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

PREPARED FOR: THE NORTHEAST LOUISIANA ECONOMIC ALLIANCE

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UTILITY FEASIBILITY STUDY
POTABLE WATER

FRANKLIN FARMS MEGA-SITE
RICHLAND PARISH, LOUISIANA

FOR

THE NORTHEAST LOUISIANA
ECONOMIC ALLAINCE

NOVEMBER 2012

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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

Potable Water Demand	Cost	Required
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.

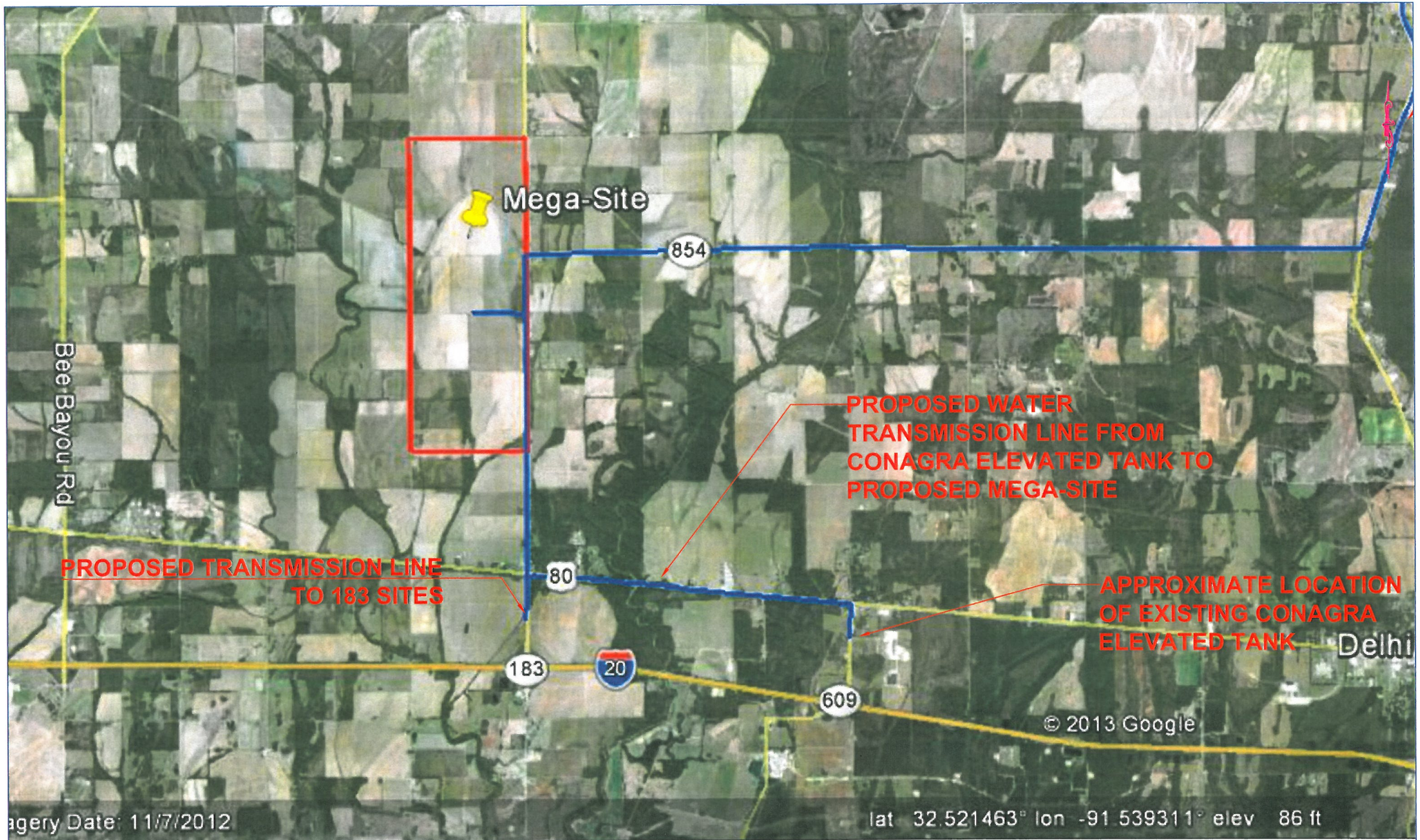
Conclusions

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 that 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. NO.	DATE	DRWN	CHKD	REMARKS

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

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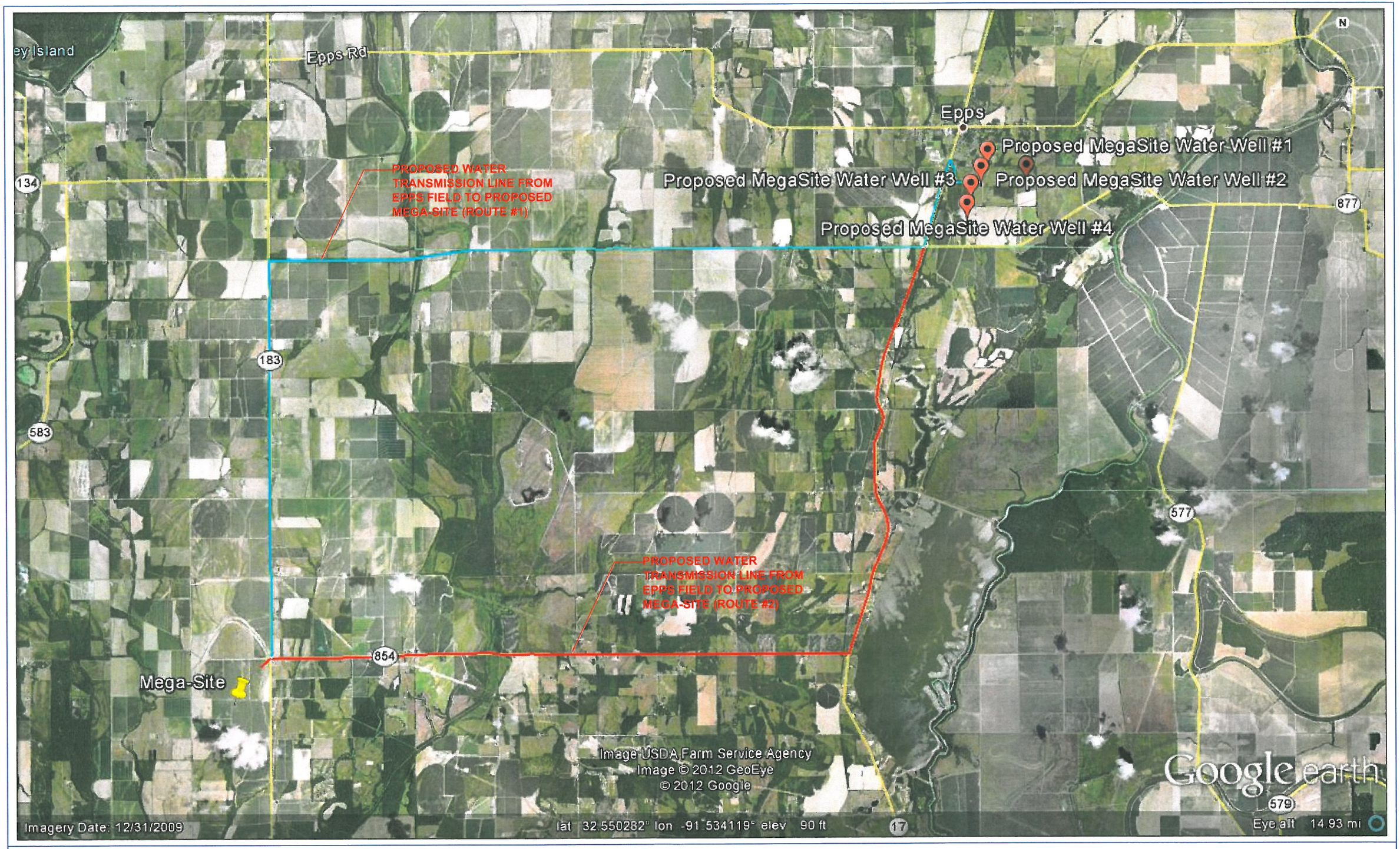
FRANKLIN FARMS
PROPOSED MEGA-SITE
UTILITY FEASIBILITY STUDY

DELHI/CONAGRA WATER
ALTERNATIVE

PROJECT NO.
FILE NAME:
SHEET NO.
1F



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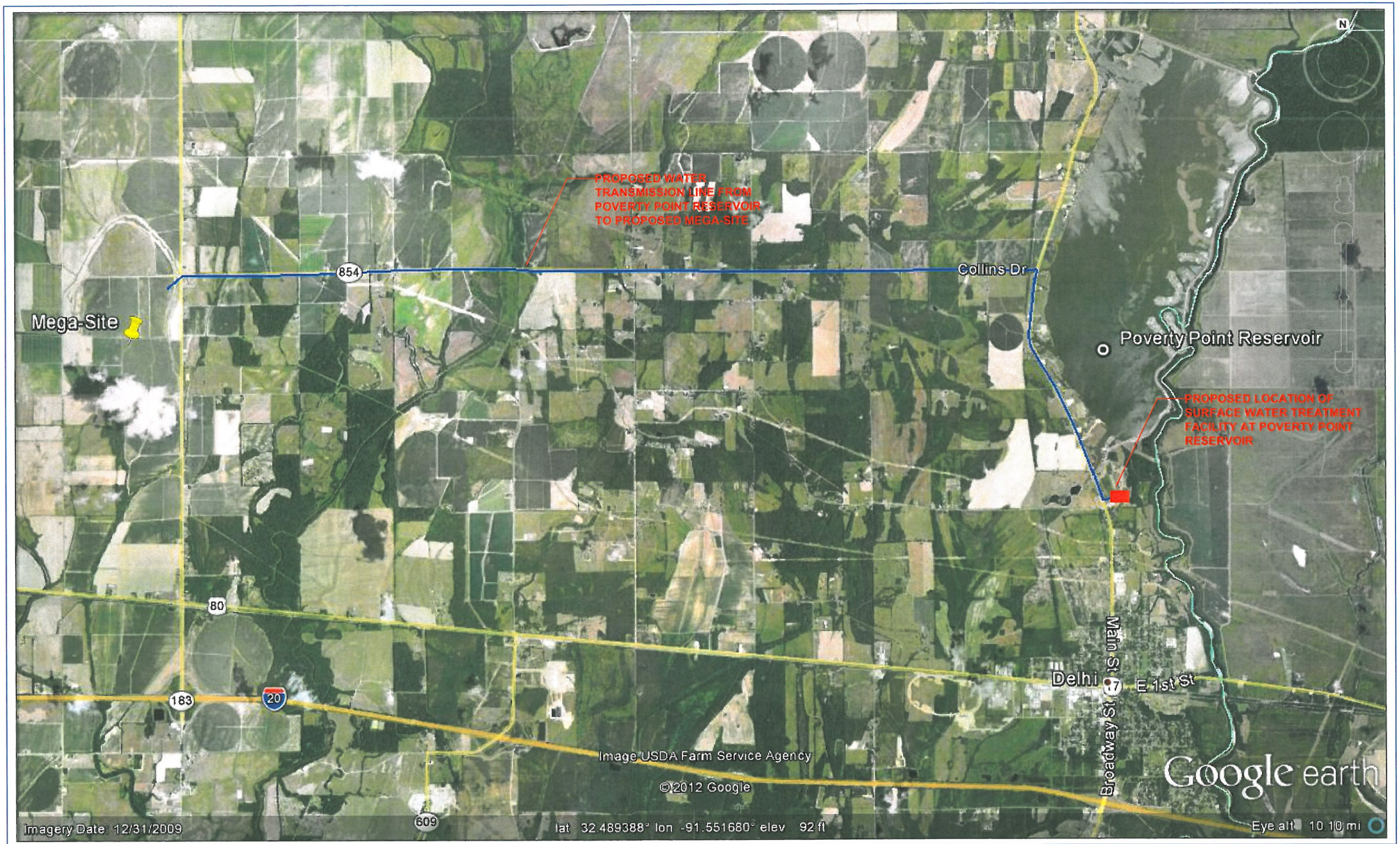
FRANKLIN FARMS
PROPOSED MEGA-SITE
UTILITY FEASIBILITY STUDY

EPPS FIELD WATER ALTERNATIVE

PROJECT NO.
FILE NAME:
SHEET NO.
1H



REV. NO.	DATE	DRWN	CHKD	REMARKS

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

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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
Transmission Lines and Storage Facilities at ConAgra Site					
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
Storage Facilities					
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
				Sub-Total	*$4,073,650*
				ESTIMATED CONSTRUCTION COST	**$4,073,650**
				CONTINGENCY (10%)	$407,365
				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.)	$5,000
				Total Engineering Costs	$497,600
				TOTAL OTHER COSTS (Bond Attorney, Legal, Interim Financing, Etc.)	$125,000
				TOTAL ESTIMATED PROJECT COST	**$5,103,615**

Prepared By: Denmon Engineering

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
Transmission Lines and Storage Facilities at ConAgra Site					
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
Storage Facilities					
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
				Sub-Total	*$4,073,650*
				ESTIMATED CONSTRUCTION COST	**$4,073,650**
				CONTINGENCY (10%)	$407,365
				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.)	$5,000
				Total Engineering Costs	$497,600
				TOTAL OTHER COSTS (Bond Attorney, Legal, Interim Financing, Etc.)	$125,000
				TOTAL ESTIMATED PROJECT COST	**$5,103,615**

Prepared By: Denmon Engineering

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
Well-Sites in Epps Field and Transmission Lines					
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
Storage Facilities at Mega-Site					
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
				Sub-Total	*$11,290,250*
				ESTIMATED CONSTRUCTION COST	**$11,290,250**
				CONTINGENCY (10%)	$1,129,025
				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	$5,000
				Total Engineering Costs	$1,193,400
				TOTAL OTHER COSTS (Bond Attorney, Legal, Interim Financing, Etc.)	$175,000
				TOTAL ESTIMATED PROJECT COST	**$13,787,675**

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 altogther. 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.

Prepared By: Denmon Engineering

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
Well-Sites in Epps Field and Transmission Lines					
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
Storage Facilities at Mega-Site					
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
				Sub-Total	*$12,847,750*
				ESTIMATED CONSTRUCTION COST	**$12,847,750**
				CONTINGENCY (10%)	$1,284,775
				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	$5,000
				Total Engineering Costs	$1,340,500
				TOTAL OTHER COSTS (Bond Attorney, Legal, Interim Financing, Etc.)	$175,000
				TOTAL ESTIMATED PROJECT COST	**$15,648,025**

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 altogther. 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.

Prepared By: Denmon Engineering

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
Well-Sites in Epps Field and Transmission Lines					
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
Storage Facilities at Mega-Site					
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
				Sub-Total	*$5,878,290*
				ESTIMATED CONSTRUCTION COST	**$5,878,290**
				CONTINGENCY (10%)	$587,829
				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	$5,000
				Total Engineering Costs	$697,200
				TOTAL OTHER COSTS (Bond Attorney, Legal, Interim Financing, Etc.)	$125,000
				TOTAL ESTIMATED PROJECT COST	**$7,288,319**

Prepared By: Denmon Engineering

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
Well-Sites in Epps Field and Transmission Lines					
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
Storage Facilities at Mega-Site					
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
				Sub-Total	*$8,720,250*
				ESTIMATED CONSTRUCTION COST	**$8,720,250**
				CONTINGENCY (10%)	$872,025
				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	$5,000
				Total Engineering Costs	$957,300
				TOTAL OTHER COSTS (Bond Attorney, Legal, Interim Financing, Etc.)	$150,000
				TOTAL ESTIMATED PROJECT COST	**$10,699,575**

Prepared By: Denmon Engineering

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
Well-Sites in Epps Field and Transmission Lines					
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
Storage Facilities at Mega-Site					
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
				Sub-Total	*$11,290,250*

ESTIMATED CONSTRUCTION COST	**$11,290,250**
CONTINGENCY (10%)	$1,129,025
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	$5,000
Total Engineering Costs	$1,193,400
TOTAL OTHER COSTS (Bond Attorney, Legal, Interim Financing, Etc.)	$175,000
TOTAL ESTIMATED PROJECT COST	**$13,787,675**

Prepared By: Denmon Engineering

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
Well-Sites in Epps Field and Transmission Lines					
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
Storage Facilities at Mega-Site					
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
				Sub-Total	*$12,847,750*
				ESTIMATED CONSTRUCTION COST	**$12,847,750**
				CONTINGENCY (10%)	$1,284,775
				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	$5,000
				Total Engineering Costs	$1,340,500
				TOTAL OTHER COSTS (Bond Attorney, Legal, Interim Financing, Etc.)	$175,000
				TOTAL ESTIMATED PROJECT COST	**$15,648,025**

Prepared By: Denmon Engineering

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
At Existing Intake Structure					
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
At New Surface Water Treatment Facility					
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
Transmission Main from Treatment Plant to Mega-Site					
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
At Mega Site					
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
				Sub-Total	*$9,747,300*

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**

Prepared By: Denmon Engineering

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
At Existing Intake Structure					
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
At New Surface Water Treatment Facility					
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
Transmission Main from Treatment Plant to Mega-Site					
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
At Mega Site					
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
				Sub-Total	*$14,047,300*
				ESTIMATED CONSTRUCTION COST	**$14,047,300**
				CONTINGENCY (10%)	$1,404,730
				CONSTRUCTION ALLOWANCE	**$15,452,030**
				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**

Prepared By: Denmon Engineering

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
At Existing Intake Structure					
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
At New Surface Water Treatment Facility					
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
Transmission Main from Treatment Plant to Mega-Site					
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
At Mega Site					
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
				Sub-Total	*$19,582,300*
				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**

Prepared By: Denmon Engineering

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
At Existing Intake Structure					
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
At New Surface Water Treatment Facility					
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
Transmission Main from Treatment Plant to Mega-Site					
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
At Mega Site					
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
				Sub-Total	*$22,987,300*

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**

Prepared By: Denmon Engineering

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
Well-Sites in Rayville, LA and Transmission Lines					
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
Storage Facilities					
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
				Sub-Total	*$5,378,400*
				ESTIMATED CONSTRUCTION COST	**$5,378,400**
				CONTINGENCY (10%)	$537,840
				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	$7,500
				Total Engineering Costs	$462,900
				TOTAL OTHER COSTS (Bond Attorney, Legal, Interim Financing, Etc.)	$75,000
				TOTAL ESTIMATED PROJECT COST	**$6,454,140**

Prepared By: Denmon Engineering

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
Well-Sites in Rayville, LA and Transmission Lines					
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
Storage Facilities					
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
				Sub-Total	*$10,846,000*
				ESTIMATED CONSTRUCTION COST	**$10,846,000**
				CONTINGENCY (10%)	$1,084,600
				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	$7,500
				Total Engineering Costs	$980,200
				TOTAL OTHER COSTS (Bond Attorney, Legal, Interim Financing, Etc.)	$125,000
				TOTAL ESTIMATED PROJECT COST	**$13,035,800**

Prepared By: Denmon Engineering

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
Well-Sites in Rayville, LA and Transmission Lines					
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
Storage Facilities					
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
				Sub-Total	*$16,586,000*

ESTIMATED CONSTRUCTION COST	**$16,586,000**
CONTINGENCY (10%)	$1,658,600
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	$7,500
Total Engineering Costs	$1,510,200
TOTAL OTHER COSTS (Bond Attorney, Legal, Interim Financing, Etc.)	$150,000
TOTAL ESTIMATED PROJECT COST	**$19,904,800**

Prepared By: Denmon Engineering

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
Well-Sites in Rayville, LA and Transmission Lines					
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
Storage Facilities					
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
				Sub-Total	*$19,076,000*
				ESTIMATED CONSTRUCTION COST	**$19,076,000**
				CONTINGENCY (10%)	$1,907,600
				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.)	$7,500
				Total Engineering Costs	$1,744,400
				TOTAL OTHER COSTS (Bond Attorney, Legal, Interim Financing, Etc.)	$175,000
				TOTAL ESTIMATED PROJECT COST	**$22,903,000**

Prepared By: Denmon Engineering

EXHIBIT 3 – DESIGN CALCULATIONS

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)			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	100 =C DIP	150 =C PVC
8 "=ID DIP	8 "=ID DIP	18 "ID PVC
f=0.2083((100/C)^1.85)*(Q^1.852)/(Dinside^4.8655)	EQ. 83 PVC PIPEHANDBOOK 2nd ED.	

III. HEAD LOSS(FT)= f*PIPE LENGTH(ft)/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	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- **83.41** Elevation in Force Main

B. LOW POINT IN SYSTEM- **72.52** Low Elevation in Force Main

TOTAL STATIC HEAD 10.89

VI. DESIGN CURVES

SYSTEM CURVE CALCULATIONS

I.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)
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	7.18	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 DIP	150 =C PVC
8 "=ID DIP	8 "=ID DIP	24 "ID PVC

f=0.2083((100/C)^1.85)*(Q^1.852)/(Dinside^4.8655) EQ. 83 PVC PIPEHANDBOOK 2nd ED.

III. HEAD LOSS(FT)= f*PIPE LENGTH(ft)/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		8 90 DEG EL	28.0	224.00
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				63,400.00

V. STATIC HEAD

A. HIGH POINT IN SYSTEM-	83.41	Elevation in Force Main
B. LOW POINT IN SYSTEM-	72.52	Low Elevation in Force Main
TOTAL STATIC HEAD	10.89	

VI. DESIGN CURVES

SYSTEM CURVE CALCULATIONS

I.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	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-	2100	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: 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)			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 "=ID DIP	12 "=ID DIP	24 "ID PVC

f=0.2083((100/C)^1.85)*(Q^1.852)/(Dinside^4.8655) EQ. 83 PVC PIPEHANDBOOK 2nd ED.

III. HEAD LOSS(FT)= f*PIPE LENGTH(ft)/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	15.00	2 REDUCING ELL	9.0	18.00	8 90 DEG EL	28.0	224.00
1 REDUCER	9.0	9.00	2 GATE VALV	2.9	5.80	2 GATE VALV	3.0	6.00
			2 CHCK 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			63,400.00

V. STATIC HEAD

A. HIGH POINT IN SYSTEM-	83.41	Elevation in Force Main
B. LOW POINT IN SYSTEM-	72.52	Low Elevation in Force Main
TOTAL STATIC HEAD	10.89	

VI. DESIGN CURVES

SYSTEM CURVE CALCULATIONS

I.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	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-	3250	1.7	9.43	13.3	9.43	38.3	2.36	53.3	10.9	64.2

II.DUPLEX PUMP OPERATION- SINGLE PUMP CURVE

	Q (GPM) EA.PUMP	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)
	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	417.6	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-	2100	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	100 =C DIP	150 =C PVC
12 "=ID DIP	12 "=ID DIP	30 "ID PVC

f=0.2083((100/C)^1.85)*(Q^1.852)/(Dinside^4.8655) EQ. 83 PVC PIPEHANDBOOK 2nd ED.

III. HEAD LOSS(FT)= f*PIPE LENGTH(ft)/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	15.00		3	REDUCING ELL	9.0	27.00	8 90 DEG EL	34.0	272.00
1	REDUCER	9.0	9.00		3	GATE VALV	2.9	8.70	2 GATE VALV	3.1	6.20
					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	PIPE LENGTH		63,170
			46.00					523.70			63,448.20

V. STATIC HEAD

A. HIGH POINT IN SYSTEM-	83.41	Elevation in Force Main
B. LOW POINT IN SYSTEM-	72.52	Low Elevation in Force Main
TOTAL STATIC HEAD	10.89	

VI. DESIGN CURVES

SYSTEM CURVE CALCULATIONS

I.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	0.8	6.05	8.6	6.05	5.7	0.97	15.0	10.9	25.9

II.DUPLEX PUMP OPERATION- SINGLE PUMP CURVE

Q (GPM) EA.PUMP	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)
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 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)
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	300 %		1,041.7
D STORAGE CAP. (MIN)		10	3,472.2

II. ROUGHNESS COEFFICIENT

100 =C DIP	100 =C DIP	150 =C PVC
8 "=ID DIP	8 "=ID DIP	18 "ID PVC
f=0.2083((100/C)^1.85)*(Q^1.852)/(Dinside^4.8655)	EQ. 83 PVC PIPEHANDBOOK 2nd ED.	

III. HEAD LOSS(FT)= f*PIPE LENGTH(ft)/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	22.0	110.00
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			55,416.00

V. STATIC HEAD

A. HIGH POINT IN SYSTEM-	119.00	Max Water Level in Ground Storage Tank
B. LOW POINT IN SYSTEM-	80.00	Water Level in Reservoir
TOTAL STATIC HEAD	39.00	

VI. DESIGN CURVES

SYSTEM CURVE CALCULATIONS

I.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)
	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	1.5	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 DIP	150 =C PVC
8 "=ID DIP	8 "=ID DIP	24 "ID PVC
f=0.2083((100/C)^1.85)*(Q^1.852)/(Dinside^4.8655)	EQ. 83 PVC PIPEHANDBOOK 2nd ED.	

III. HEAD LOSS(FT)= f*PIPE LENGTH(ft)/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-	119.00	Max Water Level in Ground Storage Tank
B. LOW POINT IN SYSTEM-	80.00	Water Level in Reservoir
TOTAL STATIC HEAD	39.00	

VI. DESIGN CURVES

SYSTEM CURVE CALCULATIONS

I.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	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-	2100	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	100 =C DIP	150 =C PVC
12 "=ID DIP	12 "=ID DIP	24 "ID PVC
f=0.2083((100/C)^1.85)*(Q^1.852)/(Dinside^4.8655)	EQ. 83 PVC PIPEHANDBOOK 2nd ED.	

III. HEAD LOSS(FT)= f*PIPE LENGTH(ft)/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	15.00	1 REDUCING ELL	9.0	9.00	5 90 DEG EL	22.0	110.00
1	REDUCER	9.0	9.00	1 GATE VALV	2.9	2.90	2 GATE VALV	3.0	6.00
				1 CHCK VALV	120.0	120.00			
				1 TEE	30.0	30.00			
				1 90 DEG EL	15.0	15.00			
	PIPE LENGTH		22.00	PIPE LENGTH		20.00	PIPE LENGTH		55,300
			46.00			187.90			55,416.00

V. STATIC HEAD

A. HIGH POINT IN SYSTEM-	119.00	Max Water Level in Ground Storage Tank
B. LOW POINT IN SYSTEM-	80.00	Water Level in Reservoir
TOTAL STATIC HEAD	39.00	

VI. DESIGN CURVES

SYSTEM CURVE CALCULATIONS

I.SINGLE PUMP OPERATION

	Q (GPM)	DIP DYNAMIC HEAD (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-	4200	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	100 =C DIP	150 =C PVC
12 "=ID DIP	12 "=ID DIP	30 "ID PVC

f=0.2083((100/C)^1.85)*(Q^1.852)/(Dinside^4.8655) EQ. 83 PVC PIPEHANDBOOK 2nd ED.

III. HEAD LOSS(FT)= f*PIPE LENGTH(ft)/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	15.00		3	REDUCING ELL	9.0	27.00	5 90 DEG EL	34.0	170.00
1	REDUCER	9.0	9.00		3	GATE VALV	2.9	8.70	2 GATE VALV	3.1	6.20
					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	PIPE LENGTH		55,300
			46.00					523.70			55,476.20

V. STATIC HEAD

A. HIGH POINT IN SYSTEM-	119.00	Max Water Level in Ground Storage Tank
B. LOW POINT IN SYSTEM-	80.00	Water Level in Reservoir
TOTAL STATIC HEAD	39.00	

VI. DESIGN CURVES

SYSTEM CURVE CALCULATIONS

I.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	7.0	1.16	20.0	39.0	59.0
	2600	1.1	7.55	12.9	7.55	7.5	1.21	21.6	39.0	60.6
	2700	1.2	7.84	13.9	7.84	8.0	1.25	23.1	39.0	62.1
	2800	1.3	8.13	14.8	8.13	8.6	1.30	24.7	39.0	63.7
	2900	1.4	8.42	15.8	8.42	9.2	1.35	26.4	39.0	65.4
	3000	1.5	8.71	16.9	8.71	9.8	1.39	28.1	39.0	67.1
	3100	1.6	9.00	17.9	9.00	10.4	1.44	29.9	39.0	68.9
	3200	1.7	9.29	19.0	9.29	11.0	1.49	31.7	39.0	70.7
	3300	1.8	9.58	20.1	9.58	11.7	1.53	33.5	39.0	72.5
	3400	1.9	9.87	21.2	9.87	12.3	1.58	35.4	39.0	74.4
	3500	2.0	10.16	22.4	10.16	13.0	1.63	37.4	39.0	76.4
DESIGN POINT-	2083	0.8	6.05	8.6	6.05	5.0	0.97	14.3	39.0	53.3

II.DUPLEX PUMP OPERATION- SINGLE PUMP CURVE

	Q (GPM) EA.PUMP	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)
	4800	3.5	13.93	145.3	27.87	84.2	4.46	233.0	39.0	272.0
	4900	3.7	14.22	150.9	28.45	87.5	4.55	242.1	39.0	281.1
	5000	3.8	14.51	156.7	29.03	90.8	4.64	251.3	39.0	290.3
	5100	4.0	14.80	162.5	29.61	94.2	4.74	260.7	39.0	299.7
	5200	4.1	15.10	168.5	30.19	97.6	4.83	270.2	39.0	309.2
	5300	4.2	15.39	174.5	30.77	101.1	4.92	279.9	39.0	318.9
	5400	4.4	15.68	180.7	31.35	104.7	5.02	289.8	39.0	328.8
	5500	4.5	15.97	186.9	31.93	108.3	5.11	299.8	39.0	338.8
	5600	4.7	16.26	193.3	32.51	112.0	5.20	310.0	39.0	349.0
	5700	4.9	16.55	199.7	33.09	115.7	5.29	320.3	39.0	359.3
	5900	5.2	17.13	212.9	34.25	123.4	5.48	341.4	39.0	380.4
DESIGN POINT-	2083	0.8	6.05	31.0	12.09	17.9	1.93	49.6	39.0	88.6

III.TRIPLEX PUMP OPERATION- SINGLE PUMP CURVE

Q (GPM) EA.PUMP	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)
5900	5.2	17.13	212.9	34.25	123.4	5.48	341.4	39.0	380.4
6000	5.3	17.42	219.6	34.83	127.3	5.57	352.2	39.0	391.2
6100	5.5	17.71	226.4	35.42	131.2	5.67	363.2	39.0	402.2
6200	5.7	18.00	233.4	36.00	135.2	5.76	374.3	39.0	413.3
6300	5.8	18.29	240.4	36.58	139.3	5.85	385.5	39.0	424.5
6400	6.0	18.58	247.5	37.16	143.4	5.95	397.0	39.0	436.0
6500	6.2	18.87	254.7	37.74	147.6	6.04	408.5	39.0	447.5
6600	6.4	19.16	262.0	38.32	151.8	6.13	420.2	39.0	459.2
6700	6.6	19.45	269.4	38.90	156.1	6.22	432.1	39.0	471.1
6800	6.7	19.74	276.9	39.48	160.5	6.32	444.1	39.0	483.1
6900	6.9	20.03	284.5	40.06	164.9	6.41	456.3	39.0	495.3
DESIGN POINT- 2083	0.8	6.05	31.0	12.09	17.9	1.93	49.6	39.0	88.6

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

CONTRACT NUMBER: Franklin Farms Mega-Site
TITLE: Rayville 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 DIP	150 =C PVC
8 "=ID DIP	8 "=ID DIP	24 "ID PVC

f=0.2083((100/C)^1.85)*(Q^1.852)/(Dinside^4.8655) EQ. 83 PVC PIPEHANDBOOK 2nd ED.

III. HEAD LOSS(FT)= f*PIPE LENGTH(ft)/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	6 90 DEG EL	28.0	168.00
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			55,474.00

V. STATIC HEAD

A. HIGH POINT IN SYSTEM-	83.41	Elevation in Force Main
B. LOW POINT IN SYSTEM-	72.52	Low Elevation in Force Main
TOTAL STATIC HEAD	10.89	

VI. DESIGN CURVES

SYSTEM CURVE CALCULATIONS

I.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	6.7	16.33	20.9	16.33	20.6	1.81	48.3	10.9	59.1
	2600	7.2	16.98	22.5	16.98	22.2	1.89	51.9	10.9	62.8
	2700	7.8	17.64	24.1	17.64	23.8	1.96	55.6	10.9	66.5
	2800	8.3	18.29	25.8	18.29	25.5	2.03	59.5	10.9	70.4
	2900	8.9	18.94	27.5	18.94	27.2	2.10	63.5	10.9	74.4
	3000	9.4	19.59	29.3	19.59	28.9	2.18	67.6	10.9	78.5
	3100	10.0	20.25	31.1	20.25	30.7	2.25	71.9	10.9	82.8
	3200	10.6	20.90	33.0	20.90	32.6	2.32	76.2	10.9	87.1
	3300	11.3	21.55	34.9	21.55	34.5	2.39	80.7	10.9	91.6
	3400	11.9	22.21	36.9	22.21	36.5	2.47	85.3	10.9	96.2
	3500	12.6	22.86	38.9	22.86	38.5	2.54	90.0	10.9	100.9
DESIGN POINT-	2100	4.9	13.72	15.1	13.72	14.9	1.52	34.9	10.9	45.8

CONTRACT NUMBER: Franklin Farms Mega-Site
TITLE: Rayville 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 "=ID DIP	12 "=ID DIP	24 "ID PVC

f=0.2083((100/C)^1.85)*(Q^1.852)/(Dinside^4.8655) EQ. 83 PVC PIPEHANDBOOK 2nd ED.

III. HEAD LOSS(FT)= f*PIPE LENGTH(ft)/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	15.00		1 REDUCING ELL	9.0	9.00		6 90 DEG EL	28.0	168.00
1	REDUCER	9.0	9.00		1 GATE VALV	2.9	2.90		2 GATE VALV	3.0	6.00
					1 CHCK VALV	120.0	120.00				
					1 TEE	30.0	30.00				
					1 90 DEG EL	15.0	15.00				
	PIPE LENGTH		22.00		PIPE LENGTH		20.00		PIPE LENGTH		55,300
			46.00				187.90				55,474.00

V. STATIC HEAD

A. HIGH POINT IN SYSTEM-	83.41	Elevation in Force Main
B. LOW POINT IN SYSTEM-	72.52	Low Elevation in Force Main
TOTAL STATIC HEAD	10.89	

VI. DESIGN CURVES

SYSTEM CURVE CALCULATIONS

I.SINGLE PUMP OPERATION

	Q (GPM)	DIP DYNAMIC HEAD (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	10.9	36.9
	2600	1.1	7.55	4.6	7.55	22.2	1.89	28.0	10.9	38.9
	2700	1.2	7.84	5.0	7.84	23.8	1.96	30.0	10.9	40.9
	2800	1.3	8.13	5.3	8.13	25.5	2.03	32.1	10.9	43.0
	2900	1.4	8.42	5.7	8.42	27.2	2.10	34.2	10.9	45.1
	3000	1.5	8.71	6.0	8.71	28.9	2.18	36.4	10.9	47.3
	3100	1.6	9.00	6.4	9.00	30.7	2.25	38.7	10.9	49.6
	3200	1.7	9.29	6.8	9.29	32.6	2.32	41.1	10.9	52.0
	3300	1.8	9.58	7.2	9.58	34.5	2.39	43.5	10.9	54.4
	3400	1.9	9.87	7.6	9.87	36.5	2.47	46.0	10.9	56.8
	3500	2.0	10.16	8.0	10.16	38.5	2.54	48.5	10.9	59.4
DESIGN POINT-	4200	2.8	12.19	11.3	12.19	53.9	3.05	68.0	10.9	78.9

CONTRACT NUMBER: Franklin Farms Mega-Site
TITLE: Rayville 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	100 =C DIP	150 =C PVC
12 "=ID DIP	12 "=ID DIP	30 "ID PVC
f=0.2083((100/C)^1.85)*(Q^1.852)/(Dinside^4.8655)	EQ. 83 PVC PIPEHANDBOOK 2nd ED.	

III. HEAD LOSS(FT)= f*PIPE LENGTH(ft)/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	15.00	2 REDUCING ELL	9.0	18.00	6 90 DEG EL	34.0	204.00
1	REDUCER	9.0	9.00	2 GATE VALV	2.9	5.80	2 GATE VALV	3.1	6.20
				2 CHCK 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		55,300
			46.00			355.80			55,510.20

V. STATIC HEAD

A. HIGH POINT IN SYSTEM-	83.41	Elevation in Force Main
B. LOW POINT IN SYSTEM-	72.52	Low Elevation in Force Main
TOTAL STATIC HEAD	10.89	

VI. DESIGN CURVES

SYSTEM CURVE CALCULATIONS

I.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	8.2	7.26	7.0	1.16	16.2	10.9	27.1
	2600	1.1	7.55	8.8	7.55	7.5	1.21	17.4	10.9	28.3
	2700	1.2	7.84	9.4	7.84	8.0	1.25	18.7	10.9	29.6
	2800	1.3	8.13	10.1	8.13	8.6	1.30	20.0	10.9	30.9
	2900	1.4	8.42	10.8	8.42	9.2	1.35	21.3	10.9	32.2
	3000	1.5	8.71	11.4	8.71	9.8	1.39	22.7	10.9	33.6
	3100	1.6	9.00	12.2	9.00	10.4	1.44	24.1	10.9	35.0
	3200	1.7	9.29	12.9	9.29	11.0	1.49	25.6	10.9	36.5
	3300	1.8	9.58	13.7	9.58	11.7	1.53	27.1	10.9	38.0
	3400	1.9	9.87	14.4	9.87	12.3	1.58	28.6	10.9	39.5
	3500	2.0	10.16	15.2	10.16	13.0	1.63	30.2	10.9	41.1
DESIGN POINT-	2083	0.8	6.05	5.8	6.05	5.0	0.97	11.6	10.9	22.4

II.DUPLEX PUMP OPERATION- SINGLE PUMP CURVE

	Q (GPM) EA.PUMP	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)
	4800	3.5	13.93	98.7	27.87	84.2	4.46	186.5	10.9	197.4
	4900	3.7	14.22	102.5	28.45	87.5	4.55	193.7	10.9	204.6
	5000	3.8	14.51	106.4	29.03	90.9	4.64	201.1	10.9	212.0
	5100	4.0	14.80	110.4	29.61	94.3	4.74	208.6	10.9	219.5
	5200	4.1	15.10	114.5	30.19	97.7	4.83	216.3	10.9	227.2
	5300	4.2	15.39	118.6	30.77	101.2	4.92	224.0	10.9	234.9
	5400	4.4	15.68	122.8	31.35	104.8	5.02	231.9	10.9	242.8
	5500	4.5	15.97	127.0	31.93	108.4	5.11	239.9	10.9	250.8
	5600	4.7	16.26	131.3	32.51	112.1	5.20	248.1	10.9	259.0
	5700	4.9	16.55	135.7	33.09	115.8	5.29	256.4	10.9	267.2
	5900	5.2	17.13	144.6	34.25	123.4	5.48	273.3	10.9	284.2
DESIGN POINT-	2083	0.8	6.05	21.0	12.09	18.0	1.93	39.7	10.9	50.6

III.TRIPLEX PUMP OPERATION- SINGLE PUMP CURVE

Q (GPM) EA.PUMP	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)
5900	5.2	17.13	144.6	34.25	123.4	5.48	273.3	10.9	284.2
6000	5.3	17.42	149.2	34.83	127.4	5.57	281.9	10.9	292.8
6100	5.5	17.71	153.8	35.42	131.3	5.67	290.7	10.9	301.6
6200	5.7	18.00	158.5	36.00	135.3	5.76	299.5	10.9	310.4
6300	5.8	18.29	163.3	36.58	139.4	5.85	308.6	10.9	319.4
6400	6.0	18.58	168.1	37.16	143.5	5.95	317.7	10.9	328.6
6500	6.2	18.87	173.0	37.74	147.7	6.04	326.9	10.9	337.8
6600	6.4	19.16	178.0	38.32	151.9	6.13	336.3	10.9	347.2
6700	6.6	19.45	183.0	38.90	156.2	6.22	345.8	10.9	356.7
6800	6.7	19.74	188.1	39.48	160.6	6.32	355.4	10.9	366.3
6900	6.9	20.03	193.3	40.06	165.0	6.41	365.2	10.9	376.1
DESIGN POINT- 2083	0.8	6.05	21.0	12.09	18.0	1.93	39.7	10.9	50.6

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

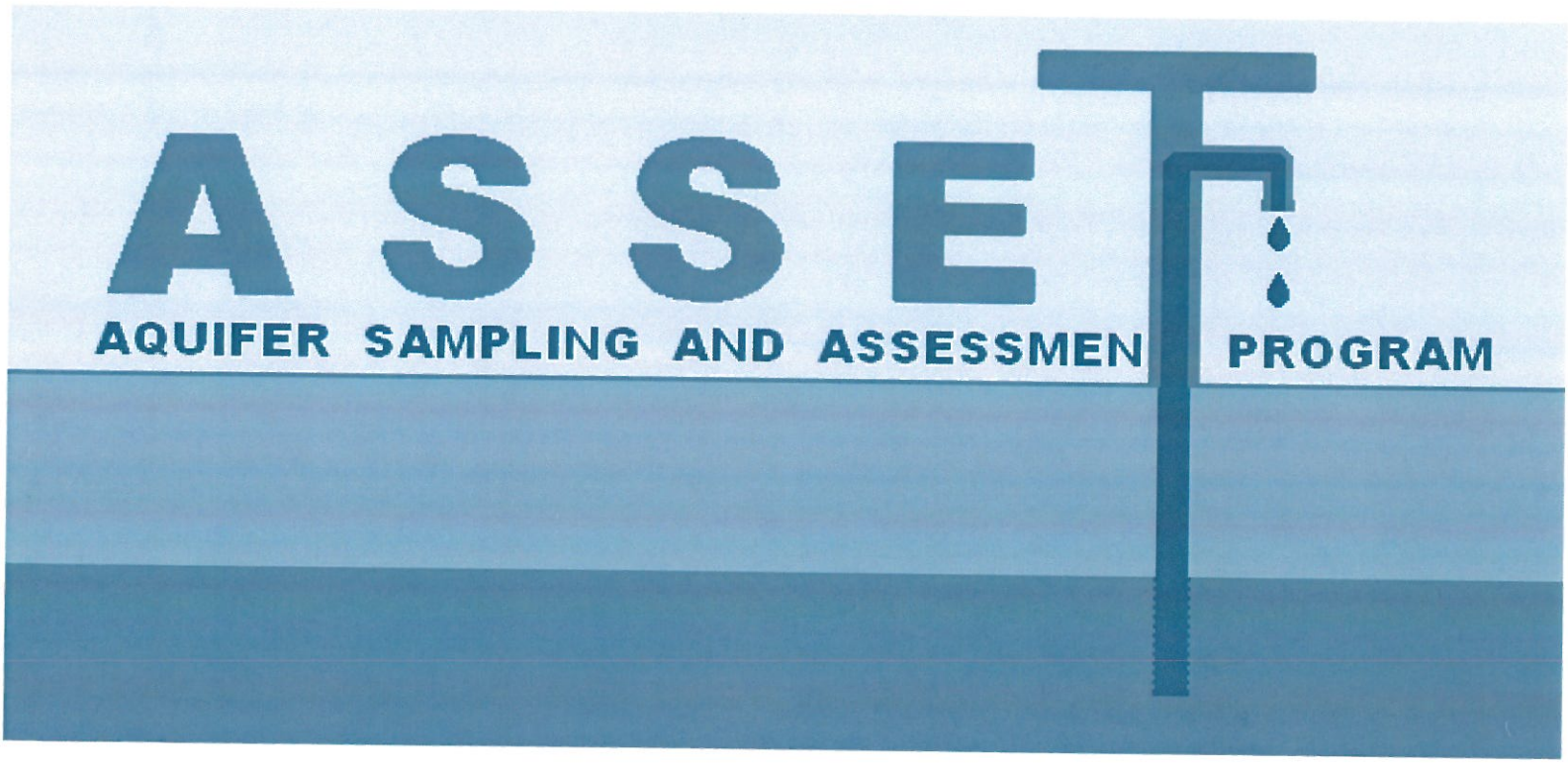
COCKFIELD AQUIFER SUMMARY, 2008

AQUIFER SAMPLING AND ASSESSMENT PROGRAM

DEQ
LOUISIANA

APPENDIX 9 TO THE 2009 TRIENNIAL SUMMARY REPORT

PARTIAL FUNDING PROVIDED BY THE CWA



Contents

BACKGROUND

The Louisiana Department of Environmental Quality's (LDEQ) Aquifer Sampling and Assessment Program (ASSET) is an ambient monitoring program established to determine and monitor the quality of ground water produced from Louisiana's major freshwater aquifers. The ASSET Program samples approximately 200 water wells located in 14 aquifers and aquifer systems across the state. The sampling process is designed so that all fourteen aquifers and aquifer systems are monitored on a rotating basis, within a three-year period so that each well is monitored every three years.

In order to better assess the water quality of a particular aquifer, an attempt is made to sample all ASSET Program wells producing from it in a narrow time frame. To more conveniently and economically promulgate those data collected, a summary report on each aquifer is prepared separately. Collectively, these aquifer summaries will make up, in part, the ASSET Program's Triennial Summary Report for 2009.

Analytical and field data contained in this summary were collected from wells producing from the Cockfield aquifer, during the 2008 state fiscal year (July 1, 2007 - June 30, 2008). This summary will become Appendix 9 of ASSET Program Triennial Summary Report for 2009.

These data show that beginning in February and continuing through May of 2008, 14 wells were sampled which produce from the Cockfield aquifer. Nine of these fourteen are classified as public supply, 4 are classified as domestic use, and 1 is classified as irrigation well. The wells are located in 10 parishes in the northeast and north-central to western Louisiana.

Figure 9-1 shows the geographic locations of the Cockfield aquifer and the associated wells, whereas Table 9-1 lists the wells in the aquifer along with their total depths, use made of produced waters and date sampled.

Well data for registered water wells were obtained from the Louisiana Department of Transportation and Development's Water Well Registration Data file.

GEOLOGY

The Cockfield aquifer is within the Eocene Cockfield formation of the Claiborne Group, which consists of sands, silts, clays, and some lignite. The aquifer units consist of fine sand with interbedded silt, clay, and lignite, becoming more massive and containing less silt and clay with depth. Beneath the Ouachita River, the Cockfield aquifer has been eroded by the ancestral Ouachita River and replaced by alluvial sands and gravels. The regional confining clays of the overlying Vicksburg and Jackson Groups confine the Cockfield.

HYDROGEOLOGY

In the Mississippi River valley, the Cockfield is overlain by and hydraulically connected to the alluvial aquifers. Recharge to the Cockfield aquifer occurs primarily by the direct infiltration of rainfall in interstream, upland outcrop-subcrop areas, the movement of water through the alluvial

and terrace deposits, and vertical leakage from the underlying Sparta aquifer. The Cockfield contains fresh water in north-central and northeast Louisiana in a narrowing diagonal band extending toward Sabine Parish. Saltwater ridges under the Red River valley and the eastern Ouachita River valley divide areas containing fresh water in the Cockfield aquifer. The hydraulic conductivity varies between 25 and 100 feet/day.

The maximum depths of occurrence of freshwater in the Cockfield range from 200 feet above sea level, to 2,150 feet below sea level. The range of thickness of the fresh water interval in the Cockfield is 50 to 600 feet. The depths of the Cockfield wells that were monitored in conjunction with the ASSET Program range from 70 to 445 feet.

PROGRAM PARAMETERS

The field parameters checked at each ASSET well sampling site and the list of conventional parameters analyzed in the laboratory are shown in Table 9-2. The inorganic (total metals) parameters analyzed in the laboratory are listed in Table 9-3. These tables also show the field and analytical results determined for each analyte. For quality control, duplicate samples were taken for each parameter at wells CA-35, RI-127, W-198, W-5120Z, and WC-187.

In addition to the field, conventional, and inorganic analytical parameters, the target analyte list includes three other categories of compounds: volatiles, semi-volatiles, and pesticides/PCBs. Due to the large number of analytes in these categories, tables were not prepared showing the analytical results for these compounds. A discussion of any detections from any of these three categories, if necessary, can be found in their respective sections. Tables 9-8, 9-9 and 9-10 list the target analytes for volatiles, semi-volatiles and pesticides/PCBs, respectively.

Tables 9-4 and 9-5 provide a statistical overview of field and conventional data, and inorganic data for the Cockfield aquifer, listing the minimum, maximum, and average results for these parameters collected in the FY 2008 sampling. Tables 9-6 and 9-7 compare these same parameter averages to historical ASSET-derived data for the Cockfield aquifer, from fiscal years 1996, 1999, 2002, and 2005.

The average values listed in the above referenced tables are determined using all valid, reported results, including non-detects. Per Departmental policy concerning statistical analysis, one-half of the detection limit (DL) is used in place of zero when non-detects are encountered. However, the minimum value is reported as less than the DL, not one-half the DL. If all values for a particular analyte are reported as non-detect, then the minimum, maximum, and average values are all reported as less than the DL. For contouring purposes, one-half the DL is also used for non-detects in the figures and charts referenced below.

Figures 9-2, 9-3, 9-4, and 9-5, respectively, represent the contoured data for pH, total dissolved solids (TDS), chloride (Cl), and iron. Charts 9-1 through 9-16 represent the trend of the graphed parameter, based on the averaged value of that parameter for each three-year reporting period. Discussion of historical data and related trends is found in the **Water Quality Trends and Comparison to Historical ASSET Data** section.

INTERPRETATION OF DATA

Under the Federal Safe Drinking Water Act, EPA has established maximum contaminant levels (MCLs) for pollutants that may pose a health risk in public drinking water. An MCL is the highest level of a contaminant that EPA allows in public drinking water. MCLs ensure that drinking water does not pose either a short-term or long-term health risk. While not all wells sampled were public supply wells, the Office of Environmental Assessment does use the MCLs as a benchmark for further evaluation.

EPA has set secondary standards, which are defined as non-enforceable taste, odor, or appearance guidelines. Field and laboratory data contained in Tables 9-2 and 9-3 show that one or more secondary MCLs (SMCLs) were exceeded in 12 of the 14 wells sampled in the Cockfield aquifer, with a total of 22 SMCLs being exceeded.

Field and Conventional Parameters

Table 9-2 shows the field and conventional parameters for which samples are collected at each well and the analytical results for those parameters. Table 9-4 provides an overview of this data for the Cockfield aquifer, listing the minimum, maximum, and average results for these parameters.

Federal Primary Drinking Water Standards: A review of the analysis listed in Table 9-2 shows that no primary MCL was exceeded for field or conventional parameters for this reporting period. Those ASSET wells reporting turbidity levels greater than 1.0 NTU do not exceed the Primary MCL of 1.0, as this standard applies to public supply water wells that are under the direct influence of surface water. The Louisiana Department of Health and Hospitals has determined that no public water supply well in Louisiana was in this category.

Federal Secondary Drinking Water Standards: A review of the analysis listed in Table 9-2 shows that 5 wells exceeded the SMCL for pH, 4 wells exceeded the SMCL for color, and 6 wells exceeded the SMCL for total dissolved solids (TDS). Laboratory results override field results in exceedance determination, thus only laboratory results will be counted in determining SMCL exceedance numbers for TDS. Following is a list of SMCL parameter exceedances with well number and results:

pH (SMCL = 6.5 – 8.5 Standard Units):

NA-5449Z	8.91 SU	UN-167	4.93 SU
W-192	8.95 SU	W-198	8.60 SU (Original and Duplicate)
W-5120Z	5.52 SU (Original and Duplicate)		

Color (SMCL = 15 color units (PCU)):

NA-5449Z	42 PCU	SA-BYRD	40 PCU
W-192	22 PCU	W-198	30 PCU (Original and Duplicate)

(4 wells did not report a result for Color)

Total Dissolved Solids (SMCL = 500 mg/L or 0.5 g/L):

	LAB RESULTS (in mg/L)	FIELD MEASURES (in g/L)
NA-5449Z	552 mg/L	0.57 g/L
RI-127	526 mg/L, Duplicate – 528 mg/L	0.57 g/L (Original and Duplicate)
SA-BYRD	748 mg/L	0.79 g/L
W-192	572 mg/L	0.59 g/L
W-187	678 mg/L, Duplicate – 688 mg/L	0.77 g/ L (Original and Duplicate)
WC-487	544 mg/L	0.59 g/L

Inorganic Parameters

Table 9-3 shows the inorganic (total metals) parameters for which samples are collected at each well and the analytical results for those parameters. Table 9-5 provides an overview of inorganic data for the Cockfield aquifer, listing the minimum, maximum, and average results for these parameters.

Federal Primary Drinking Water Standards: A review of the analyses listed on Table 9-3 shows that no primary MCL was exceeded for total metals.

Federal Secondary Drinking Water Standards: Laboratory data contained in Table 9-3 shows that 7 wells exceeded the secondary MCL for iron:

Iron (SMCL = 300 ug/L):

CA-35	6,420 ug/L, Duplicate – 6,400 ug/L	MO-479	2,150 ug/L
RI-450	1,950 ug/L	SA-BYRD	698 ug/L
UN-167	5,240 ug/L	WC-187	536 ug/L, Duplicate – 541 ug/L
WC-487	747 ug/L		

Volatile Organic Compounds

Table 9-8 shows the volatile organic compound (VOC) parameters for which samples are collected at each well. Due to the number of analytes in this category, analytical results are not tabulated; however, any detection of a VOC would be discussed in this section.

Natchitoches Parish domestic well number NA-5449Z reported detections of methylene chloride and toluene in the March 2008 sampling of the Cockfield aquifer. These compounds were reported at 11.1 ug/L for methylene chloride (MCL for methylene chloride is 5 ug/L) and 3.0 ug/L for toluene (MCL for toluene is 1,000 ug/L). Per ASSET Program standard procedures, the well was resampled (along with a duplicate sample) for VOCs in May 2008. This resampling confirmed the existence of methylene chloride, reporting results of 7.02/2.83 ug/L (resample/duplicate). However, toluene was detected in the original resample at 2.68 ug/L, but was not detected in the duplicate (detection limit for toluene is 2 ug/L).

Because the existence of methylene chloride was confirmed in the resample (and duplicate), and because the reported level of methylene chloride was above the EPA established MCL, this information was forwarded to the Remediation Services Division (formerly known as the Technology Division) within DEQ for further investigation. Even though this well is not used by the owner as a source of drinking water, the well owner was provided information concerning the health effects of these compounds and possible treatment techniques.

In addition to the VOCs discussed above, tetrachloroethene was detected in a Sabine Parish domestic well. Well number SA-BYRD reported tetrachloroethene in this well at just below the drinking water standard for this compound. Laboratory result for tetrachloroethene was 4.41 ug/L (MCL = 5.0 ug/L).

Close attention will be given to these wells in future ASSET operations, as well as coordination with the well owners and the Remediation Services Division. No other wells reported detections of a VOC at or above its detection limit during the FY 2008 sampling of the Cockfield aquifer.

Semi-Volatile Organic Compounds

Table 9-9 shows the semi-volatile organic compound (SVOC) parameters for which samples are collected at each well. Due to the number of analytes in this category, analytical results are not tabulated; however, any detection of a SVOC would be discussed in this section.

No SVOC was detected at or above its detection limit during the FY 2008 sampling of the Cockfield aquifer.

Pesticides and PCBs

Table 9-10 shows the pesticide and PCB parameters for which samples are collected at each well. Due to the number of analytes in this category, analytical results are not tabulated; however, any detection of a pesticide or PCB would be discussed in this section.

No pesticide or PCB was detected at or above its detection limit during the FY 2008 sampling of the Cockfield aquifer.

WATER QUALITY TRENDS AND COMPARISON TO HISTORICAL ASSET DATA

Analytical and field data show that the quality and characteristics of ground water produced from the Cockfield aquifer exhibit some changes when comparing current data to that of the four previous sampling rotations (three, six, nine and twelve years prior). These comparisons can be found in Tables 9-6 and 9-7, and in Charts 9-1 to 9-16 of this summary. Over the twelve-year period, 8 analytes have shown a general increase in average concentration. These analytes are: pH, chloride, TDS, hardness, nitrite-nitrate, and to lesser degree, salinity, specific conductance (field and lab), and alkalinity. For this same time period, 7 analytes have demonstrated a decrease in average concentration: color, sulfate, ammonia, TKN, iron, copper, and to a lesser degree, total phosphorus (P). Barium and temperature remained consistent for this time period.

The current number of wells with secondary MCL exceedances and the current total number of secondary exceedances have increased since the previous sampling event in FY 2005. Current sample results show that 12 wells reported one or more secondary exceedances with a total of 22 SMCL exceedances. The FY 2005 sampling of the Cockfield aquifer shows that 11 wells reported one or more SMCL exceedances with a total of 17 exceedances.

Also, FY 2008 sampling results reported that one Primary MCL was exceeded in one well while there were no Primary exceedances in FY 2005.

SUMMARY AND RECOMMENDATIONS

In summary, the data show that the ground water produced from this aquifer is moderately hard[1] and that one MCL was exceeded for the volatile organic compound methylene chloride. The data also show that this aquifer is of fair quality when considering taste, odor, or appearance guidelines, with 22 Secondary MCLs exceeded in 12 of the 14 wells sampled.

Comparison to historical ASSET-derived data shows some change in the quality or characteristics of the Cockfield aquifer, with 8 parameters showing consistent increases in concentration, 7 parameters decreasing in concentration, while 2 parameters showed no consistent change over the twelve-year period.

It is recommended that the wells assigned to the Cockfield aquifer be re-sampled as planned, in approximately three years, with close attention given to the occurrence of VOCs in this aquifer. In addition, several wells should be added to the 14 currently in place to increase the well density for this aquifer.

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[1] Classification based on hardness scale from: Peavy, H. S. et al. *Environmental Engineering*. New York: McGraw-Hill, 1985.

Table 9-1: List of Wells Sampled, Cockfield Aquifer–FY 2008

DOTD Well Number	Parish	Date	Owner	Depth (Feet)	Well Use
CA-35	CALDWELL	3/10/2008	CITY OF COLUMBIA	298	PUBLIC SUPPLY
EC-233	E CARROLL	2/12/2008	TOWN OF LAKE PROVIDENCE	371	PUBLIC SUPPLY
MO-479	MOREHOUSE	2/12/2008	BAYOU BONNE IDEE WATER SYSTEM	258	PUBLIC SUPPLY
NA-5449Z	NATCHITOCHES	3/11/2008	PRIVATE OWNER	170	DOMESTIC
OU-FRITH	OUACHITA	3/10/2008	PRIVATE OWNER	80	DOMESTIC
RI-127	RICHLAND	2/11/2008	DELHI WATER WORKS	416	PUBLIC SUPPLY
RI-450	RICHLAND	5/12/2008	RIVER ROAD WATERWORKS	283	PUBLIC SUPPLY
SA-BYRD	SABINE	3/25/2008	PRIVATE OWNER	150	DOMESTIC
UN-167	UNION	2/11/2008	PRIVATE OWNER	110	IRRIGATION
W-192	WINN	3/10/2008	RED HILL WATER SYSTEM	210	PUBLIC SUPPLY
W-198	WINN	3/25/2008	ATLANTA WATER SYSTEM	445	PUBLIC SUPPLY
W-5120Z	WINN	4/15/2008	PRIVATE OWNER	70	DOMESTIC
WC-187	W CARROLL	5/12/2008	NEW CARROLL WTR. ASSN.	110	PUBLIC SUPPLY
WC-487	W CARROLL	2/12/2008	TOWN OF OAK GROVE	396	PUBLIC SUPPLY

Table 9-2: Summary of Field and Conventional Data, Cockfield Aquifer–FY 2008

DOTD Well Number	Temp Deg. C	pH SU	Sp. Cond. mmhos/cm	Sal. ppt	TDS g/L	Alk mg/L	Cl mg/L	Color PCU	Sp. Cond. umhos/cm	SO4 mg/L	TDS mg/L	TSS mg/L	Turb. NTU	NH3 mg/L	Hard. mg/L	Nitrite-Nitrate (as N) mg/L	TKN mg/L	Tot. P mg/L
LABORATORY DETECTION LIMITS →						2.0	1.3	5	10	1.25/1.3	4	4	1	0.1	5.0	0.05	0.10	0.05
	FIELD PARAMETERS					LABORATORY PARAMETERS												
CA-35	19.72	6.57	0.352	0.17	0.23	95.7	20	5	286	46.4	270	<4	1.5	0.16	116	<0.05	0.25	0.49
CA-35*	19.72	6.57	0.352	0.17	0.23	96.1	19.9	5	316	46.2	266	<4	2.1	0.17	112	<0.05	0.24	0.49
EC-233	19.63	7.74	0.811	0.40	0.53	407	42	NA	816	<1.25	492	<4	<1	1.09	128	<0.05	1.4	0.16
MO-479	19.36	7.21	0.708	0.35	0.46	320	43.1		712	12.3	424	6	27.4	0.33	345	<0.05	‡0.66	0.12
NA-5449Z	19.20	8.91	0.883	0.44	0.57	381	17.3	42	817	67.6	552	<4	1.4	0.69	6.9	<0.05	0.78	0.88
OU-FRITH	18.52	8.17	0.563	0.27	0.37	326	<1.25	5	496	<1.25	350	<4	<1	0.52	41.9	<0.05	0.7	<0.05
RI-127	22.05	7.97	0.874	0.43	0.57	380	67.6	NA	878	<1.25	526	<4	<1	0.75	7.4	<0.05	1.17	‡0.10
RI-127*	22.05	7.97	0.874	0.43	0.57	380	67.6		877	<1.25	528	<4	<1	0.85	7.2	<0.05	0.9	‡0.19
RI-450	20.15	7.15	0.495	0.24	0.32	258	11.2	<5	501	<1.25	288	<4	13	0.31	233	<0.05	0.41	0.28
SA-BYRD	19.11	8.17	1.221	0.61	0.79	435	50.4	‡40	1204	‡147	748	<4	3.6	0.95	45.9	0.07	1.28	0.2
UN-167	19.37	4.93	0.204	0.10	0.13	3.8	17.1	NA	200	27.9	151	<4	†4.1	<0.1	9.7	‡7.7	<0.1	<0.05
W-192	19.90	8.95	0.913	0.45	0.59	361	60	22	879	35.3	572	<4	1.5	0.82	6.6	<0.05	0.96	0.49
W-198	21.96	8.60	0.418	0.20	0.27	204	11.2	30	393	2	252	<4	<1	0.25	<5	<0.05	0.26	‡1.69
W-198*	21.96	8.60	0.418	0.20	0.27	207	11	30	393	2	260	<4	<1	0.24	<5	<0.05	0.29	‡1.79
W-5120Z	19.18	5.52	0.035	0.02	0.02	8.3	2.1	<5	33	<1.25	28	<4	<1	<0.1	8.7	<0.05	<0.1	<0.05
W-5120Z*	19.18	5.52	0.035	0.02	0.02	8.4	2.1	<5	30.2	<1.25	28.7	<4	<1	<0.1	8.7	<0.05	<0.1	<0.05
WC-187	19.06	7.15	1.184	0.59	0.77	329	*189	<5	1200	13	678	<4	5	0.1	467	0.08	0.16	0.09
WC-187*	19.06	7.15	1.184	0.59	0.77	326	*189	<5	1201	13	688	<4	6	0.11	474	0.08	0.11	0.09
WC-487	19.01	7.43	0.906	0.45	0.59	365	102	NA	938	1.4	544	<4	4.1	0.2	104	<0.05	‡0.32	0.06

*Denotes Duplicate Sample †Estimated Value ‡Reported from a Dilution NA = Not analyzed by Lab. Shaded cells exceed EPA Secondary Standards

Table 9-3: Summary of Inorganic Data, Cockfield Aquifer–FY 2008

DOTD Well Number	Antimony ug/L	Arsenic ug/L	Barium ug/L	Beryllium ug/L	Cadmium ug/L	Chromium ug/L	Copper ug/L	Iron ug/L	Lead ug/L	Mercury ug/L	Nickel ug/L	Selenium ug/L	Silver ug/L	Thallium ug/L	Zinc ug/L
Laboratory Detection Limits	1	3	2	1	0.5	3	3	20	3	0.05	3	4	0.5	1	10
CA-35	<1	<3	141	<1	<0.5	<3	<3	6420	<3	0.26	<3	<4	<0.5	<1	26
CA-35*	<1	<3	141	<1	<0.5	<3	<3	6400	<3	0.05	<3	<4	<0.5	<1	17
EC-233	<1	<3	251	<1	<0.5	<3	<3	<20	<3	0.1	<3	<4	<0.5	<1	<10
MO-479	<1	<3	336	<1	<0.5	<3	<3	2150	<3	<0.05	<3	<4	<0.5	<1	<10
NA-5449Z	<1	<3	14.7	<1	<0.5	<3	9.9	143	<3	<0.05	<3	<4	<0.5	<1	<10
OU-FRITH	<1	<3	121	<1	<0.5	<3	<3	84.9	<3	0.05	<3	<4	<0.5	<1	<10
RI-127	<1	<3	34.7	<1	<0.5	<3	<3	58.9	<3	<0.05	<3	<4	<0.5	<1	<10
RI-127*	<1	<3	34.2	<1	<0.5	<3	<3	61.5	<3	0.19	<3	<4	<0.5	<1	<10
RI-450	<1	<3	167	<1	<0.5	<3	<3	1950	8	R	<3	<4	<0.5	<1	<10
SA-BYRD	<1	<3	50.6	<1	<0.5	<3	21.2	698	3.5	0.07	<3	<4	<0.5	<1	324
UN-167	<1	<3	318	<1	1.3	<3	10.4	5240	<3	0.13	7.6	<4	<0.5	<1	26.2
W-192	<1	<3	11.4	<1	<0.5	<3	<3	<20	<3	0.05	<3	<4	<0.5	<1	<10
W-198	<1	<3	3.8	<1	<0.5	<3	<3	38.3	<3	0.07	<3	<4	<0.5	<1	<10
W-198*	<1	<3	4.8	<1	<0.5	<3	<3	45.6	<3	0.07	<3	<4	<0.5	<1	<10
W-5120Z	<1	<3	15.8	<1	<0.5	<3	14.5	<20	<3	0.05	<3	<4	<0.5	<1	<10
W-5120Z*	<1	<3	15.7	<1	<0.5	<3	8.2	<20	<3	0.05	<3	<4	<0.5	<1	<10
WC-187	<1	5.1	170	<1	<0.5	<3	4.4	536	<3	R	<3	<4	<0.5	<1	<10
WC-187*	<1	4.4	167	<1	<0.5	<3	<3	541	<3	R	<3	<4	<0.5	<1	<10
WC-487	<1	<3	127	<1	<0.5	<3	10.4	747	<3	0.06	<3	<4	<0.5	<1	23.6

*Denotes Duplicate Sample. Exceeds EPA Secondary Standards.

R = Mercury values rejected; mercury reported in Field Blank for the May 2008 sampling.

Table 9-4: FY 2008 Field and Conventional Statistics, ASSET Wells

	PARAMETER	MINIMUM	MAXIMUM	AVERAGE
FIELD	Temperature (°C)	18.52	22.05	19.90
	pH (SU)	4.93	8.95	7.38
	Specific Conductance (mmhos/cm)	0.035	1.221	0.65
	Salinity (ppt)	0.02	0.61	0.32
	TDS (g/L)	0.023	0.793	0.430
LABORATORY	Alkalinity (mg/L)	3.8	435	257.4
	Chloride (mg/L)	<1.25	189	48.6
	Color (PCU)	<5	42	14.7
	Specific Conductance (umhos/cm)	30.2	1204	640.5
	Sulfate (mg/L)	<1.25	147	22.0
	TDS (mg/L)	28	748	402.4
	TSS (mg/L)	<4	6	<4
	Turbidity (NTU)	<1	27.4	3.9
	Ammonia, as N (mg/L)	<0.1	1.09	0.40
	Hardness (mg/L)	<5	474	111.9
	Nitrite - Nitrate, as N (mg/L)	<0.05	7.70	0.44
	TKN (mg/L)	<0.1	1.4	0.53
	Total Phosphorus (mg/L)	<0.05	1.79	0.38

Table 9-5: FY 2008 Inorganic Statistics, ASSET Wells

PARAMETER	MINIMUM	MAXIMUM	AVERAGE
Antimony (ug/L)	<1	<1	<1
Arsenic (ug/L)	<3	5.1	<3
Barium (ug/L)	3.8	336	111.8
Beryllium (ug/L)	<1	<1	<1
Cadmium (ug/L)	<0.5	1.3	<0.5
Chromium (ug/L)	<3	<3	<3
Copper (ug/L)	<3	21.2	5.11
Iron (ug/L)	<20	6420	1323.9
Lead (ug/L)	<3	8	<3
Mercury (ug/L)	<0.05	0.26	0.08
Nickel (ug/L)	<3	7.6	<3
Selenium (ug/L)	<4	<4	<4
Silver (ug/L)	<0.5	0.5	<0.5
Thallium (ug/L)	<1	<1	<1
Zinc (ug/L)	<10	324	25.6

Table 9-6: Triennial Field and Conventional Statistics, ASSET Wells

	PARAMETER	FY 1996 AVERAGE	FY 1999 AVERAGE	FY 2002 AVERAGE	FY 2005 AVVERAGE	FY 2008 AVERAGE
FIELD	Temperature (°C)	19.91	19.76	20.30	19.82	19.90
	pH (SU)	6.77	6.99	7.39	7.46	7.38
	Specific Conductance (mmhos/cm)	0.564	0.613	0.647	0.70	0.65
	Salinity (Sal.) (ppt)	0.27	0.30	0.32	0.35	0.32
	TDS (Total dissolved solids) (g/L)	-	-	-	0.46	0.430
LABORATORY	Alkalinity (Alk.) (mg/L)	219.2	223.9	262.4	293.7	257.4
	Chloride (Cl) (mg/L)	35.9	52.0	42.2	52.5	48.6
	Color (PCU)	37.5	11.8	11.9	11.0	14.7
	Specific Conductance (umhos/cm)	560.7	618.8	642.8	736.9	640.5
	Sulfate (SO4) (mg/L)	33.36	35.51	98.92	21.9	22.0
	TDS (Total dissolved solids) (mg/L)	320.3	429.7	396.0	437.8	402.4
	TSS (Total suspended solids) (mg/L)	5.3	<4	<4	<4	<4
	Turbidity (Turb.) (NTU)	7.14	9.74	4.71	5.4	3.9
	Ammonia, as N (NH3) (mg/L)	0.66	0.50	0.62	0.36	0.40
	Hardness (mg/L)	115.3	79.3	89.9	139.9	111.9
	Nitrite - Nitrate , as N (mg/L)	0.11	0.08	0.30	0.50	0.44
	TKN (mg/L)	0.80	0.71	0.94	0.47	0.53
	Total Phosphorus (P) (mg/L)	0.32	0.59	0.30	0.30	0.38

Table 9-7: Triennial Inorganic Statistics, ASSET Wells

PARAMETER	FY 1996 AVERAGE	FY 1999 AVERAGE	FY 2002 AVERAGE	FY 2005 AVERAGE	FY 2008 AVERAGE
Antimony (ug/L)	<5	<5	<5	<10	<1
Arsenic (ug/L)	5.43	<5	<5	<10	<3
Barium (ug/L)	121.3	124.5	140.9	161.9	111.8
Beryllium (ug/L)	<5	<5	<5	<1	<1
Cadmium (ug/L)	<5	<5	<5	<1	<0.5
Chromium (ug/L)	<5	<5	<5	<5	<3
Copper (ug/L)	39.62	5.86	11.77	8.34	5.11
Iron (ug/L)	1,835.8	1,623.2	1,319.5	1,084.1	1323.9
Lead (ug/L)	<10	<10	<10	<10	<3
Mercury (ug/L)	<0.05	<0.05	<0.05	<0.05	0.08
Nickel (ug/L)	<5	<5	<5	<5	<3
Selenium (ug/L)	<5	<5	<5	<5	<4
Silver (ug/L)	<5	<5	<5	4.72	<0.5
Thallium (ug/L)	<5	<5	<5	<5	<1
Zinc (ug/L)	117.5	34.1	30.7	<20	25.6

Table 9-8: VOC Analytical Parameters

COMPOUND	METHOD	DETECTION LIMIT (ug/L)
1,1-Dichloroethane	624	2
1,1-Dichloroethene	624	2
1,1,1-Trichloroethane	624	2
1,1,2-Trichloroethane	624	2
1,1,2,2-Tetrachloroethane	624	2
1,2-Dichlorobenzene	624	2
1,2-Dichloroethane	624	2
1,2-Dichloropropane	624	2
1,3- Dichlorobenzene	624	2
1,4-Dichlorobenzene	624	2
Benzene	624	2
Bromoform	624	2
Carbon tetrachloride	624	2
Chlorobenzene	624	2
Dibromochloromethane	624	2
Chloroethane	624	2
trans-1,2-Dichloroethene	624	2
cis-1,3-Dichloropropene	624	2
Bromodichloromethane	624	2
Methylene chloride	624	2
Ethyl benzene	624	2
Bromomethane	624	2
Chloromethane	624	2
o-Xylene	624	2
Styrene	624	2
Methylt-butyl ether	624	2
Tetrachloroethene	624	2
Toluene	624	2
trans-1,3-Dichloropropene	624	2
Trichloroethene	624	2
Trichlorofluoromethane	624	2
Chloroform	624	2
Vinyl chloride	624	2
Xylenes, m & p	624	4

Table 9-9: SVOC Analytical Parameters

COMPOUND	METHOD	DETECTION LIMIT (ug/L)
1,2-Dichlorobenzene	625	10
1,2,3-Trichlorobenzene	625	10
1,2,3,4-Tetrachlorobenzene	625	10
1,2,4-Trichlorobenzene	625	10
1,2,4,5-Tetrachlorobenzene	625	10
1,3-Dichlorobenzene	625	10
1,3,5-Trichlorobenzene	625	10
1,4-Dichlorobenzene	625	10
2-Chloronaphthalene	625	10
2-Chlorophenol	625	20
2-Methyl-4,6-dinitrophenol	625	20
2-Nitrophenol	625	20
2,4-Dichlorophenol	625	20
2,4-Dimethylphenol	625	20
2,4-Dinitrophenol	625	20
2,4-Dinitrotoluene	625	10
2,4,6-Trichlorophenol	625	20
2,6-Dinitrotoluene	625	10
3,3'-Dichlorobenzidine	625	10
4-Bromophenyl phenyl ether	625	10
4-Chloro-3-methylphenol	625	20
4-Chlorophenyl phenyl ether	625	10
4-Nitrophenol	625	20
Acenaphthene	625	10
Acenaphthylene	625	10
Anthracene	625	10
Benzidine	625	20
Benzo[a]pyrene	625	10
Benzo[k]fluoranthene	625	10
Benzo[a]anthracene	625	10
Benzo[b]fluoranthene	625	10
Benzo[g,h,i]perylene	625	10
Bis(2-chloroethoxy)methane	625	10
Bis(2-ethylhexyl)phthalate	625	10
Bis(2-chloroethyl)ether	625	10
Bis(2-chloroisopropyl)ether	625	10

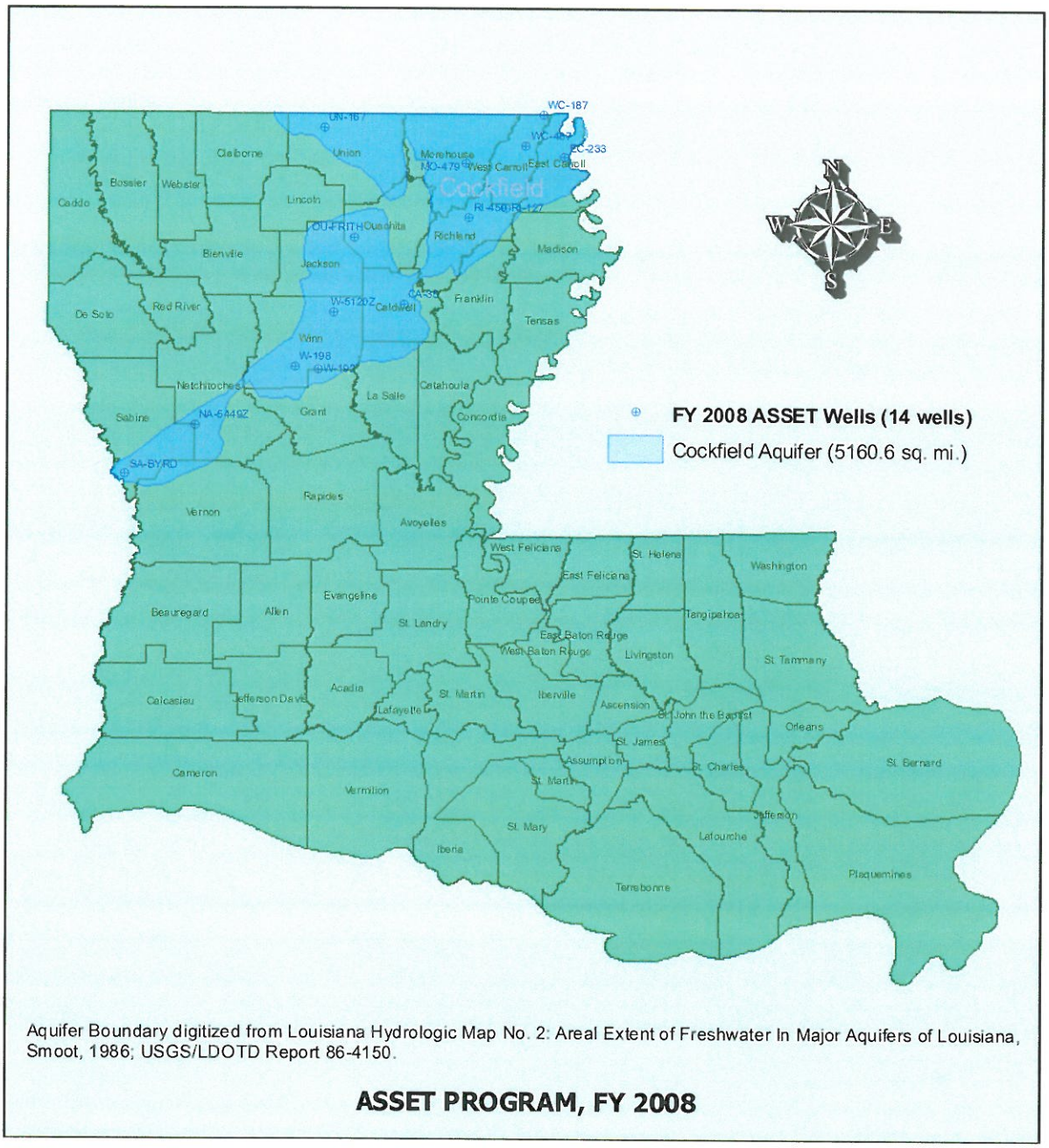
Table 9-9: SVOCs (Continued)

COMPOUND	METHOD	DETECTION LIMIT (ug/L)
Butylbenzylphthalate	625	10
Chrysene	625	10
Dibenzo[a,h]anthracene	625	10
Diethylphthalate	625	10
Dimethylphthalate	625	10
Di-n-butylphthalate	625	10
Di-n-octylphthalate	625	10
Fluoranthene	625	10
Fluorene	625	10
Hexachlorobenzene	625	10
Hexachlorobutadiene	625	10
Hexachlorocyclopentadiene	625	10
Hexachloroethane	625	10
Indeno[1,2,3-cd]pyrene	625	10
Isophorone	625	10
Naphthalene	625	10
Nitrobenzene	625	10
N-Nitrosodimethylamine	625	10
N-Nitrosodiphenylamine	625	10
N-nitroso-di-n-propylamine	625	10
Pentachlorobenzene	625	10
Pentachlorophenol	625	20
Phenanthrene	625	10
Phenol	625	20
Pyrene	625	10

Table 9-10: Pesticides and PCBs

COMPOUND	METHOD	DETECTION LIMITS (ug/L)
4,4'-DDD	608	0.05
4,4'-DDE	608	0.05
4,4'-DDT	608	0.05
Aldrin	608	0.05
Alpha-Chlordane	608	0.05
alpha-BHC	608	0.05
beta-BHC	608	0.05
delta-BHC	608	0.05
gamma-BHC	608	0.05
Chlordane	608	0.2
Dieldrin	608	0.05
Endosulfan I	608	0.05
Endosulfan II	608	0.05
Endosulfan Sulfate	608	0.05
Endrin	608	0.05
Endrin Aldehyde	608	0.05
Endrin Ketone	608	0.05
Heptachlor	608	0.05
Heptachlor Epoxide	608	0.05
Methoxychlor	608	0.05
Toxaphene	608	2
Gamma-Chlordane	608	0.05
PCB-1016	608	1
PCB-1221	608	1
PCB-1232	608	1
PCB-1242	608	1
PCB-1248	608	1
PCB-1254	608	1
PCB-1260	608	1

Figure 9-1: Location Plat, Cockfield Aquifer



Aquifer Boundary digitized from Louisiana Hydrologic Map No. 2: Areal Extent of Freshwater In Major Aquifers of Louisiana, Smoot, 1986; USGS/LDOTD Report 86-4150.

ASSET PROGRAM, FY 2008

Figure 9-2: Map of pH Data

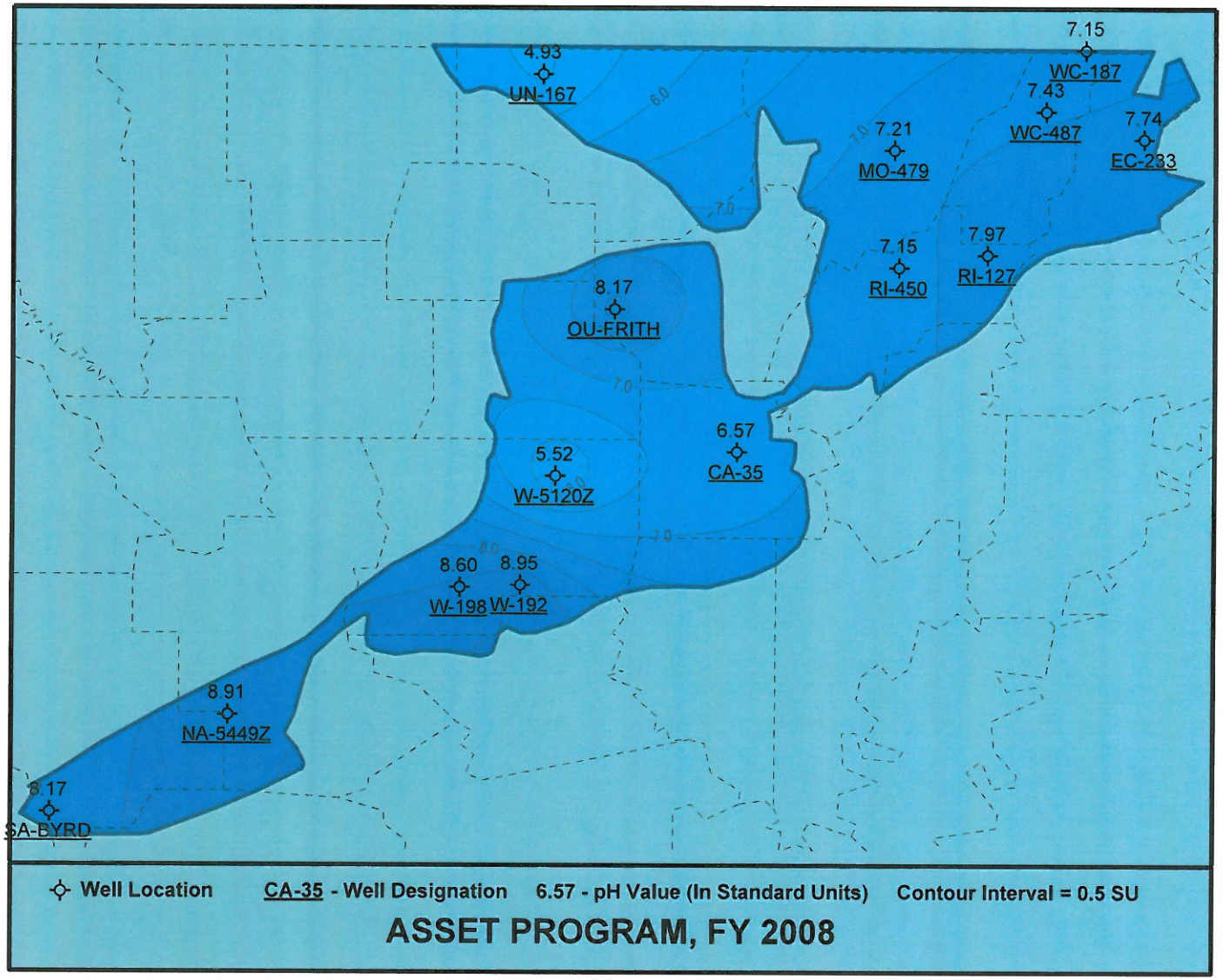


Figure 9-3: Map of TDS Lab Data

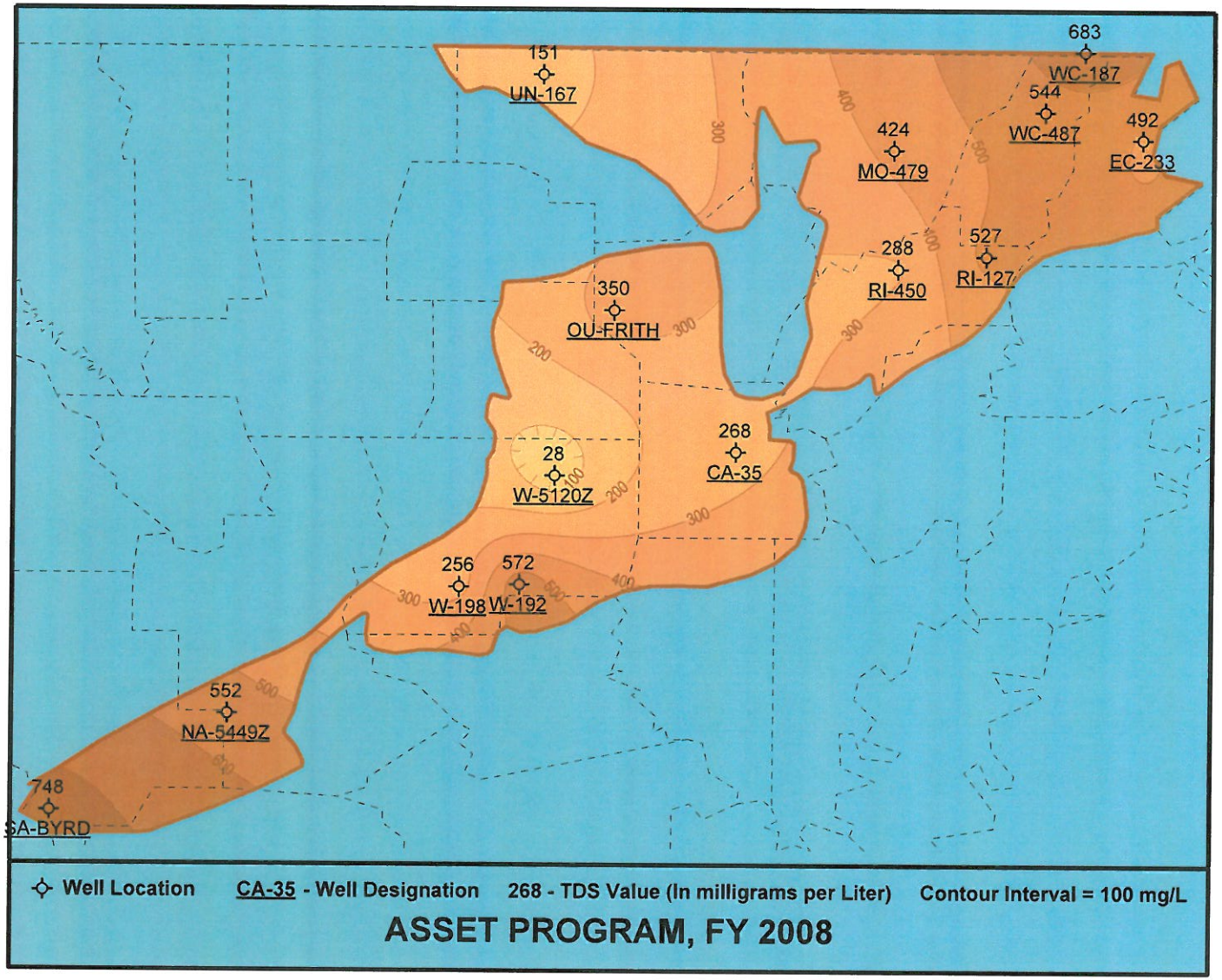


Figure 9-4: Map of Chloride Data

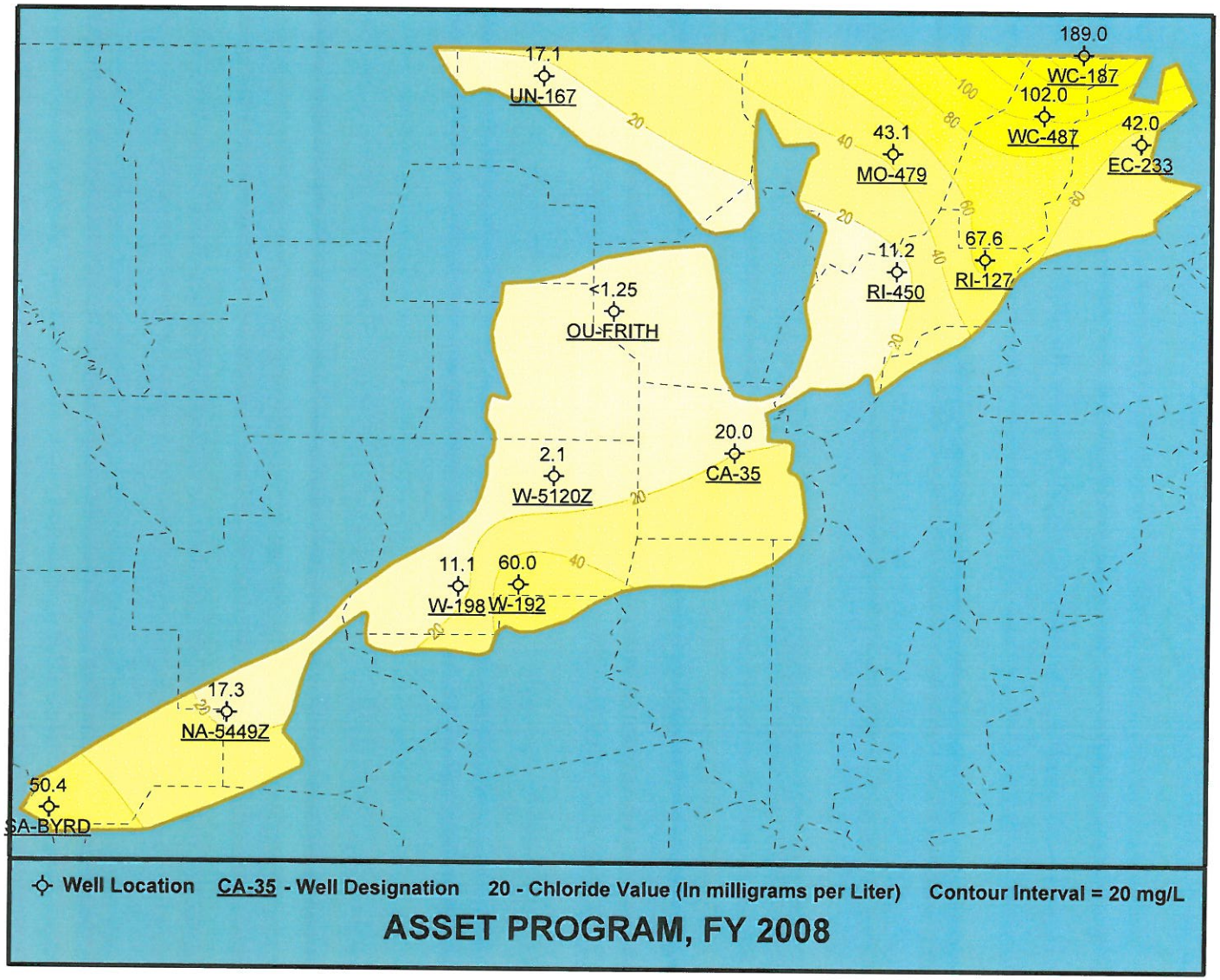


Figure 9-5: Map of Iron Data

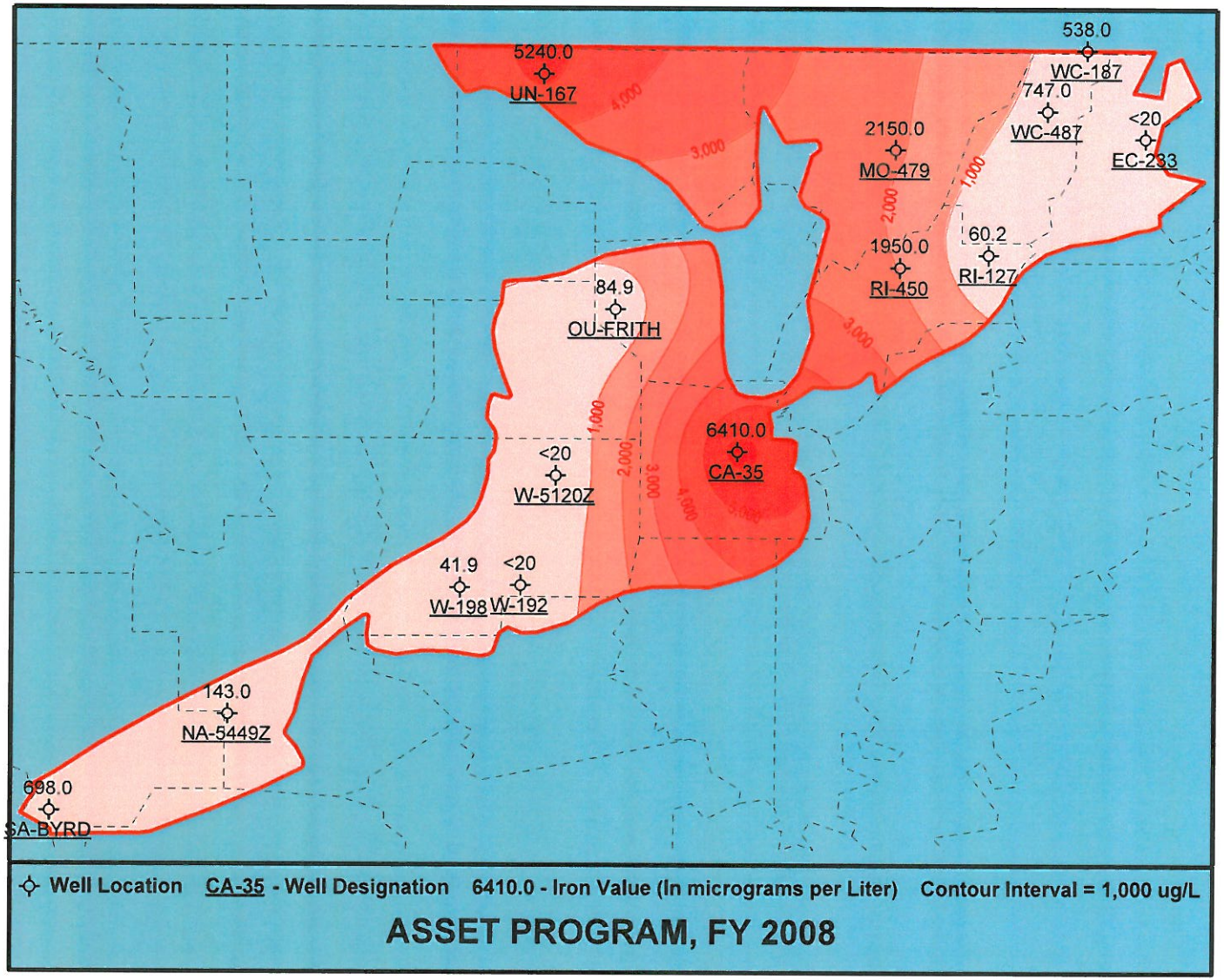


Chart 9-1: Temperature Trend

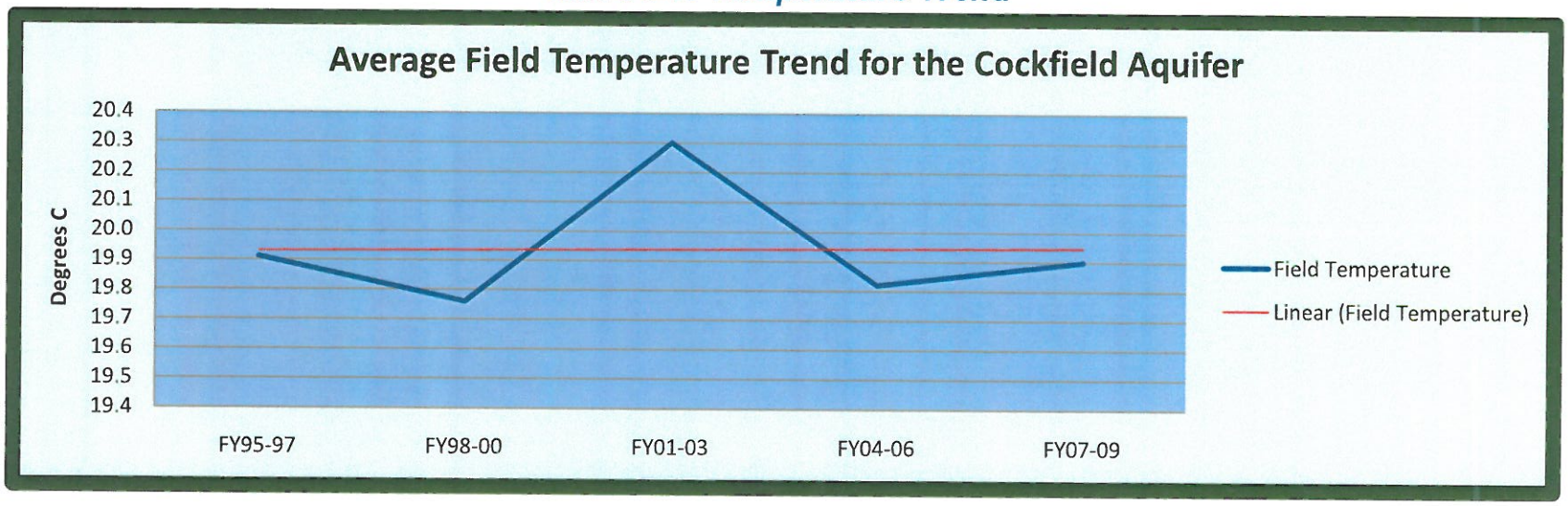


Chart 9-2: pH Trend

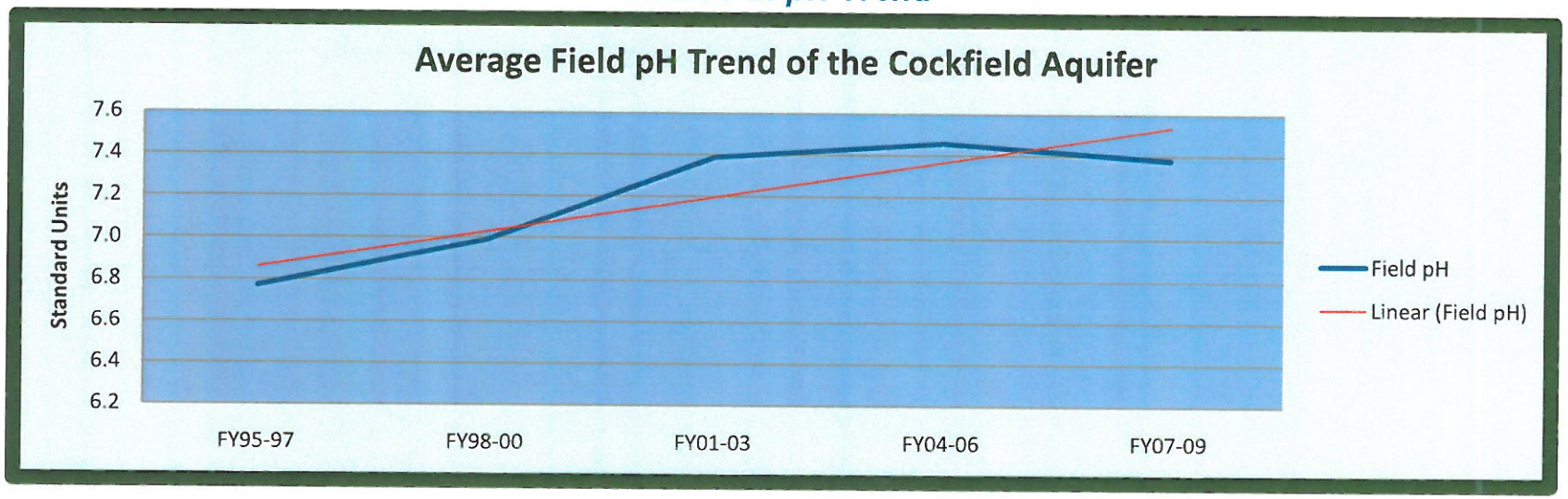


Chart 9-3: Field Specific Conductance Trend

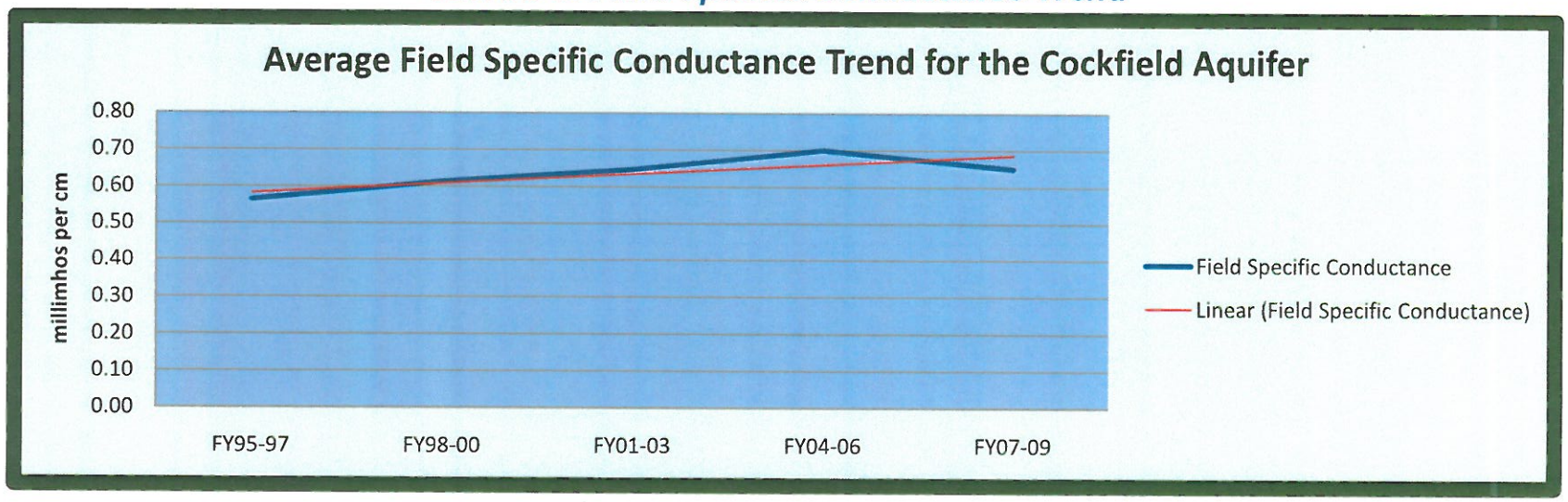


Chart 9-4: Lab Specific Conductance Trend

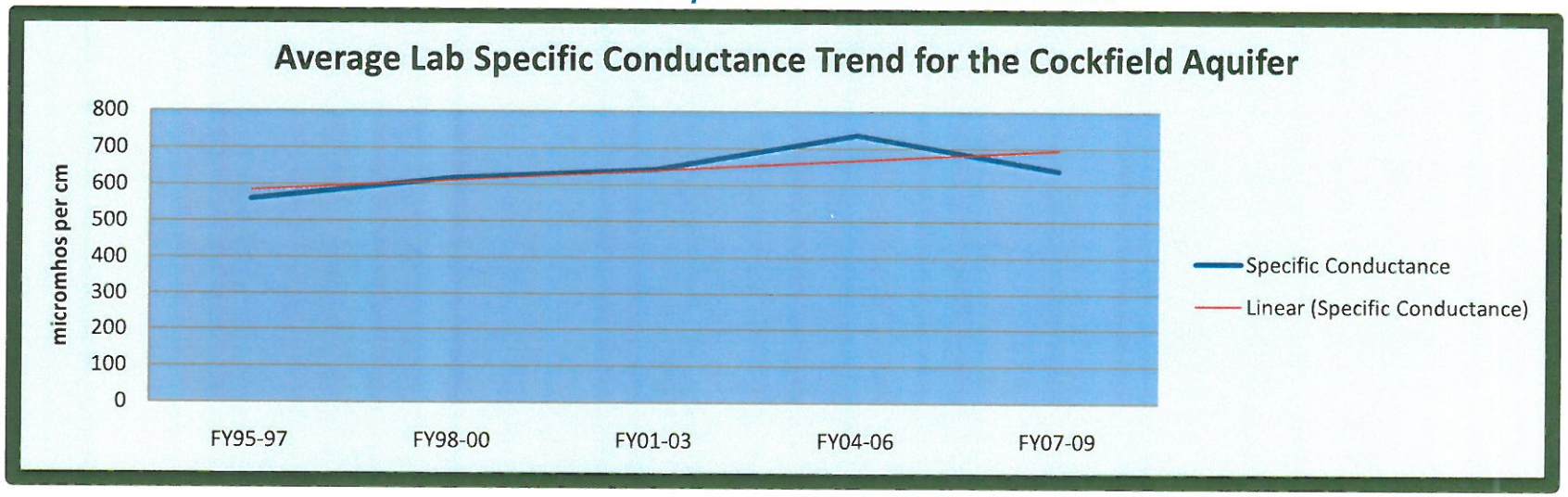


Chart 9-5: Field Salinity Trend

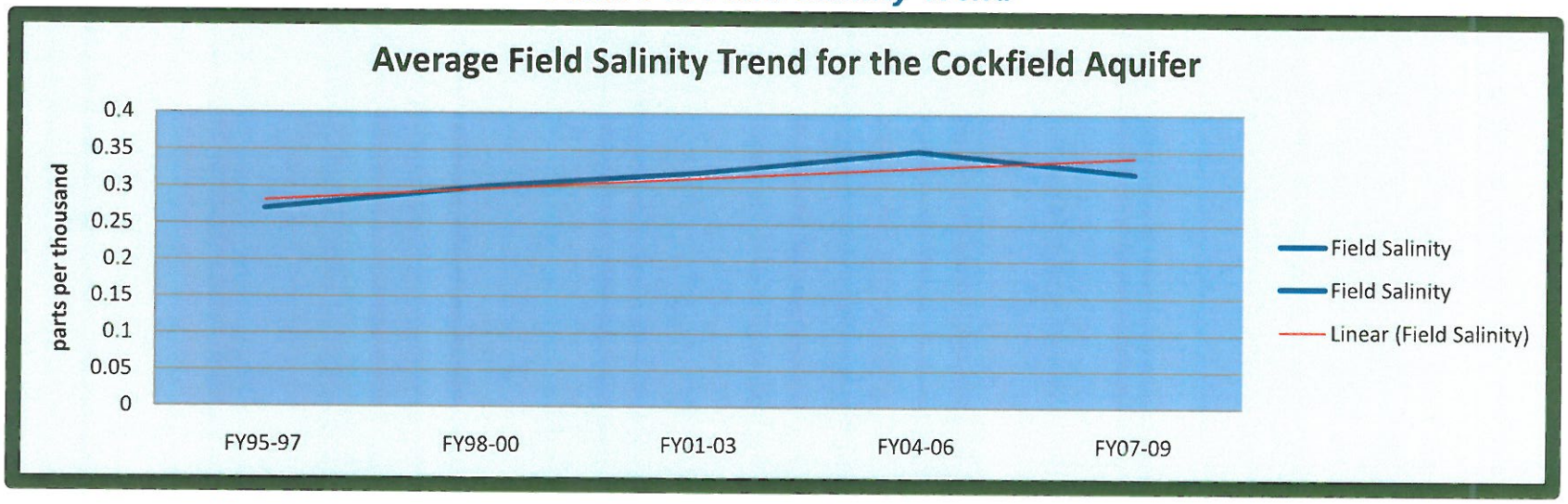


Chart 9-6: Alkalinity Trend

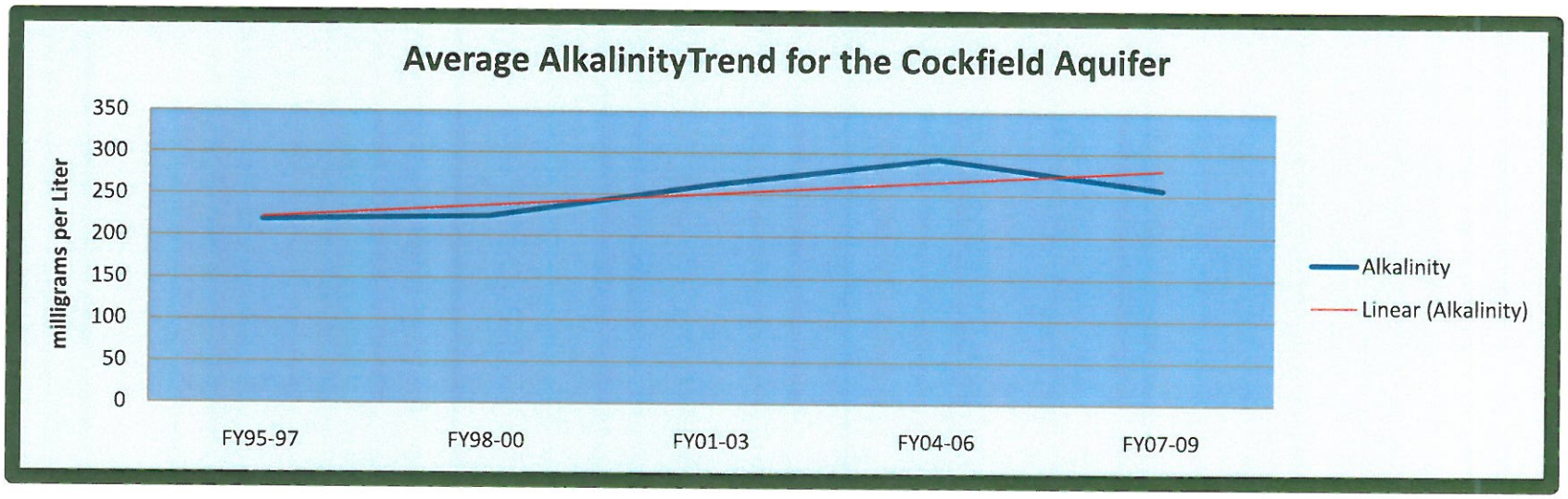


Chart 9-7: Chloride Trend

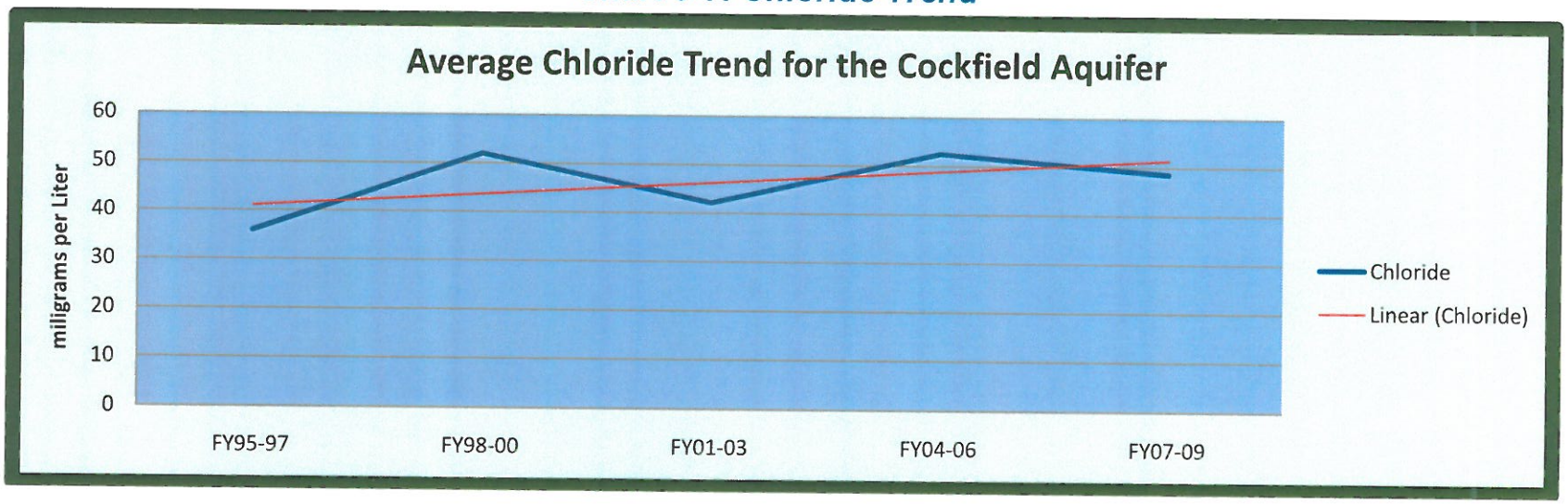


Chart 9-8: Color Trend

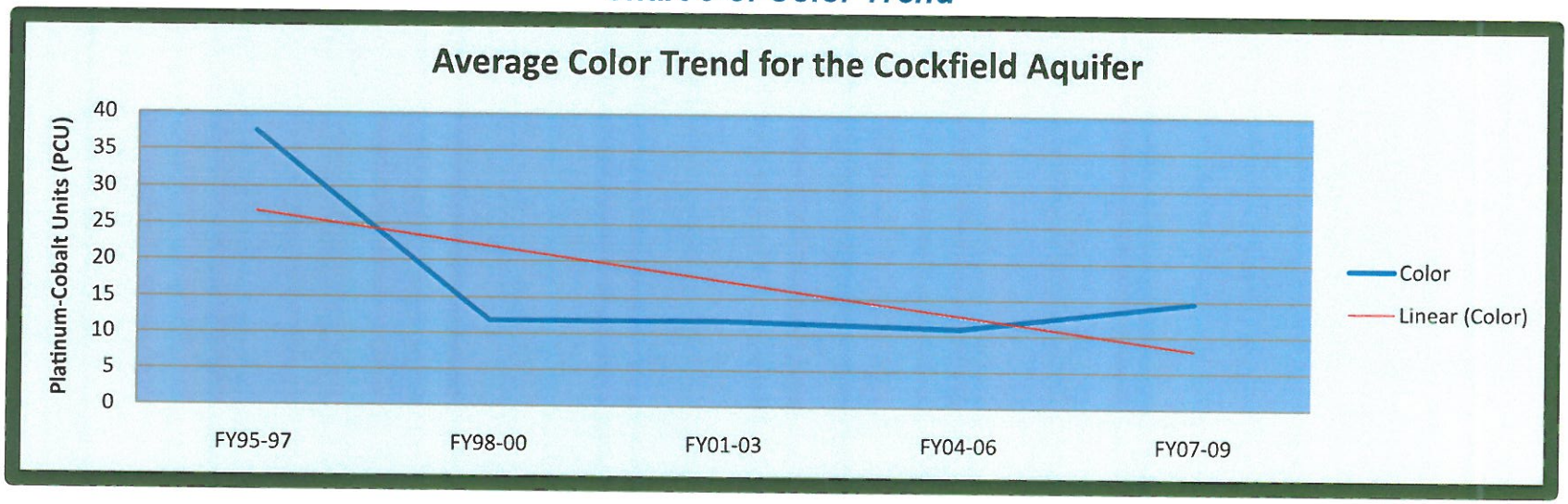


Chart 9-9: Sulfate (SO4) Trend

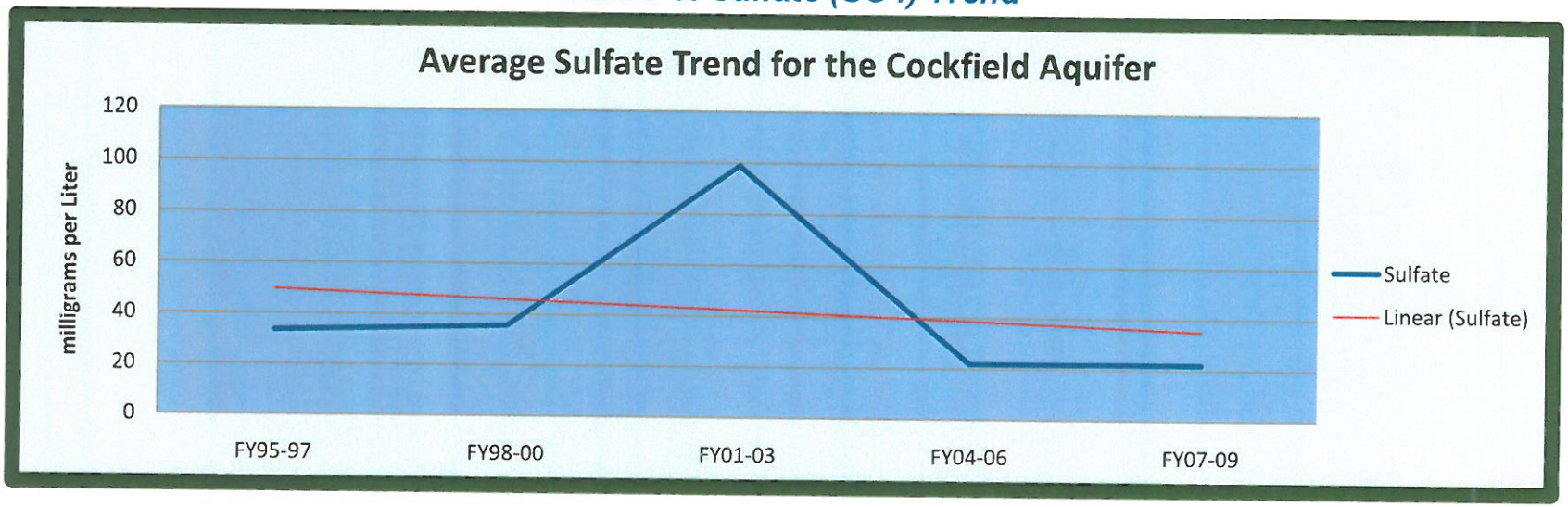


Chart 9-10: Total Dissolved Solids (TDS) Trend

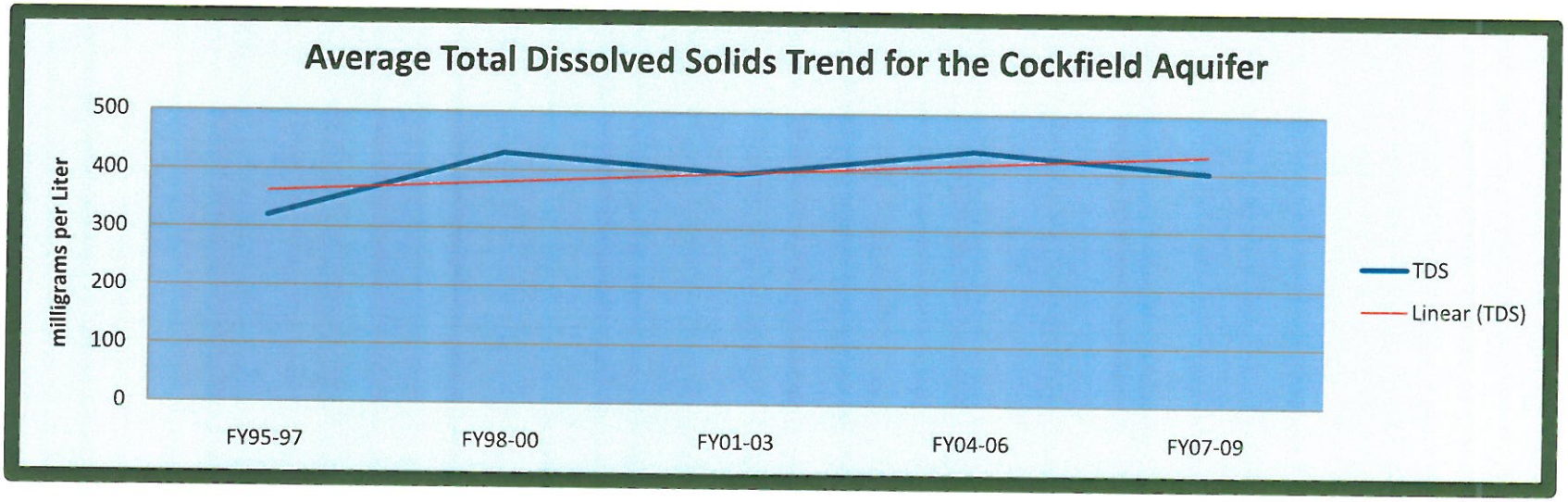


Chart 9-11: Ammonia (NH3) Trend

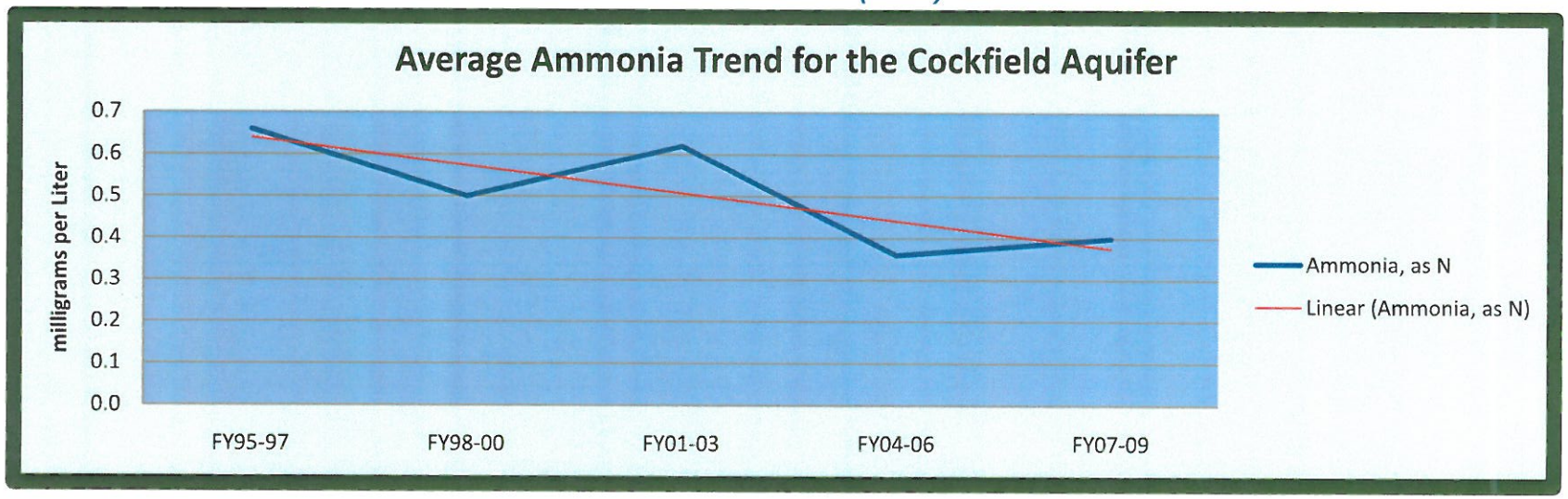


Chart 9-12: Hardness Trend

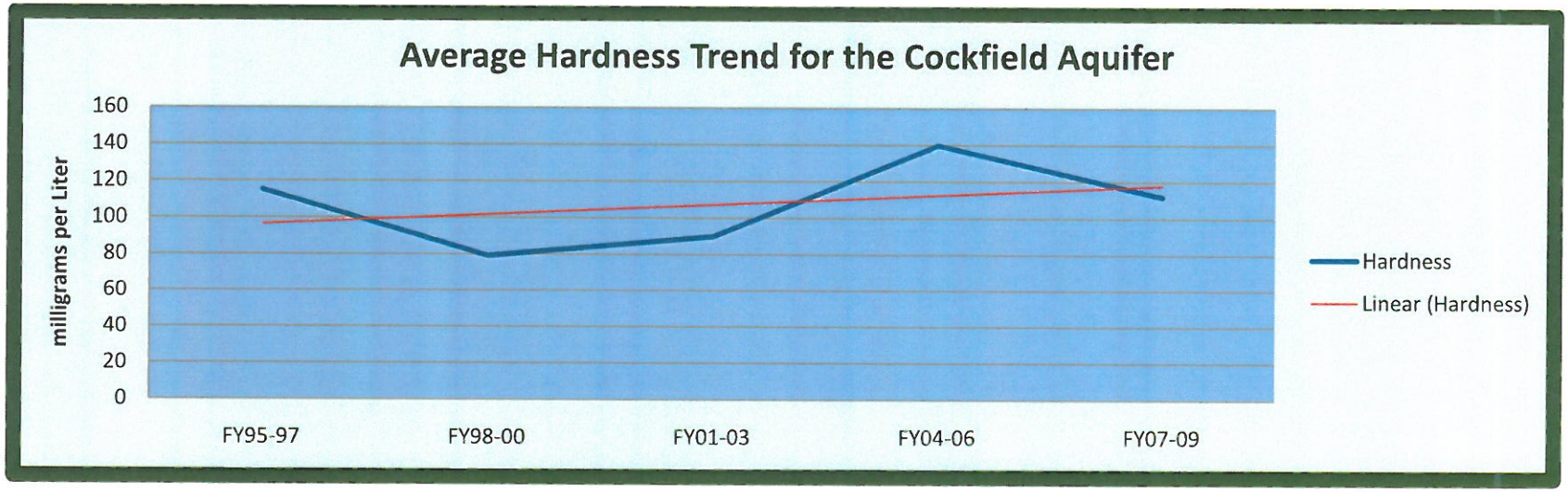


Chart 9-13: Nitrite – Nitrate Trend

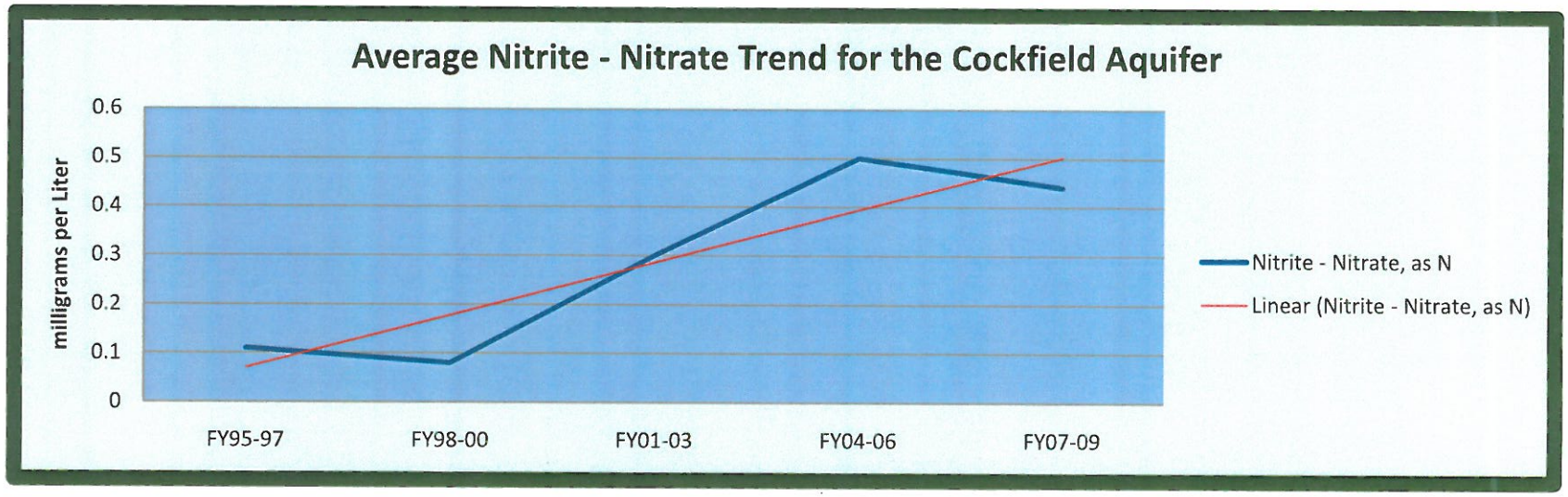


Chart 9-14: TKN Trend

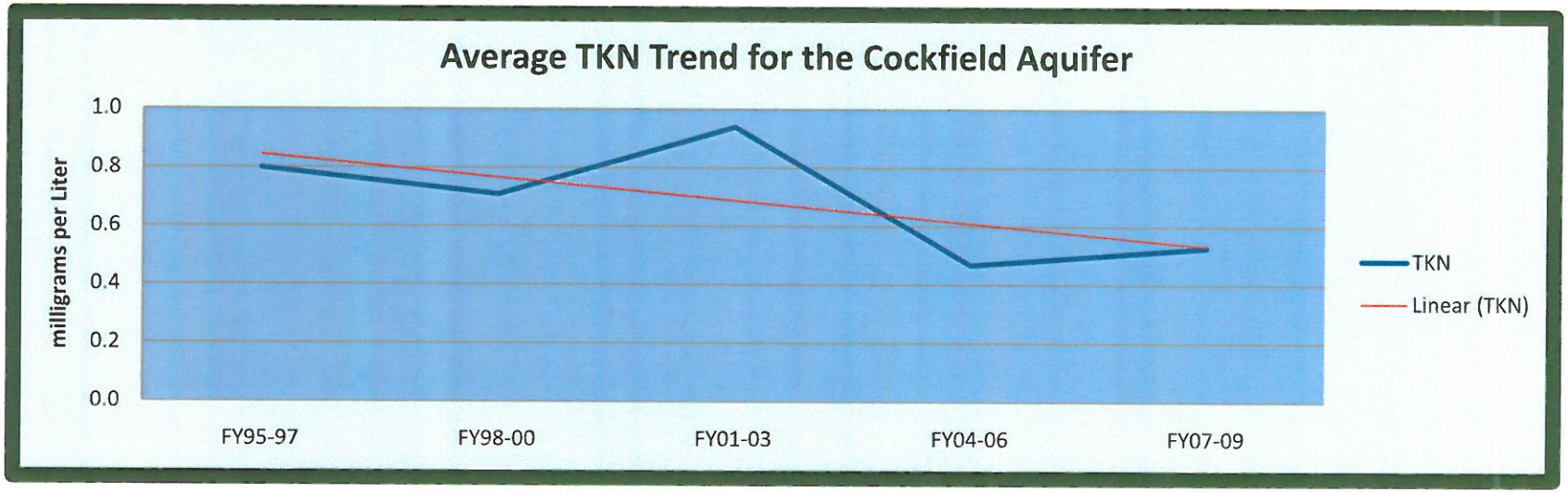


Chart 9-15: Total Phosphorus Trend

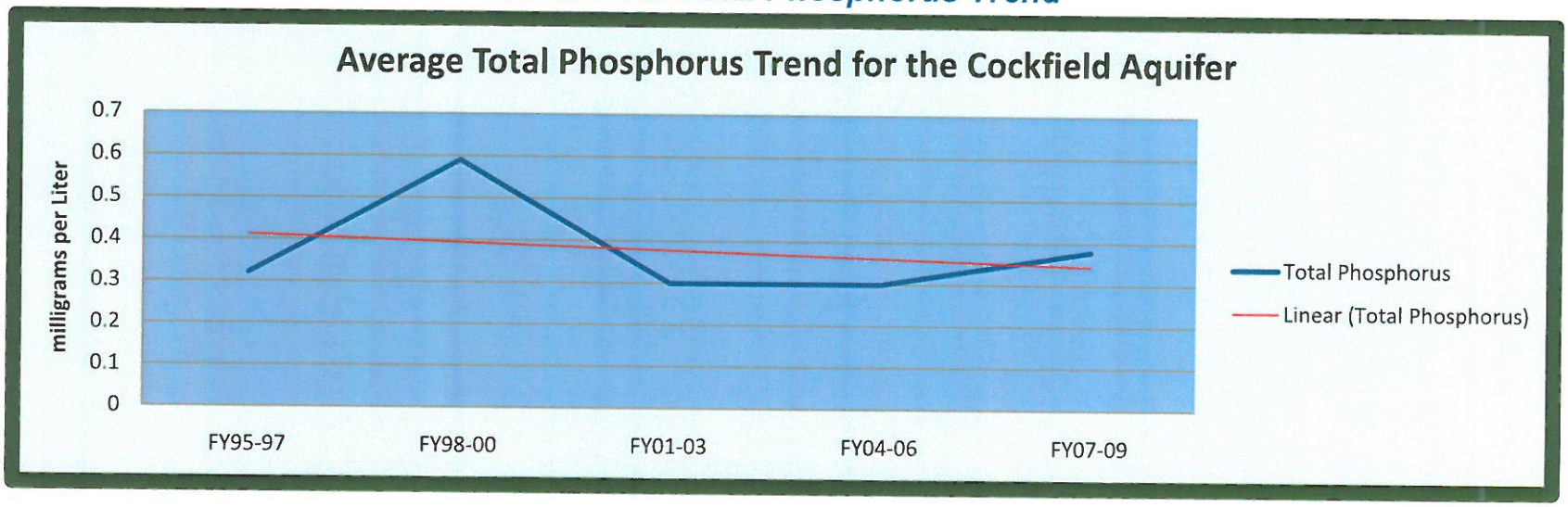


Chart 9-16: Iron Trend

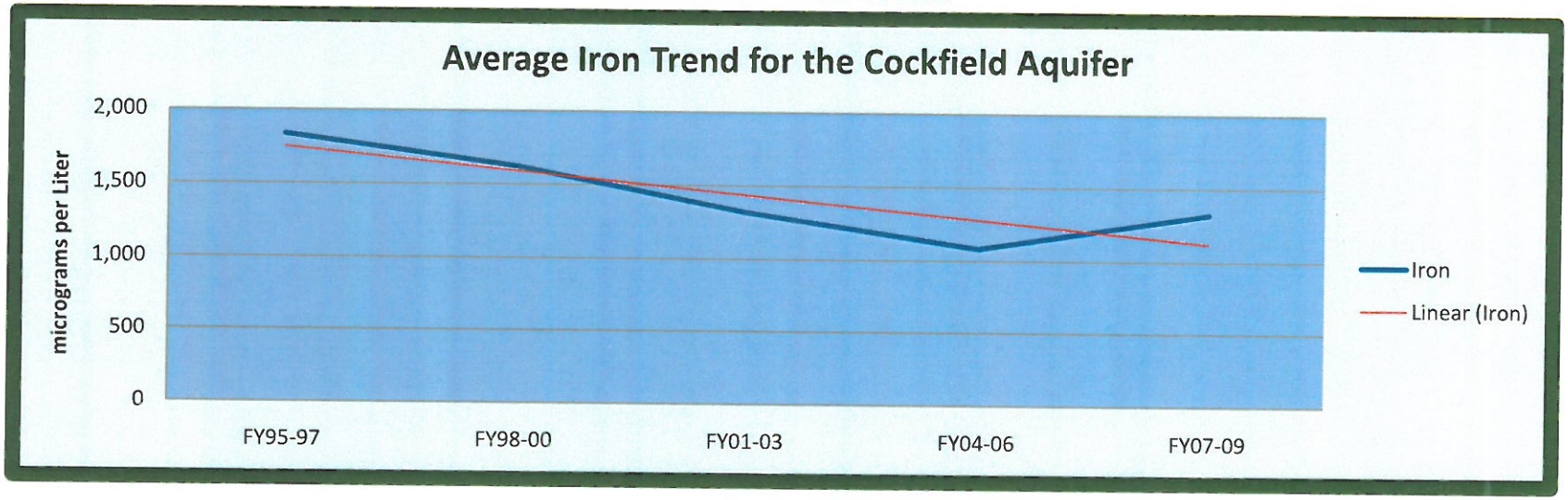


EXHIBIT 5 – LABORATORY RESULTS

UNIVERSITY OF LOUISIANA
MONROE

QUALITY ASSURANCE / QUALITY CONTROL
SAMPLE CHECK LIST

ULM CLIENT: DENMON ENGINEERING COMPANY

ULM SAMPLE NUMBERS: 11-2249, 2250

CONDITION CHECKED BY	KH
LOGGED IN BY	KH
PREPARED BY	
EXTRACTED BY	
ANALYZED BY	DHB,KM,TL,SW,KK
CALCULATIONS BY	DHB,KM,TL,SW,KK
QA/QC DATA CALCULATED BY	DHB,KM,TL,SW,KK
QA/QC DATA APPROVED BY	KK,TL
REPORT PREPARED BY	TL
REPORT APPROVED BY	TL
REPORT RELEASE DATE	11/15/11

Soil-Plant Analysis Laboratory
C&NS Building, Room 117 700 University Ave. Monroe, LA 71209-0505
Phone: (318) 342-1948 Fax: (318) 342-1949

UNIVERSITY OF LOUISIANA
MONROE

CERTIFICATE # 02018

REPORT OF ANALYSIS FOR DENMON ENGINEERING COMPANY

ULM LOG #:	11-2249	SAMPLE TYPE:	Water
SAMPLE DATE:	11/09/11	SAMPLE TIME:	11:30:00
DATE RECEIVED:	11/09/11	DATE REPORTED:	11/15/11
COLLECTED BY:	Randy Denmon	CLIENT ID:	Franklin, Farm, Miss, All, South

REPORT TABLE:

ANALYSIS	TEST METHOD	RESULTS	REPORT UNITS
pH	SM 4500-H B	6.84	su
Conductivity	SM 2510B	1001	ummhos/cm
TS	SM 2540B 19th	568	mg/l
TDS	SM 2540C 19th	556	mg/l
TSS	SM 2540D 19th	8	mg/l
Chloride	SM 4500-CL C 19th	45	mg/l
Sulfate	SM 426C 15th	110	mg/l
Nitrate	EPA 352.1	0.614	mg/l
Ammonia	SM 4500NH3D 19th	0.34	mg/l
Alkalinity	SM 2320B 19th	400	mg/l
Turbidity	SM 2130B 19th	40	NTU's
Hardness	SM 2340B 19th	415	mg/l
Color	SM 2120B 19th	105	CPU's
COD	EPA 410.4	ND	mg/l
Oil & Grease	EPA 1664 A	ND	mg/l
Arsenic	SM 3113B 19th	0.0043	mg/l
Selenium	SM 3113B 19th	ND	mg/l
Mercury	EPA 245.1	ND	mg/l
Aluminum	EPA 200.7	0.05	mg/l
Barium	EPA 200.7	0.22	mg/l
Beryllium	EPA 200.7	ND	mg/l
Boron	EPA 200.7	ND	mg/l
Cadmium	EPA 200.7	ND	mg/l
Calcium	EPA 200.7	106	mg/l
Chromium	EPA 200.7	ND	mg/l
Cobalt	EPA 200.7	ND	mg/l
Copper	EPA 200.7	ND	mg/l
Iron	EPA 200.7	3.11	mg/l
Lead	EPA 200.7	ND	mg/l
Magnesium	EPA 200.7	36.8	mg/l
Manganese	EPA 200.7	0.30	mg/l
Molybdenum	EPA 200.7	ND	mg/l
Nickel	EPA 200.7	ND	mg/l
Potassium	EPA 200.7	1.89	mg/l
Silver	EPA 200.7	ND	mg/l
Sodium	EPA 200.7	63.2	mg/l
Thallium	EPA 200.7	ND	mg/l
Tin	EPA 200.7	ND	mg/l
Vanadium	EPA 200.7	ND	mg/l
Zinc	EPA 200.7	ND	mg/l

Soil-Plant Analysis Laboratory
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Phone: (318) 342-1948 Fax: (318) 342-1949

UNIVERSITY OF LOUISIANA
MONROE

CERTIFICATE # 02018

REPORT OF ANALYSIS FOR DENMON ENGINEERING COMPANY

ULM LOG #:	11-2250	SAMPLE TYPE:	Water
SAMPLE DATE:	11/09/11	SAMPLE TIME:	11:45:00
DATE RECEIVED:	11/09/11	DATE REPORTED:	11/15/11
COLLECTED BY:	Randy Denmon	CLIENT ID:	Franklin, Farm, Miss, All, North

REPORT TABLE:

ANALYSIS	TEST METHOD	RESULTS	REPORT UNITS
pH	SM 4500-H B	6.99	su
Conductivity	SM 2510B	873	ummhos/cm
TS	SM 2540B 19th	527	mg/l
TDS	SM 2540C 19th	530	mg/l
TSS	SM 2540D 19th	5	mg/l
Chloride	SM 4500-CL C 19th	45	mg/l
Sulfate	SM 426C 15th	83.9	mg/l
Nitrate	EPA 352.1	0.216	mg/l
Ammonia	SM 4500NH3D 19th	0.19	mg/l
Alkalinity	SM 2320B 19th	320	mg/l
Turbidity	SM 2130B 19th	28	NTU's
Hardness	SM 2340B 19th	391	mg/l
Color	SM 2120B 19th	60	CPU's
COD	EPA 410.4	ND	mg/l
Oil & Grease	EPA 1664 A	ND	mg/l
Arsenic	SM 3113B 19th	0.0033	mg/l
Selenium	SM 3113B 19th	ND	mg/l
Mercury	EPA 245.1	ND	mg/l
Aluminum	EPA 200.7	ND	mg/l
Barium	EPA 200.7	0.20	mg/l
Beryllium	EPA 200.7	ND	mg/l
Boron	EPA 200.7	ND	mg/l
Cadmium	EPA 200.7	ND	mg/l
Calcium	EPA 200.7	99.4	mg/l
Chromium	EPA 200.7	ND	mg/l
Cobalt	EPA 200.7	ND	mg/l
Copper	EPA 200.7	ND	mg/l
Iron	EPA 200.7	1.89	mg/l
Lead	EPA 200.7	ND	mg/l
Magnesium	EPA 200.7	34.7	mg/l
Manganese	EPA 200.7	0.38	mg/l
Molybdenum	EPA 200.7	ND	mg/l
Nickel	EPA 200.7	ND	mg/l
Potassium	EPA 200.7	1.44	mg/l
Silver	EPA 200.7	ND	mg/l
Sodium	EPA 200.7	38.1	mg/l
Thallium	EPA 200.7	ND	mg/l
Tin	EPA 200.7	ND	mg/l
Vanadium	EPA 200.7	ND	mg/l
Zinc	EPA 200.7	ND	mg/l

Soil-Plant Analysis Laboratory
C&NS Building, Room 117 700 University Ave. Monroe, LA 71209-0505
Phone: (318) 342-1948 Fax: (318) 342-1949

ANALYSIS	DETECTION LIMIT	DATE/TIME ANALYZED	ANALYST
pH	0.01	11/09/11@14:12	DHB
Conductivity	2.17	11/11/11@09:46	DHB
TS	5.0	11/10/11@13:40	SW
TDS	5.0	11/10/11@11:21	SW
TSS	2.0	11/10/11@11:40	SW
Chloride	1.53	11/14/11@14:52	DHB
Sulfate	0.45	11/14/11@13:47	KK
Nitrate	0.005	11/14/11@14:26	DHB
Ammonia	0.06	11/10/11@10:29	KM
Alkalinity	0.2	11/14/11@15:44	DHB
Turbidity	1.0	11/10/11@13:45	KK
Hardness	0.27	11/10/11@11:05	DHB
Color	2.5	11/10/11@09:30	SW
COD	18.6	11/10/11@10:54	DHB
Oil & Grease	1.76	11/10/11@08:37	KK
Arsenic	0.0016	11/10/11@11:50	KK
Selenium	0.001	11/10/11@11:50	KK
Mercury	0.00006	11/10/11@15:04	TL
Aluminum	0.018	11/10/11@08:56	DHB
Barium	0.002	11/10/11@08:56	DHB
Beryllium	0.002	11/10/11@08:56	DHB
Boron	0.004	11/14/11@09:04	DHB
Cadmium	0.002	11/10/11@08:56	DHB
Calcium	0.010	11/10/11@11:05	DHB
Chromium	0.004	11/10/11@08:56	DHB
Cobalt	0.004	11/10/11@08:56	DHB
Copper	0.002	11/10/11@08:56	DHB
Iron	0.003	11/10/11@08:56	DHB
Lead	0.010	11/10/11@08:56	DHB
Magnesium	0.010	11/10/11@11:05	DHB
Manganese	0.002	11/10/11@08:56	DHB
Molybdenum	0.04	11/10/11@08:56	DHB
Nickel	0.002	11/10/11@08:56	DHB
Potassium	0.04	11/10/11@11:05	DHB
Silver	0.003	11/11/11@08:04	DHB
Sodium	0.018	11/10/11@11:05	DHB
Thallium	0.018	11/10/11@08:56	DHB
Tin	0.024	11/14/11@13:21	DHB
Vanadium	0.005	11/10/11@08:56	DHB
Zinc	0.003	11/10/11@08:56	DHB

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QA / QC REPORT: ULM #11-2249, 2250

ANALYSIS	BLANK	REAGENT SPIKE RECOVERY	MATRIX SPIKE RECOVERY
pH	< 0.01	NA	NA
Conductivity	< 2.17	NA	NA
TS	< 5.0	NA	NA
TDS	< 5.0	NA	NA
TSS	< 2.0	NA	NA
Chloride	< 1.53	100.0	102.5
Sulfate	< 0.45	100	105
Nitrate	< 0.005	100.0	101.2
Ammonia	< 0.06	97.2	87.0
Alkalinity	< 0.2	NA	NA
Turbidity	< 1.0	NA	NA
Hardness	< 0.27	105.8	101.3
Color	< 2.5	NA	NA
COD	< 18.6	101.0	100.3
Oil & Grease	< 1.76	95.25	89.5
Arsenic	< 0.0016	105.9	94.1
Selenium	< 0.001	101.2	105.3
Mercury	< 0.00006	99.5	97.9
Aluminum	< 0.018	87.5	90.1
Barium	< 0.002	92.8	90.9
Beryllium	< 0.002	101.4	92.4
Boron	< 0.004	101.2	99.4
Cadmium	< 0.002	92.5	86.4
Calcium	< 0.010	108.4	106.0
Chromium	< 0.004	92.8	87.4
Cobalt	< 0.004	91.3	84.7
Copper	< 0.002	88.7	82.4
Iron	< 0.003	88.2	81.5
Lead	< 0.010	90.9	84.0
Magnesium	< 0.010	102.8	96.5
Manganese	< 0.002	92.5	95.0
Molybdenum	< 0.04	92.6	92.5
Nickel	< 0.002	87.2	81.5
Potassium	< 0.04	110.9	102.1
Silver	< 0.003	94.0	87.0
Sodium	< 0.018	96.2	102.0
Thallium	< 0.018	88.9	85.0
Tin	< 0.024	113.6	81.4
Vanadium	< 0.005	95.7	90.7
Zinc	< 0.003	85.8	84.9

No nonstandard test method was utilized in the analysis of these samples.
There was no deviation from the listed test methods during analysis.

Director

Soil-Plant Analysis Laboratory
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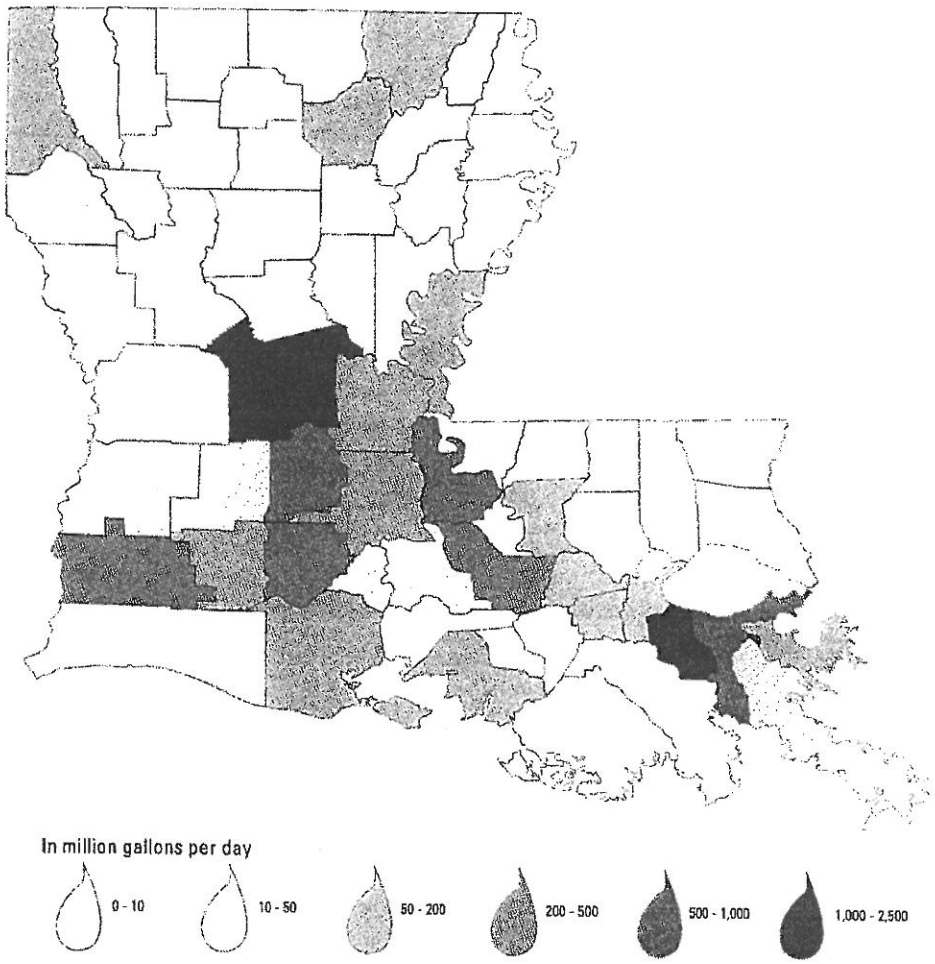
Phone: (318) 342-1948 Fax: (318) 342-1949
A Member of the University of Louisiana System · AA/EOE

EXHIBIT 6 – WATER USE IN LOUISIANA, 2010

Water Use In Louisiana, 2010

DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
Water Resources Special Report No. 17 (Revised)



STATE OF LOUISIANA
DEPARTMENT OF TRANSPORTATION AND DEVELOPMENT
PUBLIC WORKS AND WATER RESOURCES DIVISION

in cooperation with the
U.S. GEOLOGICAL SURVEY

2011 (Revised October 2012)

DOTD
TRANSPORTATION & DEVELOPMENT

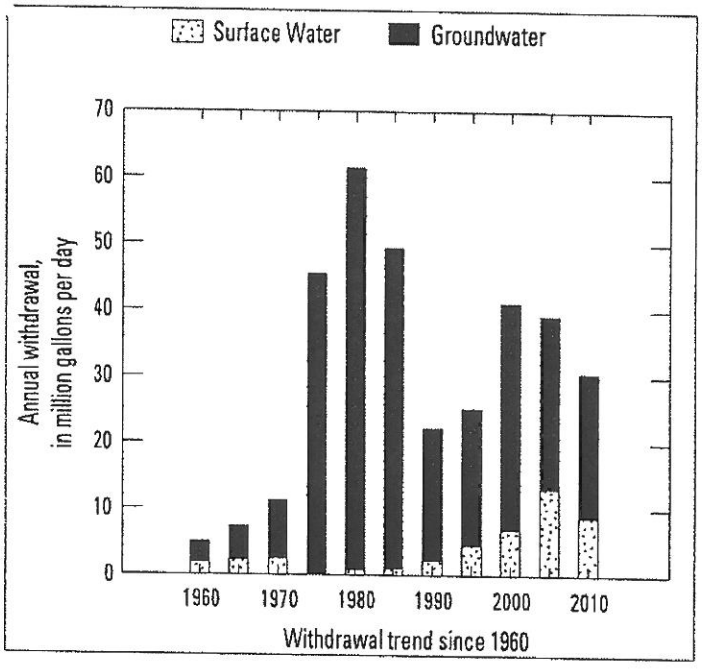
USGS
science for a changing world

Richland

Population: 20,725
Population served by public supply: 14,798
Per capita withdrawals (gal/d): 1,474
Acres irrigated: 38,056
Hydroelectric power instream use (Mgal/d): 0

Withdrawals, in million gallons per day (Mgal/d)			
	Groundwater (GW)	Surface Water (SW)	Total
Public supply	2.89		2.89
Industrial			.00
Power generation			.00
Rural domestic	.47		.47
Livestock	.06	.06	.11
Rice irrigation	9.76		9.76
General irrigation	8.65	8.65	17.31
Aquaculture			.00
Total	**21.83**	**8.71**	**30.54**

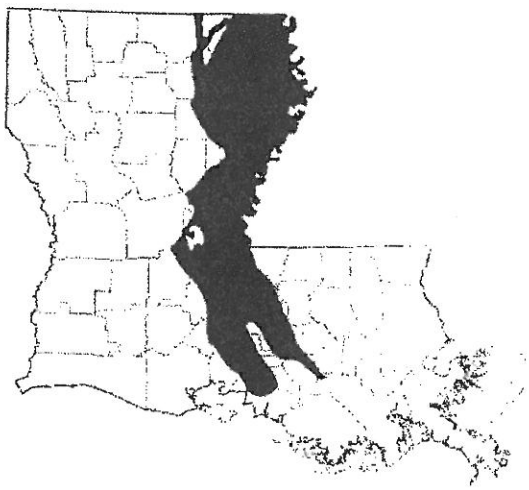
Withdrawals by Major Industrial Group (Mgal/d)		
Standard Industrial Classification	GW	SW

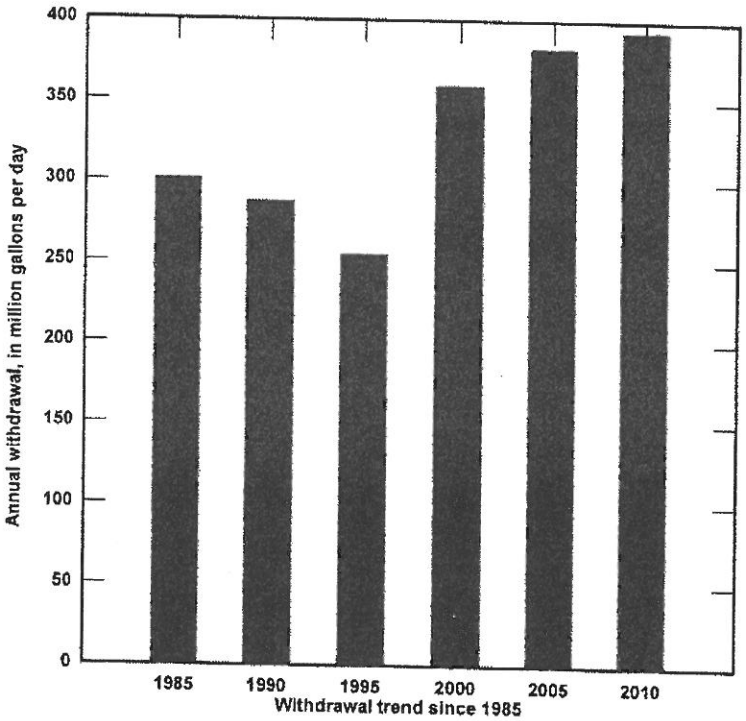


Withdrawals by Major Public Supplier (Mgal/d)		
Public Supplier	GW	SW
Archibald Water System	0.39	
Delhi Water System	1.00	
Liddieville Water System	.11	
Mangham Water System	.08	
N. Franklin Water Works	.74	
Rayville Water System	.02	
River Road Water System	.24	
Start Water System	.21	

Mississippi River Alluvial Aquifer

Withdrawals, in million gallons per day (Mgal/d)	
Public supply	10.04
Industry	28.49
Power generation	.82
Rural domestic	3.41
Livestock	1.12
Rice Irrigation	132.30
General irrigation	155.13
Aquaculture	62.26
Total	**393.57**

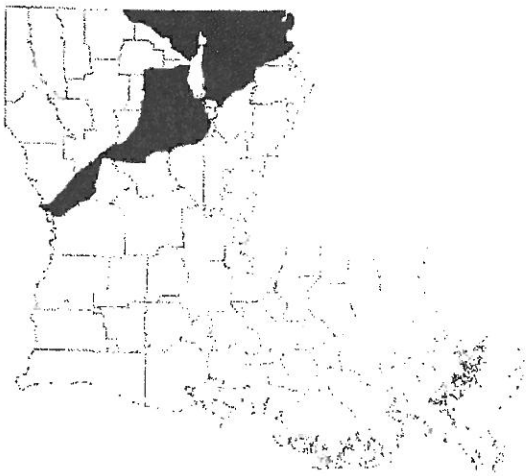


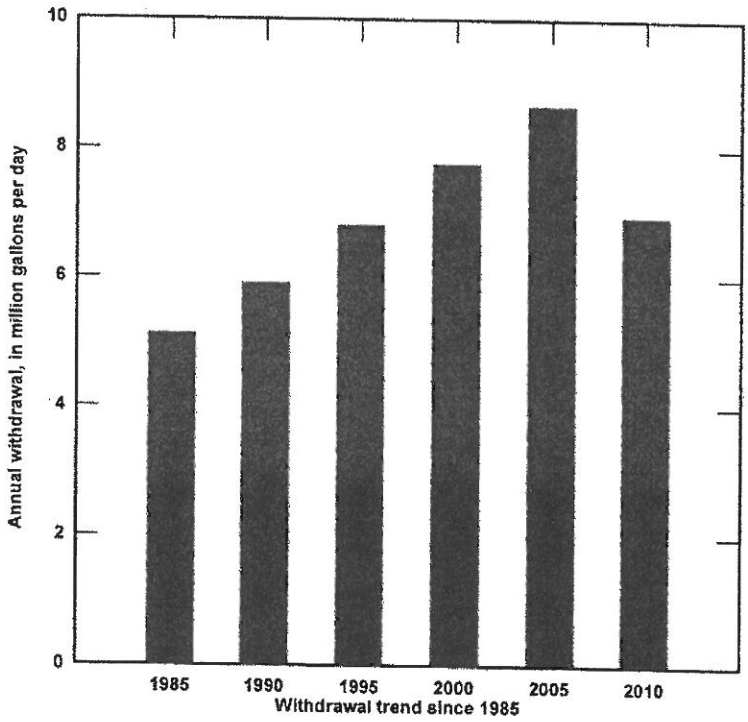


Withdrawals by Parish	
Parish	Mgal/d
Ascension	0.15
Assumption	6.81
Avoyelles	24.96
Caldwell	.61
Catahoula	20.49
Concordia	26.16
East Baton Rouge	.09
East Carroll	19.91
Franklin	35.18
Iberia	.17
Iberville	20.41
Lafayette	.29
Lafourche	4.09
Madison	38.83
Morehouse	67.50
Ouachita	.88
Pointe Coupee	17.64
Richland	20.37
St. James	.01
St. Landry	19.77
St. Martin	25.08
St. Mary	.03
Tensas	28.62
Terrebonne	.61
West Baton Rouge	2.88
West Carroll	11.98
West Feliciana	.04

Cockfield Aquifer

Withdrawals, in million gallons per day (Mgal/d)	
Public supply	6.40
Industry	.00
Power generation	.00
Rural domestic	.44
Livestock	.01
Rice Irrigation	.11
General irrigation	.00
Aquaculture	.00
Total	**6.96**





Withdrawals by Parish	
Parish	Mgal/d
Caldwell	1.09
Claiborne	.01
East Carroll	1.29
Grant	.20
Jackson	.06
La Salle	.86
Lincoln	.01
Morehouse	.34
Natchitoches	.07
Ouachita	.11
Richland	1.46
Sabine	.07
Union	.06
Vernon	.06
West Carroll	1.08
Winn	.19

EXHIBIT 7 – RICHLAND BEACON ARTICLE "DELHI EARNS STATE HONOR"

Delhi earns state honor

Posted August 16th, 2011

The Town of Delhi was awarded the Louisiana Municipal Association Community Achievement Award for Economic Development at the 2011 conference in Shreveport.

"This is a great honor for our town to take first place in this division. There is tremendous competition every year in the various categories of economic development, basic services and community development," stated Mayor Lynn Lewis.

The town's entry detailed the major infrastructure projects completed in 2010 to facilitate the services needed for the Con-Agra/Lamb Weston sweet potato processing plant. Lewis explained,

"Working with our city engineers, the overall project was divided into seven construction contracts including wastewater collection and treatment, water booster plant, a new water well, an elevated tank that holds nearly a million gallons and over twenty-six miles of d ution and wastewater force mains. A new SCADA system was added and cast c te oxidation ditch the size of a football field was created to handle the 1.2 million gallons of wastewater produced by the plant each day."

In addition, a sludge composting facility was constructed to handle the sweet potato by-products of wastewater treatment. This sludge will be mixed with woody refuse to create a marketable compost soil. "This is the first of its kind in our state," stated Lewis. "Its an innovative process that will allow us to make a useful product from waste that would normally go to a landfill." There were upgrades made to Delhi's existing four water wells along with the major additions to the town's wastewater facilities. "These new elements and upgrades will improve our capacity to serve the entire community as well as Con-Agra," explained Lewis.

The town's investment came to over 18 million dollars. "One of the unique aspects of this project was the various funding opportunities provided by the Department of Health/Hospital's

Drinking Water Revolving Loan Fund and the Department of Environmental Quality's Clean Water State Revolving Fund. These low cost loans helped Lamb Weston avoid heavy up-front expenses. The Department of Economic Development provided Con-Agra with other state incentives all of which helped make the plant possible. Funding solutions are one of the things the judges look for in these entries, and we were very successful in obtaining these."

Mayor Lewis further explained the judging process for the Community Achievement Awards. "The entries are studied by a large panel of individuals from LSU, various state departments and business advisers. One of the things they look for in an entry is the obstacles that had to be overcome. We had plenty of those," stated Lewis. "In the beginning, we were under a non-disclosure agreement, yet our engineers had to make preliminary plans and environmental studies in case the Delhi site was chosen. Once the decision was made and announced, we had one year to get the work done so Lamb-Weston could begin by the September harvest. We were really proud when one of the ConAgra engineers told us that they had never had a town complete their infrastructure as quickly as Delhi. Our city engineers from Meyer, Meyer, Lecroix and Hixson, as well as our p vorks employees, lead by Director Pete McCall, did a phenomenal job and deserve fu redit for this."

"Another judging criteria considers community involvement," said Lewis. "We detailed in our entry the critical initiative taken by Mr. Lev Dawson to interest ConAgra in coming to our region. Once this initial interest was stirred, our government officials such as Senator Francis Thompson and Representative Chaney kept support and incentives coming from

the capital through the Department of Economic Development. Northeast Louisiana Economic Alliance Director, Tana Trichel, was an instrumental mediator for us as well."

Once the announcement was made that Delhi had been chosen, the town council took immediate action to approve the necessary agendas to ensure the plant's success. "The leadership shown by Shirley McDade, Dub Sumner, the late J.C. Smith, Marvin Dale [illegible]on and Bob Benson was critical to confidently go forward with all plans. At that point, ev[illegible]one in the community was excited about this opportunity—we made that very clear in our application," explained Lewis.

"It is very rewarding for the town to be recognized for this progress by the Louisiana Municipal Association and the judges who studied these entries. These are professional people in positions who know how hard it can be to attract industry and to complete the work for such a major plant. We plan to keep on submitting our projects and hope to win again," said Lewis.

Most read articles

Headline	Published
Delhi eyes Settler's Point	11/14/2012 - 11:18
Police Report	12/12/2012 - 10:58
Delhi hosts 2011 crop forum	01/18/2011 - 15:48
November 29,2012	11/27/2012 - 09:18
Rhymes slates Tour of Homes	11/14/2012 - 11:18

more

EXHIBIT 8 – OPERATOR LETTERS

Town of Delhi

209 BROADWAY • P.O. BOX 277 • DELHI, LOUISIANA • 71232
TEL (318) 878-3792 • FAX (318) 878-3362

Northeast Louisiana Economic Alliance
P.O. Drawer 746
Ferriday, La. 71334

Re: Franklin Farm

Dear Ms. Trichel:

The Town of Delhi is agreeable to either serve as the Certified Operator of new water and wastewater systems that might be provided at the Franklin Farm Mega-site or in the vicinity, or provide such services within the capabilities of our existing systems, or upgrades that could be reasonably permitted and constructed. The Town of Delhi assisted ConAgra in the location of their new sweet potato processing facility on Highway 609 (three miles from Franklin Farms) with a $17,000,000 installation of water storage tank, capacity upgrades to the town's sewer treatment facilities including nearly twenty miles of additional 18"-20" water and sewer lines and additional well and ground storage for increased water capacity.

As with the ConAgra user agreement, the cost of any required improvements or the maintenance and operation of additional services will have to be borne by others to connect to our facilities or reasonable user rates applied to cover the cost of additional services.

The Town of Delhi is always interested in partnering or assisting in attracting new industry to our area.

Feel free to contact me if you need more assistance.

Sincerely,

Mayor J. Lynn Lewis

January 28, 2013

Northeast Louisiana Economic Alliance
P.O. Drawer 746
Ferriday, La. 71334

Re: Franklin Farm

Dear Ms. Trichel:

The Town of Rayville, Louisiana is agreeable to either serve as the Certified Operator of new water and wastewater systems that might be provided at the Franklin Farm Mega-site or in the vicinity, or provide such services within the capabilities of our existing systems, or upgrades that could be reasonably permitted and constructed.

The cost of any required improvements or the maintenance and operation of additional services will have to be borne by others or reasonable rates applied to cover the cost of additional services.

The Town of Rayville, Louisiana is always interested in partnering or assisting in attracting new industry to our area.

Feel free to contact me if you need more assistance.

Town of Rayville, Louisiana

Harry Lewis, Mayor
Harry Lewis

END OF REPORT