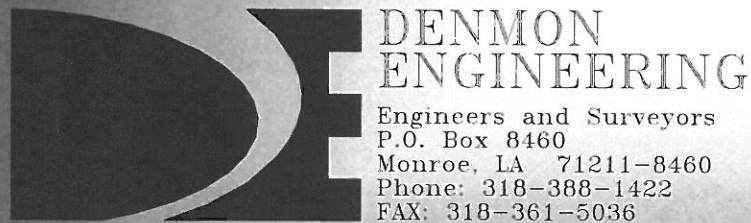


EXHIBIT G: UTILITY FEASIBILITY STUDY: POTABLE WATER: Franklin Farms Mega-Site

PREPARED FOR: THE NORTHEAST LOUISIANA
ECONOMIC ALLIANCE



**UTILITY FEASIBILITY STUDY
POTABLE WATER**

**FRANKLIN FARMS MEGA-SITE
RICHLAND PARISH, LOUISIANA**

FOR

**THE NORTHEAST LOUISIANA
ECONOMIC ALLAINCE**

NOVEMBER 2012

**DENMON ENGINEERING
114 VENABLE LANE
MONROE, LA 71203**

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Purpose of Report

The purpose of this report is to analyze the options to provide potable water, on an industrial scale, to the Louisiana Department of Economic Development's 1440 acres Franklin Farm Mega-site in Richland Parish, LA. The report makes recommendations and provides costs and timelines to complete recommended tasks that provide potable water needed for the site to attract a large commercial, industrial or manufacturing tenant.



Franklin Farm Mega-site

Assumptions

This report analyzed options for the following potable water demand rates, typical for large commercial, manufacturing or industrial demands.

Typical potable water requirements for large commercial, manufacturing or industrial sites

500,000 gpd

1,000,000 gpd

2,000,000 gpd

3,000,000 gpd

The design criteria used in this report is derived from the Recommended Standards for Water Works published by the Wastewater Committee of the Great Lakes--Upper Mississippi River Board of State and Provincial Public Health and Environmental Manager, also known as the Ten States Standards.

The recommendations in this study also include all infrastructure requirements for a fire protection system at the site based on criteria promogated by the Louisiana Office of State Fire Marshal in accordance with what is required for heavy industry. Although some cost estimates are based on the smaller volumes analyzed in this study, the facilities were designed such that they can be easily scaled up to 3 MGD.

Existing Resources

In the area of the Mega-site, all potable water, commercial and residential, is currently supplied from local groundwater aquifers. Though there is a rural water district that supplies potable water to the residents around the Mega-site, the River Road Water System, this District only produces about 250,000 gallons per day of potable water, and does not control the quantity of potable water or the distribution capabilities to supply potable water to the Mega-site on an industrial scale. Currently this System does have a 6" water main running adjacent to the site, but this water supply would likely only be sufficient to supply water needed for construction of any facilities built on the Mega-site.

The existing potable water systems in this area capable of supplying potable water are the Delhi Water and Rayville Water Systems. The Delhi Water System is located in the eastern portion of Richland Parish, 8-10 miles east of the site. The Rayville Water System is located in the central portion of Richland parish, 5-8 miles west of the site.

The Rayville Water System currently has an additional capacity of 1 MGD that could be supplied to the Mega-site with the construction of adequate distribution lines. The Delhi Water System currently supplies approximately 1.2 MGD to its customers and the recently completed ConAgra Sweet Potato Processing Plant in Dunn, 4.5 miles southeast of the Mega-site and has designed a future expansion that will provide an additional 1.2 MGD to ConAgra. This expansion will have an additional 1 MGD of capacity that could be supplied to the Mega-site, and existing distribution lines capable of supplying this water to Dunn have already been constructed. Should the amount of potable water needed rise above 1 MGD, then major modifications to those treatment and distribution facilities must be constructed before those higher flows can be obtained.

Alternates Considered

To bring potable water to the Franklin Farm Mega-site on an industrial scale, 3 options were considered:

- 1) Purchasing of Water from the Town of Delhi, 2) Purchasing of Water from the Town of Rayville, and
- 3) Construction of a Water Treatment Facility at Poverty Point Reservoir. Details of each are included.

Purchasing of Water from the Town of Delhi

The Town of Delhi currently produces approximately 1.2 million gallons of potable water daily for its general customers and the recently completed ConAgra Sweet Potato processing plant in Dunn, approximately 4.5 miles for the Mega-site. The Delhi treatment plant has plans for a future expansion to supply an additional 1.2 MGD to the ConAgra Plant. Delhi, like most of the parish, get its water from the Cockfield Aquifer. The Cockfield water is of good quality and reliability, typically only requiring chlorination before consumption. The Cockfield Aquifer supplies approximately 7 million gallons a day to several parishes in northeast Louisiana. In this area, the Cockfield stratum is located at a depth of 240 to

400 feet. Wells drilled into the Cockfield in this area can be expected to produce approximately 600 GPM.

For the Town of Delhi to supply the additional potable water volume analyzed in this study, above their planned expansion, will require the construction of additional facilities to include wells, distribution lines, and storage tanks. In this area, the best and most reliable portable water at the volumes needed to supply the Mega-site is found in the Epps Field, approximately 9 miles northeast of the Mega-site. Wells in the Epps Field typically yield 300,000 GPD, and require a spacing of 1500', but water in this area is ample and available. Other infrastructure required will include a ground storage tank in the well field area, water lines, and an onsite elevated storage tank to store the water onsite and provide for Fire Protection. Figure 1H illustrates the general location of the Epps Field and the Mega-site, and recommended routes for waterline to transport the water to the Mega-site.

In Louisiana, utilities, to include water lines, are typically constructed in Rights-of-way of existing roads or other utilities, and it is recommended that future water lines from the Mega-site be constructed in existing road or utility rights-of-way. Due to the rural nature of the setting, the construction of water lines in road or utility rights-of-way will be relatively straight forward with most of the work completed by simple trenching and cover and only a few drives and cross drives will require boring. Environmental permitting is not typically complicated since these rights-of-ways have been in use for utilities for years. Permitting will be required for installation of utilities under Kansas City Southern's railroad. The permitting process is not complicated and only requires authorization and approval of installation by boring under the railroad with the line being enclosed in an approved casing by Kansas City Southern. It is not anticipated that this permitting process will prolong the design or construction timeline for this project.

As cited earlier, improvements of this scale to bring new potable water supplies online have been completed in this area in recent years. In 2010, the improvements to the Delhi system for additional 1.2 MGD of potable water were permitted, designed and constructed in less than a 1 year. These improvements included similar infrastructure to the recommended actions, with the additional water produced with new wells in the Epps field of the Cockfield Aquifer, and the construction of transmission lines and both a ground storage tank at the well field and an elevated tank at the ConAgra Plant.



**NEW GROUND WELLS AND GROUND STORAGE TANK
CONSTRUCTED IN THE EPPS FIELD IN 2010 FOR CONAGRA**



**NEW 750,000 GALLON ELEVATED STORAGE TANK
CONSTRUCTED AT THE CONAGRA PLANT IN 2010**

The Appendix includes data on the Cockfield Aquifer and the existing water systems in Richland Parish. With groundwater comes the concern of drawdown within the aquifers. The Cockfield Aquifer has no historical data that suggest there is significant or even moderate drawdown in the Cockfield Aquifer in the area. The most recent comprehensive study of the ground water in the State of Louisiana was the Louisiana Department of natural Resources ‘Recommendations for a Statewide Groundwater Management Plan, Dec., 2011.’ This study analyzed all of Louisiana’s major aquifers and only categorized a small area of the Cockfield Aquifer in southern Winn and Northern Grant Parishes (approximately 140 miles to the southwest) as medium Impacted with regard to drawdown. Neither the Louisiana Department of environmental Quality’s ‘Cockfield Aquifer Summary, 2008,’ or the USGS’s ‘Water withdrawals and trends in ground-water levels and stream discharge in Louisiana, 2005,’ cited drawdown as a concern for the Cockfield Aquifer.

Along with data on the Cockfield Aquifer found in the Appendix are engineering and cost estimate calculations for upgrades required to supply water to the Franklin Farm Mega-site. These improvements include a 1,000,000 gallon elevated storage tank, a 500,000 gallon ground storage tank, all pumps and treatment equipment, and water distribution lines of varying sizes. These cost estimates also included all permitting, engineering, right-of-way, construction and contingences. See Table 1 for the details and cost of these upgrades.

Table 1: Cost for Upgrades to Delhi Water Supply Facilities

Potable Water Demand	Cost	Required
0.5 MGD	\$ 5,100,000	New water line from Dunn, 4.5 miles, Elevated & Ground Tank
1 MGD	\$ 5,100,000	New water line from Dunn, 4.5 miles, Elevated & Ground Tank
2MGD	\$ 13,800,000	Plus additional wells at Epps, Water Lines, and Ground Storage Tank
3MGD	\$ 15,700,000	Plus additional wells at Epps, Water Lines, and Ground Storage Tank

Purchasing of Water from the Town of Rayville

Currently, the Town of Rayville is supplying its own treated water to the residents of the Town of Rayville via their own treatment facility. The Town of Rayville’s water is also supplied to the Town from groundwater wells in the Cockfield Aquifer. Their current treatment facility can handle up to

approximately 2 MGD and is currently supplying approximately 1 MGD peak flow to the residents and customers within the Town of Rayville. This allows for an amount of 1 MGD to be purchased and pumped to the Mega-Site for a potable water source. However, if more water is to be required, the Town of Rayville would need to upgrade their current production and treatment facility.

Improvements to the Town of Rayville's water supply infrastructure would be very similar to the previously described Delhi improvements with the construction of new wells and the support equipment. The estimates again include all cost to complete construction.

Permitting will be required for installation of utilities under Kansas City Southern's railroad. The permitting process is not complicated and only requires authorization and approval of installation by boring under the railroad with the line being enclosed in an approved casing by Kansas City Southern. It is not anticipated that this permitting process will prolong the design or construction timeline for this project.

Table 2: Cost for Upgrades to Rayville Water Supply Facilities

Potable Water Demand	Cost	Required
0.5 MGD	\$ 6,500,000	New water line from Rayville, 7 miles, Elevated and ground Storage Tank
1 MGD	\$ 13,100,000	New water line from Rayville, 7 miles, Elevated and ground Storage Tank
2MGD	\$ 20,000,000	Plus additional wells at Epps, water lines
3MGD	\$ 23,000,000	Plus additional wells at Epps, water lines

Construction of a Water Treatment Facility at the Poverty Point Reservoir

The recently constructed Poverty Point Reservoir located in eastern Richland Parish is recommended as a source of surface water in the area that can be treated and supplied to the Mega-Site for potable water. The Poverty Point Reservoir is a 2432 acre reservoir located approximately 9 miles to the east of the Mega-Site and was constructed for the purposes of supplying potable water. The Reservoir already has an intake structure designed for 1.5 MGD and a location set aside near the Reservoir for a treatment facility. At present, the Reservoir is not supplying any potable water, but the Poverty Point Yield Study, prepared by Denmon Engineering, 2007, indicated the reservoir is capable of producing approximately 5.5 MGD.

The water in the Poverty Point Reservoir is owned by the Poverty Point Reservoir Commission and this district has already pledged 1.5 MGD to the Mega-Site. See included letter.

To bring Poverty Point water to the Mega-Site will require the construction of treatment and storage facilities, as well as distribution to the Mega-Site.



**POVERTY POINT RESERVOIR, LOCATED 9 MILES EAST
OF THE FRANKLIN FARM MEGA-SITE**

Facilities at the Poverty Point Reservoir will consist of two 2,100 GPM vertical turbine pumps, a 24" transmission raw water main from the intake structure to treatment site, a 1.5 MGD treatment plant, a 0.5 million gallon ground storage tank, two (2) 2,100 GPM booster pumps, and a 1 million gallon elevated water storage tank.

As stated earlier, permitting and construction of the all water lines should be in the rights-of-ways of existing road or utility right-of-ways which are abundant in the area, and the design and construction can be completed rather quickly, less than 1 year. See Figure 1I for a recommended route of water distribution lines.

The design, permitting, and construction of the water treatment facility usually requires two years, and should not require anything but standard potable water treatment processes since the water in the Reservoir is very high quality for surface water and varies through the years. Environmental permitting of the treatment plant will not be required because the Reservoir received a full USACE Section 404 permit for purpose of supplying potable water and the intake structure is already constructed. The treatment plant itself will require a permit for the Louisiana Department of Environmental Quality. A treatment facility at Poverty Point will require a licensed operator, but it is likely that one of existing water systems in the area would maintain and operate this facility. Permitting will be required for installation of utilities under Kansas City Southern's railroad. The permitting process is not complicated and only requires authorization and approval of installation by boring under the railroad with the line being enclosed in an approved casing by Kansas City Southern. It is not anticipated that this permitting process will prolong the design or construction timeline for this project.

The Appendix includes engineering and cost estimate calculations for upgrades required to supply water to the Franklin Farm Mega-site from the Poverty Point Reservoir. See Table 3 for the details and cost of these upgrades.

Table 3 Cost for Upgrades to for Potable Water from the Poverty Point Reservoir

<u>Potable Water Demand</u>	<u>Cost</u>	<u>Required</u>
0.5 MGD	\$ 11,800,000	New water lines, treatment plant, elevated and ground storage tank
1 MGD	\$ 17,000,000	New water lines, treatment plant, elevated and ground storage tank
2MGD	\$ 25,300,000	New water lines, treatment plant, elevated and ground storage tank
3MGD	\$ 30,000,000	New water lines, treatment plant, elevated and ground storage tank

Project Timeline

Though each project will complete the necessary task in providing potable water to the Mega-Site, each project will differ by how long it will take to complete the entire project from the beginning of the design phase to the permitting and reviewing phase, advertising and bidding phase, and finally the construction phase. On the following page is a table (Table 4) showing the different timelines and expected amount of time to finish each completed project.

Table 4 Project Timelines for Proposed Alternatives

	Rayville				Delhi				Poverty Point			
	0.5 MGD	1 MGD	2 MGD	3 MGD	0.5 MGD	1 MGD	2 MGD	3 MGD	0.5 MGD	1 MGD	2 MGD	3 MGD
Design	120	150	150	150	150	150	150	150	120	150	150	150
Advertising & Bidding	30	30	30	30	30	30	30	30	30	30	30	30
Construction	270	270	270	270	270	270	270	270	365	540	540	540
Total Project Time (Days)	420	450	450	450	450	450	450	450	515	720	720	720
Total Project Time (Months)	14	15	15	15	15	15	15	15	17	24	24	24

Additional Water Resources in the Area

The Mississippi River Alluvial Aquifer in the area is located at depths up to 100 feet. The Alluvial Aquifer contains vast amounts of water that could be used by the Mega-Site, but this water is low in quality and generally not suited for potable water, but could possibly be used for industrial purposes or fire protection. The water in the Alluvial Aquifer is high in iron, color, hardness, etc. Wells drilled into the Mississippi River Alluvial Aquifers in this area can be expected to produce 1 MGD and possibly three wells could be drilled on the site. This would result in a total of 3 MGD from the Alluvial Aquifer, but the water would require treatment that can be costly due to the high amount of iron, hardness and color.

Though it is unlikely that treating this Alluvial water to produce potable water is the most economical approach for supplying potable water at the Mega-site, this water is onsite, in vast quantities and shallow enough that very little energy is required to raise it to the surface. Depending on the industry, this water could be a valuable asset to the site. The Appendix includes water test data (most environmental constituents tested for potable water) taken from two existing wells on site.

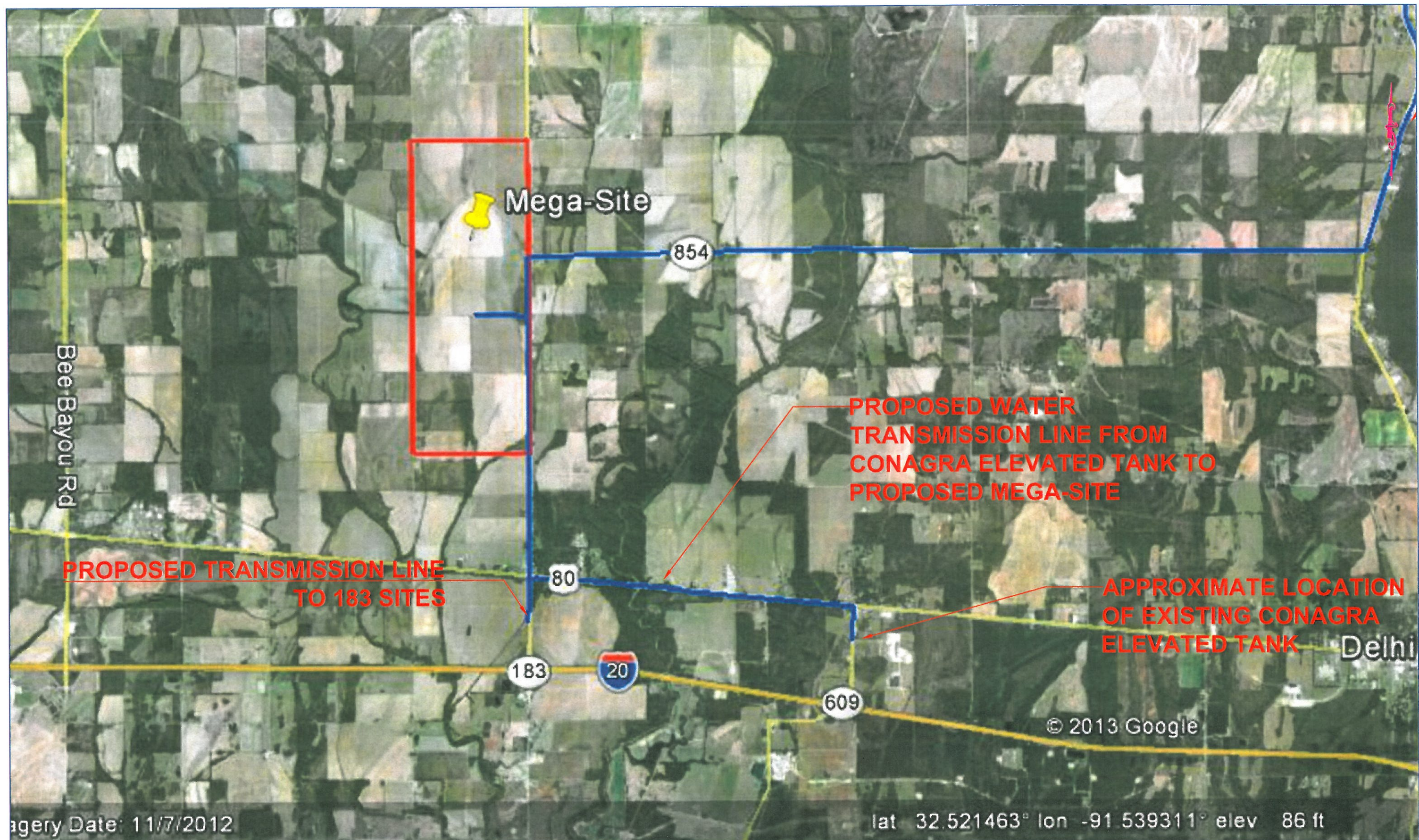
Conclusions

This study analyzed the options to provide potable water on an industrial scale at the Franklin Farm Mega-site and identified two existing water districts in the area that are capable of supplying the water volumes required by this study, the Delhi and Rayville Water Districts. Each of these water districts currently has an additional capacity of 1 MGD, either existing or in future upgrades already designed. Based on this, 1 MGD of potable water per day could be supplied to the Mega-site by simply constructing the distribution

lines to transport the water to the site, or possibly 2 MGD could be supplied by utilizing both Systems, but this would require the construction of two sets of distribution lines. Each of the cited upgrades can be completed in a timely fashion, less than 1 year, as has been demonstrated by recently completed projects of similar size in the area.

If large quantities of potable water are required, either system will be required to drill new wells or tap the Poverty Point Reservoir. With these options, additional transmission lines and treatment facilities will be required. It should be noted that the treatment of surface water is significantly more expensive than the treatment of groundwater in this area, and this option may only be economical for water volumes at the upper end of this study or greater. It should also be noted that the timeline to develop surface treatment facilities is approximately 2 years, even when fast-tracked, as opposed to a year or less for groundwater.

With any system that brings the volumes of potable water analyzed in this study to an industrial site, and all options analyzed in this study, ground and elevated storage tanks will be required for fire protection and redundancy in the supply of water.



REV.	DATE	DRWN	CHKD	REMARKS

DESIGNED BY: RBH
 DRAWN BY: CCP
 CHECKED BY: CWP
 SCALE: N/A
 DATE: DECEMBER, 2012



DENMON ENGINEERING
 Engineers and Surveyors
 P.O. Box 8460
 Monroe, LA 71211-8460
 Phone: 318-388-1422
 FAX: 318-361-5036

**FRANKLIN FARMS
 PROPOSED MEGA-SITE
 UTILITY FEASIBILITY STUDY**

**DELHI/CONAGRA WATER
 ALTERNATIVE**

PROJECT NO.
FILE NAME:
SHEET NO.
1F



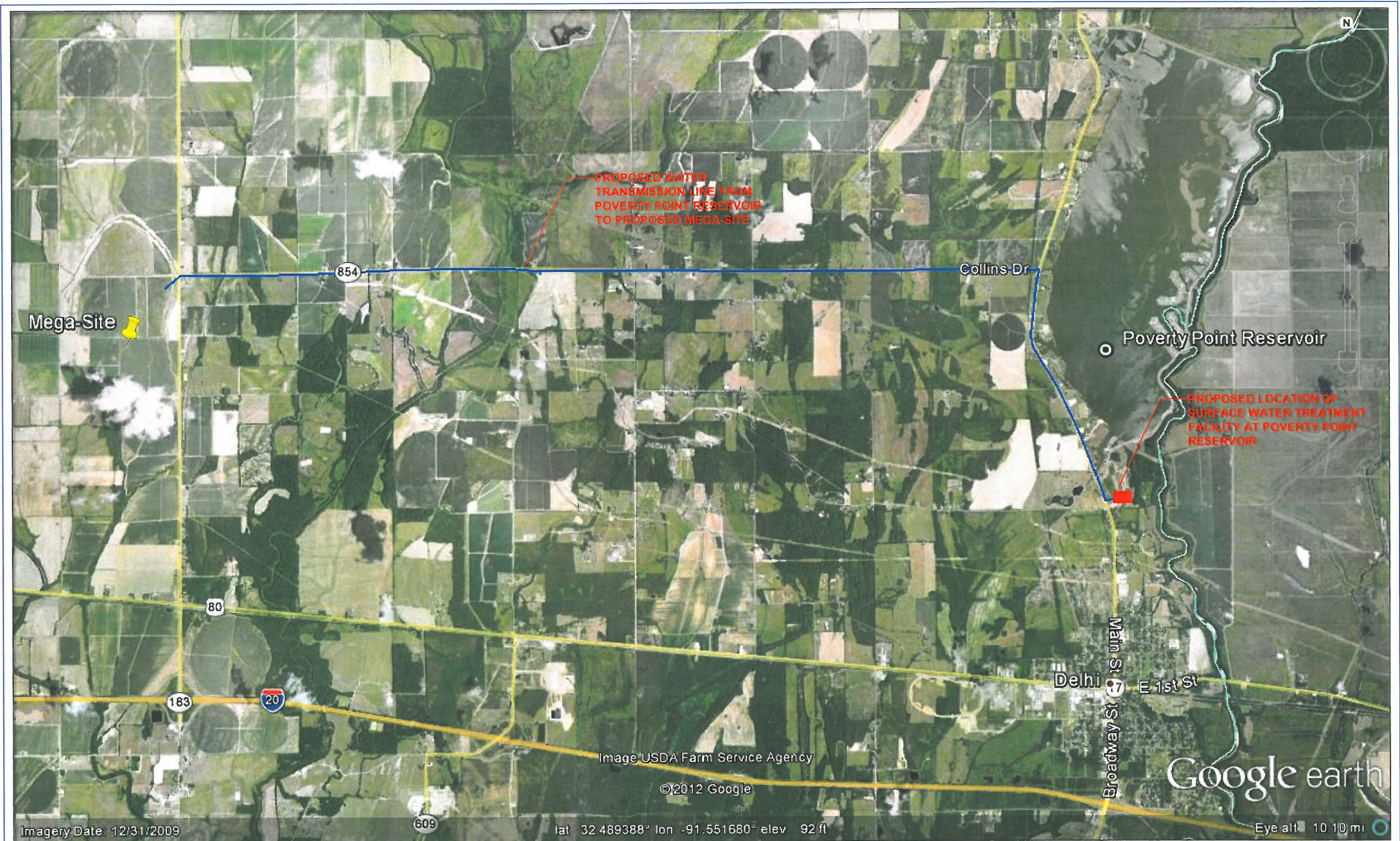
DESIGNED BY: RBH	DRWN	CHKD	REMARKS
DRAWN BY: CCP			
CHECKED BY: CWP			
SCALE: N/A			
DATE: DECEMBER, 2012			
REV. NO.	DATE	DRWN	CHKD


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FRANKLIN FARMS
PROPOSED MEGA-SITE
UTILITY FEASIBILITY STUDY

EPPS FIELD WATER ALTERNATIVE

PROJECT NO.	
FILE NAME	
SHEET NO.	1H



DESIGNED BY: RBH	DRWN	CHKD	REMARKS
DRAWN BY: CCP			
CHECKED BY: CWP			
SCALE: N/A			
DATE: DECEMBER, 2012			
REV. NO.	DATE	DRWN	CHKD

DENMON ENGINEERING
 Engineers and Surveyors
 P.O. Box 8460
 Monroe, LA 71211-8460
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 FAX: 318-361-5036

**FRANKLIN FARMS
 PROPOSED MEGA-SITE
 UTILITY FEASIBILITY STUDY**

**POVERTY POINT WATER
 ALTERNATIVE**

PROJECT NO.
FILE NAME:
SHEET NO.
11

PRELIMINARY PROJECT COST ESTIMATE
FRANKLIN FARMS MEGA-SITE
DELHI WATER ALTERNATIVE (0.5 MGD)
DECEMBER, 2012

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	TOTAL COST
<u>Transmission Lines and Storage Facilities at ConAgra Site</u>					
1.	Water Wells	0	EA.	\$300,000.00	\$0
2.	18" CL160 PVC Water Transmission Line Open Cut	29,725	L.F.	\$50.00	\$1,486,250
3.	18" CL160 PVC Water Transmission Line J&B	650	L.F.	\$90.00	\$58,500
4.	18" DR11 HDPE Water Transmission Line Directional Bore	600	L.F.	\$117.00	\$70,200
5.	24" Steel Casing, Jack & Bore	100	L.F.	\$300.00	\$30,000
6.	Water Well Electrical	JOB	L.S.	\$0.00	\$0
7.	500,000 Gallon Ground Storage Tank	1	EA.	\$310,000.00	\$310,000
8.	Masonry Buidling for Pumps & Control Room	1,000	S.F.	\$120.00	\$120,000
9.	2,100 GPM Booster Pumps w/ VFD Controls	2	EA.	\$40,000.00	\$80,000
10.	8" CL160 PVC Water Transmission Line Open Cut to 183 Site	1,850	L.F.	\$12.00	\$22,200
11.	8" CL160 PVC Water Transmission Line J&B to 183 Sites	250	L.F.	\$60.00	\$15,000
12.	10" Steel Casing, Jack & Bore	100	L.F.	\$100.00	\$10,000
<u>Storage Facilities</u>					
13.	Site Work - Light Clearing, Grubbing & Grading	0.5	ACRE	\$1,000.00	\$500
14.	Gravel Access Drive, Culverts, Etc.	JOB	L.S.	\$5,000.00	\$5,000
15.	1,000,000 Gallon Elevated Storage Tank	1	L.S.	\$1,800,000.00	\$1,800,000
16.	500,000 Gallon Ground Storage Tank (Fire Protection)	0	EA.	\$310,000.00	\$0
17.	2,100 GPM Booster Pumps w/ VFD Controls	0	EA.	\$40,000.00	\$0
18.	Booster Station Piping & Fittings	JOB	L.S.	\$0.00	\$0
19.	Masonry Buidling (Pumps & Chlorination)	400	S.F.	\$0.00	\$0
20.	6' Chain Link Fencing	400	L.F.	\$15.00	\$6,000
21.	Gaseous Chlorination Facility	JOB	L.S.	\$0.00	\$0
22.	Yard Piping	JOB	L.S.	\$10,000.00	\$10,000
23.	Electrical - Mega-Site Booster Station	JOB	L.S.	\$50,000.00	\$50,000
<i>Sub-Total</i>					<u>\$4,073,650</u>
ESTIMATED CONSTRUCTION COST					\$4,073,650
CONTINGENCY (10%)					<u>\$407,365</u>
CONSTRUCTION ALLOWANCE					\$4,481,015
Engineering					\$306,500
Surveying					\$50,000
Inspection					\$91,100
Property Surveys & Plats					\$10,000
Land Acquisition					\$15,000
Wetlands Determination					\$10,000
Geotechnical Engineering					\$2,500
Permits					\$7,500
Testing (During Construction) (Concrete, Earthwork, Etc.)					<u>\$5,000</u>
Total Engineering Costs					\$497,600
TOTAL OTHER COSTS (Bond Attorney, Legal, Interim Financing, Etc.)					<u>\$125,000</u>
TOTAL ESTIMATED PROJECT COST					<u>\$5,103,615</u>

**PRELIMINARY PROJECT COST ESTIMATE
FRANKLIN FARMS MEGA-SITE
DELHI WATER ALTERNATIVE (1 MGD)
DECEMBER, 2012**

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	TOTAL COST
<u>Transmission Lines and Storage Facilities at ConAgra Site</u>					
1.	Water Wells	0	EA.	\$300,000.00	\$0
2.	18" CL160 PVC Water Transmission Line Open Cut	29,725	L.F.	\$50.00	\$1,486,250
3.	18" CL160 PVC Water Transmission Line J&B	650	L.F.	\$90.00	\$58,500
4.	18" DR11 HDPE Water Transmission Line Directional Bore	600	L.F.	\$117.00	\$70,200
5.	24" Steel Casing, Jack & Bore	100	L.F.	\$300.00	\$30,000
6.	Water Well Electrical	JOB	L.S.	\$0.00	\$0
7.	500,000 Gallon Ground Storage Tank	1	EA.	\$310,000.00	\$310,000
8.	Masonry Buidling for Pumps & Control Room	1,000	S.F.	\$120.00	\$120,000
9.	2,100 GPM Booster Pumps w/ VFD Controls	2	EA.	\$40,000.00	\$80,000
10.	8" CL160 PVC Water Transmission Line Open Cut to 183 Site	1,850	L.F.	\$12.00	\$22,200
11.	8" CL160 PVC Water Transmission Line J&B to 183 Sites	250	L.F.	\$60.00	\$15,000
12.	10" Steel Casing, Jack & Bore	100	L.F.	\$100.00	\$10,000
<u>Storage Facilities</u>					
13.	Site Work - Light Clearing, Grubbing & Grading	0.5	ACRE	\$1,000.00	\$500
14.	Gravel Access Drive, Culverts, Etc.	JOB	L.S.	\$5,000.00	\$5,000
15.	1,000,000 Gallon Elevated Storage Tank	1	L.S.	\$1,800,000.00	\$1,800,000
16.	500,000 Gallon Ground Storage Tank (Fire Protection)	0	EA.	\$310,000.00	\$0
17.	2,100 GPM Booster Pumps w/ VFD Controls	0	EA.	\$40,000.00	\$0
18.	Booster Station Piping & Fittings	JOB	L.S.	\$0.00	\$0
19.	Masonry Buidling (Pumps & Chlorination)	400	S.F.	\$0.00	\$0
20.	6' Chain Link Fencing	400	L.F.	\$15.00	\$6,000
21.	Gaseous Chlorination Facility	JOB	L.S.	\$0.00	\$0
22.	Yard Piping	JOB	L.S.	\$10,000.00	\$10,000
23.	Electrical - Mega-Site Booster Station	JOB	L.S.	\$50,000.00	\$50,000
<i>Sub-Total</i>					<u>\$4,073,650</u>
ESTIMATED CONSTRUCTION COST					\$4,073,650
CONTINGENCY (10%)					<u>\$407,365</u>
CONSTRUCTION ALLOWANCE					\$4,481,015
Engineering					\$306,500
Surveying					\$50,000
Inspection					\$91,100
Property Surveys & Plats					\$10,000
Land Acquisition					\$15,000
Wetlands Determination					\$10,000
Geotechnical Engineering					\$2,500
Permits					\$7,500
Testing (During Construction) (Concrete, Earthwork, Etc.)					<u>\$5,000</u>
Total Engineering Costs					\$497,600
TOTAL OTHER COSTS (Bond Attorney, Legal, Interim Financing, Etc.)					<u>\$125,000</u>
TOTAL ESTIMATED PROJECT COST					<u>\$5,103,615</u>

**PRELIMINARY PROJECT COST ESTIMATE
FRANKLIN FARMS MEGA-SITE
DELHI WATER ALTERNATIVE (2 MGD)
DECEMBER, 2012**

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	TOTAL COST
<u>Well-Sites in Epps Field and Transmission Lines</u>					
1.	Water Wells	5	EA.	\$300,000.00	\$1,500,000
2.	24" CL160 PVC Water Transmission Line Open Cut	72,530	L.F.	\$70.00	\$5,077,100
3.	24" CL160 PVC Water Transmission Line J&B	2,000	L.F.	\$130.00	\$260,000
4.	24" DR11 HDPE Water Transmission Line Directional Bore	2,370	L.F.	\$145.00	\$343,650
5.	Water Well Electrical	JOB	L.S.	\$225,000.00	\$225,000
6.	500,000 Gallon Ground Storage Tank (Well Production)	1	EA.	\$310,000.00	\$310,000
7.	Masonry Buidling for Pumps & Control Room	1,000	S.F.	\$120.00	\$120,000
8.	2,100 GPM Booster Pumps w/ VFD Controls	3	EA.	\$40,000.00	\$120,000
9.	8" CL160 PVC Water Transmission Line Open Cut to 183 Site	1,850	L.F.	\$12.00	\$22,200
10.	8" CL160 PVC Water Transmission Line J&B to 183 Sites	250	L.F.	\$60.00	\$15,000
11.	10" Steel Casing, Jack & Bore	100	L.F.	\$100.00	\$10,000
<u>Storage Facilities at Mega-Site</u>					
12.	Site Work - Light Clearing, Grubbing & Grading	0.5	ACRE	\$1,000.00	\$500
13.	Gravel Access Drive, Culverts, Etc.	JOB	L.S.	\$5,000.00	\$5,000
14.	1,500,000 Gallon Elevated Storage Tank	1	L.S.	\$2,700,000.00	\$2,700,000
15.	500,000 Gallon Ground Storage Tank (Fire Protection)	1	EA.	\$310,000.00	\$310,000
16.	2,100 GPM Booster Pumps w/ VFD Controls	3	EA.	\$40,000.00	\$120,000
17.	Booster Station Piping & Fittings	JOB	L.S.	\$65,000.00	\$65,000
18.	Masonry Buidling (Pumps & Chlorination)	400	S.F.	\$120.00	\$48,000
19.	6' Chain Link Fencing	400	L.F.	\$15.00	\$6,000
20.	Gaseous Chlorination Facility	JOB	L.S.	\$20,000.00	\$20,000
21.	Yard Piping	JOB	L.S.	\$10,000.00	\$10,000
22.	Electrical - Mega-Site Booster Station	JOB	L.S.	\$50,000.00	\$50,000
<i>Sub-Total</i>					<u>\$11,290,250</u>
ESTIMATED CONSTRUCTION COST					\$11,290,250
CONTINGENCY (10%)					<u>\$1,129,025</u>
CONSTRUCTION ALLOWANCE					\$12,419,275
Engineering					\$745,100
Surveying					\$85,000
Inspection					\$248,300
Property Surveys & Plats					\$10,000
Land Acquisition					\$10,000
Wetlands Determination					\$10,000
Geotechnical Engineering					\$75,000
Permits					\$5,000
Testing					<u>\$5,000</u>
Total Engineering Costs					\$1,193,400
TOTAL OTHER COSTS (Bond Attorney, Legal, Interim Financing, Etc.)					<u>\$175,000</u>
TOTAL ESTIMATED PROJECT COST					<u>\$13,787,675</u>

Note Because the current water transmission line that services the ConAgra site has an excess capacity of 1 MGD, a transmission line was run directly to the well sites located north of Delhi in the Epps Field and now bypasses the ConAgra site altogether. However, it is possible to run two smaller transmission lines, one to the ConAgra site and one to the Epps Field location for additional capacity though this alternative would be more expensive.

**PRELIMINARY PROJECT COST ESTIMATE
FRANKLIN FARMS MEGA-SITE
DELHI WATER ALTERNATIVE (3 MGD)
DECEMBER, 2012**

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	TOTAL COST
<u>Well-Sites in Epps Field and Transmission Lines</u>					
1.	Water Wells	7	EA.	\$300,000.00	\$2,100,000
2.	30" CL160 PVC Water Transmission Line Open Cut	72,530	L.F.	\$70.00	\$5,077,100
3.	30" CL160 PVC Water Transmission Line J&B	2,000	L.F.	\$130.00	\$260,000
4.	30" DR11 HDPE Water Transmission Line Directional Bore	2,370	L.F.	\$145.00	\$343,650
5.	Water Well Electrical	JOB	L.S.	\$315,000.00	\$315,000
6.	500,000 Gallon Ground Storage Tank (Well Production)	1	EA.	\$310,000.00	\$310,000
7.	Masonry Buidling for Pumps & Control Room	1,000	S.F.	\$120.00	\$120,000
8.	2,100 GPM Booster Pumps w/ VFD Controls	4	EA.	\$40,000.00	\$160,000
9.	8" CL160 PVC Water Transmission Line Open Cut to 183 Site	1,850	L.F.	\$12.00	\$22,200
10.	8" CL160 PVC Water Transmission Line J&B to 183 Sites	250	L.F.	\$60.00	\$15,000
11.	10" Steel Casing, Jack & Bore	100	L.F.	\$100.00	\$10,000
<u>Storage Facilities at Mega-Site</u>					
12.	Site Work - Light Clearing, Grubbing & Grading	0.5	ACRE	\$1,000.00	\$500
13.	Gravel Access Drive, Culverts, Etc.	JOB	L.S.	\$5,000.00	\$5,000
14.	2,500,000 Gallon Elevated Storage Tank	1	L.S.	\$3,487,500.00	\$3,487,500
15.	500,000 Gallon Ground Storage Tank (Fire Protection)	1	EA.	\$310,000.00	\$310,000
16.	2,100 GPM Booster Pumps w/ VFD Controls	4	EA.	\$40,000.00	\$160,000
17.	Booster Station Piping & Fittings	JOB	L.S.	\$65,000.00	\$65,000
18.	Masonry Buidling (Pumps & Chlorination)	400	S.F.	\$120.00	\$48,000
19.	6' Chain Link Fencing	400	L.F.	\$15.00	\$6,000
20.	Gaseous Chlorination Facility	JOB	L.S.	\$20,000.00	\$20,000
21.	Yard Piping	JOB	L.S.	\$10,000.00	\$10,000
22.	Electrical - Mega-Site Booster Station	JOB	L.S.	\$50,000.00	\$50,000
<i>Sub-Total</i>					<u>\$12,847,750</u>
ESTIMATED CONSTRUCTION COST					\$12,847,750
CONTINGENCY (10%)					<u>\$1,284,775</u>
CONSTRUCTION ALLOWANCE					\$14,132,525
Engineering					\$847,900
Surveying					\$90,000
Inspection					\$282,600
Property Surveys & Plats					\$12,500
Land Acquisition					\$12,500
Wetlands Determination					\$10,000
Geotechnical Engineering					\$75,000
Permits					\$5,000
Testing					<u>\$5,000</u>
Total Engineering Costs					\$1,340,500
TOTAL OTHER COSTS (Bond Attorney, Legal, Interim Financing, Etc.)					<u>\$175,000</u>
TOTAL ESTIMATED PROJECT COST					<u>\$15,648,025</u>

Note Because the current water transmission line that services the ConAgra site has an excess capacity of 1 MGD, a transmission line was run directly to the well sites located north of Delhi in the Epps Field and now bypasses the ConAgra site altogether. However, it is possible to run two smaller transmission lines, one to the ConAgra site and one to the Epps Field location for additional capacity though this alternative would be more expensive.

**PRELIMINARY PROJECT COST ESTIMATE
FRANKLIN FARMS MEGA-SITE
EPPS FIELD WATER ALTERNATIVE (0.5 MGD)
DECEMBER, 2012**

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	TOTAL COST
<u>Well-Sites in Epps Field and Transmission Lines</u>					
1.	Water Wells	2	EA.	\$300,000.00	\$600,000
2.	18" CL160 PVC Water Transmission Line Open Cut	72,530	L.F.	\$50.00	\$3,626,500
3.	18" CL160 PVC Water Transmission Line J&B	2,000	L.F.	\$90.00	\$180,000
4.	18" DR11 HDPE Water Transmission Line Directional Bore	2,370	L.F.	\$117.00	\$277,290
5.	Water Well Electrical	JOB	L.S.	\$90,000.00	\$90,000
6.	500,000 Gallon Ground Storage Tank (Well Production)	1	EA.	\$310,000.00	\$310,000
7.	Masonry Buidling for Pumps & Control Room	1,000	S.F.	\$120.00	\$120,000
8.	2,100 GPM Booster Pumps w/ VFD Controls	2	EA.	\$40,000.00	\$80,000
<u>Storage Facilities at Mega-Site</u>					
9.	Site Work - Light Clearing, Grubbing & Grading	0.5	ACRE	\$1,000.00	\$500
10.	Gravel Access Drive, Culverts, Etc.	JOB	L.S.	\$5,000.00	\$5,000
11.	1,500,000 Gallon Elevated Storage Tank	0	L.S.	\$2,700,000.00	\$0
12.	500,000 Gallon Ground Storage Tank (Fire Protection)	1	EA.	\$310,000.00	\$310,000
13.	2,100 GPM Booster Pumps w/ VFD Controls	2	EA.	\$40,000.00	\$80,000
14.	Booster Station Piping & Fittings	JOB	L.S.	\$65,000.00	\$65,000
15.	Masonry Buidling (Pumps & Chlorination)	400	S.F.	\$120.00	\$48,000
16.	6' Chain Link Fencing	400	L.F.	\$15.00	\$6,000
17.	Gaseous Chlorination Facility	JOB	L.S.	\$20,000.00	\$20,000
18.	Yard Piping	JOB	L.S.	\$10,000.00	\$10,000
19.	Electrical - Mega-Site Booster Station	JOB	L.S.	\$50,000.00	\$50,000
<i>Sub-Total</i>					<u>\$5,878,290</u>
ESTIMATED CONSTRUCTION COST					\$5,878,290
CONTINGENCY (10%)					<u>\$587,829</u>
CONSTRUCTION ALLOWANCE					\$6,466,119
Engineering					\$387,900
Surveying					\$75,000
Inspection					\$129,300
Property Surveys & Plats					\$5,000
Land Acquisition					\$5,000
Wetlands Determination					\$10,000
Geotechnical Engineering					\$75,000
Permits					\$5,000
Testing					<u>\$5,000</u>
Total Engineering Costs					\$697,200
TOTAL OTHER COSTS (Bond Attorney, Legal, Interim Financing, Etc.)					<u>\$125,000</u>
TOTAL ESTIMATED PROJECT COST					<u>\$7,288,319</u>

**PRELIMINARY PROJECT COST ESTIMATE
FRANKLIN FARMS MEGA-SITE
EPPS FIELD WATER ALTERNATIVE (1 MGD)
DECEMBER, 2012**

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	TOTAL COST
<u>Well-Sites in Epps Field and Transmission Lines</u>					
1.	Water Wells	3	EA.	\$300,000.00	\$900,000
2.	24" CL160 PVC Water Transmission Line Open Cut	72,530	L.F.	\$70.00	\$5,077,100
3.	24" CL160 PVC Water Transmission Line J&B	2,000	L.F.	\$130.00	\$260,000
4.	24" DR11 HDPE Water Transmission Line Directional Bore	2,370	L.F.	\$145.00	\$343,650
5.	Water Well Electrical	JOB	L.S.	\$135,000.00	\$135,000
6.	500,000 Gallon Ground Storage Tank (Well Production)	1	EA.	\$310,000.00	\$310,000
7.	Masonry Buidling for Pumps & Control Room	1,000	S.F.	\$120.00	\$120,000
8.	2,100 GPM Booster Pumps w/ VFD Controls	2	EA.	\$40,000.00	\$80,000
<u>Storage Facilities at Mega-Site</u>					
9.	Site Work - Light Clearing, Grubbing & Grading	0.5	ACRE	\$1,000.00	\$500
10.	Gravel Access Drive, Culverts, Etc.	JOB	L.S.	\$5,000.00	\$5,000
11.	500,000 Gallon Elevated Storage Tank	1	L.S.	\$900,000.00	\$900,000
12.	500,000 Gallon Ground Storage Tank (Fire Protection)	1	EA.	\$310,000.00	\$310,000
13.	2,100 GPM Booster Pumps w/ VFD Controls	2	EA.	\$40,000.00	\$80,000
14.	Booster Station Piping & Fittings	JOB	L.S.	\$65,000.00	\$65,000
15.	Masonry Buidling (Pumps & Chlorination)	400	S.F.	\$120.00	\$48,000
16.	6' Chain Link Fencing	400	L.F.	\$15.00	\$6,000
17.	Gaseous Chlorination Facility	JOB	L.S.	\$20,000.00	\$20,000
18.	Yard Piping	JOB	L.S.	\$10,000.00	\$10,000
19.	Electrical - Mega-Site Booster Station	JOB	L.S.	\$50,000.00	\$50,000
<i>Sub-Total</i>					<u>\$8,720,250</u>
ESTIMATED CONSTRUCTION COST					\$8,720,250
CONTINGENCY (10%)					<u>\$872,025</u>
CONSTRUCTION ALLOWANCE					\$9,592,275
Engineering					\$575,500
Surveying					\$80,000
Inspection					\$191,800
Property Surveys & Plats					\$7,500
Land Acquisition					\$7,500
Wetlands Determination					\$10,000
Geotechnical Engineering					\$75,000
Permits					\$5,000
Testing					<u>\$5,000</u>
Total Engineering Costs					\$957,300
TOTAL OTHER COSTS (Bond Attorney, Legal, Interim Financing, Etc.)					<u>\$150,000</u>
TOTAL ESTIMATED PROJECT COST					<u>\$10,699,575</u>

**PRELIMINARY PROJECT COST ESTIMATE
FRANKLIN FARMS MEGA-SITE
EPPS FIELD WATER ALTERNATIVE (2 MGD)
DECEMBER, 2012**

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	TOTAL COST
<u>Well-Sites in Epps Field and Transmission Lines</u>					
1.	Water Wells	5	EA.	\$300,000.00	\$1,500,000
2.	24" CL160 PVC Water Transmission Line Open Cut	72,530	L.F.	\$70.00	\$5,077,100
3.	24" CL160 PVC Water Transmission Line J&B	2,000	L.F.	\$130.00	\$260,000
4.	24" DR11 HDPE Water Transmission Line Directional Bore	2,370	L.F.	\$145.00	\$343,650
5.	Water Well Electrical	JOB	L.S.	\$225,000.00	\$225,000
6.	500,000 Gallon Ground Storage Tank (Well Production)	1	EA.	\$310,000.00	\$310,000
7.	Masonry Buidling for Pumps & Control Room	1,000	S.F.	\$120.00	\$120,000
8.	2,100 GPM Booster Pumps w/ VFD Controls	3	EA.	\$40,000.00	\$120,000
<u>Storage Facilities at Mega-Site</u>					
9.	Site Work - Light Clearing, Grubbing & Grading	0.5	ACRE	\$1,000.00	\$500
10.	Gravel Access Drive, Culverts, Etc.	JOB	L.S.	\$5,000.00	\$5,000
11.	1,500,000 Gallon Elevated Storage Tank	1	L.S.	\$2,700,000.00	\$2,700,000
12.	500,000 Gallon Ground Storage Tank (Fire Protection)	1	EA.	\$310,000.00	\$310,000
13.	2,100 GPM Booster Pumps w/ VFD Controls	3	EA.	\$40,000.00	\$120,000
14.	Booster Station Piping & Fittings	JOB	L.S.	\$65,000.00	\$65,000
15.	Masonry Buidling (Pumps & Chlorination)	400	S.F.	\$120.00	\$48,000
16.	6' Chain Link Fencing	400	L.F.	\$15.00	\$6,000
17.	Gaseous Chlorination Facility	JOB	L.S.	\$20,000.00	\$20,000
18.	Yard Piping	JOB	L.S.	\$10,000.00	\$10,000
19.	Electrical - Mega-Site Booster Station	JOB	L.S.	\$50,000.00	\$50,000
<i>Sub-Total</i>					<u>\$11,290,250</u>
ESTIMATED CONSTRUCTION COST					\$11,290,250
CONTINGENCY (10%)					<u>\$1,129,025</u>
CONSTRUCTION ALLOWANCE					\$12,419,275
Engineering					\$745,100
Surveying					\$85,000
Inspection					\$248,300
Property Surveys & Plats					\$10,000
Land Acquisition					\$10,000
Wetlands Determination					\$10,000
Geotechnical Engineering					\$75,000
Permits					\$5,000
Testing					<u>\$5,000</u>
Total Engineering Costs					\$1,193,400
TOTAL OTHER COSTS (Bond Attorney, Legal, Interim Financing, Etc.)					<u>\$175,000</u>
TOTAL ESTIMATED PROJECT COST					<u>\$13,787,675</u>

**PRELIMINARY PROJECT COST ESTIMATE
FRANKLIN FARMS MEGA-SITE
EPPS FIELD WATER ALTERNATIVE (3 MGD)
DECEMBER, 2012**

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	TOTAL COST
<u>Well-Sites in Epps Field and Transmission Lines</u>					
1.	Water Wells	7	EA.	\$300,000.00	\$2,100,000
2.	30" CL160 PVC Water Transmission Line Open Cut	72,530	L.F.	\$70.00	\$5,077,100
3.	30" CL160 PVC Water Transmission Line J&B	2,000	L.F.	\$130.00	\$260,000
4.	30" DR11 HDPE Water Transmission Line Directional Bore	2,370	L.F.	\$145.00	\$343,650
5.	Water Well Electrical	JOB	L.S.	\$315,000.00	\$315,000
6.	500,000 Gallon Ground Storage Tank (Well Production)	1	EA.	\$310,000.00	\$310,000
7.	Masonry Buidling for Pumps & Control Room	1,000	S.F.	\$120.00	\$120,000
8.	2,100 GPM Booster Pumps w/ VFD Controls	4	EA.	\$40,000.00	\$160,000
<u>Storage Facilities at Mega-Site</u>					
9.	Site Work - Light Clearing, Grubbing & Grading	0.5	ACRE	\$1,000.00	\$500
10.	Gravel Access Drive, Culverts, Etc.	JOB	L.S.	\$5,000.00	\$5,000
11.	2,500,000 Gallon Elevated Storage Tank	1	L.S.	\$3,487,500.00	\$3,487,500
12.	500,000 Gallon Ground Storage Tank (Fire Protection)	1	EA.	\$310,000.00	\$310,000
13.	2,100 GPM Booster Pumps w/ VFD Controls	4	EA.	\$40,000.00	\$160,000
14.	Booster Station Piping & Fittings	JOB	L.S.	\$65,000.00	\$65,000
15.	Masonry Buidling (Pumps & Chlorination)	400	S.F.	\$120.00	\$48,000
16.	6' Chain Link Fencing	400	L.F.	\$15.00	\$6,000
17.	Gaseous Chlorination Facility	JOB	L.S.	\$20,000.00	\$20,000
18.	Yard Piping	JOB	L.S.	\$10,000.00	\$10,000
19.	Electrical - Mega-Site Booster Station	JOB	L.S.	\$50,000.00	\$50,000
<i>Sub-Total</i>					<u>\$12,847,750</u>
ESTIMATED CONSTRUCTION COST					\$12,847,750
CONTINGENCY (10%)					<u>\$1,284,775</u>
CONSTRUCTION ALLOWANCE					\$14,132,525
Engineering					\$847,900
Surveying					\$90,000
Inspection					\$282,600
Property Surveys & Plats					\$12,500
Land Acquisition					\$12,500
Wetlands Determination					\$10,000
Geotechnical Engineering					\$75,000
Permits					\$5,000
Testing					<u>\$5,000</u>
Total Engineering Costs					\$1,340,500
TOTAL OTHER COSTS (Bond Attorney, Legal, Interim Financing, Etc.)					<u>\$175,000</u>
TOTAL ESTIMATED PROJECT COST					<u>\$15,648,025</u>

**PRELIMINARY PROJECT COST ESTIMATE
FRANKLIN FARMS MEGA-SITE
POVERTY POINT WATER ALTERNATIVE (0.5 MGD)
DECEMBER, 2012**

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	TOTAL COST
<u>At Existing Intake Structure</u>					
1.	Pre-Engineered Metal Bldg. w/ Log Cabin Siding	540	S.F.	\$70.00	\$37,800
2.	2,100 GPM Vertical Turbine Pumps	2	EA.	\$50,000.00	\$100,000
3.	Raw Water Pump Station Piping and Fittings	JOB	L.S.	\$80,000.00	\$80,000
4.	24" C-905 PVC Raw Water Main	2,400	L.F.	\$70.00	\$168,000
5.	Compressed Air Backwash System	JOB	L.S.	\$22,000.00	\$22,000
6.	Electrical (Raw Water Pump Station Only)	JOB	L.S.	\$50,000.00	\$50,000
<u>At New Surface Water Treatment Facility</u>					
7.	Site Work - Light Clearing, Grubbing & Grading	2	ACRE	\$1,000.00	\$2,000
8.	Paved Access Road, Culverts, Etc (approx. 300')	JOB	L.S.	\$35,000.00	\$35,000
9.	500,000 GPD Surface Water Treatment Facility	JOB	L.S.	\$3,000,000.00	\$3,000,000
10.	500,000 Gallon Ground Storage Tank (Treated)	1.0	EA.	\$310,000.00	\$310,000
11.	Masonry Building for Pumps & Control Room	1,000	S.F.	\$120.00	\$120,000
12.	2,100 GPM Booster Pumps w/ VFD Controls	2	EA.	\$40,000.00	\$80,000
13.	1,000,000 Gallon Elevated Storage Tank	JOB	L.S.	\$0.00	\$0
14.	6' Chain Link Fencing	800	L.F.	\$15.00	\$12,000
15.	Yard Piping	JOB	L.S.	\$20,000.00	\$20,000
16.	Finished Water booster Station Piping & Fittings	JOB	L.S.	\$100,000.00	\$100,000
17.	Electrical - Booster Station & Treatment Plant	JOB	L.S.	\$100,000.00	\$100,000
<u>Transmission Main from Treatment Plant to Mega-Site</u>					
18.	24" DR18 C-905 PVC Water Line	10,100	L.F.	\$70.00	\$707,000
19.	30" DR9 PE Water Line, Directional bore, Creek Cross.	600	L.F.	\$350.00	\$210,000
20.	20" DR18 C-905 PVC Water Line	37,800	L.F.	\$55.00	\$2,079,000
21.	28" DR9 PE Water Line, Directional Bore, Creek Cross.	500	L.F.	\$325.00	\$162,500
22.	30" Steel Casing, Jack & Bore	100	L.F.	\$175.00	\$17,500
23.	Asphalt Repair	60	S.Y.	\$50.00	\$3,000
<u>At Mega Site</u>					
24.	Site Work - Light Clearing, Grubbing & Grading	0.5	ACRE	\$1,000.00	\$500
25.	Gravel Access Drive, Culverts, Etc.	JOB	L.S.	\$5,000.00	\$5,000
26.	1,000,000 Gallon Elevated Storage Tank	JOB	L.S.	\$1,800,000.00	\$1,800,000
27.	2,100 GPM Booster Pumps w/ VFD Controls	2	EA.	\$40,000.00	\$80,000
28.	Masonry Building (Pumps & Chlorination)	400	S.F.	\$120.00	\$310,000
29.	6' Chain Link Fencing	400	L.F.	\$15.00	\$6,000
30.	Gaseous Chlorination Facility	JOB	L.S.	\$20,000.00	\$5,000
31.	Yard Piping	JOB	L.S.	\$10,000.00	\$10,000
32.	Booster Station Piping & Fittings	JOB	L.S.	\$65,000.00	\$65,000
33.	Electrical - Mega-Site Booster Station	JOB	L.S.	\$50,000.00	\$50,000
<i>Sub-Total</i>					<i>\$9,747,300</i>
ESTIMATED CONSTRUCTION COST					\$9,747,300
CONTINGENCY (10%)					\$974,730
CONSTRUCTION ALLOWANCE					\$10,722,030
Engineering					\$544,900
Surveying					\$50,000
Inspection					\$181,600
Property Surveys & Plats					\$15,000
Land Acquisition					\$15,000
Wetlands Determination					\$10,000
Geotechnical Engineering					\$7,500
Permits					\$5,000
Testing					\$7,500
Total Engineering Costs					\$836,500
TOTAL OTHER COSTS (Bond Attorney, Legal, Interim Financing, Etc.)					\$150,000
TOTAL ESTIMATED PROJECT COST					\$11,708,530

**PRELIMINARY PROJECT COST ESTIMATE
FRANKLIN FARMS MEGA-SITE
POVERTY POINT WATER ALTERNATIVE (1 MGD)
DECEMBER, 2012**

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	TOTAL COST
<u>At Existing Intake Structure</u>					
1.	Pre-Engineered Metal Bldg. w/ Log Cabin Siding	540	S.F.	\$70.00	\$37,800
2.	2,100 GPM Vertical Turbine Pumps	2	EA.	\$50,000.00	\$100,000
3.	Raw Water Pump Station Piping and Fittings	JOB	L.S.	\$80,000.00	\$80,000
4.	24" C-905 PVC Raw Water Main	2,400	L.F.	\$70.00	\$168,000
5.	Compressed Air Backwash System	JOB	L.S.	\$22,000.00	\$22,000
6.	Electrical (Raw Water Pump Station Only)	JOB	L.S.	\$50,000.00	\$50,000
<u>At New Surface Water Treatment Facility</u>					
7.	Site Work - Light Clearing, Grubbing & Grading	2	ACRE	\$1,000.00	\$2,000
8.	Paved Access Road, Culverts, Etc (approx. 300')	JOB	L.S.	\$35,000.00	\$35,000
9.	1,000,000 GPD Surface Water Treatment Facility	JOB	L.S.	\$5,500,000.00	\$5,500,000
10.	500,000 Gallon Ground Storage Tank (Treated)	1.0	EA.	\$310,000.00	\$310,000
11.	Masonry Building for Pumps & Control Room	1,000	S.F.	\$120.00	\$120,000
12.	2,100 GPM Booster Pumps w/ VFD Controls	2	EA.	\$40,000.00	\$80,000
13.	1,000,000 Gallon Elevated Storage Tank	JOB	L.S.	\$1,800,000.00	\$1,800,000
14.	6' Chain Link Fencing	800	L.F.	\$15.00	\$12,000
15.	Yard Piping	JOB	L.S.	\$20,000.00	\$20,000
16.	Finished Water booster Station Piping & Fittings	JOB	L.S.	\$100,000.00	\$100,000
17.	Electrical - Booster Station & Treatment Plant	JOB	L.S.	\$100,000.00	\$100,000
<u>Transmission Main from Treatment Plant to Mega-Site</u>					
18.	24" DR18 C-905 PVC Water Line	10,100	L.F.	\$70.00	\$707,000
19.	30" DR9 PE Water Line, Directional bore, Creek Cross.	600	L.F.	\$350.00	\$210,000
20.	20" DR18 C-905 PVC Water Line	37,800	L.F.	\$55.00	\$2,079,000
21.	28" DR9 PE Water Line, Directional Bore, Creek Cross.	500	L.F.	\$325.00	\$162,500
22.	30" Steel Casing, Jack & Bore	100	L.F.	\$175.00	\$17,500
23.	Asphalt Repair	60	S.Y.	\$50.00	\$3,000
<u>At Mega Site</u>					
24.	Site Work - Light Clearing, Grubbing & Grading	0.5	ACRE	\$1,000.00	\$500
25.	Gravel Access Drive, Culverts, Etc.	JOB	L.S.	\$5,000.00	\$5,000
26.	1,000,000 Gallon Elevated Storage Tank	JOB	L.S.	\$1,800,000.00	\$1,800,000
27.	2,100 GPM Booster Pumps w/ VFD Controls	2	EA.	\$40,000.00	\$80,000
28.	Masonry Building (Pumps & Chlorination)	400	S.F.	\$120.00	\$310,000
29.	6' Chain Link Fencing	400	L.F.	\$15.00	\$6,000
30.	Gaseous Chlorination Facility	JOB	L.S.	\$20,000.00	\$5,000
31.	Yard Piping	JOB	L.S.	\$10,000.00	\$10,000
32.	Booster Station Piping & Fittings	JOB	L.S.	\$65,000.00	\$65,000
33.	Electrical - Mega-Site Booster Station	JOB	L.S.	\$50,000.00	\$50,000
<i>Sub-Total</i>					<i>\$14,047,300</i>

ESTIMATED CONSTRUCTION COST	\$14,047,300
CONTINGENCY (10%)	\$1,404,730

CONSTRUCTION ALLOWANCE	\$15,452,030
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Engineering	\$927,100
Surveying	\$50,000
Inspection	\$309,000
Property Surveys & Plats	\$15,000
Land Acquisition	\$15,000
Wetlands Determination	\$10,000
Geotechnical Engineering	\$7,500
Permits	\$5,000
Testing	\$7,500

Total Engineering Costs	\$1,346,100
TOTAL OTHER COSTS (Bond Attorney, Legal, Interim Financing, Etc.)	\$175,000

TOTAL ESTIMATED PROJECT COST	\$16,973,130
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**PRELIMINARY PROJECT COST ESTIMATE
FRANKLIN FARMS MEGA-SITE
POVERTY POINT WATER ALTERNATIVE (2 MGD)
DECEMBER, 2012**

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	TOTAL COST
<u>At Existing Intake Structure</u>					
1.	Pre-Engineered Metal Bldg. w/ Log Cabin Siding	540	S.F.	\$70.00	\$37,800
2.	2,800 GPM Vertical Turbine Pumps	2	EA.	\$55,000.00	\$110,000
3.	Raw Water Pump Station Piping and Fittings	JOB	L.S.	\$80,000.00	\$80,000
4.	24" C-905 PVC Raw Water Main	2,400	L.F.	\$70.00	\$168,000
5.	Compressed Air Backwash System	JOB	L.S.	\$22,000.00	\$22,000
6.	Electrical (Raw Water Pump Station Only)	JOB	L.S.	\$50,000.00	\$50,000
<u>At New Surface Water Treatment Facility</u>					
7.	Site Work - Light Clearing, Grubbing & Grading	2	ACRE	\$1,000.00	\$2,000
8.	Paved Access Road, Culverts, Etc (approx. 300')	JOB	L.S.	\$35,000.00	\$35,000
9.	2,000,000 GPD Surface Water Treatment Facility	JOB	L.S.	\$9,500,000.00	\$9,500,000
10.	500,000 Gallon Ground Storage Tank (Treated)	1.0	EA.	\$310,000.00	\$310,000
11.	Masonry Building for Pumps & Control Room	1,000	S.F.	\$120.00	\$120,000
12.	2,800 GPM Booster Pumps w/ VFD Controls	2	EA.	\$40,000.00	\$80,000
13.	1,000,000 Gallon Elevated Storage Tank	JOB	L.S.	\$1,800,000.00	\$1,800,000
14.	6' Chain Link Fencing	800	L.F.	\$15.00	\$12,000
15.	Yard Piping	JOB	L.S.	\$20,000.00	\$20,000
16.	Finished Water booster Station Piping & Fittings	JOB	L.S.	\$150,000.00	\$150,000
17.	Electrical - Booster Station & Treatment Plant	JOB	L.S.	\$150,000.00	\$150,000
<u>Transmission Main from Treatment Plant to Mega-Site</u>					
18.	24" DR18 C-905 PVC Water Line	10,100	L.F.	\$70.00	\$707,000
19.	30" DR9 PE Water Line, Directional bore, Creek Cross.	600	L.F.	\$350.00	\$210,000
20.	20" DR18 C-905 PVC Water Line	37,800	L.F.	\$55.00	\$2,079,000
21.	28" DR9 PE Water Line, Directional Bore, Creek Cross.	500	L.F.	\$325.00	\$162,500
22.	30" Steel Casing, Jack & Bore	100	L.F.	\$175.00	\$17,500
23.	Asphalt Repair	60	S.Y.	\$50.00	\$3,000
<u>At Mega Site</u>					
24.	Site Work - Light Clearing, Grubbing & Grading	0.5	ACRE	\$1,000.00	\$500
25.	Gravel Access Drive, Culverts, Etc.	JOB	L.S.	\$5,000.00	\$5,000
26.	2,000,000 Gallon Elevated Storage Tank	JOB	L.S.	\$3,225,000.00	\$3,225,000
27.	2,100 GPM Booster Pumps w/ VFD Controls	2	EA.	\$40,000.00	\$80,000
28.	Masonry Building (Pumps & Chlorination)	400	S.F.	\$120.00	\$310,000
29.	6' Chain Link Fencing	400	L.F.	\$15.00	\$6,000
30.	Gaseous Chlorination Facility	JOB	L.S.	\$20,000.00	\$5,000
31.	Yard Piping	JOB	L.S.	\$10,000.00	\$10,000
32.	Booster Station Piping & Fittings	JOB	L.S.	\$65,000.00	\$65,000
33.	Electrical - Mega-Site Booster Station	JOB	L.S.	\$50,000.00	\$50,000
<i>Sub-Total</i>					<i>\$19,582,300</i>
ESTIMATED CONSTRUCTION COST					\$19,582,300
CONTINGENCY (10%)					\$1,958,230
CONSTRUCTION ALLOWANCE					\$21,540,530
Engineering					\$1,386,400
Surveying					\$50,000
Inspection					\$462,100
Property Surveys & Plats					\$15,000
Land Acquisition					\$15,000
Wetlands Determination					\$10,000
Geotechnical Engineering					\$7,500
Permits					\$5,000
Testing					\$7,500
Total Engineering Costs					\$1,958,500
TOTAL OTHER COSTS (Bond Attorney, Legal, Interim Financing, Etc.)					\$200,000
TOTAL ESTIMATED PROJECT COST					\$23,699,030

**PRELIMINARY PROJECT COST ESTIMATE
FRANKLIN FARMS MEGA-SITE
POVERTY POINT WATER ALTERNATIVE (3 MGD)
DECEMBER, 2012**

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	TOTAL COST
<u>At Existing Intake Structure</u>					
1.	Pre-Engineered Metal Bldg. w/ Log Cabin Siding	540	S.F.	\$70.00	\$37,800
2.	2,100 GPM Vertical Turbine Pumps	4	EA.	\$50,000.00	\$200,000
3.	Raw Water Pump Station Piping and Fittings	JOB	L.S.	\$100,000.00	\$100,000
4.	24" C-905 PVC Raw Water Main	2,400	L.F.	\$70.00	\$168,000
5.	Compressed Air Backwash System	JOB	L.S.	\$22,000.00	\$22,000
6.	Additional Intake Structure	JOB	L.S.	\$100,000.00	\$100,000
7.	Electrical (Raw Water Pump Station Only)	JOB	L.S.	\$50,000.00	\$50,000
<u>At New Surface Water Treatment Facility</u>					
8.	Site Work - Light Clearing, Grubbing & Grading	2	ACRE	\$1,000.00	\$2,000
9.	Paved Access Road, Culverts, Etc (approx. 300')	JOB	L.S.	\$35,000.00	\$35,000
10.	3,000,000 GPD Surface Water Treatment Facility	JOB	L.S.	\$12,000,000.00	\$12,000,000
11.	500,000 Gallon Ground Storage Tank (Treated)	1.0	EA.	\$310,000.00	\$310,000
12.	Masonry Building for Pumps & Control Room	1,000	S.F.	\$120.00	\$120,000
13.	2,800 GPM Booster Pumps w/ VFD Controls	3	EA.	\$40,000.00	\$120,000
14.	1,000,000 Gallon Elevated Storage Tank	JOB	L.S.	\$1,800,000.00	\$1,800,000
15.	6' Chain Link Fencing	800	L.F.	\$15.00	\$12,000
16.	Yard Piping	JOB	L.S.	\$20,000.00	\$20,000
17.	Finished Water booster Station Piping & Fittings	JOB	L.S.	\$175,000.00	\$175,000
18.	Electrical - Booster Station & Treatment Plant	JOB	L.S.	\$175,000.00	\$175,000
<u>Transmission Main from Treatment Plant to Mega-Site</u>					
19.	24" DR18 C-905 PVC Water Line	10,100	L.F.	\$70.00	\$707,000
20.	30" DR9 PE Water Line, Directional bore, Creek Cross.	600	L.F.	\$350.00	\$210,000
21.	20" DR18 C-905 PVC Water Line	37,800	L.F.	\$55.00	\$2,079,000
22.	28" DR9 PE Water Line, Directional Bore, Creek Cross.	500	L.F.	\$325.00	\$162,500
23.	30" Steel Casing, Jack & Bore	100	L.F.	\$175.00	\$17,500
24.	Asphalt Repair	60	S.Y.	\$50.00	\$3,000
<u>At Mega Site</u>					
25.	Site Work - Light Clearing, Grubbing & Grading	0.5	ACRE	\$1,000.00	\$500
26.	Gravel Access Drive, Culverts, Etc.	JOB	L.S.	\$5,000.00	\$5,000
27.	3,000,000 Gallon Elevated Storage Tank	JOB	L.S.	\$3,750,000.00	\$3,750,000
28.	2,100 GPM Booster Pumps w/ VFD Controls	4	EA.	\$40,000.00	\$160,000
29.	Masonry Building (Pumps & Chlorination)	400	S.F.	\$120.00	\$310,000
30.	6' Chain Link Fencing	400	L.F.	\$15.00	\$6,000
31.	Gaseous Chlorination Facility	JOB	L.S.	\$20,000.00	\$5,000
32.	Yard Piping	JOB	L.S.	\$10,000.00	\$10,000
33.	Booster Station Piping & Fittings	JOB	L.S.	\$65,000.00	\$65,000
34.	Electrical - Mega-Site Booster Station	JOB	L.S.	\$50,000.00	\$50,000
<i>Sub-Total</i>					<i>\$22,987,300</i>
ESTIMATED CONSTRUCTION COST					\$22,987,300
CONTINGENCY (10%)					\$2,298,730
CONSTRUCTION ALLOWANCE					\$25,286,030
Engineering					\$1,645,800
Surveying					\$50,000
Inspection					\$548,600
Property Surveys & Plats					\$15,000
LDEQ Application					\$15,000
Wetlands Determination					\$10,000
Geotechnical Engineering					\$7,500
Permits					\$5,000
Testing					\$7,500
Total Engineering Costs					\$2,304,400
TOTAL OTHER COSTS (Bond Attorney, Legal, Interim Financing, Etc.)					\$225,000
TOTAL ESTIMATED PROJECT COST					\$27,815,430

**PRELIMINARY PROJECT COST ESTIMATE
FRANKLIN FARMS MEGA-SITE
RAYVILLE WATER ALTERNATIVE (0.5 MGD)
DECEMBER, 2012**

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	TOTAL COST
<u>Well-Sites in Rayville, LA and Transmission Lines</u>					
1.	Additional Water Wells	0	EA.	\$300,000.00	\$0
2.	Additional Iron Filters & Softening System	0	EA.	\$3,250,000.00	\$0
3.	18" CL160 PVC Water Transmission Line Open Cut	53,300	L.F.	\$50.00	\$2,665,000
4.	18" CL160 PVC Water Transmission Line J&B	1,300	L.F.	\$90.00	\$117,000
5.	18" DR11 HDPE Water Transmission Line Directional Bore	700	L.F.	\$117.00	\$81,900
6.	Water Well Electrical	JOB	L.S.	\$0.00	\$0
7.	500,000 Gallon Ground Storage Tank (Well Production)	0	EA.	\$310,000.00	\$0
8.	Masonry Buidling for Pumps & Control Room	1,000	S.F.	\$120.00	\$120,000
9.	2,100 GPM Booster Pumps w/ VFD Controls	0	EA.	\$40,000.00	\$0
<u>Storage Facilities</u>					
10.	Site Work - Light Clearing, Grubbing & Grading	0.5	ACRE	\$1,000.00	\$500
11.	Gravel Access Drive, Culverts, Etc.	JOB	L.S.	\$5,000.00	\$5,000
12.	1,000,000 Gallon Elevated Storage Tank	1	L.S.	\$1,800,000.00	\$1,800,000
13.	500,000 Gallon Ground Storage Tank (Fire Protection)	1	EA.	\$310,000.00	\$310,000
14.	2,100 GPM Booster Pumps w/ VFD Controls	2	EA.	\$40,000.00	\$80,000
15.	Booster Station Piping & Fittings	JOB	L.S.	\$65,000.00	\$65,000
16.	Masonry Buidling (Pumps & Chlorination)	400	S.F.	\$120.00	\$48,000
17.	6' Chain Link Fencing	400	L.F.	\$15.00	\$6,000
18.	Gaseous Chlorination Facility	JOB	L.S.	\$20,000.00	\$20,000
19.	Yard Piping	JOB	L.S.	\$10,000.00	\$10,000
20.	Electrical - Mega-Site Booster Station	JOB	L.S.	\$50,000.00	\$50,000
<i>Sub-Total</i>					<u>\$5,378,400</u>
ESTIMATED CONSTRUCTION COST					\$5,378,400
CONTINGENCY (10%)					<u>\$537,840</u>
CONSTRUCTION ALLOWANCE					\$5,916,240
Engineering					\$280,000
Surveying					\$50,000
Inspection					\$82,900
Property Surveys & Plats					\$10,000
Land Acquisition					\$10,000
Wetlands Determination					\$10,000
Geotechnical Engineering					\$7,500
Permits					\$5,000
Testing					<u>\$7,500</u>
Total Engineering Costs					\$462,900
TOTAL OTHER COSTS (Bond Attorney, Legal, Interim Financing, Etc.)					<u>\$75,000</u>
TOTAL ESTIMATED PROJECT COST					<u>\$6,454,140</u>

**PRELIMINARY PROJECT COST ESTIMATE
FRANKLIN FARMS MEGA-SITE
RAYVILLE WATER ALTERNATIVE (1 MGD)
DECEMBER, 2012**

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	TOTAL COST
<u>Well-Sites in Rayville, LA and Transmission Lines</u>					
1.	Additional Water Wells	2	EA.	\$300,000.00	\$600,000
2.	Additional Iron Filters & Softening System	1	EA.	\$3,250,000.00	\$3,250,000
3.	24" CL160 PVC Water Transmission Line Open Cut	53,300	L.F.	\$70.00	\$3,731,000
4.	24" CL160 PVC Water Transmission Line J&B	1,300	L.F.	\$130.00	\$169,000
5.	24" DR11 HDPE Water Transmission Line Directional Bore	700	L.F.	\$145.00	\$101,500
6.	Water Well Electrical	JOB	L.S.	\$90,000.00	\$90,000
7.	500,000 Gallon Ground Storage Tank (Well Production)	1	EA.	\$310,000.00	\$310,000
8.	Masonry Buidling for Pumps & Control Room	1,000	S.F.	\$120.00	\$120,000
9.	2,100 GPM Booster Pumps w/ VFD Controls	2	EA.	\$40,000.00	\$80,000
<u>Storage Facilities</u>					
10.	Site Work - Light Clearing, Grubbing & Grading	0.5	ACRE	\$1,000.00	\$500
11.	Gravel Access Drive, Culverts, Etc.	JOB	L.S.	\$5,000.00	\$5,000
12.	1,000,000 Gallon Elevated Storage Tank	1	L.S.	\$1,800,000.00	\$1,800,000
13.	500,000 Gallon Ground Storage Tank (Fire Protection)	1	EA.	\$310,000.00	\$310,000
14.	2,100 GPM Booster Pumps w/ VFD Controls	2	EA.	\$40,000.00	\$80,000
15.	Booster Station Piping & Fittings	JOB	L.S.	\$65,000.00	\$65,000
16.	Masonry Buidling (Pumps & Chlorination)	400	S.F.	\$120.00	\$48,000
17.	6' Chain Link Fencing	400	L.F.	\$15.00	\$6,000
18.	Gaseous Chlorination Facility	JOB	L.S.	\$20,000.00	\$20,000
19.	Yard Piping	JOB	L.S.	\$10,000.00	\$10,000
20.	Electrical - Mega-Site Booster Station	JOB	L.S.	\$50,000.00	\$50,000
<i>Sub-Total</i>					<u>\$10,846,000</u>
ESTIMATED CONSTRUCTION COST					\$10,846,000
CONTINGENCY (10%)					<u>\$1,084,600</u>
CONSTRUCTION ALLOWANCE					\$11,930,600
Engineering					\$646,400
Surveying					\$60,000
Inspection					\$218,800
Property Surveys & Plats					\$12,500
Land Acquisition					\$12,500
Wetlands Determination					\$10,000
Geotechnical Engineering					\$7,500
Permits					\$5,000
Testing					<u>\$7,500</u>
Total Engineering Costs					\$980,200
TOTAL OTHER COSTS (Bond Attorney, Legal, Interim Financing, Etc.)					<u>\$125,000</u>
TOTAL ESTIMATED PROJECT COST					<u>\$13,035,800</u>

**PRELIMINARY PROJECT COST ESTIMATE
FRANKLIN FARMS MEGA-SITE
RAYVILLE WATER ALTERNATIVE (2 MGD)
DECEMBER, 2012**

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	TOTAL COST
<u>Well-Sites in Rayville, LA and Transmission Lines</u>					
1.	Additional Water Wells	4	EA.	\$300,000.00	\$1,200,000
2.	Additional Iron Filters & Softening System	2	EA.	\$3,250,000.00	\$6,500,000
3.	24" CL160 PVC Water Transmission Line Open Cut	53,300	L.F.	\$70.00	\$3,731,000
4.	24" CL160 PVC Water Transmission Line J&B	1,300	L.F.	\$130.00	\$169,000
5.	24" DR11 HDPE Water Transmission Line Directional Bore	700	L.F.	\$145.00	\$101,500
6.	Water Well Electrical	JOB	L.S.	\$180,000.00	\$180,000
7.	500,000 Gallon Ground Storage Tank (Well Production)	1	EA.	\$310,000.00	\$310,000
8.	Masonry Buidling for Pumps & Control Room	1,000	S.F.	\$120.00	\$120,000
9.	2,100 GPM Booster Pumps w/ VFD Controls	2	EA.	\$40,000.00	\$80,000
<u>Storage Facilities</u>					
10.	Site Work - Light Clearing, Grubbing & Grading	0.5	ACRE	\$1,000.00	\$500
11.	Gravel Access Drive, Culverts, Etc.	JOB	L.S.	\$5,000.00	\$5,000
12.	2,000,000 Gallon Elevated Storage Tank	1	L.S.	\$3,600,000.00	\$3,600,000
13.	500,000 Gallon Ground Storage Tank (Fire Protection)	1	EA.	\$310,000.00	\$310,000
14.	2,100 GPM Booster Pumps w/ VFD Controls	2	EA.	\$40,000.00	\$80,000
15.	Booster Station Piping & Fittings	JOB	L.S.	\$65,000.00	\$65,000
16.	Masonry Buidling (Pumps & Chlorination)	400	S.F.	\$120.00	\$48,000
17.	6' Chain Link Fencing	400	L.F.	\$15.00	\$6,000
18.	Gaseous Chlorination Facility	JOB	L.S.	\$20,000.00	\$20,000
19.	Yard Piping	JOB	L.S.	\$10,000.00	\$10,000
20.	Electrical - Mega-Site Booster Station	JOB	L.S.	\$50,000.00	\$50,000
<i>Sub-Total</i>					<u>\$16,586,000</u>
ESTIMATED CONSTRUCTION COST					\$16,586,000
CONTINGENCY (10%)					<u>\$1,658,600</u>
CONSTRUCTION ALLOWANCE					\$18,244,600
Engineering					\$1,035,200
Surveying					\$70,000
Inspection					\$345,000
Property Surveys & Plats					\$15,000
Land Acquisition					\$15,000
Wetlands Determination					\$10,000
Geotechnical Engineering					\$7,500
Permits					\$5,000
Testing					<u>\$7,500</u>
Total Engineering Costs					\$1,510,200
TOTAL OTHER COSTS (Bond Attorney, Legal, Interim Financing, Etc.)					<u>\$150,000</u>
TOTAL ESTIMATED PROJECT COST					<u>\$19,904,800</u>

**PRELIMINARY PROJECT COST ESTIMATE
FRANKLIN FARMS MEGA-SITE
RAYVILLE WATER ALTERNATIVE (3 MGD)
DECEMBER, 2012**

ITEM NO.	DESCRIPTION	ESTIMATED QUANTITY	UNIT	UNIT PRICE	TOTAL COST
<u>Well-Sites in Rayville, LA and Transmission Lines</u>					
1.	Additional Water Wells	6	EA.	\$300,000.00	\$1,800,000
2.	Additional Iron Filters & Softening System	2	EA.	\$3,250,000.00	\$6,500,000
3.	30" CL160 PVC Water Transmission Line Open Cut	53,300	L.F.	\$70.00	\$3,731,000
4.	30" CL160 PVC Water Transmission Line J&B	1,300	L.F.	\$130.00	\$169,000
5.	30" DR11 HDPE Water Transmission Line Directional Bore	700	L.F.	\$145.00	\$101,500
6.	Water Well Electrical	JOB	L.S.	\$270,000.00	\$270,000
7.	500,000 Gallon Ground Storage Tank (Well Production)	1	EA.	\$310,000.00	\$310,000
8.	Masonry Buidling for Pumps & Control Room	1,000	S.F.	\$120.00	\$120,000
9.	2,100 GPM Booster Pumps w/ VFD Controls	2	EA.	\$40,000.00	\$80,000
<u>Storage Facilities</u>					
10.	Site Work - Light Clearing, Grubbing & Grading	0.5	ACRE	\$1,000.00	\$500
11.	Gravel Access Drive, Culverts, Etc.	JOB	L.S.	\$5,000.00	\$5,000
12.	3,000,000 Gallon Elevated Storage Tank	1	L.S.	\$5,400,000.00	\$5,400,000
13.	500,000 Gallon Ground Storage Tank (Fire Protection)	1	EA.	\$310,000.00	\$310,000
14.	2,100 GPM Booster Pumps w/ VFD Controls	2	EA.	\$40,000.00	\$80,000
15.	Booster Station Piping & Fittings	JOB	L.S.	\$65,000.00	\$65,000
16.	Masonry Buidling (Pumps & Chlorination)	400	S.F.	\$120.00	\$48,000
17.	6' Chain Link Fencing	400	L.F.	\$15.00	\$6,000
18.	Gaseous Chlorination Facility	JOB	L.S.	\$20,000.00	\$20,000
19.	Yard Piping	JOB	L.S.	\$10,000.00	\$10,000
20.	Electrical - Mega-Site Booster Station	JOB	L.S.	\$50,000.00	\$50,000
<i>Sub-Total</i>					<u>\$19,076,000</u>
ESTIMATED CONSTRUCTION COST					\$19,076,000
CONTINGENCY (10%)					<u>\$1,907,600</u>
CONSTRUCTION ALLOWANCE					\$20,983,600
Engineering					\$1,199,600
Surveying					\$80,000
Inspection					\$399,800
Property Surveys & Plats					\$17,500
Land Acquisition					\$17,500
Wetlands Determination					\$10,000
Geotechnical Engineering					\$7,500
Permits					\$5,000
Testing (During Construction) (Concrete, Earthwork, Etc.)					<u>\$7,500</u>
Total Engineering Costs					\$1,744,400
TOTAL OTHER COSTS (Bond Attorney, Legal, Interim Financing, Etc.)					<u>\$175,000</u>
TOTAL ESTIMATED PROJECT COST					<u>\$22,903,000</u>

EXHIBIT 3 - DESIGN CALCULATIONS

CONTRACT NUMBER: Franklin Farms Mega-Site
TITLE: Eggs Field Water
RECORD NUMBER:

CALCULATED BY:- CLINTON C. PATRICK, E.I.
DATE: 20-Feb-13

TOTAL DYNAMIC & STATIC HEAD CALCULATIONS

I. PUMP STATION DESIGN FLOW DATA		
A AVERAGE DAILY FLOW- (GPD)		500,000
B AVE. FLOW /1440- (GPM)		347.2
C PUMP RATE	300 %	1,041.7
D STORAGE CAP. (MIN)	10	3,472.2

II. ROUGHNESS COEFFICIENT		
100" =C DIP	150" =C PVC	
8" =ID DIP	18" =ID PVC	
$f=0.2083((100/C)^{1.85})/(Q^{1.852}/(D^{inside^{4.8655}}))$ EQ. 83 PVC PIPEHANDBOOK 2nd ED.		

III. HEAD LOSS(FT)= F*PIPE LENGTH(R)/100

IV. EQUIVALENT LENGTHS - MINOR LOSSES

DP(FT)		(Suction Piping)		DIP(FT)		(Discharge Piping)		PVC (FT)		(Common Force Main Piping)	
1	90 DEG EL	9.8	9.80	1	REDUCING ELL	9.0	9.00	8	90 DEG EL	22.0	176.00
1	REDUCER	9.0	9.00	1	GATE VALV	2.7	2.70	2	GATE VALV	3.0	6.00
				1	CHCK VALV	74.0	74.00				
				1	TEE	20.0	20.00				
				1	90 DEG EL	9.8	9.80				
	PIPE LENGTH	22.00			PIPE LENGTH	20.00			PIPE LENGTH	63,170	
		40.80					126.50				63,352.00

V. STATIC HEAD

- A. HIGH POINT IN SYSTEM-
B. LOW POINT IN SYSTEM-

83.41 Elevation in Force Main
72.52 Low Elevation in Force Main

TOTAL STATIC HEAD

10.89

VI. DESIGN CURVES

SYSTEM CURVE CALCULATIONS
1. SINGLE PUMP OPERATION

Q (GPM)	DIP		PE		PVC		TOTAL DYNAMIC HEAD (FT)	STATIC HEAD (FT)	TOTAL HEAD (FT)
	DYNAMIC HEAD (FT)	V (FPS)	DYNAMIC HEAD (FT)	V (FPS)	DYNAMIC HEAD (FT)	V (FPS)			
800	0.8	5.23	2.5	5.23	11.6	1.03	14.9	10.9	25.8
900	1.0	5.88	3.1	5.88	14.4	1.16	18.6	10.9	29.5
1000	1.2	6.53	3.8	6.53	17.5	1.29	22.6	10.9	33.5
1100	1.5	7.18	4.6	7.18	20.9	1.42	26.9	10.9	37.8
1200	1.7	7.84	5.4	7.84	24.5	1.55	31.6	10.9	42.5
1300	2.0	8.49	6.2	8.49	28.5	1.68	36.7	10.9	47.6
1400	2.3	9.14	7.1	9.14	32.6	1.81	42.1	10.9	53.0
1500	2.6	9.80	8.1	9.80	37.1	1.94	47.8	10.9	58.7
1600	2.9	10.45	9.1	10.45	41.8	2.06	53.9	10.9	64.8
1700	3.3	11.10	10.2	11.10	46.8	2.19	60.3	10.9	71.2
1800	3.7	11.76	11.4	11.76	52.0	2.32	67.0	10.9	77.9
DESIGN POINT-	1100	1.5	7.18	4.6	20.9	1.42	26.9	10.9	37.8

CONTRACT NUMBER: Franklin Farms Mega-Site
TITLE: Epps Field Water
RECORD NUMBER:

CALCULATED BY- CLINTON C. PATRICK, E.I.
DATE- 20-Feb-13

TOTAL DYNAMIC & STATIC HEAD CALCULATIONS

I. PUMP STATION DESIGN FLOW DATA

A AVERAGE DAILY FLOW- (GPD) 1,000,000
B AVE. FLOW /1440- (GPM) 694.4
C PUMP RATE 300 % 2,083.3
D STORAGE CAP. (MIN) 10 6,944.4

II. ROUGHNESS COEFFICIENT

100 =C DIP 100 =C PVC
8 "=ID DIP 8 "=ID PVC
EQ. 83 PVC PIPEHANDBOOK 2nd ED.

$f=0.2083((100/C)^{1.85})^{1.85}*(Q^{1.852})/(D^{5.345})$

III. HEAD LOSS(FT)= f*PIPE LENGTH(R)/100

IV. EQUIVALENT LENGTHS - MINOR LOSSES

DIP(FT)	(Suction Piping)	DIP(FT)	(Discharge Piping)	PVC (FT)	(Common Force Main Piping)
1 90 DEG EL	9.8	1 REDUCING ELL	9.0	8 90 DEG EL	224.00
1 REDUCER	9.0	1 GATE VALV	2.7	2 GATE VALV	6.00
		1 CHCK VALV	74.0		
		1 TEE	20.0		
		1 90 DEG EL	9.8		
PIPE LENGTH	22.00	PIPE LENGTH	20.00	PIPE LENGTH	63,170
	40.80		126.50		63,400.00

V. STATIC HEAD

A. HIGH POINT IN SYSTEM-

B. LOW POINT IN SYSTEM-

TOTAL STATIC HEAD

83.41 Elevation in Force Main
72.52 Low Elevation in Force Main

10.89

VI. DESIGN CURVES

SYSTEM CURVE CALCULATIONS
1. SINGLE PUMP OPERATION

Q (GPM)	DIP		PE		PVC		TOTAL DYNAMIC HEAD	STATIC HEAD (FT)	TOTAL HEAD (FT)
	DYNAMIC HEAD (FT)	V (FPS)	DYNAMIC HEAD (FT)	V (FPS)	DYNAMIC HEAD (FT)	V (FPS)			
2500	6.7	16.33	20.9	16.33	23.6	1.81	51.2	10.9	62.1
2600	7.2	16.98	22.5	16.98	25.4	1.89	55.1	10.9	65.9
2700	7.8	17.64	24.1	17.64	27.2	1.96	59.0	10.9	69.9
2800	8.3	18.29	25.8	18.29	29.1	2.03	63.2	10.9	74.0
2900	8.9	18.94	27.5	18.94	31.0	2.10	67.4	10.9	78.3
3000	9.4	19.59	29.3	19.59	33.1	2.18	71.8	10.9	82.7
3100	10.0	20.25	31.1	20.25	35.1	2.25	76.3	10.9	87.1
3200	10.6	20.90	33.0	20.90	37.3	2.32	80.9	10.9	91.8
3300	11.3	21.55	34.9	21.55	39.4	2.39	85.6	10.9	96.5
3400	11.9	22.21	36.9	22.21	41.7	2.47	90.5	10.9	101.4
3500	12.6	22.86	38.9	22.86	44.0	2.54	95.5	10.9	106.4
DESIGN POINT-	4.9	13.72	15.1	13.72	17.1	1.52	37.1	10.9	48.0

CONTRACT NUMBER: Franklin Farms Mega-Site
TITLE: Tapps Field Water
RECORD NUMBER:

CALCULATED BY: CLINTON C. PATRICK, E.I.
DATE: 20-Feb-13

TOTAL DYNAMIC & STATIC HEAD CALCULATIONS

- I. PUMP STATION DESIGN FLOW DATA
- A. AVERAGE DAILY FLOW: (GPD) **2,000,000**
 - B. AVE. FLOW/1440: (GPM) 1,388.9
 - C. PUMP RATE: 300 % 4,166.7
 - D. STORAGE CAP: (MIN) 10 13,888.9
- II. ROUGHNESS COEFFICIENT
- 100** -C DIP **100** -C DIP **150** -C PVC
 - 12** -D DIP **12** -D DIP **24** -D PVC
- $f=0.2083(100/C)^{1.852}(Q^{1.852}/\text{Dinside}^4.8655)$ EQ. 83 PVC PIPELANDBROOK 2nd ED.

III. HEAD LOSS(F)= FPIPE LENGTH(n)/100

IV. EQUIVALENT LENGTHS - MINOR LOSSES

DIP(FIT)		(Suction Piping)		DIR(FIT)		(Discharge Piping)		PVC (FIT)		(Common Freee Main Piping)	
1	90 DEG EL.	15.0	15.00	2	REDUCING FLL	9.0	18.00	8	90 DEG FL	28.0	224.00
1	REDUCER	9.0	9.00	2	GATE VALV	2.9	5.90	2	GATE VALV	3.0	6.00
				2	CHECK VALV	120.0	240.00				
				2	TEE	30.0	60.00				
				2	90 DEG EL.	15.0	30.00				
	PIPE LENGTH		22.00		PIPE LENGTH		20.00		PIPE LENGTH		63.170
			46.00				355.80				65.400.00

V. STATIC HEAD

- A. HIGH POINT IN SYSTEM-
- B. LOW POINT IN SYSTEM-

83.41 Elevation in Freee Main

72.52 Low Elevation in Freee Main

TOTAL STATIC HEAD

10.89

VL DESIGN CURVES

SYSTEM CURVE CALCULATIONS
1 SINGLE PUMP OPERATION

Q (GPM)	DP DYNAMIC HEAD (FT)	V (FPS)	PE DYNAMIC HEAD (FT)	V (FPS)	PVC DYNAMIC HEAD (FT)	V (FPS)	TOTAL DYNAMIC HEAD (FT)	STATIC HEAD (FT)	TOTAL HEAD (FT)
2500	1.1	7.26	8.2	7.26	23.6	1.81	32.8	10.9	43.7
2600	1.1	7.55	8.8	7.55	25.4	1.89	35.3	10.9	46.2
2700	1.2	7.84	9.4	7.84	27.2	1.96	37.8	10.9	48.7
2800	1.3	8.13	10.1	8.13	29.1	2.03	40.5	10.9	51.4
2900	1.4	8.42	10.8	8.42	31.0	2.10	43.2	10.9	54.1
3000	1.5	8.71	11.4	8.71	33.1	2.18	46.0	10.9	56.9
3100	1.6	9.00	12.2	9.00	35.1	2.25	48.9	10.9	59.8
3200	1.7	9.29	12.9	9.29	37.3	2.32	51.8	10.9	62.7
3300	1.8	9.58	13.7	9.58	39.4	2.39	54.9	10.9	65.8
3400	1.9	9.87	14.4	9.87	41.7	2.47	58.0	10.9	68.9
3500	2.0	10.16	15.2	10.16	44.0	2.54	61.2	10.9	72.1
DESIGN POINT-	1.7	9.43	13.3	9.43	38.3	2.36	53.3	10.9	64.2

11 DUPLICATION PUMP OPERATION- SINGLE PUMP CURVE

Q (GPM) EA PUMP	DP DYNAMIC HEAD (FT)	V (FPS)	PE * DYNAMIC HEAD (FT)	V (FPS)	PVC * DYNAMIC HEAD (FT)	V (FPS)	TOTAL DYNAMIC HEAD (FT)	STATIC HEAD (FT)	TOTAL HEAD (FT)
4800	3.5	13.93	98.7	27.87	284.9	6.97	387.2	10.9	398.1
4900	3.7	14.22	102.5	28.45	296.0	7.11	402.2	10.9	413.1
5000	3.8	14.51	106.4	29.03	307.3	7.26	417.5	10.9	428.5
5100	4.0	14.80	110.4	29.61	318.8	7.40	433.2	10.9	444.1
5200	4.1	15.10	114.5	30.19	330.5	7.55	449.0	10.9	459.9
5300	4.2	15.39	118.6	30.77	342.3	7.69	465.2	10.9	476.1
5400	4.4	15.68	122.8	31.35	354.4	7.84	481.6	10.9	492.4
5500	4.5	15.97	127.0	31.93	366.6	7.98	498.2	10.9	509.1
5600	4.7	16.26	131.3	32.51	379.1	8.13	515.1	10.9	526.0
5700	4.9	16.55	135.7	33.09	391.7	8.27	532.3	10.9	543.2
5800	5.0	16.84	140.1	33.67	404.5	8.42	549.7	10.9	560.6
DESIGN POINT-	0.8	6.10	21.3	12.19	61.6	3.05	83.8	10.9	94.6

CONTRACT NUMBER: Franklin Farms Mega-Site
TITLE: Epps Field Water
RECORD NUMBER:

CALCULATED BY- CLINTON C. PATRICK, E.I.
DATE- 20-Feb-13

TOTAL DYNAMIC & STATIC HEAD CALCULATIONS

I. PUMP STATION DESIGN FLOW DATA		
A AVERAGE DAILY FLOW- (GPD)		3,000,000
B AVE. FLOW /1440- (GPM)		2,083.3
C PUMP RATE	300 %	6,250.0
D STORAGE CAP. (MIN)	10	20,833.3
II. ROUGHNESS COEFFICIENT		
	100 =C DIP	150 =C PVC
	12 =ID DIP	30 =ID PVC
$f=0.2083(100/C)^{1.85}(Q^{1.852}/(D^{5.345}))$ EQ. 83 PVC PIPEHANDBOOK 2nd ED.		

III. HEAD LOSS(FT)= f*PIPE LENGTH(R)/100

IV. EQUIVALENT LENGTHS - MINOR LOSSES

DIP(FT)		(Suction Piping)	DIP(FT)		(Discharge Piping)	PVC (FT)		(Common Force Main Piping)
1	90 DEG EL	15.0	3	REDUCING ELL	9.0	8	90 DEG EL	272.00
1	REDUCER	9.0	3	GATE VALV	2.9	2	GATE VALV	6.20
			3	CHCK VALV	120.0			
			3	TEE	30.0			
			3	90 DEG EL	15.0			
	PIPE LENGTH	22.00		PIPE LENGTH	20.00		PIPE LENGTH	63,170
		46.00			523.70			63,448.20

V. STATIC HEAD

- A. HIGH POINT IN SYSTEM-
B. LOW POINT IN SYSTEM-

TOTAL STATIC HEAD

83.41 Elevation in Force Main
72.52 Low Elevation in Force Main

10.89

VI. DESIGN CURVES

SYSTEM CURVE CALCULATIONS
1. SINGLE PUMP OPERATION

Q (GPM)	DIP DYNAMIC HEAD (FT)	V (FPS)	PE DYNAMIC HEAD (FT)	V (FPS)	PVC DYNAMIC HEAD (FT)	V (FPS)	TOTAL DYNAMIC HEAD	STATIC HEAD (FT)	TOTAL HEAD (FT)
2500	1.1	7.26	12.0	7.26	8.0	1.16	21.0	10.9	31.9
2600	1.1	7.55	12.9	7.55	8.6	1.21	22.6	10.9	33.5
2700	1.2	7.84	13.9	7.84	9.2	1.25	24.3	10.9	35.2
2800	1.3	8.13	14.8	8.13	9.8	1.30	26.0	10.9	36.9
2900	1.4	8.42	15.8	8.42	10.5	1.35	27.7	10.9	38.6
3000	1.5	8.71	16.9	8.71	11.2	1.39	29.5	10.9	40.4
3100	1.6	9.00	17.9	9.00	11.9	1.44	31.3	10.9	42.2
3200	1.7	9.29	19.0	9.29	12.6	1.49	33.2	10.9	44.1
3300	1.8	9.58	20.1	9.58	13.3	1.53	35.2	10.9	46.1
3400	1.9	9.87	21.2	9.87	14.1	1.58	37.2	10.9	48.1
3500	2.0	10.16	22.4	10.16	14.9	1.63	39.2	10.9	50.1
DESIGN POINT-	2083	6.05	8.6	6.05	5.7	0.97	15.0	10.9	25.9

II.DUPEX PUMP OPERATION- SINGLE PUMP CURVE

Q (GPM) EA.PUMP	DIP		PE *		PVC *		V (FPS)	TOTAL		STATIC HEAD (FT)	TOTAL HEAD (FT)
	DYNAMIC HEAD (FT)	V	DYNAMIC HEAD (FT)	V	DYNAMIC HEAD (FT)	V					
			(FPS)		(FPS)			(FPS)			
4800	3.5		13.93	145.3	27.87	96.3	4.46	245.1	10.9	256.0	
4900	3.7		14.22	150.9	28.45	100.0	4.55	254.6	10.9	265.5	
5000	3.8		14.51	156.7	29.03	103.8	4.64	264.3	10.9	275.2	
5100	4.0		14.80	162.5	29.61	107.7	4.74	274.2	10.9	285.1	
5200	4.1		15.10	168.5	30.19	111.7	4.83	284.3	10.9	295.1	
5300	4.2		15.39	174.5	30.77	115.7	4.92	294.5	10.9	305.4	
5400	4.4		15.68	180.7	31.35	119.8	5.02	304.8	10.9	315.7	
5500	4.5		15.97	186.9	31.93	123.9	5.11	315.4	10.9	326.3	
5600	4.7		16.26	193.3	32.51	128.1	5.20	326.1	10.9	337.0	
5700	4.9		16.55	199.7	33.09	132.4	5.29	336.9	10.9	347.8	
5900	5.2		17.13	212.9	34.25	141.1	5.48	359.2	10.9	370.1	
DESIGN POINT-											
2083	0.8		6.05	31.0	12.09	20.5	1.93	52.2	10.9	63.1	

III.TRIPLEX PUMP OPERATION- SINGLE PUMP CURVE

Q (GPM) EA.PUMP	DIP		PE *		PVC *		V (FPS)	TOTAL		STATIC HEAD (FT)	TOTAL HEAD (FT)
	DYNAMIC HEAD (FT)	V	DYNAMIC HEAD (FT)	V	DYNAMIC HEAD (FT)	V		DYNAMIC HEAD			
			(FPS)		(FPS)			(FPS)			
5900	5.2	17.13	212.9	34.25	141.1	5.48	359.2	10.9	370.1		
6000	5.3	17.42	219.6	34.83	145.6	5.57	370.5	10.9	381.4		
6100	5.5	17.71	226.4	35.42	150.1	5.67	382.0	10.9	392.9		
6200	5.7	18.00	233.4	36.00	154.7	5.76	393.7	10.9	404.6		
6300	5.8	18.29	240.4	36.58	159.3	5.85	405.6	10.9	416.4		
6400	6.0	18.58	247.5	37.16	164.0	5.95	417.6	10.9	428.5		
6500	6.2	18.87	254.7	37.74	168.8	6.04	429.7	10.9	440.6		
6600	6.4	19.16	262.0	38.32	173.7	6.13	442.0	10.9	452.9		
6700	6.6	19.45	269.4	38.90	178.6	6.22	454.5	10.9	465.4		
6800	6.7	19.74	276.9	39.48	183.5	6.32	467.2	10.9	478.1		
6900	6.9	20.03	284.5	40.06	188.6	6.41	480.0	10.9	490.9		
DESIGN POINT-											
2083	0.8	6.05	31.0	12.09	20.5	1.93	52.2	10.9	63.1		

*- COMMON FORCE MAIN, FOR TWO PUMP OPERATION TOTAL FLOW APPROXIMATELY DOUBLED.

CONTRACT NUMBER: Franklin Farms Mega-Site
TITLE: Poverty Point Water
RECORD NUMBER:

CALCULATED BY:- CLINTON C. PATRICK, E.I.
DATE: 20-Feb-13

TOTAL DYNAMIC & STATIC HEAD CALCULATIONS

I. PUMP STATION DESIGN FLOW DATA	
A AVERAGE DAILY FLOW- (GPD)	500,000
B AVE. FLOW /1440- (GPM)	347.2
C PUMP RATE	1,041.7
D STORAGE CAP. (MIN)	10
300 %	

II. ROUGHNESS COEFFICIENT	
100" =C DIP	150" =C PVC
8" =ID DIP	18" =ID PVC

$f=0.2083((100/C)^{1.85})^{1/4} (Q^{1.852}/(D^{5.31}))^{1/4}$ EQ. 83 PVC PIPE HANDBOOK 2nd ED.

III. HEAD LOSS(FT)= F PIPE LENGTH(R)/100

IV. EQUIVALENT LENGTHS - MINOR LOSSES

DIP(FT)		DIP(FT)		DIP(FT)		PVC (FT)	
(Suction Piping)		(Discharge Piping)		(Common Force Main Piping)			
1 90 DEG EL	9.8	1 REDUCING ELL	9.0	5 90 DEG EL	22.0	110.00	
1 REDUCER	9.0	1 GATE VALV	2.7	2 GATE VALV	3.0	6.00	
		1 CHCK VALV	74.0				
		1 TEE	20.0				
		1 90 DEG EL	9.8				
PIPE LENGTH	22.00	PIPE LENGTH	20.00	PIPE LENGTH		55,300	
	40.80						55,416.00

V. STATIC HEAD

- A. HIGH POINT IN SYSTEM-
B. LOW POINT IN SYSTEM-

119.00	Max Water Level in Ground Storage Tank
80.00	Water Level in Reservoir

TOTAL STATIC HEAD

39.00

VI. DESIGN CURVES

SYSTEM CURVE CALCULATIONS

1. SINGLE PUMP OPERATION

Q (GPM)	DIP		V (FPS)	PE		V (FPS)	PVC		V (FPS)	TOTAL DYNAMIC HEAD (FT)	STATIC HEAD (FT)	TOTAL HEAD (FT)
	DYNAMIC HEAD (FT)	HEAD (FT)		DYNAMIC HEAD (FT)	HEAD (FT)		DYNAMIC HEAD (FT)	HEAD (FT)				
800	0.8	5.23	2.5	5.23	10.1	1.03	13.5	39.0	52.5			
900	1.0	5.88	3.1	5.88	12.6	1.16	16.8	39.0	55.8			
1000	1.2	6.53	3.8	6.53	15.3	1.29	20.4	39.0	59.4			
1100	1.5	7.18	4.6	7.18	18.3	1.42	24.3	39.0	63.3			
1200	1.7	7.84	5.4	7.84	21.5	1.55	28.6	39.0	67.6			
1300	2.0	8.49	6.2	8.49	24.9	1.68	33.1	39.0	72.1			
1400	2.3	9.14	7.1	9.14	28.6	1.81	38.0	39.0	77.0			
1500	2.6	9.80	8.1	9.80	32.4	1.94	43.2	39.0	82.2			
1600	2.9	10.45	9.1	10.45	36.6	2.06	48.6	39.0	87.6			
1700	3.3	11.10	10.2	11.10	40.9	2.19	54.4	39.0	93.4			
1800	3.7	11.76	11.4	11.76	45.5	2.32	60.5	39.0	99.5			
DESIGN POINT-	1100	7.18	4.6	7.18	18.3	1.42	24.3	39.0	63.3			

CONTRACT NUMBER: Franklin Farms Mega-Site
TITLE: Poverty Point Water
RECORD NUMBER:

CALCULATED BY- CLINTON C. PATRICK, E.I.
DATE- 20-Feb-13

TOTAL DYNAMIC & STATIC HEAD CALCULATIONS

I. PUMP STATION DESIGN FLOW DATA			
A AVERAGE DAILY FLOW- (GPD)			1,000,000
B AVE. FLOW /1440- (GPM)			694.4
C PUMP RATE	300 %		2,083.3
D STORAGE CAP. (MIN)	10		6,944.4
II. ROUGHNESS COEFFICIENT			
	100 =C DIP	100 =C PVC	
	8 "=ID DIP	24 "=ID PVC	
$f=0.2083((100/C)^{1.85})/(Q^{1.852})/(D_{inside}^{4.8655})$ EQ. 83 PVC PIPEHANDBOOK 2nd ED.			

III. HEAD LOSS(FT)= f*PIPE LENGTH(R)/100

IV. EQUIVALENT LENGTHS - MINOR LOSSES

DIP(FT)		(Suction Piping)		DIP(FT)		(Discharge Piping)		PVC (FT)		(Common Force Main Piping)	
1	90 DEG EL	9.8	9.80	1	REDUCING ELL	9.0	9.00	5	90 DEG EL	28.0	140.00
1	REDUCER	9.0	9.00	1	GATE VALV	2.7	2.70	2	GATE VALV	3.0	6.00
				1	CHCK VALV	74.0	74.00				
				1	TEE	20.0	20.00				
				1	90 DEG EL	9.8	9.80				
	PIPE LENGTH	22.00			PIPE LENGTH	20.00			PIPE LENGTH		55,300
			40.80				126.50				55,446.00

V. STATIC HEAD

- A. HIGH POINT IN SYSTEM-
B. LOW POINT IN SYSTEM-

TOTAL STATIC HEAD

119.00 Max Water Level in Ground Storage Tank
80.00 Water Level in Reservoir

39.00

VI. DESIGN CURVES

SYSTEM CURVE CALCULATIONS

1. SINGLE PUMP OPERATION

Q (GPM)	DIP DYNAMIC HEAD (FT)	V (FPS)	PE DYNAMIC HEAD (FT)	V (FPS)	PVC DYNAMIC HEAD (FT)	V (FPS)	TOTAL DYNAMIC HEAD (FT)	STATIC HEAD (FT)	TOTAL HEAD (FT)
2500	6.7	16.33	20.9	16.33	20.6	1.81	48.2	39.0	87.2
2600	7.2	16.98	22.5	16.98	22.2	1.89	51.9	39.0	90.9
2700	7.8	17.64	24.1	17.64	23.8	1.96	55.6	39.0	94.6
2800	8.3	18.29	25.8	18.29	25.4	2.03	59.5	39.0	98.5
2900	8.9	18.94	27.5	18.94	27.1	2.10	63.5	39.0	102.5
3000	9.4	19.59	29.3	19.59	28.9	2.18	67.6	39.0	106.6
3100	10.0	20.25	31.1	20.25	30.7	2.25	71.9	39.0	110.9
3200	10.6	20.90	33.0	20.90	32.6	2.32	76.2	39.0	115.2
3300	11.3	21.55	34.9	21.55	34.5	2.39	80.7	39.0	119.7
3400	11.9	22.21	36.9	22.21	36.4	2.47	85.3	39.0	124.3
3500	12.6	22.86	38.9	22.86	38.5	2.54	90.0	39.0	129.0
DESIGN POINT-	4.9	13.72	15.1	13.72	14.9	1.52	34.9	39.0	73.9

CONTRACT NUMBER: Franklin Farms Mega-Site
TITLE: Poverty Point Water
RECORD NUMBER:

CALCULATED BY- CLINTON C. PATRICK, E.I.
DATE- 20-Feb-13

TOTAL DYNAMIC & STATIC HEAD CALCULATIONS

I. PUMP STATION DESIGN FLOW DATA			
A AVERAGE DAILY FLOW- (GPD)			2,000,000
B AVE. FLOW /1440- (GPM)			1,388.9
C PUMP RATE	300 %		4,166.7
D STORAGE CAP. (MIN)	10		13,888.9
II. ROUGHNESS COEFFICIENT			
	100 =C DIP	150 =C PVC	
	12 "=ID DIP	24 "ID PVC	
$f=0.2083/((100/C)^{1.85})*(Q^{1.852}/(D_{inside}^{4.8655}))$ EQ. 83 PVC PIPEHANDBOOK 2nd ED.			

III. HEAD LOSS(FT)= f*PIPE LENGTH(R)/100

IV. EQUIVALENT LENGTHS - MINOR LOSSES

DIP(FT)	(Suction Piping)	DIP(FT)	(Discharge Piping)	PVC (FT)	(Common Force Main Piping)
1 90 DEG EL	15.0	1 REDUCING ELL	9.0	5 90 DEG EL	110.00
1 REDUCER	9.0	1 GATE VALV	2.9	2 GATE VALV	6.00
		1 CHCK VALV	120.0		
		1 TEE	30.0		
PIPE LENGTH	22.00	1 90 DEG EL	15.0	PIPE LENGTH	55,300
	46.00				55,416.00

V. STATIC HEAD

- A. HIGH POINT IN SYSTEM-
B. LOW POINT IN SYSTEM-

119.00	Max Water Level in Ground Storage Tank
80.00	Water Level in Reservoir

TOTAL STATIC HEAD

39.00

VI. DESIGN CURVES

SYSTEM CURVE CALCULATIONS

1. SINGLE PUMP OPERATION

Q (GPM)	DYNAMIC HEAD (FT)	DIP (FT)	V (FPS)	PE DYNAMIC HEAD (FT)	V (FPS)	PVC DYNAMIC I (FT)	V (FPS)	TOTAL DYNAMIC HEAD	STATIC HEAD (FT)	TOTAL HEAD (FT)
2500		1.1	7.26	4.3	7.26	20.6	1.81	26.0	39.0	65.0
2600		1.1	7.55	4.6	7.55	22.2	1.89	27.9	39.0	66.9
2700		1.2	7.84	5.0	7.84	23.8	1.96	30.0	39.0	69.0
2800		1.3	8.13	5.3	8.13	25.4	2.03	32.0	39.0	71.0
2900		1.4	8.42	5.7	8.42	27.1	2.10	34.2	39.0	73.2
3000		1.5	8.71	6.0	8.71	28.9	2.18	36.4	39.0	75.4
3100		1.6	9.00	6.4	9.00	30.7	2.25	38.7	39.0	77.7
3200		1.7	9.29	6.8	9.29	32.6	2.32	41.0	39.0	80.0
3300		1.8	9.58	7.2	9.58	34.5	2.39	43.4	39.0	82.4
3400		1.9	9.87	7.6	9.87	36.4	2.47	45.9	39.0	84.9
3500		2.0	10.16	8.0	10.16	38.4	2.54	48.5	39.0	87.5
DESIGN POINT-		2.8	12.19	11.3	12.19	53.9	3.05	67.9	39.0	106.9

CONTRACT NUMBER: Franklin Farms Mega-Site
TITLE: Poverty Point Water
RECORD NUMBER:

CALCULATED BY- CLINTON C. PATRICK, E.I.
DATE- 20-Feb-13

TOTAL DYNAMIC & STATIC HEAD CALCULATIONS

I. PUMP STATION DESIGN FLOW DATA		
A AVERAGE DAILY FLOW- (GPD)		3,000,000
B AVE. FLOW /1440- (GPM)		2,083.3
C PUMP RATE	300 %	6,250.0
D STORAGE CAP. (MIN)	10	20,833.3

II. ROUGHNESS COEFFICIENT		
100 =C DIP	150 =C PVC	
12 =ID DIP	30 =ID PVC	

$f=0.2083(100/C)^{1.85}(Q^{1.852}/(D_{inside}^4.8655))$ EQ. 83 PVC PIPEHANDBOOK 2nd ED.

III. HEAD LOSS(FT)= $f \times \text{PIPE LENGTH}(ft)/100$

IV. EQUIVALENT LENGTHS - MINOR LOSSES

DIP(FT)		(Suction Piping)		(Discharge Piping)		PVC (FT)		(Common Force Main Piping)	
1	90 DEG EL	15.0	15.00	3	REDUCING ELL	9.0	27.00	5	90 DEG EL
1	REDUCER	9.0	9.00	3	GATE VALV	2.9	8.70	2	GATE VALV
				3	CHCK VALV	120.0	360.00		
				3	TEE	30.0	90.00		
				3	90 DEG EL	15.0	45.00		
	PIPE LENGTH		22.00		PIPE LENGTH		20.00		55,300
			46.00				523.70		55,476.20

V. STATIC HEAD

- A. HIGH POINT IN SYSTEM-
B. LOW POINT IN SYSTEM-

119.00	Max Water Level in Ground Storage Tank
80.00	Water Level in Reservoir

TOTAL STATIC HEAD

39.00