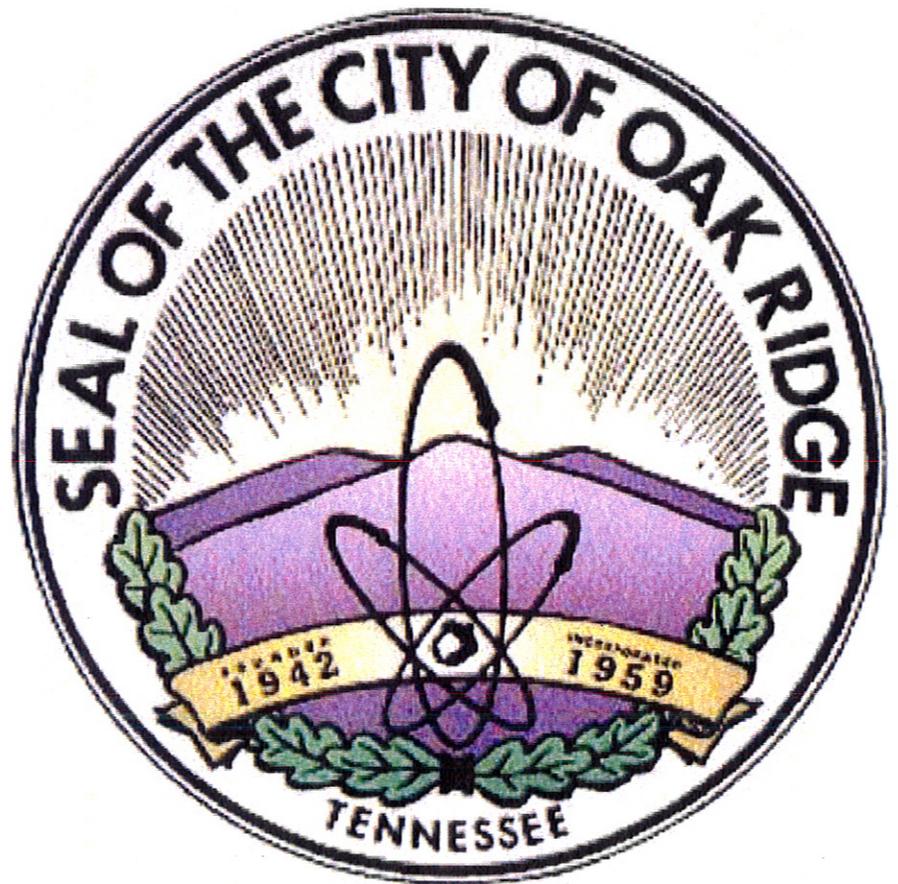


City of Oak Ridge, Tennessee

Pump Station Operations Program



September

2011



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 4
ATLANTA FEDERAL CENTER
61 FORSYTH STREET
ATLANTA, GEORGIA 30303-8960

JAN 23 2012

CERTIFIED MAIL 7010 1060 0002 1705 8073
RETURNED RECEIPT REQUESTED



Mr. Mark S. Watson
City Manager
City of Oak Ridge
P.O. Box 1
Oak Ridge, Tennessee 37831-0001

Re: The EPA Approval of the City of Oak Ridge's Pump Station Operations Program and the Management, Operations and Maintenance Programs Submitted Pursuant to Administrative Order CWA-04-2010-4772

Dear Mr. Watson:

The U.S. Environmental Protection Agency, Region 4 has received and reviewed the Pump Station Operations Program (PSOP) document and the Management, Operations and Maintenance (MOM) Program documents, received on September 30, 2011; with Addendum 1 received on November 11, 2011. The EPA hereby approves the above listed documents under the following conditions:

1. Upon full implementation of the MOM programs the City of Oak Ridge (the City) will update the documents to reflect:
 - a. The acquisition and utilization of the Info IMS software.
 - b. Any changes in the City's Sewer Use Ordinance that will affect the procedures established for the Fats, Oils and Grease (FOG) Program.
 - c. An update to the FOG Program section to include the FOG Management Policy, Food Service Establishment Response Guide, the Grease Control Equipment Certification for Grease Waste Haulers and Plumbers and the Approved Grease Waste Haulers List as enclosures or appendixes to the MOM document with any applicable instructions for use.
 - d. Changes in Pump Station status (replacement, additions, deletions or modifications).
 - e. Any additional changes made that affect the management, operations or maintenance requirements of the system.
 - f. Changes in record keeping procedures as a result of MOM implementation.

Pursuant to Section IV, Paragraph D of the Administrative Order, within 12 months of receipt of this letter, the City shall certify to the EPA that the MOM programs have been fully implemented as outlined in the approved MOM Program documents. The City may certify full implementation and document updates of the MOM programs, in part or in whole, through documenting completion in the Quarterly Report in the quarter in which implementation and document updates are complete.

If there are any questions, you may contact Mr. Dennis Sayre of the EPA at (404) 562-9756.

Sincerely,



Stacey L. Bouma, Acting Chief
Clean Water Enforcement Branch
Water Protection Division

cc: Mr. Gary Cinder ✓
Oak Ridge Director of Public Works

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Section I

Introduction

The United States Environmental protection Agency (EPA) issued a Administrative Order (A.O.) on the City of Oak Ridge, Tennessee on September 27, 2010. It had multiple sections and requirements, each with a schedule for compliance. Section D of the A.O. deals with Management, Operations, and Maintenance Programs (MOM). The first subsection of Section D required an Information Management System Program (IMS). The City had nine (9) months to develop and submit for EPA's review of the IMS programs. That submittal was made as required.

The third subsection of Section D allowed a twelve (12) month period to develop a Pump Stations Operations Program for the management of the stations operations. This requirement had two (2) basic components: a) routine pump station operations, and b) emergency pump station operations. In addition to the operations program, there is a companion requirement for maintenance programs. The maintenance program is due one year after approval of the Capacity Assessment Plan. Operations and maintenance are somewhat intertwined as it relates to wastewater pumping facilities. Therefore, this document will have some abbreviated maintenance references.

The operations program is to address both manned and unmanned stations. The City of Oak Ridge has no manned pumping stations. Therefore, the entire document deals with unmanned stations. The programs require standard forms and record procedures, where applicable, to feed the IMS.

The City has three (3) basic types of pumping stations: a) submersible, b) wet well/dry well, and c) suction lift. Each station has been visited and data collected as to the capacity, mechanical, and electrical characteristics. That data and the pump curves are in the appendix. A detailed discussion of each station is in the MOM document, which is dated September 2011.

Section II

Pump Station Names and Type

<u>Submersible</u>	<u>W-well/D-well</u>	<u>Suction Lift</u>
Centennial Bluff	East Plant	Castlewood
Emory Heights	Emory Valley	Gregory's
Fairbanks	Scarboro	Oak Hills
Graceland		Pallisades#1
Gum Hollow		Pallisades#2
Home Depot		Pallisades#3
Marina		Pallisades#4
Peach Orchard		Park Meade
Pump House Road		Westview
Radisson Cove		
Rivers Run		
Rivers Way		
Rockbridge Greens		
Rolling Links		
Southwood		
Summit Ridge		
Warehouse Road		
WATO		
West Outer		
Whippoorwill		
Williams		
Wolf Creek		

Section III

Routine Maintenance Operations

All pump station operations are performed under the direction of the Treatment Plant Maintenance Supervisor. His office is located at the wastewater treatment facility and his staff works out of that complex.

The current organizational structure and job titles, for personnel responsibility for pump station operations are as listed below:

- Treatment Plant Maintenance Supervisor
- Treatment Plant Maintenance Crew Chief
- Senior Treatment Plant Maintenance Specialist
- Treatment Plant Maintenance Specialist
- Maintenance Mechanic
- Maintenance worker

With the implementation of the MOM program, personnel and equipment will be increased. Listed below is the additional personnel and equipment which are being budgeted for pump station operations and maintenance activities. The additional staffing would be implemented along with the purchase and installation of a SCADA system for the pump stations.

- Treatment Plant Maintenance Specialist (2)
- Maintenance Mechanic (1)
- Boom Truck
- Van Style Truck
- Utility Truck

Inspection and Schedules

Operational activities are determined by the conditions that are specific to each pump station. The operation and maintenance manuals provided with the station are to be followed to determine the schedules for optimum operations. In addition to the operation and maintenance manuals, the following should be considered:

- Is the station monitored 24 hours a day using a telemetry system?
- Is the pump station or equipment critical to collection system operations?
- Does the pump station or equipment have a history of frequent failures?
- Is the equipment operating in a harsh environment?

Operational activities are divided into two (2) levels. Level 1 activities are completed by personnel who visit the pump station on a periodic basis to perform observations and a variety of minor preventative maintenance tasks. The frequency of the visits depends on the following factors:

- Size of the station
- Type of station
- Extent to which the station is critical to the operation of the collection system
- Reliability of the station
- Remote monitoring or supervisory controls available

The Level 1 activities are performed by personnel who are responsible for observing and verifying the operation of all systems in the station. They possess a broad background and understanding of various types of equipment and systems installed in pump stations. They may not possess the electrical and mechanical ability that requires specialized skill in these areas.

Level 2 activities are performed on a less frequent basis than Level 1 but require specialized skills in specific areas and equipment systems. Level 2 activities are performed by our more experienced electricians and mechanics.

Visits to pump stations are scheduled to meet the guidelines set forth by the Tennessee Department of Environment and Conservation.

Data Collection and Record Keeping

Currently, data is collected by personnel as they visit the pump stations on various inspection forms. The hard copies of the forms are given to the maintenance supervisor for review.

The City of Oak Ridge has chosen to replace the old method of record keeping with a new Information Management System (IMS) purchased from INFOR Enterprise Assets Management Systems. The new IMS will allow the City to perform Management, Operations, Maintenance, Compliance Tracking and Performance Indicators. Record keeping will be consolidated into one central location that will be accessible to many individuals.

Some of the functions of the IMS are:

- Maintain preventative maintenance and inspection schedules
- Track repair and work orders
- Organize capital replacement plans/projects
- Maintain equipment inventory

- Record customer service inquiries, complaints and requests
- Provide measurement of effectiveness of programs of operations and maintenance activities

All aspects of activities being performed within the City of Oak Ridge Wastewater Department will be recorded and tracked with the IMS. This would include all treatment, collection, compliance, pump station monitoring and maintenance, ARV-Air/Vacuum Valves maintenance and customer concerns.

Management will be able to access this information and plan future work in a more efficient manner.

Forms and Schedules

Various forms are being developed to be utilized by the operations personnel. Below is a list of typical forms which are planned to be incorporated into the IMS. Draft templates of these forms are in Appendix C.

- Pump station Inspection Report
- Annual Pump Inspection Report
- Emergency Generator Maintenance Check Sheet
- Building Inspection Schedule
- Settings for Level Control

The aforementioned pump station data form (in Appendix A) has been loaded in the City's GIS, which will be "pulled into" the IMS. All pump curves (Appendix B) are in the GIS, as well. As the IMS is further developed and experience shows need for other forms, they will be developed.

Section IV

Emergency Pump Station Program

Emergencies are incidents that require immediate responses to the potential consequences that can affect public health and safety, property and environmental damage. The Oak Ridge collection system is subject to a wide variety of potential emergency situations. These can range from recurring incidents to much more severe emergencies that are the results of human events or natural disasters. Some of the emergencies that could occur in the collection system are:

- Stoppages and overflows
- Power failure in pump stations
- Major equipment or system failure in pump stations
- Hazardous toxic spills
- Work accidents
- Fires and explosions
- Natural disasters-earthquakes, floods, tornadoes, blizzards
- Collapses or failures of force mains and main gravity lines

Emergencies are classified as normal emergencies and extraordinary emergencies. Normal emergencies, such as pump clogging and power failure, may occur with a regular frequency. They may be somewhat predictable; it is known they will happen, but the when is unknown. The operating staff must be prepared to respond to normal emergencies, usually with internal staff that include appropriate procedures, spare parts, repair materials, equipment and trained personnel.

Extraordinary emergencies are those not classified as normal or routine events. They occur with less frequency and can have a greater impact on public health and the environment. Emergencies caused by natural events tend to affect wider geographic areas and will affect other utilities and services. Managing such emergencies usually requires resources outside the utility and involves more planning and response coordination than other normal emergencies.

The City's operational programs will minimize routine emergencies by maintaining the system and equipment functionality.

Objectives of the Pump Station Emergency Program

The objectives of the pump station emergency program are:

- Develop an effective response to system failure
- Minimize SSO's
- Comply with regulatory requirements
- Ensure the public health and safety
- Protect the environment

The City of Oak Ridge has a Sewer Overflow Response Plan (SORP). All aspects on responding to and monitoring overflow are covered in the SORP. A portion of the SORP addresses pump station alarms responses.

Emergency procedures pertaining to pump stations in the Sewer Overflow Response Plan (SORP) are:

- Sewer Force Main Breaks
- Air Release and Vacuum Valve Failure
- Pump station Alarm Response Plan
- Response to Wet-well/Dry-well Stations
- Response to Submersible Stations
- Pump station Failure Due to Secondary Power Failure
- Pump station Failure Due to Valve Pit, Pump or Valve Failure
- Pump-Out Procedures

Pages 14 through 23 of the SORP are in Appendix D, which addresses these subjects.

Emergency Equipment and Contacts

Electrical

The City's Electrical Department is located in the same building with the Public Works Department. Emergency contacts relative to electrical issues are usually by radio. They can be reached on the same radios that the Wastewater Department utilizes. Their office land line number is 865-425-1803. Response time is excellent.

Three of the larger capacity wastewater pump stations have diesel generators that will activate when the stations loses power. These stations are:

- East Plant
- Emory Valley
- Park Meade

- Turtle Park

The City of Oak Ridge has arrangements with the following companies for the rental of emergency generators:

- Nixon Power Services Company
297 Hill Avenue
Nashville, TN. 37210
615-244-0650
- Stowers Industrial Power
6301 Old Rutledge Pike
Knoxville, TN. 37924
865-595-1036

The City plans to purchase two portable generators, one large and another medium size, that will run the remaining pump stations in the case of an extended power outage. These generators will be portable and easily transported to different locations.

As new designs are developed for pump stations there will be provisions for “pump around” utilizing portable pumps and either fixed generators or connections for portable generators. These provisions will enhance the reliability of the stations.

Pumps

The City has standardized the pumping equipment. Pumps that are utilized in the pump stations are listed below along with the suppliers:

- Flygt- Nedrow & Associates
2233 Southpark Drive
Murfreesboro, TN. 37128
865-867-7576
- KSB & Hydromatic- Water & Waste Equipment Inc.
2335 Shady Lane
Cleveland, TN. 37312
423-479-2084
- Gorman Rupp- Southern Sales Inc.
2929 Kraft Drive
Nashville, TN. 37204
615-245-0066

Many of the parts needed for repairs are kept in stock. If a part is not in stock, it can be ordered, which can be delivered in a very short time, or the City can make a trip

to the supplier and pick it up. The new IMS will provide and manage a good inventory of critical repair parts.

Several small pumps that are portable and easy to transport are on hand. One of the larger portable pumps is a Gorman Rupp six inch trash pump. It is driven by a four cylinder gas powered Ford motor. The City is planning to purchase two portable pumps. They will be sized to accommodate both large and small installations respectively.

The City of Oak Ridge has arrangements with the following Companies to rent pumps:

- Stone Pump and Trench
10000 Parkside Drive
Knoxville, TN. 37922
865-691-4933
- Heartland Pump Rental & Sales, Inc.
4001 Murfreesboro Road
Antioch, TN. 37013
615-471-4219

Emergency Response

The City of Oak Ridge will coordinate activities during an emergency situation. The following guidelines will be in place to coordinate actions during an emergency response:

- Review existing emergency response plans and ensure that they are current and relevant.
- Make sure that employees have the necessary training in emergency operating procedures.
- Develop clear procedures and chains-of-command for reporting and responding to threats and for coordinating with emergency management agencies, law enforcement personnel, environmental and public health officials, consumers, and the media.
- Ensure that key utility personnel (both on and off duty) have access to critical telephone numbers and contact information at all times. Keep the call list up to date.
- Develop close relationship with law enforcement agencies and make sure they know where critical assets are located.
- Work with local industries to ensure their pretreatment facilities are secure.
- Report to the health officials any illness among employees that might be associated with wastewater contamination.

- Immediately report criminal threats, suspicious behavior, or attacks on wastewater facilities to law enforcement officials.
- Develop a high priority with the electrical department to respond to power outages and emergencies at wastewater facilities.

Appendix A:
Pump Station Inspections

Appendix A

Pump Station Inspections

	City of Oak Ridge		
	Pump Station Inspection		

Date:	11/03/10	Location:	End of Cairo Road-151 Cairo Road	Date of Construction:		ID:	1
Inspector:	sb/sh/gh			Latitude:	EW: 36-02-23		
Name of Station:	East Plant			Longitude:	NS: 84-12-36		
Mechanical Station Condition:	Good	Electrical Station Condition:	Good				
Type:	W-well/D-well	Power Source:	Pad Mt Transfor	Level-Control:	Pressure		
Number of Pumps:	2	Service:	OH	Control Manufacturer:	US Filter/Sigma		
Pump Brand:	Fairbanks Morse	Transformer Number:	8504	Redundant Level Control:	No		
Serial Number:	No Nameplate	Transformer Type:	Pad	Number / Type:			
Pump Curve:	yes	Transformer Size:	unknown	Flowmeter Type:			
Wet Well Diameter:	ft	Voltage:	460	Lapse Time Meter:	No		
Wet Well Storage Depth:	ft	Phase:	3	Telemetry Mfg:			
Invert Elevation:		Disconnect Type:	Circuit Breaker	Telemetry Type:			
Pressure Gauge Dischrg:	No	Main Amps:	800A frame	Alarm Type:	Telemetry		
FM Material:	DI	Motor Control Location:	MCC	Control Sequence:	Lead on at 10 ft/ off at 6 ft Lag on at 10.5 ft / off t 6.5 ft		
FM Size:	16/18 in	Motor Controller:	Soft Start	Other Station Equipment:	Mufin monster hyd grinder w/bypass screen; power UG from drop pole to bldg; water seal sys (2-Aurora I4TBF; ser # 80-		
FM Length:	10564/3703 ft	HP:	200-1785 rpm				
Discharge Elevation:	915.82	Motor Brand:	Reliance				
Evidence of Overflow:	No	Motor Serial Number:	IMA-497830-G2-				
Fence:	Yes	Aux Power:	Diesel				
		Generator Brand:	Cummins				
		Generator kW:	260				

Remarks: Pumps are 10"X6"; Motors are: Frame-445HP, Type P, 1785 RPM, 60 Hz, Ins Cl B, 40 deg C, 223 FLA, Cont Duty, Des B, SF 1.0; Some corrosion on metals (pump bases, etc); some issues with ext shafts to pumps; hatch in floor for pump removal (no crane or trolley for pump removal); corrosion on metals at influent structure (severe in spots); name plate on Channel monster difficult to access (Info kept at maint. Dept.); stub with valve for future pump



City of Oak Ridge
Pump Station Inspection

Date: 11/03/10 Location: Emory Valley Road at Baylor Drive Date of Construction: ID: 2
 Inspector: sb/sh/gh Latitude: EW: 36-01-37
 Name of Station: Emory Valley Longitude: NS: 84-12-13

Mechanical Station Condition:	Excellent	Electrical Station Condition:	Excellent
Type:	W-well/D-well	Power Source:	480V fm pole
Number of Pumps:	2	Service:	UG
Pump Brand:	Flygt	Transformer Number:	
Serial Number:	3202.180-102008	Transformer Type:	Pole
Pump Curve:	yes	Transformer Size:	
Wet Well Diameter:	ft	Voltage:	460
Wet Well Storage Depth:	ft	Phase:	
Invert Elevation:		Disconnect Type:	Circuit Breaker
Pressure Gauge Dischg:	No	Main Amps:	400
FM Material:	DI	Motor Control Location:	MCC
FM Size:	2@10" in	Motor Controller:	Soft Start
FM Length:	7570 Parallel/ ft	HP:	70-1775 rpm
Discharge Elevation:	915.82	Motor Brand:	subm pumps
Evidence of Overflow:	No	Motor Serial Number:	N/A
Fence:	Yes	Aux Power:	Diesel
		Generator Brand:	Kohler
		Generator kW:	125
		Level Control:	Pressure
		Control Manufacturer:	US Filter
		Redundant Level Control:	No
		Number / Type:	
		Flowmeter Type:	
		Lapse Time Meter:	No
		Telemetry Mfg:	
		Telemetry Type:	
		Alarm Type:	Telemetry
		Control Sequence:	Lead on at 6.5 ft / off at 4 ft Lag on at 7.5 ft / off at 4 ft
		Other Station Equipment:	Muffin monster hyd grinder w/bypass screen; ASCO ATS; GA OL&W ck valves w/ mercoild position switch; 2 sump pumps

Remarks: Power is UG from pole w/transformers approx 190 ft west of site; pumps are dry pit submersible; 10"x8" red el on pump suction/ 5" discharge; SST flex spool on disch of each pump; Roots blower keeps solids suspended in wet well; Manual slide gates for grinder bypass very difficult to move; Muffin Monster teeth and bearings replaced October 2010; Water mark 6' high on lower floor wall due to high flows; 2-10" f mains tie to 18" fmain which also drains 16" f main from East Plant



City of Oak Ridge Pump Station Inspection

Date: 11/03/10 Location: Melton Lake Drive at Marina-695 Melton Lake Drive Date of Construction: ID: 3
Inspector: sb/sh/gh Latitude: EW: 36-01-57
Name of Station: Marina Longitude: NS: 84-11-39

Mechanical Station Condition: Good Electrical Station Condition: Excellent

Type: Submersible	Power Source: UG crossing M La	Level Control: Pressure
Number of Pumps: 2	Service: UG	Control Manufacturer: ITT Flygt/US
Pump Brand: Flygt	Transformer Number:	Redundant Level Control:
Serial Number: 9860808,986080	Transformer Type: Pole	Number / Type:
Pump Curve: yes	Transformer Size:	Flowmeter Type: None
Wet Well Diameter: 6 ft	Voltage: 240/120	Lapse Time Meter: Yes
Wet Well Storage Depth: 3 ft	Phase: 3	Telemetry Mfg:
Invert Elevation:	Disconnect Type: Fused	Telemetry Type: None
Pressure Gauge Dischrg: Yes	Main Amps: 100	Alarm Type: Horn/Light
FM Material: Other	Motor Control Location: Panel	Control Sequence: Lead on at 5.5 ft/ off at 2.5 ft Lag on at 6 ft/ off at 3.5 ft
FM Size: 4 (CI) in	Motor Controller: Across the Line	Other Station Equipment: red valve press sensor (gauge inoperable)
FM Length: 2125 ft	HP: 10-1735 rpm	
Discharge Elevation:	Motor Brand: subm pumps	
Evidence of Overflow: No	Motor Serial Number: N/A	
Fence: No	Aux Power: None	
	Generator Brand: N/A	
	Generator kW: N/A	

Remarks: Disch press gauge inoperable; debris in wet well; clear infi flow from north; pwr to site UG (approx 100 ft) from pole across Melton Lake Dr; meter and disconnect on pole; Drawdown test-pump 1 ~ 110 gpm, pump 2 ~ 117 gpm (assumes 20 gpm inflow); valve vault is 6'X6' at 4'-10" inside depth; pump nameplate info: Y-service, 7.5 kW-10 hp, 460/230,13/25A,3 ph, 60 Hz, 1735 rpm, M21-12-4AL; static press-14 psi/ run press- 35 psi



City of Oak Ridge
Pump Station Inspection

Date: 11/03/10 Location: Melton Lake Drive on Parcel 94D-E-24; ~310 ft from Melton Lake Drive- Melton Lake Peninsula Date of Construction: ID: 4
 Inspector: sb/sh/gh Latitude: EW: 36-04-44
 Name of Station: Gregory's Longitude: NS: 84-20-27

Mechanical Station Condition: <u>Replace</u>		Electrical Station Condition: <u>Replace</u>	
Type: <u>Suction Lift</u>	Power Source: <u>UG fm residential</u>	Level Control: <u>Floats</u>	
Number of Pumps: <u>2</u>	Service: <u>UG</u>	Control Manufacturer: <u></u>	
Pump Brand: <u>Hydromatic</u>	Transformer Number: <u>Unavailable</u>	Redundant Level Control: <u>No</u>	
Serial Number: <u>24019,24020</u>	Transformer Type: <u>Pad</u>	Number / Type: <u></u>	
Pump Curve: <u>No</u>	Transformer Size: <u>Unavailable</u>	Flowmeter Type: <u>None</u>	
Wet Well Diameter: <u>5</u> ft	Voltage: <u>240/120</u>	Lapse Time Meter: <u>No</u>	
Wet Well Storage Depth: <u>17 tot depth</u> ft	Phase: <u>3</u>	Telemetry Mfg: <u></u>	
Invert Elevation: <u>781.5</u>	Disconnect Type: <u></u>	Telemetry Type: <u></u>	
Pressure Gauge Dischrg: <u>No</u>	Main Amps: <u>N/A</u>	Alarm Type: <u></u>	
FM Material: <u>PVC</u>	Motor Control Location: <u>Other</u>	Control Sequence: <u>Unknown float levels</u>	
FM Size: <u>6"/8"</u> in	Motor Controller: <u>Across the Line</u>		
FM Length: <u>860'/800'</u> ft	HP: <u>15 -1735 rpm</u>		
Discharge Elevation: <u>830</u>	Motor Brand: <u>GE</u>	Other Station Equipment: <u></u>	
Evidence of Overflow: <u>No</u>	Motor Serial Number: <u>Unavailable</u>		
Fence: <u>No</u>	Aux Power: <u>None</u>		
	Generator Brand: <u>N/A</u>		
	Generator kW: <u>N/A</u>		

Remarks Station very old, needs to be replaced; grease in wet well from restaurant; new plug valve/check valve combos installed recently; pump model \$ 40MMPC 15003-4, 9-1/8" impeller; fiberglass hood over station; RR tie retaining wall on south and west sides; in back yard of condo; access by gravel drive off Melton lake Drive; 4 control floats; no electrical disconnect; drawdown test pump 1 ~ 210 gpm, pump 2 ~ 245 gpm (inflow unknown- could not see pipe)



City of Oak Ridge
Pump Station Inspection

Date: 11/10/10 Location: Turnpike behind Castlewood Apts east of ball field-Arcadia Lane Date of Construction: ID: 5
Inspector: sb/sh Latitude: EW: 36-02-43
Name of Station: Castlewood Longitude: NS: 84-12-39

Mechanical Station Condition:	Fair	Electrical Station Condition:	Fair		
Type:	Suction Lift	Power Source:	UG fm pad mt res	Level Control:	Floats
Number of Pumps:	2	Service:	UG	Control Manufacturer:	
Pump Brand:	Hydromatic	Transformer Number:		Redundant Level Control:	No
Serial Number:	19640,19639	Transformer Type:	Pad	Number / Type:	
Pump Curve:		Transformer Size:		Flowmeter Type:	None
Wet Well Diameter:	5 ft	Voltage:	240/120	Lapse Time Meter:	No
Wet Well Storage Depth:	5.25 to infl ft	Phase:	3	Telemetry Mfg:	
Invert Elevation:		Disconnect Type:		Telemetry Type:	None
Pressure Gauge Dischrg:	No	Main Amps:		Alarm Type:	Light
FM Material:	Other	Motor Control Location:	Panel	Control Sequence:	Lead/Lag w/ floats (4)
FM Size:	6 (CI) in	Motor Controller:	Across the Line	Other Station Equipment:	Heater (portable)
FM Length:	850 ft	HP:	5-1155 rpm		
Discharge Elevation:	831.2	Motor Brand:	GE		
Evidence of Overflow:	No	Motor Serial Number:	SK215DL356A		
Fence:	No	Aux Power:	None		
		Generator Brand:			
		Generator kW:			

Remarks: Drawdown 6-1/2 inches in 30 sec= 160 gpm (each pump); pump model # 40MMP500-3-6, 9-1/8" impeller;ea pump has 20A 3P breaker;



City of Oak Ridge
 Pump Station Inspection

Date: 11/10/10 Location: 113 Eastburn Lane- behind old radio station Date of Construction: ID: 6
 Inspector: sb/sh Latitude: EW: 36-02-57
 Name of Station: WATO Longitude: NS: 84-12-34

Mechanical Station Condition: Electrical Station Condition:

Type: Submersible	Power Source: OH from street	Level Control: Pressure
Number of Pumps: 2	Service: OH	Control Manufacturer: US Filter DI52
Pump Brand: Flygt	Transformer Number:	Redundant Level Control: Yes
Serial Number: 9881057,988105	Transformer Type: Pole	Number / Type: 4 floats
Pump Curve:	Transformer Size:	Flowmeter Type: None
Wet Well Diameter: 4'X4' ft	Voltage: 240/120	Lapse Time Meter: Yes
Wet Well Storage Depth: ft	Phase: 3	Telemetry Mfg:
Invert Elevation:	Disconnect Type: Fused	Telemetry Type:
Pressure Gauge Dischrg: Yes	Main Amps: 100	Alarm Type: Horn/Light
FM Material: Other	Motor Control Location: Panel	Control Sequence: Lead on 3'/ off 1-1/2' Lag on 3-1/2'/ off 2'
FM Size: 4 (CI) in	Motor Controller: Across the Line	
FM Length: 574 ft	HP: 3-1700 rpm	Other Station Equipment:
Discharge Elevation: 853.54	Motor Brand:	
Evidence of Overflow: No	Motor Serial Number:	
Fence: No	Aux Power: None	
	Generator Brand:	
	Generator kW:	

Remarks: drawdown 3-1/2" in 30sec= 70 GPM (ea Pump), stat 131/2 psi, run 17 psi???, 6'X8' valve vault w/ double door alum hatch, 4" piping; wet well tot depth 170", 138" to Inv of lowest infi;



City of Oak Ridge
Pump Station Inspection

Date: 11/10/10 Location: behind homes on Westview Lane-129 Westview Lane Date of Construction: ID: 7
 Inspector: sb/sh Latitude: EW: 36-58-41
 Name of Station: Westview Longitude: NS: 84-21-56

Mechanical Station Condition:	Replace	Electrical Station Condition:	Replace
Type:	Suction Lift	Power Source:	Transform at site
Number of Pumps:	4-2 ea in series	Service:	UG
Pump Brand:	Hydromatic	Transformer Number:	942 or b947
Serial Number:	P65127,28,29 & 3	Transformer Type:	Pad
Pump Curve:		Transformer Size:	50kVa
Wet Well Diameter:	7 ft	Voltage:	240/120
Wet Well Storage Depth:	ft	Phase:	3
Invert Elevation:		Disconnect Type:	
Pressure Gauge Dischrg:	No	Main Amps:	150A per motor
FM Material:	PVC	Motor Control Location:	Panel
FM Size:	6 in	Motor Controller:	Across the Line
FM Length:	750 ft	HP:	40
Discharge Elevation:		Motor Brand:	US
Evidence of Overflow:	No	Motor Serial Number:	V050059R027R-4
Fence:	No	Aux Power:	None
		Generator Brand:	
		Generator kW:	
		Level Control:	Floats
		Control Manufacturer:	
		Redundant Level Control:	No
		Number / Type:	
		Flowmeter Type:	None
		Lapse Time Meter:	Yes
		Telemetry Mfg:	
		Telemetry Type:	None
		Alarm Type:	Light
		Control Sequence:	2 floats only; alternator
		Other Station Equipment:	portable heater

Remarks lat is 35-58-41 N;problem with rats;all 4 pumps repl in 2009;debris on top of wet well;corrosion on metals; pumps all identical model #40MPH 9-5/32" impellers;could not access infi pipes to meas down; drawdown 1 pump 9" in 30 sec=432 GPM, 1 pump 8-1/2" in 30 sec=408 GPM; wet well tot depth 152";site access along gravel road behind houses;disconnect is meter;4" piping



City of Oak Ridge Pump Station Inspection

Date:	11/10/10	Location:	behind homes on Westview Lane-129 Westview Lane	Date of Construction:		ID:	7
Inspector:	sb/sh			Latitude:	EW: 36-58-41		
Name of Station:	Westview			Longitude:	NS: 84-21-56		
Mechanical Station Condition:	Replace	Electrical Station Condition:	Replace				
Type:	Suction Lift	Power Source:	Transform at site	Level Control:	Floats		
Number of Pumps:	4-2 ea in series	Service:	UG	Control Manufacturer:			
Pump Brand:	Hydromatic	Transformer Number:	942 or b947	Redundant Level Control:	No		
Serial Number:	P65127,28,29 &3	Transformer Type:	Pad	Number / Type:			
Pump Curve:		Transformer Size:	50kVa	Flowmeter Type:	None		
Wet Well Diameter:	7 ft	Voltage:	240/120	Lapse Time Meter:	Yes		
Wet Well Storage Depth:	ft	Phase:	3	Telemetry Mfg:			
Invert Elevation:		Disconnect Type:		Telemetry Type:	None		
Pressure Gauge Dischrg:	No	Main Amps:	150A per motor	Alarm Type:	Light		
FM Material:	PVC	Motor Control Location:	Panel	Control Sequence:	2 floats only; alternator		
FM Size:	6 in	Motor Controller:	Across the Line				
FM Length:	750 ft	HP:	40				
Discharge Elevation:		Motor Brand:	US				
Evidence of Overflow:	No	Motor Serial Number:	V050059R027R-4	Other Station Equipment:	portable heater		
Fence:	No	Aux Power:	None				
		Generator Brand:					
		Generator kW:					

Remarks: lat is 35-58-41 N; problem with rats; all 4 pumps repl in 2009; debris on top of wet well; corrosion on metals; pumps all identical model #40MPH 9-5/32" impellers; could not access infl pipes to meas down; drawdown 1 pump 9" in 30 sec=432 GPM, 1 pump 8-1/2" in 30 sec=408 GPM; wet well tot depth 152"; site access along gravel road behind houses; disconnect is meter; 4" piping



City of Oak Ridge
Pump Station Inspection

Date: 11/10/10 Location: Williams Lane Date of Construction: ID: 8
 Inspector: sb/sh Latitude: EW: 36-59-25
 Name of Station: Williams Longitude: NS: 84-20-56

Mechanical Station Condition: Good		Electrical Station Condition: Excellent	
Type: Submersible	Power Source: PMnt Trans	Level Control: Pressure	
Number of Pumps: 2	Service: UG	Control Manufacturer: US Filter D152	
Pump Brand: KSB	Transformer Number: 1860	Redundant Level Control: Yes	
Serial Number: 5-M07-782 282/1	Transformer Type: Pad	Number / Type: 2 floats	
Pump Curve:	Transformer Size: 75kVA	Flowmeter Type: None	
Wet Well Diameter: 7 ft	Voltage: 460	Lapse Time Meter: Yes	
Wet Well Storage Depth:	Phase: 3	Telemetry Mfg:	
Invert Elevation:	Disconnect Type: Fused	Telemetry Type: None	
Pressure Gauge Dischrg: No	Main Amps: 200	Alarm Type: Light	
FM Material:	Motor Control Location: Panel	Control Sequence: Lead on at 3'/ off at 1.75' Lag on at 3.5'/ off at 2.25'	
FM Size: 4 in	Motor Controller: Across the Line		
FM Length: 1454 ft	HP: 49		
Discharge Elevation: 1028.92	Motor Brand: KSB	Other Station Equipment: Yard hydrant	
Evidence of Overflow: No	Motor Serial Number: 029442&3 AA		
Fence: No	Aux Power: None		
	Generator Brand:		
	Generator kW:		

Remarks Consolidated Electric control panel NEMA 4X SS, ser #58120A; Red Valve on discharge (press gauge inoperable); valve vault 6'X7'X4'-7" deep; pump has guide cables, not rails; 4" piping; pt where guide cables conn to concrete struct heavily corroded; drawdown ea pump pumps 4" in 30 sec=192 GPM; pump model #KRTF 100-400/414XG; 120 gpm @ 210 ft TDH; lat is actually 35 59 25



City of Oak Ridge
Pump Station Inspection

Date: 11/17/10 Location: 40 Pallisades Pkwy- behind houses Date of Construction: ID: 10
 Inspector: sb/sh Latitude: EW: 36-02-19
 Name of Station: Pallisades #4 Longitude: NS: 84-12-34

Mechanical Station Condition: Fair Electrical Station Condition: Poor

Type: Suction Lift	Power Source: UG from street	Level Control: Floats
Number of Pumps: 2	Service: UG	Control Manufacturer:
Pump Brand: Hydromatic	Transformer Number: N/A	Redundant Level Control: No
Serial Number: P1595/P1596	Transformer Type: Other	Number / Type:
Pump Curve:	Transformer Size:	Flowmeter Type: None
Wet Well Diameter: 5 ft	Voltage: 240/120	Lapse Time Meter: Yes
Wet Well Storage Depth: 2.5/103" total ft	Phase: 1	Telemetry Mfg:
Invert Elevation:	Disconnect Type: Fused	Telemetry Type: None
Pressure Gauge Dischrg: No	Main Amps: 30	Alarm Type: Light
FM Material: PVC	Motor Control Location: Panel	Control Sequence: 4 floats w/ alternator
FM Size: 4 in	Motor Controller: Across the Line	
FM Length: 962 ft	HP: 3	
Discharge Elevation: 811.7	Motor Brand: U.S.	Other Station Equipment: yard hydrant
Evidence of Overflow: No	Motor Serial Number: F077A/U04F	
Fence: No	Aux Power: None	
	Generator Brand:	
	Generator kW:	

Remarks: Meter is disconnect;w-well has alum hatch;mice in sta cover;pump 1-4.5" in 30 sec=110 GPM; pump 2- 4" in 30 sec=98 GPM;pump model # 30 MP,imp dia 8.13",motor 1735 rpm,19 FLA; paved access to site



City of Oak Ridge Pump Station Inspection

Date:	11/17/10	Location:	28 Pallisades Pkwy- behind house	Date of Construction:		ID:	11
Inspector:	sb/sh			Latitude:	EW: 36-02-25		
Name of Station:	Pallisades #3			Longitude:	NS: 84-12-27		
Mechanical Station Condition:	Fair	Electrical Station Condition:	Good				
Type:	Suction Lift	Power Source:	UG fm street	Level Control:	Floats		
Number of Pumps:	2	Service:	UG	Control Manufacturer:			
Pump Brand:	Hydromatic	Transformer Number:	617/618	Redundant Level Control:	No		
Serial Number:	P424/P427	Transformer Type:	Pad	Number / Type:	4 floats		
Pump Curve:		Transformer Size:	2@15 kvA	Flowmeter Type:	None		
Wet Well Diameter:	6 ft	Voltage:	240/120	Lapse Time Meter:	Yes		
Wet Well Storage Depth:	6.5/tot 123" ft	Phase:	3	Telemetry Mfg:			
Invert Elevation:		Disconnect Type:	Fused	Telemetry Type:	None		
Pressure Gauge Dischrg:	No	Main Amps:	70	Alarm Type:	Light		
FM Material:	PVC	Motor Control Location:	Panel	Control Sequence:	4 floats w/alternator		
FM Size:	4 in	Motor Controller:	Across the Line				
FM Length:	780 ft	HP:	7.5 1740 rpm	Other Station Equipment:	yard hydrant, heater, exhaust fan		
Discharge Elevation:	801.38	Motor Brand:	U.S				
Evidence of Overflow:	No	Motor Serial Number:	U05U028R021M				
Fence:	No	Aux Power:	None				
		Generator Brand:					
		Generator kW:					
Remarks:	mice under sta cover; suct pipe repl on 1 pump recently; pump 1- 6" in 30 sec=211 GPM; pump 2- 6.5" in 30 sec=229 GPM; motor 208-230/460, SF 1.15; pump imp dia 9-5/32". Pump model 40MP; gravel access to site along side and rear lot lines						



City of Oak Ridge
Pump Station Inspection

Date: 11/17/10 Location: 18 Pallisades Pkwy-behind house Date of Construction: ID: 12
 Inspector: sb/sh Latitude: EW: 36-02-28
 Name of Station: Pallisades #2 Longitude: NS: 84-12-20

Mechanical Station Condition: Fair	Electrical Station Condition: Good	
Type: Suction Lift	Power Source: UG fm street	Level Control: Floats
Number of Pumps: 2	Service: UG	Control Manufacturer:
Pump Brand: Hydromatic	Transformer Number: N/A	Redundant Level Control: No
Serial Number: P1695/P169?	Transformer Type: Other	Number / Type:
Pump Curve:	Transformer Size:	Flowmeter Type: None
Wet Well Diameter: 5 ft	Voltage: 240/120	Lapse Time Meter: Yes
Wet Well Storage Depth: 52"/107" total ft	Phase: 1	Telemetry Mfg:
Invert Elevation:	Disconnect Type: Fused	Telemetry Type: None
Pressure Gauge Dischrg: No	Main Amps: 50	Alarm Type: Light
FM Material: PVC	Motor Control Location: Panel	Control Sequence: 4 floats
FM Size: 4 in	Motor Controller: Across the Line	
FM Length: 528 ft	HP: 3	
Discharge Elevation: 813.53	Motor Brand: US	
Evidence of Overflow: No	Motor Serial Number: F077A/V01F;	Other Station Equipment: yard hydrant, heater, exhaust fan
Fence: No	Aux Power: None	
	Generator Brand:	
	Generator kW:	

Remarks: nameplate inaccessible on 1 pump;pump 1- 4" in 30 sec=98 GPM+, pump 2- 3" in 30 sec=74 GPM+ (10-15 gpm inflow);al hatch on wet well (needs replaced); stone ret wall on 1 side of station (hood can not be slid all the way off)



City of Oak Ridge
Pump Station Inspection

Date: 11/17/10 Location: 10 Pallsades Pkwy- behind/between houses Date of Construction: ID: 13
Inspector: sb/sh Latitude: EW: 36-02-30
Name of Station: Pallsades #1 Longitude: NS: 84-12-16

Mechanical Station Condition: Fair

Electrical Station Condition: Good

Type: Suction Lift	Power Source: UG fm street	Level Control: Floats
Number of Pumps: 2	Service: UG	Control Manufacturer:
Pump Brand: Hydromatic	Transformer Number: N/A	Redundant Level Control: No
Serial Number: P1693,P1695	Transformer Type:	Number / Type: 4 floats
Pump Curve:	Transformer Size:	Flowmeter Type: None
Wet Well Diameter: 5 ft	Voltage: 240/120	Lapse Time Meter: Yes
Wet Well Storage Depth: 52"/92" total ft	Phase: 1	Telemetry Mfg:
Invert Elevation:	Disconnect Type: Fused	Telemetry Type: None
Pressure Gauge Dischrg: No	Main Amps: 50	Alarm Type: Light
FM Material: PVC	Motor Control Location: Panel	Control Sequence: 4 floats w/alternator
FM Size: 4 in	Motor Controller: Across the Line	
FM Length: 488 ft	HP: 3	
Discharge Elevation: 797.59	Motor Brand: U.S.	
Evidence of Overflow: No	Motor Serial Number: F077A/U04F	Other Station Equipment: yard hydrant, heater, exhaust fan
Fence: Yes	Aux Power: None	
	Generator Brand:	
	Generator kW:	

Remarks: void under slab on 3 sides;pump imp dia 8-13/32";pump model 30MP;motor 19.1 FLA;1 pump inoperable;exposed conduit/wire entering station (unknown use); pump 1 6-1/2" in 30 sec=159 GPM; float hanger needs work (hanging from wire)



City of Oak Ridge
Pump Station Inspection

Date: 12/02/10 Location: 1402 Edgemoor Road across from Melton Hill Lake Date of Construction: ID: 16
 Inspector: sb/sh Latitude: EW: 36-59-53
 Name of Station: Park Meade Longitude: NS: 84-11-07

Mechanical Station Condition: Good Electrical Station Condition: Good

Type: Suction Lift	Power Source: Pmount Trans	Level Control: Pressure
Number of Pumps: 2	Service: UG	Control Manufacturer: GR
Pump Brand: Gorman Rupp	Transformer Number: 1888	Redundant Level Control: No
Serial Number: 1083675N/10836	Transformer Type: Pad	Number / Type:
Pump Curve:	Transformer Size: 112.5kVA	Flowmeter Type: None
Wet Well Diameter: 6 ft	Voltage: 460	Lapse Time Meter: Yes
Wet Well Storage Depth: ?? ft	Phase: 3	Telemetry Mfg:
Invert Elevation:	Disconnect Type: Circuit Breaker	Telemetry Type: None
Pressure Gauge Dischrg: Yes	Main Amps: 250	Alarm Type: Light
FM Material:	Motor Control Location: Panel	Control Sequence: Lead on 4.1'/off 2.1' Lag on 6.1'/off 4.1' Low Alarm 0.4'/off 1.3' High Alarm
FM Size: 10 in	Motor Controller: Soft Start	Other Station Equipment: ATS; yard hyd; yard light port heater; exhaust fan;
FM Length: 10278 ft	HP: 50 1765 RPM	
Discharge Elevation: 811.88	Motor Brand: G	
Evidence of Overflow: No	Motor Serial Number: Model B0504VLF	
Fence: Yes	Aux Power: Diesel	
	Generator Brand: Kohler	
	Generator kW: 50?	

Remarks stat press 84/running 140+ (gauge pegged);suct and disch gauges on both pumps (disch gauge on P2 missing); GR ARV's (P2 valve disch cont during pump run test);ValMatic PL valves(model 58069);6" disch to 10" exiting sta. LAT ACTUALLY 35-59-53;sliding cover over sta good shape;motor amps 63A;total w well depth 131" (could not access infi pipe (approx 4' below gnd level));Drawdown P1 2.5" in 1 min(redo 35" in 2 min)=307 GPM;P2 7.5" in 1 min=132 GPM



City of Oak Ridge Pump Station Inspection

Date: 12/02/10 Location: 117 Rock Bridge at front common prop line Date of Construction: ID: 17
Inspector: sb/sh Latitude: EW: 36-00-57
Name of Station: Rockbridge Gree Longitude: NS: 84-10-46

Mechanical Station Condition:	Good	Electrical Station Condition:	Good		
Type:	Submersible	Power Source:	UG fm trans	Level Control:	Pressure
Number of Pumps:	2	Service:	UG	Control Manufacturer:	CSI
Pump Brand:	Flygt	Transformer Number:	1870	Redundant Level Control:	No
Serial Number:	9670191/967019	Transformer Type:	Pad	Number / Type:	
Pump Curve:		Transformer Size:	300 kVA	Flowmeter Type:	None
Wet Well Diameter:	5 ft	Voltage:	240/120	Lapse Time Meter:	Yes
Wet Well Storage Depth:	19' tot depth ft	Phase:	3	Telemetry Mfg:	
Invert Elevation:		Disconnect Type:	Circuit Breaker	Telemetry Type:	
Pressure Gauge Dischrg:	No	Main Amps:	100	Alarm Type:	Light
FM Material:	PVC	Motor Control Location:	Panel	Control Sequence:	Lead on 5.7'/off 3.7' Lag on 8.2'/off 3.7' High alarm 9.2'
FM Size:	6 in	Motor Controller:	Soft Start	Other Station Equipment:	Yard hydrant
FM Length:	1887 ft	HP:	23		
Discharge Elevation:	975.0	Motor Brand:	Flygt		
Evidence of Overflow:	No	Motor Serial Number:			
Fence:	No	Aux Power:	None		
		Generator Brand:			
		Generator kW:			

Remarks: 8' and 9' to inv of infl pipes; total w wellpth 19'; 4'x9'x53" deep cast-in-place valve vault(pipes too close to wall to access check valves easily, drain pipe clogged with mulch), 3-1/2' x 3-1/2' al hatch; station in landscape area, mulch over access lids (dangerous to be around openings due to mulch sloping toward openings); guide brackets on pumps snag on disch pipe flanges; Pump model 3152.181-6273; 51 FLA; 4-wire Y service; Drawdown 17" in 1 min=208 GPM for both pumps



City of Oak Ridge
Pump Station Inspection

Date:	12/02/10	Location:	51 Rolling Links-behind house adjacent to large pond	Date of Construction:		ID:	18
Inspector:	sb/sh			Latitude:	EW: 36-01-18		
Name of Station:	Rolling Links			Longitude:	NS: 84-10-19		
Mechanical Station Condition:	Good	Electrical Station Condition:	Fair				
Type:	Submersible	Power Source:	Pad mnt trans	Level Control:	Pressure		
Number of Pumps:	2	Service:	UG	Control Manufacturer:	Consolidated D-1		
Pump Brand:	Flygt	Transformer Number:	2284/2276	Redundant Level Control:	No		
Serial Number:	9670310/967030	Transformer Type:	Pad	Number / Type:			
Pump Curve:		Transformer Size:	25 kVA	Flowmeter Type:	None		
Wet Well Diameter:	5 ft	Voltage:	240/120	Lapse Time Meter:	Yes		
Wet Well Storage Depth:	ft	Phase:	3	Telemetry Mfg:			
Invert Elevation:		Disconnect Type:	Circuit Breaker	Telemetry Type:	None		
Pressure Gauge Dischrg:	No	Main Amps:	100	Alarm Type:	Light		
FM Material:	PVC	Motor Control Location:	Panel	Control Sequence:	Lead on 3.5'/off 2.0' Lag on 5'/off 3.5' 1.25'/2.5'	Low al High	
FM Size:	6 in	Motor Controller:	Across the Line	Other Station Equipment:	Yard hydrant		
FM Length:	770 ft	HP:	10				
Discharge Elevation:	903.6	Motor Brand:	Flygt				
Evidence of Overflow:	No	Motor Serial Number:					
Fence:	No	Aux Power:	None				
		Generator Brand:					
		Generator kW:					

Remarks Flygt motors have MINI CAS II; Valve vault 4'x8'x56" deep cast-in-place, 3-1/2' x 4' AL hatch' drain is 3" above floor; vault top 1' below surrounding ground (water stands over lid); pumps barely clear hatch on wet well; pump model 3127.180-6184; Gravel access drive to site; Drawdown 8" in 30 nsec=196 GPM for both pumps



City of Oak Ridge Pump Station Inspection

Date: 12/02/10 Location: Radisson Cove adjacent to Edgemoor Road Date of Construction: ID: 19
Inspector: sb/sh Latitude: EW: 36-01-37
Name of Station: Radisson Cove Longitude: NS: 84-10-25

Mechanical Station Condition: Good

Electrical Station Condition: Good

Type: Submersible	Power Source: Pad mnt trans	Level Control: Pressure
Number of Pumps: 2	Service: UG	Control Manufacturer: Digital Control Co
Pump Brand: KSB	Transformer Number: N/A	Redundant Level Control: Yes
Serial Number: 5-M07-765659/4;	Transformer Type: Pad	Number / Type: 4 floats
Pump Curve:	Transformer Size: ???	Flowmeter Type: None
Wet Well Diameter: 6 ft	Voltage: 240/120	Lapse Time Meter: No
Wet Well Storage Depth: ft	Phase: 3	Telemetry Mfg:
Invert Elevation:	Disconnect Type: Fused	Telemetry Type: None
Pressure Gauge Dischrg: Yes	Main Amps: 300	Alarm Type:
FM Material:	Motor Control Location: Panel	Control Sequence: Lead on 48%/off at 32% Lag on 54%/off 32% High alarm 66%/Low alarm 22%
FM Size: 8 in	Motor Controller: Across the Line	
FM Length: 1159 ft	HP: 20	
Discharge Elevation: 891.45	Motor Brand: KSB	Other Station Equipment: APC batt backup for controls; PumpPak FloatPak controller for floats
Evidence of Overflow: No	Motor Serial Number:	
Fence: No	Aux Power: None	
	Generator Brand:	
	Generator kW:	

Remarks Pump model KRTE80-251/164XG-270;;150-7-- gpm,118-85 ft head;1765 rpm,59 FLA;wet well is new to 86", tot dpth 207.5",142" to influent pipe;ret wall (locking block) on lower side of site;paved access with gate;valve vault 7'x7'x5' deep,4'x4' alum hatch,no pipe supports; APCO 400 AVV;no yard hydrant;drawdown P1-10.5 in 35 sec=317 GPM;P2 8" in 35 sec=241 GPM



City of Oak Ridge Pump Station Inspection

Date: 12/10/10 Location: 100 Rivers Run Blvd behind landscaping and ent sign Date of Construction: ID: 20
Inspector: sb/sh Latitude: EW: 36-01-28
Name of Station: Rivers Run Longitude: NS: 84-10-50

Mechanical Station Condition:	Good	Electrical Station Condition:	Good		
Type:	Submersible	Power Source:	UG fm pad mt tra	Level Control:	Pressure
Number of Pumps:	2	Service:	UG	Control Manufacturer:	Dig Cont P/N 119
Pump Brand:	KSB	Transformer Number:	2213 277/480	Redundant Level Control:	Yes
Serial Number:	5-MO7-703 480/	Transformer Type:	Pad	Number / Type:	5 floats
Pump Curve:		Transformer Size:	45 kVA	Flowmeter Type:	None
Wet Well Diameter:	6 ft	Voltage:	460	Lapse Time Meter:	Yes
Wet Well Storage Depth:	ft	Phase:	3	Telemetry Mfg:	
Invert Elevation:		Disconnect Type:	Fused	Telemetry Type:	None
Pressure Gauge Dischrg:	Yes	Main Amps:	200	Alarm Type:	Light
FM Material:		Motor Control Location:	Panel	Control Sequence:	Lead on 30%/off 18% Lag on 35%/off 18% High level 40%/ Low level 8%
FM Size:	6 in	Motor Controller:	Soft Start	Other Station Equipment:	Yard hydrant; Pur-A-Fil scrubber- Ser no. I06-8020, Model DS-1005
FM Length:	7978 ft	HP:	36		
Discharge Elevation:	793.59	Motor Brand:	KSB		
Evidence of Overflow:	No	Motor Serial Number:			
Fence:	No	Aux Power:	None		
		Generator Brand:			
		Generator kW:			

Remarks Pump 2 could not be pulled due to floats being tangled around it; Pumps are KRTE 100-316/294XG, 300 gpm at 130 ft, DKN 181.4-29 AC3, M No. 075203, 1770 rpm, FLA 48; Valve vault 6'x6'x63" deep precast w/ 21"x45" dbl hatch, ARV's disch to wet well, 4" piping w/ OL&W ck valves; wet well hatch is 51"x28" dbl; drawdown P1 4" in 30 sec=141 GPM, P2 7" in 30 sec=246 GPM (inflow higher due to infl pipe being submerged); total wet well dpth 189" / infl pipe at 149"



City of Oak Ridge
Pump Station Inspection

Date: 12/10/10 Location: Warehouse Road east of Dresden Date of Construction: ID: 21
 Inspector: sb/sh Latitude: EW: 36-02-06
 Name of Station: Warehouse Roa Longitude: NS: 84-13-19

Mechanical Station Condition: <u>Good</u>	Electrical Station Condition: <u>Good</u>	
Type: <u>Submersible</u>	Power Source: <u>Overhead fm Wa</u>	Level Control: <u>Probe</u>
Number of Pumps: <u>2</u>	Service: <u>OH</u>	Control Manufacturer: <u>Multiprobe MT2P</u>
Pump Brand: <u>Flygt</u>	Transformer Number: <u>11526/11630/??</u>	Redundant Level Control: <u>Yes</u>
Serial Number: <u>9451282/945128</u>	Transformer Type: <u>Pole</u>	Number / Type: <u>2 floats</u>
Pump Curve: _____	Transformer Size: <u>25kVA/??/?</u>	Flowmeter Type: <u>None</u>
Wet Well Diameter: <u>4' X 4'</u> ft	Voltage: <u>240/120</u>	Lapse Time Meter: <u>Yes</u>
Wet Well Storage Depth: _____ ft	Phase: <u>3</u>	Telemetry Mfg: _____
Invert Elevation: _____	Disconnect Type: <u>Fused</u>	Telemetry Type: <u>None</u>
Pressure Gauge Dischrg: <u>No</u>	Main Amps: <u>60</u>	Alarm Type: <u>Light</u>
FM Material: <u>Other</u>	Motor Control Location: <u>Panel</u>	Control Sequence: <u>Lead on 50%/off</u>
FM Size: <u>4 (CI)</u> in	Motor Controller: <u>Across the Line</u>	<u>10% Lag on</u>
FM Length: <u>90</u> ft	HP: <u>2.2</u>	<u>60% /off</u>
Discharge Elevation: <u>828.86</u>	Motor Brand: <u>Flygt</u>	<u>20% High level</u>
Evidence of Overflow: <u>No</u>	Motor Serial Number: _____	Other Station Equipment: <u>Yard hydrant</u>
Fence: <u>Yes</u>	Aux Power: <u>None</u>	
	Generator Brand: _____	
	Generator kW: _____	

Remarks: Valve Vault 4'x4' X 54" deep w/3'x3' Al Hatch, 4" piping, no ARV; Pumps 3085.181-6167, FLS M15-07-4AA, 6.7 FLA, 1670 rpm; wet well 4'x4' inside, steps up to top, tot depth 149", 118 to influent; P1 4" in 30 sec=80 GPM, P2 4-1/2" in 30 sec =90 GPM; gravel drive; fence overgrown, tree inside fence interferes w/ access, guy wire interferes w/ boom truck operation; could not access disconnect (lock wouldn't open)



City of Oak Ridge
Pump Station Inspection

Date: 12/10/10 Location: 545 Oak Ridge Turnpike Date of Construction: ID: 22
 Inspector: sb/sh in commercial development Latitude: EW: 36-02-30
 Name of Station: Fairbanks Longitude: NS: 84-14-06

Mechanical Station Condition:	Fair	Electrical Station Condition:	Good
Type:	Submersible	Power Source:	UG from ???
Number of Pumps:	2	Service:	UG
Pump Brand:	Flygt	Transformer Number:	??
Serial Number:	9451251/945125	Transformer Type:	Other
Pump Curve:		Transformer Size:	??
Wet Well Diameter:	4'x4' ft	Voltage:	208
Wet Well Storage Depth:	ft	Phase:	3
Invert Elevation:		Disconnect Type:	Fused
Pressure Gauge Dischrg:	No	Main Amps:	60
FM Material:	DI	Motor Control Location:	Panel
FM Size:	6 in	Motor Controller:	Across the Line
FM Length:	86 ft	HP:	2.2
Discharge Elevation:	836.63	Motor Brand:	
Evidence of Overflow:	No	Motor Serial Number:	
Fence:	No	Aux Power:	None
		Generator Brand:	
		Generator kW:	
		Level Control:	Pressure
		Control Manufacturer:	Consol D152 w/
		Redundant Level Control:	Yes
		Number / Type:	2 floats
		Flowmeter Type:	None
		Lapse Time Meter:	Yes
		Telemetry Mfg:	
		Telemetry Type:	None
		Alarm Type:	Light
		Control Sequence:	Lead on 3'/off 1.75' Lag on 4'/off 2' High Alarm 6' Low
		Other Station Equipment:	Yard Hydrant

Remarks: Wet well 4'x4' (CIP) w/3-1/2'x3-1/2' Al hatch, total depth 194" ,140" to influent; P1 5" in 30 sec=100 GPM, P2 5-1/2" in 30 sec=110 GPM; Pumps 3085.181-6244,FLS M15-07-4AA, 7.4 FLA, 1670 rpm, .85 PF



City of Oak Ridge
Pump Station Inspection

Date: 12/10/10 Location: Coe Road in Emory Hts Subdv behind house, adj to RR tracks Date of Construction: ID: 23
 Inspector: sb/sh Latitude: EW: 36-01-54
 Name of Station: Emory Heights Longitude: NS: 84-13-25

Mechanical Station Condition:		Electrical Station Condition:	
Type: Submersible	Power Source: UG fm pole	Level Control: Pressure	
Number of Pumps: 2	Service: UG	Control Manufacturer: Dig Cont Corp P/	
Pump Brand: KSB	Transformer Number: 2722/2723/2724	Redundant Level Control: Yes	
Serial Number: 869018/869019	Transformer Type: Pole	Number / Type: 4 FLOATS	
Pump Curve:	Transformer Size: 15kVA ea	Flowmeter Type: None	
Wet Well Diameter: 6 ft	Voltage: 208	Lapse Time Meter: Yes	
Wet Well Storage Depth:	Phase: 3	Telemetry Mfg:	
Invert Elevation:	Disconnect Type: Fused	Telemetry Type: None	
Pressure Gauge Dischrg: No	Main Amps: 100	Alarm Type: Light	
FM Material: AC	Motor Control Location: Panel	Control Sequence: Lead on 50%/off 28% Lag on 58%/off 30% High alarm 78% Low	
FM Size: 6 in	Motor Controller: Across the Line		
FM Length: 583 ft	HP: 4.5	Other Station Equipment:	
Discharge Elevation: 830 +/- (tee in gr)	Motor Brand:		
Evidence of Overflow: No	Motor Serial Number:		
Fence: No	Aux Power: None		
	Generator Brand:		
	Generator kW:		

Remarks: Gravel drive; PumpPak Control panel; valve vault 6' x 6' x 62" deep, 4" piping; wet well tot depth 170", 100" to influent pipe; P1 10-1/2" in 60 sec=185+ GPM, P2 8-1/2" in 60 sec=150 GPM (infl flow into station clear and at 20-30 gpm); evidence of surcharge to top of wet well, no evidence of overflow NEED A YARD HYDRANT HERE



City of Oak Ridge Pump Station Inspection

Date: 12/10/10 Location: Laboratory Drive at Home Depot entrance Date of Construction: ID: 24
 Inspector: sb/sh Latitude: EW: 36-01-34
 Name of Station: Home Depot Longitude: NS: 84-14-02

Mechanical Station Condition: Good Electrical Station Condition: Good

Type: <u>Submersible</u>	Power Source: <u>UG fm pole</u>	Level Control: <u>Probe</u>
Number of Pumps: <u>2</u>	Service: <u>UG</u>	Control Manufacturer: <u>Flygt</u>
Pump Brand: <u>Flygt</u>	Transformer Number: <u>562/1257/13068</u>	Redundant Level Control: <u>Yes</u>
Serial Number: <u>3085.182-001-63</u>	Transformer Type: <u>Pole</u>	Number / Type: <u>5 floats</u>
Pump Curve: <u> </u>	Transformer Size: <u>15kVA</u>	Flowmeter Type: <u>None</u>
Wet Well Diameter: <u>6</u> ft	Voltage: <u>240/120</u>	Lapse Time Meter: <u>Yes</u>
Wet Well Storage Depth: <u> </u> ft	Phase: <u>3</u>	Telemetry Mfg: <u> </u>
Invert Elevation: <u> </u>	Disconnect Type: <u>Fused</u>	Telemetry Type: <u>None</u>
Pressure Gauge Dischrg: <u>Yes</u>	Main Amps: <u>35</u>	Alarm Type: <u>Horn/Light</u>
FM Material: <u>PVC</u>	Motor Control Location: <u>Panel</u>	Control Sequence: <u>????? Could not determine</u>
FM Size: <u>4</u> in	Motor Controller: <u>Across the Line</u>	
FM Length: <u>478</u> ft	HP: <u>3</u>	
Discharge Elevation: <u>858.0</u>	Motor Brand: <u> </u>	Other Station Equipment: <u>Yard hydrant, bypass pump connectoin</u>
Evidence of Overflow: <u>No</u>	Motor Serial Number: <u> </u>	
Fence: <u>No</u>	Aux Power: <u>None</u>	
	Generator Brand: <u> </u>	
	Generator kW: <u> </u>	

Remarks: Valve vault 6'x8'x6-1/2' deep, 4'x6' al hatch, 1 ARV, 6" water standing in vault, press gauge inoperable, 4" piping, yard hydrant needs repairs; Pumps 3085.182-6005 414, 1700 rpm, 8.7 FLA, .83 PF; wet well total depth 120", 74" to influent; P1 10-1/2" in 30 sec=370 GPM, P2 8-1/2" in 30 sec=299 GPM; gravel drive; wet well has a substance in it that hardens and adheres to pumps, cables, floats, etc.; floats were inoperable due to substance



City of Oak Ridge
Pump Station Inspection

Date: 12/15/10 Location: OR Turnpike/SR 58 Date of Construction: ID: 25
 Inspector: sb/sh Latitude: EW: 36-58-56
 Name of Station: Oak Hills Longitude: NS: 84-20-02

Mechanical Station Condition:	Good	Electrical Station Condition:	Fair
Type:	Suction Lift	Power Source:	Pole mnt trans
Number of Pumps:	2	Service:	OH
Pump Brand:	Gorman Rupp	Transformer Number:	4433/4403
Serial Number:	1045838/138300	Transformer Type:	
Pump Curve:		Transformer Size:	37.5kVA/25kVA
Wet Well Diameter:	9 ft	Voltage:	240/120
Wet Well Storage Depth:	ft	Phase:	3
Invert Elevation:		Disconnect Type:	Fused
Pressure Gauge Dischrg:	Yes	Main Amps:	200
FM Material:	Other	Motor Control Location:	Panel
FM Size:	6 (CI) in	Motor Controller:	Across the Line
FM Length:	3933 ft	HP:	25
Discharge Elevation:	816.9	Motor Brand:	Gorman Rupp
Evidence of Overflow:	No	Motor Serial Number:	94410044/94410
Fence:	Yes	Aux Power:	None
		Generator Brand:	
		Generator kW:	
		Level Control:	Pressure
		Control Manufacturer:	Gorman Rupp
		Redundant Level Control:	Yes
		Number / Type:	3 floats
		Flowmeter Type:	None
		Lapse Time Meter:	Yes
		Telemetry Mfg:	
		Telemetry Type:	None
		Alarm Type:	Horn/Light
		Control Sequence:	Lead on 4.6/ off 2.5 Lag on 5.4/ off 3.1 High Al on 10.0/ off 9.5 Low Al on 1.1/ off 1.5
		Other Station Equipment:	Yard hydrant, port heater, exhaust fan

Remarks: Lat is actually 35 58 56; Self priming pumps, GR ARV, Valmatic PI valves, M&H OL&Spring Ck valves; Wet well has surcharged almost to top-no sign of overflow; disch ga on one pump doesn't work; wet well tot depth 207", 123" to top of infl pipe (16" DIP); P1 6" in 1 min' P2 9" in 1 min; inflow 4-1/2" in 2 min; gravel lot with asph drive, fence approx 25' off EOP



City of Oak Ridge Pump Station Inspection

Date: 12/15/10 Location: 197 Gum Hollow Road Date of Construction: ID: 26
 Inspector: sb/sh Latitude: EW: 36-58-31
 Name of Station: Gum Hollow Longitude: NS: 84-19-13

Mechanical Station Condition: Excellent

Electrical Station Condition: Excellent

Type: <u>Submersible</u>	Power Source: <u> </u>	Level Control: <u>Pressure</u>
Number of Pumps: <u>2</u>	Service: <u> </u>	Control Manufacturer: <u>Dig Cont P/N 119</u>
Pump Brand: <u>KSB</u>	Transformer Number: <u> </u>	Redundant Level Control: <u>Yes</u>
Serial Number: <u>874908/874909</u>	Transformer Type: <u> </u>	Number / Type: <u>5 floats</u>
Pump Curve: <u> </u>	Transformer Size: <u> </u>	Flowmeter Type: <u>None</u>
Wet Well Diameter <u>8</u> ft	Voltage: <u> </u>	Lapse Time Meter: <u>Yes</u>
Wet Well Storage Depth: <u> </u> ft	Phase: <u> </u>	Telemetry Mfg: <u> </u>
Invert Elevation: <u> </u>	Disconnect Type: <u>Fused</u>	Telemetry Type: <u>None</u>
Pressure Gauge Dischrg: <u>Yes</u>	Main Amps: <u>200</u>	Alarm Type: <u>Light</u>
FM Material: <u> </u>	Motor Control Location: <u>Panel</u>	Control Sequence: <u>Lead on 65/off 28 % Lag on 70/ off 40% High/Low Al 80/20%</u>
FM Size: <u>6</u> in	Motor Controller: <u>Soft Start</u>	
FM Length: <u>4323</u> ft	HP: <u>36</u>	
Discharge Elevation: <u>797.2</u>	Motor Brand: <u>KSB</u>	Other Station Equipment: <u>Pur-A-Fil scrubber ser #106-8019, model DS1005</u>
Evidence of Overflow: <u>No</u>	Motor Serial Number: <u> </u>	
Fence: <u>No</u>	Aux Power: <u>None</u>	
	Generator Brand: <u> </u>	
	Generator kW: <u> </u>	

Remarks Pumps KRT F100-316/294XG-279 mm,DKN 814,29KW,1750 rpm,FLA 36/48,SF 1.1; wet well tot depth 177.5", 90" to infl (10"?), P1 14" in 1 min, P2 12" in 1 min, inflow 1.5" in 2 min; disch press 10-39 psi; valve vault 6'x6'x70" precast, 42"x42" hatch, 2 ARV (APCO) piped to wet well, OL&W ck valves, 4" piping; no yard hydrant; evidence of surcharge, no overflow;steqady stream of clear water in (2" deep in 10"? Pipe)



City of Oak Ridge
Pump Station Inspection

Date: 12/15/10 Location: 105 Wedgewood Road/ behind houses Date of Construction: ID: 27
 Inspector: sb/sh Latitude: EW: 36-01-37
 Name of Station: Peach Orchard Longitude: NS: 84-16-03

Mechanical Station Condition:	Excellent	Electrical Station Condition:	Fair
Type:	Submersible	Power Source:	Overhead from
Number of Pumps:	2	Service:	OH
Pump Brand:	Flygt	Transformer Number:	N/A
Serial Number:	9880657/988065	Transformer Type:	Pole
Pump Curve:		Transformer Size:	30kVA
Wet Well Diameter:	6 ft	Voltage:	240/120
Wet Well Storage Depth:	ft	Phase:	3
Invert Elevation:		Disconnect Type:	Fused
Pressure Gauge Dischrg:	Yes	Main Amps:	100
FM Material:	AC	Motor Control Location:	Panel
FM Size:	4 in	Motor Controller:	Across the Line
FM Length:	485 ft	HP:	10
Discharge Elevation:	1078.4	Motor Brand:	
Evidence of Overflow:	No	Motor Serial Number:	
Fence:	No	Aux Power:	None
		Generator Brand:	
		Generator kW:	
		Level Control:	Pressure
		Control Manufacturer:	Us Filter D152
		Redundant Level Control:	Yes
		Number / Type:	5 floats
		Flowmeter Type:	None
		Lapse Time Meter:	Yes
		Telemetry Mfg:	
		Telemetry Type:	None
		Alarm Type:	Light
		Control Sequence:	Lead on 3-1/4'/ off 2-1/2' Lag on 4' off 2-3/4' High Al on 5'/off 4-3/4' Low Al on 1-3/4'/ off 1-1/2'
		Other Station Equipment:	N/A

Remarks: Valve vault 6'x6'x67" deep, 42" sq al hatch, 2 ARV piped to wet well, OL&W ck valves;pumps 3127.180-3030 15mm,M21-12-4AL, 1735 rpm, 25 FLA; wet well tot depth = 174", 126" to infl pipe, 38"x48" al hatch, P1 3-1/2" in 30 sec, P2 3" in 30 sec; pressures 36psi stat, 45 psi running;disconnect switch latch is broken; access from Wedgewood along gravel drive(steel tube lift gate)



City of Oak Ridge
Pump Station Inspection

Date: 12/15/10 Location: 1129 West Outer Drive, behind house, access off of Sugar Road Date of Construction: ID: 28
 Inspector: sb/sh Latitude: EW: 36-59-27
 Name of Station: West Outer Longitude: NS: 84-20-42

Mechanical Station Condition: Fair	Electrical Station Condition: Poor	
Type: Submersible	Power Source: Oh from West Ou	Level Control: Pressure
Number of Pumps: 2	Service: OH	Control Manufacturer: Consol Electric D
Pump Brand: KSB	Transformer Number: ??	Redundant Level Control: No
Serial Number: 881244/888553	Transformer Type: Pole	Number / Type:
Pump Curve:	Transformer Size:	Flowmeter Type: None
Wet Well Diameter: 5 ft	Voltage: 240/120	Lapse Time Meter: Yes
Wet Well Storage Depth: ft	Phase: 3	Telemetry Mfg:
Invert Elevation:	Disconnect Type: Fused	Telemetry Type: None
Pressure Gauge Dischrg: Yes	Main Amps: 200	Alarm Type: Light
FM Material:	Motor Control Location: Panel	Control Sequence: lead on 3-1/2'/off 1-1/2' Lag on 5-1/2'/ off 1-3/4' High Al on 8-1/4'/ off 8' Low Al on 8-1/4'/ off 8'
FM Size: 3 in	Motor Controller: Across the Line	Other Station Equipment: Yard hydrant
FM Length: 1093 ft	HP: 23	
Discharge Elevation: 992.89?	Motor Brand: KSB	
Evidence of Overflow: No	Motor Serial Number:	
Fence: No	Aux Power: None	
	Generator Brand:	
	Generator kW:	

Remarks: Valve vault 6'x6'x54" deep, 4" piping, 2 ARV (disch not piped), OL&W ck valves, vault located ~25' from wet well; new 2" SST disch pipes in wet well; grease reported to be a problem at station; pumps KRTS 40-250/172XG 205mm, DKN160 2-11, 3500 rpm, FLA 58, .80 PF; wet well tot depth 126", 60" to infl, P1 2" in 30 sec, P2 1.5" in 30 sec; Lat actually 35 59 27; electric meter read via telephone line



City of Oak Ridge
Pump Station Inspection

Date: 12/22/10 Location: 720 S. Illinois Ave. in Summit Ridge Development Date of Construction: ID: 29
 Inspector: sb/sh Latitude: EW: 36-00-02
 Name of Station: Summit Ridge Longitude: NS: 84-14-22

Mechanical Station Condition: Excellent Electrical Station Condition: Excellent

Type: Submersible	Power Source: UG from pad mo	Level Control: Pressure
Number of Pumps: 2	Service: UG	Control Manufacturer: Dig Cont Corp P/
Pump Brand: KSB	Transformer Number: 1903	Redundant Level Control: Yes
Serial Number: 871987M/87216	Transformer Type: Pad	Number / Type: 5 floats
Pump Curve:	Transformer Size: 75 kVA	Flowmeter Type: None
Wet Well Diameter: 6 ft	Voltage: 460	Lapse Time Meter: Yes
Wet Well Storage Depth: 6 (max) ft	Phase: 3	Telemetry Mfg:
Invert Elevation:	Disconnect Type: Fused	Telemetry Type: None
Pressure Gauge Dischrg: Yes	Main Amps: 40	Alarm Type: Horn/Light
FM Material:	Motor Control Location: Panel	Control Sequence: Lead on 38/ off 12% Lag on 44/ off 12% High/Low Al 62/ 2 %
FM Size: ?? in	Motor Controller: Across the Line	
FM Length: ?? ft	HP: 10	
Discharge Elevation: ??	Motor Brand: KSB	Other Station Equipment: Yard hydrant;bypass pump connection
Evidence of Overflow: No	Motor Serial Number:	
Fence: Yes	Aux Power: None	
	Generator Brand:	
	Generator kW:	

Remarks: Valve vault 6'x8'x4' deep w/4'x5' Al double door hatch, 4" piping, 1 APCO ARV (disch not piped),OL&W ck valves, bypass pump conn, press ga on red valve (gauge not readable);pumps KSB KRTF 100-25-/74 XG (215), DKN 1324-5.5, 10 hp, 460V, SF 1.1, 1745, FLA 14.5, LRA 82, PF 76%; Disch pipe flange interferes with pump removal/replacement;appears to be mud? On pumps;Wet well tot depth 204", 130" & 123" to infl pipes; P1 4" in 30 sec (140 GPM), P2 4" in 30 sec (140 GPM); XYPEX additive in wetwell and valve vault;conduit seals are failing in wet well-need to be replaced ASAP;street lighting electrical panel (service,disconn,meter) directly adjacent to station



City of Oak Ridge
Pump Station Inspection

Date: 12/22/10 Location: 720 S. Illinois Ave. in Summit Ridge Development Date of Construction: ID: 29
 Inspector: sb/sh Latitude: EW: 36-00-02
 Name of Station: Summit Ridge Longitude: NS: 84-14-22

Mechanical Station Condition: Excellent Electrical Station Condition: Excellent

Type: Submersible	Power Source: UG from pad mo	Level Control: Pressure
Number of Pumps: 2	Service: UG	Control Manufacturer: Dig Cont Corp P/
Pump Brand: KSB	Transformer Number: 1903	Redundant Level Control: Yes
Serial Number: 871987M/87216	Transformer Type: Pad	Number / Type: 5 floats
Pump Curve:	Transformer Size: 75 kVA	Flowmeter Type: None
Wet Well Diameter: 6 ft	Voltage: 460	Lapse Time Meter: Yes
Wet Well Storage Depth: 6 (max) ft	Phase: 3	Telemetry Mfg:
Invert Elevation:	Disconnect Type: Fused	Telemetry Type: None
Pressure Gauge Dischrg: Yes	Main Amps: 40	Alarm Type: Horn/Light
FM Material:	Motor Control Location: Panel	Control Sequence: Lead on 38/ off 12% Lag on 44/ off 12% High/Low Al 62/ 2 %
FM Size: ?? in	Motor Controller: Across the Line	
FM Length: ?? ft	HP: 10	
Discharge Elevation: ??	Motor Brand: KSB	Other Station Equipment: Yard hydrant;bypass pump connection
Evidence of Overflow: No	Motor Serial Number:	
Fence: Yes	Aux Power: None	
	Generator Brand:	
	Generator kW:	

Remarks: Valve vault 6'x8'x4' deep w/4'x5' Al double door hatch, 4" piping, 1 APCO ARV (disch not piped),OL&W ck valves, bypass pump conn, press ga on red valve (gauge not readable);pumps KSB KRTF 100-25-/74 XG (215), DKN 1324-5.5, 10 hp, 460V, SF 1.1, 1745, FLA 14.5, LRA 82, PF 76%; Disch pipe flange interferes with pump removal/replacement;appears to be mud? On pumps;Wet well tot depth 204", 130" & 123" to infl pipes; P1 4" in 30 sec (140 GPM), P2 4" in 30 sec (140 GPM); XYPEX additive in wetwell and valve vault;conduit seals are failing in wet well-need to be replaced ASAP;street lighting electrical panel (service,disconn,meter) directly adjacent to station



City of Oak Ridge Pump Station Inspection

Date: 12/22/10 Location: East Southwood at Shagbark Ln Date of Construction: ID: 30
 Inspector: sb/sh Latitude: EW: 36-58-19
 Name of Station: Southwood Longitude: NS: 84-20-21

Mechanical Station Condition: <u>Fair</u>	Electrical Station Condition: <u>Poor</u>	
Type: <u>Submersible</u>	Power Source: <u>UG fm 2 pad mou</u>	Level Control: <u>Probe</u>
Number of Pumps: <u>2</u>	Service: <u>UG</u>	Control Manufacturer: <u>Flygt Multitrode</u>
Pump Brand: <u>Flygt</u>	Transformer Number: <u>240/480V-#'s 623</u>	Redundant Level Control: <u>Yes</u>
Serial Number: <u>9450351/945035</u>	Transformer Type: <u>Pad</u>	Number / Type: <u>1 transducer</u>
Pump Curve: <u> </u>	Transformer Size: <u>2@25 KVA</u>	Flowmeter Type: <u>None</u>
Wet Well Diameter: <u>6</u> ft	Voltage: <u>460</u>	Lapse Time Meter: <u>No</u>
Wet Well Storage Depth: <u>5.2 (max)</u> ft	Phase: <u>3</u>	Telemetry Mfg: <u> </u>
Invert Elevation: <u>768.67</u>	Disconnect Type: <u>Fused</u>	Telemetry Type: <u>None</u>
Pressure Gauge Dischrg: <u>No</u>	Main Amps: <u>60</u>	Alarm Type: <u>Light</u>
FM Material: <u>PVC</u>	Motor Control Location: <u>Panel</u>	Control Sequence: <u>Lead on 70/ off 20%</u> <u>Lag on 90/ off 20%</u>
FM Size: <u>4</u> in	Motor Controller: <u>Across the Line</u>	
FM Length: <u>2638</u> ft	HP: <u>10</u>	
Discharge Elevation: <u>791.99</u>	Motor Brand: <u>Flygt</u>	Other Station Equipment: <u>Yard hydrant</u>
Evidence of Overflow: <u>No</u>	Motor Serial Number: <u> </u>	
Fence: <u>No</u>	Aux Power: <u>None</u>	
	Generator Brand: <u> </u>	
	Generator kW: <u> </u>	

Remarks valve vault 56"x70"x52" deep CMU, 4'x4' al dbi door hatch, no ARV, 4" piping; Pumps 3127.180-6322, FLS M21-12-4AL, 10 hp, 460/230, 13/25 FLA, 1735 RPM; grease buildup in wet well, galv guide rails need to be replaced, P2 very difficult to remove due to corrosion on rails, LAT ACTUALLY 35 58 19; lifting rings on wet well need to be removed (tripping hazard); ground wire disconnected from ground rod; fused disconn enclosure very corroded; wet well total depth 172"; 109" & 2 @ 86" to influent pipes; P1 4" in 30 sec (140 GPM), P2 2" in 30 sec (70 GPM)



City of Oak Ridge
Pump Station Inspection

Date:	12/22/10	Location:	113 Graceland Rd	Date of Construction:	2008	ID:	31
Inspector:	sb/sh			Latitude:	EW: 36-57-52		
Name of Station:	Graceland			Longitude:	NS: 84-19-38		
Mechanical Station Condition:	Excellent	Electrical Station Condition:	Excellent				
Type:	Submersible	Power Source:	UG fm pole	Level Control:	Probe		
Number of Pumps:	2	Service:	UG	Control Manufacturer:			
Pump Brand:	Flygt	Transformer Number:	11131/11132/11	Redundant Level Control:	Yes		
Serial Number:		Transformer Type:	Pole	Number / Type:			
Pump Curve:		Transformer Size:	3@ 25 kVA	Flowmeter Type:	None		
Wet Well Diameter:	10 ft	Voltage:	460	Lapse Time Meter:	Yes		
Wet Well Storage Depth:	5.9 (max) ft	Phase:	3	Telemetry Mfg:			
Invert Elevation:	803.0	Disconnect Type:	Fused	Telemetry Type:	None		
Pressure Gauge Dischrg:	Yes	Main Amps:	200/150 A brkr	Alarm Type:	Light		
FM Material:		Motor Control Location:	Panel	Control Sequence:	lead on 50/off 20% Lag on 60/off 20% High/Low AL 90/10%		
FM Size:	6 in	Motor Controller:	Soft Start	Other Station Equipment:	yard hydrant;Purafil DS500		
FM Length:	2059 ft	HP:	20				
Discharge Elevation:	894.7	Motor Brand:	Flygt				
Evidence of Overflow:	No	Motor Serial Number:					
Fence:	No	Aux Power:	None				
		Generator Brand:					
		Generator kW:					

Remarks 35 psi stat/40 psi running; Purafil unit ser # L08-0199; ground very soft around station, needs access drive to pull pumps



City of Oak Ridge
Pump Station Inspection

Date: 01/05/11 Location: Pump House Road adjacent to Melton Hill Lake backwater Date of Construction: 2008 ID: 32
 Inspector: sh Latitude: EW: 36-58-30
 Name of Station: Pump House Roa Longitude: NS: 84-13-33

Mechanical Station Condition: Excellent		Electrical Station Condition: Excellent	
Type: Submersible	Power Source: OH fm pole	Level Control: Pressure	
Number of Pumps: 2	Service: OH	Control Manufacturer: Multi-Tröde MS	
Pump Brand: Flygt	Transformer Number: 2189,2190,2060	Redundant Level Control: Yes	
Serial Number:	Transformer Type: Pole	Number / Type: Probe	
Pump Curve:	Transformer Size: 3@100 kVA	Flowmeter Type: None	
Wet Well Diameter: 10 ft	Voltage: 460	Lapse Time Meter: Yes	
Wet Well Storage Depth: 11 (max) ft	Phase: 3	Telemetry Mfg:	
Invert Elevation: 776.0	Disconnect Type: Fused	Telemetry Type: None	
Pressure Gauge Dischrg: Yes	Main Amps: 400	Alarm Type: Horn/Light	
FM Material: Other	Motor Control Location: Panel	Control Sequence:	
FM Size: 8 (CI) in	Motor Controller: VFD		
FM Length: 3038 ft	HP: 105		
Discharge Elevation: To Scarboro wet	Motor Brand: Flygt	Other Station Equipment: yard light	
Evidence of Overflow: No	Motor Serial Number:		
Fence: Yes	Aux Power: None		
	Generator Brand:		
	Generator kW:		

Remarks: LAT ACTUALLY 35-58-30; Pumps 3301.090-0940005, 1775 RPM, 125 FLA; 2 ARV piped to wet well; station designed for additional pump (160 hp) to pump past Scarboro through new force main to abandon Scarboro station in future.



City of Oak Ridge
Pump Station Inspection

Date: 01/05/11 Location: 108 Pavillion Drive Date of Construction: under construction ID: 33
 Inspector: sh Latitude: EW: 36-00-47
 Name of Station: Wolf Creek Longitude: NS: 84-13-29

Mechanical Station Condition:	Poor	Electrical Station Condition:	Good
Type:	Submersible	Power Source:	UG fm pad mnt tr
Number of Pumps:	2	Service:	UG
Pump Brand:		Transformer Number:	4441
Serial Number:		Transformer Type:	Pad
Pump Curve:		Transformer Size:	45kVA
Wet Well Diameter:	8 ft	Voltage:	460
Wet Well Storage Depth:	ft	Phase:	3
Invert Elevation:		Disconnect Type:	Circuit Breaker
Pressure Gauge Dischrg:	Yes	Main Amps:	100
FM Material:		Motor Control Location:	Panel
FM Size:	in	Motor Controller:	Across the Line
FM Length:	ft	HP:	
Discharge Elevation:		Motor Brand:	
Evidence of Overflow:	No	Motor Serial Number:	
Fence:	No	Aux Power:	None
		Generator Brand:	
		Generator kW:	
		Level Control:	Pressure
		Control Manufacturer:	Dig Control 1192
		Redundant Level Control:	Yes
		Number / Type:	4 floats (PumpPa
		Flowmeter Type:	None
		Lapse Time Meter:	Yes
		Telemetry Mfg:	
		Telemetry Type:	
		Alarm Type:	Horn/Light
		Control Sequence:	Lead on/off @ 4'/2' Lag on/off @ 5'/2'
		Other Station Equipment:	Pur-A-Fil scrubber;yard hydrant

Remarks: No lock on wet well hatch; P2 check valve is inoperable, allows flow back into wet well; Single ARV piped back to wet well, pipe broken at valve due to no support for pipe; 4" piping in vault; debris in valve vault; COR HAS NOT ACCEPTED STATION AS OF DATE OF INSPECTION



City of Oak Ridge Pump Station Inspection

Date:	01/05/11	Location:	300A Centennial Bluff	Date of Construction:	under construction	ID:	34
Inspector:	sh	Latitude:	EW: 36-01-15	Longitude:	NS: 84-10-05		
Name of Station:	Centennial Bluff						
Mechanical Station Condition:	Fair	Electrical Station Condition:	Good				
Type:	Submersible	Power Source:	Underground fm	Level Control:	Pressure		
Number of Pumps:	2	Service:	UG	Control Manufacturer:			
Pump Brand:		Transformer Number:	2557	Redundant Level Control:	Yes		
Serial Number:		Transformer Type:	Pad	Number / Type:	Probe		
Pump Curve:		Transformer Size:	75 kVA	Flowmeter Type:	None		
Wet Well Diameter:	6 ft	Voltage:	240/120	Lapse Time Meter:	Yes		
Wet Well Storage Depth:	ft	Phase:	3	Telemetry Mfg:			
Invert Elevation:		Disconnect Type:	Circuit Breaker	Telemetry Type:	None		
Pressure Gauge Dischrg:		Main Amps:	200	Alarm Type:	Horn/Light		
FM Material:		Motor Control Location:	Panel	Control Sequence:	Lead on/off 50/10% Lag on/off 60/20%		
FM Size:	in	Motor Controller:	VFD	Other Station Equipment:	Yard hydrant;Pur-A-Fil scrubber;yard light		
FM Length:	ft	HP:					
Discharge Elevation:		Motor Brand:					
Evidence of Overflow:		Motor Serial Number:					
Fence:	Yes	Aux Power:	None				
		Generator Brand:					
		Generator kW:					

Remarks: VFD is Altivar 48; Valve vault is floded; 1 pump running continuously (very hot) with no flow into wet well; 1 pump faulted; STATION NOT ACCEPTED BY COR AS OF INSPECTION DATE



City of Oak Ridge Pump Station Inspection

Date: 01/05/11 Location: 300A Centennial Bluff Date of Construction: under construction ID: 34
 Inspector: sh Latitude: EW: 36-01-15
 Name of Station: Centennial Bluff Longitude: NS: 84-10-05

Mechanical Station Condition: Fair Electrical Station Condition: Good

Type: Submersible	Power Source: Underground fm	Level Control: Pressure
Number of Pumps: 2	Service: UG	Control Manufacturer:
Pump Brand:	Transformer Number: 2557	Redundant Level Control: Yes
Serial Number:	Transformer Type: Pad	Number / Type: Probe
Pump Curve:	Transformer Size: 75 kVA	Flowmeter Type: None
Wet Well Diameter: 6 ft	Voltage: 240/120	Lapse Time Meter: Yes
Wet Well Storage Depth:	Phase: 3	Telemetry Mfg:
Invert Elevation:	Disconnect Type: Circuit Breaker	Telemetry Type: None
Pressure Gauge Dischrg:	Main Amps: 200	Alarm Type: Horn/Light
FM Material:	Motor Control Location: Panel	Control Sequence: Lead on/off 50/10% Lag on/off 60/20%
FM Size: in	Motor Controller: VFD	
FM Length: ft	HP:	
Discharge Elevation:	Motor Brand:	Other Station Equipment: Yard hydrant;Pur-A-Fil scrubber;yard light
Evidence of Overflow:	Motor Serial Number:	
Fence: Yes	Aux Power: None	
	Generator Brand:	
	Generator kW:	

Remarks: VFD is Altivar 48; Valve vault is floded; 1 pump running continuously (very hot) with no flow into wet well; 1 pump faulted; STATION NOT ACCEPTED BY COR AS OF INSPECTION DATE

**Appendix B:
Pump Curves**

Project
 Project ID
 Pos.no
 Created by

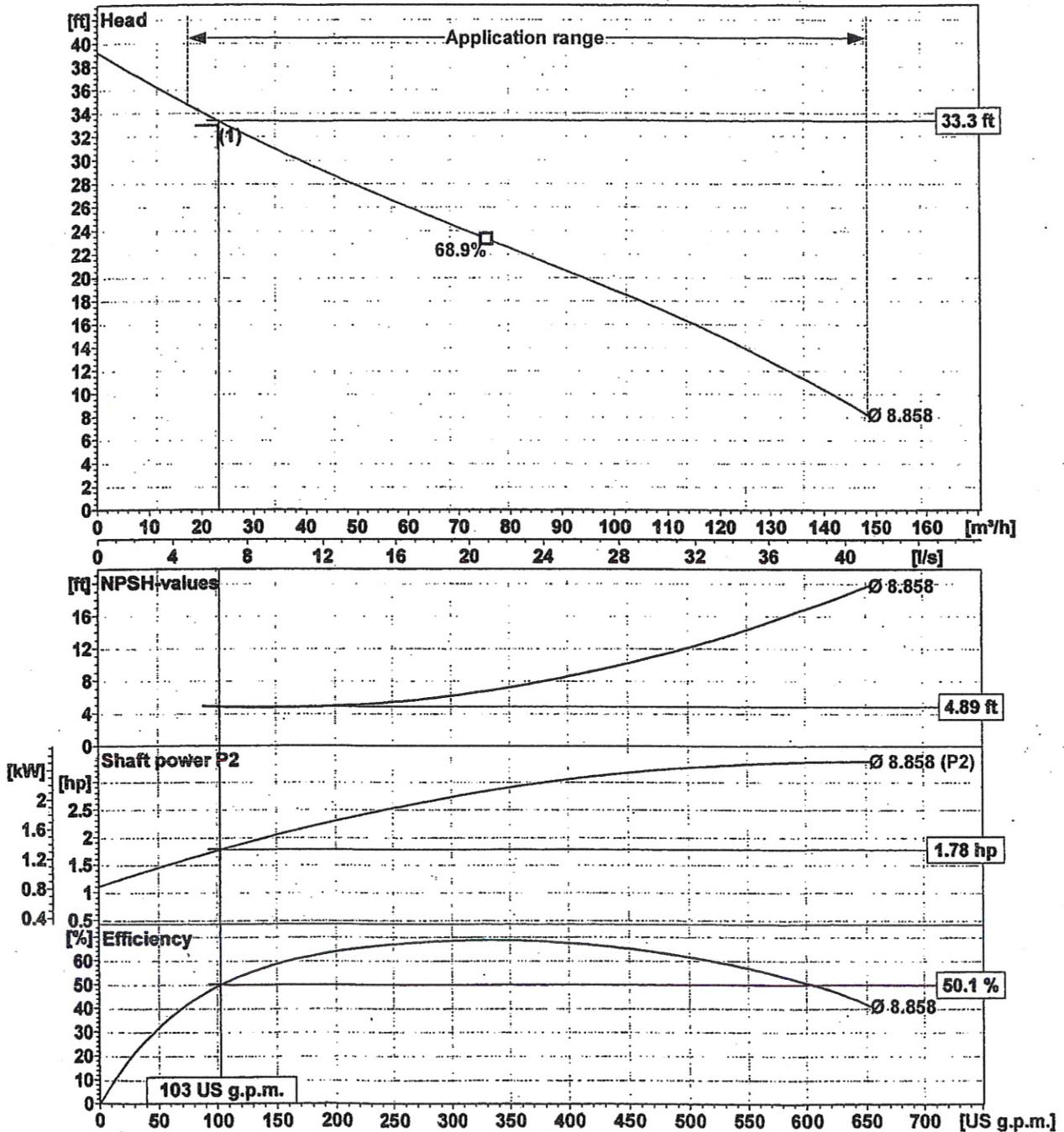
Wolf Creek Subdivision
 Oak Ridge, TN
 Water and Waste Equipment INC.



2007-11-12

Performance curve

Pump type KRT E 80-251/46XG-S



Impeller type	Single vane impeller	Closed	Curve number	K42883/1	
Free passage	3"	Density of fluid	62.32 lb/ft³	Frequency	60 Hz
Impeller size	(225) 8 7/8"	Viscosity	1.082E-05 ft²/s	Speed	1160 1/min

KSB Inc., Richmond, VA. / KSB Pumps Inc., Mississauga, Ontario / KSB AG, Halle (Saale), Germany

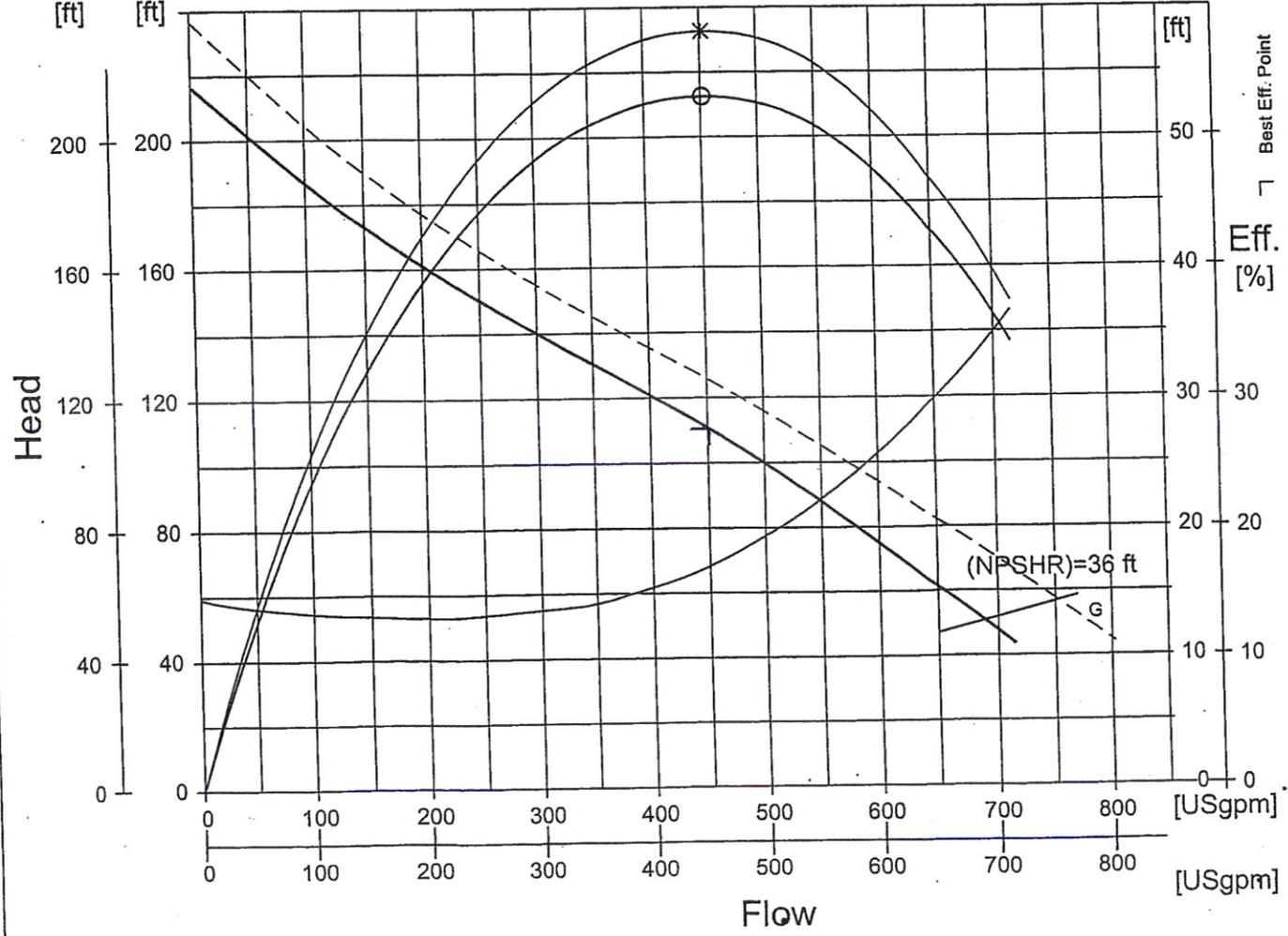
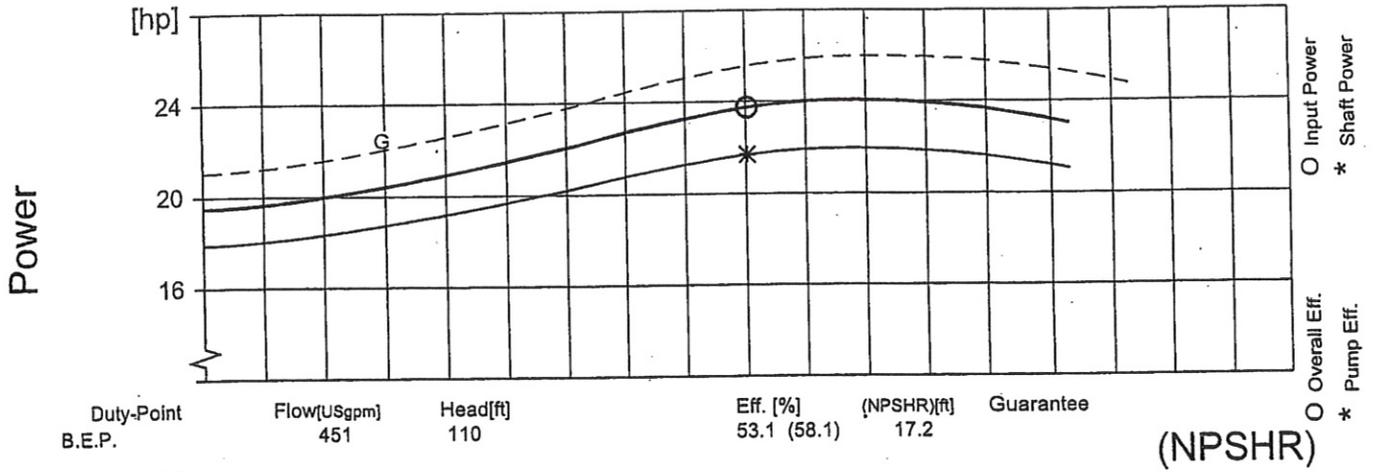


Performance Curve

Product **NP3153.181** Type **SH**

Date **2007-11-19** Project **CENTENNIAL BLUFF 300 GPM 140 FT** Curve No **63-274-00-1078** Issue **5**

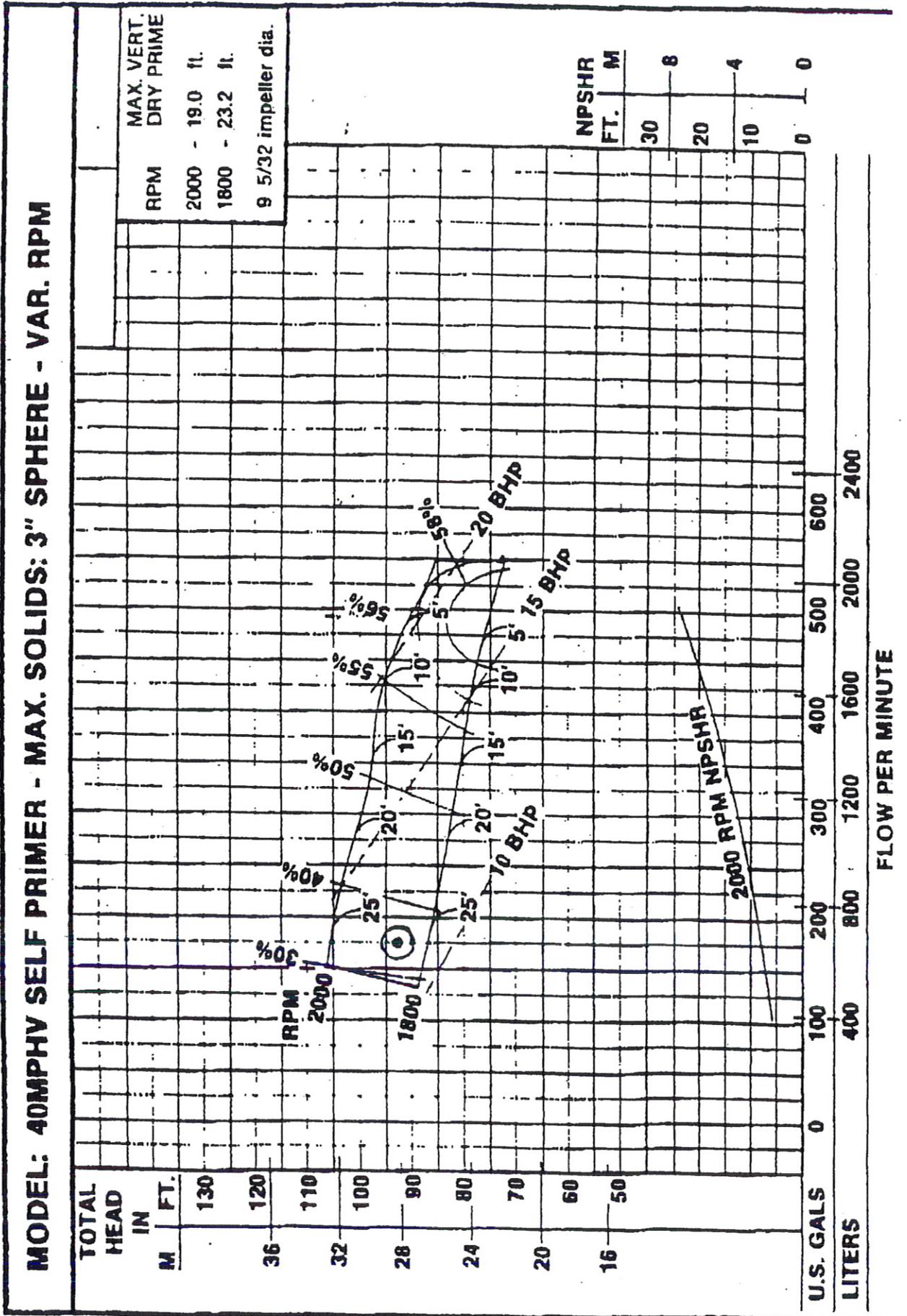
Power Factor	1/1-Load	3/4-Load	1/2-Load	Rated Power ...	23 hp	Impeller Diameter			
	0.91	0.87	0.79			176 mm			
Efficiency	91.0 %	91.5 %	91.5 %	Starting Current ...	415 A	Motor #	Stator	Rev	
Motor Data	---	---	---	Rated Current ...	52 A	21-18-2BB	04Y//	10	
Comments	Inlet/Outlet			Rated Speed ...	3510 rpm	Freq.	Phases	Voltage	Poles
	- / 4 inch			Tot. Mom. of Inertia ...	0.032 kgm2	60 Hz	3	230 V	2
Imp. Throughlet				No. of Blades	2	Geartype		Ratio	---



unix AUTHOR: GPWEB1 SACU (rev:7.49)

Guarantee between limits (G) 100 to

21. WESTVIEW PUMP STATION



17. RIVERS RUN BOULEVARD PUMP STATION

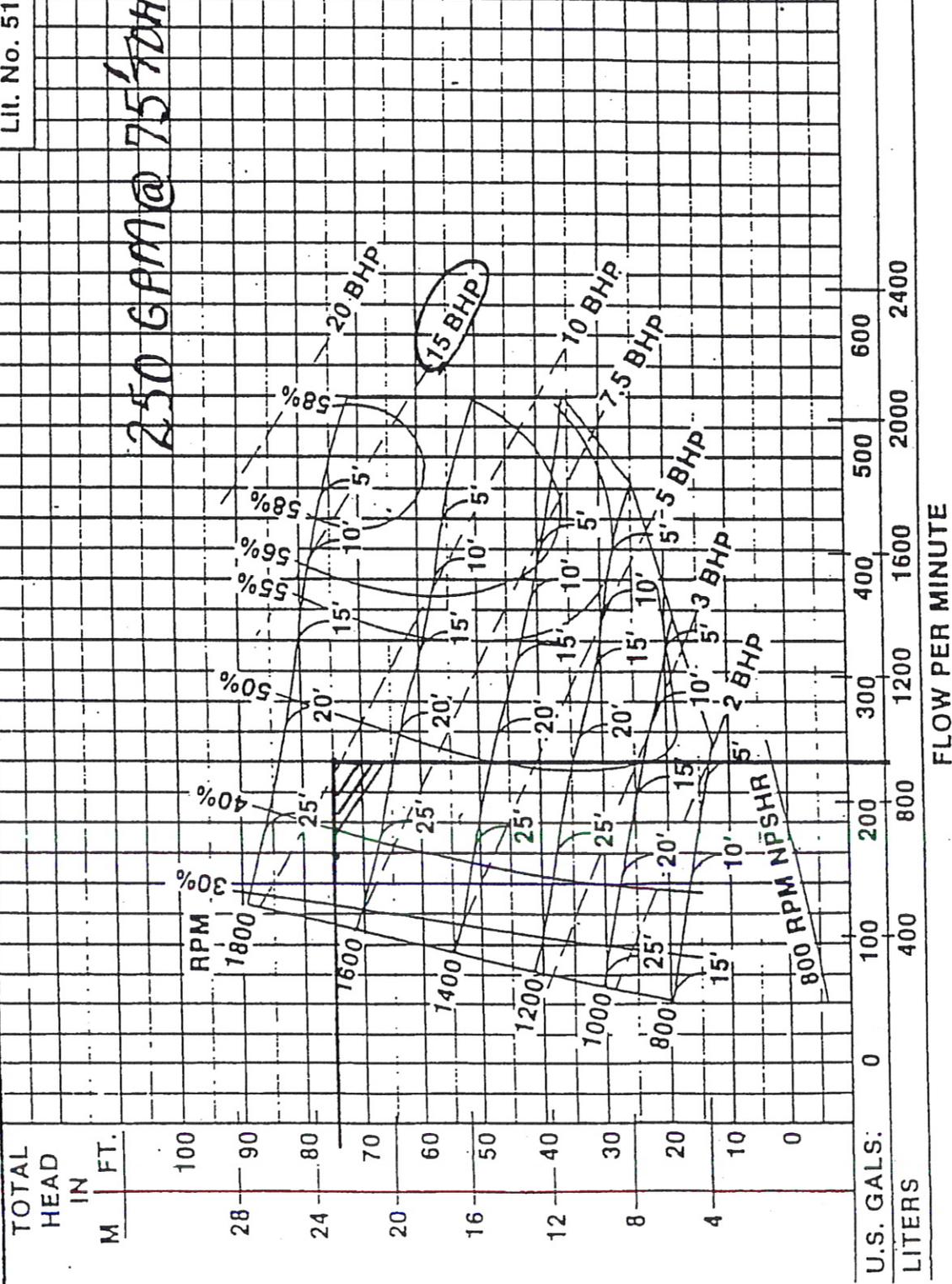
MODEL: 40MPV - 40MP5V SELF PRIMER - MAX. SOLIDS: 3" SPHERE - VAR. RPM

LII. No. 513.43 10845-003-1

RPM	MAX. VERT. DRY PRIME
1800	- 23.2 ft.
1600	- 16.6
1400	- 25.0
1200	- 24.4
1000	- 24.3
800	- 15.5 ft.

9 5/32 impeller dia.

250 GPM @ 75' TDH

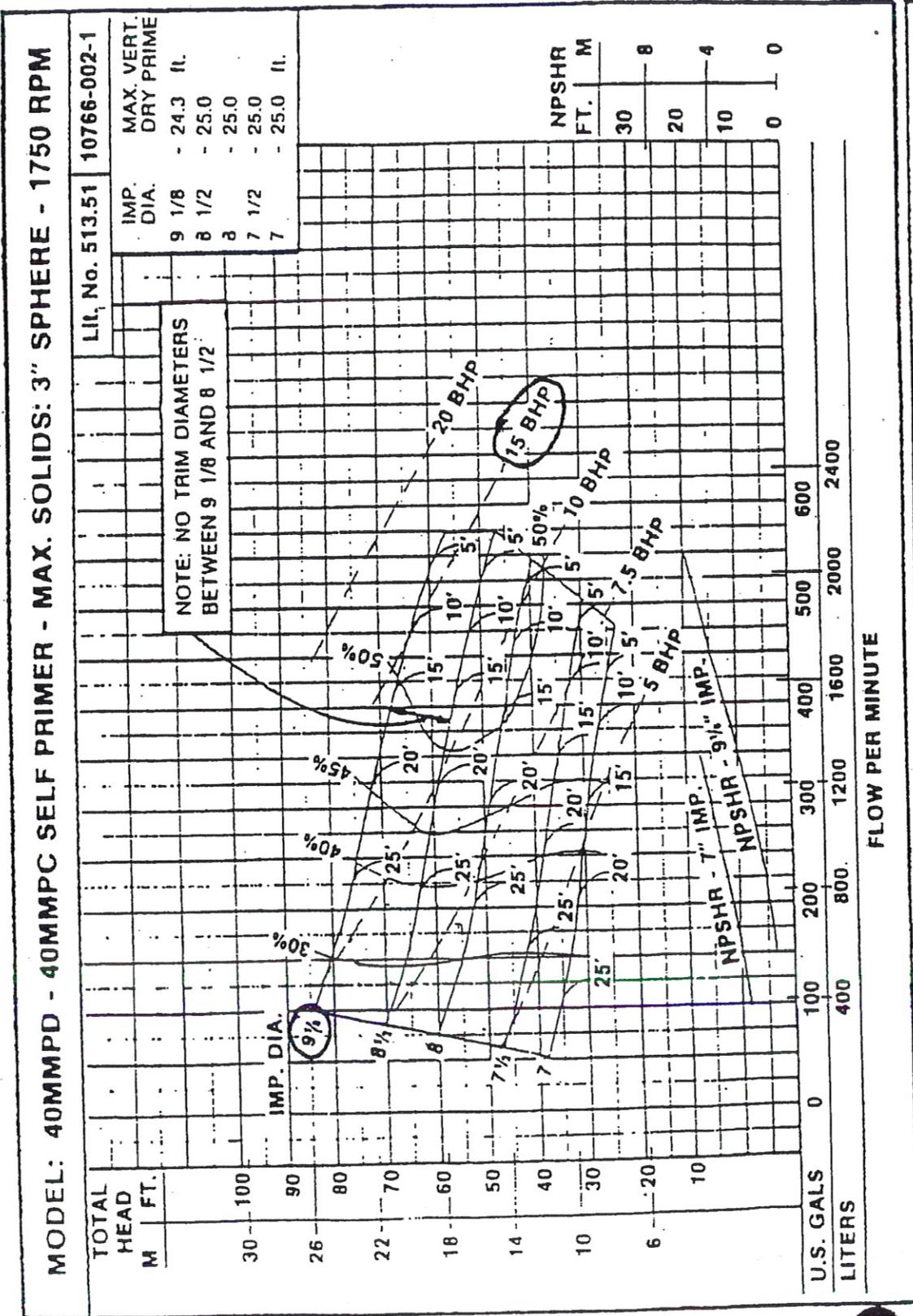


NPSHR	FT.	M
	30	8
	20	4
	10	4

SECTION 510
PERFORMANCE DATA

HYDR-O-MATIC
PUMPS

10. GREGORY'S PUMP STATION



MODEL: 40MMPV SELF PRIMER - MAX. SOLIDS: 3" SPHERE - VAR. RPM

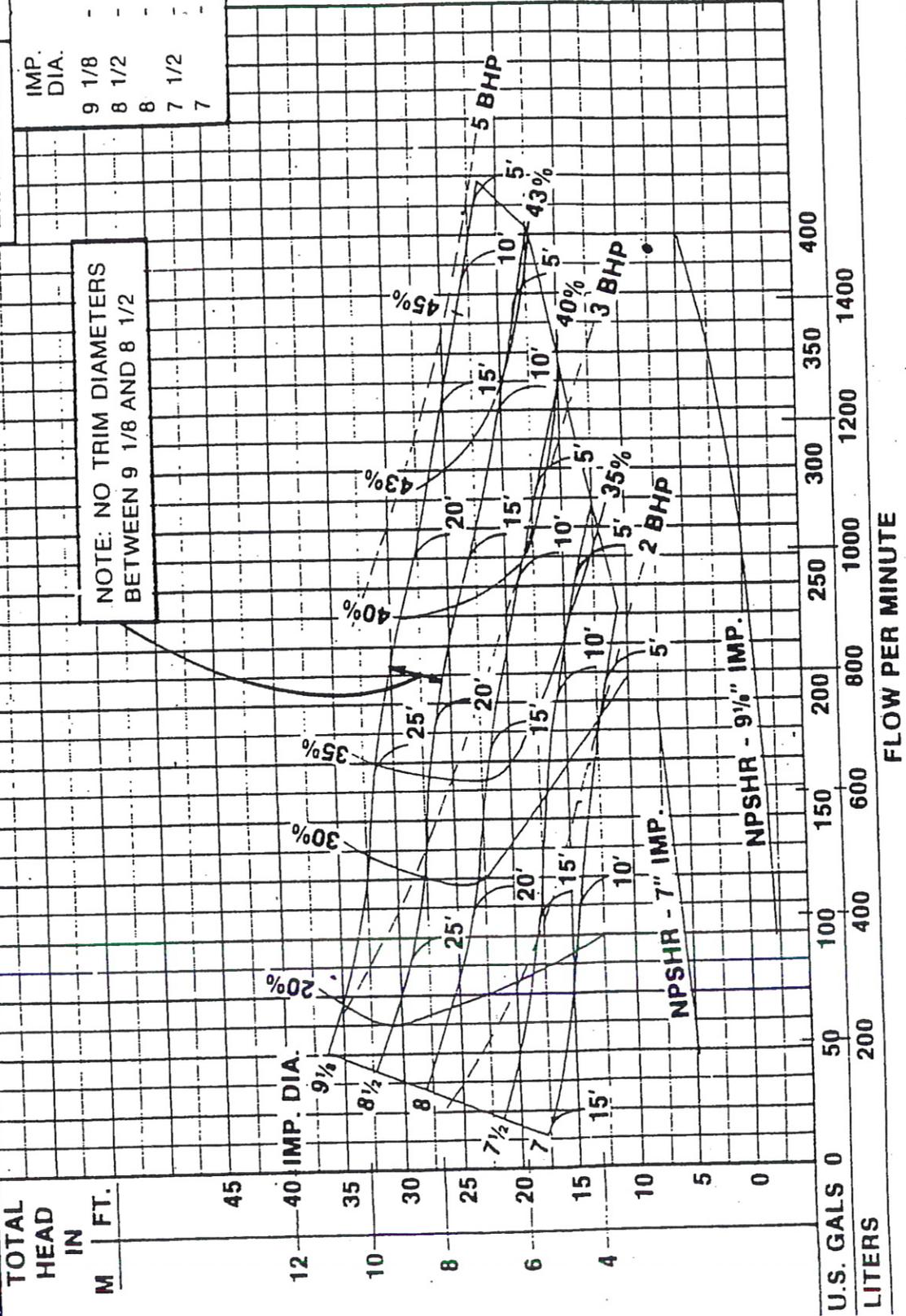
4. CASTLEWOOD PUMP STATION

MODEL: 40MMPD - 40MMPC SELF PRIMER - MAX. SOLIDS: 3" SPHERE - 1150 RPM

Lit. No. 513.50 10766-001-1

IMP. DIA.	MAX. VERT. DRY PRIME
9 1/8	- 23.2 ft.
8 1/2	- 25.4
8	- 25.0
7 1/2	- 23.75
7	- 18.3 ft.

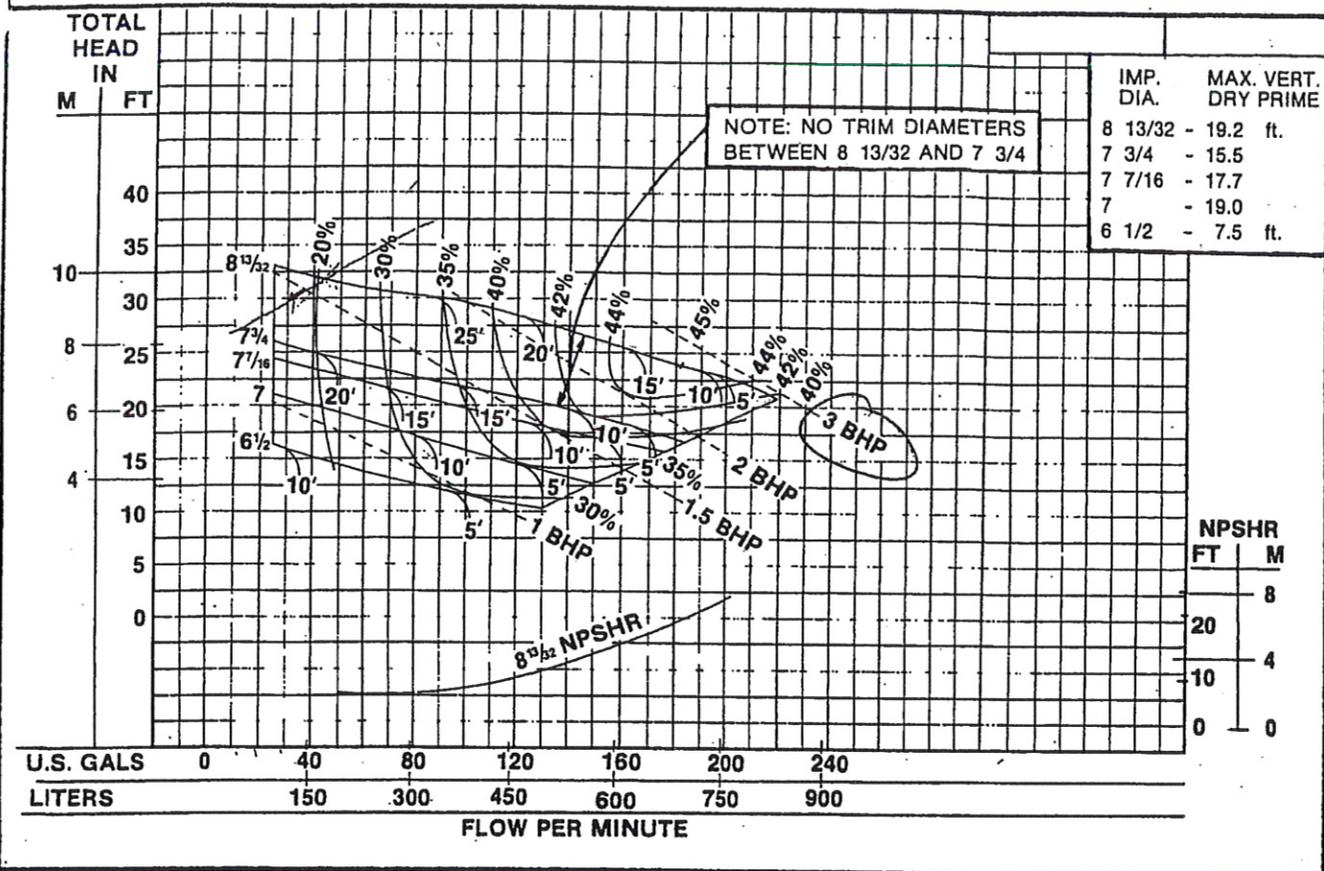
NOTE: NO TRIM DIAMETERS BETWEEN 9 1/8 AND 8 1/2



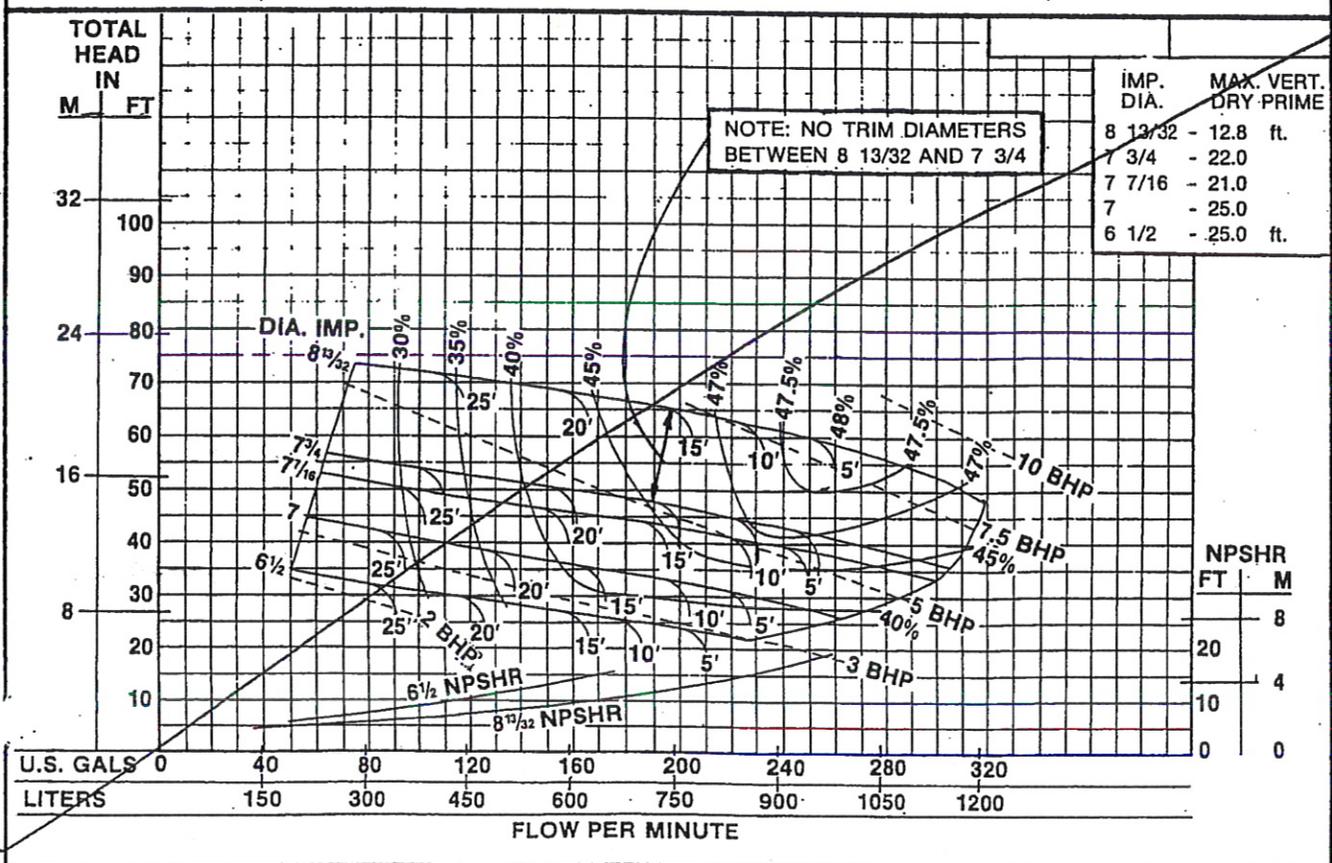
NPSHR	FT.	M
	30	8
	20	4
	10	0
	0	0



MODEL: 30MPSD SELF PRIMER - MAX. SOLIDS: 2 1/2" SPHERE - 1150 RPM

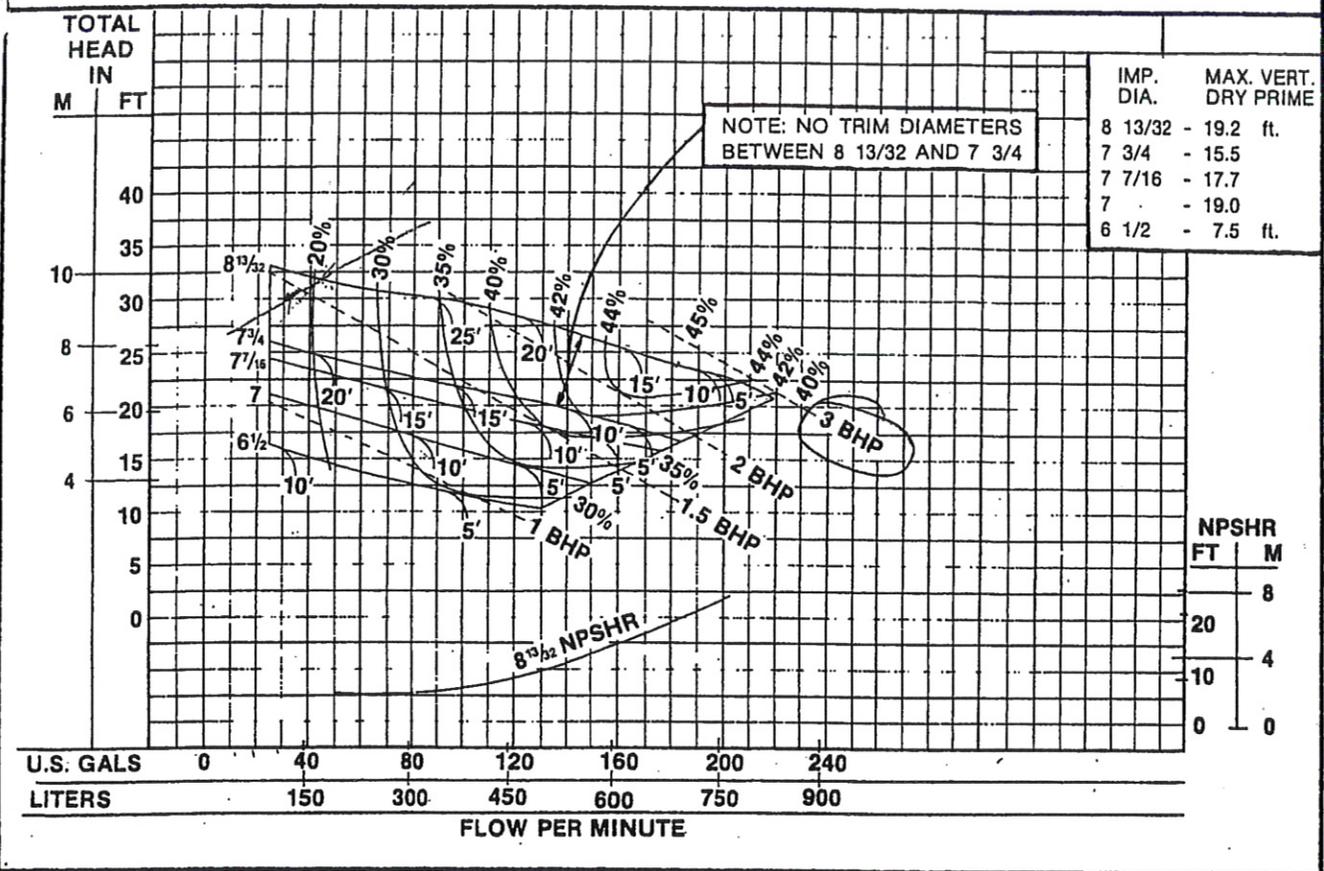


MODEL: 30MPSD SELF PRIMER - MAX. SOLIDS: 2 1/2" SPHERE - 1750 RPM

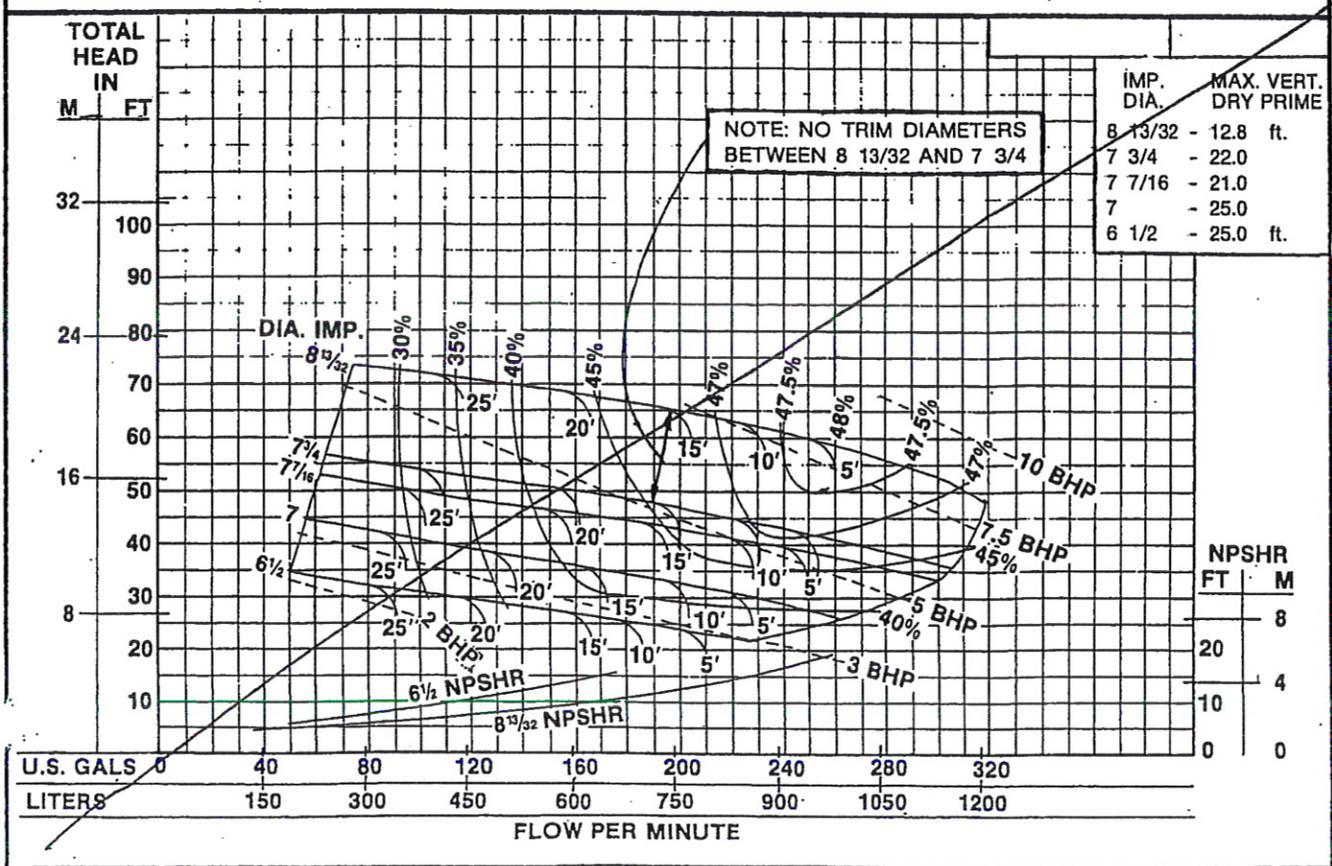




MODEL: 30MPSD SELF PRIMER - MAX. SOLIDS: 2 1/2" SPHERE - 1150 RPM



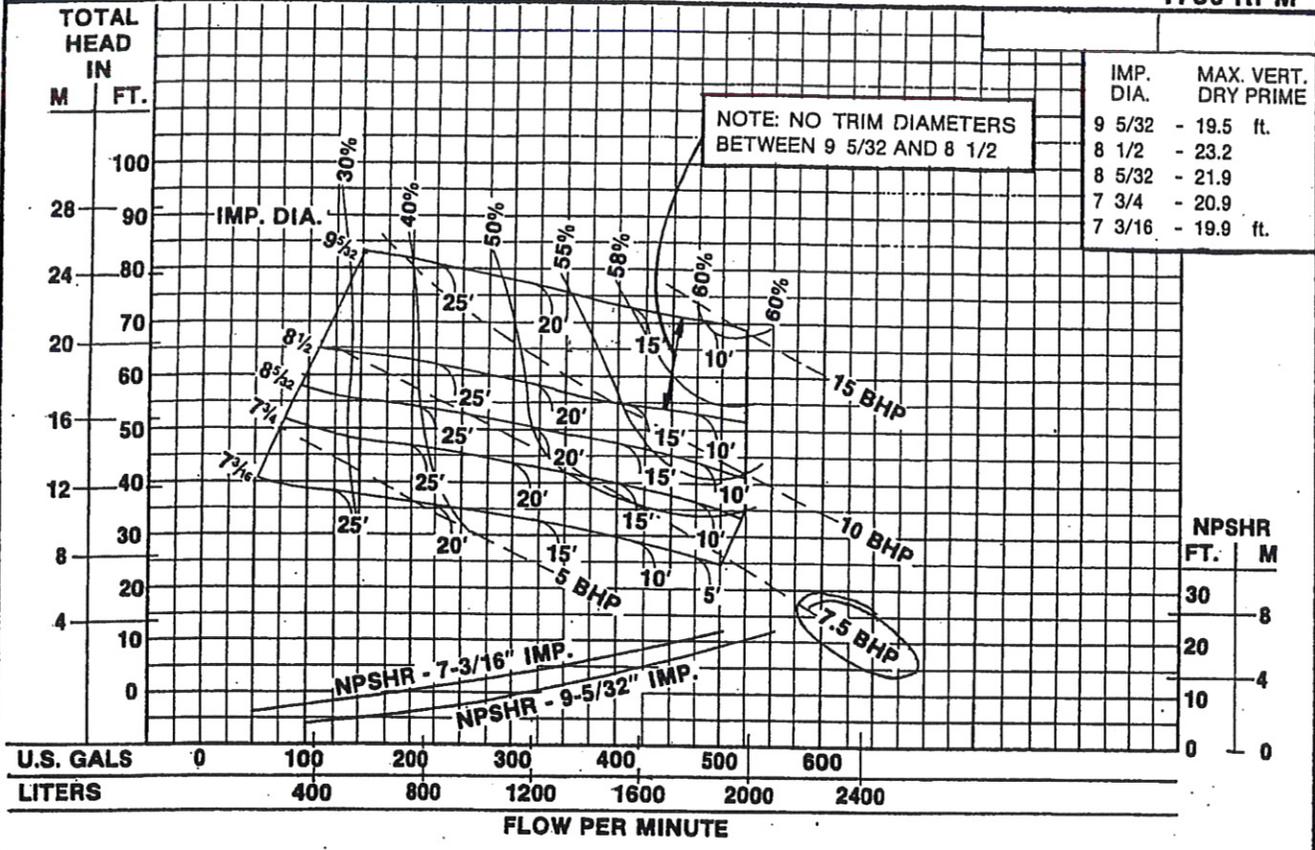
MODEL: 30MPSD SELF PRIMER - MAX. SOLIDS: 2 1/2" SPHERE - 1750 RPM



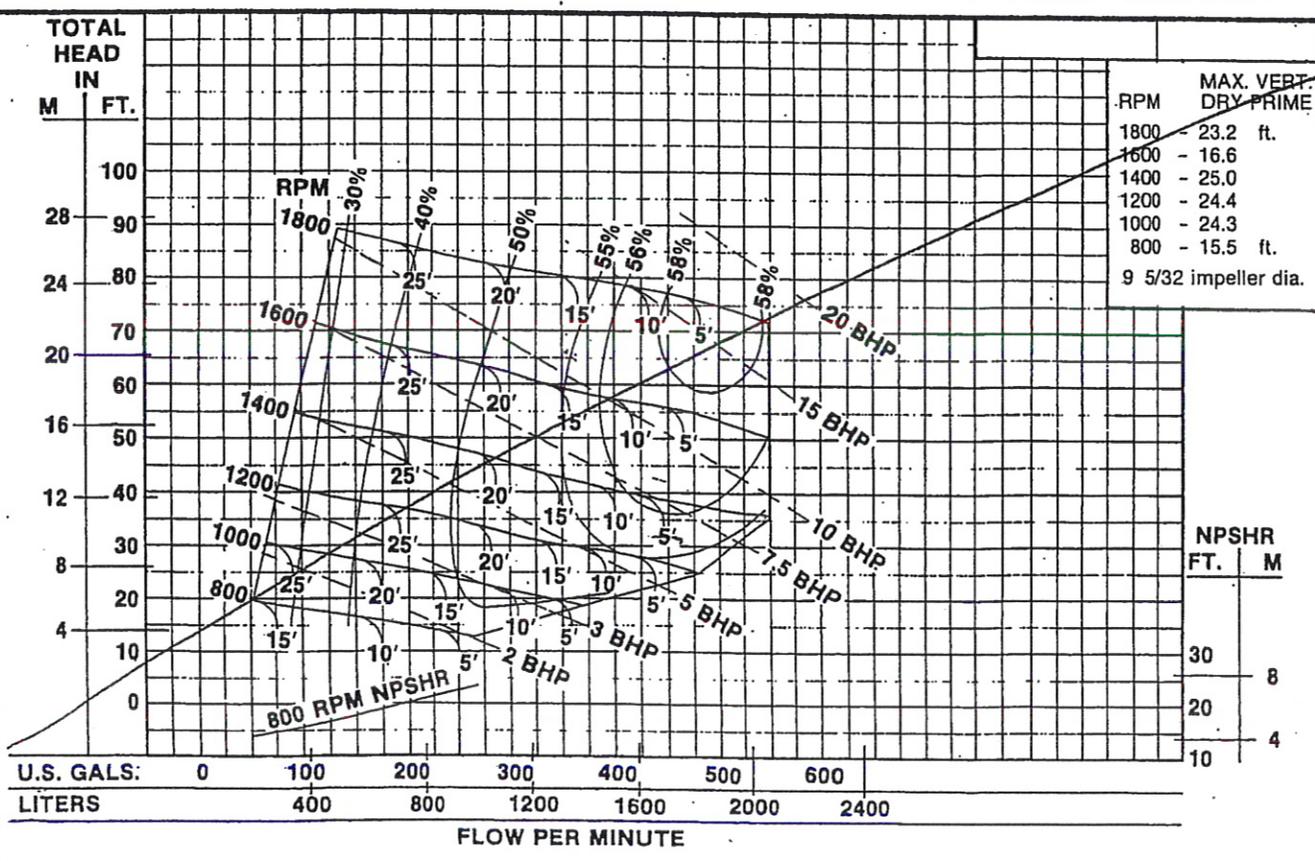


PERFORMANCE DATA

MODEL: 40MPD - 40MPC - 40MPSF SELF PRIMER - MAX. SOLIDS: 3" SPHERE - 1750 RPM

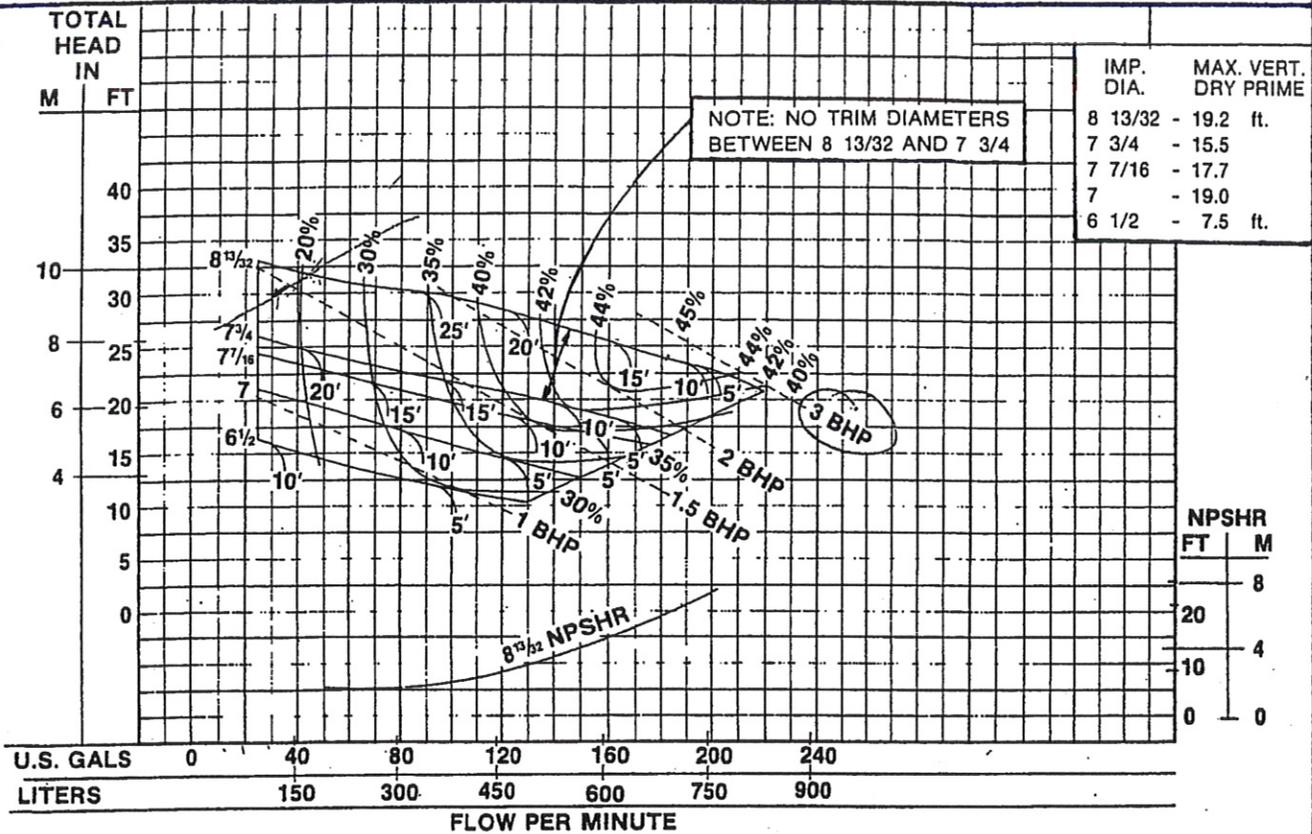


MODEL: 40MPV - 40MPSFV SELF PRIMER - MAX. SOLIDS: 3" SPHERE - VAR. RPM

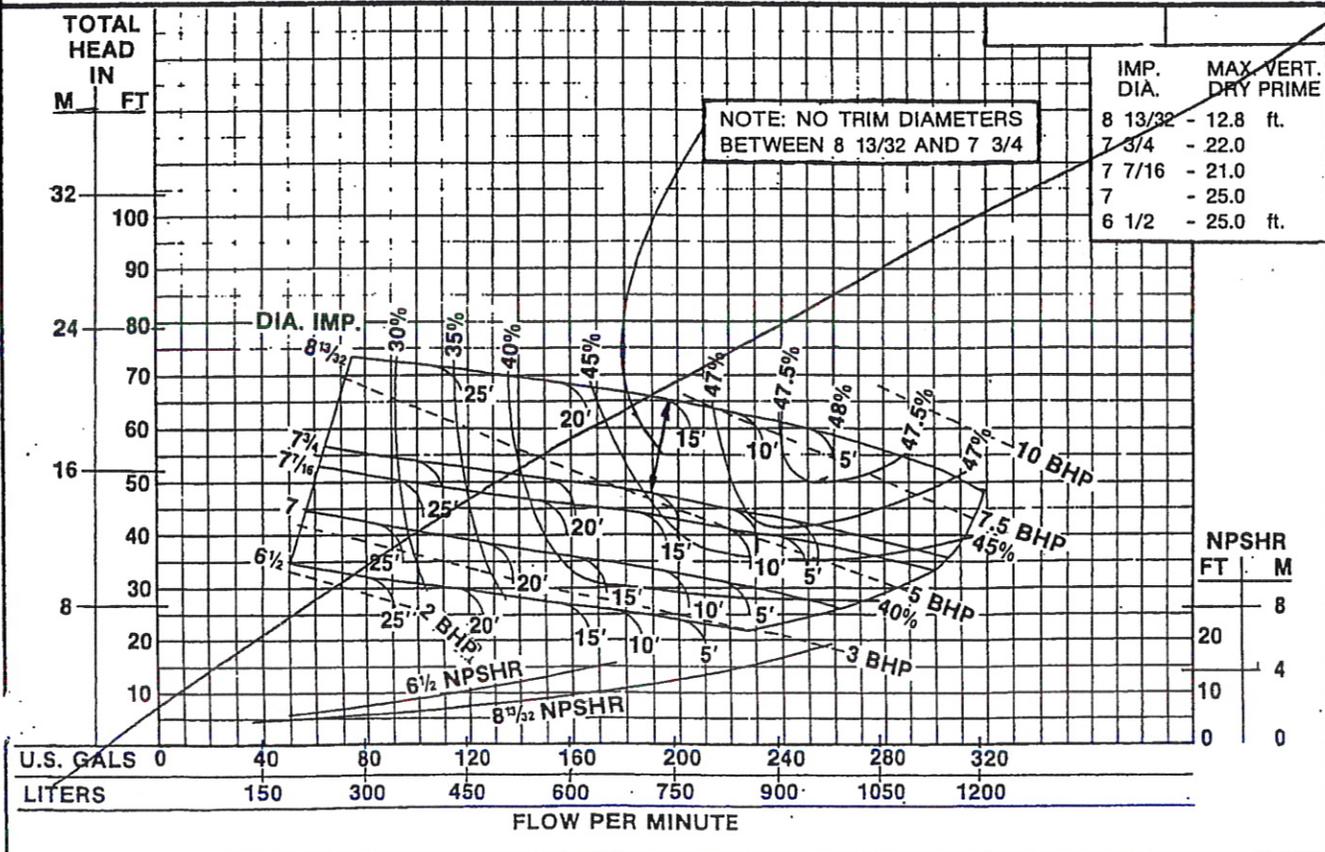


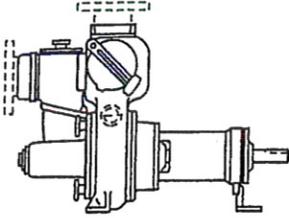


MODEL: 30MPSD SELF PRIMER - MAX. SOLIDS: 2 1/2" SPHERE - 1150 RPM



MODEL: 30MPSD SELF PRIMER - MAX. SOLIDS: 2 1/2" SPHERE - 1750 RPM



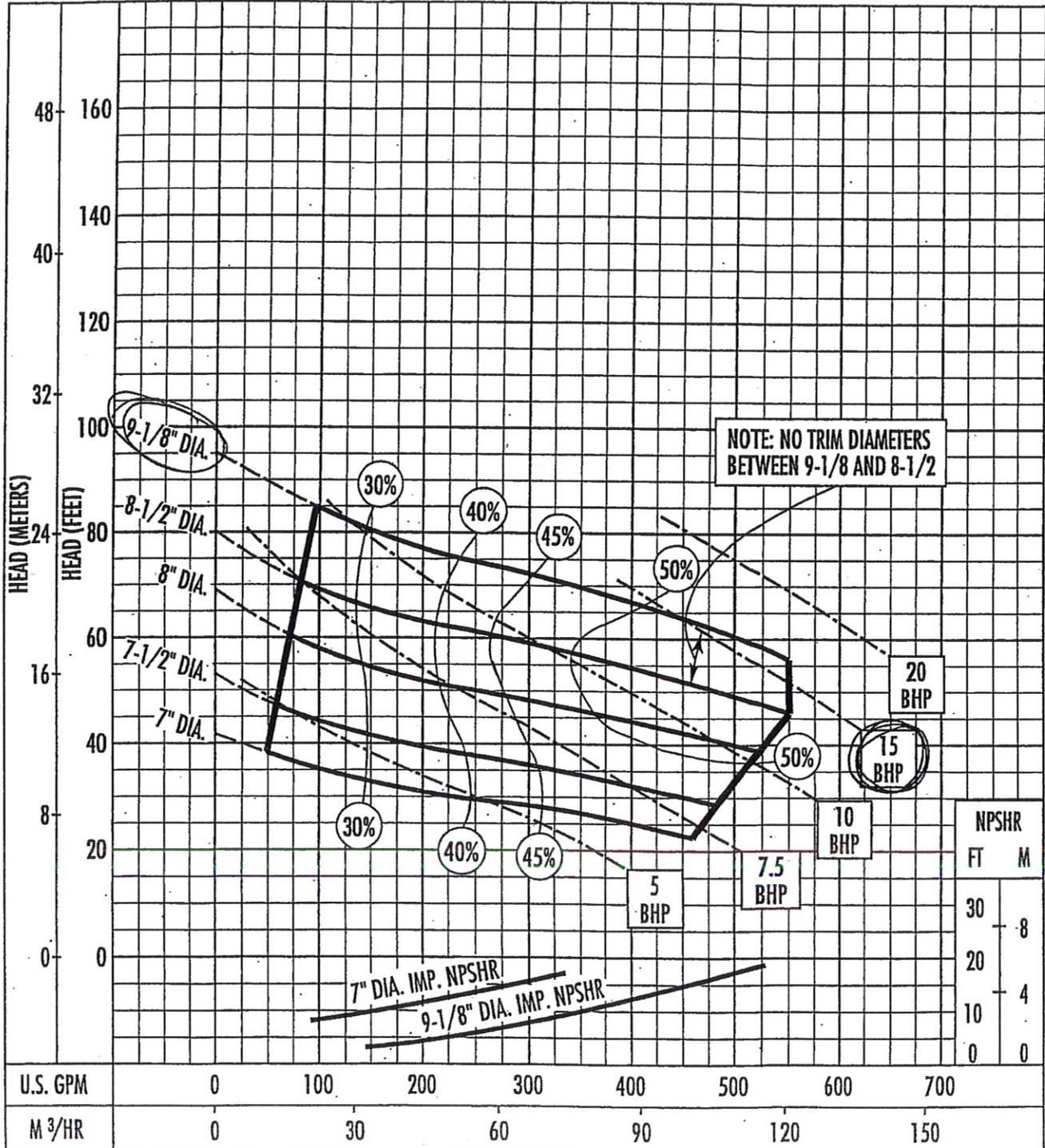


Performance Curve

40MMP

RPM: **1750** Discharge: **4"**

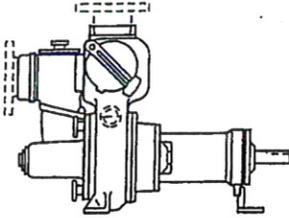
Solids: **3"**



Operation is recommended in the bounded area with operational point within the curve limit.
 Performance curves are based on actual tests with clear water at 70° F. and 1280 feet site elevation.

Conditions of Service:

GPM: _____ TDH: _____

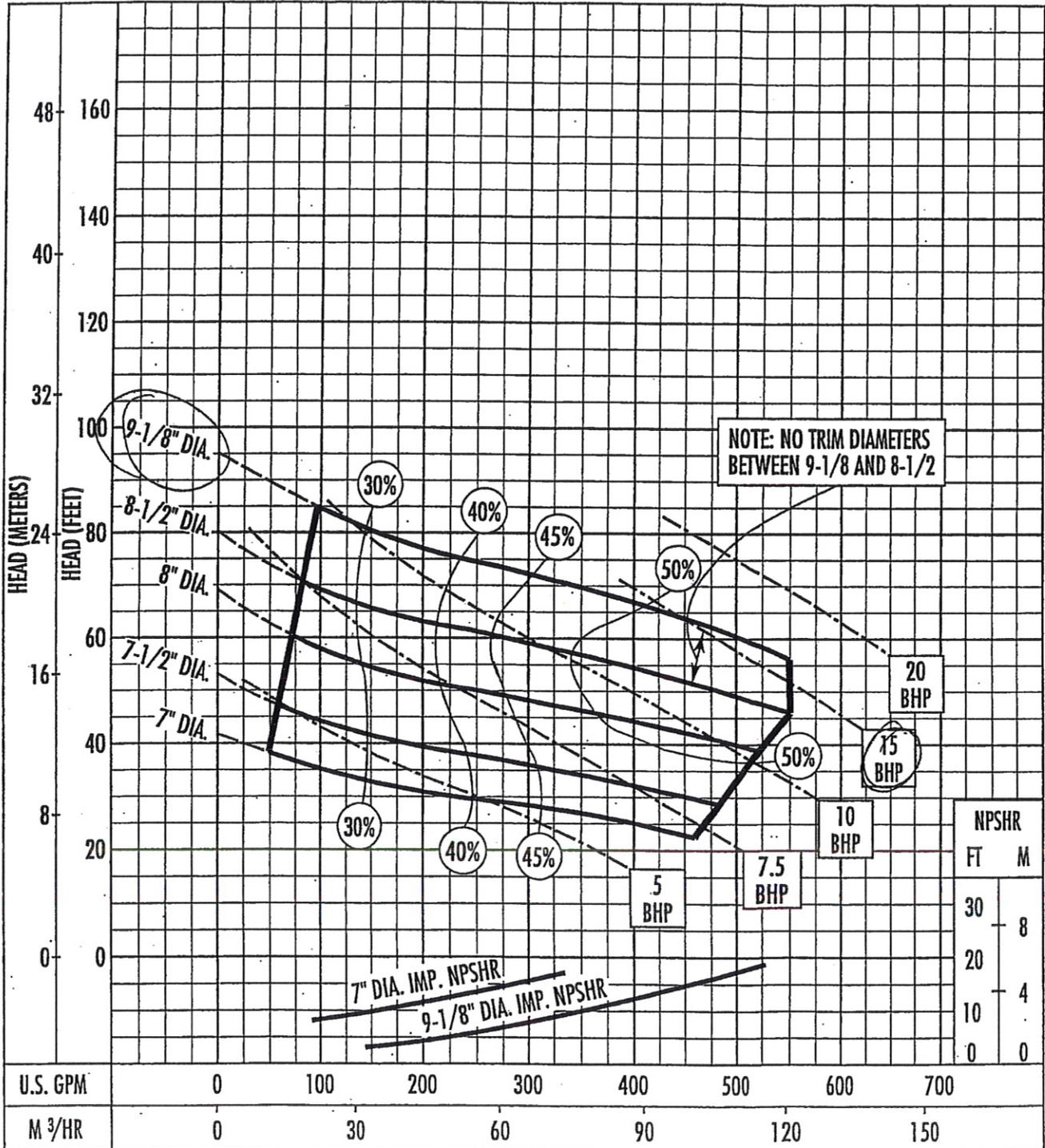


Performance Curve

40MMP

RPM: **1750** Discharge: **4"**

Solids: **3"**



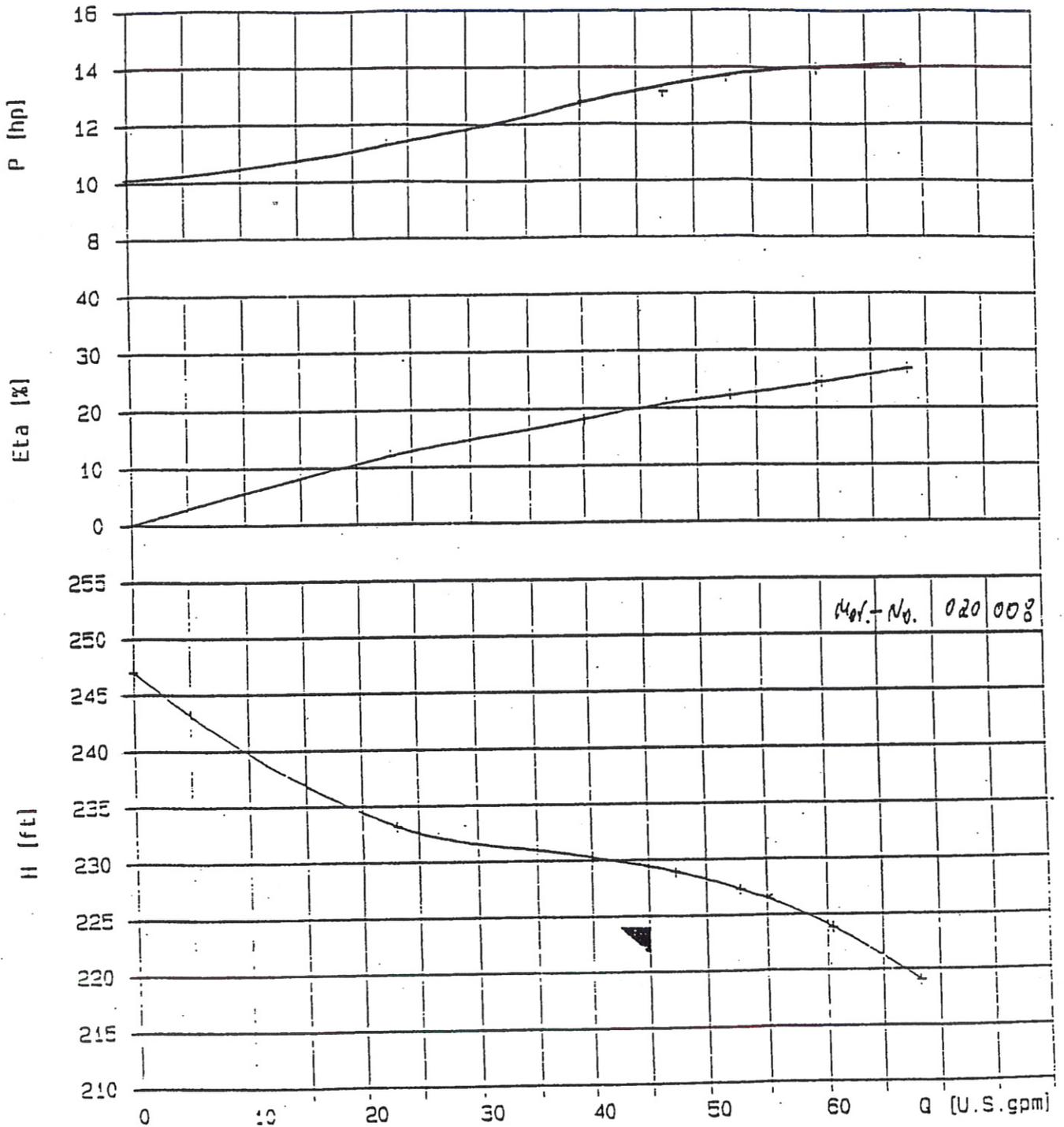
Operation is recommended in the bounded area with operational point within the curve limit.
 Performance curves are based on actual tests with clear water at 70° F. and 1280 feet site elevation.

Conditions of Service:

GPM: _____ TDH: _____

1. WEST OUTER PUMP STATION

Rho = 998.200 (kg/m³)



IMP. MACH. NO.	DIFFUSOR/CASING	ORDER-NO. :
IMP. PATT. NO.	MACH. BRWG. NO. :	CODE : Kennlinie a.ProbeLA
IMP. CODE	PATTERN NO. :	TYPE : KATS 40-250/122X1G
IMP. MAX. DIA.		n (1/min) : 3549..3559
IMP. TRIMMED 231.410		SERIAL NO. : 5-407-757383/-
FORM (IN/OUT)	KSB Halle 30.11.1994	CURVE NO. : 5-407-757383/-
KSB-INSPECTOR	Q - CURVE	



Williams Lane - 1206pm @ 210' TDH KRT

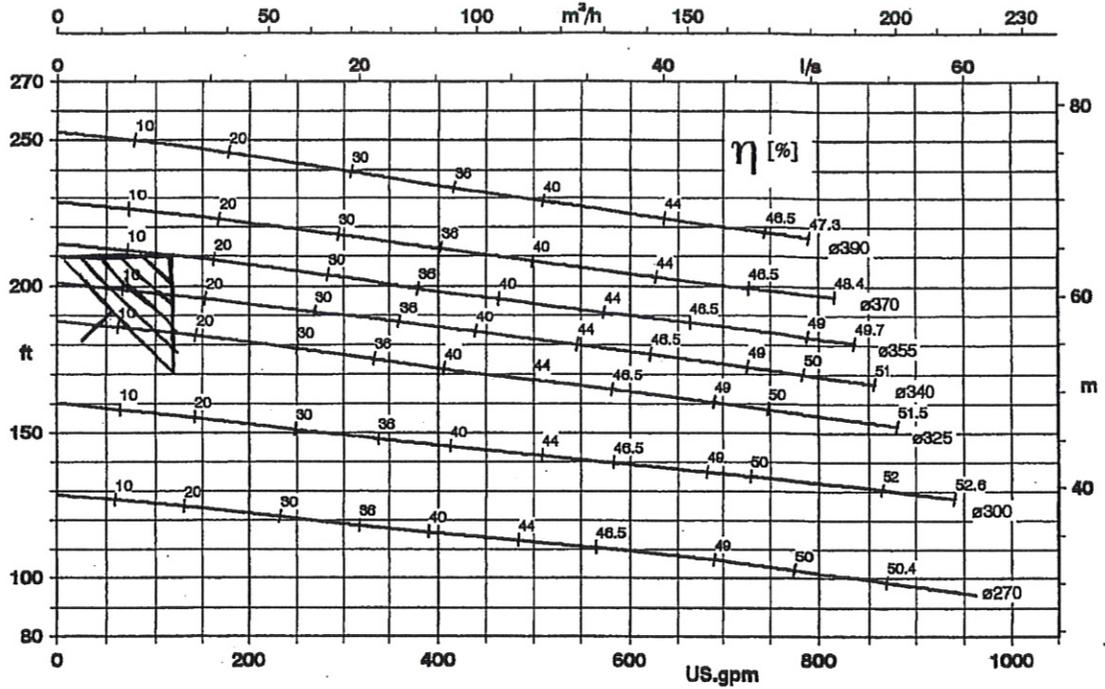
KRT F 100-401

1750 rpm

4 inch

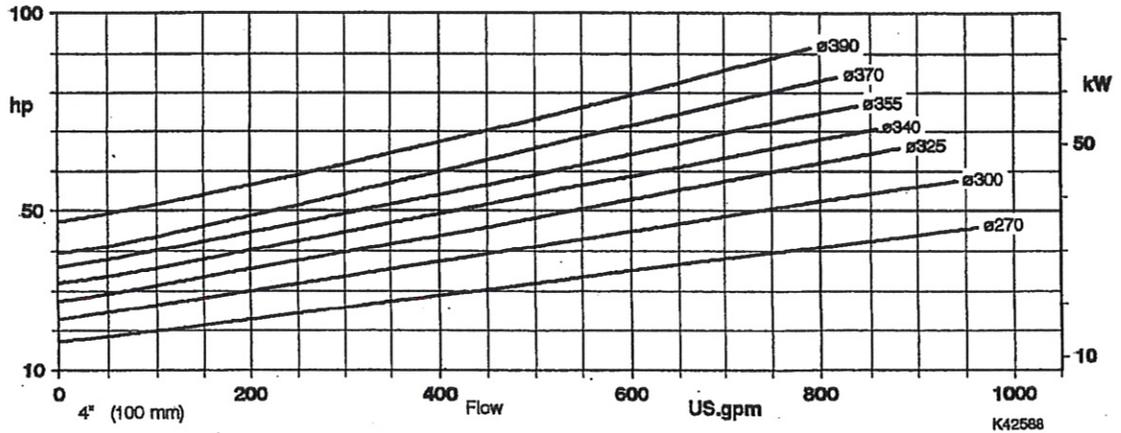


TDH



Power Input

Free passage



MOTOR RATING Material				MAX. LIQUID TEMP.		MOTOR CODE
G, G1, G2, GH, H	C1, C2		°F	°C		
28	20.9	-	-	104	40	234U 234X *)
31	23.1	-	-	140	60	294W 294Z *)
36	26.8	-	-	104	40	294U 294X *)
45	33.6	37	27.6	140	60	354W 354X *)
50	37	45	34	104	40	354U 354X *)
				140	60	504W 504Z *)
				104	40	504U 504X *)
65	48.5	56	41.8	104	40	654W 654X *)
				140	60	654U 654Z *)

MOTOR RATING Material				MAX. LIQUID TEMP.		MOTOR CODE
G, G1, G2, GH, H	C1, C2		°F	°C		
83	61.9	74	55.2	104	40	654U 654X *)
100	74.6	75	56	140	60	804WN 804ZN *)
107	79.8	90	67	104	40	804UN 804XN *)
121	90.2	95	71	140	60	954WN 954ZN *)
127	94.7	100	75	104	40	954UN 954XN *)
-	-	115	86	140	60	1104WN 1104ZN *)

*) FM/CSA = Explosionproof to Class I, Division 1, Groups C & D

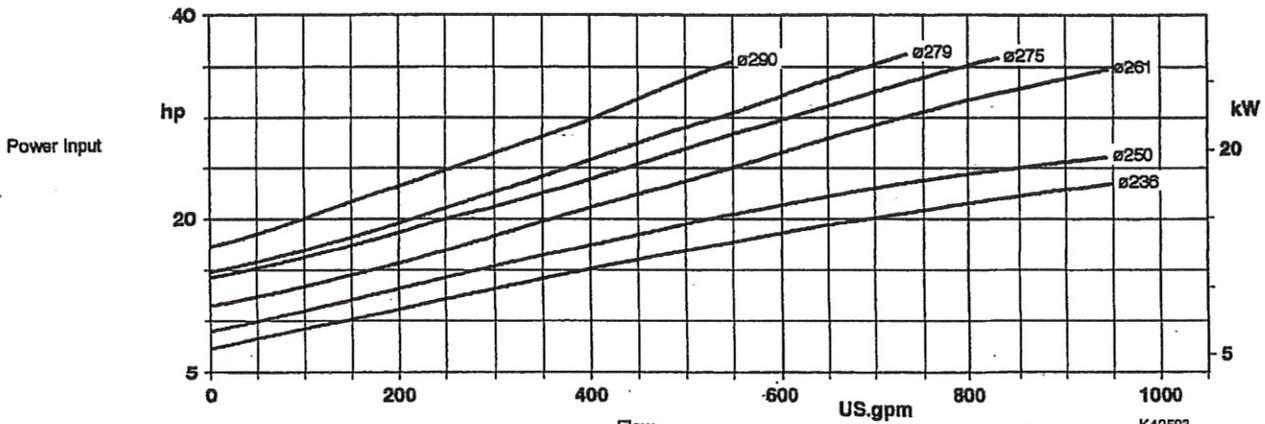
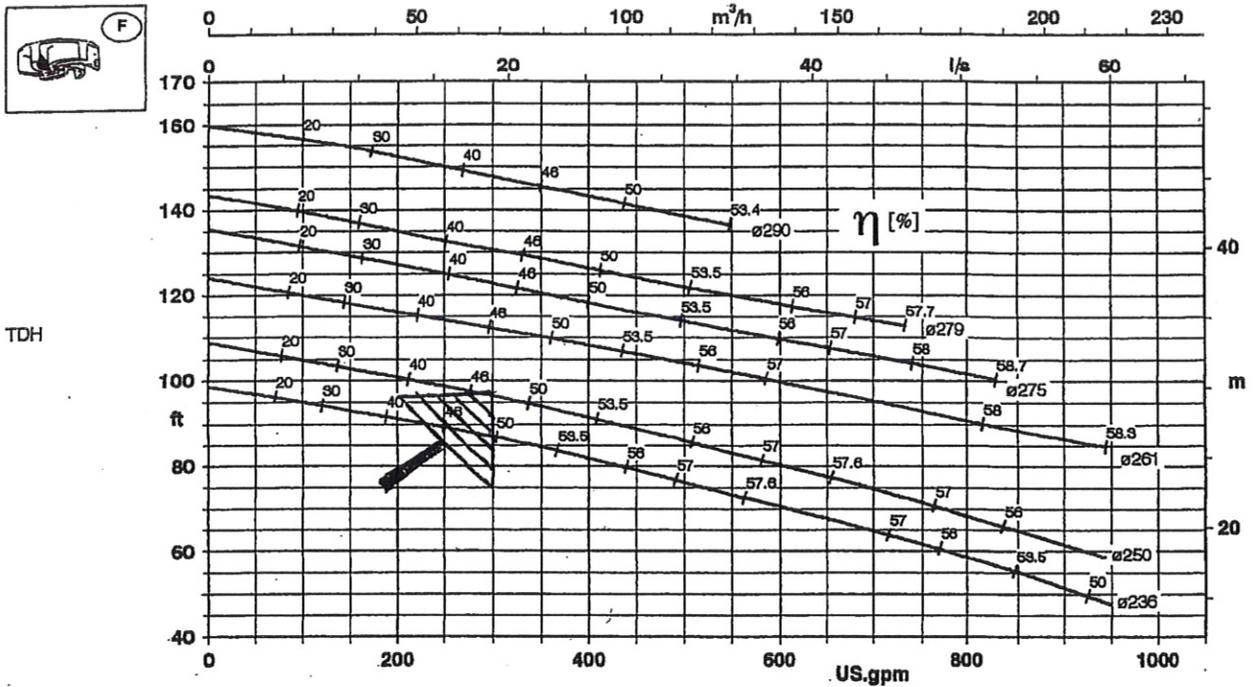
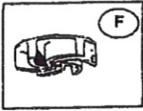


Whippoor Will - 3006PM @ 96' TDH KRT

KRT F 100-316

1750 rpm

4 inch



Free passage

4" (100 mm)

Flow

K42593

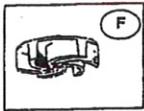
MOTOR RATING				MAX. LIQUID TEMP.		MOTOR CODE
Material						
G, G1, G2, GH, H	C1, C2			°F	°C	
Hp	kW	Hp	kW			
15	11.2	15	11.2	104	40	114U
						114X *)
				140	60	164W 164Z *)
20	14.9	20	14.9	104	40	164U 164X *)
				140	60	294W 294Z *)
36	26.8	34	25.4	104	40	294U 294X *)

*) FM/CSA = Explosionproof to Class I, Division 1, Groups C & D

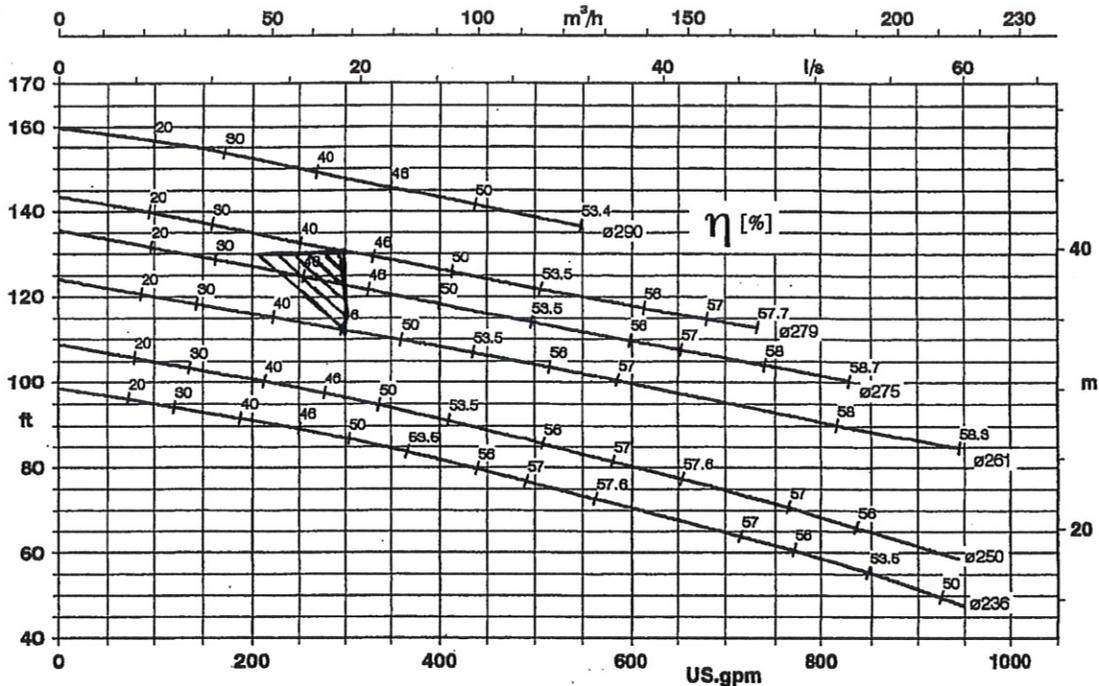
KRT F 100-316

1750 rpm

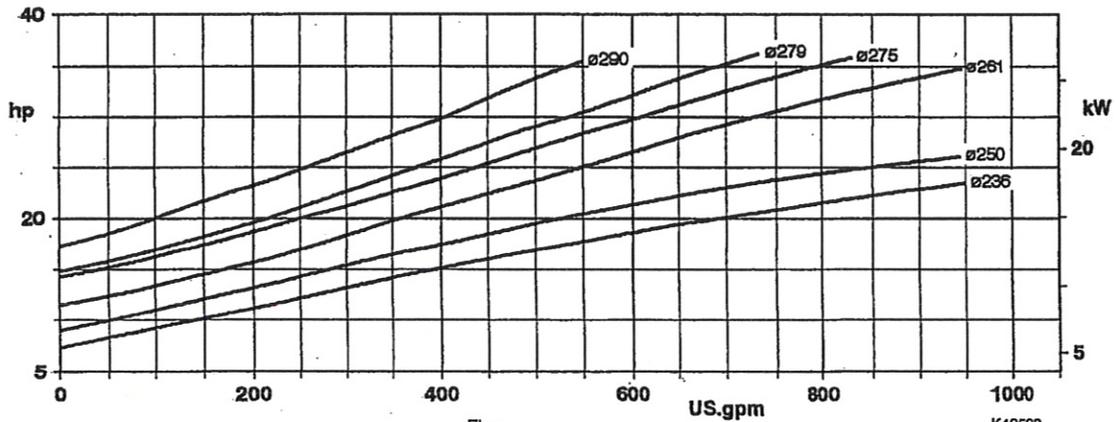
4 inch



TDH



Power Input



Free passage

4" (100 mm)

Flow

K42593

MOTOR RATING				MAX. LIQUID TEMP.		MOTOR CODE
Material				°F	°C	
G, G1, G2, GH, H	C1, C2					
Hp	kW	Hp	kW			
15	11.2	15	11.2	104	40	114U
						114X *)
				140	60	164W
						164Z *)
20	14.9	20	14.9	104	40	164U
						164X *)
31	23.1	28	20.9	140	60	294W
						294Z *)
36	26.8	34	25.4	104	40	294U
						294X *)

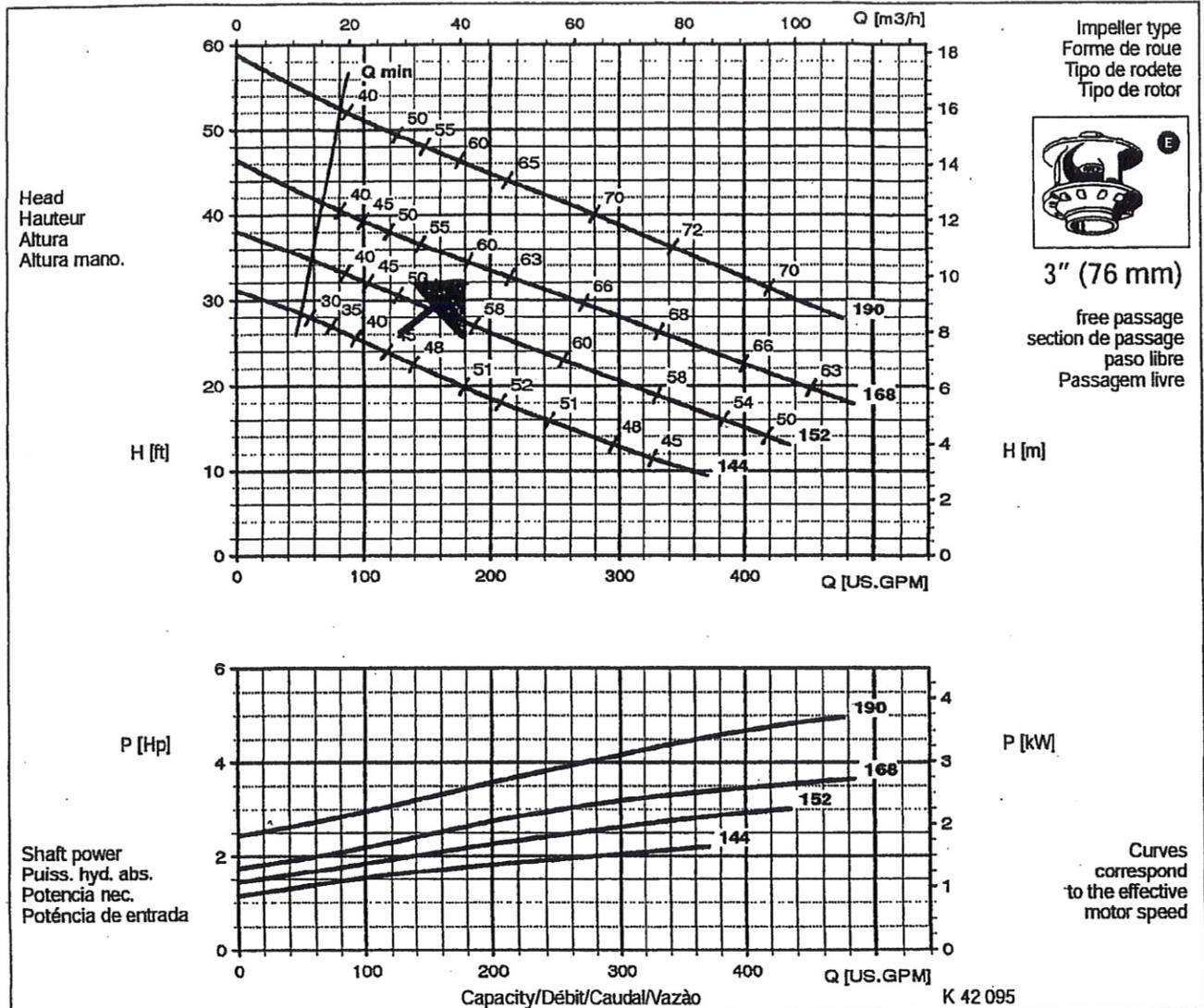
*) FM/CSA = Explosionproof to Class I, Division 1, Groups C & D



Emory Heights - 180 GPM @ 32' TO 14 KRT

KRT E 80-200 / ...

1750 rpm



Suitable motor sizes/Définition taille moteur/Tamaños de motor aplicables/Tamanhos apropriados de motores

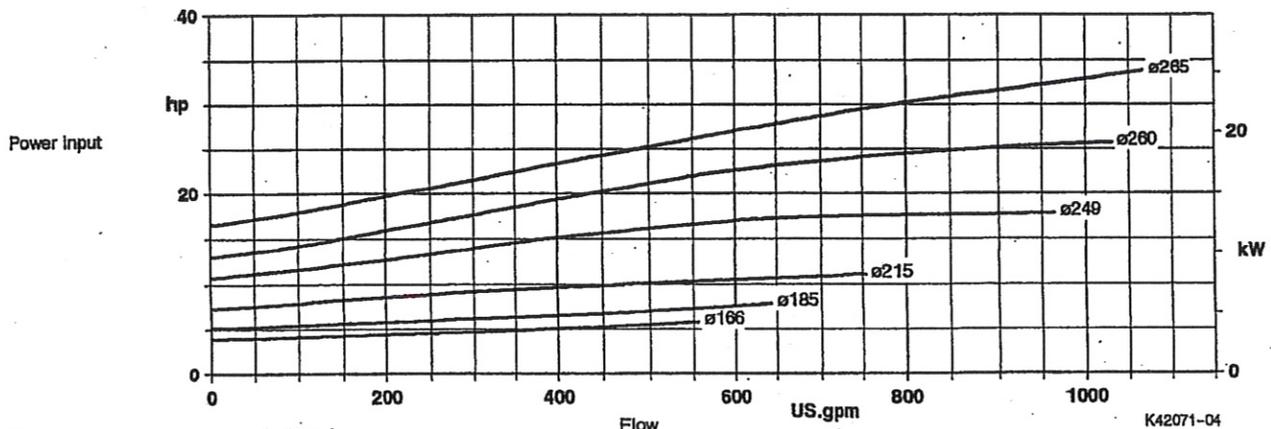
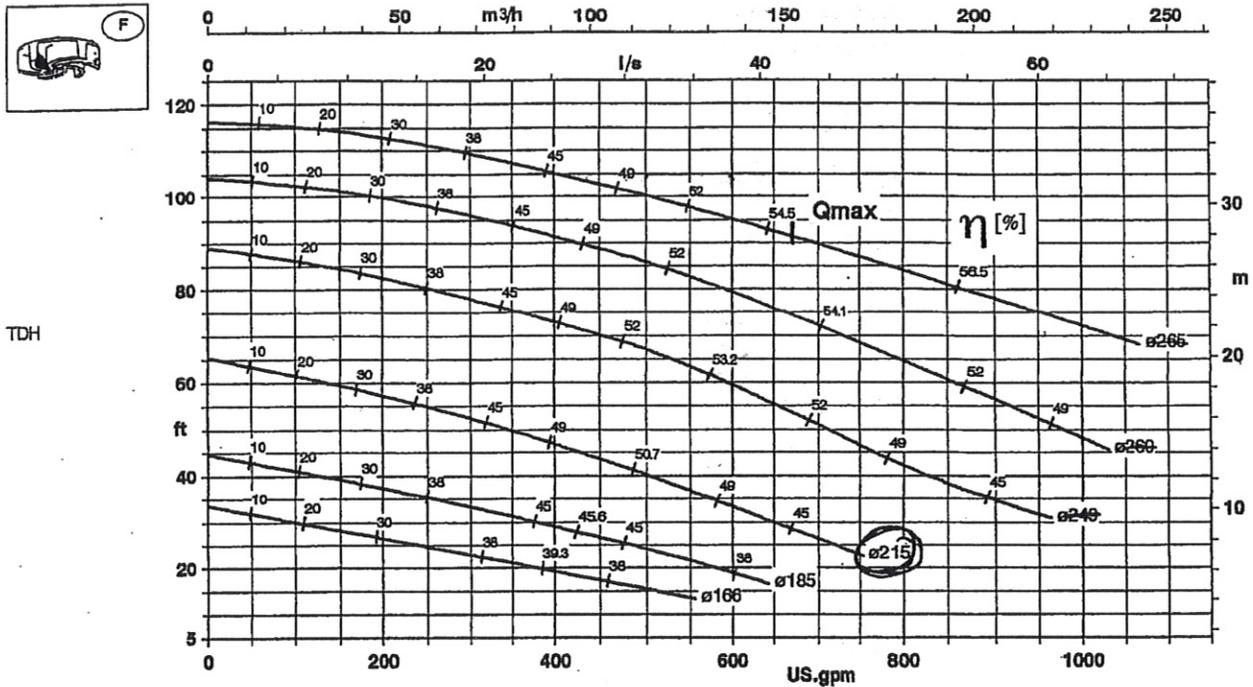
MOTOR RATING Material G Hp (kW)	MAX. LIQUID TEMP. °F (°C)	MOTOR CODE
1.75 (1.3)	104 (40)	1 4 U2G
		1 4 X2G (FM)
2.4 (1.8)	104 (40)	2 4 UG
	140 (60)	2 4 XG (FM)
3.4 (2.5)	104 (40)	2 4 UG
	140 (60)	2 4 XG (FM)
5.0 (3.7)	104 (40)	3 4 UG
		3 4 XG (FM)

(FM) = Explosionproof to Class I, Division 1, Groups C & D
(Explosionproof according to IEC 79 (EEx d II B) on request).

KRT F 100-250

1750 rpm

4 inch



Free passage

4" (100 mm)

Flow

US.gpm

K42071-04

MOTOR RATING Material				MAX. LIQUID TEMP.		MOTOR CODE	
G, G1, G2, GH, H	C1, C2						
Hp	kW	Hp	kW	°F	°C		
7.5	5.6	-	-	104	40	54UK IE3	
						54XK IE3 *)	
						54U	
		7.5	5.6	-	140	60	54X *)
							74W
							74Z *)
10	7.5	-	-	104	40	74UK IE3	
						74XK IE3 *)	
						74U	
		10	7.5	-	140	60	74X *)
							114W
							114Z *)

MOTOR RATING Material				MAX. LIQUID TEMP.		MOTOR CODE
G, G1, G2, GH, H	C1, C2					
Hp	kW	Hp	kW	°F	°C	
15	11.2	15	11.2	104	40	114U
						114X *)
				140	60	164W
						164Z *)
20	14.9	20	14.9	104	40	164U
						164X *)
				140	60	214W
						214Z *)
25	18.6	-	-	104	40	194U
						194X *)
30	22.3	25	18.6	104	40	214U
						214X *)

*) FM/CSA = Explosionproof to Class I, Division 1, Groups C & D

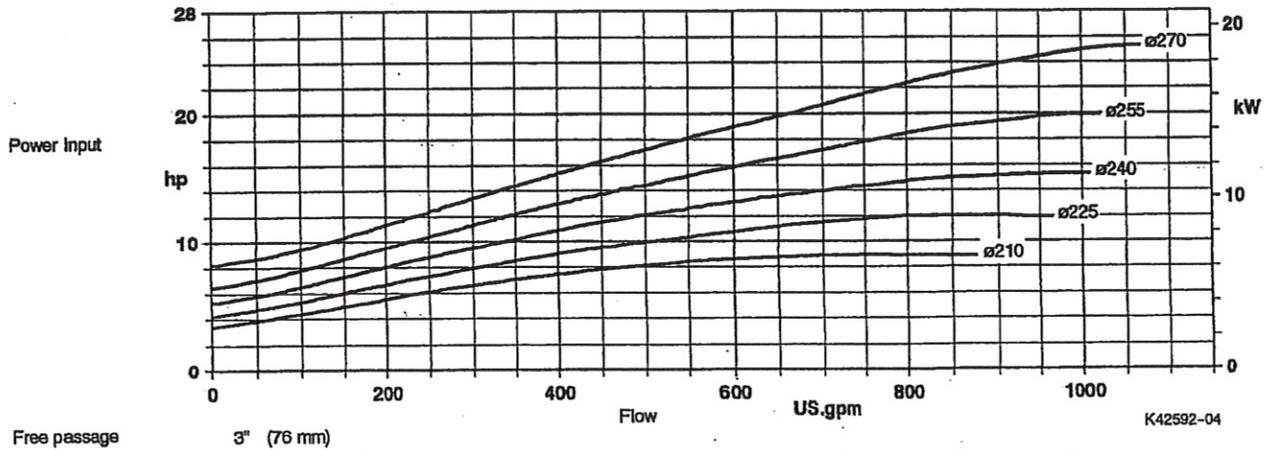
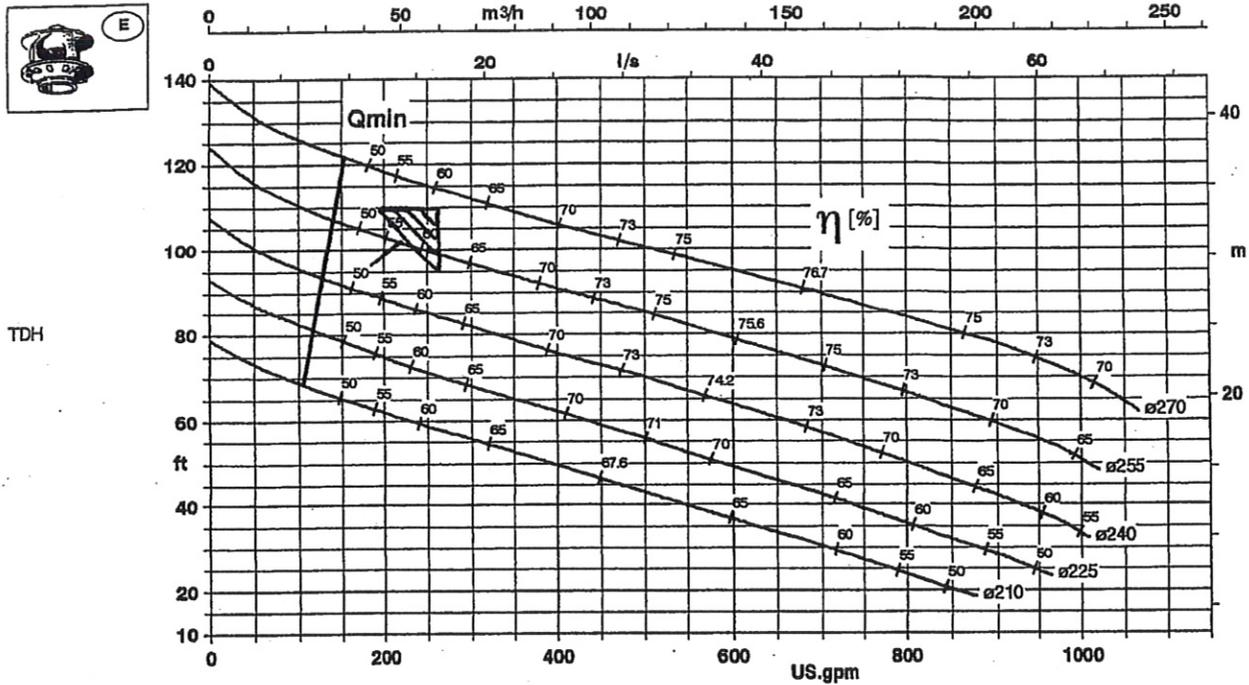


RADISSON COVE - 230 GPM @ 110' TDH KRT

KRT E 80-251

1750 rpm

3 inch



Free passage

3" (76 mm)

K42592-04

MOTOR RATING Material G		MAX. LIQUID TEMP.		MOTOR CODE
Hp	kW	°F	°C	
10	7.5	104	40	74UK IE3
				74XK IE3*)
				74U
				74X *)
				114W
15	11.2	104	40	114Z *)
				114U
				114X *)
				184W
				184Z *)
10	7.5	140	60	114W
				114Z *)
				114U
				114X *)
				184W
15	11.2	140	60	114Z *)
				114U
				114X *)
				184W
				184Z *)

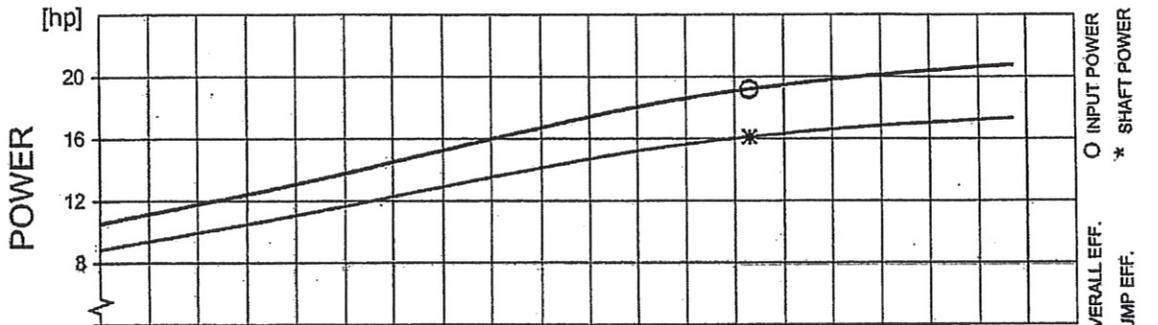


MOTOR RATING Material G		MAX. LIQUID TEMP.		MOTOR CODE
Hp	kW	°F	°C	
20	14.9	104	40	164U
			60	164X *)
		140	60	214W
25	18.6	104	40	214Z *)
			60	194U
30	22.3	104	40	194X *)
			60	214U
30	22.3	104	40	214U
				60

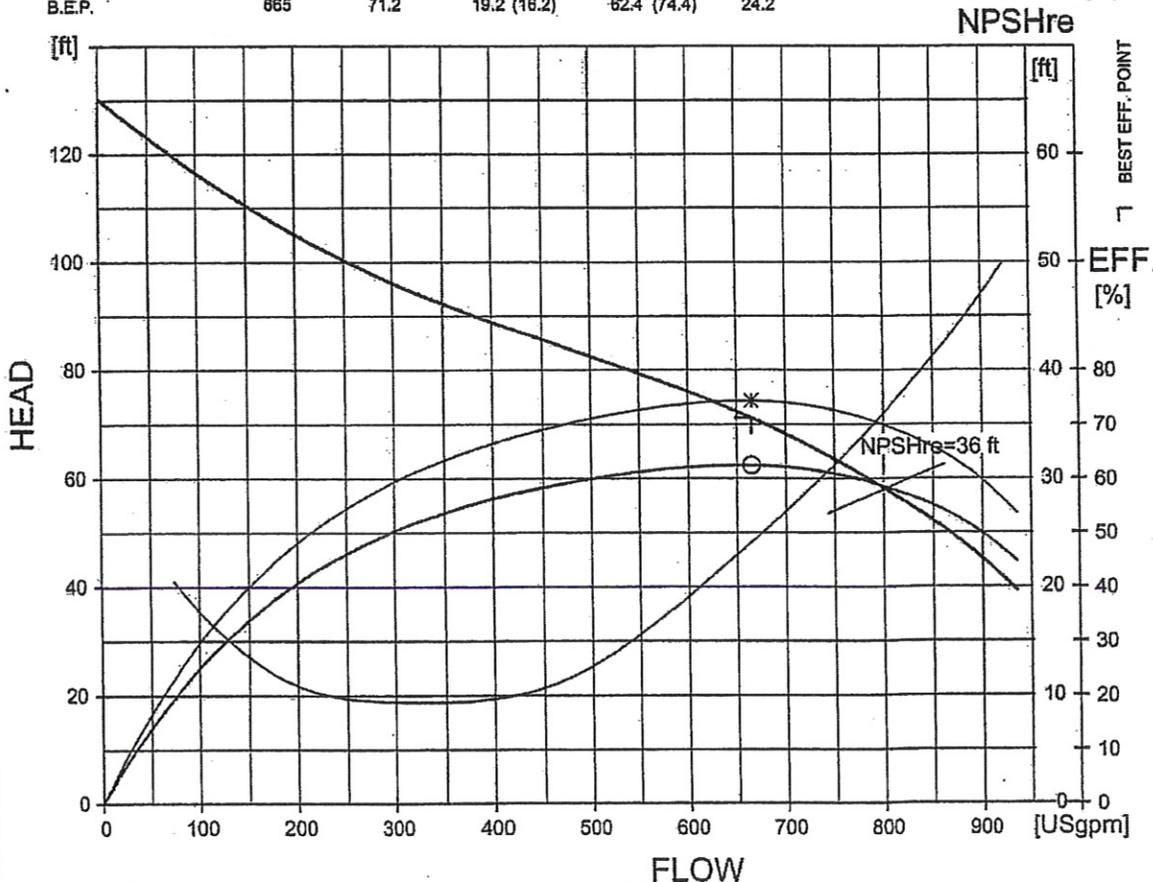
*) FM/CSA = Explosionproof to Class I, Division 1, Groups C & D

GRACELAND

PERFORMANCE CURVE		PRODUCT CP3152.181	TYPE HT
DATE 2011-07-27	PROJECT		ISSUE 2
		CURVE NO 63-487-00-3855	
POWER FACTOR	1/1-LOAD 0.84	3/4-LOAD 0.79	1/2-LOAD 0.69
EFFICIENCY	87.0 %	87.0 %	86.0 %
MOTOR DATA	INLET/OUTLET - / 4 inch		RATED POWER 20 hp
COMMENTS	IMP. THROUGHLET 3.0 inch	RATED CURRENT ... 142 A	IMPELLER DIAMETER 265 mm
		RATED CURRENT ... 26 A	MOTOR # 25-15-4AA STATOR 12YSER REV 11
		RATED SPEED 1750 rpm	FREQ. 60 Hz PHASES 3 VOLTAGE 460 V POLES 4
		TOT.MOM.OF INERTIA ... ---	GEARTYPE --- RATIO ---
		NO. OF BLADES 1	



DUTY-POINT	FLOW[USgpm]	HEAD[ft]	POWER [hp]	EFF. [%]	NPSHre[N]
B.E.P.	665	71.2	19.2 (16.2)	62.4 (74.4)	24.2



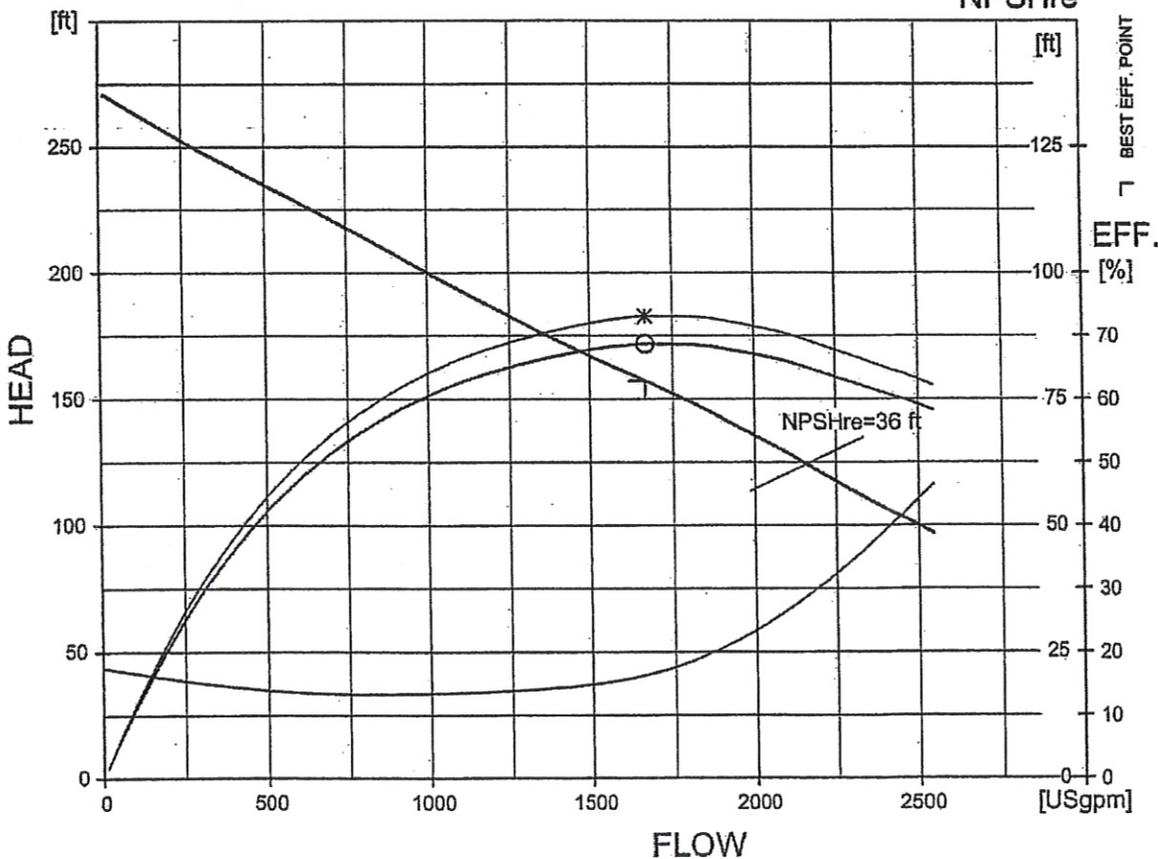
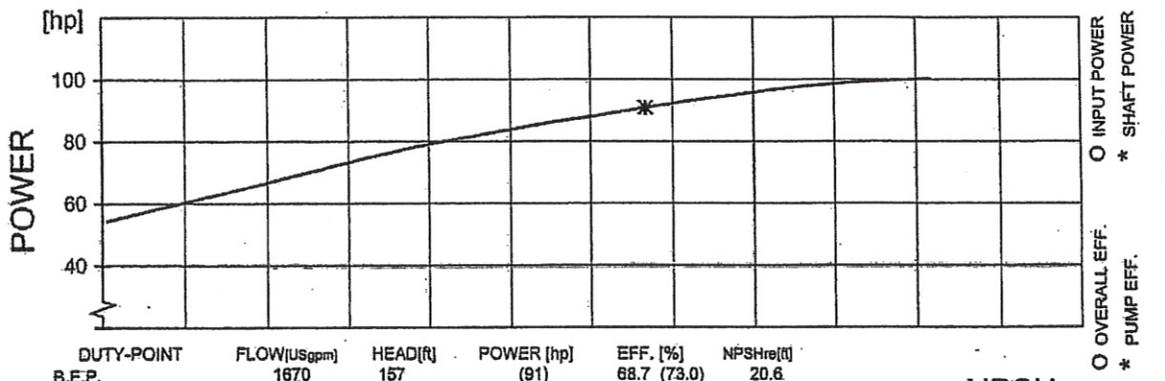
FLYPS3.1.5.8 (20060531)

NPSHre = NPSH3% + min. operational margin
Performance with clear water and ambient temp 40 °C

HI B Curve

PUMP HOUSE

		PERFORMANCE CURVE		PRODUCT NP3301.180	TYPE HT			
DATE 2010-08-02	PROJECT FLYGT US Catalog			CURVE NO 63-462-00-1150	ISSUE 2			
POWER FACTOR	1/1-LOAD 0.84	3/4-LOAD 0.81	1/2-LOAD 0.72	RATED POWER 105 hp	IMPELLER DIAMETER 390 mm			
EFFICIENCY	93.0 %	94.5 %	95.0 %	STARTING CURRENT ... 560 A	MOTOR # 35-29-4AA	STATOR 1 D	REV 12	
MOTOR DATA	---	---	---	RATED CURRENT ... 125 A	FREQ. 60 Hz	PHASES 3	VOLTAGE 460 V	POLES 4
COMMENTS	INLET/OUTLET -/ 6 inch		RATED SPEED 1775 rpm	TOT.MOM.OF INERTIA ... 0.89 kgm2	GEARTYPE ---			RATIO ---
NEMA Code Letter: D			IMP. THROUGHLET ---	NO. OF BLADES 2				



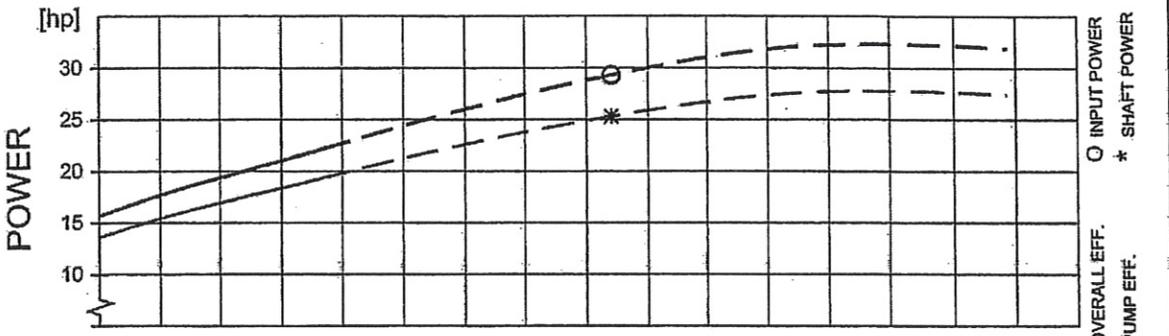
FLYPS 3.1.6.3 (20060531)

NPSHre = NPSH3% + min. operational margin
Performance with clear water and ambient temp 40 °C

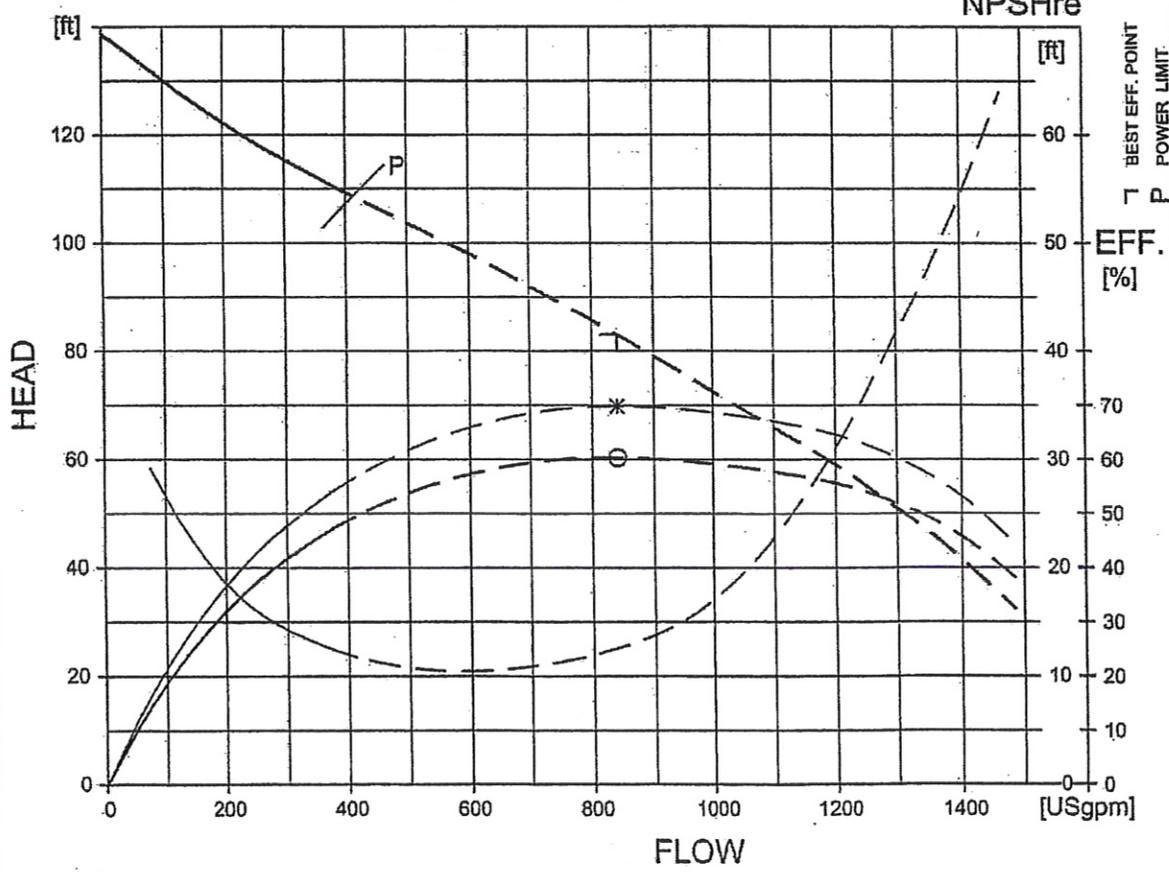
	CURVE
--	--------------

ROCKBRIDGE GREEN

PERFORMANCE CURVE		PRODUCT CP3152.181	TYPE HT
DATE 2011-07-27	PROJECT		CURVE NO 63-452-00-5360
POWER FACTOR 0.84	1/1-LOAD 0.84	3/4-LOAD 0.79	1/2-LOAD 0.69
	EFFICIENCY 87.0%	87.0%	86.0%
MOTOR DATA	INLET/OUTLET -/ 4 inch		RATED POWER 20 hp
COMMENTS	IMP. THROUGHLET 3.0 inch		STARTING CURRENT ... 142 A
			RATED CURRENT ... 26 A
		RATED SPEED 1750 rpm	IMPELLER DIAMETER 280 mm
		TOT.MOM.OF INERTIA ... 0.23 kgm2	MOTOR # 25-15-4AA STATOR 12YSER REV 11
		NO. OF BLADES 1	FREQ. 60 Hz PHASES 3 VOLTAGE 460 V POLES 4
			GEARTYPE --- RATIO ---



DUTY-POINT	FLOW[USgpm]	HEAD[ft]	POWER [hp]	EFF. [%]	NPSHre[ft]
B.E.P.	841	83.1	29.3 (25.4)	60.3 (69.8)	12.6



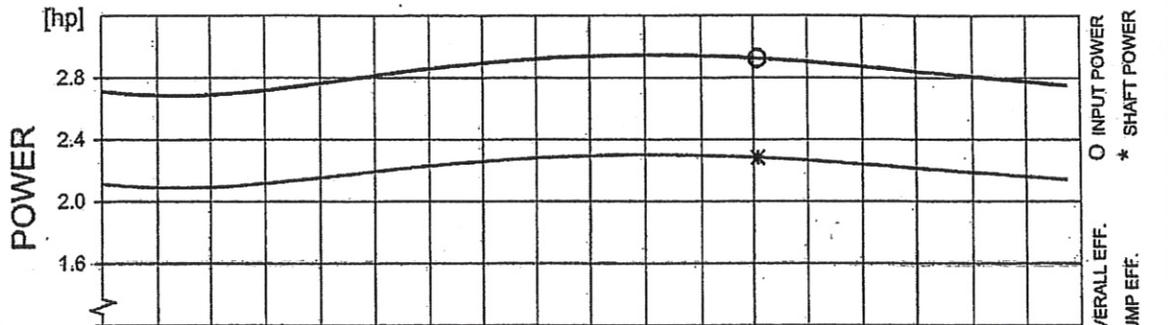
FLYPS3.1.5.8 (20060531)

NPSHre = NPSH3% + min. operational margin
 Performance with clear water and ambient temp 40 °C

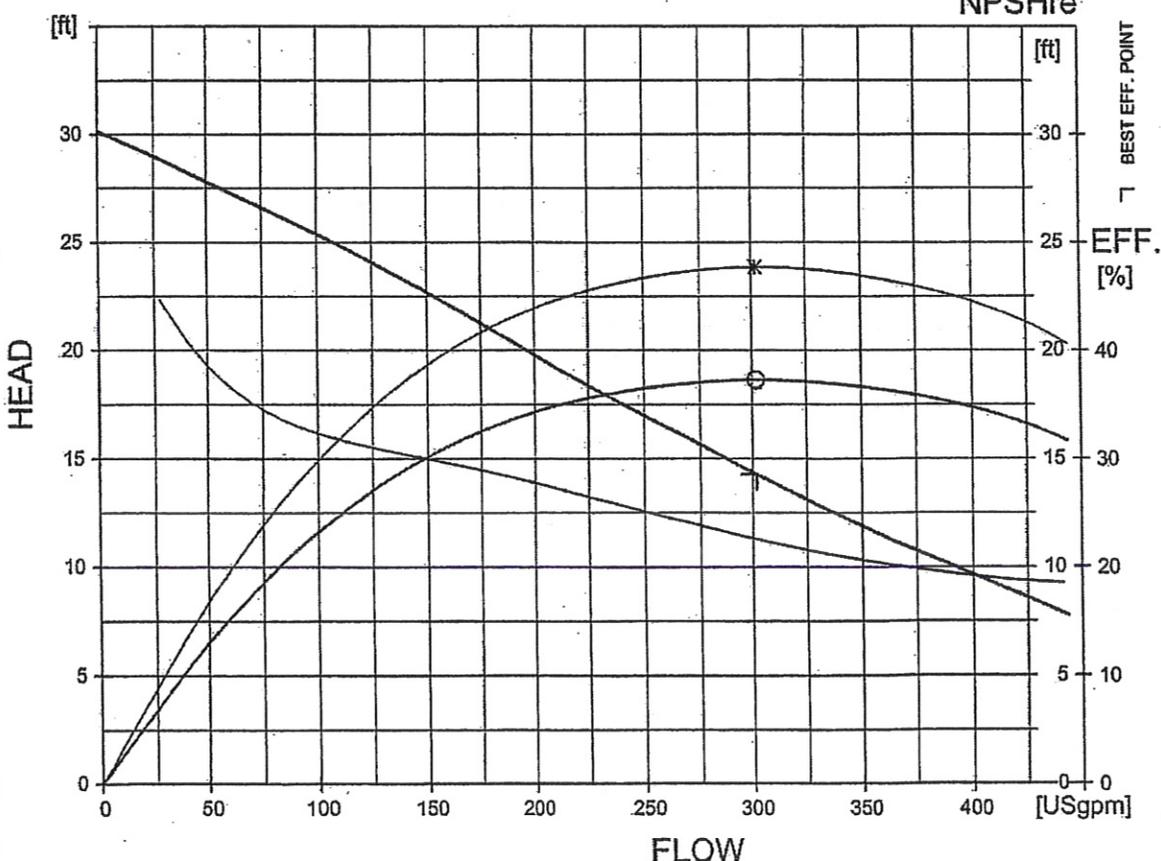
HI B Curve

HOME DEPOT

		PERFORMANCE CURVE		PRODUCT	TYPE
DATE 2011-07-27		PROJECT		CURVE NO 63-414-00-5301	ISSUE 1
POWER FACTOR	1/1-LOAD 0.83	3/4-LOAD 0.77	1/2-LOAD 0.66	RATED POWER	3 hp
EFFICIENCY	78.0 %	79.0 %	77.0 %	STARTING CURRENT ...	22 A
MOTOR DATA	---			RATED CURRENT ...	4.3 A
COMMENTS	INLET/OUTLET		RATED SPEED	IMPELLER DIAMETER	
	- / 4 inch		1700 rpm	183 mm	
	IMP. THROUGHLET		TOT.MOM.OF	MOTOR #	STATOR
	3.1 inch		INERTIA ...	15-10-4AL	12YSER
			NO. OF	FREQ.	PHASES
			BLADES	60 Hz	3
			1	VOLTAGE	460 V
				POLES	4
				GEARTYPE	RATIO
				---	---



DUTY-POINT	FLOW[USgpm]	HEAD[ft]	POWER [hp]	EFF. [%]	NPSHre[ft]
B.E.P.	302	14.3	2.93 (2.29)	37.3 (47.7)	11.3



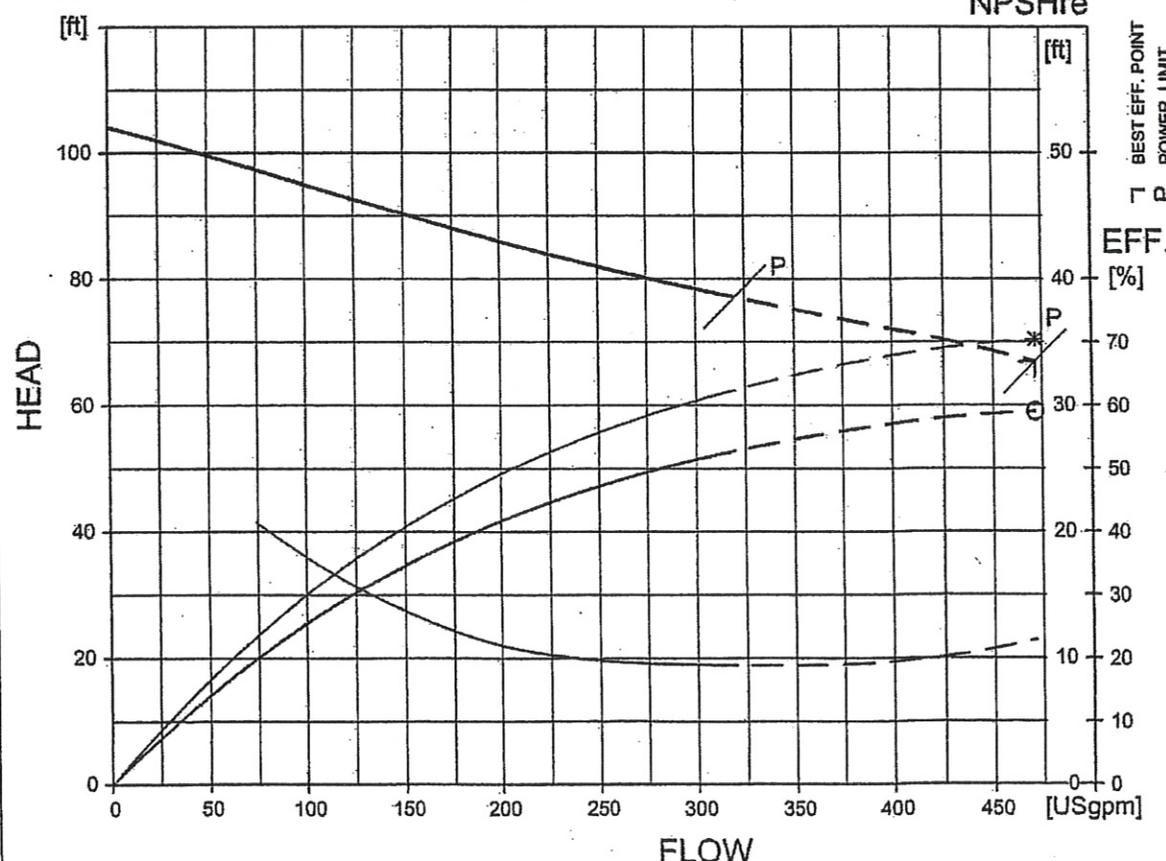
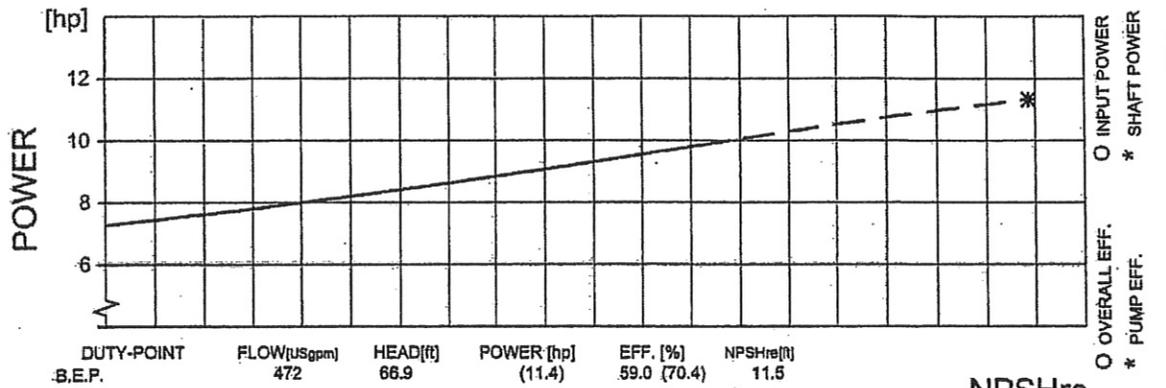
FLYPS3.1.5.8 (20060531)

NPSHre = NPSH3% + min. operational margin
Performance with clear water and ambient temp 40 °C

	HI B Curve
--	-------------------

PEACH ORCHARD

	PERFORMANCE CURVE	PRODUCT CP3127.181	TYPE HT
DATE 2010-08-02	PROJECT FLYGT US Catalog	CURVE NO 63-481-00-3702	ISSUE 2
POWER FACTOR 0.89	1/1-LOAD 0.89	3/4-LOAD 0.87	1/2-LOAD 0.81
EFFICIENCY 83.5 %	83.5 %	85.0 %	84.5 %
MOTOR DATA	INLET/OUTLET - / 4 inch	RATED POWER 10 hp	IMPELLER DIAMETER 248 mm
COMMENTS	IMP. THROUGHLET 3.0 inch	STARTING CURRENT ... 128 A	MOTOR # 21-12-4AL
NEMA Code Letter: F	RATED SPEED 1735 rpm	RATED CURRENT ... 25 A	STATOR 12Y//
		TOT. MOM. OF INERTIA ... 0.12 kgm2	REV 11
	NO. OF BLADES 1	FREQ. 60 Hz	PHASES 3
		VOLTAGE 230 V	POLES 4
		GEARTYPE ---	RATIO ---

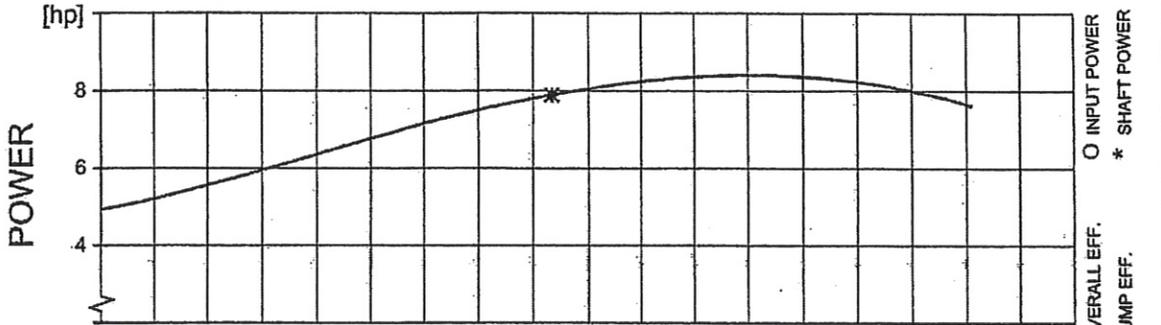


FLYPS 3.1.6.3 (20060531)

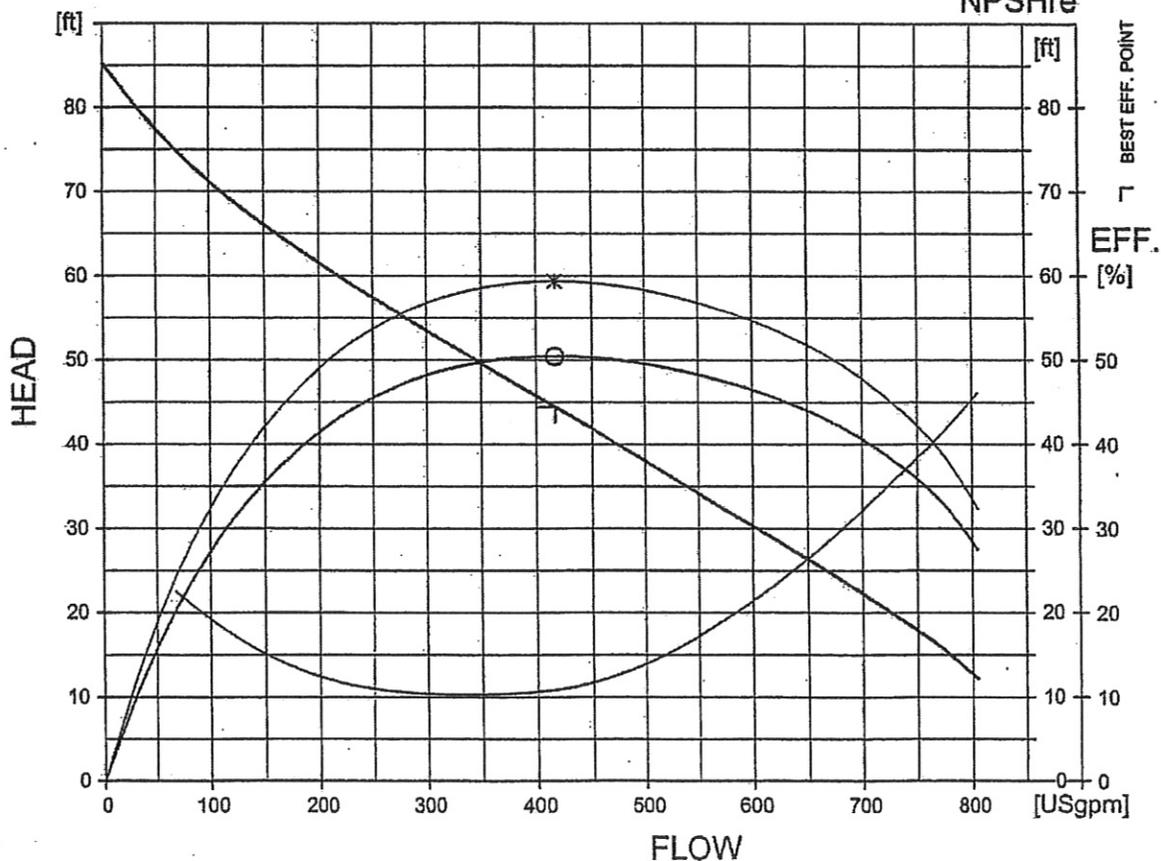
NPSH_{re} = NPSH_{3%} + min. operational margin
 Performance with clear water and ambient temp 40 °C

ROLLING LINKS

PERFORMANCE CURVE		PRODUCT CP3127.181	TYPE HT
DATE 2010-08-02	PROJECT FLYGT US Catalog		CURVE NO 63-484-00-3702
POWER FACTOR 0.89	1/1-LOAD 0.89	3/4-LOAD 0.87	1/2-LOAD 0.81
EFFICIENCY 83.5 %	83.5 %	85.0 %	84.5 %
MOTOR DATA ---	---	---	---
COMMENTS NEMA Code Letter: F	INLET/OUTLET -/ 4 inch		RATED POWER 10 hp
	IMP. THROUGHLET 3.0 inch		STARTING CURRENT ... 128 A
			RATED CURRENT ... 25 A
			RATED SPEED 1735 rpm
			TOT. MOM. OF INERTIA ... 0.11 kgm2
			NO. OF BLADES 1
			IMPELLER DIAMETER 217 mm
			MOTOR # 21-12-4AL
			STATOR 12Y//
			REV 11
			FREQ. PHASES VOLTAGE 60 Hz 3 230 V
			POLES 4
			GEARTYPE RATIO --- ---



DUTY-POINT	FLOW[USgpm]	HEAD[ft]	POWER [hp]	EFF. (%)	NPSHre[ft]
B.E.P.	417	44.4	(7.9)	50.4 (59.4)	10.9



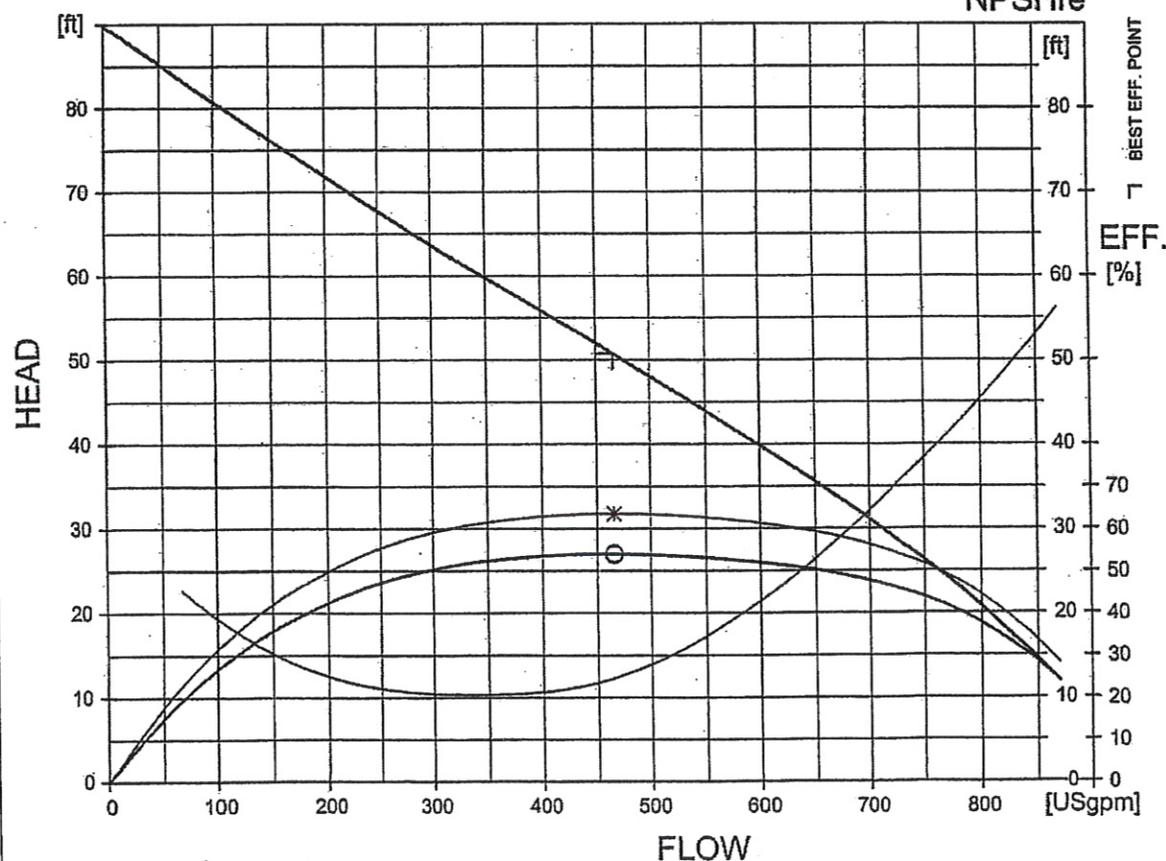
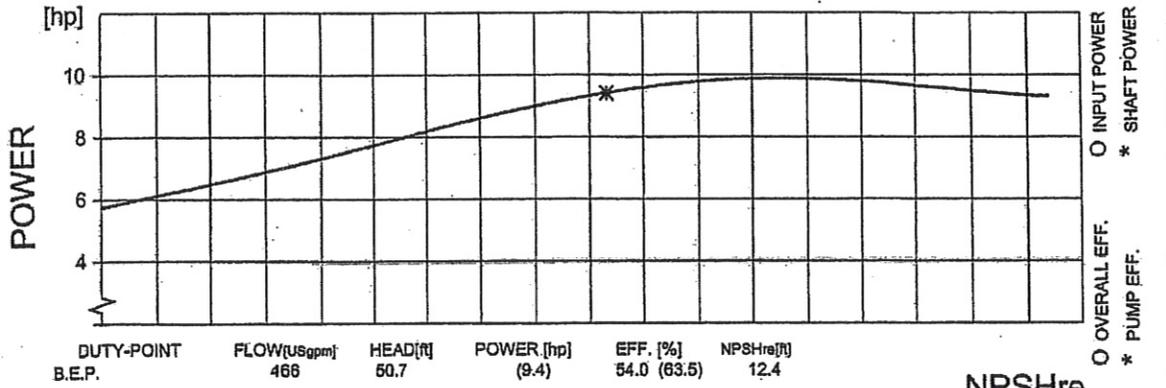
FLYPS 3.1.6.3 (20060531)

NPSHre = NPSH3% + min. operational margin
 Performance with clear water and ambient temp 40 °C

CURVE

MARINA

		PERFORMANCE CURVE		PRODUCT CP3127.181	TYPE HT		
DATE 2010-08-02	PROJECT FLYGT US Catalog			CURVE NO 63-483-00-3702	ISSUE 3		
POWER FACTOR	1/1-LOAD 0.89	3/4-LOAD 0.87	1/2-LOAD 0.81	RATED POWER 10 hp	IMPELLER DIAMETER 228 mm		
EFFICIENCY	83.5 %	85.0 %	84.5 %	STARTING CURRENT ... 128 A	MOTOR # 21-12-4AL		
MOTOR DATA	---	---	---	RATED CURRENT ... 25 A	STATOR 12Y//		
COMMENTS NEMA Code Letter: F	INLET/OUTLET -/ 4 inch		RATED SPEED 1735 rpm	FREQ. 60 Hz	PHASES 3	VOLTAGE 230 V	REV 11
	IMP. THROUGHLET 3.0 inch		TOT.MOM.OF INERTIA ... 0.12 kgm2	GEARTYPE ---	RATIO ---		
			NO. OF BLADES 1				

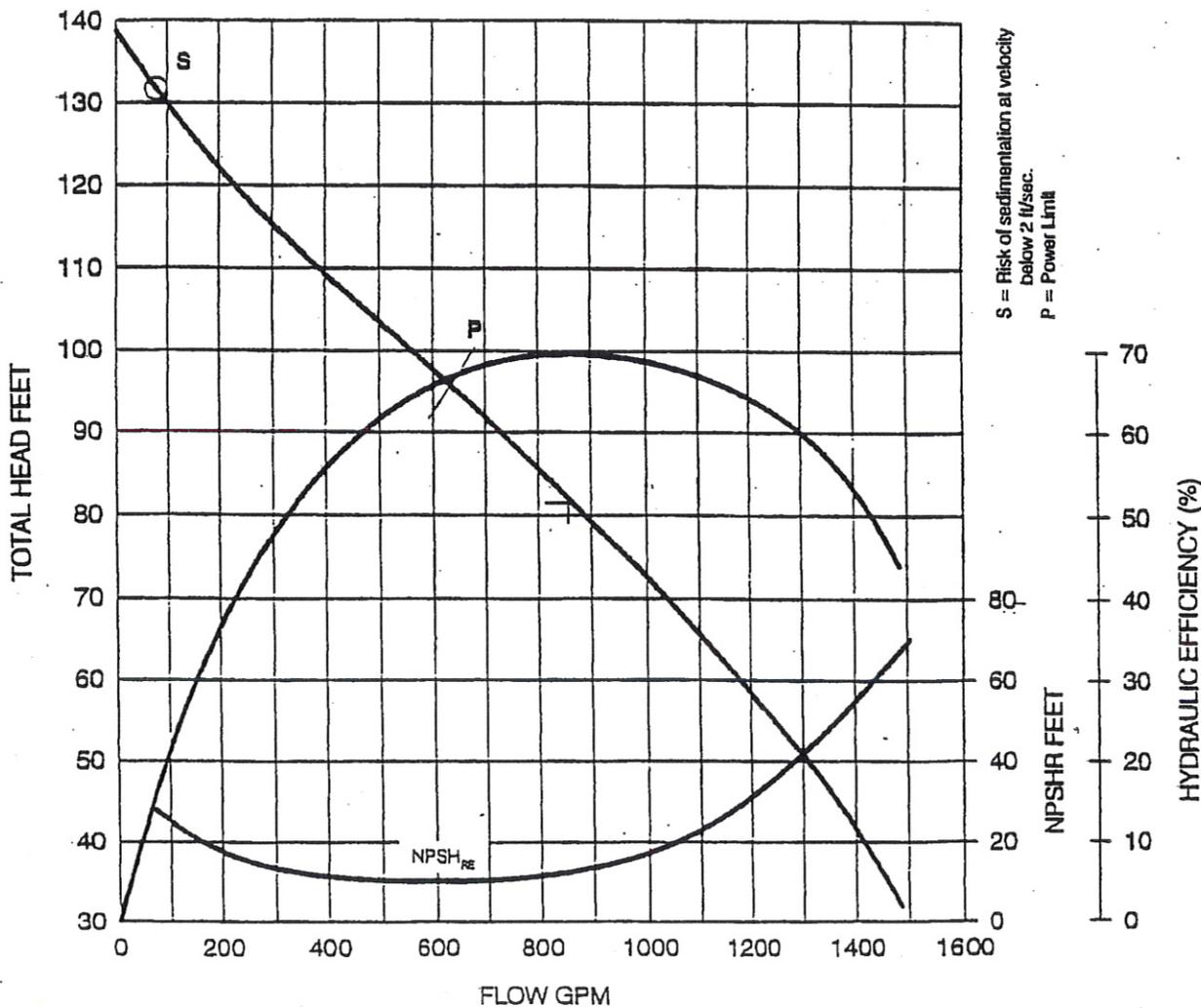
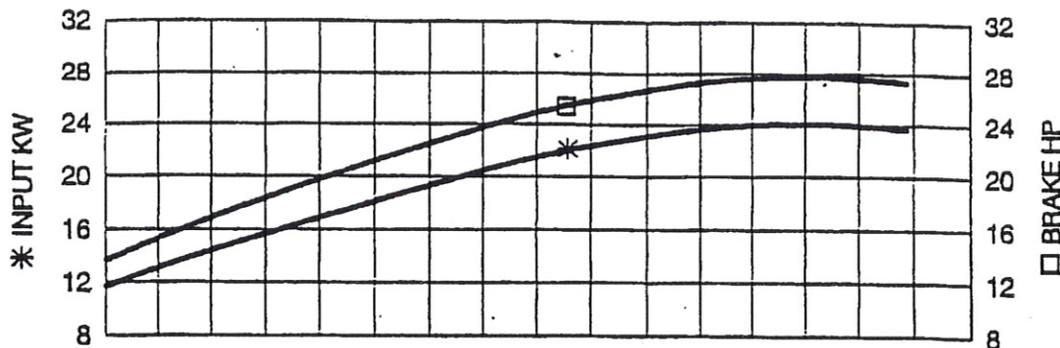


FLYPS 3.1.6.3 (20060531)

NPSHre = NPSH3% + min. operational margin
Performance with clear water and ambient temp 40 °C

28. ROYAL TROON PUMP STATION

PAGE 12	SECTION 3	C-3152 452 Impeller (4" volute)	CONFIG.	
ISSUED 2/96	SUPERSEDES 6/94		CP/CT	
			VANES 1	PHASE 3



S = Risk of sedimentation at velocity below 2 ft/sec.
P = Power Limit



PERFORMANCE CURVE

PRODUCT
CP3127.181

TYPE
HT

DATE
2010-11-11

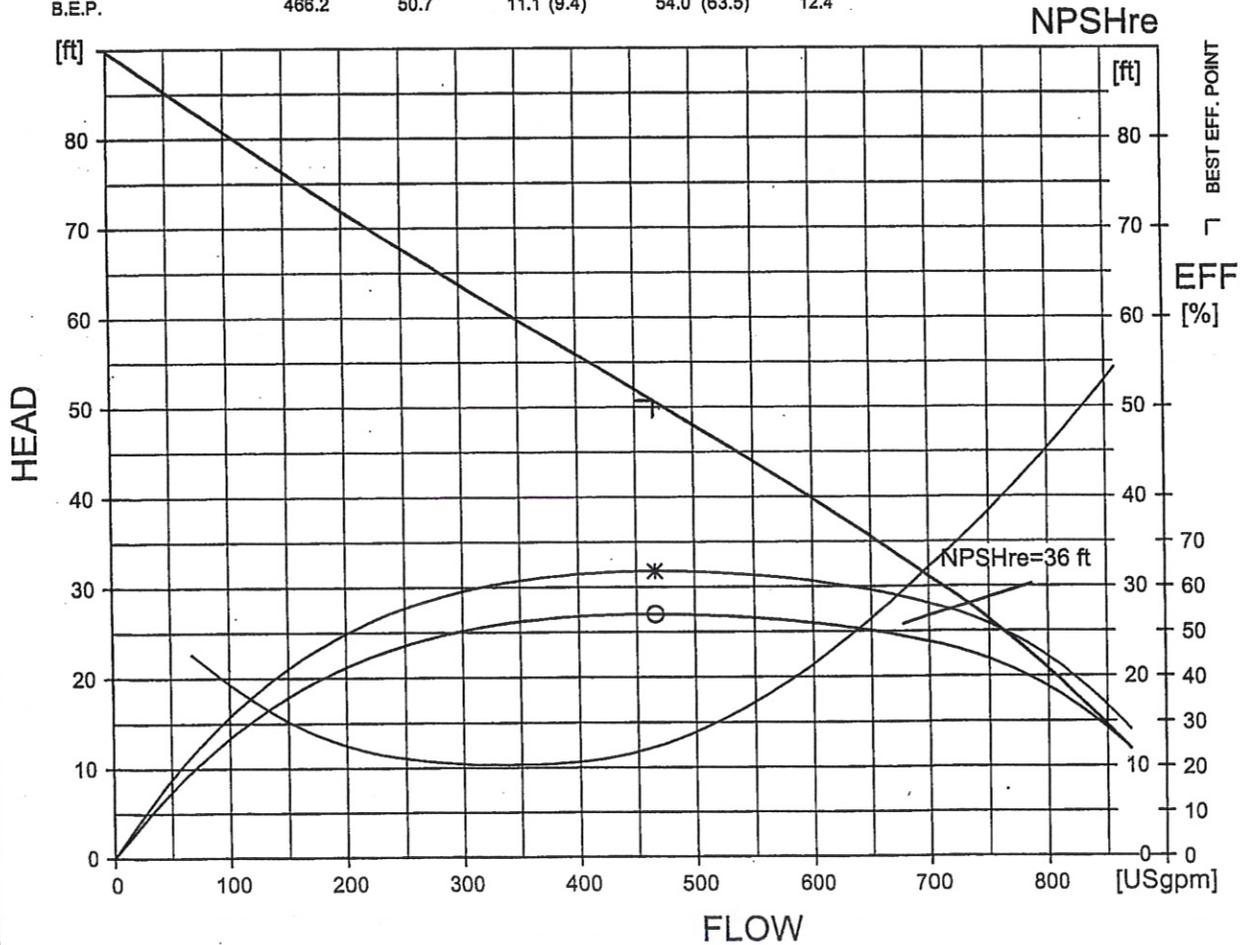
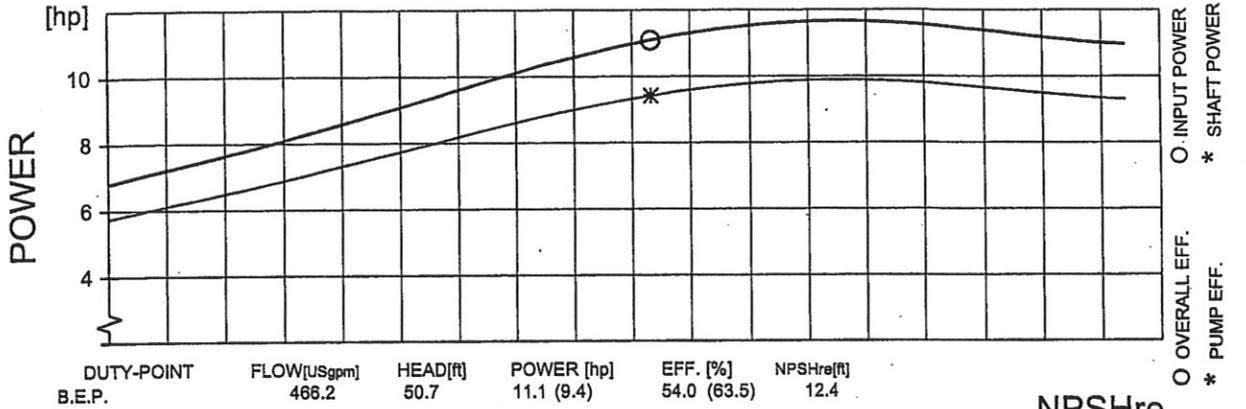
PROJECT
<unnamed> RIVERSWAY

CURVE NO
63-483-00-3702

ISSUE
3

	1/1-LOAD	3/4-LOAD	1/2-LOAD		
POWER FACTOR	0.89	0.87	0.81	RATED POWER	10 hp
EFFICIENCY	83.5 %	85.0 %	84.5 %	STARTING CURRENT ...	64 A
MOTOR DATA	---	---	---	RATED CURRENT ...	13 A
COMMENTS	INLET/OUTLET			RATED SPEED	1735 rpm
	- / 4 inch			TOT.MOM.OF INERTIA ...	0.12 kgm2
	IMP. THROUGHLET			NO. OF BLADES	1
	2.9 inch				

IMPELLER DIAMETER 228 mm			
MOTOR #	STATOR	REV	
21-12-4AL	12YSER	11	
FREQ.	PHASES	VOLTAGE	POLES
60 Hz	3	460 V	4
GEARTYPE	RATIO		
---	---		



FLYPS3.1.6.5 (20090313)

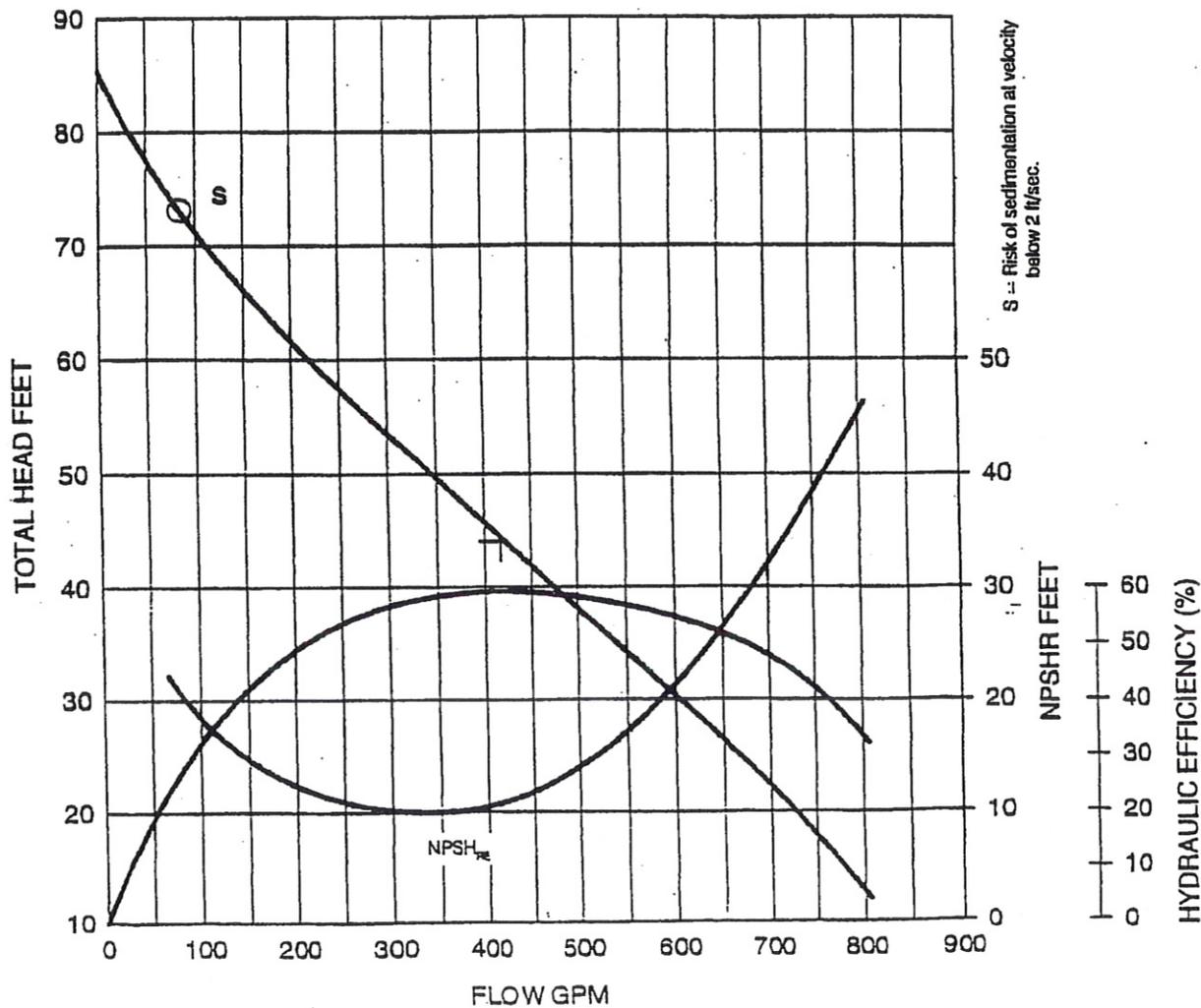
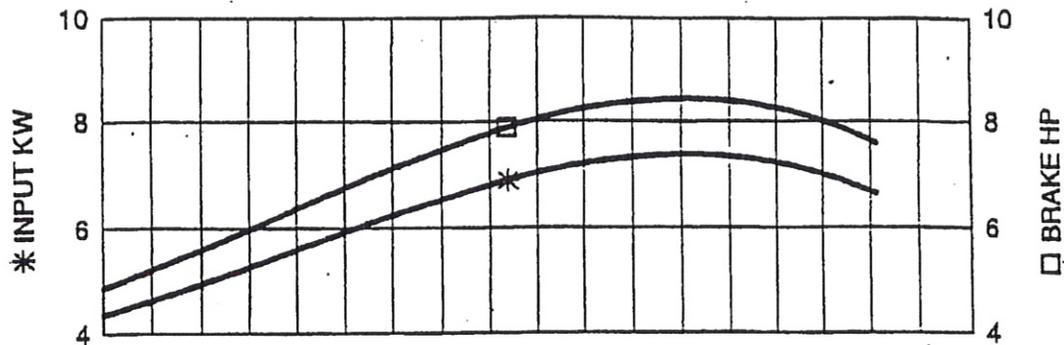
NPSHre = NPSH3% + min. operational margin
Performance with clear water and ambient temp 40 °C



HI B Curve

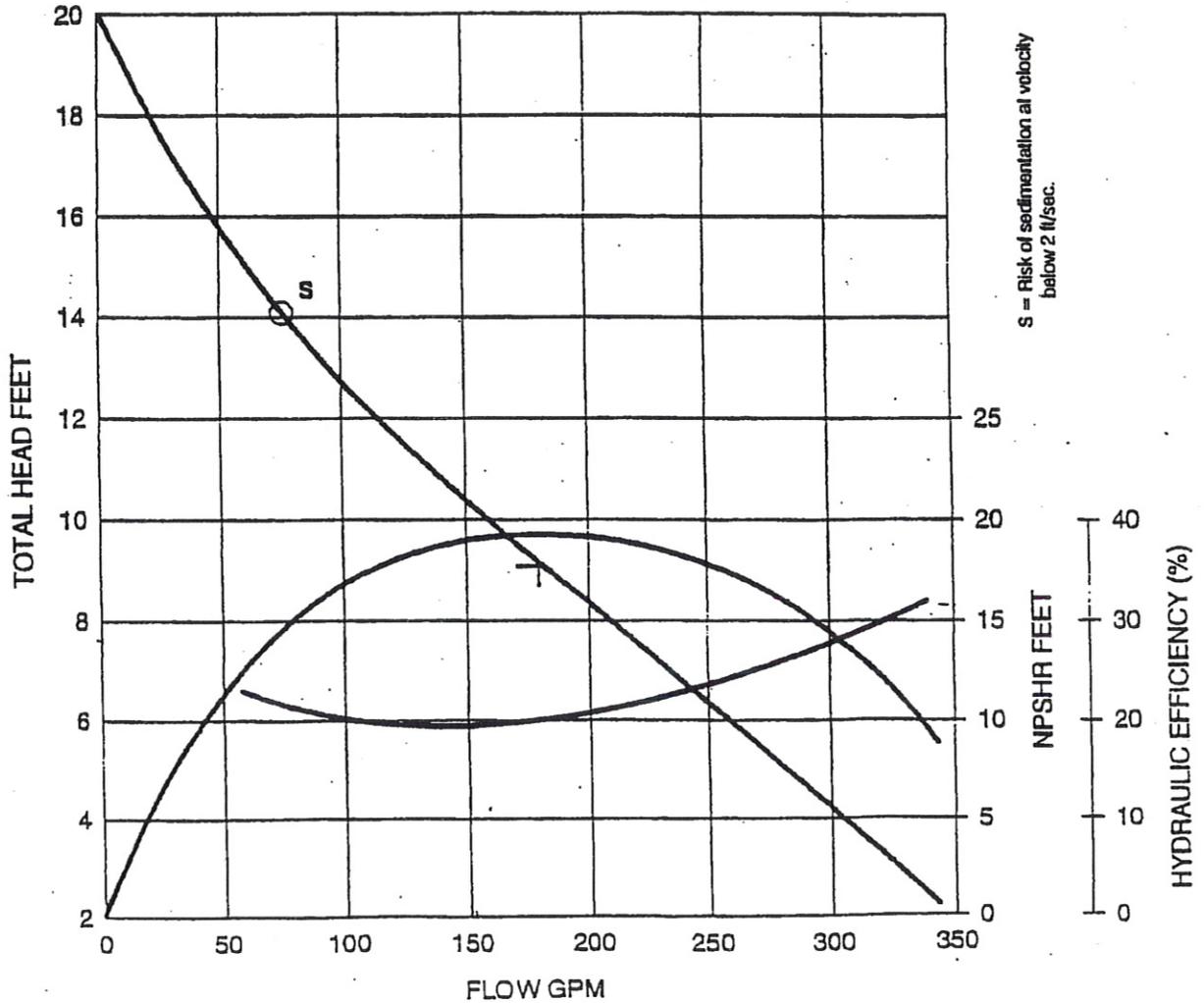
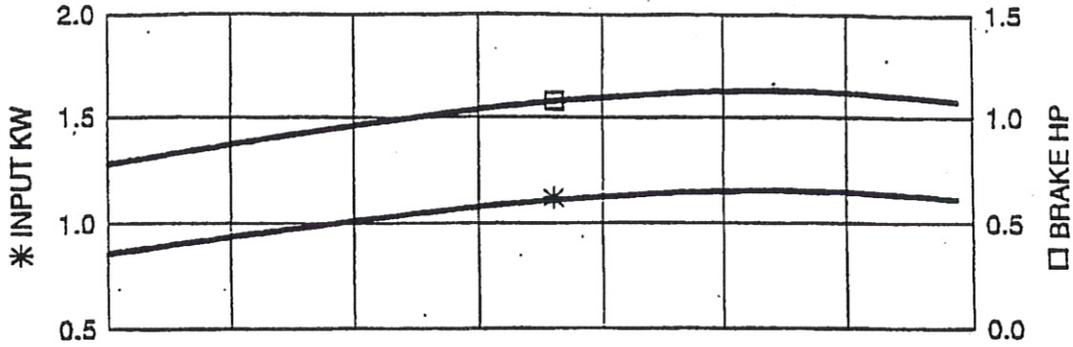
20. SOUTHWOOD PUMP STATION

PAGE	SECTION	C-3127 484 Impeller	CONFIG.	
28	3		CP/CS	
ISSUED	SUPERSEDES		VANES	PHASE
2/96	6/94	1	3	



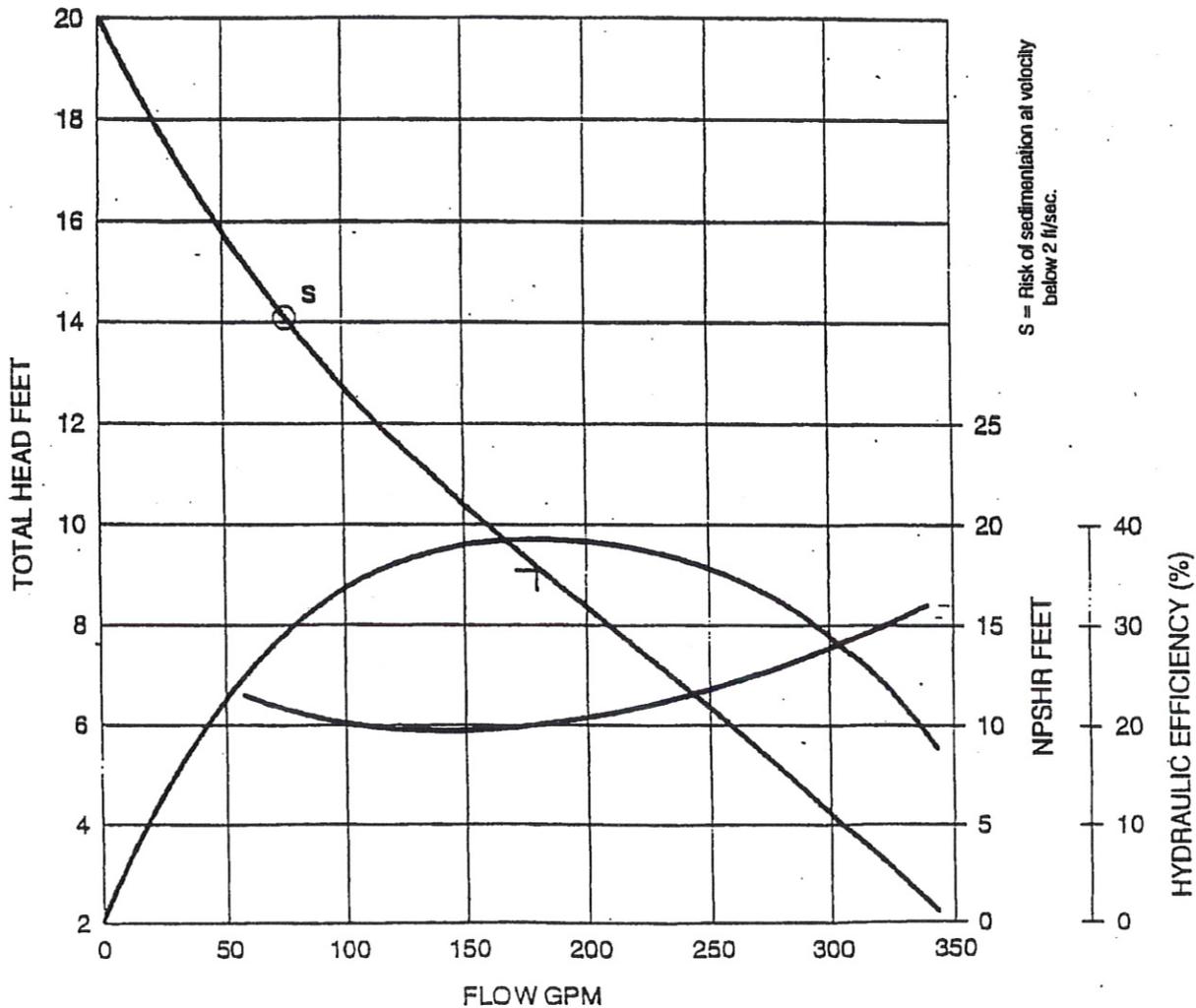
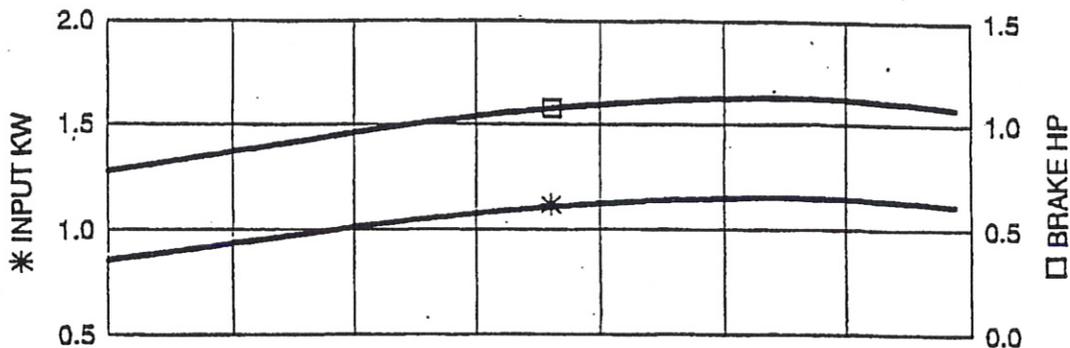
13. WAREHOUSE ROAD PUMP STATION

CONFIG.		C-3085 440 Impeller	SECTION	PAGE
CP/CS			3	9
PHASE	VANES		SUPERSEDES	ISSUED
3	1	6/94	2/96	



14. FAIRBANKS PUMP STATION

CONFIG.		C-3085 440 Impeller	SECTION	PAGE
CP/CS			3	9
PHASE	VANES		SUPERSEDES	ISSUED
3	1	6/94	2/96	

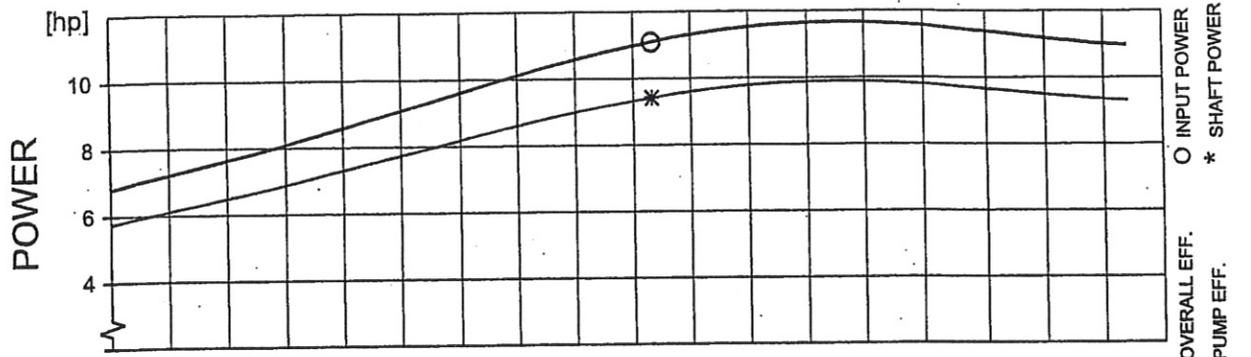




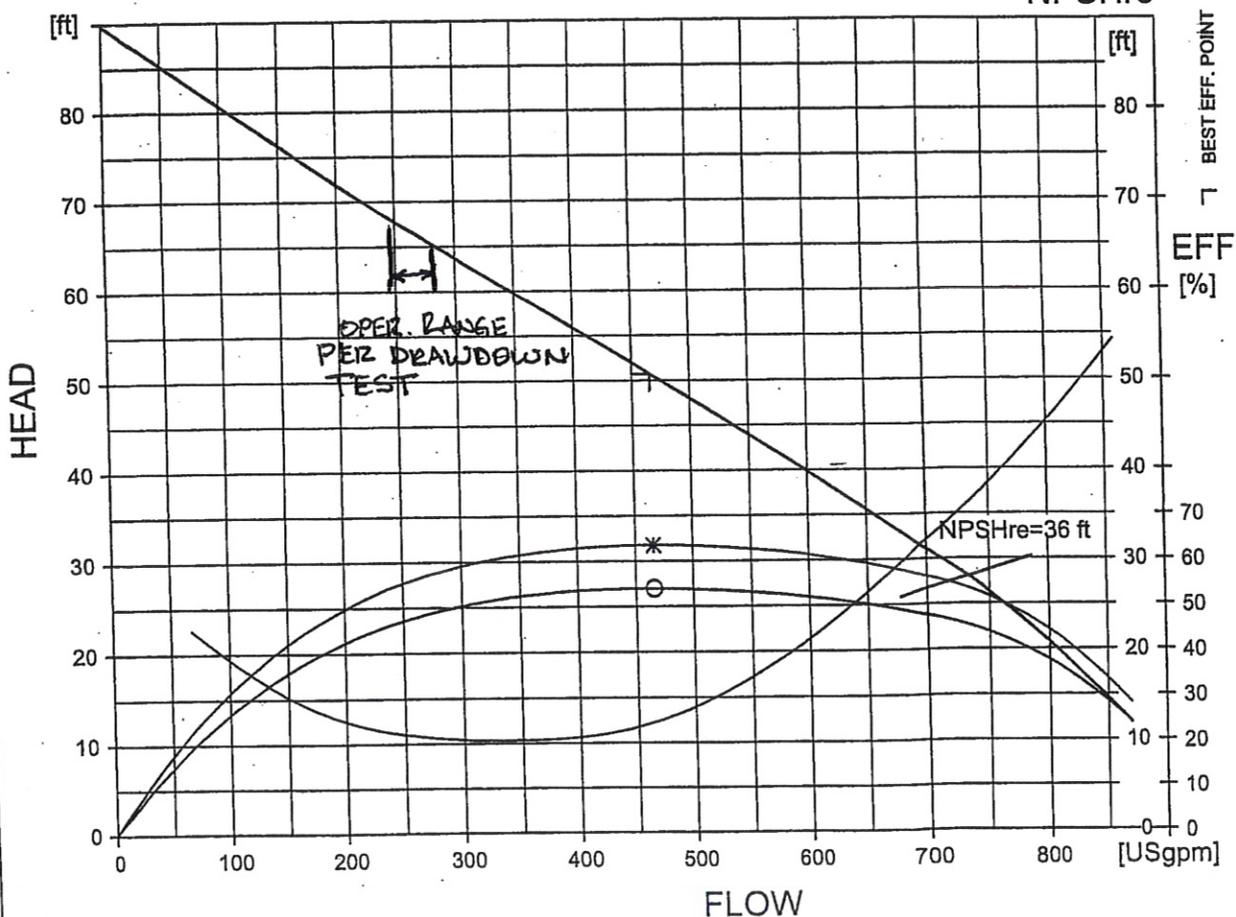
PERFORMANCE CURVE

PRODUCT	CP3127.181	TYPE	HT
CURVE NO	63-483-00-3702	ISSUE	3
IMPELLER DIAMETER		228 mm	
MOTOR #	21-12-4AL	STATOR REV	12YSER 11
FREQ.	60 Hz	PHASES	3
VOLTAGE	460 V	POLES	4
GEARTYPE	---	RATIO	---

DATE	2010-11-11	PROJECT	<unnamed> RIVERS WAY
1/1-LOAD	0.89	3/4-LOAD	0.87
1/2-LOAD	0.81		
POWER FACTOR	83.5 %	EFFICIENCY	85.0 %
MOTOR DATA	---		
COMMENTS	INLET/OUTLET	RATED POWER	10 hp
	-/ 4 inch	STARTING CURRENT ...	64 A
	IMP. THROUGHLET	RATED CURRENT ...	13 A
	2.9 inch	RATED SPEED	1735 rpm
		TOT.MOM.OF INERTIA ...	0.12 kgm2
		NO. OF BLADES	1



DUTY-POINT	FLOW[USgpm]	HEAD[ft]	POWER [hp]	EFF. [%]	NPSHre[ft]
B.E.P.	466.2	50.7	11.1 (9.4)	54.0 (63.5)	12.4



FLYPS3.1.6.5 (20090313)

NPSHre = NPSH3% + min. operational margin
 Performance with clear water and ambient temp 40 °C



HI B Curve



PERFORMANCE CURVE

PRODUCT
NT3202.180

TYPE
HT

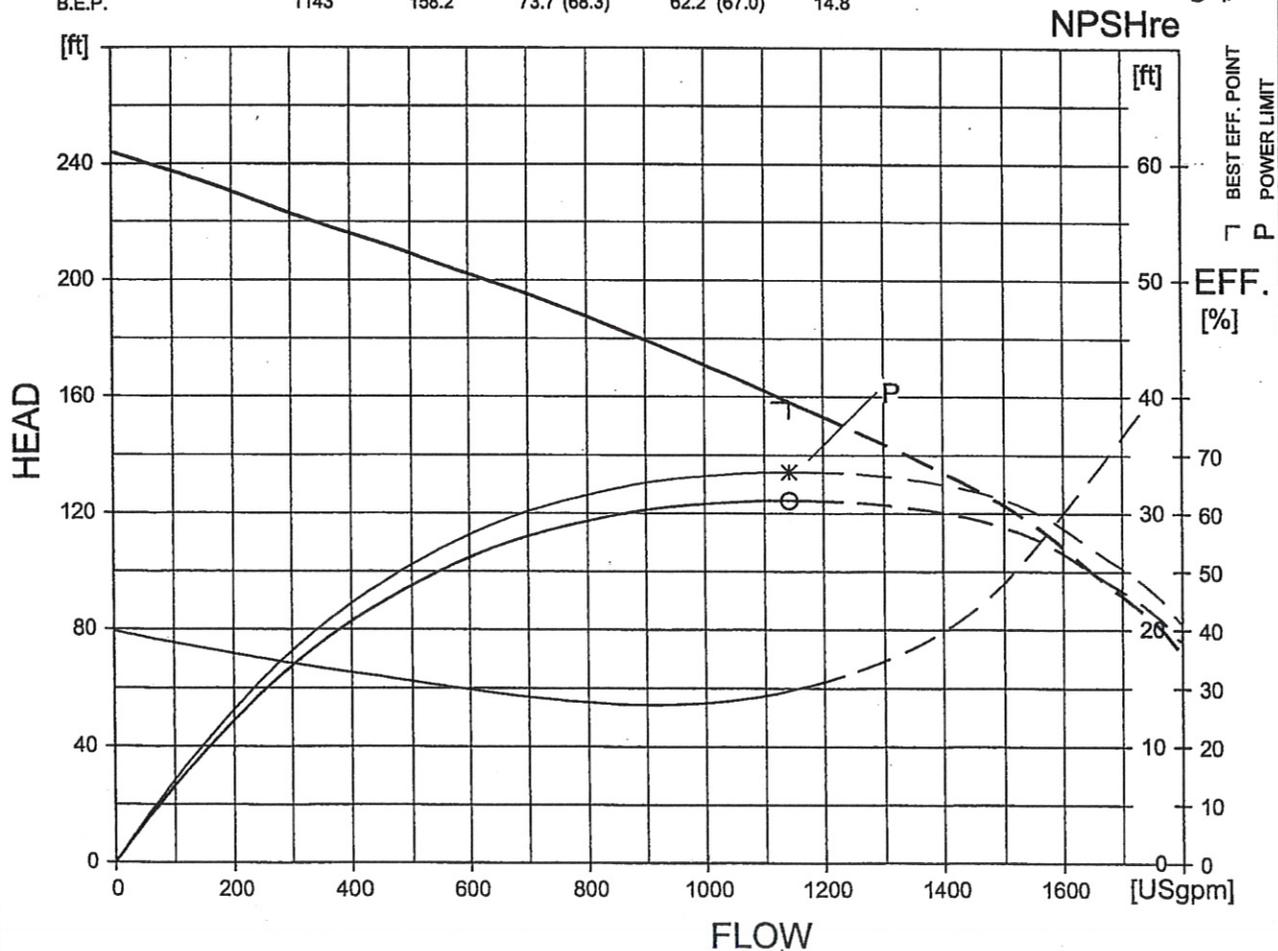
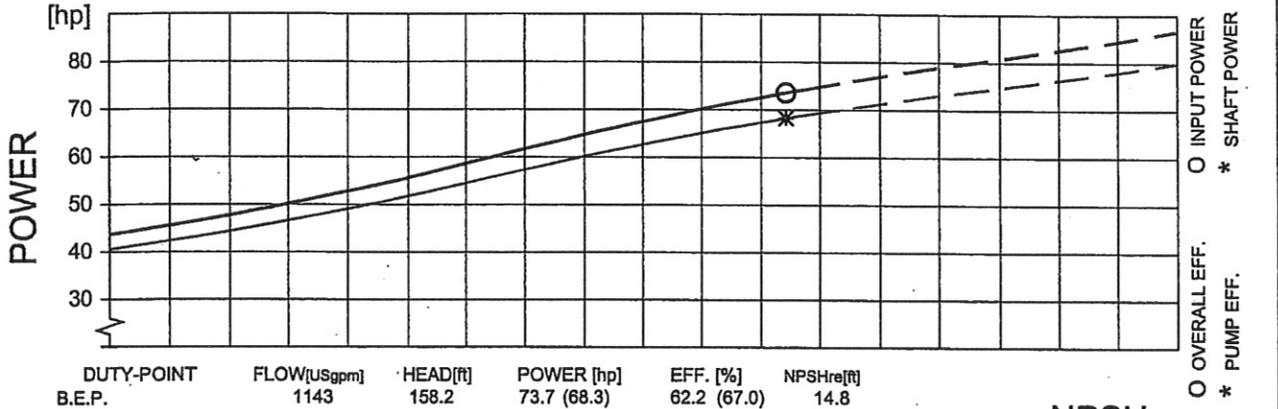
DATE
2010-11-02

PROJECT
EMORY VALLEY

CURVE NO
63-465-00-4060

ISSUE
4

POWER FACTOR	1/1-LOAD	3/4-LOAD	1/2-LOAD	RATED POWER	70	hp	IMPELLER DIAMETER			
	0.90	0.87	0.80				370 mm			
EFFICIENCY	92.5 %	93.0 %	93.0 %	STARTING CURRENT ...	550	A	MOTOR #	STATOR	REV	
MOTOR DATA	---	---	---	RATED CURRENT ...	79	A	30-29-4AA	01D	12	
COMMENTS	INLET/OUTLET			RATED SPEED	1775	rpm	FREQ.	PHASES	VOLTAGE	POLES
	8/ 4 inch			TOT.MOM.OF INERTIA ...	0.49	kgm2	60 Hz	3	460 V	4
IMP. THROUGHLET			NO. OF BLADES	2			GEARTYPE	RATIO		
---							---	---		



FLYPS3.1.6.5 (20090313)

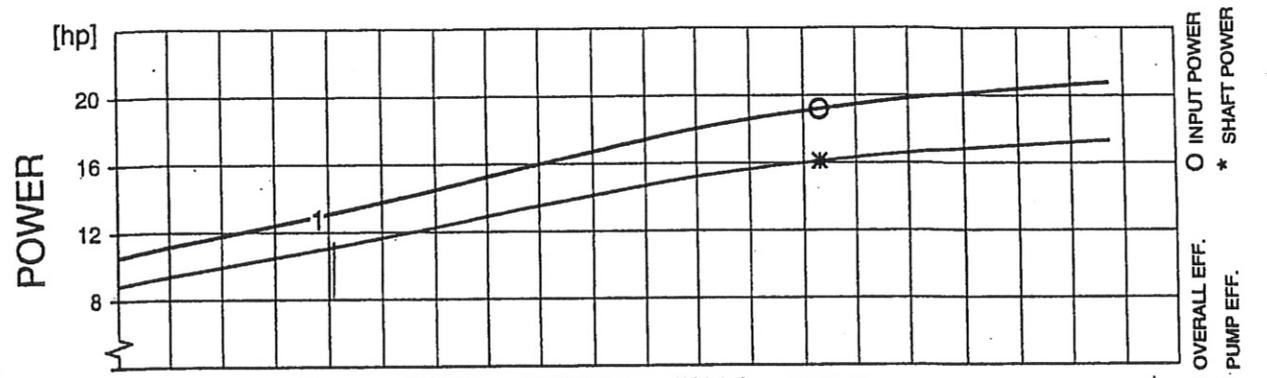
NPSHre = NPSH3% + min. operational margin

Performance with clear water and ambient temp 40 °C

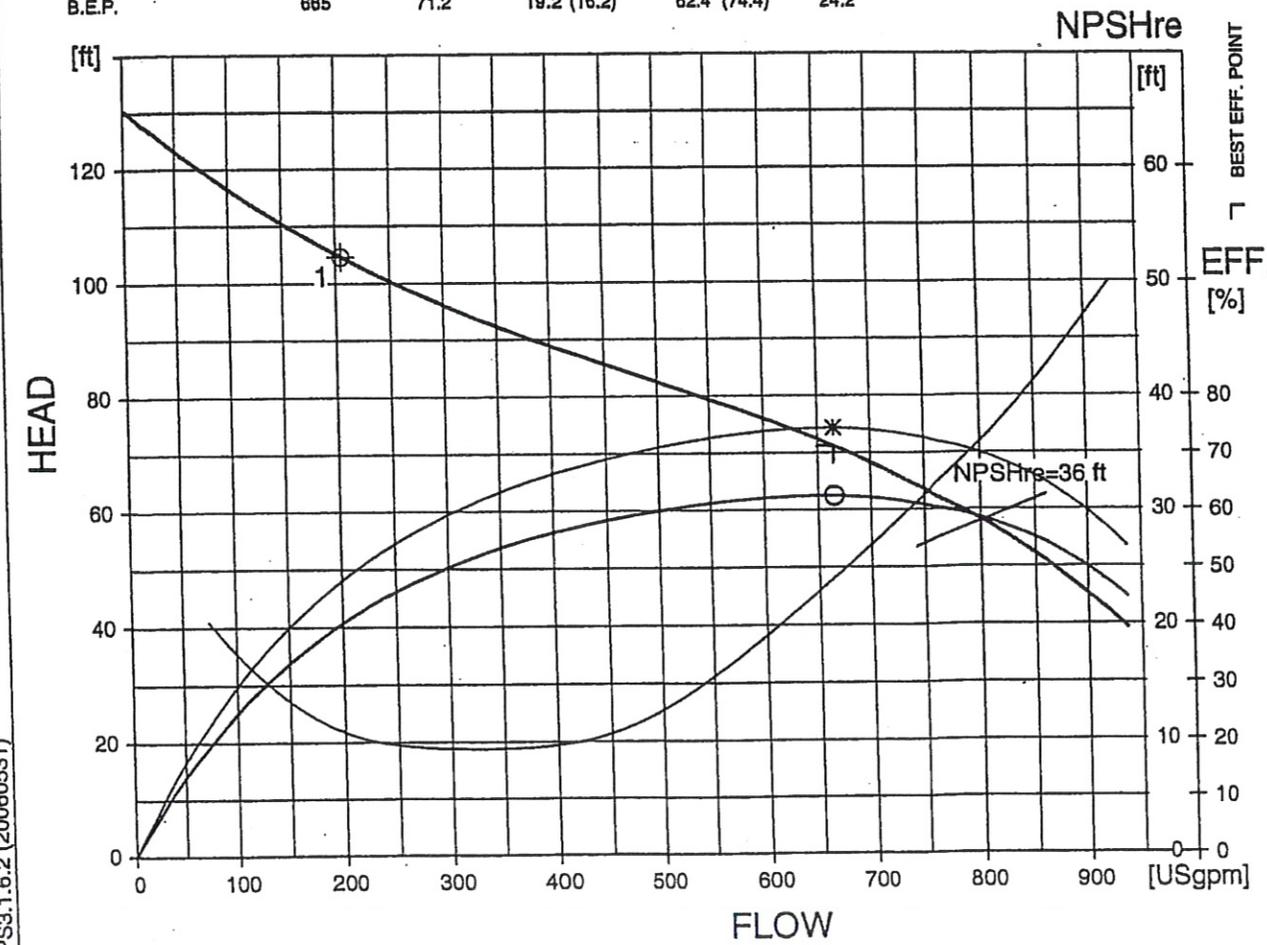


HI B Curve

FLYGT		PERFORMANCE CURVE			PRODUCT	CP3152.181	TYPE	HT	
DATE	PROJECT			CURVE NO	ISSUE				
2009-03-16	Graceland Pump Station			63-487-00-3855	2				
POWER FACTOR	1/1-LOAD	3/4-LOAD	1/2-LOAD	RATED POWER	20	hp	IMPELLER DIAMETER		
	0.84	0.79	0.69	STARTING CURRENT ...	142	A	265 mm		
EFFICIENCY	87.0 %	87.0 %	86.0 %	RATED CURRENT ...	26	A	MOTOR #	STATOR	REV
MOTOR DATA	---	---	---	RATED SPEED	1750	rpm	25-15-4AA	12YSER	11
COMMENTS	INLET/OUTLET		RATED CURRENT ...	TOT.MOM.OF	---	FREQ.	PHASES	VOLTAGE	POLES
	- / 4 inch			INERTIA ...	---	60 Hz	3	460 V	4
IMP. THROUGHLET		NO. OF	BLADES	1	GEARTYPE		RATIO		
3.0 inch					---		---		



DUTY-POINT	FLOW[USgpm]	HEAD[ft]	POWER [hp]	EFF. [%]	NPSHre[ft]
1	205	105	13.2 (11.2)	41.3 (48.7)	10.8
B.E.P.	665	71.2	19.2 (16.2)	62.4 (74.4)	24.2



FLYPS3.1.6.2 (20060531)

NPSHre = NPSH3% + min. operational margin
 Performance with clear water and ambient temp 40 °C



PERFORMANCE CURVE

PRODUCT	NP3301.180	TYPE	HT
CURVE NO	63-462-00-1150	ISSUE	1

DATE
2009-03-16

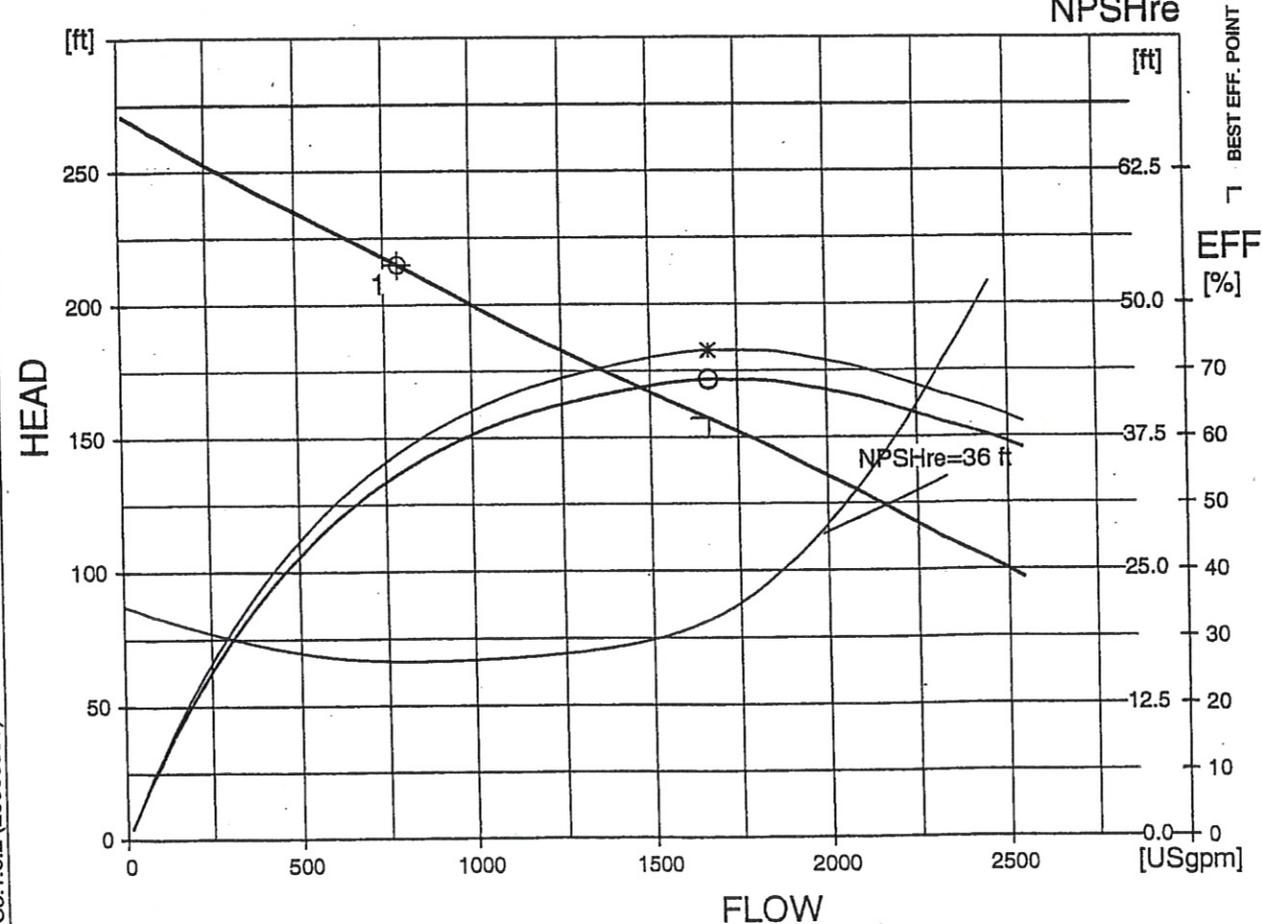
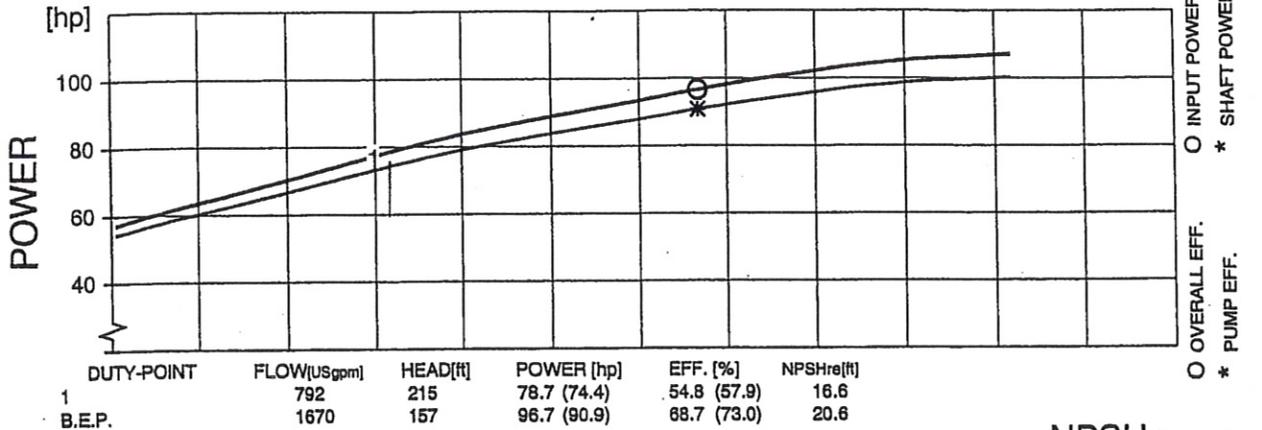
PROJECT
Pumphouse Road

POWER FACTOR	1/1-LOAD 0.84	3/4-LOAD 0.81	1/2-LOAD 0.72	RATED POWER	105 hp
EFFICIENCY	93.0 %	94.5 %	95.0 %	STARTING CURRENT ...	560 A
MOTOR DATA	---	---	---	RATED CURRENT ...	125 A

IMPELLER DIAMETER 390 mm			
MOTOR #	35-29-4AA	STATOR	01D
REV	12		

COMMENTS	INLET/OUTLET	RATED SPEED	1775 rpm
	-/ 6 inch	TOT.MOM.OF INERTIA ...	0.89 kgm2
	IMP. THROUGHLET	NO. OF BLADES	2

FREQ.	60 Hz	PHASES	3	VOLTAGE	460 V	POLES	4
GEARTYPE	---	RATIO		---			



FLYPS3.1.6.2 (20060531)

NPSHre = NPSH3% + min. operational margin
Performance with clear water and ambient temp 40 °C



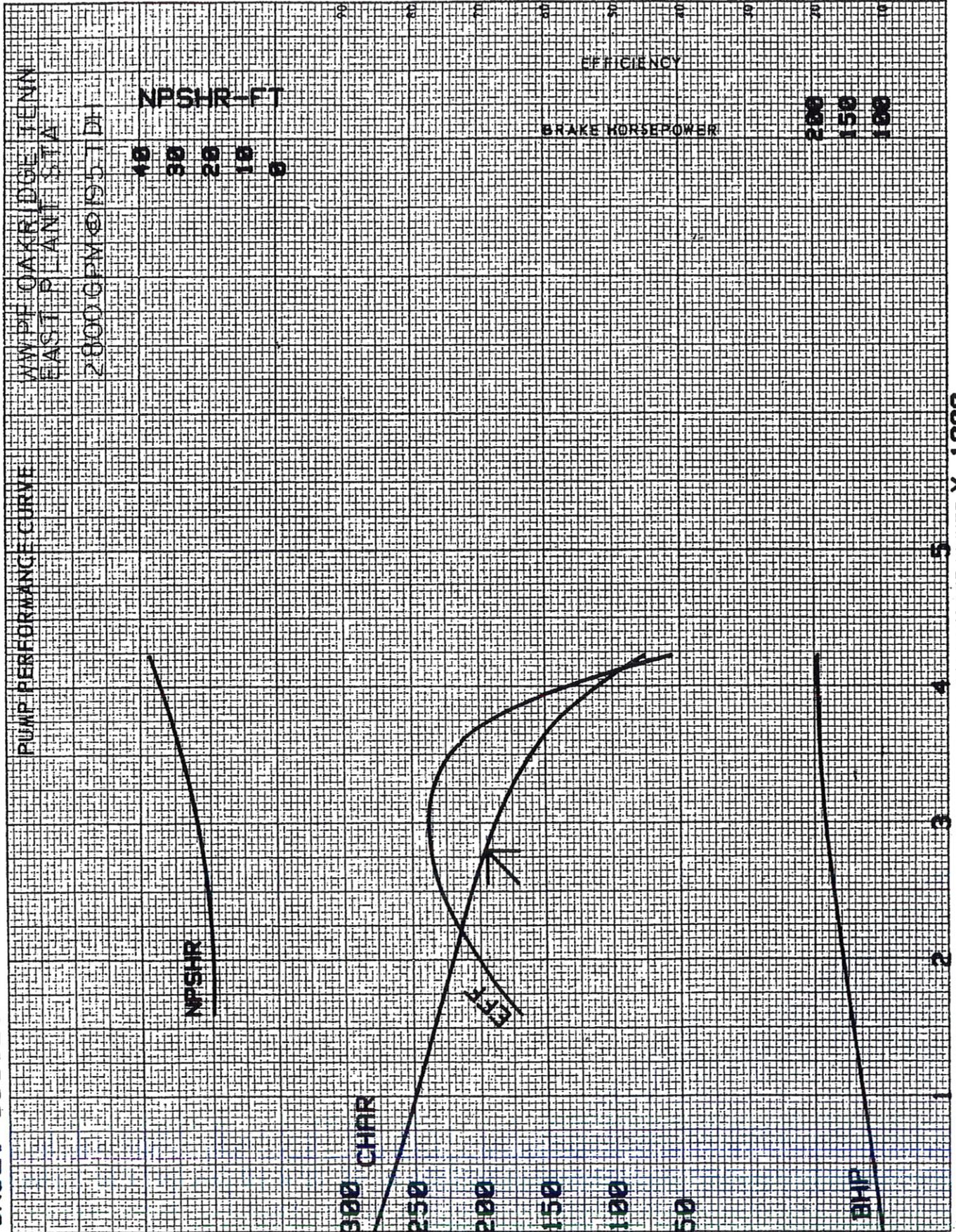
Hi B Curve



THIS CHART IS BASED ON ACTUAL TEST PERFORMANCE OF A SIMILAR PUMP. ONLY THE INDICATED POINT IS GUARANTEED.

NO. STAGES ONE SIZE-FIGURE 6-B5416
 REFERENCE TL-603343 IMPELLER T6E1G
 PLOTTED BY JM IMP. DIA. 16.0"
 BASED ON MAXIMUM SUCTION LIFT OF _____ DATE 12-12-00 R. P. M. 1785

CK3E1-060120

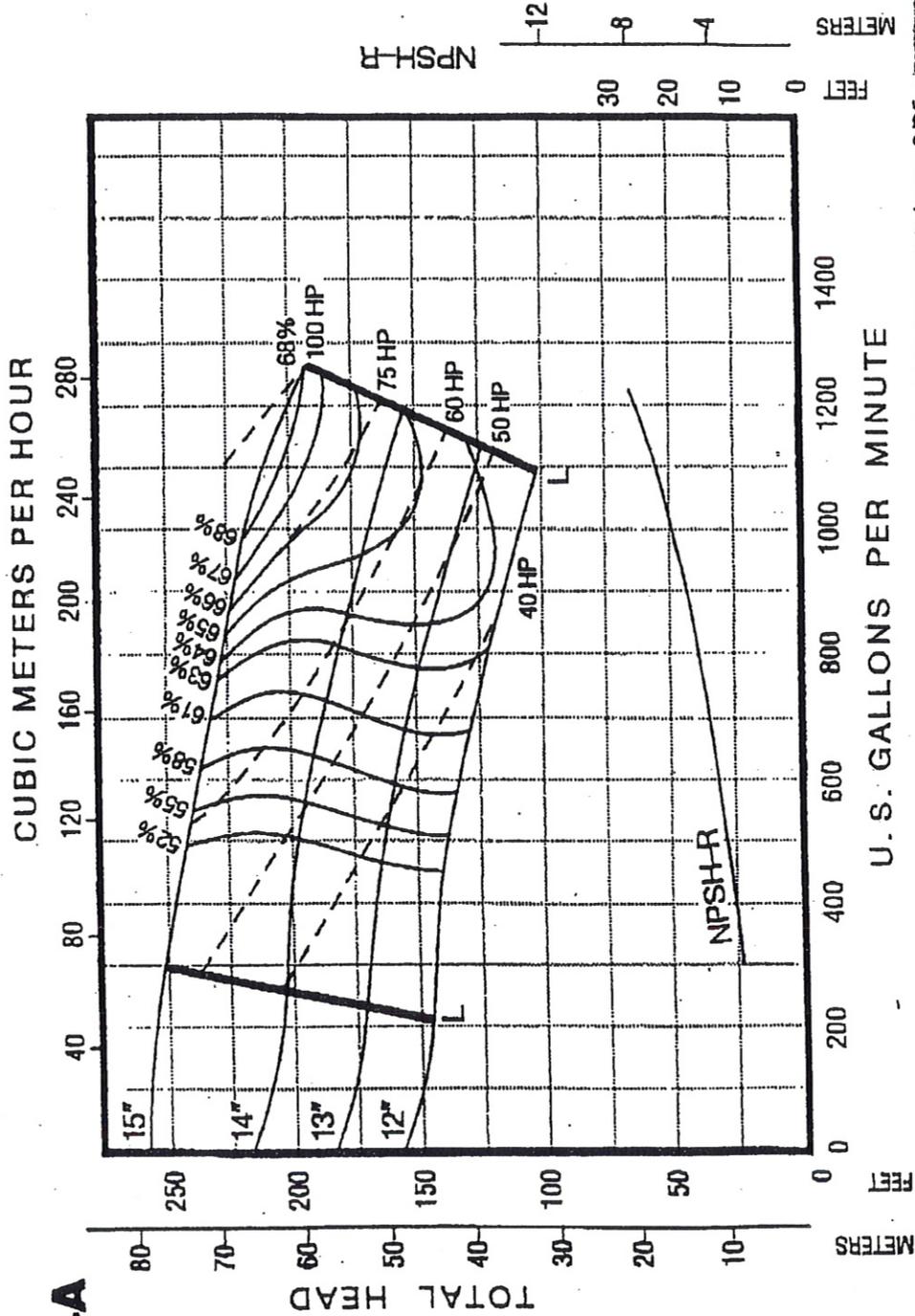


U. S. GALLONS PER MINUTE X 1000

15. SCARBORO ROAD PUMP STATION

Model
4315SC-4A

Curve No.	40166
Impeller No.	Y-5117
Number of Vanes	2
Max. Sphere	3"
Discharge Size	4"
Suction Size	4" or 6"
Inlet Area	12.57 sq. in.



L = Limit Line

Issue 8/95

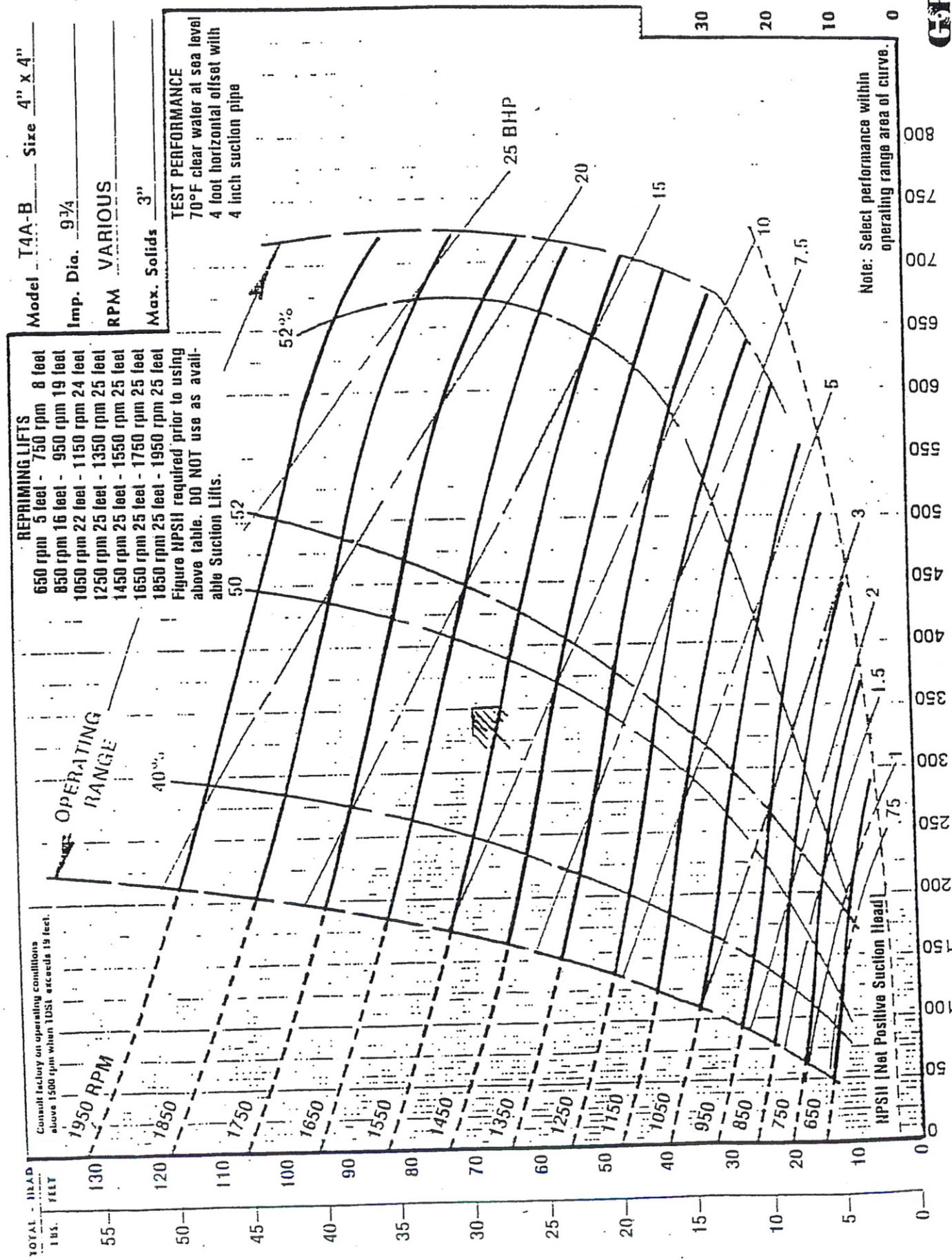
8. OAK HILLS PUMP STATION

PERFORMANCE CHART NO. T4A-4

2-21-79

SECTION 55 PAGE 1154

REQUIRED NPSH



Note: Select performance within operating range area of curve.

Consult the factory on special applications or applications exceeding including or other performance limitations indicated

U. S. GALLONS PER MINUTE

Produced in U.S.A.

**Appendix C:
Operational Forms**

Building Inspection Schedule

Item	Daily	Weekly	Monthly	Quarterly	Semi- annually	Annually	Other
Exterior							
General Appearance							As Needed
Grass-Shrubs							As Needed
Walks-Drives						X	
Doors-Windows- Trim						X	
Fence-Gates- Driveway Barrier						X	
Walls						X	
Gutters-Down- spouts						X	
Roofing - Vents- Chimney						X	
Steps-Rails- Hatches			X			X	
Louvers-Screens- Grills						X	
Emerg. Signs -Address No.						X	
Vaults-Chambers					X		
M. H. Covers - Valve Boxes					X		
Paint Code Observed							As Needed
Interior							
General Appearance							As Needed
Walls-Ceilings-Floors						X	
Steps-Rails-Platforms						X	
Ventilation Ductwork						X	
Doors-Windows-Trim						X	
Other							

Settings for Level Control

Pump Station _____ Type of Controls _____

Settings

Low Level Alarm	On _____	Off _____
Unit No. 1	On _____	Off _____
Unit No. 2	On _____	Off _____
Unit No. 3	On _____	Off _____
Unit No. 4	On _____	Off _____
High Water Alarm	On _____	Off _____

Sequence

Date: _____

Settings authorized and/or checked by: _____

Annual Pump Inspections Report (PRS)

Location:		Pump #:	
Date:		Clock Reading:	
Indicate condition of items listed below as either Good, Fair or Needs Repair (NR). Record measurements before and after repairs; record any problems and/or corrective action taken on reverse side			
Pump Frame	Check Valve	Packing Gland	
Top Bearing	Suction Valve	Sleeve	
Bottom Bearing	Discharge Valve	Packing Installed	
# of Rings			
Impeller	Nose Ring (Before)	Nose Ring (After)	
Condition	Condition	Condition	
Length Before	OD	OD	
Length After	ID	ID	
Diameter	Thickness	Thickness	
Volute	Base Ring (Before)	Base Ring (After)	
Condition	Condition	Condition	
Depth	OD	OD	
Throat	ID	ID	
Devcon	Thickness	Thickness	
Clearance	Motor RPMs Checked:	Yes	No
Before	Remarks:		
After			
Shims			
	Signature:		

Appendix D:
Portions of Sewer Overflow Response Plan

- If it has been determined that it is a cavity or depression caused by another utility (storm drain, water main, etc.), the crew should notify the supervisor.
- The crew leader should thoroughly document the nature and extent of the impact including the use of photographs and/or video footage.
- Complete a report indicating the time of the call, a description of the problem, the repair work done, personnel and equipment used.
- If sewage overflowed the collection system, complete the Sanitary Sewer Overflow report form as required.
- Notify TDEC within the required 24 hours, followed by the Final Report within five days.

3.4.4 SORP-Sewage Force Main Break

EMERGENCY PROCEDURES

- Dispatch a crew to the site to assess the situation, determine who or what might be affected and the immediate danger to the environment.
- Refer to sewer maps for location of sewer lines, manholes and what pump station is associated with the force main.
- Set up traffic cones and barricades as needed.
- Initiate measures to contain the overflow, protect the street, public areas, catch basins, etc. that might be subject to flooding and collect wastewater that has been discharged. These measures will help minimize impact to the public health and the environment.
- Determine if it will be possible to pump around the break from the pump station wet well to the force main discharge manhole or other accessible manhole. If it is possible, then prepare to pump around the break as follows: (1) request additional manpower and equipment as needed (excavating crews, bypass pumping equipment, etc.), (2) set up pump equipment and hoses from the wet well to the nearest sewer discharge point, (3) draw down the wet well as much as possible to maintain a low level, (4) lock out and tag out the pumps at the station.



- If pumping around the break is not possible, utilize the vac-truck or tanker truck to draw down the wet well as much as possible and maintain a low level.
- Call in additional crews as necessary to help contain the sewer overflow. Set up flotation booms across streams and sandbag storm drains, etc.
- Check the tributary area to determine if the discharge will affect any receiving waters and notify the proper authorities and agencies as necessary.
- If the wastewater is in the road, contain the wastewater to the extent possible with sandbags. Sandbag nearby catch basins inlets or paved spillways to prevent wastewater from entering the drainage system and causing potential contamination of receiving waters.
- Cordon off the area if ponding occurs. Collect as much of the wastewater as possible, disinfect and lime area and notify surrounding homeowners and the appropriate officials and agencies.
- If the wastewater jeopardizes a playground or park, cordon off the entire area. Close the park to the public until the issue has been remediated to the satisfaction of the local and state regulatory authorities and the park superintendent.
- Gather and remove sewage related debris and organic matter from the affected area.
- Drain the force main as follows: (1) close the gate valve on the upstream side of the discharge check valve on the pumping station, (2) Open the check valve by hand and secure it in place, (3) Bleed the force main back into the wet well by slowly opening the gate valve on the discharge side of the pump, but only to the point where the force main stops leaking and there is enough room to make the repair. Constant communication must take place between the crew at the leak and the crew at the pump station, (4) Close the gate valve and return the check valve to its normal operating position and then fully open the gate valve.
- Repair force main break.
- After the repair is complete, remove the lock out-tag out and return the pumps to normal operating position.
- Run the pumps in the hand position to fill the force main. Care must be taken while filling the force main (use only one pump



during filling). Once complete, observe several pump cycles before completely backfilling the excavation.

- Upon confirmation of no leaks at the repair, backfill the excavation and restore surface area.
- While the crew is restoring the excavation, the crew leader should conduct a preliminary assessment of damage to private and public property. The crew leader should thoroughly document the nature and extent of the impact using photographs and videos.
- Complete a report indicating the time of the call, a description of the problem, the repair work performed and persons and equipment used.
- If sewage overflowed the collection system, complete the Sanitary Sewer Overflow report form as required.
- Notify TDEC within the required 24 hours, followed by the Final Report within five days.

3.4.5 SORP-Sewer Main Breaks/Collapse

EMERGENCY PROCEDURES

- Dispatch a crew to the location of the break/collapse immediately while referring to the sewer maps for the location of sewer, manholes, etc., to determine if critical facilities are in the area.
- Crew sets up signs, barricades or barrels for traffic control and public safety, rerouting traffic as necessary and deploying traffic control measures such as police and flag persons as needed.
- If it is a main line break, notify the appropriate authorities.
- Request additional manpower and equipment as needed based on initial damage assessment (excavating crew, equipment to pump around break, etc.).
- Pumping around the break from the upstream manhole to the downstream manhole may be required. If necessary, set up bypass pumping equipment. If not necessary, prepare for repairs while the pipe is flowing.
- Call in additional crews to set up flotation booms across streams, install sandbags, etc., as needed. Unless special conditions exist, pumping around the failed sewer main is a priority before containing the overflow.



- Gather and remove sewage related debris and organic matter from the affected area.
- If the wastewater is in the street/roads use sandbags to contain the wastewater to minimize any impact to the public health or the environment.
- Sandbag nearby catch basin inlets or paved spillways to prevent the wastewater from entering the drainage system and causing potential contamination to the receiving waters.
- Cordon off the area if ponding occurs.
- Collect as much of the sewage as possible, disinfect and lime area; notify surrounding homeowners and the appropriate officials.
- If the wastewater jeopardizes a playground or park, cordon off the entire area. Close the park to the public until the issue has been remediated to the satisfaction of the local and state regulatory authorities and the local park superintendent.
- Determine the location of the break/collapse and make any necessary repairs. Use repair procedures consistent with policy. If the break is on the pipe length, then a repair can be made with a repair clamp. If the break is at the bell, cut out the bell and replace with a piece of pipe for a point repair.
- Upon confirmation of adequacy of the repair, backfill the excavation and restore surface conditions.
- To restore the sewer line to full capacity, the crew should remove any debris that may have entered and accumulated in the sewer line downstream and upstream from the break/collapse. The crew should clean the sewer line. Install the proper size debris basket in the downstream invert to trap any debris that may have accumulated in the sewer line.
- The crew leader should thoroughly document the nature and extent of the impact including the use of photographs and videos.
- Complete a report indicating the time of the call, a description of the problem, the repair work done personnel present and equipment used.
- If sewage overflowed the collection system, complete the Sanitary Sewer Overflow report form as required.
- Notify TDEC within the required 24 hours, followed by the Final Report within five days.



3.4.6 SORP-Air Release and Vacuum Valve Failure

EMERGENCY PROCEDURES

- These valves require frequent inspection and maintenance. Their failure is often found during routine inspections. Both valves may fail to operate if grease is allowed to accumulate in the valve or on the opening mechanism.
- The maintenance crew should inspect valves in accordance with the specific manufacturer's recommendations.
- Attach fittings at the top and bottom to permit flushing of all valves upon initial installation or retrofit upon failure.
- Isolate the valve from the force main by closing the shutoff valve attached to the force main.
- Clean the internal components of the valves. Attach a back-flushing hose to a pressurized water source using a quick disconnect coupling.
- Place a blow-off discharge hose in a container to collect the back-flush water from the blow-off valve. This is wastewater that should not be discharged onto the street or into the valve pit.
- Open the shutoff valve and back-flush the valve through the blow-off valve at the bottom.
- If a potable water source is being used, provide the system with an anti-siphon device or backflow device to prevent contamination of the potable water.
- Prepare a report indicating the time of the visit, description of the problem, repair work done and personnel and equipment used.
- If sewage overflowed the collection system, complete the Sanitary Sewer Overflow report form as required.
- Notify TDEC within the required 24 hours, followed by the Final Report within five days.

3.4.7 SORP-Wastewater Pump Station Alarms General Response Plan

EMERGENCY PROCEDURES

- Send an individual to the station indicating an alarm as soon as possible. Responders should bring a detailed station-specific



trouble-shooting guide with them for the pump station. If serious trouble is found, call for additional assistance and keep an individual at the station until further instructions are received.

- Always check with the Electric Department when an alarm activates. The pole number nearest the station should be reported to the Electric Department.
- Personnel called in to investigate pump station alarms shall respond to the station even if the alarm has cleared prior to their arrival. All alarm conditions are to be checked and logged. Use the following guidelines and follow confined space entry procedures.

Wet well/Dry well Stations

- Observe all safety precautions per training.
- Check the atmosphere within the dry well with a gas meter prior to entering.
- Upon entering, identify the storage capacity in the wet well. This will give some indication of the time available for response. If flooded, skip to pump-out steps under "Pumping Station Failure inside valve pits, Pump or Valve Failure".
- Take your time entering the dry well. Never enter a flooded dry well.
- Note any unusual odors (burning electrical equipment or paint).
- Listen and note any unusual noises.
- Check for heat around pump motors and pump bearing housings. Note anything that seems unusually hot.
- Observe every piece of equipment in the station. Note anything that looks out of place.
- Record all gauge readings including wet well hour meters, flow charts, on/off levels, pressure gauges on pumps, rpm and anything else deemed significant.
- Using available information and the trouble-shooting guide, systematically run through the system. Use a process of elimination to identify the cause of the failure. Check the level controls, pump operation using manual position, and check the pump outlet by pressing on the check valve counterweight as defined in the trouble-shooting guide. Once the cause is isolated, engage mechanical or electrical disciplines for repairs.



- Emergency personnel should be absolutely certain that the cause of the pump station alarm or failure has been properly identified and corrected prior to leaving the station.
- Reset any / all alarm feature indicator lights.

Submersible Type Stations

- Take all safety precautions per training.
- Check the atmosphere within the wet well with a gas meter prior to working over the station.
- Note any unusual odors (burning electrical wires, hot or smoking oil or paint).
- Listen for any unusual noises and note if pumps are operating.
- Observe every piece of equipment in the station. Specific attention should be given to level controls. Note anything that looks out of place.
- Record all gauge readings from the control panel wet well level, hour meters, flow charts, on-off levels, pressure gauges on pumps rpm and anything else deemed significant.
- Using available information and the trouble-shooting guide, systematically run through the system. Use a process of elimination to isolate the cause of the failure. Check level controls, pump operation using the manual position and pump output by observing the check valve counterweight as defined in the guide. Once the cause is isolated, engage mechanical and electrical disciplines for repairs.
- Emergency personnel should be absolutely certain that the cause of the pump station alarm or failure has been properly identified and corrected prior to leaving the station.
- Reset any/all alarm feature indicator lights.
- The Operation and Maintenance (O&M) manual should be used to check the level sensors and pump controls. Pumps may be checked for operation by checking the arm of the check valve in the discharge line of an operating pump. If it feels “spongy” or soft when pressed downward, the pumps are pumping. If a breaker is off and the pump motor is hot to the touch, do not attempt to reset and start. If a pump motor is simply warm, one attempt to restart can be made. If the pump has lost prime or is plugged the check valve will not open.



- If there has been an overflow at any pump station, prepare a report of the time and duration of the spill, cause and corrective actions, personnel and equipment on site.
- If sewage overflowed the collection system, complete the Sanitary Sewer Overflow report form as required.
- Notify TDEC within the required 24 hours, followed by the Final Report within five days.



3.4.8 SORP-Pump Station Failure due to Secondary Power Failure

EMERGENCY PROCEDURES

- Dispatch crews to the pump station immediately. The crew needs to bring the auxiliary generator for that specific station as a backup. If the dedicated generator can't be repaired in a timely manner the auxiliary generator will be installed.
- Upon entry, identify the storage capacity in the well. This will give some indication of the time available for response. If flooded, skip to pump out steps under "Pumping Station Failure Inside Valve Pit, Pump or Valve Failure" procedures.
- Crew may request the assistance of the Electric Department in restoring power to the station.
- As they approach the station, the crew should check the overhead power lines for fuses that might be blown or downed power lines. If the crew notices a blown fuse or downed power lines, identify the location and pole number and notify the Electric Department.
- Lock out and tag out (LOTO) the main line.
- Check all components of the dedicated generator to determine failure. Use the manufacturer's prepared troubleshooting guide to aid in the diagnosis. If it cannot be repaired immediately, connect the portable generator to the auxiliary power connection located outside the building. Examine plug type and insure consistency. Use adapters as necessary.
- Follow manufacturer's recommendation for starting the generator.
- Obtain the service of a qualified generator repair company to address the repairs to the dedicated generator.
- Once the dedicated generator is repaired, place back into service and return auxiliary generator to storage. Operate the dedicated generator through several cycles to insure reliability.
- If sewage overflowed the collection system, complete the Sanitary Sewer Overflow report form as required.
- Notify TDEC within the required 24 hours, followed by the Final Report within five days.



3.4.9 SORP- Pump Station Failure inside Valve Pit, Pump or Valve Failure

EMERGENCY PROCEDURES

- Dispatch crew to the pump station immediately.
- Prior to viewing the wet well, measure the atmospheric conditions for sufficient oxygen and the presence of explosive or toxic gases.
- Upon arrival, the crew should determine the storage capacity of the wet well. This will give some indication of the time for response. If flooded, skip to pump-out steps.
- Inspect the main controls looking for failure indicators. Check processors to determine failure. If pump failure is determined, skip to wet well inspection steps.
- Inspect the valve pit. Observe all valves and force mains. If flooded, skip to pump out steps.
- Constantly monitor the atmospheric conditions while working in or above the wet well. Inspect the wet well, checking the floats or level system, bar rack and pump volute area for clogging or other problems.

Pump-Out Steps

- If pump failure, determine if pump out is necessary. If so, skip to repair procedures.
- Pump the flow with portable pumps. If necessary, call additional crews to bring appropriate portable pumps, suction and discharge hose to the station. Connect the portable pump placing the suction hose in the wet well and the discharge hose to a downstream manhole or pre-determined connection point. Start the portable pump and begin pumping.

Repair Steps

- Lock out and tag out (LOTO) the main line.
- Monitor the atmospheric conditions for sufficient oxygen and the presence of explosive or toxic gases. If safe, enter valve pit or wet well and inspect the piping and valves for cause of failure.

