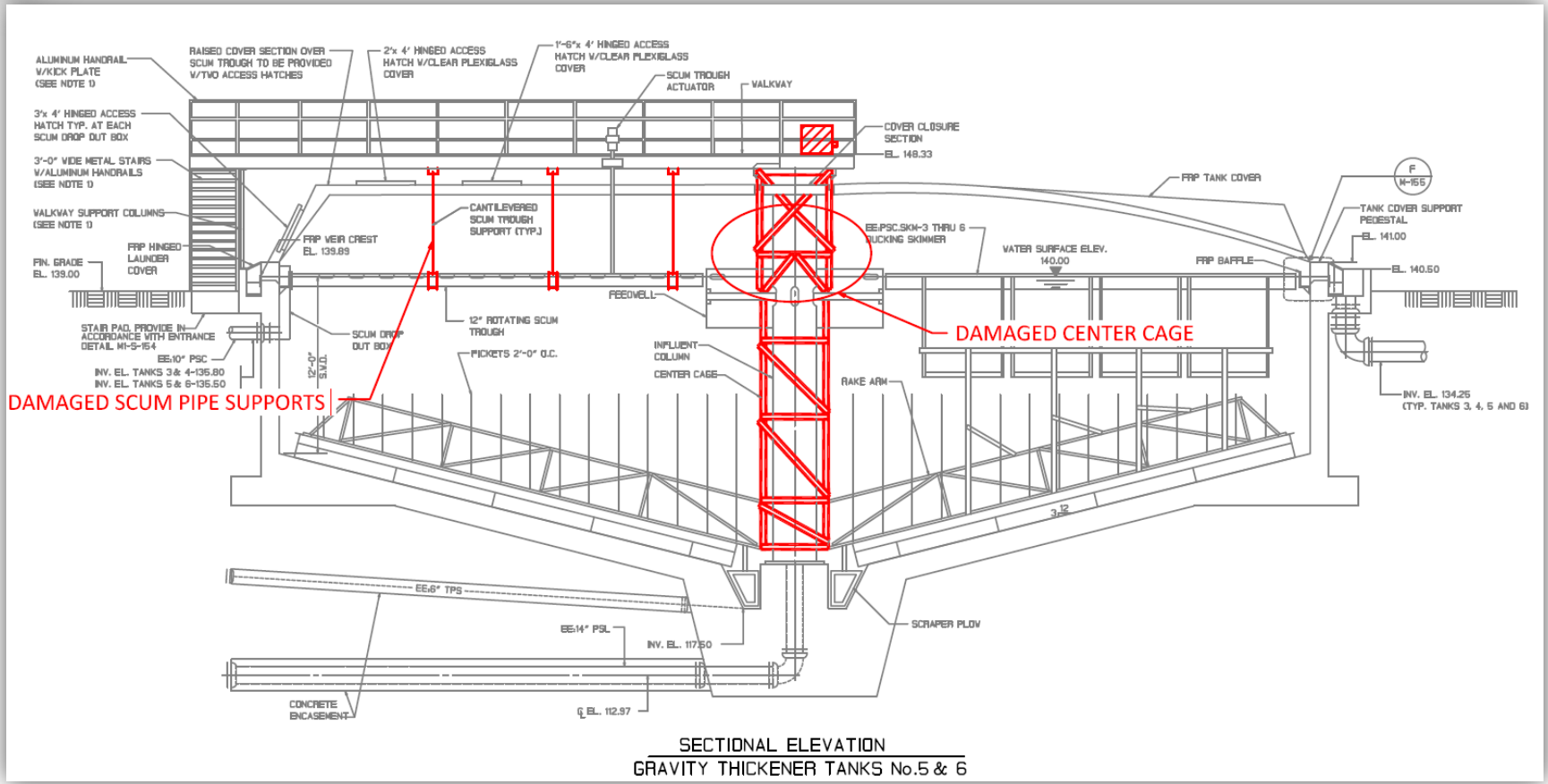
Which Units Failed And When?

Gravity Thickener Failures:

- **GT 1 – February 2015**
 - Result of FRP dome collapse due to heavy snow load
 - To be repaired by GT Rehab Capital Project
- **GT 5 – December 2017**
 - Result of structural failure of center cage
 - Emergency DCAMM waiver / awarded repair
- **GT 6 – January 2018**
 - Result of structural failure of center cage
 - Received emergency DCAMM waiver / bid repair, bids received yesterday



Center Cage Support Failed on GTs 5 and 6

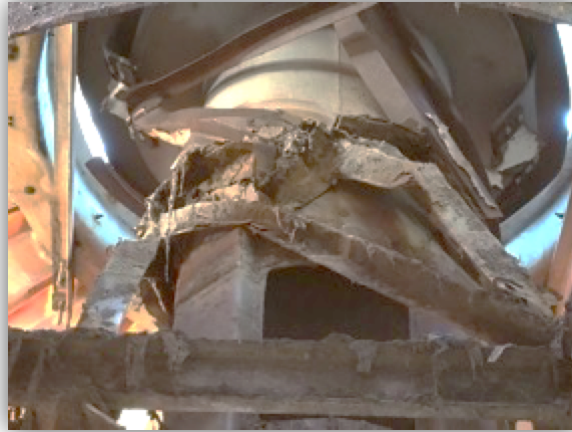




Center Cage Support Failed on GTs 5 and 6



Undamaged Center Cage



GT 5 & 6: Damaged Center Cage



GT 5 Center Cage failure caused lower structure (rake arms) to lift off GT floor



Contingency Plans

Increase monitoring frequency at GTs - hourly

Visual inspections

Monitor torque and amp readings on drive

Determine sludge blanket depths and thickness

Test sludge solids

Manage sludge inventory between GTs and Primary Clarifiers

Balance sludge loads between processes

Implement cross-connection piping

Provide piping to divert primary sludge to centrifuge thickening operation

Use offline digester as thickening vessel



Corrective Actions

Maximo maintenance work orders

- Add Metal Thickness Inspection to Annual PM

Award Capital Contract 7428, Gravity Thickener Rehabilitation Project

- All 6 GTs scheduled for complete rehab - \$18 million
- Change from coated carbon steel to 316 stainless steel
- On street now, bid opening planned for March 20
 - April Board / May Notice to Proceed
 - Repair GT 1 expected completion: December 2018
 - 3 year construction duration



Emergency Repairs

GT 5 repair (Contract S576): (construction completion May 1 est.)

O'Connor Constructors	\$219,817 - Non-Responsive
Engineer's Estimate	\$400,000
Walsh Construction Co. II	\$609,100

GT 6 repair (Contract S577): (construction completion June 15 est.)

- Increased number of firms solicited from four to six.
- One bid received:

Walsh Construction Co. II	\$475,315
---------------------------	-----------





***Chelsea Creek Headworks Upgrade
Contract 7161 - Change Order 8***

February 21, 2018



Chelsea Headworks Upgrade: Field Painting



Structural Framing

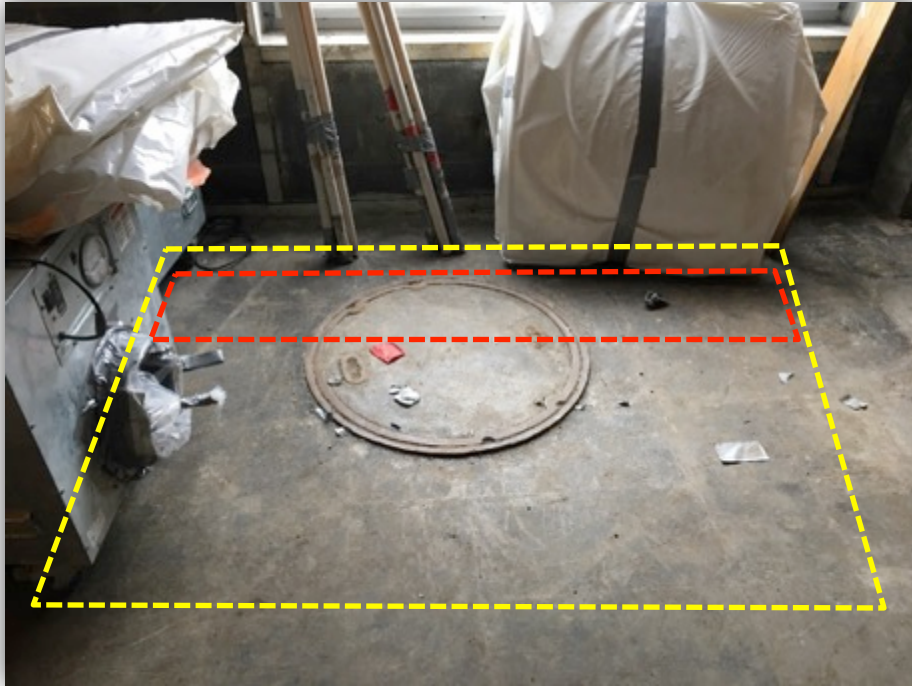
Piping Systems

Hangers and Supports

Process Equipment



Chelsea Headworks Upgrade: Influent Channel Openings





Chelsea Creek Headworks: Channel 1 Rehab





Chelsea Headworks Upgrade: Channel 1 Rehab





Chelsea Headworks Upgrade: Channel 1 Rehab





Chelsea Headworks Upgrade: Abatement





Chelsea Creek Headworks: Section 37 Relocation





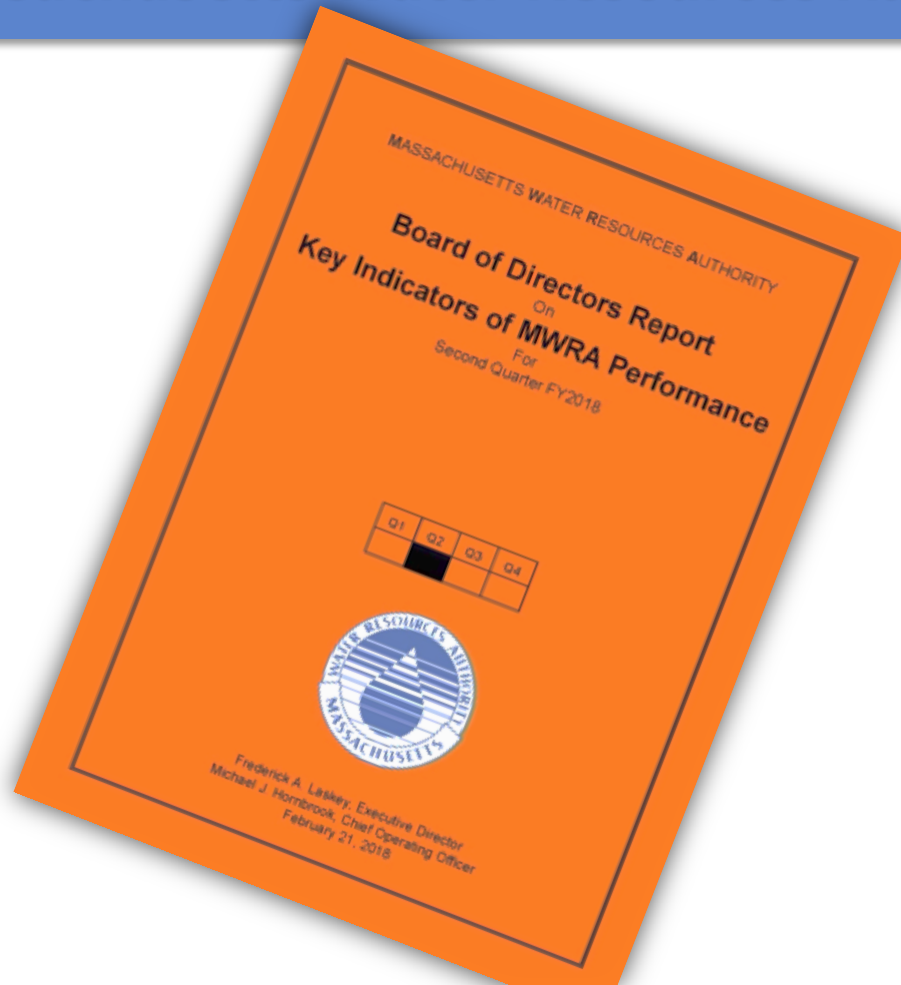
Chelsea Creek Headworks: Exterior Siding







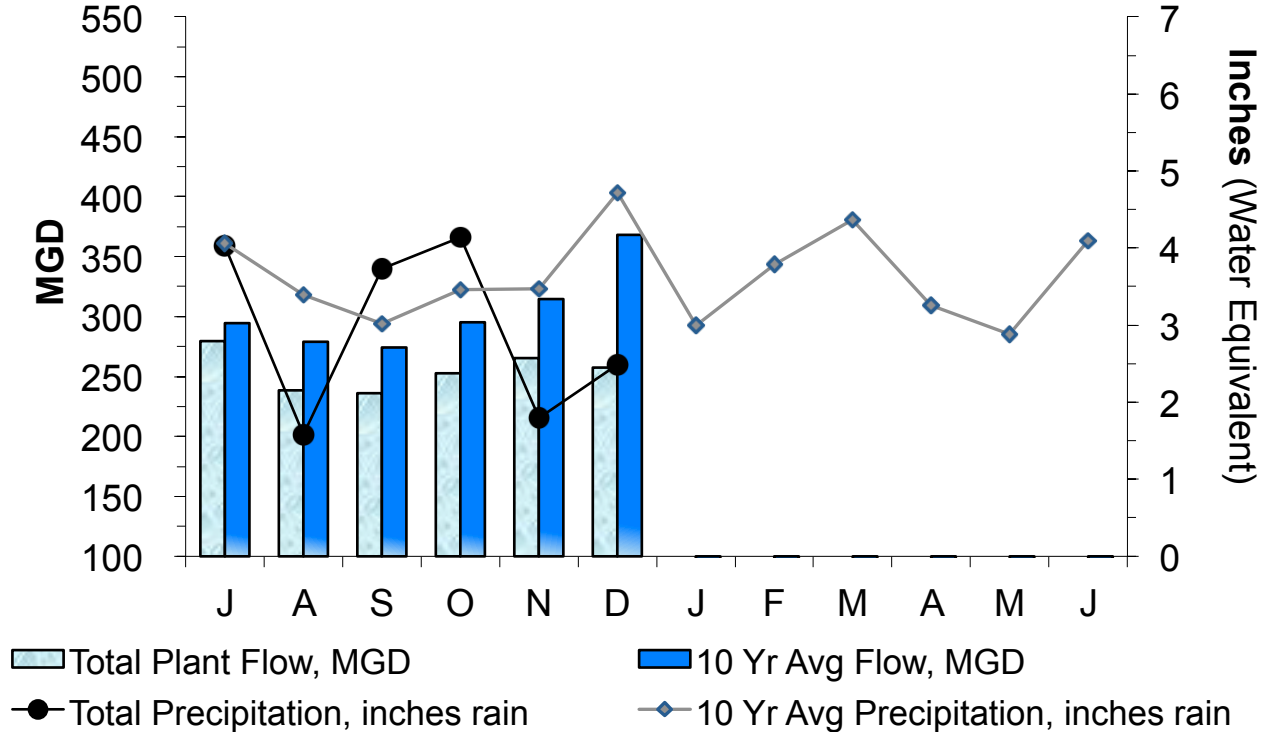
Massachusetts Water Resources Authority





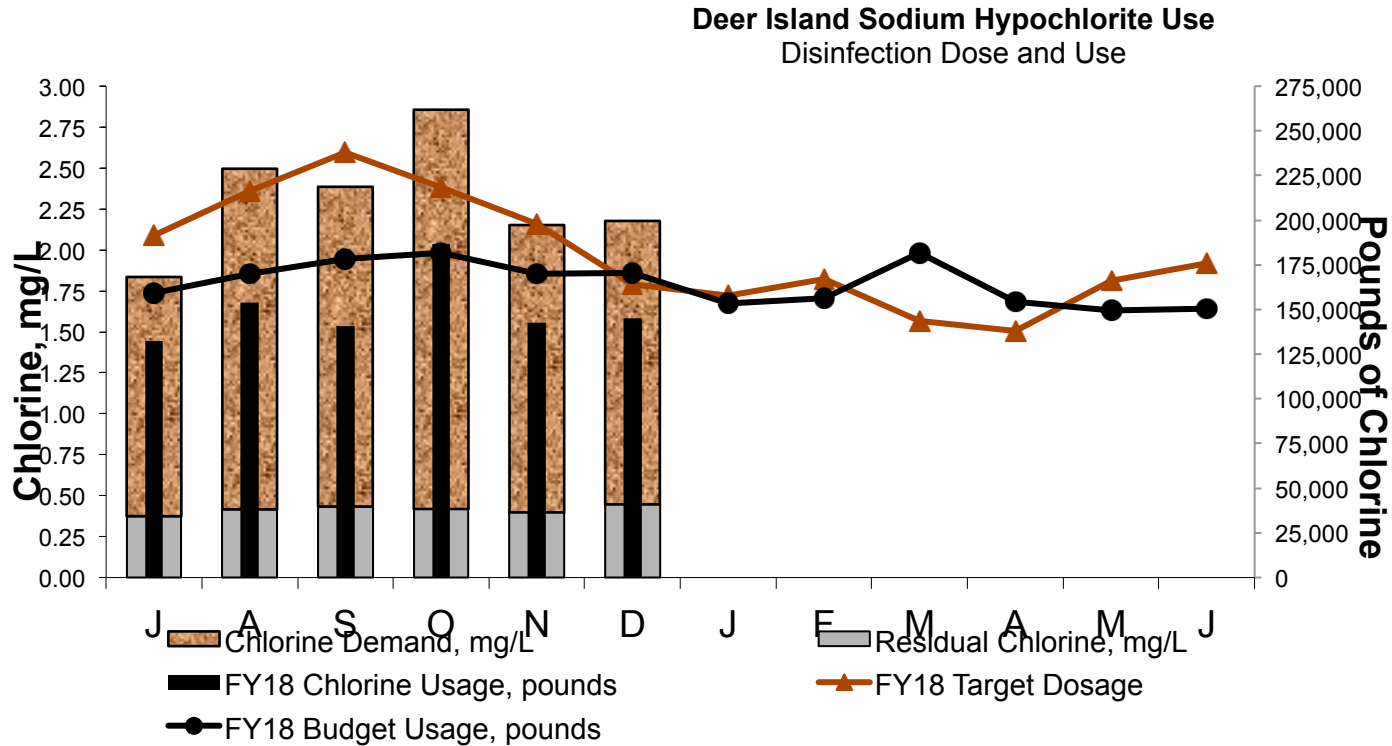
Deer Island Wastewater Flows

Plant Flow & Precipitation



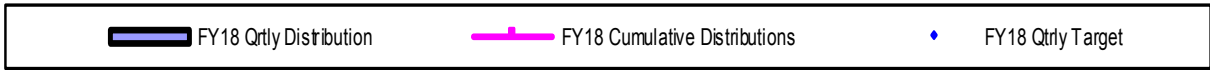
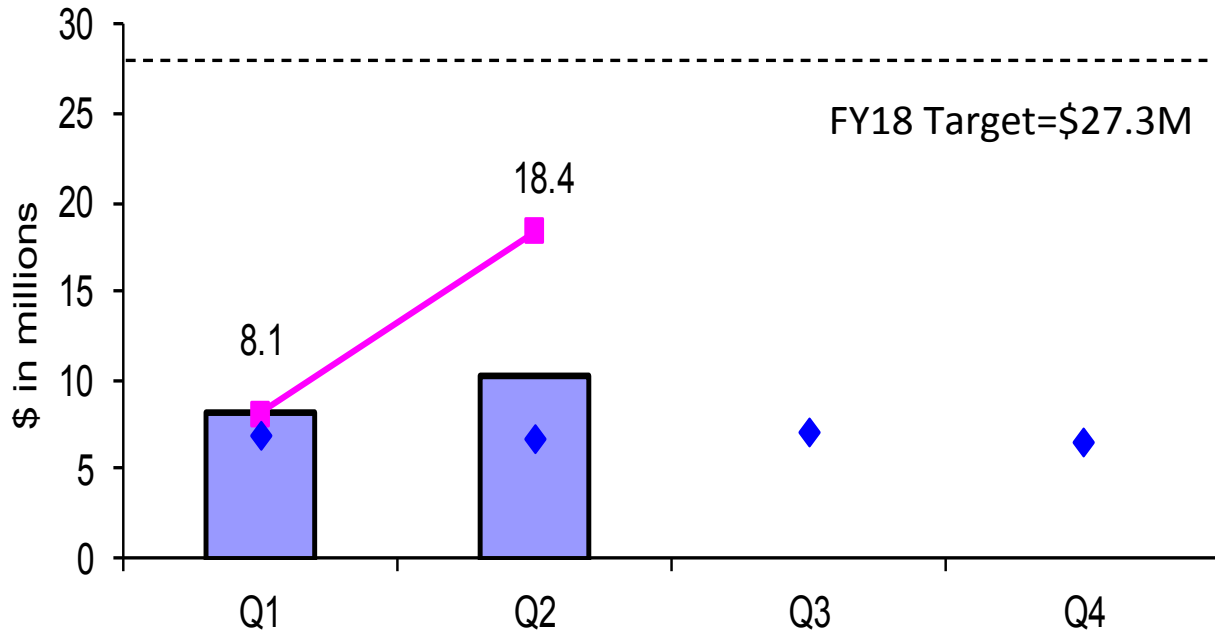


Deer Island Sodium Hypochlorite Use



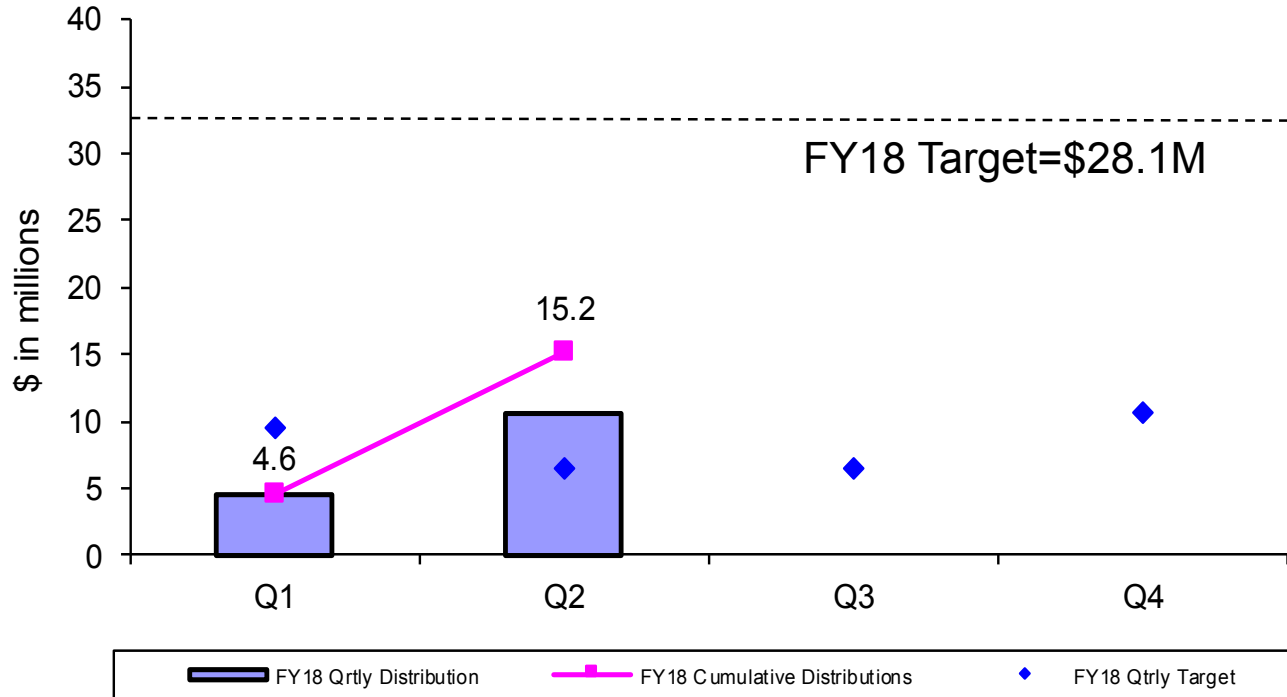


FY18 Quarterly Distributions of Sewer Grant/Loans



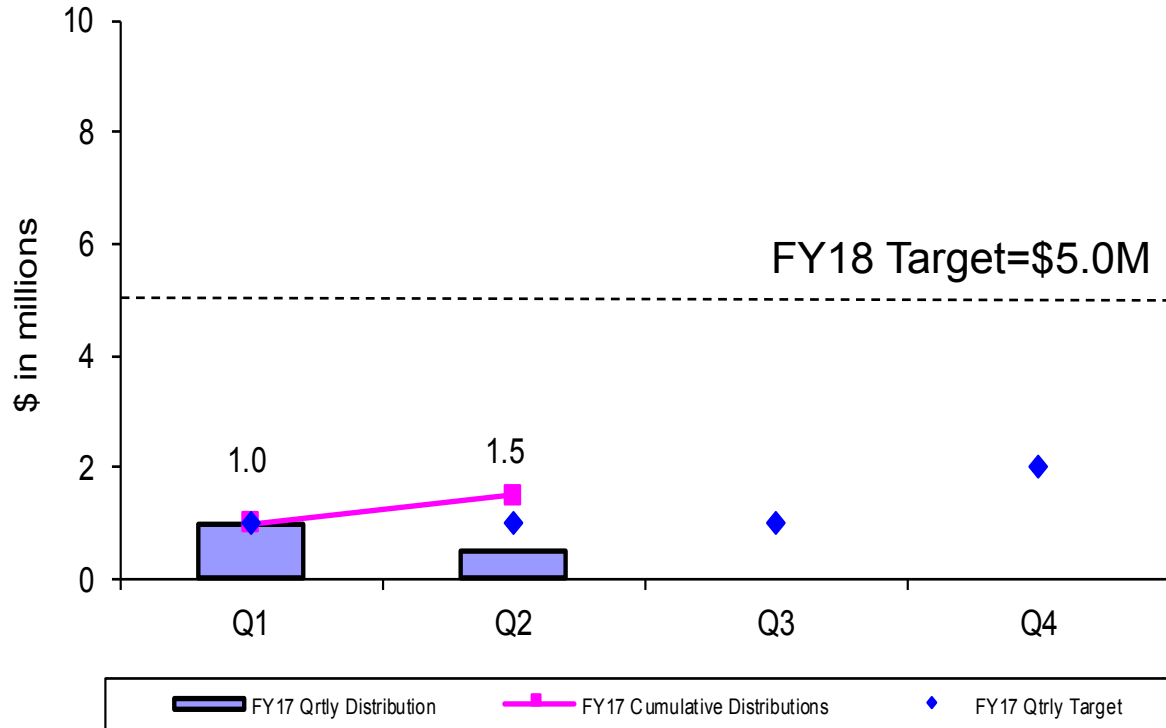


FY18 Quarterly Distributions of Water Loans





FY18 Quarterly Distributions Lead Service Line Replacement Loans

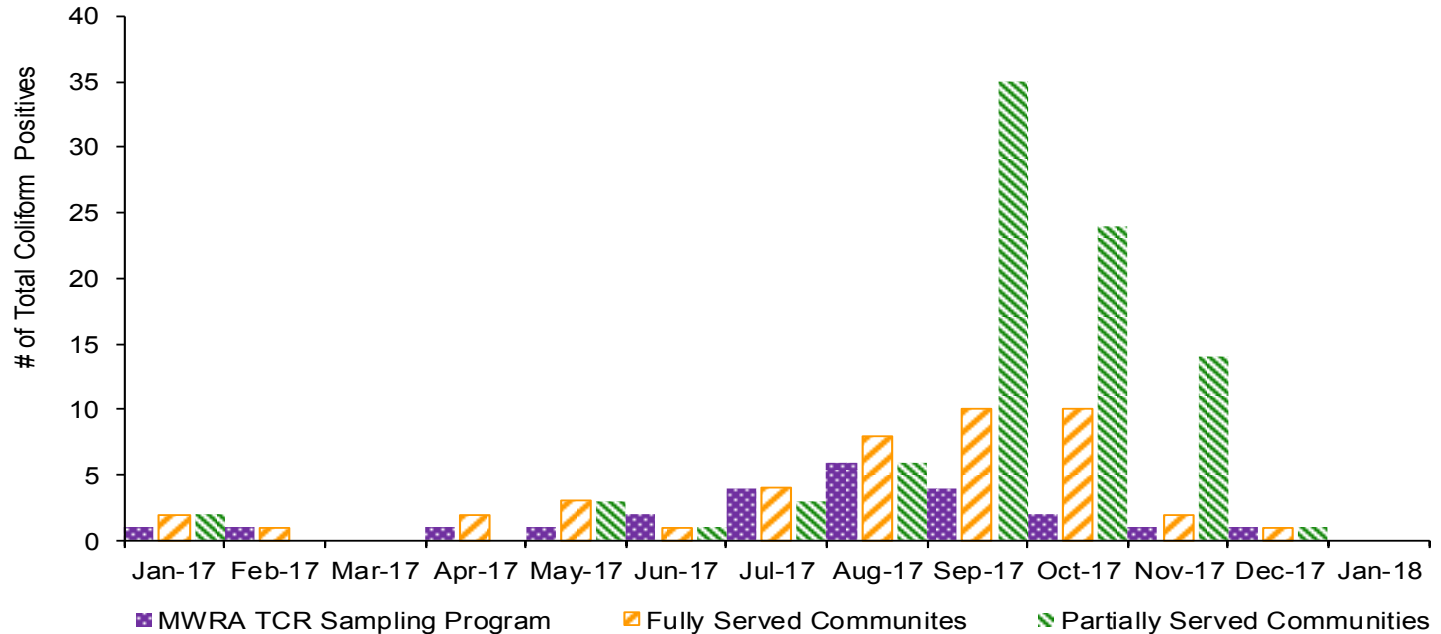




Community Systems Water Quality – Total Coliform Positives

Community Systems Water Quality - Total Coliform Positives

Monthly Total Coliform Positives





Community Systems Water Quality - Chlorine Residuals

Chlorine Residuals in Fully Served Communities

	2016	2017											
	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
% <0.1	0.6	0.1	0.1	0.1	0.0	0.1	0.1	0.3	1.0	1.1	0.8	0.7	0.6
% <0.2	1.0	0.4	0.2	0.1	0.1	0.1	0.2	0.8	2.9	2.9	2.6	2.6	1.2
% <0.5	2.0	1.0	0.8	0.7	0.7	0.4	0.7	3.5	6.2	6.8	6.1	6.1	3.4
% <1.0	4.6	1.9	1.7	1.1	1.3	1.2	2.1	7.4	13.4	11.5	10.3	10.3	6.5
% \geq 1.0	95.4	98.2	98.3	98.9	98.7	98.8	98.0	92.6	86.6	88.5	89.7	89.7	93.5





***MWRA Fiscal Year 2019
Proposed Current Expense Budget***

February 21, 2018



Multi-Year Rates Management Strategy



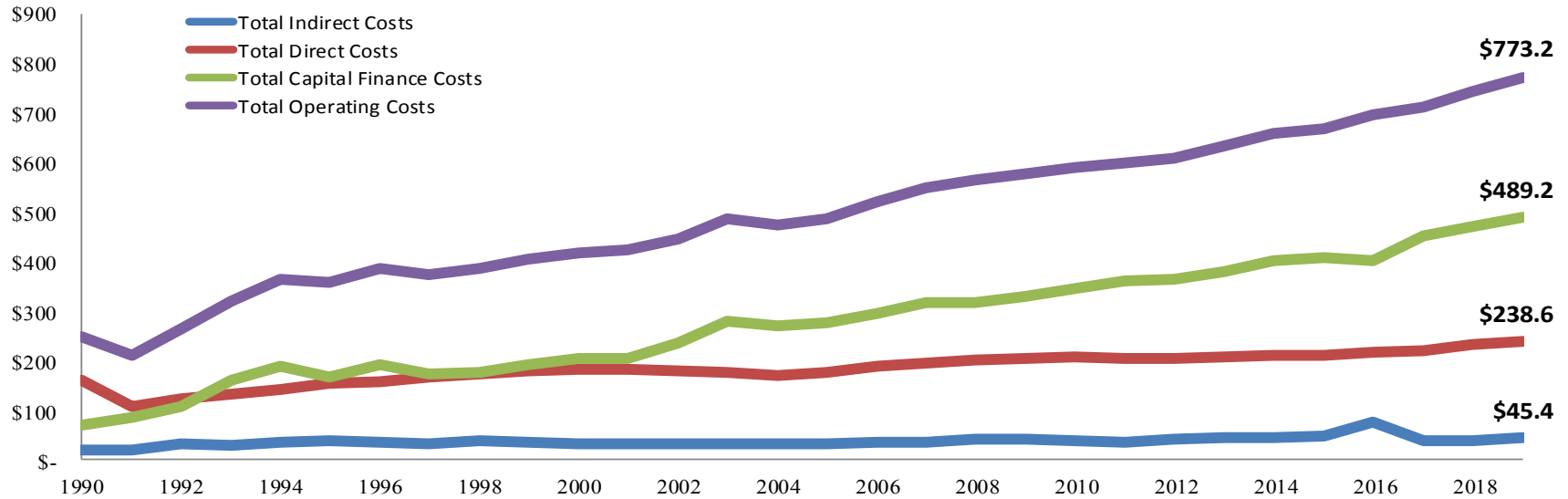
Goals

- Deliver Sustainable and Predictable Assessments
- Continue Multi-Year Rates Management



Historical Budgeted Spending

\$s in millions





Budget Drivers For Multi-Year Planning

- Capital Finance Expenses
- Existing Expenses and Revenue - inflation
- New Expenses
 - Long-Term Water Redundancy Program Staffing
 - New HEEC Cable Operating and Maintenance Costs
- Long-Term Liabilities



Ways to address the Debt Service challenge

- Defeasance
- Refundings
- Use of Reserves
 - Rate Stabilization Fund
 - Bond Redemption Fund
- Tactical Issuance – Repayment Structure
- Control Capital Spending
- Strategic Use of Current Revenue/Capital Funding



Current Expense Budget Assumptions

- Inflation assumptions
- Actuarial valuations
- Interest rate assumptions




- Long-Term Water Redundancy Staffing
 - FY19 FTEs: 1,150 + 5
 - First 5 FTEs of the projected new 15 FTEs for the Metropolitan Tunnels Long-Term Redundancy project



New Expenses

- New HEEC Cable to be operational by December 2019
- \$6.5 million established HEEC Reserve Fund in FY18
- 30 year repayment schedule

New HEEC Cable in place Dec 2019 

(\$s in millions)

	FY19	FY20	FY21	FY22	FY23	FY24
Projected HEEC Payments	\$1.4	\$4.1	\$5.7	\$5.4	\$8.9	\$7.9

- FY19 existing cable
- FY21-24 new cable payments
 - \$2.5 million reserve offset in FY21
 - \$4.0 million reserve offset in FY22



Long-Term Liabilities

- FY 19 retirement contribution: \$7.1 million, increase of \$3.8 million or 117.0% over FY18
- Pension fund is currently 96.5% funded
- Projected contributions to fully fund the plan by 2024

	(\$s in millions)					
	FY19	FY20	FY21	FY22	FY23	FY24
Retirement Contributions	\$7.1	\$9.2	\$10.8	\$10.5	\$10.9	\$11.4

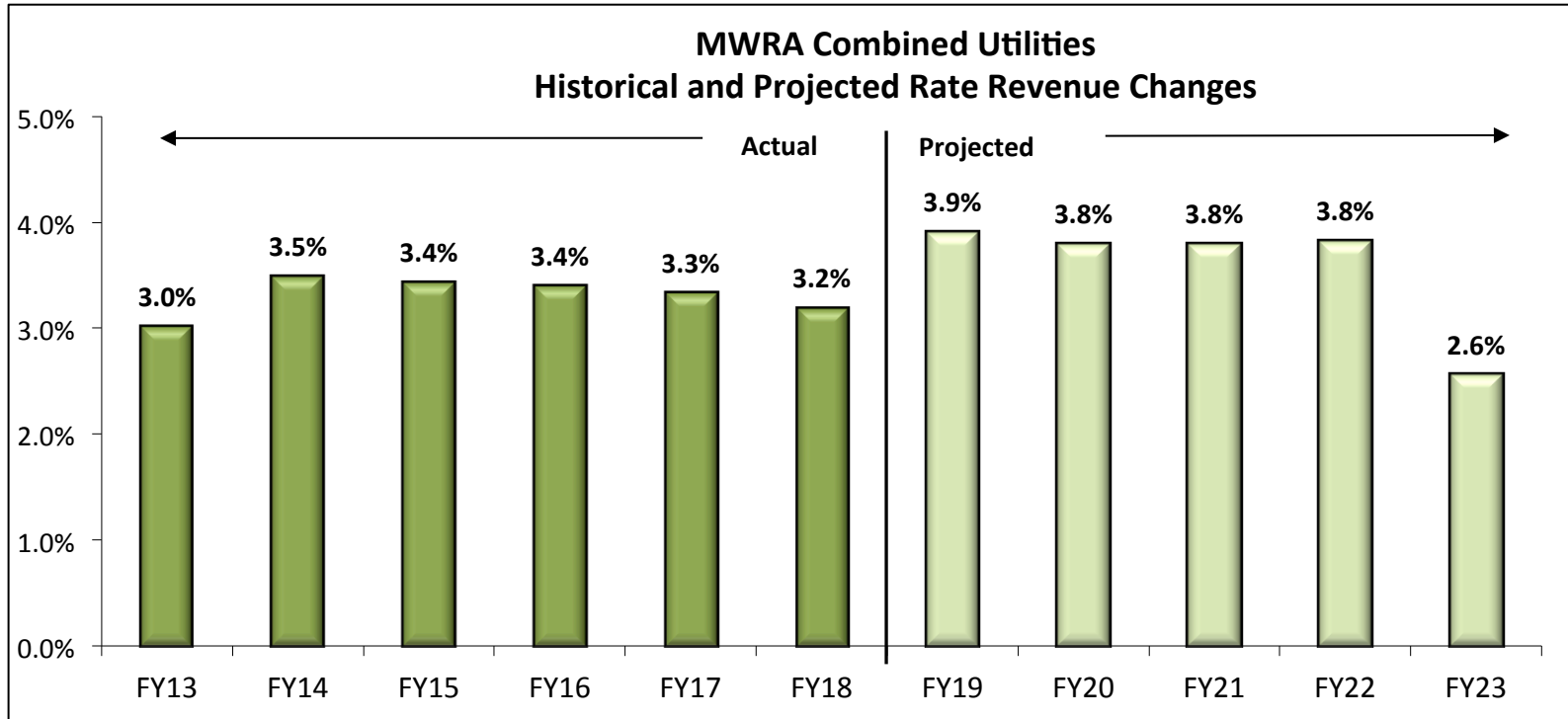


Long-Term Liabilities

- OPEB liability funding: \$5.6 million based on 50% of the contribution per actuarial report
- Current OPEB Trust balance: \$24.4 million

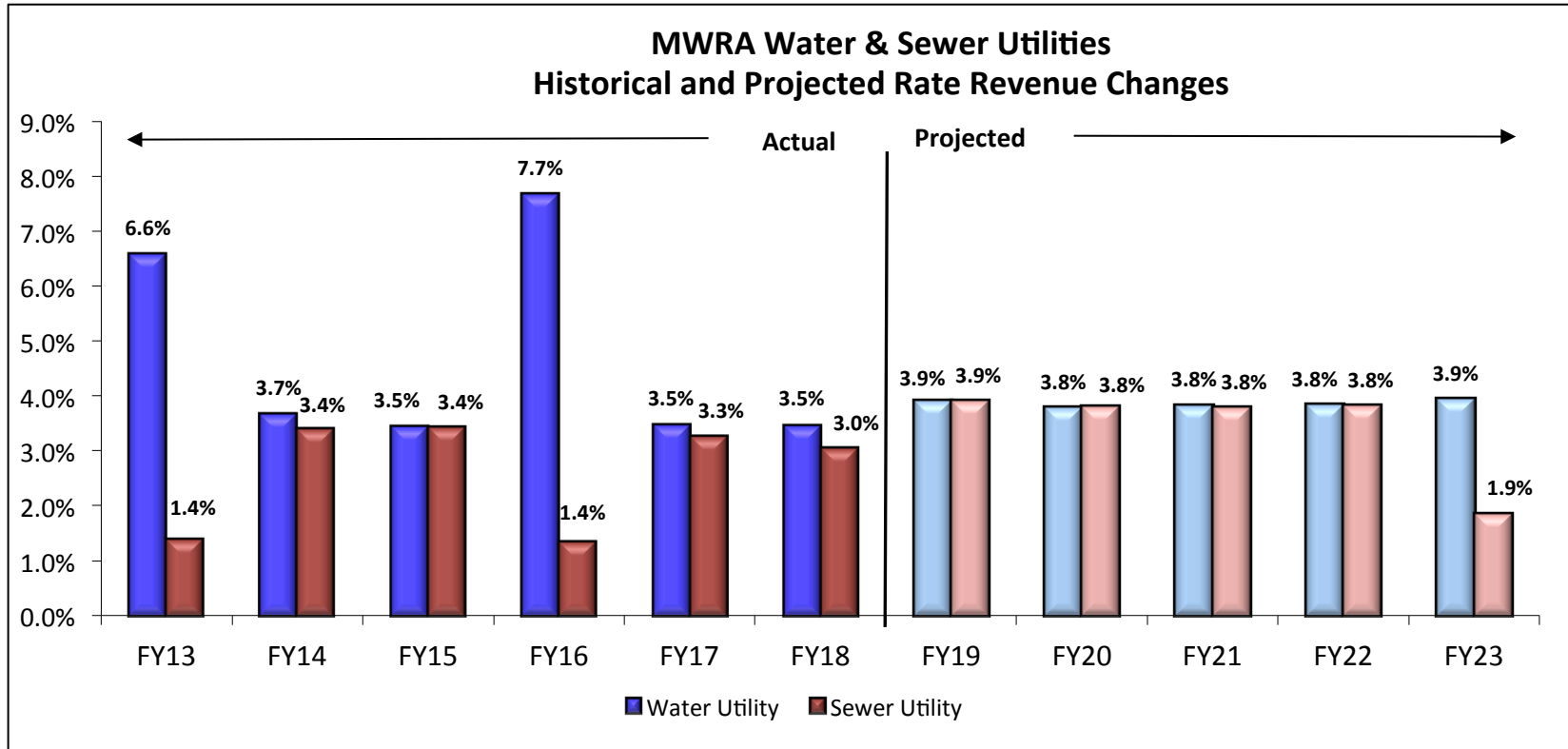


Actual and Forecasted Rate Revenue Changes





Actual and Forecasted Rate Revenue Changes by Utility





CEB Budget Structure

- Direct Expenses
- Indirect Expenses
- Capital Finance Expenses
- Non-Rate Revenue
- Rate Revenue

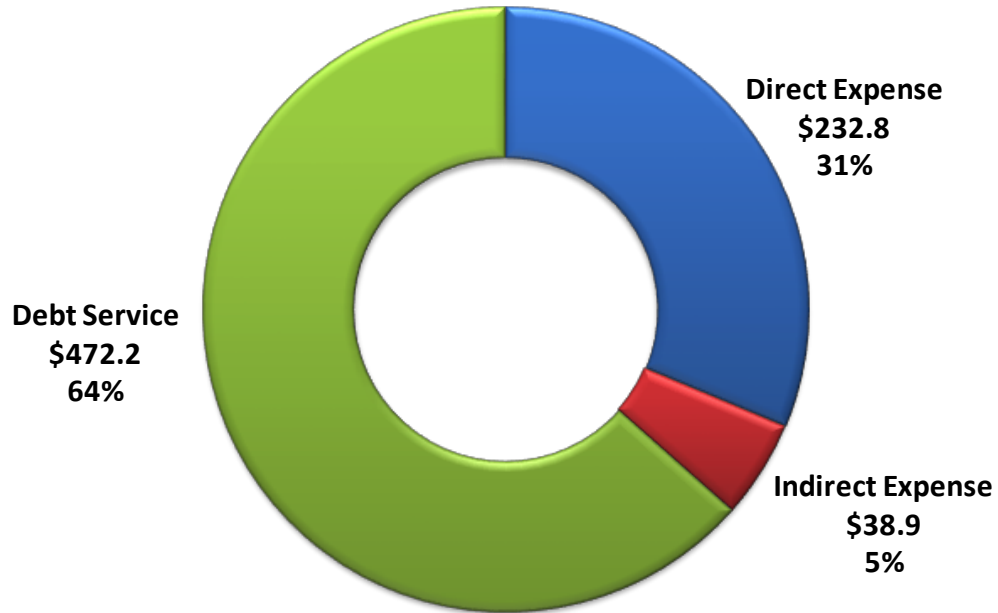
ATTACHMENT A
FY19 Proposed Budget vs FY18 Approved Budget

EXPENSES	TOTAL MWRA			Change FY19 Proposed Budget vs FY18 Approved Budget \$ %
	FY17 Actuals	FY18 Approved Budget	FY19 Proposed Budget	
WAGES AND SALARIES	\$ 98,494,291	\$ 104,286,370	\$ 107,118,716	\$ 2,832,346 2.7%
OVERTIME	4,951,621	4,110,637	4,247,554	136,917 3.3%
FRINGE BENEFITS	19,623,635	20,977,975	21,274,617	776,642 3.7%
WORKERS COMPENSATION	2,565,335	2,322,980	2,322,609	(371) 0.0%
CHEMICALS	9,262,849	9,836,933	10,855,856	1,018,923 10.4%
ENERGY AND UTILITIES	20,295,594	21,735,222	22,041,919	306,697 1.4%
MAINTENANCE	30,798,789	32,590,786	31,637,582	(953,204) -2.9%
PROFESSIONAL AND MEETINGS	360,115	406,269	316,377	(89,892) -22.1%
OTHER MATERIALS	6,698,861	7,221,622	455,770	(6,765,852) -93.1%
OTHER SERVICES	5,851,449	6,692,659	7,047,117	354,458 5.3%
TOTAL DIRECT EXPENSES	\$ 220,721,905	\$ 232,575,979	\$ 238,603,532	\$ 6,027,553 2.6%
INSURANCE	\$ 1,339,542	\$ 2,013,452	\$ 2,099,064	\$ 85,612 4.3%
WATERSHED/PILOT	23,911,694	25,164,006	25,906,427	742,421 3.0%
HECC PAYMENT	782,258	957,445	1,386,832	429,387 44.8%
MITIGATION	1,542,800	1,596,950	1,614,262	17,312 1.1%
ADDITIONS	(167,742)	1,596,950	1,732,193	911,077 117.0%
RETIREMENT TO RESERVES	4,632,624	3,277,369	7,110,663	3,833,294 117.0%
ADDITIONAL PENSION DEPOSIT	4,876,050	5,033,422	5,574,152	538,730 10.7%
POST EMPLOYMENT BENEFITS	\$ 37,324,226	\$ 38,865,760	\$ 45,423,594	\$ 6,557,834 16.9%
TOTAL INDIRECT EXPENSES	\$ 80,459,851	\$ 84,931,906	\$ 89,380,358	\$ 4,448,452 5.2%
STATE REVOLVING FUND	287,931,637	264,566,267	273,126,129	8,565,862 3.2%
SENIOR DEBT	69,997,992	858,685	92,032,294	6,588,847 7.7%
LOCAL WATER PIPELINE CP	3,217,060	3,794,944	4,750,393	955,449 25.2%
CAPITAL LEASE	12,200,000	13,200,000	14,200,000	1,000,000 7.6%
DEBT REPAYMENT	10,994,960	12,217,060	12,217,060	1,000,000 8.0%
BOND REDEMPTION	(11,027,773)	10,990,000	12,500,000	1,600,000 14.7%
VARIABLE RATE SAVINGS	(1,265,384)	(391,580)	-	-
DEBT SERVICE ASSISTANCE	-	6,532,146	-	-
HECC CABLE CAPACITY RESERVE FUND	-	-	391,580	(6,532,146) -100.0%
TOTAL DEBT SERVICE	\$ 453,267,028	\$ 472,188,190	\$ 489,206,234	\$ 17,018,044 3.6%
TOTAL EXPENSES	\$ 711,413,158	\$ 743,629,929	\$ 773,233,360	\$ 29,603,431 4.0%
REVENUE & INCOME				
RATE REVENUE	\$ 694,878,500	\$ 717,054,000	\$ 745,080,300	\$ 28,026,300 3.91%
OTHER REVENUE CHARGES	8,809,434	9,011,070	9,469,933	458,863 5.1%
RATE STABILIZATION	13,087,910	7,359,078	6,225,719	(1,133,359) -15.4%
INVESTMENT INCOME	9,758,480	10,205,781	12,457,408	2,251,627 22.1%
TOTAL REVENUE & INCOME	\$ 726,534,324	\$ 743,629,929	\$ 773,233,360	\$ 29,603,431 4.0%



FY18 Proposed Current Expense Budget (CEB)

FY19 Proposed Current Expense Budget





FY19 Proposed CEB vs FY18

\$s in thousands

Category	FY18 Approved Budget	FY19 Proposed Budget	Change FY19 Proposed Budget vs FY18 Approved Budget	
			\$	%
TOTAL DIRECT EXPENSES	\$ 232,576	\$ 238,604	\$ 6,028	2.6%
TOTAL INDIRECT EXPENSES	\$ 38,866	\$ 45,424	\$ 6,558	16.9%
TOTAL CAPITAL FINANCING	\$ 472,188	\$ 489,206	\$ 17,018	3.6%
TOTAL EXPENSES	\$ 743,630	\$ 773,233	\$ 29,603	4.0%



FY19 Proposed Direct Expenses vs. FY18

Highlights –

- Wages and Salaries: \$107.1M, \$2.8M or 2.7% increase
- Chemicals: \$10.9M, \$1.0M or 10.4% increase
- Fringe Benefits: \$21.8M, \$0.8M or 3.7% increase
- Other Materials: \$7.4M, \$0.7M or 10.3% increase
- Utilities: \$22.0M, \$0.3M or 1.4% increase

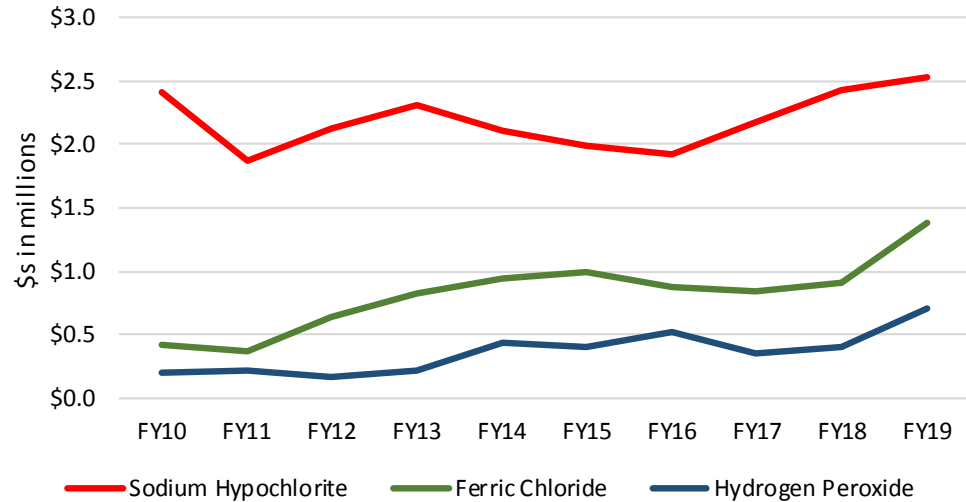


Chemicals

Chemicals - \$10.9M, \$1.0 million or 10.4% increase Budget

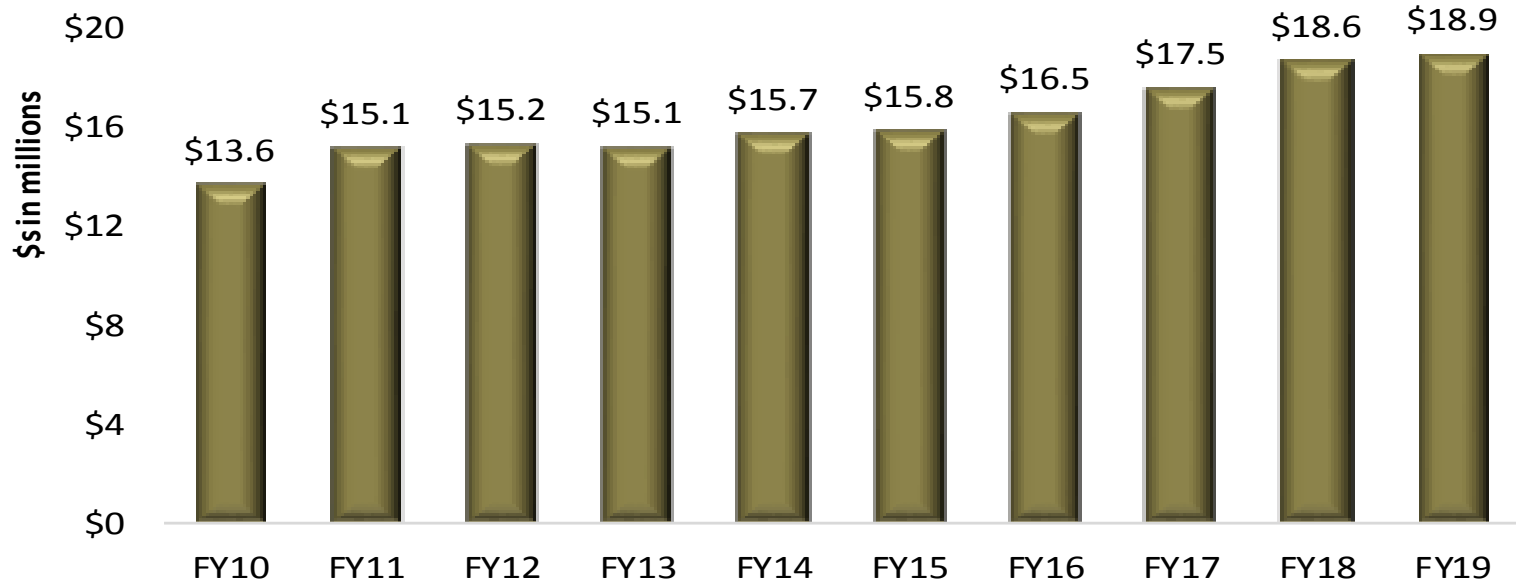
- 3 months funding for the Deer Island NPDES permit, \$294k.
- Increased pricing for Ferric Chloride at the Deer Island, \$1.4M budget - increase of \$476k.
- Increased use of Hydrogen Peroxide for odor control at Deer Island and a projected increase in pricing, \$0.7M budget - increase of \$308k.

Historical & Projected Chemical Cost





Historical Health Insurance Cost



GIC: assume 5% increase in health insurance

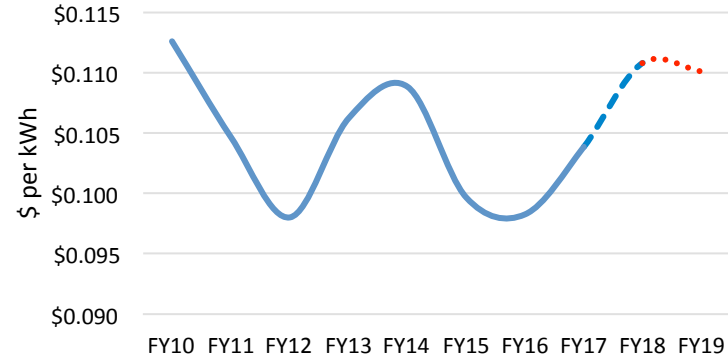


Utilities

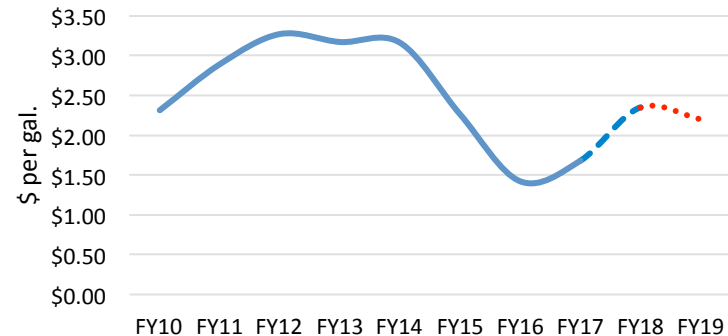
\$22.0M for Utilities, \$307k or 1.4% increase

- \$16.5M for Electricity, level funded with FY18 with similar usage and price
 - New Eversource T&D rate structure reviewed in the spring with potential \$0.5M-\$1.0M impact.
- \$2.5M for Diesel level funded with FY18 with lower projected pricing offset by higher usage

\$/kWh



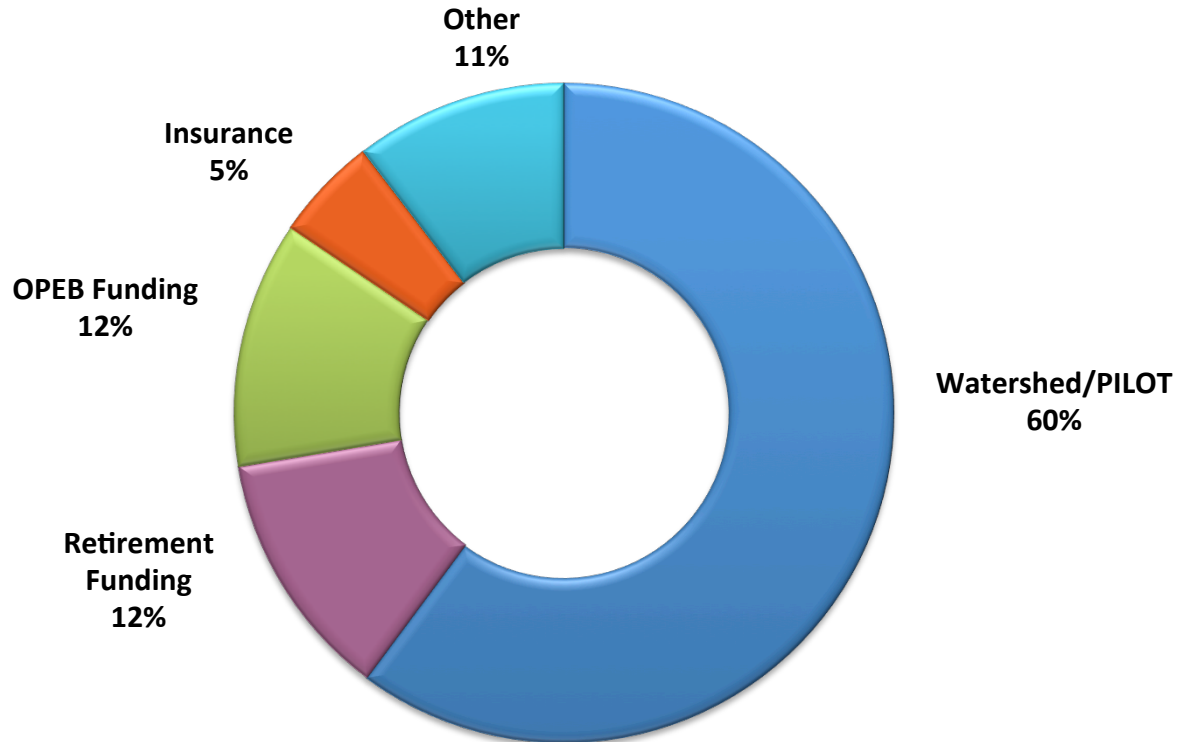
\$/gal





CEB Budget Structure – Indirect Expenses

Indirect Expenses





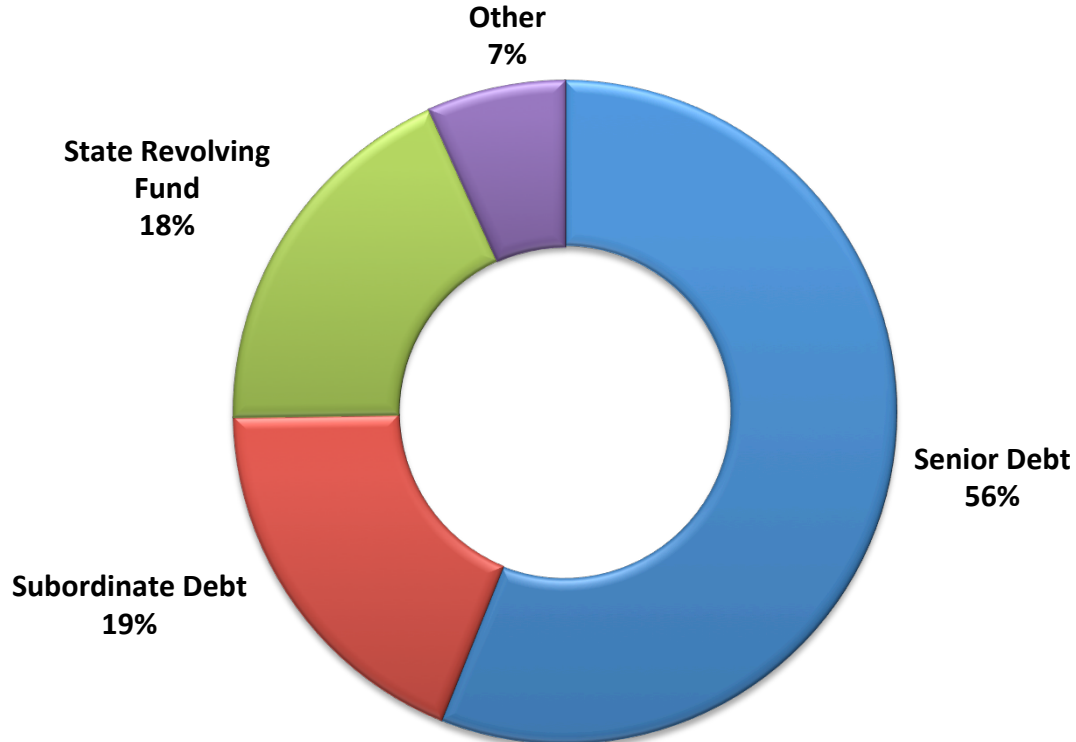
FY19 Proposed Indirect Expenses vs. FY18

Highlights:

- Watershed Program operating and PILOT: \$25.9M, \$0.7M or 3.0% increase
- Pension Fund required contribution: \$7.1M, \$3.8M or 117.0% increase
- OPEB half of actuarial contribution: \$5.6M, \$0.5M or 10.7% increase
- Insurance: \$2.1M, level funded
- Mitigation: \$1.6M, level funded
- HEEC contract: \$1.4M, \$0.4M or 44.8% increase due to capital improvements on sub-stations



Capital Financing





Highlights:

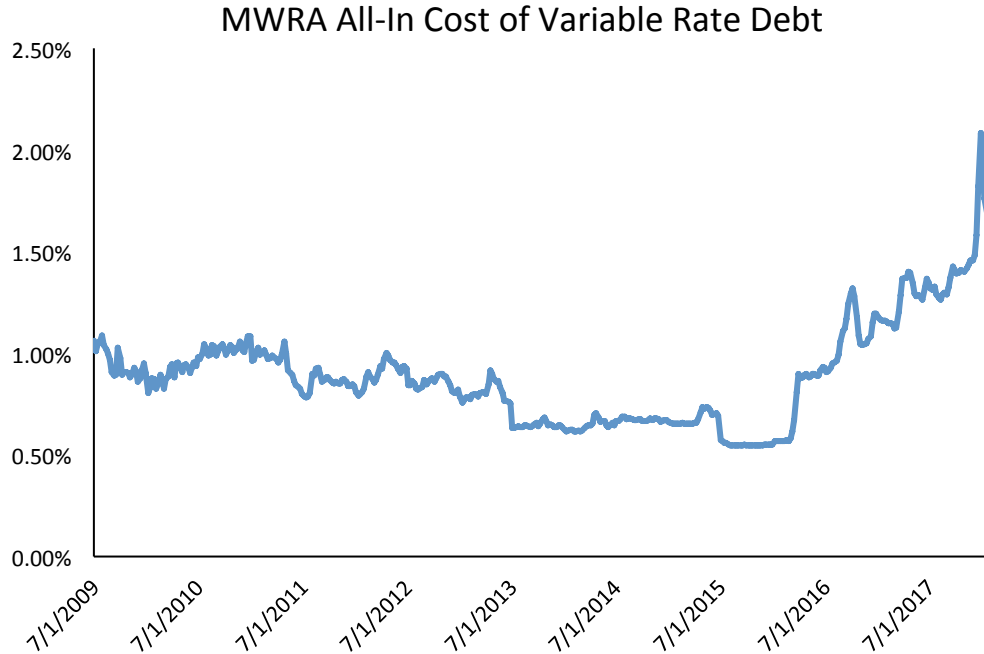
- Variable Rate Debt Assumption 3.50%, 25 bp increase
- \$25.9M defeasance
- \$12.5M prepayment of debt
- \$14.2M to Current Revenue for Capital
- No Debt Service Assistance



Interest Rates

Interest trending up with the Fed balancing economic expansion, inflation and employment

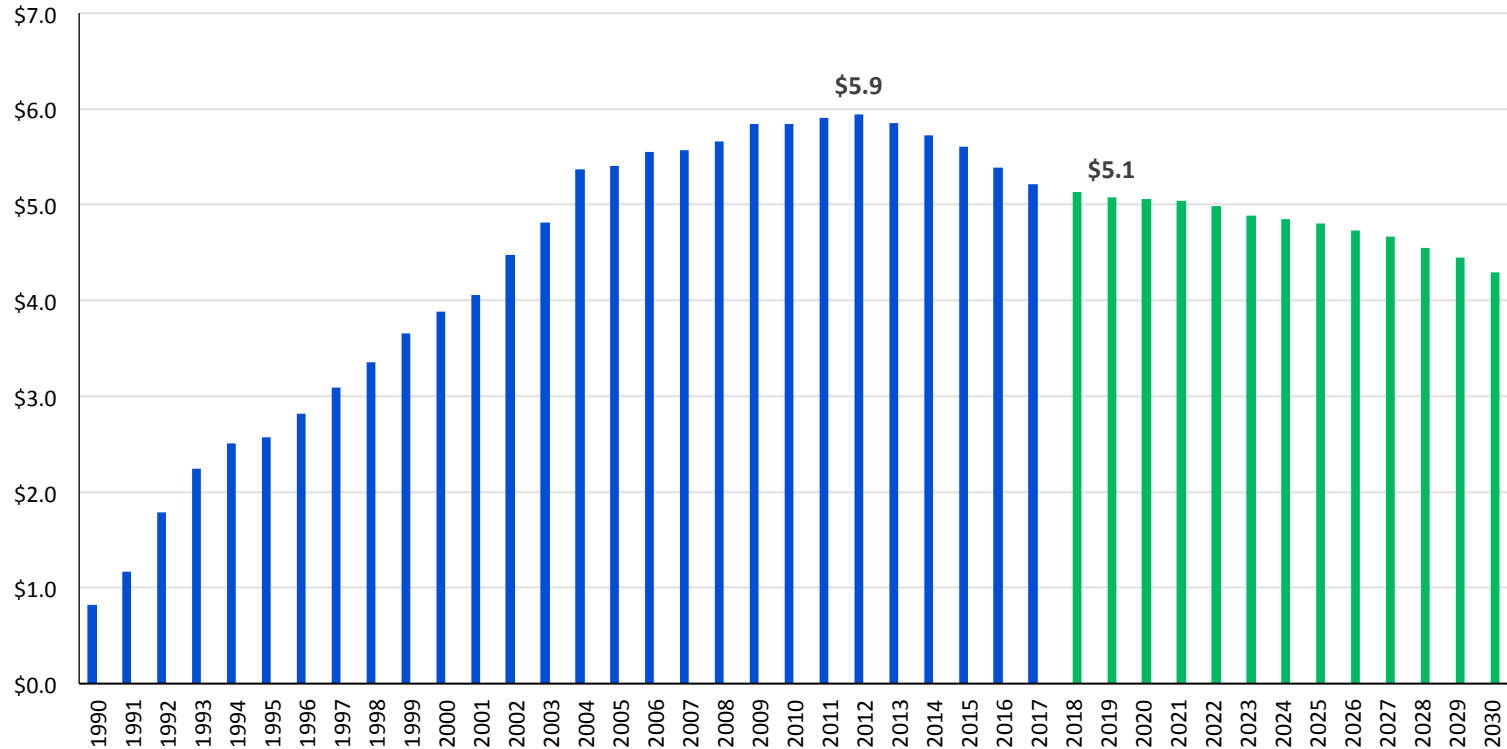
- 3 rate hikes projected in 2018 with the next 25 bp increase expected in March
- 2 rate hikes projected in 2019





Outstanding Debt Matt to Update

Outstanding Debt
\$s in billions





FY19 Non-Rate Revenue vs. FY18

Highlights -

- Other User Charges: \$9.5M, \$0.5M or 5.1% increase
- Other Revenue: \$6.2M, \$1.1M or 15.4% decrease (related to demand response and RPS programs)
- Investment Income: \$12.5M, \$2.3M or 22.1% increase

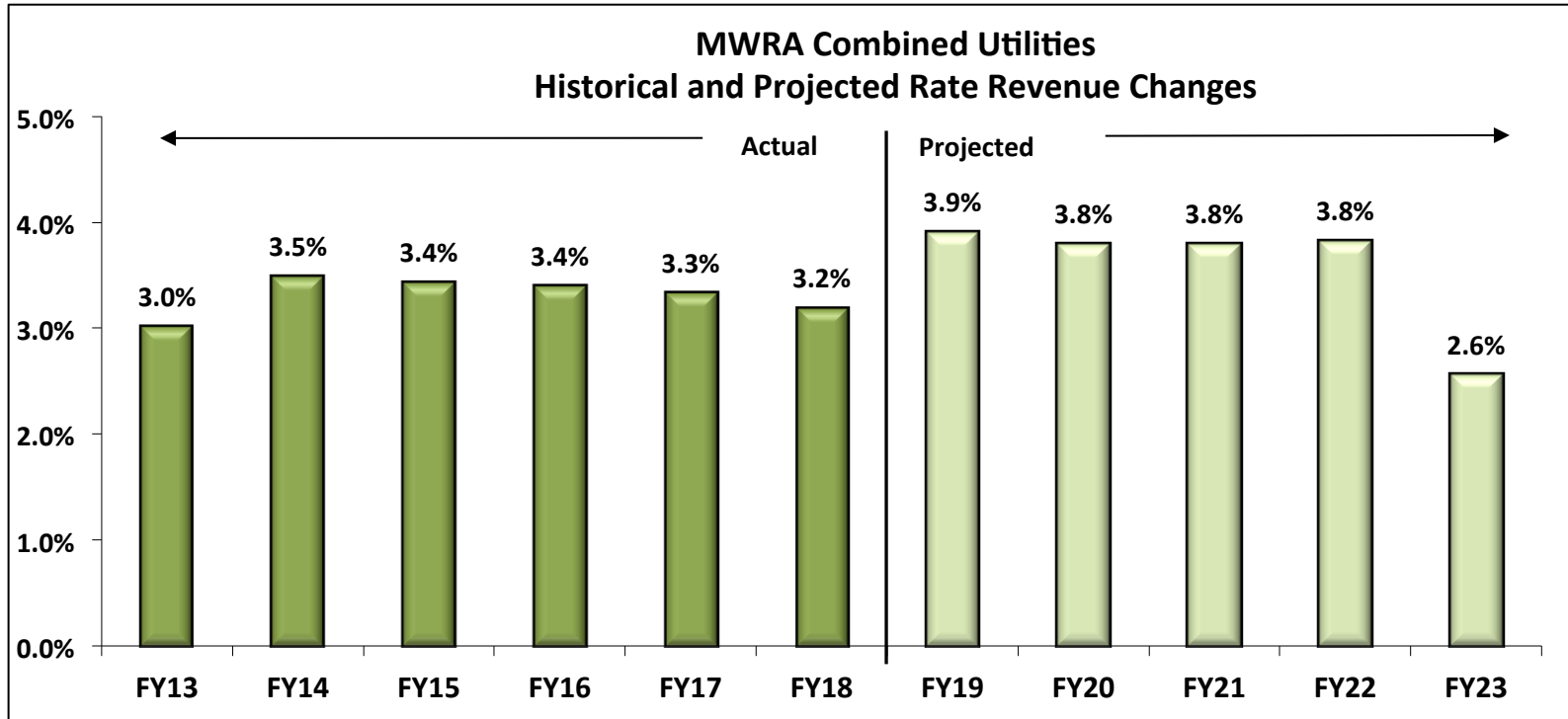


Rate Revenue Requirement \$s in Millions

Direct Expenses	\$238.6
Indirect Expenses	\$45.4
Capital Financing	\$489.2
Non-Rate Revenue	(\$28.2)
Rate Revenue Requirement	<hr/> <u>\$745.1</u>



Actual and Forecasted Rate Revenue Changes





FY19 Current Expense Budget Next Steps

- Transmit Proposed Budget to Advisory Board for 60 day review
- Public Hearing
- MWRA Board Hearing
- Staff will present Draft Final Budget in May



Thank You

