

Village of Ridgefield Park

Supplemental CSO Team

Meeting Number 2

Commissioner's Conference Room

Village of Ridgefield Park Municipal Building

September 11, 2017, 9 am

Group Meeting Minutes

1) Introduction

John Rolak opened the meeting at 9 am with an acknowledgement of the events of 9/11 and a moment of silence.

2) Minutes of meeting #1 distributed.

3) Presentation (see power point slides)

Update Sewer System Characterization Report

John presented a review of the current modeling data and updates that have been made to improve the accuracy of the models. A member asked for clarification of the meaning of transient infiltration. John explained that transient infiltration is also known as rain induced infiltration that occurs during and after a rain event, which can result in 2-3 days of higher flows. John also explained how to read the graph of flow patterns and noted that current models are coming much closer to reality.

Typical Year Analysis and Report

John explained that the report was completed by a consultant for Passaic Valley Sewerage Authority (PVSC). He described the process that the consultant used to arrive at a "typical" year, which was determined to be 2004. Currently, the members of the NJ CSO Group are reviewing the report. Once approved by the members the reports will be sent to NJDEP for approval.

Deadlines

John reviewed upcoming deadlines

4) Discussion

Input from the members of the SCSO group

- a) John asked the members to provide input about places that people come in contact with the water, such as for swimming, kayaking, etc. so that we can establish a realistic list of “sensitive areas.”
- b) One member commented that, based on his observations, people around the Village are becoming more aware of the CSO issues. He has been educating the public about rain gardens and the impact they have on runoff. John added that rain gardens can potentially reduce overflows by 15 percent. John added that separate storm sewers may have a greater impact on water quality than the CSOs. The models should help expose the actual sources of contamination.
- c) The group discussed finding ways to entice people to use rain gardens, pervious pavement, green roofs and other green infrastructure. These ideas will be part of future recommendations.
- d) Steven and Linda Quinn noted that they will not be able to attend the BCUA SCSO team meeting on September 19, but Mark Olson will be able to attend.
- e) Ridgefield Park SCSO team will meet again in December.

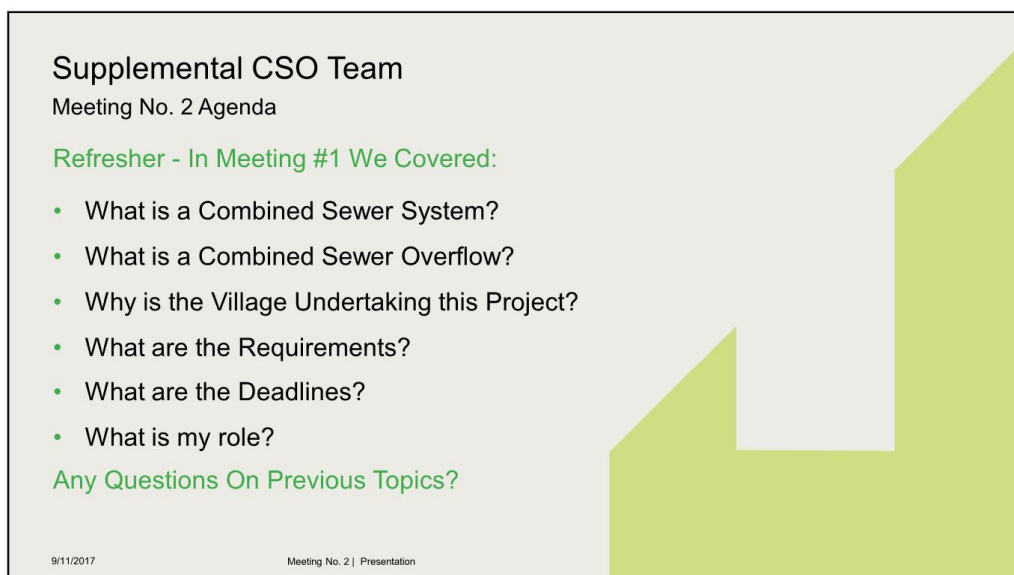
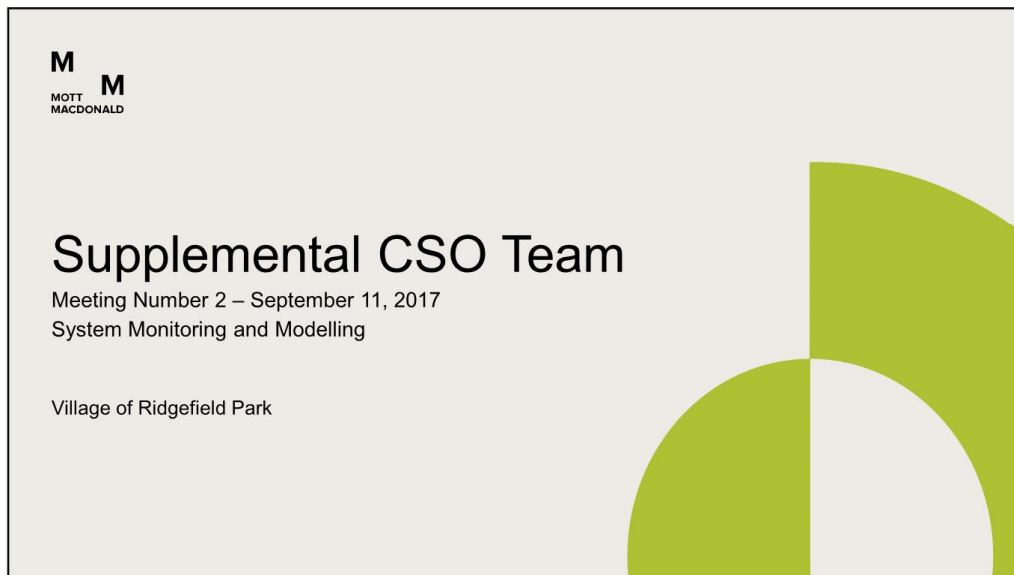
Meeting concluded at 10 am

Minutes submitted by: Donna Gregory

Ridgefield Park
Supplemental CSO Team
Meeting Number 2
Municipal Building, Public Meeting Room
September 11, 2017, 9 am

	Name	Organization	Email	Phone Number
<i>CR</i>	John Rolak	Mott MacDonald	<i>john.rolak@ mottmac.com</i>	<i>973-912-2521</i>
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	James Donohue	Principal, Ridgefield Park High School		
<i>hm</i>	Flo Muller	Ridgefield Park Shade Tree Commission	<i>flo.muller@ nj.rfp.com</i>	<i>201-814-9019</i>
<i>RO</i>	Mark Olson	Chairman, Green Team		
<i>SP</i>	Stephen Quinn	Ridgefield Park Environmental Commission		
<i>LQ</i>	Linda Quinn	Ridgefield Park Environmental Commission		
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			<i>1</i>	

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Supplemental CSO Team

Meeting No. 2 Agenda

Topics to Discuss Today:

- Update of Sewer System Characterization Report
- Typical Hydraulic Year Analysis and Report
- Deadlines within Next 12 months.
- Major Deadlines thereafter.

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Sewer System Characterization Report

Description and Status

Initial System Characterization Completed 2003 - 2006

- Sewer System Mapping
- Dry and Wet Weather Monitoring at Regulators and Outfalls.
- Review of Land Use and Population Data
- Development of Land Side Computer Model
- Computer Output used to Characterize CSO Discharge

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Sewer System Characterization Report Update

Description and Status

- Land Use – No Change.
- Population – No Change.
- Sewer System – No Change.
- Global Positioning Stationing (GPS) 2016
- New GIS Mapping Using GPS Data 2017
- Info Works Computer Model Updated
- Additional Flow Monitoring Data
- Model Calibration and Verification

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Sewer System Characterization Report Update

Info Works Computer Model Update

- ☐ Computer Model Updated from Info Works CS to Info Works ICM (Integrated Catchment Model)
- ☐ GIS Data Imported to Model for Sewer Network.
- ☐ New Flow Data Used to Better Calibrate Model.

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Sewer System Characterization Report Update

Info Works Computer Model Update

- GIS Sewer Reaches and Details Added



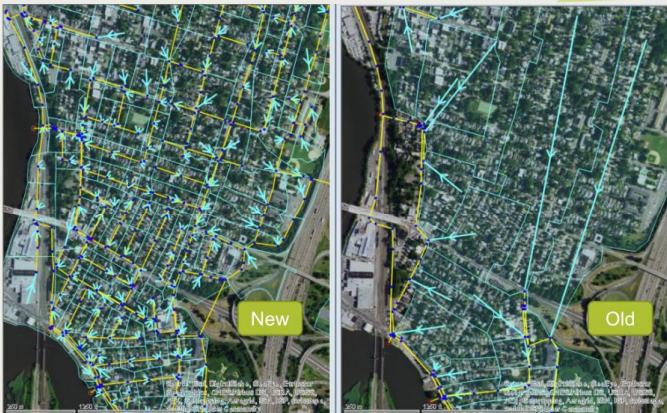
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Sewer System Characterization Report Update

Info Works Computer Model Update

- GIS Sewer Reaches and Details Added



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Sewer System Characterization Report Update

Info Works Computer Model Update

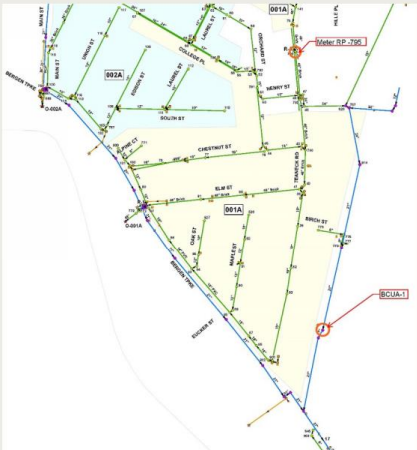


- New Flow Data Obtained on East Side of Village

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Sewer System Characterization Report Update

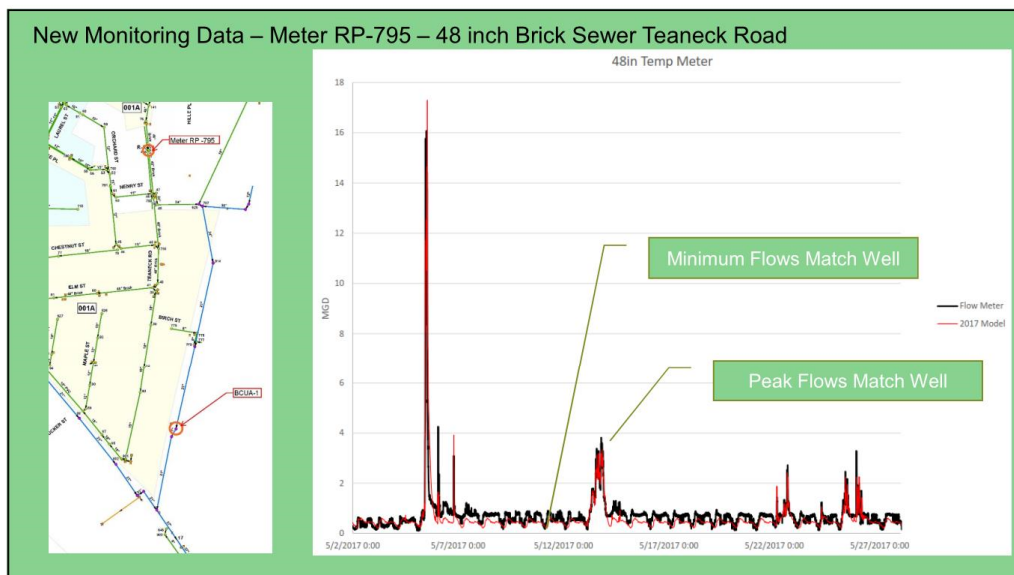
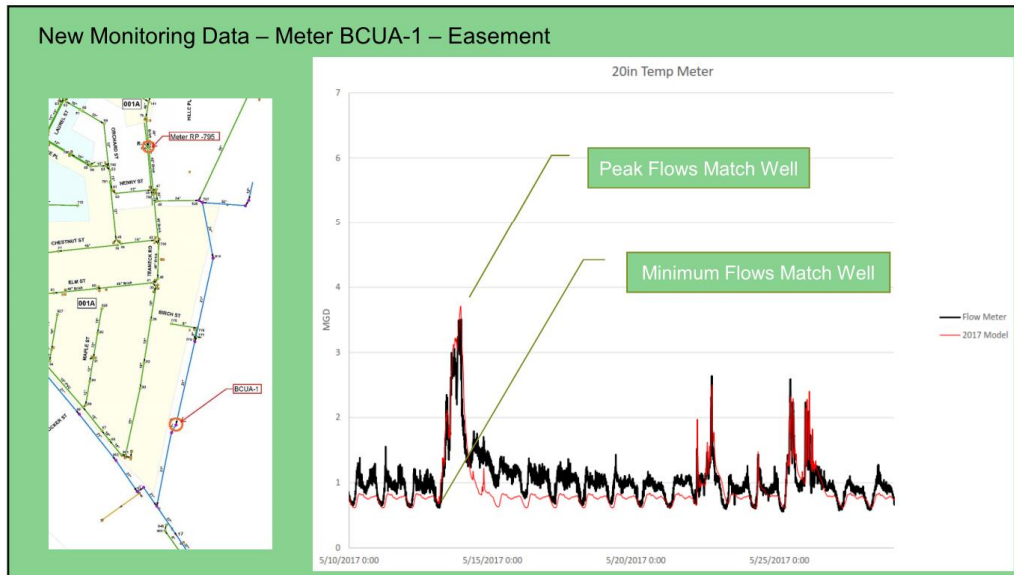
Info Works Computer Model Update



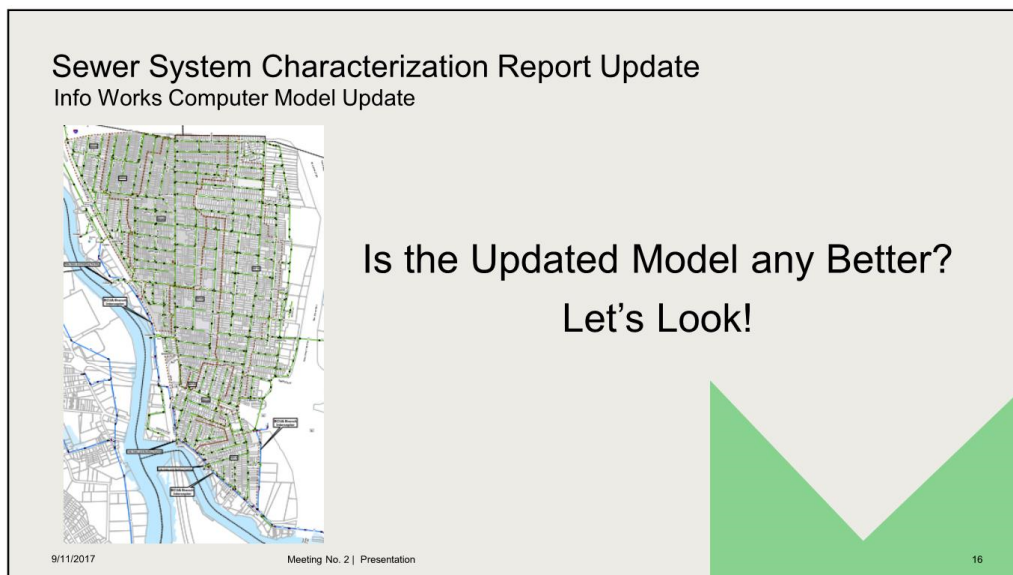
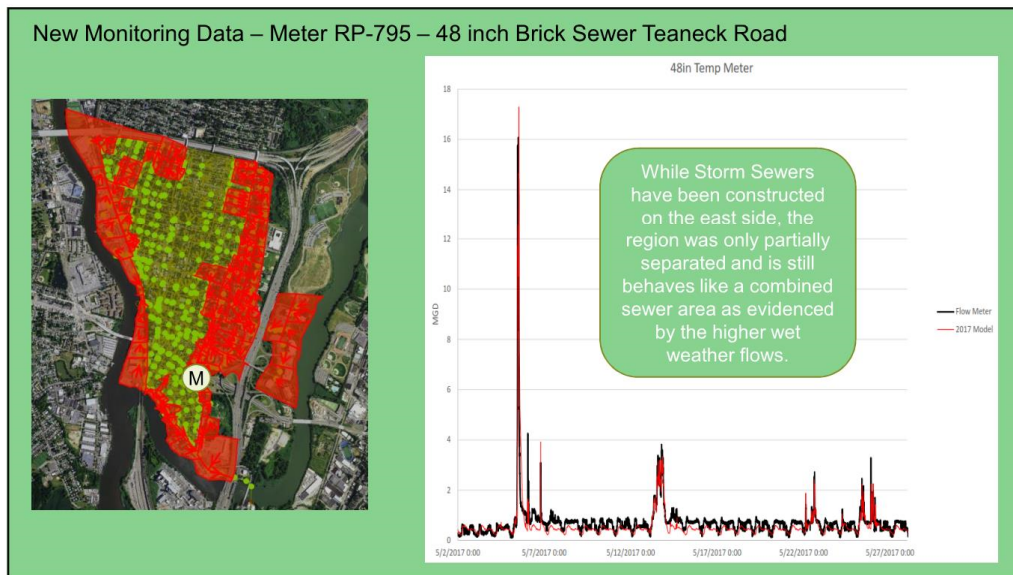
- New Flow Data Obtained on East Side of Village

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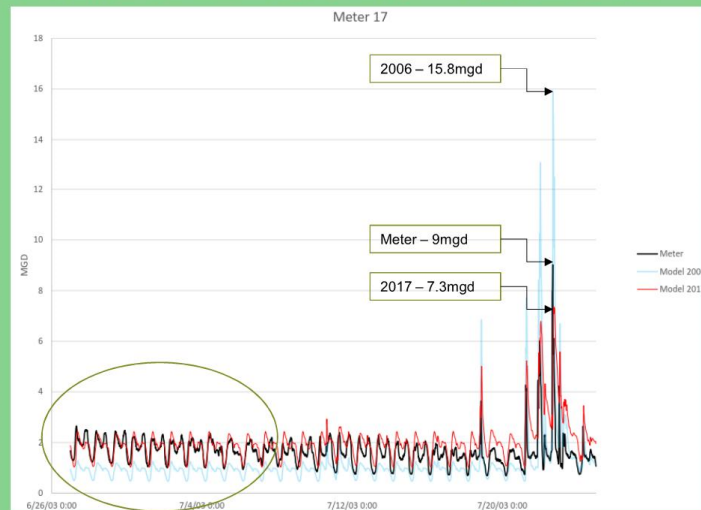


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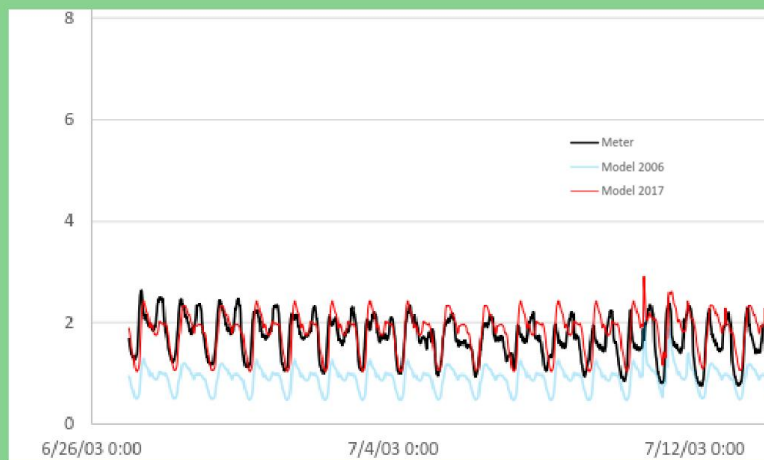


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Comparison of Computer Simulation at BCUA Meter 17 for 2006 Model vs 2017 Model

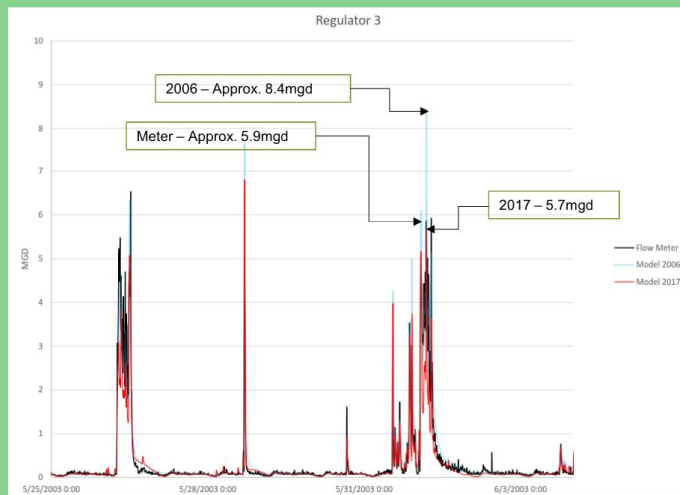


Comparison of Dry Weather Computer Simulation – Meter 17 for 2006 Model vs 2017 Model

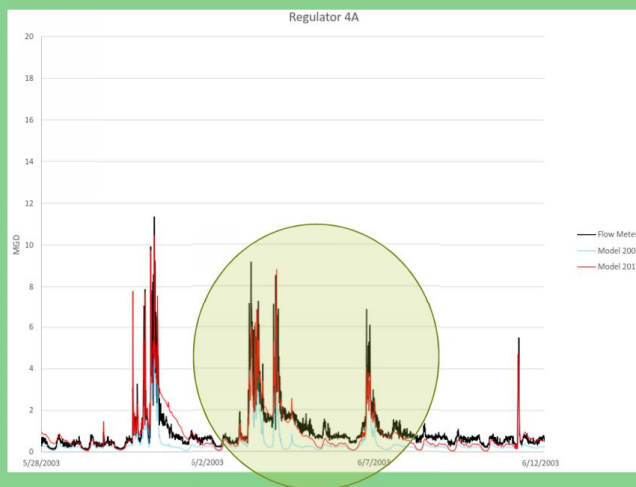


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Comparison of Computer Simulation at Regulator 3 for 2006 Model vs 2017 Model

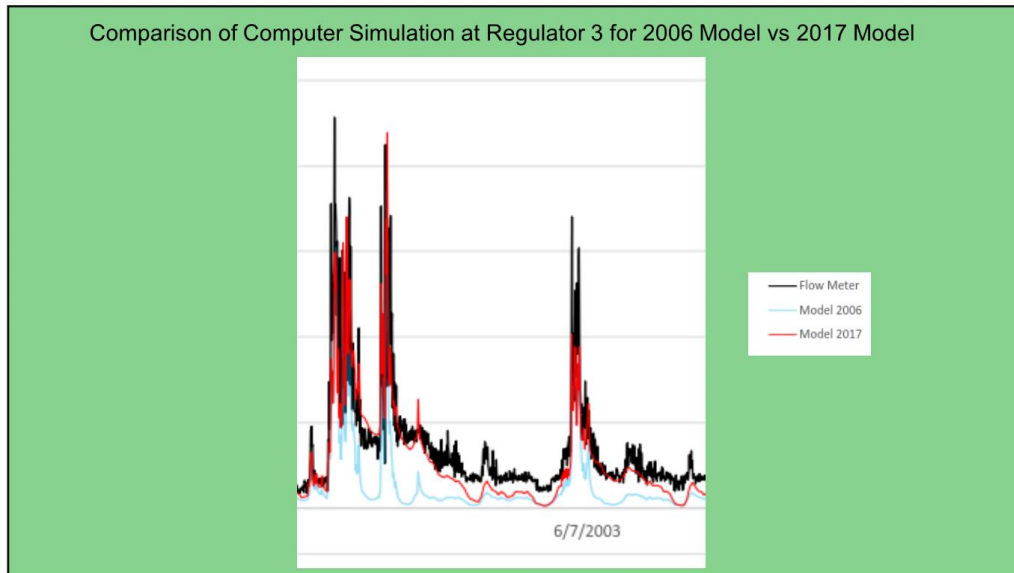


Comparison of Computer Simulation at Regulator 3 for 2006 Model vs 2017 Model



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Sewer System Characterization Report Update
Info Works Computer Model Update

Is the Updated Model any Better?

YES!

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Typical Hydraulic Year Analysis and Report

We need to Establish a
Average Precipitation
Characteristics for Use in
the Analysis of Alternatives

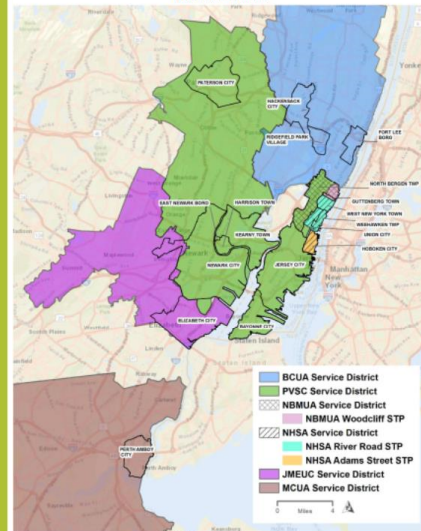
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The Combined Sewer
Discharges in the Region
Should Base their
Analyses on the Same
Rainfall Data

Figure 1-1: Participating NJCSO Group Members and Associated Central Sewage Treatment Facilities



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Typical Hydraulic Year Analysis and Report

1. What is a typical hydraulic year?
 - Average/typical Annual Rainfall Volume
 - Average/typical Storm Intensities
 - Average/typical Peak Rainfall Volume per Storm
2. Why is It important?
 - Permit Requires no more than an average of four overflows per year, or
 - 85% capture of CSO Volume on an average basis.
3. How is it determined?
 - Analysis of Historic Rainfall data.

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Typical Hydraulic Year Analysis and Report

Analysis is Being Undertaken by PVSC
For the New Jersey CSO Group

Analysis as Presented is in Draft Form
(August 2017)

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Typical Hydraulic Year Analysis and Report

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
1996	5.24	2.34	4.40	5.63	2.59	5.06	5.27	2.39	6.05	6.92	2.31	6.57	55.07
1997	3.50	2.15	5.19	3.05	3.12	2.42	7.05	2.59	2.20	2.02	4.54	4.16	42.35
1998	4.93	4.77	4.14	6.17	6.52	5.95	1.34	3.20	2.72	1.51	0.55	1.03	43.47
1999	6.57	3.10	3.63	1.90	4.19	0.41	1.01	5.51	9.35	2.90	2.90	2.95	44.75
2000	3.39	1.60	3.43	3.57	5.65	3.42	6.30	4.73	4.55	0.54	2.71	3.42	43.35
2001	2.57	1.79	6.69	1.71	2.55	3.97	2.29	1.97	4.29	0.46	0.51	2.01	31.44
2002	1.55	0.52	3.59	3.70	3.59	5.05	1.19	4.05	3.66	6.79	4.40	3.71	43.37
2003	2.94	3.90	3.95	2.42	3.45	10.50	2.59	5.21	5.57	3.72	3.94	5.11	56.33
2004	1.59	2.44	3.07	4.55	4.60	2.95	5.35	3.70	5.01	0.59	4.21	3.37	45.37
2005	3.93	2.51	4.16	3.42	1.21	2.99	4.05	0.51	0.45	13.22	3.74	3.65	44.14
2006	4.52	2.35	0.79	4.05	3.35	5.99	6.71	2.52	3.35	6.75	6.95	2.19	50.16
2007	3.50	1.43	3.93	11.55	1.87	5.24	6.71	7.32	1.51	3.70	2.35	4.75	54.49
2008	2.30	5.52	3.61	2.70	5.95	5.63	3.14	2.50	7.14	2.79	3.07	5.55	45.53
2009	2.55	0.55	1.61	4.61	4.05	7.96	6.60	4.14	1.73	5.43	1.20	7.13	47.93
2010	1.65	5.45	10.05	2.90	3.45	2.37	1.93	2.44	3.55	3.54	1.53	3.55	43.47
2011	4.40	3.49	5.54	5.96	4.75	2.74	2.04	15.79	5.13	5.50	3.53	4.51	69.91
2012	2.59	1.33	1.05	3.45	4.32	5.02	2.27	2.56	3.13	3.05	1.62	5.06	36.35
2013	2.49	3.55	3.00	1.47	5.44	5.74	3.74	4.57	1.54	0.51	2.97	4.02	42.94
2014	2.75	4.94	3.65	7.95	4.03	4.41	5.10	1.76	1.52	4.15	4.13	4.91	49.33
2015	4.42	2.06	4.63	1.67	4.53	5.90	2.69	1.40	2.33	3.35	1.30	4.40	35.95
2016	4.01	4.04	1.35	1.12	3.55	2.40	6.05	0.93	2.17	3.00	6.52	2.91	35.41

Rainfall is Highly Variable

Newark Airport – 1996 to 2015

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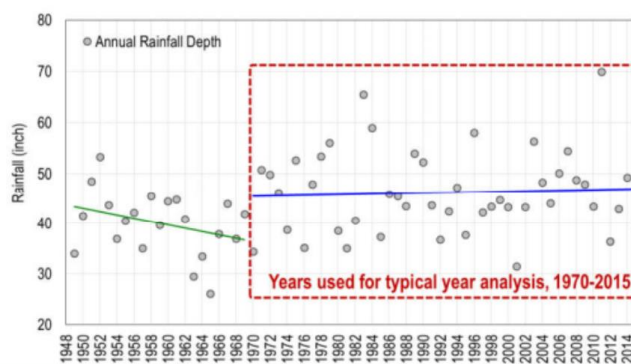
Typical Hydraulic Year Analysis and Report

Tables and Figures are
from PVSC Draft Report

PVSC's
Consultant
reviewed the
Period from
1948 to 2014
initially.

Selected Period
from 1970 - 2014

Figure 1-2: Historical Annual Precipitation at Newark Liberty International Airport



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Typical Hydraulic Year Analysis and Report

Tables and Figures are
from PVSC Draft Report

PVSC's Consultant separated the 45 years of rainfall data into rainfall volumes (inches) over set time increments from 5-min to 24-hrs to establish return periods to characterize storms

Table 1-3: Partial Duration Series (PDS) - Based Precipitation Frequency Estimates with 90% Confidence Intervals (in inches) for Newark WSO Airport
(Source: NOAA Precipitation Frequency Data Server)

Duration	Average recurrence interval (years)					
	1	2	5	10	25	50
5-min	0.332 (0.304-0.365)	0.396 (0.363-0.435)	0.469 (0.429-0.516)	0.522 (0.476-0.573)	0.59 (0.536-0.647)	0.636 (0.575-0.698)
10-min	0.529 (0.484-0.580)	0.633 (0.580-0.695)	0.75 (0.685-0.824)	0.834 (0.759-0.915)	0.935 (0.848-1.03)	1.01 (0.909-1.11)
15-min	0.66 (0.604-0.724)	0.793 (0.726-0.870)	0.946 (0.863-1.04)	1.05 (0.957-1.15)	1.18 (1.07-1.30)	1.27 (1.15-1.40)
30-min	0.903 (0.827-0.991)	1.09 (1.00-1.20)	1.34 (1.22-1.47)	1.52 (1.38-1.67)	1.74 (1.58-1.91)	1.91 (1.72-2.09)
60-min	1.12 (1.03-1.23)	1.37 (1.25-1.50)	1.71 (1.56-1.88)	1.97 (1.80-2.16)	2.31 (2.10-2.54)	2.58 (2.33-2.83)
2-hr	1.38 (1.26-1.52)	1.68 (1.53-1.85)	2.13 (1.93-2.35)	2.47 (2.24-2.73)	2.96 (2.66-3.26)	3.35 (3.00-3.69)
3-hr	1.54 (1.40-1.69)	1.87 (1.71-2.06)	2.37 (2.16-2.61)	2.76 (2.51-3.04)	3.3 (2.98-3.63)	3.75 (3.36-4.12)
6-hr	1.98 (1.81-2.18)	2.4 (2.20-2.64)	3.03 (2.77-3.33)	3.55 (3.22-3.88)	4.28 (3.85-4.68)	4.88 (4.37-5.34)
12-hr	2.43 (2.22-2.67)	2.95 (2.70-3.24)	3.75 (3.42-4.11)	4.41 (4.01-4.83)	5.39 (4.85-5.87)	6.22 (5.56-6.76)
24-hr	2.72 (2.52-2.96)	3.3 (3.06-3.58)	4.23 (3.91-4.59)	5.02 (4.63-5.44)	6.21 (5.69-6.72)	7.25 (6.59-7.83)

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Typical Hydraulic Year Analysis and Report

Tables and Figures are
from PVSC Draft Report

PVSC's Consultant Setup the Variables that needed to be Considered and Gave Each a Weighing Factor

Table 1-2: Typical Hydrologic Year Ranking Parameters

Criteria Parameter	Description / Importance	Weighting Factor
Annual rainfall depth	Impacting total overflow volume and storage volume	10%
Rainfall, May 15-Sep 15	Rainfall during Recreational Season, May 15-Sep 15	5%
Passaic River Flow, May 15-Sep 15	River flow during Recreational Season, May 15-Sep 15	5%
Ratio (Passaic River Flow)/(Rainfall), May 15-Sep 15	Impacts waterbody dilution factor	10%
5 th largest storm	Determining max storage volume or WWTP capacity	15%
Rainfall volume for 85% captured	Determining max storage volume or WWTP capacity	15%
# of events with rainfall depth ≥ 0.2 in	Rainfall depth to trigger overflow in existing system	5%
# of back-to-back rainfall events	Determining antecedent conditions and potential storage facility operation	15%
Maximum peak intensities of the 5 th largest storm and less	Determining the sizing of conveyance pipes, diversions, regulators, pumps, etc.	15%
# of storms with return frequency ≥ 1 -year	Extremely large storms to be avoided	5%

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Typical Hydraulic Year Analysis and Report

Tables and Figures are
from PVSC Draft Report

PVSC's
Consultant then
took each year
and calculated
each of the items
associated with
the ranking
system

Table 2-1: Annual Rainfall Statistics 1970-2015

Year	Demonstration Approach				Presumption		Operational			
	Annual Rainfall (in)	Rainfall (in) May 15 - Sep 15	River Avg. Flow (cfs) May 15 - Sep 15	Ratio Rainfall/ River, May 15 - Sep 15	5th Largest Storm Volume (in)	Rainfall Volume for 85% Captured (in)	# of Events ≥0.2" Rainfall Depth	# of back-to-back events	Max Peak Intensity of 5th Largest & Smaller	# of Storms with Return Freq. ≥ 1-yr
1970	34.4	12.7	289	22.8	1.07	0.79	50	7	0.98	0
1971	50.8	27.1	1,110	41.0	1.67	3.10	49	6	0.99	3
1972	49.9	16.2	1,957	120.8	1.78	1.38	57	5	0.62	4
1973	46.3	15.1	1,318	87.1	2.15	1.30	50	5	0.72	2
1974	38.8	17.3	634	36.6	1.2	0.94	54	5	0.88	1
1975	52.7	20.3	1,377	68.0	1.72	1.60	59	13	1.01	4
1976	35.2	10.3	503	49.1	1.3	0.97	50	3	0.91	2
1977	48.0	10.3	262	25.4	2.04	2.12	49	3	1.00	1
1978	53.4	21.1	1,042	49.3	2.42	1.54	51	3	1.28	5
1979	56.1	20.2	1,083	53.6	2.17	1.59	59	9	0.87	3
1980	38.5	7.9	291	37.0	1.85	1.35	37	1	0.71	2
1981	35.0	10.8	447	41.5	1.45	0.97	47	6	0.92	1
1982	40.6	14.4	686	47.6	1.54	1.17	44	6	0.75	1
1983	65.5	12.3	703	57.1	2.49	1.40	58	3	0.93	4
1984	59.0	24.6	1,653	67.2	1.98	1.65	51	4	0.94	7
1985	37.3	13.6	316	23.3	1.42	1.25	40	6	0.84	2
1986	46.0	14.4	545	37.9	1.77	1.48	52	7	0.76	2
1987	45.5	17.9	529	29.6	1.61	1.09	54	7	0.97	0
1988	43.5	18.4	768	41.8	1.66	1.13	55	10	0.80	2
1989	54.0	22.8	1,352	59.3	1.95	1.24	61	10	0.69	2
1990	52.3	20.8	1,269	61.2	1.88	1.10	62	6	1.04	2

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Typical Hydraulic Year Analysis and Report

Tables and Figures are
from PVSC Draft Report

PVSC's
Consultant then
took each year
and ranked it
based on the
ranking factors
and assigned
weights.

Table 2-2: Typical Hydraulic Year Ranking Analysis

	Demonstration Approach				Presumption		Operational				Deviation Score	Rank
	Annual Rainfall (in)	Rainfall (in) May 15 - Sep 15	River Avg. Flow (cfs) May 15 - Sep 15	Ratio Rainfall/ River, May 15 - Sep 15	5th Largest Storm Volume (in)	Rainfall Volume for 85% Captured (in)	Events >0.2" Rainfall Depth	# of back-to-back events	Max Peak Intensity of 5th Largest & Smaller	# of Storms with Return Freq. > 1-yr		
Weight Factor	10%	5.0%	5.0%	10%	15%	15%	5%	15%	15%	5%		
1970	0.026	0.012	0.031	0.048	0.057	0.065	0.001	0.036	0.013	0.050	0.338	38
1971	0.010	0.031	0.021	0.006	0.005	0.188	0.002	0.010	0.014	0.019	0.306	33
1972	0.008	0.001	0.076	0.177	0.005	0.000	0.006	0.017	0.047	0.042	0.378	42
1973	0.000	0.005	0.035	0.099	0.037	0.008	0.001	0.017	0.031	0.004	0.237	24
1974	0.016	0.002	0.009	0.016	0.046	0.048	0.003	0.017	0.004	0.027	0.197	13
1975	0.014	0.011	0.038	0.056	0.000	0.024	0.008	0.196	0.018	0.042	0.407	44
1976	0.024	0.019	0.018	0.012	0.037	0.044	0.001	0.070	0.001	0.004	0.231	22
1977	0.004	0.019	0.033	0.042	0.028	0.081	0.002	0.070	0.016	0.027	0.321	35
1978	0.015	0.013	0.017	0.013	0.061	0.018	0.000	0.070	0.062	0.065	0.335	37
1979	0.021	0.011	0.020	0.023	0.039	0.023	0.008	0.090	0.006	0.019	0.258	28
1980	0.017	0.026	0.031	0.015	0.011	0.003	0.014	0.123	0.032	0.004	0.277	30
1981	0.024	0.018	0.021	0.005	0.024	0.044	0.004	0.010	0.003	0.027	0.180	10
1982	0.012	0.007	0.006	0.009	0.016	0.023	0.007	0.010	0.026	0.027	0.142	4
1983	0.042	0.013	0.005	0.031	0.067	0.002	0.007	0.070	0.004	0.042	0.283	32
1984	0.028	0.024	0.056	0.054	0.022	0.030	0.000	0.043	0.006	0.111	0.374	41

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Typical Hydraulic Year Analysis and Report

To Be Conservative PVSC's Consultant
Eliminated any Year Where the Total Rainfall
was less than the Average of 46.3 inches

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Typical Hydraulic Year Analysis and Report

Tables and Figures are
from PVSC Draft Report

PVSC's
Consultant
determined the
top 5 years
based on the
results of the
analysis.

Table 2-3: Top 5 Ranked Years

Rank	Year	Score	Demonstration Approach				Presumption		Operational			
			Annual Rainfall (in)	Rainfall (in) May 15 - Sep 15	River Avg. Flow (cfs) May 15 - Sep 15	Ratio Rainfall / River, May 15 - Sep 15	5th Largest Storm (in)	Rainfall Volume for 85% Captur ed (in)	# of Events >0.2" Rainfall Depth	# of back- to- back events	Maximum Peak Intensity of 5th Largest & Smaller	# of Storms with Return Freq > 1-yr
1	2004	0.100	48.4	19.9	850	42.8	1.63	1.21	54	5	0.99	3
2	2008	0.130	48.8	18.5	504	27.3	1.84	1.37	49	6	0.77	3
3	2009	0.161	47.9	19.8	1,140	57.5	1.87	1.16	54	6	0.80	1
4	1996	0.165	58.1	18.6	770	41.4	2.00	1.32	63	7	1.09	3
5	2014	0.186	49.3	14.8	686	46.3	1.56	1.26	60	8	1.26	2
Average 1970-2015			46.3	16.7	779	43.7	1.72	1.38	51	5.6	0.90	2

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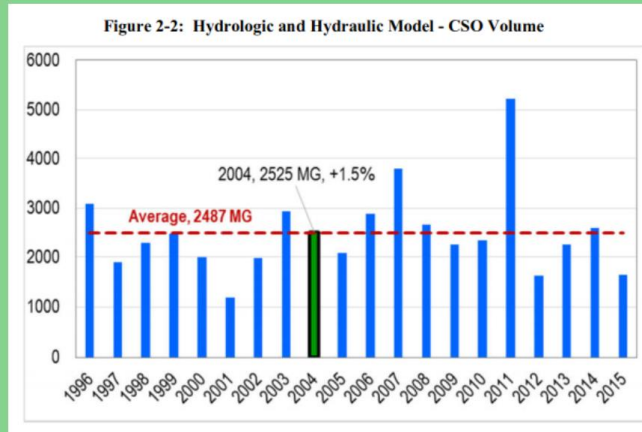
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Typical Hydraulic Year Analysis and Report

Tables and Figures are
from PVSC Draft Report

To check the results PVSC's Consultant conducted a continuous modeling simulation to evaluated the total CSO Volume generated during the selected year of 2004 to the average.



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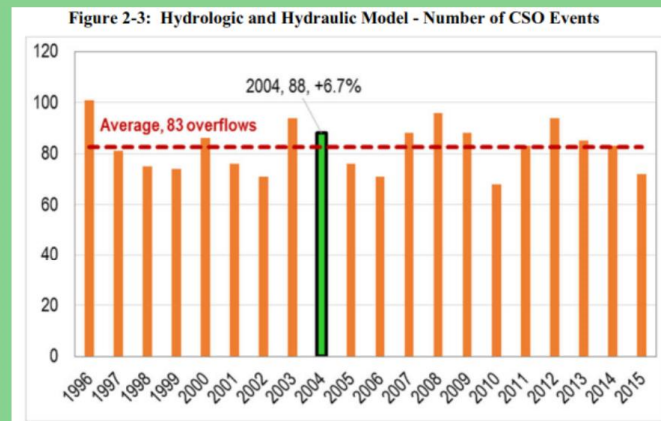
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Typical Hydraulic Year Analysis and Report

Tables and Figures are
from PVSC Draft Report

To check the results PVSC's Consultant conducted a continuous modeling simulation to evaluated the total number of CSO events generated during the selected year of 2004 to the average.



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Typical Hydraulic Year Analysis and Report

Tables and Figures are from PVSC Draft Report

How does it Compare to Average Conditions?

Table 2-5: Summary of the Recommended Typical Year - 2004

Parameters		2004
Rank		Top 1
Annual Rainfall		48.37 in (4.5% greater than average 46.27)
Extreme Storm		1 Year Storm (2) 2 Year Storm (1)
Back-to-Back Storm Events		5 (11% less than average 5.6)
May 15 through Sep 15	Rainfall	19.9 in (19% greater than average 16.7)
	Passaic River Flow	850 cfs (9% greater than average 779)
	Ratio, River Flow / Rainfall	42.8 (2% less than average 43.7)
Modeled Annual CSO Volume		2,525 MG (1.5% greater than average 2,487)
Modeled Annual Overflow Frequency		88 (6.7% greater than average 83)

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Typical Hydraulic Year Analysis and Report

PVSC's Consultant Has Completed the Draft and Is Recommending 2004 as the Typical Year.

- Currently Under Review by Individual Municipalities
- Needs to Be Submitted and Approved by NJDEP

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Ridgefield Park Project Schedule

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Ridgefield Park Project Schedule

Reports with Deadline of July 1, 2018:

- Quarterly Reports to NJDEP
- Submit Regional System Characterization Report
 - Develop Template for Report (BCUA)
 - Coordinate Model Integration (BCUA)
 - Draft Ridgefield Park Report – March 1, 2018
- Submit Public Participation Report
- Submit Compliance Monitoring Program Report*
- Submit Consideration of Sensitive Areas Plan

* New Jersey CSO Group Joint Effort

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Ridgefield Park Project Schedule

Deadlines After July 1, 2018:

- Quarterly Reports to NJDEP
- Submit Development and Evaluation of Alternatives Report
- Submit Selection and Implementation of Alternatives Report in Final Regional LTCP

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Questions?

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