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June 1, 2015

Mr. Jeff Derouen
Executive Director
Public Service Commission
211 Sower Blvd.
Frankfort, KY 40601

Case No. 2015-00169

Dear Mr. Derouen:

Northern Kentucky Water District submits its application for a certificate of convenience and necessity. I certify that the electronically filed documents are a true representation of the original documents.

Very truly yours,

John N. Hughes

John N. Hughes

Attorney for Northern Kentucky
Water District

COMMONWEALTH OF KENTUCKY

BEFORE THE PUBLIC SERVICE COMMISSION

In the Matter of:

APPLICATION OF NORTHERN KENTUCKY WATER DISTRICT FOR APPROVAL OF THE REPLACEMENT OF THE DUDLEY COMPLEX SODIUM HYPOCHLORITE BUILDING, ISSUANCE OF A CERTIFICATE OF CONVENIENCE AND NECESSITY AND APPROVAL OF FINANCING	)))))))	CASE NO. 2015-00169

APPLICATION FOR APPROVAL OF CONSTRUCTION AND FINANCING

Northern Kentucky Water District (NKWD), by counsel, petitions for an order approving the construction the Dudley Complex Sodium Hypochlorite Building as described below pursuant to KRS 278.020. Approval of the financing pursuant to KRS 278.300, if necessary, is also requested.

In support of the application, the following information is provided:

1. NKWD's office address is 2835 Crescent Spring Rd., Erlanger, KY 41018-0640. Its principal officers are listed in its current Annual Report on page 6, which is filed with the Commission as are its prior years Reports and is incorporated by reference.

Its contact officer is:

Jack Bragg, Vice President Finance
2835 Crescent Spring Rd.
Erlanger, KY 41018-0640
(859) 578 9898 Phone
(859) 578-3668 fax
jbragg@nkywater.org

2. NKWD is a non-profit water district organized under Chapter 74 and has no separate articles of incorporation;

3. A description of NKWD's water system and its property stated at original cost by accounts is contained in its Annual Report.

4. NKWD serves retail customers in Kenton, Boone and Campbell Counties and sells water at wholesale to non-affiliated water distribution systems in Kenton, Boone, Pendleton and Campbell Counties.

5. NKWD proposes to construct new facilities as described in Exhibit A. The project at the Dudley Complex, which consists of two five million gallon storage tanks and two pumping stations, involves demolition of the existing chemical feed building and construction of a new building for housing the chemical storage and feed equipment for sodium hypochlorite. This equipment is needed to boost chlorine in the distribution system. The recommended award amount for construction is $875,861. The estimated cost of the total project with engineering, construction, and contingencies is $1,060,000.

6. This project will be paid from the District's Five-Year Capital Budget, PSC No. 209 "Annual General Facility R&R 2014 — Plants, Tanks, Pump Stations" with a budget of $1,060,000 which includes construction cost, engineering, and contingencies. A summary of the project costs is provided below:

- Design Engineering $ 95,000
- Construction Engineering $ 10,000
- Contractor's Bid $ 875,861
- Misc. & Contingencies $ 79,139

  Total Project Cost $1,060,000

The project will be funded using $1,060,000 from a future Bond Anticipation Note. Because the BAN is temporary financing for fewer than two years and is the only source of funding, NKWD believes no approval of financing is necessary. However, if approval pursuant to KRS 278.300 is needed, such approval is requested.

7. The construction is in the public interest and is required to allow NKWD to continue to provide adequate service to its customers. The project, its cost, need and other details are contained in Exhibit A. The District has received all approvals from the DOW for the Plans and Specifications and funding for these improvements. See Exhibit B.

8. Easements and rights of way are not required, see Exhibit B.

9. This service will not compete with any other utility in the area.

10. The proposed construction project identified in Exhibit A is scheduled to begin construction in upon PSC approval and the expected in service date is in May, 2016. Board approval of the final bids for the project is included in Exhibit C. The bids were opened April 30, 2015 and are subject to acceptance for 90 days. Therefore, **the bids will expire July 29, 2015.**

11. No new franchises are required. A copy of the DOW letter approving the Plans and Specifications for the proposed improvements is attached as Exhibit B.

12. Construction descriptions are in Exhibit A and Bid Documents. Facts relied on to justify the public need are included in the project descriptions in Exhibit A.

13. Maps of the area showing location of the proposed facilities are in Exhibit A.

14. The construction costs will be funded by as described above.

15. Estimated operating costs for operation and maintenance, depreciation and debt service after construction are shown in Exhibit D.

16. A description of the facilities and operation of the system are in Exhibit A.

17. A full description of the route, location of the project, description of construction and related information is in Exhibit A.

18. The start date for construction is August, 2015, or upon PSC approval. The proposed in-service date is May, 2016. The total estimated cost of construction at completion is referenced in Exhibits A, B and D.

19. CWIP at end of test year is listed in the Annual Report incorporated by reference.

20. Plant retirements are listed in Exhibit B and the Annual Report. No salvage values are included as booked.

21. The use of the funds and need for the facilities is justified based on a the engineering report included as Exhibit A

22. No rate adjustment is being proposed.

23. The following information is provided in response to 807 KAR 5:001 (8):

a. Articles of Incorporation – None. NKWD is a statutorily created water district under KRS Chapter 74;

24. The following information is supplied pursuant to 807 KAR 5:001(9):

a. Facts relied upon to show that the application is in the public interest: See Exhibit A.

25. The following information is provided as required by 807 KAR 5:001 (11):

a. A general description of the property is contained in the Annual Report,

b. No stock is to be issued; No bonds are to be issued in this case;

c. There is no refunding or refinancing;

d. The proceeds of the financing are to construct the property described in Exhibit A.

e. The par value, expenses, use of proceeds, interest rates and other information is not applicable because no bonds are being issued at this time.

26. The following exhibits are provided pursuant to 807 KAR 5:001 (11)(2):

a. There are no trust deeds. All notes, indebtedness and mortgages are included in Exhibit F, which is dated February, 28, 2015. There have been no changes in the exhibit. A deviation to comply with 807 KAR 5:001(12), if necessary, is requested.

b. Property is to be constructed is described in Exhibit A.

27. The following information is provided pursuant to 807 KAR 5:001(6):

a. No stock is authorized.

b. No stock is issued.

c. There are no stock preferences.

d. Mortgages are listed in Exhibit F.

e. Bonds are listed in Exhibit F.

f. Notes are listed in Exhibit F.

g. Other indebtedness is listed in Exhibit F.

h. No dividends have been paid.

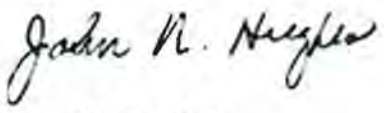
i. Current balance sheet, income statement and debt schedule are attached as Exhibits E and F.

28. USoA plant accounts are included in Exhibit D.

29. Depreciation cost, cost of operation after installation and debt service are in Exhibit D.

For these reasons, the District requests issuance of an order granting authority to construct and finance the facilities and for any other authorization that may be necessary.

SUBMITTED BY:



John N. Hughes
124 W. Todd St.
Frankfort, KY 40601

Attorney for Northern
Kentucky Water District
jnhughes@fewpb.net
502 227 7270 Ph.

LIST OF EXHIBITS

Section 8(1)	Full name and post office address of applicant and a reference to the particular provision of law requiring Commission approval.	Application
Section 8(2)	The original and 10 copies of the application with an	yes

	additional copy for any party named therein as an interested party.	
Section 8(3)	If applicant is a corporation, a certified copy of the Articles of Incorporation and all amendments thereto or if the articles were filed with the PSC in a prior proceeding, a reference to the style and case number of the prior proceeding.	n/a
Section 9(2)	1. The facts relied upon to show that the proposed new construction is or will be required by public convenience or necessity.	Exhibit A
	2. Copies of franchises or permits, if any, from the proper public authority for the proposed new construction or extension, if not previously filed with the commission.	Exhibit B
	3. A full description of the proposed location, route, or routes of the new construction or extension, including a description of the manner in which same will be constructed, and also the names of all public utilities, corporations, or persons with whom the proposed new construction or extension is likely to compete.	Exhibit A
	4. Three (3) maps to suitable scale (preferably not more than two (2) miles per inch) showing the location or route of the proposed new construction or extension, as well as the location to scale of any like facilities owned by others located anywhere within the map area with adequate identification as to the ownership of such other facilities.	Exhibit A
	5. The manner, in detail, in which it is proposed to finance the new construction or extension.	Exhibits A, D
	6. An estimated cost of operation after the proposed facilities are completed.	Exhibit D
KRS 322.340	Engineering plans, specifications, plats and report for the proposed construction. The engineering documents prepared by a registered engineer,	Exhibit A

	requires that they be signed, sealed, and dated by an engineer registered in Kentucky.	

Section 8(1)	Full name and post office address of applicant and a reference to the particular provision of law requiring Commission approval.	Application
Section 8(2)	The original and 10 copies of the application with an additional copy for any party named therein as an interested party.	yes
Section 8(3)	If applicant is a corporation, a certified copy of the Articles of Incorporation and all amendments thereto or if the articles were filed with the PSC in a prior proceeding, a reference to the style and case number of the prior proceeding.	n/a
KRS 278.300(2)	Every financing application shall be made under oath, and shall be signed and filed on behalf of the utility by its president, or by a vice president, auditor, comptroller or other executive officer having knowledge of the matters set forth and duly designated by the utility.	Application
807 KAR 5:001:		
Section 11(1)(a)	Description of applicant's property.	
	Statement of original cost of applicant's property and the cost to the applicant, if different.	Annual Rpt
Section 11(1)(b)	If stock is to be issued: and kinds to be issued.	none
	--Description of amount and kinds to be issued.	
	--If preferred stock, a description of the preferences.	none
	If Bonds or Notes or Other Indebtedness is proposed:	Exhibit F
	--Description of the amount(s)	
	--Full description of all terms	
	--Interest rates(s)	
	--Whether the debt is to be secured and if so a description of how it's secured.	

Section 11(1)(c)	Statement of how proceeds are to be used. Should show amounts for each type of use (i.e., property, debt refunding, etc.)	Exhibit A
807 KAR 5:001:		
Section 11(1)(d)	If proceeds are for property acquisition, give a full description thereof. Supply any contracts.	n/a
Section 11(1)(e)	If proceeds are to refund outstanding obligations, give:	n/a
	--Par value	
	--Amount for which actually sold	
	--Expenses and application of proceeds	
	--Date of obligations	
	--Total amount	
	--Time held	
	--Interest rate	
	--Payee	
Section 11(2)(a)	Financial Exhibit (see below)	
Section 11(2)(b)	Copies of all trust deeds or mortgages. If previously filed, state case number.	Annual Rpt
Section 11(2)(c)	If Property to be acquired:	Exhibit A
	--Maps and plans of property.	
Section 11(2)(c)	--Detailed estimates by USOA account number.	Exhibit D

ALL INFORMATION BELOW IN SECTIONS 6(1) THROUGH 6(9) SHOULD COVER THE PERIOD ENDING NOT MORE THAN 90 DAYS PRIOR TO DATE ON WHICH APPLICATION WAS FILED:

807 KAR 5:001		
Section 6(1)	Amount and types of stock authorized.	None
Section 6(2)	Amount and types of stock issued and outstanding.	None
Section 6(3)	Detail of preference terms of preferred stock.	None
Section 6(4)	Mortgages:	Exhibit E

	--Date of Execution	
	--Name of Mortgagor	
	--Name of Mortgagee or Trustee	
	--Amount of Indebtedness Secured	
	--Sinking Fund Provisions	
Section 6(5)	Bonds	Exhibit E
	--Amount Authorized	
	--Amount Issued	
	--Name of Utility Who Issued	
	--Description of Each Class Issued	
	--Date of Issue	
	--Date of Maturity	
	--How Secured	
	--Interest Paid in Last Fiscal Year	
Section 6(6)	Notes Outstanding:	Exhibit E
	--Date of Issue	
	--Amount	
	--Maturity Date	
	--Rate of Interest	
	--In Whose Favor	
	--Interest Paid in Last Fiscal Year	
Section 6(7)	Other Indebtedness:	
	--Description of Each Class	
	--How Secured	

	--Description of Any Assumption of Indebtedness by Outside Party (i.e., any transfer)	
	--Interest Paid in Last Fiscal Yr.	none
Section 6(8)	Rate and amount of dividends paid during the five (5) previous fiscal years and the amount of capital stock on which dividends were paid each year.	None
Section 6(9)	Detailed income statement and balance sheet.	Exhibits F

NORTHERN KENTUCKY WATER DISTRICT

Project
Dudley Complex Sodium Hypochlorite Building

Kenton County
184-0485

NORTHERN KENTUCKY WATER DISTRICT
Dudley Complex Sodium Hypochlorite Building
184-485

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Dudley Complex Sodium Hypochlorite Building

Project 184-485

ProjectDescription:

The project at the Dudley Complex, which consists of two five million gallon storage tanks and two pumping stations, involves demolition of the existing chemical feed building and construction of a new building for housing the chemical storage and feed equipment for sodium hypochlorite. This equipment is needed to boost chlorine in the distribution system.

The recommended award amount for construction is $875,861.

The bids were opened April 30, 2015 and are subject to acceptance for 90 days. Therefore, the bids will expire July 29, 2015.

The estimated cost of the total project with engineering, construction, and contingencies is $1,060,000.

Case No. 2015-00169
Exhibit ____A____

NORTHERN KENTUCKY WATER DISTRICT

Project
Dudley Complex Sodium Hypochlorite Building

Kenton County
184-0485

ENGINEERING REPORTS AND INFORMATION

Project Map

Basis of Design Report

Engineer's Opinion of Probable Total Construction Cost

Plans prepared by GRW titled "Dudley Complex Sodium Hypochlorite Building" dated May 2015

Specifications prepared by GRW titled "Dudley Complex Sodium Hypochlorite Building" dated May 2015

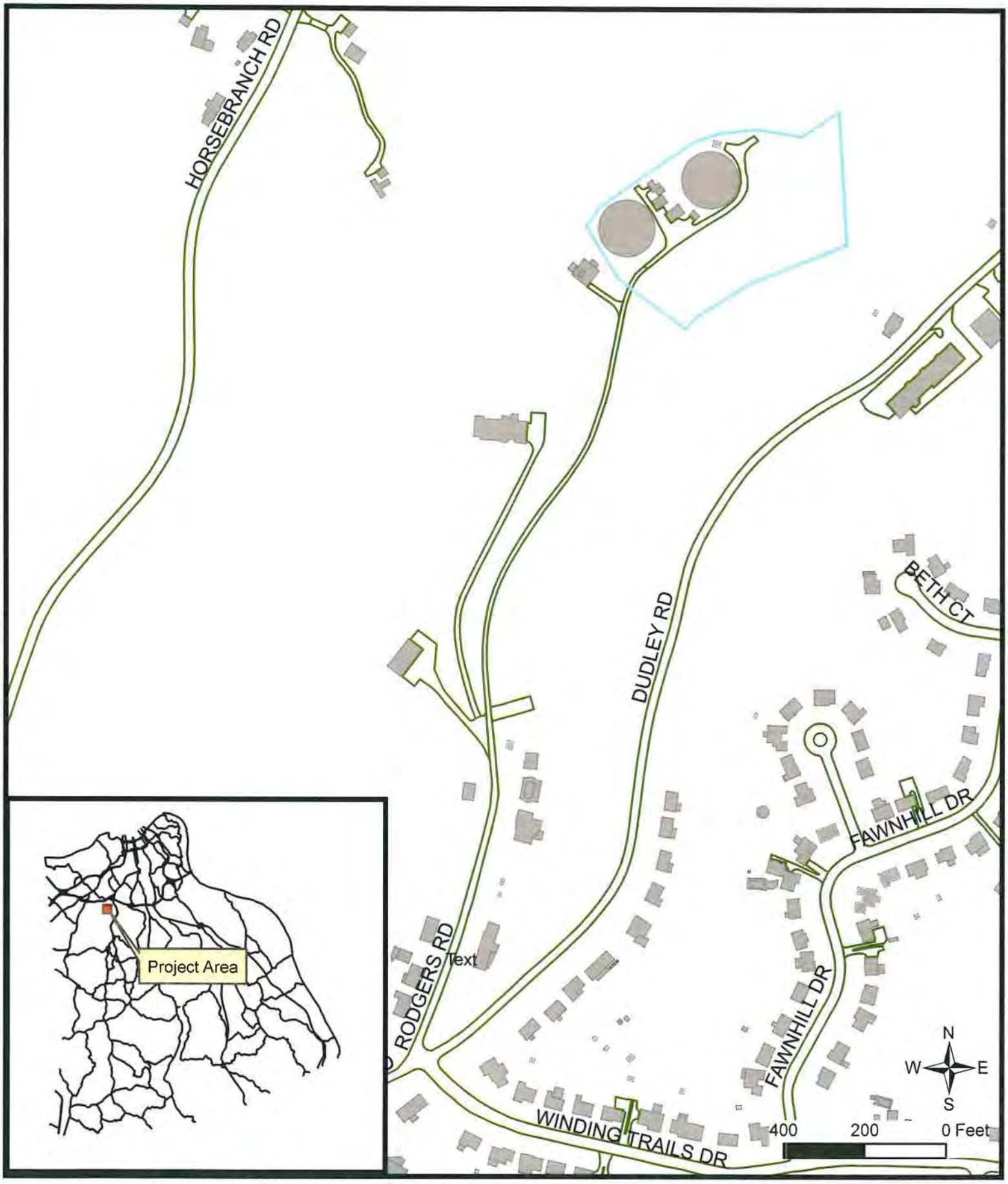
Case No. 2015-00169
Exhibit ____A____

NORTHERN KENTUCKY WATER DISTRICT

Project
Dudley Complex Sodium Hypochlorite Building

Kenton County
184-0485

Project Map



Dudley Complex Sodium Hypochlorite Building

Case No. 2015-00169
Exhibit ___A_____

NORTHERN KENTUCKY WATER DISTRICT

Project
Dudley Complex Sodium Hypochlorite Building

Kenton County
184-0485

Basis of Design Report

Preliminary Engineering Report

Dudley Complex Sodium Hypochlorite Building

Northern Kentucky Water District
Erlanger, KY

December 16, 2014

STATE OF KENTUCKY
ALAN A. BRYAN
20884
LICENSED PROFESSIONAL ENGINEER

5-26-15

GRW | engineering | architecture | geospatial

GRW | 801 Corporate Drive | Lexington, KY 40503 | 859.223.3999

NORTHERN KENTUCKY WATER DISTRICT
DUDLY COMPLEX
SODIUM HYPOCHLORITE BUILDING

PRELIMINARY ENGINEERING REPORT
December 16, 2014

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LIST OF FIGURES

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LIST OF ATTACHMENTS

NORTHERN KENTUCKY WATER DISTRICT
DUDLY COMPLEX
SODIUM HYPOCHLORITE BUILDING

PRELIMINARY ENGINEERING REPORT
December 16, 2014

1.0 BACKGROUND

The Northern Kentucky Water District (NKWD) has identified a need to replace the sodium hypochlorite storage and feed buildings at the Dudley Tank and Pumping Station Facilities. The existing chemical feed facilities had been previously converted from a gaseous chlorine feed system to a liquid sodium hypochlorite. The existing facilities have been identified as not having adequate spill containment and a history of solution line breakage. The existing bulk storage building for housing of the sodium hypochlorite is located on the north end of the property. The day tank and feed pump building is located between the two five million gallon water storage tanks and next to the "1040" and "1080" booster pumping stations. This building houses the day tanks and chemical metering feed pumps. This project includes construction of a new building for liquid sodium hypochlorite storage, spill containment and pumping capabilities for subsequent delivery into the distribution system.

2.0 DESIGN CONCEPT

Based on the desired features and requests outlined in the Request for Proposals and discussed during on-site meetings between NKWD and GRW, the new Sodium Hypochlorite Building will be constructed to house all of the storage and feed equipment associated with the liquid sodium hypochlorite. At the on-site kick off meeting, it was decided that the sodium hypochlorite will be pumped into the suction sides of the "1040" and "1080" pump stations. It was also decided to utilize one (1) bulk storage tank and two (2) day tanks, one for each pump station. The building site location was selected within the fencing area of the east side of the property just north of the electrical service entrance and adjacent to the access road which allows for convenient chemical deliveries. Refer to **Figure A** for the proposed site plan layout.

One issue with feeding 12.5% sodium hypochlorite is off gassing. When sodium hypochlorite sits in piping, pumps and valves, gas bubbles will form and can cause air (gas) binding. To prevent this when feeding sodium hypochlorite, a preferred method is to utilize a positive displacement pump, typically a peristaltic pump. A limitation of peristaltic feed pumps is that they have a low discharge pressure limit, due to the flexible tubing used in the pump. This low discharge limit was a deciding factor in selecting the suction side of the pump stations as the application point for the sodium hypochlorite. It was decided that the low maintenance and reliability of operation of the peristaltic pump led to their selection in lieu of a diaphragm type pump. More detail will be given as to the recommended major equipment items listed hereinafter.

3.0 PROJECT DESIGN DATA

A. Flow and Storage Data

Pump Station Capacities

1040 Pump Building	4 pump each rated for 2,225 gpm @ 375'
1080 Pump Building	4 pump each rated for 6,000 gpm @ 282'

Chemical Characteristics and Feed Rate

Chemical:	Sodium Hypochlorite 12.5%
Purpose:	Disinfectant
Unit Weight: (varies)	10.00 lb/gal
Specific Gravity:	1.08 to 1.27 (1.20 avg.)
Available Cl_2:	1.13 to 1.32 lb per gallon

B. Chemical Feed Equipment

Chemical Storage Tanks

1) Bulk Storage Tanks

Type:	High-Density Cross-linked Polyethylene (HDXLPE)
Manufacturer:	Poly Processing Company
Size:	7'-1" diameter by 12'-0" tall
Quantity:	one (1)
Volume:	3,000 gal

Bulk Storage Tank Openings:

Manway:	24" bolted with Viton gasket
Outlet:	3" Integrally Molded Flanged Outlet (IMFO)
Fill:	(top) 2" Flange Fitting
Vent:	(top) 8" Flange Fitting
pH Probe:	(top) 2" Flange Fitting
Continuous Radar Level Sensor:	(top) 4" Flange Fitting
High Alarm Level Switch:	(top) 2" Flange Fitting
Visual Sight Gauge:	(top) 2" Reverse Level Float Gauge
Overflow:	(Sidewall) 4" Bolted Flange Bulkhead Fitting

All bolts and fasteners shall be constructed of Titanium.
Gaskets shall be constructed of Viton.

2) Day Storage Tanks

Type:	High-Density Cross-linked Polyethylene (HDXLPE)
Manufacturer:	Poly Processing Company
Size:	2'-7" diameter by 6'-4" tall
Quantity:	two (2)
Volume:	200 gal (each)

Day Storage Tank Openings:

Manway:	7" threaded and gasketed
Outlet:	2" Integrally Molded Flanged Outlet (IMFO)
Fill:	2" Line Connected to Side of Vent Riser
Vent:	3" Universal Flange Fitting – Self Aligning
Continuous Radar Level Sensor:	(top) 4" Made-Vertical Flange Fitting
High Alarm Level Sensor:	(top) 2" Flange Fitting
Overflow:	2" Sidewall Bolted Flange Bulkhead Fitting

All bolts and fasteners shall be constructed of Titanium.
Gaskets shall be constructed of Viton.

Chemical Pumps

1) Transfer Pumps

Type:	Centrifugal End Suction (seal-less orbital magnetic drive type)
Manufacturer:	Finish Thompson
Model:	DB6
Quantity:	two (2)
Impeller Dia.:	3.0 in
Suction Size:	1 in FNPT
Discharge Size:	1 in MNPT
Design Flow:	32 gpm
Design Head:	16 ft
Efficiency:	35%
Shut-off Head:	32.5 ft
Motor Speed	3,450 RPM
Motor Horsepower:	1/3 HP
Motor Voltage:	120/240 volt
Motor Hertz:	60 Hz
Motor Phase:	3 phase
Pump Head/Impeller Construction:	PVDF (Kynar) with Titanium bolts, Viton seals and Teflon Impeller Bushing

2) Metering Pumps

Type:	Peristaltic (Positive Displacement)
Manufacturer:	Watson-Marlow
Model:	520DuN/R2 (w/pump head leak detection)
Quantity:	four (4)
Impeller Dia.:	3.687 in
Suction Size:	3/8 in
Discharge Size:	3/8 in
Flow Range:	0.02-52.3 gal/hr
Max Pressure:	30 psi
Efficiency:	100%
Motor Voltage:	115 volt
Motor Hertz:	60 Hz
Pump Case Rating:	NEMA 2 (wash down)
Pump Interface:	4-20 mA / RS-485
Pump Tubing Construction:	Marprene

C. Electrical Equipment

Power Distribution Equipment

1) Existing Motor Control Center (Dudley 1080 Pump Station)

Manufacturer:	Westinghouse
Series:	2100
Serial Number:	CN80866 IT.2 –FVC
Rating:	600 Amperes
Enclosure:	NEMA 1
Voltage:	480/277V, 3-Phase, 4-Wire
Ground Fault Protection:	None
Quantity:	3 Sections – 14 Tubs
Comment:	Existing 66" Bussed Space

2) 480V Branch Panel

Manufacturer:	Square D; or approved equal
Model:	SQ D NF, Class 1670
Rating:	250 Amperes / 150 Ampere MCB
Enclosure:	NEMA 4X
Voltage:	480/277V, 3-Phase, 4-Wire
Ground Fault Protection:	None
Quantity:	One (1) Panel w/42 Bussed Spaces

Comment: Will contain branch circuit breakers for instantaneous water heater, transfer pumps, air conditioner, and the dry-type transformer.

3) Dry-Type Transformer

Manufacturer:	Square D; or approved equal
Model:	SQ D General Purpose, Class 7400 Energy Efficient
Rating:	15 KVA
Enclosure:	Enclosed, Non-Ventilated, Steel
Voltage:	480-Volt, 3-Phase, 3-Wire, Delta Primary; 120/240-Volt, 3-Phase, 4-Wire, Wye Secondary
Quantity:	One (1)

Comment: Used to derive power for 120/208V small power circuits.

4) 120/240V Branch Panel

Manufacturer:	Square D; or approved equal
Model:	SQ D Model NQOD, Class 1640
Rating:	100 Amperes, with 80A Main Circuit Breaker
Enclosure:	NEMA 4X
Voltage:	120/240-Volt, 1-Phase, 3-Wire
Quantity:	One (1) Panel w/30 Bussed Spaces

Comment: Will contain branch circuit breakers for building lighting (interior and exterior), instrumentation (level sensors), general purpose receptacles, and chemical feed pumps.

Motor Starters

1) Transfer Pumps

Manufacturer:	Square D; or approved equal
Type:	NEMA Full Voltage Non-Reversing, Combination Breaker, Magnetic Starter w/melting alloy overload relays.
Model:	SQ D Class 8539
Rating:	NEMA Size 1
Enclosure:	NEMA 4X
Voltage:	480-Volt, 3-Phase, 3-Wire
Quantity:	Two (2)

Comment: Accessories will include fused 24V control power transformer, Hand-Off-Auto selector switch, green ON pilot, red OFF pilot, auxiliary contacts, and phase failure motor protection relay. Contact outputs will be provided from each motor starter to the existing Dudley 1040 Pump Station RTU Cabinet for monitoring/control of each transfer pump.

Lighting Fixtures

1) Interior Lighting Fixtures

Manufacturer: Lithonia; or approved equal
Type: Low-Profile Enclosed and Gasketed Industrial LED.
Model: Lithonia Model FEM LED
Lamps: LED, 4100K
Driver: Electronic, Dimming Driver, 0-10V
Enclosure: Fiberglass with 100% impact modified frosted acrylic lens with lineal ribs.
Voltage: 120Volt
Quantity: TBD
Comment: Surface mounted to structure. Fixtures will be switched On-Off with standard lighting toggle switch.

2) Exterior Lighting Fixtures

Manufacturer: Lithonia; or approved equal
Type: Architectural Wall Sconce LED.
Model: Lithonia Model WST LED
Lamps: LED, 4000K
Driver: Electronic Driver
Enclosure: Single-Piece, Die-Cast Aluminum Housing (IP65)
Voltage: 120Volt
Quantity: TBD
Comment: Wall mounted on each exterior wall of building. Fixtures will be controlled via wall mounted photocell. A bypass toggle switch will be provided to override the photocell control.

3) Lighting Fixtures (Emergency Lighting)

Manufacturer: Lithonia; or approved equal
Type: Industrial Emergency Lighting fixture w/lamps
Model: Lithonia Model INDX
Lamps: (2) 12W/12V Halogen
Battery: Sealed, maintenance free, lead-calcium battery w/36W capacity
Enclosure: Injection-molded thermoplastic
Voltage: 120 Volt w/12V output
Quantity: per Drawings
Comment: Emergency Lighting – wall mounted within building with remote heads at exterior door.

Existing Programmable Controller (Dudley 1040 Pump Station SCADA RTU)

1) Programmable Controller

Manufacturer:	Rockwell Allen Bradley
Model:	1756 ControLogix Controller (1756-L55M13)
Enclosure:	NEMA 4X
Voltage:	24Volt
Quantity:	One (1)

Comment: There are numerous spare digital and analog inputs/outputs available and wired to terminal blocks. Existing spare inputs and outputs will be utilized for this project. A new analog input module (1756-IF8), analog output module (1756-OF8), and digital input modules (1756-IB16) will be provided as required for new I/O points.

Instruments

1) Non-Contact Radar Level Sensor

Manufacturer:	Ohmart Vega; or approved equal
Model:	PS66 Series
Voltage:	24Vdc
Quantity:	Three (3)

Comment: For Bulk Storage Tank and Day Tanks

2) Vibration Level Switches

Manufacturer:	Endress+Hauser; or approved equal
Model:	Liquiphant FTL51
Voltage:	24Vdc
Quantity:	Three (3)
Comment:	for Bulk Storage Tank and Day Tanks

3) Flow Sensor (Thermal Dispersion)

Manufacturer:	Endress+Hauser; or approved equal
Model:	Liquiphant M FTL50/51
Type:	Thermal Dispersion
Voltage:	24Vdc
Quantity:	Four (4)

Comment: One flow sensor shall be installed at each chemical metering line and one flow sensor shall be installed at each transfer pump discharge.

4) pH Probe

Manufacturer:	Hach
Voltage:	24Vdc
Quantity:	One (1)

Comment: Monitor pH at Bulk Storage Tank

5) Sump High Level Switch (Vibration)

Manufacturer:	Endress+Hauser; or approved equal
Model:	Liquiphant FTL51
Voltage:	24Vdc
Quantity:	One (1)

Comment: Monitor high level at chemical feed area sump

6) Pressure Gauges

Manufacturer:	Ashcroft; or approved equal
Model:	1279 Duragauge
Quantity:	Two (2)

Comment: Monitor pressure at each chemical metering line (discharge of each chemical feed pump). Diaphragm seal – 316 SS upper housing, PVC lower housing, Kalrez elastomer.

D. Mechanical/Plumbing Equipment

Plumbing

1) Emergency Shower/Eyewash

Manufacturer:	Bradley
Model:	S19-310PVC
Quantity:	one (1)

Comment: Combination Drench Shower and Eye/Fact Wash Unit. Shower has Stainless Steel Ball Valve with stainless steel pull rod with triangular handle. Eyewash Bowl: 10-inch yellow impact resistant plastic, twin perforated disc eye/face wash heads with protective pop-off sprayhead covers. Eyewash valve is stainless steel stay-open valve, hand operated with high visibility PVC push handle. Pipe and Fittings: 2-inch schedule 80 PVC piping with 2-inch socket welded supply joint and a 6-inch diameter base floor flange. Emergency Shower and Eyewash station will be provided with an alarm package, including a flow switch. The flow switch will be interfaced with the existing SCADA RTU to monitor emergency shower and eyewash station operation.

2) Safety Shower Heater

Manufacturer:	Keltech
Model:	SNA
Quantity:	one (1)

Comment: 72kW, alarm light with distributed control system link, internal fused disconnect, ground fault protection, ASME heat exchanger, and NEMA-4X enclosure (stainless steel), ASME pressure/temperature relief valve, and stainless steel y-strainer.

3) Wall Hydrant

Manufacturer: Zurn
Model: Z1300
Quantity: one (1)
Comment: Complete with non-freeze type integral backflow preventer, bronze casing, all bronze interior parts, non-turning operating rod with free-floating compression closure valve, replaceable bronze seat and seat washer, and combination ¾-inch straight IP inlet. Nickel bronze box and hinged cover with operating key lock and "WATER" cast on cover.

HVAC

1) Wall-mount Heat Pump

Manufacturer: Bard
Model: T24H
Quantity: one (1)
Comment: Self-contained, vertical, exterior wall mount, through-wall air conditioner. Unit is factory assembled, pre-charged, pre-wired, tested and ready to operate. Unit performance is certified in accordance with the Air Conditioning and Refrigeration Institute Standard 390-2003 for Single Package Vertical Units. All airsteam surfaces will be provided with protective coating for the expected sodium hypochlorite environment.

4.0 NARRATIVE OF FACILITY OPERATION

A. Description of Chemical Feed Facility

This chemical storage and feed facility is being designed to provide sodium hypochlorite (NaOCl) as a disinfectant to boost chlorine residual in the distribution being fed from the Dudley Pumping Stations and Storage Tanks. The chemical feed facility is being designed to provide redundancy in the equipment installed and to provide Operator flexibility in selection of the equipment used in the feed process. Refer to **Figure B** for details of the chemical building plan and section layouts.

Storage of Sodium Hypochlorite

The storage of sodium hypochlorite is regulated by the International Building Code (IBC) as a class 'H' occupancy designation, which sets requirements for construction of a structure that stores chemicals that are considered to be a hazardous environment. The Material Safety Data Sheet (MSDS) indicates that the threshold to consider sodium hypochlorite as an oxidizer is in a concentration of 12.0% or greater. In this project, the sodium hypochlorite being purchased is at 12.5% and is therefore defined as an oxidizer. Due to the low percentage of

the concentration at 12.5%, this application considers the sodium hypochlorite to be a Class 1 oxidizer. Also at this low concentration the IBC does not consider this chemical to be "corrosive". The IBC indicates that the maximum allowable quantity (MAC) for storage of a Class 1 oxidizer and to not require a sprinkler system is 4,000 gallons. As part of this design, NKWD does not plan on storing more than 3,500 gallons in this building (bulk tanks plus day tanks and associated piping). Therefore, the design of a fire protection sprinkler system will not be required for this project.

Building Features

The proposed Sodium Hypochlorite Building project consists of the construction of a new one-story concrete masonry unit (cmu) facility with brick veneer and a split-faced cmu block wainscot. The design intent is that the new exterior brick veneer will match the adjacent existing structures. The building is designed to be constructed without windows. However, to allow for some natural light, a few glass blocks in the brick pattern are proposed in a soldier coursing around the building.

The floor plan footprint consists of approximately 550 SF with a roof plan footprint of approximately 750 SF which includes the vented soffit overhangs. The 1'-2"(thk) perimeter cavity walls consist of a 4"(thk) running-bond brick veneer, 1 ½"(thk) rigid insulation, vapor barrier, 5/8"(thk) exterior grade plywood sheathing, and 8"(thk) cmu w/ masonry anchors spaced vertically @ 16" O.C.. All insulation seams and penetrations will be taped to provide a continuous water barrier. Within the perimeter walls there is a rollup type 12'-0"(W) x 10'-0"(H) insulated manual overhead door, to allow for the bulk tank to be removed, facing plan west. Outside of the overhead door is a 55 SF concrete apron with (2) 6" diameter bollards protecting each door jamb. There is a 3'-0"(W) x 7'-0(H) FRP man door located along the plan north wall. This door will be equipped with stainless steel hardware, an alarm, and keypad security access. Entrance into the building through either the man door or overhead door is at EL. 828.50'. The adjacent equipment area currently steps down to EL. 825.50' and is accessed by a set of FRP stairs consisting of five (5) grated treads. The two areas are separated by a continuous 1-1/2" diameter FRP double tube handrail with 4"(H) FRP continuous kick plate and vertical FRP posts located at 5'-0" O.C. anchored to the face of the concrete foundation wall. Located at the lower level, adjacent to the FRP handrail, is a combination emergency eye wash / shower station. Running parallel to the FRP handrails, beneath the emergency eye wash / shower station, is a 2'-0"(W) x 2'-0"(D) trench w/ FRP grating extending the full width of the building. The trench is sized to hold the emergency eye wash / shower station water expelled over a 15 minute period.

The proposed building will have a 'hipped' roof with standing seam metal decking with an area of 750 SF consisting of 2x10 wood rafters spaced at 16" O.C.. To accommodate NKWD's request to provide 5 to 6 feet of headroom for service access on top of the bulk and day tanks, the spill containment area with the storage tanks will be recessed below the entry level finished floor and the roofing structure is recommended to be constructed with rafters and a vaulted ceiling. Due to the hip configuration and overall size of the building, the roof rigid length is limited. To meet the roof ventilation code requirements, supplemental wood

joists were added to create an open space for air to flow freely from the soffits located at the lower 1/2 of the roof through exhaust vents located at the upper 1/2 of the roof. Continuous R-30 unfaced batt insulation is located between the wood rafters and joists as shown in the proposed section. The roof exterior consists of 16"(W) x 2"(H) machined-seamed prefinished standing seam metal roof panels over 5/8"(thk) exterior grade plywood sheathing with a continuous weather barrier. A continuous self-adhered ice dam membrane will be installed along the perimeter of the roof. The perimeter of the roof rafters will be finished with an exterior grade 2x wood end rafter and 1x exterior grade wood fascia wrapped in prefinished metal.

The building construction shall comply with the current requirements of the current International Building Code (IBC) and Kentucky Building Code (KBC).

Bulk Storage Tanks

The bulk storage of the sodium hypochlorite will be contained in a single 3,000 gallon HDXLPE tank. The tank will be designed with no wetted penetrations and equipped with a single, integrally molded, flanged outlet at the base which will serve as the transfer pump suction and tank drain. A manual vented ball valve will be immediately attached to this flanged outlet to allow for maintenance and repairs.

All other penetrations will be through the top of the tank with the exception of the overflow connection. The overflow connection (with duckbill check valve) will be in the sidewall at the top of the tank, above the normal maximum liquid level. The top penetrations will consist of the fill line, vent, manway, pH probe, continuous radar level sensor, high alarm level indicator, and reverse float visual sight gauge. The radar level sensor will provide continuous level monitoring with information being sent to the NKWD's SCADA system. The high level alarm indicator will be a vibrating fork level switch, which will send an alarm signal to the remote fill station and to the SCADA system. A bulk tank level status control panel will be located on the exterior wall next to the overhead door. It will annunciate imminent overflow of the bulk tank and will include a local digital indicator which will display the bulk storage tank level in feet. A pH probe will be installed in the bulk tank to monitor the strength of the sodium hypochlorite and be connected to the SCADA system.

The bulk tank chemical fill connection will have a 2" cam-lock connection for the delivery truck and will be located inside the structure next to the man door and handrail. The bulk tank vent system has been designed to accommodate pneumatically filling from chemical tanker trucks, typically at 30 psi. After dispensing the chemical into the bulk tank, the tanker truck typically air purges the fill line clear it out.

Dedicated Chemical Feed Trains

The Dudley Pumping Stations and Storage Tanks Complex has two independently operating booster pump stations. These two booster pump stations pump to two distinctly different pressure zones in the distribution system. The booster pump stations are named after the

hydraulic grade of the pressure zone of which they pump into. One is named the "1040" Pump Station and the other is named the "1080" Pump Station. Since these pump stations are independent, they will run at different times and each will require a dedicated chemical feed train. In the description hereinafter the independent chemical feed trains will be referred to as the "1040" chemical feed and the "1080" chemical feed.

Chemical Transfer Pumps

Chemical transfer pumps are being installed to pump the sodium hypochlorite from the bulk storage tank to the day storage tanks in a controlled fashion. The transfer pump discharge lines are designed to prevent siphonage and gravity flow from occurring between the bulk tank and day tanks. The discharge line of the transfer pump extends above the maximum liquid level in the bulk tank and discharges into a larger line entering the day tank that is connected to the day tank vent. At the request of the NKWD, the transfer pumps are being automatically controlled by the level controls in the day tanks. This procedure allows the day tanks to be automatically refilled without having an operator visit the facility on a daily basis.

There will be two (2) transfer pumps installed. One of the pumps will be dedicated to the "1040" chemical feed and the other to the "1080" chemical feed. In the situation where one of the pumps is taken out of service for repairs, the day tanks will be valved in such a way that they can float together and be fed by one (1) transfer pump. Signals will be sent from the Transfer Pump Control Panel to the Dudley 1040 PVC to monitor run status, motor overload, and transfer pumps locked out. Piping between the bulk storage tank and the day storage tanks will be Schedule 80 PVC with solvent weld joints.

A flow switch will be provided on the discharge of each transfer pump for monitoring a no flow condition. The flow switch will be interfaced with the existing Dudley 1040 PLC and monitored via the SCADA System.

Day Storage Tanks

The day storage tanks are designed to function as two (2) independent tanks, one will be dedicated to the "1040" chemical feed and the other to the "1080" chemical feed. Each day storage tank has a capacity of 200 gallons and constructed of HDXLPE. Just like the bulk storage tank, the day tanks will be designed with no wetted penetrations and equipped with a single, integrally molded, flanged outlet at the base which will serve as the metering pump suction and tank drain. A manual vented ball valve will be directly attached to this flanged outlet to allow for maintenance and repairs. Also, the two day tanks will be interconnected by plumbing and valves at these flanged outlets. The interconnecting valve between the day tanks will normally be closed, to maintain separate chemical feed trains, and only be opened when a transfer pump is taken out of service. Opening the interconnecting valve will allow the day tanks to float together during the maintenance and service of a transfer pump.

All other penetrations will be through the top of the tank with the exception of the overflow connection. The overflow connection (with duckbill check valve) will be in the sidewall at the

top of the tank, above the normal maximum liquid level. The top penetrations will consist of the fill line, vent, manway, continuous radar level sensor, and high alarm level indicator. The non-contact radar level sensor will provide continuous level monitoring with information being sent to the NKWD's SCADA system. This will also provide start and stop signals for the transfer pump to automatically fill the day tanks. The high level alarm indicator will be a vibrating fork level switch, which will send an alarm signal to the SCADA system and warn the Operator that tank overflow in imminent. The discharge from the day tanks will be a header that the metering pump will connect to and valved so the day tanks can be isolated. Piping from the day storage tank up to the metering pump discharge header will be Schedule 80 PVC with solvent weld joints.

Chemical Metering Pumps

Chemical metering pumps will be of the positive displacement peristaltic type design and are being provided to deliver the sodium hypochlorite to the point of application in the suction side of the booster pumping stations. There will be four (4) peristaltic metering pumps being installed. Two (2) of the pumps (a pair) are dedicated to the "1040" chemical feed and the other pair of pumps dedicated to the "1080" chemical feed. The pair of metering pumps on each chemical feed is designed for redundancy. Of each pair of metering pumps, one is the primary and the other is a back-up. All four (4) metering pumps will be installed and connected to the SCADA system and ready to run. To switch from a primary pump to a back-up pump the Operator will have to manually switch some isolation valves and then call in to activate the back-up pump through the SCADA system. Each individual metering pump has been designed to provide the full range of flow required. The metering pumps will draw from a 1-1/2" suction header interconnected between the two (2) day tanks. The pump feed tubing will connect to the suction header with flexible tubing. The pump head flexible tubing will be constructed of Marprene for chemical resistance. The discharge side of the metering pump will have a pressure relief valve installed with the discharge plumbed back to the suction header. On the discharge side of each pump train will be a pressure gauge and a flow indicating sensor. The metering pumps will be interfaced with the Dudley 1040 PLC via analog and digital signals from the scada module furnished with each metering pump. Metering pumps can be controlled remotely thru the plant SCADA or locally on the machine's front panel user interface. The peristaltic metering pumps have a leak detection sensor located in the pump head. The flow indicating sensor will also be connected to the plant SCADA through a PLC.

Each pair of metering pumps will have isolation valves and be connected to a dedicated discharge line for each chemical feed train to the point of application. The discharge lines will be constructed of clear nylon reinforced PVC flexible tubing. A 3/8" I.D. flexible tubing feed line and pull wire will be installed inside a 2-inch conduit. The 2-inch conduit will be installed below grade and used to chase the flexible tubing to the point of application for each chemical feed train. The flexible tubing will then connect to an injection quill tapped into the suction main for each booster pump station. The injection quill will be constructed of PVC and be provided with an integral check valve.

Spill Containment Area

The spill containment area will be recessed to 3'-0" below the entry level finished floor elevation. All chemical storage tanks and chemical pump will be housed in the spill containment area. Also in the spill containment area will be the tankless water heater and the emergency shower and eyewash. A sump receiving trough will be cast into the floor in the spill containment area near the access stairs for the Owner to lower a portable pump. This sump will have a vibrating fork level switch installed at 12 inches off the bottom to detect fluid in the sump trough. Access steps, grating, and handrails will be provided to gain access to the spill containment area and be constructed of FRP.

B. Description of Electrical Work

Electrical Power Distribution

Electrical power for the new Chemical Feed Facility can be supplied from the existing Westinghouse Series 2100 motor control center located in Dudley 1080 Pump Station. There is an available 48" bussed space that may be utilized for a new branch circuit feeder to the new Chemical Feed Facility. A new 150A circuit breaker tub will be installed in section 3 of the existing motor control center. There is an existing 50A circuit breaker, located in section 1 – tub 6, which feed the existing chemical feed building. This feeder will be disconnected and removed prior to demolition of the existing chemical feed building. The existing 50A circuit breaker for the chemical feed building will be provided with a new nameplate stating "spare." Load calculations will be provided to verify adequacy of existing system to accept the new load.

A new 150 Ampere, 480-Volt, 3-phase, 4-wire circuit will be connected to a new 150A/3P circuit breaker located in the existing motor control center and then extended to the new Chemical Building where a new 150A, Service Entrance Labeled Main Circuit Breaker, 480V, 3-phase, 4-wire branch circuit panelboard (HP). From this panelboard, a new 15 KVA dry-type transformer panelboard will be installed. The dry-type transformer will convert 480V, 3-phase power to 120/240V, 1-phase, 3-wire power which will serve a new 80A main circuit breaker, 120/240V, 1-phase, 3-wire branch circuit panelboard (LP). Panelboards HP and LP shall be located within the new Chemical Feed Building and serve the instantaneous water heater, transfer pumps, chemical feed pumps, lighting, instrumentation, and general purpose receptacles.

General Wiring Methods and Materials

Galvanized rigid steel conduit with threaded fittings, cast metal conduit bodies, and steel boxes and enclosures will be used for electrical power and control wiring installations within the Dudley 1040 and Dudley 1080 Pump Stations.

Schedule 80 PVC conduit and PVC fittings, conduit bodies and enclosures will be used for power and control wiring installations within the new Chemical Feed Facility. PVC coated "seal-tight" flexible metal conduit and fittings will be used for final connections to all items of equipment and motors where flexible final connections are required.

Underground conduit routed between the Dudley 1040, Dudley 1080 Pump Station and the new chemical feed building will be Schedule 40 PVC, concrete encased.

Control panel enclosures will be NEMA 4X PVC or fiberglass, where located in the Chemical Feed Facility. Exterior control panel enclosures will be NEMA 4X stainless steel.

All power conductors will be copper, 600V rated, type THHN-THWN, #12 AWG minimum gauge. Instrument cables will be copper, 600V, PVC insulated, twisted, shielded and jacketed, #16 AWG minimum gauge, Belden #8917. Network cables will be copper, Category 6.

Lighting and Receptacles

New LED lighting fixtures are proposed for the Chemical Feed Facility. Fixtures will be 4 Ft., enclosed and gasketed industrial type, with LED lamps/drivers, wrap-around acrylic lens, non-metallic housing, and 120Volt operating voltage. Fixtures will be strategically located to allow maintenance staff to maintain/repair fixtures without climbing around the storage tank/day tanks. Fixtures will be surface-mounted and supported from the structure or wall mounted where required. Conventional toggle switch, local on-off control will be provided.

New receptacle circuits will be provided for convenience outlet usage. Receptacles will be duplex GFI type with non-metallic weatherproof while-in-use covers and PVC boxes. A new receptacle will be located on the building exterior for servicing any HVAC equipment and general use by maintenance personnel.

SCADA System Network Connection

An existing SCADA RTU cabinet is currently located within the Dudley 1040 Pump Station. The SCADA RTU panel is relatively new (installed in 2004) and includes a ControlLogic 1756 PLC. The ControlLogic 10-slot chassis currently has 4 empty slots, 2 spare analog outputs, 11 spare digital inputs and 7 spare digital outputs. One new Allen-Bradley 1756-IF8 analog input module, one new Allen-Bradley 1756-OF8 analog output modules, and two new Allen-Bradley 1756-IB16 digital input modules will be required at the existing PLC chassis to accommodate all new I/O – final quantity of inputs/outputs will be determined during final design. The new transfer pumps will be controlled and monitored via the existing SCADA RTU and the chemical feed pumps will be controlled and monitored via the existing SCADA RTU. Metering pump low flow, run status, transfer pump run status, tanks levels (bulk and day tanks), pH level (bulk tank), and emergency eyewash/shower in use will be monitored via the existing SCADA RTU. The existing SCADA HMI screens will be updated to reflect new

equipment in this project. See Section E of Report for anticipated I/O terminations at the existing SCADA RTU.

Security System

A card reader with key pad shall be provided on the entry door of the Chemical Feed Facility. The card reader shall be interfaced with the existing DSX access control system located within the Dudley 1040 Pump Station. A magnetic door contact switch shall be provided at the man door and shall be connected to the DSX access control system located within the Dudley 1040 Pump Station. A magnetic door contact switch shall be provided at the overhead door of the new Chemical Feed Facility and shall be connected to the ADEMCO security system.

C. Description of Heating, Ventilating, and Air Conditioning Work

HVAC

A single self-contained, vertical, exterior wall mount, through-wall air conditioner will be provided to provide all heating, ventilation, and air-conditioning needs for the facility. The unit will maintain indoor conditions at 65°F year-round, utilizing energy recovery ventilation and economizing as needed to minimize energy consumption. Unit will have all airstream components suitably coated for corrosion protection.

D. Description of Plumbing Work

Emergency Eye Wash and Shower

A new emergency eye wash and shower with tempered water supply will be provided within the facility. Shower assembly will be schedule 80 PVC construction with stainless steel components (valves and heads). Domestic water piping will be copper and a reduced pressure style backflow preventer provided.

Activation of the eyewash/shower will be alarmed on the SCADA system, the intent being that if the eyewash/shower is activated, an employee will need assistance and help may be dispatched from the SCADA control room. A flow switch in the supply piping will be used to monitor activation.

Hose Outlet

Two (2) hose bibbs with ¾" hose connection with integral vacuum breaker, cold water supply and isolation valve will be provided in the vicinity of the project area for cleaning usage. One hose bibb will be installed at an interior location and the other at an exterior location.

E. I/O List and HMI Data

ANALOG INPUTS

Bulk Tank Level – Radar 4-20 mAdc
Day Tank 1040 Level – Radar 4-20 mAdc
Day Tank 1080 Level – Radar 4-20 mAdc
pH Level – 4-20mAdc
Chemical Metering Pump 1 Speed Feedback – 4-20mAdc
Chemical Metering Pump 2 Speed Feedback – 4-20mAdc
Chemical Metering Pump 3 Speed Feedback – 4-20mAdc
Chemical Metering Pump 4 Speed Feedback – 4-20mAdc

DIGITAL INPUTS

Bulk Tank – High Level Alarm – Vibration Fork Switch
Transfer Pump 1040 – Run Status – Contact
Transfer Pump 1080 – Run Status – Contact
Transfer Pump 1040 – H-O-A Switch in Auto Position – Contact
Transfer Pump 1080 – H-O-A Switch in Auto Position – Contact
Transfer Pump 1040 – Motor Overload – Contact
Transfer Pump 1080 – Motor Overload – Contact
Transfer Pump 1040 – Flow Indication – Thermal Dispersion Switch Contact
Transfer Pump 1080 – Flow Indication – Thermal Dispersion Switch Contact
Day Tank 1040 – High Level Alarm – Vibration Fork Switch
Day Tank 1080 – High Level Alarm – Vibration Fork Switch
Chemical Metering Pump 1 – Run Status – Contact
Chemical Metering Pump 2 – Run Status – Contact
Chemical Metering Pump 3 – Run Status - Contact
Chemical Metering Pump 4 – Run Status - Contact
Chemical Metering Train 1040 – Flow Indication – Thermal Dispersion Switch Contact
Chemical Metering Train 1080 – Flow Indication – Thermal Dispersion Switch Contact
Chemical Metering Pump 1 – H-O-A Switch in Auto Position – Contact
Chemical Metering Pump 2 – H-O-A Switch in Auto Position – Contact
Chemical Metering Pump 3 – H-O-A Switch in Auto Position – Contact
Chemical Metering Pump 4 – H-O-A Switch in Auto Position – Contact
Chemical Metering Pump 1 – Leak Detected – Contact
Chemical Metering Pump 2 – Leak Detected – Contact
Chemical Metering Pump 3 – Leak Detected – Contact
Chemical Metering Pump 4 – Leak Detected – Contact
Containment Sump – High Level Alarm – Vibration Fork Switch
Transfer Pumps Locked Out - Contact
Emergency Shower/Eyewash Flow Alarm - Contact

ANALOG OUTPUTS

Chemical Feed Pump 1 Speed Control – 4-20mAdc
Chemical Feed Pump 2 Speed Control – 4-20mAdc
Chemical Feed Pump 3 Speed Control – 4-20mAdc
Chemical Feed Pump 4 Speed Control – 4-20mAdc

DIGITAL OUTPUTS

Transfer Pump 1040 – Start-Stop Command
Transfer Pump 1080 – Start-Stop Command
Chemical Feed Pump 1 – Start-Stop Command
Chemical Feed Pump 2 – Start-Stop Command
Chemical Feed Pump 3 – Start-Stop Command
Chemical Feed Pump 4 – Start-Stop Command

SCADA HMI

System Commands – Auto, Local Modes
Bulk Tank Level – Tank Level Graphic
Bulk Tank High Level Alert
Bulk Tank High Level Alarm, Acknowledge, Reset
Bulk Tank pH Low Level Alert
Bulk Tank pH Low Level Alarm, Acknowledge, Reset
Transfer Pump 1040 - Run Status
Transfer Pump 1080 – Run Status
Transfer Pump 1040 – Overload Alarm, Acknowledge, Reset
Transfer Pump 1080 - Overload Alarm, Acknowledge, Reset
Transfer Pump 1040 – H-O-A Switch Position; Auto
Transfer Pump 1080 - H-O-A Switch Position; Auto
Day Tank 1040 Level – Tank Level Graphic
Day Tank 1080 Level – Tank Level Graphic
Day Tank 1040 Level - High Level Alarm; Acknowledge, Reset
Day Tank 1080 Level - High Level Alarm; Acknowledge, Reset
Chemical Metering Pump 1 Start-Stop Command
Chemical Metering Pump 2 Start-Stop Command
Chemical Metering Pump 3 Start-Stop Command
Chemical Metering Pump 4 Start-Stop Command
Chemical Metering Pump 1 Variable Pumping Rate Control (paced off Dudley 1040 Chlorine Residual)
Chemical Metering Pump 2 Variable Pumping Rate Control (paced off Dudley 1040 Chlorine Residual)
Chemical Metering Pump 3 Variable Pumping Rate Control (paced off Dudley 1080 Chlorine Residual)
Chemical Metering Pump 4 Variable Pumping Rate Control (paced off Dudley 1080

Chlorine Residual)
Chemical Metering Pump 1 – Pumping Rate Indication
Chemical Metering Pump 2 – Pumping Rate Indication
Chemical Metering Pump 3 – Pumping Rate Indication
Chemical Metering Pump 4 – Pumping Rate Calculation and Indication
Chemical Metering Pump 1 – Pump Head Leak Detection - Alert, Acknowledge, Reset
Chemical Metering Pump 2 – Pump Head Leak Detection - Alert, Acknowledge, Reset
Chemical Metering Pump 3 – Pump Head Leak Detection - Alert, Acknowledge, Reset
Chemical Metering Pump 4 – Pump Head Leak Detection - Alert, Acknowledge, Reset
Chemical Metering Train 1040 – Flow Indication
Chemical Metering Train 1080 – Flow Indication
Containment Sump Spill Detection – Alarm, Acknowledge, Reset
Transfer Pump 1040 – Elapsed Time (Total Running Hours)
Transfer Pump 1080 – Elapsed Time (Total Running Hours)
Chemical Metering Pump 1 – Elapsed Time (Total Running Hours)
Chemical Metering Pump 2 – Elapsed Time (Total Running Hours)
Chemical Metering Pump 3 – Elapsed Time (Total Running Hours)
Chemical Metering Pump 4 – Elapsed Time (Total Running Hours)
Shower/ Eye Wash Activated – Alarm, Acknowledge, Reset

5.0 PERMITS

Based on the scope of work, the required permits anticipated to be secured during the design phase are:

- Kentucky Division of Water "*Construction Application for Drinking Water Distribution*" Form DW-1.
- Kentucky Department of Housing, Building and Construction "*Plan Application Form*"
- Local permits or inspections, if any, will be the responsibility of the contractor.

6.0 OPINION OF PROJECT COST

See Included Opinion of Project Cost.

* * * * * * * * * * * * *

GRW Engineers, Inc.	Project:	Northern Kentucky Water District		
	Owner:	Dudley Complex Sodium Hypochlorite Building		
	Project No.:	4325		
Opinion of Project Cost	Date:	12/16/14	Dwg. No.:	All
	Estimator:	AAB/KAZ/DG/WR/ DH/JMT/ADH	Type:	Preliminary

Item Description	No. of Units	Units of Measure	Unit Cost	Total Cost
****Sodium Hypochlorite Building**				
Div. 02 - Existing Conditions				
Existing Chemical Feed Building Demolition	1	LSUM	$ 30,000.00	$ 30,000.00
Div. 03 - Concrete				
Concrete Footings	8	CY	$ 500.00	$ 4,100.00
Concrete Foundation Walls (formed)	14	CY	$ 950.00	$ 13,186.00
Concrete Slab - 12"(T)	16	CY	$ 500.00	$ 8,175.00
Concrete Injection Vault	1	EA	$ 4,000.00	$ 4,000.00
Wall Coring(s)	1	LSUM	$ 1,500.00	$ 1,500.00
Concrete Entrance Pad	2	CY	$ 500.00	$ 1,000.00
Concrete Equipment Pads	2	CY	$ 500.00	$ 1,000.00
Div. 04 - Masonry				
Perimeter Cavity Wall: 4" Brick Veneer, 1 1/2" Rigid Insulation, Vapor Barrier, 5/8" Plywood Sheathing, 8" cmu, Masonry Anchors	1,200	SF	$ 50.00	$ 60,000.00
Masonry Bond Beams	1	LSUM	$ 2,500.00	$ 2,500.00
Div 05 - Metals				
Steel Beam @ Overhead Door.	1	LSUM	$ 1,000.00	$ 1,000.00
Steel Lintel @ Manway Door	1	LSUM	$ 500.00	$ 500.00
Steel Lintel @ HVAC Opening	1	LSUM	$ 500.00	$ 500.00
Pipe Bollards	2	EA	$ 100.00	$ 200.00
Misc. Anchors / Ties	1	LSUM	$ 450.00	$ 450.00
Div. 06 - Wood, Plastics, and Composites				
Rough Carpentry	1	LSUM	$ 3,500.00	$ 3,500.00
2x Rafters and Joists	1	LSUM	$ 5,000.00	$ 5,000.00
Sheathing (not included under Div. 04)	828	SF	$ 1.50	$ 1,242.00
FRP Grating w/ Supports	1	LSUM	$ 3,000.00	$ 3,000.00
FRP Pump Stand	1	LSUM	$ 500.00	$ 500.00
FRP Stairs	1	LSUM	$ 3,000.00	$ 3,000.00
FRP Handrail System w/ Cont. Kickplate	30	LF	$ 200.00	$ 6,000.00

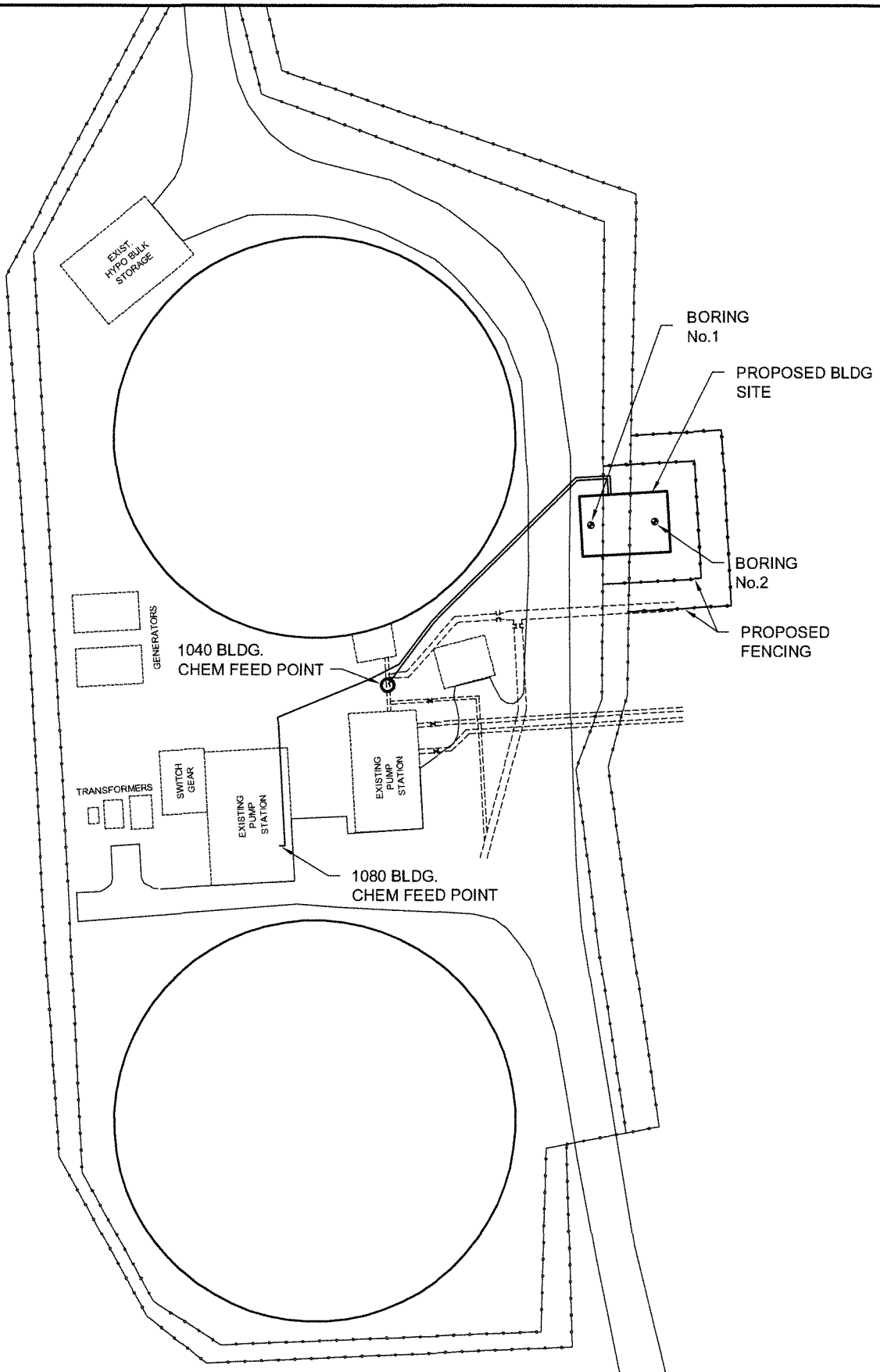
GRW Engineers, Inc.	Project:	Northern Kentucky Water District		
	Owner:	Dudley Complex Sodium Hypochlorite Building		
	Project No.:	4325		
Opinion of Project Cost	Date:	12/16/14	Dwg. No.:	All
	Estimator:	AAB/KAZ/DG/WR/ DH/JMT	Type:	Preliminary

Item Description	No. of Units	Units of Measure	Unit Cost	Total Cost
Div. 07 - Thermal and Moisture Protection				
Bituminous Damproofing	190	SF	$ 5.00	$ 950.00
Foundation Insulation	190	SF	$ 15.00	$ 2,850.00
Thermal Insulation (not included in Div. 04)	547	SF	$ 5.00	$ 2,735.00
Weather Barriers / Self-adheared Ice Shield	828	SF	$ 5.00	$ 4,140.00
Prefinished Machine-seamed Metal Roof Panel	828	SF	$ 10.00	$ 8,280.00
Prefinished Metal Hip / Ridge Roof Panels	56	LF	$ 15.00	$ 840.00
Sheet metal flashing and trim	95	LF	$ 15.00	$ 1,425.00
Prefinished vented soffit & support framing	205	SF	$ 10.00	$ 2,050.00
Misc. Roof Venting	1	LSUM	$ 1,000.00	$ 1,000.00
Joint Sealants	1	LSUM	$ 500.00	$ 500.00
Div. 08 - Openings				
3'-0" x 7'-0" FRP door and frame	1	EA	$ 3,250.00	$ 3,250.00
(manual)	1	EA	$ 5,000.00	$ 5,000.00
30" x 30" Aluminum Access Hatch	1	EA	$ 3,500.00	$ 3,500.00
Div. 09 - Finishes				
Paint - Walls	1,200	SF	$ 3.50	$ 4,200.00
Paint - Containment Area Floor and Walls	700	SF	$ 8.00	$ 5,600.00
Paint - Ceiling	602	SF	$ 4.25	$ 2,558.50
Div. 10 - Specialties				
Interior room signage	1	LSUM	$ 500.00	$ 500.00
Wall-mounted fire extinguisher w/ wall bracket	1	EA	$ 200.00	$ 200.00
Div. 22 - Plumbing				
Identification	1	LSUM	$ 200.00	$ 200.00
Reduced pressure backflow assembly	1	EA	$ 1,500.00	$ 1,500.00
Instantaneous electric water heater, Keltech	1	EA	$ 24,900.00	$ 24,900.00
Copper piping	1	LSUM	$ 325.00	$ 325.00
Emergency shower/eyewash	1	EA	$ 2,500.00	$ 2,500.00
Controls	1	EA	$ 1,000.00	$ 1,000.00
Hose Bibb (Indoor & Outdoor)	2	EA	$ 250.00	$ 500.00
Div. 23 - HVAC				
Identification	1	LSUM	$ 230.00	$ 230.00
Air devices	2	EA	$ 500.00	$ 1,000.00
Heat pump, Bard unit with special coating	1	EA	$ 9,700.00	$ 9,700.00
Controls	1	EA	$ 1,000.00	$ 1,000.00
Testing, adjusting and balancing	1	LSUM	$ 450.00	$ 450.00
Div. 26 - Electrical				
Lighting Interior	1	LSUM	$ 5,000.00	$ 5,000.00
Lighting Exterior	1	LSUM	$ 7,500.00	$ 7,500.00
Chemical Transfer Control Panel	1	LSUM	$ 11,000.00	$ 11,000.00
Electrical Feed & Connection	1	LSUM	$ 35,000.00	$ 35,000.00
Bulk Tank Level Status Control Panel	1	LSUM	$ 15,000.00	$ 15,000.00

GRW Engineers, Inc.	Project:	Northern Kentucky Water District		
	Owner:	Dudley Complex Sodium Hypochlorite Building		
	Project No.:	4325		
Opinion of Project Cost	Date:	12/16/14	Dwg. No.:	All
	Estimator:	AAB/KAZ/DG/WR/ DH/JMT	Type:	Preliminary

Item Description	No. of Units	Units of Measure	Unit Cost	Total Cost
Div. 31 - Earthwork				
Erosion Control	1	LSUM	$ 1,500.00	$ 1,500.00
Foundation Excavation (150 CY)	1	LSUM	$ 5,000.00	$ 5,000.00
Crushed Stone Backfill (50 CY)	1	LSUM	$ 2,500.00	$ 2,500.00
Soil for Backfill & Grading	1	LSUM	$ 5,000.00	$ 5,000.00
Div. 32 - Exterior Improvements				
Site Restoration	1	LSUM	$ 2,500.00	$ 2,500.00
Asphalt Paving	1	LSUM	$ 1,000.00	$ 1,000.00
Security Fencing	250	LF	$ 50.00	$ 12,500.00
Div. 33 - Utilities				
6-inch DI Water Main	20	LF	$ 30.00	$ 600.00
Fire Hydrant (Relocation)	1	LSUM	$ 500.00	$ 500.00
1-1/2" Copper Service Line	50	LF	$ 15.00	$ 750.00
Div. 40 - Instrumentation				
Instrumentation, SCADA, Controls & Programming	1	LSUM	$ 80,000.00	$ 80,000.00
Instruments (Radar Level, pH probe, etc.)	1	LSUM	$ 17,400.00	$ 17,400.00
Div. 43 - Chemical Storage Tanks				
3,000 Gal. Bulk Storage Tank - HDXLPE	1	EA	$ 12,000.00	$ 12,000.00
200 Gal. Day Storage Tank - HDXLPE	2	EA	$ 2,500.00	$ 5,000.00
Accessories & Fittings - Ladder, Level Gauge, Flg. Etc..	1	LSUM	$ 4,000.00	$ 4,000.00
Div. 46 - Chemical Feed Pumps & Piping				
Centrifugal Chemical Transfer Pumps	2	EA	$ 1,500.00	$ 3,000.00
Peristaltic Chemical Metering Pumps	4	EA	$ 9,000.00	$ 36,000.00
Sch 80 PVC Piping	400	LF	$ 15.00	$ 6,000.00
Buried PVC Conduit	400	LF	$ 25.00	$ 10,000.00
Chemical Feed Tubing Pull Boxes	1	LSUM	$ 1,000.00	$ 1,000.00
Flexible PVC Chemical Feed Tubing	800	LF	$ 5.00	$ 4,000.00
Calibration Column, Injection Tube, Pressure Relief	2	LSUM	$ 3,000.00	$ 6,000.00
PVC Ball Valves	1	LSUM	$ 2,500.00	$ 2,500.00
Misc. Appurtenences (Cam-locks, check valves, etc.)	1	LSUM	$ 2,000.00	$ 2,000.00
Sub-Total				**$ 537,486.50**
Contingency (5%)				**$ 26,870.00**
Sub-Total				**$ 564,356.50**
Bonding & Insurance (2%)				**$ 11,290.00**
Division 1/General Conditions (4%)				**$ 22,580.00**
Contractor Overhead & Profit (15%)				**$ 89,740.00**
			TOTAL, Rounded	**$ 688,000.00**
Engineering Services (Design, Admin, CA)				**$ 99,704.00**
			TOTAL CONSTRUCTION	**$ 787,704.00**

FIGURES

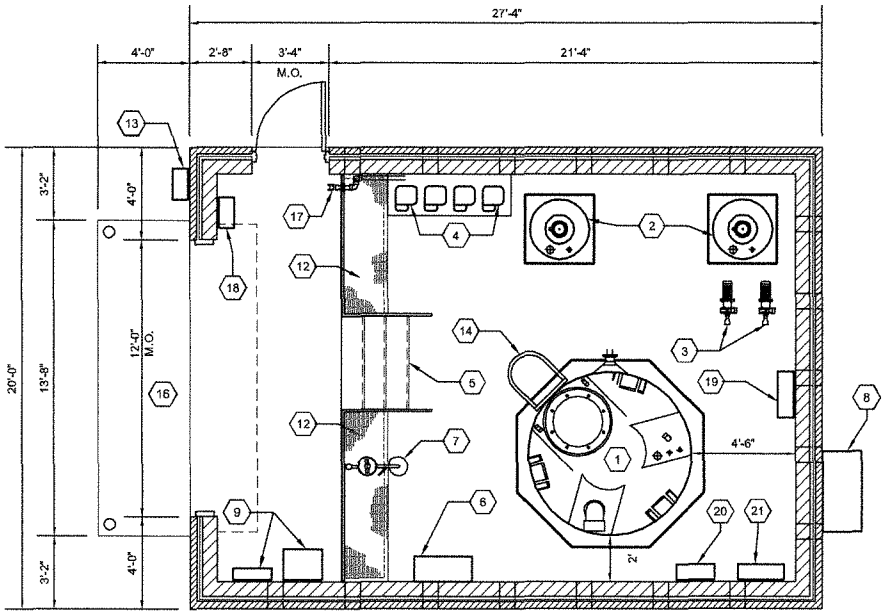


GRW PROJECT NO. 4325	CLIENT PROJECT NO.	DESIGNED: AAB	SITE PLAN NORTHERN KENTUCKY WATER DISTRICT DUDLEY COMPLEX SODIUM HYPOCHLORITE BUILDING
REVISIONS NO. DESCRIPTION DATE BY		DRAWN: AAB	
		REVIEWED: AAB	
SCALE CHECK: THIS MARK SHOULD MEASURE EXACTLY 1/2" WHEN PLOTTED		APPROVED: AAB	

engineering | architecture | geospatial
www.grwinc.com

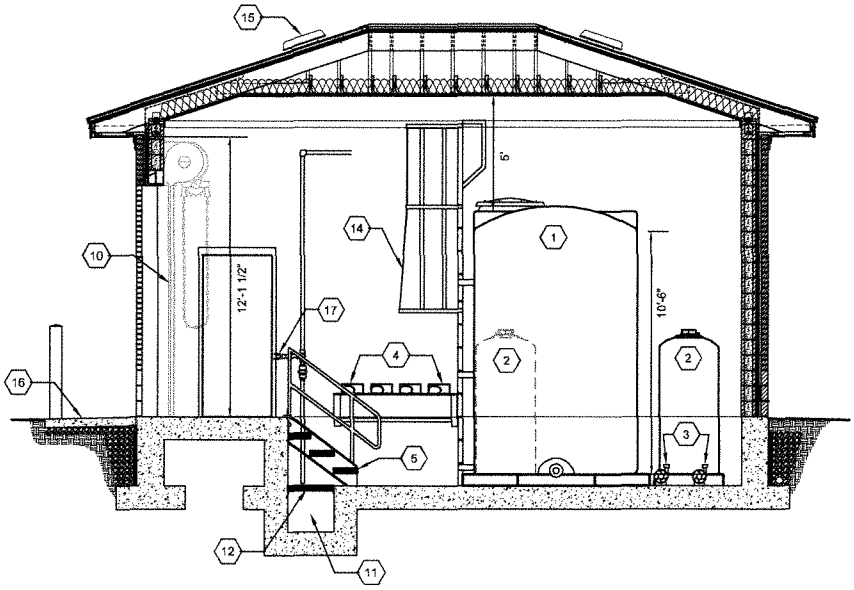
DATE: DECEMBER, 2014
SCALE: 1" = 50'
SHEET NO. A

KEYNOTES:



1 FLOOR PLAN

SCALE: 1/8"=1'-0" 0 4' 8' 16'



2 SECTION

SCALE: 1/8"=1'-0" 0 4' 8' 16'

1. 7'-1" DIA. BULK STORAGE TANK 3,000 GAL.
2. 2'-6" DIA. DAY TANK 200 GAL.
3. TRANSFER PUMP
4. PERISTALTIC FEED PUMPS
5. FRP STEPS DOWN TO CONTAINMENT PIT
6. TANKLESS WATER HEATER
7. EMERGENCY SHOWER AND EYEWASH
8. WALL MOUNTED HEAT PUMP
9. ELECTRICAL/COMMUNICATION PANELS
10. 10'-0" ROLLUP DOOR
11. 2'-0" WIDE x 2'-0" DEEP RECESSED TROUGH
12. FRP GRATING
13. BULK TANK LEVEL STATUS CONTROL PANEL
14. ACCESS LADDER
15. ROOF VENT (TYP.)
16. CONCRETE ENTRANCE PAD
17. CHEMICAL FILL CONNECTION
18. HIGH LEVEL ALARM CONTROL PANEL
19. TRANSFER PUMP CONTROL PANEL
20. DIGITAL CONNECTION TO 1040 PLC
21. ANALOG CONNECTION TO 1040 PLC

GRW PROJECT NO. 4325	CLIENT PROJECT NO.	DESIGNED: AAB	PROPOSED FLOOR PLAN AND SECTION
REVISIONS		DRAWN: BTR	NKWD - DUDLEY COMPLEX
NO. / DESCRIPTION / DATE / BY		REVIEWED: AAB	SODIUM HYPOCHLORITE BUILDING
		APPROVED: AAB	
SCALE CHECK — THIS MARK SHOULD MEASURE EXACTLY 1/2" WHEN PLOTTED			

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www.grwinc.com

DATE: DECEMBER, 2014
SCALE: AS NOTED
SHEET NO. B

ATTACHMENTS

PolyProcessing
SOLUTIONS, SIMPLIFIED.
www.polyprocessing.com

Innovative Tank Solutions

IMFO®: integrally molded for major hazard control.

Traditional tank maintenance can be a challenge with many chemicals – so Poly has developed a unique system that helps minimize the hazards associated with traditional vertical tank maintenance. With Poly's Integrally Molded Flanged Outlet, or IMFO® system, the flange is molded while the tank is processing, making it a stress-free part of the tank. The flange is created from the same material as the tank – it's not an insert introduced during or at post-production.

The IMFO's advantages are many:

- Since the flange is at the bottom of the tank, full drainage is achieved below the tank knuckle radius, which can eliminate the need to enter the tank for cleaning.
- One-piece construction enhances long-term performance of the tank, since it doesn't compromise the tank hoop's integrity or structural design.
- In aggressive applications, the complete flange face is protected by the antioxidant OR-1000™ system.
- The IMFO's design brings you the highest amount of static head pressure, which contributes to the highest net positive suction head (NPSH) of any vertical non-coned tank.

CALIFORNIA
8055 S. Ash St.
French Camp, CA 95231
Tel: 877.325.3142

LOUISIANA
P.O. Box 4150
2201 Old Sterlington Rd.
Monroe, LA 71203
Tel: 866.590.6845
sales@polyprocessing.com

VIRGINIA
161 McGhee Rd.
Winchester, VA 22603
Tel: 877.633.6416

Plumbing

REVERSE FLOAT LEVEL GAUGES

The reverse float level gauges offer a safe and reliable means of determining the chemical level in your tank and especially in the SAFE-Tank®. Available in PVC as standard.

Advantages:

- No sidewall tank penetrations or chemical exposure
- All joints are dry fit for easier part replacement
- Internal float now weighted to chemical specific gravity
- Polypropylene rope used for indicator
- Calibration tape can be added for tank capacity
- Standard or freestanding pipe supports available

NOTE: These gauges are NOT intended to be used for metering purposes.

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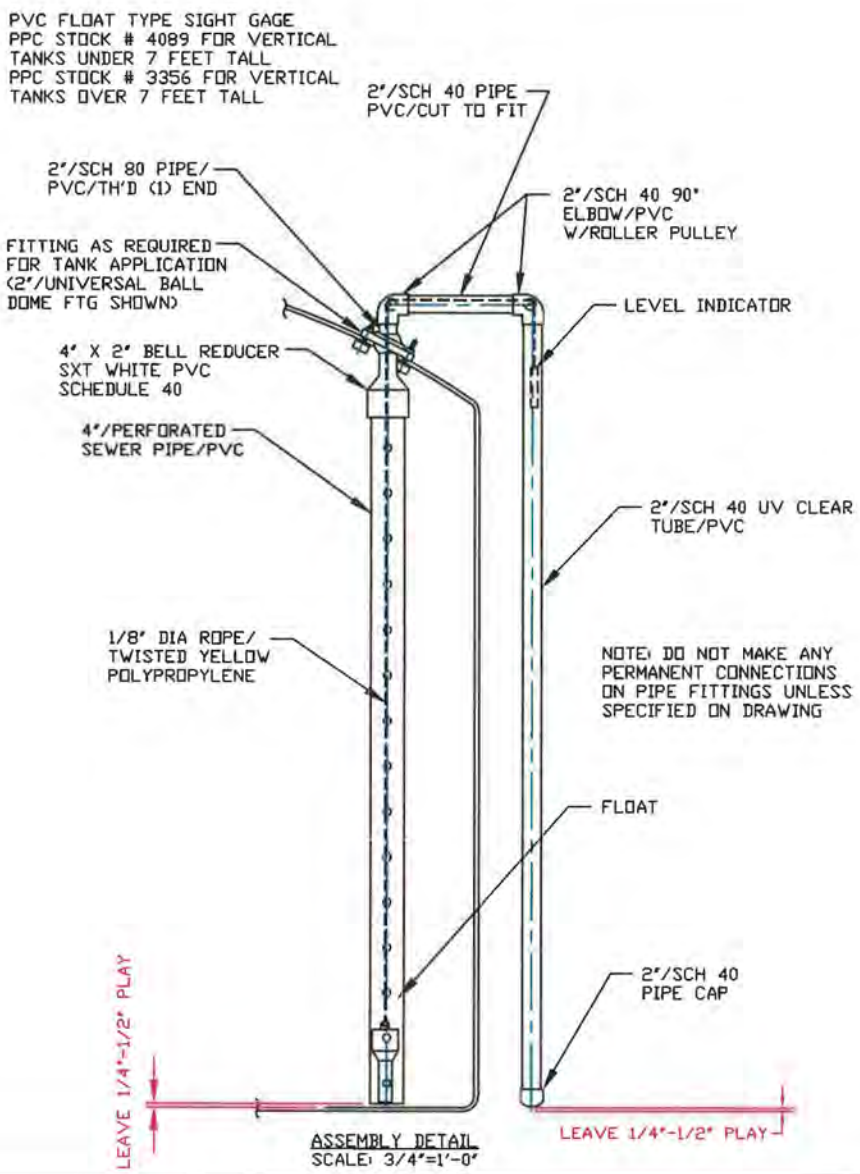
VERIFY REV LEVEL OF PAPER COPY WITH REV LEVEL ON PPC WEB SITE



Tank Connection Fitting:
BULKHEAD FITTING
Fitting Material:
PVC
Bolt Type:
TITANIUM
Gasket Material:
EPDM

NOTES

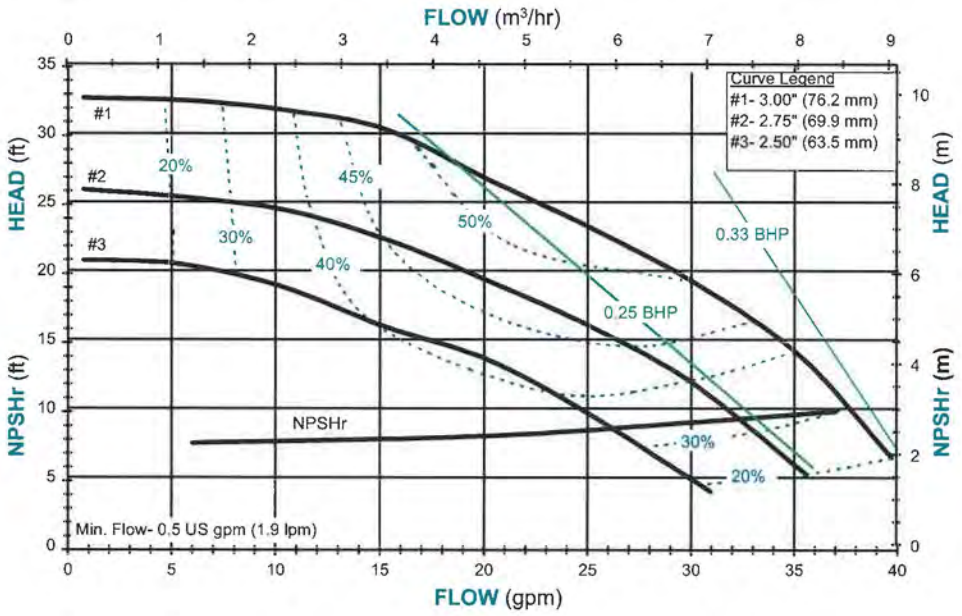
1. THIS IS A COMPUTER GENERATED DWG. DO NOT REVISE BY HAND.

DWG TITLE: REVERSE FLOAT TYPE SIGHT GAUGE			
SCALE: 6"=1'-0"	POLYPROCESSING COMPANY LLC	Central Region	DR: C. DAVIES
DATE: 4/28/10			CK: J. BRANTLEY
		SHEET: 1 OF 1	COMPUTER FILE: FTSGM / REV: -

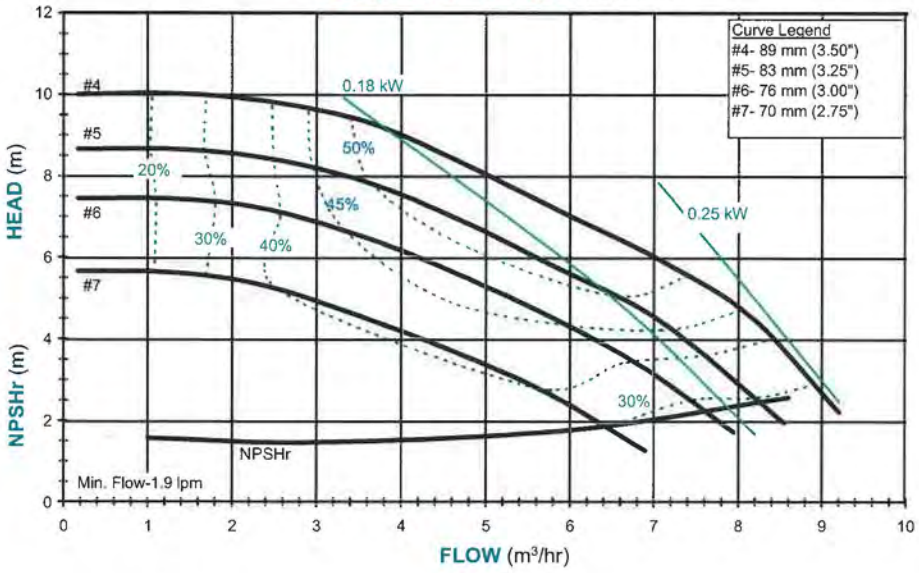
FINISH THOMPSON INC.

DB Series: Model DB6

DB6 PERFORMANCE 3450 RPM



DB6 PERFORMANCE 2900 RPM



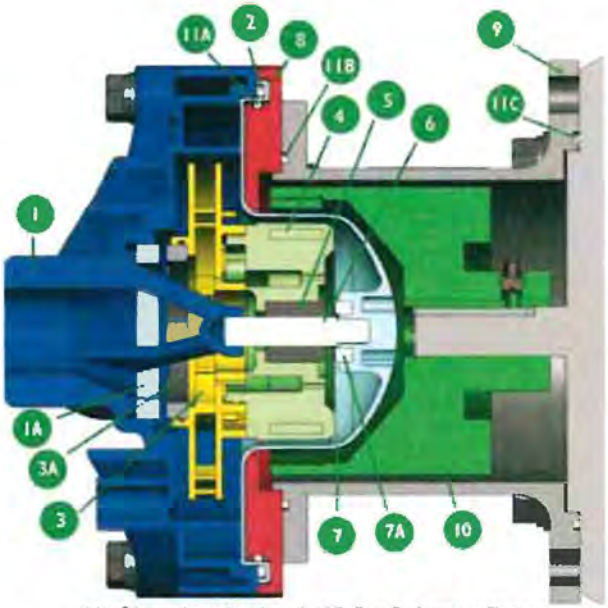
FEATURES & CAPABILITIES

+ *Five-year warranty*
+ *Extended run dry ability (with carbon bushing)*
+ *High operating efficiency*
+ *Polypropylene or PVDF construction*
+ *Powerful neodymium magnets*
+ *Close-coupled design*
+ *Threaded (NPT or BSP), flanged, or union connections*
+ *Horizontal or vertical installation with IEC motor*
+ *Back pullout design*
+ *Mounts to NEMA and IEC (B5 & B14) motor frames*
+ *Easy set measurement free drive*
+ *ISO 1940 G2.5 balancing*
+ *CE certified/ATEX available*
+ *Working pressure to 80 psi (5.5 bar)*
+ *Specific gravity over 1.8*
+ *Viscosity up to 150 cP*
+ *Polypropylene—180° F (82° C)*
+ *PVDF—220° F (104° C)*

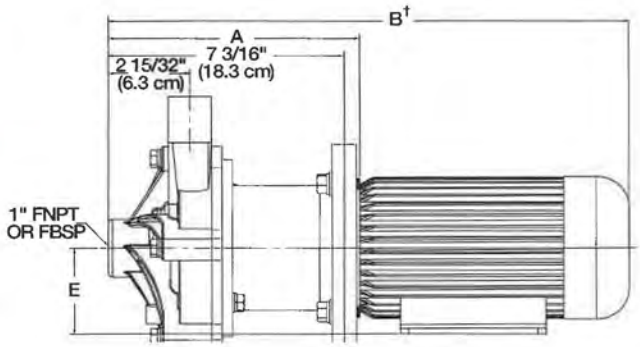
APPLICATIONS

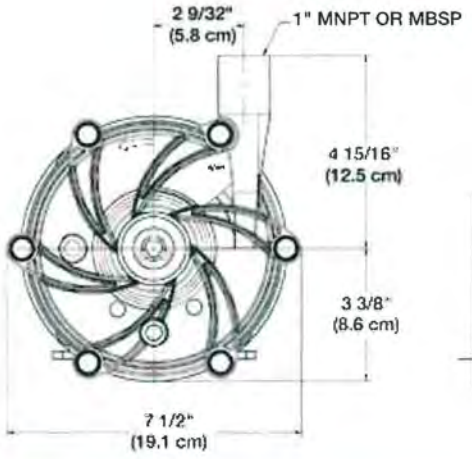
+ *Chemical processing*
+ *Plating*
+ *Water and wastewater*
+ *Electronics*
+ *Pharmaceuticals*
+ *Wet scrubber*
+ *Pulp and paper*
+ *Heat exchanger*
+ *and many more!*

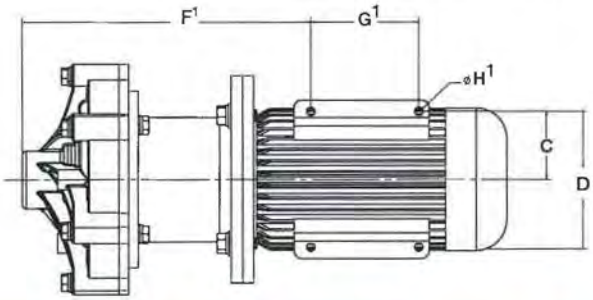
	Description	Polypropylene Models	PVDF Models
1	Impeller housing	Glass-fiber reinforced polypropylene	Carbon-fiber reinforced PVDF
1A	Impeller housing thrust ring options	High-purity alumina ceramic, silicon carbide	
2	O-ring options	FKM, EPDM, Simriz®, Kalrez®	
3	Impeller	Glass-fiber reinforced polypropylene	Carbon-fiber reinforced PVDF
3A	Impeller thrust ring options	Glass-fiber molybdenum disulfide filled PTFE, silicon carbide	
4	Inner drive	Neodymium iron boron magnets encapsulated in unfilled polypropylene	Neodymium iron boron magnets encapsulated in unfilled PVDF
5	Bushing options	Carbon, PTFE, high-purity alumina ceramic, silicon carbide	
6	Shaft options	High-purity alumina ceramic, Hastelloy® C, silicon carbide	
7	Barrier	Glass-fiber reinforced polypropylene	Carbon-fiber reinforced PVDF
7A	Barrier thrust ring	High-purity alumina ceramic	
8	Clamp ring	Ductile iron	
9	Motor adapter	Glass-fiber reinforced polypropylene	
10	Outer drive magnet	Nickel plated neodymium iron boron magnets/steel	
11A 11B 11C	Motor adapter sealing option (NEMA only)	Buna N (STD), FKM, EPDM	



Kalrez® is a registered trademark of DuPont Performance Elastomers
Simriz® Perfluoroelastomer is a registered trademark of the Simrit® division of Freudenberg-NOK
Hastelloy® C is a registered trademark of Haynes International, Inc.







†Dimensions for F, G, and H can be found in the Outline Dimensions booklet in the Downloads section of www.finishthompson.com.

Motor Frame	A	B†	C	D	E	Weight - lbs. [kg] PP	Weight - lbs. [kg] PVDF
NEMA 56C	7-3/16" [18.3 cm]	17-7/16" [44.3 cm]	2-7/16" [6.2 cm]	4-7/8" [12.4 cm]	3-1/2" [8.9 cm]	10.5 [4.8]	11.1 [5.0]
NEMA 145TC	7-3/16" [18.3 cm]	17 15/16" [45.6 cm]	2-3/4" [7.0 cm]	5-1/2" [14.0 cm]	3-1/2" [8.9cm]	10.5 [4.8]	11.1 [5.0]
IEC 63 w/B14 or B5 flange	7-5/8" [19.4 cm]	14-7/8" [37.8 cm]	1-31/32" [5.0 cm]	3-15/16" [10.0 cm]	2-15/32" [6.3 cm]	14.0 [6.4]	15.0 [6.8]
IEC 71 w/B14 or B5 flange	7-5/8" [19.4 cm]	15-13/16" [40.2 cm]	2-7/32" [5.6 cm]	4-13/32" [11.2 cm]	2-25/32" [7.1 cm]	14.0 [6.4]	15.0 [6.8]

Dimensions and weights are for reference only.
†Varies with motor manufacturer.

Note: Weights listed above are for pump only. Motors not included.

921 Greengarden Road • Erie, PA 16501-1591 U.S.A • Ph 814-455-4478 • Fax 814-455-8518
E-mail fti@finishthompson.com • www.finishthompson.com

520S/R2, 520U/R2, 520Du/R2 NEMA 2 pumps fitted with 520R2 pumphead for 2.4mm wall tubing

500 series

Watson-Marlow Pumps Group

FEATURES

- **Flow rates from 0.004ml/min to 3.5 liter/min using 2.4mm wall thickness tubing**
- **520R2 pumphead features large swept volume with sprung rollers for high accuracy, gentle pumping of shear-sensitive fluids**
- **Robust pumphead construction with PPS (polyphenylene sulphide) track and rotor and stainless steel rollers and bearings**
- **Precise 2200:1 speed control range from 0.1 to 220rpm in 0.1rpm increments**
- **High efficiency maintenance free brushless DC motor**
- **NEMA 2 ingress protection for light industrial and wipedown environments**
- **Dual voltage, 115V/230V 50/60Hz**

5 YEARS WARRANTY

24 hour duty

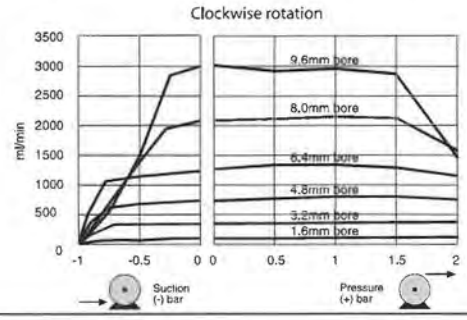
Watson-Marlow...Innovation in Full Flow

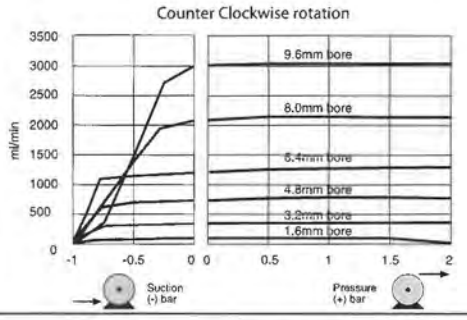
FUNCTIONALITY

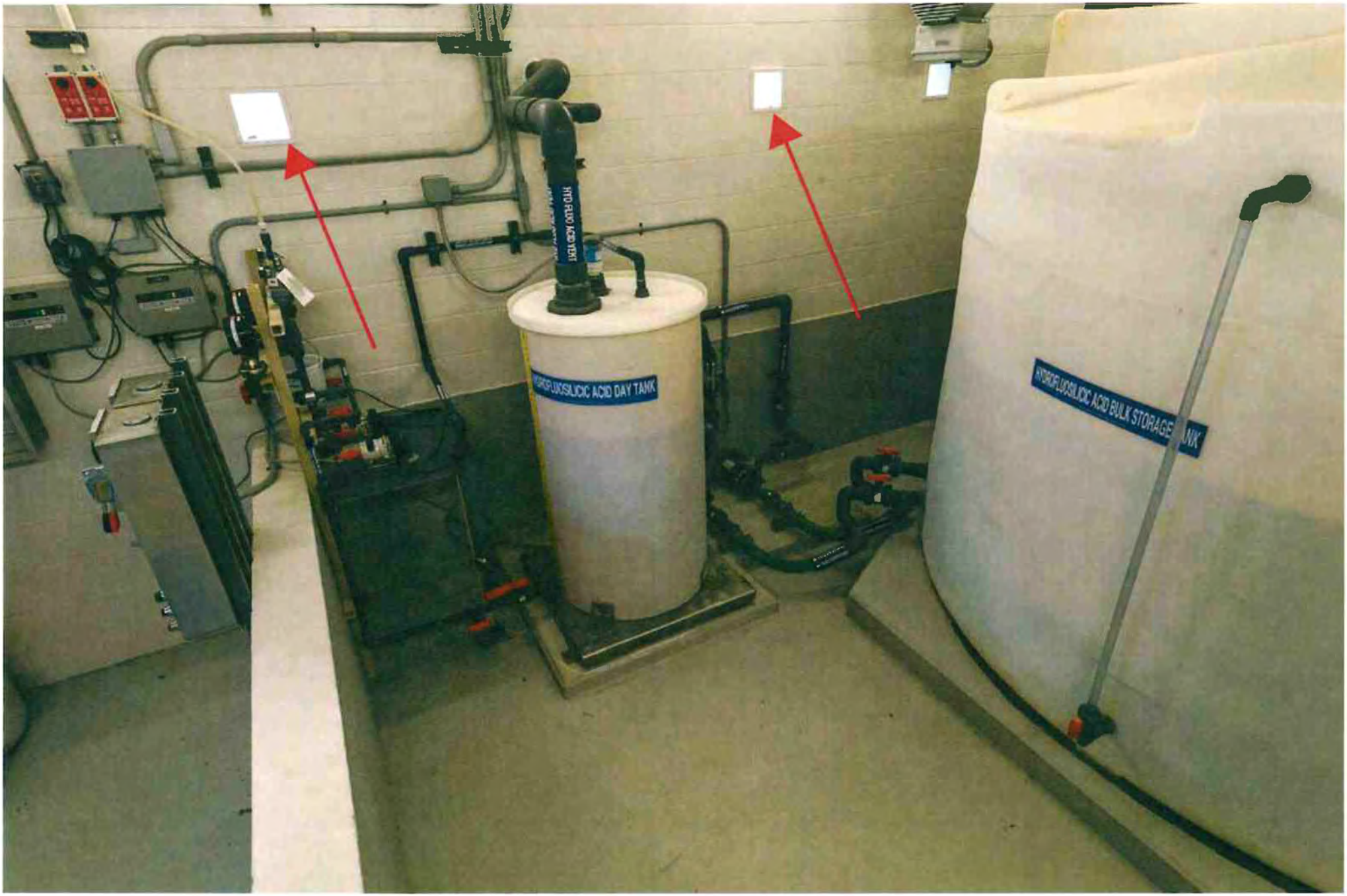
Pump drives	520S	520U	520Du
Manual control			
MemoDose - accurate single shot dispensing	•	•	•
Full calibration with choice of flow units			•
Simple calibration to display flow in ml/min	•	•	
Choice of flowrate or speed display	•	•	•
Remote control			
Run/Stop, direction change, auto/manual toggle, leak detector input (via contact closure or 5V TTL or 24V industrial logic)		•	•
Remote operation of MemoDose (foot/hand-switch or logic input)		•	•
Analogue speed control			
Software programmable inputs; 0-10V, 1-5V or 4-20mA		•	•
Analogue outputs; 0-10V		•	
Analogue outputs; 0-10V, 4-20mA			•
Keypad/analogue input scaling (replacement of diaphragm pumps)			•
Tacho frequency output; 0-1258Hz		•	•
Digital communication			
RS232 network control			•
Security			
Software configurable of collector outputs		•	•
Basic security code to protect set-up		•	•

PERFORMANCE

Tube bore and flow rates (ml/min)							
Tube material	Speed	1.6mm	3.2mm	4.8mm	6.4mm	8.0mm	9.6mm
STA-PURE® Series PCS and Series PFL, Pumpsil	0.1 to 220rpm	0.04-97	0.18-390	0.40-870	0.70-1500	1.1-2400	1.6-3500
Marprene/Bioprene, PureWeld XL	0.1 to 220rpm	0.04-92	0.17-370	0.38-830	0.67-1500	1.1-2300	1.5-3300







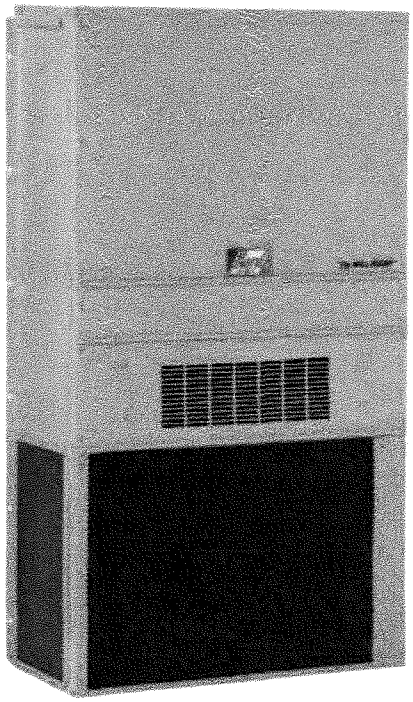
Masonry Glass Blocks For Natural Lighting

THE WALL-MOUNT™ "QUIET CLIMATE" HEAT PUMPS

Models: T24H to T60H Up to 11.2 EER
Heating Capacities: 22,200 to 54,000 BTUH
Cooling Capacities: 22,400 to 57,500 BTUH

GREEN REFRIGERANT R-410A

The Bard Wall-Mount Heat Pump is a self-contained energy efficient heating and cooling system, which is designed to offer maximum indoor comfort at a minimal cost without using valuable indoor floor space or outside ground space. This unit is the ideal product for versatile applications such as: new construction, modular offices, school modernization, telecommunication structures, portable structures or correctional facilities. Factory or field installed accessories are available to meet specific job requirements.



Engineered Features

Copper Tube / Aluminum Fin Coils:
Grooved copper tubing and enhanced aluminum fins provide maximum heat transfer and high energy efficiency. Evaporator coil constructed with hydrophilic fin stock that seals fin surface against aluminum oxide formation, is resistant to mold and mildew growth (tested to ASTM D3273, no growth) and reduces beading of condensate on the fin surface. Optional phenolic-coated coils are also available.

Twin Blowers:
Move air quietly. All models feature variable speed blower motors providing airflow adjustment for high and low static operation. Motor overload protection is standard on all models.

ECM Indoor Blower Motor:
Features a variable speed motor providing super-high efficiency, low sound levels and soft-start capabilities. The motor is self-adjusting to provide the proper airflow rate for the staged capacity, and for higher static pressure in ducted installations without user adjustment or wiring changes.

Heat Pump Compressor:
Scroll Compressors are standard on all 2 to 5 ton models. Eliminates need for crankcase heater.

Double isolated floating compressor mounting system and compressor sound blanket for reduced outdoor sound level.

Phase Rotation Monitor:
Standard on all 3 phase scroll compressors. Protects against reverse rotation if power supply is not properly connected.

R-410A Refrigerant:
Designed with R-410A (HFC) non-ozone depleting refrigerant in compliance with the Montreal protocol and 2010 EPA requirements.

Liquid Line Filter Drier:
Standard on all units. Protects system against moisture.

Galvanized 20 Gauge Zinc Coated Steel Cabinet:
Cleaned, rinsed, sealed and dried before the polyurethane primer is applied. The cabinet is handsomely finished with a baked on, beige textured enamel, which allows it to withstand 1000 hours of salt spray tests per ASTM B117-03.

Stainless Steel cabinets available.

Foil Faced Insulation:
Standard on all units.

Electrical Components:
Are easily accessible for routine inspection and maintenance through a right side, service panel opening. Features a lockable, hinged access cover to the circuit breaker or rotary disconnect switch.

Electric Heat Strips:
Features an automatic limit and thermal cut-off safety control. Heater packages are factory or field installed for all 2 through 5 ton models. Features easy slide-in field assembly with various BTUH outputs.

Condenser Fan and Motor Shroud Assembly:
Slide out for easy access.

Filter Service Door:
Separate service door provides easy access for filter change.

One Inch, Disposable Air Filters:
Are standard equipment. Optional one inch washable filters available and filter racks permit the addition of 2" pleated filter. Factory or field installed.

Solid State Electronic Heat Pump Control:
Provides efficient 30, 60 or 90 minute defrost cycle. A thermistor sensor, speed up terminal for service and 10 minute defrost override are standard on the electronic heat pump control.

High & Low Pressure Switches are Auto-Reset:
Standard on all units. Built-in lockout circuit resets from the room thermostat. Provides commercial quality protection to the compressor.

Five Minute Compressor Time Delay:
Short cycle protection is standard. Built into the heat pump control.

Emergency Heat Circuit:
Permits continuous operation of the system.

Barometric Fresh Air Damper:
Standard on all units. Allows up to 25% outside fresh air. Not installed if other optional vent packages selected.

Built-in Circuit Breakers:
Standard on all electric heat versions of single and three phase (230/208 volt) equipment. Rotary disconnects are standard on all electric heat versions of three phase (460 volt) equipment.

Slope Top:
Standard feature for water run-off.

Full Length Mounting Brackets:
Built into cabinet for improved appearance and easy installation. NOTE: Bottom mounting bracket included to assist in installation.

Top Rain Flashing:
Standard feature on all models.

Ventilation System Packages

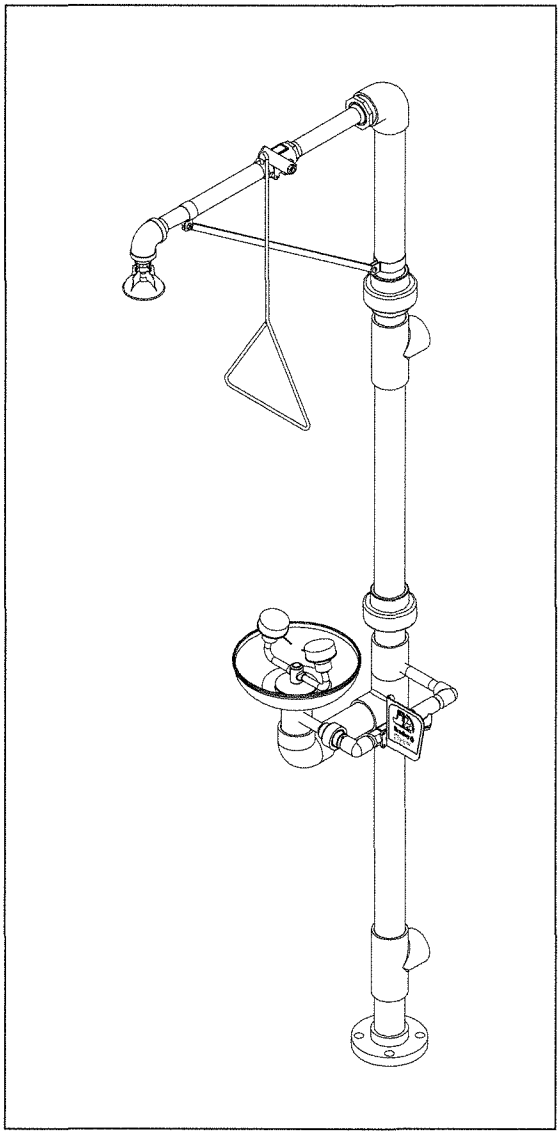
Six ventilation options are available.
See Page 3 for details on these options.

- Complies with efficiency requirements of ANSI/ASHRAE/IESNA 90.1-2010.
- Certified to ANSI/ARI Standard 390-2003 for SPVU (Single Package Vertical Units).
- Intertek ETL Listed to Standard for Safety Heating and Cooling Equipment ANSI/UL 1995/CSA 22.2 No. 236-05, Fourth Edition.
- Commercial Product - Not intended for Residential application.

Form No. S3436-1113
Supersedes S3436-413

S19-310PVC
Combination Drench Shower and Eye/Face Wash Unit

- Exceeds American National Standard Z358.1 Specifications
- Corosion-Resistant PVC Construction with All-Stainless Steel Valve Fittings
- Combination Units may be Top-Supplied or Mid-Supplied
- Universal Identification Sign and Inspection Tag Included
- Full, One-Year Warranty
- SpinTec™ showerheads are covered by one or more of the following patents: 8113446; D594,089; D669,555; Reg. Comm. Des. D001079560-0001. Other patents pending.
- Classified by Underwriters Laboratory Inc. to ANSI Z358.1



Specifications

Combination Drench Shower and Eye/Face Wash Unit saves space and is durable for highly corrosive work environments. Shower valve operates quickly by a pull rod with a triangular handle. Shower provides a superior washdown with a more even spray pattern. Eye/face wash is operated by a highly visible push handle Safe, steady water flow under varying water supply conditions from 30–90 PSI is assured by integral flow control in the sprayhead assembly. NOTE: The ANSI Z358.1 standard requires an uninterruptible supply of flushing fluid at a minimum 30 PSI flowing pressure. Eye/face wash sprayheads contain an antimicrobial agent to protect the sprayheads.

This plumbing fixture is not intended to dispense water for human consumption through drinking or for preparation of food or beverages.

Model	Description
☐ **S19-310PVC**	Combination Drench Shower and Eye/Face Wash Unit
☐ **S45-620**	Optional Foot Treadle Kit for Hand or Foot Operation (sold separately)
☐ **S19-2100**	Navigator EFX25 - Emergency Thermostatic Mixing Valve

Recommended Option:

Navigator S19-2100 EFX25
Emergency Thermostatic Mixing Valve

NAVIGATOR

Satisfies ANSI Z358.1
tepid water requirements.

P.O. Box 309, Menomonee Falls, WI 53052-0309
Phone: 800.BRADLEY (800.272.3539) Fax: 262.251.5817
bradleycorp.com

KELTECH INCORPORATED
A Subsidiary of Bradley

SNA-Series - Safety Shower Heaters

Tankless Water Heating Solutions

- 36 - 144 kW (122,800 - 491,300 BTUs)
- Temperature overshoot purge system
- Certified Lead-Free Design
- NEMA 4 enclosure standard
- ASME and NB Certified options available
- New & Improved Pressure Drop Advantage
- Dual Flow Activation
- Variable Temp Heat Exchanger
- Liquid-Cooled Solid State Relays
- Internal fusing (included) adds safety and permits single power connection
- Controller-locked temperature setting, output fixed at 80°F (27°C)
- Meets ANSI Z358.1 standards
- Emergency stop button
- Door cutoff switch

Standard Equipment

Tankless Water Heating Specifications

Keltech, Inc. Tankless Shower Heaters provide warm water intended to supply safety fixtures. The heaters uniquely perform in applications with low line pressure, while still accommodating ANSI standard flow rates. The durable components withstand higher pressures which result in longer service life, while ensuring the delivery of precise output temperature. Keltech's durable components withstand power abnormalities found in industrial environments and ensure tepid water standards are never exceeded (100°F), with it's three-tier anti-scald protection and hot water purge. SNA-Series units are also suited to applications with 3 Phase Delta 480V or 600V. The heat exchanger features o-ring seals that out last typical gasket construction. 1-1/4" NPT female inlet and outlet connections.

Construction

Temperature Controller

Keltech's PID Temperature Controller is more energy efficient and reliable than traditional microprocessors using staged elements. Power is infinitely variable, with no fixed inputs. The PID controller makes it possible to modulate the amount of power applied to the elements while also dispersing the required power evenly across all elements. This unique feature increases the product's life cycle.

Heating Element

Each heater features a heavy duty, low watt density, incoloy 800 sheathed resistive element. The Keltech design ensures greater protection, durability and resistance to scaling from hard water because water is only heated when flowing; this means sediment will not collect in the heat exchanger.

Solid State Relays

The liquid cooled solid state relays provide silent switching, which has a fast response and works in conjunction with the PID controller to infinitely modulate and add to the life of the heater.

Electrical

The SNA-Series requires only one service feed per unit. Includes internal fusing as standard. Internal fusing provides superior protection so the incoming circuit can be higher than 48 amps (NEC). Keltech protects each heating element with fusing and every unit is constructed to comply with UL508A.

Cabinet Enclosure

The floor-mounted standard cabinet enclosure is NEMA 4 rated and made from 14 gauge mild steel and powder coated with ANSI 61 gray, corrosive resistant paint. The NEMA 4X enclosures are corrosion resistant for harsher environments and made from 16 gauge 304 stainless steel. The NEMA 4X enclosure can also be specified with 316 stainless steel. Additional service access panel located on top of cabinet enclosure.

Independent Safeties

Each heater has three-tier anti-scald protection and hot water evacuation (overshoot purge protection). The controller alarm sends a signal to disconnect power to the elements if the temperature reaches 90°F (32°C). The internal thermostat with auto reset high limit switch ensures that when the temperature limit is reached, the unit will power down a bank of elements; when the temperature returns to the set point, power is restored. The surface mounted bi-metal thermostat with manual reset acts as a fail-safe and must be manually reset before power can be restored to the elements if the temperature limit is exceeded.

TepidGuard® is an anti-scald feature, standard on all SNA-Series Safety Shower Heaters. This overshoot purge will automatically open and purge excess temperature water. This feature actively monitors temperature within the heater while operational. It also passively monitors water temperature while the heater is inactive. This is beneficial for outdoor installations where sun and weather can cause water temperature to exceed ANSI standards.

Temperature Safety Values:
Internal thermostat with auto reset high limit switch: 95°F (35°C)
Surface mounted bi-metal thermostat with manual reset: 100°F (38°C)
Overshoot purge: 95°F (35°C)

Dual Flow Activation

Keltech Safety Shower heaters have a dual flow activation. The low flow activation is used with eyewashes, eye/face washes, and drench hoses. The high flow activation is for safety shower usage. This allows just the right capacity of heated water to be used for each application.

Code Compliance and Certifications

Lead-Free

Products marked with the Lead-Free logo comply with the Safe Drinking Water Act (SDWA) requirements of a weighted average of less than 0.25% lead content on wetted surfaces of pipes, pipe fittings, plumbing fittings, and fixtures.

ETL listed to UL499
ETL listed to UL 50E
ETL listed to NFPA 496, 2013 Edition (Requires EXP2 Option)
cETL listed to CSA-C22.2 No. 88

Standard product selections contained within this document are third party CERTIFIED to NSF/ANSI 372 meeting the Lead-Free content requirement. Any product configured with custom options will be COMPLIANT with NSF/ANSI 372 meeting the Lead-Free content requirement.

ASME Certification available. Keltech units 58kW (200,000 btu) and higher are the only electric tankless water heaters National Board certified with the HLW stamp (Requires HLW Option).

Protected by one or more of the following patents: 7,007,316 B2; 7,243,381 B2.

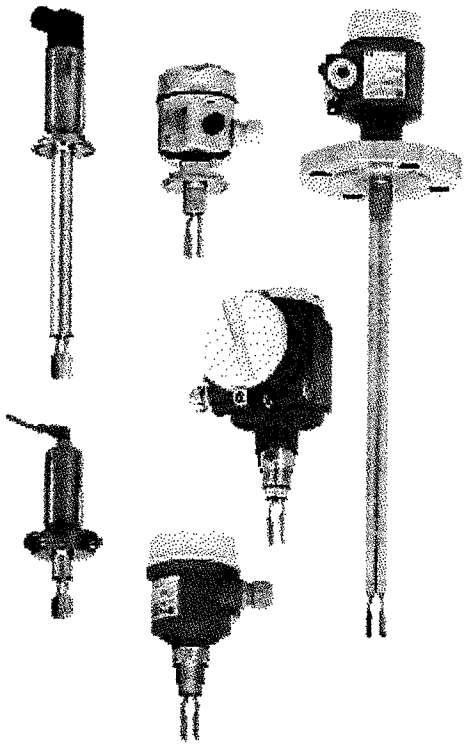
729 South Grove Street, Delton, Michigan 49046
Phone: 800-999-4320 Fax: 269-623-6398
www.keltech-inc.com

Level | Pressure | Flow | Temperature | Liquid Analysis | Registration | Systems Components | Services | Solutions

Technical Information

Liquiphant M FTL50(H), FTL51(H)

Vibration Limit Switch
Level limit switch for all liquids.
Suitable for use in hazardous areas, food and pharmaceuticals



Application
The Liquiphant M is a level limit switch for use in all liquids
- for process temperatures of –50 °C to 150 °C
- for pressures up to 100 bar
- for viscosity up to 10000 mm^2/s
- for densities 0.5 g/cm^3 or 0.7 g/cm^3 other settings available on request
- foam detection on request

The function is not affected by flow, turbulence, bubbles, foam, vibration, bulk solids content or build-up.
The Liquiphant is thus the ideal substitute for float switches.

FTL50:
Compact design, ideal for mounting in pipes and for installation in areas difficult to access

FTL51:
With extension pipe up to 3 m
(6 m on request)

FTL50H, FTL51H:
With polished tuning fork and easy-to-clean process connections and housings for food and pharmaceutical applications.

High corrosion-resistant AlloyC4 (2.4610) is available for the fork and process connections for applications in very aggressive liquids.

EEx ia, EEx de and EEx d protection enable it to be used in hazardous areas.

Your benefits
- Use in safety systems requiring functional safety to SIL2/SIL3 in accordance with IEC 61508/ IEC 61511-1
- Large number of process connections to choose from: universal usage
- Wide variety of electronics, e.g. NAMUR, relay, thyristor, PFM signal output: the right connection for every process control system
- PROFIBUS PA protocol: for commissioning and maintenance
- No calibration: quick, low-cost start-up
- No mechanically moving parts: no maintenance, no wear, long operating life
- Monitoring of fork for damage: guaranteed function
- FDA approved materials (PFA Edlon)

Endress+Hauser
People for Process Automation

FLT93® Series Features

- **Dual trip points and relays**
- **SIL 2 rated, ultra reliable**
- **3 year warranty**
- **Ex agency approvals on complete instrument** – FM, CSA, ATEX, IECEx and more
- **Small lines to largest diameter pipes**
- **Designed for rugged, industrial installations**
- **Apply in fluids to 850 °F [454 °C]**
- **No moving parts to foul, clog or maintain**
- **All welded elements**
- **Easy to install and set-up**
- **Highly sensitive and accurate**
- **Threaded, flanged, packing gland installation**
- **Integral or remote mounted electronics with choice of enclosures**
- **Field selectable AC and DC power**

The FLT93 Series with FlexSwitch Technology

FCI's FLT93 Series are the most popularly installed heavy duty thermal dispersion flow and level switches in the world. The reasons are simple; FLT93s were developed from more than 40 years of flow and level switch engineering and application experience to deliver the most reliable, repeatable, rugged and longest life industrial grade switch products found anywhere.

FLT93s are found in continuous operation in the most demanding and critical process and plant applications. You will find FLT93 the most preferred solution in oil and gas upstream and downstream applications; wastewater treatment; chemical operations; power plants, including nuclear power; food and beverage; refineries; mining; metals; manufacturing and more. Whether your application is for flow, level, flow + temperature or level + temperature, there is an FLT93 configuration to meet your needs.

Standardization

This sensing and switching breakthrough is achieved in the FLT93 Series switches by combining a new, highly accurate, all-welded sensing element with an advanced, user-friendly FlexSwitch control circuit.

Sensing Element. Two standard sensing element configurations are available to meet your most demanding application requirements. The FLT93 S is designed for use in standard heavy industrial applications and in applications with high velocity liquid setpoint requirements; the FLT93 F is designed for fast response gas applications. Both sensing elements can be supplied in either standard (-40 °F to 350 °F [-40 °C to 177 °C]) or medium (-100 °F to 500 °F [-73 °C to 260 °C]) temperature configurations. The FLT93 S is also available in a high temperature (-100 °F to 850 °F [-73 °C to 454 °C]) configuration.

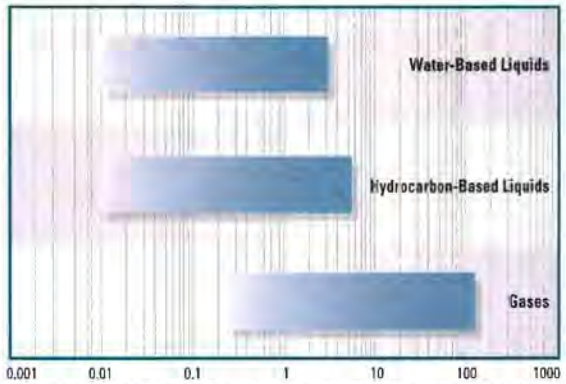
Control Circuit. One standardized, field-configurable FlexSwitch control circuit satisfies virtually any combination of application requirements. The FlexSwitch technology can be packaged to meet most integral or remote configurations.

Precise Performance Accuracy

Leveraged from FCI's field-proven thermal dispersion experience, the unique sensor technology of the FLT93 Series switches, combined with FlexSwitch temperature compensation circuitry, introduces unparalleled performance capabilities:

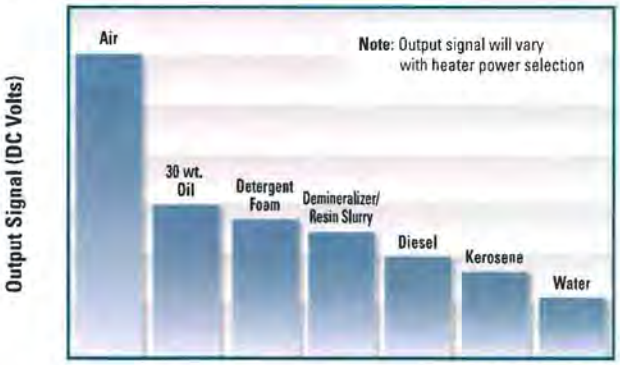
- Exclusive flow accuracy as precise as ±2% of the setpoint velocity over a ±50 °F [± 28 °C] temperature range; repeatability of ±0.5% reading
- Level resolution of ±0.1 inch [±2.5 mm]; repeatability of ±0.05 inch [±1.3 mm]
- Standard temperature accuracy ±2.0 °F [± 1 °C]; repeatability ± 1.0 °F [±0.6 °C]; improved temperature accuracy is available with factory calibration

Flow Ranges for FLT93 S, FLT93 F, FLT93 C



For meters per second, multiply by 0.3048

Typical Level and Interface Output Signals



Case No. 2015-00169
Exhibit A

NORTHERN KENTUCKY WATER DISTRICT

Project
Dudley Complex Sodium Hypochlorite Building

Kenton County
184-0485

Engineer's Opinion Of Probable Construction Cost

GRW Engineers, Inc.	Project:	Dudley Complex Sodium Hypochlorite Building		
	Owner:	Northern Kentucky Water District		
	Project No.:	4325		
Opinion of Project Cost	Date:	05/15/15	Dwg. No.:	All
	Estimator:	AAB/KAZ/DG/WR/ DH/JMT/ADH	Type:	Final Design

Item Description	No. of Units	Units of Measure	Unit Cost	Total Cost
****Sodium Hypochlorite Building**				
Div. 02 - Existing Conditions				
Existing Chemical Feed Building Demolition	1	LSUM	$ 30,000.00	$ 30,000.00
Div. 03 - Concrete				
Concrete Footings	8	CY	$ 500.00	$ 4,100.00
Concrete Foundation Walls (formed)	14	CY	$ 950.00	$ 13,186.00
Concrete Slab - 12"(T)	16	CY	$ 500.00	$ 8,175.00
Concrete Injection Vault	1	EA	$ 4,000.00	$ 4,000.00
Wall Coring(s)	1	LSUM	$ 1,500.00	$ 1,500.00
Concrete Entrance Pad	2	CY	$ 500.00	$ 1,000.00
Concrete Equipment Pads	2	CY	$ 500.00	$ 1,000.00
Div. 04 - Masonry				
4" Brick Veneer (running bond), 1 1/2" Rigid Insulation, Vapor Barrier, 8" CMU, Masonry Anchors	814	SF	$ 32.50	$ 26,455.00
4" Brick Veneer (soldier coarse), 1 1/2" Rigid Insulation, Vapor Barrier, 8" CMU, Masonry Anchors	83	LF	$ 39.00	$ 3,237.00
4" Split-Face CMU Veneer (running bond), 1 1/2" Rigid Insulation, Vapor Barrier, 8" CMU, Masonry Anchors	155	SF	$ 28.50	$ 4,417.50
Masonry Bond Beams	1	LSUM	$ 2,500.00	$ 2,500.00
Div 05 - Metals				
Steel Beam @ Overhead Door	1	LSUM	$ 500.00	$ 500.00
Steel Lintel @ Manway Door	1	LSUM	$ 500.00	$ 500.00
Steel Lintel @ HVAC Opening	1	LSUM	$ 500.00	$ 500.00
Pipe Bollards	2	EA	$ 800.00	$ 1,600.00
Misc. Anchors / Ties	1	LSUM	$ 450.00	$ 450.00
Div. 06 - Wood, Plastics, and Composites				
Rough Carpentry	1	LSUM	$ 500.00	$ 500.00
2x Rafters and Joists	1	LSUM	$ 2,200.00	$ 2,200.00
Sheathing (not included under Div. 04)	828	SF	$ 2.00	$ 1,656.00
FRP Grating w/ Supports	1	LSUM	$ 1,750.00	$ 1,750.00
FRP Pump Stand	1	LSUM	$ 500.00	$ 500.00
FRP Stairs	1	LSUM	$ 1,000.00	$ 1,000.00
FRP Handrail System w/ Cont. Kickplate	24	LF	$ 115.00	$ 2,760.00

GRW Engineers, Inc.	Project:	Dudley Complex Sodium Hypochlorite Building		
	Owner:	Northern Kentucky Water District		
	Project No.:	4325		
Opinion of Project Cost	Date:	05/15/15	Dwg. No.:	All
	Estimator:	AAB/KAZ/DG/WR/ DH/JMT/ADH	Type:	Final Design

Item Description	No. of Units	Units of Measure	Unit Cost	Total Cost
Div. 07 - Thermal and Moisture Protection				
Bituminous Damproofing	190	SF	$ 2.00	$ 380.00
Foundation Insulation	190	SF	$ 2.50	$ 475.00
Thermal Insulation (not included in Div. 04)	547	SF	$ 1.50	$ 820.50
Weather Barriers / Self-adheared Ice Shield	828	SF	$ 2.50	$ 2,070.00
Prefinished Machine-seamed Metal Roof Panel	828	SF	$ 8.50	$ 7,038.00
Prefinished Metal Hip / Ridge Roof Panels	56	LF	$ 9.50	$ 532.00
Sheet metal flashing and trim	95	LF	$ 12.00	$ 1,140.00
Prefinished vented soffit & support framing	205	SF	$ 7.50	$ 1,537.50
Misc. Roof Venting	1	LSUM	$ 1,000.00	$ 1,000.00
Joint Sealants	1	LSUM	$ 350.00	$ 350.00
Aluminum S-rail Snow Guards	84	LF	$ 30.00	$ 2,520.00
8"x8"x4" Glass Block	19	EA	$ 33.50	$ 636.50
Div. 08 - Openings				
3'-0" x 7'-0" FRP Door and Frame	1	EA	$ 3,250.00	$ 3,250.00
10'-0" x 12'-0" Prefinished Insulated Overhead Coiling Door (manual)	1	EA	$ 3,500.00	$ 3,500.00
Prefinished Fixed Louver (12"x12")	1	EA	$ 250.00	$ 250.00
Div. 09 - Finishes				
Paint - Walls	1,200	SF	$ 3.50	$ 4,200.00
Paint - Containment Area Floor and Walls	700	SF	$ 8.00	$ 5,600.00
Paint - Ceiling	602	SF	$ 4.25	$ 2,558.50
Div. 10 - Specialties				
Interior Room Signage	1	LSUM	$ 250.00	$ 250.00
Wall-mounted fire extinguisher w/ wall bracket	1	EA	$ 100.00	$ 100.00
36" x 36" Aluminum Access Hatch	1	EA	$ 3,500.00	$ 3,500.00
Div. 22 - Plumbing				
Mobilization, SDs, Closeout, etc.	1	LSUM	$ 3,000.00	$ 3,000.00
Identification	1	LSUM	$ 200.00	$ 200.00
Reduced Pressure Backflow Assembly	1	EA	$ 2,250.00	$ 2,250.00
Instantaneous Electric Water Heater	1	EA	$ 24,900.00	$ 24,900.00
Copper Piping	1	LSUM	$ 450.00	$ 450.00
Emergency Shower/Eyewash	1	EA	$ 2,500.00	$ 2,500.00
Controls	1	EA	$ 1,000.00	$ 1,000.00
Hose Bibb (Indoor & Outdoor)	2	EA	$ 250.00	$ 500.00
Meter Assembly	1	EA	$ 1,250.00	$ 1,250.00

GRW Engineers, Inc.	Project:	Dudley Complex Sodium Hypochlorite Building		
	Owner:	Northern Kentucky Water District		
	Project No.:	4325		
Opinion of Project Cost	Date:	05/15/15	Dwg. No.:	All
	Estimator:	AAB/KAZ/DG/WR/ DH/JMT/ADH	Type:	Final Design

Item Description	No. of Units	Units of Measure	Unit Cost	Total Cost
Div. 23 - HVAC				
Mobilization, SDs, Closeout, etc.	1	LSUM	$ 3,000.00	$ 3,000.00
Identification	1	LSUM	$ 200.00	$ 200.00
Ductwork & Air Devices	1	EA	$ 1,450.00	$ 1,450.00
Heat Pump, Bard Unit with Special Coating	1	EA	$ 10,700.00	$ 10,700.00
Controls	1	EA	$ 1,000.00	$ 1,000.00
Testing, Adjusting and Balancing	1	LSUM	$ 450.00	$ 450.00
Div. 26 - Electrical				
Lighting Interior	1	LSUM	$ 4,320.00	$ 4,320.00
Lighting Exterior	1	LSUM	$ 2,000.00	$ 2,000.00
Conduit - 3/4" Schedule 80 PVC (Lighting)	130	LF	$ 6.25	$ 812.50
Conduit - 3/4" Schedule 80 PVC (Power/Signal)	750	LF	$ 6.25	$ 4,687.50
Conduit - 1" Schedule 80 PVC (Power/Signal)	500	LF	$ 8.00	$ 4,000.00
Conduit - 1" RGS	25	LF	$ 14.45	$ 361.25
Conduit - 2" RGS	50	LF	$ 23.50	$ 1,175.00
Conductors - #12 AWG	25,500	LF	$ 0.76	$ 19,380.00
#16 STP Signal Wiring	4,250	LF	$ 0.96	$ 4,080.00
Security System Cabling	750	LF	$ 0.96	$ 720.00
Trenching/Backfill	250	LF	$ 5.00	$ 1,250.00
Pullbox	5	EACH	$ 500.00	$ 2,500.00
Underground Conduit/Concrete Encasement	250	LF	$ 35.00	$ 8,750.00
Lightning Protection	1	LSUM	$ 4,100.00	$ 4,100.00
Chemical Transfer Control Panel	1	LSUM	$ 7,500.00	$ 7,500.00
Sodium Hypo High Level Alarm Control Panel	1	LSUM	$ 6,500.00	$ 6,500.00
Service Entrance Conductors	800	LF	$ 5.70	$ 4,560.00
New 150A Breaker - MCC No.2	1	LSUM	$ 2,000.00	$ 2,000.00
Panelboard - 480/277V	1	EACH	$ 10,000.00	$ 10,000.00
Panelboard - 120/240V	1	EACH	$ 4,000.00	$ 4,000.00
Transformer	1	EACH	$ 2,975.00	$ 2,975.00
NEMA 4X Disconnect Switch	1	EACH	$ 5,100.00	$ 5,100.00
Surge Protection Device	2	EACH	$ 1,750.00	$ 3,500.00
Security System Modifications	1	LSUM	$ 2,500.00	$ 2,500.00
Chemical Metering Pump Control Panel	1	LSUM	$ 9,000.00	$ 9,000.00
Bulk Tank Level Status Control Panel	1	LSUM	$ 6,500.00	$ 6,500.00
Process Controllers	4	EACH	$ 1,750.00	$ 7,000.00
Receptacles - Weatherproof, GFI	7	EACH	$ 251.00	$ 1,757.00

GRW Engineers, Inc.	Project:	Dudley Complex Sodium Hypochlorite Building		
	Owner:	Northern Kentucky Water District		
	Project No.:	4325		
Opinion of Project Cost	Date:	05/15/15	Dwg. No.:	All
	Estimator:	AAB/KAZ/DG/WR/ DH/JMT/ADH	Type:	Final Design

Item Description	No. of Units	Units of Measure	Unit Cost	Total Cost
Div. 31 - Earthwork				
Erosion Control	1	LSUM	$ 1,500.00	$ 1,500.00
Foundation Excavation (150 CY)	1	LSUM	$ 5,000.00	$ 5,000.00
Crushed Stone Backfill (50 CY)	1	LSUM	$ 2,500.00	$ 2,500.00
Soil for Backfill & Grading	1	LSUM	$ 5,000.00	$ 5,000.00
Concrete Mud Mat	15	CY	$ 200.00	$ 3,000.00
Hydro-Excavate or Hand Dig at 1040 Chem. Feed MH	1	LSUM	$ 4,000.00	$ 4,000.00
Div. 32 - Exterior Improvements				
Site Restoration	1	LSUM	$ 2,500.00	$ 2,500.00
Asphalt Paving	1	LSUM	$ 1,000.00	$ 1,000.00
Security Fencing	250	LF	$ 50.00	$ 12,500.00
Concrete Below Fencing Fabric	8	CY	$ 500.00	$ 4,243.83
Div. 33 - Instrumentation				
Instrumentation, SCADA, Controls & Programming	1	LSUM	$ 40,000.00	$ 40,000.00
Modifications to Existing Dudley 1040 PLC	1	LSUM	$ 15,000.00	$ 15,000.00
Instruments (Radar Level, pH probe, etc.) incl/surge arr.	1	LSUM	$ 37,500.00	$ 37,500.00
Factory Acceptance Testing	1	LSUM	$ 8,000.00	$ 8,000.00
Remote Indicators for Radar Level and pH	4	EACH	$ 2,250.00	$ 9,000.00
Div. 43 - Chemical Storage Tanks				
3,000 Gal. Bulk Storage Tank - HDXLPE	1	EA	$ 12,000.00	$ 12,000.00
200 Gal. Day Storage Tank - HDXLPE	2	EA	$ 2,500.00	$ 5,000.00
Accessories & Fittings - Ladder, Level Gauge, Flg. Etc..	1	LSUM	$ 4,000.00	$ 4,000.00
Div. 46 - Water and Wastewater Equipment				
6-inch DI Water Main (PE Wrapped)	20	LF	$ 50.00	$ 1,000.00
Buried PVC Conduit	400	LF	$ 25.00	$ 10,000.00
Fire Hydrant (Relocation)	1	LSUM	$ 500.00	$ 500.00
1-1/4" Copper Service Line	60	LF	$ 15.00	$ 900.00
Setting New Water Meter	1	LSUM	$ 500.00	$ 500.00
Chemical Feed Tubing Pull Boxes	1	LSUM	$ 1,000.00	$ 1,000.00
Centrifugal Chemical Transfer Pumps	2	EA	$ 1,500.00	$ 3,000.00
Peristaltic Chemical Metering Pumps	4	EA	$ 9,000.00	$ 36,000.00
Sch 80 PVC Piping (Interior)	400	LF	$ 15.00	$ 6,000.00
Flexible PVC Chemical Feed Tubing	800	LF	$ 5.00	$ 4,000.00
Calibration Column, Injection Tube, Pressure Relief	2	LSUM	$ 3,000.00	$ 6,000.00
PVC Ball Valves	1	LSUM	$ 2,500.00	$ 2,500.00
Misc. Appurtenences (Cam-locks, check valves, etc.)	1	LSUM	$ 4,000.00	$ 4,000.00
Rodgers Road Paving Allowance	1	LSUM	$ 30,000.00	$ 30,000.00

GRW Engineers, Inc.	Project:	Dudley Complex Sodium Hypochlorite Building		
	Owner:	Northern Kentucky Water District		
	Project No.:	4325		
Opinion of Project Cost	Date:	05/15/15	Dwg. No.:	All
	Estimator:	AAB/KAZ/DG/WR/ DH/JMT/ADH	Type:	Final Design

Item Description	No. of Units	Units of Measure	Unit Cost	Total Cost
Sub-Total				$ 616,216.58
Contingency (5%)				$ 30,810.00
Sub-Total				$ 647,026.58
Bonding & Insurance (2%)				$ 12,950.00
Division 1/General Conditions (4%)				$ 25,890.00
Contractor Overhead & Profit (15%)				$ 102,880.00
			TOTAL, Rounded	$ 789,000.00
Engineering Services (Design, Admin, CA)				$ 99,704.00
			TOTAL CONSTRUCTION	$ 888,704.00

Case No. 2015-00169
Exhibit ___A____

NORTHERN KENTUCKY WATER DISTRICT

Project
Dudley Complex Sodium Hypochlorite Building

Kenton County
184-0485

Plans and Specifications prepared by GRW titled "Dudley Complex Sodium Hypochlorite Building"

Northern Kentucky
Water District

The following items are enclosed separately from this volume in hard copy and enclosed in this submittal in electronic copy.

- Plans prepared by GRW titled "Dudley Complex Sodium Hypochlorite Building" dated May 2015

- Specifications prepared by GRW titled "Dudley Complex Sodium Hypochlorite Building" dated May 2015

2835 Crescent Springs Rd Erlanger, KY 41018 (859) 578-9898 Fax (859) 578-5456

Case No. 2015-00169
Exhibit B

NORTHERN KENTUCKY WATER DISTRICT

Project
Dudley Complex Sodium Hypochlorite Building

Kenton County
184-0485

CERTIFIED STATEMENTS

Affidavit

Franchises

Plan Review and Permit Status

Easements and Right-of-Way Status

Construction Dates and Proposed Date In Service

Plant Retirements

AFFIDAVIT
Dudley Complex Sodium Hypochlorite Building

Affiant, Jack Bragg, Jr., being the first duly sworn, deposes and says that he is the Vice President of Finance and Support Services of the Northern Kentucky Water District, which he is the Applicant in the proceeding styled above; that he has read the foregoing "Dudley Complex Sodium Hypochlorite Building" Application and knows the contents thereof, and that the same is true of his own knowledge, except as to matters which are therein stated on information or belief, and that is to those matters he believes them to be true.

Jack Bragg, Jr.
Vice President, Finance & Support Services
Northern Kentucky Water District

Subscribed and sworn to before me in said County to be his act and deed by Jack Bragg, Jr., Vice President of Finance and Support Services of the Northern Kentucky Water District, this

27th day of May 2015.

John A. Scheben, Jr.
Notary Public, ID No. 532791
State at Large, Kentucky
My Commission Expires on May 13, 2019

NOTARY PUBLIC
Kenton County, Kentucky
My commission expires May 13, 2019

Northern Kentucky
Water District

Franchises required – None

Plan Review and Permit Status - The District has reviewed and approved the plans and specifications prepared by GRW titled "Dudley Complex Sodium Hypochlorite Building" dated May 2015.

The District received technical approval from the Division of Water on April 9, 2015 (see attached letter).

Easements and Right-of-Way Status - Easement and Right-of-Way statements are not required.

Start date of construction – August 2015

Proposed date in service – May 2016

Plant retirements – There are no retirements as a result of this project.

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PLAN REVIEW AND PERMIT STATUS

Approval Letter from Kentucky Division of Water

184-485
Scan/file in permits

STEVEN L. BESHEAR
GOVERNOR

LEONARD K. PETERS
SECRETARY

ENERGY AND ENVIRONMENT CABINET
DEPARTMENT FOR ENVIRONMENTAL PROTECTION
DIVISION OF WATER
200 FAIR OAKS LANE, 4TH FLOOR
FRANKFORT, KENTUCKY 40601
www.kentucky.gov

April 9, 2015

Ms. Amy Kramer
Northern KY Water District
2835 Crescent Springs Rd
Erlanger, KY 41018

RE: Northern KY Water District
AI#: 2485, APE20150004
PWSID # 0590220-15-004
Dudley Complex Sodium Hypochlorite Building
Kenton County, KY

Dear Ms. Kramer:

We have received the Plans and Specifications for the above referenced project. The project consists of installation replacement of the existing sodium hypochlorite storage and feed building with a new building for liquid sodium hypochlorite storage containing a 3,000 gallon tank, two chemical transfer pumps, two day storage tanks, four chemical metering pumps, and spill containment.

This is to advise that plans and specifications covering the above referenced subject are APPROVED with respect to sanitary features of design as of this date with the following stipulations:

a. Sodium hypochlorite shall be stored bulk liquid storage tanks approved for sodium hypochlorite storage.
b. Storage containers or tanks shall be located out of the sunlight in a cool area and shall be vented to the outside of the building. Bulk tanks and day tanks shall not use common vent lines.
c. Sodium hypochlorite shall be pumped undiluted to the point of addition. De-ionized or softened water should be used if dilution is unavoidable.
d. Positive displacement pumps with sodium hypochlorite compatible materials for wetted surfaces shall be used.
e. Calibration tubes or mass flow monitors which allow for direct physical checking of actual feed rates shall be provided.
f. Injectors shall be made removable for regular cleaning where hard water is to be treated.
g. At least 30 days of chemical supply shall be available to this facility.
h. Storage tanks and piping for liquid chemicals shall be specified for use with individual chemicals and not used for different chemicals.

i. Offloading areas shall be clearly labeled to prevent accidental cross-contamination.
k. Liquid chemical storage tanks shall have a liquid level indicator, and have an overflow and a receiving basin capable of receiving accidental spills or over flows without uncontrolled discharge; a common receiving basin may be provided for each group of compatible chemicals that provides sufficient containment volume to prevent accidental discharge in the event of failure of the largest tank.
l. Each liquid storage tank shall be provided with a valved drain, and be protected against cross-connections

When this project is completed, the owner shall submit a written certification to the Division of Water that the above referenced water supply facilities have been constructed and tested in accordance with the approved plans and specifications and the above stipulations. Such a certification shall be signed by a licensed professional engineer.

This approval has been issued under the provisions of KRS Chapter 224 and regulations promulgated pursuant thereto. Issuance of this approval does not relieve the applicant from the responsibility of obtaining any other permits or licenses required by this Cabinet and other state, federal and local agencies.

Unless construction on this project commences within two years from the date of this approval letter, Northern Kentucky Water District shall re-submit the original plans and specifications for a new comprehensive review.

If you have any questions concerning this project, please contact Mr. Abbas Pourghasemi at 502-564-3410 extension 4833.

Sincerely,

Mark Rasche

Mark Rasche, P.E.
Supervisor, Engineering Section
Water Infrastructure Branch
Division of Water

MR:AP
Enclosures
C: GRW Engineers, Inc.
Northern Kentucky District Health Department (by e-mail only)
Public Service Commission (by e-mail only)
Division of Plumbing (by e-mail only)

PORT0000000245 (Dudley Complex Sodium Hypochlorite Building) A pump station with two pumps each up to 38 GPM and 16.7 feet TDH and 20 LF of 1.5-inch PVC FM:

Narrative Requirements:

Condition No.	Condition
T-1	Construction of this project shall not result in the water system's inability to supply consistent water service in compliance with 401 KAR 8:010 through 8:600. [401 KAR 8:100 Section 5]
T-2	The public water system shall not implement a change to the approved plans without the prior written approval of the cabinet. [401 KAR 8:100 Section 4(3)]
T-3	A proposed change to the approved plans affecting sanitary features of design shall be submitted to the cabinet for approval in accordance with Section 2 of this administrative regulation. [401 KAR 8:100 Section 4(2)]
T-4	During construction, a set of approved plans and specifications shall be available at the job site. Construction shall be performed in accordance with the approved plans and specifications. [401 KAR 8:100 Section 3(1)]
T-5	Unless construction begins within two (2) years from the date of approval of the final plans and specifications, the approval shall expire. [401 KAR 8:100 Section 3(3)]
T-6	Upon completion of construction, a professional engineer shall certify in writing that the project has been completed in accordance with the approved plans and specifications. [401 KAR 8:100 Section 4(1)]
T-7	The system shall be designed to maintain a minimum pressure of 20 psi at ground level at all points in the distribution system under all conditions of flow. [Recommended Standards for Water Works 8.2.1, Drinking Water General Design Criteria IV.1.a]
T-8	Pumping facilities shall be elevated to a minimum of three feet above the 100?year flood elevation, or three feet above the highest recorded flood elevation, whichever is higher, or protected to such elevations, [Recommended Standards for Water Works 6.1.1.a]
T-9	Pumping facilities shall be readily accessible at all times. [Recommended Standards for Water Works 6.1.1.b]
T-10	Pumping facilities shall be graded around the station so as to lead surface drainage away from the station. [Recommended Standards for Water Works 6.1.1.c]
T-11	Pumping facilities shall be protected to prevent vandalism and entrance by animals or unauthorized persons. [Recommended Standards for Water Works 6.1.1.d]

PORT0000000245 (continued):

Narrative Requirements:

Condition No.	Condition
T-12	Raw and finished pump stations shall have adequate space for the installation of additional units if needed, and for the safe servicing of all equipment. [Recommended Standards for Water Works 6.2.a]
T-13	Raw and finished pump stations shall have floors that slope to a suitable drain. [Recommended Standards for Water Works 6.2.e]
T-14	Raw and finished pump stations shall provide a suitable outlet for drainage from pump glands without discharging onto the floor. [Recommended Standards for Water Works 6.2.f]
T-15	At least two pumping units shall be provided. With any pump out of service, the remaining pump or pumps shall be capable of providing the maximum pumping demand of the system. [Recommended Standards for Water Works 6.3]
T-16	Pumps shall have ample capacity to supply the peak demand against the required distribution system pressure without dangerous overloading, [Recommended Standards for Water Works 6.3.a]
T-17	Pumps shall be driven by prime movers able to meet the maximum horsepower condition of the pumps. [Recommended Standards for Water Works 6.3.b]
T-18	Pumps shall be provided with readily available spare parts and tools. [Recommended Standards for Water Works 6.3.c]
T-19	Pump stations shall have indicating, totalizing, and recording metering of the total water pumped. [Recommended Standards for Water Works 6.6.3]
T-20	Each pump shall have a standard pressure gauge on its discharge line. [Recommended Standards for Water Works 6.6.3.a]
T-21	Each pump shall have a compound gauge on its suction line. [Recommended Standards for Water Works 6.6.3.b]
T-22	Where two or more pumps are installed, provision shall be made for alternation. [Recommended Standards for Water Works 6.6.5]
T-23	Provisions shall be made to prevent energizing the pump motor in the event of a backspin cycle. [Recommended Standards for Water Works 6.6.5]
T-24	Electrical controls shall be located above grade. [Recommended Standards for Water Works 6.6.5]

PORT0000000245 (continued):

Narrative Requirements:

Condition No.	Condition
T-25	Equipment shall be provided or other arrangements made to prevent surge pressures from activating controls which switch on pumps or activate other equipment outside the normal design cycle of operation. [Recommended Standards for Water Works 6.6.5]
T-26	Pump stations shall have a power supply provided from at least two independent sources or a standby or an auxiliary source. [Recommended Standards for Water Works 6.6.6]
T-27	If standby power is provided by onsite generators or engines, the fuel storage and fuel line must be designed to protect the water supply from contamination. [Recommended Standards for Water Works 6.6.6]
T-28	All lubricants which come into contact with the potable water shall be certified for conformance to ANSI/NSF Standard 60. [Recommended Standards for Water Works 6.6.8]
T-29	Booster pumps stations shall have a bypass available. [Recommended Standards for Water Works 6.4.e]
T-30	Each booster pumping station shall contain not less than two pumps with capacities such that peak demand can be satisfied with the largest pump out of service. [Recommended Standards for Water Works 6.4.1]
T-31	All booster pumping stations shall be fitted with a flow rate indicating and totalizer meter. [Recommended Standards for Water Works 6.4.2]
T-32	Inline booster pumps shall be accessible for servicing and repairs. [Recommended Standards for Water Works 6.4.3]
T-33	Each pump must have an isolation valve on the intake and discharge side of the pump to permit satisfactory operation, maintenance and repair of the equipment. [Recommended Standards for Water Works 6.6.1]
T-34	Each pump shall have a positive?acting check valve on the discharge side between the pump and the shut?off valve. [Recommended Standards for Water Works 6.6.1]
T-35	Pump station piping shall be designed so that the friction losses will be minimized, not be subject to contamination, have watertight joints, be protected against surge or water hammer with suitable restraints when necessary, and be such that each pump has an individual suction line or the lines shall be manifolded that they will insure similar hydraulic and operating conditions. [Recommended Standards for Water Works 6.6.2]

PORT0000000245 (continued):

Narrative Requirements:

Condition No.	Condition
T-36	Booster pumps taking suction from storage tanks shall be provided adequate net positive suction head. [Recommended Standards for Water Works 6.4.b]
T-37	Booster pumps shall controlled so that automatic shutoff or low pressure controllers maintain at least 20 psi in the suction line under all operating conditions. [Recommended Standards for Water Works 6.4.c]
T-38	Booster pumps taking suction from ground storage tanks shall be equipped with automatic shutoffs or low pressure controllers. [Recommended Standards for Water Works 6.4.c]
T-39	All automatic pump stations should be provided with automatic signaling apparatus which will report when the station is out of service. [Recommended Standards for Water Works 6.5]
T-40	All remote controlled stations shall be electrically operated and controlled and shall have signaling apparatus of proven performance. [Recommended Standards for Water Works 6.5]
T-41	Raw and finished pump stations shall have a floor elevation of at least six inches above finished grade. [Recommended Standards for Water Works 6.2.c]

Case No. 2015-00169
Exhibit C

NORTHERN KENTUCKY WATER DISTRICT

Project
Dudley Complex Sodium Hypochlorite Building

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184-0485

BID INFORMATION AND BOARD RESOLUTION

Bid Tabulation

Engineer's Recommendation of Award

Board Resolution

Case No. 2015-00169
Exhibit C

NORTHERN KENTUCKY WATER DISTRICT

Project
Dudley Complex Sodium Hypochlorite Building

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Bid Tabulation

BID TAB

Northern Kentucky Water District
Dudley Complex
Sodium Hypochlorite Building

April 30, 2015

CONTRACTOR	BID AMOUNT
EGC Construction Corp.	$875,861.00
Empire Building Co.	$993,000.00
Building Crafts, Inc.	$1,033,000.00
DER Development Co.	bid withdrawn

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NORTHERN KENTUCKY WATER DISTRICT

Project
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Kenton County
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Engineer's Recommendation of Award

GRW | engineers | architects | planners
9710 Bunsen Parkway • Louisville, KY 40299
502.489.8484 • www.grwinc.com

May 15, 2015

Amy Kramer, P.E.
Acting V.P., Engineering, Production
and Distribution
Northern Kentucky Water District
2835 Crescent Springs Road
P.O. Box 18640
Erlanger, KY 41018

Re: Dudley Complex Sodium
Hypochlorite Building
Edgewood, KY
GRW Project No. 4325
Recommendation Letter

Dear Ms. Kramer

As you are aware, construction bids for the referenced project were received on Thursday, April 30, 2015. The bid results are as follows:

Contractor	Total Bid Price
DER Development Company, LLC	$738,900.00
EGC Construction Corporation	$875,861.00
Empire Building Company, LLC	$993,000.00
Building Crafts, Inc.	$1,033,000.00

DER Development Company, LLC was the apparent low bidder for the project at the time of the bid opening. However, soon after the bids were opened, DER submitted a letter to GRW to withdraw their bid due to a mathematical error. EGC Construction Corporation was then determined to be the lowest responsive and responsible bidder for the above referenced project.

EGC Construction Corporation is a privately owned construction company that has continuously operated since December 1978. They are located in Newport, Kentucky. GRW contacted some of the references provided by EGC Construction in their bid package. The following is a brief summary of these discussions.

Project References:

- EGC Construction listed Hixon Architecture / Engineering / Interiors as a project reference. Mr. Steve Schulte of Hixon indicated that Hixon has worked with EGC on multiple projects in the past. He added that the projects were industrial wastewater treatment type projects in the $1,500,000 to $2,000,000 dollar range. Mr. Schulte indicated that there have not been any problems with any of EGC's projects and that he has in general been satisfied with the Contractor's work. He added that he had no complaints about EGC's project supervision and that the projects have gone fairly smoothly. Mr. Schulte concluded that Hixon would recommend to clients to invite EGC Construction to bid on any of their future projects.

- EGC Construction also listed HAL-PE Associates Engineering Services Inc. as a project reference. Dean Gosney with HAL-PE indicated that HAL-PE has worked with EGC on a number of projects for 12 years or more. He stated that the projects were mostly design-build type projects for various purposes such as school house buildings, medical facilities, specialty laboratories, process pump stations for industrial and commercial applications, etc. Mr. Gosney indicated that EGC uses a core set of mechanical and electrical subcontractors that they trust and work with frequently. He added that EGC is a reputable company and would recommend them and work with them again in the future.

- EGC Construction also listed Process Plus Engineering + Architecture + Construction as a project reference. John Kaller with Process Plus indicated that Process Plus worked with EGC on a private chemical process project, which included process piping and pumping. The project was in the $900,000 range. He stated that there were not any problems with the Contractor and that EGC did a good job. Mr. Kaller felt that EGC is qualified to perform chemical process type of work. He added that Process Plus and chosen to partner with EGC on future projects, so he would recommend them and work with them again.

Supplier References:

- EGC Construction listed F.D. Lawrence as their supplier reference. Mr. Eric Relchert with F.D. Lawrence stated that EGC has been a customer of theirs for at least 20 years. Mr. Relchert indicated that he was not aware of any problems EGC has had with late payments or not paying as agreed. He stated that EGC has a $200,000 credit limit with F.D. Lawrence and they are well under that limit at this time. Mr. Relchert concluded that EGC Construction is a really good customer of F.D. Lawrence's.

Surety Reference:

- Travelers Casualty/USI Insurance was listed by EGC as their Surety reference. Ms. Paulette Aerni indicated that Travelers Casualty has been writing bonds for EGC for over 20 years and that EGC is an excellent client. Ms. Aerni indicated that the Contractor is well within their bonding capacity and that EGC should not have any problems handling the dollar amount of the job in question. She concluded that Travelers Casualty has not had any forfeitures or problems with any of EGC Construction's bonds.

Financial Reference:

- EGC Construction listed the Bank of Kentucky as their financial reference. Mr. Chris Haley of the Bank of Kentucky indicated EGC has been a customer of the Bank's for at least five years, since Mr. Haley has been handling their account. He added that EGC has been a customer longer than that however, for probably more like 25 years. He stated that EGC has absolutely maintained their accounts in good standing and that they are a great customer. Mr. Haley indicated that EGC has excellent credit and that the Bank has not had any problems with the Contractor paying as agreed. He added that EGC has a strong reputation in the Cincinnati market. Mr. Haley indicated that EGC should have no trouble with the dollar amount of this project.

Based upon the above research, it would appear that EGC Construction Corporation has a capable record of performance on similar projects. Based on the overall review of EGC's references, it is recommended that EGC Construction Corporation be awarded this project.

Regards,

Adalyn Haney

Adalyn Haney, P.E.
Project Engineer

cc: Dave Enzweiler, NKWD

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Exhibit C

NORTHERN KENTUCKY WATER DISTRICT

Project
Dudley Complex Sodium Hypochlorite Building

Kenton County
184-0485

Board Resolution

Northern Kentucky Water District
Board of Commissioners
Regular Meeting
May 21, 2015

A regular meeting of the Board of Commissioners of the Northern Kentucky Water District was held on May 21, 2015 at the District's facility located at 2835 Crescent Springs Road, Erlanger, Kentucky. All Commissioners were present, except for Commissioner Cunningham and Commissioner Spaulding. Also present were Jack Bragg, Dave Enzweiler, Matt Piccirillo, Steve Broering, Rusty Collinsworth, Brian Dunham, Marshall Dosker and Amy Kramer.

Chairperson Sommerkamp called the meeting to order at 12:30 p.m., and John Scheben led the pledge of allegiance.

The Commissioners reviewed correspondence received and articles published since the last board meeting, which was a Regular Meeting on April 16, 2015.

On motion of Commissioner Wagner, seconded by Commissioner Macke, the Commissioners unanimously approved the minutes for the Regular Board of Commissioners meeting held on April 16, 2015.

The Board was provided a copy of the District's check registers, which included the check number, check date, payee, check amount and description of the reason for each payment, detailing the District's expenditures for the period April 1, 2015 through April 30, 2015. On motion of Commissioner Collins, seconded by Commissioner Wagner, and after discussion, the Commissioners unanimously approved the expenditures of the District for the month of April, 2015.

On motion of Commissioner Macke, seconded by Commissioner Wagner, and after discussion that included comments from Marshall Dosker, as counsel to the property owner on which the main is located, the Commissioners unanimously approved the District's acceptance of the proposal by and the entering into an engineering services agreement with Viox & Viox, Inc. to design the 24-inch Cross-Country Water Main Replacement Project, and authorized staff to execute the appropriate documents.

On motion of Commissioner Collins, seconded by Commissioner Wagner, the Commissioners unanimously approved the District's acceptance of the proposed change of $27,121 from Century Construction, Inc. for the Memorial Parkway Treatment Plant Building Improvements Project with a total project budget of $1,150,000, and authorized staff to execute the appropriate contract documents.

On motion of Commissioner Collins, seconded by Commissioner Wagner, the Commissioners unanimously approved the District's acceptance of the bid by and awarding a

contract to EGC Construction Corporation for the Dudley Complex Sodium Hypochlorite Building Project with a total project budget of $1,060,000, and authorized staff to execute the appropriate documents.

On motion of Commissioner Wagner, seconded by Commissioner Collins, the Commissioners unanimously approved the District's acceptance of the proposal by and the entering into an engineering services agreement with Dixon Engineers to design the Rossford Tank Painting Project, and authorized staff to execute the appropriate documents.

On motion of Commissioner Wagner, seconded by Commissioner Collins, the Commissioners unanimously approved the District's acceptance of the bid by and awarding a contract to Univar USA, Inc. for the purchase of sodium hypochlorite, and authorized staff to execute the appropriate documents.

On motion of Commissioner Macke, seconded by Commissioner Wagner, the Commissioners unanimously approved the District's acceptance of the bid by and awarding a contract to various vendors highlighted on the bid tabulation for the purchase of Water Treatment Chemicals, and authorized staff to execute the appropriate documents.

On motion of Commissioner Collins, seconded by Commissioner Wagner, the Commissioners unanimously approved the District's acceptance of the bid by and awarding a contract to J.K. Meurer Corporation for the 2015 Asphalt Restoration Milling and Paving contract, and authorized staff to execute the appropriate documents.

On motion of Commissioner Wagner, seconded by Commissioner Macke, the Commissioners unanimously approved the District's acceptance of the bid by and awarding a contract to Hartman & Smith Construction Co., for the KY 8 (Four Mile to St. Anne) Water Main Replacement Project with a total project budget of $460,000, and authorized staff to execute the appropriate documents.

On motion of Commissioner Wagner, seconded by Commissioner Collins, the Commissioners unanimously approved the District's acceptance of the bid by and awarding a contract to Literature Fulfillment Services for generating and mailing billing statements, which contract includes three one-year extension options each exercisable at the District's discretion, and authorized staff to execute the appropriate documents.

On motion of Commissioner Wagner, seconded by Commissioner Collins, the Commissioners unanimously approved the District's purchase of the vehicles highlighted in the bid tabulation attached hereto and incorporated herein, and authorized staff to execute the appropriate documents.

The Commissioners reviewed the District's financial reports and Department reports. As part of her report, Ms. Kramer reviewed with the Commissioners the status of on-going projects within the 2014 5-Year Capital Budget and operating budget, including providing an update regarding a change order since the last board meeting.

Mr. Lovan advised the board of an upcoming meeting scheduled with AUS regarding joint bill processing options with Sanitation District No. 1.

Other matters of a general nature were discussed.

On a motion by Commissioner Collins, seconded by Commissioner Wagner, the meeting was adjourned at 2:22 p.m.

_____ _____

CHAIRMAN SECRETARY

0008168.0617439 4836-1304-0164v1

Case No. 2015-00169
Exhibit D

NORTHERN KENTUCKY WATER DISTRICT

Project
Dudley Complex Sodium Hypochlorite Building

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184-0485

PROJECT FINANCE INFORMATION

Customers Added and Revenue Effect

Debt Issuance and Source of Debt

Additional Costs for Operating and Maintenance

USoA Plant Account

Depreciation Cost and Debt Service After Construction

KIA Financing Documents

Customers Added and Revenue Effect: There will be zero new customers added and no revenue effect as a result of the Dudley Complex Sodium Hypochlorite Building project.

Debt Issuance and Source of Debt: This project will be paid from the District's Five-Year Capital Budget, PSC No. 209 "Annual General Facility R&R 2014 – Plants, Tanks, Pump Stations" with a budget of $1,060,000 which includes construction cost, engineering, and contingencies. A summary of the project costs is provided below:

o Design Engineering	$ 95,000
o Construction Engineering	$ 10,000
o Contractor's Bid	$ 875,861
o Misc. & Contingencies	$ 79,139
Total Project Cost	$1,060,000

The project will be funded using $1,060,000 from a future Bond Anticipation Note.

USoA Accounts: The anticipated amounts for the project cost of $1,060,000 will fall under the following Uniform System of Accounts Codes:

Code 304 "Structures and Improvements"	$875,000
Code 320 "Water Treatment Equipment"	$185,000

Additional Costs and O&M: Additional operating and maintenance costs incurred for the project are as follows:

Power	$ 0
Labor	$ 0
Maintenance	$18,000 (2% of construction)
	$18,000 Additional Annual O&M

Depreciation and Debt Service: Annual depreciation and debt service after construction are as follows:

Depreciation: $23,333/year over 37.5 years for Code 304 Structures & Improvements
$6,166/year over 30 years for Code 320 Water Treatment Equipment

Debt Service: $67,852 over 25 years (conventional loan)

Dudley Complex			
Sodium Hypochlorite Building			
		Depreciation	**Annual**
Depreciation	**Cost**	**Years**	**Depreciation**
Account 304 Structures & Improvements	$875,000	37.5	$23,333.33
Account 320 Water Treatment Equipment	$185,000	30	$6,166.67
Total	**$1,060,000.00**		**$29,500.00**
Debt Service on SRF Loan			
Total Borrowed	$0		
Interest Rate including administration fee	1.75%		
Term (Years)	20		
Annual Debt Service SRF	**$0.00**		
Debt service on bond issue			
Total Borrowed	$1,060,000		
Interest Rate	4.00%		
Term (Years)	25		
Annual Debt Service Traditional	**$67,852.68**		
Total Annual Debt Service	**$67,852.68**		

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Exhibit E

NORTHERN KENTUCKY WATER DISTRICT

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SCHEDULE OF MORTGAGES, BONDS, NOTES, AND OTHER INDEBTEDNESS

Northern Kentucky Water District		
Bonds & Notes		
2/28/2015		
Bonds		
USDA 2000	$1,913,000	
Series 2006	$22,105,000	
Series 2009	$24,030,000	
Series 2011	$27,380,000	
Series 2012	$49,440,000	
Series 2013A	$25,155,000	
Series 2013B	$20,200,000	
Series 2014B	$13,805,000	
	$184,028,000	
KIA Currently Servicing		
F06-03	$2,958,784	
C08-01	$3,716,267	
F08-07	$3,634,945	
F9-02	$22,512,420	
Total KIA	**$32,822,416**	
Notes		
Taylor Mill	$575,000	Non-Interest Note
Deferred Note	$100,000	

Case No. 2015-00169
Exhibit F

NORTHERN KENTUCKY WATER DISTRICT

Project
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CURRENT BALANCE SHEET AND INCOME STATEMENT

Northern Kentucky Water District

Balance Sheet
As of March 31, 2015

Assets	2015	2014
Current Assets		
Cash and Cash Equivalents	$21,402,836	$21,790,412
Accrued Interest Receivable	$3,189	$4,848
Accounts Receivable Customers	$4,657,751	$5,268,793
Accounts Receivable Unbilled Customers	$5,900,000	$5,700,000
Accounts Receivable Other	$67,463	$71,726
Assessments Receivable	$117,464	$110,953
Inventory Supplies for New Installation and Maintenance, at Cost	$1,515,295	$1,399,343
Prepaid Expenses	$1,702,227	$1,044,507
Total Current Assets	**$35,366,225**	**$35,390,582**
Restricted Assets		
Bond Proceeds Fund	$4,675,775	$7,927,698
Debt Service Reserve Account	$18,280,663	$18,255,577
Debt Service Account	$7,861,711	$6,876,927
Improvement, Repair, & Replacement	$3,242,282	$10,951,091
Boone/Florence Settlement Account	$0	$307,911
Total Restricted Assets	**$34,060,431**	**$44,319,204**
Non Current Assets		
Miscellaneous Deferred Charges	($5,321,147)	($5,207,990)
Capital Assets:		
Land, System, Buildings, and Equipment	$438,826,076	$429,402,049
Construction in Progress	$25,085,047	$16,697,315
Total Capital Assets before Accumulated Depreciation	$463,911,123	$446,099,364
Less: Accumulated Depreciation	($123,966,257)	($114,150,895)
Capital Assets Net of Accumulated Depreciation	$339,944,866	$331,948,469
Total Noncurrent Assets	**$334,623,719**	**$326,740,479**
Total Assets	**$404,050,375**	**$406,450,265**

Northern Kentucky Water District

Balance Sheet
As of March 31, 2015

Liabilities and Retained Earnings	2015	2014
Current Liabilities		
Current Portion of Long Term Debt	$11,241,015	$10,968,754
Accounts Payable	$2,760,210	$1,726,824
Accrued Payroll & Liabilities	$286,963	$372,914
Other Accrued Liabilities	$212,549	$213,370
Total Current Liabilities	**$14,500,737**	**$13,281,862**
Current Liabilities From Restricted Assets		
Accounts Payable	$623,695	$1,317,429
Accrued Interest Payable	$1,729,138	$1,799,253
Total Current Liabilities From Restricted Assets	**$2,352,833**	**$3,116,682**
Long Term Debt		
Long Term Portion of Bonded Indebtedness	$207,306,062	$217,932,344
Bond Anticipation Notes Payable	$0	$0
Note Payable-Taylor Mill Purchase	$400,000	$575,000
Deferred Note Payable	$100,000	$100,000
Total Long Term Debt	**$207,806,062**	**$218,607,344**
Total Liabilities	**$224,659,632**	**$235,005,888**
Retained Earnings	**$179,390,743**	**$171,444,377**
Total Liabilites and Retained Earnings	**$404,050,375**	**$406,450,265**

Northern Kentucky Water District

Income and Expense Report Summary
For the Three Months ending March 31, 2015

Current Period	March 2015	March 2014	March Budget	Variance Over (Under) %
Total Income	$5,170,007	$5,274,749	$5,414,305	-4.5%
Total O&M Expenses	$1,907,095	$1,997,300	$2,141,214	-10.9%
Transfer to Debt Service	$1,680,000	$1,600,000	$1,680,000	0.0%
Available for Transfer to Operating Capital	$1,582,912	$1,677,449	$1,593,091	-0.6%

Year to Date	YTD 2015	YTD 2014	YTD Budget	Variance Over (Under) %	2013 Annual Budget
Total Income	$12,097,432	$12,272,108	$12,587,218	-3.9%	$52,271,763
Total O&M Expenses	$6,137,667	$6,281,829	$6,647,308	-7.7%	$27,161,761
Transfer to Debt Service	$5,040,000	$4,800,000	$5,040,000	0.0%	$20,185,177
Available for Transfer to Operating Capital	$919,765	$1,190,279	$899,910	2.2%	$4,924,825