1913 Herschell-Spillman Carousel

CITY OF STORY CITY

504 Broad Street
Story City, IA 50248
515.733.2121
www.cityofstorycity.org

COUNCIL WORK SESSION AGENDA
MONDAY, DECEMBER 7, 2020
5:30 P.M. - - CITY HALL SECOND FLOOR

I. CALL TO ORDER AND ROLL CALL, 5:30 P.M.

II. APPROVE/AMEND THE AGENDA

III. WASTEWATER TREATMENT PLANT FACILITY STUDY

IV. ADJOURNMENT

City of Story City

Wastewater Treatment Facility

MSA

Existing Wastewater Treatment System

- Sequencing Batch Reactor
- Iowa DNR Compliance Concerns with Existing Treatment system
  - Bypasses
  - Infiltration and Inflow
- Operational Concerns

DEPARTMENT OF NATURAL RESOURCES

GOVERNOR KIM REYNOLDS
LT. GOVERNOR ADAM GREGG
DIRECTOR CHUCK GIPP

December 13, 2017

MIKE JENSEN, MAYOR
CITY OF STORY CITY
504 BROAD STREET
STORY CITY, IA 50248

SUBJECT: Letter of Non-Compliance: Bypassing (567 IAC 63.6(455B))
NPDES Permit #: 8584001

Honorable Mayor and Council:

Enclosed is the report completed by Tom Atkinson of the Field Office #5 staff following his visit to the City of Story City's wastewater Treatment Facility. A Letter of Non-Compliance is being issued due to the bypassing events that occurred during 2017.

Due to the significant maintenance needs of the facility resulting in multiple bypassing events during the past year, the DNR is hereby requesting preparation and submittal of a Plan of Action to address these issues. The Plan of Action must be prepared in accordance with the attached guidance document and submitted to this office by July 1, 2018. However, more pressing maintenance needs may need to be addressed prior to this deadline.

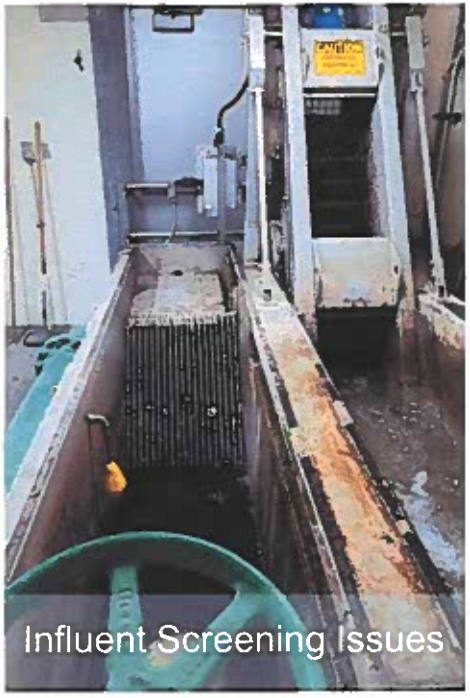
The operators of the water and wastewater facilities must continue making progress towards obtaining the required operator certification for the respective facilities.

MSA

Existing Headworks Building Issues

Outdated Grit System

Inoperable Exhaust System



Influent Screening Issues

Jetco Inc.
2608 1st Ave S
Altoona, IA 50009
Phone: 515-967-5874
Fax: 515-967-4110

AutomaticSystemsCo.
Industry Leading Control Systems Integrator Since 1967

Changed System Integrators

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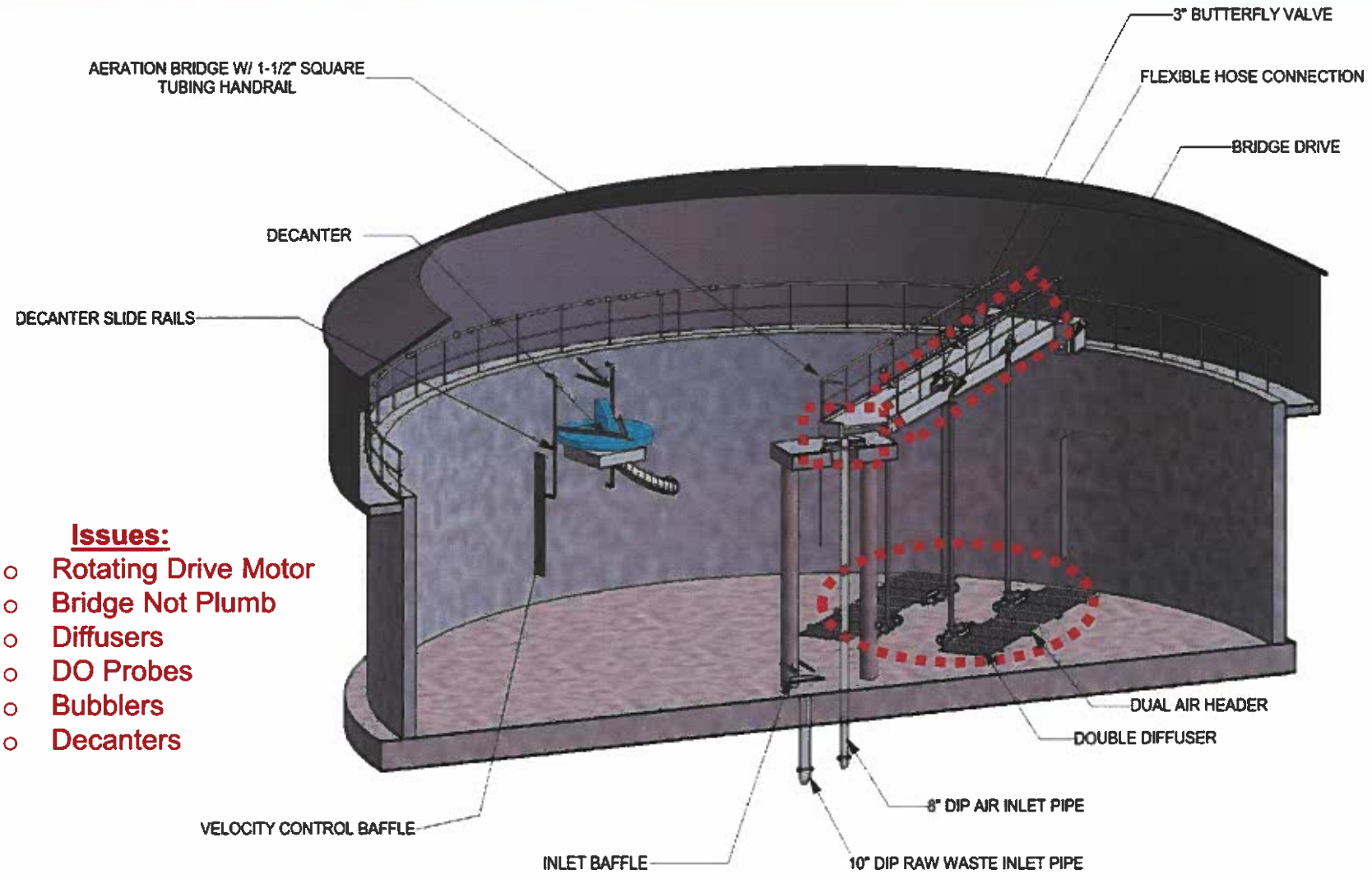
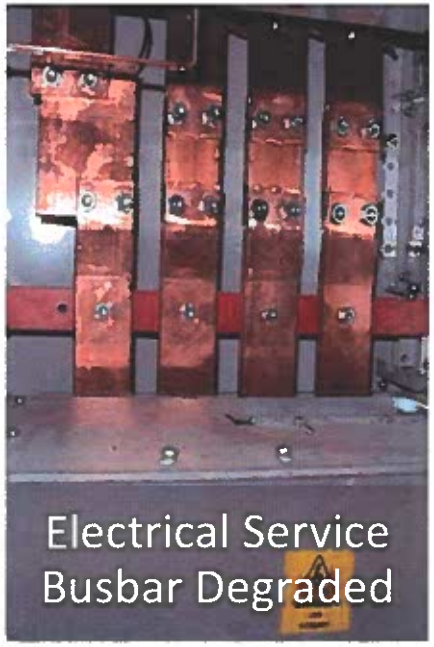
Existing Sequencing Batch Reactor Issues



Issues:

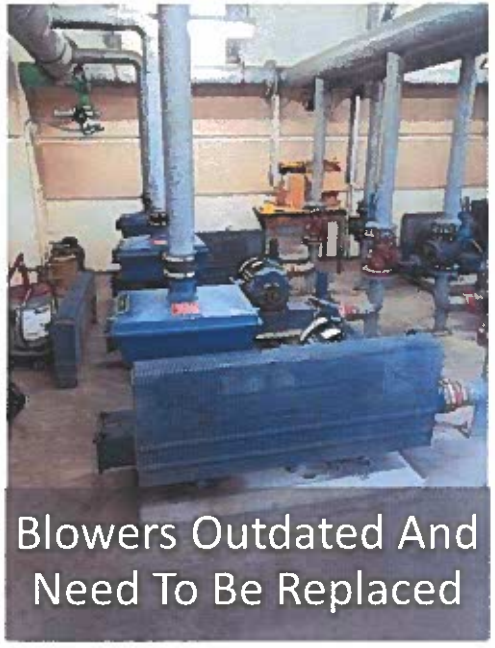
- Rotating Drive Motor
- Bridge Not Plumb
- Diffusers
- DO Probes
- Bubblers
- Decanters

Existing Blower Building Issues



Electrical Service Busbar Degraded

Exhaust Issues Within Building (Excessive Heat Retention)



Blowers Outdated And Need To Be Replaced

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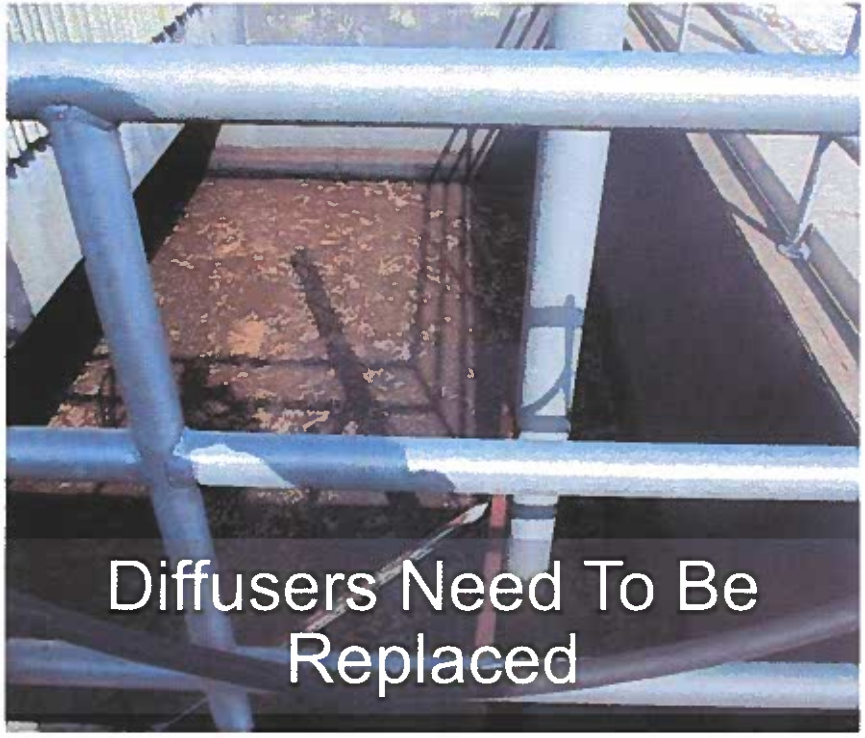
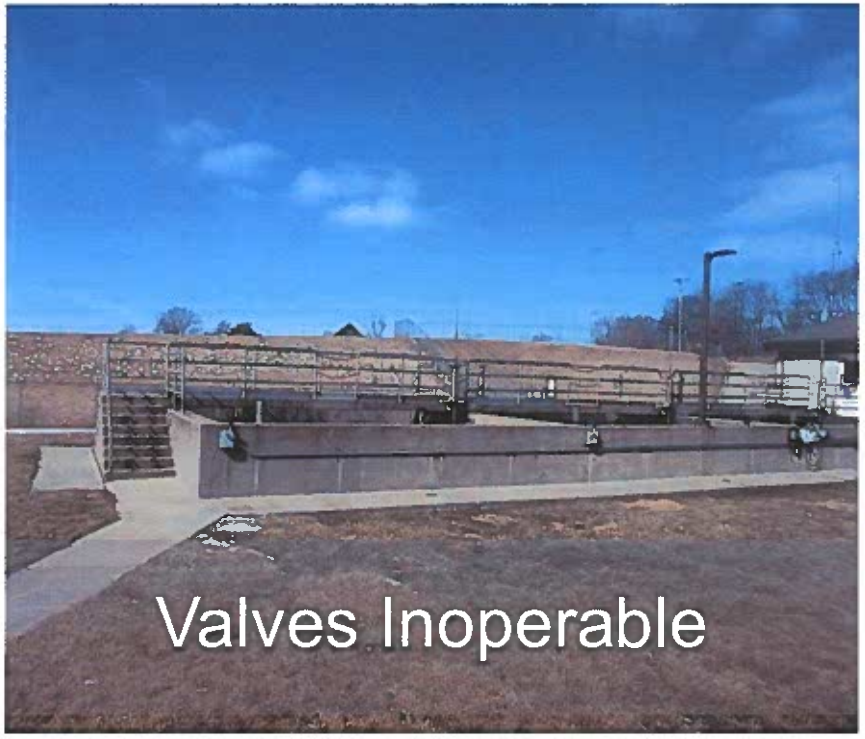
Existing Sludge Tanks/Aerobic Digesters



Diffusers Need To Be Replaced



Valves Inoperable

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Existing Ultraviolet Disinfection Building

UV Disinfection System Outdated and Limited Capacity

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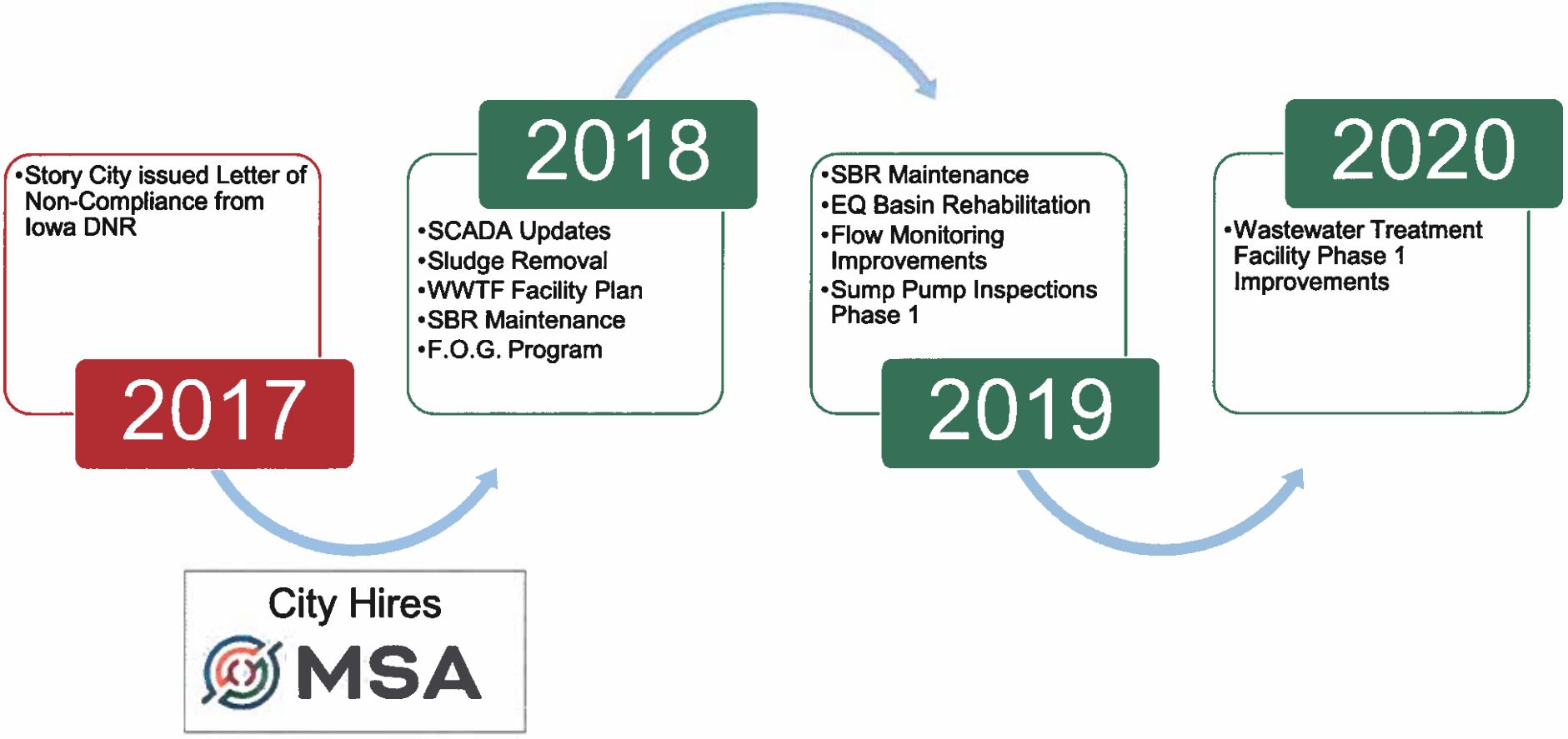
History


•Story City issued Letter of Non-Compliance from Iowa DNR
2017
City Hires
MSA
2018
•SCADA Updates
•Sludge Removal
•WWTF Facility Plan
•SBR Maintenance
•F.O.G. Program
•SBR Maintenance
•EQ Basin Rehabilitation
•Flow Monitoring Improvements
•Sump Pump Inspections Phase 1
2019
2020
•Wastewater Treatment Facility Phase 1 Improvements

Sludge Removal

Contractor:	Midwest Injection
Cost:	$62,000
Final Completion:	June 28, 2018

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Existing SBR Maintenance

Before

Replacing Aeration Diffusers

City:

- Repaired SBR Bubbler Tubes
- Replaced SBR DO Probes
- Replaced Decanter In SBR #2
- Replaced Influent Actuator
- Replaced SBR Wasting Actuators

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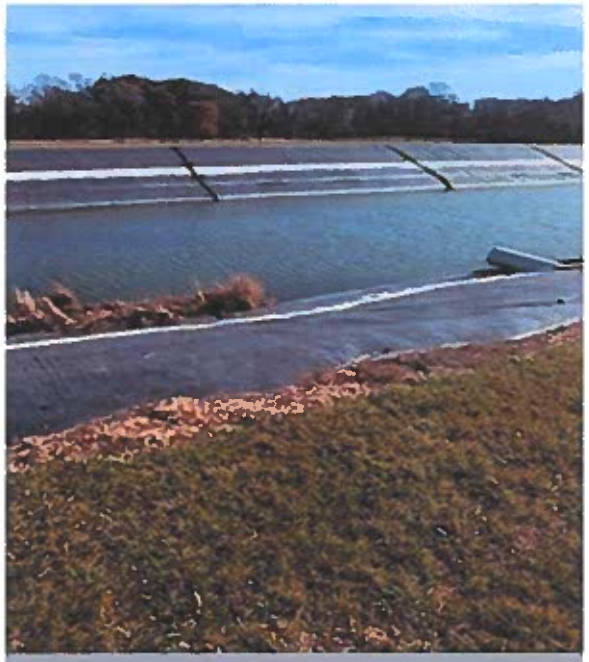
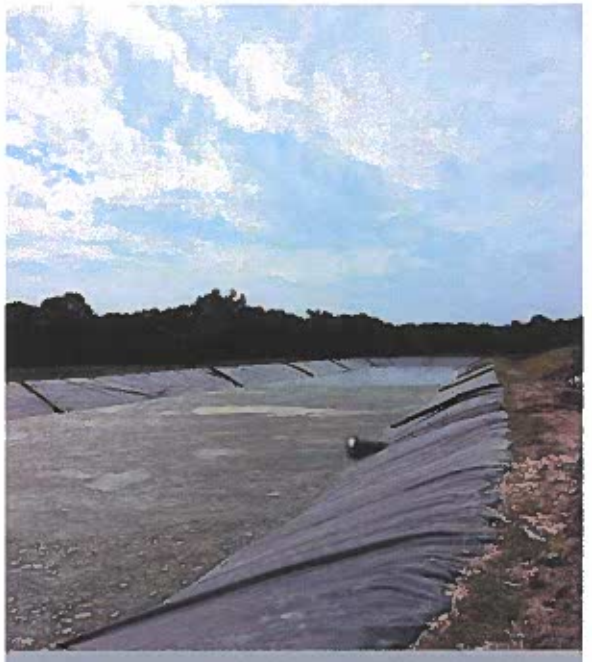
Equalization Basin Liner Replacement

Contractor:	Minturn
Cost:	$235,201
Final Completion:	9/15/2019



Before

During Construction



After Construction

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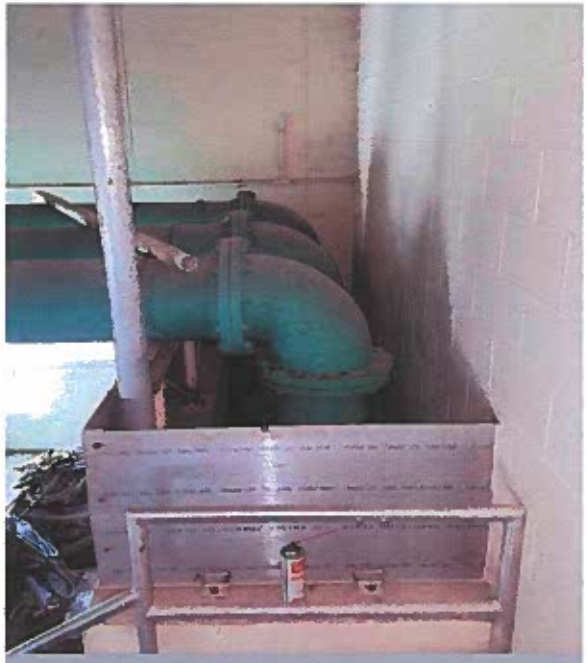
Flow Monitoring Improvements

Contractor:	Minturn
Cost:	$315,310
Final Completion:	1/2/2020



Before

During Construction

After Construction

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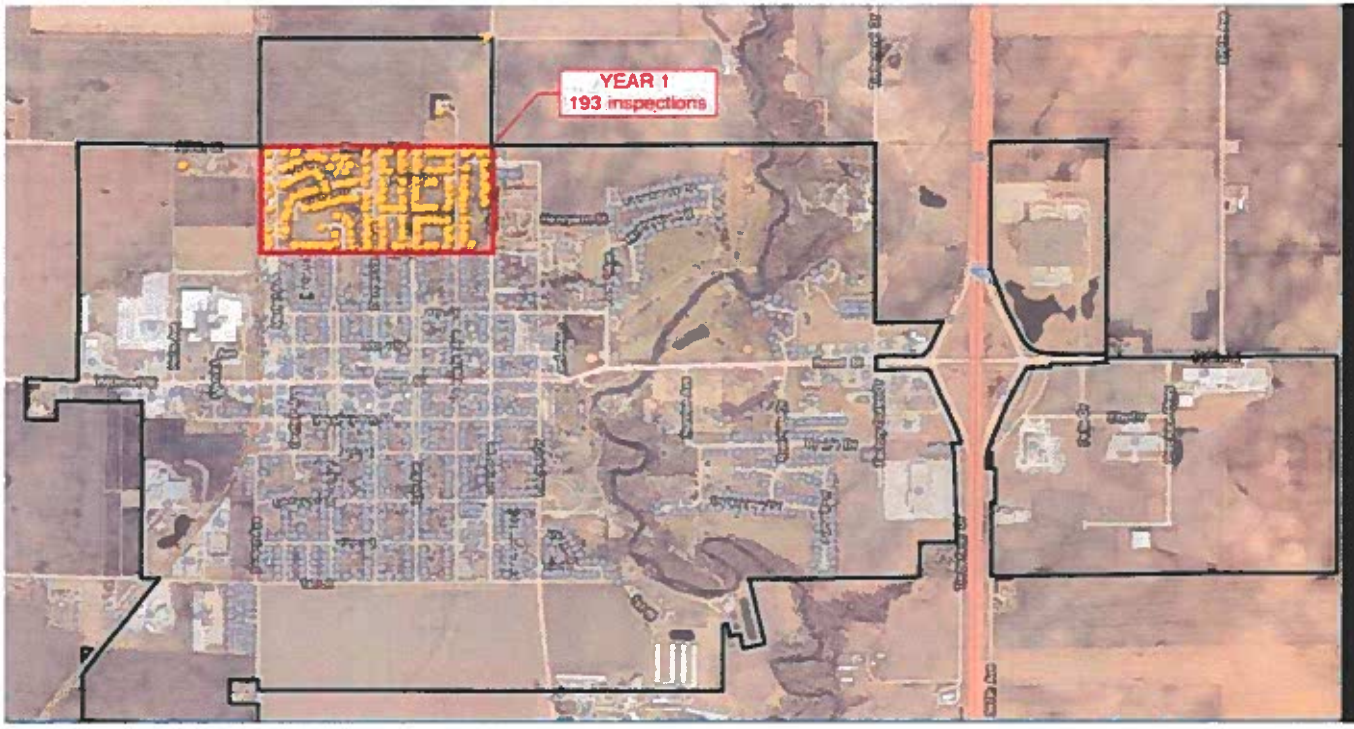
Sump Pump Inspections Phase 1, Yearly I/I Reduction, and FOG Program



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Wastewater Treatment Facility Phase 1 Improvements

Contractor: Weidner
Cost: $1,050,637
Construction Ongoing

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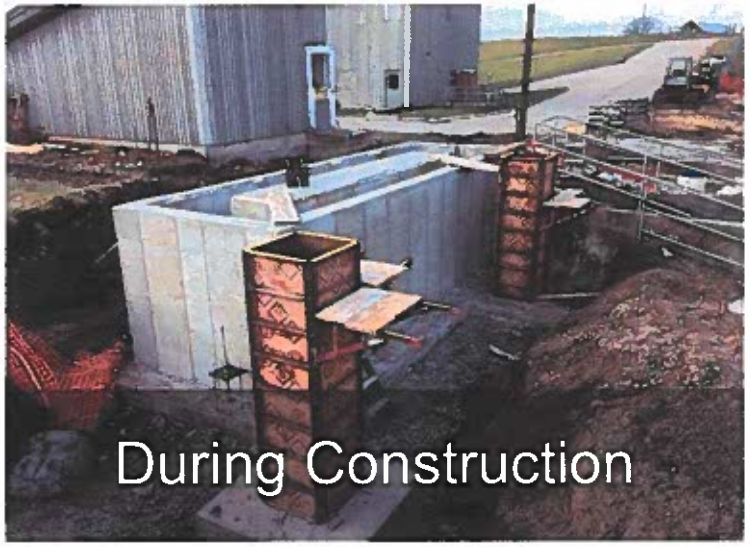
Wastewater Treatment Facility Phase 1 Improvements



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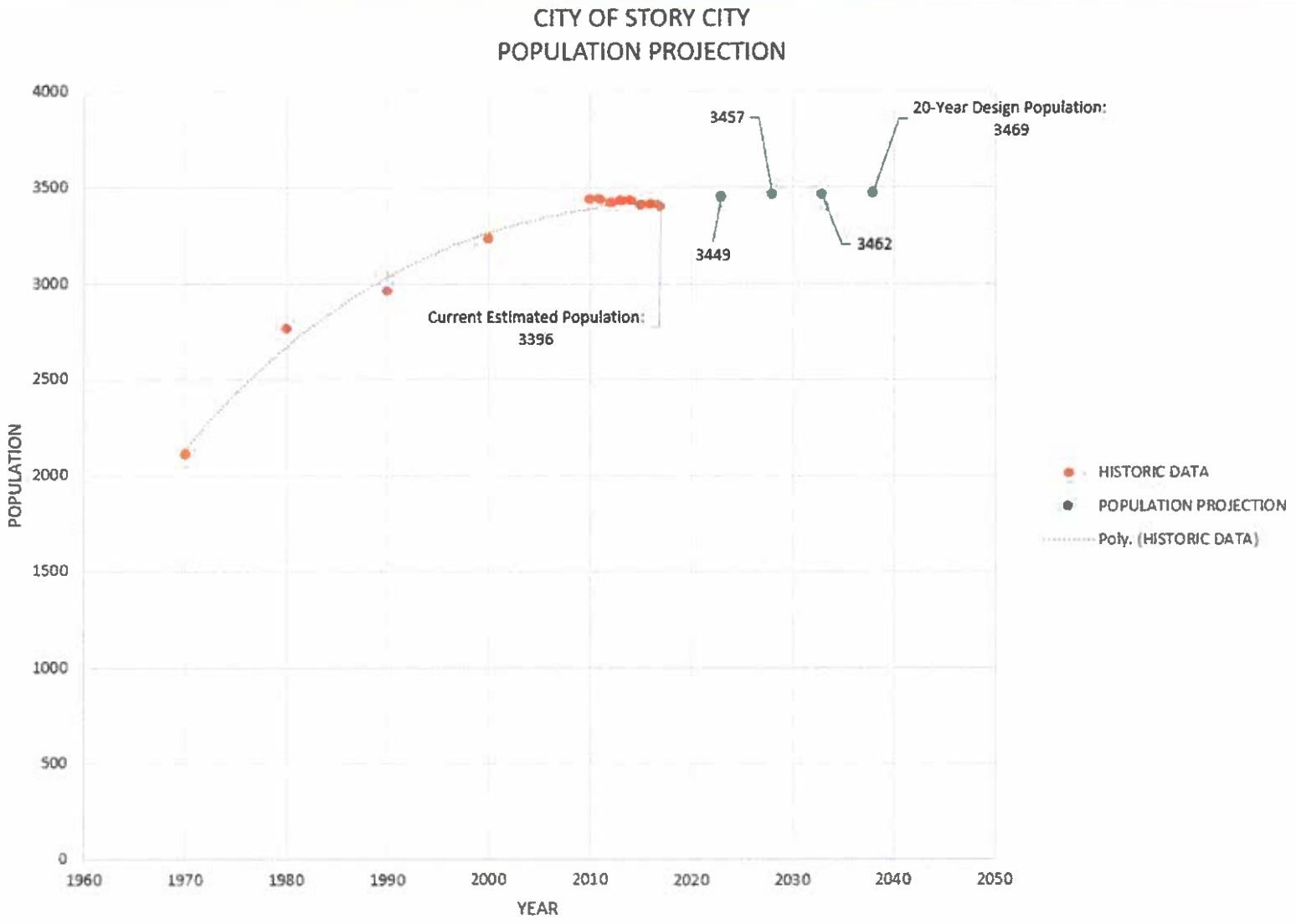
STORY CITY WASTEWATER FACILITY PLAN

- Review Existing wastewater Treatment Plant
- Projections for Growth
- New Regulations
- Potential improvement options
- Walkthrough of recommended solution
- Schedule and cost

Story City Design Population for Wastewater Treatment Facility



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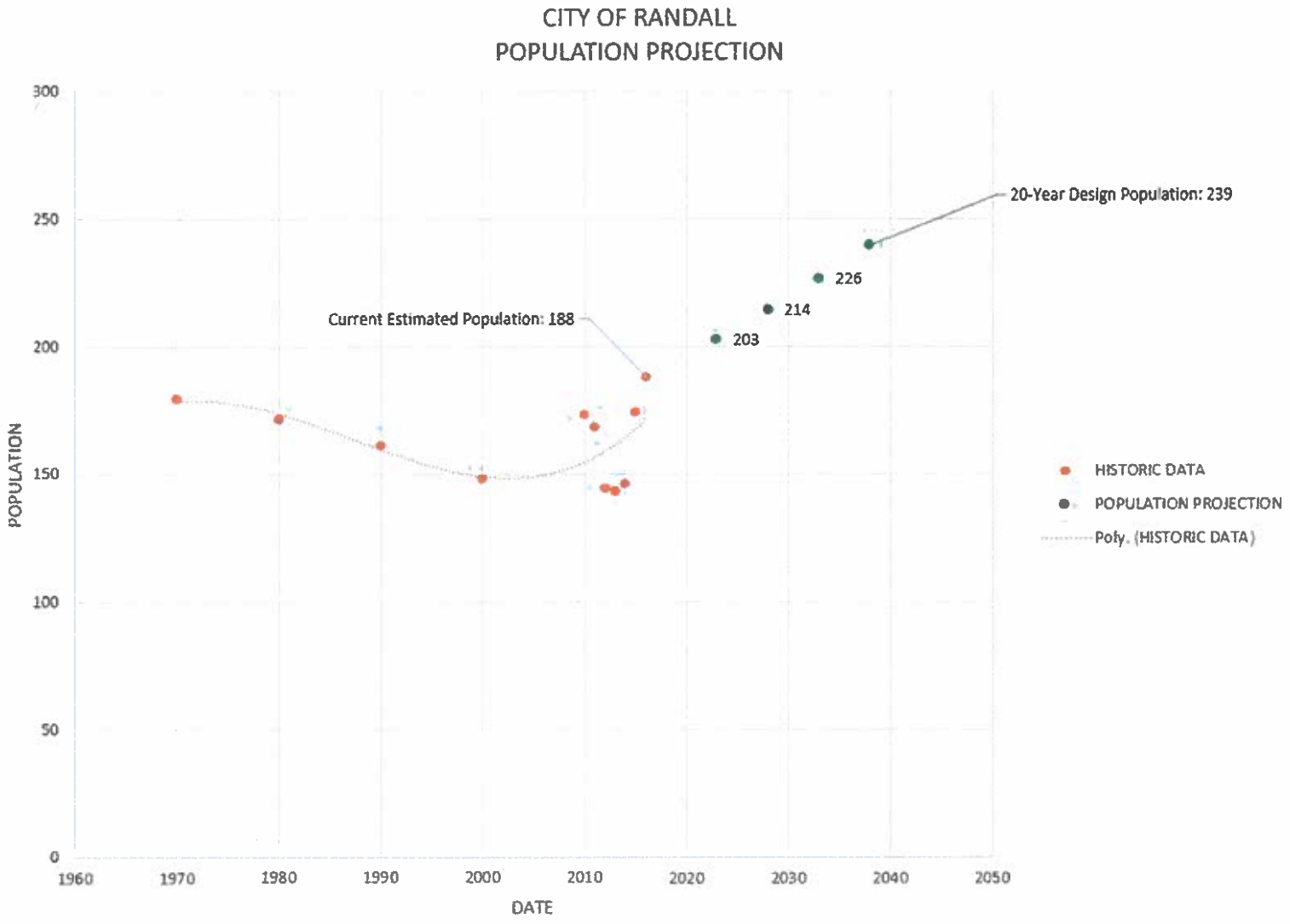
Randall Design Population for Wastewater Treatment Plant



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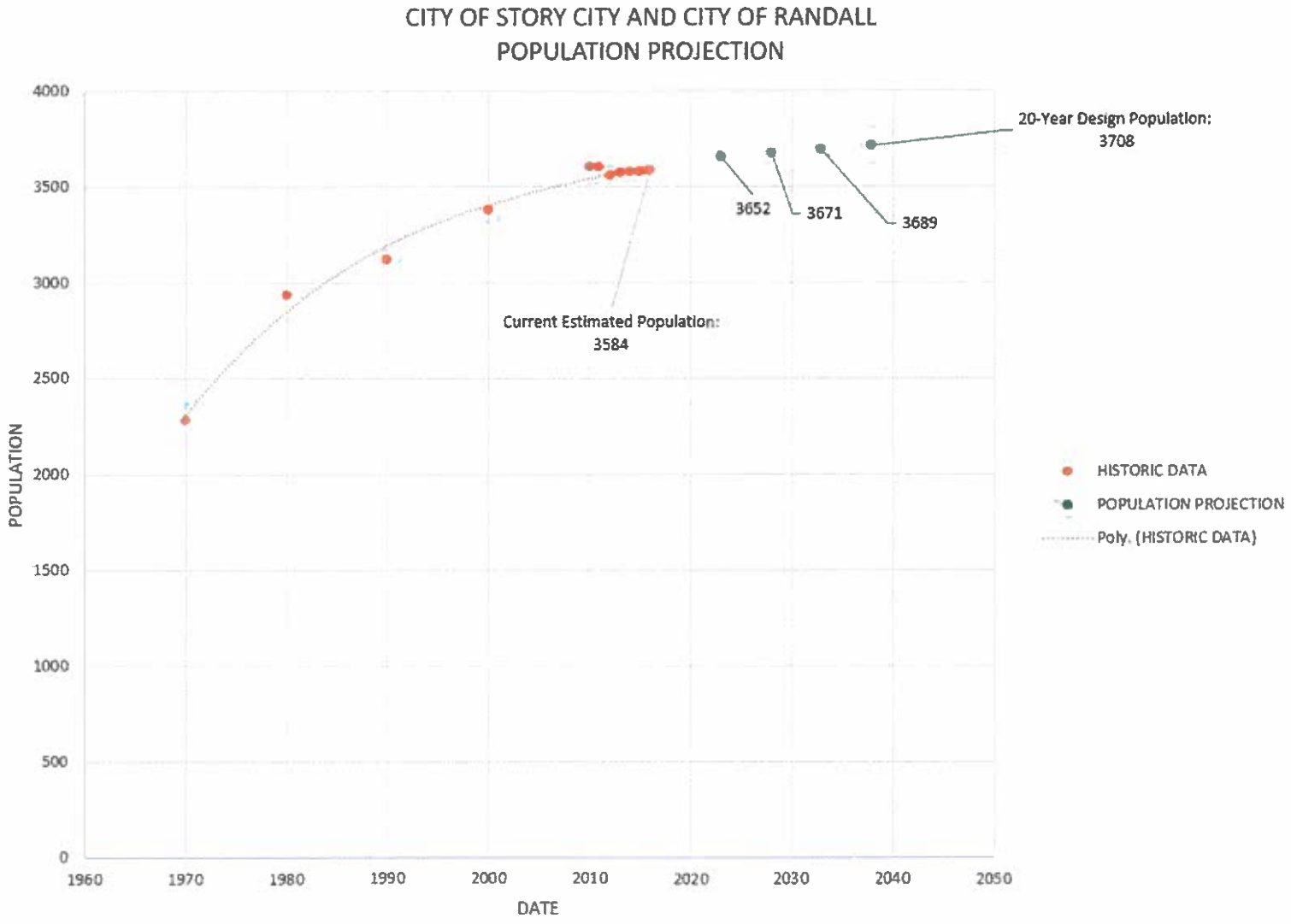
Wastewater Treatment Plant Design Population



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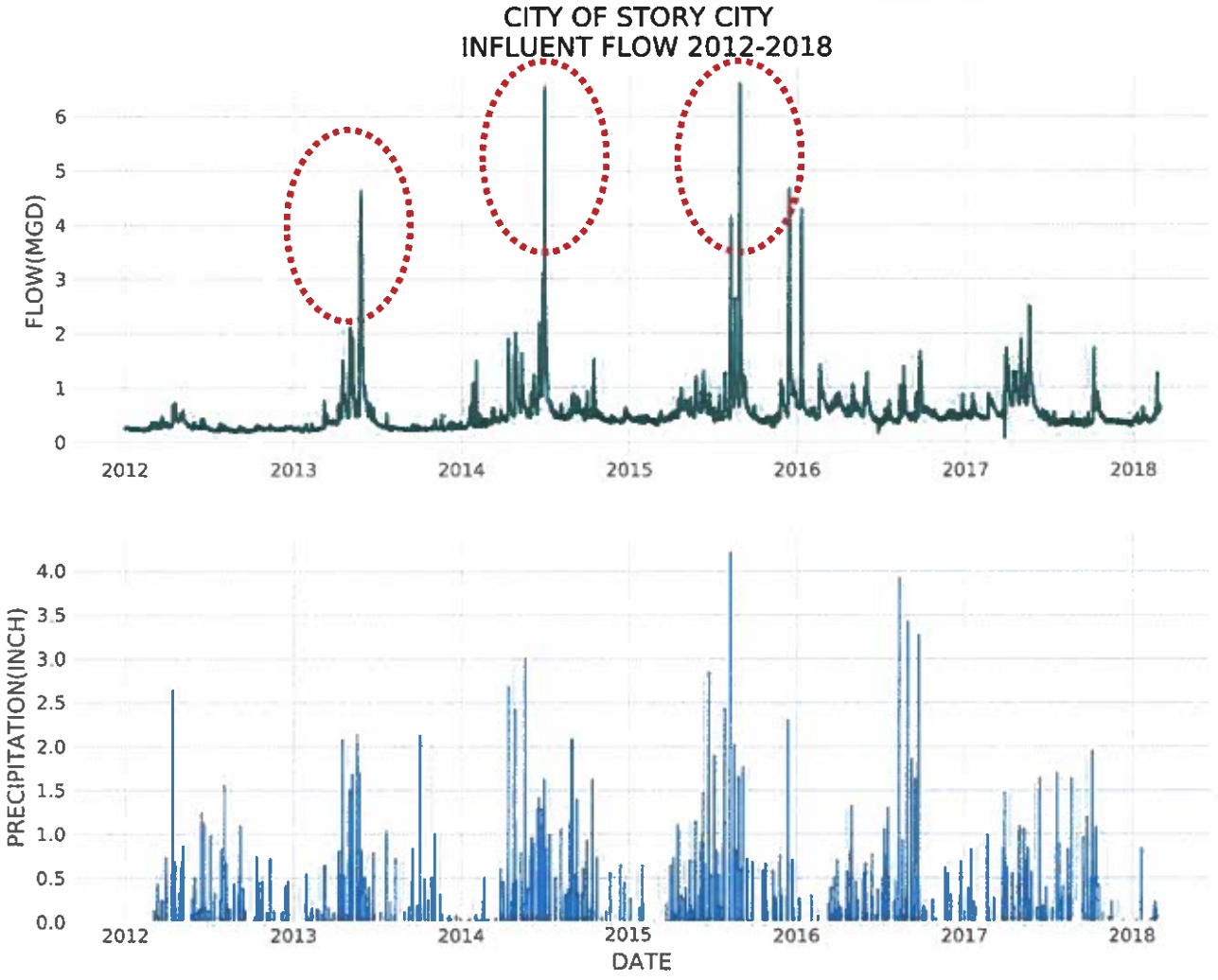
MONTHLY WASTEWATER FLOWRATES



Significant Infiltration & Inflow Causes Spikes in Flowrates at WWTF

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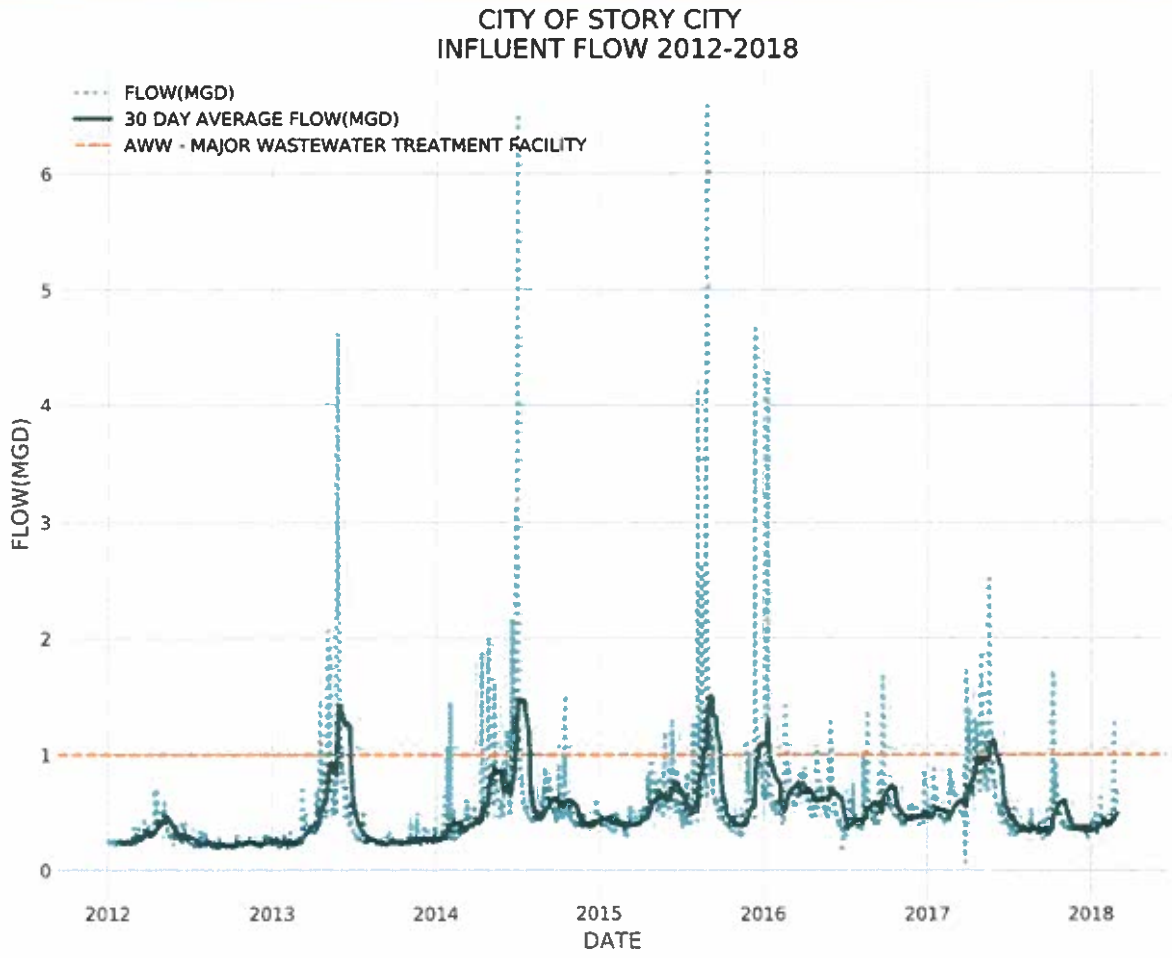
MONTHLY WASTEWATER FLOW RATES – MAJOR WASTEWATER TREATMENT FACILITY



Pushes Proposed Treatment Plant Above 1 MGD Threshold

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PROPOSED DESIGN OF WASTEWATER TREATMENT PLANT

Existing Wastewater Plant Population served 3,584

EXISTING FLOWS		EXISTING LOADS	
ADW	0.423 MGD	BOD	412 lb/day
AWW	1.508 MGD	TSS	447 lb/day
MWW	6.585 MGD	TKN	81 lb/day
PHWW	13.96 MGD		

Proposed Wastewater Plant Population will serve 3,708

PROPOSED FLOWS		PROPOSED LOADS	
ADW	0.438 MGD	BOD	426 lb/day
AWW	1.56 MGD	TSS	462 lb/day
MWW	6.813 MGD	TKN	84 lb/day
PHWW	14.43 MGD		

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New Permit Compliance Issues

New/More Stringent Permit Limits:

- Ammonia Nitrogen
- E Coli
- Phosphorus
- Total Nitrogen

ENVIRONMENTAL SERVICES DIVISION
WATER QUALITY BASED PERMIT LIMITS

SECTION VI: WATER QUALITY-BASED PERMIT LIMITS

Facility Name: Story City, City of STP — Sewage File Number: 6-85-84-0-01

Parameters	Ave. Conc. (mg/l)	Max. Conc. (mg/l)	Ave. Mass (lbs/d)	Max. Mass (lbs/d)
Outfall No. 001	**ADW = 0.438 mgd & AWW = 1.560 mgd**			
CBOD5	Secondary Treatment Levels Will Not Violate WQS			
Total D.O.	Minimum Concentration (mg/l)			
January - December	5.0			
Ammonia – Nitrogen*				
January	4.0	15.2	46.5	197.7
February	4.6	14.2	53.9	184.8
March	2.4	14.7	28.6	191.2
April	1.8	15.7	20.8	204.4
May	2.0	15.2	23.7	**167.8**
June	1.5	**13.6**	17.9	**108.0**
July	1.2	**9.8**	13.7	**74.2**
August	1.1	**9.3**	13.0	**69.0**
September	1.2	**12.3**	14.4	**95.0**
October	1.8	15.7	21.2	**148.3**
November	2.7	14.7	31.7	191.2
December	2.9	16.0	33.8	207.7
Bacteria	Geometric Mean (#org./100 ml)		March 15th – November 15th	
E. coli	126			
Chloride	397	630	5,085	8,185
Sulfate	1,516	1,516	19,702	19,702
TRC**	0.0087	0.0190	0.1116	0.2473
pH	6.5-9.0 Standard Units			
Major Facility Acute WET Testing Ratio: Use 99.9% of effluent and 0.1% of dilution water for the testing				
Stream Network/Classification of Receiving Stream: South Skunk River (A1, B(WW-1), HH)				

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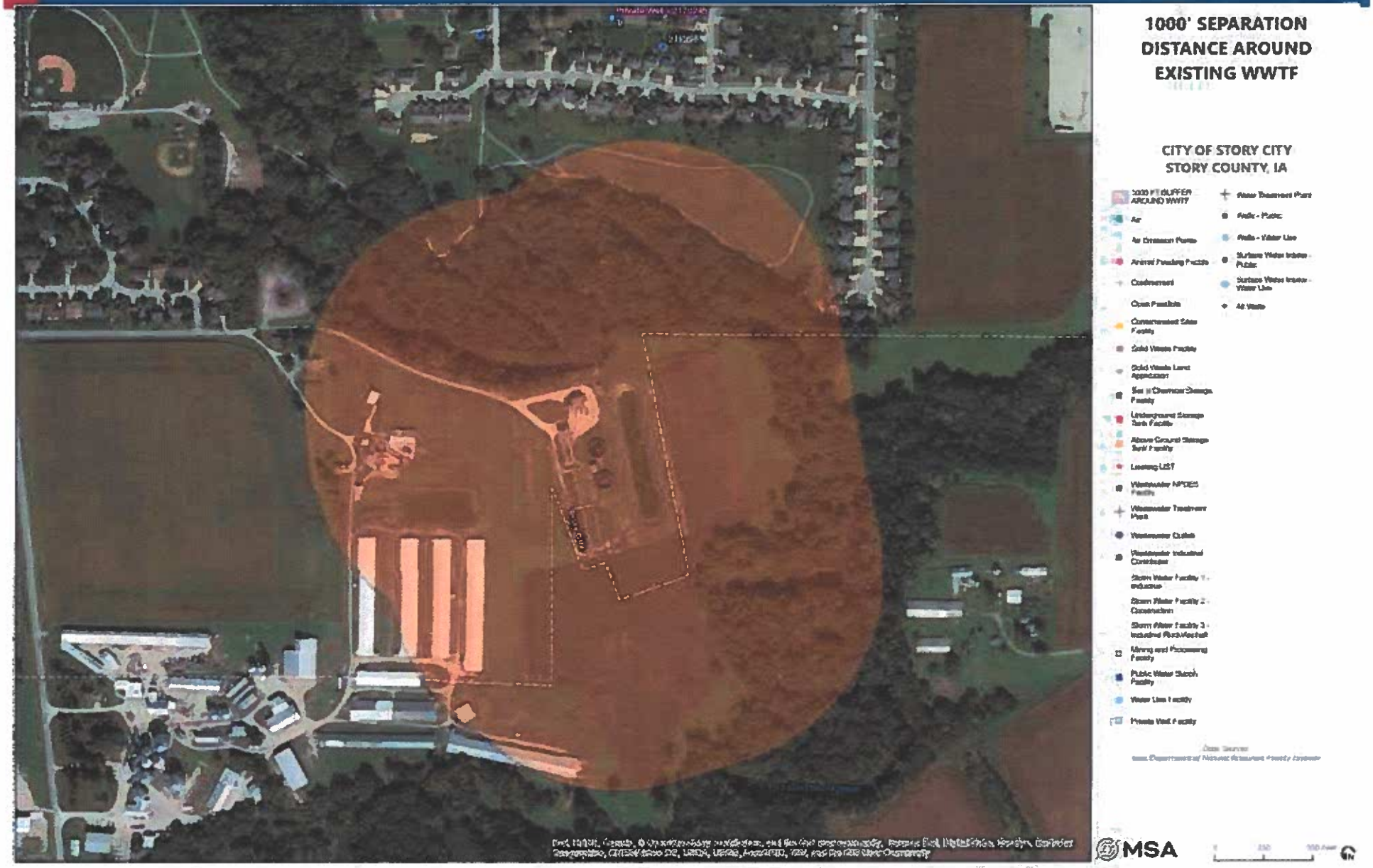
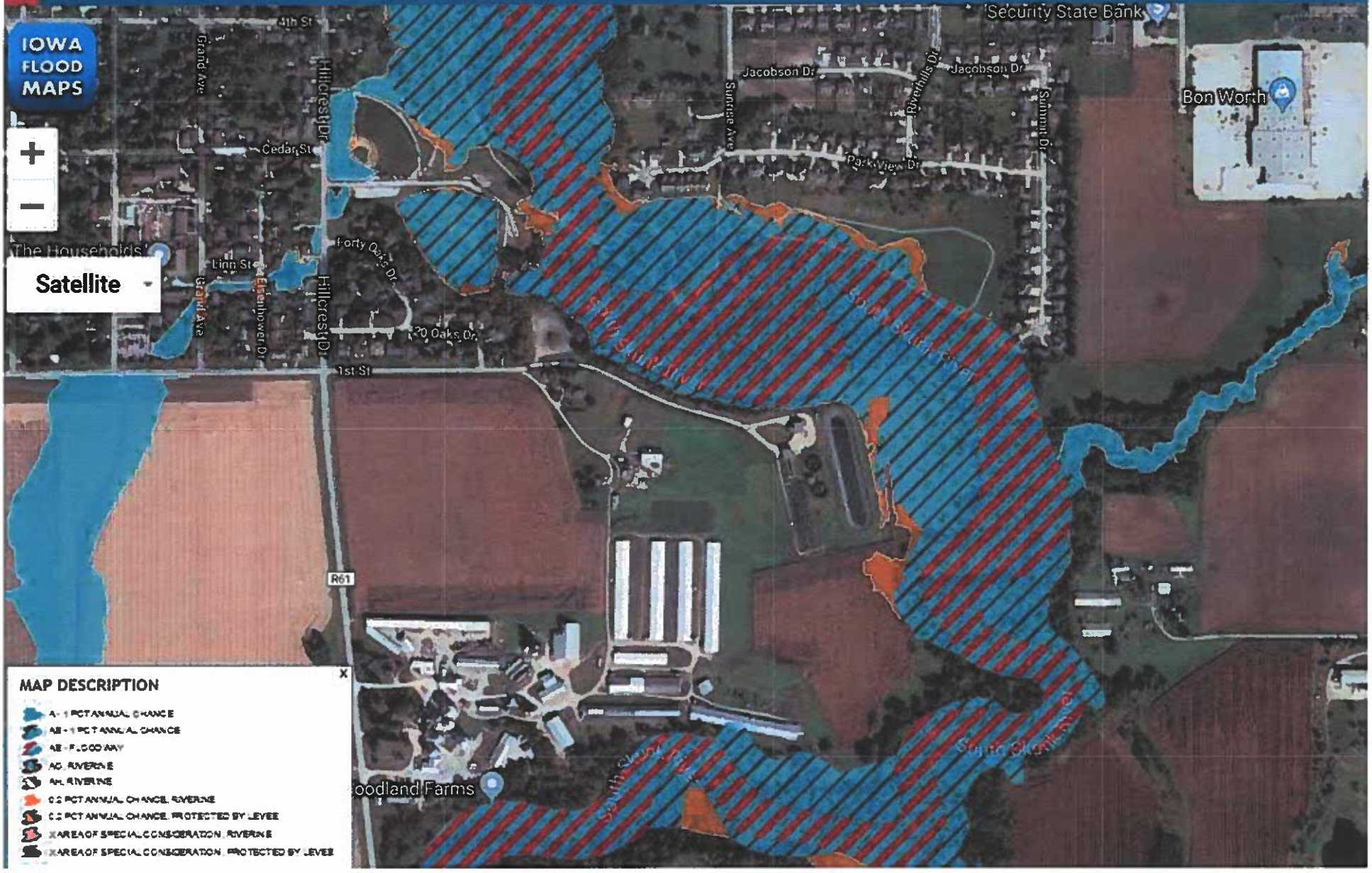
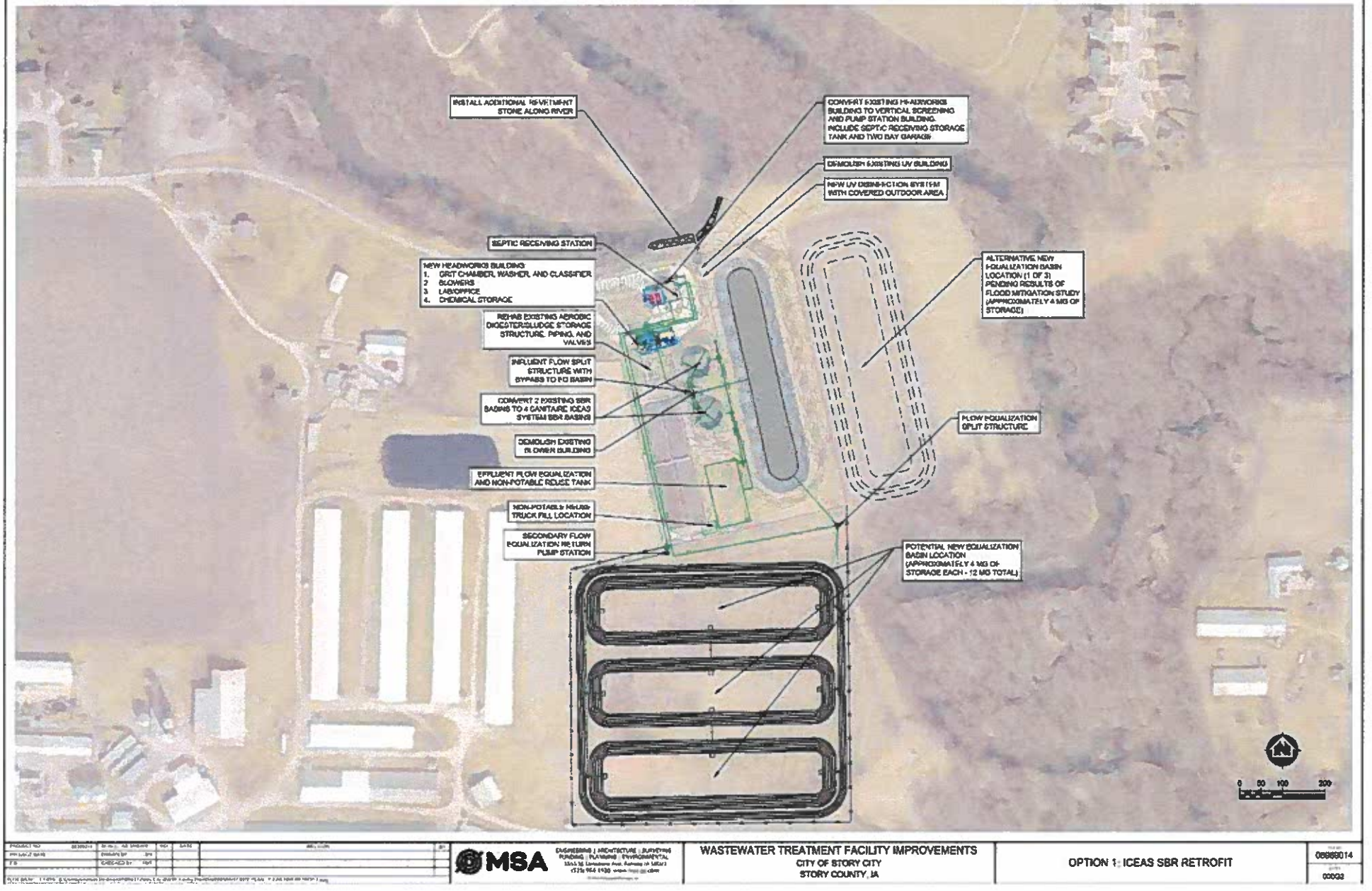
LIMITATIONS ON LOCATIONS FOR IMPROVEMENTS



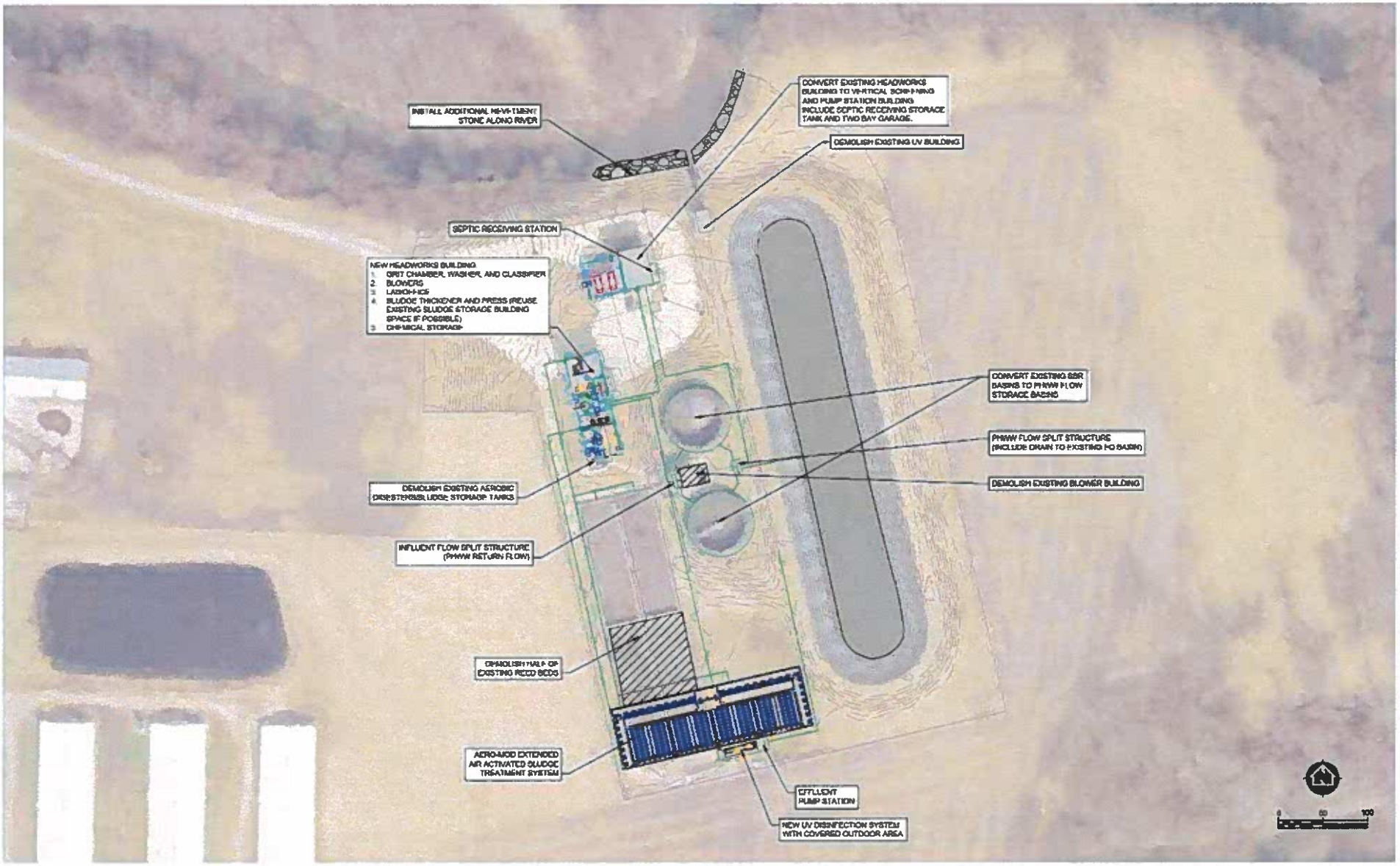
Flood Plain Concerns



Option 1 - SBR Retrofit



Option 2 – Aero-Mod Treatment System



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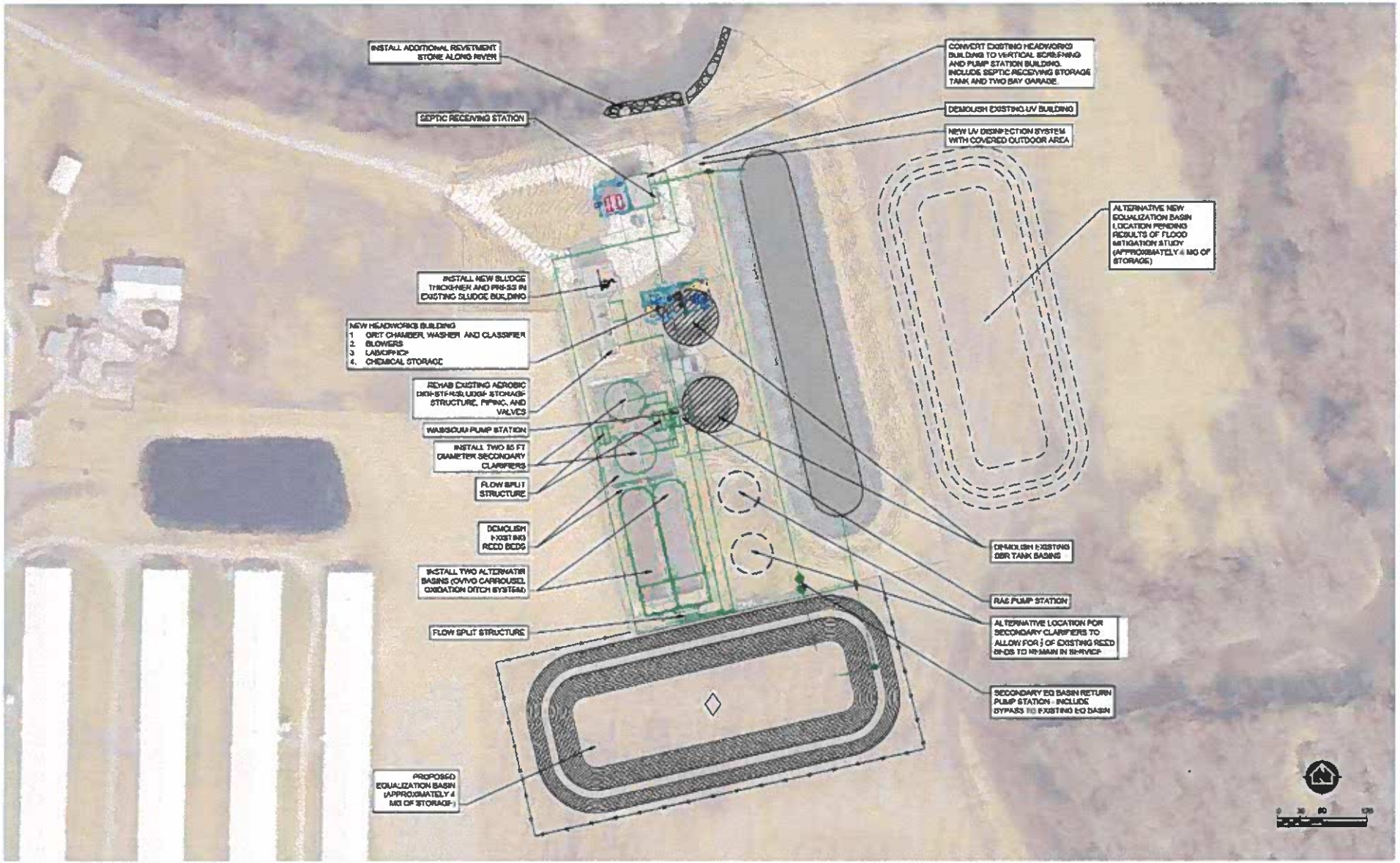
WASTEWATER TREATMENT FACILITY IMPROVEMENTS
CITY OF STORY CITY
STORY COUNTY, IA

OPTION 2: AERO-MOD TREATMENT SYSTEM

08989014

000G2

Option 3 – Oxidation Ditch



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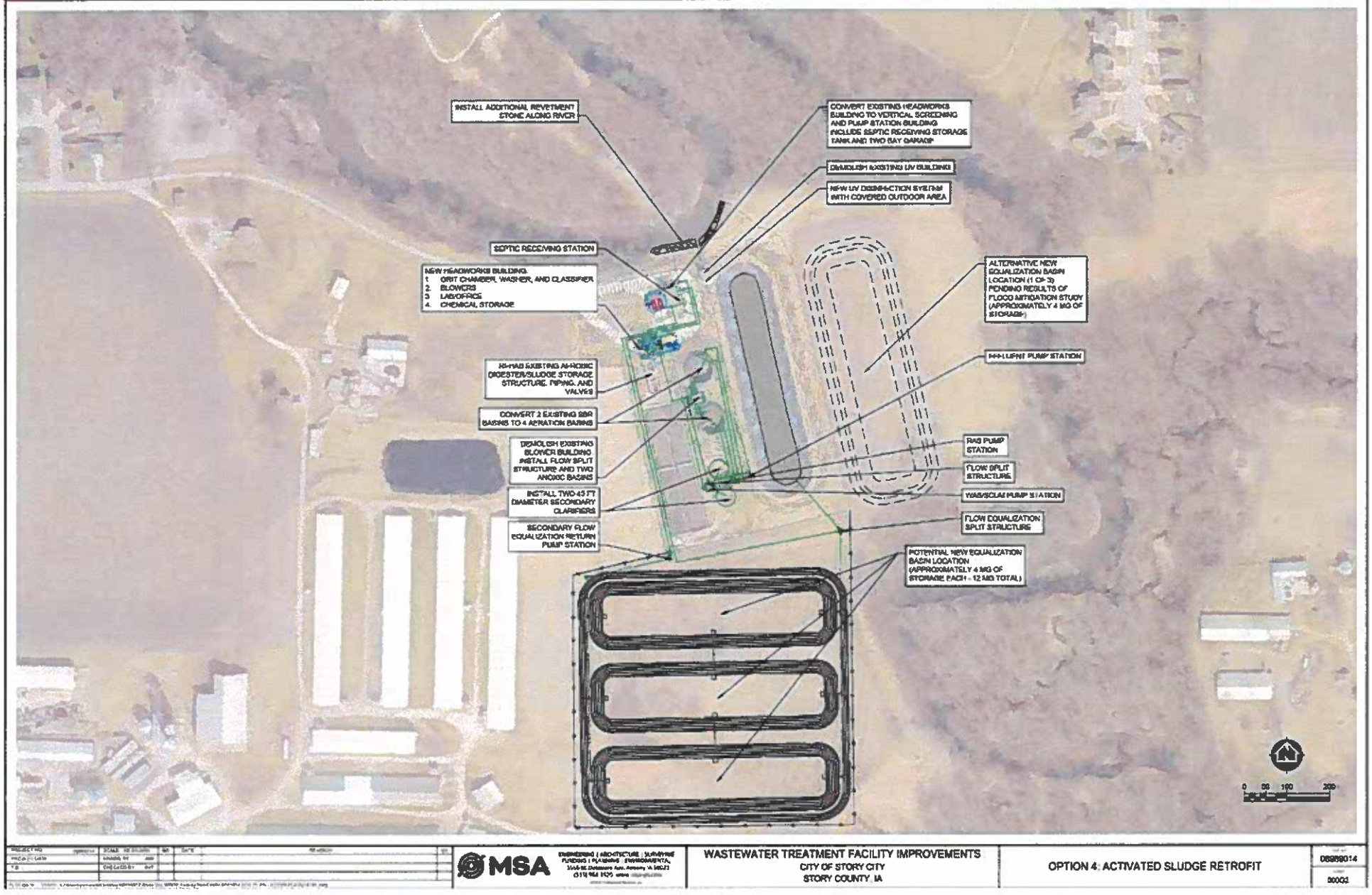
WASTEWATER TREATMENT FACILITY IMPROVEMENTS
CITY OF STORY CITY
STORY COUNTY, IA

OPTION 3: OVIVO CARROUSEL OXIDATION DITCH

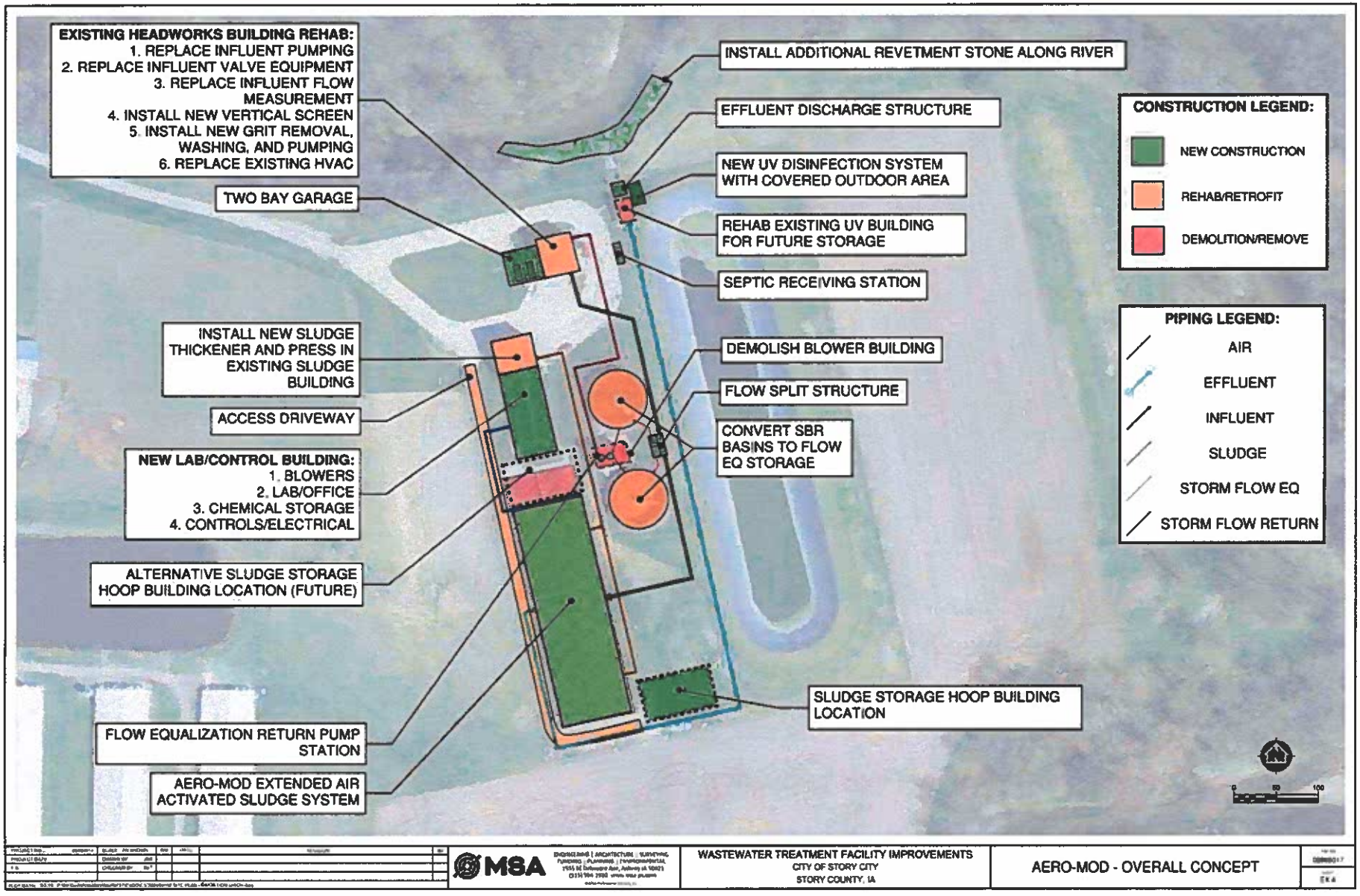
08089014

Option 4 – Activated Sludge Conversion

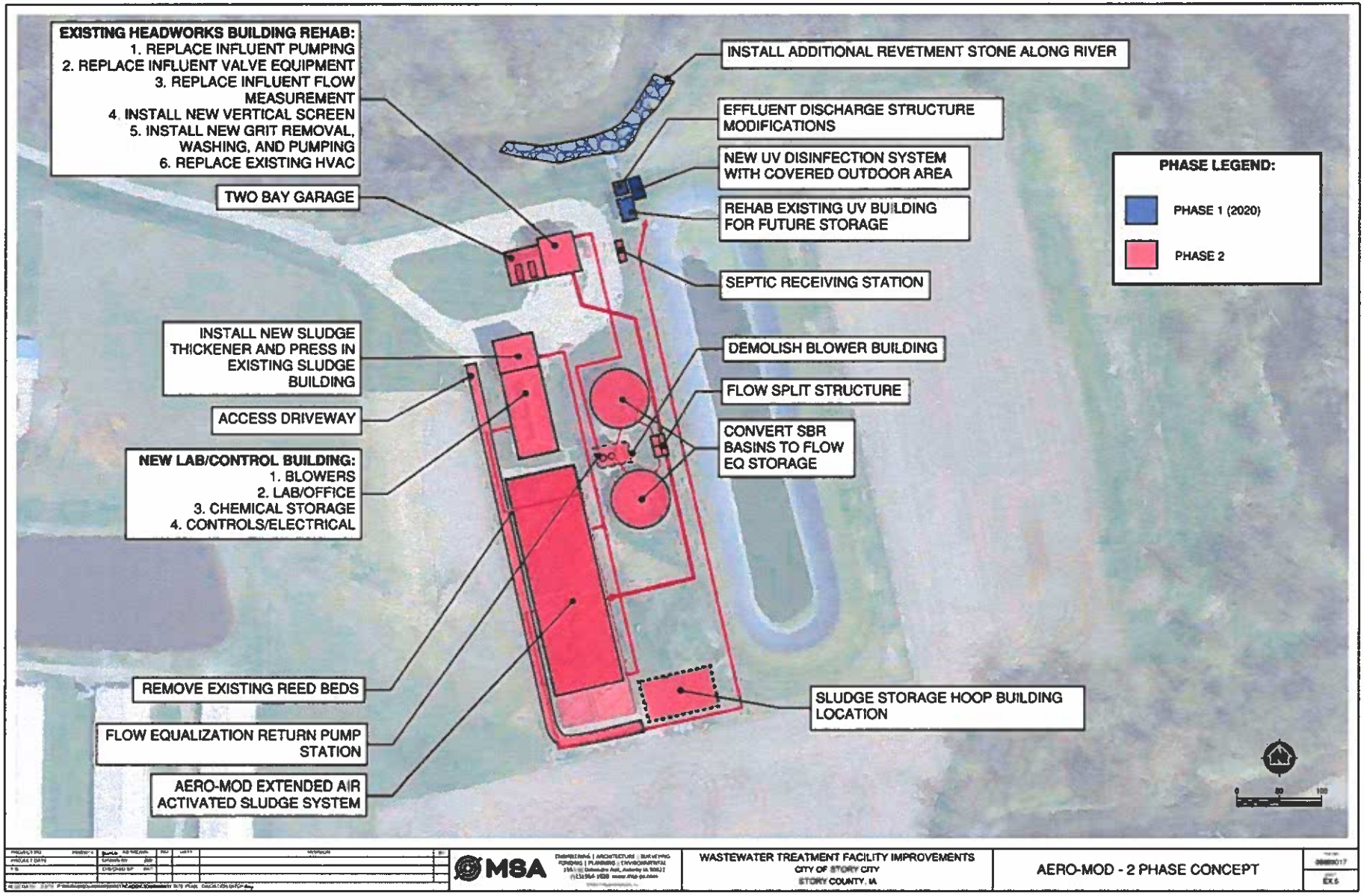


Touring Other Facilities With Story City Staff

Aero-Mod – New Construction vs. Rehab/Retrofit



Aeromod - Potential Construction Phasing



Aero-Mod - Conceptual Renderings

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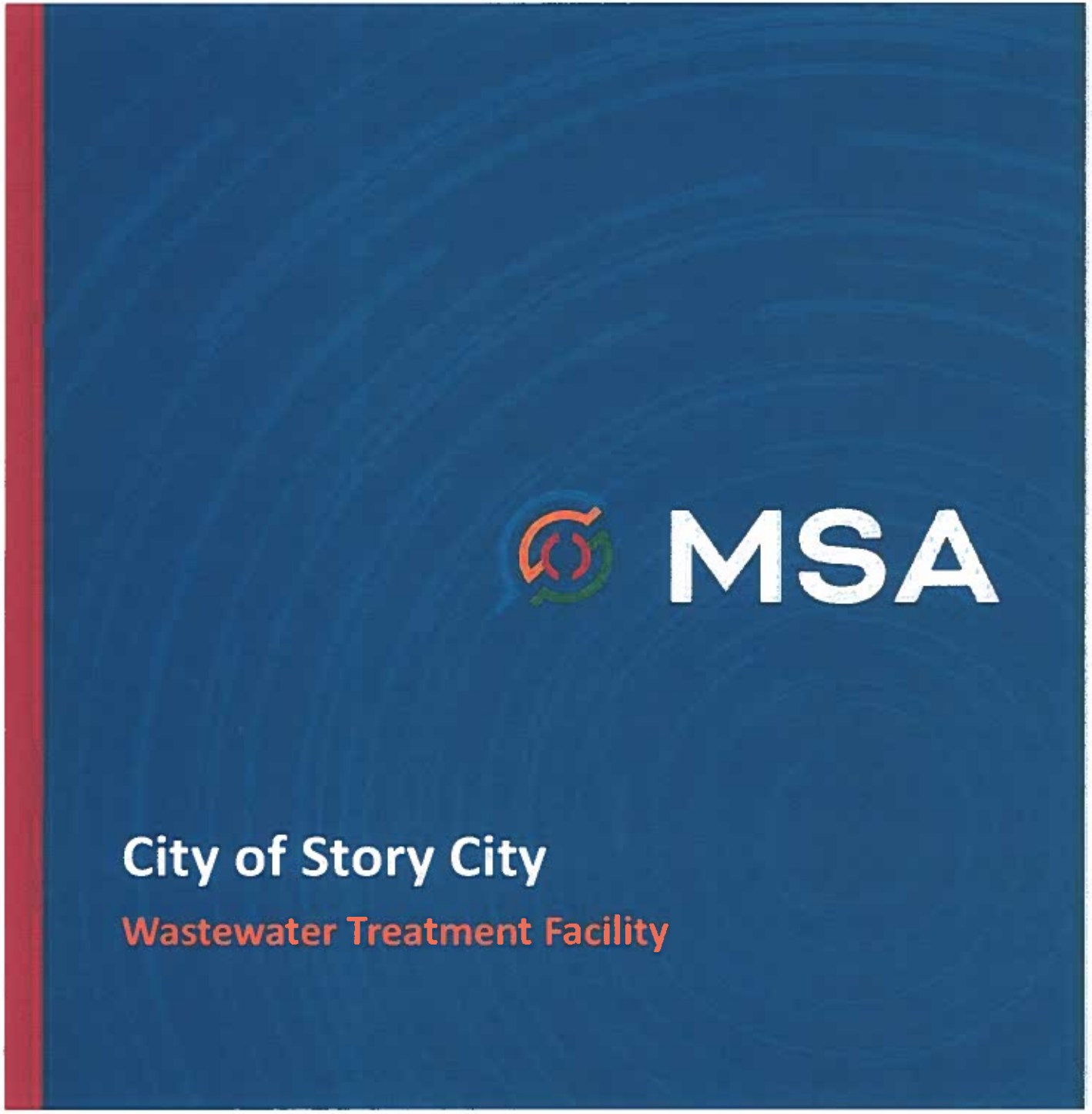

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