
APPENDIX C

REQUIRED STORAGE FACILITIES

Recommended Storage Facilities

Adams Field WWTP Storage (Option 1)

Existing Storage = 13 MG

Recommended Add'l Storage (Option 1) = 14 MG

	Area (SF)	Avg (SF)	Depth (ft)	Vol (CF)	MG Storage	USE (MG)	Cost / Gal
Area at Bottom El.	79,750						
		106,850	20	2,137,000	15,984,760		
Area at Top El.	133,950						
Ratio'd storage 18 ft/20 ft			18			14,000,000	\$ 0.70
Ratio'd storage 16 ft/18 ft			16				

Option 1

CONSTR COST ADAMS FIELD WWTP STORAGE	\$9,800,000
LAND COST	\$0
TOTAL COST ADAMS FIELD WWTP STORAGE	\$9,800,000

Mabelvale Pike Site Equalization Basin Storage (Option 1)

Existing Mabelvale Pike Equalization Basin Storage = 0 MG

Recommended Add'l Storage (Option 1) = 51 MG

	Area (SF)	Avg (SF)	Depth (ft)	Vol (CF)	MG Storage	USE (MG)	Cost / Gal
Area at Bottom El.	344,850						
		392,025	18	7,056,450	52,782,246		
Area at Top El.	439,200					51,000,000	\$ 0.70
Ratio'd storage 17 ft/18 ft			17				
Ratio'd storage 16 ft/17 ft			16				

Option 1

CONSTR COST MABELVALE PIKE BASIN STORAGE	\$35,700,000
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	Length (LF)	Unit Cost (\$/LF)	Acres	Unit Cost (\$/Ac)	Unit Cost (\$/Ea)	Wall Area (SF)	Unit Cost (\$/SF)	Unit Cost (\$/CY)		
Influent Pipe	48" Dia	1100		\$ 500.00					INFLUENT PIPING COST	\$550,000
Influent Valve Structure	1 ea.				\$ 50,000.00				INFLUENT VALVE STRUCTURE COST	\$50,000
Aeration	1			\$ 40,000.00					AERATION COST	\$40,000
Bentonite Slurry Cutoff Trench Wall (@ \$6/SF)						60000	\$ 6.00		SLURRY CUTOFF TRENCH COST	\$360,000
Levee Clay Core (@\$30/CY)		10,000 CY						\$ 30.00	CLAY LINER COST	\$300,000
Land Cost			31	\$ 43,560.00					LAND COST	\$1,350,360
									TOTAL COST MABELVALE PIKE STORAGE	\$38,350,360

Adams Field WWTP Storage (Option 2)

Existing Storage = 13 MG

Recommended Add'l Storage (Option 2) = 34 MG

	Area (SF)	Avg (SF)	Depth (ft)	Vol (CF)	MG Storage	USE (MG)	Cost / Gal
Area at Bottom El.	226,800						
		267,959	20	5,359,170	40,086,592		
Area at Top El.	309,117						
Ratio'd storage 18 ft/20 ft			18		36,077,932		
						34,000,000	\$ 0.70
Ratio'd storage 16 ft/18 ft			16		32,069,273		

Option 2	
CONSTR COST ADAMS FIELD WWTP STORAGE	\$23,800,000
LAND COST	\$0
TOTAL COST ADAMS FIELD WWTP STORAGE	\$23,800,000

Peak Flow Equalization Basin Site Storage (Option 2)

Existing Equalization Basin Storage = 30 MG

Recommended Add'l Storage (Option 2) = 30 MG

	Area (SF)	Avg (SF)	Depth (ft)	Vol (CF)	MG Storage	USE (MG)	Cost / Gal
Area at Bottom El.	234,864						
		278,549	20	5,570,970	41,670,856		
Area at Top El.	322,233						
Ratio'd storage 18 ft/20 ft			18		37,503,770		
Ratio'd storage 16 ft/18 ft			16		33,336,684		
						30,000,000	\$ 0.70
Ratio'd storage 14ft/16 ft			14		29,169,599		

Option 2	
CONSTR COST PEAK FLOW BASIN STORAGE	\$21,000,000
LAND COST	\$0
TOTAL COST PEAK FLOW BASIN STORAGE	\$21,000,000

Rock Creek Basin/Markham Area In-Line Site Storage

Existing Storage = 0 MG
Recommended Add'l Storage = 7 MG

	width (ft)	height (ft)	area (sf)	Vol/lf (Gal)	Length (LF) Req for 7MG		Perimeter LF
20x10 Box Culvert	20	10	200	1,496	4,679	5 barrels @ 940 LF	2,100
12x12 Box Culvert	12	12	144	1,077	6,499	6 barrels @ 1080 LF	2,328
12x10 Box Culvert	12	10	120	898	7,799	7 barrels @ 1115 LF	2,426
12x8 Box Culvert	12	8	96	718	9,748	9 barrels @ 1080 LF	2,412

Reinforced Box Culvert Cost(s) - quotes from Rinker Mat'ls (David Rubenkoenig) 7/28/10
Costs are FOB jobsite Little Rock

30-40 mil thickness @ \$4/SF

	Box Mat'l Cost / LF	Frt FOB LRWW	Total Mat'l Cost FOB LRWW / LF	Add'l Floor Cost/LF	Total Mat'l Cost / LF	Gal/LF	Mat'l Cost per Gal	Mat'l Exc & Haul / Gal @ \$50/CY	Field Restoration (Sod) / Gal	SF sod @ \$1/SF	Embedm't (CY)	Embedm't Cost/Gal @ \$40/CY	Placem't (Equipm't & Labor) / Gal @ 25% of Mt'l Cost	TOTAL Cost / Gal
20x10 - 3 sided box (4700 LF)	\$ 1,500	\$300	\$ 1,800	\$ 250.00	\$ 2,050	1496	\$ 1.37	\$ 0.33	\$ 0.02	136,000	4,596	\$ 0.13	\$ 0.34	\$ 2.19
20x10 "Mega Box" - 4 sided	\$ 1,800	\$350	\$ 2,150	\$ -	\$ 2,150	1496	\$ 1.44	\$ 0.33	\$ 0.02	136,000	4,596	\$ 0.13	\$ 0.36	\$ 2.28
12x12 RBC (6500 LF)	\$ 670	\$275	\$ 945	\$ -	\$ 945	1077	\$ 0.88	\$ 0.37	\$ 0.02	123,000	4,044	\$ 0.16	\$ 0.22	\$ 1.65
12x10 RBC (7800 LF)	\$ 608	\$250	\$ 858	\$ -	\$ 858	898	\$ 0.96	\$ 0.34	\$ 0.02	141,500	4,853	\$ 0.15	\$ 0.24	\$ 1.70
12x8 RBC (9750 LF)	\$ 560	\$225	\$ 785	\$ -	\$ 785	718	\$ 1.09	\$ 0.31	\$ 0.02	170,000	6,067	\$ 0.13	\$ 0.27	\$ 1.83

	Acres	Unit Cost (\$/Ac)	CONSTR COST	TOTAL COST
Land Cost	4.5	\$ 87,120.00	(Using 12x12 RBC @ \$1.65/Gal)	\$ 11,525,109
Epoxy Coating	48 SF/LF	6,500 LF	\$ 12.75 /SF	\$ 392,040
			COATINGS COST	\$ 3,978,000
			MISC CONNECTION PIPING & MH'S	\$ 100,000
			TOTAL COST HENDERSON M. S. STORAGE	\$ 15,995,149

Upper Cantrell Basin In-Line Site Storage

Existing Storage = 0 MG
Recommended Add'l Storage = 4 MG

12x12 RBC (3700 LF) = 4MG 2 barrels @ 1850 LF
12x10 RBC (4450 LF) = 4MG 2 barrels @ 2220 LF

	Acres	Unit Cost (\$/Ac)	Wall Area (SF)	Unit Cost (\$/SF)	Clay Vol CY	Unit Cost (\$/CY)	CONSTR COST	TOTAL COST
Levee Core & Exc Base Clay (@\$30/CY)	2.75	\$ 87,120.00					(Using 12x12 RBC @ \$1.65/Gal)	\$ 6,585,776
Epoxy Coating	48 SF/LF	3700 LF	\$ 12.75 /SF		12,500	\$ 30.00		\$ 239,580
							CLAY LINER COST	\$ 375,000
							COATINGS COST	\$ 2,264,400
							MISC CONNECTION PIPING & MH'S	\$ 25,000
							TOTAL COST UPPER CANTRELL BASIN STORAGE	\$ 9,489,756

Engineering & Contingencies

In-Line Storage

Rock Creek / Markham Area Site			
Construction Contingency	15%	\$	2,340,466
Engineering Design & Constr Admin	12%	\$	2,153,229
Upper Cantrell Basin Site			
Construction Contingency	15%	\$	1,387,526
Engineering Design & Constr Admin	12%	\$	1,276,524
Total In-Line Storage Engineering & Contingencies			\$ 7,157,746

Open Basin Storage

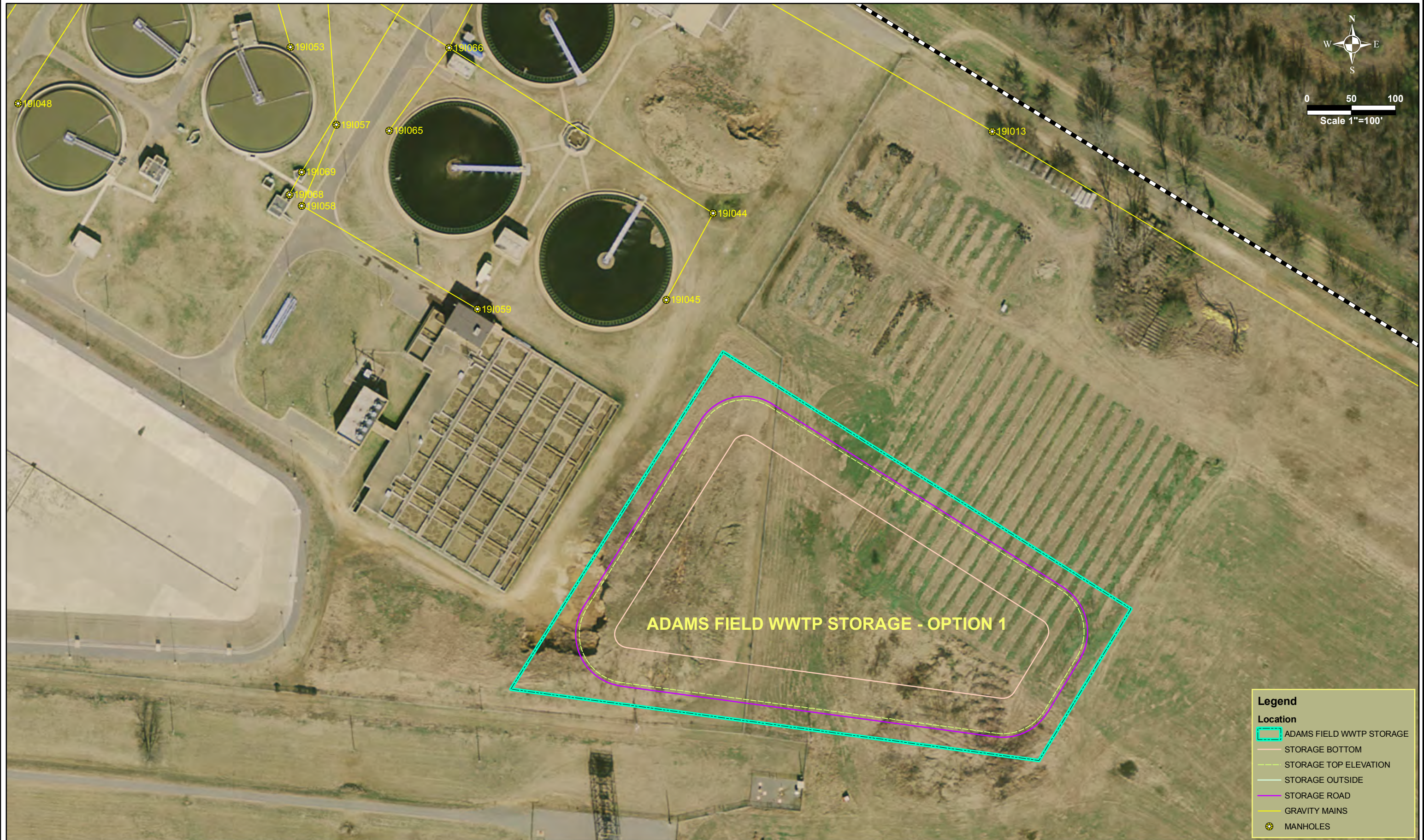
Option 1 (Adams Field & Mabelvale Pike)			
Adams Field WWTP Site			
Construction Contingency	15%	\$	1,470,000
Engineering Design & Constr Admin	12%	\$	1,352,400
Mabelvale Pike Site			
Construction Contingency	15%	\$	5,550,000
Engineering Design & Constr Admin	12%	\$	5,106,000
Total Option 1 Open Basin Storage Engineering & Contingencies			\$ 13,478,400

Option 2 (Adams Field & Peak Flow)			
Adams Field WWTP Site			
Construction Contingency	15%	\$	3,570,000
Engineering Design & Constr Admin	12%	\$	3,284,400
Peak Flow Basin Site			
Construction Contingency	15%	\$	3,150,000
Engineering Design & Constr Admin	12%	\$	2,898,000
Total Option 2 Open Basin Storage Engineering & Contingencies			\$ 12,902,400

Total Project Cost

In-Line Storage			
Rock Creek / Markham Area Site		\$	20,488,844
Upper Cantrell Basin Site		\$	12,153,807
		Total In-Line Storage	\$ 32,642,651
Open Basin Storage			
Option 1 (Adams Field & Mabelvale Pike)		\$	61,628,760
Option 2 (Adams Field & Peak Flow Addition)		\$	57,702,400

STORAGES - PROJECT #1



Legend

Location

- ADAMS FIELD WWTW STORAGE
- STORAGE BOTTOM
- STORAGE TOP ELEVATION
- STORAGE OUTSIDE
- STORAGE ROAD
- GRAVITY MAINS
- MANHOLES

STORAGES - PROJECT #1



Legend

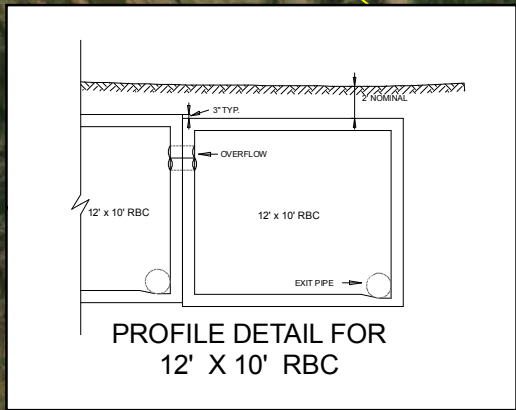
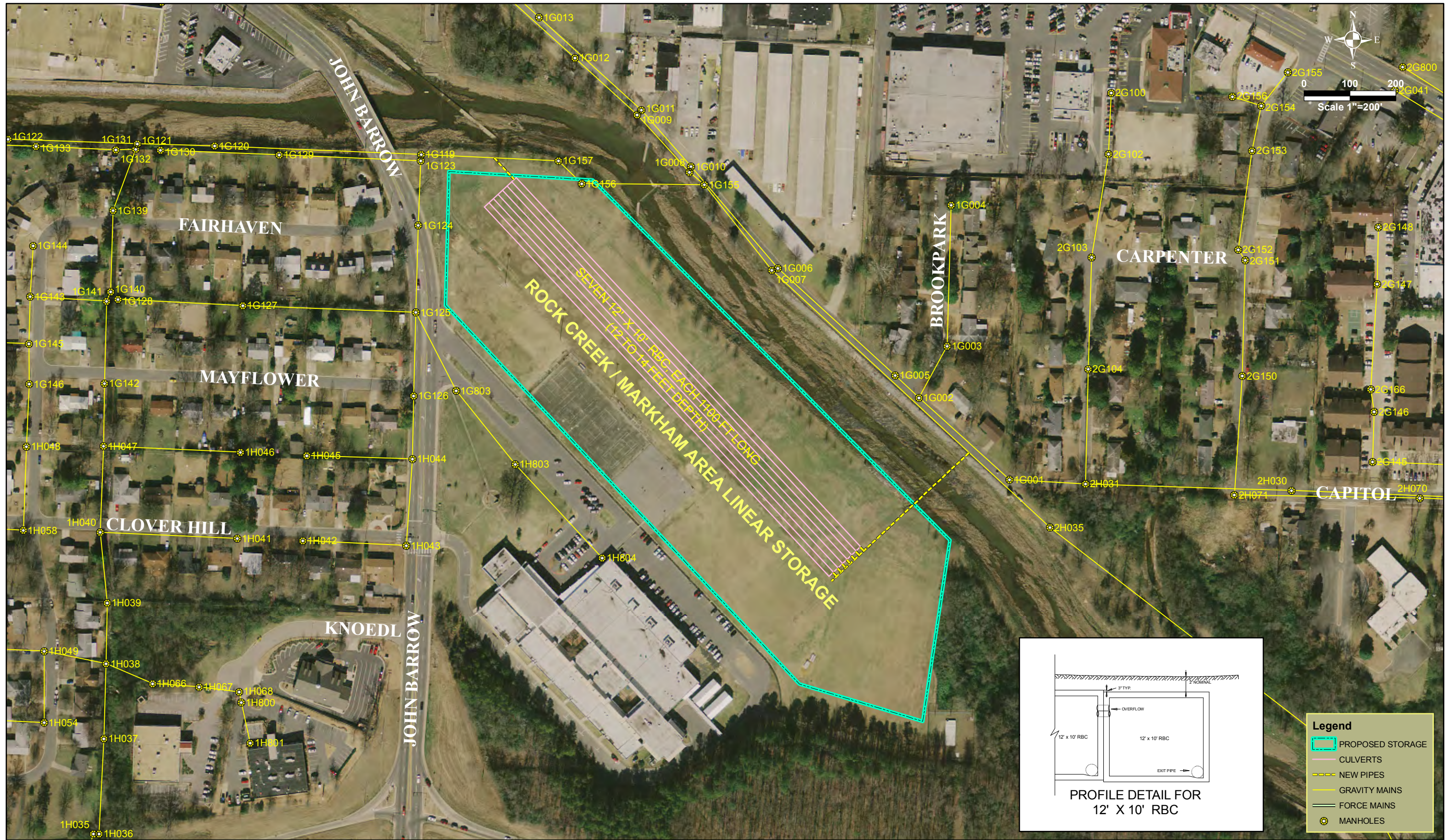
Location

- ADAMS FIELD WWTP STORAGE
- STORAGE TOP
- STORAGE ROAD
- STORAGE BOTTOM
- GRAVITY MAINS
- MANHOLES

STORAGES - PROJECT #2



STORAGES - PROJECT #3

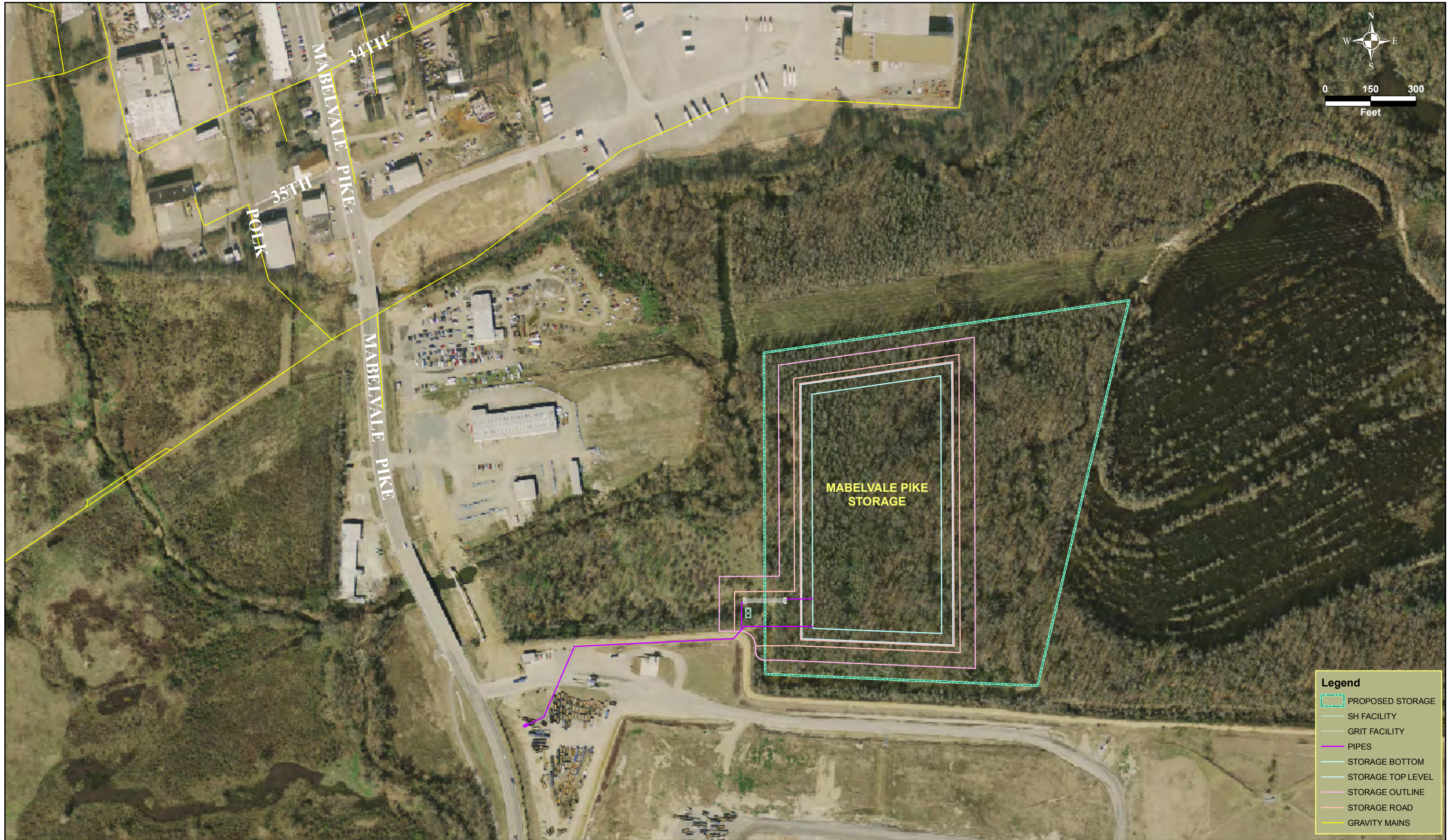


- Legend**
- ▭ PROPOSED STORAGE
 - ▭ CULVERTS
 - NEW PIPES
 - GRAVITY MAINS
 - FORCE MAINS
 - MANHOLES

STORAGES - PROJECT #4



STORAGES - PROJECT #5



Legend

	PROPOSED STORAGE
	SH FACILITY
	GRIT FACILITY
	PIPES
	STORAGE BOTTOM
	STORAGE TOP LEVEL
	STORAGE OUTLINE
	STORAGE ROAD
	GRAVITY MAINS