Appendix B: Condition Assessments

CONDITION ASSESSMENT REPORT

NAVY STREET WASTEWATER PUMPING STATION (W-19)

4 Navy Street, Oakville South West

RMOH-ID 18

March 2010

R.V. Anderson Associates Limited
engineering · environment · infrastructure

CONDITION ASSESSMENT REPORT

Inspection Date: October 24, 2008

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CONDITION ASSESSMENT

THE REGIONAL MUNICIPALITY OF HALTON

PUMPING STATION INSPECTION FINDINGS- 2008

AREA: Oakville South-West **TYPE**: Wet Well/Dry Well
STATION: Navy Street Wastewater Pumping Station
ADDRESS: 4 Navy Street **BUILT:** 1985
MMIS: W19 **NORTH:** 43 26 29.1 **SERVICE:** 600 V-3 ph
RMOHID: 18 **WEST:** 79 39 58.4 **GENSET:** N/A
PUMPS: 2 Flygt-20 hp
FIRM STATION CAPACITY (L/s): 66.1 **CONTROLS:** Floats; No SCADA

BUILDING AND PROCESS STRUCTURAL

The Navy Street Wastewater Pumping Station is one of the older stations in the Oakville West area with its construction dating back to 1985. No appreciable changes have taken place over the years other than routine maintenance work. The station is typical of the age with the pump house at grade and the dry well – wet well structures below grade and adjacent to each other (Photos 1 through 4). Although being older the station structure above and below grade is appears to be still in good condition and no major building and process structural concerns were identified.

BUILDING ARCHITECTURAL

The station is a small one-storey, stucco building constructed with no notable architectural features (Photo 1). The station is located at the lake terminus end of Navy Street and abuts a marine slip open to Lake Ontario (Photos 5 and 6). The building has a flat roof which has been rebuilt in recent years (Photo 5). The building exterior finishes have overgrown with climbing vines that obscured air ventilation louvres and trees that should be removed. The exterior walls are in good condition. The floors of the station should be cleaned and epoxy coated for long-term ease of maintenance (Photos 7 and 8). The interior painting in the dry well has also deteriorated and should be repainted. The interior walls of the wet well access room above grade should be washed and painted (Photo 9).

BUILDING SERVICES

Building services at the site were reviewed and no major deficiencies in the power supply, lighting, heating and drainage were noted (Photo 10). The building does have fire/smoke/heat detection units installed (Photo 11). The backflow preventor inspection tag could not be read and the unit should be checked. No deficiencies were noted with regard to the base building electrical services. A fire extinguisher needs to be installed. A fresh air supply fan is installed and provides forced air into the dry well pump floor area (Photo 12). The above ground station room is provided with fresh air ventilation and unit heaters (Photo 13). Intrusion protection has been provided with limit switches on the doors.

SITE WORKS

The site is located at the end of Navy Street and is close to Lake Ontario (Photo 6). The site is totally open to the residential and commercial neighbourhood and it is recommended that fencing and increased sit lighting be installed as a measure of upgrading security (Photo 5).

PROCESS PIPING

Dry well process piping

The station dry well piping is old and is recommended to be replaced (Photos 14 through 16). The age of the process piping, valves date back about as many years and have not been upgrade with exception some of the shut-off valves. Presently, the piping system is operating satisfactorily and no immediate concerns were identified. On account of age it is recommended that the process piping be replaced. A dehumidifier has been installed in the dry well pit (Photo 17).

Wet well piping

Pump out lines are installed to the wet well and also to the dry well pump pit for emergency services. The wet well is accessible from grade and is a flooded concrete tank reviewed from grade only (Photo 2). Mechanical ventilation of the wet well appears to be in good condition (Photo 19). The unit heater in the wet well room appears to be rusted (Photo 18).

PROCESS MECHANICAL

The station mechanical works include two (2) submersible pumps in the dry well (Photos 20 through 24). The pumps have been upgraded in recent years. No major deficiencies were noted.

PROCESS ELECTRICAL

The process electrical equipment appears to be in good condition and most of the equipment has been upgraded in recent years (Photos 25 through 35). Provision for emergency power supply has been provided on the outside wall of the building c/w a transfer switch. No major concerns relating the electrical equipment were identified.

PROCESS INSTRUMENTATION AND SCADA

Process instrumentation was reviewed and no concerns identified relating to deficient equipment operation. Presently this station is not equipped with SCADA and it is recommended this equipment be installed to provide on-line status of process operations including station alarms and security.

SCADA ASSESSMENT

OAKVILLE SOUTHWEST WWTP DRAINAGE AREA
NAVY STREET PUMPING STATION

SWWW-PS19- 4 Navy Street

(RMOH ID: 18)

General

The Station is a wet well/dry well type pumping station with one wet well. The building exterior is stucco on block wall construction. The date of initial construction is 1985.

The system uses 2 pumps to control the level in the single well. The wet well is equipped with one hi wet well level float and two level transmitters for monitoring and controlling the level in the well.

The PLC and Motor control systems panels are in good condition. The panels are well laid out; however there is no room for expansion. The wiring in the PLC panel is in an untidy state.

The building security entry alarms, smoke alarm, temperature switches are all acceptable.

Field Devices Inventory to be connected to SCADA

In general, the status of many of the devices and instruments are wired into the PLC system. The non-conforming Items are discussed below.

Generator

There is no generator.

Automatic Transfer Switch (ATS)

There is no generator.

Phase Monitoring

There is currently no phase failure monitor installed at the facility. From the RMoH templates supplied this is not a requirement for the station, but could be added if desired. Phase monitoring allows for trouble shooting of issues surrounding phase imbalance, grounding, and failure.

UPS

The existing UPS system has a provision for a relay monitoring card which is not installed. To bring the system into compliance an XSlot relay card would need to be installed and wired to the PLC system to alert the operators of UPS faults (Line OK, Battery Low, UPS on Bypass etc.).

PFR (Power Failure Relay)

The panel is equipped with a power fail relay. The power fail relay is required to inform the PLC that the system is running on UPS power. This allows the PLC to alert the operations personnel and to take any automatic actions deemed necessary during a power failure.

PLC Processor

The existing PLC processor is an Allen-Bradley SLC 5/03 processor which should be upgraded to an Allen-Bradley SLC 5/05 to be in compliance with RMoH standards. This would allow the system to be connected to the RMoH's existing SCADA network. New graphics, alarms and trends could then be configured at the main station to allow operations personnel to better monitor the station. There are spare slots available in the rack should additional I/O cards be required, and sufficient space below for new terminal blocks as required.

Loss of Echo

There is no loss of echo (LOE) alarm wired to the PLC. The LOE signal is required to monitor the existing Milltronics level transmitter. Ultrasonic level transmitters (such as the Milltronics unit installed in this location) use the echo of an ultrasonic pulse to determine the level of the effluent in the well. Trouble with the alignment of the transducer, damage, or other issues may prevent the system from "hearing" the echo. Each unit has an alarm contact which can be programmed to annunciate this condition to allow the operations personnel to dispatch maintenance to determine the problem and, if required, switch the system to[i] float control until the level transmitter is functioning again.

Float Status

The float status is required to be monitored by the PLC system as per RMoH standards. Additional Floats and wiring is required to add these statuses to the PLC.

Pump Motor Current Draw

The existing motor control panel does not have enough room to install current transformers (CT's) to monitor the current draw of the pump motor. Either a separate panel for the CT's or new starter panel is required to bring the system into compliance.

Pump Running Status

Both of the existing pumps require auxiliary contacts to be installed to monitor the following conditions:

- Pump Motor Overload
- Motor Temperature / Leakage

Pump Control

The Start / Stop control circuits for the pump motors need to be modified to allow for the RMoH standard pulse start, pulse stop standard.

Remote Communications Equipment

A SLC 5/05 system allows for the connection to the existing RMoH SCADA network. Fibre (or other high speed communications connections) would need to be brought to the panel. There is no room in the panel to add an Ethernet switch.

Eye-Wash Station

The Eye-Wash Station does not exist.

Conclusions and Preliminary Cost Estimate

The station is in generally good order. Many of the status signals and instrumentation signals are not wired to the PLC. There are physical space limitations in the Station. It is estimated that to bring the station into compliance with the RMoH SCADA standards would cost $42,400. This cost estimate is +/- 20%. Some shut down of individual equipment and panels will be required to complete the work and needs to be coordinated with the RMOH operation personnel. The system is deemed to be a Medium priority installation.

The existing I/O data summary sheet is appended. The breakdown of the preliminary cost estimate for bringing the station into compliance with RMoH standards is provided in a separate document.

Regional Municipality Of Halton

SCADA I/O List

SWWW PS#19 (Navy Street)

Station Address:	**4 Navy Street**	Firm Cap Posted (L/s):	**52**	Assessment Date:	
Station ID:	**SWWW - PS19**	Build/Major Upgrade Year:	**1985**	Assessed By:	**Sirron**
RMOH ID:	**18**	Flow Monitoring:	**None**		
Station Type:	**Separate Wet Well / Dry Well**	Confined Space Requirement:	**No**		

Description	IO Type	Regional Requirement	Comments
Building			
Control Panel Power Fail (PLC on UPS)	DI	Mandatory Where PLC Exists	Acceptable
UPS Fault	DI	Mandatory Where PLC Exists	Modification Required - UPS requires XSLOT relay card and wiring to PLC
Normal Power Phase Failure	DI	If Available	Not Present
Station Low Temperature Alarm	DI	Mandatory Where A Building Exists	Acceptable
Station High Temperature Alarm	DI	Mandatory Where A Building Exists	Acceptable
Security Key Switch	DI	Mandatory Where A Building Exists	Acceptable
Door/Hatch Contacts	DI	Mandatory Where A Building Exists	Acceptable
Dry Well Flood Alarm	DI	Mandatory Where A Building Exists	Acceptable
Milltronics #1 Loss Of Echo	DI	Mandatory	Modification Required - Milltronics requires programming for LOE and wiring to PLC
Milltronics #2 Loss Of Echo	DI	Mandatory Where Present	Modification Required - Milltronics requires programming for LOE and wiring to PLC
Smoke Alarm	DI	Mandatory Where A Building Exists	Acceptable
Building Combustible Gas Detector - Failure	DI	Mandatory Where Present	Not Present
Building Combustible Gas Detector - Warning	DI	Mandatory Where Present	Not Present
Building Combustible Gas Detector - Alarm	DI	Mandatory Where Present	Not Present
Ventilation System Local/Remote	DI	Mandatory Where Present	Not Present
Ventilation System Running Status	DI	Mandatory Where Present	Not Present
Emergency Shower/Eyewash Activated Alarm	DI	Mandatory Where One Exists	Not Present
Diesel Containment Flood	DI	Mandatory Where There Is A Diesel Containment Area	Not Present
Floats			
Pump One Stop Float	DI	Mandatory	Not Present
Pump One Start Float	DI	Mandatory	Not Present
Pump Two Stop Float	DI	Mandatory	Not Present
Pump Two Start Float	DI	Mandatory	Not Present
Wet Well High Level Float Alarm	DI	Mandatory	Acceptable
Auto Transfer Switch			
Auto Transfer Switch - Test Position	DI	Where Applicable	Not Present
Auto Transfer Switch - Off Position	DI	Where Applicable	Not Present
Auto Transfer Switch - Auto Position	DI	Where Applicable	Not Present
Auto Transfer Switch - Manual Position	DI	Where Applicable	Not Present
Auto Transfer Switch - On Normal Power	DI	Where Applicable	Not Present
Auto Transfer Switch - On Emergency Power	DI	Where Applicable	Not Present
Generator Function Test	DO	Where Applicable	Not Present

Regional Municipality Of Halton

SCADA I/O List

SWWW PS#19 (Navy Street)

Description	IO Type	Regional Requirement	Comments
Generator			
Generator Remote (Not In Auto)	DI	Where Applicable	Not Present
Generator Running	DI	Where Applicable	Not Present
Generator Pre-Alarm	DI	Where Applicable	Not Present
Generator Failure Alarm	DI	Where Applicable	Not Present
Generator Emergency Stop	DI	Where Applicable	Not Present
Pumps			
Pump One Running Status	DI	Mandatory	Acceptable
Pump One Control Mode Status	DI	Mandatory	Acceptable
Pump One Overload	DI	Mandatory	Modifications Required - Overload and Leak/Temp common
Pump One Motor Temp/Leakage	DI	Where Applicable	Modifications Required - Overload and Leak/Temp common
Pump One Start	DO	Mandatory	Acceptable (start/stop controlled by maintained contact - no separate stop output)
Pump One Stop	DO	Mandatory	Modificaitons Required - circuit could be rewired to support pulse to start and pulse to stop
Pump One Speed Setpoint	AO	Mandatory Where There Is A VFD	Not Present
Pump One Speed Current Value	AI	Mandatory Where There Is A VFD	Not Present
Pump One VFD Fault	DI	Mandatory Where There Is A VFD	Not Present
Pump One Emergency Stop Push Button	DI	Mandatory Where Present	Not Present
Pump One VFD/Soft Start Bypass Mode Status	DI	Mandatory Where A Bypass Contactor Exists	Not Present
Pump Two Running Status	DI	Mandatory	Acceptable
Pump Two Control Mode Status	DI	Mandatory	Acceptable
Pump Two Overload	DI	Mandatory	Modifications Required - Overload and Leak/Temp common
Pump Two Motor Temp/Leakage	DI	Mandatory Where Present	Modifications Required - Overload and Leak/Temp common
Pump Two Start	DO	Mandatory	Acceptable (start/stop controlled by maintained contact - no separate stop output)
Pump Two Stop	DO	Mandatory	Modificaitons Required - circuit could be rewired to support pulse to start and pulse to stop
Pump Two Speed Setpoint	AO	Mandatory Where There Is A VFD	Not Present
Pump Two Speed Current Value	AI	Mandatory Where There Is A VFD	Not Present
Pump Two VFD Fault	DI	Mandatory Where There Is A VFD	Not Present
Pump Two Emergency Stop Push Button	DI	If Available	Not Present
Pump Two VFD/Soft Start Bypass Mode Status	DI	Mandatory Where A Bypass Contactor Exists	Not Present
Analogue Signals			
Wet Well #1 Level Input	AI	Mandatory	Acceptable
Wet Well #2 Level Input	AI	Mandatory Where A Second Wet Well Exists	Not Present
Diesel Tank Level	AI	Where Applicable	Not Present
Pump 1 Amperage Reading	AI	Mandatory	Modification Required - requires CT
Pump 2 Amperage Reading	AI	Mandatory	Modification Required - requires CT
Station Discharge Flow	AI	If Available	Not Present
Station Discharge Pressure	AI	If Available	Not Present
Station Bypass Flow	AI	If Available	Not Present

Regional Municipality Of Halton

SCADA I/O List

SWWW PS#19 (Navy Street)

Description	IO Type	Regional Requirement	Comments

Notes

The Following General Notes And Observations To Be Recorded	Recorded Findings
Photographs Of Facility (Inside And Out)	Yes
Prospective Panel & Communications Equipment Location	PLC panel placement is Ok - no room for expansion and no room to install communications panel
Inventory All Relevant Instrumentation & Assets	Yes
Equipment Condition Assessment For RMOH Standards Compliance	yes
Explanation Of Required Modifications	Yes
Number Of Floats And Function Of Floats	1 Float - high level tied to PLC and pribusin
Pump Starter Type (For Each Pump - FVNR/Soft Starter/VFD or Combination	FVNR
Diesel Engine - Coupled Direct To Pump(s) Or Generator	no generator or ATS
Transfer Switch Ability To Test Standby Power Remotely	no generator or ATS
Number Of Wet Wells	1
Number Of Ultrasonic Level Instruments And Function	2 - 1 is primary level control; 2 is backup pump control
Current Transformer Ability To Be Installed On Each Pump Starter (To Measure Current Draw)	yes - requires expansion panel (flygt panel is full)
Practical Location For Flow Meter Installation	yes - in the drywell - plenty of pipe space
Practical Possibility Of Bypass Flow Measurement	no
Modifications To Instrumentation For SCADA Availability	station instrumentation is already tied to PLC

Other Observations PLC SLC/503 does not meet RMOH standard and should be upgraded to SLC 5/05 - program does not conform either DTAM local operator interface does not meet RMOH standards standy power is only available by portable generator	

HYDRAULIC ASSESSMENT

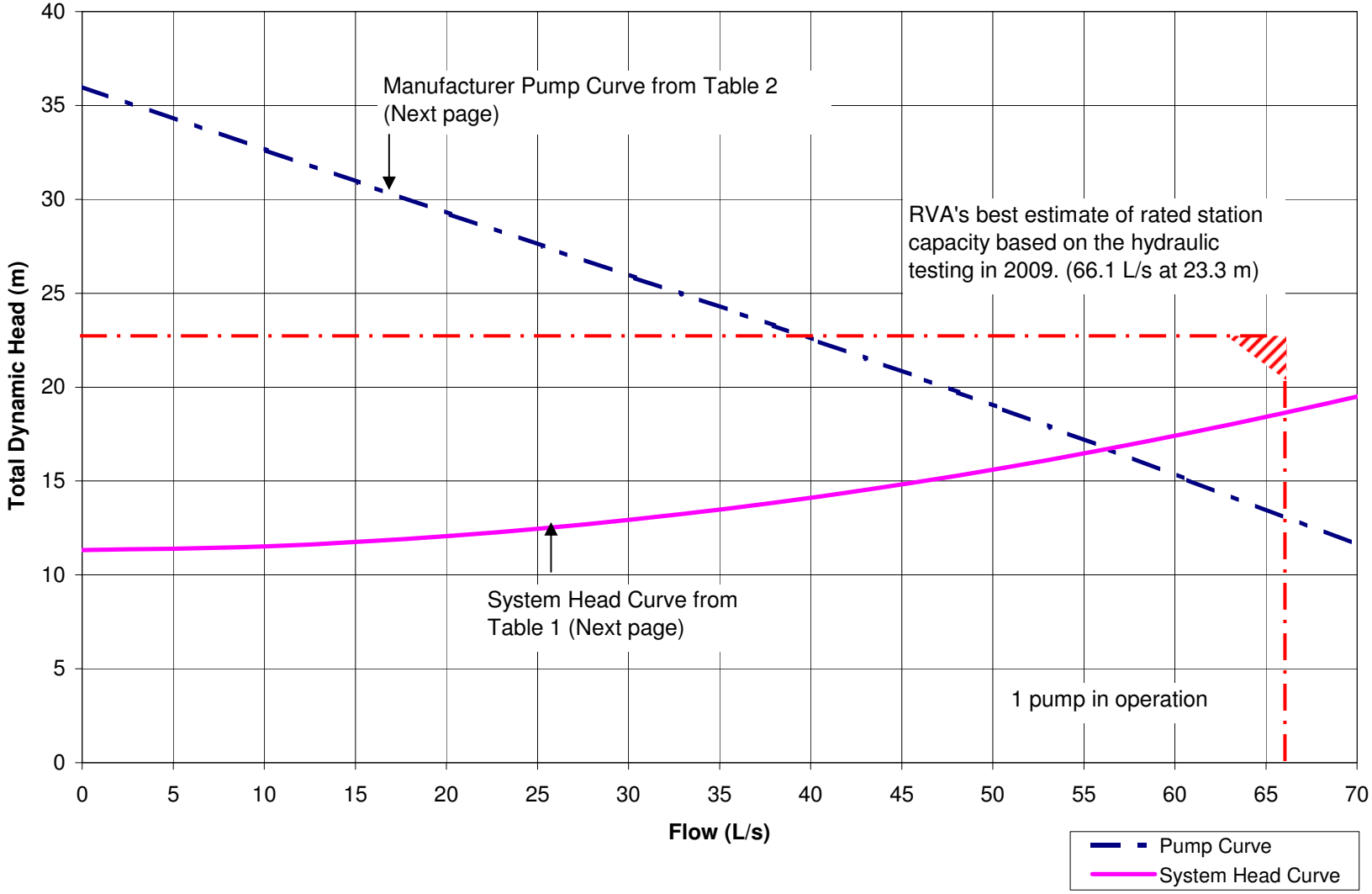
HALTON REGION SPS HYDRAULIC ASSESSMENT

OAKVILLE SOUTHWEST WWTP DRAINAGE AREA

RMoH ID # 18 - NAVY STREET WASTEWATER PUMPING STATION

SYSTEM HEAD CURVE

C=120 (From Earth-Tech Model)
LWL=74.40 m (From Region's Drawing-O-12211)
Estimated Rated Station Capacity=52.1 L/s
Future Flow=69.16 L/s
(Based on data provided by The Region)



OAKVILLE SOUTHWEST WWTP DRAINAGE AREA

RMoH ID # 18 - NAVY STREET WASTEWATER PUMPING STATION

Table 1: System Head Curve Output by InfoWater Model

Flow - Q (L/s)	Head (m)
0	11.32
10.13	11.52
20.25	12.08
30.38	12.97
40.51	14.18
50.63	15.71
60.76	17.55
70.89	19.69
81.01	22.13
91.14	24.87
101.27	27.9

Table 2: Characteristics of Individual Pumps (Pumps 1 and 2)*

Flow - Q (L/s)	Head (m)
0	36
45	20.9
80	7.9

* Based on information contained in manufacturer's pump curve provided by The Region.

RMOH_ID #18 Navy St. 18 PDF ✓ - OK

FLYGT

PERFORMANCE CURVE

PRODUCT	TYPE
CT3152.181	HT

DATE	PROJECT	CURVE NO	ISSUE
2002-05-21		63-454-00-5350	2

	1/1-LOAD	3/4-LOAD	1/2-LOAD
MOTOR COS PHI	0.83	0.79	0.68
MOTOR EFFICIENCY	87.0 %	87.5 %	86.0 %
GEAR EFFICIENCY	---	---	---

MOTOR SHAFT POWER	14.9	kW
STARTING CURRENT ...	121	A
RATED CURRENT ...	20	A
RATED SPEED	1755	rpm
TOT.MOM.OF INERTIA ...	0.24	kgm2
NO. OF BLADES	1	

IMPELLER DIAMETER: 275 mm

MOTORTYPE	STATOR	REV
25-15-4AA	52D	10

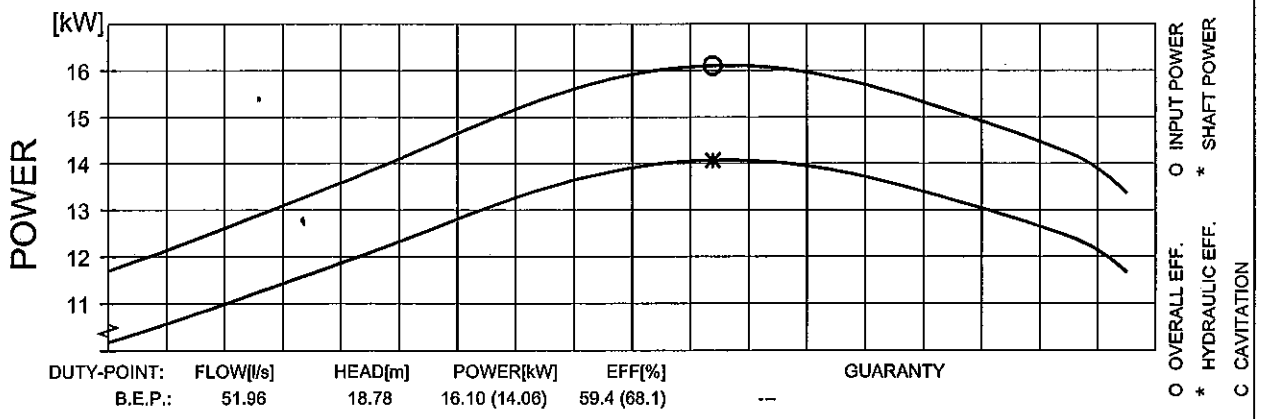
FREQ.	PHASES	VOLTAGE	POLES
60 Hz	3	600 V	4

GEARTYPE	RATIO
---	---

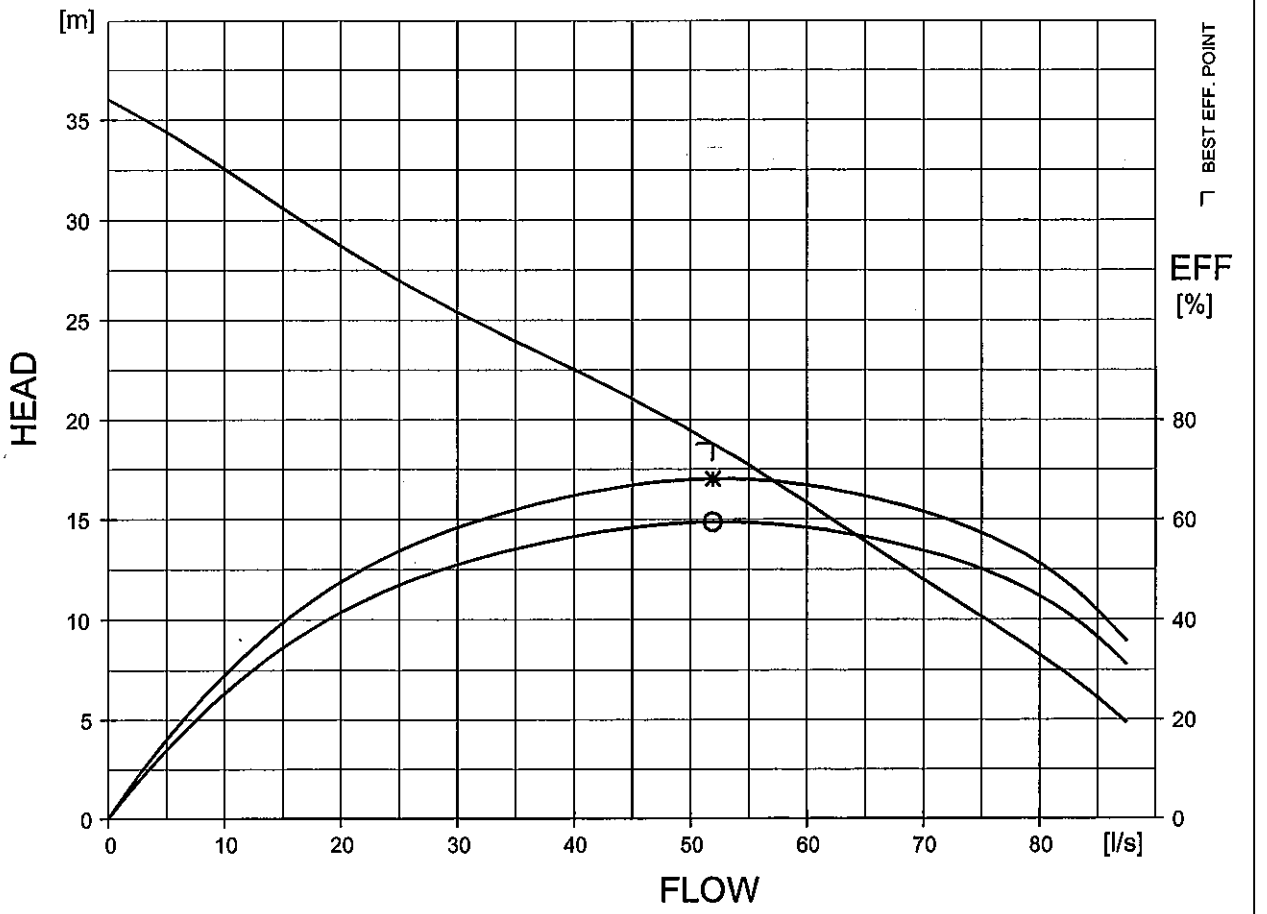
COMMENTS

INLET/OUTLET: 125/150 mm

IMP. THROUGHLET: 76 mm



DUTY-POINT:	FLOW[l/s]	HEAD[m]	POWER[kW]	EFF[%]	GUARANTY
B.E.P.:	51.96	18.78	16.10 (14.06)	59.4 (68.1)	--



FLYPS 2.0 (1118)

Performance with clear water and rating data at 40 °C

FLYGT CURVE

FLYGT

Navy St (E-1) (W-19) #34
P2

TEST REPORT

PRODUCT

Serial No.		Performance curve No.	Motor module/type	Voltage (V)
3152.181	9810279	63- 454-00-5350	157	600

Base module	Impellor No.	Gear type	Gear ratio	Imp.diam/Blade angle	Water temp °C
051	395 72 00				17

TEST RESULTS

Pump total head H (m)	Volume rate of flow Q (l/s)	Motor input power P (kW)	Voltage U (V)	Current I (A)	Overall efficiency η (%)
36.15	0.00	12.87	600	16.2	0.00
30.95	14.02	13.15	600	16.5	32.37
26.51	26.45	14.34	600	17.6	47.97
21.95	41.59	15.98	599	19.0	56.05
17.88	53.83	16.53	599	19.6	57.11
14.24	63.69	15.86	599	19.0	56.09
8.52	78.15	14.62	599	17.8	44.68

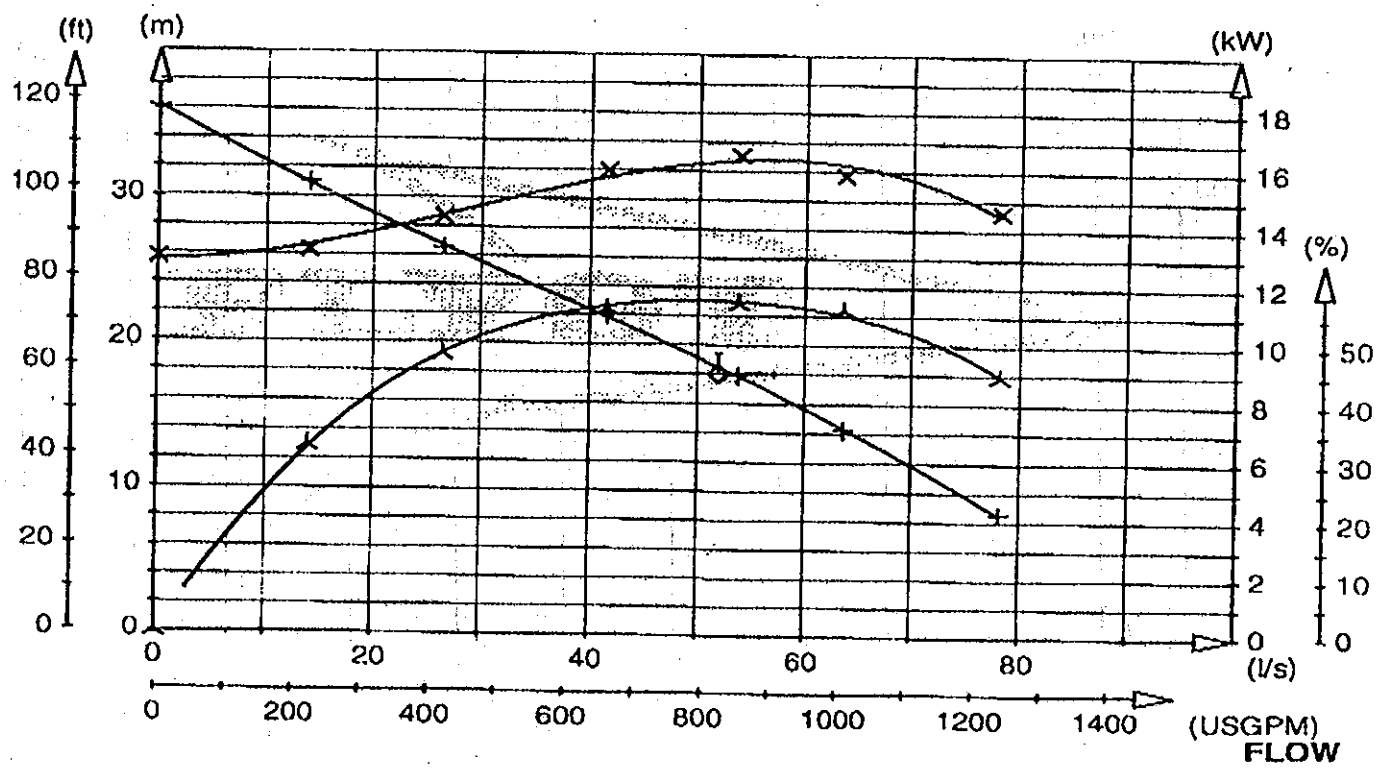
Accepted after	Test facility	Test date	Time	Chief tester
HI	LINDAS Sweden Q1	98-02-04	14:11	1358

311241/01

PLOTTED TEST RESULTS

Measured point : + = Q/H, × = Q/P Duty point : ◇ = Q/H, □ = Q/P, △ = Q/ETA overall Calculated point : 人 = Q/ETA overall

1



CONFIRMATION OF ASSET INVENTORY AS OF 2008-10-24

R.V. Anderson Associates Limited
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THE REGION OF HALTON

PS CAPITAL NEEDS ASSESSMENT AND MASTER PLAN CLASS ENVIRONMENTAL ASSESSMENT STUDY

OAKVILLE SOUTHWEST WWTP DRAINAGE AREA CONFIRMATION OF ASSET INVENTORY BY FIELD INSPECTION

ASSET INVENTORY LIST PROVIDED BY THE REGION OF HALTON									CONFIRMATION OF INVENTORY LIST BY RVA FIELD INSPECTION		
RMOH ID	Object Type	Equipment Category	Equipment	Description	Function Location	Description	Manufacturer	Model number	Checked	Comments on Equipment	General Comments
18	PM162	M	201529	PUMP #1 SUMP	H-P-WW-ES-PS-PS01	Navy Street Pump Station	LITTLE GIANT	6E-CIA-SFS	Yes		Oct 24/08
	PI235	I	201531	TRANSMITTER LVL.#1- WET WELL (PRIM.CONT)	H-P-WW-ES-PS-PS01	Navy Street Pump Station	MILLTRONICS	MULTIRANGER PLUS	Yes		
	PI235	I	211065	TRANSMITTER LEVEL #2-WET WELL (BKUP.CTR)	H-P-WW-ES-PS-PS01	Navy Street Pump Station	MILLTRONICS	MULTIRANGER PLUS	Yes		Extremely high inflow (operator)
	PM162	M	216152	PUMP #2 - SUMP	H-P-WW-ES-PS-PS01	Navy Street Pump Station	FLYGT	4610.410.0650103			Small wet well limited retention time
	PI235	I	217299	NEWTRANSMIT ENVIRO RANGER 500 NAVY ST	H-P-WW-ES-PS-PS01	Navy Street Pump Station	SIEMENS	7 ML500 13AA11AA 2	Yes		No issues with running pumps manual or surcharging wet well
	PM125	M	201519	CRANE #1	H-P-WW-ES-PS-PS01-CS-CRAN	Cranes - Navy St.	JET	L-90	Yes		Infill / flush water available
	PH050	H	201520	FAN EXHAUST #1 - DRY WELL	H-P-WW-ES-PS-PS01-CS-HVAC-FAN	Ventilation Fans - Navy St.	CANADIAN BLOWER	DBV5	Yes		Heavy grease scum accumulations
	PH050	H	201522	FAN EXHAUST #2 - WET WELL	H-P-WW-ES-PS-PS01-CS-HVAC-FAN	Ventilation Fans - Navy St.	CANADIAN BLOWER	DBV5	Yes		Check Milltronics for calibration date
	PH050	H	211066	FAN EXHAUST #3 - DRY WELL	H-P-WW-ES-PS-PS01-CS-HVAC-FAN	Ventilation Fans - Navy St.	LEADER FAN IND. LTD.	P12-1	Yes		
	PH046	H	211067	HEATER UNIT #1 - DRY WELL	H-P-WW-ES-PS-PS01-CS-HVAC-HTG	Heating - Navy St.	OUELLET CANADA INC.	N/A	Yes		
	PH046	H	211068	HEATER UNIT #2 - WET WELL	H-P-WW-ES-PS-PS01-CS-HVAC-HTG	Heating - Navy St.	OUELLET CANADA INC.	OAX03038-4647-1007	Yes		
	PE075	E	211069	TRANSFORMER #1 - 3 PHASE	H-P-WW-ES-PS-PS01-CS-HYDR	Hydro - Navy St.	REX MANUFACTURER	BC15JM	Yes		
	PI115	I	215103	PLC #1 - NAVY ST. - E01RT01	H-P-WW-ES-PS-PS01-CS-SCDA-PLC	PLC'S - Navy St. P.S.	ALLEN BRADLEY	SLC 5/03	Yes		
	PI114	I	216514	UP#1 - NAVEY ST	H-P-WW-ES-PS-PS01-CS-SCDA-UPS	UPS#1 - NAVEY ST	POWER WARE	PW 9120 700	Yes		
	PM290	M	211070	BACKFLOW PREVENTER #1	H-P-WW-ES-PS-PS01-CS-WATR-BFP	Back Flow Prevention - Navy St.	WATTS	N/A	Yes		
	PM160	M	201524	PUMP #1 SEWAGE LIFT	H-P-WW-ES-PS-PS01-LP-SLP1	Sewage Lift Pump #1 - Navy St.	FLYGT	3152	Yes	20 hp 600v	
	PM320	M	204653	VALVE CHECK SEWAGE LIFT PUMP #1	H-P-WW-ES-PS-PS01-LP-SLP1	Sewage Lift Pump #1 - Navy St.	VALMATIC	SERIES 500 SWINGFLEX	Yes		
	PM375	M	211071	VALVE INLET SEWAGE LIFT PUMP #1	H-P-WW-ES-PS-PS01-LP-SLP1	Sewage Lift Pump #1 - Navy St.	STAFSJO	MPL15	Yes		
	PM375	M	211072	VALVE DISCHARGE SEWAGE LIFT PUMP #1	H-P-WW-ES-PS-PS01-LP-SLP1	Sewage Lift Pump #1 - Navy St.	STAFSJO	MPL15	Yes		
	PM160	M	201526	PUMP #2 SEWAGE LIFT	H-P-WW-ES-PS-PS01-LP-SLP2	Sewage Lift Pump #2 - Navy St.	FLYGT	3152	Yes		
	PM320	M	201527	VALVE CHECK SEWAGE LIFT PUMP #2	H-P-WW-ES-PS-PS01-LP-SLP2	Sewage Lift Pump #2 - Navy St.	VALMATIC	SERIES 500 SWINGFLEX	Yes		
	PM375	M	211073	VALVE INLET SEWAGE LIFT PUMP #2	H-P-WW-ES-PS-PS01-LP-SLP2	Sewage Lift Pump #2 - Navy St.	STAFSJO	N/A	Yes		
	PM375	M	211074	VALVE DISCHARGE SEWAGE LIFT PUMP #2	H-P-WW-ES-PS-PS01-LP-SLP2	Sewage Lift Pump #2 - Navy St.	STAFSJO	MPL15	Yes		
				Isolation valve on forcemain		Navy Street Pump Station	STAFSJO		Yes		
				Forcemain drain valve		Navy Street Pump Station			Yes		

PHOTOS

Oakville Southwest WWTP Drainage Area
Navy Street Wastewater Pumping Station
Process

Photo 1
Pump House at Grade

Photo 2
Wet Well

Photo 3
Wet - Well Access Room

Photo 4
Dry Well

Photo 5
Building Structure and Location

Photo 6
Building Structure and Location

Photo 7
Interior Painting in the Dry Well Access Room

Photo 8
Interior Painting in the Dry Well Access Room

Photo 9
Interior Painting in the Wet – Well Access Room

Photo 10
Fire/Smoke/Heat Detection Unit

Photo 11
Outside Lighting

Photo 12
Dry Well Pump Floor Area - Air Supply Fan

Photo 13
Above Ground Station Room - Air Ventilation Unit

Photo 14
Pump and Suction Piping

Photo 15
Pump and Suction Piping

Photo 16
Pump and Suction Piping

Photo 17
Pump and Suction Piping

Photo 18
Wet – Well Mechanical Ventilation

Photo 19
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Photo 20
Two (2) Submersible Pumps in the Dry Well

Photo 21
Submersible Pump

Photo 22
Submersible Pump

Photo 23
Sump Pump

Oakville Southwest WWTP Drainage Area
Navy Street Wastewater Pumping Station
Electrical

Photo 25
Level Transmitter

Photo 26
Level Transmitter (Back-Up)

Photo 27
Main Service Panel

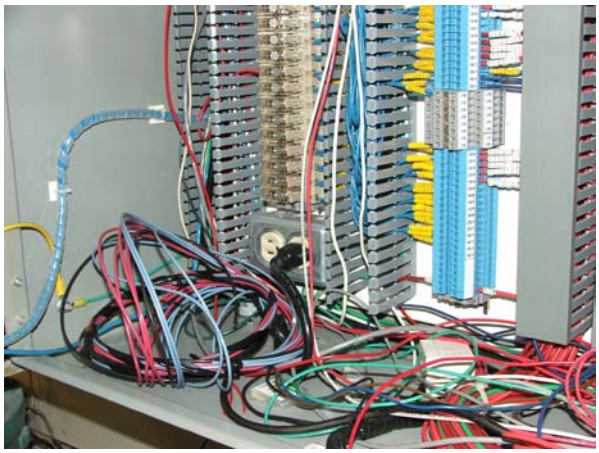

Photo 28
Power Supply Wiring

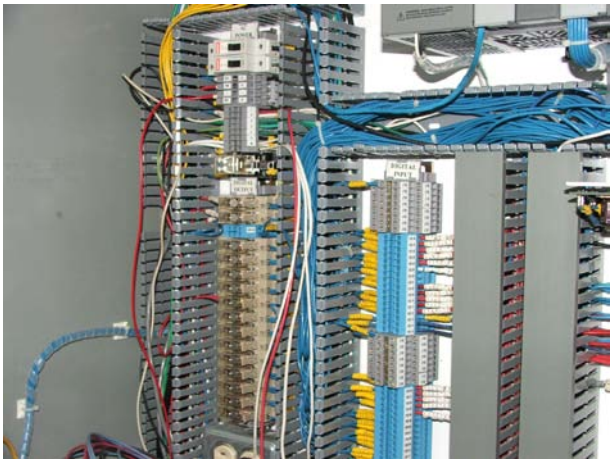

Photo 29
Power Supply Wiring

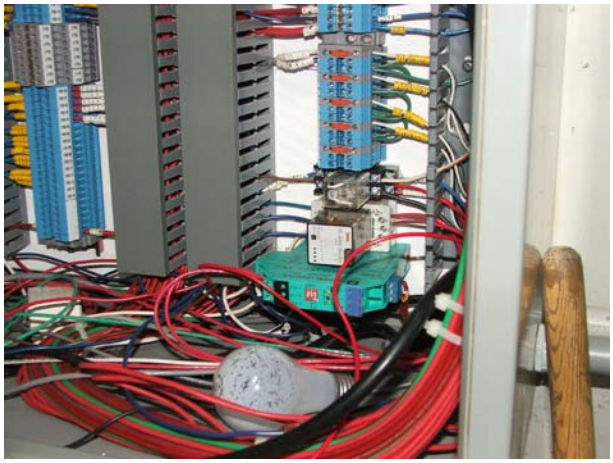

Photo 30
Power Supply Wiring

Photo 31
Overflow Float

Photo 32

Photo 33

Photo 34

Photo 35

CONDITION ASSESSMENT REPORT

WATER STREET WASTEWATER PUMPING STATION (W-13)

130 Water Street, Oakville South West

RMOH-ID 7

March 2010

R.V. Anderson Associates Limited
engineering · environment · infrastructure

CANADA'S 50 BEST MANAGED COMPANIES

CONDITION ASSESSMENT REPORT

Inspection Date: September 30, 2008

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CONDITION ASSESSMENT

THE REGIONAL MUNICIPALITY OF HALTON

PUMPING STATION INSPECTION FINDINGS- 2008

AREA: Oakville South-West **TYPE**: Prefabricated **MAKE:** S&L
STATION: Water Street Wastewater Pumping Station
ADDRESS: 130 Water Street **BUILT:** 1967
MMIS: W13 **NORTH:** 43 24 40 **SERVICE:** 600 V-3 ph
RMOHID: 07 **WEST:** 79 40 20 **GENSET:** N/A
PUMPS: 2 S&L 4.6 hp
FIRM STATION CAPACITY (L/s): 20 **CONTROLS:** Controlotron; No SCADA

BUILDING AND PROCESS STRUCTURAL

The pumping station is a steel "pre-fabricated" underground chamber with an adjacent wet well nearby (Photo 1). The station has no attached GenSet or associated above ground buildings with it.

Building Structural
The building structural component consists of a circular steel shaft that provides access via a ships ladder to an underground circular chamber in which pumps, discharge piping, valves and controls are located (Photo 2). The access shaft rises approximately 1 meter above grade and is closed with a lockable hinged lid (Photo 3). The true condition of the structural shell could not be assessed accurately since 50% of it is buried and is 41 years old. The inside of the access shaft is in good condition with no rusting (Photo 4). The chamber floor is scaling and it should be cleaned and re-painted (Photo 5). It is recommended that new cathodic protection be installed in order to extend the service life of the shell. It is not known whether rust protection of the steel shell in the form of sacrificial anodes is still present and active at this site.

Process Structural
The process structural components consist of 2 adjacent wet wells; 1 overflow control chamber and 1 collection chamber which collect the sewage from the nearby residential community and, the piping to the dry well where the pumps are located (Photos 6 and 7). The wet wells are both flooded type wells with manholes and were reviewed from grade only (Photos 8 and 9).

BUILDING ARCHITECTURAL

There is no above ground attached pumping station building at this site.

BUILDING SERVICES

The building services present in the underground pumping chamber include a portable type heater, dehumidifier and sump pump (Photos 10 through 12). These units are of the disposable variety, are old and should be checked for operational efficiency and replaced if found inadequate. The space ventilation fan is very small and weak and should be replaced on a priority basis (Photo 13). It is recommended to install a fire-extinguisher.

SITE WORKS

The pumping station site is located off the side of the road; is situated in the boulevard area and partially hidden by surrounding shrubs (Photo 1). The site is open to pedestrian traffic and it is recommended that the pumping station site be protected with fencing and site lighting as a measure of upgrading security.

PROCESS PIPING

Sewage flows by gravity into the wet well and further by gravity to the pumps in the dry well pump chamber. The pumps combine into a single header exiting the shell approx. 1.5 m below grade connecting to a sewer outside the station (Photo 14). The process piping is of the same vintage as the station. No immediate concerns with regard to the condition of the piping and valves were identified. The shut-off valves have been replaced in recent years. On the basis of age it is recommended that the piping be replaced since significant rusting may be present in the piping affecting the flow efficiency of the system.

PROCESS MECHANICAL

Process mechanical for the station includes the sewage pumps of the vertical-centrifugal design (Photos 15 and 16). Although performance is said to be adequate, both pumps are old and date back to the original installation of the station. In view of the age of the station, it is recommended the pumps be replaced with units with upgraded design and operational efficiency.

PROCESS ELECTRICAL

The Process electrical components include a main service panel in the underground chamber, supplied from a pole mounted transformer that provides power to the pumps, houses the process controls and housekeeping power to the building services units (Photo 17). Power supply wiring, conduit, lighting and distribution equipment is of the same vintage as the station, is deteriorated, and therefore recommended to be replaced and upgraded and installed in a new cabinet above grade (Photos 18 through 24). In particular, new motor starters are required for the pumps.

PROCESS INSTRUMENTATION AND SCADA

The process instrumentation includes basic level control functions that provide control of pump operation and alarm status. Level control units and associated equipment is ageing and upgrading electrical equipment and controls is highly recommended (Photos 25 and 26). The station is not connected to central control with SCADA capability which is recommended for future station upgrading.

SCADA ASSESSMENT

OAKVILLE SOUTHWEST WWTP DRAINAGE AREA
WATER STREET PUMPING STATION

SWWW-PS13 – 130 Water Street

(RMOH ID: 7)

General

The Station is a prefabricated type pumping station with one wet well. The date of initial construction is 1967. There is considerable rust on well metal surfaces and in the electrical and motor control panels.

The system uses two pumps to control the level in the single well. The wet well is equipped with one High Level float alarm and a level transmitter to monitor and control the wet well level. A remote alarm system (Pribusin) sends back a high level alarm to the main station over the telephone lines.

The Motor control systems panels are in adequate condition.

Field Devices Inventory to be connected to SCADA

In general, due to the age of the system, there is no PLC and the status of many of the devices and instruments are not available. The non-conforming Items are discussed below.

Generator

There is no generator.

Automatic Transfer Switch (ATS)

There is no ATS.

Phase Monitoring

There is currently no phase failure monitor installed at the facility. From the RMoH templates supplied this is not a requirement for the station, but could be added if desired. Phase monitoring allows for trouble shooting of issues surrounding phase imbalance, grounding, and failure.

UPS

There is no UPS.

PFR (Power Failure Relay)

The panel is not currently equipped with a power fail relay. The power fail relay is required to inform the PLC that the system is running on UPS power. This allows the PLC to alert the operations personnel and to take any automatic actions deemed necessary during a power failure.

PLC Processor

A Rockwell Automation CompactLogix processor is required to comply with RMoH standards. This would allow the system to be connected to the RMoH's existing SCADA network. New graphics, alarms and trends could then be configured at the main station to allow operations personnel to better monitor the station.

There is space above ground to install a control panel.

Loss of Echo

There is no PLC to wire a loss of echo (LOE) alarm. The LOE signal is required to monitor the existing Milltronics level transmitter. Ultrasonic level transmitters (such as the Milltronics unit installed in this location) use the echo of an ultrasonic pulse to determine the level of the effluent in the well. Trouble with the alignment of the transducer, damage, or other issues may prevent the system from "hearing" the echo. Each unit has an alarm contact which can be programmed to annunciate this condition to allow the operations personnel to dispatch maintenance to determine the problem and, if required, switch the system to[i] float control until the level transmitter is functioning again.

Float Status

Floats and float statuses are required to be monitored by a PLC system as per RMoH standards. Additional floats and wiring is required to add this status to a PLC.

Pump Motor Current Draw

The existing motor controls can accept current transformers (CT's) to monitor the current draw of the pump motor.

Pump Running Status

The existing pumps require auxiliary contacts to be installed to monitor the following conditions:

- Pump Control Mode (Remote / Local)
- Pump Motor Running
- Pump Motor Overload
- Motor Temperature / Leakage

Pump Control

The Start / Stop control circuits for the pump motors need to be modified to allow for the RMoH standard pulse start, pulse stop standard.

Remote Communications Equipment

There is an existing remote panel which houses the Pribusin alarm system. The addition of a PLC system allows for the connection to the existing RMoH SCADA network. Fibre (or other high speed communications connections) would need to be brought to the panel. The existing Pribusin system would be replaced by an Ethernet switch.

Eye-Wash Station

There is no Eye-Wash Station.

Conclusions and Preliminary Cost Estimate

The station is quite old and requires maintenance to tidy things up and to paint rusted surfaces. Due to its age there is no PLC and many of the status signals and instrumentation signals do not exist. It is estimated that to bring the station into compliance with the RMoH SCADA standards would cost $49,370. This cost estimate is +/- 20%. Some shut down of individual equipment and panels will be required to complete the work and needs to be coordinated with the RMoH operation personnel. The system is deemed to be a high priority installation.

The existing I/O data summary sheet is appended. The breakdown of the preliminary cost estimate for bringing the station into compliance with RMoH standards is provided in a separate document.

Regional Municipality Of Halton

SCADA I/O List

Wastewater SWWW-PS#13 (Water Street)

Station Address:	**130 Water St.**	Firm Cap Posted (L/s):	**21**	Assessment Date:	
Station ID:	**SWWW - PS13**	Build/Major Upgrade Year:	**1967**	Assessed By:	**Sirron**
RMOH ID:	**7**	Flow Monitoring:	**Testing Controlotron**		
Station Type:	**Below Grade - Metal**	Confined Space Requirement:	**Yes**		

Description	IO Type	Regional Requirement	Comments	
Building				
Control Panel Power Fail (PLC on UPS)	DI	Mandatory Where PLC Exists	Not Present	
UPS Fault	DI	Mandatory Where PLC Exists	Not Present	
Normal Power Phase Failure	DI	If Available	Not Present	
Station Low Temperature Alarm	DI	Mandatory Where A Building Exists	Not Present	
Station High Temperature Alarm	DI	Mandatory Where A Building Exists	Not Present	
Security Key Switch	DI	Mandatory Where A Building Exists	Not Present	
Door/Hatch Contacts	DI	Mandatory Where A Building Exists	Not Present	
Dry Well Flood Alarm	DI	Mandatory Where A Building Exists	MODIFICATION REQUIRED	REQUIRES AUX CONTACTS AND WIRING
Milltronics #1 Loss Of Echo	DI	Mandatory	MODIFICATION REQUIRED	REQUIRES AUX CONTACTS AND WIRING
Milltronics #2 Loss Of Echo	DI	Mandatory Where Present	Not Present	
Smoke Alarm	DI	Mandatory Where A Building Exists	Not Present	
Building Combustible Gas Detector - Failure	DI	Mandatory Where Present	Not Present	
Building Combustible Gas Detector - Warning	DI	Mandatory Where Present	Not Present	
Building Combustible Gas Detector - Alarm	DI	Mandatory Where Present	Not Present	
Ventilation System Local/Remote	DI	Mandatory Where Present	Not Present	
Ventilation System Running Status	DI	Mandatory Where Present	Not Present	
Emergency Shower/Eyewash Activated Alarm	DI	Mandatory Where One Exists	Not Present	
Diesel Containment Flood	DI	Mandatory Where There Is A Diesel Containment Area	Not Present	
Floats				
Pump One Stop Float	DI	Mandatory	Not Present	REQUIRES FLOAT, CONTACTS AND WIRING
Pump One Start Float	DI	Mandatory	Not Present	REQUIRES FLOAT, CONTACTS AND WIRING
Pump Two Stop Float	DI	Mandatory	Not Present	REQUIRES FLOAT, CONTACTS AND WIRING
Pump Two Start Float	DI	Mandatory	Not Present	REQUIRES FLOAT, CONTACTS AND WIRING
Wet Well High Level Float Alarm	DI	Mandatory	ACCEPTABLE	
Auto Transfer Switch				
Auto Transfer Switch - Test Position	DI	Where Applicable	Not Present	
Auto Transfer Switch - Off Position	DI	Where Applicable	Not Present	
Auto Transfer Switch - Auto Position	DI	Where Applicable	Not Present	
Auto Transfer Switch - Manual Position	DI	Where Applicable	Not Present	
Auto Transfer Switch - On Normal Power	DI	Where Applicable	Not Present	
Auto Transfer Switch - On Emergency Power	DI	Where Applicable	Not Present	
Generator Function Test	DO	Where Applicable	Not Present	

Regional Municipality Of Halton

SCADA I/O List

Wastewater SWWW-PS#13 (Water Street)

Description	IO Type	Regional Requirement	Comments	
Generator				
Generator Remote (Not In Auto)	DI	Where Applicable	Not Present	
Generator Running	DI	Where Applicable	Not Present	
Generator Pre-Alarm	DI	Where Applicable	Not Present	
Generator Failure Alarm	DI	Where Applicable	Not Present	
Generator Emergency Stop	DI	Where Applicable	Not Present	
Pumps				
Pump One Running Status	DI	Mandatory	MODIFICATION REQUIRED	REQUIRES AUX CONTACT AND WIRING
Pump One Control Mode Status	DI	Mandatory	MODIFICATION REQUIRED	REQUIRES AUX CONTACT AND WIRING
Pump One Overload	DI	Mandatory	MODIFICATION REQUIRED	OVERLOAD REQUIRES AUX CONTACT AND WIRING
Pump One Motor Temp/Leakage	DI	Where Applicable	Not Present	
Pump One Start	DO	Mandatory	MODIFICATION REQUIRED	REQUIRES AUX CONTACT AND WIRING
Pump One Stop	DO	Mandatory	MODIFICATION REQUIRED	REQUIRES AUX CONTACT AND WIRING
Pump One Speed Setpoint	AO	Mandatory Where There Is A VFD	Not Present	
Pump One Speed Current Value	AI	Mandatory Where There Is A VFD	Not Present	
Pump One VFD Fault	DI	Mandatory Where There Is A VFD	Not Present	
Pump One Emergency Stop Push Button	DI	Mandatory Where Present	Not Present	
Pump One VFD/Soft Start Bypass Mode Status	DI	Mandatory Where A Bypass Contactor Exists	Not Present	
Pump Two Running Status	DI	Mandatory	MODIFICATION REQUIRED	REQUIRES AUX CONTACT AND WIRING
Pump Two Control Mode Status	DI	Mandatory	MODIFICATION REQUIRED	REQUIRES AUX CONTACT AND WIRING
Pump Two Overload	DI	Mandatory	MODIFICATION REQUIRED	OVERLOAD REQUIRES AUX CONTACT AND WIRING
Pump Two Motor Temp/Leakage	DI	Mandatory Where Present	Not Present	
Pump Two Start	DO	Mandatory	MODIFICATION REQUIRED	REQUIRES AUX CONTACT AND WIRING
Pump Two Stop	DO	Mandatory	MODIFICATION REQUIRED	REQUIRES AUX CONTACT AND WIRING
Pump Two Speed Setpoint	AO	Mandatory Where There Is A VFD	Not Present	
Pump Two Speed Current Value	AI	Mandatory Where There Is A VFD	Not Present	
Pump Two VFD Fault	DI	Mandatory Where There Is A VFD	Not Present	
Pump Two Emergency Stop Push Button	DI	If Available	Not Present	
Pump Two VFD/Soft Start Bypass Mode Status	DI	Mandatory Where A Bypass Contactor Exists	Not Present	
Analogue Signals				
Wet Well #1 Level Input	AI	Mandatory	ACCPEPTABLE	
Wet Well #2 Level Input	AI	Mandatory Where A Second Wet Well Exists	Not Present	
Diesel Tank Level	AI	Where Applicable	Not Present	
Pump 1 Amperage Reading	AI	Mandatory	MODIFICATION REQUIRED	REQUIRES CURRENT TRANSMITTER AND WIRING
Pump 2 Amperage Reading	AI	Mandatory	MODIFICATION REQUIRED	REQUIRES CURRENT TRANSMITTER AND WIRING
Station Discharge Flow	AI	If Available	Not Present	
Station Discharge Pressure	AI	If Available	Not Present	
Station Bypass Flow	AI	If Available	Not Present	

Regional Municipality Of Halton

SCADA I/O List

Wastewater SWWW-PS#13 (Water Street)

Description	IO Type	Regional Requirement	Comments

Notes

The Following General Notes And Observations To Be Recorded	Recorded Findings
Photographs Of Facility (Inside And Out)	YES
Prospective Panel & Communications Equipment Location	NO SPACE FOR PLC PANEL - COMM PANEL LOCATION OK
Inventory All Relevant Instrumentation & Assets	YES
Equipment Condition Assessment For RMOH Standards Compliance	EQUIPMENT DOES NOT COMPLY TO RMOH STANDARDS
Explanation Of Required Modifications	YES
Number Of Floats And Function Of Floats	1 FLOAT - HIGH LEVEL
Pump Starter Type (For Each Pump - FVNR/Soft Starter/VFD or Combination	FVNR
Diesel Engine - Coupled Direct To Pump(s) Or Generator	NO GENERATOR EXISTS
Transfer Switch Ability To Test Standby Power Remotely	NO TRANSFER SWITCH EXISTS
Number Of Wet Wells	1
Number Of Ultrasonic Level Instruments And Function	1- LEVEL
Current Transformer Ability To Be Installed On Each Pump Starter (To Measure Current Draw)	CT CAN BE INSTALLED IN EXISTING PANEL
Practical Location For Flow Meter Installation	NO - INSUFFICENT PIPING AVAILABILITY
Practical Possibility Of Bypass Flow Measurement	NO - INSUFFICENT PIPING AVAILABILITY
Modifications To Instrumentation For SCADA Availability	ULTRASONICS REQUIRES LOE PROGRAMMING, AUX CONTACTS AND WIRING

Other Observations	
SPACE FOR CONTROL PANEL AVAILABLE ABOVE GROUND BACKUP FLOAT CONTROL REQUIRED	

HYDRAULIC ASSESSMENT

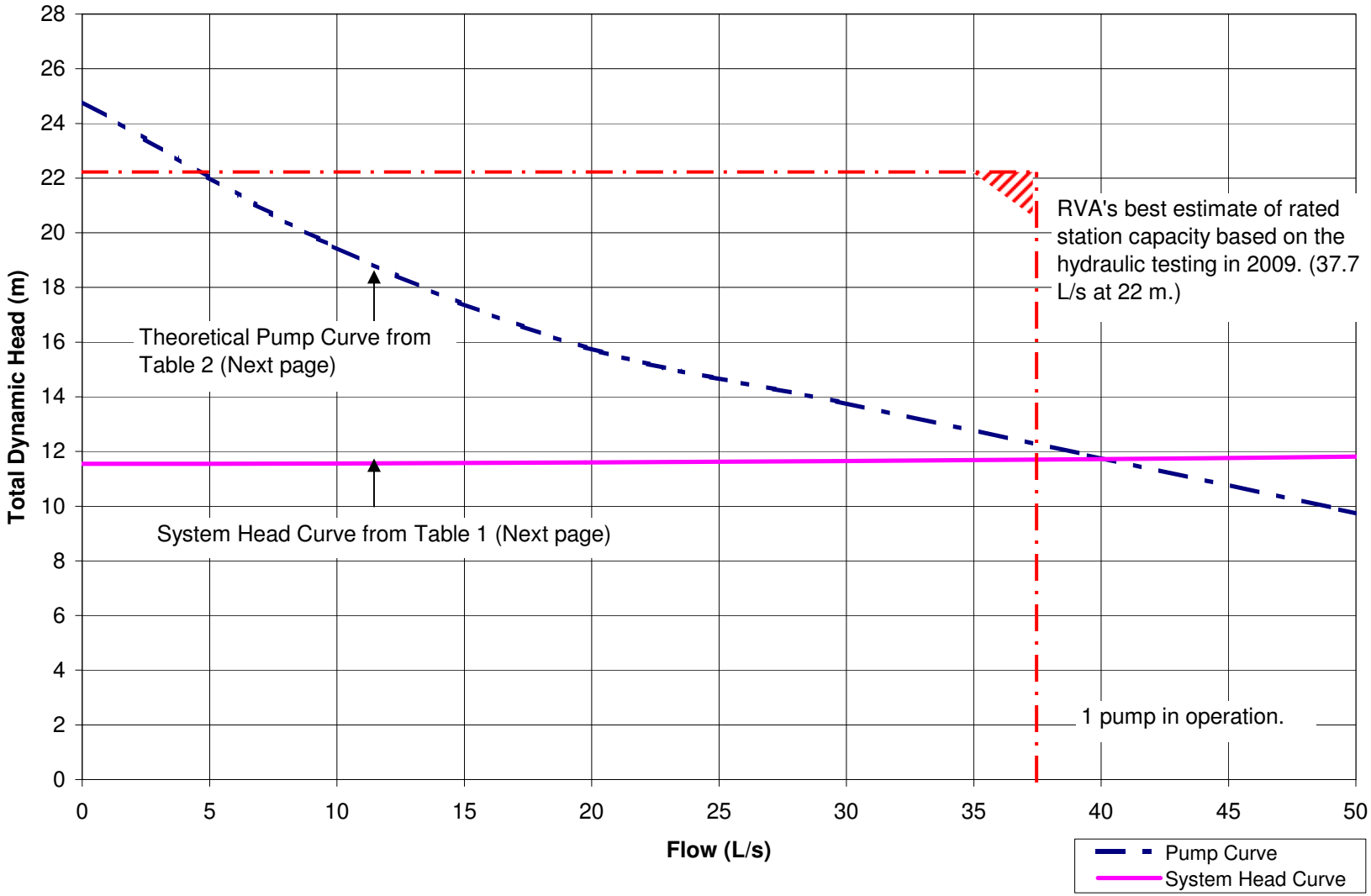
HALTON REGION SPS HYDRAULIC ASSESSMENT

OAKVILLE SOUTHWEST WWTP DRAINAGE AREA

RMoH ID # 7 - WATER STREET WASTEWATER PUMPING STATION

SYSTEM HEAD CURVE

C=120 (From Earth-Tech Model)
LWL=75.54 m (From Region's Drawing-O-0047)
Estimated Rated Station Capacity=37.7 L/s
Future Flow= 6.17 L/s
(Based on data provided by The Region)



OAKVILLE SOUTHWEST WWTP DRAINAGE AREA

RMoH ID # 7 - WATER STREET WASTEWATER PUMPING STATION

Table 1: System Head Curve Output by InfoWater Model

Flow - Q (L/s)	Head (m)
0	11.55
9.88	11.56
19.76	11.6
29.64	11.65
39.52	11.72
49.4	11.81
59.28	11.92
69.16	12.04
79.04	12.17
88.92	12.33
98.8	12.49

Table 2: Characteristics of Individual Pumps (Pumps 1 and 2)*

Flow - Q (L/s)	Head (m)
0	24.8
15	16.76
22.8	15.2

* Based on information contained in InfoWater Model dated 2008 provided by Earth-Tech.

CONFIRMATION OF ASSET INVENTORY AS OF 2008-09-30

R.V. Anderson Associates Limited
engineering · environment · infrastructure

THE REGION OF HALTON

PS CAPITAL NEEDS ASSESSMENT AND MASTER PLAN CLASS ENVIRONMENTAL ASSESSMENT STUDY

OAKVILLE SOUTHWEST WWTP DRAINAGE AREA CONFIRMATION OF ASSET INVENTORY BY FIELD INSPECTION

ASSET INVENTORY LIST PROVIDED BY THE REGION OF HALTON									CONFIRMATION OF INVENTORY LIST BY RVA FIELD INSPECTION		
RMOH ID	Object Type	Equipment Category	Equipment	Description	Function Location	Description	Manufacturer	Model number	Checked	Comments on Equipment	General Comments
7	PI235	I	204031	TRANSMITTER LEVEL #1 - WET WELL	H-P-WW-WS-PS-PS13	Water Street Pump Station	MILLTRONICS	MULTIRANGER PLUS	Yes		Sept 30/08
	PH050	H	210926	FAN EXHAUST #1	H-P-WW-WS-PS-PS13-CS-HVAC-FAN	Ventilation Fans - Water St. P.S.	N/A	N/A	Yes		Moderate inflow
	PM155	M	204025	PUMP #1 SEWAGE LIFT	H-P-WW-WS-PS-PS13-LP-SLP1	Sewage Lift Pump #1 - Water St. P.S.	SMITH AND LOVELESS	4B2A	Yes		Restrictive access to wet well
	PM320	M	204026	VALVE CHECK SEWAGE LIFT PUMP #1	H-P-WW-WS-PS-PS13-LP-SLP1	Sewage Lift Pump #1 - Water St. P.S.	SMITH AND LOVELESS	N/A	Yes		Milltronics calibrated May 24/02
	PE050	E	204027	MOTOR DRIVE SEWAGE LIFT PUMP #1	H-P-WW-WS-PS-PS13-LP-SLP1	Sewage Lift Pump #1 - Water St. P.S.	SMITH AND LOVELESS	TDR BPVZ	Yes		Check with D.Jones re: status of current transit time meter, it may be possible to use for testing purposes
	PM370	M	210927	VALVE INLET SEWAGE LIFT PUMP #1	H-P-WW-WS-PS-PS13-LP-SLP1	Sewage Lift Pump #1 - Water St. P.S.	TRUELINE	F8112-RS	Yes		No issues with wet wel surcharging or running pumps by hand
	PM370	M	210928	VALVE DISCHARGE SEWAGE LIFT PUMP #1	H-P-WW-WS-PS-PS13-LP-SLP1	Sewage Lift Pump #1 - Water St. P.S.	TRUELINE	F8112-NRS	Yes		
	PM155	M	204028	PUMP #2 SEWAGE LIFT	H-P-WW-WS-PS-PS13-LP-SLP2	Sewage Lift Pump #2 - Water St. P.S.	SMITH AND LOVELESS	4B2A	Yes		
	PM320	M	204029	VALVE CHECK SEWAGE LIFT PUMP #2	H-P-WW-WS-PS-PS13-LP-SLP2	Sewage Lift Pump #2 - Water St. P.S.	SMITH AND LOVELESS		Yes		
	PE050	E	204030	MOTOR DRIVE SEWAGE LIFT PUMP #2	H-P-WW-WS-PS-PS13-LP-SLP2	Sewage Lift Pump #2 - Water St. P.S.	SMITH AND LOVELESS	TDR BPVZ	Yes		
	PM370	M	210929	VALVE INLET SEWAGE LIFT PUMP #2	H-P-WW-WS-PS-PS13-LP-SLP2	Sewage Lift Pump #2 - Water St. P.S.	TRUELINE	F8112-RS	Yes		
	PM370	M	210930	VALVE DISCHARGE SEWAGE LIFT PUMP #2	H-P-WW-WS-PS-PS13-LP-SLP2	Sewage Lift Pump #2 - Water St. P.S.	TRUELINE	F8112-NRS	Yes		

PHOTOS

Oakville Southwest WWTP Drainage Area
Water Street Wastewater Pumping Station
Process

Photo 1
Prefabricated Chamber with Adjacent Wet Well

Photo 2
Circular Steel Structure with Ships Ladder

Photo 3
Hinged Lid

Photo 4
Inside of the Access Shaft

Photo 5
Valve Chamber Floor

Photo 6
Overflow Chamber

Photo 7
Wet Well

Photo 8
Pump and Suction Piping

Photo 9
Pump and Suction Piping

Photo 10
Portable Heater

Photo 11
Sump Pump

Photo 12
Discharge Header

Photo 14
Vertical – Centrifugal Pump

Photo 15
Vertical – Centrifugal Pump

Photo 17
Main Service Panel

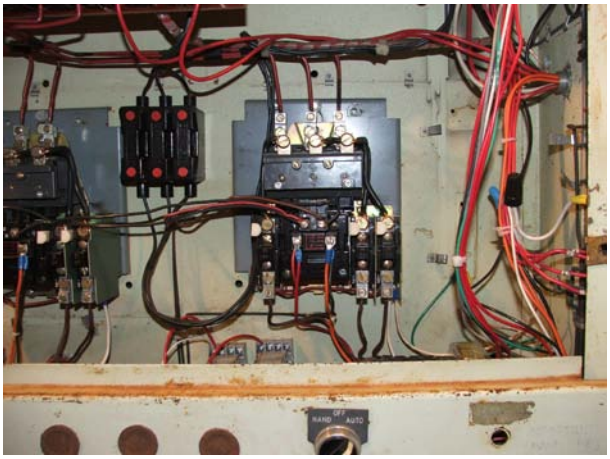


Photo 18
Power Supply Wiring

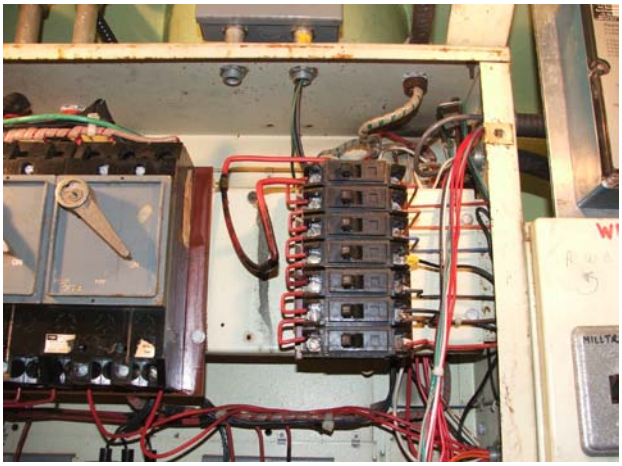


Photo 19
Power Supply Wiring

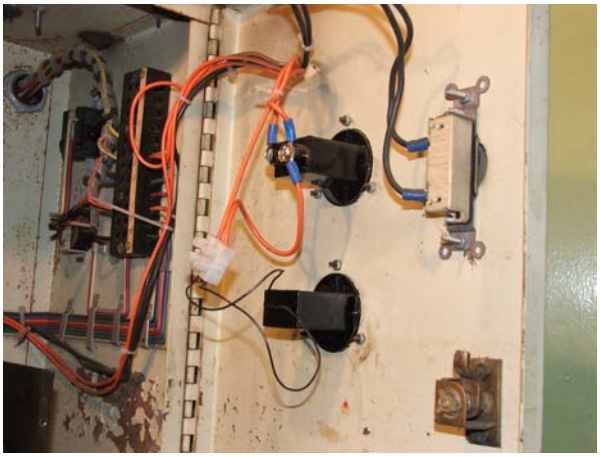


Photo 20
Power Supply Wiring

Photo 21
Power Supply Wiring

Photo 22
Lighting Equipment

Photo 23
Power Supply Conduit

Photo 24
Process Instrumentation - Level Transmitter

Photo 25
Process Instrumentation – Overflow Float